REF DOC 5
KNOTHE BRUCE ARCHITECTS
CONSTRUCTION DRAWINGS AND PROJECT MANUAL

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REF DOC 5 – KNOTHE BRUCE ARCHITECTS CONSTRUCTION DRAWINGS AND PROJECT MANUAL
TABLE OF CONTENTS

END OF SECTION

ROYSTER CROSSINGS

86 UNIT APARTMENT BUILDING ABOVE FIRST FLOOR
COMMERCIAL TENANT SPACE
521-523 GRAND OAK TRAIL, MADISON, WI

ABBREVIATIONS

@	AT
A.B.	ANCHOR BOLT
A/C	AIR CONDITIONER
ACCESS.	ACCESSIBLE
ACT	ACOUSTICAL CEILING TILE
ADJ.	ADJACENT
ADJ. R. & S.	ADJUSTABLE ROD AND SHELF
A.F.F.	ABOVE FINISH FLOOR
AL	ALUMINUM
ALT.	ALTERNATE
ALUM.	ALUMINUM
APPROX.	APPROXIMATE
B##	BASE CABINET
BD.	BOARD
BIT.	BITUMINOUS
BLDG.	BUILDING
BRG.	BEARING
CAB.	CABINET
CJ	CONTROL JOINT
CLG.	CEILING
CMU	CONCRETE MASONRY UNIT
COL.	COLUMN
COMN.	COMMUNICATION
CONT.	CONTINUOUS
CORR.	CORRIDOR
CPT	CARPET
CT	CERAMIC TILE
D	DRYER
DB##	DRAWER BASE CABINET
D.F.	DRINKING FOUNTAIN
DIA.	DIAMETER
DIM.	DIMENSION
DN	DOWN
D.S.	DOWN SPOUT
D.T.	DRAIN TILE
DW	DISHWASER
EA.	EACH
ELEC.	ELECTRIC
ELEV.	ELEVATION OR ELEVATOR
EJ	EXPANSION JOINT
EQ.	EQUAL
E.W.C.	ELECTRIC WATER COOLER
EXIST.	EXISTING
EXP.	EXPANSION
EXT.	EXTERIOR
F.E.	FIRE EXTINGUISHER
FEC	FIRE EXTINGUISHER CABINET
F.D.	FLOOR DRAIN
FIN.	FINISHED
FLR.	FLOOR
FNDN.	FOUNDATION
F.O.C.	FACE OF CONCRETE
F.O.M.	FACE OF MASONRY
F.O.S.	FACE OF STUD
F.R.P.	FIBERGLASS REINFORCED PANEL
FT.	FOOT OR FEET
FTG.	FOOTING
GA.	GAUGE
G.C.	GENERAL CONTRACTOR
G.T.	GIRDER TRUSS
G.W.B.	GYPSUM WALL BOARD
GYP.	GYPSUM
H.B.	HOSE BIB
HCW	HOLLOW CORE WOOD
HGT.	HEIGHT
H.M.	HOLLOW METAL
HORZ.	HORIZONTAL
HR	HOUR
HTG.	HEATING
HVAC	HEATING/VENTILATION/AIR CONDITIONING
IBC	INTERNATIONAL BUILDING CODE
IFC	INTERNATIONAL FIRE CODE
IMC	INTERNATIONAL MECHANICAL CODE
INSUL.	INSULATION
INT.	INTERIOR
INV.	INVERT
JT.	JOINT
LAV.	LAVATORY
LLH	LONG LEG HORIZONTAL
LLV	LONG LEG VERTICAL
LS##	LAZY SUSAN
LVP	LUXURY VINYL PLANK
LVT	LUXURY VINYL TILE
MATL.	MATERIAL
MAX.	MAXIMUM
MC	MEDICINE CABINET
MECH.	MECHANICAL
MFR.	MANUFACTURER(S)
MH.	MANHOLE
MIN.	MINIMUM
M.O.	MASONRY OPENING
MOD.	MODULE
M.R.	MOISTURE RESISTANT
MTL.	METAL
N.I.C.	NOT IN CONTRACT
N.T.S.	NOT TO SCALE
O.C.	ON CENTER
O.D.	OVERFLOW DRAIN
O.S.B.	ORIENTED STRAND BOARD
OPP.	OPPOSITE HAND
P.C.	PRECAST CONCRETE
P.D.F.	POWER DRIVEN FASTENER
PLBG.	PLUMBING
P.T.	PRESSURE TREATED
PLWD.	PLYWOOD
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
Q.T.	QUARRY TILE
###R	NUMBER OF STAIR RISERS
R.D.	ROOF DRAIN
REINF.	REINFORCING OR REINFORCED
REM.	REMOVABLE
REQ'D.	REQUIRED
R.O.	ROUGH OPENING
R. & S.	ROD AND SHELF
SB##	SINK BASE CABINET
SCW	SOLID CORE WOOD
SF	SQUARE FEET
SH.	SHELF OR SHELVES
SIM.	SIMILAR
S.M.	SHEET METAL
SPECS.	SPECIFICATIONS
SQ.	SQUARE
STD.	STANDARD
STL.	STEEL
STOR.	STORAGE
S.V.	SHEET VINYL FLOORING
##T	NUMBER OF STAIR TREADS
T&B	TOP AND BOTTOM
T&G	TONGUE AND GROOVE
T.B.	TOP OF BEAM
TBM	TRAFFIC BEARING MEMBRANE
T.O.A.	TOP OF COLUMN
T.O.CMU	TOP OF CMU
T.O.F.	TOP OF FOOTING
T.O.L.	TOP OF LEDGE
T.O.P.	TOP OF PIER
T.O.W.	TOP OF WALL
THRU.	THROUGH
TWF	THROUGH WALL FLASHING
TYP.	TYPICAL
UNEXC.	UNEXCAVATED
U.N.O.	UNLESS NOTED OTHERWISE
VB##	VANITY BASE CABINET
VCT	VINYL COMPOSITION TILE
VERT.	VERTICAL
VWC	VINYL WALL COVERING
W	WASHER
W##	WALL CABINET
WCC##	WALL CORNER CABINET
W/	WITH
WD.	WOOD
W/D	STACKED WASHER / DRYER
W.H.	WATER HEATER
W/O	WITHOUT
WP	WATERPROOF
WT	WEIGHT
W.W.F.	WIRE WELDED FABRIC

GRAPHIC SYMBOLS

NORTH ARROW

INTERIOR ELEVATIONS

DETAIL CALLOUT

SECTION CUT

EXTERIOR ELEVATION

COLUMN REFERENCE GRID

WALL TYPE

DOOR TAG

WINDOW TAG

ALUM. / WOOD WINDOW TAG

REVISION CLOUD & TAG

EXTERIAL FINISH MATERIAL TAG

PROJECT INFO

PROJECT: #1421 ROYSTER CROSSINGS
ADDRESS: 521-523 GRAND OAK TRL, MADISON, WI
WORK DESCRIPTION: 86 UNIT APARTMENT BUILDING ABOVE FIRST FLOOR
COMMERCIAL SPACE w/ BASEMENT PARKING

APPLICABLE CODES AND STANDARDS:
CITY OF MADISON ZONING CODE
SPS 361-366 WISCONSIN COMMERCIAL BUILDING CODE
INTERNATIONAL BUILDING CODE (IBC) 2009
NATIONAL FIRE PROTECTION ASSOCIATION NFPA 13 AND 13R
ICC/ANSI A117.1-2003

BUILDING SUMMARY:
4 STORIES ABOVE GRADE w/ 1 LEVEL UNDERGROUND PARKING:
- APARTMENT BUILDING, 3 STORY (2ND - 4TH):
  - GROUP R-2
  - VA CONSTRUCTION
  - SPRINKLERED PER NFPA 13R
- LIBRARY, 1 STORY (1ST):
  - GROUP A-3
  - IA CONSTRUCTION
  - SPRINKLERED PER NFPA 13
  - 2 HR SEPARATED USE TO R2
- COMMERCIAL SPACE, 1 STORY (1ST):
  - GROUP B/M/A-2
  - IA CONSTRUCTION
  - SPRINKLERED PER NFPA 13
  - 2 HR SEPARATED USE TO R-2
- BASEMENT VEHICLE & BICYCLE PARKING / STORAGE:
  - GROUP S-2
  - IA CONSTRUCTION
  - SPRINKLERED PER NFPA 13
  - 2 HR SEPARATED USE TO A-3/A-2/B/M

IMAGINARY PROPERTY LINES BETWEEN BUILDINGS ALLOWED TO TERMINATE AT SECOND FLOOR 3 HR HORIZONTAL SYSTEM ABOVE 1A (A-3/A-2/B/M)

BUILDING HEIGHT & AREAS:	
R-2 MODIFIED ALLOWABLE HEIGHT (VA) =	4 STORIES / 60 FEET
R-2 MODIFIED ALLOWABLE AREA (VA) =	19,044(W) / 19,488(E) SF
A-3/A-2/B/M MODIFIED ALLOWABLE AREA (IA) =	UNLIMITED
A-3/A-2/B/M MODIFIED ALLOWABLE HEIGHT (1A) =	UNLIMITED
S-2 MODIFIED ALLOWABLE AREA (1A) =	UNLIMITED
S-2 MODIFIED ALLOWABLE HEIGHT (1A) =	UNLIMITED
TOTAL BUILDING HEIGHT =	4 STORIES / 59 FEET

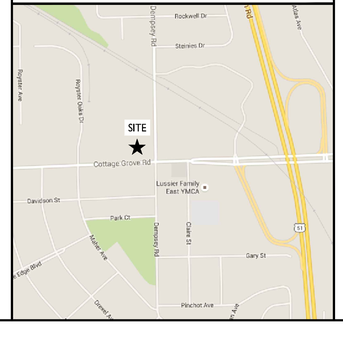
FLOOR AREAS:	
BASEMENT (S-2) =	44,730 SF
1ST FLOOR (A-3/A-2/B/M) =	43,832 SF
2ND FLOOR WEST (R-2) =	18,039 SF
2ND FLOOR EAST (R-2) =	18,440 SF
3RD FLOOR WEST (R-2) =	18,039 SF
3RD FLOOR EAST (R-2) =	17,023 SF
4TH FLOOR WEST (R-2) =	18,039 SF
4TH FLOOR EAST (R-2) =	17,023 SF
TOTAL AREA:	195,165 SF (INCL. BASEMENT)

FIRE RATINGS:

	VA	IA
STRUCTURAL FRAME =	1 HR	3 HR
EXTERIOR WALLS, BEARING =	1 HR	3 HR
INTERIOR BEARING WALLS =	1 HR	3 HR
FLOOR CONSTRUCTION =	1 HR	2 HR
ROOF CONSTRUCTION =	1 HR	1 HR
STAIR ENCLOSURES =	2 HR	2 HR
ELEVATOR SHAFT =	2 HR	2 HR
CORRIDOR WALLS =	1/2 HR MIN.	N/A
UNIT SEPARATIONS =	1 HR	N/A
FIRE WALL =	2 HR	N/A

ACCESSIBILITY:
TOTAL DWELLING UNITS = 86
TYPE A ACCESSIBLE UNITS (2%) = 2
ALL OTHER DWELLING UNITS TO BE TYPE B ACCESSIBLE
ACCESSIBLE STORAGE LOCKERS (5%) = 5
SEE SHEETS A-7.1 FOR ADDITIONAL REQUIREMENTS

VICINITY MAP



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Middleton, WI 53562
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E-mail: scottp@ruedebusch.com

STRUCTURAL ENGINEER:
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Phone: (608) 256-7307 x204
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Phone: (608) 836-7041
E-mail: rstrohmenger@brucecompany.com

SHEET INDEX

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Middleton, WI 53562

ISSUED
Issued for Bid: September 25, 2015
Revised Bid Sec: January 19, 2016
Issued For Plan Review: February 8, 2016
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Revised Set - May 23, 2018

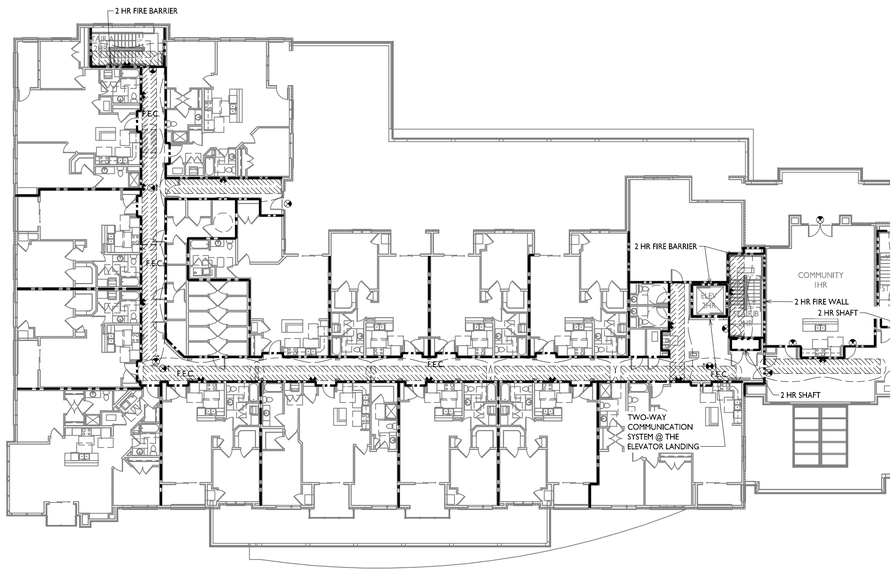
PROJECT TITLE
ROYSTER CROSSINGS

521-523 Grand Oak Trail
MADISON, WI

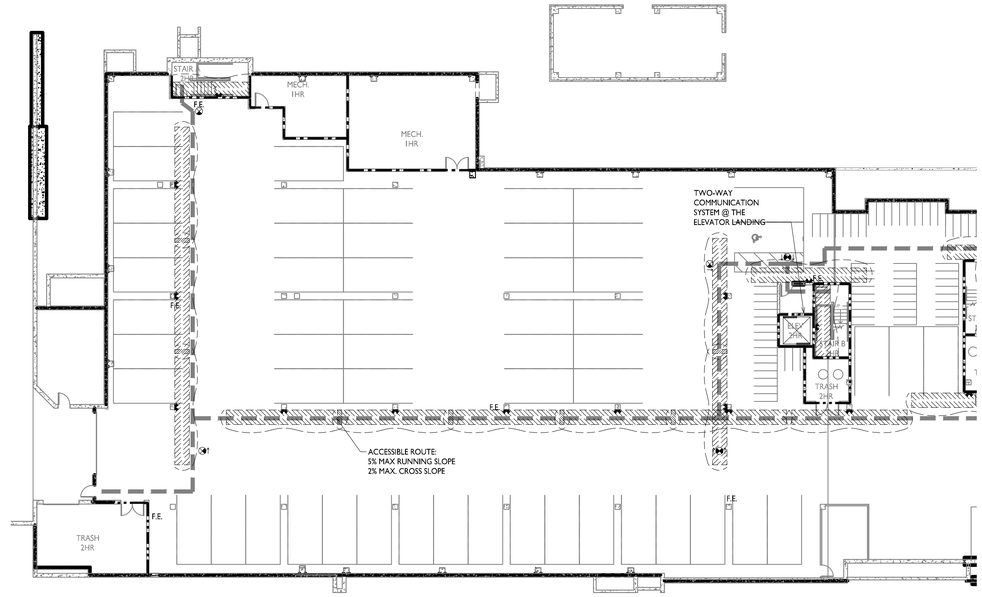
SHEET TITLE
Title Sheet

SHEET NUMBER
T-1.1

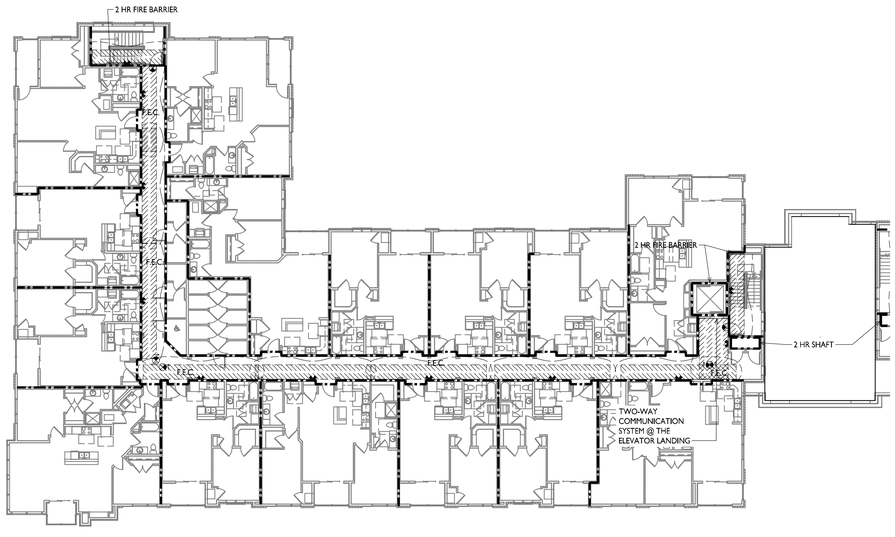
PROJECT NO. 1421



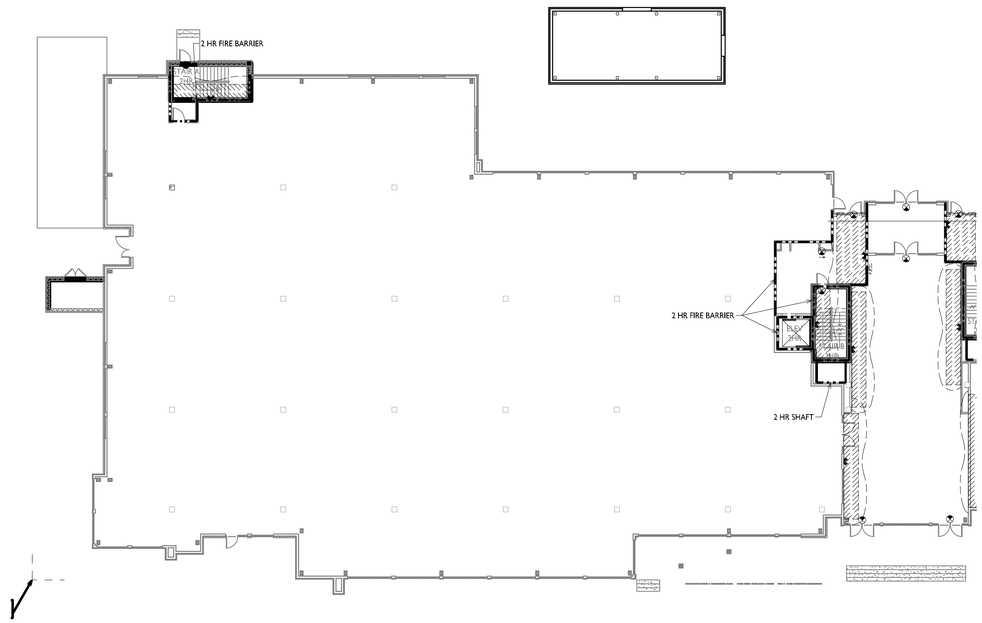
3 T-1.2 SECOND FLOOR LIFE SAFETY PLAN
1/16" = 1'-0"



1 T-1.2 BASEMENT LIFE SAFETY PLAN
1/16" = 1'-0"



4 T-1.2 THIRD/FOURTH FLOOR LIFE SAFETY PLAN
1/16" = 1'-0"



2 T-1.2 FIRST FLOOR LIFE SAFETY PLAN
1/16" = 1'-0"

LIFE SAFETY LEGEND

- 1 HR. RATED PARTITION
- 2 HR. RATED PARTITION
- TYP. EXIT SIGNS
- EXIT SIGN WITH EMERGENCY LIGHTING

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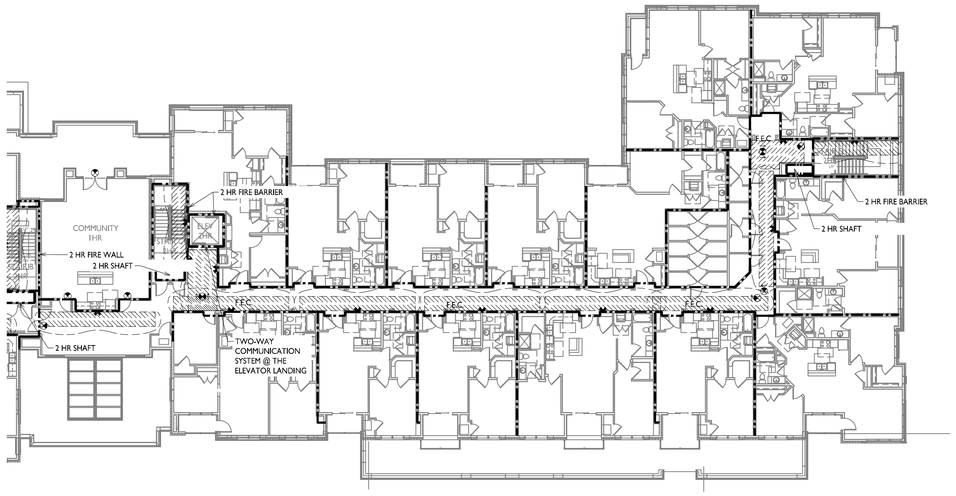
PROJECT TITLE
ROYSTER CROSSINGS

521-523 Grand Oak Trail
MADISON, WI

SHEET TITLE
Life Safety Plans - West Wing

SHEET NUMBER
T-1.2

PROJECT NO. 1421



3 T-1.3 SECOND FLOOR LIFE SAFETY PLAN
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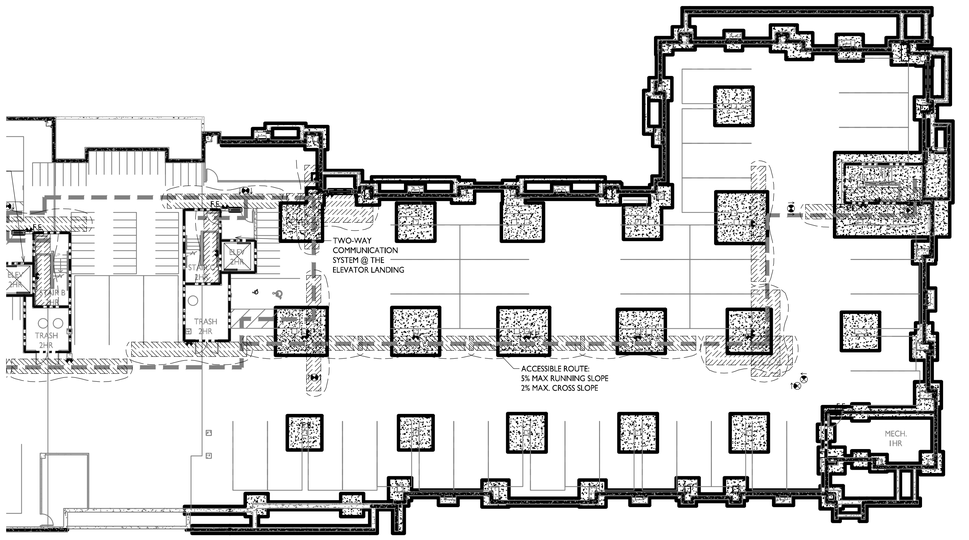

1 T-1.3 BASEMENT LIFE SAFETY PLAN
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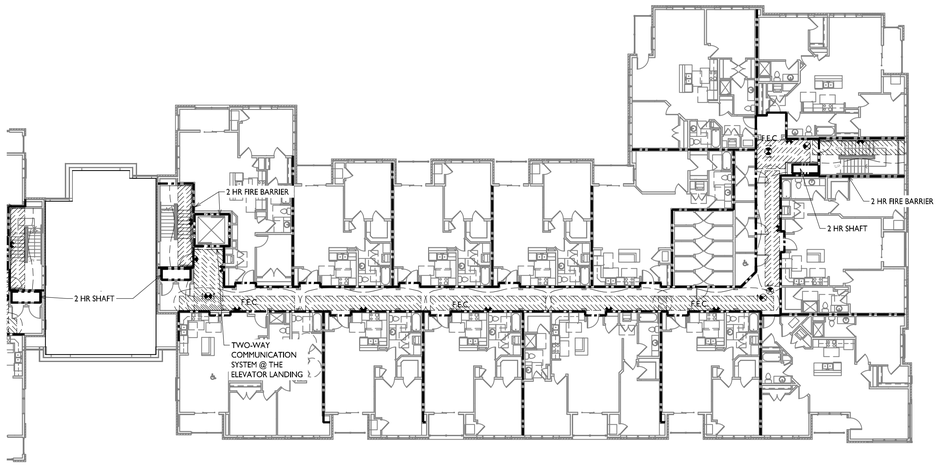
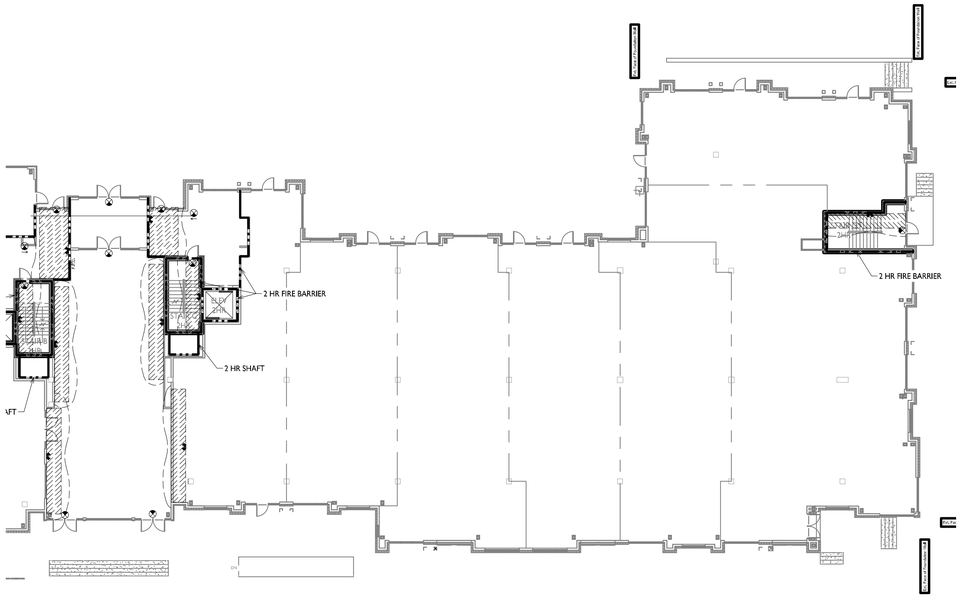


4 T-1.3 THIRD/FOURTH FLOOR LIFE SAFETY PLAN
1/16" = 1'-0"



2 T-1.3 FIRST FLOOR LIFE SAFETY PLAN
1/16" = 1'-0"

LIFE SAFETY LEGEND

- 1 HR. RATED PARTITION
- 2 HR. RATED PARTITION
- TYP. EXIT SIGNS
- EXIT SIGN WITH EMERGENCY LIGHTING

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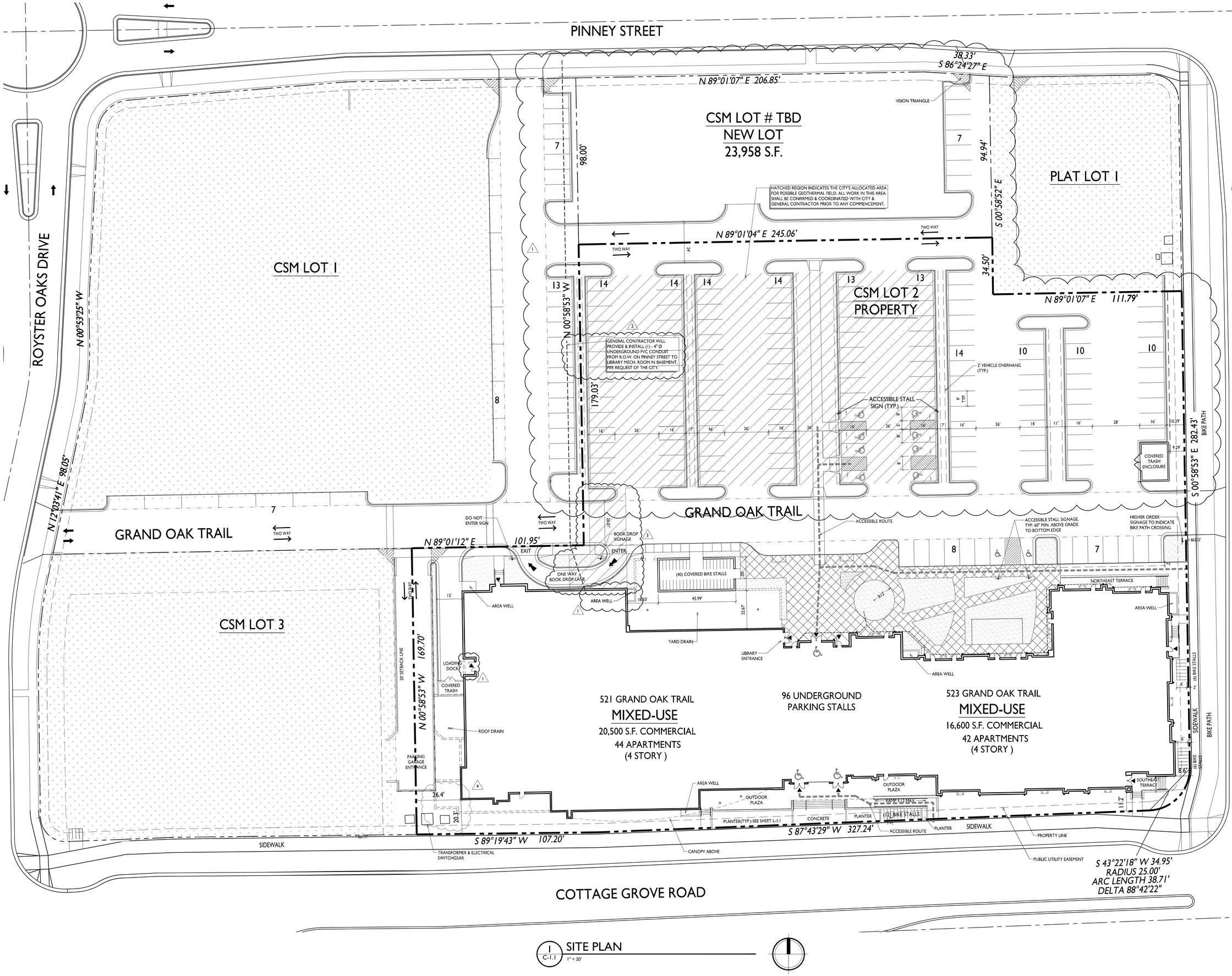
PROJECT TITLE
ROYSTER CROSSINGS

521-523 Grand Oak Trail
MADISON, WI

SHEET TITLE
Life Safety Plans - East Wing

SHEET NUMBER
T-1.3

PROJECT NO. 1421



1 C-1.1 SITE PLAN
1" = 20'

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SITE DEVELOPMENT STATISTICS

LOT AREA	136,599 S.F./ 3.13 ACRES
DWELLING UNITS	86 DU
LOT AREA/D.U.	1,588 S.F./D.U.
DENSITY	27.48 UNITS/ACRE
BUILDING HEIGHT	4 STORIES
USABLE OPEN SPACE	27,194 S.F. (316/UNIT)
LOT COVERAGE	114,107 S.F. (83%)

GROSS FLOOR AREA	
COMMERCIAL AREA	37,100 S.F.
RESIDENTIAL AREA	104,465 S.F.
TOTAL	141,565 S.F.

UNIT MIX	
ONE BEDROOM	46
ONE BEDROOM + DEN	6
TWO BEDROOM	34
TOTAL	86

VEHICLE PARKING	
ON SITE	183 STALLS
UNDERGROUND	96 STALLS
TOTAL	279 STALLS

ACCESSIBLE STALLS ON SITE	10
ACCESSIBLE STALLS UNDERGROUND	2
TOTAL ACCESSIBLE STALLS	12

CSM LOT 2 - ONSITE PARKING ALLOCATION	
LIBRARY	80 STALLS
MIXED USE	61 STALLS
TOTAL	141 STALLS

BICYCLE PARKING	
UNDERGROUND 2X6	78
ON SITE COVERED	40
ON SITE UNCOVERED	24
TOTAL PROVIDED	142 STALLS

TOTAL REQUIRED - 114 (86 PERMANENT FOR APARTMENTS, 9 GUEST FOR APARTMENTS, 19 GUEST FOR COMMERCIAL SPACE)

NOTE:
THE RIGHT-OF-WAY IS THE SOLE JURISDICTION OF THE CITY OF MADISON AND IS SUBJECT TO CHANGE AT ANYTIME PER THE RECOMMENDATION/PLAN OF TRAFFIC ENGINEERING AND CITY ENGINEERING DEPTS.

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4 Revised - May 18, 2018
3 Revised - January 5, 2018
2 Revised - September 15, 2017
1 Implemented City's 401 Clarifications - August 7, 2017

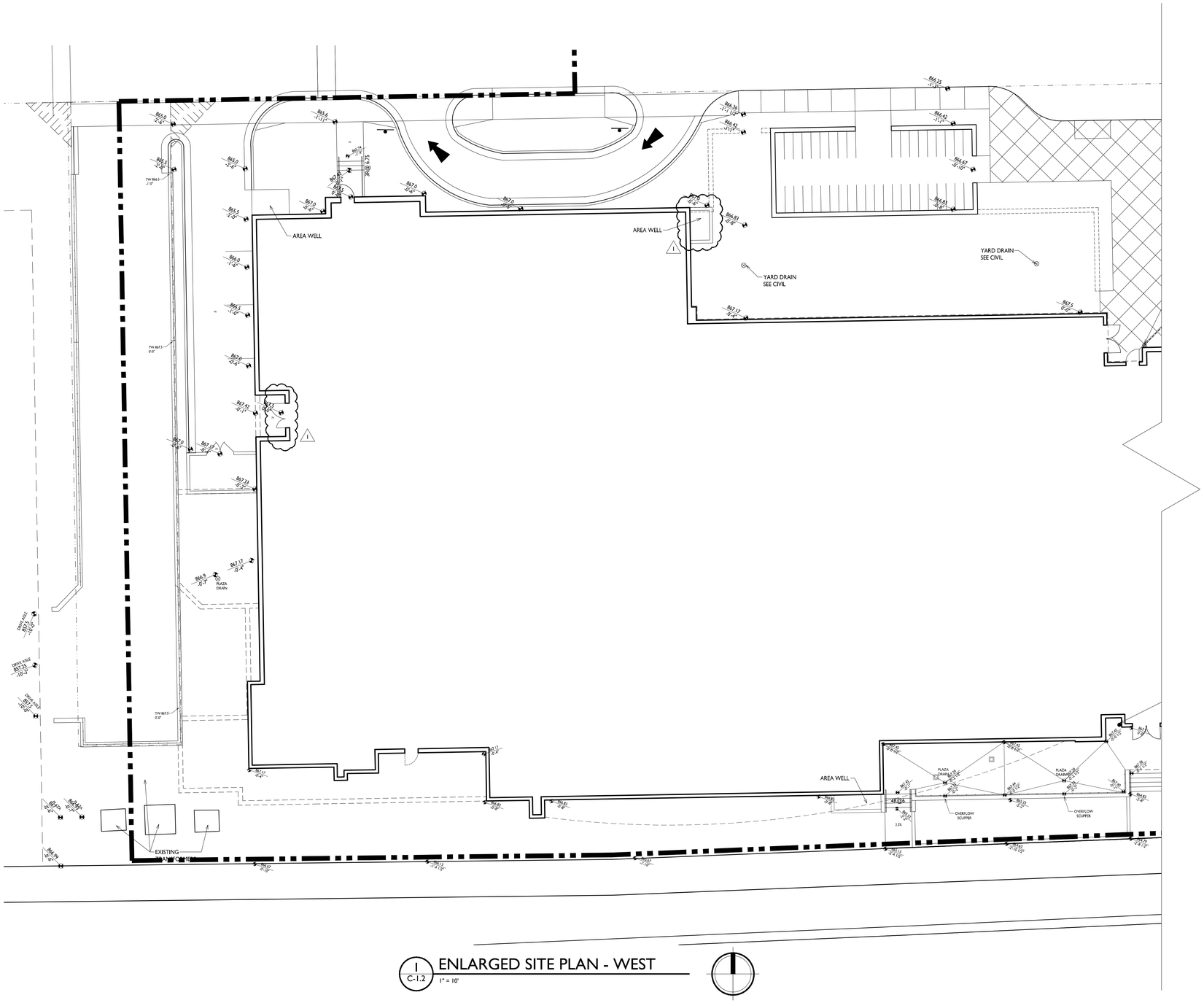
PROJECT TITLE
ROYSTER CROSSINGS

521-523 Grand Oak Trail
MADISON, WI

SHEET TITLE
Site Plan

SHEET NUMBER
C-1.1

PROJECT NO. 1421



1 C-1.2 ENLARGED SITE PLAN - WEST

1" = 10'

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1 Implemented City's LOI Clarifications - August 7, 2017

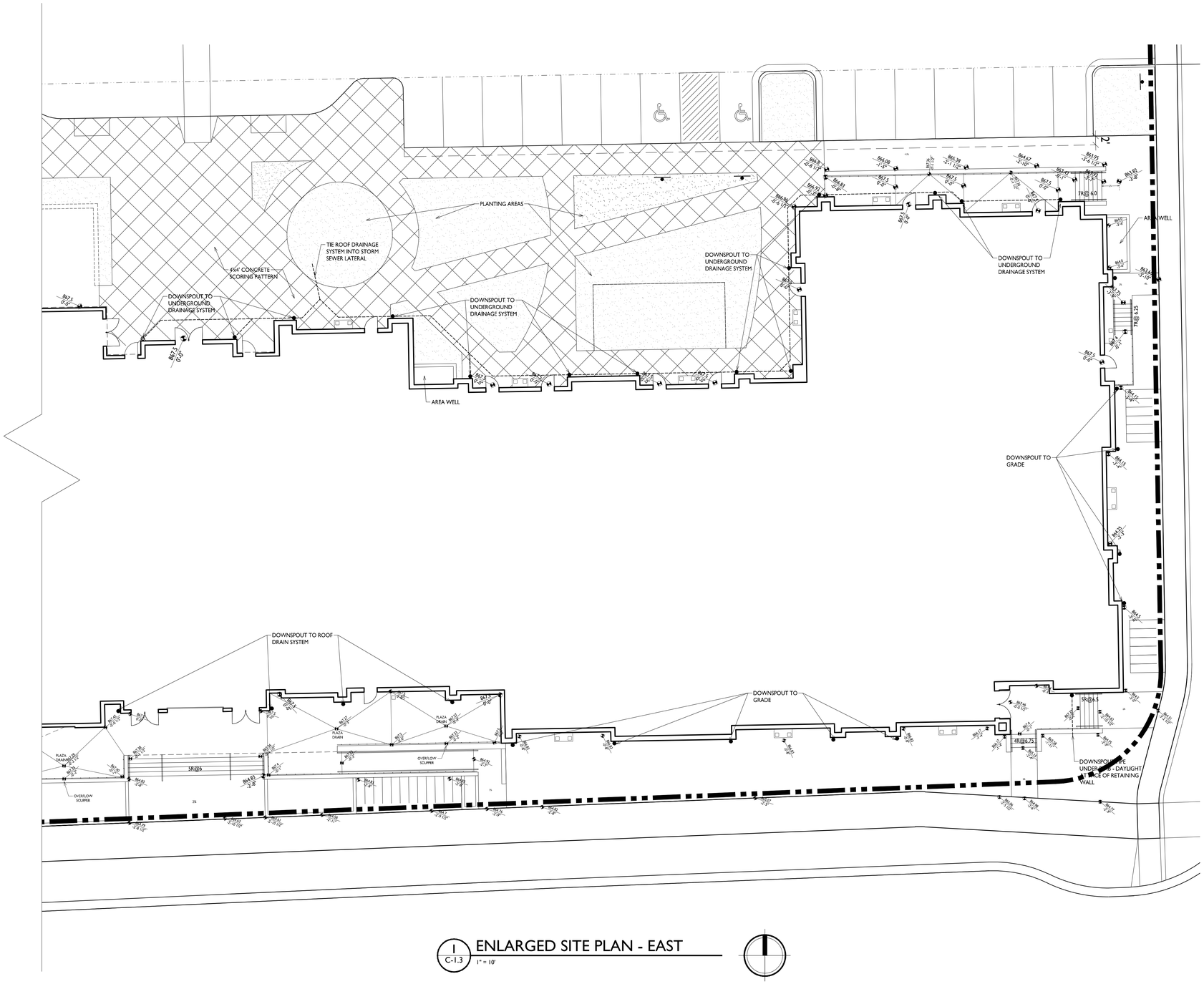
PROJECT TITLE
ROYSTER CROSSINGS

521-523 Grand Oak Trail
MADISON, WI

SHEET TITLE
Enlarged Site Plan - West

SHEET NUMBER
C-1.2

PROJECT NO. 1421



1 C-1.3 ENLARGED SITE PLAN - EAST

1" = 10'

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ROYSTER CROSSINGS

521-523 Grand Oak Trail
MADISON, WI

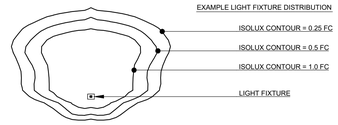
SHEET TITLE
Enlarged Site Plan - East

SHEET NUMBER
C-1.3

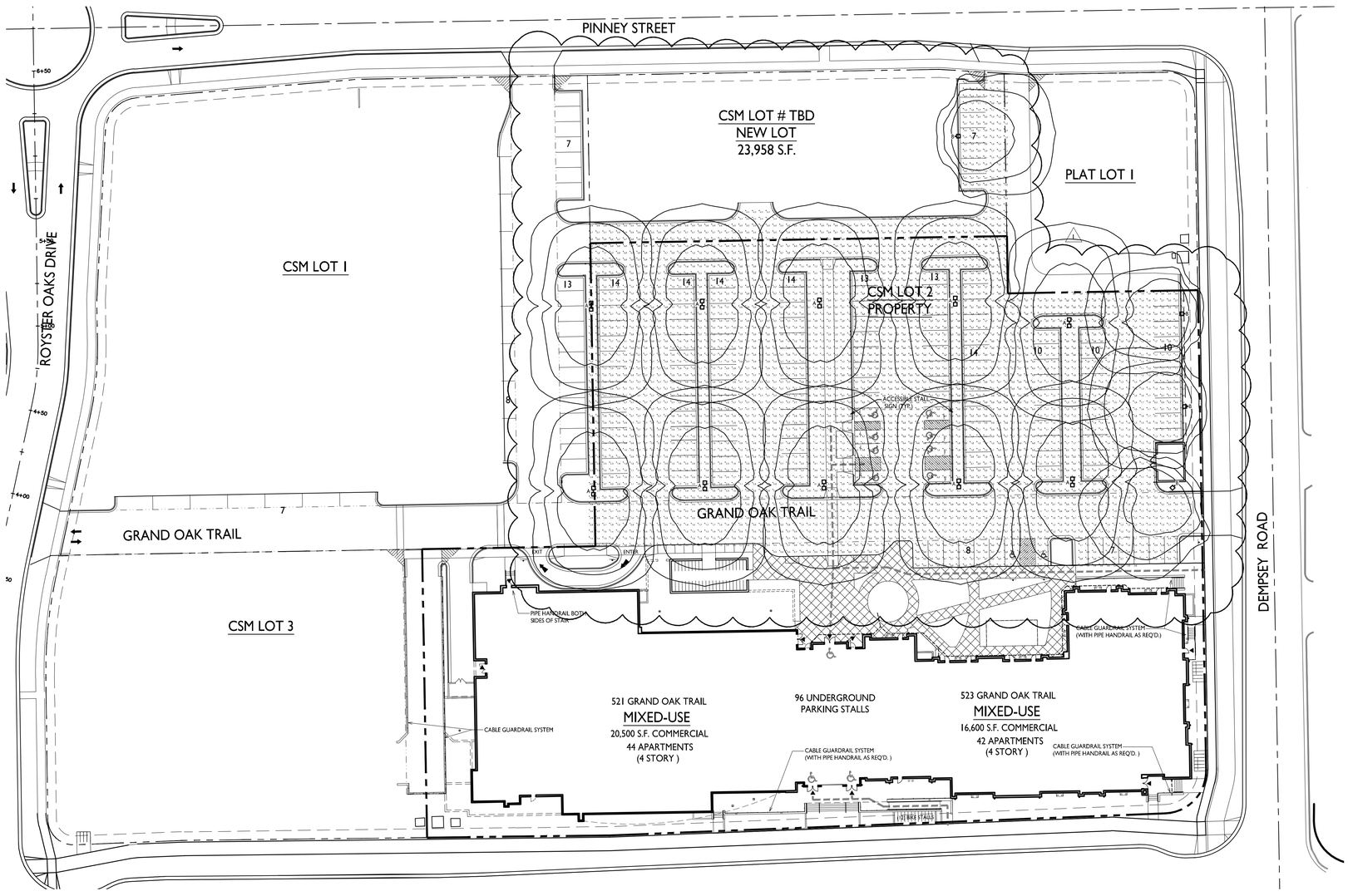
PROJECT NO. 1421

LIGHTING SCHEDULE								
Symbol	Label	Qty	Manufacturer	Catalog Number	Description	Lamp	File	Mounting
	A	10	RUUD LIGHTING	MAC410SBL	12" AREA CUTOFF w/ BACK LT. SHIELD	175W MH	MAC417SBL.ies	20'-0" POLE ON 6" TALL CONC. BASE
	B	4	RUUD LIGHTING	MAC410SBL	12" AREA CUTOFF w/ BACK LT. SHIELD	175W MH	MAC417SBL.ies	20'-0" POLE ON 6" TALL CONC. BASE

EXAMPLE LIGHT FIXTURE DISTRIBUTION



LIGHTING STATISTICS						
Description	Symbol	Avg	Max	Min	Max/Min	Avg/Min
PARKING / DRIVE	+	1.3 fc	4.1 fc	0.3 fc	13.7:1	4.3:1



1 C-1.4 SITE LIGHTING PLAN

1" = 30'-0"

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1 Implemented City's LOI Clarifications August 7, 2017

PROJECT TITLE
ROYSTER CROSSINGS

521-523 Grand Oak Trail
MADISON, WI

SHEET TITLE
Site Lighting Plan

SHEET NUMBER
C-1.4

PROJECT NO. 1421

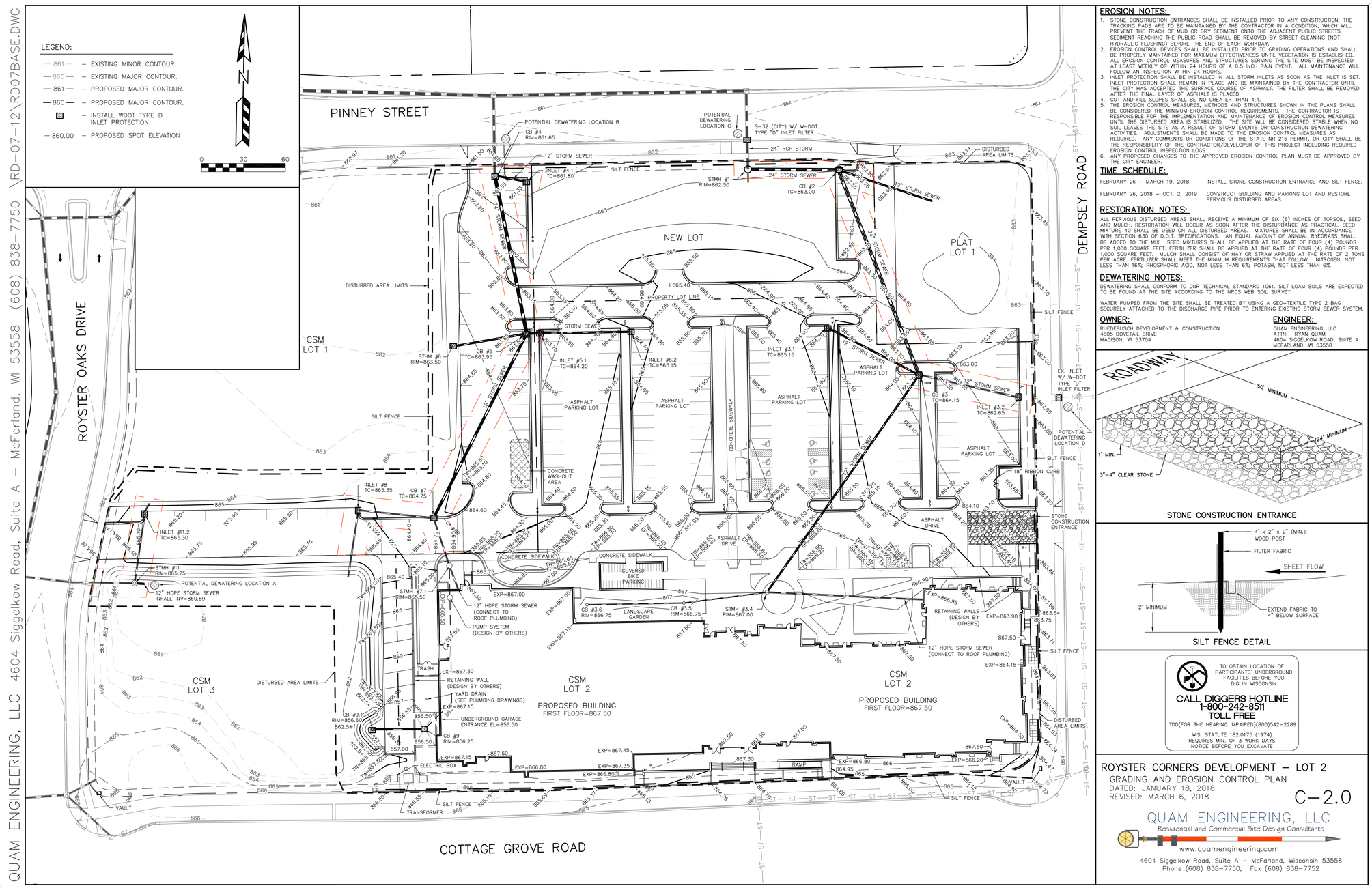
QUAM ENGINEERING, LLC 4604 Siggelkow Road, Suite A – McFarland, WI 53558 (608) 838-7750 \RD-07-12\RD07BASE.DWG

LEGEND:

- 861 — – EXISTING MINOR CONTOUR.
- 860 — – EXISTING MAJOR CONTOUR.
- 861 — – PROPOSED MAJOR CONTOUR.
- 860 — – PROPOSED MAJOR CONTOUR.
- ▨ – INSTALL WDOT TYPE D INLET PROTECTION.
- 860.00 – PROPOSED SPOT ELEVATION

N

0 30 60



EROSION NOTES:

1. STONE CONSTRUCTION ENTRANCES SHALL BE INSTALLED PRIOR TO ANY CONSTRUCTION. THE TRACKING PADS ARE TO BE MAINTAINED BY THE CONTRACTOR IN A CONDITION, WHICH WILL PREVENT THE TRACK OF MUD OR DRY SEDIMENT ONTO THE ADJACENT PUBLIC STREETS. SEDIMENT REACHING THE PUBLIC ROAD SHALL BE REMOVED BY STREET CLEANING (NOT HYDRAULIC FLUSHING) BEFORE THE END OF EACH WORKDAY.
2. EROSION CONTROL DEVICES SHALL BE INSTALLED PRIOR TO GRADING OPERATIONS AND SHALL BE PROPERLY MAINTAINED FOR MAXIMUM EFFECTIVENESS UNTIL VEGETATION IS ESTABLISHED. ALL EROSION CONTROL MEASURES AND STRUCTURES SERVING THE SITE MUST BE INSPECTED AT LEAST WEEKLY OR WITHIN 24 HOURS OF A 0.5 INCH RAIN EVENT. ALL MAINTENANCE WILL FOLLOW AN INSPECTION WITHIN 24 HOURS.
3. INLET PROTECTION SHALL BE INSTALLED IN ALL STORM INLETS AS SOON AS THE INLET IS SET. INLET PROTECTION SHALL REMAIN IN PLACE AND BE MAINTAINED BY THE CONTRACTOR UNTIL THE CITY HAS ACCEPTED THE SURFACE COURSE OF ASPHALT. THE FILTER SHALL BE REMOVED AFTER THE FINAL LAYER OF ASPHALT IS PLACED.
4. CUT AND FILL SLOPES SHALL BE NO GREATER THAN 4:1.
5. THE EROSION CONTROL MEASURES, METHODS AND STRUCTURES SHOWN IN THE PLANS SHALL BE CONSIDERED THE MINIMUM EROSION CONTROL REQUIREMENTS. THE CONTRACTOR IS RESPONSIBLE FOR THE IMPLEMENTATION AND MAINTENANCE OF EROSION CONTROL MEASURES UNTIL THE DISTURBED AREA IS STABILIZED. THE SITE WILL BE CONSIDERED STABLE WHEN NO SOIL LEAVES THE SITE AS A RESULT OF STORM EVENTS OR CONSTRUCTION DEWATERING ACTIVITIES. ADJUSTMENTS SHALL BE MADE TO THE EROSION CONTROL MEASURES AS REQUIRED. ANY COMMENTS OR CONDITIONS OF THE STATE NR 216 PERMIT, OR CITY SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR/DEVELOPER OF THIS PROJECT INCLUDING REQUIRED EROSION CONTROL INSPECTION LOGS.
6. ANY PROPOSED CHANGES TO THE APPROVED EROSION CONTROL PLAN MUST BE APPROVED BY THE CITY ENGINEER.

TIME SCHEDULE:

FEBRUARY 26 – MARCH 19, 2018 — INSTALL STONE CONSTRUCTION ENTRANCE AND SILT FENCE.

FEBRUARY 26, 2018 – OCT. 2, 2019 — CONSTRUCT BUILDING AND PARKING LOT AND RESTORE PERVIOUS DISTURBED AREAS.

RESTORATION NOTES:

ALL PERVIOUS DISTURBED AREAS SHALL RECEIVE A MINIMUM OF SIX (6) INCHES OF TOPSOIL, SEED AND MULCH. RESTORATION WILL OCCUR AS SOON AFTER THE DISTURBANCE AS PRACTICAL. SEED MIXTURE 40 SHALL BE USED ON ALL DISTURBED AREAS. MIXTURES SHALL BE IN ACCORDANCE WITH SECTION 630 OF D.O.T. SPECIFICATIONS. AN EQUAL AMOUNT OF ANNUAL RYEGRASS SHALL BE ADDED TO THE MIX. SEED MIXTURES SHALL BE APPLIED AT THE RATE OF FOUR (4) POUNDS PER 1,000 SQUARE FEET. FERTILIZER SHALL BE APPLIED AT THE RATE OF FOUR (4) POUNDS PER 1,000 SQUARE FEET. MULCH SHALL CONSIST OF HAY OR STRAW APPLIED AT THE RATE OF 2 TONS PER ACRE. FERTILIZER SHALL MEET THE MINIMUM REQUIREMENTS THAT FOLLOW: NITROGEN, NOT LESS THAN 16%; PHOSPHORIC ACID, NOT LESS THAN 6%; POTASH, NOT LESS THAN 6%.

DEWATERING NOTES:

DEWATERING SHALL CONFORM TO DNR TECHNICAL STANDARD 1061. SILT LOAM SOILS ARE EXPECTED TO BE FOUND AT THE SITE ACCORDING TO THE NRCS WEB SOIL SURVEY.

WATER PUMPED FROM THE SITE SHALL BE TREATED BY USING A GEO-TEXTILE TYPE 2 BAG SECURELY ATTACHED TO THE DISCHARGE PIPE PRIOR TO ENTERING EXISTING STORM SEWER SYSTEM.

OWNER:
RUEDEBUSCH DEVELOPMENT & CONSTRUCTION
4605 DOVETAIL DRIVE
MADISON, WI 53704

ENGINEER:
QUAM ENGINEERING, LLC
ATTN: RYAN QUAM
4604 SIGGELKOW ROAD, SUITE A
MCFARLAND, WI 53558

STONE CONSTRUCTION ENTRANCE

SILT FENCE DETAIL

TO OBTAIN LOCATION OF PARTICIPANTS' UNDERGROUND FACILITIES BEFORE YOU DIG IN WISCONSIN

CALL DIGGERS HOTLINE
1-800-242-8511
TOLL FREE
TDD(FOR THE HEARING IMPAIRED)(800)542-2289

WIS. STATUTE 182.0175 (1974)
REQUIRES MIN. OF 3 WORK DAYS
NOTICE BEFORE YOU EXCAVATE

ROYSTER CORNERS DEVELOPMENT – LOT 2

GRADING AND EROSION CONTROL PLAN
DATED: JANUARY 18, 2018
REVISED: MARCH 6, 2018

C–2.0

QUAM ENGINEERING, LLC
Residential and Commercial Site Design Consultants
www.quamengineering.com
4604 Siggelkow Road, Suite A – McFarland, Wisconsin 53558
Phone (608) 838-7750; Fax (608) 838-7752

GENERAL NOTES:

ALL WORK IN THE PUBLIC RIGHT-OF-WAY SHALL BE PERFORMED BY A CITY LICENSED CONTRACTOR.

ANY DAMAGE TO THE PUBLIC INFRASTRUCTURE INCLUDING SIDEWALK, CURB AND GUTTER, STREET, PAVEMENT, AND PUBLIC UTILITIES RESULTING FROM CONSTRUCTION OF THIS DEVELOPMENT SHALL BE THE APPLICANT'S RESPONSIBILITY TO REPAIR.

UTILITY NOTES:

CONTRACTOR SHALL VERIFY ALL UTILITY LOCATIONS, SIZES, AND ELEVATIONS PRIOR TO THE START OF CONSTRUCTION. ANY DISCREPANCIES SHALL BE REPORTED TO ENGINEER.

THIS PROPERTY IS NOT IN A WELLHEAD PROTECTION DISTRICT. ALL WELLS ON PROPERTY SHALL BE ABANDONED IF NO VALID WELL OPERATION PERMIT HAS BEEN OBTAINED FROM MADISON WATER UTILITY.

ALL WATER MAIN SHALL BE BURIED TO A DEPTH OF 6.5 FEET. THE DEPTH IS DEFINED AS THE DISTANCE BETWEEN THE FINISHED GRADE ELEVATION AND THE TOP OF WATER MAIN OR SERVICE.

ALL UTILITIES SHALL BE CONSTRUCTED IN ACCORDANCE TO CITY OF MADISON STANDARD SPECS.

CONTRACTOR SHALL OBTAIN ALL NECESSARY SEWER CONNECTION PERMITS AND SEWER PLUGGING PERMITS PRIOR TO ANY UTILITY WORK. THE PERMIT APPLICATION IS AVAILABLE ON LINE AT HTTP://WWW.CITYOFMADISON.COM/ENGINEERING/PERMITS.CFM.

CONTRACTOR SHALL OBTAIN A CONNECTION PERMIT AND EXCAVATION PERMIT PRIOR TO COMMENCING STORM SEWER CONSTRUCTION MGO 37.05(7). PERMIT APPLICATION IS AVAILABLE ON LINE AT HTTP: //WWW.CITYOFMADISON.COM/ENGINEERING/PERMITS.CFM.

ALL UNDERGROUND EXTERIOR NON-METALLIC SEWERS/MAINS AND WATER SERVICES/MAINS MUST BE PROVIDED WITH TRACER WIRE OR OTHER METHODS IN ORDER TO BE LOCATED IN ACCORDANCE WITH 182.0715(2r) OF STATE STATUTES.

CONTRACTOR SHALL FIELD VERIFY SANITARY, WATER, & STORM SEWER LATERALS PRIOR TO CONSTRUCTION.

CONTRACTOR SHALL PROVIDE A CONCRETE MANAGEMENT AND WASHOUT AREA, AS SHOWN ON PLAN, TO PREVENT CONCRETE WASTE FROM ENTERING THE CITY RIGHT-OF-WAY.

TO OBTAIN LOCATION OF PARTICIPANTS' UNDERGROUND FACILITIES BEFORE YOU DIG IN WISCONSIN

CALL DIGGERS HOTLINE
1-800-242-8511
TOLL FREE

TDD(FOR THE HEARING IMPAIRED)(800)542-2289

WIS. STATUTE 182.0175 (1974) REQUIRES MIN. OF 3 WORK DAYS NOTICE BEFORE YOU EXCAVATE

OIL AND GREASE CONTROL
PARKING LOT INLETS SHALL HAVE "CATCH-ALL" INLET FILTER INSTALLED AFTER BEING SET. HRI PILLOW SHALL BE INSTALLED FOLLOWING PAVING.

PINNEY STREET

ROYSTER OAKS DRIVE

DEMPSEY ROAD

COTTAGE GROVE ROAD

NEW LOT

PLAT LOT 1

CSM LOT 1

CSM LOT 2

CSM LOT 3

PROPOSED BUILDING FIRST FLOOR=867.50

PROPOSED BUILDING FIRST FLOOR=867.50

RETAINING WALL (DESIGN BY OTHERS)

CONCRETE WASHOUT AREA

TRASH

ELECTRIC BOX

ELECTRIC TRANSFORMER

COMMUNICATION VAULT

EX. HYDRANT

RELOCATED HYDRANT

0 30 60

N

ROYSTER CORNERS DEVELOPMENT – LOT 2

UTILITY AND FIRE LANE PLAN
DATED: JANUARY 16, 2018
REVISED: MARCH 6, 2018
REVISED: MAY 22, 2018

C-2.1

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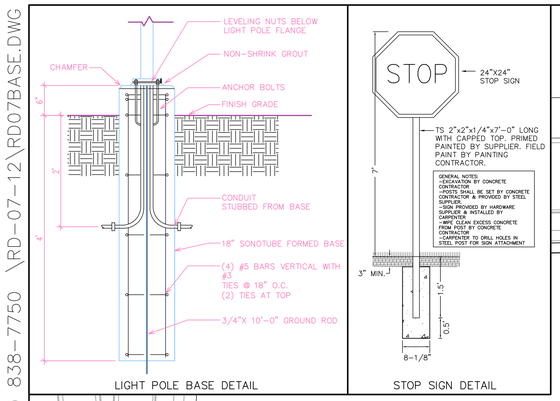
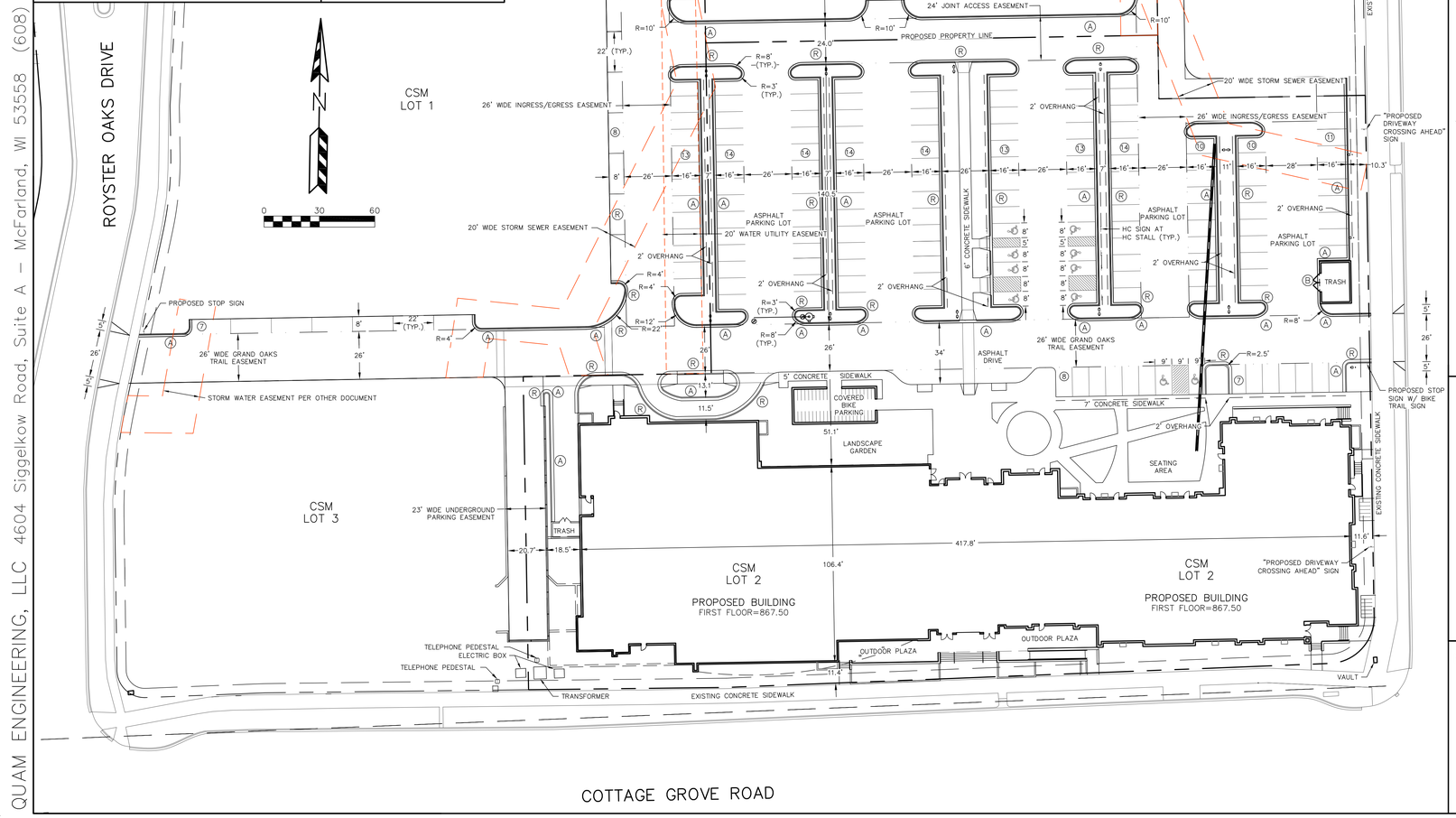
Phone (608) 838-7750; Fax (608) 838-7752

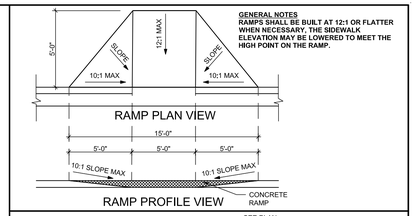
QUAM ENGINEERING, LLC 4604 Siggelkow Road, Suite A – McFarland, WI 53558 (608) 838-7750 \RD-07-12\RD07BASE.DWG

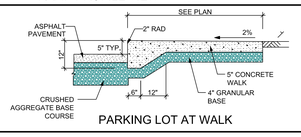


LIGHT POLE BASE DETAIL

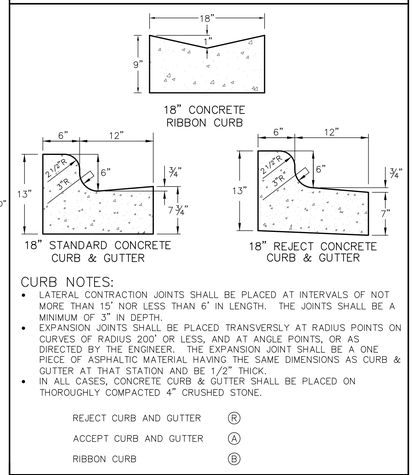
STOP SIGN DETAIL







PARKING LOT AT WALK



CURB NOTES:

- LATERAL CONTRACTION JOINTS SHALL BE PLACED AT INTERVALS OF NOT MORE THAN 15' NOR LESS THAN 6' IN LENGTH. THE JOINTS SHALL BE A MINIMUM OF 3" IN DEPTH.
- EXPANSION JOINTS SHALL BE PLACED TRANSVERSLY AT RADIUS POINTS ON CURVES OF RADIUS 200' OR LESS, AND AT ANGLE POINTS, OR AS DIRECTED BY THE ENGINEER. THE EXPANSION JOINT SHALL BE A ONE PIECE OF ASPHALTIC MATERIAL HAVING THE SAME DIMENSIONS AS CURB & GUTTER AT THAT STATION AND BE 1/2" THICK.
- IN ALL CASES, CONCRETE CURB & GUTTER SHALL BE PLACED ON THOROUGHLY COMPACTED 4" CRUSHED STONE.

REJECT CURB AND GUTTER (R)

ACCEPT CURB AND GUTTER (A)

RIBBON CURB (B)

HANDICAP ACCESSIBLE SIGN DETAIL

PARKING LOT SITE INFORMATION BLOCK

Site Address 516 Cottage Grove Road
Site acreage (total) 3.69

Number of building stories (above grade) 4
Building height 92'
DSPS type of construction (new structures or additions):
IA Basement & First Floor, VA 2nd – 4th
Total square footage of building 191,504 SF (includ. basement)
Total square footage of garage N/A

Use of property Mixed Use
Gross square feet of office N/A
Gross square feet of retail area N/A
Number of employees in warehouse N/A
Number of employees in production N/A
Capacity of restaurant/place of assembly N/A

Number of bicycle stalls shown 52

Number of Parking stalls:

	SHOWN
Small Car	0
Large Car	226
Accessible	10
Total	236

Number of trees shown (See Landscape Plan)

ROYSTER CORNERS DEVELOPMENT – LOT 2
SITE PLAN
DATED: MARCH 6, 2018

C-2.2

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QUAM ENGINEERING, LLC 4604 Siggelkow Road, Suite A – McFarland, WI 53558 (608) 838-7750 \RD-07-12\RD07BASE.DWG

Plant Material List

Broadleaf Deciduous

Quantity	Code Name	Common Name	Scientific Name	Planting Size
7	SSMM	State Street Miyabe Maple	Acer Miyabei 'morton'	2 1/2" B&B
3	GMM	Green Mountain Sugar Maple	Acer Saccharum 'green Mountain'	2 1/2" B&B
4	MAM	Marmo Maple	Acer X Freemanii 'marmo'	2 1/2" B&B
6	CHB	Common Hackberry	Celtis Occidentalis	2 1/2" B&B
10	SHL	Skyline Thnls Honeylocust	Gleditsia Triacan Iner 'skycole'	2 1/2" B&B
7	ADC	Adirondack Crabapple	Malus 'adirondack'	2" B&B
6	CAC	Camelot Crabapple	Malus 'camelot'	2" B&B
2	GCST	Guinevere Crabapple (std)	Malus 'guinzam' (std)	2" B&B
1	MLC	Molten Lava Crabapple	Malus 'molazam'	2 1/2" B&B
4	RGCS	Royal Gem Crabapple (std)	Malus 'royal Gem' (std)	2" B&B
2	RPO	Regal Prince English Oak	Quercus Robur 'long'	2 1/2" B&B
7	RAL	Redmond Amer Linden	Tilia Americana 'redmond'	2 1/2" B&B
3	AE	Accolade Elm	Ulmus Japonica X Wilsoniana 'morton'	2 1/2" B&B

Conifer Evergreen

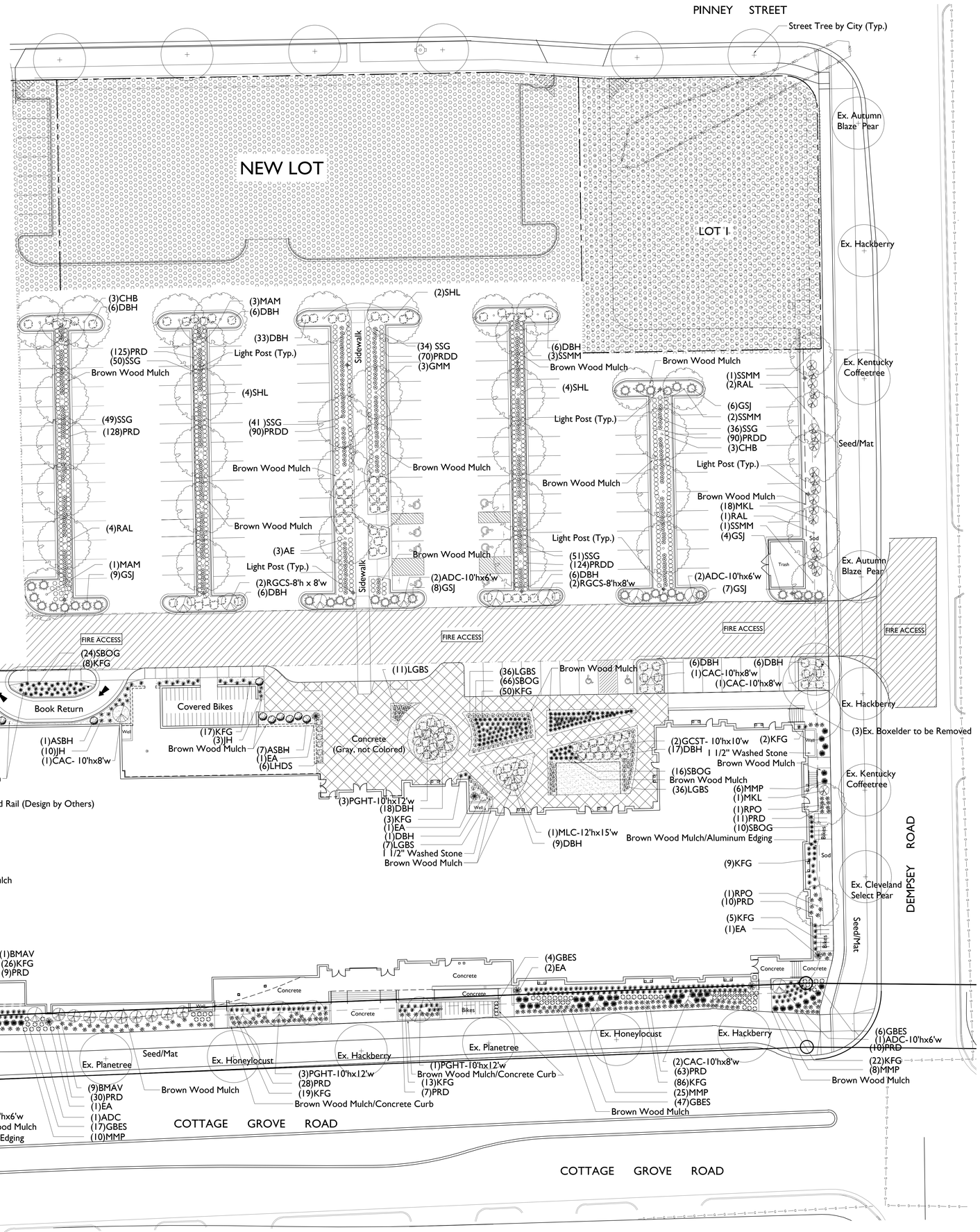
Quantity	Code Name	Common Name	Scientific Name	Planting Size
34	GSJ	Green Sargent Juniper	Juniperus Chinen Var Sargentii 'viridis'	#3 CONT.
51	MMP	Mops Mugo Pine	Pinus Mugo 'mops'	#3 CONT.
6	EA	Emerald Arborvitae	Thuja Occidentalis 'smaragd'	4' B&B

Perennial

Quantity	Code Name	Common Name	Scientific Name	Planting Size
281	KFG	Karl Foerster's Feather Reed Grass	Calamagrostis Acutiflora 'karl Foerster'	#1 CONT.
124	SBOG	Sapphire Blue Oat Grass	Helictotrichon Sempervirens 'saphirsprudel'	#1 CONT.
27	JH	June Hosta	Hosta 'june'	#1 CONT.
24	MG	Maiden Grass	Miscanthus Sinensis 'gracillimus'	#1 CONT.
261	SSG	Shenandoah Switch Grass	Panicum Virgatum 'shenandoah'	4 1/2" POT
75	GBES	Goldsturm Black-Eyed Susan	Rudbeckia Ful Var Sullivan 'goldsturm'	#1 CONT.
90	LGBS	Little Goldstar Black-Eyed Sus	Rudbeckia Ful Var Sullivan 'little Goldstar'	#1 CONT.
167	PRD	Prairie Dropseed	Sporobolus Heterolepis	#1 CONT.
627	PRDD	Prairie Dropseed	Sporobolus Heterolepis	4 1/2" POT

Shrub

Quantity	Code Name	Common Name	Scientific Name	Planting Size
135	DBH	Dwf Bush-Honeysuckle	Diervilla Lonicera	#3 CONT.
11	ASBH	All Summer Beauty Hydrangea	Hydrangea Macro 'all Summer Beauty'	#3 CONT.
8	PGHT	Peegee Hydrangea (tf)	Hydrangea Paniculata 'grandiflora' (tf)	1 3/4" B&B
12	LHDS	Little Henry Dwf Sweetspire	Itea Virginica 'sprich'	#2 CONT.
20	MKL	Miss Kim Lilac	Syringa Pubescens Subsp. Patula 'miss Kim'	3' B&B
11	BMAV	Blue Muffin Arwd Viburnum	Viburnum Dentatum 'christom'	#5 CONT.



LANDSCAPE PLAN CSM LOT 2

SCALE: 1"=20'-0"

RICHARD J. STROHMENGER LA-55 OREGON, WI LANDSCAPE ARCHITECT WISCONSIN

the bruce company OF WISCONSIN INC
LANDSCAPE ARCHITECTS
LANDSCAPE CONTRACTORS
2830 PARMENTER STREET
P.O. BOX 620330
MIDDLETON, WI 53562-0330
TEL (608) 836-7041
FAX (608) 831-6266

ROYSTER CROSSINGS

LOTS 2 AND 3 ROYSTER PLAT
MADISON, WISCONSIN

Checked By: SS
Drawn By: 11/06/13 RS

Revised: 11/21/13 RS
Revised: 12/05/13 RS
Revised: 12/10/13 RS
Revised: 10/29/14 RS
Revised: 12/11/14 RS
Revised: 2/03/15 RS
Revised: 2/25/15 RS
Revised: 4/03/15 RS
Revised: 7/17/15 RS
Revised: 9/25/15 RS
Revised: 2-24-16 RS
Revised: 3-08-16 RS
Revised: 8-11-17 RS
Revised: 1-29-18 RS

L-1.1

LANDSCAPE PLAN
CSM LOT 2

©2017 C:\ACTIVE\SHORT ROYSTER CROSSING\PHASE II ROYSTER CROSSING INCLADING Created: 11/6/2013, Saved: 1/29/2018, Printed: 1/29/2018

LANDSCAPE WORKSHEET

Zoning district is TE
Total square footage of developed area (Lots 2 and 3) .....77,055 SF
Total square footage of first 5 acres of developed area ÷ 300 square feet = ...257 Landscape Units
Total square footage of 0 additional acres of developed area ÷ 100 square feet = ...0 Landscape Units

NUMBER OF LANDSCAPE POINT REQUIRED
335 Landscape Units x 5 landscape points for first 5 acres..... 1,285 points
__0 Landscpe Units x 1 landscape point for additional 0 acres.....0 points
TOTAL LANDSCAPE POINTS REQURED.....1,285 points

PLANT TYPE or ELEMENT	Point Value	NEW		EXISTING		
		Qty.	Points Achieved	Qty.	Points Achieved	
Overstory Deciduous Tree : 2-1/2" (dbh)	35	42	1,470			
Tall Evergreen Tree : 5-6 feet tall	35	--	--			
Ornamental Tree : 1-1/2" Caliper (dbh)	15	20	300			
Upright Evergreen Shrub : 3-4 feet tall	10	6	60			
Shrub, deciduous : 3 gallon / 12"-24"	3	187	561			
Shrub, evergreen : 3 gallon / 12"-24"	4	85	340			
Ornamental grass/perennial :1gallon / 8"-18"	2	788	1,576			
Ornamental / Decorative fencing or wall	4 per 10 l.f.	--	--			
Existing significant specimen tree	14 per Cal. In.	--	--			TOTAL POINTS PROVIDED
Landscape furniture for public seating and /or transit connections	5 per 'seat'	--	--			
		Sub Totals	5,307	+	0	= 5,307

Plant Material List

Broadleaf Deciduous

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11	BMAV	Blue Muffin Arwd Viburnum	Viburnum Dentatum 'christom'	#5 CONT.

GENERAL NOTES

A) Areas labeled "BrownWood Mulch" to receive a mixture of recycled wood mulch, colored brown, spread to a 3" depth over pre-emergent herbicide.

B) Individual trees (and shrub groupings) found along perimeter of property as well as those found within lawn areas to receive wood mulch rings (and wood mulch beds) consisting of a mixture of recycled wood mulch, colored brown, spread to a minimum 3" depth (3' wide beds for shrub groupings).

C) "Aluminum Edging" to be Curv Rite Aluminum Edging or equivalent.

D) Areas labeled "washed stone" to receive 1-1/2" washed stone spread to a 3" depth over fabric weed barrier.

E) "Seed" areas shall be finish-graded and seeded at a rate of 4 lbs. per 1,000 sq. ft.

F) Seed shall consist of the following mixture:
10% Palmer IV Perennial Ryegrass
20% Dragon Kentucky Bluegrass
20% Diva Kentucky Bluegrass
20% Foxy II Creeping Red Fescue
15% Vail II Perennial Ryegrass
15% Ginney Kentucky Bluegrass

G) Areas labeled "Seed/Mat" shall be seeded with the above-noted premium lawn seed mixture and overlaid with Class 1 Urban Type A Biodgradable straw erosion control netting that is then pegged into the soil with biodegradable staples.

H) Areas labeled "Sod" shall receive only No. 1 grade nursery-grown bluegrass sod.

I) Existing street trees shall be protected. Contractor shall install tree protection fencing in the area between the curb and sidewalk and extend it at least 5 feet from both sides of the tree along the length of the terrace. No excavation is permitted within 5 feet of the outside edge of the tree trunk. If Excavation within 5 feet of any tree is necessary, contractor shall contact City Forestry (608)266-4816 prior to excavation to assess the impact to the tree and root system. Tree pruning shall be coordinated with City Forestry. Tree protection specifications can be found in section 107.13 of City of Madison Standard specifications for Public Works Construction-
http://www.cityofmadison.com/business/pw/documents/StdSpecs/2013/Part1.pdf.

J) Contractor shall contact City Forestry (608)266-4816 at least one week prior to installing street trees to schedule inspecting the nursery stock and reviewing landscaping specifications with the landscaper.

WISCONSIN
RICHARD J. STROHMENGER
LA-85
OREGON, WI
LANDSCAPE ARCHITECT

LANDSCAPE NOTES - CSM LOT 2

the bruce company of wisconsin inc
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ROYSTER CROSSINGS
CSM LOT 2
MADISON, WISCONSIN

Checked By: SS
Drawn By: 11/06/13 RS

Revised: 11/21/13 RS
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Revised: 1-29-18 RS

L-2.1
LANDSCAPE NOTES
CSM LOT 2

\\DATA\CAD\TBCW\ROYSTER CROSSINGS\PHASE II\ROYSTER CROSSINGS INC ELEVNG Created: 11/6/2013, Saved: 1/29/2018, Printed: 1/29/2018

DESIGN DATA

DESIGN CODE:
2011 WISCONSIN COMMERCIAL BUILDING CODE (2009 IBC)

WIND LOAD INFORMATION:

BASIC WIND SPEED	90 MPH
BUILDING OCCUPANCY CATEGORY	II
WIND LOAD IMPORTANCE FACTOR (Iw)	1.0
WIND EXPOSURE	C
INTERNAL PRESSURE COEFFICIENTS	± .18

COMPONENTS AND CLADDING (GROSS WIND PRESSURES):
(FOR ZONE DEFINITIONS & DIAGRAMS SEE DESIGN GUIDE ASCE/SEI 7 SECTION 6) BASED ON EXPOSURE D.
WIDTH OF PRESSURE COEFFICIENT ZONE (a) 8 ft

TRIBUTARY WIND LOAD AREAS:	$10\ ft^2$	$50\ ft^2$	$100\ ft^2$
ROOF (MONOSLOPE):			
NEGATIVE ZONE 1	-22.9 psf	-21.6 psf	-21.0 psf
NEGATIVE ZONE 2	-38.5 psf	-29.0 psf	-24.9 psf
NEGATIVE ZONE 3	-38.5 psf	-29.0 psf	-24.9 psf
POSITIVE (ALL ZONES)	10.0 psf	10.0 psf	10.0 psf
WALLS:			
NEGATIVE ZONE 4	-22.7 psf	-19.7 psf	-17.5 psf
NEGATIVE ZONE 5	-28.0 psf	-21.8 psf	-17.5 psf
PARAPETS:			
CORNER ZONE	53.1 psf	36.2 psf	34.0 psf
INTERIOR ZONE	53.1 psf	36.2 psf	34.0 psf
OVERHANGS/ CANOPIES:			
CORNER ZONE	-33.0 psf	-31.7 psf	-31.1 psf
INTERIOR ZONE	-33.0 psf	-31.7 psf	-31.1 psf

SEISMIC LOAD INFORMATION - LIGHT FRAMING (FLOORS 3 THRU ROOF):

SEISMIC OCCUPANCY CATEGORY	II
SEISMIC LOAD IMPORTANCE FACTOR (Ie)	1.00
SEISMIC SITE CLASS	D
MAPPED SPECTRAL RESPONSE ACCELERATION (Ss)	0.106g
MAPPED SPECTRAL RESPONSE ACCELERATION (S1)	0.044g
SPECTRAL RESPONSE COEFFICIENT (Sds)	0.113g
SPECTRAL RESPONSE COEFFICIENT (Sd1)	0.070g
SEISMIC DESIGN CATEGORY	A
BASIC SEISMIC FORCE RESISTING SYSTEM	LIGHT FRAME WALLS w/ SHEAR PANELS
RESPONSE MODIFICATION FACTOR (R)	2.0
SEISMIC RESPONSE COEFFICIENT (Cs)	0.057
DESIGN BASE SHEAR	0.057W
ANALYSIS PROCEDURE	EQUIVALENT LATERAL FORCE

SEISMIC LOAD INFORMATION - FLOORS 1&2:

SEISMIC OCCUPANCY CATEGORY	II
SEISMIC LOAD IMPORTANCE FACTOR (Ie)	1.00
SEISMIC SITE CLASS	D
MAPPED SPECTRAL RESPONSE ACCELERATION (Ss)	0.106g
MAPPED SPECTRAL RESPONSE ACCELERATION (S1)	0.044g
SPECTRAL RESPONSE COEFFICIENT (Sds)	0.113g
SPECTRAL RESPONSE COEFFICIENT (Sd1)	0.071g
SEISMIC DESIGN CATEGORY	B
BASIC SEISMIC FORCE RESISTING SYSTEM	INTERMEDIATE REINFORCED MASONRY SHEAR WALLS
RESPONSE MODIFICATION FACTOR (R)	4
SEISMIC RESPONSE COEFFICIENT (Cs)	0.028
ANALYSIS PROCEDURE	EQUIVALENT LATERAL FORCE

SNOW LOAD INFORMATION:

GROUND SNOW LOAD (Pg)	30 psf
SNOW EXPOSURE FACTOR (Ce)	1.00
SNOW LOAD IMPORTANCE FACTOR (Is)	1.00
THERMAL FACTOR (Ct)	1.00
FLAT ROOF SNOW LOAD (Pf)	21 psf + DRIFT OR 30 psf UNIFORM (SEE SNOW DRIFT PLAN, S-0.2)

SOIL LOAD INFORMATION:

COEFFICIENT OF SLIDING FRICTION (μ)	0.30 (ASSUMED)
LATERAL EARTH PRESSURE:	
ACTIVE	35 pcf
AT-REST	55 pcf
PASSIVE	200 pcf
ALLOWABLE NET SOIL BEARING PRESSURE	Qa = 3,500 psf

LIVE LOADS:

RESIDENTIAL:	
UNITS	40 psf
BALCONIES NOT EXCEEDING 100ft²	60 psf
BALCONIES OVER 100ft²	100 psf
STAIRWAYS, LOBBIES, COMMON AREAS	100 psf
LIBRARY	150 psf
CORRIDORS	80 psf
COMMERCIAL / RETAIL	100 psf
STORAGE	125 psf
ROOF	SEE SNOW LOAD INFO

MATERIAL DESIGN PROPERTIES

CIP CONCRETE STRENGTHS:

SPREAD FOOTINGS	f'c = 3000 psi
WALLS / PIERS	f'c = 4000 psi
SLAB ON GRADE	f'c = 4000 psi
EXTERIOR SLAB ON GRADE	f'c = 4500 psi

REINFORCING STEEL STRENGTHS:

BARS (ASTM A 615, grade 60)	Fy = 60,000 psi
WWF (ASTM A 185)	Fy = 65,000 psi

STRUCTURAL MASONRY STRENGTHS:

ASTM C 90, grade N (CMU)	f'm = 1900 psi
MORTAR (ASTM C270)	
TYPE S (ABOVE GRADE)	fu = 1800 psi
GROUT (ASTM C476)	
BOND BEAMS (pea gravel)	f'c = 3000 psi
MASONRY WALLS & PIERS (pea gravel)	f'c = 3000 psi

STRUCTURAL STEEL STRENGTHS:

WF SHAPES (ASTM A992)	Fy = 50,000 psi
ANGLES, CHANNELS, PLATES, & BARS (ASTM A36)	Fy = 36,000 psi
SQUARE & RECTANGULAR TS OR HSS SECTIONS	Fy = 46,000 psi
ROUND HSS SECTIONS (ASTM A500, grade B)	Fy = 42,000 psi
STEEL PIPE (ASTM A53, grade B)	Fy = 35,000 psi
HIGH STRENGTH BOLTS (ASTM A325)	(ASTM A500, Grade B)
ANCHOR BOLTS (ASTM F1554)	Fy = 36,000 psi
WELD ELECTRODES	E70 XX
HEADED WELDED STUDS (ASTM A108)	Fu = 55,000 psi

WOOD STRENGTHS:
DIMENSIONAL LUMBER (SEE PLANS & WOOD FRAMING NOTES)

LAMINATED VENEER LUMBER, (LVL):	E = 1,900 ksi Fb = 2,600 psi Fv = 285 psi Fc(perp) = 750 psi Fc(para) = 2,510 psi
PARALLEL STRAND LUMBER (PSL):	E = 2,000 ksi Fb = 2,900 psi Fv = 290 psi Fc(perp) = 750 psi Fc(para) = 2,900 psi
LAMINATED STRAND LUMBER (LSL):	E = 1,300 ksi Fb = 1,700 psi Fv = 400 psi Fc(perp) = 680 psi Fc(para) = 1,400 psi

EARTHWORK NOTES

1. FOR DETAILED DESCRIPTION OF EXISTING SOILS AND BORING LOGS, REFER TO REPORT OF GEOTECHNICAL EXPLORATION DATED MARCH 3, 2014 FROM CGC, INC. (C14047).
2. COMPLIANCE OF SOIL COMPACTION AND MEASURES TAKEN TO ACHIEVE ALLOWABLE BEARING PRESSURE SHALL BE FIELD VERIFIED BY A QUALIFIED SOILS ENGINEER PRIOR TO PLACEMENT OF SLAB OR FOUNDATIONS.
3. ALL TOPSOIL, DEBRIS, SILTS, AND ORGANIC MATERIAL SHALL BE STRIPPED AND REMOVED FROM LIMITS OF EXCAVATIONS AND EXISTING SUBGRADE SHALL BE COMPACTED TO 95% STANDARD PROCTOR MAXIMUM DRY DENSITY PRIOR TO PLACEMENT OF FILL MATERIAL
4. FILL MATERIAL SHALL BE PLACED AND COMPACTED IN LIFTS NO THICKER THAN 8". EACH LIFT SHALL MEET COMPACTION REQUIREMENTS PRIOR TO PLACEMENT AND COMPACTION OF ADDITIONAL LIFTS.
5. FILL MATERIAL SHALL BE PLACED AND COMPACTED AT +1% TO -4% OPTIMUM MOISTURE CONTENT TO 95% STANDARD PROCTOR MAXIMUM DRY DENSITY, UNLESS RECOMMENDED OTHERWISE BY A QUALIFIED SOILS ENGINEER.
6. UNSATISFACTORY SOILS LOCATED BELOW FOUNDATIONS SHALL BE REMOVED AND REPLACED AS DIRECTED BY THE SOILS ENGINEER.

GENERAL FOUNDATION NOTES

1. ANCHOR BOLTS AND/OR EMBEDMENTS SHALL BE SET TO THE FOLLOWING TOLERANCES:
   TOP ELEVATION +1" TO - 3/8"
   OUT OF POSITION ± 1/8"
2. PROTECT IN-PLACE FOUNDATIONS AND SLABS ON GRADE FROM FROST PENETRATION UNTIL PROJECT COMPLETION
3. WHERE FILL MATERIAL IS REQUIRED ON BOTH SIDES OF GRADE BEAMS OR WALLS, IT SHALL BE PLACED SIMULTANEOUSLY. REFER TO PLANS AND SPECIFICATIONS FOR TYPE AND PLACING OF BACKFILL.
4. WHERE FILL MATERIAL IS PLACED ON ONE SIDE OF A WALL (OR GRADE BEAM), THE WALL (OR BEAM) SHALL BE ADEQUATELY SHORED AND BRACED OR THE MATERIAL SHALL NOT BE PLACED UNTIL SUPPORTING FLOOR SLABS HAVE BEEN POURED AND SET.
5. REFER TO ARCHITECTURAL DRAWINGS OR PLUMBING DRAWINGS FOR SPECIFIC FLOOR DRAIN LOCATIONS & ELEVATIONS.
6. COORDINATE STOOP DIMENSIONS WITH ARCHITECTURAL DRAWINGS.

CAST-IN-PLACE CONCRETE NOTES

1. DESIGN AND CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE LATEST PROVISIONS OF ACI 318.
2. CONTRACTOR SHALL NOTIFY THE ARCHITECT/ENGINEER AT LEAST 48 HOURS PRIOR TO PLACING CONCRETE TO FACILITATE ON SITE OBSERVATION OF REBAR.
3. ARRANGEMENT AND BENDING OF REINFORCING STEEL SHALL BE IN ACCORDANCE WITH ACI DETAILING MANUAL (ACI SP-66), LATEST EDITION.
4. WHEN THE AVERAGE TEMPERATURE FROM MIDNIGHT TO MIDNIGHT IS EXPECTED TO DROP BELOW 40 DEGREES FAHRENHEIT FOR THREE SUCCESSIVE DAYS, COLD WEATHER CONCRETING REQUIREMENTS MUST BE FOLLOWED.
5. WHEN AMBIENT AIR OR CONCRETE TEMPERATURES EXCEED 90 DEGREES FAHRENHEIT, STEEL REINFORCING AND/OR FORMING SURFACES ARE ABOVE 120 DEGREES, OR WHEN WIND VELOCITY, HUMIDITY, OR SOLAR RADIATION CREATE CONDITIONS OF ACCELERATED MOISTURE LOSS AND INCREASED RATE OF HYDRATION, HOT WEATHER CONCRETING REQUIREMENTS SHALL BE FOLLOWED.
6. ALL HOOKS IN STEEL REINFORCING SHALL BE ACI STANDARD HOOKS, UNLESS NOTED OTHERWISE IN CONSTRUCTION DOCUMENTS.
7. ALL CONCRETE SURFACES SHALL BE FORMED, UNLESS OTHERWISE NOTED.
8. CONTROL JOINTS SHALL BE PLACED IN SLAB ON GRADE AND SLAB ON METAL DECK CONSTRUCTION WITHIN 24 HOURS OF INITIAL POUR.
9. WIRE SPACERS, CHAIRS, TIES, ETC., FOR SUPPORT OF STEEL REINFORCING SHALL BE PROVIDED BY THE CONTRACTOR TO ENSURE REINFORCING IS PLACED IN THE PROPER POSITION DURING CONCRETE PLACEMENT.
10. STEEL REINFORCING SPLICES OF ADJACENT BARS SHALL BE STAGGERED SUCH THAT SPLICES ARE 4 FEET APART, MINIMUM.
11. PROVIDE (2) #5 BARS AROUND ALL OPENINGS AND (2) #5 DIAGONALLY AT ALL OPENING CORNERS UNLESS OTHERWISE SPECIFIED. EXTEND 2'-6" PAST OPENING TYPICALLY.
12. WELDED WIRE REINFORCING SHALL BE IN FLAT SHEETS ONLY, AND LAPPED A MINIMUM OF 6 INCHES.
13. WELDING OF STEEL REINFORCING IS NOT PERMITTED.
14. SLEEVES, CONDUITS, OR PIPES THROUGH SLABS AND WALLS SHALL BE PLACED AT THREE DIAMETERS ON CENTER, OR 4 INCHES MINIMUM.
15. ALUMINUM CONDUIT OR PIPING SHALL NOT BE CAST IN CONCRETE.
16. PROVIDE A 3/4" CHAMFER ON EXPOSED CORNERS OF CONCRETE UNO. TOP EDGES OF WALLS SHALL BE TOOLED UNO.
17. FINISH & COVER CONCRETE SLABS w/ FILM FORMING CURING COMPOUND OR VAPOR RETARDER UNO OR SPECIFIED OTHERWISE.

CAST-IN-PLACE CONCRETE TOLERANCES

1. CONCRETE COVER MEASURED PERPENDICULAR FROM THE SURFACE IN DIRECTION OF TOLERANCES:
   MEMBERS 12" OR LESS ±3/8"
   MEMBERS OVER 12" ±1/2"
2. STEEL REINFORCEMENT SPACING SHALL BE WITHIN THE FOLLOWING TOLERANCES:
   1/4" SPACING DISTANCE, NOT TO EXCEED 1"
3. PLACEMENT OF EMBEDDED ITEMS SHALL BE WITHIN THE FOLLOWING TOLERANCES:
   VERTICAL ALIGNMENT ±1"
   LATERAL ALIGNMENT ±1"
   LEVEL ALIGNMENT ±1"
4. PLACEMENT OF FOOTINGS SHALL BE WITHIN THE FOLLOWING TOLERANCES:
   LATERAL ALIGNMENT ±2"
   LEVEL ALIGNMENT +1/2" TO -2"
   (LEVEL ALIGNMENT SUPPORTING MASONRY) ±1/2"
5. CROSS-SECTIONAL DIMENSION OF FOUNDATIONS SHALL BE WITHIN THE FOLLOWING TOLERANCES:
   SPREAD FOOTINGS / PILE CAPS +2" TO -1/2"
   FOUNDATION THICKNESS ±5%
6. TOP OF FOOTING SLOPE 1" IN 10'

COLD WEATHER CONCRETING NOTES

1. SNOW, FROST, AND ICE SHALL BE REMOVED FROM ALL SURFACES, INCLUDING REINFORCING, AGAINST WHICH THE CONCRETE IS TO BE PLACED
2. DO NOT PLACE CONCRETE ON FROZEN SUBGRADE.
3. THE MINIMUM PLACEMENT AND PROTECTION TEMPERATURE OF CONCRETE SHALL BE AS FOLLOWS:

LEAST DIMENSION OF SECTION	MINIMUM TEMP OF CONCRETE AS PLACED AND MAINTAINED DURING PROTECTION PERIOD (DEGREES FAHRENHEIT)
LESS THAN 12"	55
12" TO LESS THAN 36	50
36" TO 72"	45
GREATER THAN 72"	40

4. TEMPERATURES OF CONCRETE SHALL BE MEASURED AT THE CONCRETE SURFACE.
5. CONCRETE TEMPERATURES SHALL BE MEASURED AND RECORDED FOR THE FIRST 3 DAYS UPON PLACEMENT OF CONCRETE, AT THE BEGINNING, MIDDLE, AND END OF EACH WORK DAY AT 4 HOUR INTERVALS. OVERNIGHT TEMPERATURE MEASUREMENTS ARE NOT REQUIRED.
6. HEATED AIR TEMPERATURES SHALL NOT EXCEED THE REQUIRED CONCRETE TEMPERATURES LISTED IN TABLE ABOVE BY MORE THAN 20 DEGREES.
7. CONCRETE SHALL BE CURED AND PROTECTED AGAINST DAMAGE FROM FREEZING FOR A MINIMUM PERIOD OF 3 DAYS.
8. DURING PERIODS NOT DEFINED AS COLD WEATHER, BUT WHEN FREEZING TEMPERATURES MAY OCCUR, PROTECT CONCRETE SURFACES FROM FREEZING THE FIRST 24 HOURS AFTER PLACEMENT.
9. IF TEMPERATURE REQUIREMENTS DURING PROTECTION PERIOD ARE NOT MET, BUT CONCRETE WAS PREVENTED FROM FREEZING, CONTACT ARCHITECT/ENGINEER FOR EXTENT OF ADDITIONAL PROTECTION TIME REQUIRED.

HOT WEATHER CONCRETING NOTES

1. CONCRETE MIXES TO BE PLACED DURING DRY AND WINDY CONDITIONS SHALL BE MODIFIED BY THE ADDITION OF RETARDING ADMIXTURES OR SLOWER CURING CEMENT SUBSTITUTES TO MINIMIZE THE EFFECTS OF ACCELERATED CURING.
2. WATER SHALL NOT BE ADDED TO CONCRETE MIXES ON SITE FOR WORKABILITY. MID OR HIGH RANGE WATER REDUCERS SHALL BE APPROVED BY ENGINEER BEFORE ADDING TO CONCRETE MIX FOR INCREASED WORKABILITY.
3. INGREDIENTS USED IN CONCRETE MIXES SHALL BE COOLED TO MAINTAIN A CONCRETE TEMPERATURE BELOW 90 DEGREES FAHRENHEIT AT TIME OF PLACEMENT.
4. CHILLED WATER AND CHOPPED ICE MAY BE USED IN CONCRETE MIXTURES TO CONTROL CONCRETE TEMPERATURES. AMOUNT OF CHOPPED ICE SHALL NOT EXCEED THE EQUIVALENT AMOUNT OF MIXING WATER REQUIRED FOR THE DESIGN MIX.
5. RETARDING ADMIXTURES SHALL NOT BE USED IN CONCRETE MIXES WITHOUT THE APPROVAL OF THE ENGINEER.

CLASS 'B' TENSION LAP SPLICE LENGTHS (INCHES)

BAR SIZE	f'c = 3000		f'c = 4000	
	BOT	TOP	BOT	TOP
#3	22	28	19	24
#4	29	37	25	33
#5	36	47	31	41
#6	43	56	37	49
#7	63	81	54	71
#8	72	93	62	81
#9	81	105	70	91
#10	91	118	79	102
#11	101	131	87	113

NOTES (d_b = BAR DIAMETER, C-C = CENTER TO CENTER):

1. SCHEDULE BASED ON CLEAR COVER >1 d_b AND C-C > 2d_b
2. TOP BARS OF BEAMS AND JOIST AND HORIZONTAL WALL REINFORCING

THIS SCHEDULE IS PROVIDED FOR THE CONVENIENCE OF THE CONTRACTOR AND IS NOT INTENDED TO COVER ALL SITUATIONS. SHOP DRAWINGS SHALL CLEARLY INDICATE ALL REQUIRED LAP LENGTHS

MILD STEEL PROTECTION

FOOTINGS / PILE CAPS - BOTTOM & SIDES	3"
FOOTING - TOP	2"
PERIMETER WALLS - #5 & SMALLER	1 1/2"
PERIMETER WALLS - #6 & LARGER	2"
INTERIOR WALLS	3/4"
BEAMS, PIERS, & COLUMNS	1 1/2"
SLABS - BOTTOM & SIDES	3/4"
SLABS - TOP	3/4"
PARKING SLABS - TOP & CORROSIVE ENVIRONMENTS	1 1/2"

CMU WALL CONSTRUCTION NOTES

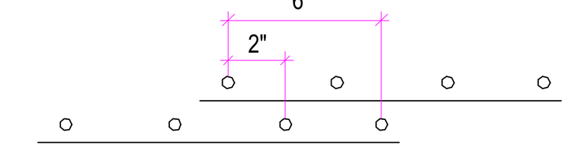
1. IN ACCORDANCE WITH "ACI 530-05/ASCE 6-05/TMS 402-05 BUILDING CODE FOR MASONRY STRUCTURES" PROVIDE LEVEL B QUALITY ASSURANCE PER TABLE 1.15.2 AND AS REQUIRED IN CHAPTER 1. VERIFY f'm REQUIRED USING THE UNIT STRENGTH METHOD.
2. CMU SHALL BE LAID IN RUNNING BOND WITH TYPE S MORTAR (TYPE M BELOW GRADE).
3. PROVIDE MINIMUM 1- #5 VERTICAL BAR AT ALL WALL CORNERS, ENDS OF WALLS, & EACH SIDE OF CONTROL JOINTS.
4. ALL REINFORCED CELLS SHALL BE GROUTED WITH PEA GRAVEL CONCRETE HAVING A MIN. COMPRESSIVE STRENGTH OF 3,000psi.
5. HORIZONTAL REINFORCING AND BOND BEAM REINFORCING AT CORNERS SHALL BE LAPPED A MINIMUM OF 48 BAR DIAMETERS, OR 24" INCHES, WHICHEVER IS LARGER.
6. CLEANOUTS SHALL BE PROVIDED IN THE BOTTOM COURSE OF MASONRY FOR EACH GROUT POUR, WHEN THE POUR HEIGHT EXCEEDS 5 FEET.
7. FACE SHELLS AND WEB FORMING CELLS SHALL BE FULL-BEDDED IN THE STARTING COURSE ON FOUNDATIONS, AND IN ALL COURSES OF PIERS AND PILASTERS.
8. PROVIDE HORIZONTAL JOINT REINFORCING AT 16" O.C. VERTICALLY (8" O.C. IN PARAPET WALLS) U.N.O.
9. HORIZONTAL JOINT REINFORCING SHALL BE TERMINATED AT CONTROL JOINTS. BOND BEAM REINFORCING SHALL BE CONTINUOUS.
10. REFER TO ARCHITECTURAL DRAWINGS FOR CONTROL JOINT SPACINGS, COURSING AND MORTAR JOINT DETAILING.
11. SOLID OR SOLID GROUTED CMU SHALL BE PROVIDED IN COURSES IMMEDIATELY ABOVE AND BELOW ANY CHANGES IN WYTHE THICKNESS.

NON-LOAD BEARING CMU PARTITION WALLS

1. NON-LOAD BEARING CMU PARTITION WALLS ARE NOT SHOWN ON STRUCTURAL PLANS.
2. REFER TO ARCHITECTURAL DRAWINGS FOR ALL WALL LOCATIONS & DIMENSIONS.
3. PROVIDE HORIZONTAL JOINT REINFORCING, (2) LONGITUDINAL W1.7 WIRES AT 16"OC VERTICALLY.
4. PROVIDE 8" HIGH BOND BEAM w/ 2- #5 x CONT AT TOP OF WALLS AND AT FLOOR LINES FOR MULTI-STORY WALLS. SEE DETAIL 6/S502 FOR TOP OF WALL STABILITY CONNECTIONS.
5. CELLS DO NOT REQUIRE GROUT EXCEPT AT BOND BEAM LINTEL BEARING LOCATIONS.
6. AT PARTITION WALL MASONRY OPENINGS (M.O.), PROVIDE THE FOLLOWING MASONRY BOND BEAMS:
   M.O. < 6' 8" HIGH w/ 2- #5 8" BRG EACH END, GROUT 2 CELL COURSES SOLID BENEATH
   6' < M.O. < 10' 16" HIGH w/ 2- #5 8" BRG EACH END, GROUT CELL SOLID FULL HEIGHT
   SHORE LINTELS UNTIL GROUT HAS FULLY CURED.
7. SEE CMU WALL CONSTRUCTION NOTES FOR GROUT STRENGTH.
8. NON-LOAD BEARING PARTITION WALLS MAY BE PLACED DIRECTLY ON UNTHICKENED SLAB ON GRADE.

CONCRETE REINFORCING NOTES

1. REINFORCING SHALL BE DETAILED IN ACCORDANCE WITH ACI 315 (CURRENT EDITION). ARRANGEMENT AND BENDING OF REINFORCING STEEL SHALL BE IN ACCORDANCE WITH ACI DETAILING MANUAL (ACI SP-66), LATEST EDITION.
2. ALL LAPS SHALL BE CLASS "B" PER ACI 318 UNLESS OTHERWISE NOTED ON THE DESIGN DRAWINGS, OR UNLESS THE DETAILER TAKES SPECIAL CARE TO PROVIDE STAGGERED LAPS. USE TOP BAR LAP LENGTHS FOR ALL HORIZONTAL WALL BARS AND FOR TOP BARS IN SLABS AND BEAMS OVER 12" DEEP.
3. LAP LENGTH SHALL BE SPECIFICALLY NOTED ON PLACING DRAWINGS WHERE MORE THAN ONE BAR MAKES UP A CONTINUOUS STRING.
4. CORNER BARS WITH CLASS "B" PER ACI 318 LAPS SHALL BE PROVIDED AT ALL WALL CORNERS AND INTERSECTIONS.
5. HORIZONTAL BARS, EXCEPT FOR CONTINUOUS STRINGS FROM ONE CORNER OF OPENING TO ANOTHER, SHALL BE DETAILED TO SHOW THE DISTANCE FROM AT LEAST ONE END OF THE BAR TO THE NEAREST BUILDING GRID LINE OR WALL.
6. WELDED WIRE FABRIC SHALL BE LAPPED AND/OR ANCHORED TO DEVELOP Fy PER ACI 315.



7. PROVIDE MINIMUM COVER PER ACI 318, 7.7.1 (AS SHOWN ON THIS SHEET)
8. ARRANGEMENT AND BENDING OF REINFORCING STEEL SHALL BE IN ACCORDANCE WITH ACI DETAILING MANUAL (ACI SP-66), LATEST EDITION.
9. ALL HOOKS IN STEEL REINFORCING SHALL BE ACI STANDARD HOOKS, UNLESS NOTED OTHERWISE IN CONSTRUCTION DOCUMENTS.
10. WIRE SPACERS, CHAIRS, TIES, ETC., FOR SUPPORT OF STEEL REINFORCING SHALL BE PROVIDED BY THE CONTRACTOR TO ENSURE REINFORCING IS PLACED IN THE PROPER POSITION DURING CONCRETE PLACEMENT.
11. STEEL REINFORCING SPLICES OF ADJACENT BARS SHALL BE STAGGERED SUCH THAT SPLICES ARE 4 FEET APART, MINIMUM.
12. WELDING OF STEEL REINFORCING IS NOT PERMITTED.

STRUCTURAL STEEL NOTES

1. FABRICATION AND ERECTION OF STRUCTURAL STEEL SHALL CONFORM WITH THE AISC (AMERICAN INSTITUTE OF STEEL CONSTRUCTION), "MANUAL OF STEEL CONSTRUCTION", LATEST EDITION.
2. ALL STEEL DETAILS AND CONNECTIONS SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE AISC "SPECIFICATIONS FOR STRUCTURAL STEEL BUILDINGS, ALLOWABLE STRESS DESIGN AND PLASTIC DESIGN", LATEST EDITION.
3. FABRICATORS SHALL DESIGN CONNECTIONS NOT SPECIFICALLY DETAILED ON PLANS AS FOLLOWS:

   A. GENERAL: MEMBERS REQUIRING END MOMENT CONNECTIONS SHALL MEET THE REQUIREMENTS OF TYPE 1 "RIGID FRAME" CONSTRUCTION INCLUDING FRICTION BOLTS IF UTILIZED. ALL OTHER MEMBERS SHALL FOLLOW THE REQUIREMENTS OF TYPE 2 "SIMPLE" CONSTRUCTION.

   B. MEMBER SHEAR CONNECTIONS: UNLESS A LARGER END VERTICAL REACTION IS SHOWN OTHERWISE ON THE DRAWINGS (IE R = 85k), MINIMUM DESIGN SHEAR FORCES SHALL BE AS FOLLOWS:

   I. NON-COMPOSITE BEAMS: SUPPORT A REACTION "R" EQUAL TO ONE HALF THE TOTAL UNIFORM LOAD CAPACITY FROM THE TABLE OF UNIFORM LOAD CONSTANTS IN THE AISC MANUAL PART 2 FOR GIVEN SHAPE, SPAN, AND GRADE OF STEEL.
4. USE A325N BOLTS UNLESS NOTED OTHERWISE.
5. SPLICES SHALL BE ALLOWED ONLY AT LOCATIONS SPECIFICALLY INDICATED ON THE STRUCTURAL DRAWINGS UNLESS APPROVED OTHERWISE BY THE ENGINEER.
6. OVERSIZED OR SLOTTED HOLES SHALL NOT BE USED FOR ANY CONNECTIONS UNLESS SPECIFICALLY INDICATED ON THE DRAWINGS OR APPROVED BY THE ENGINEER.
7. BEAM AND GIRDER CONNECTIONS SHALL BE AS NOTED ON PLANS AND IN DETAILS.
8. PROVIDE HOLES IN ALL STEEL AS REQUIRED TO PREVENT ANY ACCUMULATION OF WATER DURING ERECTION. ALL PENETRATIONS THROUGH MAIN MEMBERS SHALL NOT EXCEED 1 1/2" IN DIAMETER AND SHALL BE GROUND SMOOTH.
9. CUTS, HOLES, COPING, ETC. REQUIRED FOR WORK OF OTHER TRADES SHALL BE SHOWN ON THE SHOP DRAWINGS AND MADE IN THE SHOP. CUTS OR BURNING OF HOLES IN STRUCTURAL STEEL MEMBERS IN THE FIELD WILL NOT BE PERMITTED.
10. PROVIDE ANY NECESSARY TEMPORARY BRACING OR GUYS TO PROVIDE LATERAL SUPPORT OF THE BUILDING UNTIL PERMANENT FRAME IS COMPLETELY INSTALLED.
11. STRUCTURAL STEEL FRAMING SHALL BE TRUE AND PLUMB BEFORE CONNECTIONS ARE FINALLY BOLTED OR WELDED.

COLD-FORMED METAL MATERIAL NOTES

1. ALL COLD-FORMED METAL FRAMING SHALL CONFORM TO:
   PAINTED SECTIONS: 10, 12, 14 & 16 GA - A570 Fy=50,000 PSI
   PAINTED SECTIONS: 18 & 20 GA - A611 GD C Fy=33,000 PSI
   GALVANIZED SECTIONS: 10, 12, 14 & 16 GA - A446 GD D Fy=50,000 PSI
   GALVANIZED SECTIONS: 18 & 20 GA - A446 GD A Fy=33,000 PSI
2. REFER TO PLANS AND DETAILS FOR GAUGE AND SIZE REQUIREMENTS OF COLD-FORMED METAL FRAMING MEMBERS.
3. ALL FRAMING PRODUCTS SHALL BE FORMED FROM STEEL POSSESSING A COATING CORRESPONDING TO THE MINIMUM REQUIREMENTS OF ASTM C955.
4. ALL SIDE CLIPS, SUPPORT CLIPS, AND CLIP ANGLES ARE 50 ksi, UNLESS NOTED OTHERWISE.
5. NOMENCLATURE: CONFORMS TO SSMA STANDARDS, PRODUCT TECHNICAL INFORMATION, PAGE 5 (www.SSMA.com), FOR "GENERIC" FRAMING MANUFACTURER.
6. GALVANIZING: ALL FRAMING TO BE GALVANIZED, G60 COATING MINIMUM, UNLESS NOTED OTHERWISE.
7. SUGGESTED WELD METAL AND PROCESS FOR SHOP WELDING ARE: 60 ksi WELD MATERIAL STRENGTH (MINIMUM). SUGGESTED METHODS FOR FIELD WELDING: 1/8" UNLESS NOTED OTHERWISE, E60XX (MINIMUM) ELECTRODE- SMAW - OR "GASLESS" MIG. MINIMUM WELD THROAT THICKNESS (t) MUST MATCH OR EXCEED THE BASE STEEL THICKNESS OF THE THINNEST CONNECTED PART UNLESS NOTED OTHERWISE.
8. ZINC RICH PAINT: FOR WELD TOUCH-UP USE PAINT 20 TYPE II ORGANIC ZINC RICH.
9. FASTENERS: SHALL BE CORROSION-RESISTANT CADMIUM OR ZINC PLATED SCREWS, NUTS, BOLTS, WASHERS AND OTHER FASTENERS.
10. UNLESS NOTED OTHERWISE, REFER TO LITERATURE PUBLISHED BY HILTI FASTENING SYSTEMS, INC. FOR EXPANSION BOLT, OR POWDER ACTUATED FASTENER (P.A.F.) INFORMATION, AND ITW BUILDEX, INC. FOR TEKS SCREW DATA. ALTERNATE MANUFACTURER'S FASTENERS OF COMPARABLE SPECIFICATIONS AND LOAD CAPACITIES ARE ACCEPTABLE WITH APPROVAL. ALL FASTENER'S SUBJECT TO TENSION SHALL HAVE 15MM (MINIMUM) DIAMETER STEEL WASHERS.

COLD-FORMED METAL FRAMING NOTES

1. HEADERS AND JAMBS AT OPENINGS MAY CONSIST OF BUILT-UP COLD-FORMED METAL SECTIONS OR HOT ROLLED STEEL SECTIONS (TUBES, ANGLES, ETC.) SOME CONDITIONS MAY NECESSITATE HOT-ROLLED STEEL SECTIONS, AND ARE TO BE SUPPLIED AND INSTALLED BY THE COLD-FORMED METAL CONTRACTOR.
2. MECHANICAL BRIDGING SHALL BE INSTALLED PRIOR TO THE ATTACHMENT OF FACING MATERIALS AND SHALL BE SECURED IN A MANNER TO PREVENT STUD ROTATION AND BE SPACED ACCORDING TO THE MANUFACTURER'S RECOMMENDATIONS. MAXIMUM SPACING SHALL BE 6'-0" ON CENTER FOR LATERALLY LOADED WALLS AND 4'-0" ON CENTER FOR AXIALLY LOADED WALLS.
3. PROVIDE WEB STIFFENERS AT HORIZONTAL AND VERTICAL REACTION POINTS.
4. PROVIDE ALL HORIZONTAL AND VERTICAL ATTACHMENT MECHANISMS WHERE REQUIRED.
5. PROVIDE JACK STUDS OR CRIPPLES BELOW WINDOW SILLS, AND ABOVE WINDOW AND DOOR HEADS. THESE SHALL BE SECURELY ATTACHED TO SUPPORTING MEMBERS.
6. ALL WELDING SHALL BE PERFORMED BY AWS D1.3 CERTIFIED WELDERS IN ACCORDANCE WITH THE PROVISIONS OF THE LATEST EDITION OF AWS D1.3, "SPECIFICATIONS FOR WELDING SHEET STEEL IN STRUCTURES."
7. TEMPORARY BRACING SHALL BE PROVIDED AND REMAIN IN PLACE UNTIL THE STRUCTURE IS COMPLETELY STABILIZED. PRIOR TO ATTACHMENT OF WALL SHEATHING, PROVIDE TEMPORARY BRACING TO RESIST BUCKLING OF LOAD-BEARING STUDS, TEMPORARY X-BRACING TO RESIST LATERAL WIND AND SEISMIC LOADS AND ANY OTHER TEMPORARY BRACING DEEMED NECESSARY DURING CONSTRUCTION. TEMPORARY BRACING IS THE RESPONSIBILITY OF THE COLD-FORMED METAL INSTALLER.
8. ALL FIELD CUTTING OF STUDS MUST BE DONE BY SAWING OR SHEARING. TORCH CUTTING OF COLD-FORMED MEMBERS IS UNACCEPTABLE.
9. STUDS SHALL NOT DEVIATE FROM PLUMB, LEVEL AND TRUE TO LINE OF 1/8" IN 10'-0" OR IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.

COLD-FORMED METAL PRODUCT IDENTIFICATION

PRODUCT GEOMETRIES MUST MEET OR EXCEED THE MINIMUM PROPOSED BY THE STEEL STUD MANUFACTURERS ASSOCIATION FOR INDUSTRY STANDARDIZATION. FOR SSMA DESIGNATIONS SEETABLES BELOW.

MEMBER SECTION TABLE

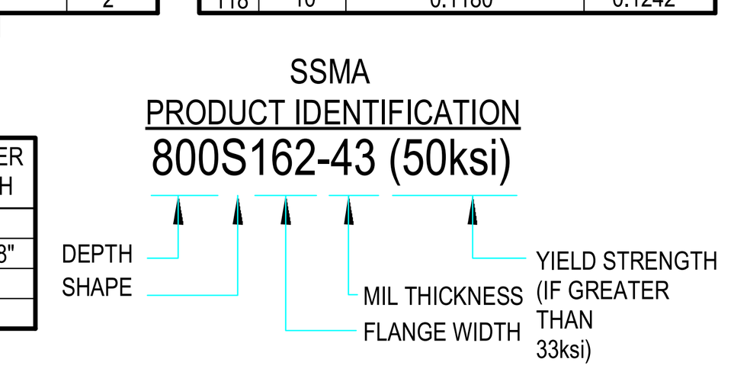
SECTION	SSMA IDENTIFICATION	FLANGE WIDTH
S-SECTIONS (STUDS)	S137	1 3/8"
	S162	1 5/8"
	S200	2"
	S250	2 1/2"
T-SECTIONS (TRACKS)	T125	1 1/4"
	T200	2"

MEMBER THICKNESS TABLE

MILS	GAUGE	MINIMUM DELIVERED THICKNESS	DESIGN THICKNESS
33	20	0.0329"	0.0346"
43	18	0.0428"	0.0451"
54	16	0.0538"	0.0566"
68	14	0.0677"	0.0713"
97	12	0.0966"	0.1017"
118	10	0.1180"	0.1242"

MEMBER DEPTH (WEB SIZE) TABLE

SSMA IDENTIFICATION	MEMBER DEPTH
600	6"
362	3 5/8"
800	8"
1000	10"



WOOD FRAMING NOTES

1. ARCHITECT & CONTRACTOR SHALL DETAIL & CONSTRUCT BUILDING FINISHES TO ACCOMMODATE AN EXPECTED BUILDING SHRINKAGE OF APPROXIMATELY 3/16" TO 3/8" PER FLOOR OF WOOD CONSTRUCTION. PROPER CARE SHALL BE TAKEN TO PREVENT STORED & INSTALLED LUMBER FROM THE ELEMENTS. DO NOT ALLOW LUMBER TO REST IN STANDING WATER.
2. FRAMING MEMBERS:

VERTICAL MEMBERS:	SEE BEARING WALL SCHEDULE, KILN DRIED, MOISTURE CONTENT SHALL BE BETWEEN 15% AND 19%
JOISTS:	2x NO. 1 / NO. 2 SPF U.N.O. SIZE & SPACING PER PLANS
JOISTS (EXPOSED TO WEATHER):	2x NO. 1 / NO.2 TREATED SOUTHERN YELLOW PINE U.N.O. SIZE & SPACING PER PLANS.
POSTS:	SEE FRAMING PLANS & POST SCHEDULE

3. TOP & BOTTOM PLATES OF STUD WALLS SHALL BE AS INDICATED IN THE BEARING WALL SCHEDULE.
4. FLOOR SHEATHING SHALL BE 3/4" APA RATED, T&G SHEATHING, GLUED & NAILED TO FLOOR FRAMING w/ 8d RING SHANK NAILS @ 6" O.C. ALONG EDGES AND 12" O.C. ALONG INTERMEDIATE MEMBERS. STAGGER PANEL EDGES.
5. ROOF SHEATHING SHALL BE 3/4" T&G APA RATED SHEATHING ATTACHED TO THE ROOF FRAMING MEMBERS w/ 8d RING SHANK NAILS @ 6" O.C. ALONG EDGES AND 12" O.C. ALONG INTERMEDIATE MEMBERS. STAGGER PANEL EDGES. (1" MIN. EMBED. INTO FRAMING MEMBER).
6. EXTERIOR WALLS SHALL BE SHEATHED w/ 7/16" APA RATED SHEATHING. ATTACH DIRECTLY TO THE OUTSIDE FACE OF EXTERIOR STUD WALLS WITH 8d COMMON OR BOX NAILS @ 6"O.C. ALONG EDGES AND 12" O.C. ALONG INTERMEDIATE MEMBERS. U.N.O.
7. ALL INTERIOR LOAD BEARING WALLS NOT SPECIFICALLY DESIGNATED AS A SHEAR WALL, SHALL BE CONSTRUCTED WITH A MINIMUM OF 1 LAYER 5/8" GYPSUM BOARD ATTACHED W/ 6d COOLER NAILS @ 8" O.C. ALONG EDGES & 12" O.C. AT INTERMEDIATE MEMBERS, U.N.O. SEE ARCHITECTURAL DRAWINGS FOR NON-LOAD BEARING WALL CONFIGURATIONS.
8. COORDINATE WALL STUD LOCATIONS TO ALIGN WITH TRUSS BEARING LOCATIONS @ ALL WALLS.
9. PROVIDE EQUIVALENT SIZE SOLID BLOCKING & VERTICAL MEMBERS THROUGH UNDERLYING FLOORS/WALLS BELOW MULTIPLE MEMBERS OR POSTS CARRYING CONCENTRATED LOADS.
10. COLUMN SIZES SHOWN ARE MINIMUM. CONTRACTOR MAY USE LARGER SECTION IF REQUIRED TO FULLY SUPPORT MEMBERS. LARGER COLUMNS MUST FIT INTO WALLS THEY ARE INTENDED TO FIT IN.
11. AS A MINIMUM, ALL CONNECTIONS SHALL CONFORM TO IBC 2009 TABLE 2304.9.1 FASTENING SCHEDULE (SEE SHEET S002 FOR SCHEDULE). DRAWING DETAILS SHALL GOVERN IF THEIR CONNECTION CAPACITY IS GREATER THAN THOSE SPECIFIED IN TABLE 2304.9.1.
12. WHERE BUILT-UP/MULTI-PLY BEAMS AND HEADERS OF DIMENSIONAL LUMBER OR LVL MATERIAL ARE INDICATED, SEE DETAIL 2/S5.0 FOR SIDE LOADED MEMBERS AND SEE DETAIL 4/S500 FOR TOP LOADED MEMBERS FOR MINIMUM FASTENING REQUIREMENTS. ALSO SEE MANUFACTURER'S MINIMUM FASTENING REQUIREMENTS.
13. WHERE BUILT-UP/MULTI-PLY POSTS AND COLUMNS ARE INDICATED, FASTENING SHALL BE IN ACCORDANCE WITH NATIONAL DESIGN SPECIFICATION SECTION 15.3.3.
14. USE JOIST HANGERS DESIGNED FOR GIVEN MEMBER SIZE TO SUPPORT ALL JOISTS/HEADERS FRAMING INTO SIDES OF OTHER MEMBERS.
15. PROVIDE CROSS BRIDGING/BLOCKING BETWEEN FLOOR JOISTS PER NATIONAL DESIGN SPECIFICATION 4.4.1.
16. DO NOT CUT, NOTCH, OR DRILL HOLES IN LVL OR PSL BEAMS OR JOISTS WITHOUT ENGINEER APPROVAL. AT ENGINEERED APPROVED LOCATIONS, SEE DETAIL 4/S5.0 FOR LIMITS ON FIELD CUT HOLES IN LVL HEADERS AND BEAMS. VERIFY WITH MANUFACTURER'S REQUIREMENTS.
17. SEE SHEET S5.0 FOR DETAILS NOT CUT ON PLAN.
18. COORDINATE WALL & FACE BRICK DIMENSIONS W/ ARCHITECTURAL DRAWINGS.

ROOF & FLOOR TRUSS BRACING NOTES

1. ALL BRACING SHOWN OR DESCRIBED SHALL BE MINIMUM 2x4 WITH 2- 16d IN EVERY TRUSS IT CROSSES.
2. ALL TRUSS TOP CHORDS SHALL BE CONTINUOUSLY BRACED BY THE ROOF OR FLOOR DECKING.
3. ALL TRUSS WEB MEMBERS SHALL BE BRACED @ 4'-0" O.C. UNLESS CALCULATIONS SHOW OTHERWISE.
4. ALL ROOF TRUSS HORIZONTAL BRACING SHALL BE STIFFENED @ 20'-0" O.C. WITH EITHER:
   a. DIAGONAL BRACING EXTENDED TO A SHEAR WALL PARALLEL TO THE ORIGINAL BRACING. SEE BRACING DETAILS 3/S600 FIG. 1(a)-1(d).
   b. 1/2" APA RATED SHEATHING EXTENDED TO ROOF DECK OR SHEAR WALL.
5. ALL TRUSS BOTTOM CHORDS SHALL BE BRACED @ 6'-0" O.C. UNLESS CALCULATIONS SHOW OTHERWISE. CONTINUOUS SHEETING APPLIED TO BOTTOM CHORD WILL SATISFY THIS BRACING REQUIREMENT.

ROOF & FLOOR TRUSS SUBMITTAL NOTES

NOTE: TRUSS MANUFACTURER MAY NOT DEVIATE FROM THE FRAMING PLANS UNLESS PRIOR APPROVAL FROM THE STRUCTURAL ENGINEER HAS BEEN GIVEN. IT IS THE TRUSS MANUFACTURER'S RESPONSIBILITY TO SEEK SUCH APPROVAL PRIOR TO MANUFACTURE AND INSTALLATION OF FRAMING MEMBERS.

WOOD TRUSS SHOP DRAWINGS SHALL SHOW THE FOLLOWING INFO:

a. ERECTION PLAN: SHOWING DIMENSIONED LOCATIONS AND TRUSS IDENTIFICATION.
b. BEARING DETAILS: SHOWING BEARING LENGTH, WIDTH, AND DEPTH INDICATING CONFORMANCE TO DESIGN CALCULATIONS.
c. DESIGN LOADS: ALL DEAD AND LIVE LOADS SHALL BE SHOWN ON THE FRAMING PLAN OR TRUSS ELEVATION INDICATING CONFORMANCE TO TRUSS CALCULATIONS.
d. ALL PERMANENT BRACING: SHOW TOP CHORD, BOTTOM CHORD, & WEB MEMBER BRACING ON FRAMING PLAN AND TRUSS ELEVATION. SUPPLIER AND INSTALLER OF THIS BRACING SHALL ALSO BE INDICATED.
e. TRUSS DIMENSIONS: SHOW DEPTH, SPAN BEARING, HEIGHT, AND SLOPES AT ALL CRITICAL POINTS.
f. TRUSS DEFLECTIONS: SHOW LIVE LOAD AND TOTAL LOAD DEFLECTION BASED UPON DESIGN LOADS
g. MEMBER DESIGN: INCLUDING WEB CONFIGURATION, MEMBER SIZE, GRADE OF LUMBER, FABRICATED SPLICES, AND MEMBER BRACING REQUIRED BY TRUSS DESIGN.
   MEMBER CONNECTIONS: DESIGN AND INDICATE ALL NECESSARY HARDWARE FOR PROPER
h. INSTALLATION OF TRUSSES INCLUDING, BUT NOT LIMITED TO, GIRDER PLY CONNECTIONS, TRUSS-TO-GIRDER CONNECTIONS, TIE-DOWNS, AND FIELD SPLICES.
   INTERIOR CONNECTIONS: DESIGN AND SHOW DETAIL OF WEB AND CHORD CONNECTIONS, INCLUDING CONNECTOR PLATE SIZES, CAPACITIES, AND BOLT SIZES.
i. ERECTION PLAN: SHOW SPACING AND LAYOUT OF ANY TEMPORARY BRACING REQUIRED FOR ERECTION.
j. STRUCTURAL DESIGN OF TRUSSES: SUBMIT COMPLETE TRUSS CALCULATIONS STAMPED AND SIGNED BY A PROFESSIONAL ENGINEER IN THE STATE OF WISCONSIN AND OBTAIN ALL
k. APPROVALS NECESSARY FOR CONFORMANCE TO BUILDING CODE. VERIFY SUBMITTAL AND APPROVAL BY SENDING A COPY TO THE BUILDING DESIGN PROFESSIONAL.
l. PROVIDE CONTRACTOR/INSTALLER WITH ALL DATA NECESSARY FOR PROPER INSTALLATION.

DESIGN NOTES

1. ROOF TRUSS DESIGNER TO VERIFY MINIMUM DESIGN LOADS.
2. DESIGN UPLIFT ON ROOF TRUSSES AS INDICATED IN THE DESIGN DATA. PROVIDE A TIE DOWN CLIP AT EACH TRUSS, AT EVERY POINT OF BEARING.
3. UNBALANCED SNOW LOAD SHALL BE TAKEN ON EITHER SIDE OF RIDGE AND SHALL BE CONSIDERED CUMULATIVE @ VALLEY LOCATIONS. APPLY DESIGN DRIFT LOADS TO ROOF TRUSSES WHERE REQUIRED BY THE APPLICABLE BUILDING CODE, CURRENT EDITION.

DEFLECTION LIMITS:

ROOF	
LIVE LOAD	L/360
TOTAL LOAD	L/240
FLOOR	
LIVE LOAD	L/480
TOTAL LOAD	L/240

LOADS:

SEE DRAWINGS FOR TRUSS LOADS

STRUCTURAL ABBREVIATIONS

ABBRV.	WORD OR PHRASE
@	AT
&	AND
AB	ANCHOR BOLT
ALT	ALTERNATE
APA	AMERICAN PLYWOOD ASSOC.
ARCH	ARCHITECT(URAL)
BC	BOTTOM CHORD
BLDG	BUILDING
BLKG	BLOCKING
BM	BEAM
BOT	BOTTOM
BRG	BEARING
℄	CENTERLINE
CB	COLUMN BASE
CIP	CAST-IN-PLACE
CL	CENTERLINE
CLR	CLEAR
CJ	CONTROL OR CONSTRUCTION JOINT
CMU	CONCRETE MASONRY UNIT
COL	COLUMN
CONC	CONCRETE OR CONCENTRATED
CONT	CONTINUOUS
DBA	DECK BEARING ANGLE
DEFL	DEFLECTION
DEMO	DEMOLITION
DFL	DOUGLAS FIR LARCH
DIA (Ø)	DIAMETER
DIM	DIMENSION
DL	DEAD LOAD
DTL	DETAIL
DWL	DOWEL
DWG	DRAWING
EA	EACH
EF	EACH FACE
EJ	EXPANSION JOINT
EL	ELEVATION
EMBED	EMBEDMENT
EOSL	EDGE OF SLAB
EOS	EDGE OF STEEL
EQ	EQUAL
EW	EACH WAY
EXIST	EXISTING
EXP	EXPANSION
EXT	EXTERIOR
FD	FLOOR DRAIN
FND	FOUNDATION
FF	FINISH FLOOR
FIN	FINISH
FLR	FLOOR
FRMG	FRAMING
FTG	FOOTING
GA	GAGE
GALV.	GALVANIZED
GB	GRADE BEAM
GC	GENERAL CONTRACTOR
GT	GIRDER TRUSS
GYP	GYPSUM
HORIZ	HORIZONTAL
HIF	HORIZONTAL INSIDE FACE
HOF	HORIZONTAL OUTSIDE FACE
HSS	HOLLOW STRUCTURAL SECTION
HT	HEIGHT
HVAC	HEATING, VENTILATING & AIR COND.
HWS	HEADED WELD STUD
I.F.	INSIDE FACE
INFO	INFORMATION
JST	JOIST
KSI	KIPS PER SQUARE INCH
L	ANGLE

ABBRV.	WORD OR PHRASE
LL	LIVE LOAD
LLH	LONG LEG HORIZONTAL
LLV	LONG LEG VERTICAL
LSL	LAMINATED STRAND LUMBER
LVL	LAMINATED VENEER LUMBER
LW	LONG WAY
MFR	MANUFACTURER
MAX	MAXIMUM
MECH	MECHANICAL
MIN	MINIMUM
MISC	MISCELLANEOUS
NIC	NOT IN CONTRACT
NTS	NOT TO SCALE
OC	ON CENTER
O.F.	OUTSIDE FACE
OPP	OPPOSITE
PARA	PARALLEL
P/C	PRECAST CONCRETE
PCF	POUNDS PER CUBIC FOOT
PERP	PERPENDICULAR
ℙ	STEEL PLATE
PLY	PLYWOOD
PSI	POUNDS PER SQUARE INCH
PSF	POUNDS PER SQUARE FOOT
PSL	PARALLEL STRAND LUMBER
P/T	POST TENSIONED CONCRETE
PT	PRESSURE TREATED
REINF	REINFORCEMENT
REQD	REQUIRED
RTU	ROOF TOP UNIT
SCHD	SCHEDULE
SHT	SHEET
SIM	SIMILAR
SMS	SHEET METAL SCREWS
SOG	SLAB ON GRADE
SPEC	SPECIFICATION
SPF	SPRUCE-PINE-FIR
SQ	SQUARE
SS	STAINLESS STEEL
STL	STEEL
STR	STRUCTURAL
SW	SHORT WAY
SYM	SYMMETRICAL
SYP	SOUTHERN YELLOW PINE
T&B	TOP AND BOTTOM
TC	TOP CHORD
T&G	TONGUE AND GROOVE
TF	TOP OF FOOTING ELEVATION
TL	TOP OF LEDGE ELEVATION
TOC	TOP OF CONCRETE ELEVATION
TOSL	TOP OF SLAB ELEVATION
TOS	TOP OF STRUCTURAL SLAB ELEVATION
TP	TOP OF PIER ELEVATION
TPC	TOP OF PILE CAP
TRANS	TRANSVERSE
TS	TUBE STEEL
TW	TOP OF WALL ELEVATION
TYP	TYPICAL
UNO	UNLESS NOTED OTHERWISE
VERT	VERTICAL
VIF	VERTICAL INSIDE FACE
VOF	VERTICAL OUTSIDE FACE
w/	WITH
WF	WIDE FLANGE
w/o	WITHOUT
WP	WORKPOINT
WT	WEIGHT
WWF	WELDED WIRE FABRIC
SLRS	SEISMIC LOAD RESISTING SYSTEM
SMF	SPECIAL MOMENT FRAME
SCBF	SPECIAL CONCENTRIC BRACED FRAME

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KEY PLAN

PIERCE ENGINEERS INC
CONSULTING STRUCTURAL ENGINEERS
10 West Mifflin St, Suite 205 | Madison, WI 53703
Phone: 608.256.7304 | Fax: 608.256.7306
PE PROJECT 15213

ISSUED

Issued for Bid	September 25, 2015
Revised Bid Set	January 19, 2016
Issued for Plan Review	February 8, 2016
2 CB #1	December 7, 2017

WISCONSIN RICHARD C. PIERCE E-22511 WAUKESHA, WI PROFESSIONAL ENGINEER 1/12/18

PROJECT TITLE
ROYSTER CROSSINGS LOT 2

521-523 GRAND OAK TRL, MADISON, WI

SHEET TITLE
STRUCTURAL NOTES

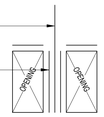
SHEET NUMBER
S-0.0

PROJECT NUMBER 1421

MASONRY WALL & PIER REINFORCEMENT SCHEDULE

MARK	SIZE / REINFORCEMENT	CONFIGURATION	REMARKS
1	8" CMU w/ #5 @ 32"OC	PROVIDE AS REINFORCING CENTERED IN WALLS EXCEPT WHERE OTHERWISE NOTED	NOTE 7
2	8" x 8" CMU PIER w/ 2 - #5 x CONT	BAR BETWEEN LINTEL BEARING & FOUNDATION	
3	8" x 24" CMU PIER w/ 6 - #5 x CONT FULL HEIGHT	6 - #5 BARS, FULL HEIGHT	
4	8" x 48" CMU PIER w/ 12 - #5 x CONT FULL HEIGHT	12 - #5 BARS, FULL HEIGHT	

MASONRY WALL & PIER REINFORCEMENT SCHEDULE NOTES:
1. PROVIDE MATCHING DOWELS w/ STANDARD 90° HOOK INTO FOUNDATION WALL FOR ALL REINFORCED WALLS & PIERS. LAP 48 BAR DIAMETERS w/ VERTICALS.
2. ALL REINFORCING SHALL EXTEND FULL HEIGHT, UNLESS NOTED OTHERWISE.
3. PROVIDE 1 - VERTICAL BAR AT CORNERS, AND ON EACH SIDE OF CONTROL JOINTS.
4. EXCEPT WHERE NOTED OTHERWISE, PROVIDE 1 - VERTICAL BAR IN THE CELL ADJACENT TO LINTEL BEARING AT ALL OPENINGS.
5. REFER TO ARCHITECTURAL DRAWINGS FOR ADDITIONAL GROUTING REQUIREMENTS.
6. 2 - #5 IN GROUTED CELLS ADJACENT TO LINTEL BEARING FROM FOUNDATION TO ROOF BEARING
   1 - #6 IN GROUTED CELL ADJACENT TO M.O. FROM FOUNDATION TO LINTEL BEARING
7. SEE SHEARWALL ELEVATIONS FOR ADDITIONAL CORNER BARS AND GROUT INFORMATION.



POINT LOAD SCHEDULE

MARK	SNOW LOAD (k)	LIVE LOAD (k)	DEAD LOAD (k)
PL-1	0.0	7.2	6.3
PL-2	0.0	14.4	12.6
PL-3	0.0	8.6	7.6
PL-4	1.5	3.3	3.3
PL-5	0.0	7.4	3.9
PL-6	0.0	2.8	2.6
PL-7	0.0	1.3	0.5
PL-8	2.3	4.3	5.7
PL-9	2.2	7.4	3.3

LINE LOAD SCHEDULE

MARK	SNOW LOAD (k/ft)	LIVE LOAD (k/ft)	DEAD LOAD (k/ft)
LL-1	0.8	2.0	1.3
LL-2	0.0	0.3	0.8
LL-3	0.0	1.9	1.7
LL-4	0.8	2.1	1.1
LL-5	0.8	0.8	1.1
LL-6	0.1	0.2	0.6
LL-7	0.1	1.7	0.6
LL-8	0.8	1.4	1.1
LL-9	0.2	2.4	0.4
LL-10	0.1	0.5	0.2
LL-11	0.5	4.2	1.1
LL-12	0.0	2.0	0.4
LL-13	0.1	0.5	0.2
LL-14	1.2	1.2	1.8
LL-15	1.0	0.0	0.8
LL-16	0.2	0.0	0.1
LL-17	0.3	1.0	0.8
LL-18	0.0	0.0	0.5

LINE LOAD SCHEDULE NOTE:
1. LIVE LOAD LINE LOAD INCLUDES BRICK LOAD AT BRICK WALL LOCATIONS.

PRECAST PLANK SCHEDULE

MARK	PLANK DEPTH	TOPPING	DEAD LOAD	LIVE LOAD	FIRE RATING	REMARKS
PC-1	8"	NONE	SELF WT + 20 psf	150 psf	2 HR	
PC-2	12"	NONE	SELF WT + 20 psf	150 psf	2 HR	
PC-3	8"	3"	SELF WT + 15 psf	100 psf	2 HR	
PC-4	12"	3"	SELF WT + 15 psf	100 psf	2 HR	
PC-5	8"	NONE	SELF WT + 20 psf	NOTE 5	3 HR	
PC-6	12"	NONE	SELF WT + 20 psf	NOTE 5	3 HR	
PC-7	8"	NONE	SELF WT + 60 psf	NOTE 5	3 HR	NOTE 8
PC-8	12"	NONE	SELF WT + 60 psf	NOTE 5	3 HR	
PC-9	12"	NONE	SELF WT + 35 psf	30 psf	3 HR	
PC-11	12"	NONE	SELF WT + 30 psf	100 psf	3 HR	
PC-12	12"	NONE	SELF WT + 30 psf	NOTE 7	3 HR	
PC-13	12"	NONE	SELF WT + 100 psf	250 psf	2 HR	
PC-14	12"	NONE	SELF WT + 100 psf	NOTE 6	2 HR	

PRECAST PLANK SCHEDULE NOTES:
1. VERIFY FIRE RATING w/ ARCHITECTURAL.
2. ALL TOPPING (BONDED OR NON-BONDED) TO BE REINFORCED w/ 6x6 - W1.4xW1.4 WWF.
3. AT BONDED TOPPING AREAS THE SELF WT NOTED AS DEAD LOAD IS THE WEIGHT OF THE PLANK PLUS THE BONDED TOPPING.
4. IN ADDITION TO THE LOADS NOTED IN THE SCHEDULE, THE PLANK IS TO BE DESIGNED FOR LINE LOADS AND POINT LOADS FROM WOOD BEARING WALLS, POINT LOADS AND EXTERIOR CLADDING MATERIALS.
5. LIVE LOAD = 40 psf @ UNIT AREAS AND 80 psf AT CORRIDOR, 100 psf @ ELEVATOR LOBBY AREAS, 70 psf @ BALCONIES, 55 psf @ ROOF AREAS AND 100 psf @ EXTERIOR. SEE ARCHITECTURAL FOR LOCATIONS.
6. LIVE LOAD = 150 psf @ FLOOR AREA
   LIVE LOAD = 250 psf @ EXTERIOR AREA
7. LIVE LOAD = 100 psf @ FLOOR AREA
   LIVE LOAD = 75 psf @ ROOF AREA
8. 2 HOUR AT FIRST FLOOR. 3 HOUR AT SECOND FLOOR.

STRIP FOOTING SCHEDULE

MARK	WIDTH	THICKNESS	REINFORCING	REMARKS
W1	1'-4"	1'-0"	NONE	
W2	2'-0"	1'-0"	NONE	
W3	3'-0"	1'-0"	NONE	
WALL A	3'-0"	1'-0"	NONE	
WALL B	4'-4"	1'-0"	NONE	
WALL C	5'-6"	1'-0"	NONE	

SPREAD FOOTING SCHEDULE

MARK	WIDTH	LENGTH	THICKNESS	REINFORCING	REMARKS
F1	3'-6"	3'-6"	1'-0"	5 - #4	
F2	4'-6"	4'-6"	1'-3"	4 - #5 EW	
F3	7'-0"	7'-0"	1'-6"	7 - #6 EW	
F4	9'-0"	9'-0"	1'-11"	8 - #7 EW	
F4a	10'-0"	9'-0"	1'-11"	8 - #7 EW	
F5	10'-0"	10'-0"	2'-2"	8 - #8 EW	
F5a	11'-0"	10'-0"	2'-2"	8 - #8 EW	
F6	11'-6"	11'-6"	2'-5"	10 - #8 EW	
F6a	12'-6"	11'-6"	2'-5"	10 - #8 EW	
F7	12'-6"	12'-6"	2'-8"	12 - #8 EW	
F7a	13'-6"	12'-6"	2'-8"	12 - #8 EW	
F8	6'-0"	6'-0"	1'-5"	5 - #6 EW	
F9	13'-6"	13'-6"	2'-8"	13 - #8 EW TOP & BOTTOM	
F14070	14'-0"	7'-0"	1'-6"	10 - #7 EW	

STEEL COLUMN SCHEDULE

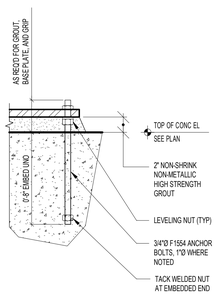
MARK	COLUMN SIZE	TYPE (SEE 1/S-0.1)	BASEPLATE SIZE	ANCHOR BOLTS	REMARKS
C1	HSS6x6x1/4	TYPE 1	3/4" x 14" x 1'-2"	4 - 3/4"Ø (8" EMBED)	
C1-A	HSS6x6x1/4	TYPE 2	3/4" x 6'-1/2" x 1'-2"	NOTE 1	
C2	HSS6x6x1/4	N/A	3/4" x 10" x 1'-0"	NOTE 1	
C3	HSS8x6x1/2	TYPE 1	3/4" x 7" x 1'-0"	4 - 3/4"Ø (8" EMBED)	
C4	HSS6x6x1/2	N/A	3/4" x 10" x 1'-0"	NOTE 1	
C5	HSS5x5x1/4	TYPE 1	3/4" x 14" x 1'-2"	4 - 3/4"Ø (8" EMBED)	

STEEL COLUMN SCHEDULE NOTES:
1. COLUMN SITS ON TOP PRECAST BEAM. SEE SECTION FOR INFORMATION.
2. COLUMN SITS ON TOP OF PRECAST BEAM. BOTTOM OF BASEPLATE IS FLUSH w/ TOP OF BEAM. SEE SECTION FOR INFORMATION.

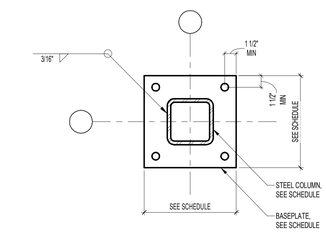
LINTEL SCHEDULE

MARK	SIZE	CONFIGURATION	REMARKS
L1	8"x8" CMU BOND BEAM w/ 2 - #5 x CONT	GROUT SOLID OVER OPENING WIDTH PLUS 8" EACH END	6" BEARING
L2	W16x45	EQUAL — INFILL FOLLOWING ERECTION	
L3	L8x4x1/2 (LLV)		

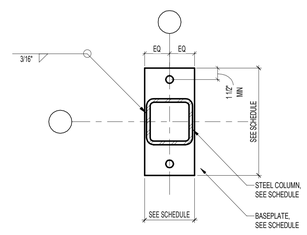
LINTEL SCHEDULE NOTES:
1. PROVIDE 8" MINIMUM BEARING FOR ALL LINTELS, UNO.
2. PROVIDE MINIMUM OF 3 COURSES SOLID GROUTED CMU BELOW LINTEL BEARING (UNLESS OTHERWISE NOTED). SEE MASONRY WALL SCHEDULE.
3. CENTER BEAMS WITHIN WIDTH OF BLOCK UNLESS NOTED OTHERWISE.
4. PROVIDE ADJUSTABLE MASONRY ANCHORS ON WEBS / FLANGES AT 32"OC. AND ON UNDERSIDE OF BOTTOM PLATE FOR LINTELS IN FUTURE OPENINGS.
5. PROVIDE HORIZONTAL REINFORCING IN THE JOINT ABOVE THE LINTEL, AND EXTEND 24" BEYOND EDGE OF OPENING.
6. REFER TO ARCHITECTURAL DRAWINGS FOR OPENING LOCATIONS, ELEVATIONS, & SIZES.
7. EXTEND BOTTOM PLATES FULL LENGTH.
8. SHORE ALL CMU LINTELS UNTIL GROUT HAS CURED.
9. BOTTOM PLATE TO BE 1" NARROWER THAN NOMINAL TOTAL WALL THICKNESS, UNLESS NOTED WHERE LINTEL BRG COINCIDES w/ IN-WALL PIER. WRAP ENDS OF STEEL LINTEL w/ BUILDING PAPER AND GROUT SOLID.
10. LOOSE BRICK LINTELS:
    OPENINGS 6'-0" AND SMALLER PROVIDE L3 1/2x3 1/2x5/16"
    OPENINGS LARGER THAN 6'-0" & LESS THAN 7'-6" PROVIDE L5x3 1/2x3/8" (LLV)
    OPENINGS LARGER THAN 7'-6" & LESS THAN 9'-0" PROVIDE L8x4x3/8" (LLV)
11. VERIFY LOOSE BRICK LINTEL HORIZONTAL LEG DIMENSION w/ ARCHITECTURAL DETAILS.



2 S-0.1 **ANCHOR BOLT DETAIL**



TYPE 1



TYPE 2

1 S-0.1 **BASE PLATE DETAIL**

knothe bruce ARCHITECTS
knothebruce.com 608.836.3690
7601 University Ave. • Suite 201 • Middleton, WI 53562

KEY PLAN

PIERCE ENGINEERS INC
CONSULTING STRUCTURAL ENGINEERS
10 West Mifflin St, Suite 205 | Madison, WI 53703
Phone: 608.256.7304 | Fax: 608.256.7306
PE PROJECT 15213

ISSUED

Issued for Bid	September 25, 2015
Revised Bid Set	January 19, 2016
Issued for Plan Review	February 8, 2016
2 CB #1	December 7, 2017
3 Revision To Prevously Approved Plan	January 12, 2018
4 Revisions	May 11, 2018

WISCONSIN RICHARD C. PIERCE E-22511 WAUKESHA WI PROFESSIONAL ENGINEER 1/12/18

PROJECT TITLE
ROYSTER CROSSINGS LOT 2

521-523 GRAND OAK TRL, MADISON, WI

SHEET TITLE
STRUCTURAL SCHEDULES

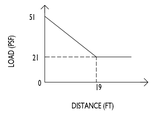
SHEET NUMBER
S-0.1

PROJECT NUMBER 1421

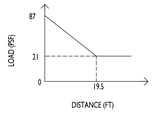
ROOF DESIGN LOADS

LIVE LOAD	20 PSF
GROUND SNOW LOAD, Pg	30 PSF
SNOW LOAD, Pf	
FLAT ROOFS	21 PSF
SNOW EXPOSURE FACTOR, Ce	1.0
IMPORTANCE FACTOR, I	1.0
THERMAL FACTOR, Ct	1.0

* NO ROOFTOP EQUIPMENT, SOLAR PANELS, OR ROOF BALLAST FACTORED IN STRUCTURAL DESIGN



DRIFTING SNOW @ PARAPET
(3'-10" MAX. HEIGHT)



ANNEX/COMMUNITY ROOM
DRIFT@ LOW ROOF

SHEAR WALL SCHEDULE

MARK	SHEATHING	BLOCKING REQ. (NOTE #1)	FASTENER SPACING	ANCHOR BOLTS SILL FASTENER	SOLE PLATE NAILING	HOLD DOWN ANCHOR	END WALL STUDS	
SW-1	7/16" O.S.B.	YES	6" O.C. @ EDGES 12" O.C. IN FIELD	½" DIA. @ 4'-0" O.C.	16d @ 16" O.C.	NONE	2	TYPICAL ALL EXTERIOR WALLS
SW-2	5/8" GYPSUM	NO	8" O.C. @ EDGES 12" O.C. IN FIELD	½" DIA. @ 4'-0" O.C.	16d @ 16" O.C.	NONE	2	TYPICAL ALL CORRIDOR WALLS @ ALL LEVELS
SW-3	5/8" GYPSUM	NO	7" O.C. @ EDGES 7" O.C. IN FIELD	½" DIA. @ 4'-0" O.C.	16d @ 16" O.C.	CS20 STRAP TIE	2	DENOTES LOCATION HOLD DOWN LOCATION AT SECOND AND THIRD FLOOR ONLY - ▶▶▶
SW-4	5/8" GYPSUM	YES	4" O.C. @ EDGES 4" O.C. IN FIELD	½" DIA. @ 4'-0" O.C.	16d @ 12" O.C.	SEE DETAILS 8 & 9 - S-4.1 @ FT 1 - S-0.2 ABOVE	2	
SW-5	7/16" O.S.B.	YES	6" O.C. @ EDGES 12" O.C. IN FIELD	½" DIA. @ 4'-0" O.C.	16d @ 12" O.C.	SEE DETAILS 8 & 9 - S-4.1 @ FT 1 - S-0.2 ABOVE	2	

NOTES:
1. WHEN BLOCKING IS REQUIRED, USE 2x BLOCKING AT ALL PANEL EDGES, SAME DEPTH AS STUD, AND PROVIDE NAILING AT ALL SUPPORTS & PANEL EDGES.
2. APPLY SHEATHING PANELS EITHER VERTICALLY OR HORIZONTALLY IN 4'-0" OR WIDER SHEETS ONLY.
3. FOR SILL PLATE AND HOLD DOWN ANCHORAGE TO PRECAST PLANK SEE SECOND FLOOR FRAMING PLAN & DETAILS.

DESIGN LOADS

FLOOR LIVE LOAD	40 PSF
FLOOR DEAD LOADS, INCL. PARTITIONING	35 PSF (20 PSF TOP CHORD, 15 PSF BOTTOM CHORD)
STAIRWAYS LIVE LOAD	100 PSF
CORRIDORS LIVE LOAD	80 PSF
BALCONY / DECK LOADING	40 PSF LIVE + 15 PSF DEAD
ASSEMBLY AREA LIVE LOAD	100 PSF
BASIC WIND SPEED	90 MPH
WIND EXPOSURE	B
WIND IMPORTANCE FACTOR	1.00
SEISMIC DESIGN CATEGORY	A
SEISMIC IMPORTANCE FACTOR	I
SITE CLASS	D (TO BE VERIFIED BY SOILS REPORT)

S_s	0.102
S_1	0.043
S_{DS}	0.109
S_{D1}	0.070
C_t	0.054

FRAME WALL ATTACHMENT TO PRECAST

LOCATION	ATTACHMENT
ALL SHEAR WALLS	12" O.C. MAX. + HOLD-DOWNS PER SHEAR WALL SCHEDULE
EXTERIOR WALLS	32" O.C.
INTERIOR BEARING WALLS	32" O.C.
MISC. INTERIOR WALLS	AS REQ'D. TO STRAIGHTEN & SECURE IN PLACE

1/4" "SPIKE" ANCHOR BY POWERS FASTENERS, INC. INSTALL PER MANUFACTURERS INSTRUCTIONS. ZINC PLATED CARBON STEEL. (1 1/4" MIN. EMBEDMENT)

LOOSE BRICK LINTEL SCHEDULE: 8'-0" MAX. HEIGHT

SIZE @ BRICK 5" FROM STUD	SIZE @ BRICK 7" FROM STUD	WALL TYPE	L = SPAN	REMARKS
L4x4x5/16"	L4x4x6/16" LLH	4" BRICK	0 < L ≤ 6'-0"	
L4x4x5/16"	L4x6x5/16" LLH	4" BRICK	6'-0" < L ≤ 8'-0"	
L6x4x5/16" LLV	L6x6x5/16"	4" BRICK	8'-0" < L ≤ 10'-0"	

LOOSE BRICK LINTEL SCHEDULE NOTES:
1. PROVIDE 8" MIN. BRG FOR ALL LINTELS, U.N.O.
2. ALL LINTELS GALVANIZED.
3. REFER TO ARCHITECTURAL DRAWINGS FOR OPENING LOCATIONS, ELEVATIONS & SIZES.
4. ARCHITECT TO VERIFY HORIZONTAL LEG LENGTH.

GENERAL FRAMING NOTES:
1. WOOD SPECIES = S-P-F
2. FLR JSTS & HDRS GRADE = #2 U.N.O.
3. STUDS = CONSTRUCTION GRADE
4. "TJI = TJI JOISTS BY TRUSS JOIST MACMILLAN OR EQUAL.
5. LVL = MICROLAM LVL BY TRUSS JOIST MACMILLAN OR EQUAL. 1.9E ES LVL OR BETTER.
6. PSL = PARALAM LVL BY TRUSS JOIST MACMILLAN OR EQUAL.
7. ALL UNSPECIFIED HEADERS 4" AND LESS ARE TO BE (2) 2x10'S OR BETTER.
8. DOUBLE FLOOR JOISTS AROUND OPENINGS
9. MULTIPLE PLY BEAMS TO BE FASTENED/NAILED TOGETHER PER THE MANUFACTURER'S RECOMMENDATIONS
10. SPACING OF ROOF AND FLOOR TRUSSES IS TO SHOW DESIGN INTENT ONLY. FINAL DESIGN BY TRUSS SUPPLIER.
11. ALLOWABLE FLOOR TRUSS DEFLECTION =
    L/480 FROM LIVE LOAD ONLY
    L/360 FROM TOTAL LOAD
12. DECK FRAMING TO BE 2x8 SPF TREATED @ 16" O.C.
13. TYPICAL FLOOR SYSTEM TO BE 18" TRUSSES W/ 2x6 LET-IN 2X8 @ DECKS
14. TYP. STAIR STRINGER TO BE (4) 14" LVL W/ 8" MIN. THROAT

HEADER SCHEDULE

MARK	MATERIAL	BEARING (EA. END)		
		2nd-3rd	3rd-4th	4th-Roof
H1	(2) 2x10	(3) 2x6	(2) 2x6	(2) 2x6
H2	(2) 2x12	(3) 2x6	(2) 2x6	
H3	(3) 2x12	(3) 2x6	(2) 2x6	
H4	(2) 1 3/4 x 9 1/2 LVL			
H5	(2) 1 3/4" X 11 7/8" LVL			
H6	(2) 1 3/4" X 14" LVL			

BEAM SCHEDULE

MARK	MATERIAL	BEARING (EA. END)		
		2nd-3rd	3rd-4th	4th-Roof
B1	(2) 2x10	(3) 2x6	(2) 2x6	(2) 2x6
B2	(2) 2x12	(3) 2x6	(2) 2x6	(2) 2x6
B3	(3) 2x12	(3) 2x6	(2) 2x6	
B4	(2) 1 3/4 x 9 1/2 LVL	(3) 2x6	(3) 2x6	(2) 2x6
B5	(2) 1 3/4" X 11 7/8" LVL	(3) 2x6	(3) 2x6	(3) 2x6
B6	(2) 1 3/4" X 14" LVL	(3) 2x6		
B7	(2) 2x10	(3) 2x6	(2) 2x6	(2) 2x6
B8	(3) 2x10	(3) 2x6	(2) 2x6	(2) 2x6
B9	(3) 2x12	(3) 2x6	(2) 2x6	(2) 2x6
B10	(2) 1 3/4" X 11 7/8" LVL	(4) 2x6	(3) 2x6	(2) 2x6
B11	(3) 1 3/4" X 11 7/8" LVL	(4) 2x6	(3) 2x6	
B12	(3) 1 3/4" X 14" LVL	(4) 2x6	(3) 2x6	
B13	(3) 1 3/4" X 16" LVL	5 1/4"x 5 1/4" PSL	3 1/2"x 5 1/4" PSL	(3) 2x6
B14	(2) 1 3/4" X 18" LVL	(2) 2x6	(2) 2x6	
B15	(2) 1 3/4 x 9 1/2 LVL	(3) 2x6	(2) 2x6	(2) 2x6
B16	(2) 1 3/4" X 11 1/4" LVL	(3) 2x6	(2) 2x6	
B17	(4) 1 3/4" X 14" LVL	3 1/2"x 7" PSL	3 1/2"x 7" PSL	3 1/2"x 7" PSL

* NOTE: FOR B4 & B5 BEAMS, WHERE SPACE ALLOWS, THE USE OF (4) 2x6 FROM THE 3RD TO 4TH LEVEL AND (5) 2x6 FROM THE 2ND TO 3RD LEVEL IS ACCEPTABLE

POST SCHEDULE

MARK	SIZE

WOOD BEARING WALL SCHEDULE

LEVEL	EXTERIOR WALLS	CORRIDOR WALLS	DEMISING WALLS (BRG.)	INTERIOR WALLS (BEARING)	DEMISING WALLS (NON-BRG.)
SECOND FLOOR	2 x 6 @ 16" O.C. SPF NO1 / NO2	2 x 6 @ 16" O.C. SPF STUD GRADE	(2)2 x 6 @ 16" O.C. SPF NO1 / NO2 2 x 6 LET-IN @ TRUSS END	2 x 6 @ 16" O.C. SPF NO1 / NO2 STUDS TO STACK	2 x 4 @ 16" O.C. SPF NO1 / NO2
THIRD FLOOR	2 x 6 @ 16" O.C. SPF STUD GRADE	2 x 6 @ 16" O.C. SPF STUD GRADE	2 x 6 @ 16" O.C. SPF NO1 / NO2 2 x 6 LET-IN @ TRUSS END	2 x 6 @ 16" O.C. SPF STUD GRADE STUDS TO STACK	2 x 4 @ 16" O.C. SPF STUD GRADE
FOURTH FLOOR	2 x 6 @ 16" O.C. SPF STUD GRADE	2 x 6 @ 16" O.C. SPF STUD GRADE	2 x 4 @ 16" O.C. SPF NO1 / NO2 2 x 6 LET-IN @ TRUSS END	2 x 6 @ 16" O.C. SPF STUD GRADE STUDS TO STACK	2 x 4 @ 16" O.C. SPF STUD GRADE
FIFTH FLOOR	2 x 6 @ 16" O.C. SPF STUD GRADE	2 x 6 @ 16" O.C. SPF STUD GRADE	2 x 4 @ 16" O.C. SPF STUD GRADE 2 x 6 LET-IN @ TRUSS END	2 x 6 @ 16" O.C. SPF STUD GRADE STUDS TO STACK	2 x 4 @ 16" O.C. SPF STUD GRADE

WALL PLATES	
SECOND FLOOR	TOP & BOT. PLATES TO BE LSL. PLATES IN CONTACT W/ CONCRETE TO BE TREATED
THIRD FLOOR	TOP & BOT. PLATES TO BE LSL.
FOURTH FLOOR	TOP & BOT. PLATES TO MATCH STUD GRADE MATERIAL - PROVIDE ALTERNATE FOR LSL PLATES
FIFTH FLOOR	TOP & BOT. PLATES TO MATCH STUD GRADE MATERIAL - PROVIDE ALTERNATE FOR LSL PLATES

NOTES
1. BEARING WALLS DESIGNATED BY ~~~ ON PLAN.
2. ■ - DESIGNATES LOCATION OF POINT LOADS. CONTINUE ALL POINT LOADS AT BEAMS & HEADERS (INCLUDING EXTERIOR WALLS) THROUGH FLOOR SYSTEMS, AND DOWN TO PRECAST PLANK. (TYP.)
3. CONFIRM BEARING REQUIREMENTS OF GIRDER TRUSSES WITH ARCHITECT DURING SHOP DRAWING APPROVALS.

STEEL BEAM SCHEDULE

MARK	MATERIAL	BEARING (EA. END)
		2nd-3rd
L1	W8x13	4" STANDARD STEEL PIPE

knothe bruce ARCHITECTS
Phone: 608.836.3690
7601 University Ave, Ste 201
Middleton, WI 53562

ISSUED

Issued for Bid: September 25, 2015
Revised Bid Set: January 19, 2016
Issued For Plan Review: February 8, 2016
Minor Alteration: December 13, 2017
Revision to Previously Approved Plan - January 12, 2018
Revised Set - May 23, 2018

1 Construction Bulletin - Month Day, 2017

PROJECT TITLE
ROYSTER CROSSINGS

521-523 Grand Oak Trail
MADISON, WI

SHEET TITLE
Framing Schedules & Legends

SHEET NUMBER
S-0.2

PROJECT NO. 1421

CONCRETE PIER SCHEDULE

PIER MARK	SIZE	VERTICAL REINFORCEMENT	PIER TIES	DETAIL	DOWELS	REMARKS
P1	6'x18"	(4) #5	#3 AT 12" o/c	13/S3.2	(4) #5	
P2	16'x16"	(4) #5	#3 AT 12" o/c		(4) #5	
P3	18"x18"	(4) #7	#3 AT 12" o/c	9/S3.2	(4) #7	
P4	18"x22"	(4) #7	#3 AT 12" o/c	2/S3.2	(4) #7	
P5	18"x23"	(4) #7	#3 AT 12" o/c	13/S3.2	(4) #7	
P6	22"x24"	(4) #7	#3 AT 12" o/c	5/S3.2	(4) #7	
P7	22"x36"	(8) #7	#3 AT 12" o/c	8/S3.2	(8) #7	
P8	23"x23"	(4) #7	#3 AT 12" o/c	3/S3.2	(4) #7	
P9	23"x24"	(4) #7	#3 AT 12" o/c	3/S3.2	(4) #7	
P10	23"x37"	(8) #7	#3 AT 12" o/c	8/S3.2	(8) #7	
P11	23"x47"	(8) #7	#3 AT 12" o/c	6/S3.2	(8) #7	
P12	23"x49"	(8) #7	#3 AT 12" o/c	6/S3.2	(8) #7	
P13	23"x61"	(8) #7	#3 AT 12" o/c	10/S3.2	(8) #7	
P14	24"x24"	(4) #7	#3 AT 12" o/c	4/S3.2 & 9/S3.2	(4) #7	
P15	24"x48"	(8) #7	#3 AT 12" o/c	7/S3.2 & 8/S3.2	(8) #7	
P16	24"x49.5"	(8) #7	#3 AT 12" o/c	12/S3.2	(8) #7	
P17	25"x25"	(4) #7	#3 AT 12" o/c	3/S3.2	(4) #7	
P18	26"x49.5"	(8) #7	#3 AT 12" o/c	12/S3.2	(8) #7	
P19	26"x59.5"	(8) #7	#3 AT 12" o/c	12/S3.2	(8) #7	
P20	31"x49.5"	(8) #7	#3 AT 12" o/c	12/S3.2	(8) #7	
P21	26"x24"	(4) #7	#3 AT 12" o/c	9/S3.2	(4) #7	
P22	12"x16"	(4) #7	#3 AT 12" o/c	21/S3.2	(4) #7	

CONCRETE PIER SCHEDULE NOTES:
1. REFER TO PLAN FOR TOP OF CONCRETE PIER ELEVATION.
2. AT TOP OF CONCRETE PIER, PROVIDE (3) #3 TIES AT 3" o/c.
3. WHERE NO DOWELS ARE SHOWN FROM THE CONCRETE PIER TO THE CONCRETE FOOTING, EMBED VERTICAL PIER REINFORCEMENT TO BOTTOM OF FOOTING w/ 3" CONCRETE COVERAGE AND PROVIDE A STANDARD 90 DEGREE HOOK.
5. CENTER CONCRETE PIER BELOW COLUMN ABOVE UNLESS DETAILED OTHERWISE. LAP VERTICAL REINFORCEMENT 30 BAR DIAMETERS OR 24", WHICH EVER IS GREATER.

FOUNDATION PLAN KEYED NOTES

MARK	DESCRIPTION
A	PROVIDE CONCRETE WALL OPENING FOR DOOR. SEE ARCH FOR SIZE & LOCATION. REINFORCE DOOR HEAD PER 13/S-3.0. PROVIDE 2 - #5 x 4'-0" CORNER BARS AT CORNERS OF WALL OPENING.
B	PROVIDE CONCRETE WALL OPENING FOR DOOR. SEE ARCH FOR SIZE & LOCATION. REINFORCE DOOR HEAD PER 20/S-3.0. PROVIDE 2 - #5 x 4'-0" CORNER BARS AT CORNERS OF WALL OPENING.
C	8'x24" WITH 2 - #8 TOP AND BOTTOM AND #3 TIES AT 6"OC.
D	PROVIDE CONCRETE WALL OPENING. SEE ARCH FOR SIZE & LOCATION. REINFORCE HEADER PER 6/S-4.2.

STRIP FOOTING SCHEDULE

MARK	WIDTH	THICKNESS	REINFORCING	REMARKS
W1	1'-4"	1'-0"	NONE	
W2	2'-0"	1'-0"	NONE	
W3	3'-0"	1'-0"	NONE	
WALL A	3'-0"	1'-0"	NONE	
WALL B	4'-4"	1'-0"	NONE	
WALL C	5'-6"	1'-0"	NONE	

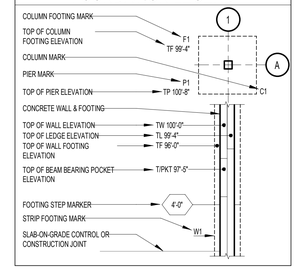
SPREAD FOOTING SCHEDULE

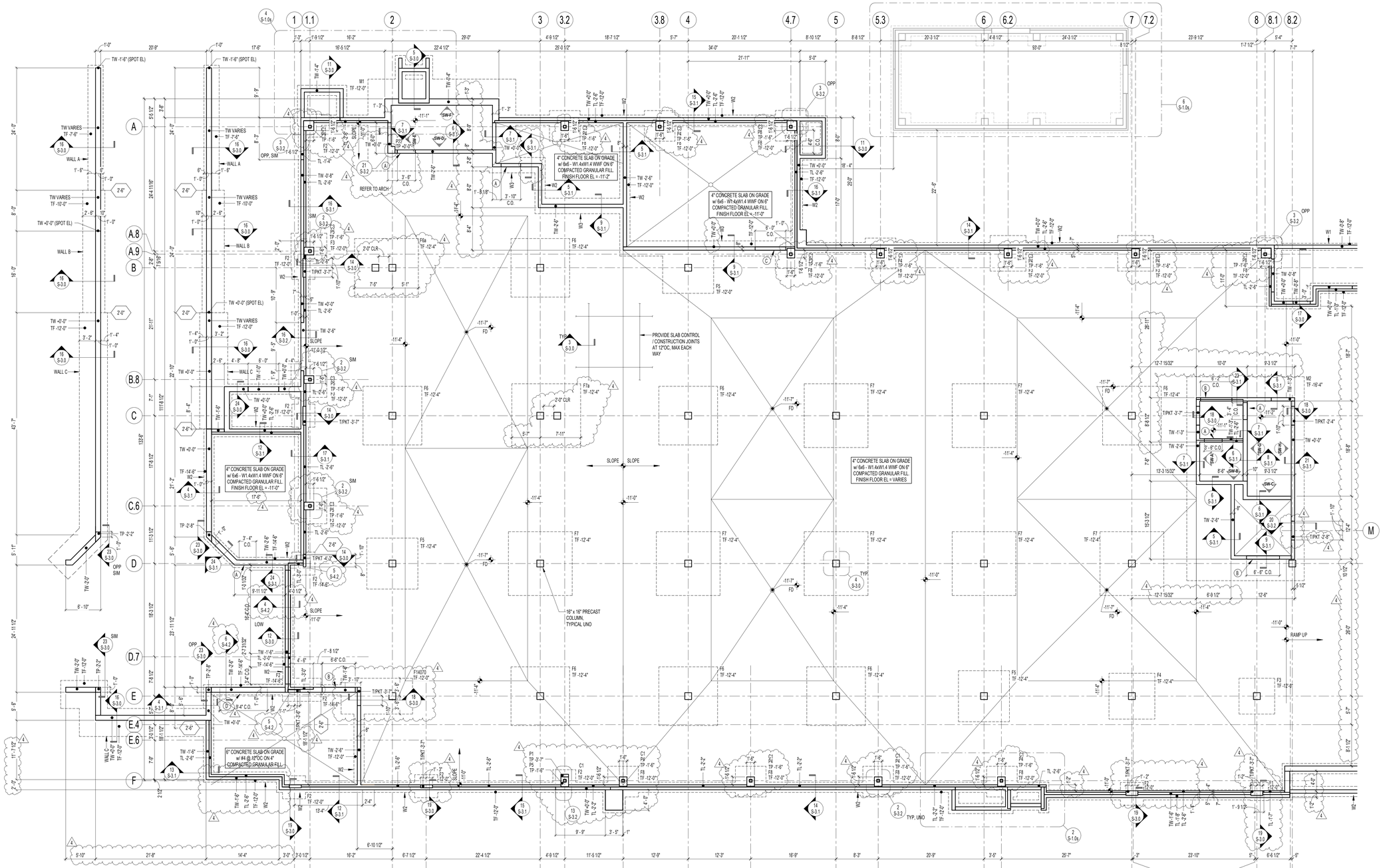
MARK	WIDTH	LENGTH	THICKNESS	REINFORCING	REMARKS
F1	3'-6"	3'-6"	1'-0"	5 - #4	
F2	4'-6"	4'-6"	1'-3"	4 - #5 EW	
F3	7'-0"	7'-0"	1'-6"	7 - #6 EW	
F4	9'-0"	9'-0"	1'-11"	8 - #7 EW	
F4a	10'-0"	9'-0"	1'-11"	8 - #7 EW	
F5	10'-0"	10'-0"	2'-2"	8 - #8 EW	
F5a	11'-0"	10'-0"	2'-2"	8 - #8 EW	
F6	11'-6"	11'-6"	2'-5"	10 - #8 EW	
F6a	12'-6"	11'-6"	2'-5"	10 - #8 EW	
F7	12'-6"	12'-6"	2'-8"	12 - #8 EW	
F7a	13'-6"	12'-6"	2'-8"	12 - #8 EW	
F8	6'-0"	6'-0"	1'-5"	5 - #6 EW	
F9	13'-6"	13'-6"	2'-8"	13 - #8 EW TOP & BOTTOM	
F14070	14'-0"	7'-0"	1'-6"	10 - #7 EW	
M1	29'-0"	18'-0"	1'-6"	#6 @ 12"OC EACH WAY TOP & BOTTOM	
M2	40'-0"	23'-0"	1'-6"	#6 @ 12"OC EACH WAY TOP & BOTTOM	
M3	30'-0"	22'-0"	1'-6"	#6 @ 12"OC EACH WAY TOP & BOTTOM	

FOUNDATION PLAN GENERAL NOTES

1. REFER TO SHEET S-0.1 FOR STRUCTURAL NOTES.
2. REFER TO SHEET S-0.2 FOR STRUCTURAL SCHEDULES.
3. REFER TO SHEET S-2.0 FOR SHEARWALL ELEVATIONS.
4. REFER TO S-3.0 FOR TYPICAL DETAILS THAT APPLY TO PLAN THAT ARE NOT NECESSARILY CUT AT ALL LOCATIONS.
5. REFERENCE FOUNDATION 0'-0" = SITE ELEVATION 867.5'. VERIFY w/ CIVIL DRAWINGS.

FOUNDATION LEGEND





1 S-1.0w FOUNDATION PLAN - WEST
SCALE: 1/8" = 1'-0"

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KEY PLAN

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PE PROJECT 15213

ISSUED

Issued for Bid	September 25, 2015
Revised Bid Set	January 19, 2016
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1 Implemented City's LOI Clarifications	August 7, 2017
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4 Revisions	May 11, 2018

WISCONSIN RICHARD C. PIERCE E-22511 WAUKESHA, WI PROFESSIONAL ENGINEER 5/11/18

PROJECT TITLE
ROYSTER CROSSINGS LOT 2

521-523 GRAND OAK TRL, MADISON, WI

SHEET TITLE
FOUNDATION PLAN - WEST

SHEET NUMBER
S-1.0w

PROJECT NUMBER 1421

CONCRETE PIER SCHEDULE

PIER MARK	SIZE	VERTICAL REINFORCEMENT	PIER TIES	DETAIL	DOWELS	REMARKS
P1	6"x18"	(4) #5	#3 AT 12" o/c	13/S3.2	(4) #5	
P2	16"x16"	(4) #5	#3 AT 12" o/c		(4) #5	
P3	18"x18"	(4) #7	#3 AT 12" o/c	9/S3.2	(4) #7	
P4	18"x22"	(4) #7	#3 AT 12" o/c	2/S3.2	(4) #7	
P5	18"x23"	(4) #7	#3 AT 12" o/c	13/S3.2	(4) #7	
P6	22"x24"	(4) #7	#3 AT 12" o/c	5/S3.2	(4) #7	
P7	22"x36"	(8) #7	#3 AT 12" o/c	8/S3.2	(8) #7	
P8	23"x23"	(4) #7	#3 AT 12" o/c	3/S3.2	(4) #7	
P9	23"x24"	(4) #7	#3 AT 12" o/c	3/S3.2	(4) #7	
P10	23"x37"	(8) #7	#3 AT 12" o/c	8/S3.2	(8) #7	
P11	23"x47"	(8) #7	#3 AT 12" o/c	6/S3.2	(8) #7	
P12	23"x49"	(8) #7	#3 AT 12" o/c	6/S3.2	(8) #7	
P13	23"x61"	(8) #7	#3 AT 12" o/c	10/S3.2	(8) #7	
P14	24"x24"	(4) #7	#3 AT 12" o/c	4/S3.2 & 9/S3.2	(4) #7	
P15	24"x48"	(8) #7	#3 AT 12" o/c	7/S3.2 & 8/S3.2	(8) #7	
P16	24"x49.5"	(8) #7	#3 AT 12" o/c	12/S3.2	(8) #7	
P17	25"x25"	(4) #7	#3 AT 12" o/c	3/S3.2	(4) #7	
P18	26"x49.5"	(8) #7	#3 AT 12" o/c	12/S3.2	(8) #7	
P19	26"x59.5"	(8) #7	#3 AT 12" o/c	12/S3.2	(8) #7	
P20	31"x49.5"	(8) #7	#3 AT 12" o/c	12/S3.2	(8) #7	
P21	26"x24"	(4) #7	#3 AT 12" o/c	9/S3.2	(4) #7	
P22	12"x16"	(4) #7	#3 AT 12" o/c	21/S3.2	(4) #7	

CONCRETE PIER SCHEDULE NOTES:
1. REFER TO PLAN FOR TOP OF CONCRETE PIER ELEVATION.
2. AT TOP OF CONCRETE PIER, PROVIDE (3) #3 TIES AT 3" o/c.
3. WHERE NO DOWELS ARE SHOWN FROM THE CONCRETE PIER TO THE CONCRETE FOOTING, EMBED VERTICAL PIER REINFORCEMENT TO BOTTOM OF FOOTING w/ 3" CONCRETE COVERAGE AND PROVIDE A STANDARD 90 DEGREE HOOK.
4. CENTER CONCRETE PIER BELOW COLUMN ABOVE UNLESS DETAILED OTHERWISE. LAP VERTICAL REINFORCEMENT 30 BAR DIAMETERS OR 24", WHICH EVER IS GREATER.

FOUNDATION PLAN KEYED NOTES

MARK	DESCRIPTION
A	PROVIDE CONCRETE WALL OPENING FOR DOOR. SEE ARCH FOR SIZE & LOCATION. REINFORCE DOOR HEAD PER 13/S-3.0. PROVIDE 2 - #5 x 4'-0" CORNER BARS AT CORNERS OF WALL OPENING.
B	PROVIDE CONCRETE WALL OPENING FOR DOOR. SEE ARCH FOR SIZE & LOCATION. REINFORCE DOOR HEAD PER 20/S-3.0. PROVIDE 2 - #5 x 4'-0" CORNER BARS AT CORNERS OF WALL OPENING.
C	8'x24" WITH 2 - #8 TOP AND BOTTOM AND #3 TIES AT 6"OC.
D	PROVIDE CONCRETE WALL OPENING. SEE ARCH FOR SIZE & LOCATION. REINFORCE HEADER PER 6/S-4.2.

STRIP FOOTING SCHEDULE

MARK	WIDTH	THICKNESS	REINFORCING	REMARKS
W1	1'-4"	1'-0"	NONE	
W2	2'-0"	1'-0"	NONE	
W3	3'-0"	1'-0"	NONE	
WALL A	3'-0"	1'-0"	NONE	
WALL B	4'-4"	1'-0"	NONE	
WALL C	5'-6"	1'-0"	NONE	

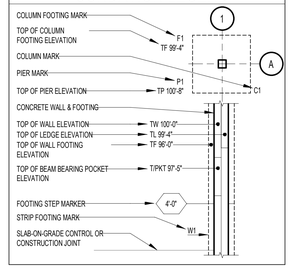
SPREAD FOOTING SCHEDULE

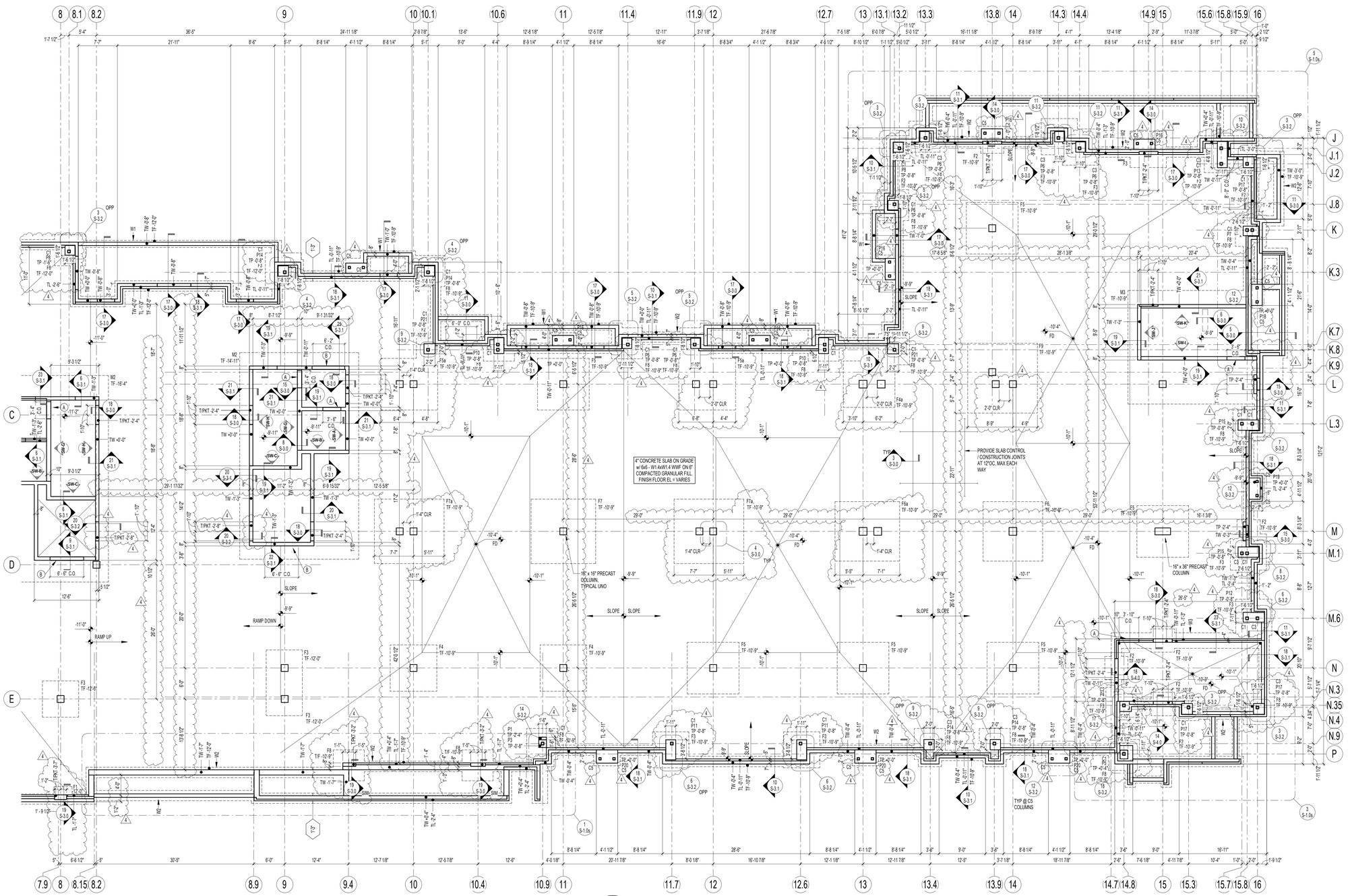
MARK	WIDTH	LENGTH	THICKNESS	REINFORCING	REMARKS
F1	3'-6"	3'-6"	1'-0"	5 - #4	
F2	4'-6"	4'-6"	1'-3"	4 - #5 EW	
F3	7'-0"	7'-0"	1'-6"	7 - #6 EW	
F4	9'-0"	9'-0"	1'-9 1/2"	8 - #7 EW	
F4a	10'-0"	9'-0"	1'-11"	8 - #7 EW	
F5	10'-0"	10'-0"	2'-2"	8 - #8 EW	
F5a	11'-0"	10'-0"	2'-2"	8 - #8 EW	
F6	11'-6"	11'-6"	2'-5"	10 - #8 EW	
F6a	12'-6"	11'-6"	2'-5"	10 - #8 EW	
F7	12'-6"	12'-6"	2'-8"	12 - #8 EW	
F7a	13'-6"	12'-6"	2'-8"	12 - #8 EW	
F8	6'-0"	6'-0"	1'-5"	5 - #6 EW	
F9	13'-6"	13'-6"	2'-8"	13 - #8 EW TOP & BOTTOM	
F14070	14'-0"	7'-0"	1'-6"	10 - #7 EW	
M1	29'-0"	18'-0"	1'-6"	#6 @ 12"OC EACH WAY TOP & BOTTOM	
M2	40'-0"	23'-0"	1'-6"	#6 @ 12"OC EACH WAY TOP & BOTTOM	
M3	30'-0"	22'-0"	1'-6"	#6 @ 12"OC EACH WAY TOP & BOTTOM	

FOUNDATION PLAN GENERAL NOTES

1. REFER TO SHEET S-0.1 FOR STRUCTURAL NOTES.
2. REFER TO SHEET S-0.2 FOR STRUCTURAL SCHEDULES.
3. REFER TO SHEET S-2.0 FOR SHEARWALL ELEVATIONS.
4. REFER TO S-3.0 FOR TYPICAL DETAILS THAT APPLY TO PLAN THAT ARE NOT NECESSARILY CUT AT ALL LOCATIONS.
5. REFERENCE FOUNDATION 0'-0" = SITE ELEVATION 867.5'. VERIFY w/ CIVIL DRAWINGS.

FOUNDATION LEGEND





1 S-1.0e FOUNDATION PLAN - EAST
SCALE: 1/8" = 1'-0"

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2. CB #1	December 7, 2017
4. Revisions	May 11, 2018

WISCONSIN RICHARD C. PIERCE E-22511 WAUKESHA, WI PROFESSIONAL ENGINEER 7/2/18

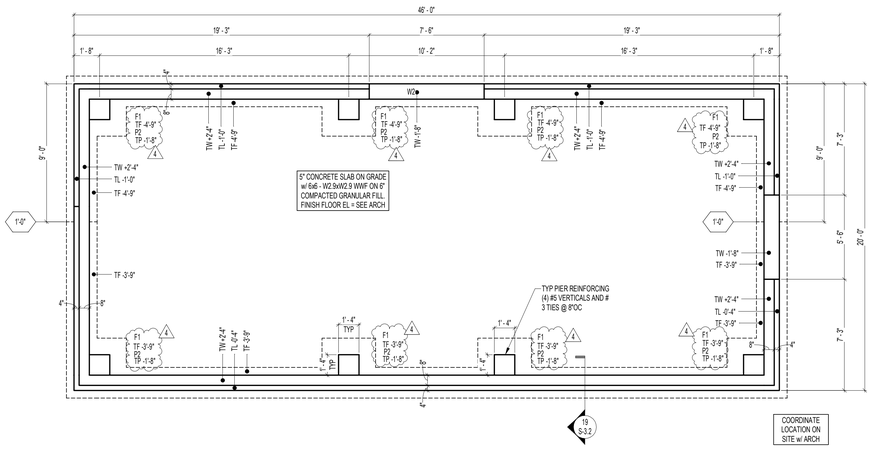
PROJECT TITLE
ROYSTER CROSSINGS LOT 2

521-523 GRAND OAK TRL, MADISON, WI

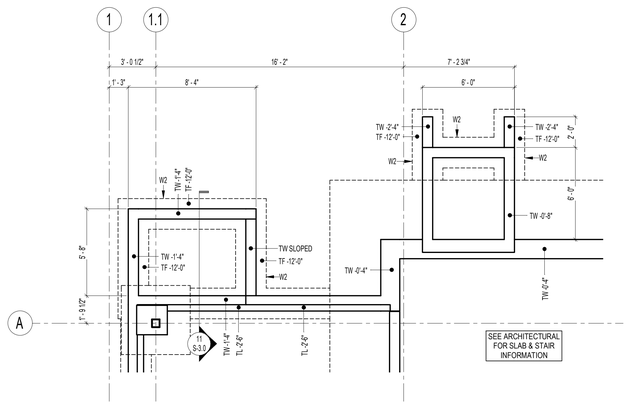
SHEET TITLE
FOUNDATION PLAN - EAST

SHEET NUMBER
S-1.0e

PROJECT NUMBER 1421

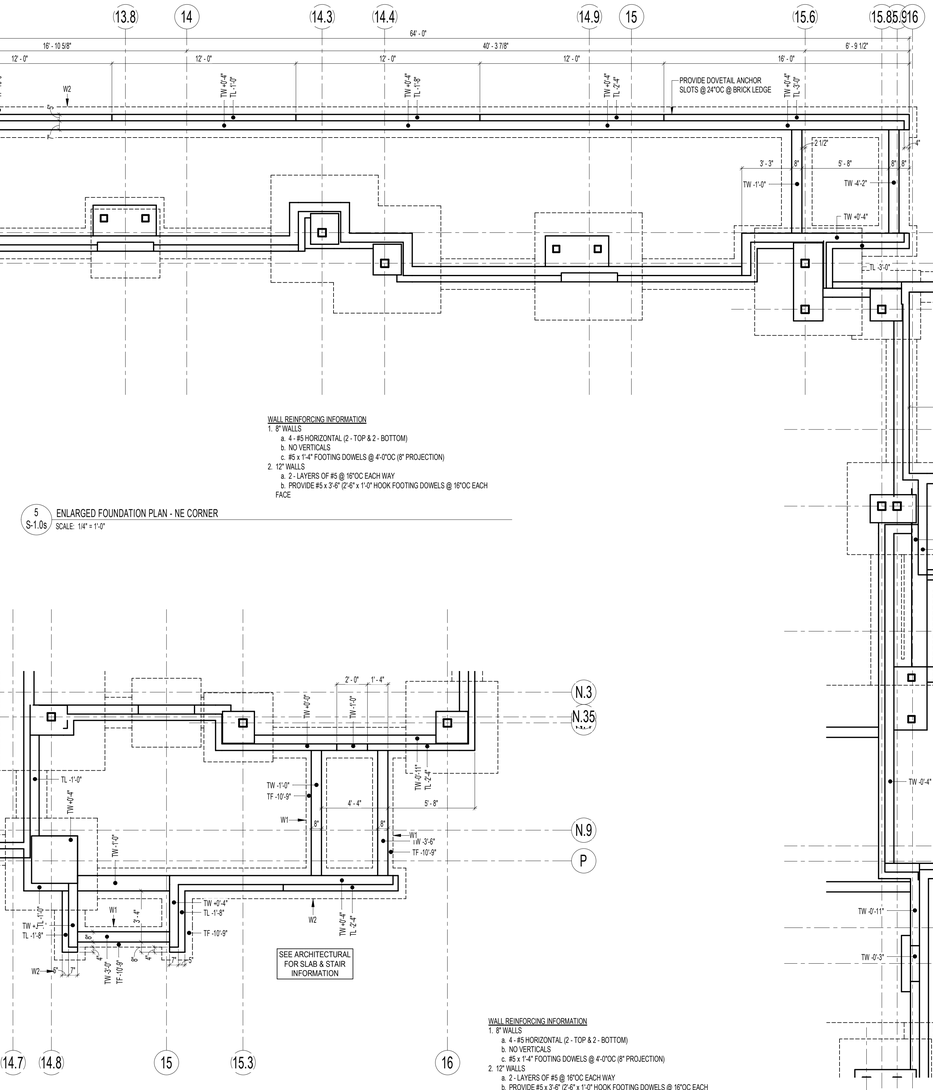


6 S-1.0s ENLARGED FOUNDATION PLAN - BIKE ENCLOSURE
SCALE: 1/4" = 1'-0"



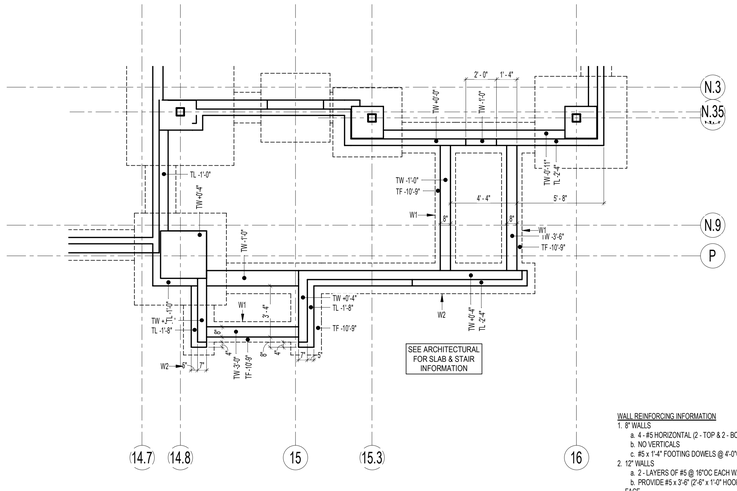
WALL REINFORCING INFORMATION
1. 2 - LAYERS OF #4 @ 16"OC EACH WAY
2. PROVIDE #4 x 3'-6" (2'-6" x 1'-0" HOOK) DOWELS @ 16"OC EACH FACE OF WALL.

4 S-1.0s ENLARGED FOUNDATION PLAN - NW CORNER
SCALE: 1/4" = 1'-0"



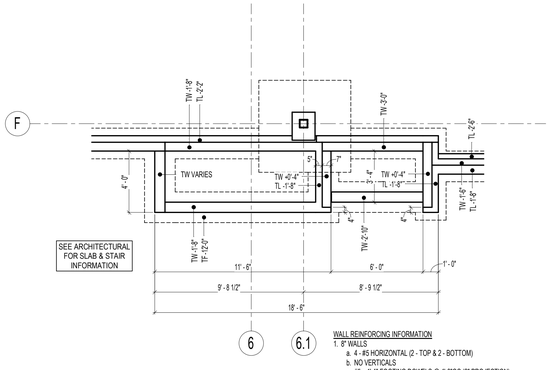
WALL REINFORCING INFORMATION
1. 8" WALLS
   a. 4 - #5 HORIZONTAL (2 - TOP & 2 - BOTTOM)
   b. NO VERTICALS
   c. #5 x 1'-4" FOOTING DOWELS @ 4'-0"OC (8" PROJECTION)
2. 12" WALLS
   a. 2 - LAYERS OF #5 @ 16"OC EACH WAY
   b. PROVIDE #5 x 3'-6" (2'-6" x 1'-0" HOOK FOOTING DOWELS @ 16"OC EACH FACE

5 S-1.0s ENLARGED FOUNDATION PLAN - NE CORNER
SCALE: 1/4" = 1'-0"



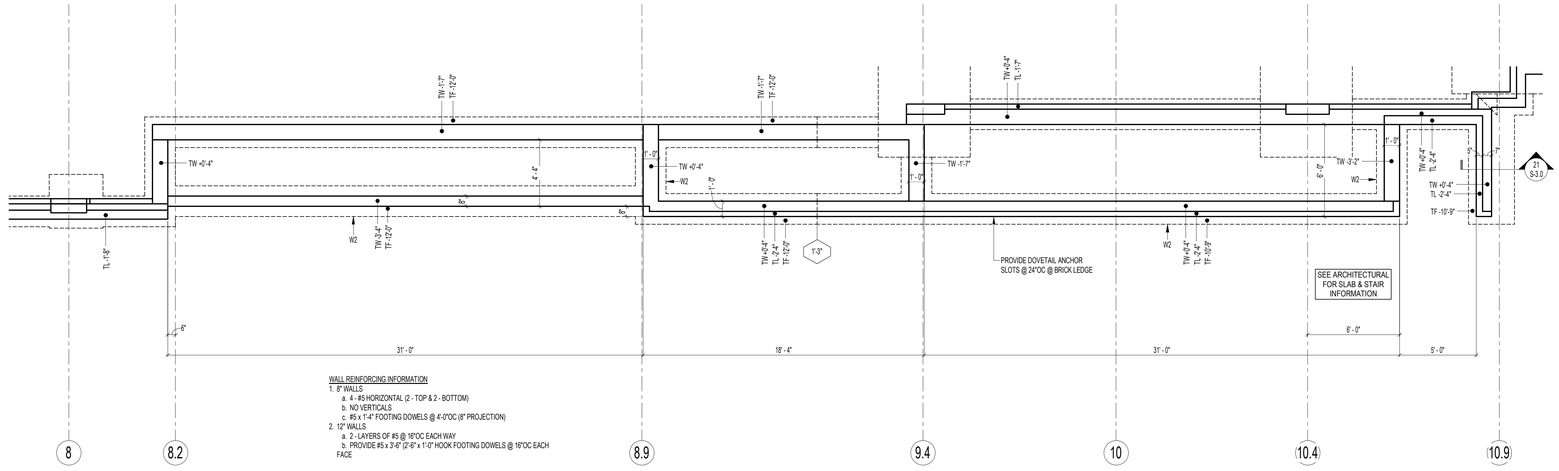
WALL REINFORCING INFORMATION
1. 8" WALLS
   a. 4 - #5 HORIZONTAL (2 - TOP & 2 - BOTTOM)
   b. NO VERTICALS
   c. #5 x 1'-4" FOOTING DOWELS @ 4'-0"OC (8" PROJECTION)
2. 12" WALLS
   a. 2 - LAYERS OF #5 @ 16"OC EACH WAY
   b. PROVIDE #5 x 3'-6" (2'-6" x 1'-0" HOOK FOOTING DOWELS @ 16"OC EACH FACE

3 S-1.0s ENLARGED FOUNDATION PLAN - SE CORNER
SCALE: 1/4" = 1'-0"



WALL REINFORCING INFORMATION
1. 8" WALLS
   a. 4 - #5 HORIZONTAL (2 - TOP & 2 - BOTTOM)
   b. NO VERTICALS
   c. #5 x 1'-4" FOOTING DOWELS @ 4'-0"OC (8" PROJECTION)
2. 12" WALLS
   a. 2 - LAYERS OF #5 @ 16"OC EACH WAY
   b. PROVIDE #5 x 3'-6" (2'-6" x 1'-0" HOOK FOOTING DOWELS @ 16"OC EACH FACE

2 S-1.0s ENLARGED PLAZA FOUNDATION PLAN
SCALE: 1/4" = 1'-0"



WALL REINFORCING INFORMATION
1. 8" WALLS
   a. 4 - #5 HORIZONTAL (2 - TOP & 2 - BOTTOM)
   b. NO VERTICALS
   c. #5 x 1'-4" FOOTING DOWELS @ 4'-0"OC (8" PROJECTION)
2. 12" WALLS
   a. 2 - LAYERS OF #5 @ 16"OC EACH WAY
   b. PROVIDE #5 x 3'-6" (2'-6" x 1'-0" HOOK FOOTING DOWELS @ 16"OC EACH FACE

1 S-1.0s ENLARGED PLAZA FOUNDATION PLAN
SCALE: 1/4" = 1'-0"

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4 Revised-Revisions	February 29, 2016 May 11, 2018

WISCONSIN RICHARD C. PIERCE E-22511 WAUKESHA WI PROFESSIONAL ENGINEER 11/9/18

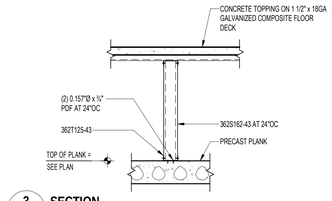
PROJECT TITLE
ROYSTER CROSSINGS LOT 2

521-523 GRAND OAK TRL, MADISON, WI

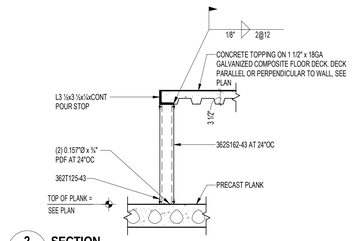
SHEET TITLE
ENLARGED FOUNDATION PLANS

SHEET NUMBER
S-1.0s

PROJECT NUMBER 1421



3 SECTION S-1.1w



2 SECTION S-1.1w

FRAMING PLAN KEYED NOTES

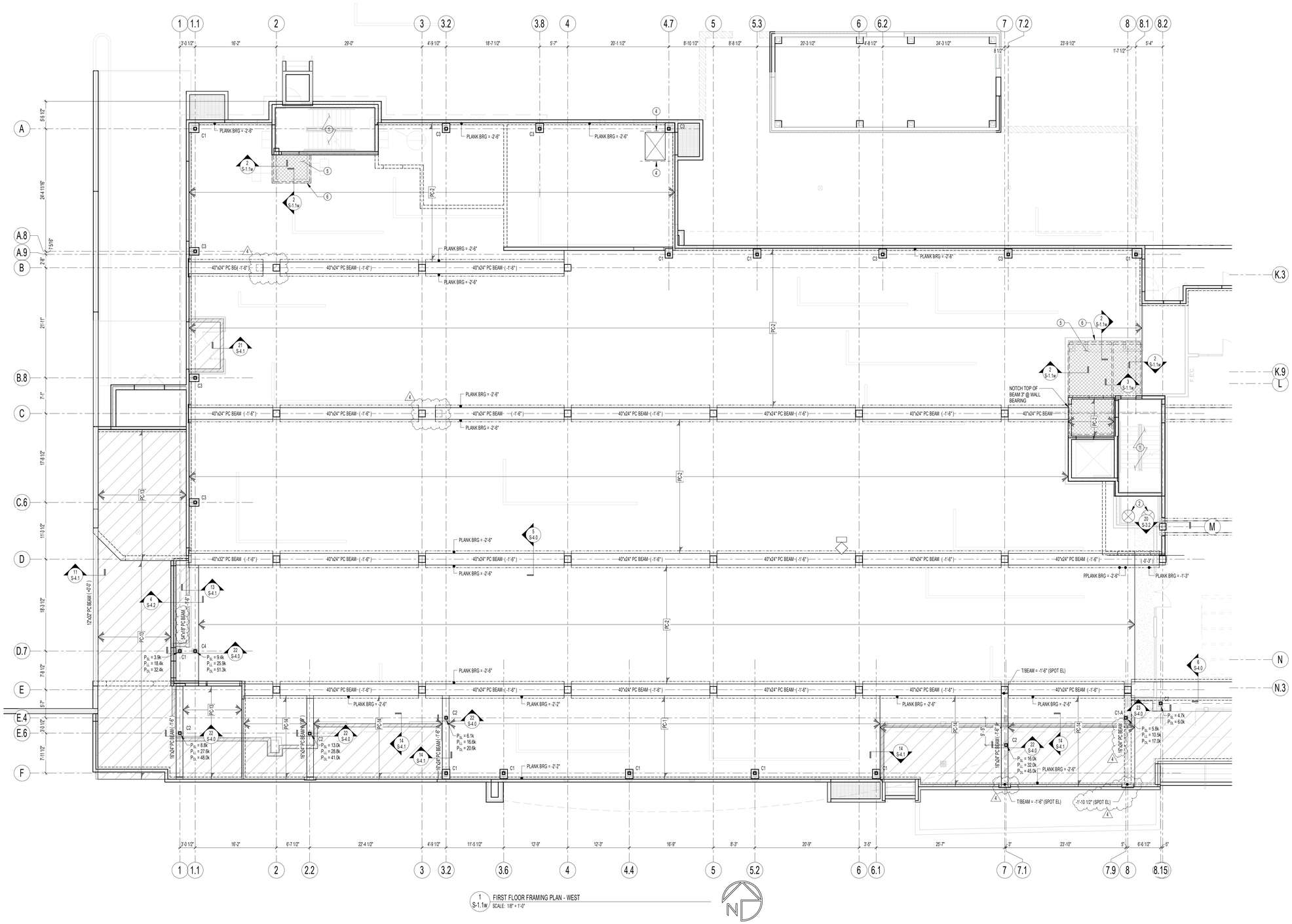
MARK	DESCRIPTION
1	STEEL-FRAMED STAIR w/ CONCRETE FILLED PANS DESIGNED AND SUPPLIED BY FABRICATOR FOR 100 psf IMPOSED LOAD. PROVIDE SOLID OR SOLID-GROUTED CMU AT STAIR CONNECTION POINTS. PROVIDE PIPE OR HSS SUPPORTS AT LANDINGS AT FABRICATOR'S OPTION.
2	OPENING FOR TRASH CHUTE, SEE ARCH FOR SIZE & LOCATION.
3	FLOOR OPENING FOR HVAC, COORDINATE SIZE & LOCATION w/ HVAC CONTRACTOR.
4	STEEL SADDLE @ OPENING BY PRECASTER, SEE 3/S-4.0.
5	3 1/2" CONCRETE TOPPING (2" ABOVE THE METAL DECK) w/ 6x6 - W1.4xW1.4 WWF ON 1 1/2x18GA GALVANIZED COMPOSITE FLOOR DECK.
6	DASHED WALLS INDICATE 362S162-43 AT 24"OC STUB WALLS FOR SUPPORT OF CONCRETE TOPPING ON METAL DECK FLOOR.
7	DASHED LINE INDICATED STRUCTURAL STEEL SUPPORT FRAMING TO SUPPORT EXTERIOR BRICK. REFER TO DETAILS FOR SIZES AND SPACING.
8	NOTCH IN BOTTOM OF PC BEAM WHERE PC BEARS ON STEEL BEAM. REFER TO PC AND STEEL BEAM ELEVATIONS TO DETERMINE DEPTH OF NOTCH. PC SUPPLIER/ENGINEER TO ACCOUNT FOR NOTCH IN BEAM DESIGN. SITE CAST MILDLY REINFORCED BEAM MAY BE USED IN PLACE OF PC AT GC'S OPTION.

PRECAST PLANK SCHEDULE

MARK	PLANK DEPTH	TOPPING	DEAD LOAD	LIVE LOAD	FIRE RATING	REMARKS
PC-1	8"	NONE	SELF WT + 20 psf	150 psf	2 HR	
PC-2	12"	NONE	SELF WT + 20 psf	150 psf	2 HR	
PC-3	8"	3"	SELF WT + 15 psf	100 psf	2 HR	
PC-4	12"	3"	SELF WT + 15 psf	100 psf	2 HR	
PC-5	8"	NONE	SELF WT + 20 psf	NOTE 5	3 HR	
PC-6	12"	NONE	SELF WT + 20 psf	NOTE 5	3 HR	
PC-7	8"	NONE	SELF WT + 60 psf	NOTE 5	3 HR	NOTE 8
PC-8	12"	NONE	SELF WT + 60 psf	NOTE 5	3 HR	
PC-9	12"	NONE	SELF WT + 35 psf	30 psf	3 HR	
PC-11	12"	NONE	SELF WT + 30 psf	100 psf	3 HR	
PC-12	12"	NONE	SELF WT + 30 psf	NOTE 7	3 HR	
PC-13	12"	NONE	SELF WT + 100 psf	250 psf	2 HR	
PC-14	12"	NONE	SELF WT + 100 psf	NOTE 6	2 HR	

PRECAST PLANK SCHEDULE NOTES:

1. VERIFY FIRE RATING w/ ARCHITECTURAL.
2. ALL TOPPING (BONDED OR NON-BONDED) TO BE REINFORCED w/ 6x6 - W1.4xW1.4 WWF.
3. AT BONDED TOPPING AREAS THE SELF WT NOTED AS DEAD LOAD IS THE WEIGHT OF THE PLANK PLUS THE BONDED TOPPING.
4. IN ADDITION TO THE LOADS NOTED IN THE SCHEDULE, THE PLANK IS TO BE DESIGNED FOR LINE LOADS AND POINT LOADS FROM WOOD BEARING WALLS, POINT LOADS AND EXTERIOR CLADDING MATERIALS.
5. LIVE LOAD = 40 psf @ UNIT AREAS AND 80 psf AT CORRIDOR, 100 psf @ ELEVATOR LOBBY AREAS, 70 psf @ BALCONIES, 55 psf @ ROOF AREAS AND 100 psf @ EXTERIOR. SEE ARCHITECTURAL FOR LOCATIONS.
6. LIVE LOAD = 150 psf @ FLOOR AREA
   LIVE LOAD = 250 psf @ EXTERIOR AREA
7. LIVE LOAD = 100 psf @ FLOOR AREA
   LIVE LOAD = 75 psf @ ROOF AREA
8. 2 HOUR AT FIRST FLOOR. 3 HOUR AT SECOND FLOOR.



1 S-1.1w FIRST FLOOR FRAMING PLAN - WEST
SCALE: 1/8" = 1'-0"

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WISCONSIN RICHARD C. PIERCE E-22511 WAUKESHA, WI PROFESSIONAL ENGINEER 11/2/18

PROJECT TITLE
ROYSTER CROSSINGS LOT 2

521-523 GRAND OAK TRL, MADISON, WI

SHEET TITLE
FIRST FLOOR FRAMING PLAN - WEST

SHEET NUMBER
S-1.1w

PROJECT NUMBER 1421

FRAMING PLAN KEYED NOTES

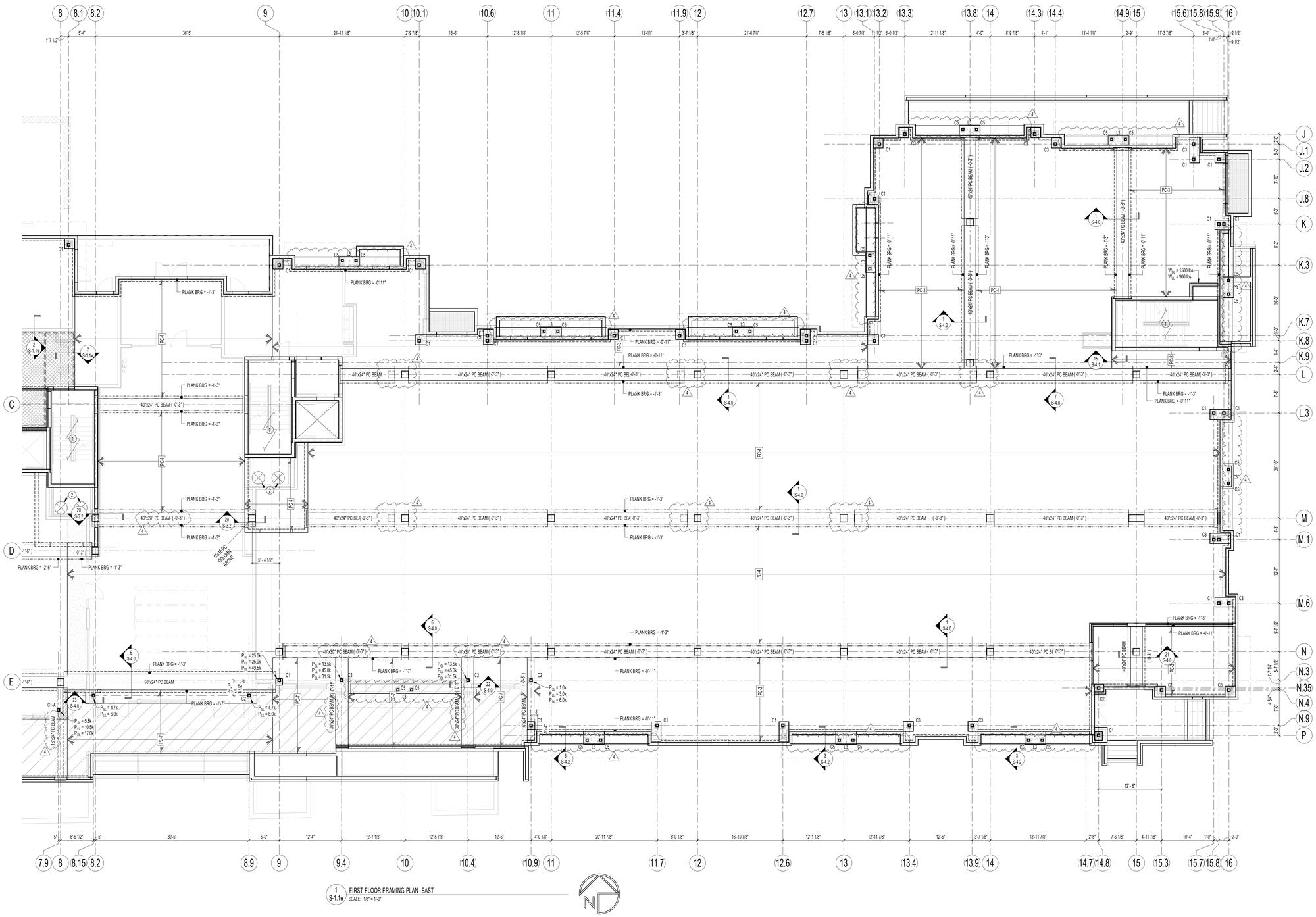
MARK	DESCRIPTION
1	STEEL-FRAMED STAIR w/ CONCRETE FILLED PANS DESIGNED AND SUPPLIED BY FABRICATOR FOR 100 psf IMPOSED LOAD. PROVIDE SOLID OR SOLID-GROUTED CMU AT STAIR CONNECTION POINTS. PROVIDE PIPE OR HSS SUPPORTS AT LANDINGS AT FABRICATOR'S OPTION.
2	OPENING FOR TRASH CHUTE, SEE ARCH FOR SIZE & LOCATION.
3	FLOOR OPENING FOR HVAC, COORDINATE SIZE & LOCATION w/ HVAC CONTRACTOR.
4	STEEL SADDLE @ OPENING BY PRECASTER, SEE 3/S-4.0.
5	3 1/2" CONCRETE TOPPING (2" ABOVE THE METAL DECK) w/ 6x6 - W1.4xW1.4 WWF ON 1 1/2x18GA GALVANIZED COMPOSITE FLOOR DECK.
6	DASHED WALLS INDICATE 362S162-43 AT 24"OC STUB WALLS FOR SUPPORT OF CONCRETE TOPPING ON METAL DECK FLOOR.
7	DASHED LINE INDICATED STRUCTURAL STEEL SUPPORT FRAMING TO SUPPORT EXTERIOR BRICK. REFER TO DETAILS FOR SIZES AND SPACING.
8	NOTCH IN BOTTOM OF PC BEAM WHERE PC BEARS ON STEEL BEAM. REFER TO PC AND STEEL BEAM ELEVATIONS TO DETERMINE DEPTH OF NOTCH. PC SUPPLIER/ENGINEER TO ACCOUNT FOR NOTCH IN BEAM DESIGN. SITE CAST MILDLY REINFORCED BEAM MAY BE USED IN PLACE OF PC AT GC'S OPTION.

PRECAST PLANK SCHEDULE

MARK	PLANK DEPTH	TOPPING	DEAD LOAD	LIVE LOAD	FIRE RATING	REMARKS
PC-1	8"	NONE	SELF WT + 20 psf	150 psf	2 HR	
PC-2	12"	NONE	SELF WT + 20 psf	150 psf	2 HR	
PC-3	8"	3"	SELF WT + 15 psf	100 psf	2 HR	
PC-4	12"	3"	SELF WT + 15 psf	100 psf	2 HR	
PC-5	8"	NONE	SELF WT + 20 psf	NOTE 5	3 HR	
PC-6	12"	NONE	SELF WT + 20 psf	NOTE 5	3 HR	
PC-7	8"	NONE	SELF WT + 60 psf	NOTE 5	3 HR	NOTE 8
PC-8	12"	NONE	SELF WT + 60 psf	NOTE 5	3 HR	
PC-9	12"	NONE	SELF WT + 35 psf	30 psf	3 HR	
PC-11	12"	NONE	SELF WT + 30 psf	100 psf	3 HR	
PC-12	12"	NONE	SELF WT + 30 psf	NOTE 7	3 HR	
PC-13	12"	NONE	SELF WT + 100 psf	250 psf	2 HR	
PC-14	12"	NONE	SELF WT + 100 psf	NOTE 6	2 HR	

PRECAST PLANK SCHEDULE NOTES:

1. VERIFY FIRE RATING w/ ARCHITECTURAL.
2. ALL TOPPING (BONDED OR NON-BONDED) TO BE REINFORCED w/ 6x6 - W1.4xW1.4 WWF.
3. AT BONDED TOPPING AREAS THE SELF WT NOTED AS DEAD LOAD IS THE WEIGHT OF THE PLANK PLUS THE BONDED TOPPING.
4. IN ADDITION TO THE LOADS NOTED IN THE SCHEDULE, THE PLANK IS TO BE DESIGNED FOR LINE LOADS AND POINT LOADS FROM WOOD BEARING WALLS, POINT LOADS AND EXTERIOR CLADDING MATERIALS.
5. LIVE LOAD = 40 psf @ UNIT AREAS AND 80 psf AT CORRIDOR. 100 psf @ ELEVATOR LOBBY AREAS. 70 psf @ BALCONIES. 55 psf @ ROOF AREAS AND 100 psf @ EXTERIOR. SEE ARCHITECTURAL FOR LOCATIONS.
6. LIVE LOAD = 150 psf @ FLOOR AREA
   LIVE LOAD = 250 psf @ EXTERIOR AREA
7. LIVE LOAD = 100 psf @ FLOOR AREA
   LIVE LOAD = 75 psf @ ROOF AREA
8. 2 HOUR AT FIRST FLOOR. 3 HOUR AT SECOND FLOOR.



1 S-1.1e FIRST FLOOR FRAMING PLAN - EAST
SCALE: 1/8" = 1'-0"

knothe bruce ARCHITECTS
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7601 University Ave. • Suite 201 • Middleton, WI 53562

KEY PLAN

PIERCE ENGINEERS INC
CONSULTING STRUCTURAL ENGINEERS
10 West Mifflin St, Suite 205 | Madison, WI 53703
Phone: 608.256.7304 | Fax: 608.256.7306
PE PROJECT 15213

ISSUED

Issued for Bid	September 25, 2015
Revised Bid Set	January 19, 2016
Issued for Plan Review	February 8, 2016
Revised-	February 29, 2016
2 CB #1	December 7, 2017
3 Revision To Prevously Approved Plan	January 12, 2018
4 Revisions	May 11, 2018

WISCONSIN RICHARD C. PIERCE E-22511 WAUKESHA, WI PROFESSIONAL ENGINEER 1/2/18

PROJECT TITLE
ROYSTER CROSSINGS LOT 2

521-523 GRAND OAK TRL, MADISON, WI

SHEET TITLE
FIRST FLOOR FRAMING PLAN - EAST

SHEET NUMBER
S-1.1e

PROJECT NUMBER 1421

FRAMING PLAN KEYED NOTES

MARK	DESCRIPTION
1	STEEL-FRAMED STAIR w/ CONCRETE FILLED PANS DESIGNED AND SUPPLIED BY FABRICATOR FOR 100 psf IMPOSED LOAD. PROVIDE SOLID OR SOLID-GROUTED CMU AT STAIR CONNECTION POINTS. PROVIDE PIPE OR HSS SUPPORTS AT LANDINGS AT FABRICATOR'S OPTION.
2	OPENING FOR TRASH CHUTE, SEE ARCH FOR SIZE & LOCATION.
3	FLOOR OPENING FOR HVAC, COORDINATE SIZE & LOCATION w/ HVAC CONTRACTOR.
4	STEEL SADDLE @ OPENING BY PRECASTER, SEE 3/S-4.0.
5	3 1/2" CONCRETE TOPPING (2" ABOVE THE METAL DECK) w/ 6x6 - W1.4xW1.4 WWF ON 1 1/2x18GA GALVANIZED COMPOSITE FLOOR DECK.
6	DASHED WALLS INDICATE 3025162-43 AT 24"OC STUB WALLS FOR SUPPORT OF CONCRETE TOPPING ON METAL DECK FLOOR.
7	DASHED LINE INDICATED STRUCTURAL STEEL SUPPORT FRAMING TO SUPPORT EXTERIOR BRICK. REFER TO DETAILS FOR SIZES AND SPACING.
8	NOTCH IN BOTTOM OF PC BEAM WHERE PC BEARS ON STEEL BEAM. REFER TO PC AND STEEL BEAM ELEVATIONS TO DETERMINE DEPTH OF NOTCH. PC SUPPLIER/ENGINEER TO ACCOUNT FOR NOTCH IN BEAM DESIGN. SITE CAST MILDLY REINFORCED BEAM MAY BE USED IN PLACE OF PC AT GC'S OPTION.

SECOND FLOOR FRAMING PLAN GENERAL NOTES

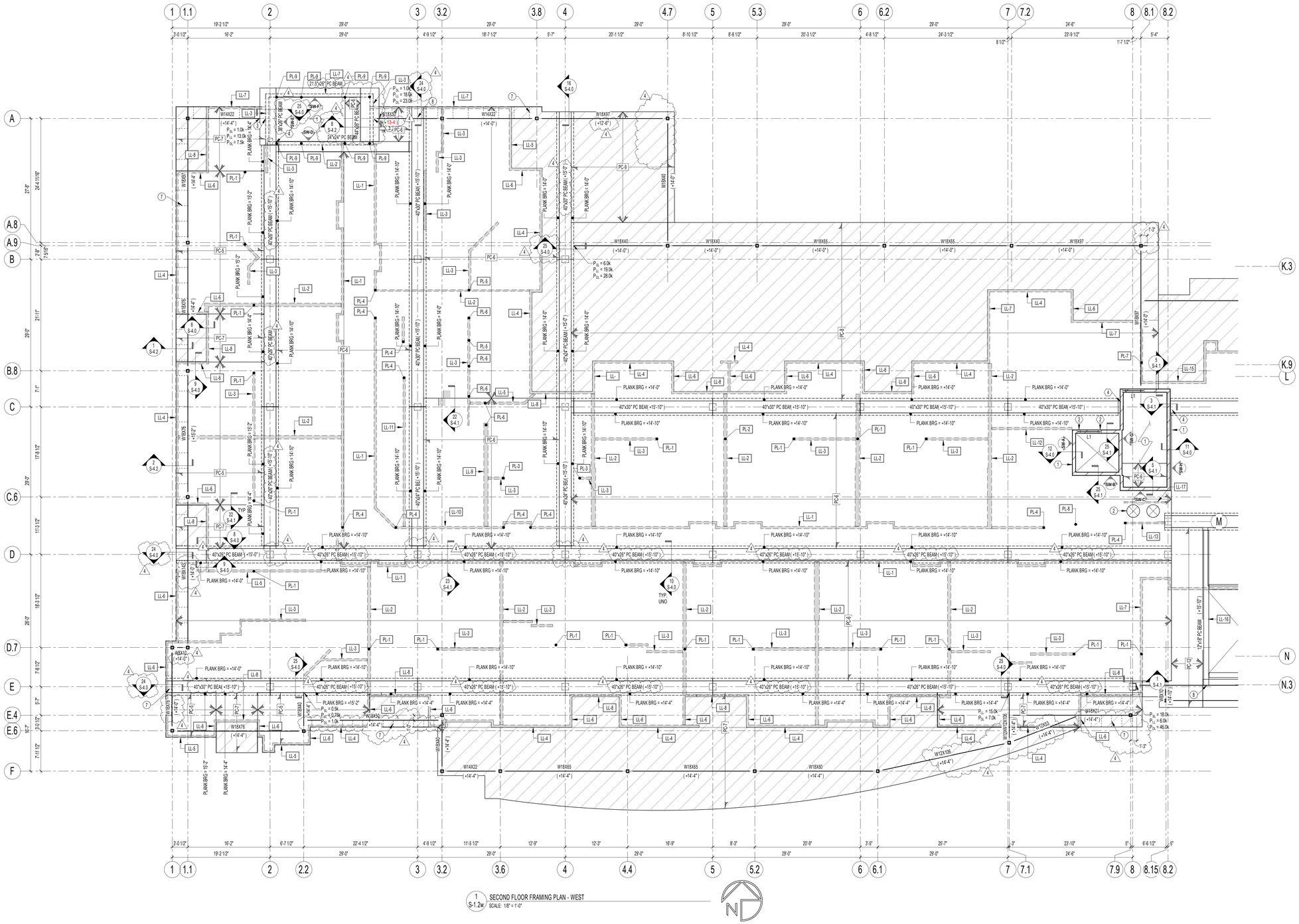
1. REFER TO SHEET S-0.1 FOR STRUCTURAL NOTES.
2. REFER TO SHEET S-0.2 FOR STRUCTURAL SCHEDULES.
3. TOP OF SECOND FLOOR = +16'-0".
4. TOP OF STEEL BEAM = TOS = x'-x" OR (x'-x")
5. REFER TO S-2.0 FOR CMU SHEAR WALL ELEVATIONS.

PRECAST PLANK SCHEDULE

MARK	PLANK DEPTH	TOPPING	DEAD LOAD	LIVE LOAD	FIRE RATING	REMARKS
PC-1	8"	NONE	SELF WT + 20 psf	150 psf	2 HR	
PC-2	12"	NONE	SELF WT + 20 psf	150 psf	2 HR	
PC-3	8"	3"	SELF WT + 15 psf	100 psf	2 HR	
PC-4	12"	3"	SELF WT + 15 psf	100 psf	2 HR	
PC-5	8"	NONE	SELF WT + 20 psf	NOTE 5	3 HR	
PC-6	12"	NONE	SELF WT + 20 psf	NOTE 5	3 HR	
PC-7	8"	NONE	SELF WT + 60 psf	NOTE 5	3 HR	NOTE 8
PC-8	12"	NONE	SELF WT + 60 psf	NOTE 5	3 HR	
PC-9	12"	NONE	SELF WT + 35 psf	30 psf	3 HR	
PC-11	12"	NONE	SELF WT + 30 psf	100 psf	3 HR	
PC-12	12"	NONE	SELF WT + 30 psf	NOTE 7	3 HR	
PC-13	12"	NONE	SELF WT + 100 psf	250 psf	2 HR	
PC-14	12"	NONE	SELF WT + 100 psf	NOTE 6	2 HR	

PRECAST PLANK SCHEDULE NOTES:

1. VERIFY FIRE RATING w/ ARCHITECTURAL.
2. ALL TOPPING (BONDED OR NON-BONDED) TO BE REINFORCED w/ 6x6 - W1.4xW1.4 WWF.
3. AT BONDED TOPPING AREAS THE SELF WT NOTED AS DEAD LOAD IS THE WEIGHT OF THE PLANK PLUS THE BONDED TOPPING.
4. IN ADDITION TO THE LOADS NOTED IN THE SCHEDULE, THE PLANK IS TO BE DESIGNED FOR LINE LOADS AND POINT LOADS FROM WOOD BEARING WALLS, POINT LOADS AND EXTERIOR CLADDING MATERIALS.
5. LIVE LOAD = 40 psf @ UNIT AREAS AND 80 psf AT CORRIDOR, 100 psf @ ELEVATOR LOBBY AREAS, 70 psf @ BALCONIES, 55 psf @ ROOF AREAS AND 100 psf @ EXTERIOR. SEE ARCHITECTURAL FOR LOCATIONS.
6. LIVE LOAD = 150 psf @ FLOOR AREA
   LIVE LOAD = 250 psf @ EXTERIOR AREA
7. LIVE LOAD = 100 psf @ FLOOR AREA
   LIVE LOAD = 75 psf @ ROOF AREA
8. 2 HOUR AT FIRST FLOOR. 1 HOUR AT SECOND FLOOR.



1 S-1.2w SECOND FLOOR FRAMING PLAN - WEST
SCALE: 1/8" = 1'-0"

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KEY PLAN

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4	Revisions	May 11, 2018

WISCONSIN RICHARD C. PIERCE E-22511 WAUKESHA, WI PROFESSIONAL ENGINEER 11/3/18

PROJECT TITLE
ROYSTER CROSSINGS LOT 2

521-523 GRAND OAK TRL, MADISON, WI

SHEET TITLE
SECOND FLOOR FRAMING PLAN - WEST

SHEET NUMBER
S-1.2w

PROJECT NUMBER 1421

FRAMING PLAN KEYED NOTES

MARK	DESCRIPTION
1	STEEL-FRAMED STAIR w/ CONCRETE FILLED PANS DESIGNED AND SUPPLIED BY FABRICATOR FOR 100 psf IMPOSED LOAD. PROVIDE SOLID OR SOLID-GROUTED CMU AT STAIR CONNECTION POINTS. PROVIDE PIPE OR HSS SUPPORTS AT LANDINGS AT FABRICATOR'S OPTION.
2	OPENING FOR TRASH CHUTE, SEE ARCH FOR SIZE & LOCATION.
3	FLOOR OPENING FOR HVAC, COORDINATE SIZE & LOCATION w/ HVAC CONTRACTOR.
4	STEEL SADDLE @ OPENING BY PRECASTER, SEE 3/S-4.0.
5	3 1/2" CONCRETE TOPPING (2" ABOVE THE METAL DECK) w/ 6x6 - W1.4xW1.4 WWF ON 1 1/2x18GA GALVANIZED COMPOSITE FLOOR DECK.
6	DASHED WALLS INDICATE 3625160-43 AT 24"OC STUB WALLS FOR SUPPORT OF CONCRETE TOPPING ON METAL DECK FLOOR.
7	DASHED LINE INDICATED STRUCTURAL STEEL SUPPORT FRAMING TO SUPPORT EXTERIOR BRICK. REFER TO DETAILS FOR SIZES AND SPACING.
8	NOTCH IN BOTTOM OF PC BEAM WHERE PC BEARS ON STEEL BEAM. REFER TO PC AND STEEL BEAM ELEVATIONS TO DETERMINE DEPTH OF NOTCH. PC SUPPLIER/ENGINEER TO ACCOUNT FOR NOTCH IN BEAM DESIGN. SITE CAST MILDLY REINFORCED BEAM MAY BE USED IN PLACE OF PC AT GC'S OPTION.

SECOND FLOOR FRAMING PLAN GENERAL NOTES

1. REFER TO SHEET S-0.1 FOR STRUCTURAL NOTES.
2. REFER TO SHEET S-0.2 FOR STRUCTURAL SCHEDULES.
3. TOP OF SECOND FLOOR = +16'-0".
4. TOP OF STEEL BEAM = TOS = x'-x" OR (x'-x")
5. REFER TO S-2.0 FOR CMU SHEAR WALL ELEVATIONS.

PRECAST PLANK SCHEDULE

MARK	PLANK DEPTH	TOPPING	DEAD LOAD	LIVE LOAD	FIRE RATING	REMARKS
PC-1	8"	NONE	SELF WT + 20 psf	150 psf	2 HR	
PC-2	12"	NONE	SELF WT + 20 psf	150 psf	2 HR	
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PC-4	12"	3"	SELF WT + 15 psf	100 psf	2 HR	
PC-5	8"	NONE	SELF WT + 20 psf	NOTE 5	3 HR	
PC-6	12"	NONE	SELF WT + 20 psf	NOTE 5	3 HR	
PC-7	8"	NONE	SELF WT + 60 psf	NOTE 5	3 HR	NOTE 8
PC-8	12"	NONE	SELF WT + 60 psf	NOTE 5	3 HR	
PC-9	12"	NONE	SELF WT + 35 psf	30 psf	3 HR	
PC-11	12"	NONE	SELF WT + 30 psf	100 psf	3 HR	
PC-12	12"	NONE	SELF WT + 30 psf	NOTE 7	3 HR	
PC-13	12"	NONE	SELF WT + 100 psf	250 psf	2 HR	
PC-14	12"	NONE	SELF WT + 100 psf	NOTE 6	2 HR	

PRECAST PLANK SCHEDULE NOTES:

1. VERIFY FIRE RATING w/ ARCHITECTURAL.
2. ALL TOPPING (BONDED OR NON-BONDED) TO BE REINFORCED w/ 6x6 - W1.4xW1.4 WWF.
3. AT BONDED TOPPING AREAS THE SELF WT NOTED AS DEAD LOAD IS THE WEIGHT OF THE PLANK PLUS THE BONDED TOPPING.
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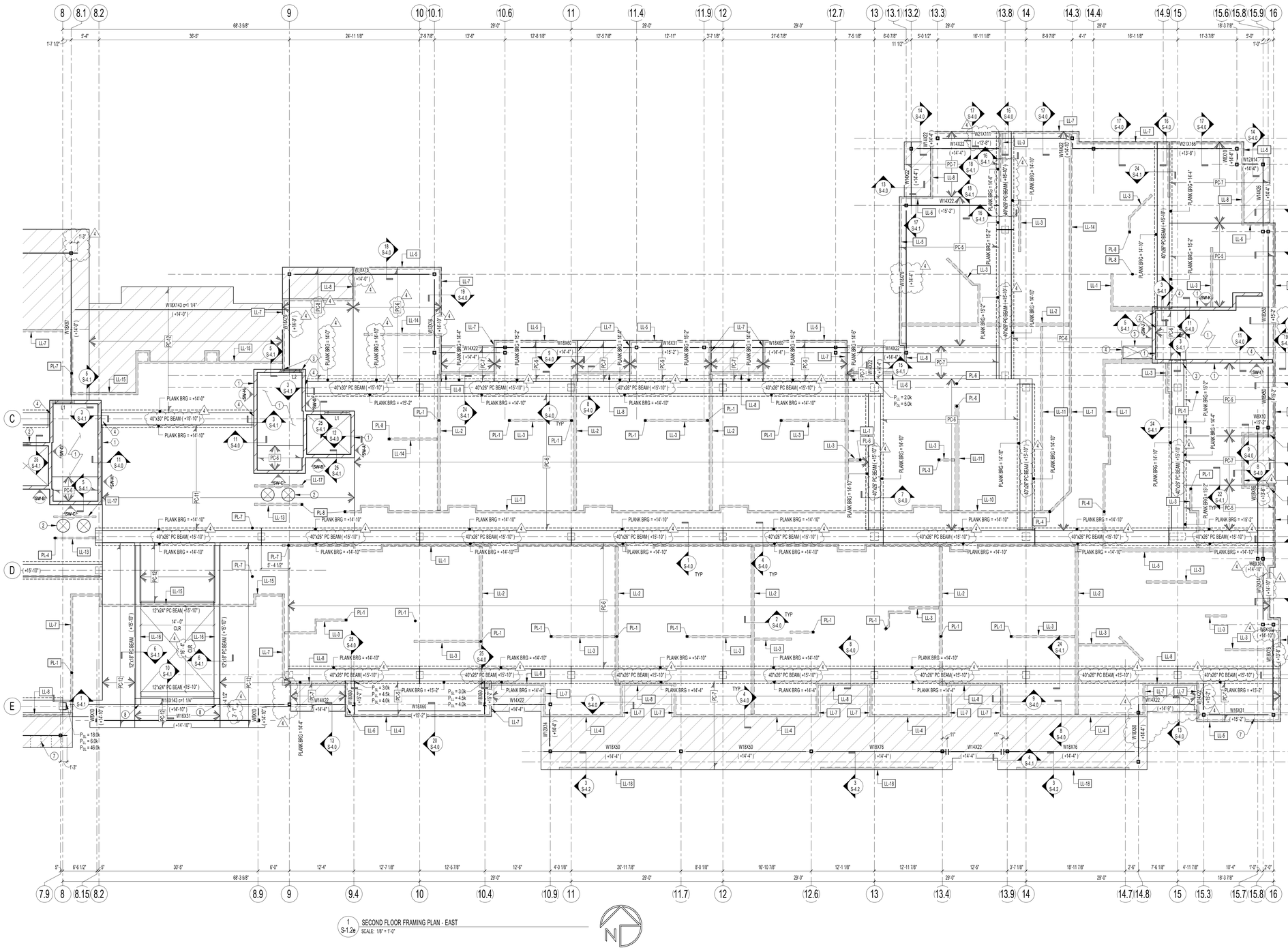
6. LIVE LOAD = 150 psf @ FLOOR AREA
   LIVE LOAD = 250 psf @ EXTERIOR AREA
7. LIVE LOAD = 100 psf @ FLOOR AREA
   LIVE LOAD = 75 psf @ ROOF AREA
8. 2 HOUR AT FIRST FLOOR. 3 HOUR AT SECOND FLOOR.



1 S-1.2e SECOND FLOOR FRAMING PLAN - EAST
SCALE: 1/8" = 1'-0"

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KEY PLAN

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WISCONSIN RICHARD C. PIERCE E-22511 WAUKESHA, WI PROFESSIONAL ENGINEER 7/2/18

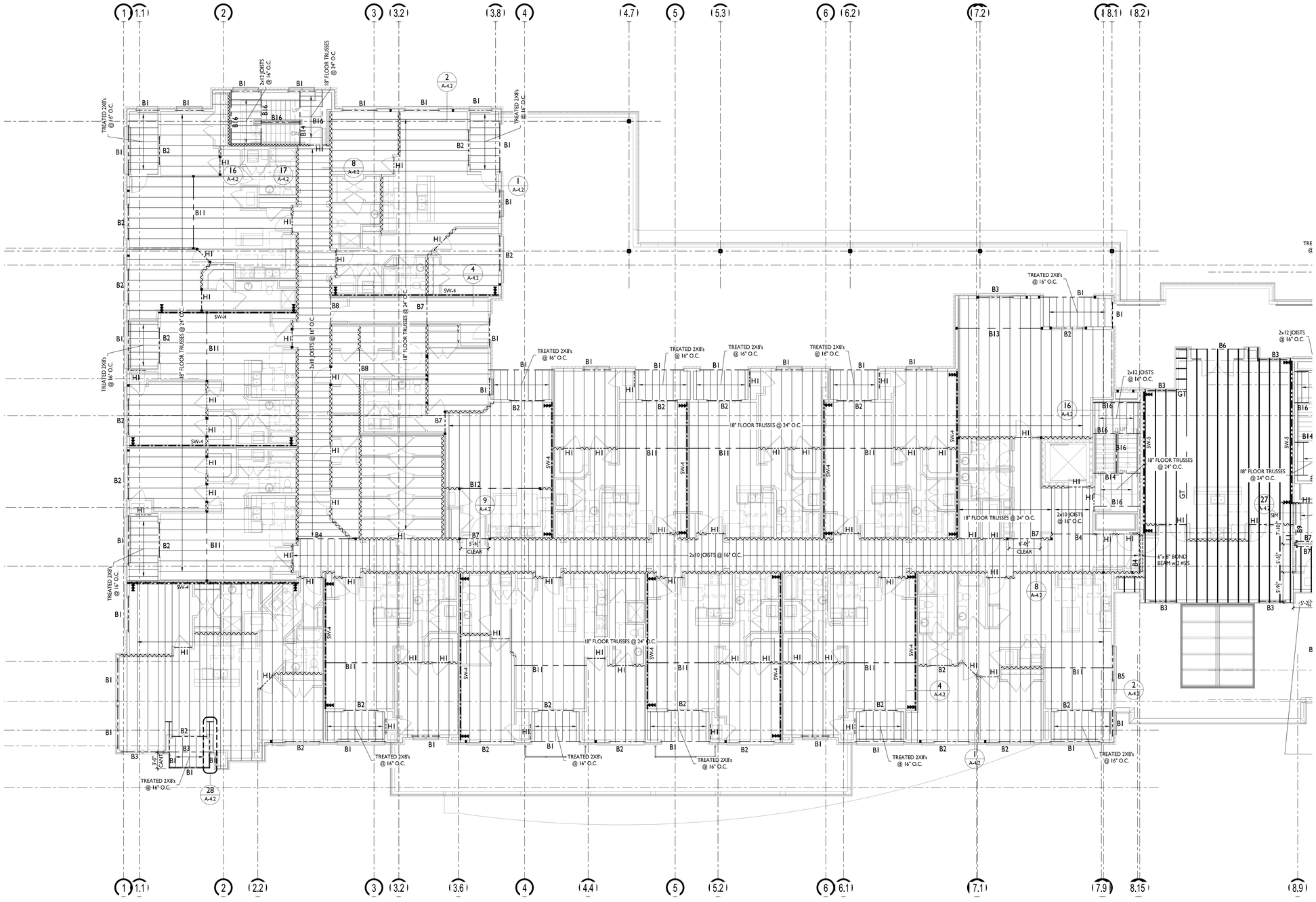
PROJECT TITLE
ROYSTER CROSSINGS LOT 2

521-523 GRAND OAK TRL, MADISON, WI

SHEET TITLE
SECOND FLOOR FRAMING PLAN - EAST

SHEET NUMBER
S-1.2e

PROJECT NUMBER 1421



1 S-1.3W THIRD FLOOR FRAMING PLAN - WEST

1/8"=1'-0"

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Phone: 608.836.3690
7601 University Ave, Ste 201
Middleton, WI 53562

ISSUED

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Revision to Previously Approved Plan - January 12, 2018
Revised Set - May 23, 2018

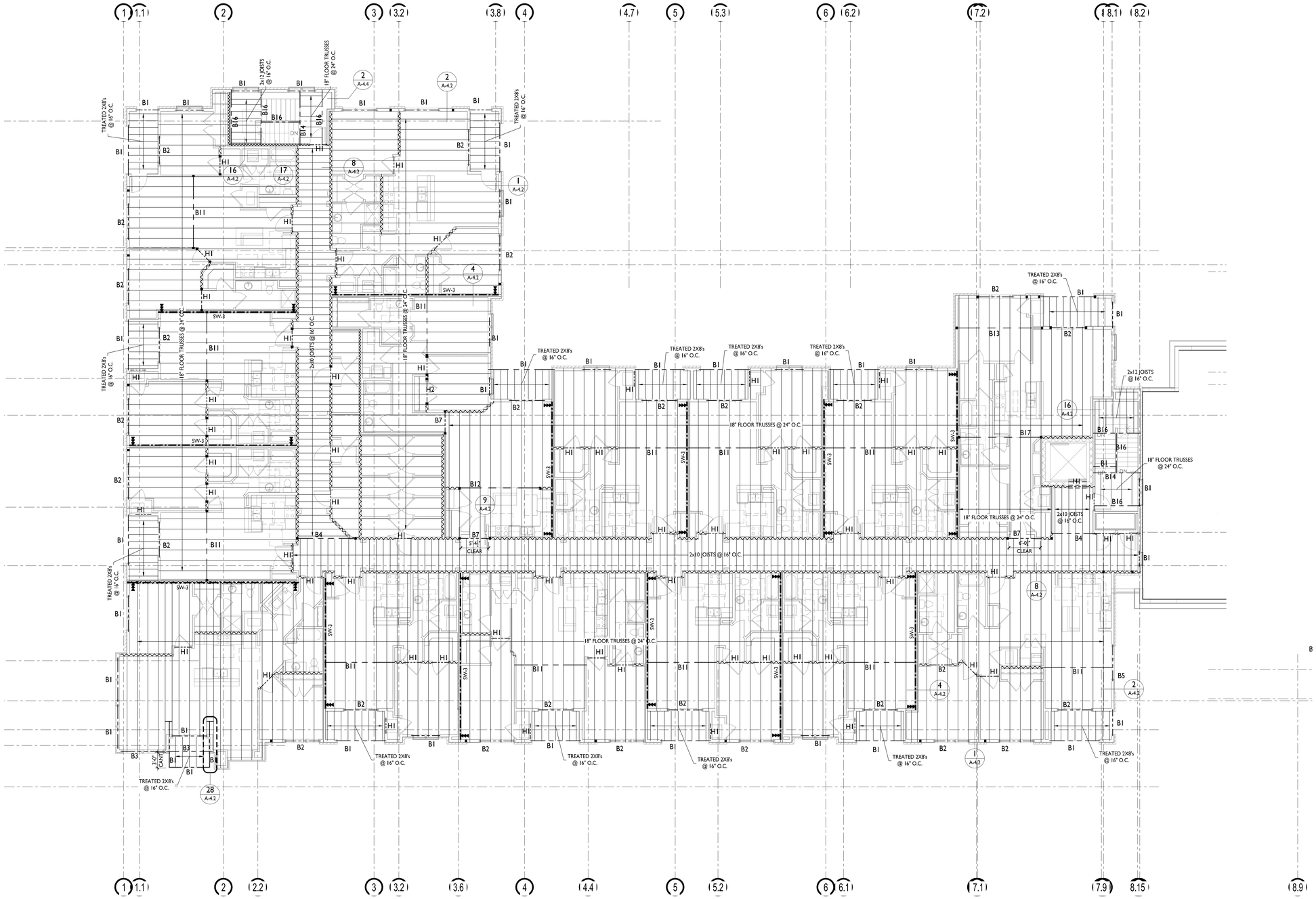
PROJECT TITLE
ROYSTER CROSSINGS

521-523 Grand Oak Trail
MADISON, WI

SHEET TITLE
Third Floor Framing Plan - West

SHEET NUMBER
S-1.3W

PROJECT NO. 1421



1 FOURTH FLOOR FRAMING PLAN - WEST
S-1.4W
1/8"=1'-0"

knothe bruce ARCHITECTS
Phone: 608.836.3690
7601 University Ave, Ste 201
Middleton, WI 53562

ISSUED

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Revised Set - May 23, 2018

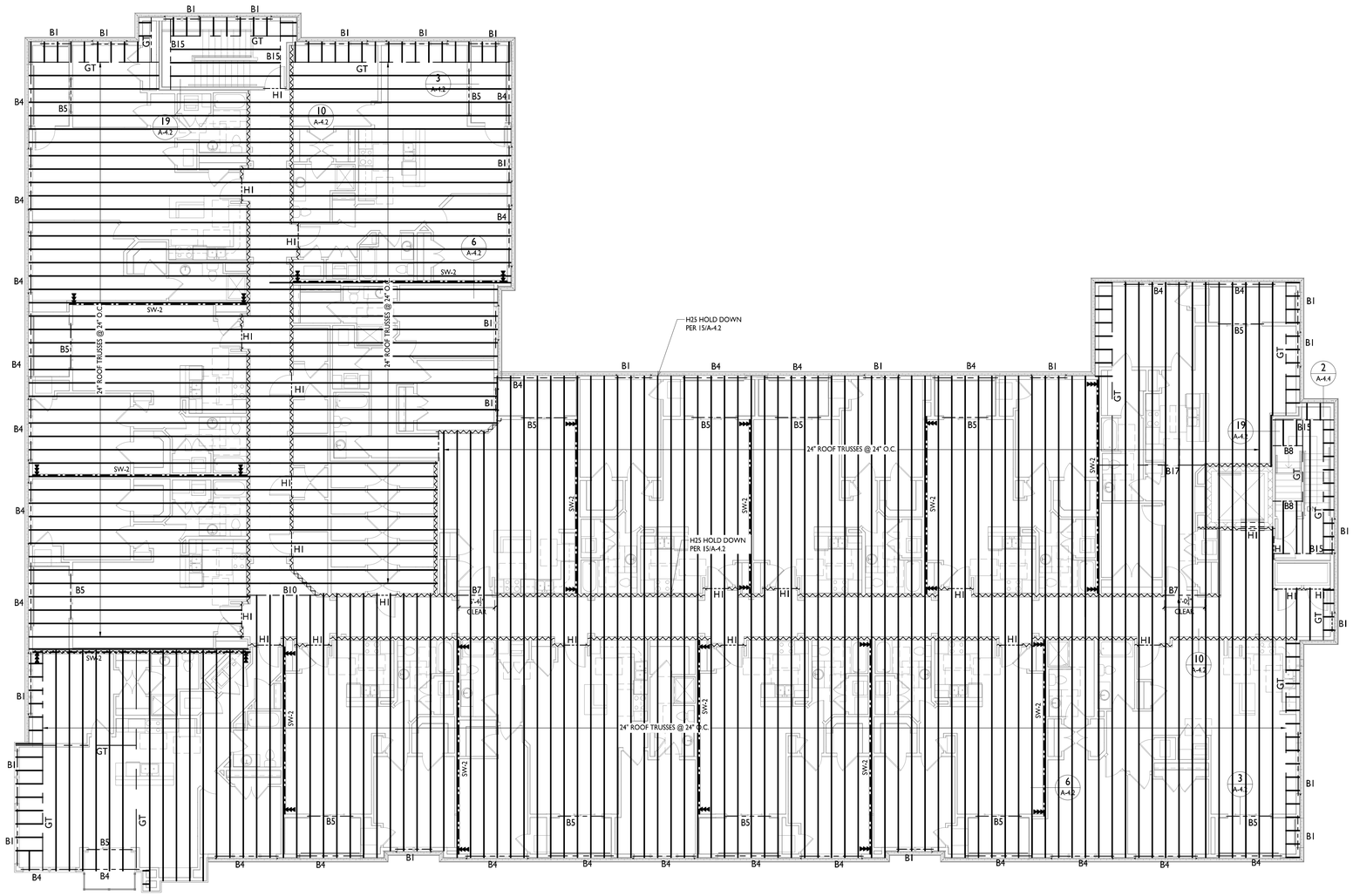
PROJECT TITLE
ROYSTER CROSSINGS

521-523 Grand Oak Trail
MADISON, WI

SHEET TITLE
Fourth Floor Framing Plan - West

SHEET NUMBER
S-1.4W

PROJECT NO. 1421



1 S-1.5W ROOF FRAMING PLAN - WEST

1/8"=1'-0"

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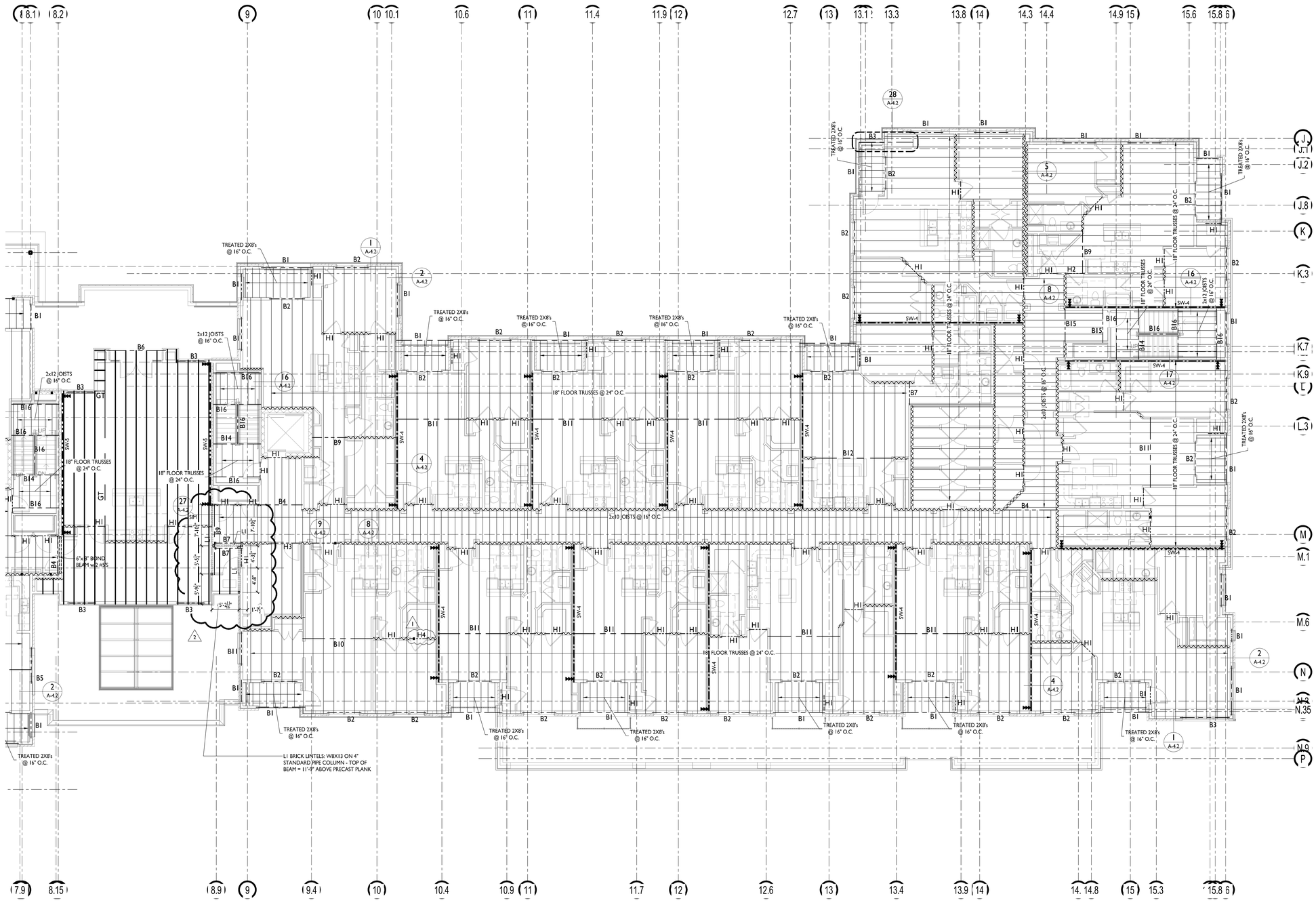
PROJECT TITLE
ROYSTER CROSSINGS

521-523 Grand Oak Trail
MADISON, WI

SHEET TITLE
Roof Framing Plan - West

SHEET NUMBER
S-1.5W

PROJECT NO. 1421



1 THIRD FLOOR FRAMING PLAN -EAST
S-1.3E
1/8"=1'-0"

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Revision to Previously Approved Plan - January 12, 2018
Revised Set - May 23, 2018

2 Added Dimensions - May 18, 2018
1 Revised - February 10, 2016

PROJECT TITLE
ROYSTER CROSSINGS

521-523 Grand Oak Trail
MADISON, WI

SHEET TITLE
Third Floor Framing Plan - East

SHEET NUMBER
S-1.3E

PROJECT NO. 1421

1 S-1.4E FOURTH FLOOR FRAMING PLAN - EAST

1/8"=1'-0"

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Revised Set - May 23, 2018

1 Revised - February 10, 2016

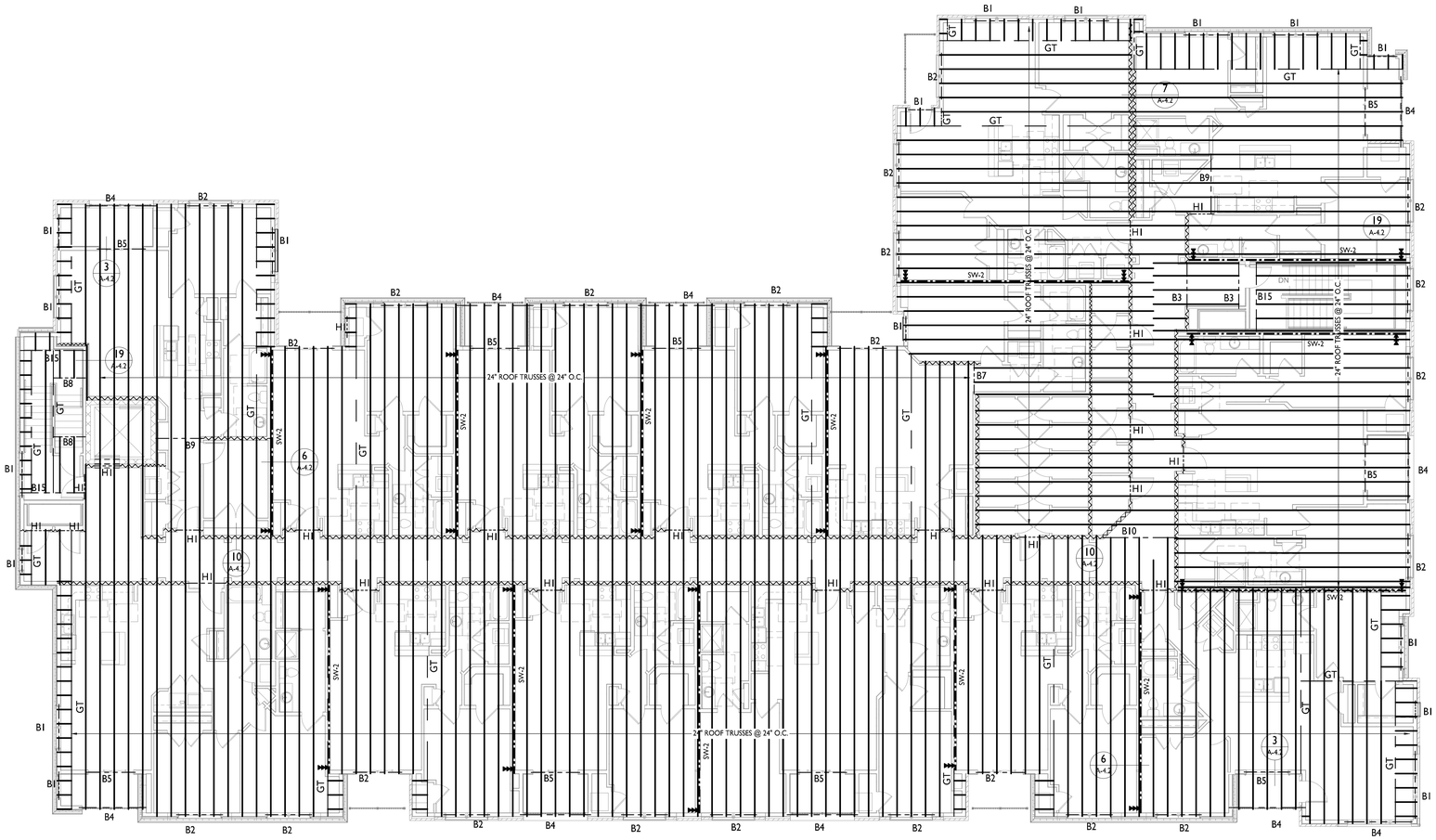
PROJECT TITLE
ROYSTER CROSSINGS

521-523 Grand Oak Trail
MADISON, WI

SHEET TITLE
Fourth Floor Framing Plan - East

SHEET NUMBER
S-1.4E

PROJECT NO. 1421



1 S-1.5E ROOF FRAMING PLAN - EAST

1/8"=1'-0"

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PROJECT TITLE

ROYSTER CROSSINGS

521-523 Grand Oak Trail
MADISON, WI

SHEET TITLE

Roof Framing Plan - East

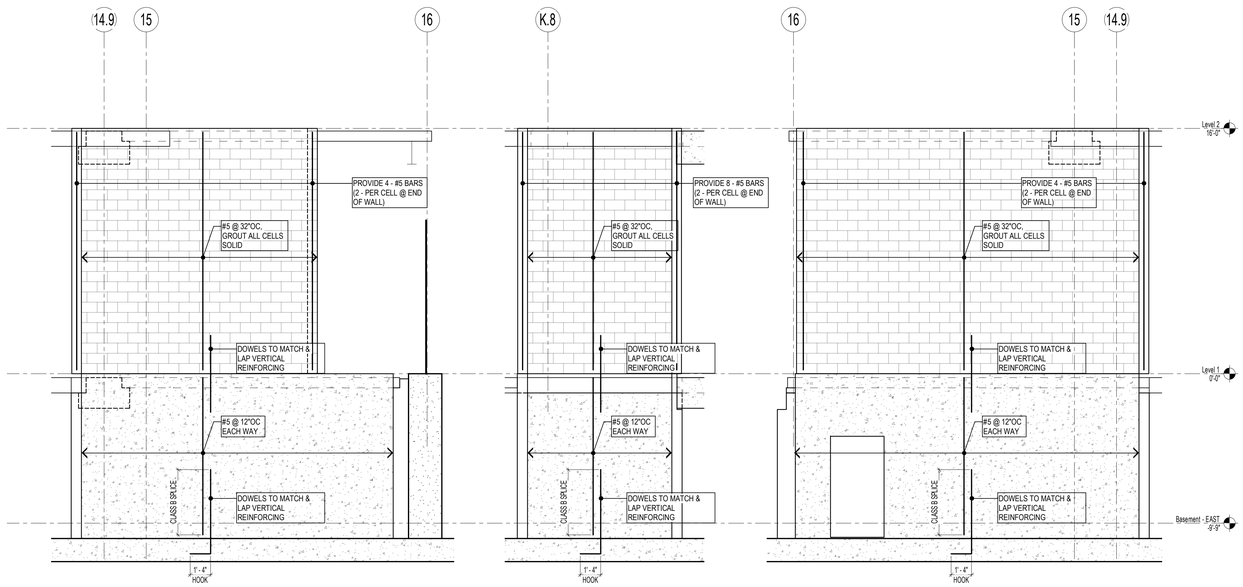
SHEET NUMBER

S-1.5E

PROJECT NO. 1421

SHEARWALL ELEVATION GENERAL NOTES

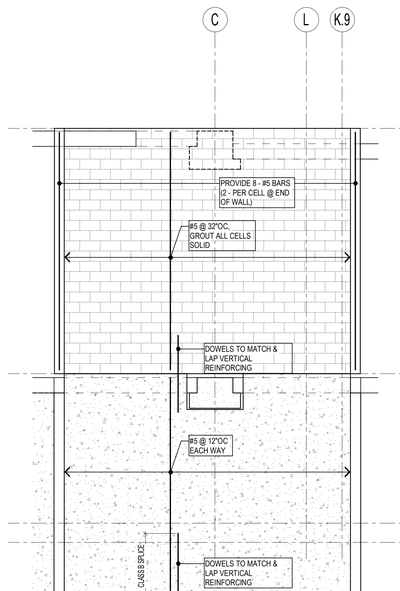
1. ALL HORIZONTAL AND VERTICAL REINFORCING SHALL BE LAP SPLICED.
2. ALL MASONRY WALLS TO BE FULL GROUTED. SEE ELEVATIONS FOR VERTICAL REINFORCING.
3. #5 BARS TO BE LAP SPLICED 30".
4. MASONRY f'm = 1500 psi. MASONRY FILL PEA GRAVEL = 3000 psi.
5. AT WALL STEPS ADJUST VERTICAL BARS TO LAP INTO REDUCED WALL THICKNESS. DO NOT PLACE CONTROL JOINTS IN SHEARWALLS.



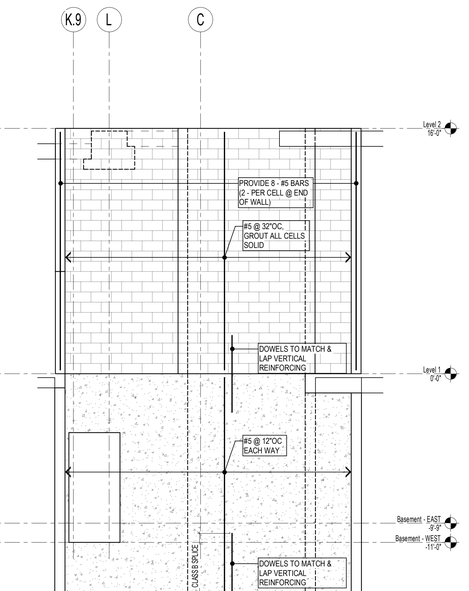
11 S-2.0 SW-K
SCALE: 1/4" = 1'-0"

10 S-2.0 SW-J
SCALE: 1/4" = 1'-0"

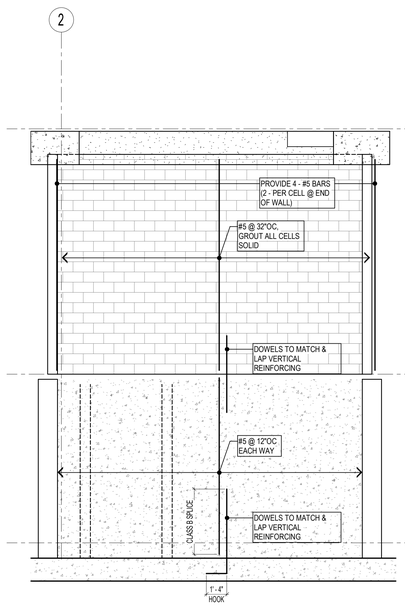
9 S-2.0 SW-I
SCALE: 1/4" = 1'-0"



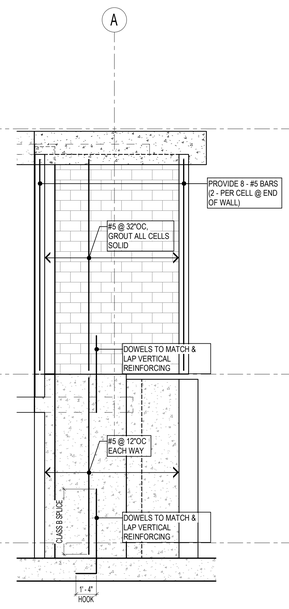
5 S-2.0 SW-H
SCALE: 1/4" = 1'-0"



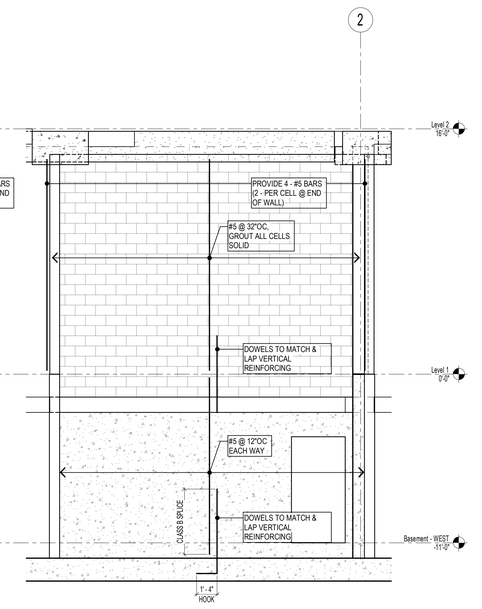
4 S-2.0 SW-G
SCALE: 1/4" = 1'-0"



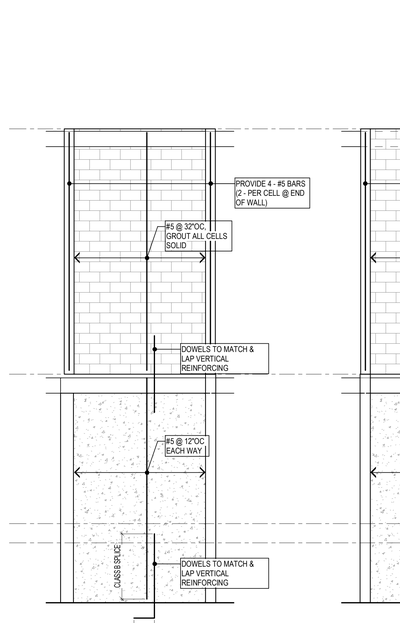
8 S-2.0 SW-F
SCALE: 1/4" = 1'-0"



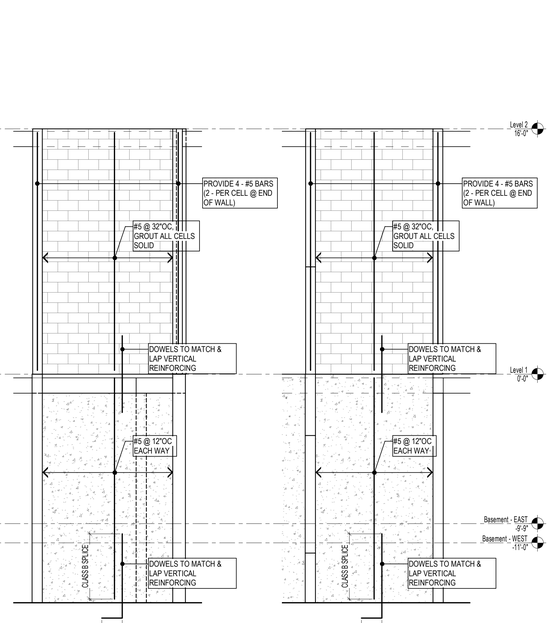
7 S-2.0 SW-E
SCALE: 1/4" = 1'-0"



6 S-2.0 SW-D
SCALE: 1/4" = 1'-0"



3 S-2.0 SW-C
SCALE: 1/4" = 1'-0"



2 S-2.0 SW-B
SCALE: 1/4" = 1'-0"

1 S-2.0 SW-A
SCALE: 1/4" = 1'-0"

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WISCONSIN RICHARD C. PIERCE E-22511 WAUKESHA WI PROFESSIONAL ENGINEER 11/13/18

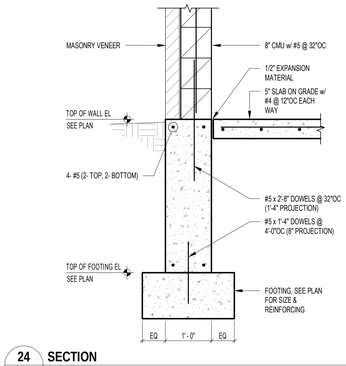
PROJECT TITLE
ROYSTER CROSSINGS LOT 2

521-523 GRAND OAK TRL, MADISON, WI

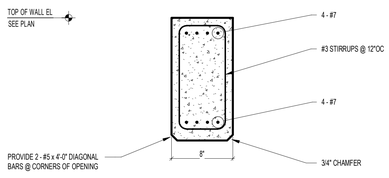
SHEET TITLE
SHEARWALL ELEVATIONS

SHEET NUMBER
S-2.0

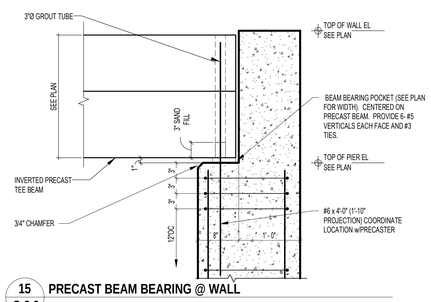
PROJECT NUMBER 1421



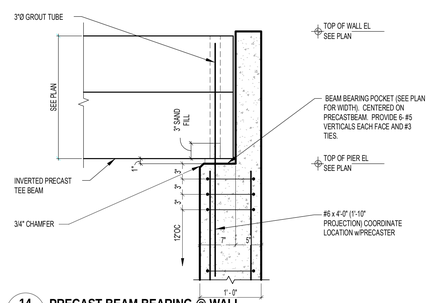
24 SECTION
S-3.0



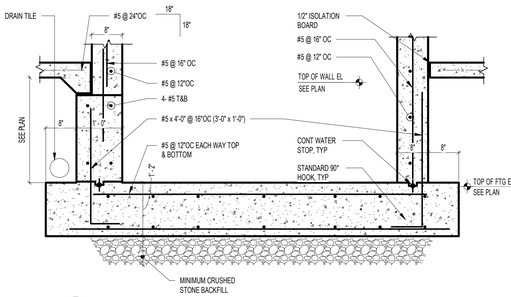
20 CONCRETE WALL OPENING
S-3.0



15 PRECAST BEAM BEARING @ WALL
S-3.0



14 PRECAST BEAM BEARING @ WALL
S-3.0



10 ELEVATOR PIT FOOTING SECTION
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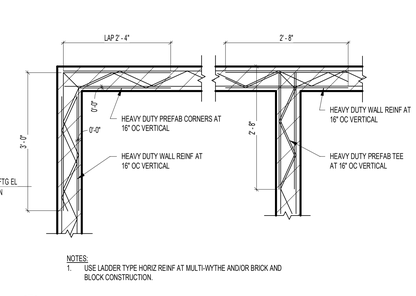
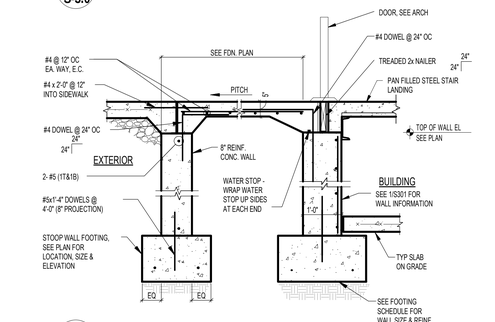


9 HORIZ. MASONRY WALL REINF.
S-3.0



5 STOOP SECTION
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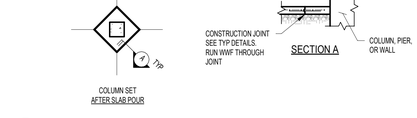
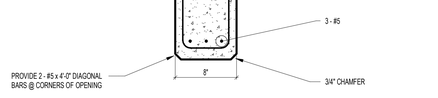


4 TYPICAL SLAB ON GRADE @ COLUMN
S-3.0



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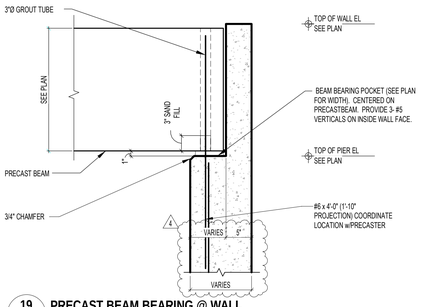
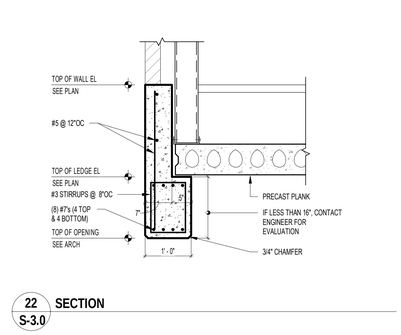
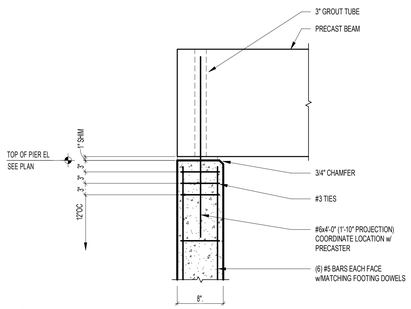


19 PRECAST BEAM BEARING @ WALL
S-3.0

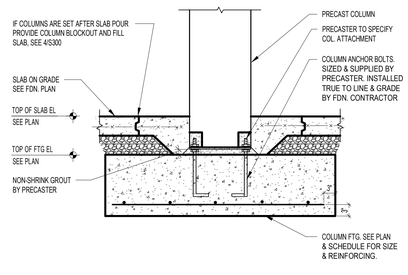


22 SECTION
S-3.0



18 SECTION
S-3.0

13 CONCRETE WALL OPENING
S-3.0



8 COLUMN ANCHORAGE DETAIL
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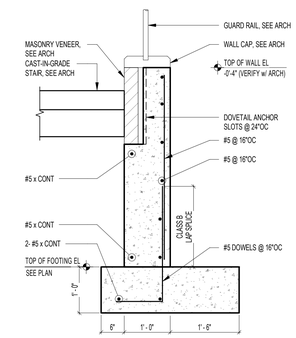

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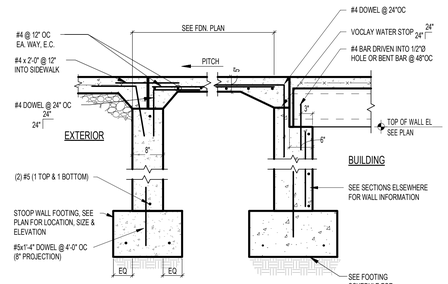
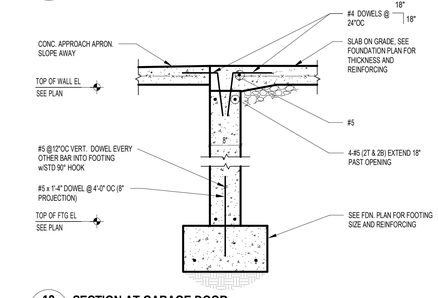
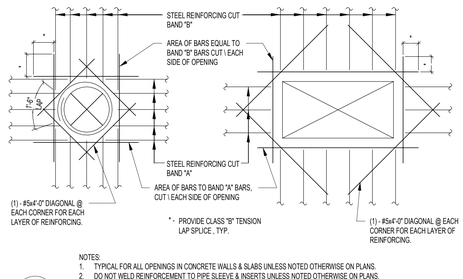


17 STOOP SECTION w/ PRECAST BEARING
S-3.0



12 SECTION AT GARAGE DOOR
S-3.0

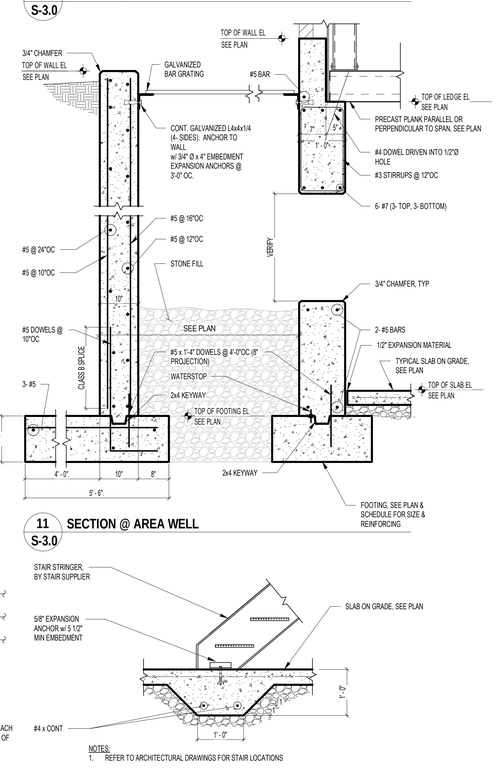


NOTES:
1. TYPICAL FOR ALL OPENINGS IN CONCRETE WALLS & SLABS UNLESS NOTED OTHERWISE ON PLANS.
2. DO NOT WELD REINFORCEMENT TO PIPE SLEEVE & INSERTS UNLESS NOTED OTHERWISE ON PLANS.

7 REINFORCING @ CONCRETE OPENINGS
S-3.0

NOTES:
1. REFER TO ARCHITECTURAL DRAWINGS FOR STAIR LOCATIONS

6 STEEL STAIR FOOTING / FOUNDATION
S-3.0

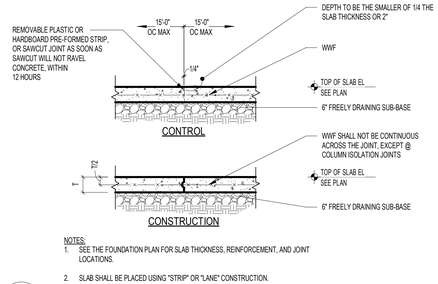


11 SECTION @ AREA WELL
S-3.0

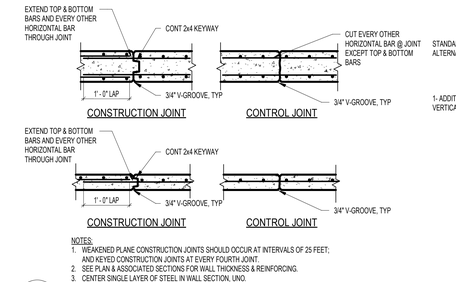
16 SECTION @ RETAINING WALL
S-3.0

5 STOOP SECTION
S-3.0

4 TYPICAL SLAB ON GRADE @ COLUMN
S-3.0

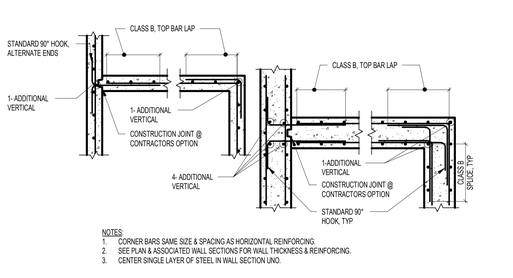


3 SLAB ON GRADE
S-3.0



NOTES:
1. WEAKENED PLANE CONSTRUCTION JOINTS SHOULD OCCUR AT INTERVALS OF 25 FEET; AND KEYED CONSTRUCTION JOINTS AT EVERY FOURTH JOINT.
2. SEE PLAN & ASSOCIATED SECTIONS FOR WALL THICKNESS & REINFORCING.
3. CENTER SINGLE LAYER OF STEEL IN WALL SECTION, UNO.

2 TYPICAL VERTICAL WALL JOINTS
S-3.0



NOTES:
1. CORNER BARS SAME SIZE & SPACING AS HORIZONTAL REINFORCING.
2. SEE PLAN & ASSOCIATED WALL SECTIONS FOR WALL THICKNESS & REINFORCING.
3. CENTER SINGLE LAYER OF STEEL IN WALL SECTION UNO.

1 REINFORCING @ WALL CORNERS
S-3.0

WALL INFO SCHEDULE

MARK	A	B	C	D	E	F	G
WALL A	3'-0"	1'-6"	6"	NONE	2 - #5	#5 @ 16"OC	#5 @ 16"OC
WALL B	4'-4"	2'-6"	10"	#5 @ 24"OC	3 - #5	#5 @ 16"OC	#5 @ 16"OC
WALL C	5'-6"	3'-2"	1'-4"	#5 @ 16"OC	4 - #5	#5 @ 16"OC	#5 @ 16"OC

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KEY PLAN

PIERCE ENGINEERS INC
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10 West Mifflin St, Suite 205 | Madison, WI 53703
Phone: 608.256.7304 | Fax: 608.256.7306
PE PROJECT 15213

ISSUED

Issued for Bid	September 25, 2015
Revised Bid Set	January 19, 2016
Issued for Plan Review	February 8, 2016

4	Revisions	May 11, 2018

WISCONSIN RICHARD C. PIERCE E-22511 WAUKESHA, WI PROFESSIONAL ENGINEER 5/11/18

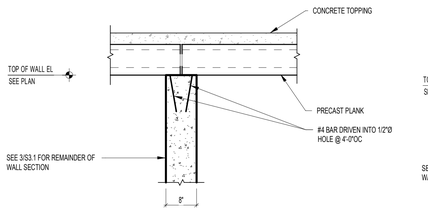
PROJECT TITLE
ROYSTER CROSSINGS LOT 2

521-523 GRAND OAK TRL, MADISON, WI

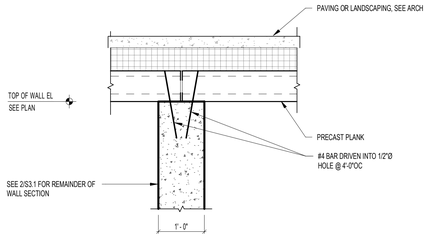
SHEET TITLE
FOUNDATION DETAILS

SHEET NUMBER
S-3.0

PROJECT NUMBER 1421



25 TOP OF WALL DETAIL
S-3.1



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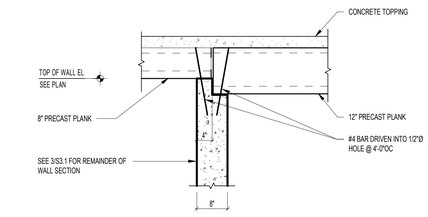

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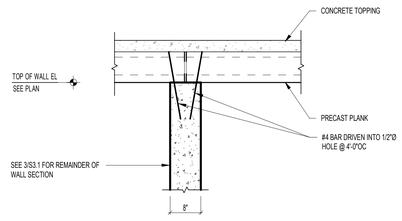

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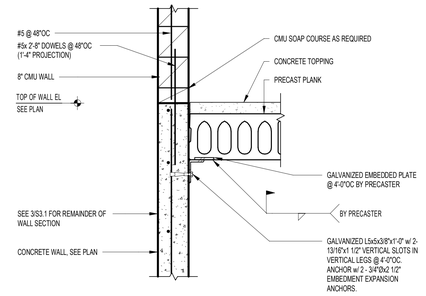
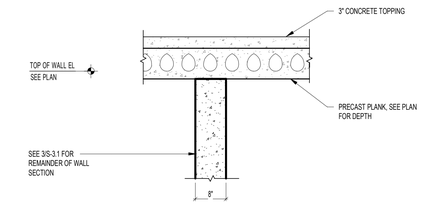


21 TOP OF WALL DETAIL
S-3.1



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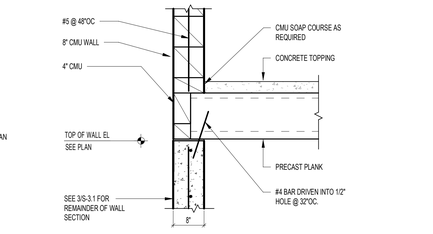

19 TOP OF WALL DETAIL
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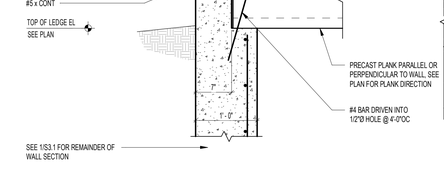
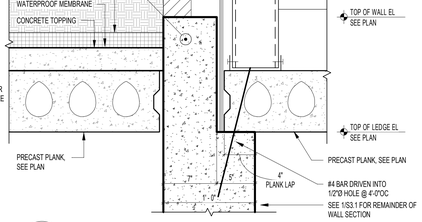
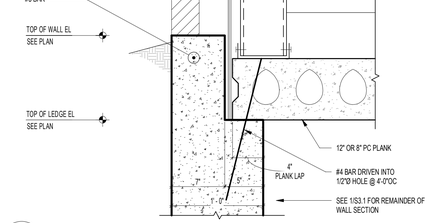


18 SECTION
S-3.1



17 DETAIL @ TOP OF WALL
S-3.1



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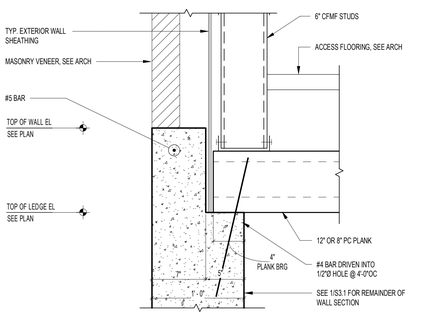

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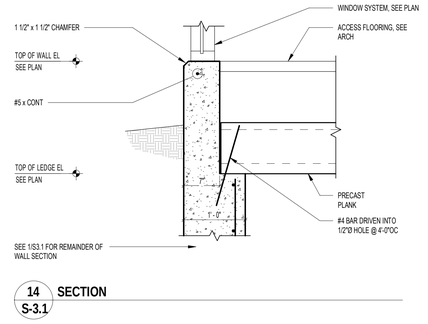

14 SECTION
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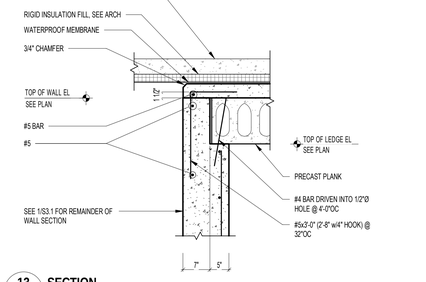

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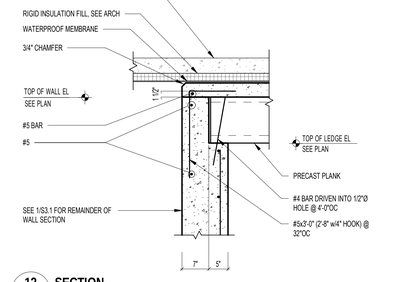

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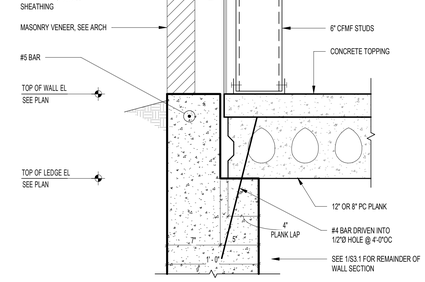
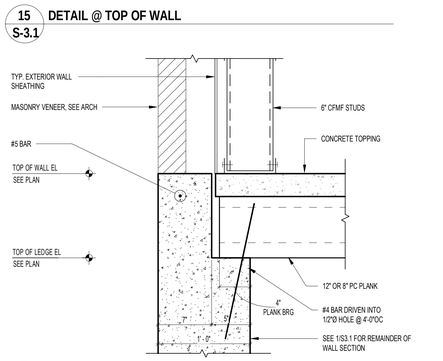


11 DETAIL @ TOP OF WALL
S-3.1



10 DETAIL @ TOP OF WALL
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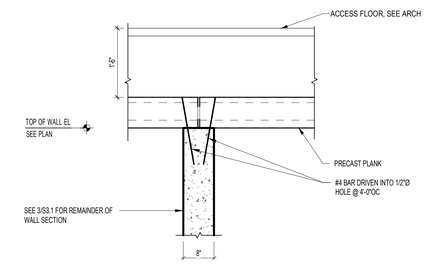
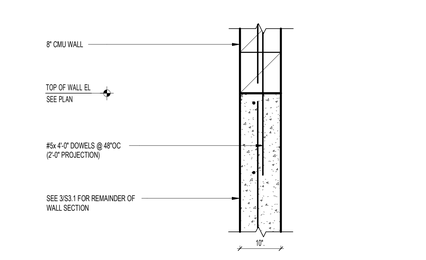


9 TOP OF WALL DETAIL
S-3.1



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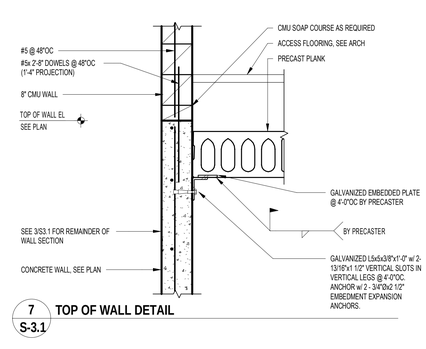

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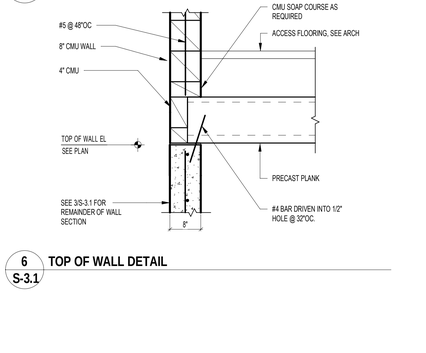

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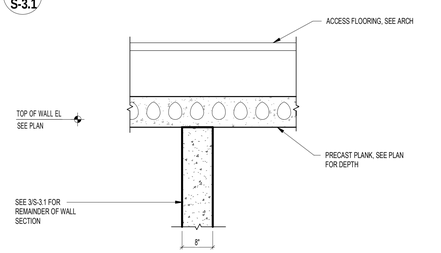
S-3.1



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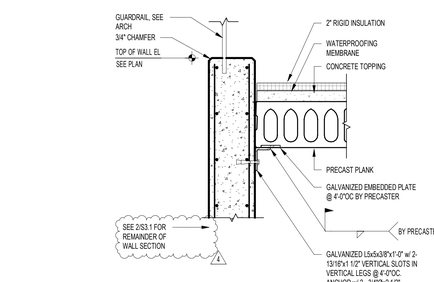

4 TOP OF WALL DETAIL
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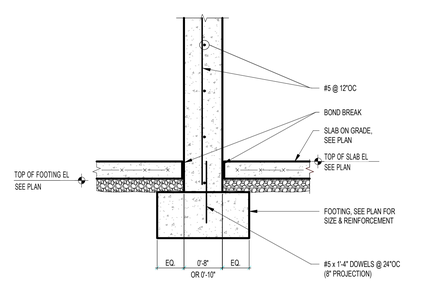
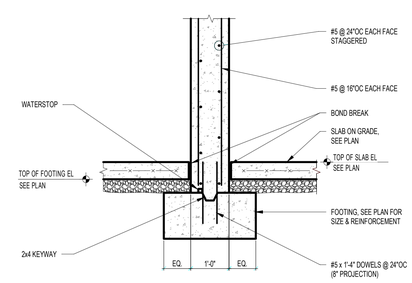
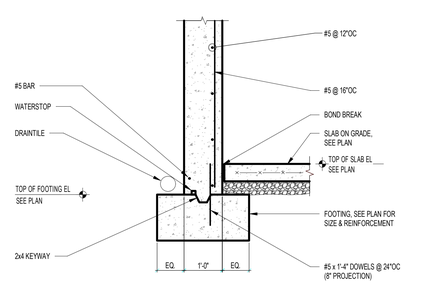


3 8" OR 10" FOUNDATION WALL SECTION
S-3.1



2 12" FOUNDATION WALL SECTION
S-3.1



1 12" FOUNDATION WALL SECTION
S-3.1

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KEY PLAN

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WISCONSIN
RICHARD C. PIERCE
E-22511
WAUKESHA, WI
PROFESSIONAL ENGINEER
5/11/18

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FOUNDATION DETAILS

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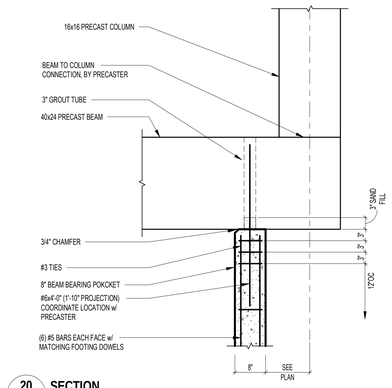
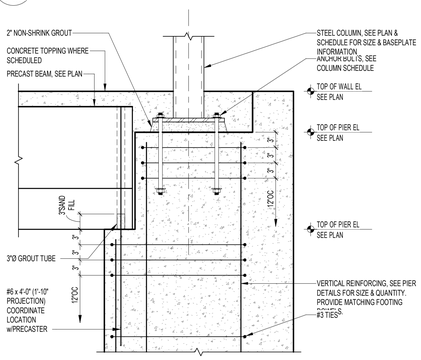
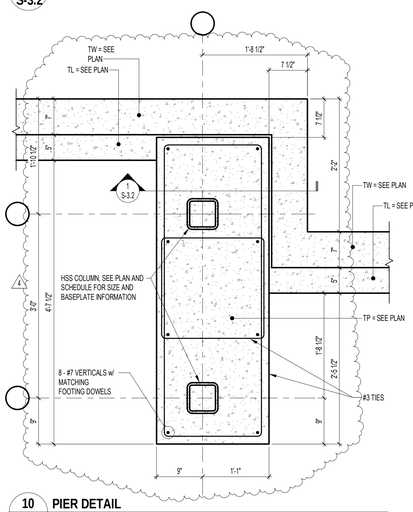


20 SECTION
S-3.2

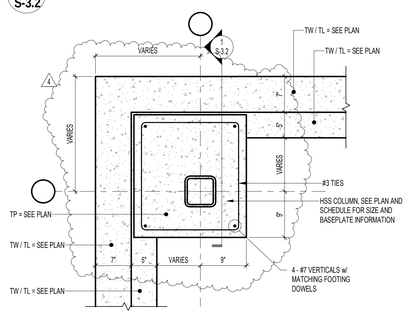


NOTE: STEEL ERECTOR TO COORDINATE w/ PRECASTER TO SET AND GROUT BASEPLATES w/ PRECAST PLANK ERECTION AS REQUIRED OR STEEL FABRICATOR TO STEEL SETTING PLATES PRIOR TO PRECAST PLANK ERECTION.

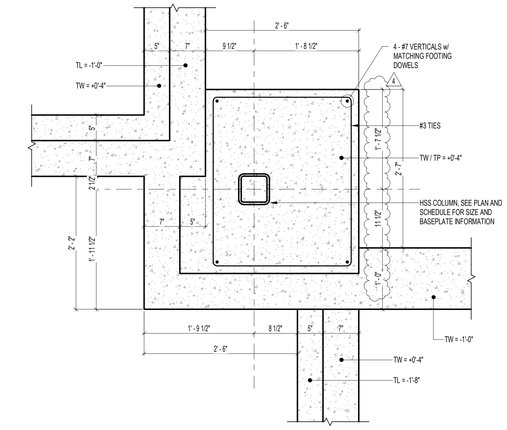
15 COLUMN PIER DETAIL
S-3.2



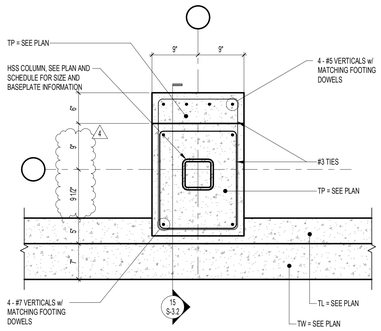
10 PIER DETAIL
S-3.2



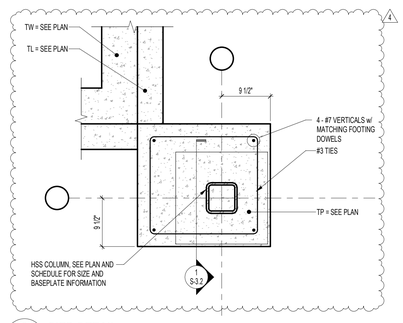
5 PIER DETAIL
S-3.2



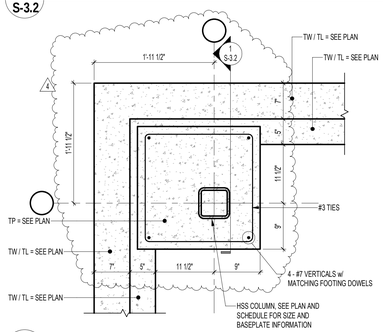
19 SECTION
S-3.2



14 PIER DETAIL
S-3.2

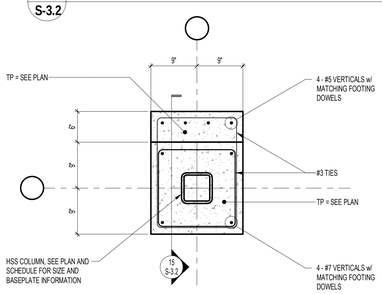


9 PIER DETAIL
S-3.2

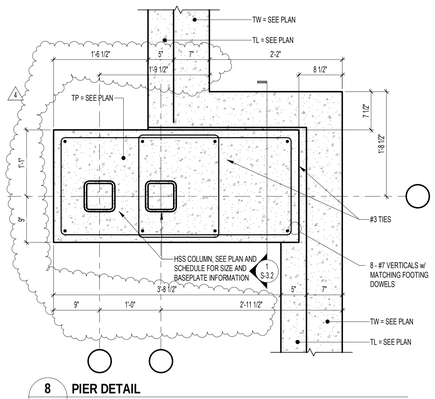


4 PIER DETAIL
S-3.2

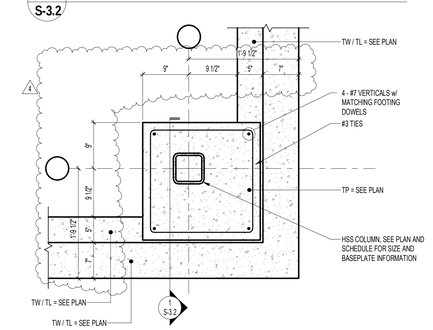
18 PIER DETAIL
S-3.2



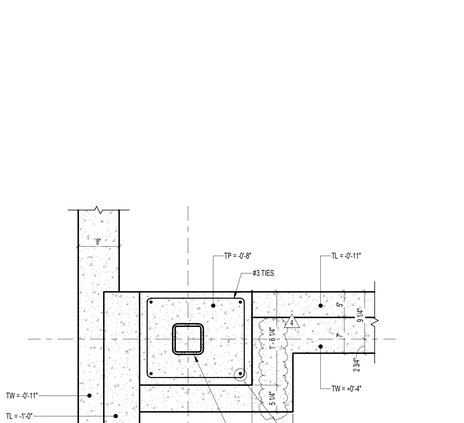
13 PIER DETAIL
S-3.2



8 PIER DETAIL
S-3.2

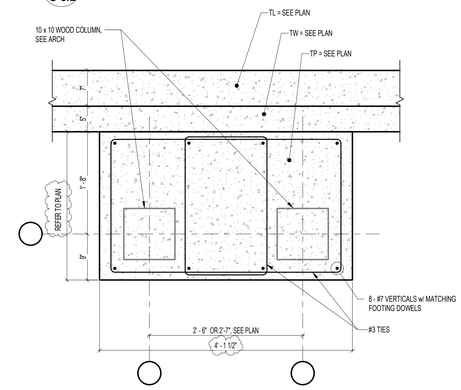


3 PIER DETAIL
S-3.2

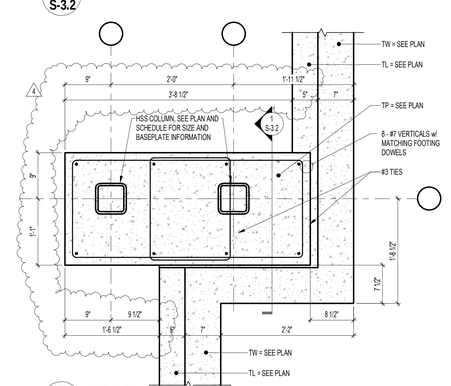


21 PIER DETAIL
S-3.2

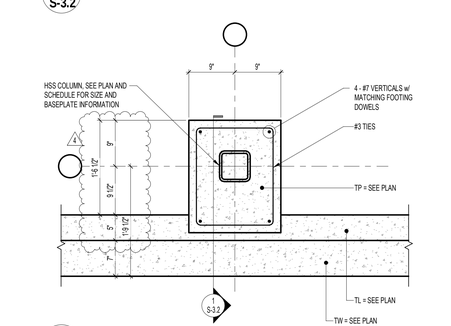
17 PIER DETAIL
S-3.2



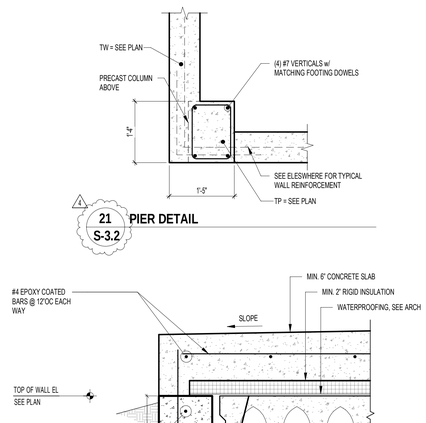
12 PIER DETAIL
S-3.2



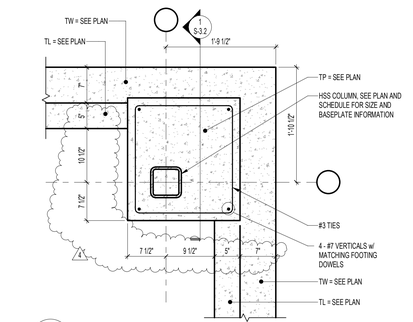
7 PIER DETAIL
S-3.2



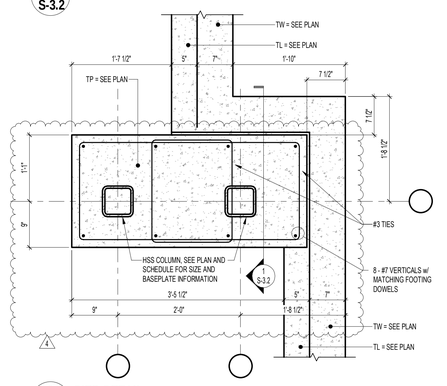
2 PIER DETAIL
S-3.2



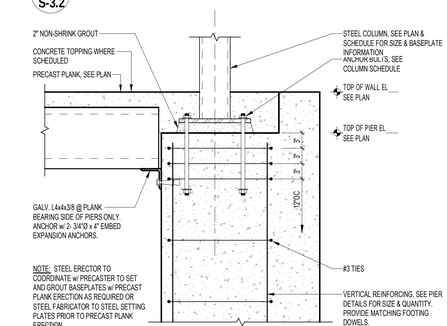
16 DETAIL @ TOP OF WALL
S-3.2



11 PIER DETAIL
S-3.2



6 PIER DETAIL
S-3.2



NOTE: STEEL ERECTOR TO COORDINATE w/ PRECASTER TO SET AND GROUT BASEPLATES w/ PRECAST PLANK ERECTION AS REQUIRED OR STEEL FABRICATOR TO STEEL SETTING PLATES PRIOR TO PRECAST PLANK ERECTION.

1 COLUMN PIER DETAIL
S-3.2

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Phone: 608.256.7304 | Fax: 608.256.7306
PE PROJECT 15213

ISSUED

Issued for Bid	September 25, 2015
Revised Bid Set	January 19, 2016
Issued for Plan Review	February 8, 2016
4 Revised-Revisions	February 29, 2016 May 11, 2018

WISCONSIN RICHARD C. PIERCE E-22511 WAUKESHA, WI PROFESSIONAL ENGINEER 5/11/18

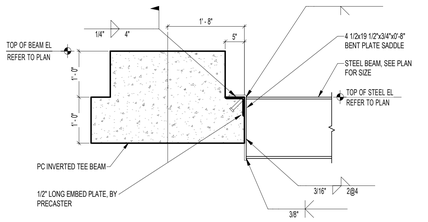
PROJECT TITLE
ROYSTER CROSSINGS LOT 2

521-523 GRAND OAK TRL, MADISON, WI

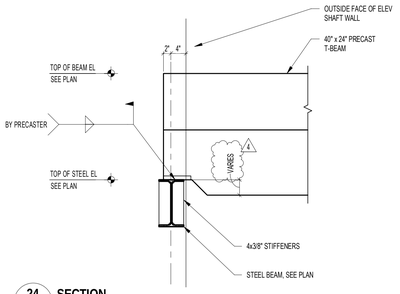
SHEET TITLE
FOUNDATION DETAILS

SHEET NUMBER
S-3.2

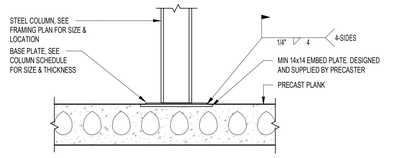
PROJECT NUMBER 1421



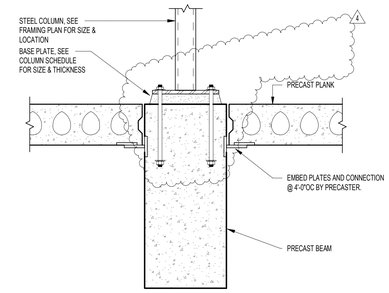
25 S-4.0 SECTION
SCALE: 3/4" = 1'-0"



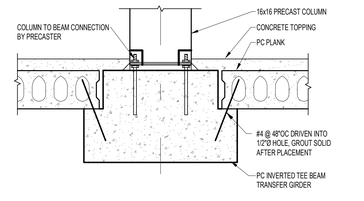
24 S-4.0 SECTION



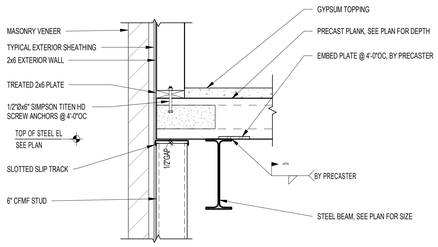
23 S-4.0 STEEL COLUMN @ PLANK
SCALE: 1" = 1'-0"



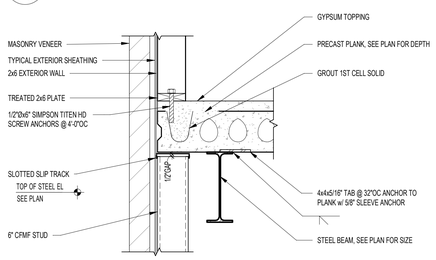
22 S-4.0 STEEL COLUMN @ PLANK



21 S-4.0 SECTION



20 S-4.0 PRECAST BEAM BEARING @ CMU WALL



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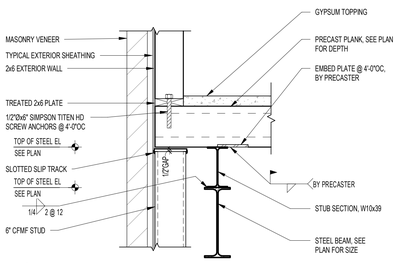
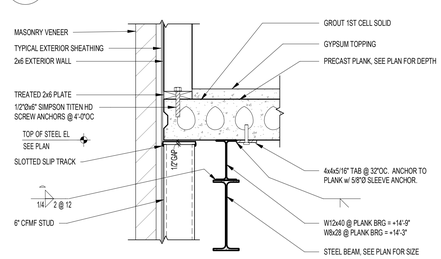


18 S-4.0 SECTION



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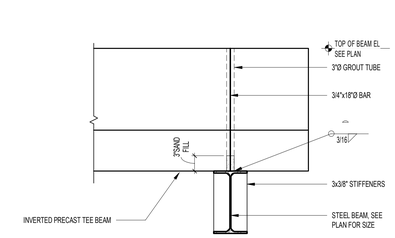

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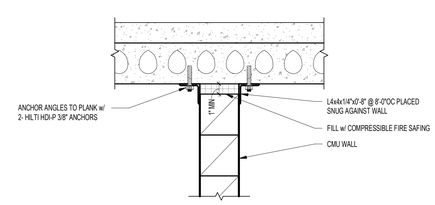
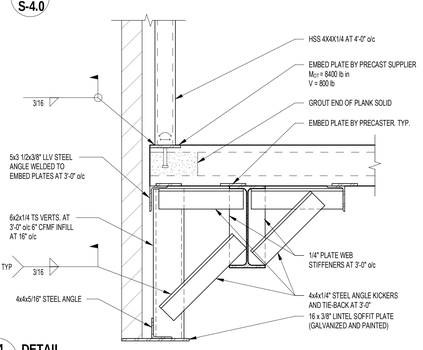
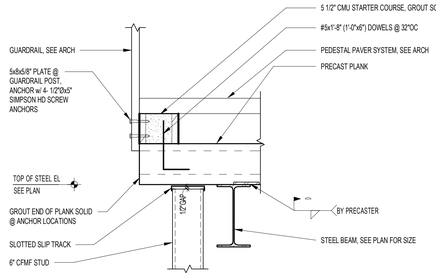


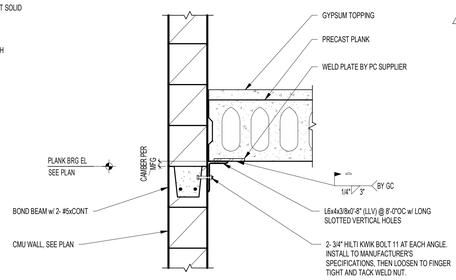
15 S-4.0 LATERAL SUPPORT OF MASONRY PARTITION



14 S-4.0 DETAIL



13 S-4.0 DETAIL



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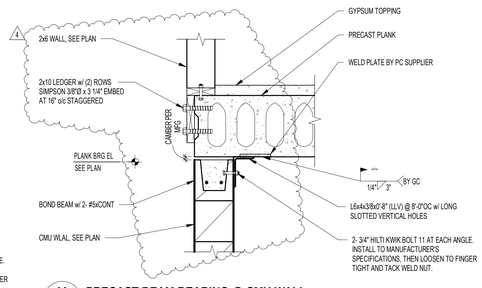
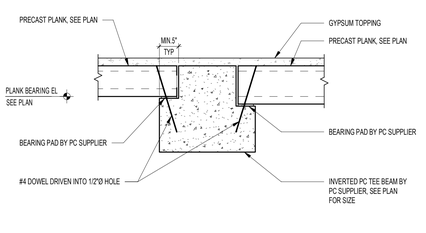


11 S-4.0 PRECAST BEAM BEARING @ CMU WALL



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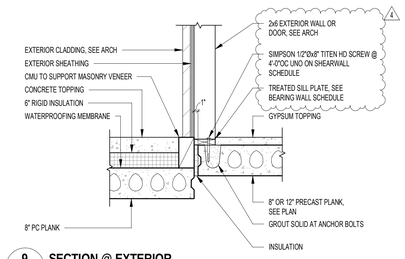
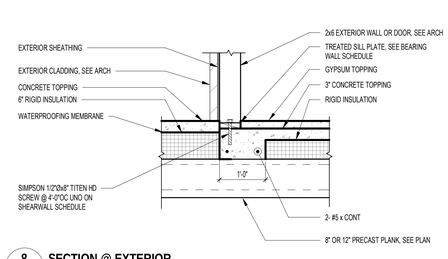
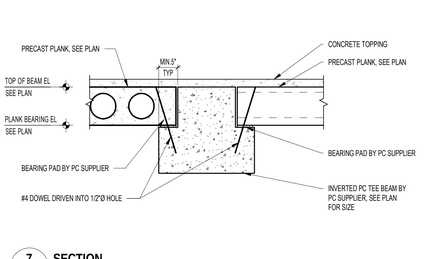


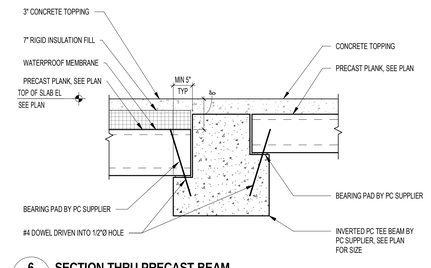
9 S-4.0 SECTION @ EXTERIOR



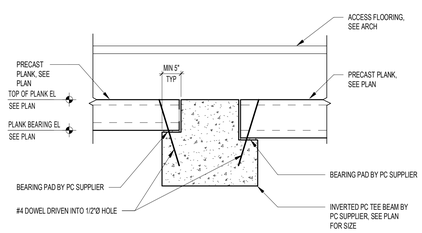
8 S-4.0 SECTION @ EXTERIOR



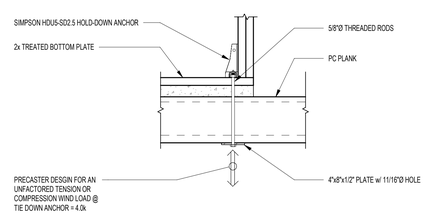
7 S-4.0 SECTION



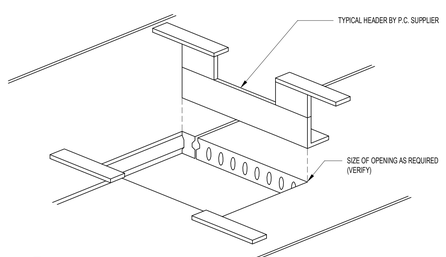
6 S-4.0 SECTION THRU PRECAST BEAM



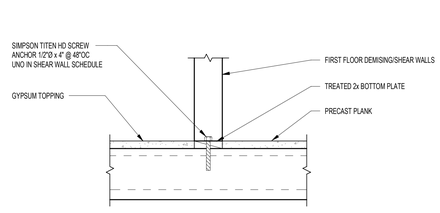
5 S-4.0 SECTION THRU PRECAST BEAM



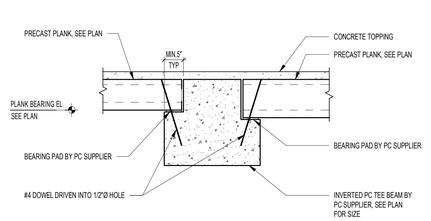
4 S-4.0 HOLD DOWN ANCHOR @ PC PLANK



3 S-4.0 PRECAST PLANK HEADER



2 S-4.0 SECTION



1 S-4.0 SECTION

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KEY PLAN

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CONSULTING STRUCTURAL ENGINEERS
10 West Mifflin St, Suite 205 | Madison, WI 53703
Phone: 608.256.7304 | Fax: 608.256.7306
PE PROJECT 15213

ISSUED

Issued for Bid	September 25, 2015
Revised Bid Set	January 19, 2016
Issued for Plan Review	February 8, 2016
2 CB #1	December 7, 2017
4 Revisions	May 11, 2018

WISCONSIN
RICHARD C. PIERCE
E-22511
WAUKESHA, WI
PROFESSIONAL ENGINEER
5/11/18

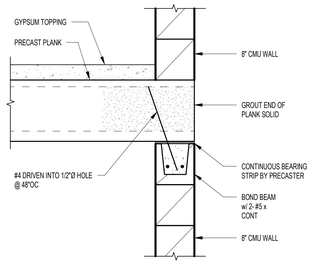
PROJECT TITLE
ROYSTER CROSSINGS LOT 2

521-523 GRAND OAK TRL, MADISON, WI

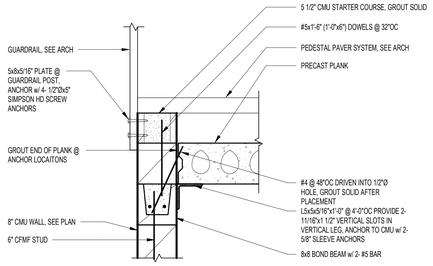
SHEET TITLE
FRAMING DETAILS

SHEET NUMBER
S-4.0

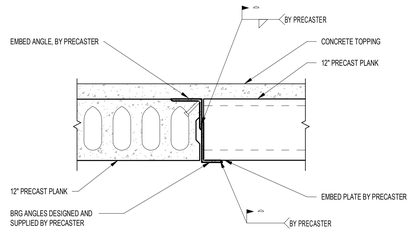
PROJECT NUMBER 1421



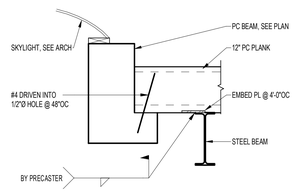
25 SECTION
S-4.1



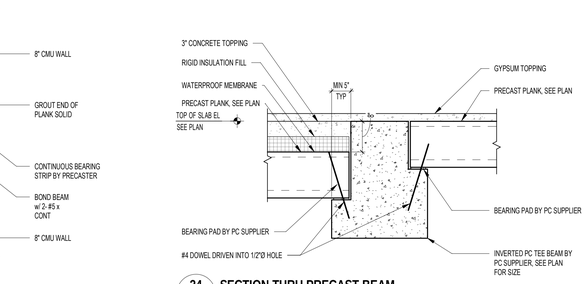
20 DETAIL
S-4.1



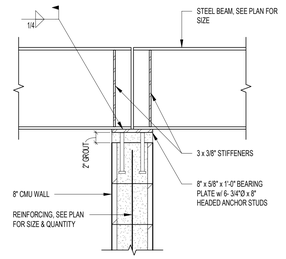
15 PRECAST BEAM BEARING @ CMU WALL
S-4.1



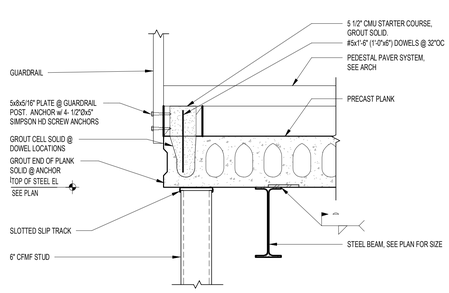
10 SECTION
S-4.1



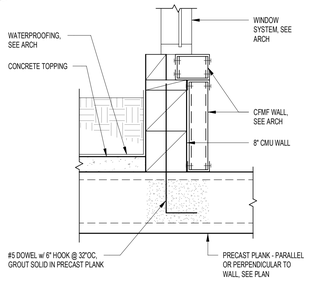
24 SECTION THRU PRECAST BEAM
S-4.1



9 DETAIL
S-4.1



19 SECTION
S-4.1



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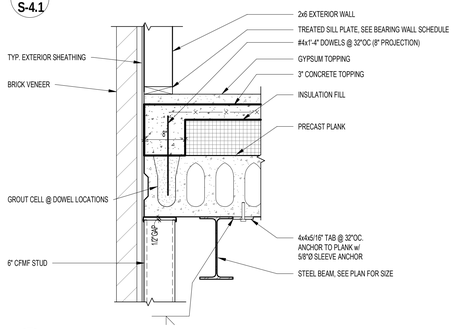
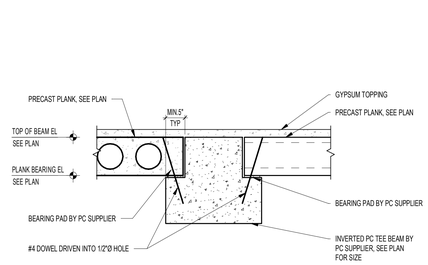


8 DETAIL
S-4.1



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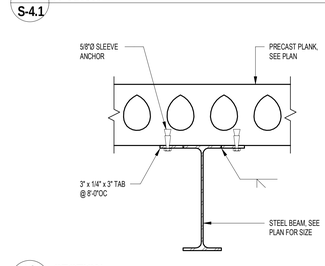

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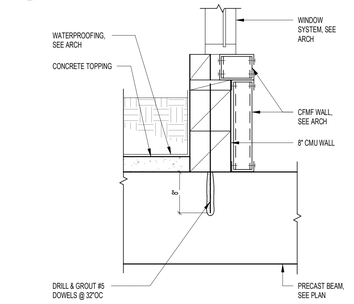

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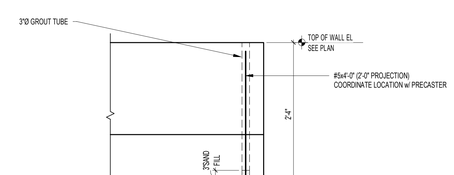
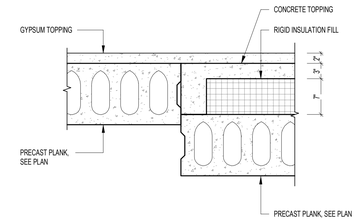
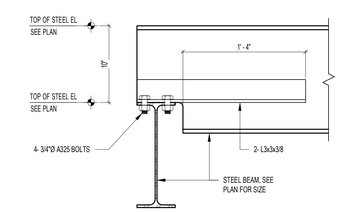
S-4.1



3 PRECAST BEAM BEARING @ CMU WALL
S-4.1



22 SECTION @ PLANK DROP
S-4.1



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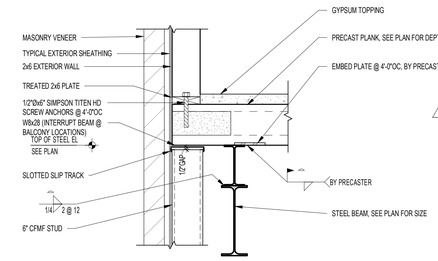

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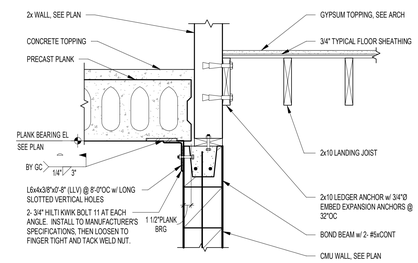

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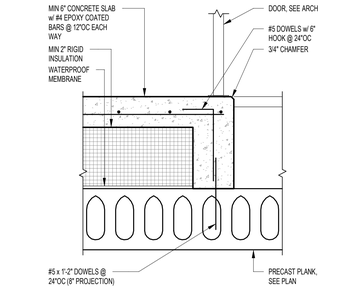

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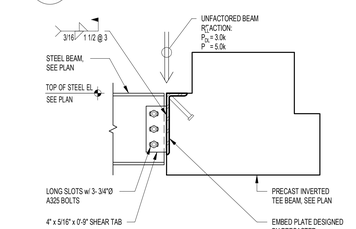

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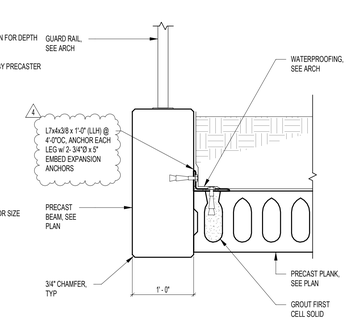

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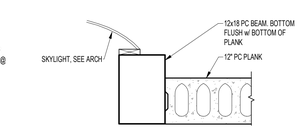
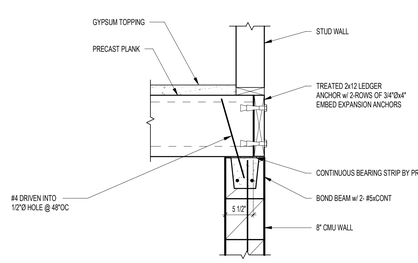
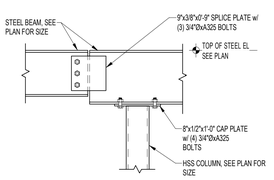
S-4.1



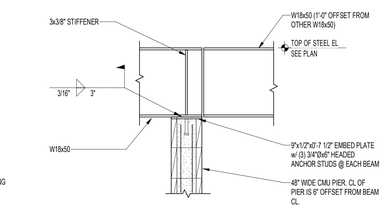
6 SECTION
S-4.1



5 PRECAST BEAM BEARING @ CMU WALL
S-4.1



4 SECTION
S-4.1



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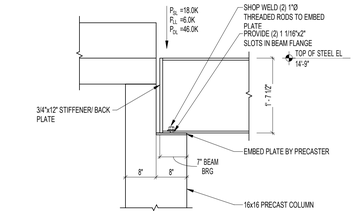

1 SECTION
S-4.1

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KEY PLAN

PIERCE ENGINEERS INC
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10 West Mifflin St, Suite 205 | Madison, WI 53703
Phone: 608.256.7304 | Fax: 608.256.7306
PE PROJECT 15213

ISSUED

Issued for Bid	September 25, 2015
Revised Bid Set	January 19, 2016
Issued for Plan Review	February 8, 2016
1. Implemented City's LOI Clarifications	August 7, 2017
2. CB #1	December 7, 2017
4. Revisions	May 11, 2018

WISCONSIN RICHARD C. PIERCE E-22511 WAUKESHA, WI PROFESSIONAL ENGINEER 11/2/18

PROJECT TITLE
ROYSTER CROSSINGS LOT 2

521-523 GRAND OAK TRL, MADISON, WI

SHEET TITLE
FRAMING DETAILS

SHEET NUMBER
S-4.1

PROJECT NUMBER 1421

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PE PROJECT 15213

ISSUED

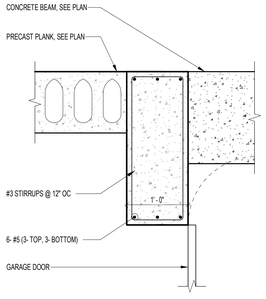
2	CB #1	December 7, 2017
3	Revision To Prevously Approved Plan	January 12, 2018
4	Revisions	May 11, 2018

4 8 SECTION S-4.2

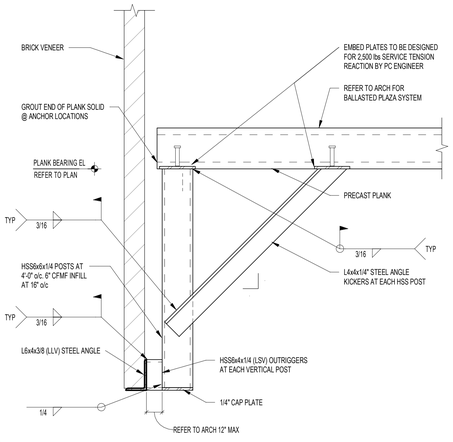
4 7 PRECAST BEARING @ STAIR S-4.2

4 6 CONCRETE WALL OPENING D S-4.2

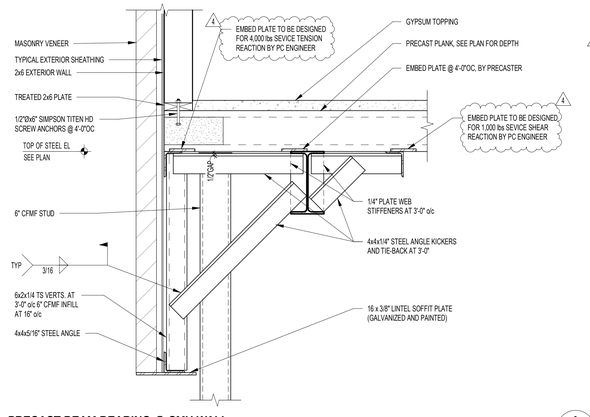
4 5 PIER DETAIL S-4.2



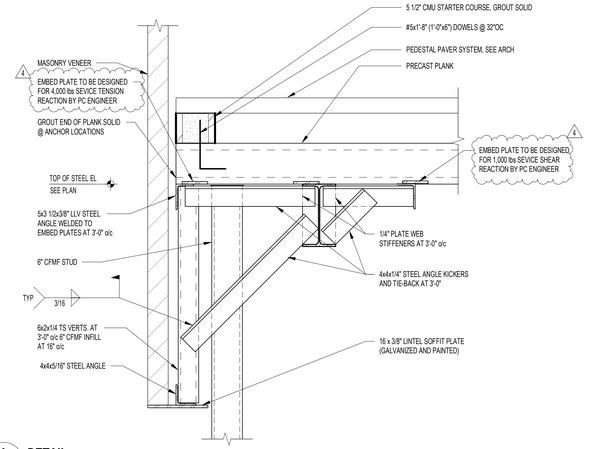
4 4 GARAGE HEADER S-4.2



4 3 SECOND FLOOR BRICK SUPPORT S-4.2



4 2 PRECAST BEAM BEARING @ CMU WALL S-4.2



4 1 DETAIL S-4.2

PROJECT TITLE
ROYSTER CROSSINGS LOT 2

521-523 GRAND OAK TRL, MADISON, WI

SHEET TITLE
FRAMING DETAILS

SHEET NUMBER
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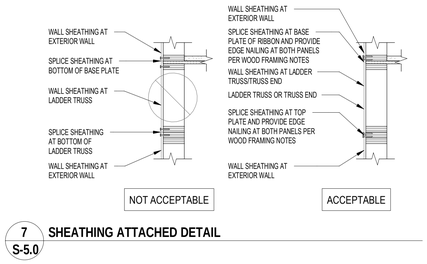
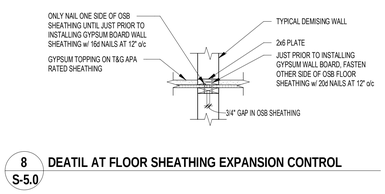
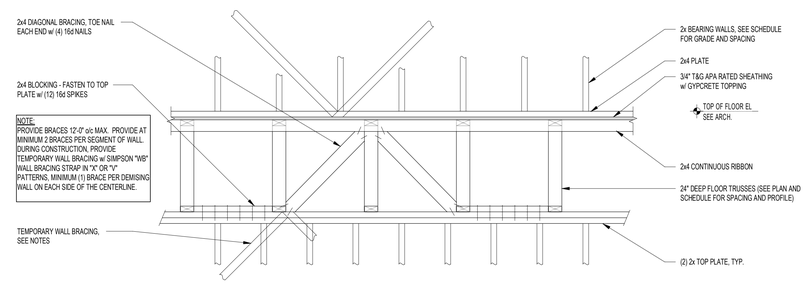


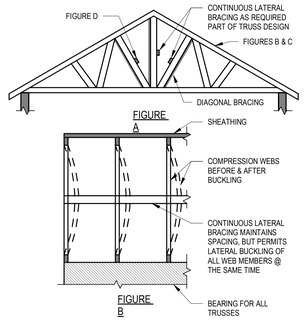
7 S-5.0 **SHEATHING ATTACHED DETAIL**



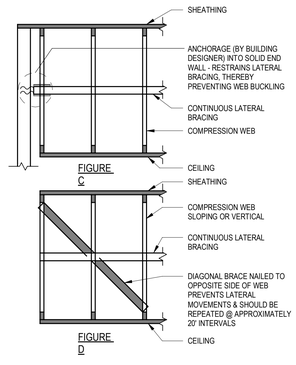
8 S-5.0 **DEATIL AT FLOOR SHEATHING EXPANSION CONTROL**

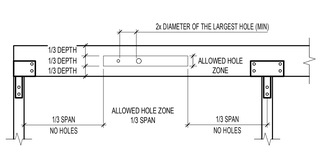


6 S-5.0 **BRACING AT CORRIDOR AND EXTERIOR WALLS**



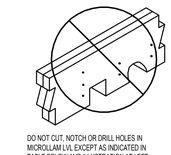
5 S-5.0 **BRACING DETAILS**





NOTES:
1. THE ALLOWED HOLE ZONE IS SUITABLE ONLY FOR UNIFORMLY LOADED BEAMS USING MAXIMUM LOADS FOR ANY TABLES LISTED IN THIS BROCHURE. FOR OTHER LOAD CONDITIONS OR HOLE CONFIGURATIONS, PLEASE CONTACT YOUR TRUSS JOIST MACMILLAN REPRESENTATIVE.
2. RECTANGULAR HOLES ARE NOT ALLOWED.
3. HOLES IN CANTILEVERS REQUIRE ADDITIONAL ANALYSIS.
4. IF LARGER HOLES ARE REQUIRED CONTACT STRUCTURAL ENGINEER FOR EVALUATION.

4 S-5.0 **ALLOWABLE HOLES IN LVL & PARALLAM BEAMS**



DO NOT CUT, NOTCH OR DRILL HOLES IN MICROLLAM LVL EXCEPT AS INDICATED IN TABLE BELOW AND ILLUSTRATION AT LEFT.

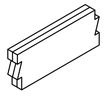
BEAM DEPTH	MAXIMUM ROUND HOLE SIZE
5 1/2"	1 3/4"
7 1/4" TO 18"	2"

1 3/4" WIDTH PIECES:
1. MINIMUM OF 2 ROWS 12d (3 1/4") COMMON NAILS AT 12" o/c.
2. MINIMUM OF 3 ROWS 12d (3 1/4") COMMON NAILS AT 12" o/c FOR 14", 16", 18", AND 20" BEAMS.
3. NAILED CONNECTIONS REQUIRE AN ADDITIONAL ROW OF NAILS WHEN NAIL SIZE IS SMALLER THAN SPECIFIED ABOVE (MINIMUM 0.125"x3").
4. LOAD MUST BE APPLIED EVENLY ACROSS ENTIRE BEAM WIDTH. OTHERWISE, USE CONNECTIONS FOR SIDE-LOADED BEAMS.

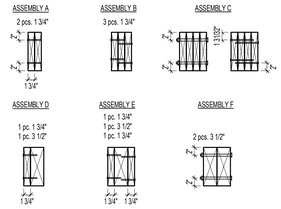
3 1/2" WIDTH PIECES:
1. MINIMUM OF (2) ROWS "I" BOLTS AT 24" o/c, STAGGERED.

   FOR ALL OTHER TWO PIECE, CONTINUOUS HEADERS, PROVIDE 16d COMMON NAILS AT 16" o/c ALONG EACH EDGE, UNLESS NOTED OTHERWISE.

NOTE:
1. MULTIPLE PIECES OF MICROLLAM LVL OR TIMBERSTRAND LSL CAN BE NAILED OR BOLTED TOGETHER TO FORM A HEADER OR BEAM OF THE REQUIRED SIZE, UP TO A MAXIMUM WIDTH OF 7".



3 S-5.0 **MULTIPLE-MEMBER CONN. FOR TOP-LOADED BEAMS**



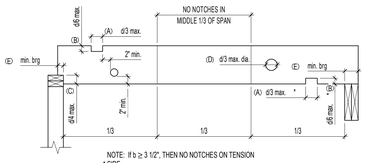
NOTE:
1. 7" WIDE BEAMS SHOULD ONLY BE SIDE-LOADED WHEN LOADS ARE APPLIED TO BOTH SIDES OF THE MEMBERS (TO MINIMIZE ROTATION)

2 S-5.0 **MULTIPLE-MEMBER CONNECTIONS FOR SIDE-LOADED BEAMS**

MAXIMUM UNIFORM LOAD APPLIED TO EITHER OUTSIDE MEMBER (PLF)

MULTIPLE ASSEMBLY	NAILED CONNECTION (1), (2)		THROUGH-BOLTED CONNECTION (3)		STRUCTURAL WOOD SCREW CONNECTION (4)	
	2 ROWS 12d (0.148"x3.25") COMMON WIRE AT 12" o/c	3 ROWS 12d (0.148"x3.25") COMMON WIRE AT 12" o/c	2 ROWS 1/2" BOLTS AT 24" o/c	2 ROWS 1/2" BOLTS AT 12" o/c	2 ROWS 1/4" x 3 1/2" SCREW AT 24" o/c	2 ROWS 1/4" x 3 1/2" SCREW AT 12" o/c
A	470	705	505	1015	500	995
B	355	530	380	760	375	745
C			340	680	330 (5)	665 (5)
D	355	530	520	1045	375	745
E	315	470	465	930	330	665
F			860	1720		

NOTES:
1. NAILED CONNECTION VALUES MAY BE DOUBLED FOR 6" ON-CENTER OR TRIPLED FOR 4" o/c NAIL SPACING.
2. NAILED CONNECTION VALUES REQUIRE AN ADDITIONAL ROW OF NAILS WHEN NAIL SIZE IS SMALLER THAN SPECIFIED ABOVE (MINIMUM 0.128"x3").
3. A307 BOLTS WITH WASHERS REQUIRED. BOLT HOLES TO BE 9/16" MAXIMUM.
4. SCREWS MUST HAVE SELF-DRILLING TIP AND MINIMUM BENDING YIELD STRENGTH OF 217,000 psi. LEAD HOLES MAY BE REQUIRED BY LOCAL BUILDING OFFICIAL.



NOTE: If b ≥ 3 1/2", THEN NO NOTCHES ON TENSION
* SIDE EXCEPT AT ENDS. b = MEMBER THICKNESS.

1 S-5.0 **JOIST HOLES & NOTCHES**

JOIST SIZE	(A) MAXIMUM NOTCH LENGTH	(B) MAXIMUM NOTCH DEPTH	(C) MAXIMUM END NOTCH DEPTH	(D) MAXIMUM HOLE DEPTH	(E) MINIMUM BEARING LENGTH (1)	
2x6	1-13/16"	7/8"	1-3/8"	1-13/16"	1-1/2"	3"
2x8	2-3/8"	1-3/16"	1-13/16"	2-3/8"	1-1/2"	3"
2x10	3-1/16"	1-1/2"	2-5/16"	3-1/16"	1-1/2"	3"
2x12	3-3/4"	1-7/8"	2-13/16"	3-3/4"	1-1/2"	3"

NOTE:
1. MINIMUM BEARING: 1-1/2" ON WOOD OR STEEL; 3" BEARING ON MASONRY.

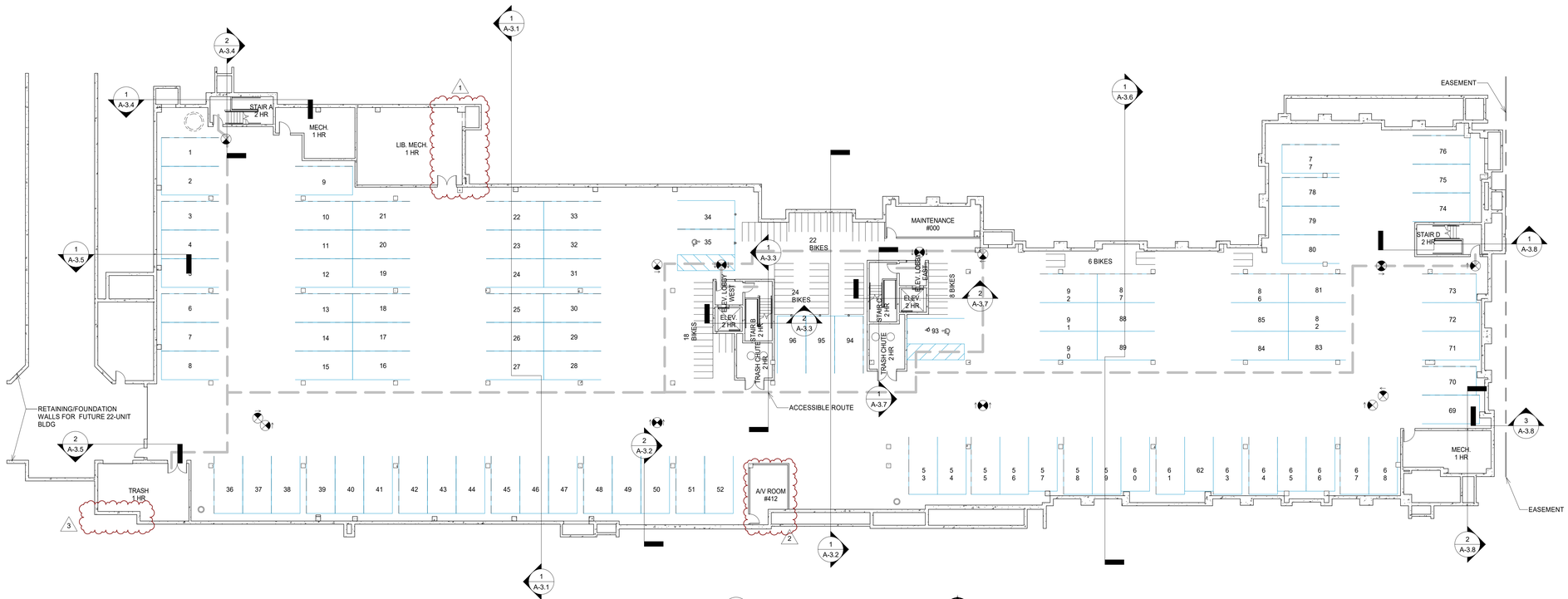
PROJECT TITLE
ROYSTER CROSSINGS LOT 2

521-523 GRAND OAK TRL, MADISON, WI

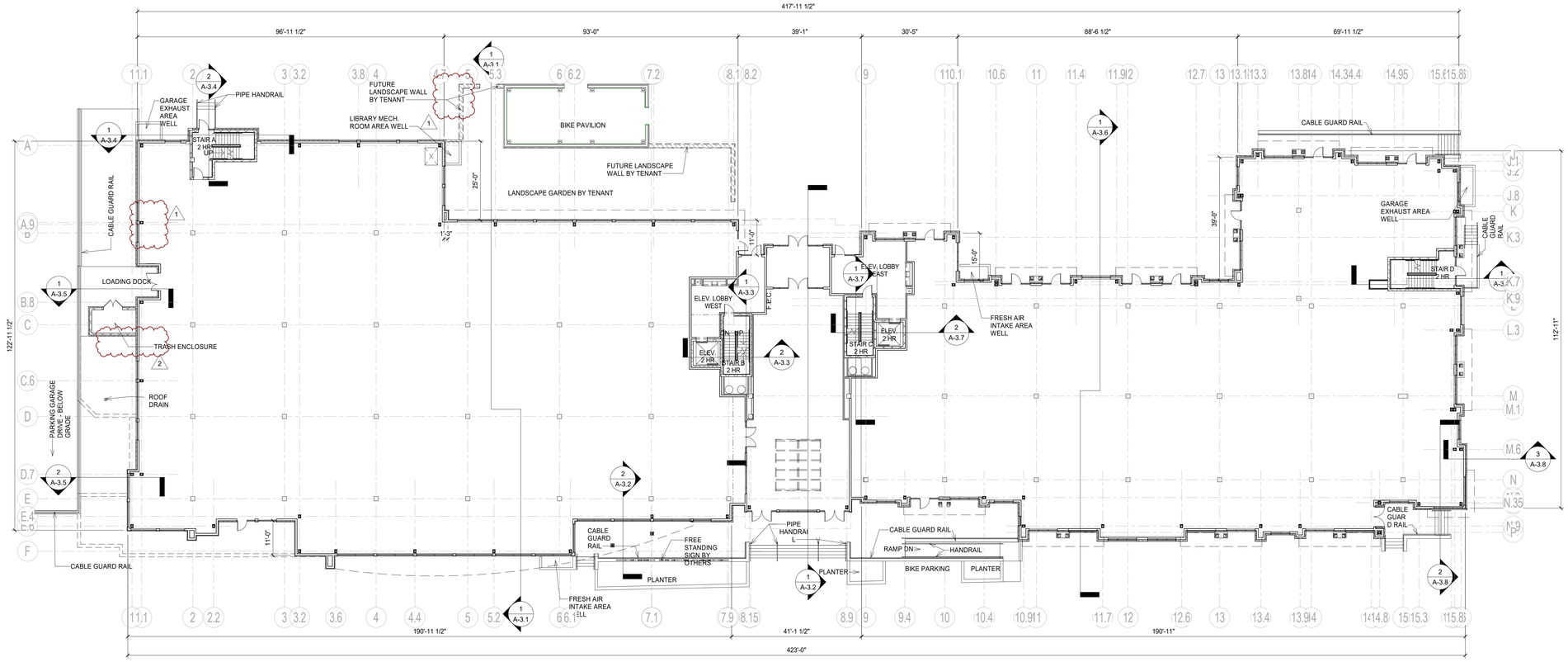
SHEET TITLE
FRAMING DETAILS

SHEET NUMBER
S-5.0

PROJECT NUMBER 1421



1 Basement Floor Plan
A-1.0 1/16" = 1'-0"



2 First Floor Plan
A-1.0 1/16" = 1'-0"

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KEY PLAN

ISSUED
Issued for Bid: September 25, 2015
Revised Bid Set: January 19, 2016
Issued for Plan Review - February 8, 2016
Revision to Previously Approved Plan - January 12, 2018
Revised Set - May 23, 2018

3	Revised -	May 18, 2018
2	Revised -	November 18, 2015
1	Implemented City's LCI Clarifications -	August 7, 2017

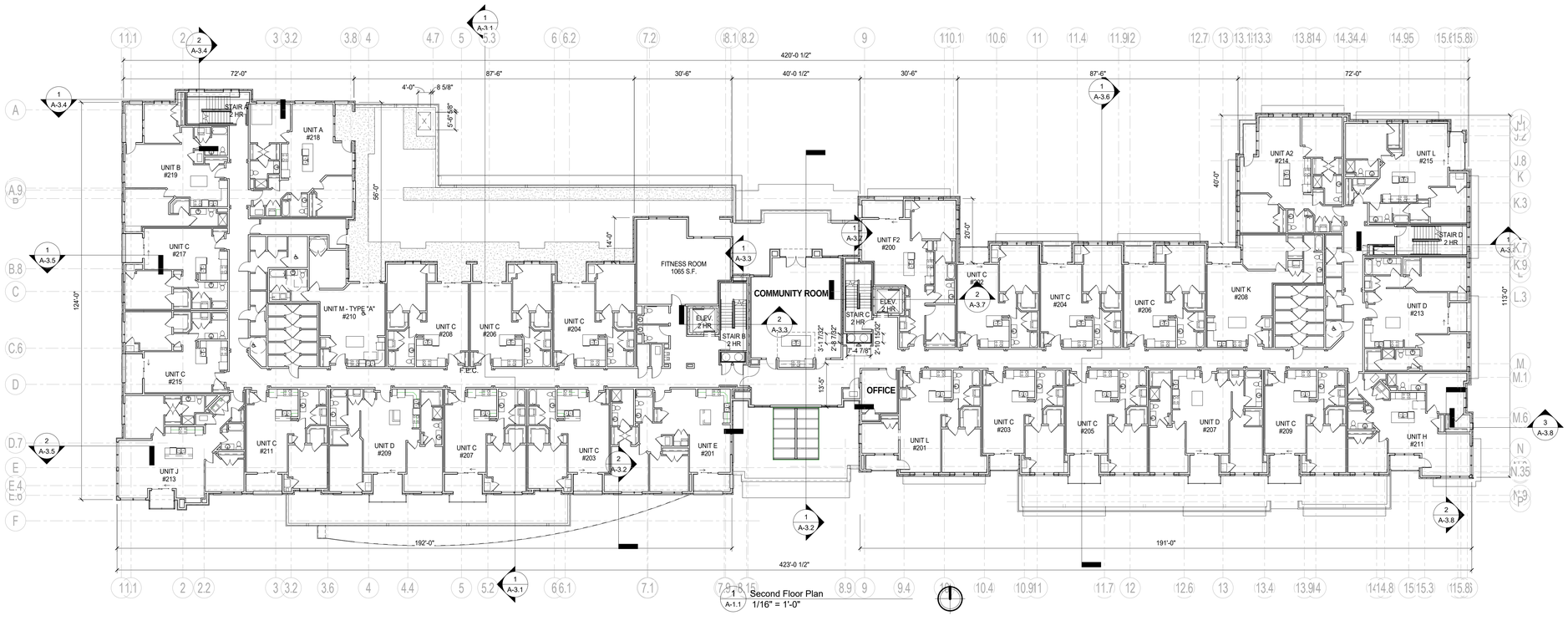
PROJECT TITLE
ROYSTER CROSSINGS

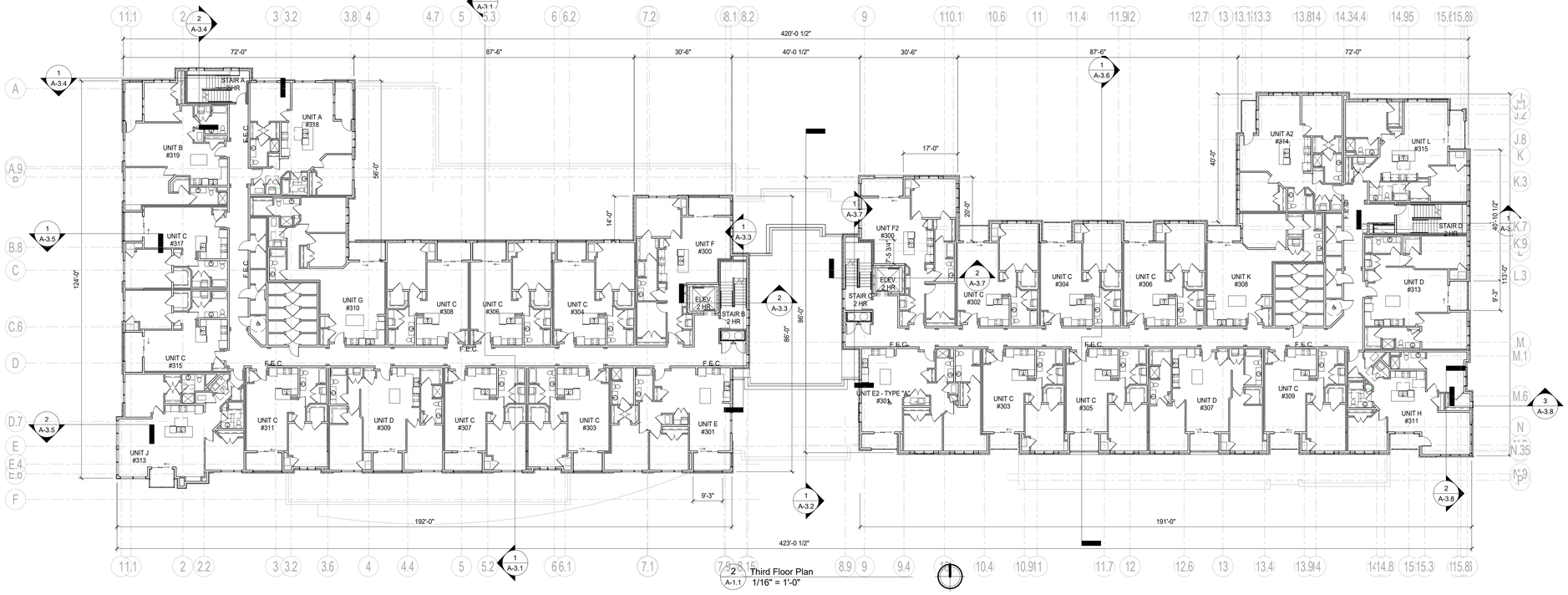
521-523 Grand Oak Trail MADISON, WI

SHEET TITLE
Overall Floor Plans

SHEET NUMBER
A-1.0

PROJECT NUMBER 1421





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PROJECT TITLE
ROYSTER CROSSINGS

521-523 Grand Oak Trail MADISON, WI

SHEET TITLE
Overall Floor Plans

SHEET NUMBER
A-1.1

PROJECT NUMBER 1421

1 A-1.2 Fourth Floor Plan
1/16" = 1'-0"

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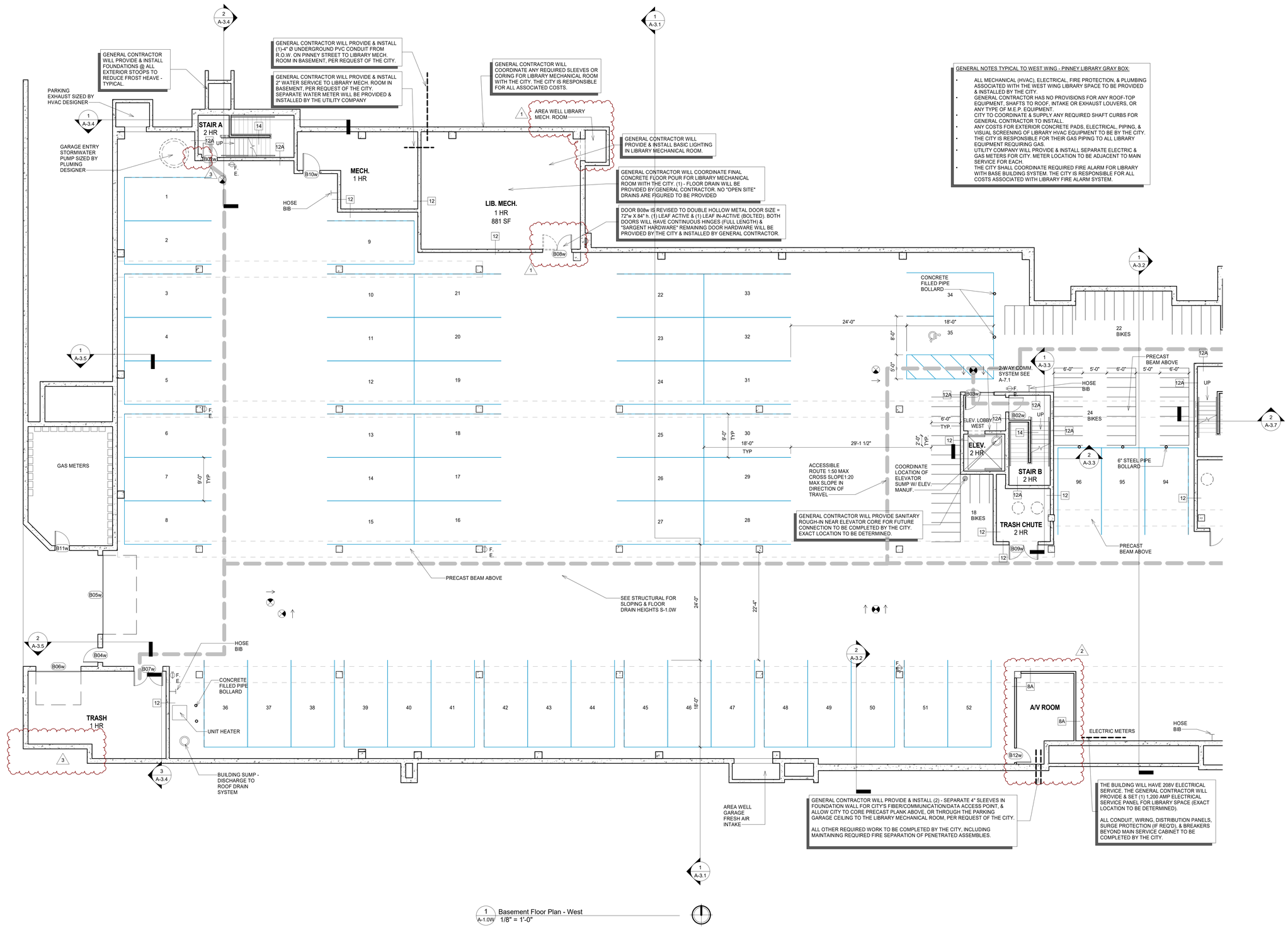
PROJECT TITLE
ROYSTER CROSSINGS

521-523 Grand Oak Trail MADISON, WI

SHEET TITLE
Overall Floor Plan

SHEET NUMBER
A-1.2

PROJECT NUMBER 1421



1 A-1.0W Basement Floor Plan - West
1/8" = 1'-0"

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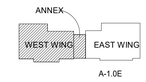
KEY PLAN



ISSUED
Issued for Bid. September 25, 2015
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Revised Set - May 23, 2018

3	Revised -	May 18, 2018
2	Revised -	November 18, 2015
1	Implemented City's LCI Clarifications -	August 7, 2017

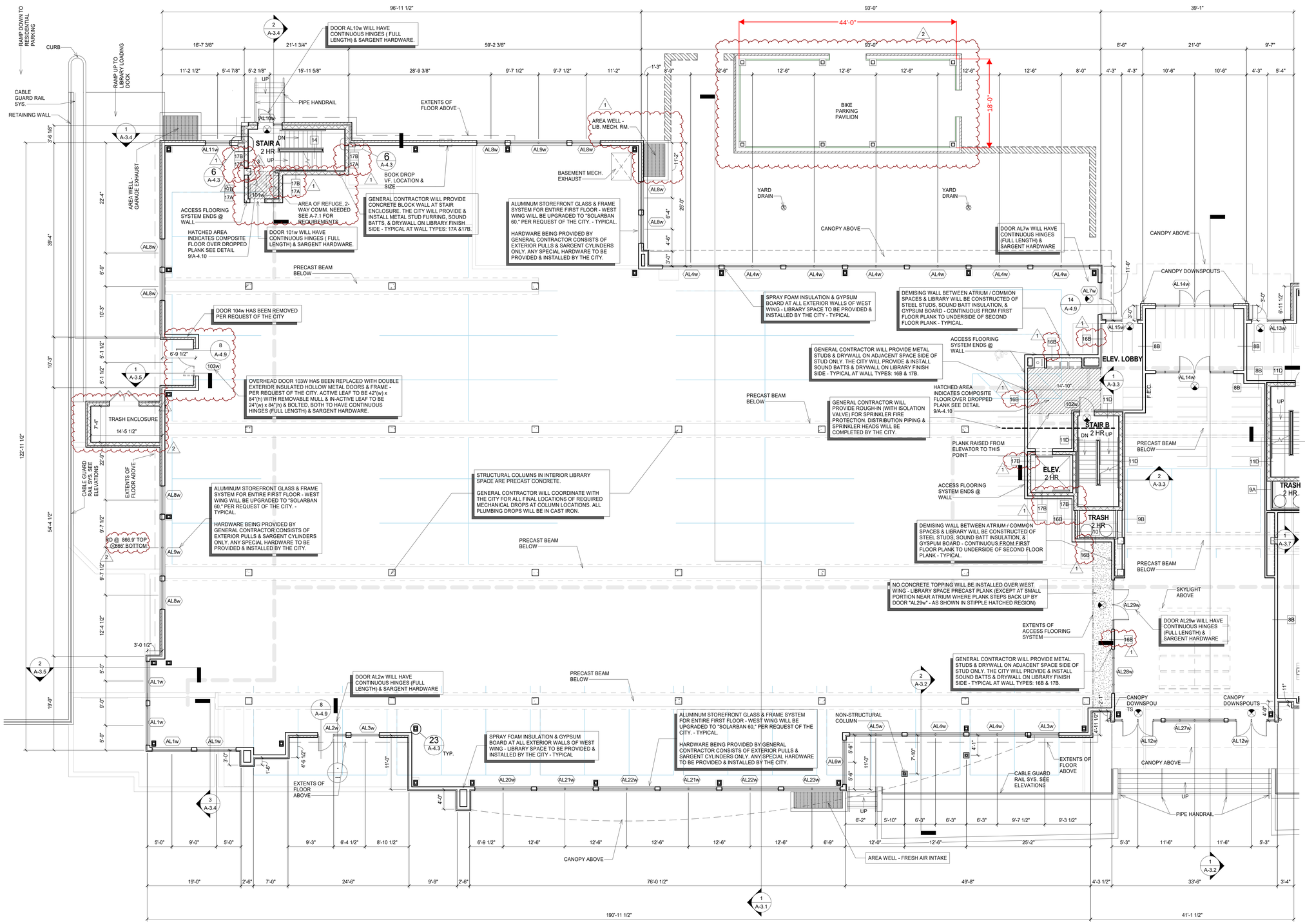
PROJECT TITLE
ROYSTER CROSSINGS

521-523 Grand Oak Trail MADISON, WI

SHEET TITLE
Basement Floor Plan-West

SHEET NUMBER
A-1.0W

PROJECT NUMBER 1421



1 A-1.1W First Floor Plan - West
1/8" = 1'-0"

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3	Revised -	May 18, 2018
2	Revised -	November 18, 2015
1	Implemented City's LOI Clarifications -	August 7, 2017

PROJECT TITLE
ROYSTER CROSSINGS

521-523 Grand Oak Trail MADISON, WI

SHEET TITLE
First Floor Plan-West

SHEET NUMBER
A-1.1W

PROJECT NUMBER 1421

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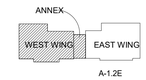

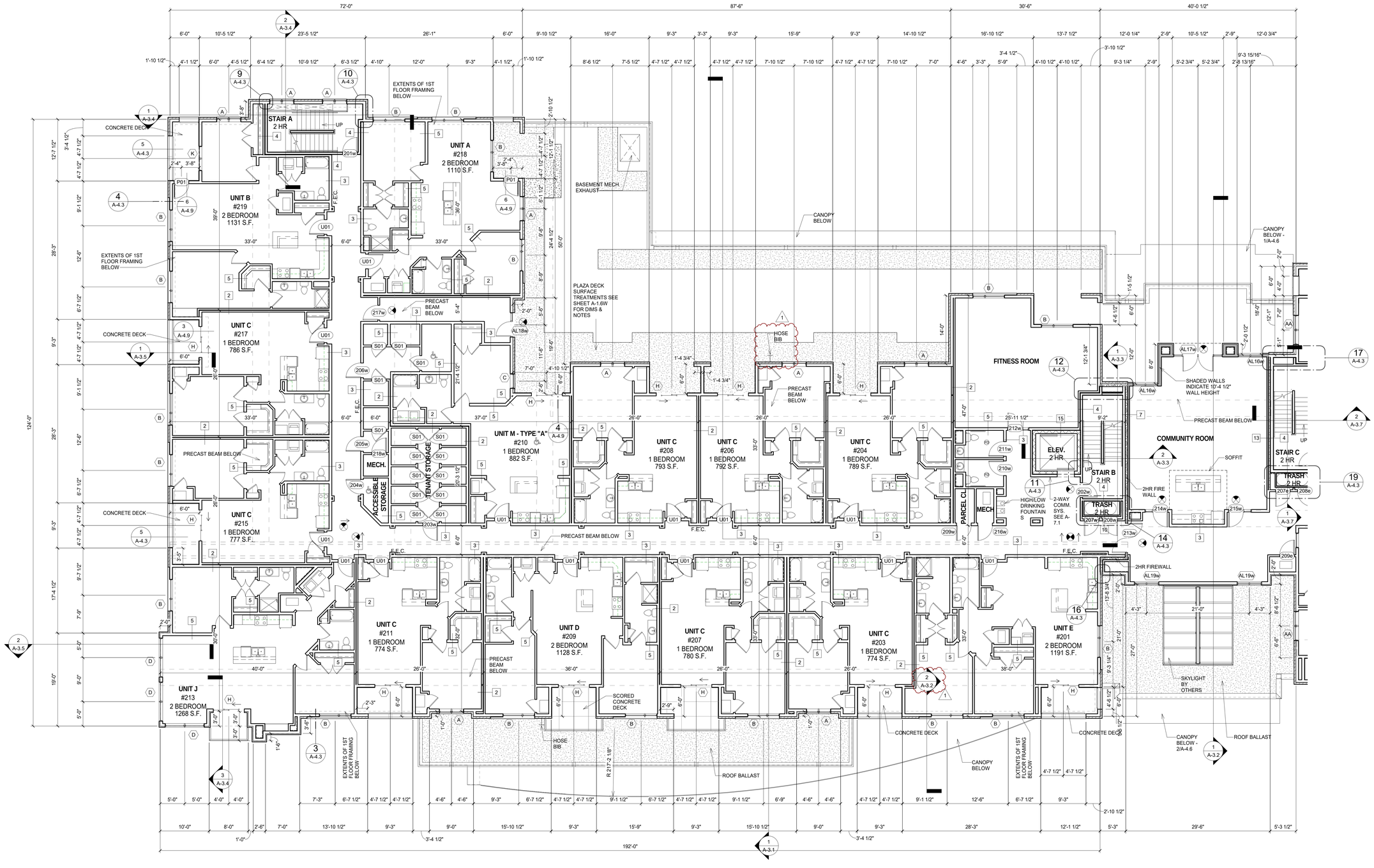

1 A-1.2W Second Floor Plan - West
1/8" = 1'-0"

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1 | Revised - November 18, 2015

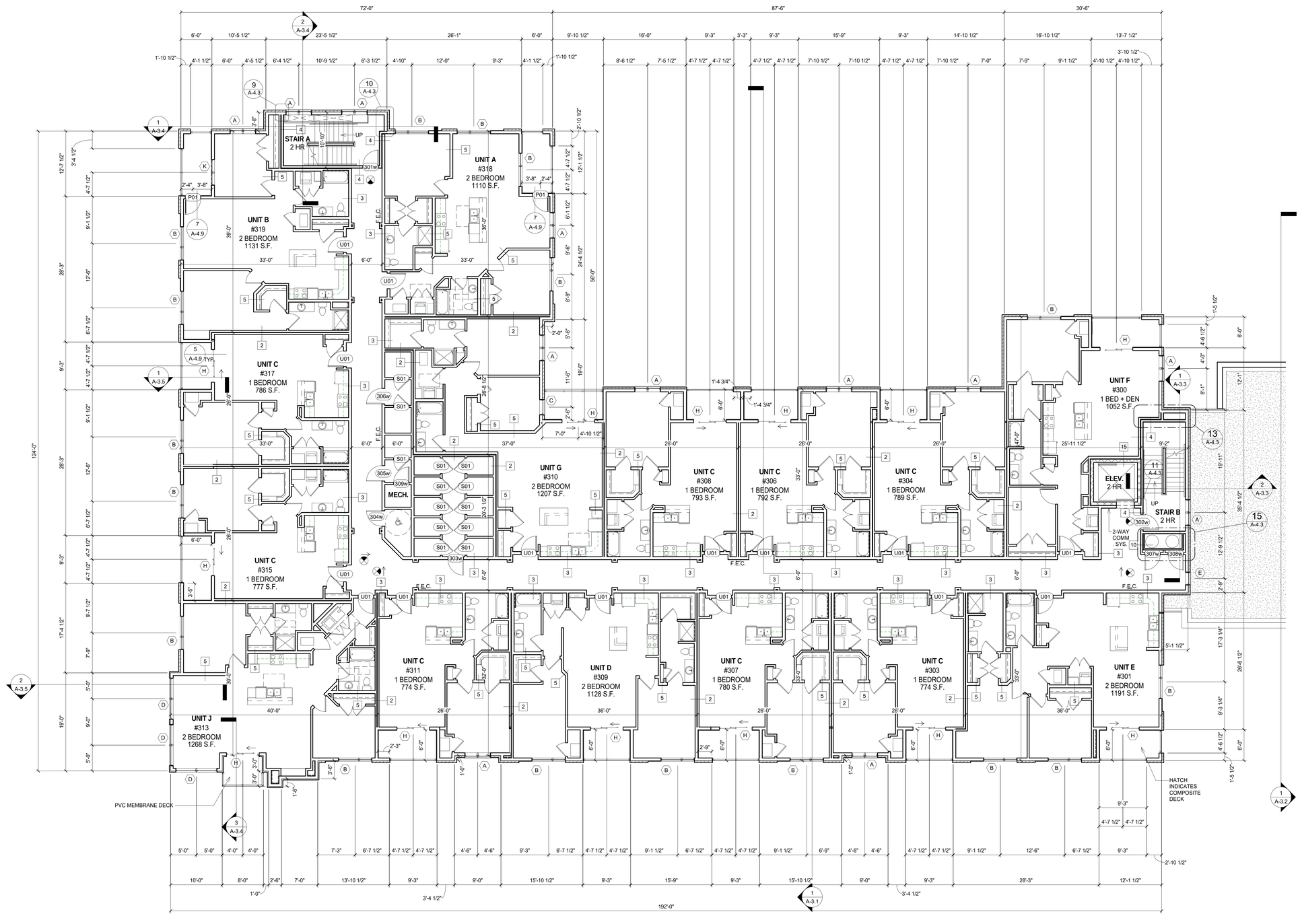
PROJECT TITLE
ROYSTER CROSSINGS

521-523 Grand Oak Trail MADISON, WI

SHEET TITLE
Second Floor Plan-West

SHEET NUMBER
A-1.2W

PROJECT NUMBER 1421



5 A-1.3W Third Floor Plan - West
1/8" = 1'-0"

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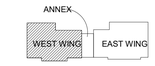

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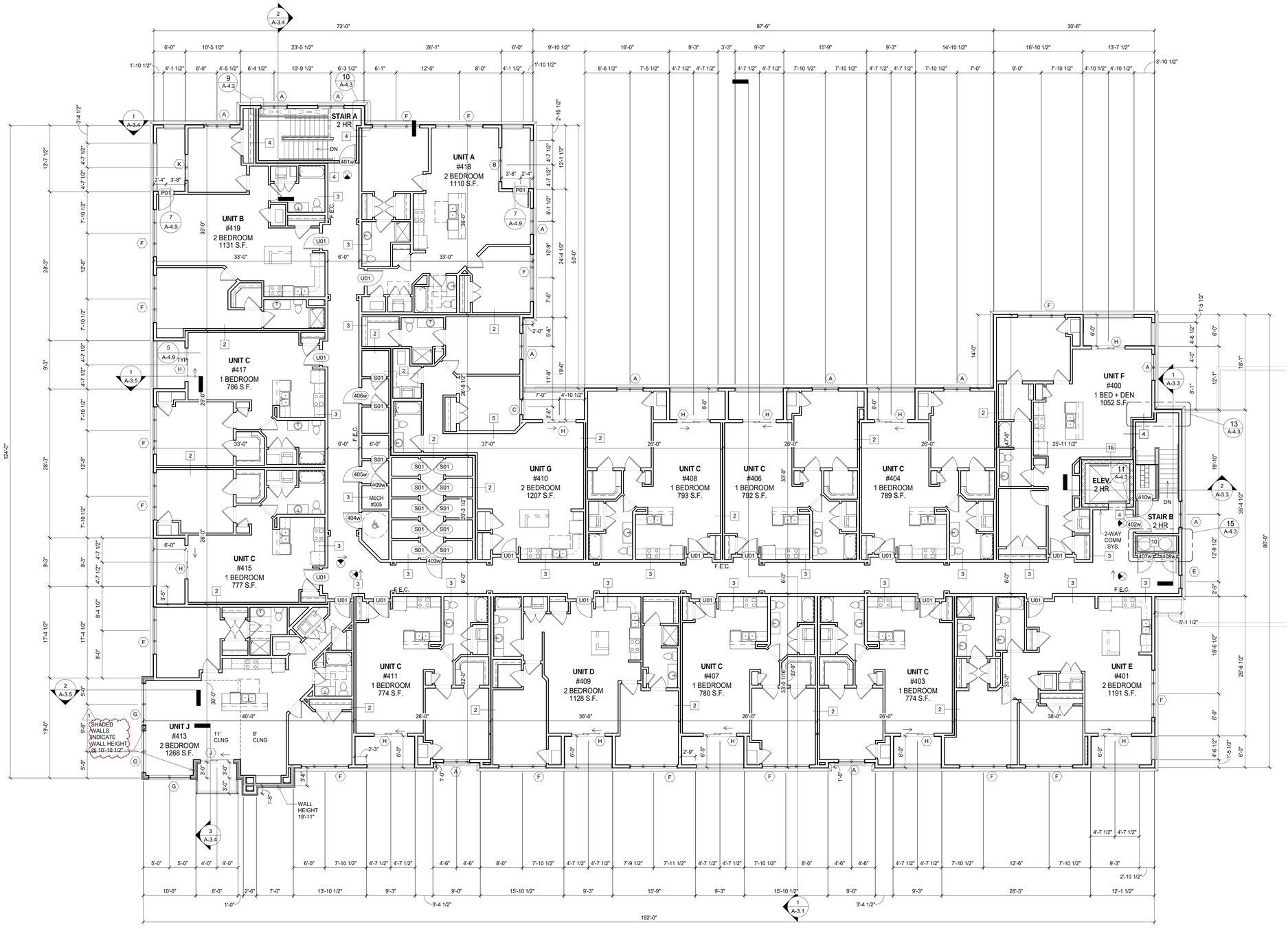
PROJECT TITLE
ROYSTER CROSSINGS

521-523 Grand Oak Trail MADISON, WI

SHEET TITLE
Third Floor Plan-West

SHEET NUMBER
A-1.3W

PROJECT NUMBER 1421



1 A-1.4W Fourth Floor Plan - West
1/8" = 1'-0"

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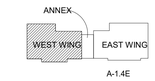
KEY PLAN



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1 | Revised - November 18, 2015

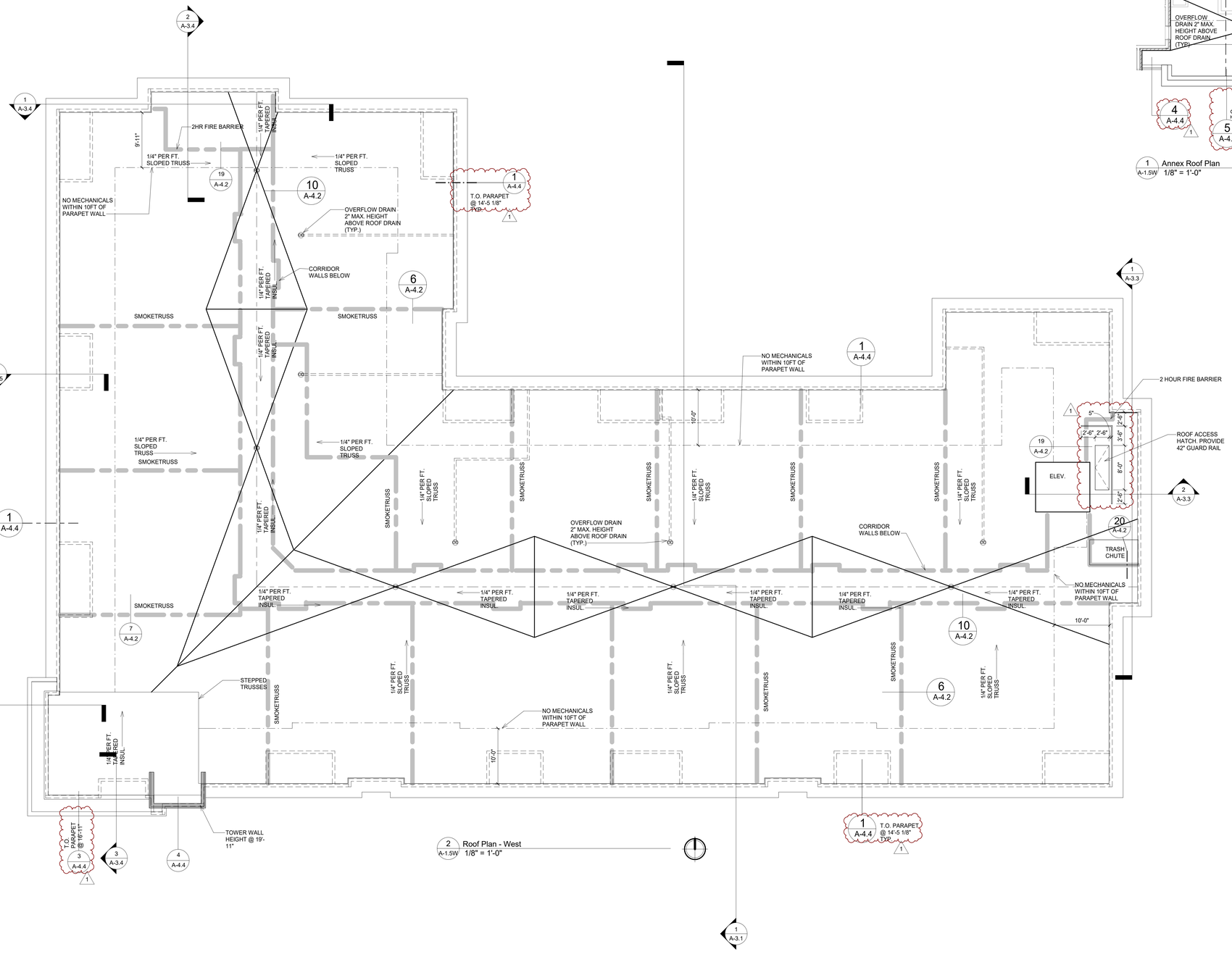
PROJECT TITLE
ROYSTER CROSSINGS

521-523 Grand Oak Trail MADISON, WI

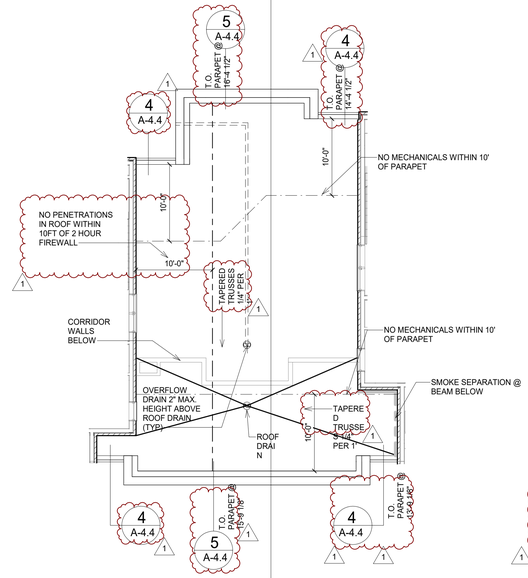
SHEET TITLE
Fourth Floor Plan-West

SHEET NUMBER
A-1.4W

PROJECT NUMBER 1421



2 A-1.5W Roof Plan - West
1/8" = 1'-0"



1 A-1.5W Annex Roof Plan
1/8" = 1'-0"

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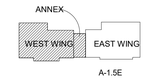
KEY PLAN



GENERAL NOTES:

1. HVAC CONTRACTOR TO PROVIDE TRUSS DESIGNER WITH LOCATION AND LOADING INFORMATION FOR ALL ROOF TOP MECHANICAL EQUIPMENT.
2. ROOFER SHALL SUBMIT TAPERED INSULATION (SADDLE / CRICKET) PLAN FOR REVIEW PRIOR TO INSTALLATION.
3. NO MECHANICAL EQUIPMENT TO BE LOCATED WITHIN 10'-0" OF ROOF EDGE.
4. TOP OF PARAPET HEIGHTS ARE DETERMINED FROM THE TOP OF FLOOR DECK BELOW.
5. ALL HORIZ. ROOF DRAIN PIPING NEEDS TO BE WRAPPED IN INSULATION IN ROOF TRUSS SPACE.
6. ALL DRAIN/WASTE/VENT PIPING RUNNING THROUGH/IN THE LIBRARY ENCLOSURE IS TO BE CAST IRON.

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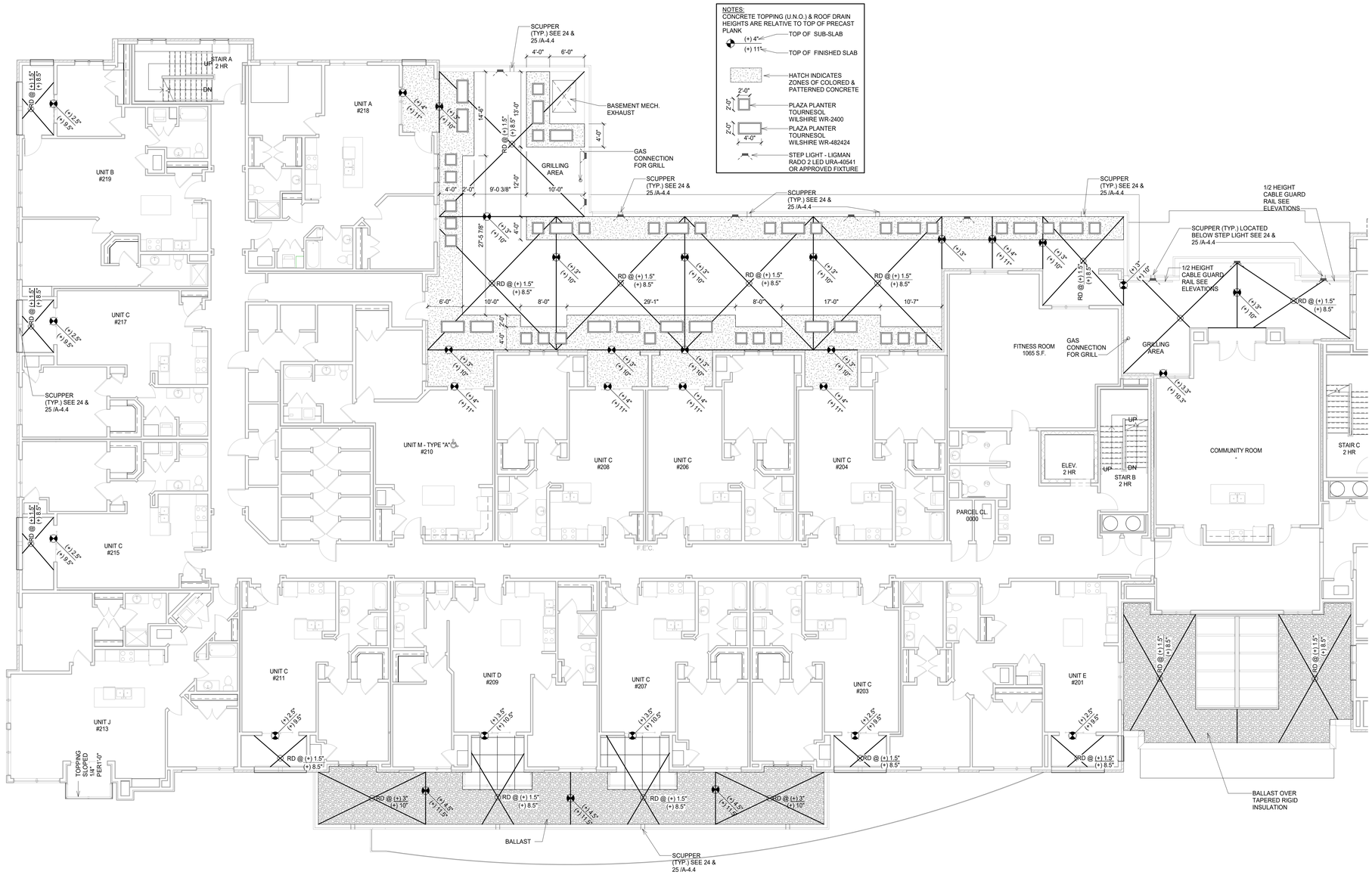
PROJECT TITLE
ROYSTER CROSSINGS

521-523 Grand Oak Trail MADISON, WI

SHEET TITLE
Roof Plan-West & Annex

SHEET NUMBER
A-1.5W

PROJECT NUMBER 1421



1 A-1.6W Second Floor Plaza Plan - West
1/8" = 1'-0"

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KEY PLAN

A-1.6E

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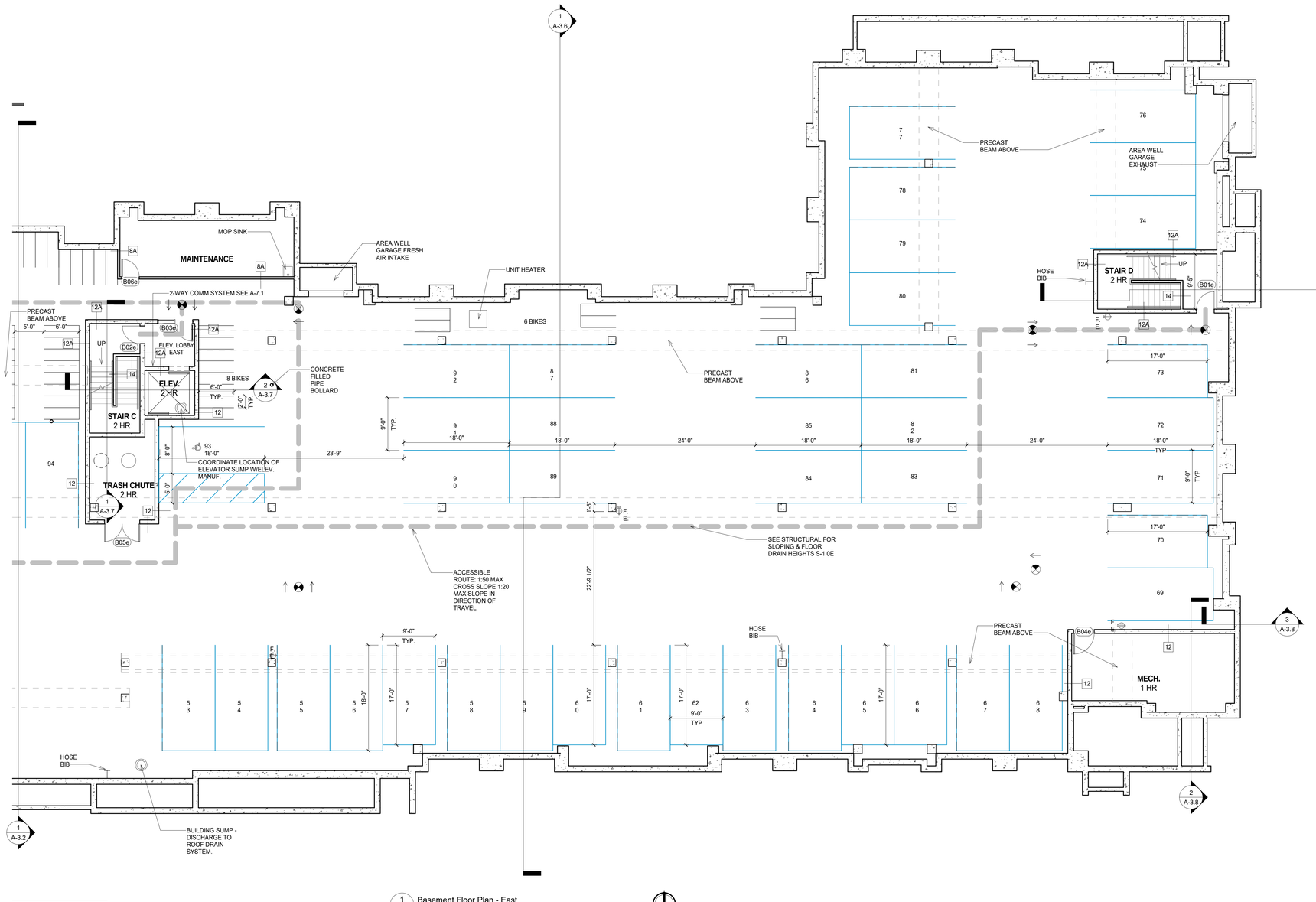
PROJECT TITLE
ROYSTER CROSSINGS

521-523 Grand Oak Trail MADISON, WI

SHEET TITLE
Second Floor Plaza Plan - West

SHEET NUMBER
A-1.6W

PROJECT NUMBER 1421



1 A-1.0E Basement Floor Plan - East
1/8" = 1'-0"

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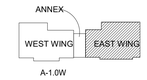

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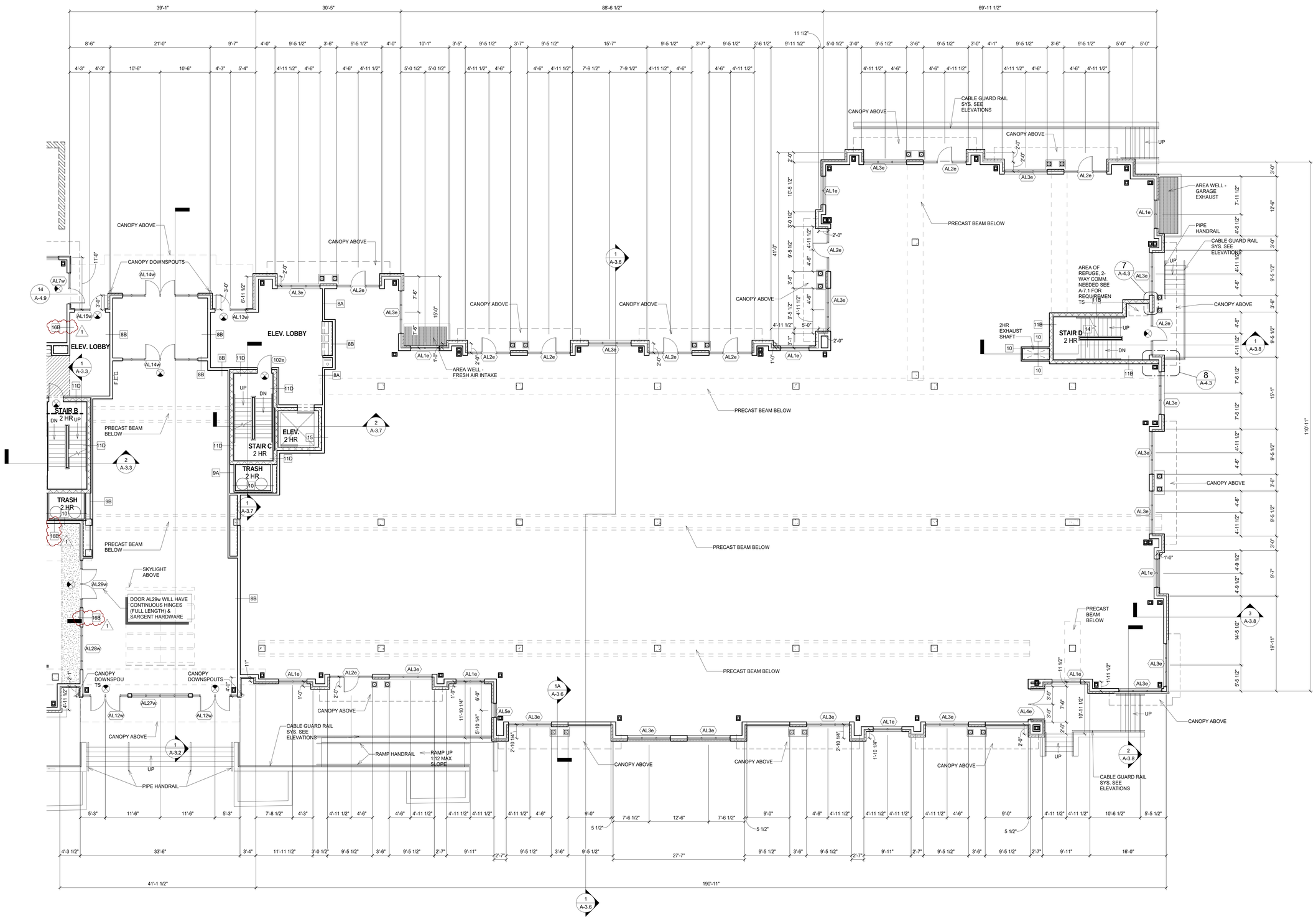
PROJECT TITLE
ROYSTER CROSSINGS

521-523 Grand Oak Trail MADISON, WI

SHEET TITLE
Basement Floor Plan-East

SHEET NUMBER
A-1.0E

PROJECT NUMBER 1421



1 A-1.1E First Floor Plan - East
1/8" = 1'-0"

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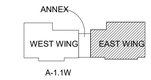

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1 Implemented City's LOI Clarifications - August 7, 2017

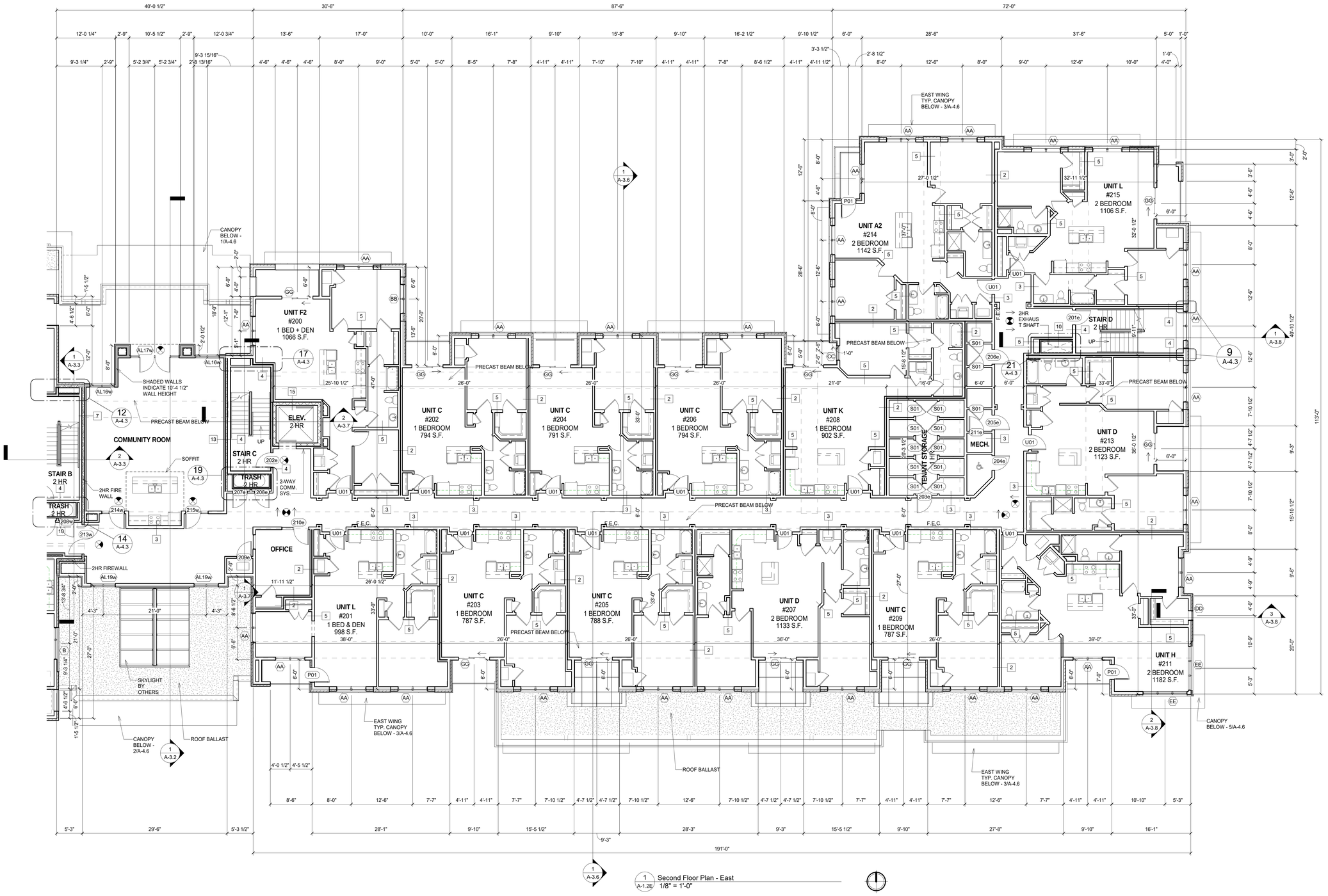
PROJECT TITLE
ROYSTER CROSSINGS

521-523 Grand Oak Trail MADISON, WI

SHEET TITLE
First Floor Plan-East

SHEET NUMBER
A-1.1E

PROJECT NUMBER 1421



1 A-3.6 Second Floor Plan - East
A-1.2E 1/8" = 1'-0"

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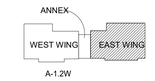
KEY PLAN



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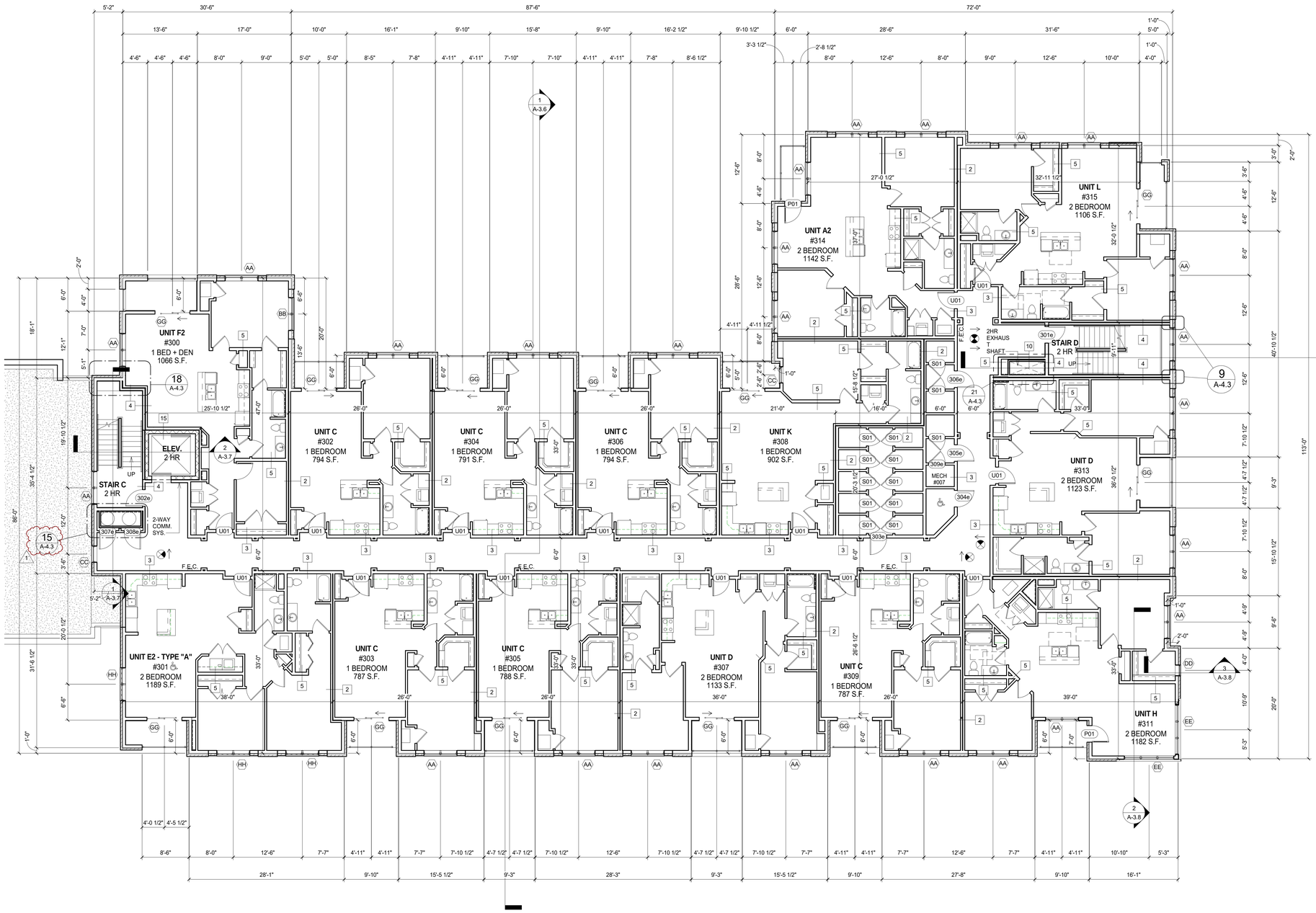
PROJECT TITLE
ROYSTER
CROSSINGS

521-523 Grand Oak
Trail MADISON, WI

SHEET TITLE
Second
Floor
Plan-East

SHEET NUMBER
A-1.2E

PROJECT NUMBER 1421



1 A-1.3E Third Floor Plan - East
1/8" = 1'-0"

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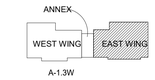

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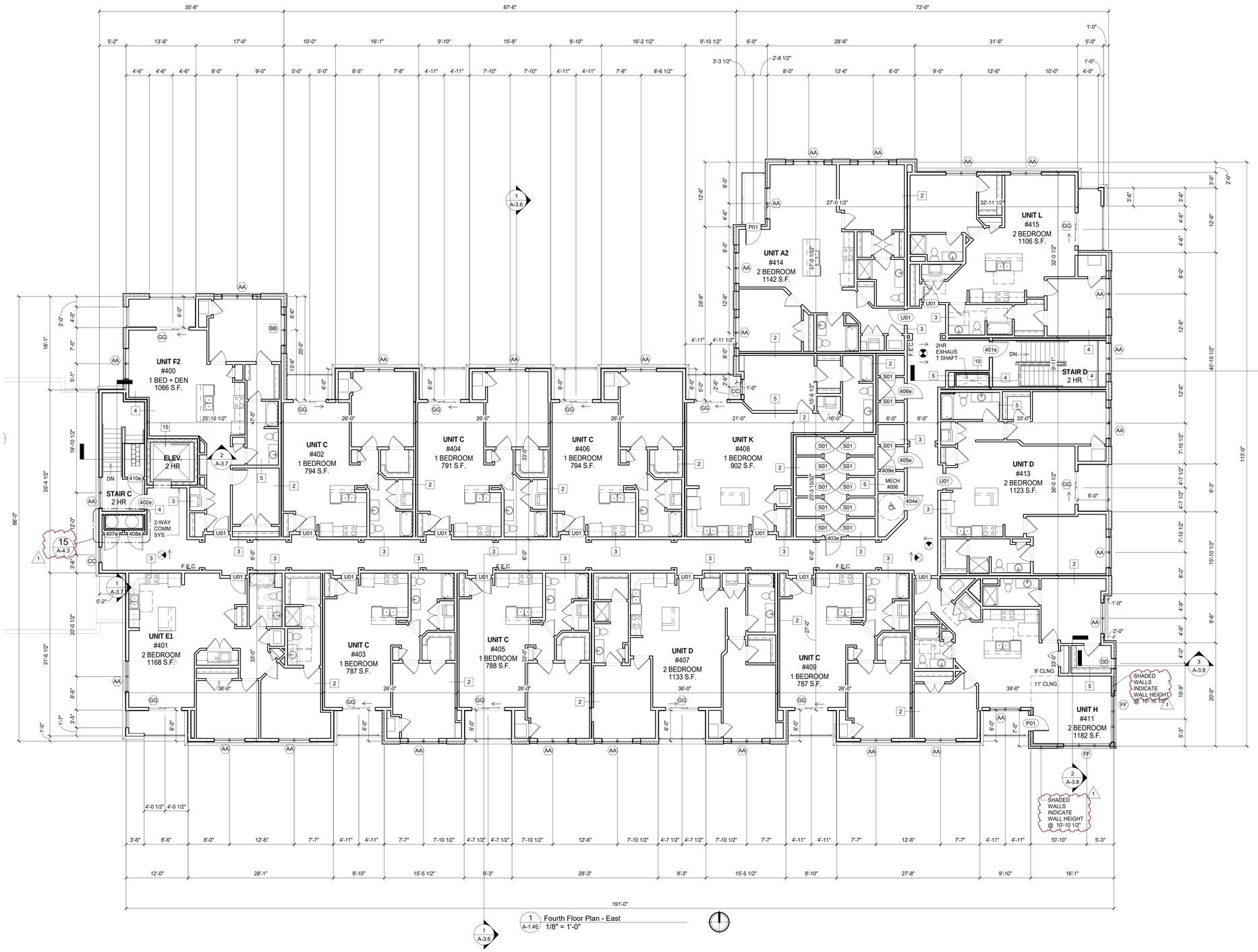
PROJECT TITLE
ROYSTER CROSSINGS

521-523 Grand Oak Trail MADISON, WI

SHEET TITLE
Third Floor Plan-East

SHEET NUMBER
A-1.3E

PROJECT NUMBER 1421



1 Fourth Floor Plan - East
A-1.4E 1/8" = 1'-0"

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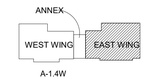
KEY PLAN



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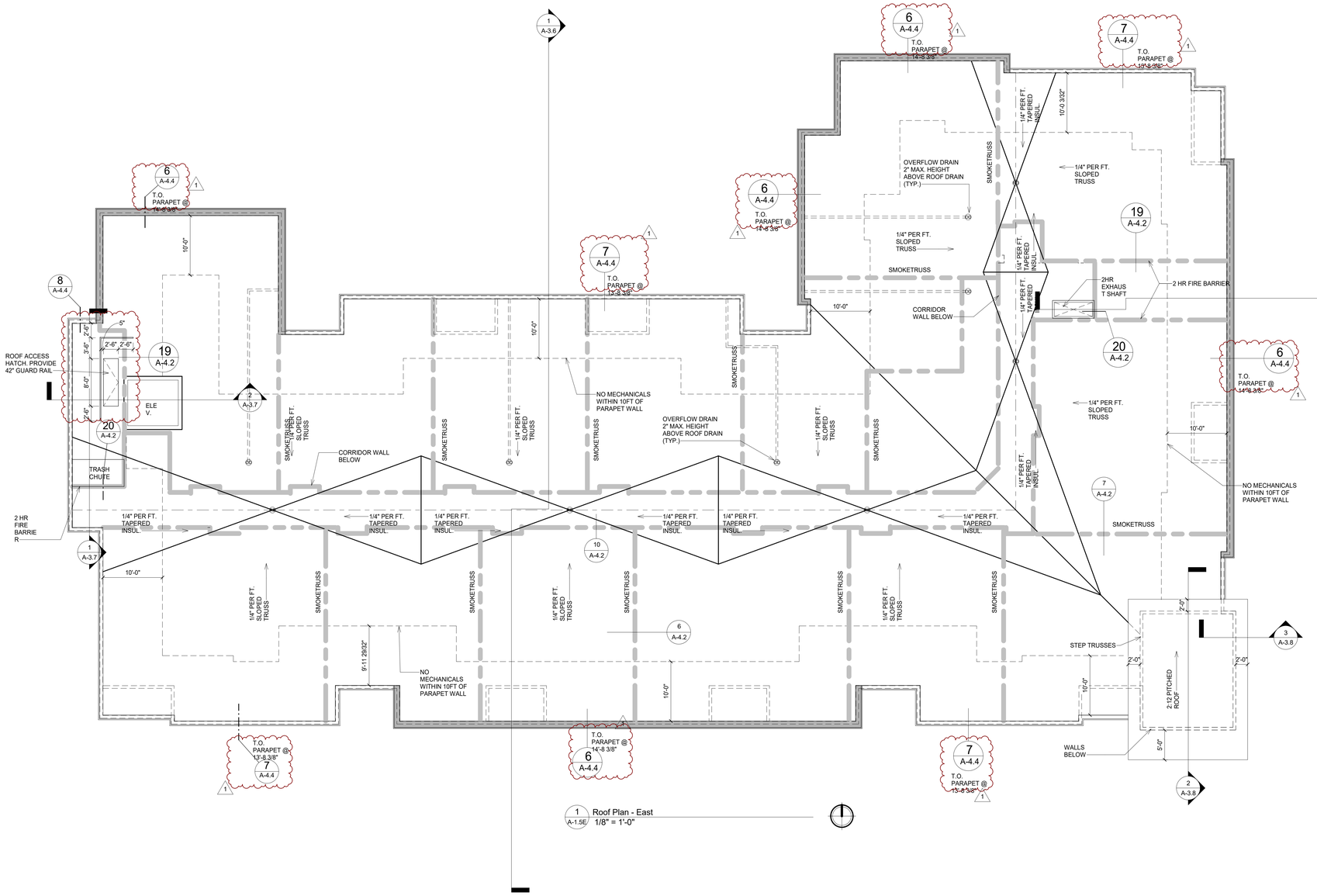
PROJECT TITLE
ROYSTER CROSSINGS

521-523 Grand Oak Trail MADISON, WI

SHEET TITLE
Fourth Floor Plan-East

SHEET NUMBER
A-1.4E

PROJECT NUMBER 1421



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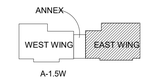

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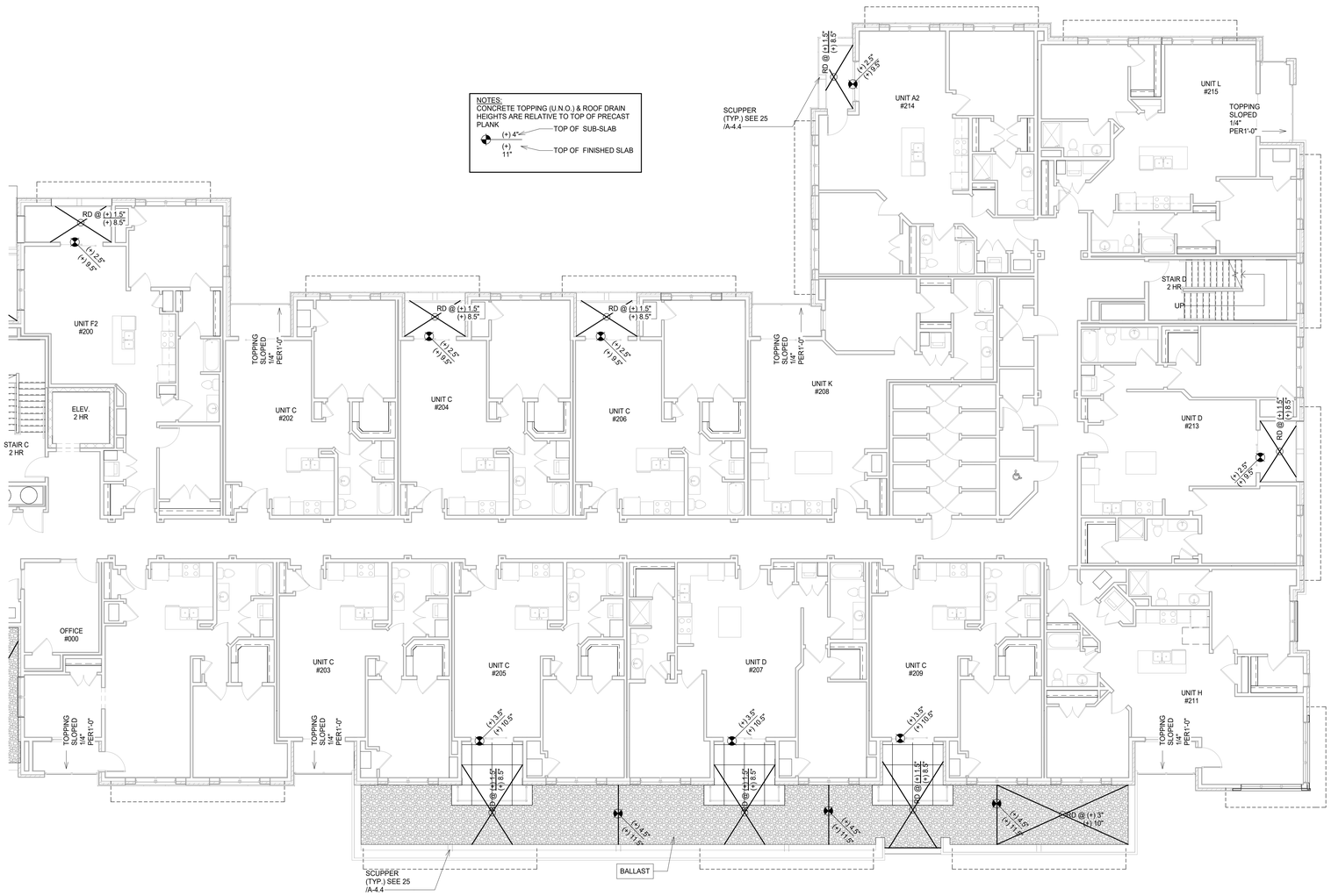
PROJECT TITLE
ROYSTER CROSSINGS

521-523 Grand Oak Trail MADISON, WI

SHEET TITLE
Roof Plan-East

SHEET NUMBER
A-1.5E

PROJECT NUMBER 1421



1 A-1.6E Second Floor Plaza Plan - East
1/8" = 1'-0"

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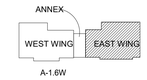

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PROJECT TITLE
ROYSTER CROSSINGS

521-523 Grand Oak Trail MADISON, WI

SHEET TITLE
Second Floor Plaza Plan - East

SHEET NUMBER
A-1.6E

PROJECT NUMBER 1421

1 A-2.0 Overall North Elevation
1/16" = 1'-0"

2 A-2.0 Overall South Elevation
1/16" = 1'-0"

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PROJECT TITLE
ROYSTER CROSSINGS

521-523 Grand Oak Trail MADISON, WI

SHEET TITLE
Exterior Elevations - Overall

SHEET NUMBER
A-2.0

PROJECT NUMBER 1421

2 A-2.1W West Wing - South
1/8" = 1'-0"

ALL LIBRARY SIGNAGE LOCATIONS, QUANTITY, SIZE, & LIMITATIONS TO BE REVIEWED WITH THE DEVELOPER & CITY.

THE GENERAL CONTRACTOR WILL PROVIDE (1) CONDUIT & (1) JUNCTION BOX FOR (2) SIGN LOCATIONS ON FACE OF BUILDING - CITY TO COORDINATE LOCATIONS. ALL EXPENSES FOR ELECTRICAL CONNECTIONS & MOUNTING POINTS FOR EXTERIOR BLDG SIGNAGE TO BE BY THE CITY.

ANY ARCHITECTURAL, ACCENT, AND/OR SITE LIGHTING REQUIRED BY LIBRARY TO BE AT EXPENSE OF THE CITY & MUST BE APPROVED BY THE DEVELOPER & THE CITY.

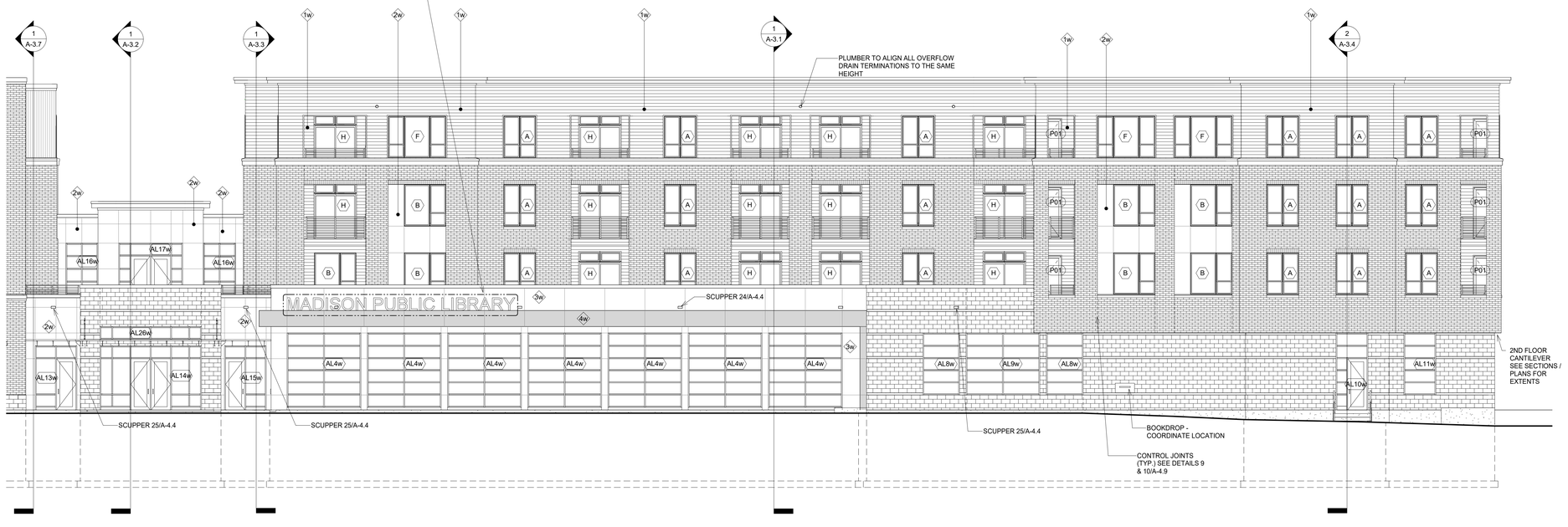
EXTERIOR MATERIAL SCHEDULE - WEST

BUILDING MATERIAL	MATERIAL	COLOR
BRICK VENEER	MASONRY	SIOUX CITY BRICK - SEDONA IORNSPOT
MORTAR COLOR @ BRICK VENEER	MASONRY	TBD
METAL FLASHING @ BRICK VENEER	STEEL	MATCH MASONRY
HORIZONTAL METAL SIDING 1w	STEEL	FABRAL - HCF SERIES 12in. (2) RIBS
		COLOR MATCH PAC-CLAD GRANITE
COMPOSITE METAL PANEL 2w	MCM	ALPOLIC - PE, SILVER METALLIC
COMPOSITE METAL PANEL 3w	MCM	ALPOLIC - PE, MFS MICA GREY
COMPOSITE METAL PANEL 4w	ACM	ALCOA ARCHITECTURAL PRODUCTS - REYNOBOND
		DURAGLOSS 5000 - RUST PATINA
MASONRY BASE	CAST STONE	RENAISSANCE - SANDDRIFT SANDBLASTED FACE (8" PIECES)
		RENAISSANCE - SANDDRIFT SANDBLASTED FACE (4" RECESSED BANDS)
MORTAR COLOR @ CAST STONE	MASONRY	COLOR MATCH SANDDRIFT
METAL FLASHING @ CAST STONE	STEEL	MATCH CAST STONE
WINDOWS	COMPOSITE	ANDERSON 100 - BLACK
PRECAST SILLS	CAST STONE	RENAISSANCE - SANDDRIFT SAND BLASTED FACE
RAILINGS - CABLE RAILING SYS.	STAINLESS STEEL	
ALUMINUM STOREFRONTS	ALUMINUM	ANODIZED - NATURAL

ALL LIBRARY SIGNAGE LOCATIONS, QUANTITY, SIZE, & LIMITATIONS TO BE REVIEWED WITH THE DEVELOPER & CITY.

THE GENERAL CONTRACTOR WILL PROVIDE (1) CONDUIT & (1) JUNCTION BOX FOR (1) EXTERIOR SIGN LOCATION AT WEST OUTDOOR PLAZA ALONG COTTAGE GROVE ROAD - CITY TO COORDINATE LOCATIONS. ALL EXPENSES FOR ELECTRICAL CONNECTIONS & MOUNTING POINTS FOR EXTERIOR SIGNAGE TO BE BY THE CITY.

ANY ARCHITECTURAL, ACCENT, AND/OR SITE LIGHTING REQUIRED BY LIBRARY TO BE AT EXPENSE OF THE CITY & MUST BE APPROVED BY THE DEVELOPER & THE CITY.



1 A-2.1W West Wing - North
1/8" = 1'-0"

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2	Revised -	November 18, 2015
1	Implemented City's LOI Clarifications -	August 7, 2017

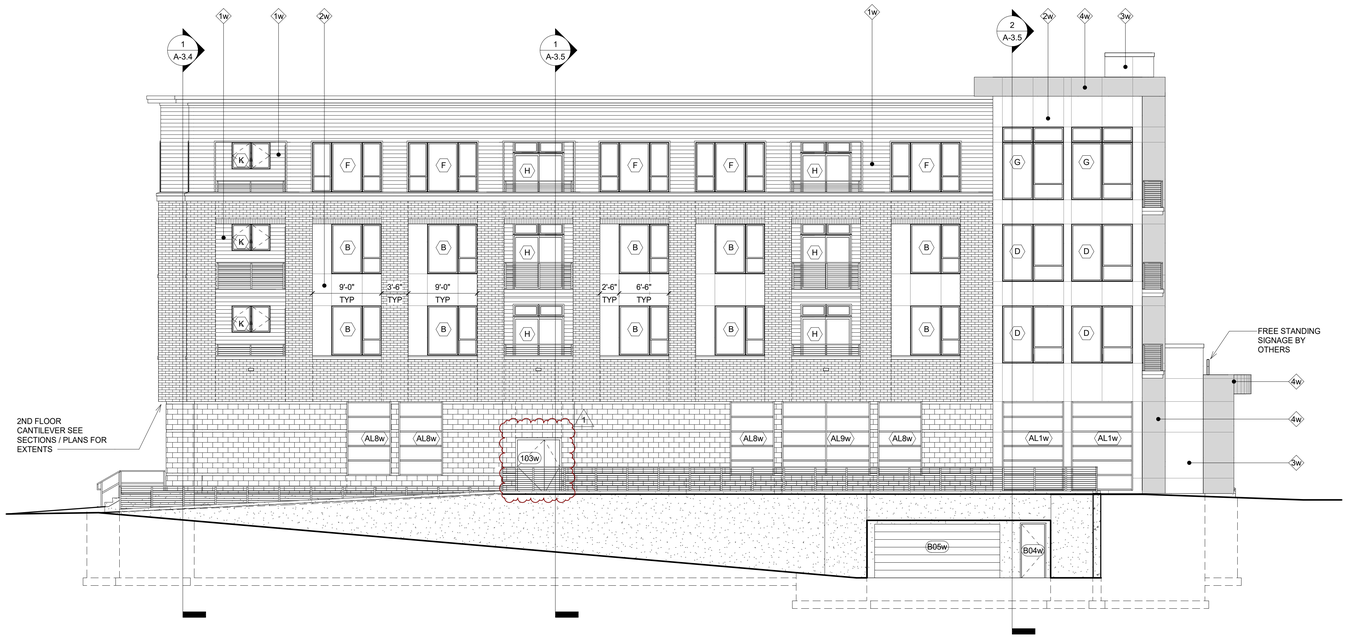
PROJECT TITLE
ROYSTER CROSSINGS

521-523 Grand Oak Trail MADISON, WI

SHEET TITLE
Exterior Elevations N/S

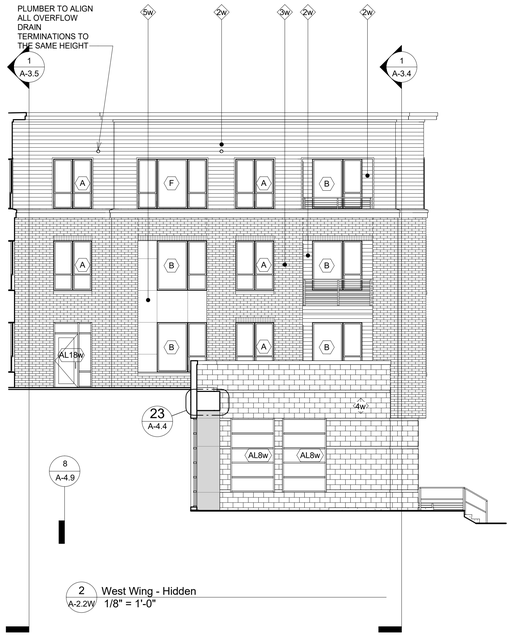
SHEET NUMBER
A-2.1W

PROJECT NUMBER 1421



1 A-2.2W West Wing - West
1/8" = 1'-0"

3 A-2.2W West Wing - East
1/8" = 1'-0"



2 A-2.2W West Wing - Hidden
1/8" = 1'-0"

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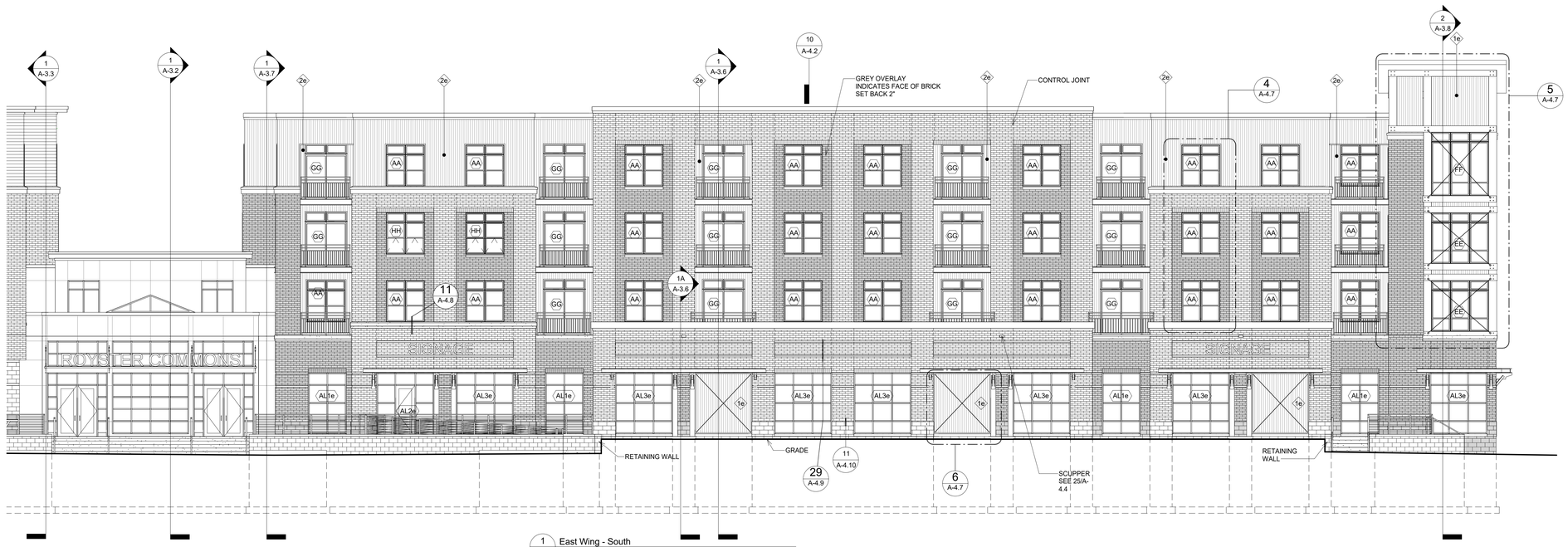
PROJECT TITLE
ROYSTER CROSSINGS

521-523 Grand Oak Trail MADISON, WI

SHEET TITLE
Exterior Elevations E/W

SHEET NUMBER
A-2.2W

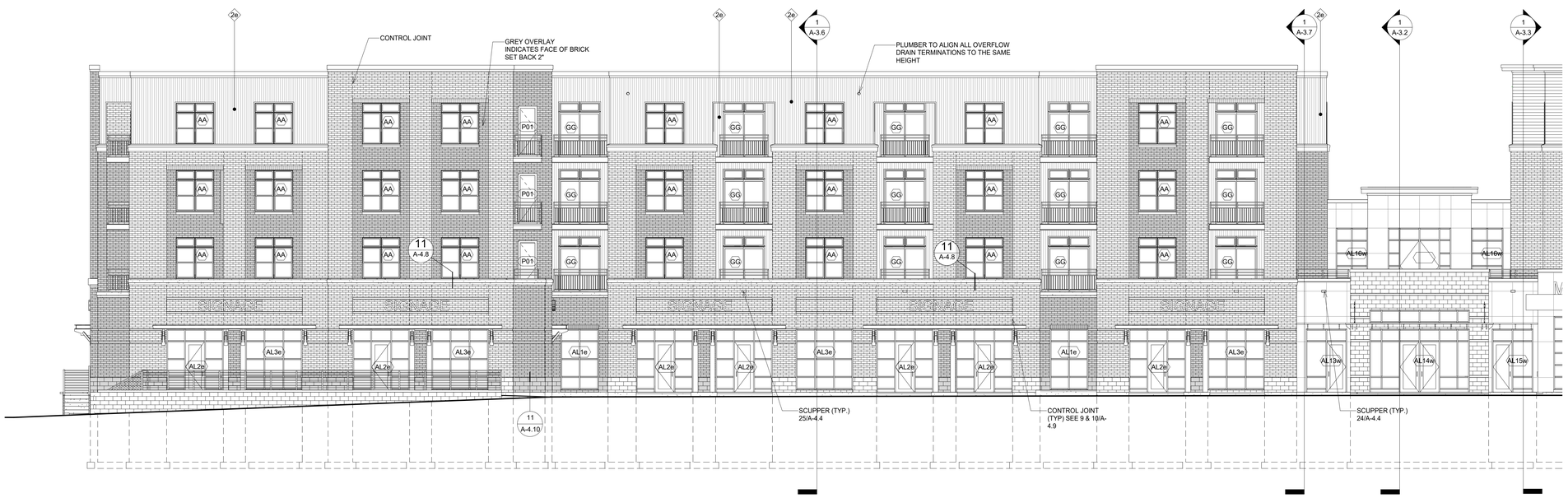
PROJECT NUMBER 1421



1 A-2.1E East Wing - South
1/8" = 1'-0"

EXTERIOR MATERIAL SCHEDULE - EAST

BUILDING MATERIAL	MATERIAL	COLOR
BRICK VENEER	MASONRY	SIOUX CITY BRICK - CRANBERRY
MORTAR COLOR @ BRICK VENEER	MASONRY	TBD
METAL FLASHING @ BRICK VENEER	STEEL	MATCH MASONRY
VERTICAL METAL SIDING 1e	CORRUGATED STEEL	MORIN CORRUGATED EXPOSED FASTENER
		S16 METAL PANEL - GALVANIZED ZINC
VERTICAL METAL SIDING 2e	CORRUGATED STEEL	MORIN CORRUGATED CONCEALED FASTENER
		S16 METAL PANEL - WEATHERED ZINC
MASONRY BASE	CAST STONE	RENAISSANCE - SANDDRIFT SANDBLASTED FACE (8" PIECES)
		RENAISSANCE - SANDDRIFT SANDBLASTED FACE (4" RECESSED BANDS)
MORTAR COLOR @ CAST STONE	MASONRY	MORTAR TECHNOLOGIES - COLOR MATCH SANDDRIFT
METAL FLASHING @ CAST STONE	STEEL	MATCH CAST STONE
WINDOWS	COMPOSITE	ANDERSON 100 - BLACK
PRECAST SILLS	CAST STONE	RENAISSANCE - SANDDRIFT SANDBLASTED FACE
RAILINGS - BALUSTERS	ALUMINUM	BLACK
ALUMINUM STOREFRONTS	ALUMINUM	ANODIZED - BLACK



2 A-2.1E East Wing - North
1/8" = 1'-0"

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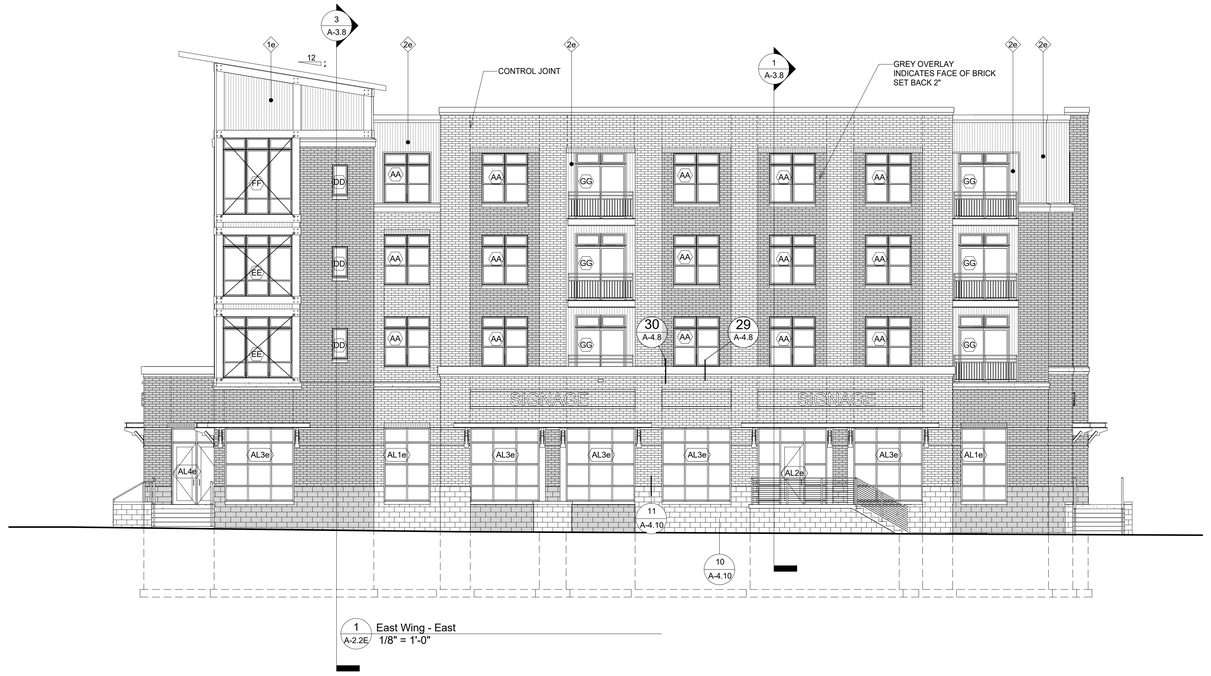
ROYSTER CROSSINGS

521-523 Grand Oak Trail MADISON, WI

SHEET TITLE
Exterior Elevations N/S

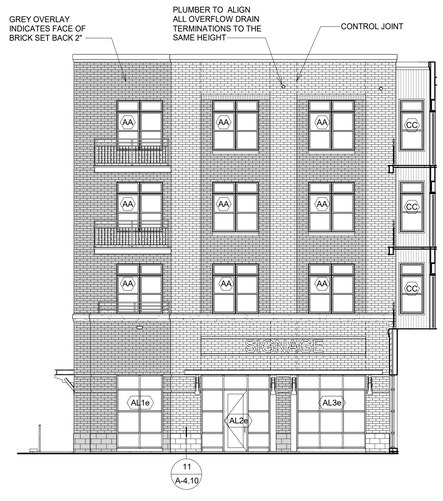
SHEET NUMBER
A-2.1E

PROJECT NUMBER 1421



1 East Wing - East
A-2.2E 1/8" = 1'-0"

3 East Wing - West
A-2.2E 1/8" = 1'-0"



2 East Wing - Hidden
A-2.2E 1/8" = 1'-0"

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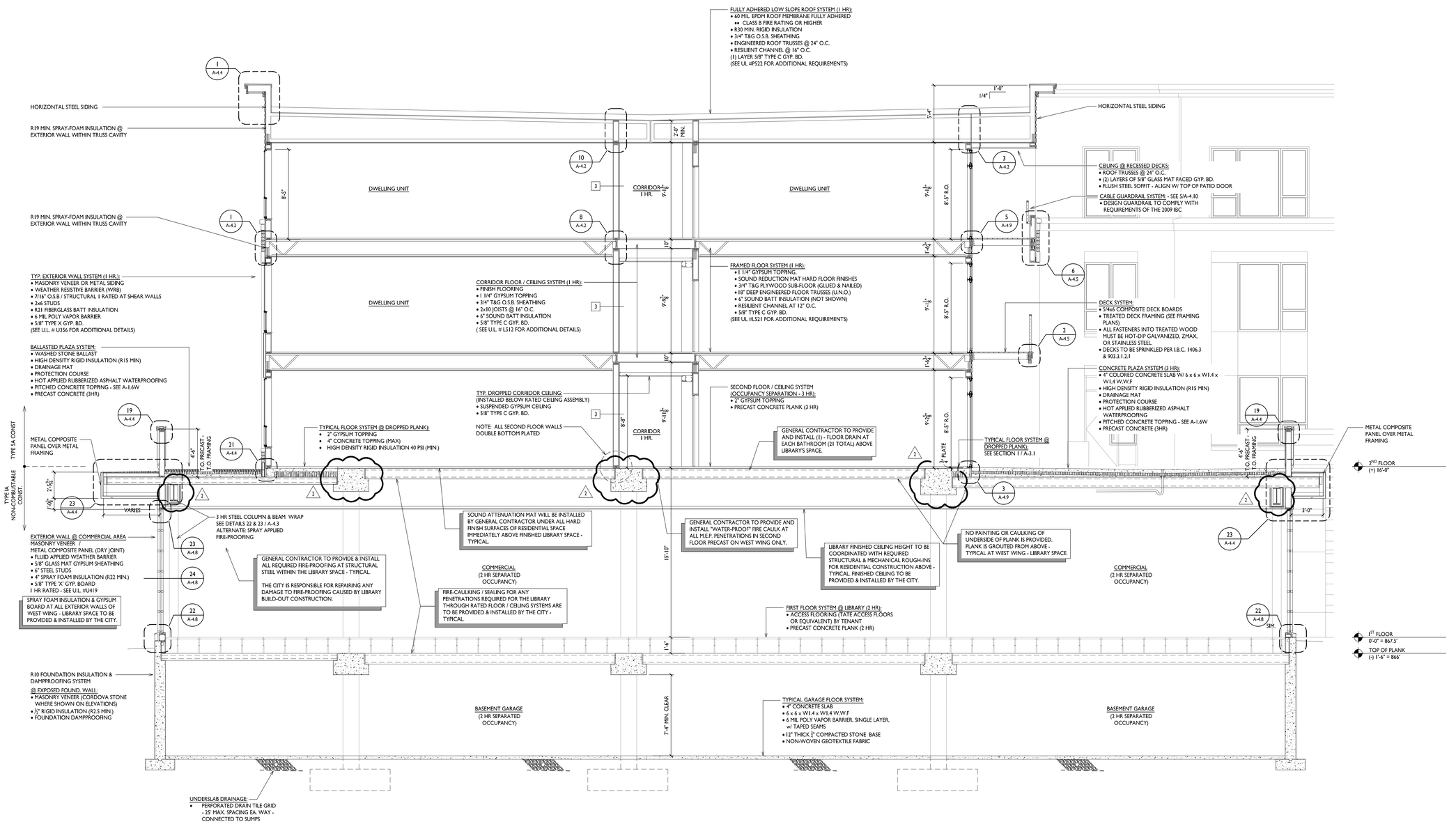
ROYSTER CROSSINGS

521-523 Grand Oak Trail MADISON, WI

SHEET TITLE
Exterior Elevations E/W

SHEET NUMBER
A-2.2E

PROJECT NUMBER 1421



1 A-3.1 BUILDING SECTION - WEST

1/4"=1'-0"

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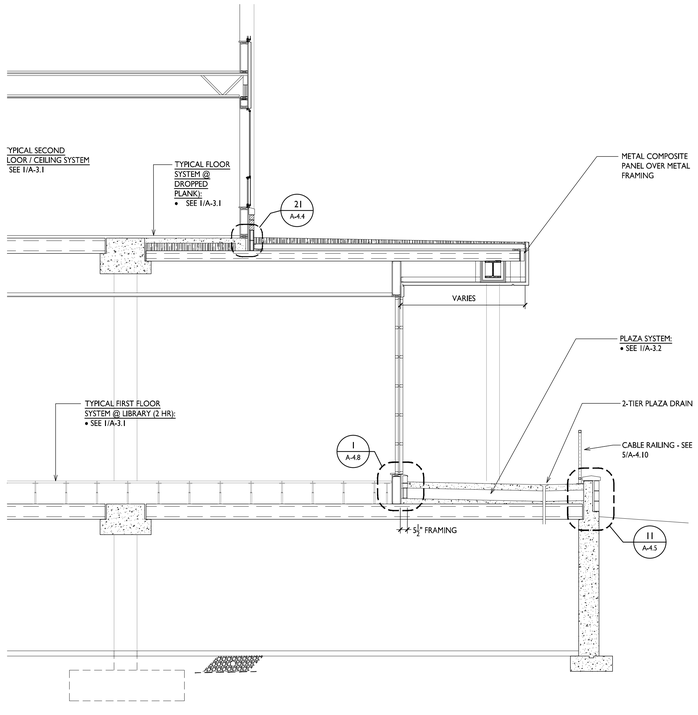
PROJECT TITLE
ROYSTER CROSSINGS

521-523 Grand Oak Trail
MADISON, WI

SHEET TITLE
Building Section - West

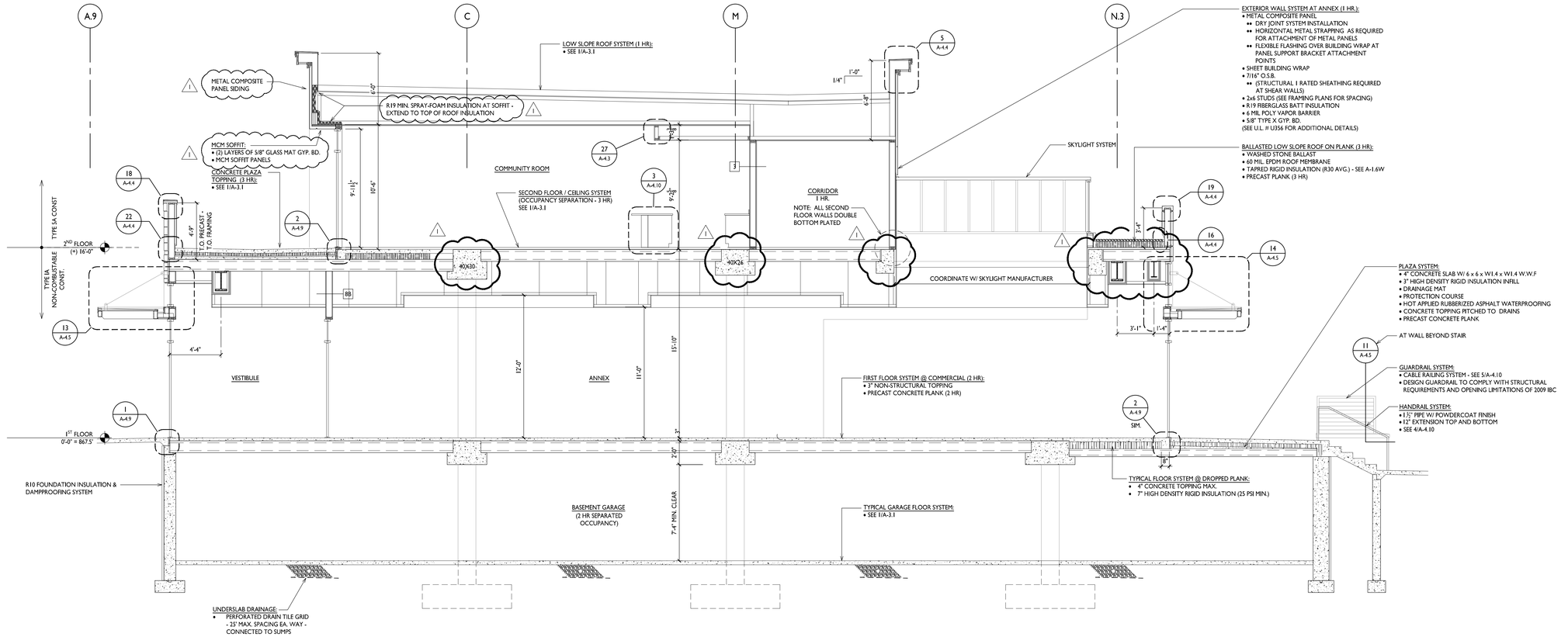
SHEET NUMBER
A-3.1

PROJECT NO. 1421



2 A-3.2 **WALL SECTION - WEST**

1/4"=1'-0"



1 A-3.2 **BUILDING SECTION - ANNEX**

1/4"=1'-0"

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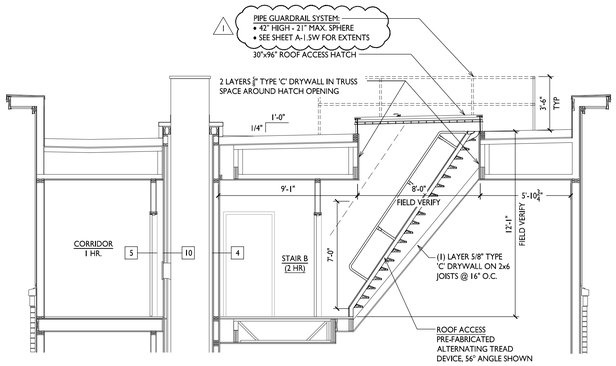
521-523 Grand Oak Trail
MADISON, WI

SHEET TITLE
Building Section - Annex

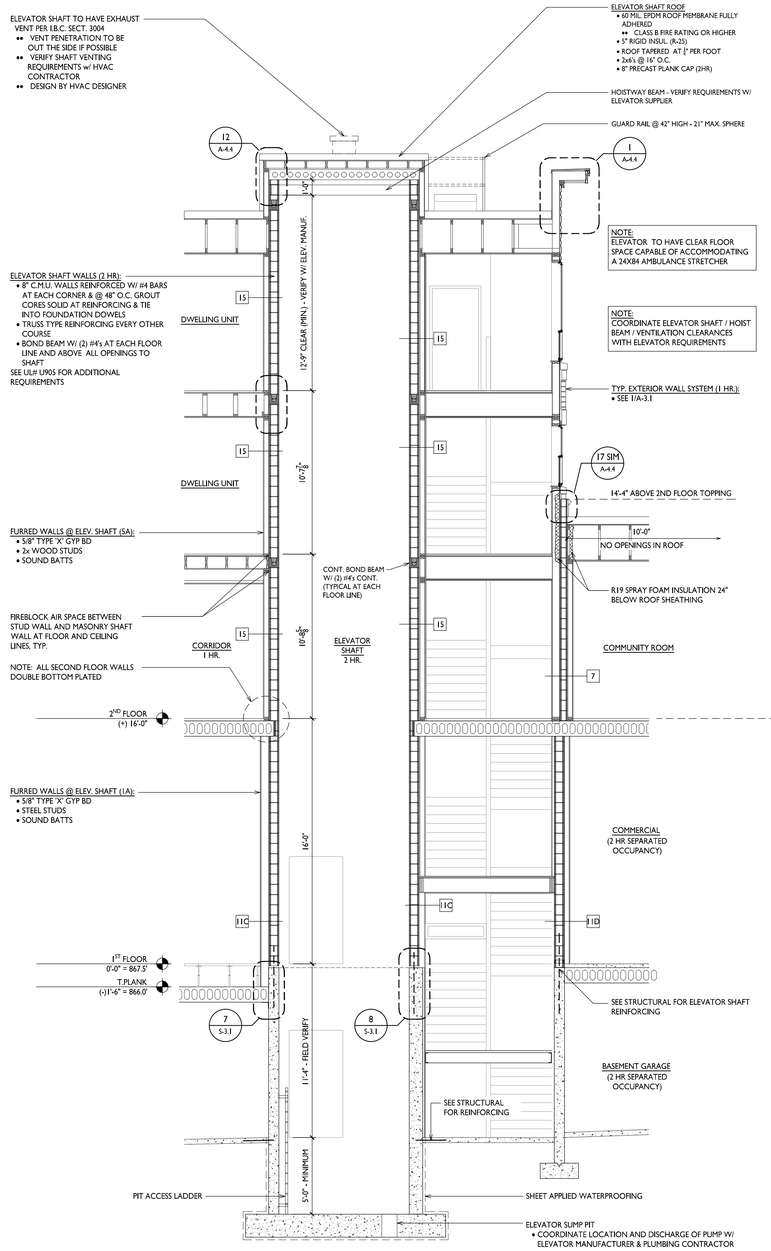
SHEET NUMBER
A-3.2

PROJECT NO. 1421



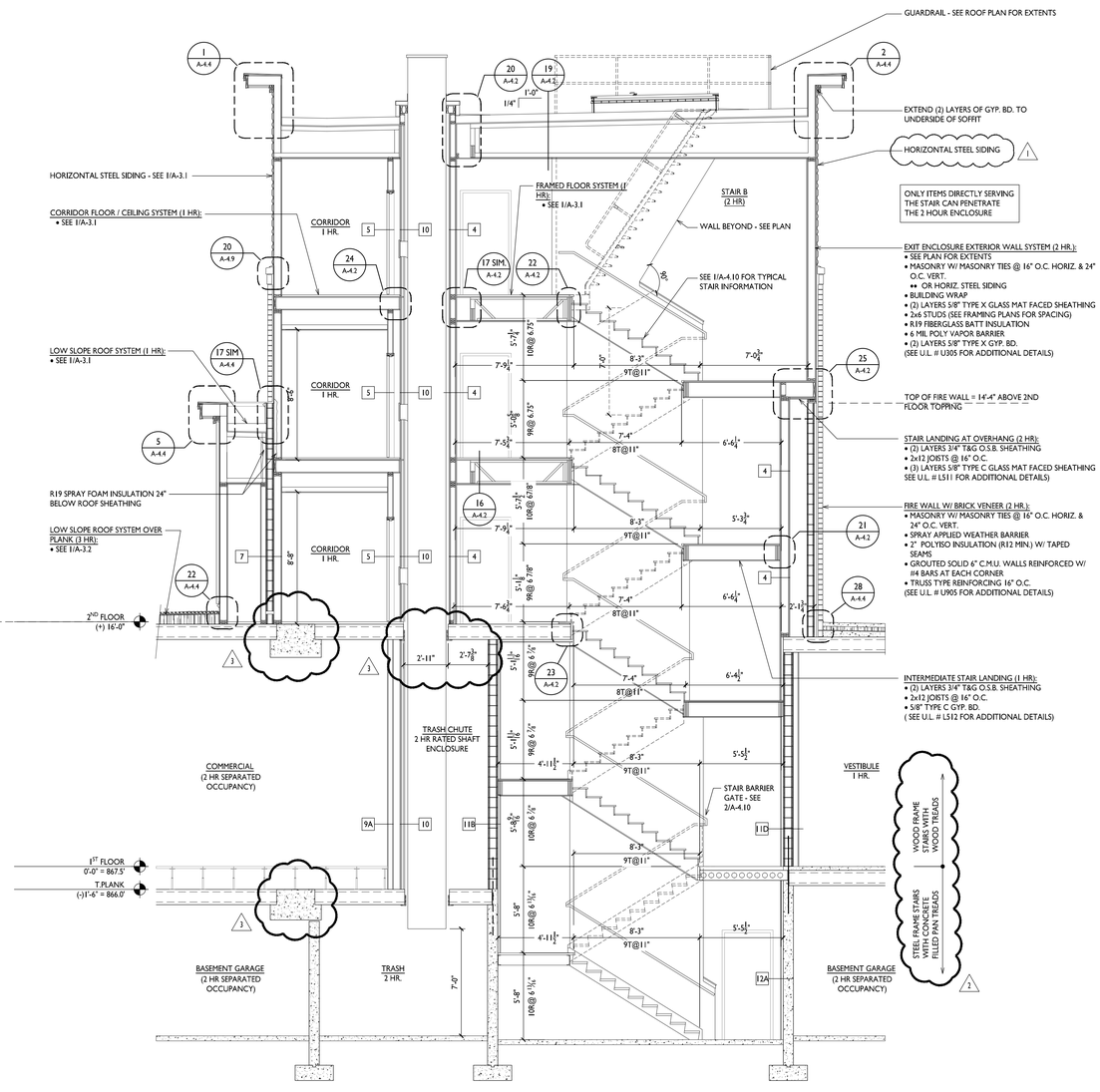
3 A-3.3 ROOF ACCESS LADDER SECTION

1/4"=1'-0"



2 A-3.3 STAIR B & ELEVATOR SECTION

1/4"=1'-0"



1 A-3.3 STAIR B - SECTION

1/4"=1'-0"

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PROJECT TITLE
ROYSTER CROSSINGS

521-523 Grand Oak Trail
MADISON, WI

SHEET TITLE
Stair B Sections

SHEET NUMBER
A-3.3

PROJECT NO. 1421

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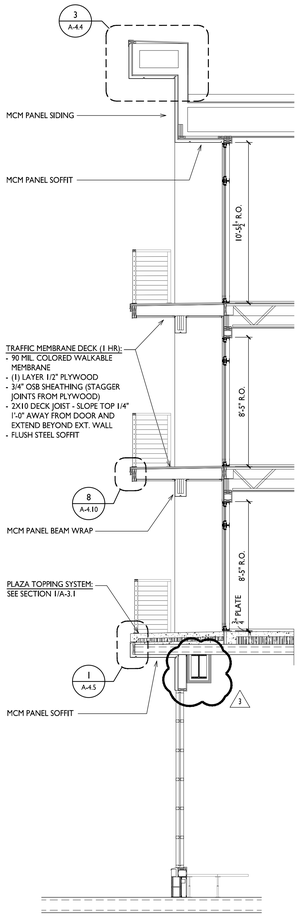
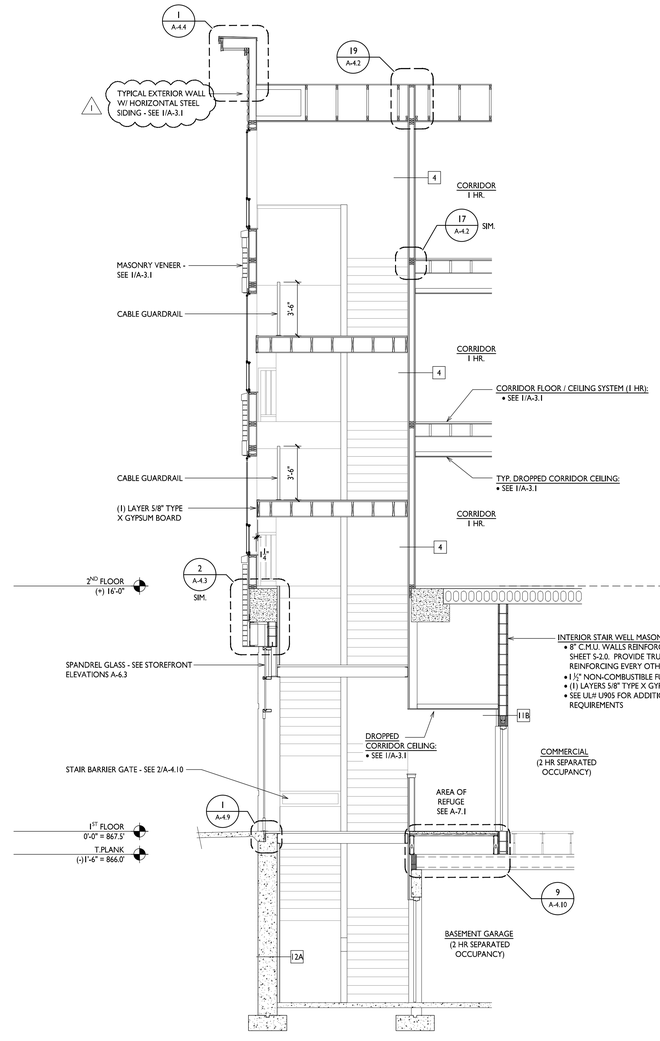
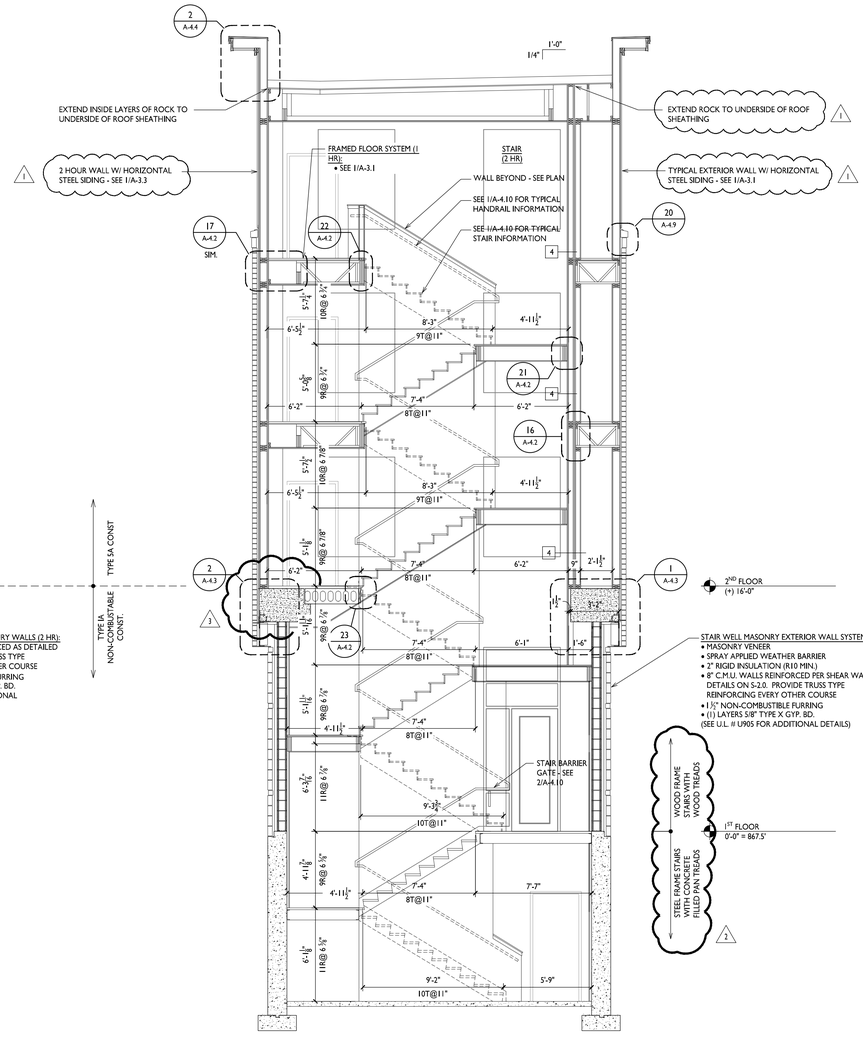


3 SECTION @ CANTILEVERED BALCONIES
3 / A-3.4 — 1/4"=1'-0"



2 STAIR A - SECTION
2 / A-3.4 — 1/4"=1'-0"



1 STAIR A - SECTION
1 / A-3.4 — 1/4"=1'-0"

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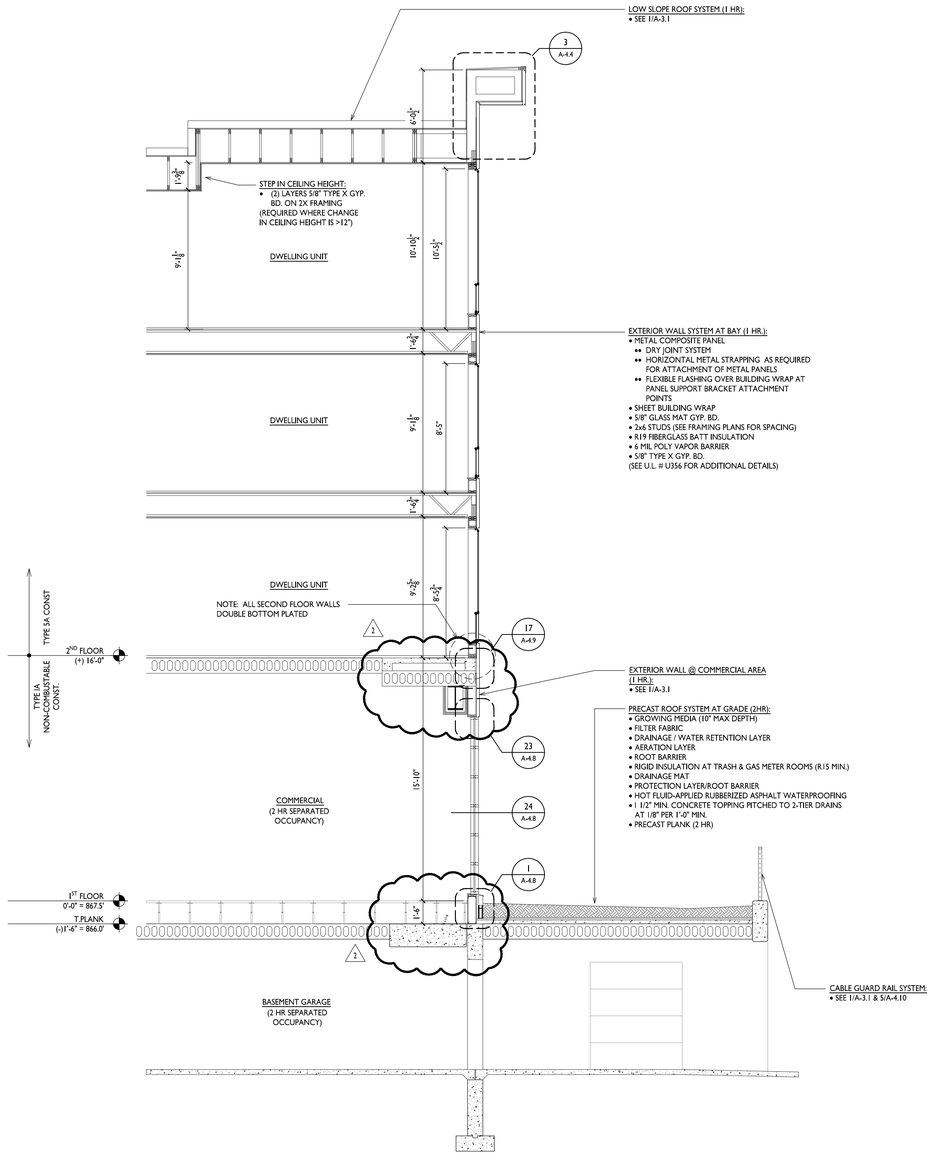
PROJECT TITLE
ROYSTER CROSSINGS

521-523 Grand Oak Trail
MADISON, WI

SHEET TITLE
Stair A & Wall Sections

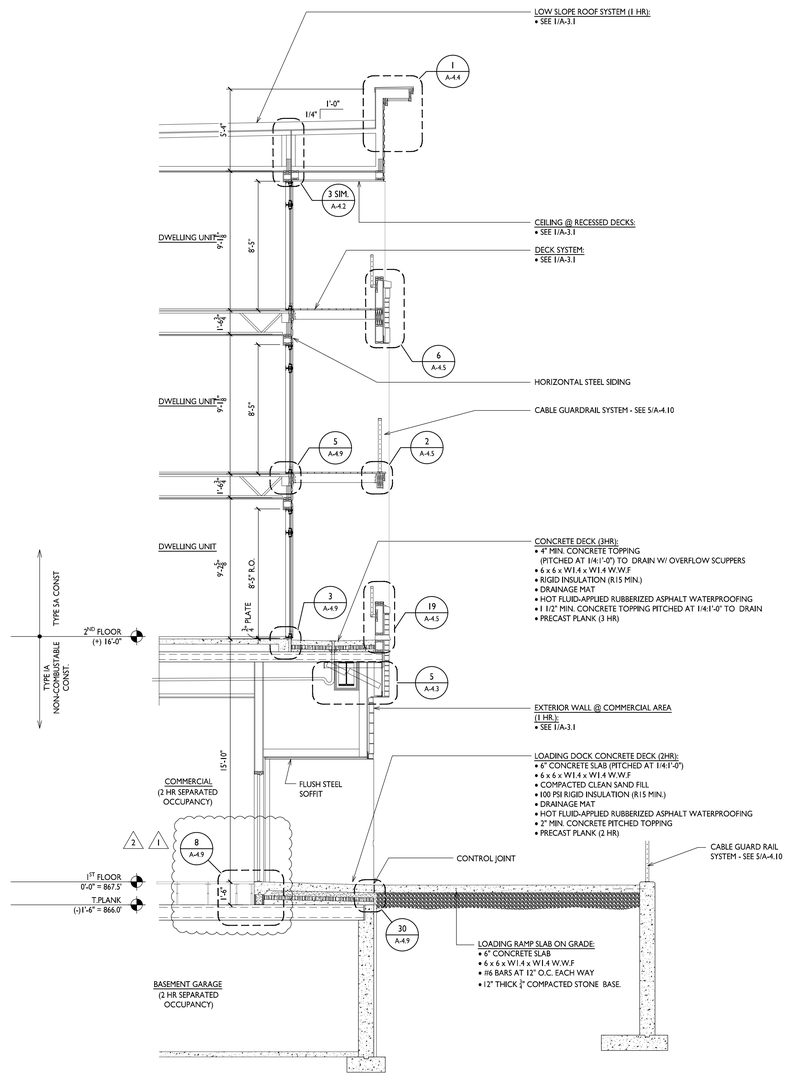
SHEET NUMBER
A-3.4

PROJECT NO. 1421



2 A-3.5 WALL SECTION - WEST

1/4"=1'-0"



1 A-3.5 SECTION @ LOADING DOCK

1/4"=1'-0"

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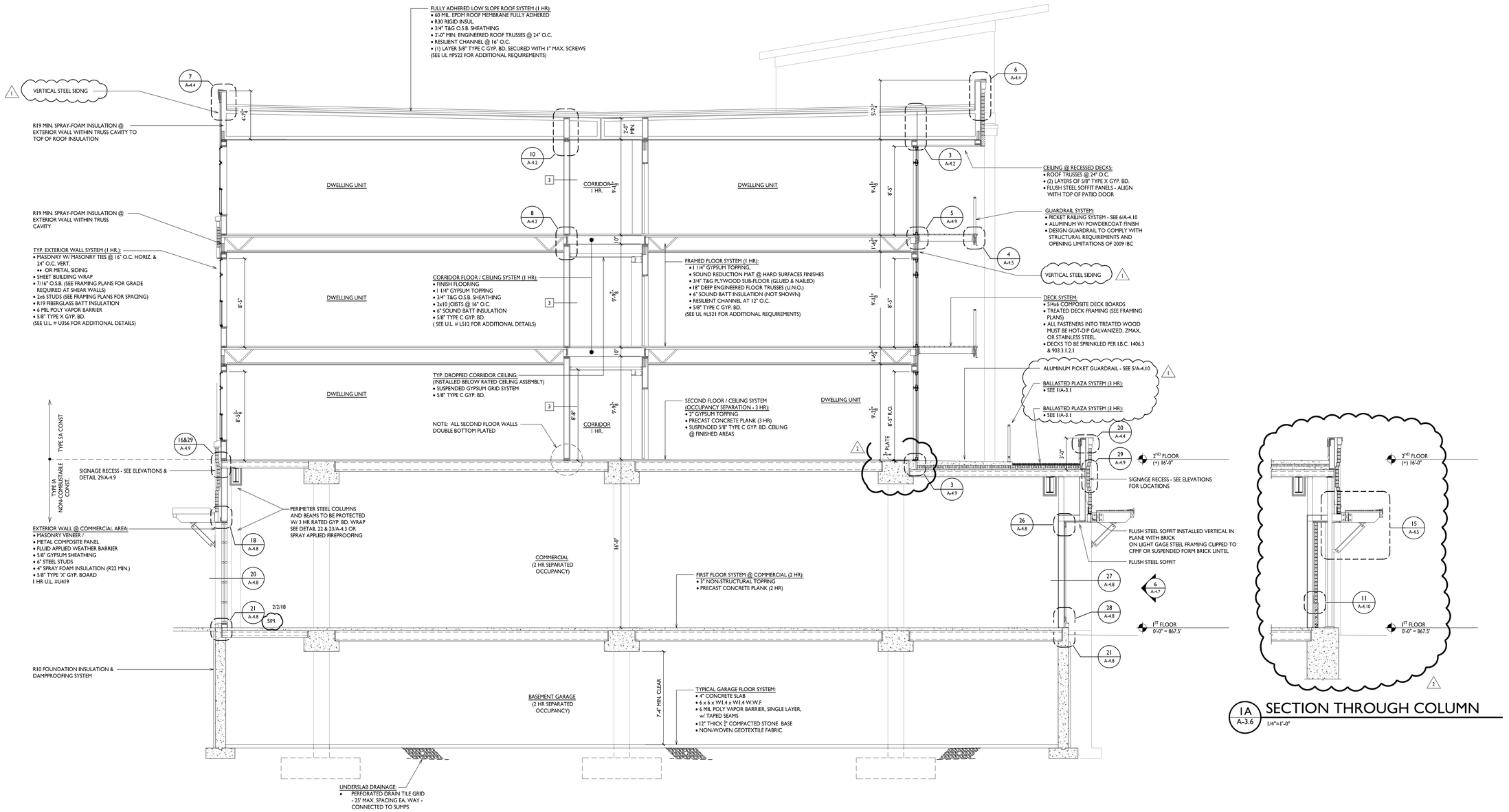
PROJECT TITLE
ROYSTER CROSSINGS

521-523 Grand Oak Trail
MADISON, WI

SHEET TITLE
West Wall Sections

SHEET NUMBER
A-3.5

PROJECT NO. 1421



1 A-3.6 BUILDING SECTION - EAST
1/4"=1'-0"

1A A-3.6 SECTION THROUGH COLUMN
1/4"=1'-0"

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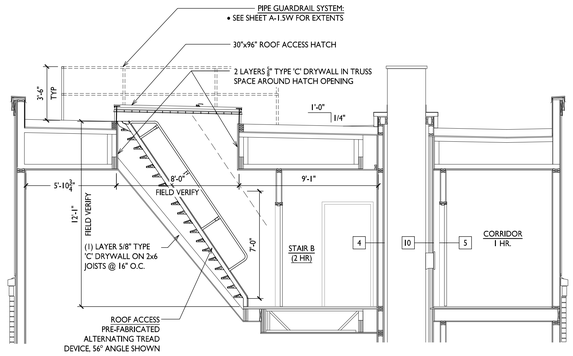
PROJECT TITLE
ROYSTER CROSSINGS

521-523 Grand Oak Trail
MADISON, WI

SHEET TITLE
Building Section - East

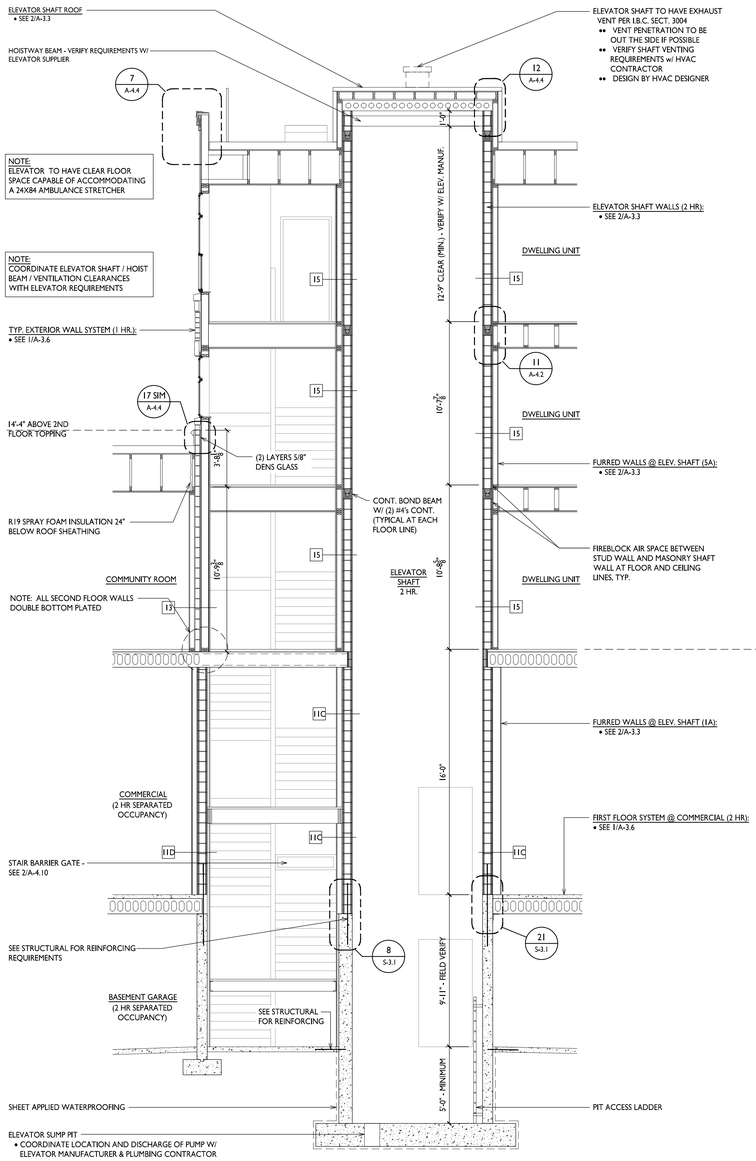
SHEET NUMBER
A-3.6

PROJECT NO. 1421



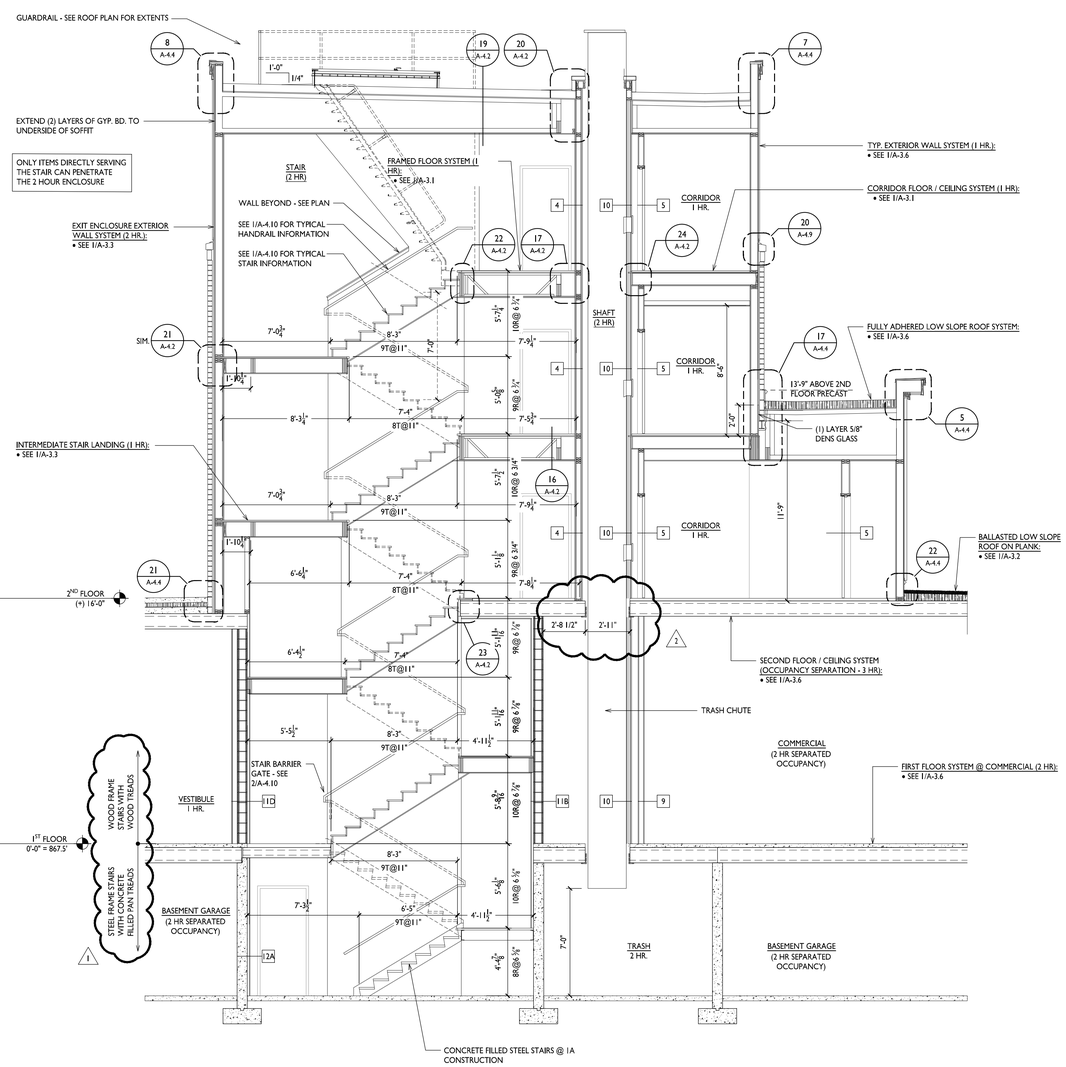
3 A-3.7 ROOF ACCESS LADDER SECTION

1/4"=1'-0"



2 A-3.7 STAIR C & ELEVATOR SECTION

1/4"=1'-0"



1 A-3.7 STAIR C - SECTION

1/4"=1'-0"

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ROYSTER CROSSINGS

521-523 Grand Oak Trail
MADISON, WI

SHEET TITLE
Stair C Sections

SHEET NUMBER
A-3.7

PROJECT NO. 1421

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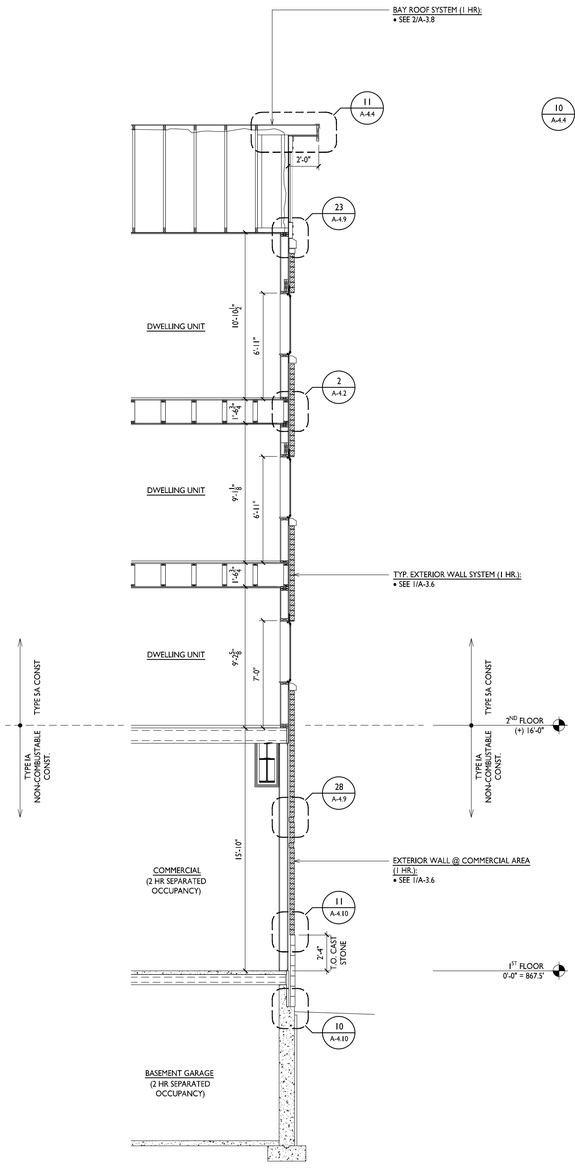

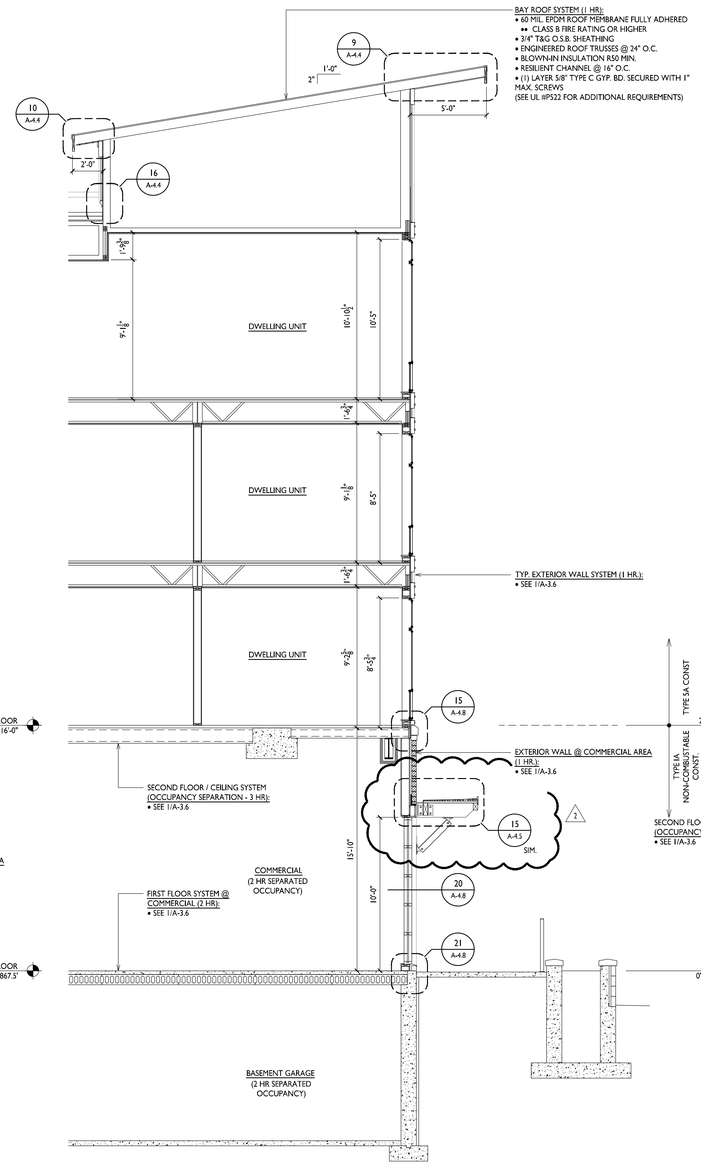

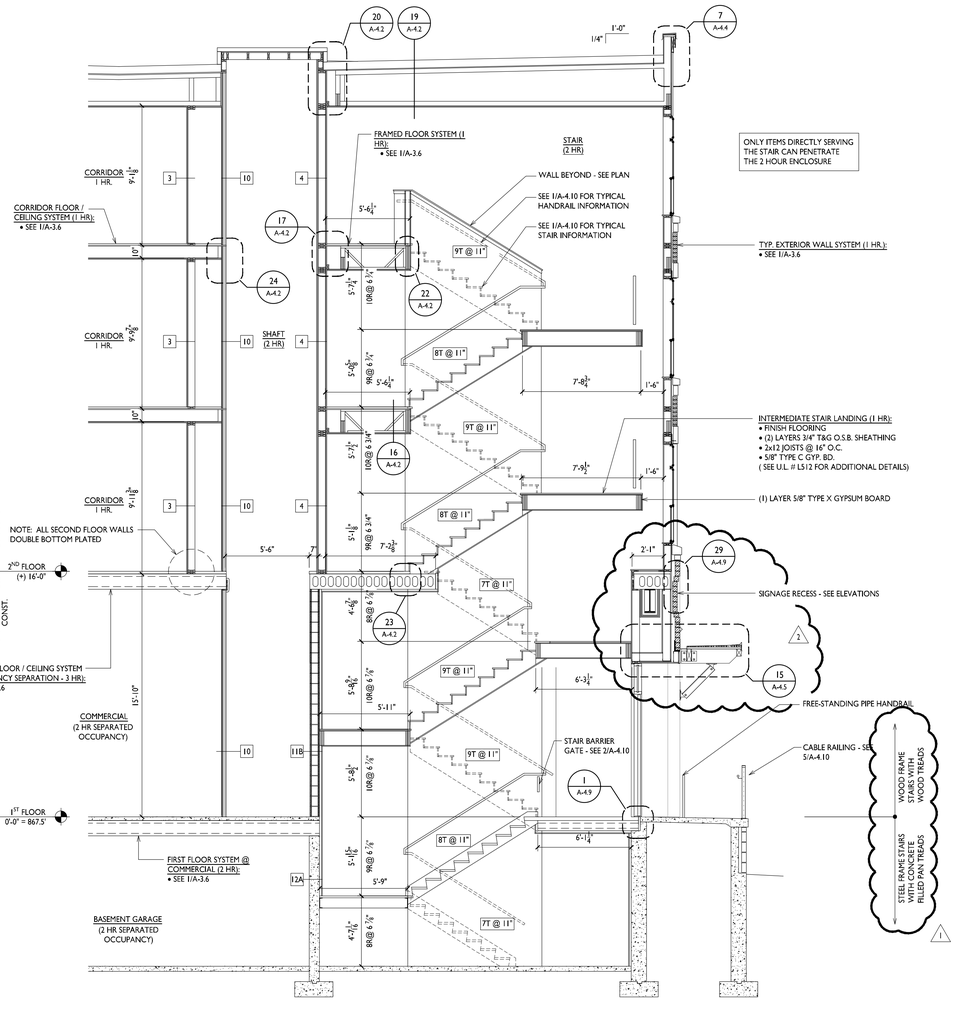

3 A-3.8 WALL SECTION - EAST
1/4"=1'-0"

2 A-3.8 WALL SECTION - SOUTH
1/4"=1'-0"

1 A-3.8 STAIR D - SECTION
1/4"=1'-0"

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PROJECT TITLE
ROYSTER CROSSINGS

521-523 Grand Oak Trail
MADISON, WI

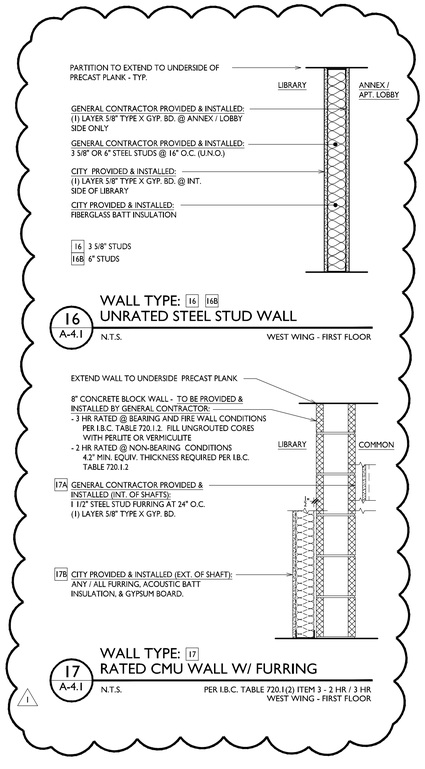
SHEET TITLE
Stair D & East Wall Sections

SHEET NUMBER
A-3.8

PROJECT NO. 1421

GENERAL SECTION / DETAIL NOTES:

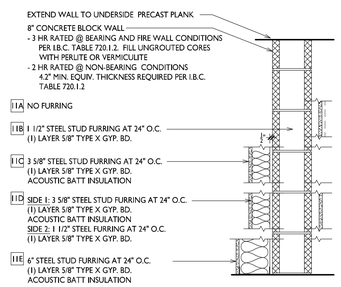
1. PLAN DIMENSIONS ARE TO FACE OF FRAMING/CMU/CONCRETE, CENTERLINE OF STRUCTURAL COLUMNS, CENTERLINE OF WINDOW/DOOR OPENINGS, AND EDGE OF STAIR NOSING.
2. ALL LUMBER IN CONTACT WITH CONCRETE BELOW OR WITHIN 8" OF GRADE SHALL BE PRESERVATIVE TREATED.
3. ALL SUB-FLOOR PANELS TO BE GLUED & NAILED.
4. SEE STRUCTURAL DRAWINGS FOR WOOD STUD GRADE, SIZE AND SPACING.
5. REFERENCE CURRENT FIRE RATED ASSEMBLY DESIGN REQUIREMENTS ONLINE AT HTTP://WWW.UL.COM/ - ALL CONTRACTORS ARE RESPONSIBLE FOR MEETING CURRENT SYSTEM REQUIREMENTS AS PUBLISHED BY U.L.
6. PENETRATIONS IN RATED ASSEMBLIES SHALL COMPLY WITH IBC 713. SUBMIT FIRESTOP SYSTEMS TO LOCAL AHJ FOR REVIEW PRIOR TO INSTALLATION. FIRESTOP SYSTEMS IN HORIZONTAL ASSEMBLIES SHALL HAVE "T" RATING = TO "F" RATING.
7. GYPSUM BOARD ON FIRE-RATED WALLS (EXTERIOR, PARTY, CORRIDOR, AND BEARING WALLS) SHALL BE INSTALLED BEHIND SOFFITS, TUB & SHOWER UNITS AND CONCEALED OR FURRED-OUT SPACES.
8. CEILINGS AT CONCEALED SPACES SHALL BE COMPLETED IN ACCORDANCE WITH THE FIRE RATING OF THEY ASSEMBLY THEY ARE A PART OF. FOR 1 HOUR RATED CONSTRUCTION INSTALL (2) LAYERS 5/8" TYPE C GYPSUM BD.
9. M.E.P. BOXES IN FIRE RATED WALLS SHALL BE UL LISTED AND INSTALLED IN ACCORDANCE WITH THEIR LISTING. BOXES SERVING DIFFERENT DWELLING UNITS SHALL NOT BE INSTALLED WITHIN THE SAME STUD CAVITY.
10. BOXES IN DEMISING WALLS AND CEILINGS SHALL HAVE THEIR ANNULAR SPACE SEALED WITH ACOUSTIC SEALANT. SEE 29 & 30 / A-4.3
11. FLEXIBLE DUCTS AND AIR CONNECTORS SHALL NOT PASS THRU ANY RATED ASSEMBLY.
12. ACOUSTIC INSULATION: INSTALL FIBERGLASS BATT INSULATION IN ALL DEMISING AND MECHANICAL ROOM WALLS. INSULATE STUD CAVITIES CONTAINING DWV PIPING.
13. BATT INSULATION THICKNESS SHALL BE EQUAL TO DEPTH OF STUD CAVITY, U.N.O.
14. ALL RESILIENT CHANNEL SHALL BE "RC DELUXE" BY DIETRICH INDUSTRIES . RESILIENT CHANNEL ON WALLS SHALL BE INSTALLED OPEN SIDE UP. FASTEN GYPSUM BOARD TO CHANNEL WITH MAX. 1" LONG SCREWS.
15. INSTALL ACOUSTIC SEALANT AT JOINT BETWEEN WALL AND CEILING GYPSUM BOARD AT ALL DEMISING WALLS.
16. USE GLASS MAT FACED GYPSUM IN ALL ASSEMBLIES IN PARKING GARAGES AND WHERE SURFACES WILL BE EXPOSED TO WEATHER DURING CONSTRUCTION.
17. DESIGN HEAD OF PARTITION CONNECTIONS TO ACCOMMODATE DEFLECTION OF BUILDING STRUCTURE.
18. SEE STRUCTURAL DRAWINGS FOR ADDITIONAL CONCRETE AND CMU WALL REQUIREMENTS.
19. HOLD NON-BEARING CMU WALLS DOWN 1" FROM UNDERSIDE OF PRECAST PLANK / FLOOR SLAB. INSTALL BACKER ROD AND SEALANT OR LISTED JOINT FIRESTOP SYSTEM AT RATED WALLS.
16. GYPSUM FLOOR TOPPING SHALL BE INSTALLED WITH PERIMETER AND FLOOR SURFACE ISOLATION MATERIALS AS DETAILED BY MANUFACTURER IN SUBMITTED ACOUSTIC TEST.
17. PREPARE ALL EXTERIOR WALL OPENINGS (WINDOWS, DOORS, ETC.) IN ACCORDANCE WITH WRB INSTRUCTIONS AND AS DETAILED BY COMPONENT MANUFACTURER AND THESE DRAWINGS.
18. ALL WINDOWS DRYWALL RETURN HEAD AND JAMB W/ SEALANT ENTIRE PERIMETER.
19. VERIFY COMPATIBILITY OF FLASHING / WATERPROOFING MATERIALS THAT WILL BE IN CONTACT PRIOR TO INSTALLATION.
20. MAINTAIN GRADE MINIMUM 8" BELOW WOOD FRAMING OR 4" BELOW MASONRY VENEER, SLOPE GRADE AWAY FROM BUILDING 1/2" PER FOOT MINIMUM FOR AT LEAST 10'.



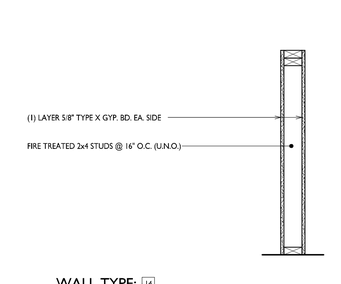
16 A-4.1 — WALL TYPE: 16 16B
UNRATED STEEL STUD WALL
N.T.S. — WEST WING - FIRST FLOOR

17 A-4.1 — WALL TYPE: 17
RATED CMU WALL W/ FURRING
N.T.S. — PER I.B.C. TABLE 720.1(2) ITEM 3 - 2 HR / 3 HR
WEST WING - FIRST FLOOR

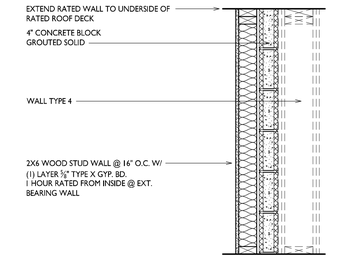
1



11 A-4.1 — WALL TYPE: 11
RATED CMU WALL W/ FURRING
N.T.S. — PER I.B.C. TABLE 720.1(2) ITEM 3 - 2 HR / 3 HR

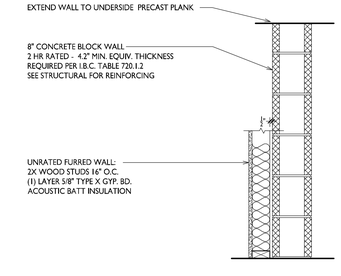


12 A-4.1 — WALL TYPE: 12
RATED CONC. WALL W/ FURRING
N.T.S. — PER I.B.C. TABLE 720.1(2) ITEM 4-1.1 - 2 HR / 3 HR

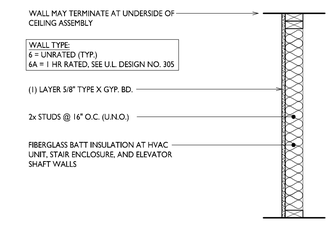


13 A-4.1 — WALL TYPE: 13
4" CMU WALL
N.T.S.

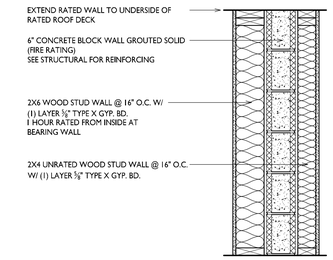
14 A-4.1 — WALL TYPE: 14
FIRE TREATED WOOD STUD WALL
N.T.S.



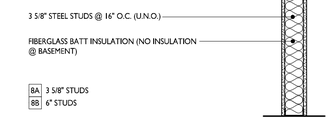
15 A-4.1 — WALL TYPE: 15
RATED CMU WALL W/ FURRING
N.T.S. — PER I.B.C. TABLE 720.1(2) ITEM 3 - 2 HR



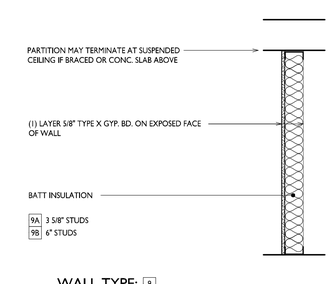
6 A-4.1 — WALL TYPE: 6
WOOD STUD FURRING WALL
N.T.S.



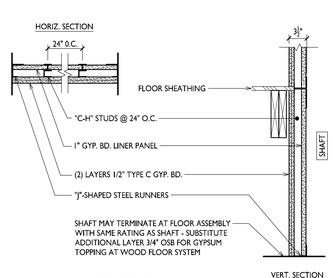
7 A-4.1 — WALL TYPE: 7
2 HR CMU FIRE WALL
N.T.S. — U.L. DESIGN NO. U906 - 2 HR



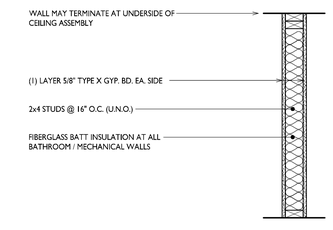
8 A-4.1 — WALL TYPE: 8A 8B
UNRATED STEEL STUD WALL
N.T.S.



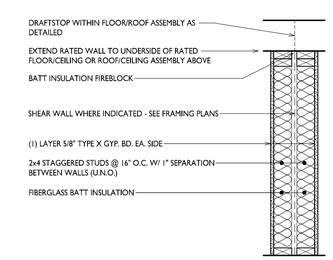
9 A-4.1 — WALL TYPE: 9
UNRATED STEEL STUD FURRING WALL
N.T.S.



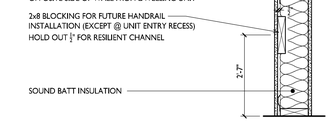
10 A-4.1 — WALL TYPE: 10
2 HR STEEL STUD SHAFT WALL
N.T.S. — U.L. DESIGN NO. U415, SYSTEM B - 2 HR



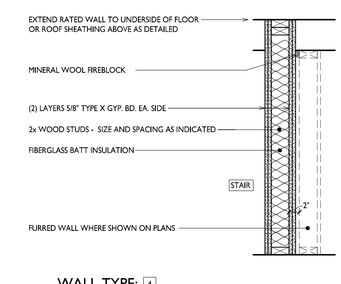
1 A-4.1 — WALL TYPE: 1
UNRATED WOOD STUD WALL
N.T.S. — TYPICAL INTERIOR PARTITION FLOORS 2-4



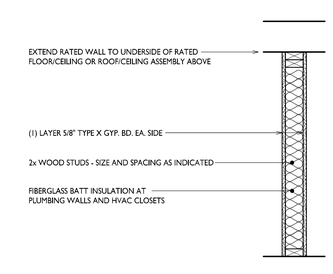
2 A-4.1 — WALL TYPE: 2
1 HR WOOD STUD FIRE PARTITION WALL
N.T.S. — TYP. UNIT SEPARATION WALL - U.L. DESIGN NO. U341 - 1 HR STC RATING - 53



3 A-4.1 — WALL TYPE: 3
1 HR WOOD STUD FIRE PARTITION WALL
N.T.S. — TYPICAL CORRIDOR WALL - U.L. DESIGN NO. U305 - 1 HR STC RATING - 53



4 A-4.1 — WALL TYPE: 4
2 HR WOOD STUD FIRE BARRIER WALL
N.T.S. — RATED WALL: U.L. DESIGN NO. U301 - 2 HR WALL SYSTEM W/ FURRED WALL: STC RATING - 64



5 A-4.1 — WALL TYPE: 5
1 HR WOOD STUD BEARING WALL
N.T.S. — U.L. DESIGN NO. U305 - 1 HR

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ISSUED

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Revised Bid Sec: January 19, 2016
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Minor Alteration: December 13, 2017
Revision to Previously Approved Plan - January 12, 2018
Revised Sec - May 23, 2018

1 Implemented City's LOI Clarifications - August 7, 2017

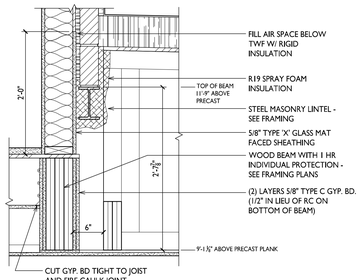
PROJECT TITLE
ROYSTER CROSSINGS

521-523 Grand Oak Trail
MADISON, WI

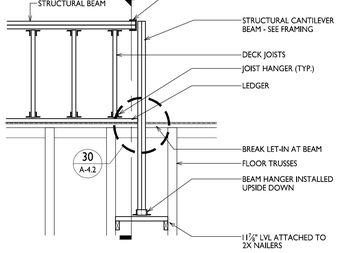
SHEET TITLE
Wall Types & General Notes

SHEET NUMBER
A-4.1

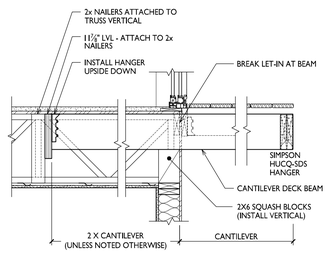
PROJECT NO. 1421



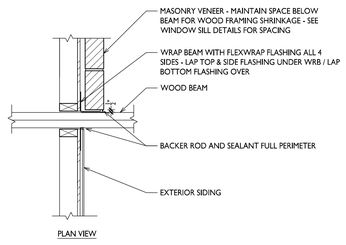
26 NOT USED
A-4.2 — 1" = 1'-0"



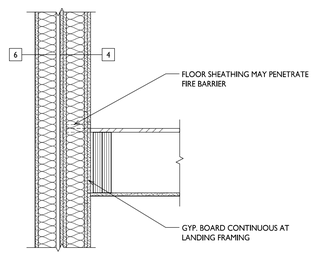
28 CANTILEVER DECK FRAMING
A-4.2 — 1/2" = 1'-0"



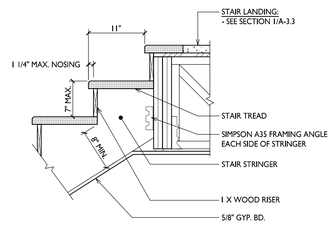
29 CANTILEVER DECK BEAM
A-4.2 — 3/4" = 1'-0"



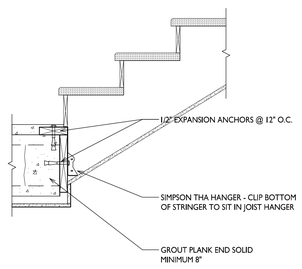
30 FLASHING @ BEAM PENETRATION
A-4.2 — 1" = 1'-0"



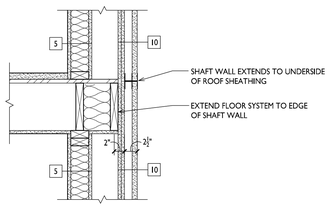
21 STAIR ENCL. WALL @ STAIR LANDING
A-4.2 — 1" = 1'-0"



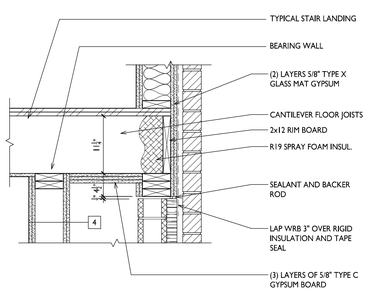
22 TYP. STAIR CONSTRUCTION
A-4.2 — 1" = 1'-0"



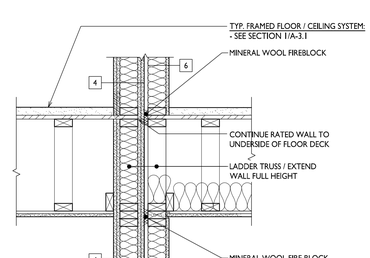
23 STRINGER TO PRECAST CONNECTION
A-4.2 — 1" = 1'-0"



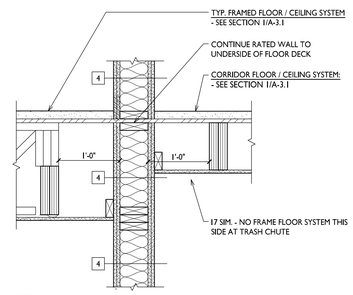
24 FLOOR SYSTEM AT SHAFT
A-4.2 — 1" = 1'-0"



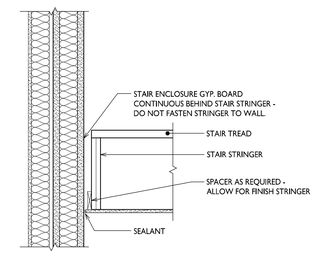
25 2 HR FIRE BARRIER @ FLOOR / CEILING
A-4.2 — 1" = 1'-0"



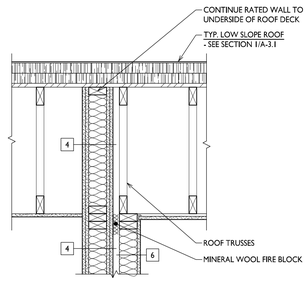
16 STAIR ENCL. WALL @ FLOOR TRUSSES
A-4.2 — 1" = 1'-0"



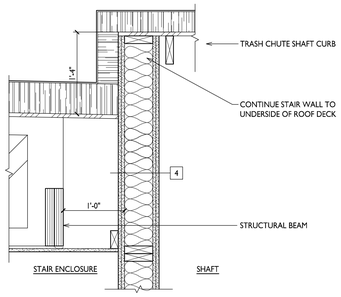
17 STAIR ENCL. WALL @ CORRIDOR
A-4.2 — 1" = 1'-0"



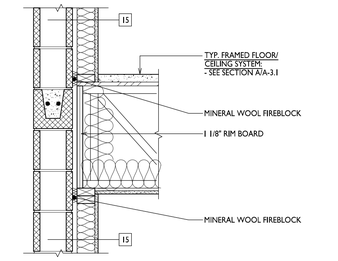
18 STAIR STRINGER @ STAIR ENCL. WALL
A-4.2 — 1" = 1'-0"



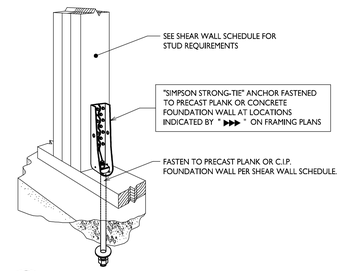
19 STAIR ENCL. WALL @ ROOF TRUSSES
A-4.2 — 1" = 1'-0"



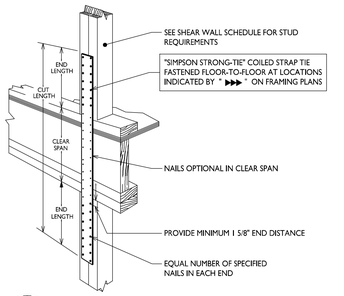
20 STAIR ENCL. @ TRASH CHUTE ROOF
A-4.2 — 1" = 1'-0"



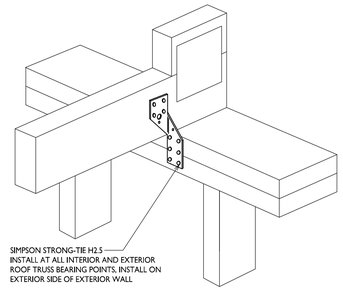
11 TRUSS BEARING @ ELEV. SHAFT
A-4.2 — 1" = 1'-0"



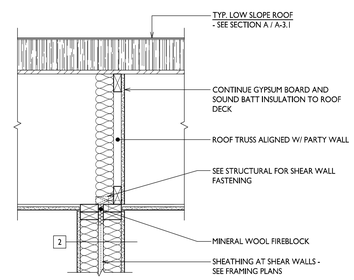
12 NOT USED
A-4.2 — 1" = 1'-0"



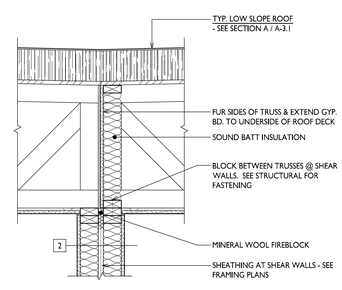
14 SHEAR WALL STRAP TIE
A-4.2 — N.T.S.



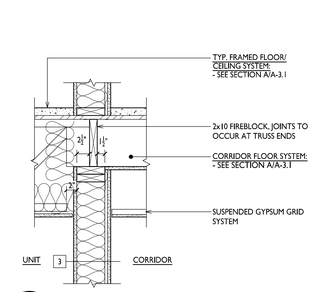
15 TRUSS ANCHOR
A-4.2 — N.T.S.



6 UNIT SEPARATION WALL @ ROOF/CEILING
A-4.2 — 1" = 1'-0"



7 UNIT SEPARATION WALL @ ROOF/CEILING
A-4.2 — 1" = 1'-0"

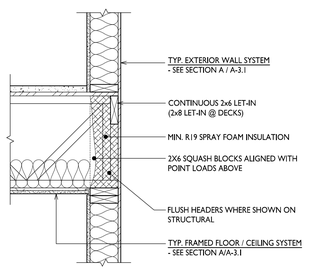


8 CORRIDOR WALL @ BEARING
A-4.2 — 1" = 1'-0"

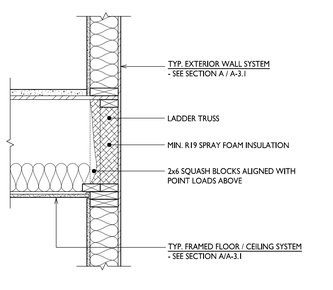
9 FRAMING @ UNIT ENTRY
A-4.2 — 1" = 1'-0"

10 CORRIDOR WALL @ ROOF / CEILING
A-4.2 — 1" = 1'-0"

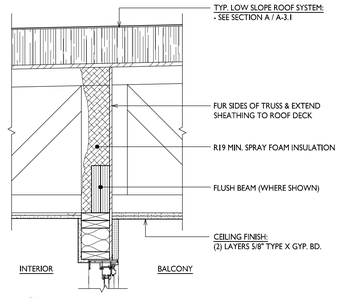
UNIT SEPARATION WALL @ SIM.



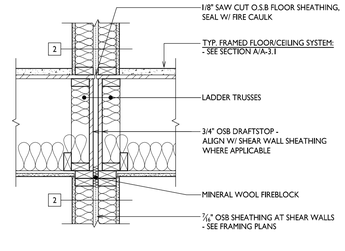
1 EXTERIOR RIM @ FLOOR TRUSS BEARING
A-4.2 — 1" = 1'-0"



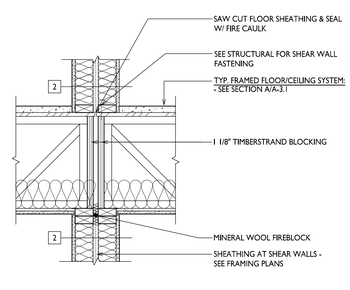
2 EXTERIOR RIM @ FLOOR LADDER TRUSS
A-4.2 — 1" = 1'-0"



3 ROOF TRUSS AT BALCONY
A-4.2 — 1" = 1'-0"



4 UNIT SEPARATION @ FLOOR/CEILING
A-4.2 — 1" = 1'-0"



5 UNIT SEPARATION @ FLOOR/CEILING
A-4.2 — 1" = 1'-0"

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ISSUED
Issued for Bid: September 25, 2015
Revised Bid Set: January 19, 2016
Issued For Plan Review: February 8, 2016
Minor Alteration: December 13, 2017
Revision to Previously Approved Plan - January 12, 2018
Revised Set - May 23, 2018

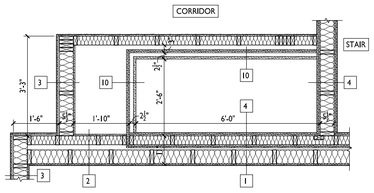
PROJECT TITLE
ROYSTER CROSSINGS

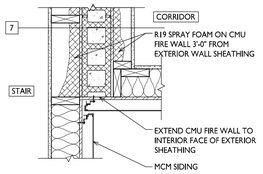
521-523 Grand Oak Trail
MADISON, WI

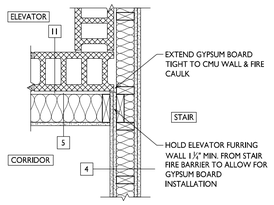
SHEET TITLE
Details

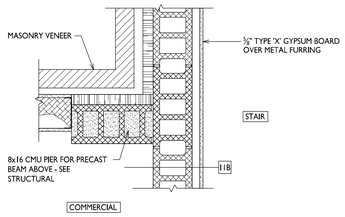
SHEET NUMBER
A-4.2

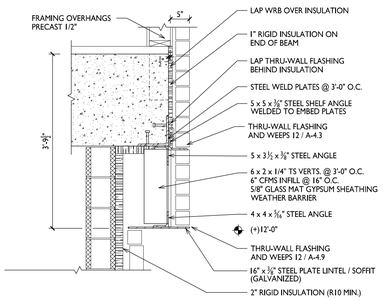
PROJECT NO. 1421



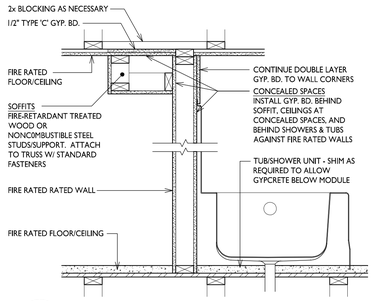




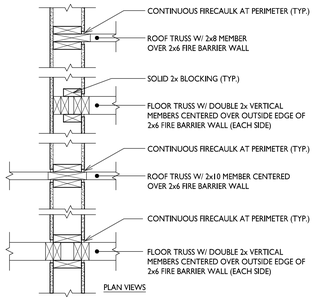




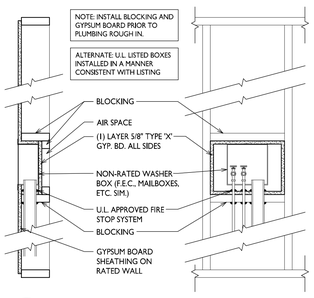
26 A-4.3 NOT USED
1" = 1'-0"



27 A-4.3 CONCEALED SPACES
1" = 1'-0"

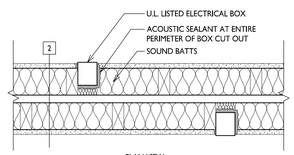


28 A-4.3 TRUSS PENETRATION OF FIRE BARRIER
1" = 1'-0"



29 A-4.3 RATED WALL PENETRATIONS
1" = 1'-0"

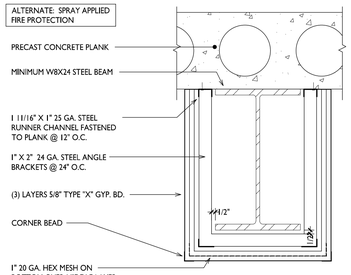
INCLUDING PLUMBING BOXES, FIRE EXTINGUISHER CABINETS, MAILBOXES, ETC.



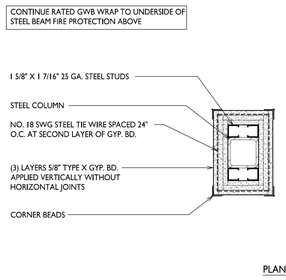
INSTALLATION NOTES:
- BOXES FROM DIFFERENT DWELLING UNITS SHALL NOT BE LOCATED IN THE SAME STUD CAVITY
- NEATLY TRIM ACOUSTIC INSULATION AROUND BOX
- FULLY COAT ENTIRE BOX WITH ACOUSTIC SEALANT (EXCEPT WHERE BOX HAS FIRE PROTECTIVE PUTTY PAD)
- SEAL ANNULAR SPACE AROUND BOX AFTER INSTALLATION OF GYP. BD.
- ALL MECHANICAL ROUGH-IN BOXES SHALL BE FIRESTOPPED WITH A LISTED SYSTEM

30 A-4.3 ELECTRICAL BOXES @ UNIT SEPARATION WALL
N.T.S.

21 A-4.3 2 HR SHAFT PLAN DETAIL
1/2" = 1'-0"



22 A-4.3 3 HR STEEL BEAM - GYP. BD. WRAP
1 1/2" = 1'-0" U.L. DESIGN NO. N505 - 3 HR

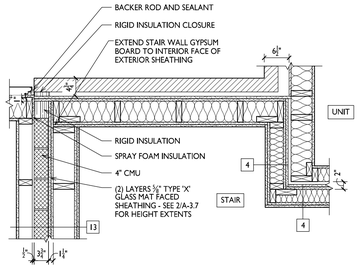


23 A-4.3 3 HR STEEL COL. - GYP. BD. WRAP
1 1/2" = 1'-0" IBC TABLE 720.1(1) I-7.3 - 3HR RATED

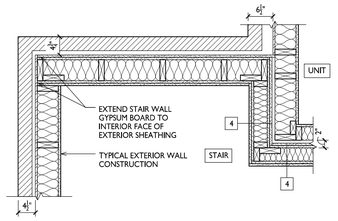
24 A-4.3 NOT USED
1" = 1'-0"

25 A-4.3 NOT USED
1" = 1'-0"

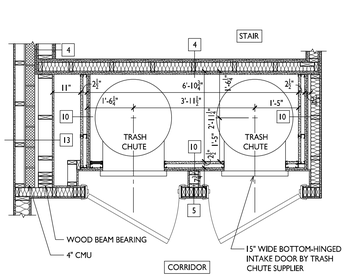
16 A-4.3 FIRE WALL TERMINATION
1" = 1'-0"



17 A-4.3 FIRE BARRIER TERMINATION DETAIL
3/4" = 1'-0"



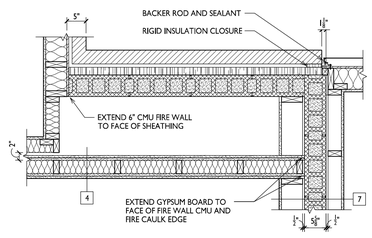
18 A-4.3 FIRE BARRIER TERMINATION DETAIL
3/4" = 1'-0"



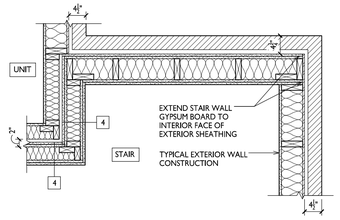
19 A-4.3 2 HR SHAFT PLAN DETAIL
1/2" = 1'-0"

20 A-4.3 NOT USED
1/2" = 1'-0"

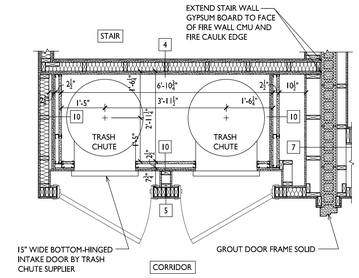
11 A-4.3 FIRE BARRIER TERMINATION
1" = 1'-0"



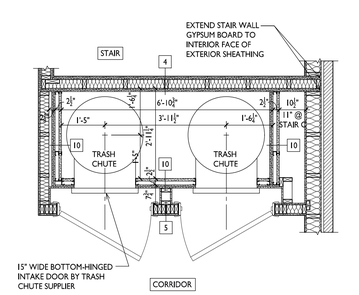
12 A-4.3 FIRE BARRIER TERMINATION DETAIL
3/4" = 1'-0"



13 A-4.3 FIRE BARRIER TERMINATION DETAIL
3/4" = 1'-0"

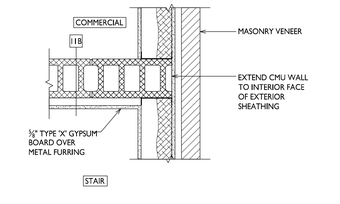


14 A-4.3 2 HR SHAFT PLAN DETAIL
1/2" = 1'-0"

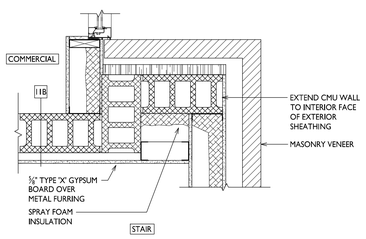


15 A-4.3 2 HR SHAFT PLAN DETAIL
1/2" = 1'-0"

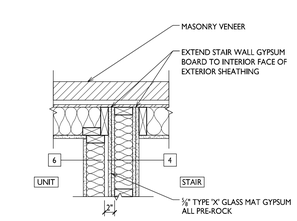
6 A-4.3 FIRE BARRIER TERMINATION
1" = 1'-0"



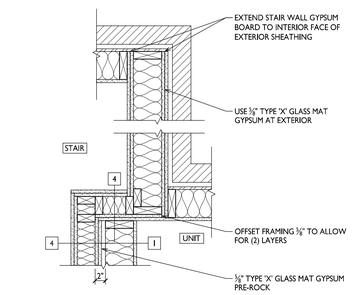
7 A-4.3 FIRE BARRIER TERMINATION
1" = 1'-0"



8 A-4.3 FIRE BARRIER TERMINATION
1" = 1'-0"

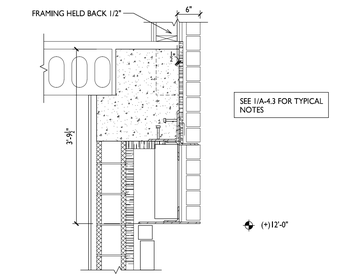


9 A-4.3 FIRE BARRIER TERMINATION
1" = 1'-0"

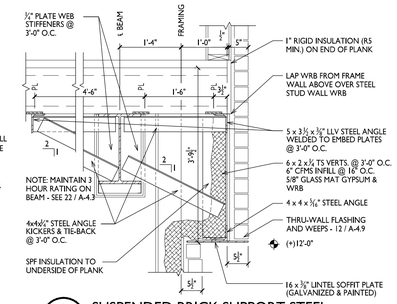


10 A-4.3 FIRE BARRIER TERMINATION
1" = 1'-0"

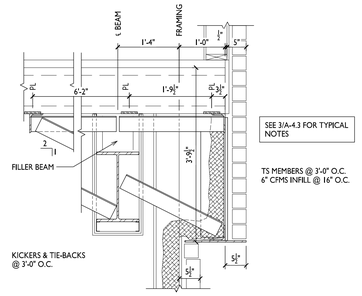
1 A-4.3 SUSPENDED BRICK AT PRECAST BEAM
3/4" = 1'-0" WEST SIDE OF STAIR A



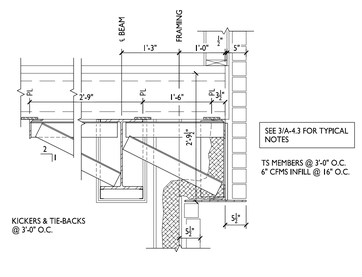
2 A-4.3 SUSPENDED BRICK AT PRECAST BEAM
3/4" = 1'-0" EAST SIDE OF STAIR A



3 A-4.3 SUSPENDED BRICK SUPPORT STEEL
3/4" = 1'-0" TYPICAL AT CANTILEVERED PRECAST



4 A-4.3 SUSPENDED BRICK SUPPORT STEEL
3/4" = 1'-0" AT PRECAST ON FILLER BEAM



5 A-4.3 SUSPENDED BRICK SUPPORT STEEL
3/4" = 1'-0" AT DROPPED PRECAST PLANK

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ISSUED
Issued for Bid: September 25, 2015
Revised Bid Sec: January 19, 2016
Issued For Plan Review: February 8, 2016
Minor Alteration: December 13, 2017
Revision to Previously Approved Plan - January 12, 2018
Revised Set - May 23, 2018

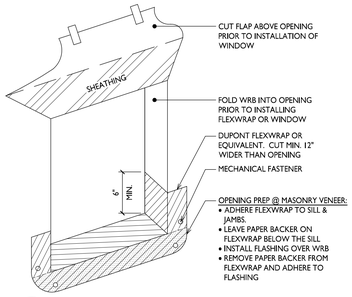
PROJECT TITLE
ROYSTER CROSSINGS

521-523 Grand Oak Trail
MADISON, WI

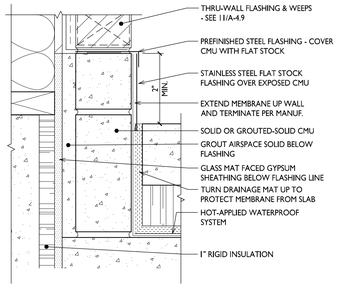
SHEET TITLE
Details

SHEET NUMBER
A-4.3

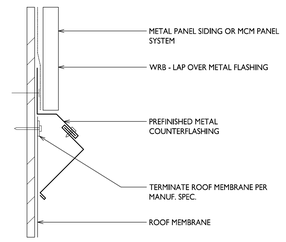
PROJECT NO. 1421



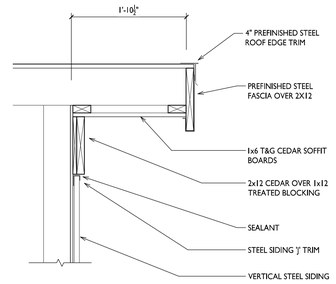
26 A-4.4 OPENING PREP FLASHING
NTS



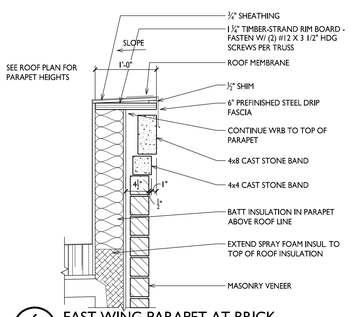
21 A-4.4 PLAZA FLASHING AT MASONRY
3" = 1'-0"



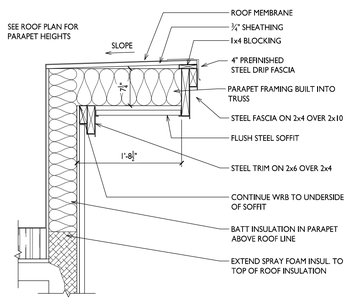
16 A-4.4 COUNTERFLASHING DETAIL
3" = 1'-0"



11 A-4.4 EAST WING - RAKE AT BAY
1" = 1'-0"

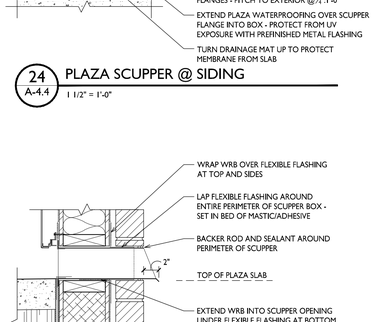


6 A-4.4 EAST WING PARAPET AT BRICK
1" = 1'-0"

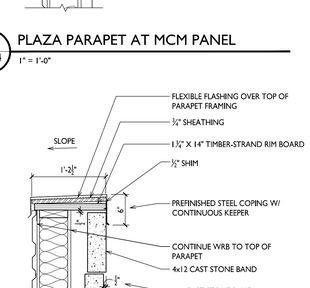


1 A-4.4 WEST WING PARAPET
1" = 1'-0"

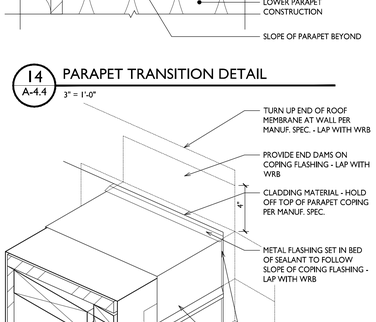
27 A-4.4 OPENING FLASHING
NTS



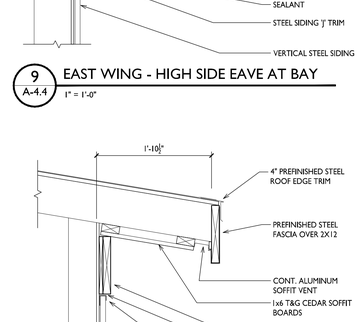
22 A-4.4 PLAZA FLASHING AT METAL PANEL
3" = 1'-0"



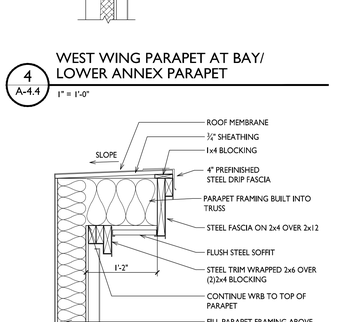
17 A-4.4 COUNTERFLASHING DETAIL
3" = 1'-0"



12 A-4.4 ELEVATOR CAP AT ROOF
1" = 1'-0"



7 A-4.4 EAST WING PARAPET AT METAL PANEL
1" = 1'-0"



2 A-4.4 WEST WING PARAPET AT FIRE BARRIER
1" = 1'-0"

28 A-4.4 PLAZA FLASHING AT CMU
1 1/2" = 1'-0"

23 A-4.4 CANOPY DETAIL
3/4" = 1'-0"

18 A-4.4 PLAZA PARAPET AT MASONRY
1" = 1'-0"

13 A-4.4 PARAPET TRANSITION DETAIL
3" = 1'-0"

8 A-4.4 EAST WING PARAPET AT FIRE BARRIER
1" = 1'-0"

3 A-4.4 WEST WING PARAPET AT BAY
1" = 1'-0"
MCM PANEL SOFFIT & FASCIA

24 A-4.4 PLAZA SCUPPER @ SIDING
1 1/2" = 1'-0"

19 A-4.4 PLAZA PARAPET AT MCM PANEL
1" = 1'-0"

14 A-4.4 PARAPET TRANSITION DETAIL
3" = 1'-0"

9 A-4.4 EAST WING - HIGH SIDE EAVE AT BAY
1" = 1'-0"

4 A-4.4 WEST WING PARAPET AT BAY/ LOWER ANNEX PARAPET
1" = 1'-0"

25 A-4.4 PLAZA SCUPPER DETAIL @ MASONRY
1 1/2" = 1'-0"

20 A-4.4 PLAZA PARAPET AT MASONRY
1" = 1'-0"

15 A-4.4 PARAPET FLASHING AT WALL
3" = 1'-0"
WHERE PARAPET INTERSECTS VERTICAL SURFACE

10 A-4.4 EAST WING - LOW SIDE EAVE AT BAY
1" = 1'-0"

5 A-4.4 UPPER ANNEX PARAPET
1" = 1'-0"

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ISSUED
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Issued For Plan Review: February 8, 2016
Minor Alteration: December 13, 2017
Revision to Previously Approved Plan - January 12, 2018
Revised Set - May 23, 2018

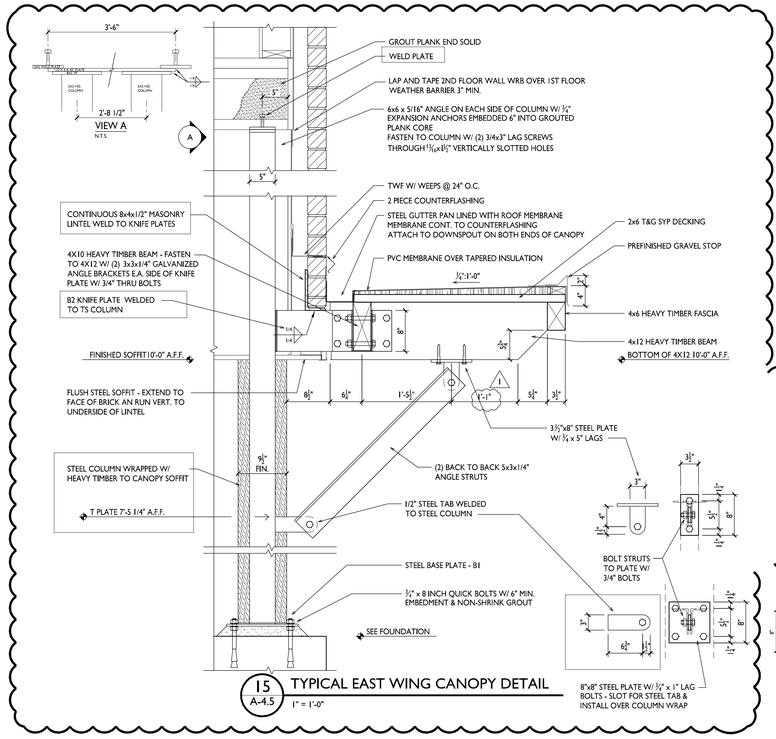
PROJECT TITLE
ROYSTER CROSSINGS

521-523 Grand Oak Trail
MADISON, WI

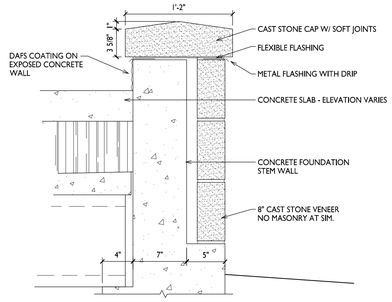
SHEET TITLE
Details

SHEET NUMBER
A-4.4

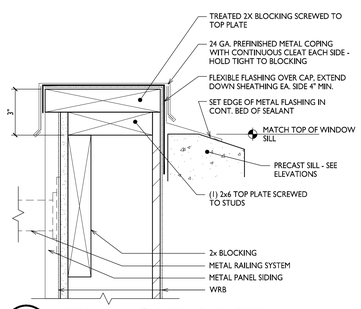
PROJECT NO. 1421



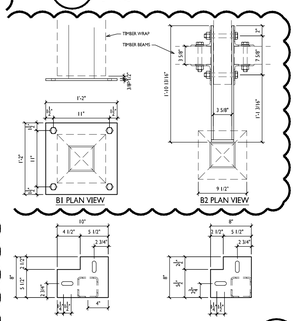
15 A-4.5 TYPICAL EAST WING CANOPY DETAIL
1" = 1'-0"

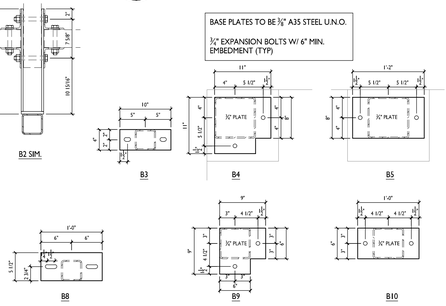


11 A-4.5 PLAZA/RETAINING WALL CAP DETAIL
3" = 1'-0"

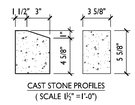


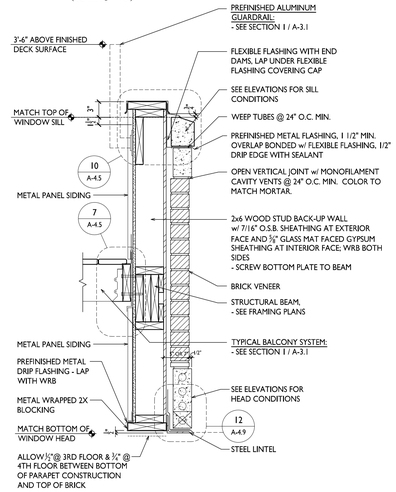
10 A-4.5 METAL CAP @ DECK PARAPETS
3" = 1'-0"



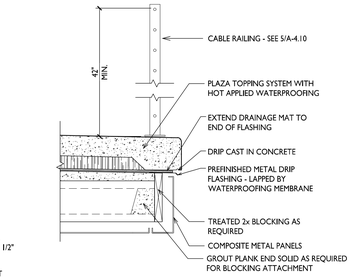


12 A-4.5 BASE PLATE DETAILS
1" = 1'-0"

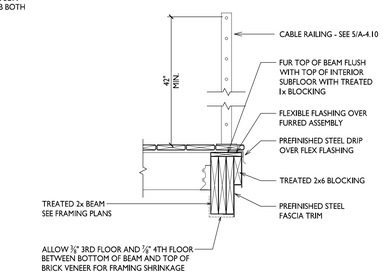




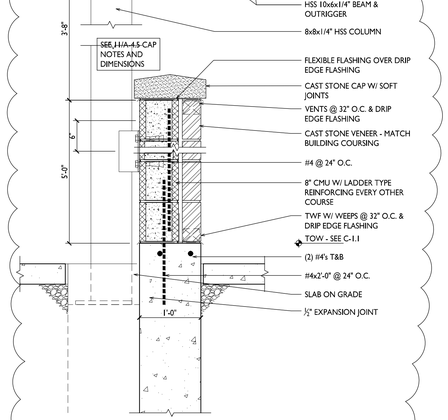
6 A-4.5 BALCONY PARAPET
1" = 1'-0"



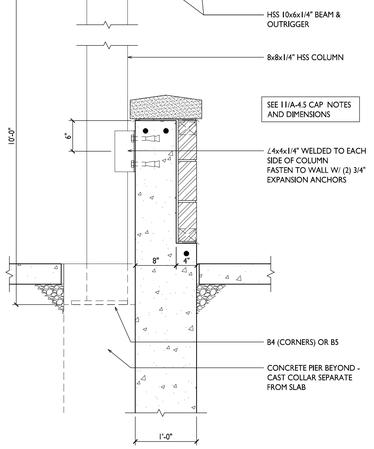
1 A-4.5 CONCRETE BALCONY EDGE
1" = 1'-0"



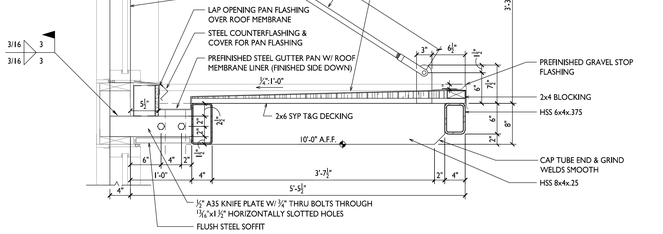
2 A-4.5 BALCONY / DECK EDGE
1" = 1'-0"



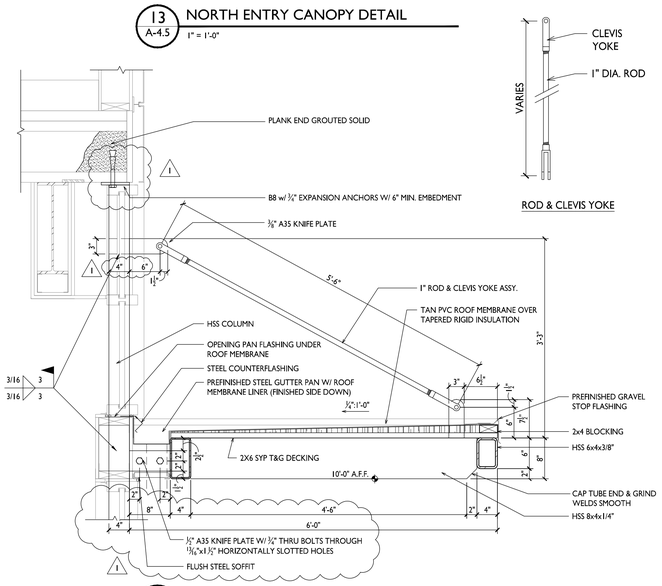
18 A-4.5 TRASH ENCLOSURE DETAIL
1" = 1'-0"



16 A-4.5 BIKE PARKING ENCLOSURE DETAIL
1" = 1'-0"

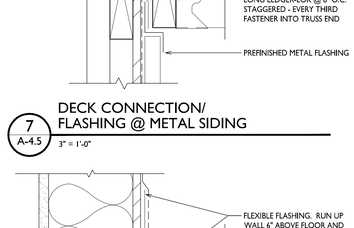


13 A-4.5 NORTH ENTRY CANOPY DETAIL
1" = 1'-0"

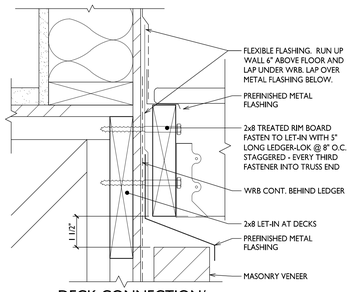


ROD & CLEVIS YOKE

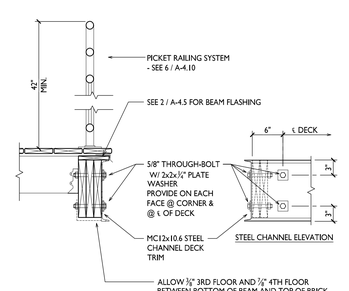
14 A-4.5 SOUTH CANOPY DETAIL
1" = 1'-0"



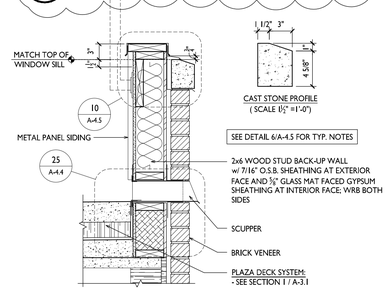
7 A-4.5 DECK CONNECTION/ FLASHING @ METAL SIDING
3" = 1'-0"



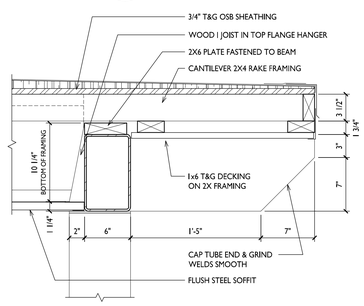
8 A-4.5 DECK CONNECTION/ FLASHING @ MASONRY
3" = 1'-0"



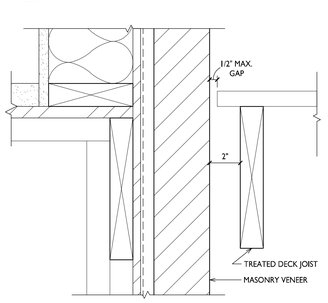
4 A-4.5 BALCONY / DECK EDGE
1" = 1'-0"
EAST WING BALCONIES



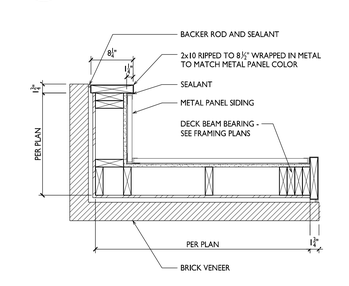
19 A-4.5 BALCONY PARAPET @ PLAZA DECK
1" = 1'-0"



17 A-4.5 ROOF EDGE DETAIL
1 1/2" = 1'-0"
BIKE PARKING AND TRASH ENCLOSURES



9 A-4.5 DECK FRAMING @ MASONRY
3" = 1'-0"



4 A-4.5 BALCONY COLUMN
1" = 1'-0"

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2 Coordinated w/ Precast / Steel Shops - May 18, 2018
1 Revised January 12, 2018

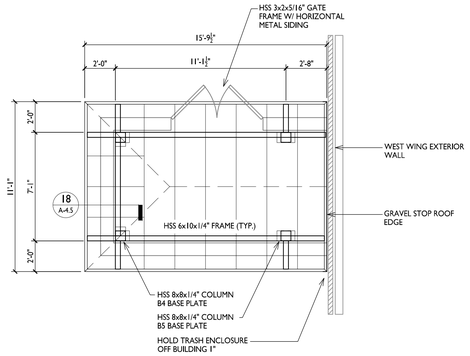
PROJECT TITLE
ROYSTER CROSSINGS

521-523 Grand Oak Trail
MADISON, WI

SHEET TITLE
Details

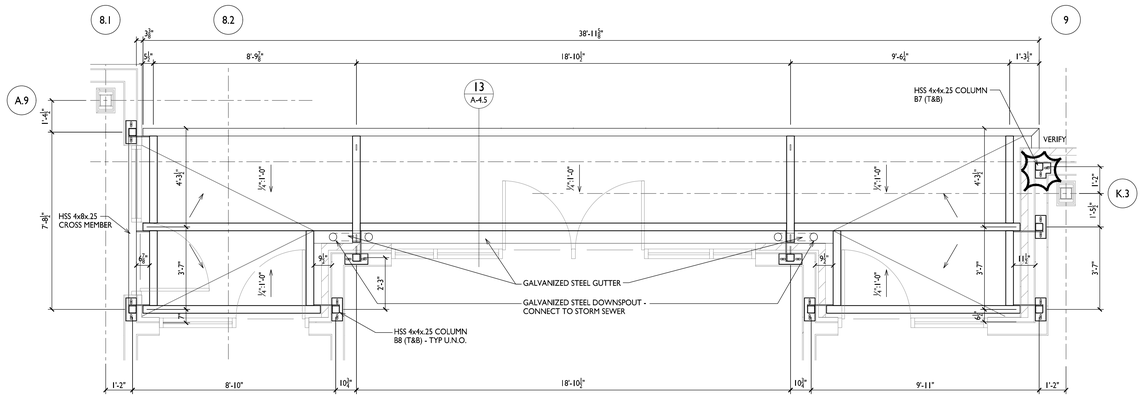
SHEET NUMBER
A-4.5

PROJECT NO. 1421



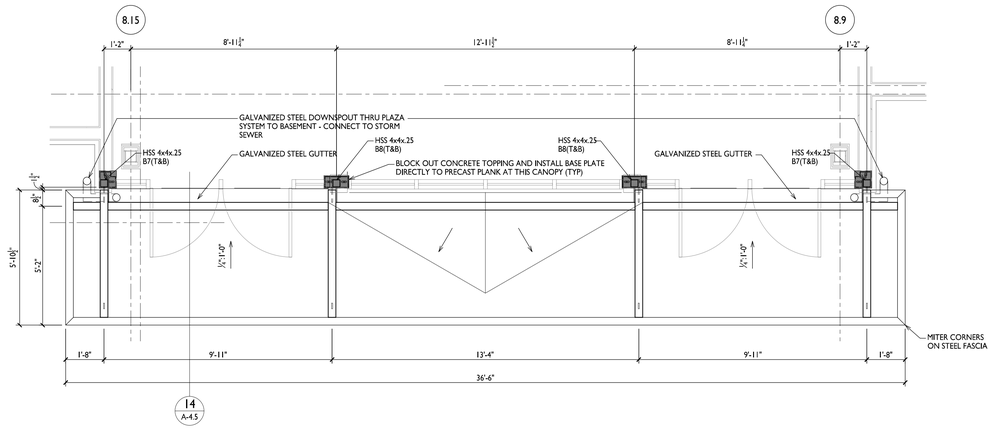
4 A-4.6 TRASH ENCLOSURE FRAMING PLAN

1/4" = 1'-0"



1 A-4.6 NORTH ENTRY CANOPY FRAMING

3/8" = 1'-0"



2 A-4.6 SOUTH ENTRY CANOPY FRAMING

3/8" = 1'-0"

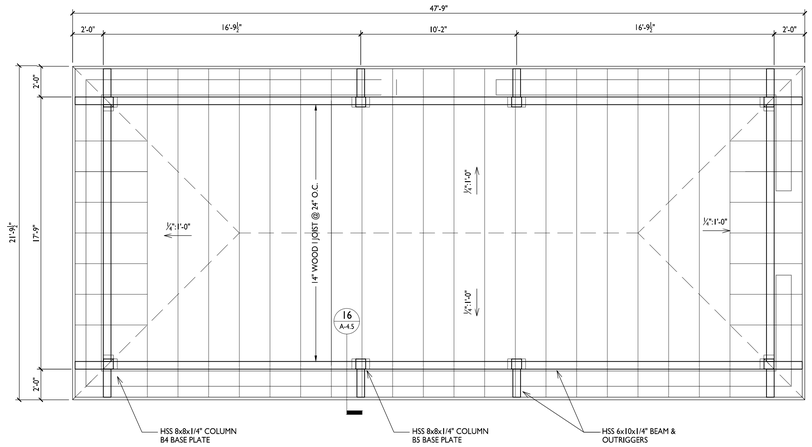
STEEL FRAMING NOTES:

FIELD VERIFY ALL DIMENSIONS PRIOR TO FABRICATION

EXTERIOR STEEL MEMBERS TO BE GALVANIZED

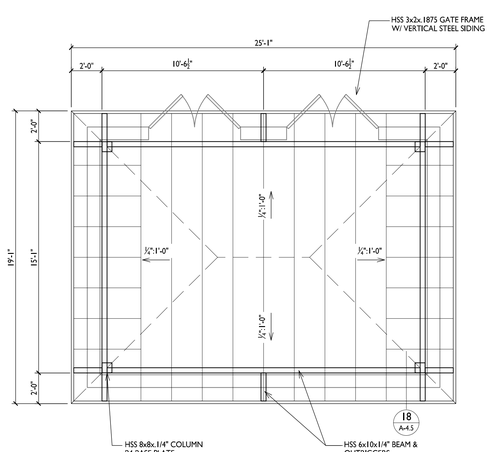
EXTERIOR STEEL MEMBERS TO BE SHOP PRIMED AND FIELD PAINTED U.N.O.

ALL BOLTED CONNECTIONS WITH GALVANIZED FASTENERS



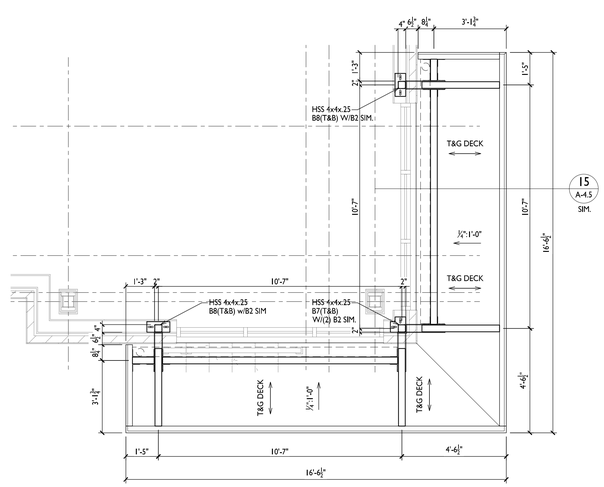
6 A-4.6 BIKE PARKING CANOPY FRAMING

1/4" = 1'-0"



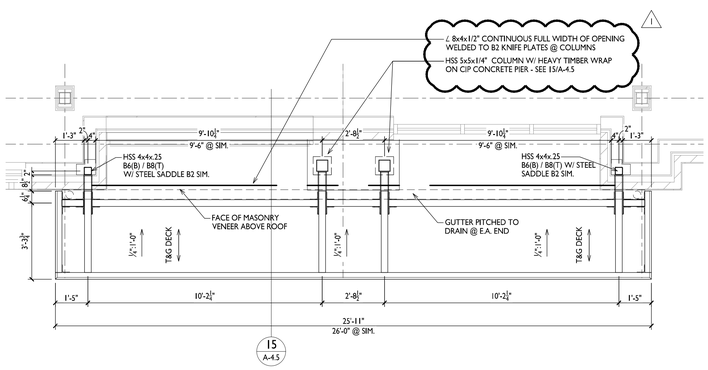
7 A-4.6 TRASH ENCLOSURE FRAMING PLAN

1/4" = 1'-0"



5 A-4.6 SOUTHEAST ENTRY CANOPY FRAMING

3/8" = 1'-0"



3 A-4.6 TYPICAL EAST WING CANOPY FRAMING

3/8" = 1'-0"

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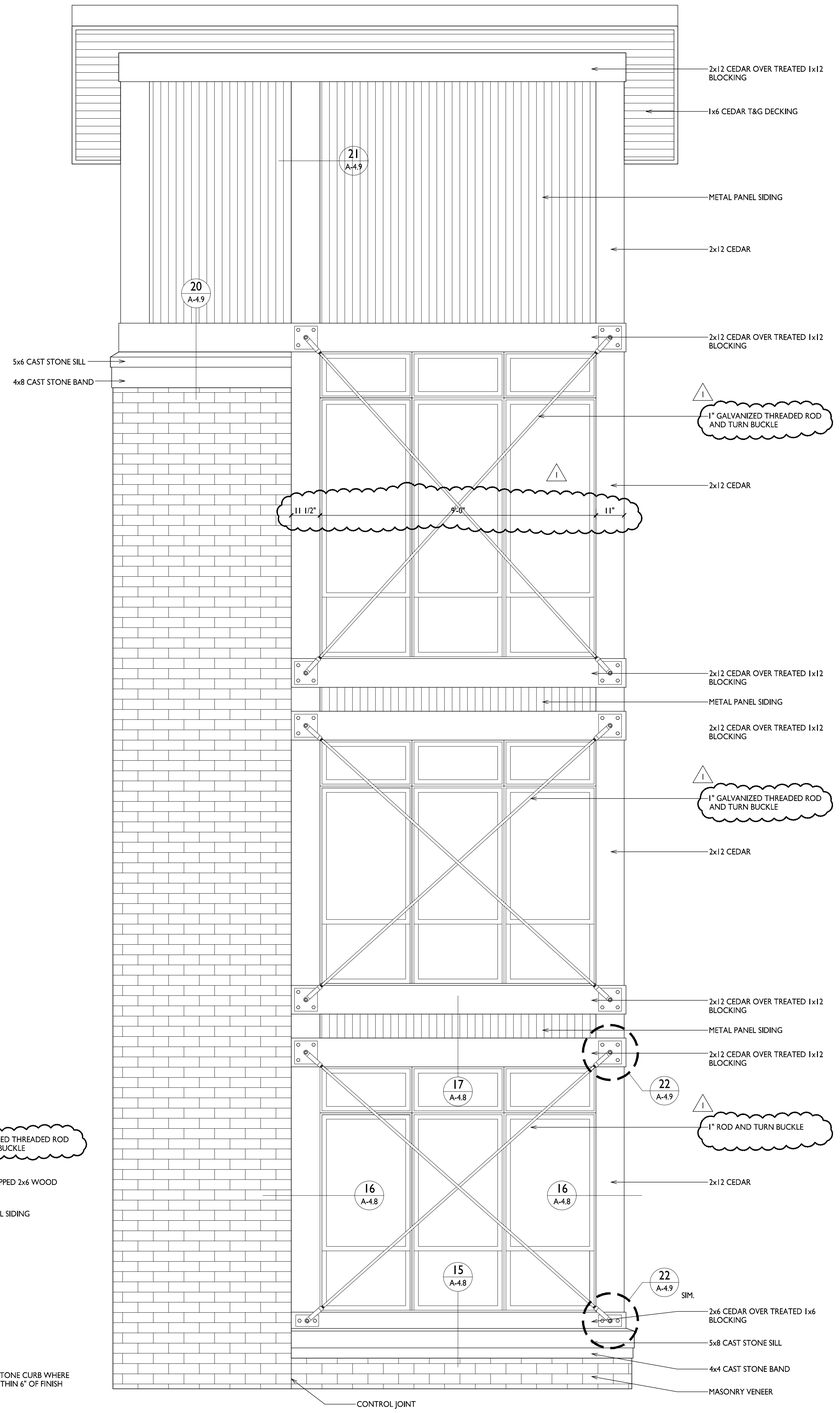
PROJECT TITLE
ROYSTER CROSSINGS

521-523 Grand Oak Trail
MADISON, WI

SHEET TITLE
Details

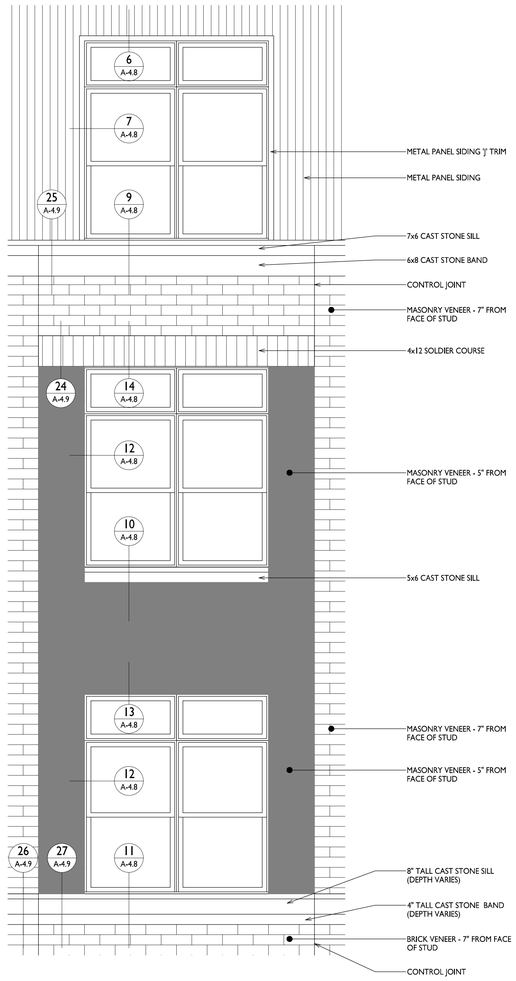
SHEET NUMBER
A-4.6

PROJECT NO. 1421

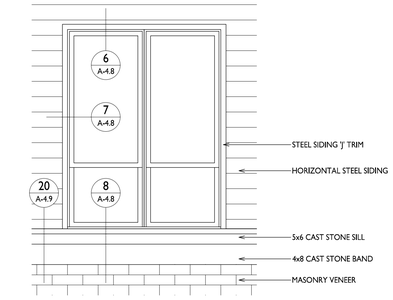


5 A-4.7 EAST WING WINDOW DETAIL
1/2" = 1'-0"

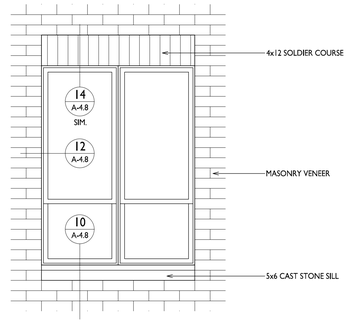
6 A-4.7 METAL PANEL INFILL DETAIL
1/2" = 1'-0"



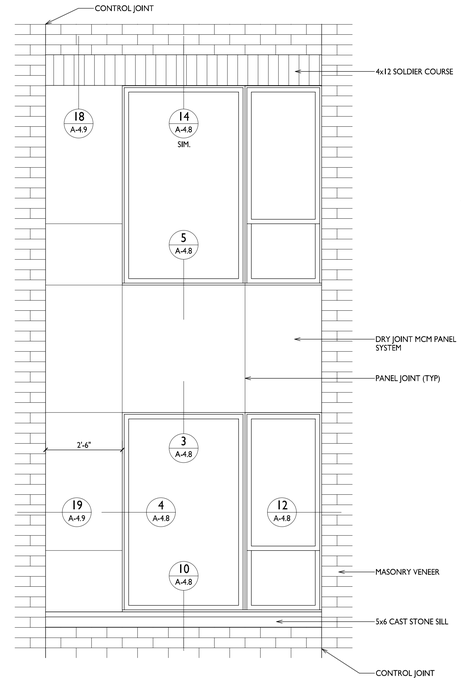
4 A-4.7 EAST WING WINDOW DETAIL
1/2" = 1'-0"



1 A-4.7 WEST WING WINDOW DETAIL
1/2" = 1'-0"



2 A-4.7 WEST WING WINDOW DETAIL
1/2" = 1'-0"



3 A-4.7 WEST WING WINDOW DETAIL
1/2" = 1'-0"

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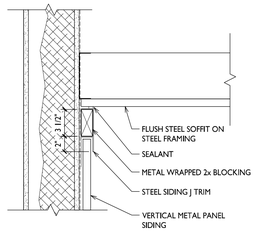
PROJECT TITLE
ROYSTER CROSSINGS

521-523 Grand Oak Trail
MADISON, WI

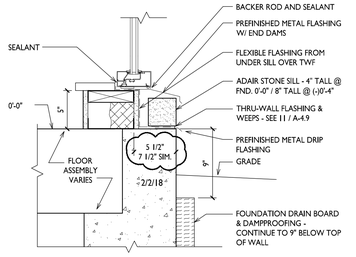
SHEET TITLE
Details

SHEET NUMBER
A-4.7

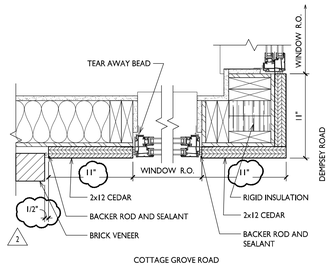
PROJECT NO. 1421



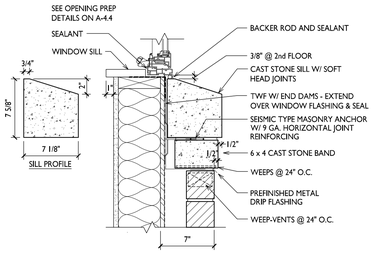
26 A-4.8 STEEL SIDING @ FLUSH STEEL SOFFIT
1 1/2" = 1'-0"



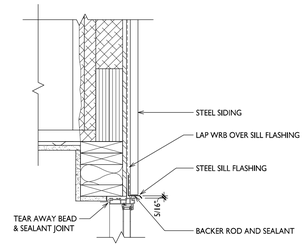
21 A-4.8 STORefront SILL @ MASONRY - EAST
1 1/2" = 1'-0"



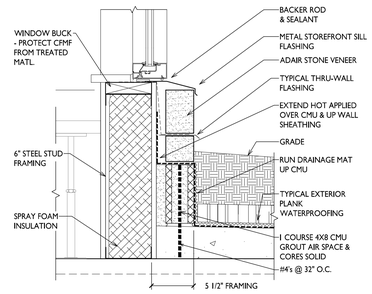
16 A-4.8 WINDOW JAMB @ EAST BAY
1 1/2" = 1'-0"



11 A-4.8 WINDOW SILL @ MASONRY VENEER
1 1/2" = 1'-0"



6 A-4.8 WINDOW HEAD @ STEEL SIDING
1 1/2" = 1'-0"



1 A-4.8 EXT. WALL ON PRECAST BELOW GRADE
1 1/2" = 1'-0"

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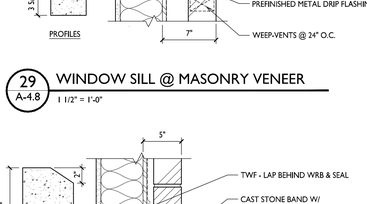
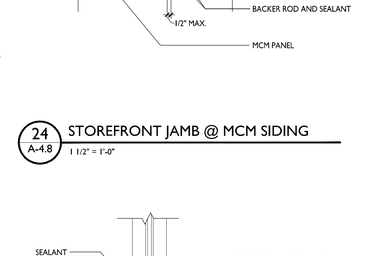
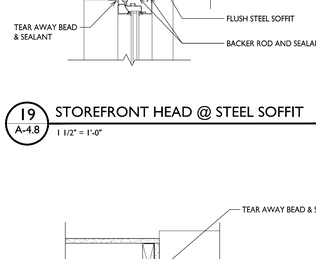


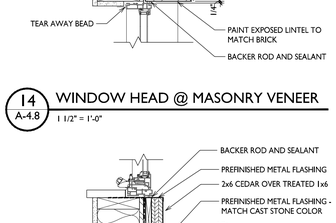
27 A-4.8 BRICK TO STEEL SIDING TRANSITION
1 1/2" = 1'-0"



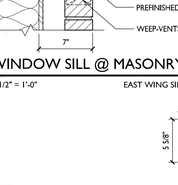
22 A-4.8 STORefront SILL @ MASONRY - WEST
1" = 1'-0"



17 A-4.8 WINDOW HEAD @ EAST BAY
1 1/2" = 1'-0"

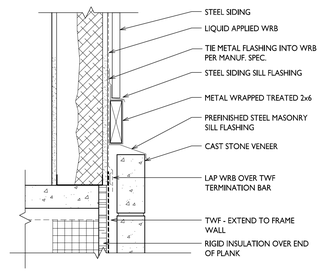


12 A-4.8 WINDOW JAMB @ MASONRY VENEER
1 1/2" = 1'-0"

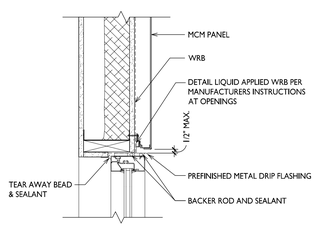


7 A-4.8 WINDOW JAMB @ METAL PANEL SIDING
1 1/2" = 1'-0"

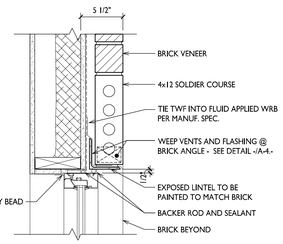
2 A-4.8 NOT USED
1 1/2" = 1'-0"



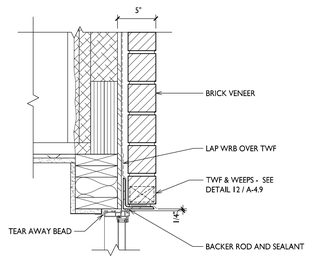
28 A-4.8 STEEL SIDING SILL @ MASONRY
1 1/2" = 1'-0"



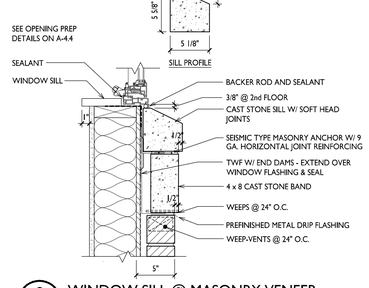
23 A-4.8 STORefront HEAD @ MCM SIDING
1 1/2" = 1'-0"



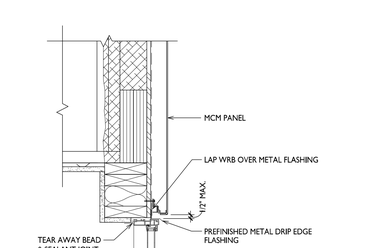
18 A-4.8 STOREFRONT HEAD @ MASONRY
1 1/2" = 1'-0"



13 A-4.8 WINDOW HEAD @ MASONRY VENEER
1 1/2" = 1'-0"



8 A-4.8 WINDOW SILL @ MASONRY VENEER
1 1/2" = 1'-0" WEST WING TWO-PIECE SILL



3 A-4.8 WINDOW HEAD @ MCM SIDING
1 1/2" = 1'-0"

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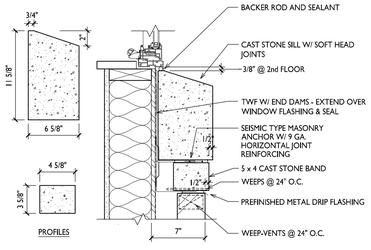
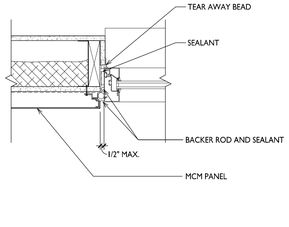
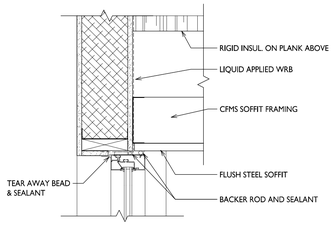


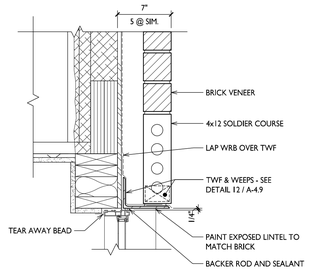
29 A-4.8 WINDOW SILL @ MASONRY VENEER
1 1/2" = 1'-0"



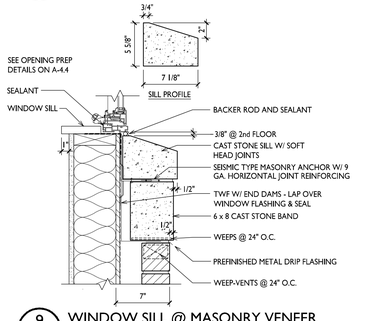
24 A-4.8 STOREFRONT JAMB @ MCM SIDING
1 1/2" = 1'-0"



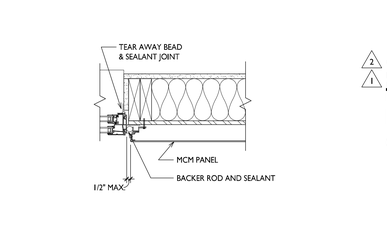
19 A-4.8 STOREFRONT HEAD @ STEEL SOFFIT
1 1/2" = 1'-0"



14 A-4.8 WINDOW HEAD @ MASONRY VENEER
1 1/2" = 1'-0"



9 A-4.8 WINDOW SILL @ MASONRY VENEER
1 1/2" = 1'-0" EAST WING SILL @ 7" BRICK VENEER



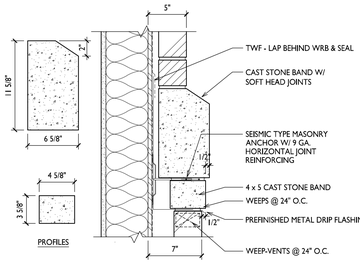
4 A-4.8 WINDOW JAMB @ MCM SIDING
1 1/2" = 1'-0"

2 Coordinated w/ Precast / Steel Shops - May 18, 2018
1 Implemented City's LOI Clarifications - August 7, 2017

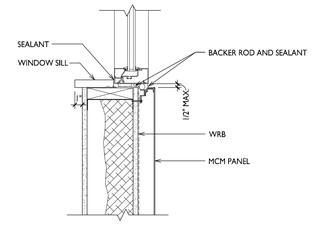
PROJECT TITLE
ROYSTER CROSSINGS

521-523 Grand Oak Trail
MADISON, WI

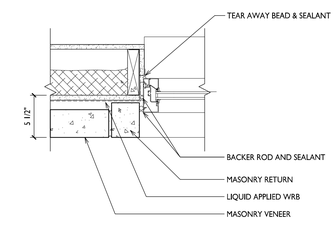
SHEET TITLE
Details



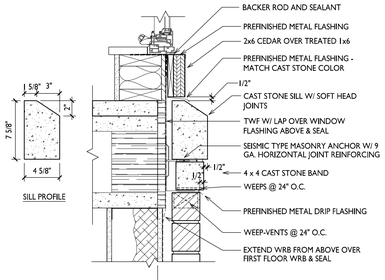
30 A-4.8 PRECAST BAND @ MASONRY VENEER
1 1/2" = 1'-0"



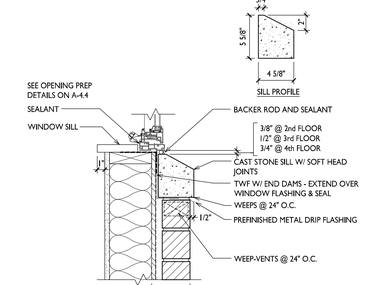
25 A-4.8 STOREFRONT SILL @ MCM SIDING
1 1/2" = 1'-0"



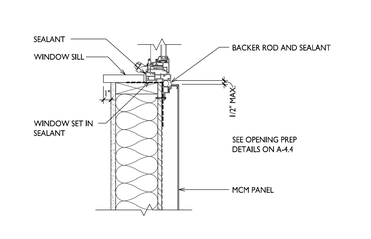
20 A-4.8 STOREFRONT JAMB @ MASONRY
1 1/2" = 1'-0"



15 A-4.8 WINDOW SILL @ EAST BAY
1 1/2" = 1'-0"



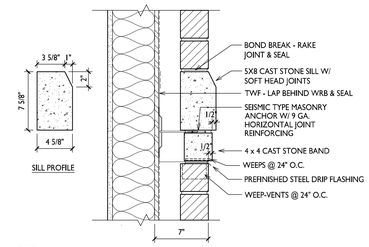
10 A-4.8 WINDOW SILL @ MASONRY VENEER
1 1/2" = 1'-0" EAST & WEST WING SILL



5 A-4.8 WINDOW SILL @ MCM SIDING
1 1/2" = 1'-0"

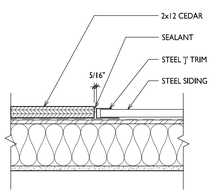
SHEET NUMBER
A-4.8

PROJECT NO. 1421



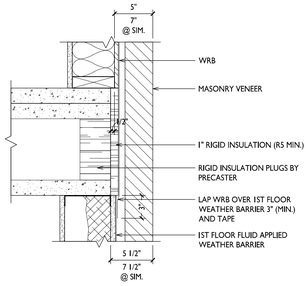
26 A-4.9 CAST STONE BAND

1 1/2" = 1'-0" AT 7" BRICK VENEER



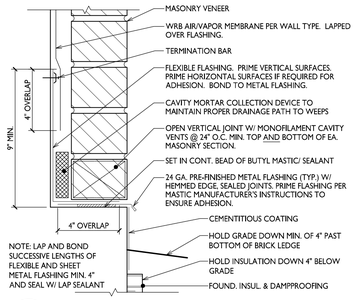
21 A-4.9 METAL PANEL SIDING TRANSITION DETAIL

1 1/2" = 1'-0"



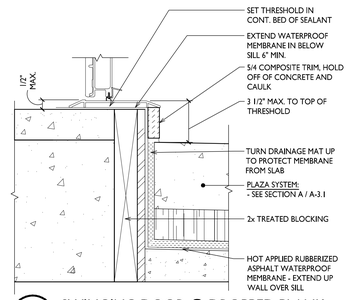
16 A-4.9 PLANK EDGE DETAIL @ OFFSET FRAMING

1 1/2" = 1'-0"



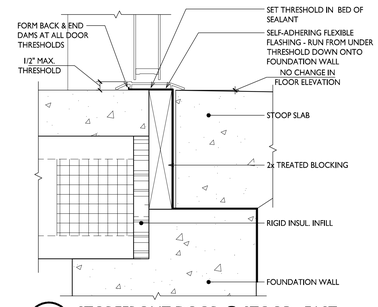
11 A-4.9 FLASHING @ MASONRY BASE COURSE

3" = 1'-0"



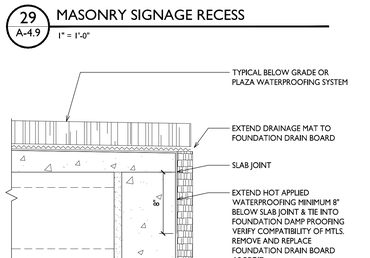
6 A-4.9 SWINGING DOOR @ DROPPED PLANK

3" = 1'-0"



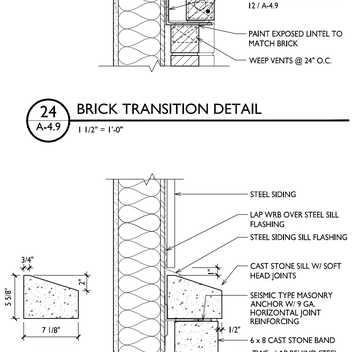
1 A-4.9 STOREFRONT DOOR @ STOOP - EAST

3" = 1'-0"



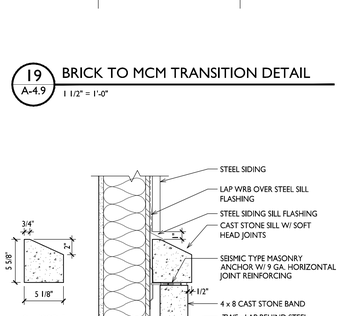
27 A-4.9 CAST STONE BAND

1 1/2" = 1'-0" AT 7" TO 5" BRICK VENEER TRANSITION



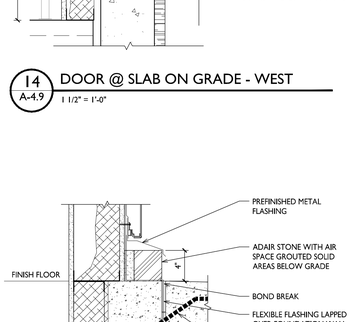
22 A-4.9 WINDOW HEAD @ EAST BAY

1 1/2" = 1'-0"



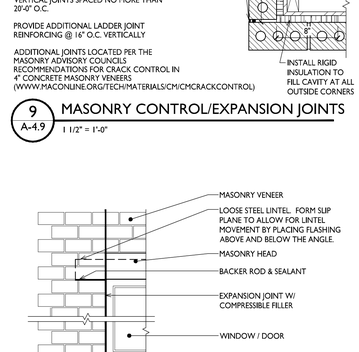
17 A-4.9 PLANK EDGE DETAIL @ ALIGNED FRAMING

1 1/2" = 1'-0"



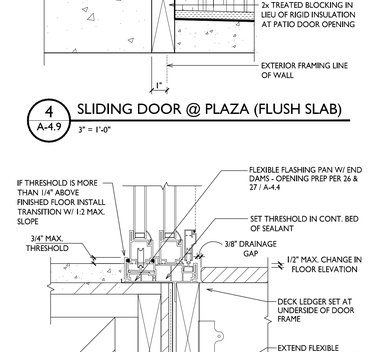
12 A-4.9 FLASHING @ SHELF ANGLE / LINTEL

3" = 1'-0"



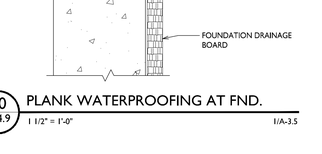
7 A-4.9 SWINGING DOOR FLASHING @ DECK

3" = 1'-0"



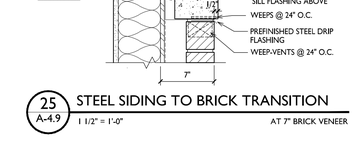
2 A-4.9 STOREFRONT DOOR @ PLAZA

3" = 1'-0"



28 A-4.9 RECESSED MASONRY COURSE

1 1/2" = 1'-0"



23 A-4.9 VERTICAL STEEL SIDING TO MASONRY

1 1/2" = 1'-0" EAST BAY WITH CEDAR TRIM

18 A-4.9 BRICK TO MCM TRANSITION DETAIL

1 1/2" = 1'-0"

13 A-4.9 WALL BASE @ MASONRY - WEST

1 1/2" = 1'-0"

8 A-4.9 WALK DOOR AT LOADING DOCK

1 1/2" = 1'-0"

3 A-4.9 SLIDING DOOR @ DROPPED SLAB

3" = 1'-0"

29 A-4.9 MASONRY SIGNAGE RECESS

1" = 1'-0"

24 A-4.9 BRICK TRANSITION DETAIL

1 1/2" = 1'-0"

19 A-4.9 BRICK TO MCM TRANSITION DETAIL

1 1/2" = 1'-0"

14 A-4.9 DOOR @ SLAB ON GRADE - WEST

1 1/2" = 1'-0"

9 A-4.9 MASONRY CONTROL/EXPANSION JOINTS

1 1/2" = 1'-0"

4 A-4.9 SLIDING DOOR @ PLAZA (FLUSH SLAB)

3" = 1'-0"

30 A-4.9 PLANK WATERPROOFING AT FND.

1 1/2" = 1'-0" 1/A-3.5

25 A-4.9 STEEL SIDING TO BRICK TRANSITION

1 1/2" = 1'-0" AT 7" BRICK VENEER

20 A-4.9 STEEL SIDING TO BRICK TRANSITION

1 1/2" = 1'-0" AT 5" BRICK VENEER

15 A-4.9 WALL BASE @ COMPOSITE METAL (WEST)

1 1/2" = 1'-0"

10 A-4.9 VERT. MASONRY EXPANSION JOINT @ OPENING

1" = 1'-0"

5 A-4.9 SLIDING DOOR FLASHING @ DECK

3" = 1'-0"

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Minor Alteration: December 13, 2017
Revision to Previously Approved Plan - January 12, 2018
Revised Set - May 23, 2018

1 Implemented City's LOI Clarifications - August 7, 2017

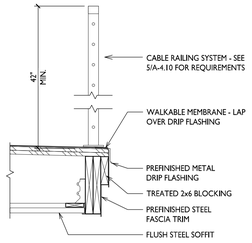
PROJECT TITLE
ROYSTER CROSSINGS

521-523 Grand Oak Trail
MADISON, WI

SHEET TITLE
Details

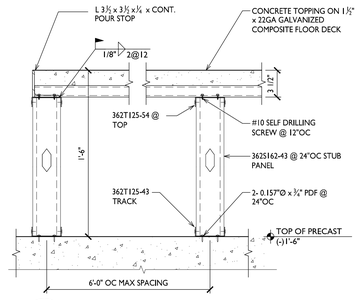
SHEET NUMBER
A-4.9

PROJECT NO. 1421



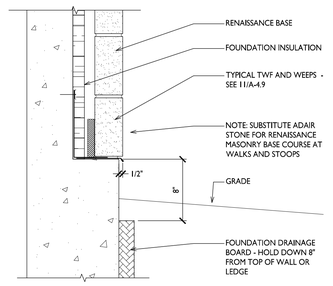
8 A-4.10 BALCONY / DECK EDGE

1" = 1'-0" — WEST WING AT WALKABLE MEMBRANE



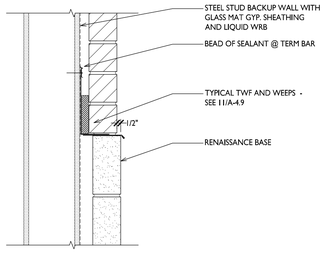
9 A-4.10 INFILL COMPOSITE FLOOR SYSTEM

1 1/2" = 1'-0" — AT DROPPED PLANK WHERE ACCESS FLOORING DOES NOT OCCUR



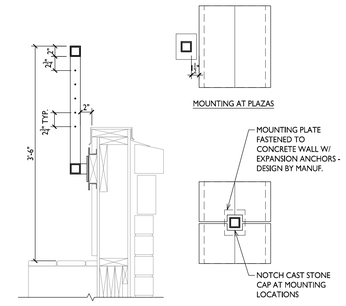
10 A-4.10 RENAISSANCE BASE @ DROPPED LEDGE

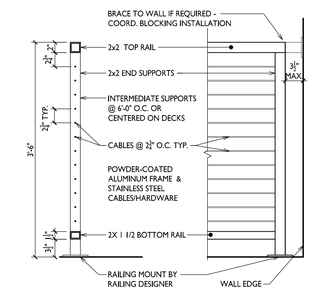
1 1/2" = 1'-0"



11 A-4.10 RENAISSANCE TO BRICK TRANSITION

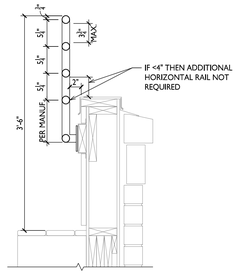
1 1/2" = 1'-0"

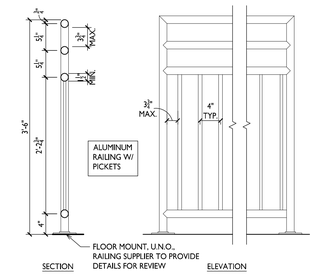




5 A-4.10 CABLE RAILING

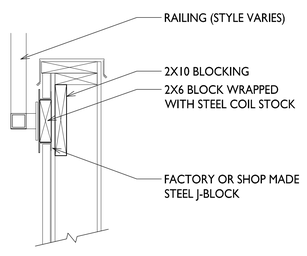
1" = 1'-0"





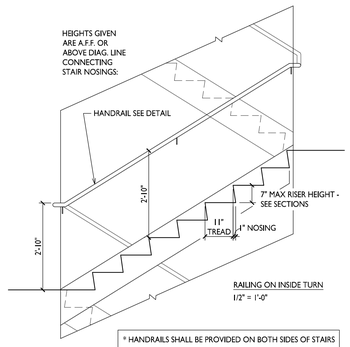
6 A-4.10 ALUMINUM PICKET RAILING

1" = 1'-0"



7 A-4.10 RAILING ATTACHMENT AT PARAPET

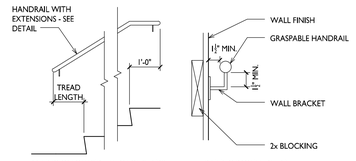
1 1/2" = 1'-0"



* HANDRAILS SHALL BE PROVIDED ON BOTH SIDES OF STAIRS

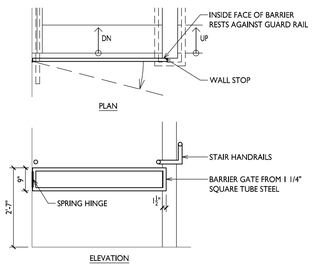
* HANDRAILS SHALL HAVE EXTENSIONS PER THIS DRAWING. EXTENSIONS SHALL RETURN TO A WALL, GUARD, OR THE WALKING SURFACE. EXCEPTION: HANDRAILS ON INSIDE TURN OF STAIRS MAY BE CONTINUOUS

* STEEL STAIRS, GUARDS, AND HANDRAILS TO BE PREPARED FOR FINISH PER SPECS.



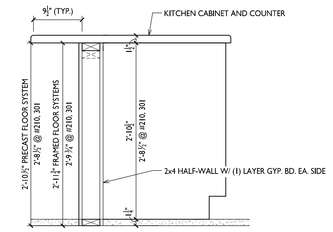
1 A-4.10 TYPICAL STAIR RAILING

1/2" = 1'-0"



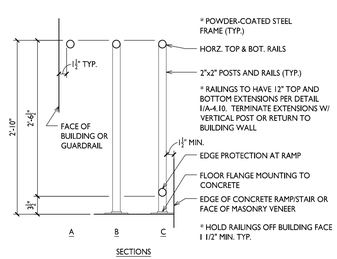
2 A-4.10 STAIR BARRIER GATE

1/2" = 1'-0"



3 A-4.10 BREAKFAST COUNTER SECTION

1" = 1'-0"



4 A-4.10 HANDRAILS @ SITE RAMPS / STAIRS

1" = 1'-0"

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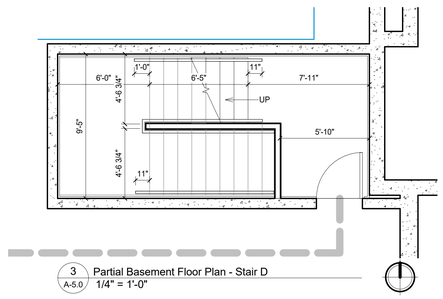
PROJECT TITLE
ROYSTER CROSSINGS

521-523 Grand Oak Trail
MADISON, WI

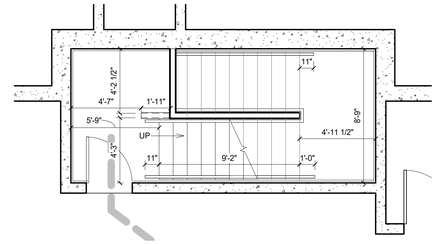
SHEET TITLE
Details

SHEET NUMBER
A-4.10

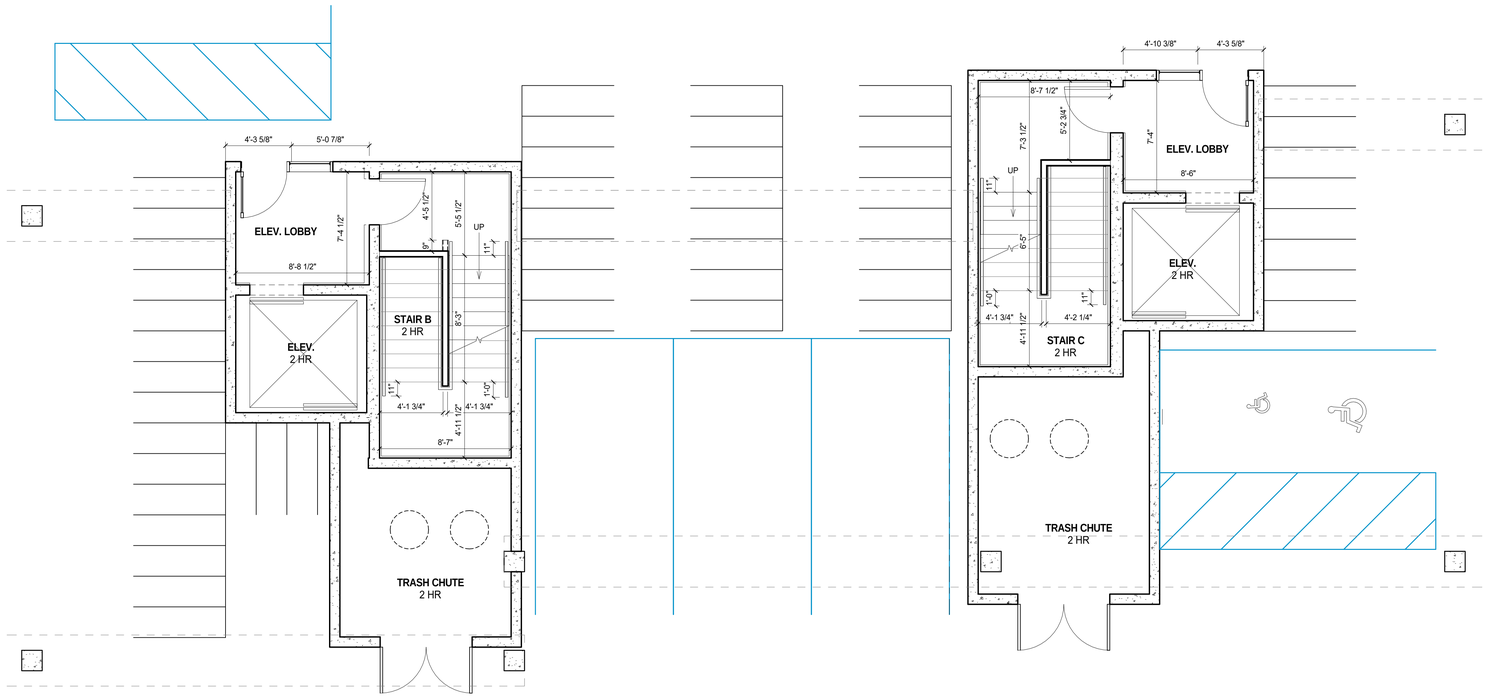
PROJECT NO. 1421



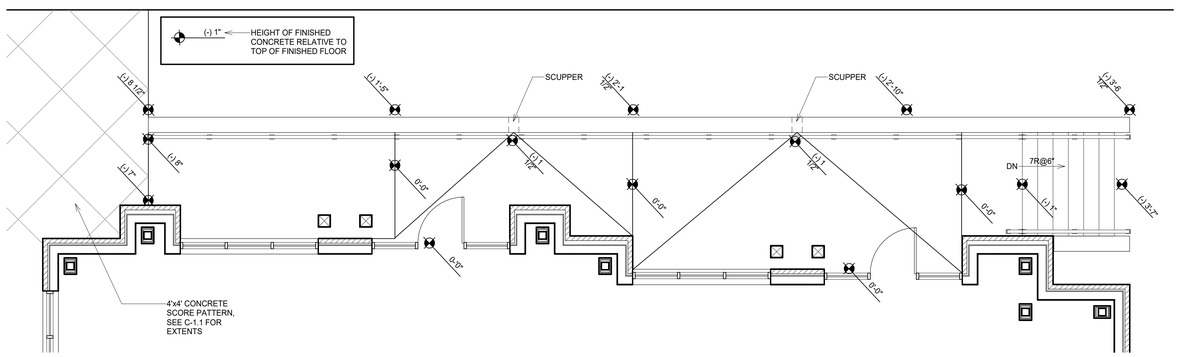
3 A-5.0 Partial Basement Floor Plan - Stair D
1/4" = 1'-0"



1 A-5.0 Partial Basement Floor Plan - Stair A
1/4" = 1'-0"



2 A-5.0 Partial Basement Floor Plan - Stairs B & C
1/4" = 1'-0"



4 A-5.0 Northeast Terrace Plaza Sloping
1/4" = 1'-0"

GENERAL NOTES:

1. SEE TITLE SHEET T-1.1 FOR BUILDING CODE REQUIREMENTS AND ADDITIONAL INFORMATION.
2. TYPICAL AT ALL TUB / SHOWERS AND CONCEALED SPACES ADJACENT TO FIRE RATED CONSTRUCTION (i.e. BEARING WALLS, PARTY WALLS, CORRIDOR WALLS...), PROVIDE (1) LAYER 5/8" TYPE 'X' GYPSUM BOARD ON THE RATED WALL SEGMENT BEHIND TUB / SHOWER UNIT AND IN CONCEALED SPACES, AS INDICATED ON PLANS BY BOLD DASHED LINE - ---------- SEE DETAIL 27/A-4.3
3. SEE SHEET A-7.1 FOR ADDITIONAL NOTES REGARDING ALL ACCESSIBILITY REQUIREMENTS.
4. ALL BATHROOMS TO BE PROVIDED WITH AUTOMATIC SPRINKLER PROTECTION
5. PROVIDE OFFSET CONTROLS ON ALL TUB / SHOWER UNITS.
6. PROVIDE ARCHITECT WITH BATHROOM & KITCHEN CABINET SHOP DRAWINGS FOR REVIEW AND APPROVAL PRIOR FABRICATION & INSTALLATION.
7. SEE 3 / A-4.10 FOR TYPICAL BREAKFAST COUNTER SECTION
8. DIMENSIONS ARE TO FACE OF STUD FRAMING AND CENTERLINE OF STRUCTURAL COLUMNS, TYP.
9. ALL DROPPED SOFFITS / BULKHEADS TO BE CONSTRUCTED OF TYPE "C" GYPSUM BOARD ON 2x WOOD FRAMING. RATED CEILING ASSEMBLY TO RUN CONTINUOUS ABOVE SOFFIT / BULKHEAD - SEE 27 / A-4.3
10. SMOKE DETECTORS TO BE PROVIDED IN EACH BEDROOM, OUTSIDE EACH SLEEPING AREA, AND ON ALL FLOOR LEVELS IN CORRIDORS. SMOKE DETECTORS SHALL BE INTERCONNECTED AND POWERED WITH BUILDING POWER WITH A BATTERY BACKUP.
11. CARBON MONOXIDE DETECTORS TO BE INSTALLED IN ACCORDANCE WITH WISCONSIN COMM. 62.1200.
12. HORIZONTAL WALL-MOUNTED MAILBOXES SHALL COMPLY WITH USPS STD-4C.
-MIN. COMPARTMENT SIZE OF 12" W x 15" D x 3" H
-1 PARCEL CLOSET FOR EACH 10 CUSTOMER APARTMENTS
-AT LEAST ONE CUSTOMER COMPARTMENT POSITIONED 48" MAX. A.F.F.
-NO PARCEL LOCKER POSITIONED LESS THAN 15" A.F.F.
-NO PATRON LOCK POSITIONED ABOVE 67" A.F.F. OR SHELF LESS THAN 28" A.F.F.
-USPS ARROW LOCK LOCATED BETWEEN 36" AND 48" A.F.F.

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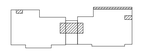
KEY PLAN



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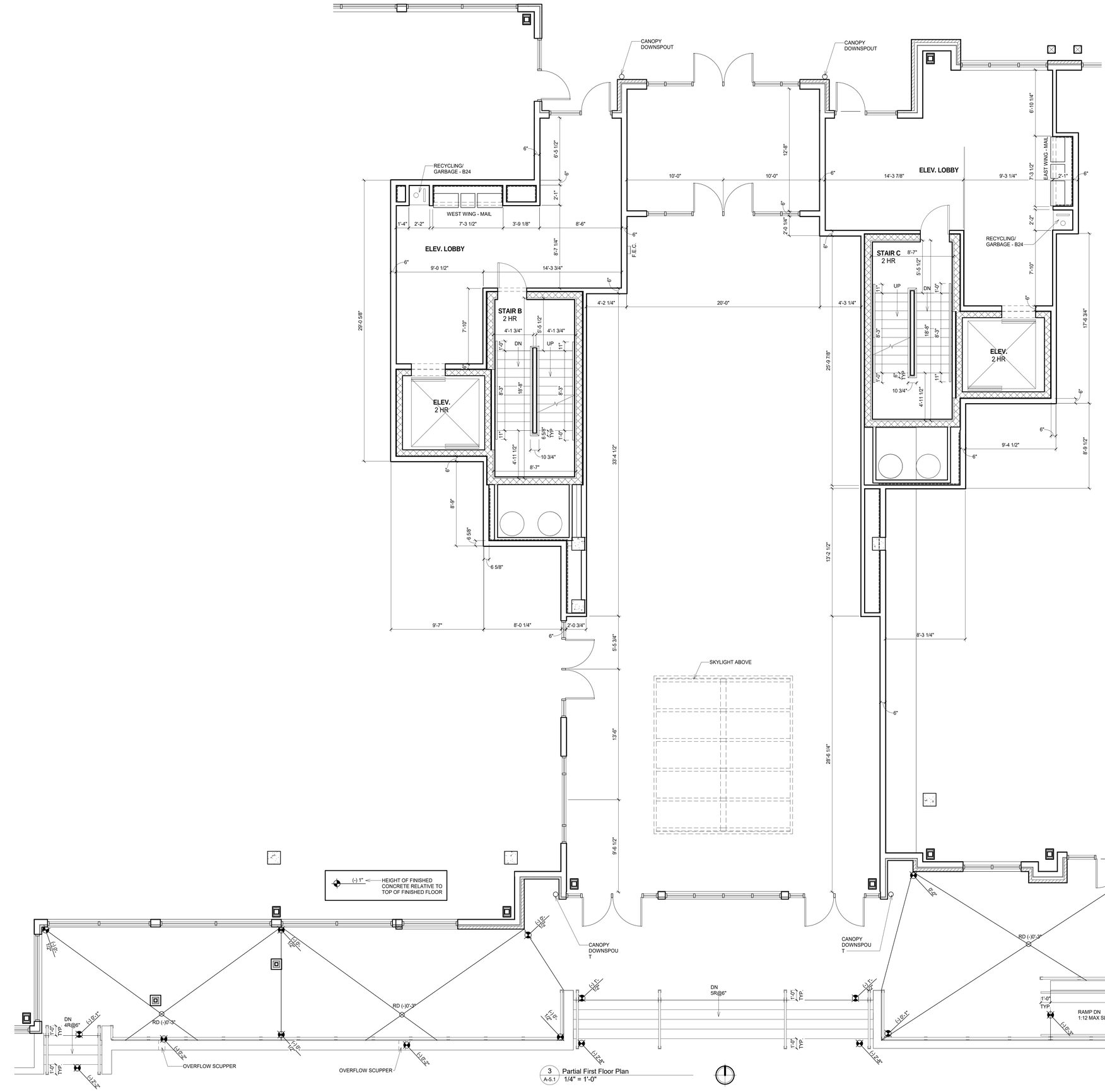
PROJECT TITLE
ROYSTER CROSSINGS

521-523 Grand Oak Trail MADISON, WI

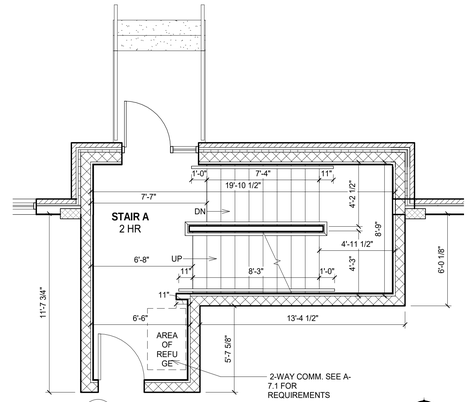
SHEET TITLE
Basement Stair Plans & Plaza Sloping Plans

SHEET NUMBER
A-5.0

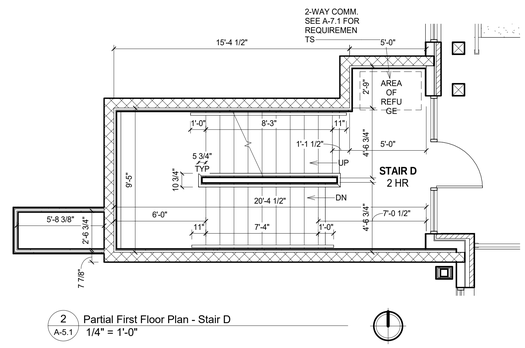
PROJECT NUMBER 1421



3 A-5.1 Partial First Floor Plan
1/4" = 1'-0"



1 A-5.1 Partial First Floor Plan - Stair A
1/4" = 1'-0"



2 A-5.1 Partial First Floor Plan - Stair D
1/4" = 1'-0"

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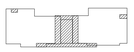
KEY PLAN



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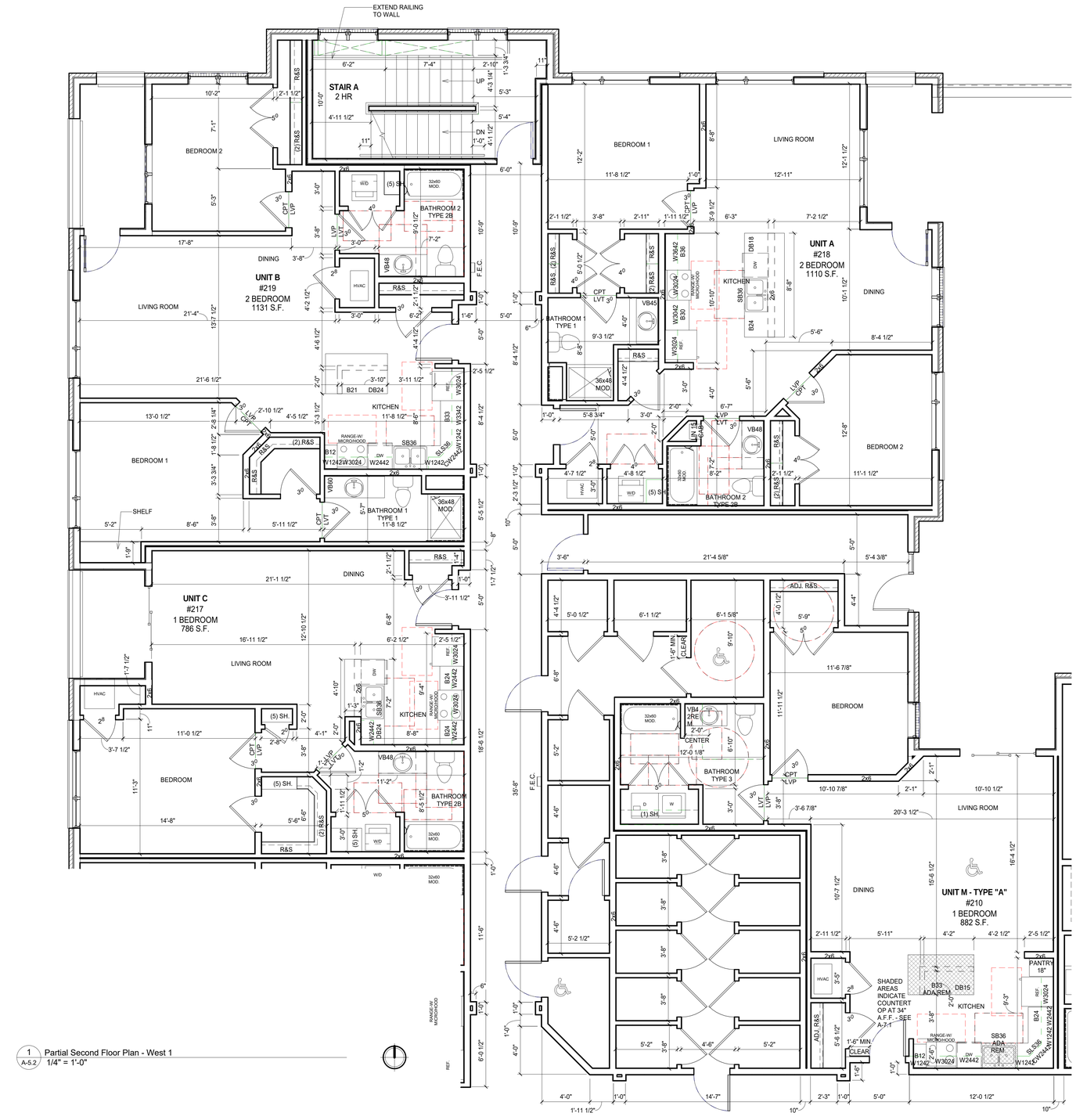
PROJECT TITLE
ROYSTER CROSSINGS

521-523 Grand Oak Trail MADISON, WI

SHEET TITLE
Partial First Floor Plans

SHEET NUMBER
A-5.1

PROJECT NUMBER 1421



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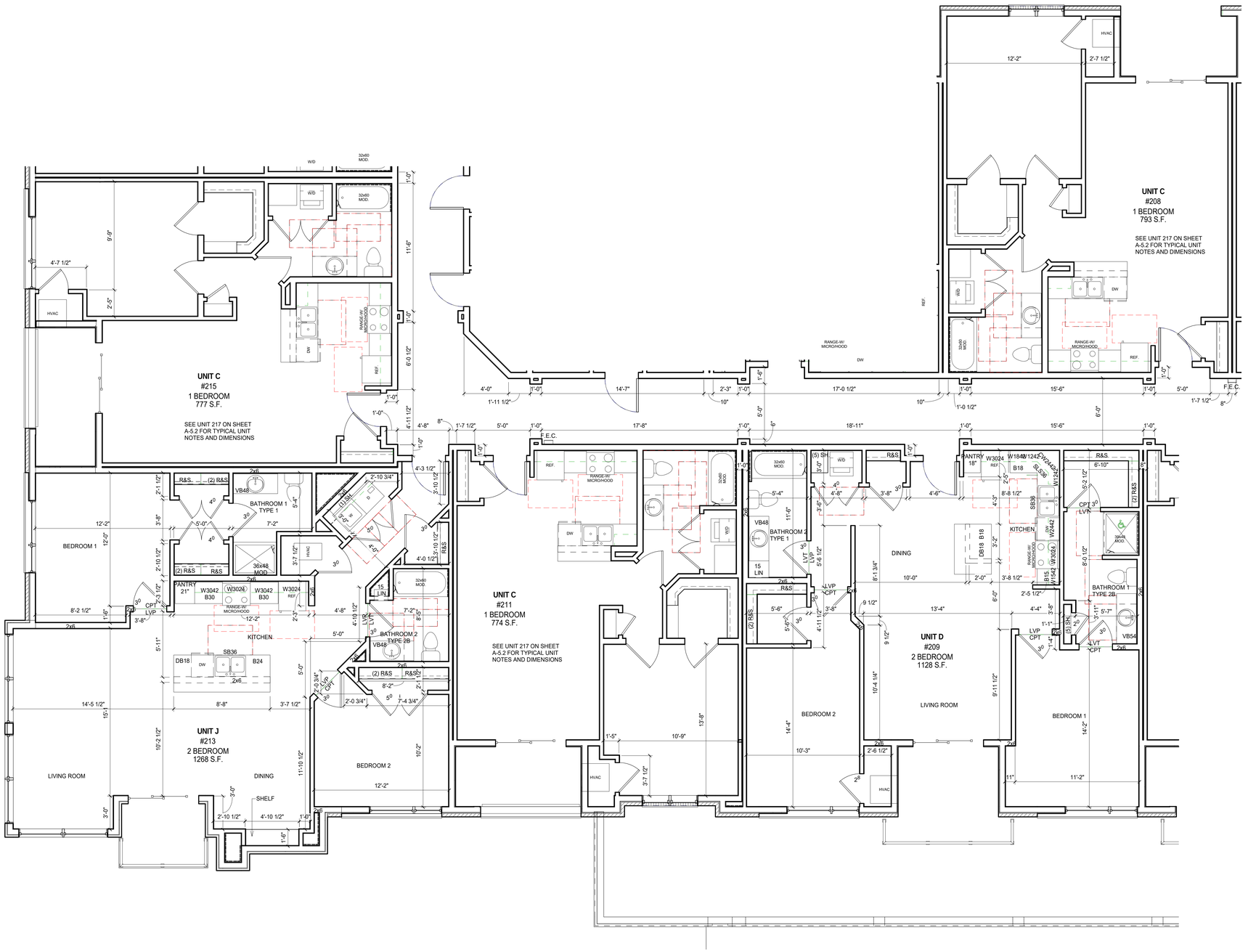
PROJECT TITLE
ROYSTER CROSSINGS

521-523 Grand Oak Trail MADISON, WI

SHEET TITLE
Partial Second Floor Plan - West

SHEET NUMBER
A-5.2

PROJECT NUMBER 1421



1 A-5.3 Partial Second Floor Plan - West 2
1/4" = 1'-0"

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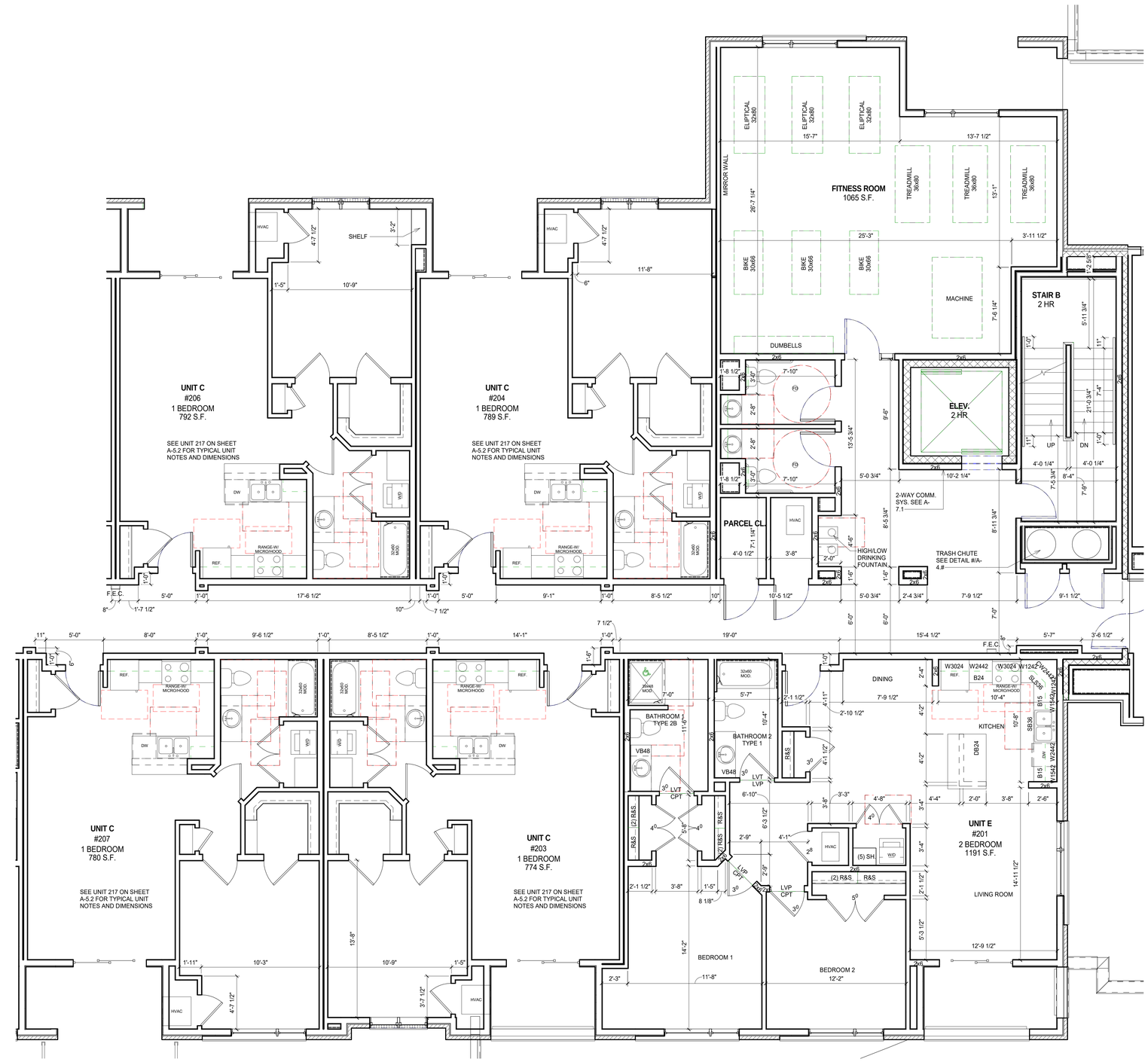
PROJECT TITLE
ROYSTER CROSSINGS

521-523 Grand Oak Trail MADISON, WI

SHEET TITLE
Partial Second Floor Plan - West

SHEET NUMBER
A-5.3

PROJECT NUMBER 1421



1 A-5.4 Partial Second Floor Plan - West 3
1/4" = 1'-0"

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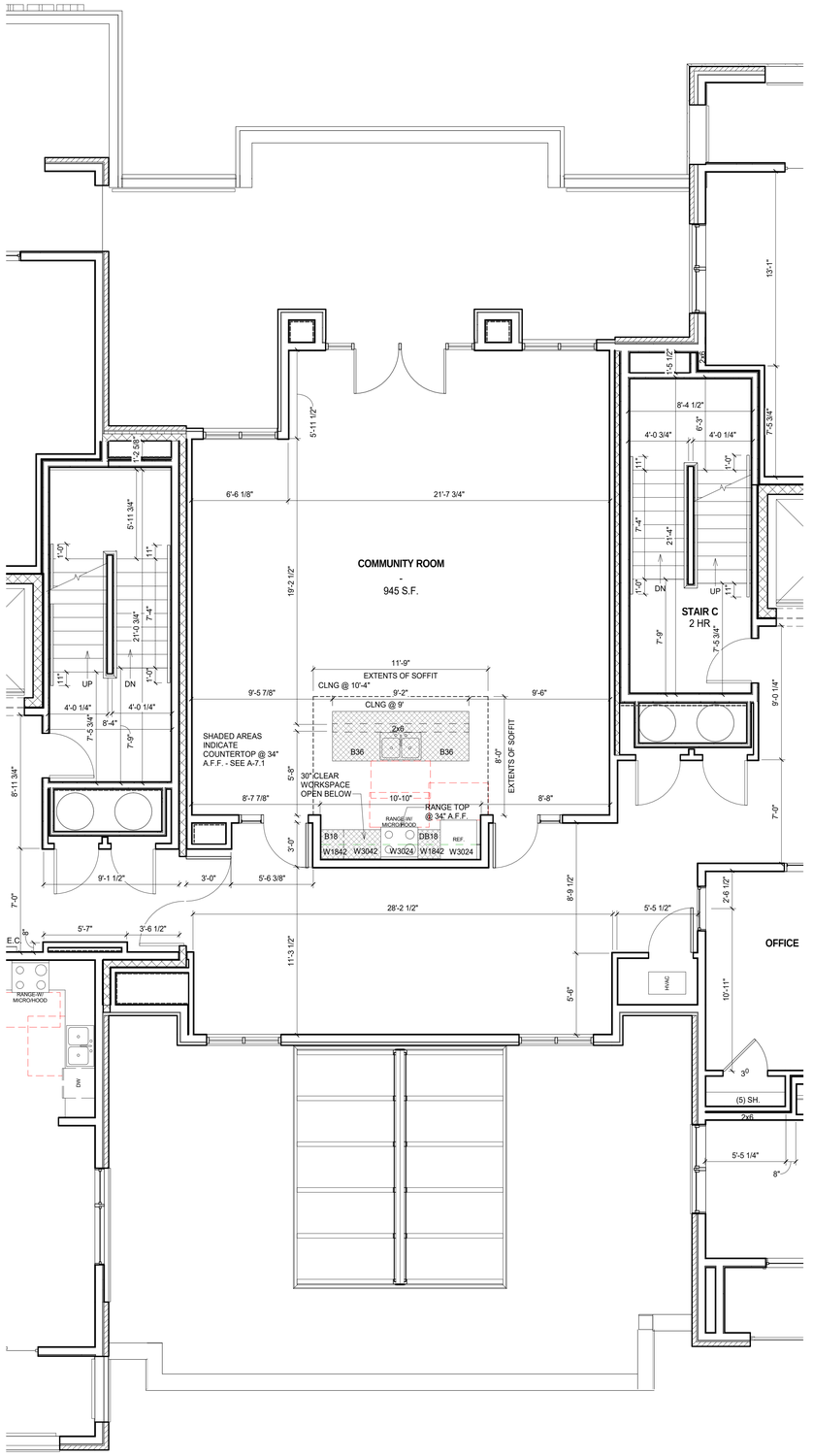
PROJECT TITLE
ROYSTER CROSSINGS

521-523 Grand Oak Trail MADISON, WI

SHEET TITLE
Partial Second Floor Plan - West

SHEET NUMBER
A-5.4

PROJECT NUMBER 1421



1 A-5.5 Partial Second Floor Plan - Comm. Rm.
1/4" = 1'-0"

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1 Revised - November 18, 2015

PROJECT TITLE

ROYSTER CROSSINGS

521-523 Grand Oak Trail MADISON, WI

SHEET TITLE

Partial Second Floor Plan - Annex

SHEET NUMBER

A-5.5

PROJECT NUMBER 1421

1 A-5.6 Partial Second Floor Plan - East 1
1/4" = 1'-0"

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PROJECT TITLE
ROYSTER CROSSINGS

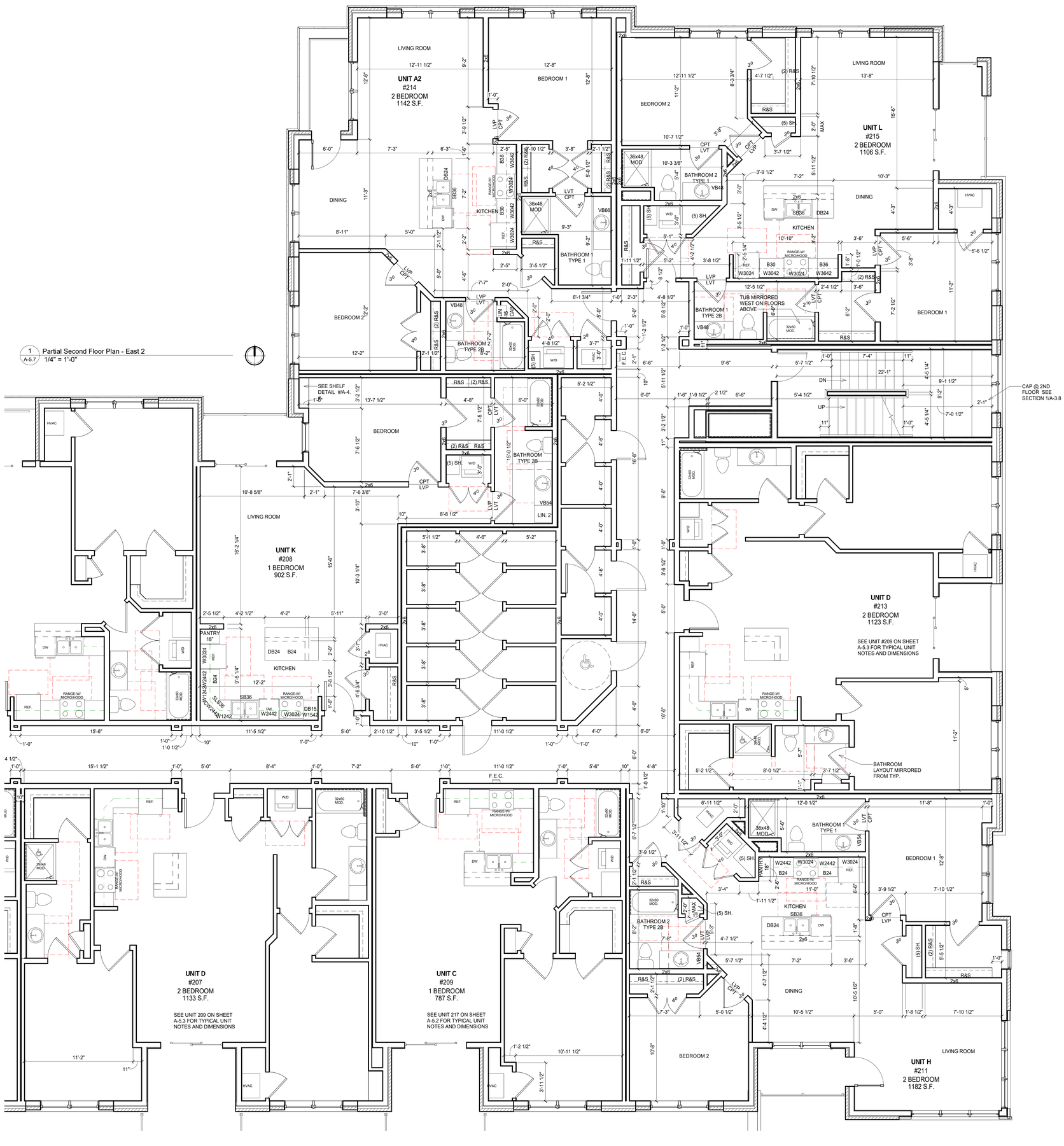
521-523 Grand Oak Trail MADISON, WI

SHEET TITLE
Partial Second Floor Plan - East

SHEET NUMBER
A-5.6

PROJECT NUMBER 1421

1 A-5.7 Partial Second Floor Plan - East 2
1/4" = 1'-0"



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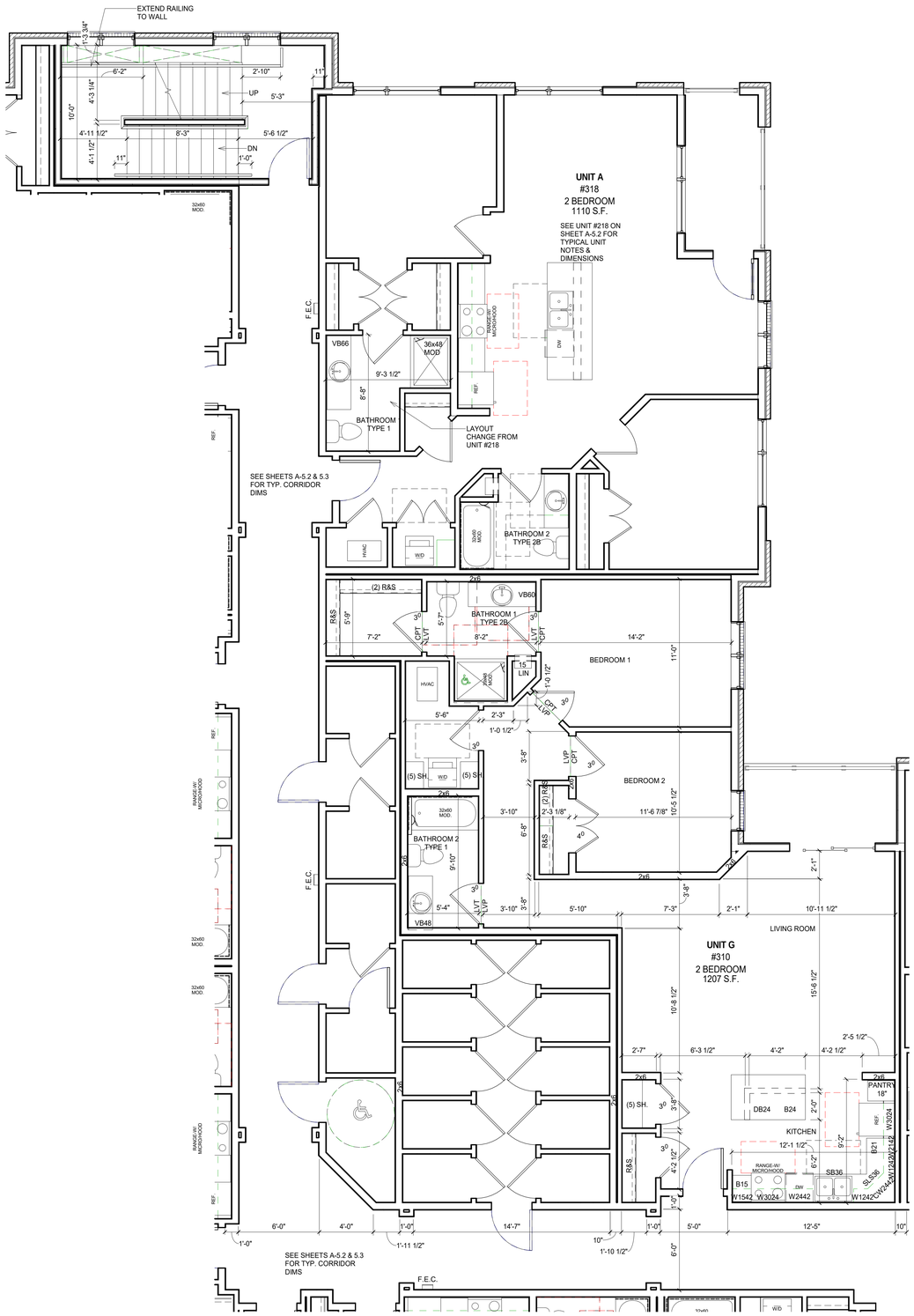
521-523 Grand Oak Trail MADISON, WI

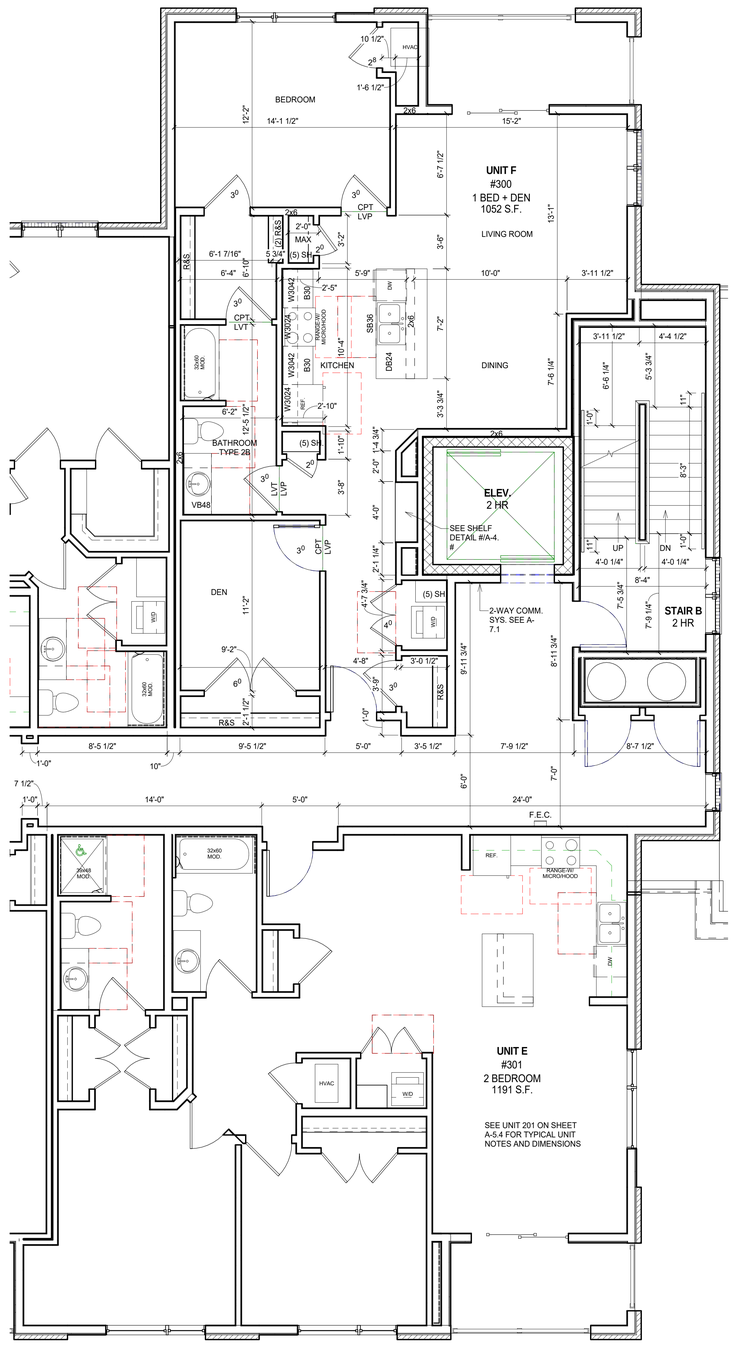
SHEET TITLE
Partial Second Floor Plan - East

SHEET NUMBER
A-5.7

PROJECT NUMBER 1421



2 A-5.8 Partial Third Floor Plan - Units G & A, Stair A
1/4" = 1'-0"



1 A-5.8 Partial Third Floor Plan - Stair B & Unit F
1/4" = 1'-0"

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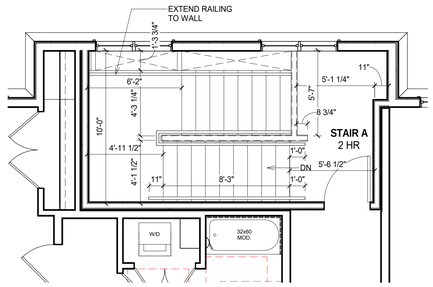
521-523 Grand Oak Trail MADISON, WI

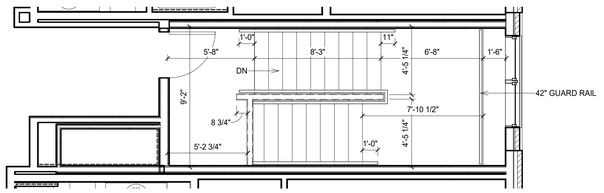
SHEET TITLE
Partial Third Floor Plan - West

SHEET NUMBER
A-5.8

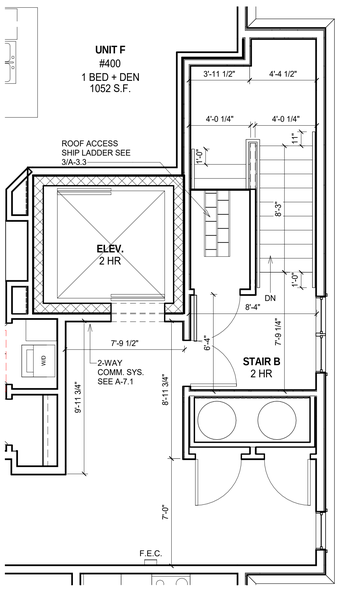
PROJECT NUMBER 1421



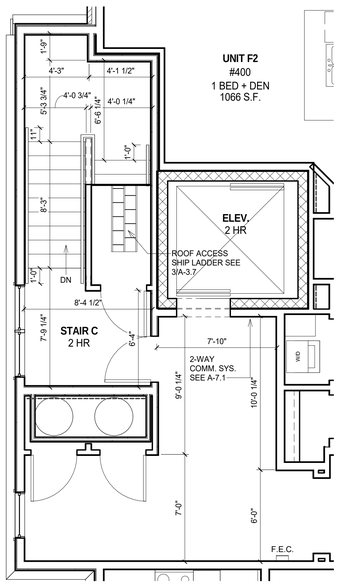
5 A-5.9 4th Floor Stair Plans - Stair A
1/4" = 1'-0"



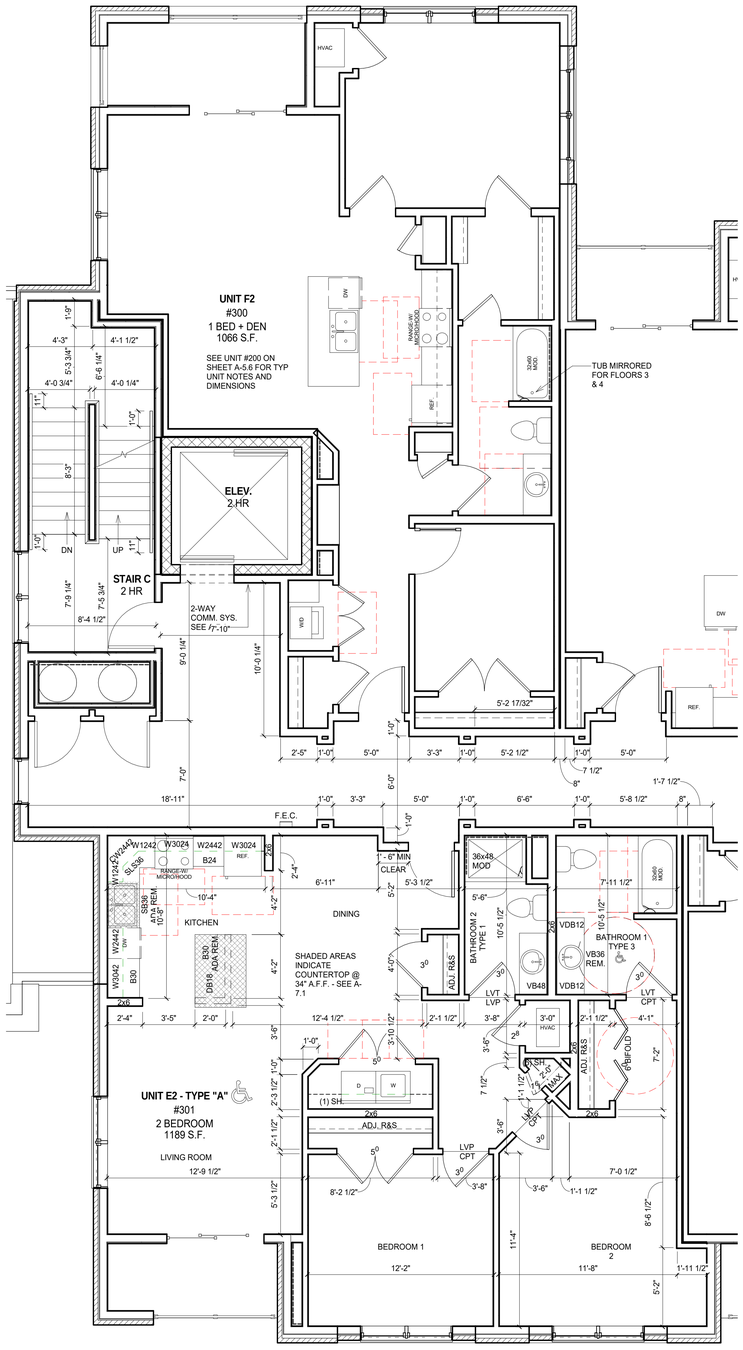
3 A-5.9 4th Floor Stair Plans - Stair D
1/4" = 1'-0"



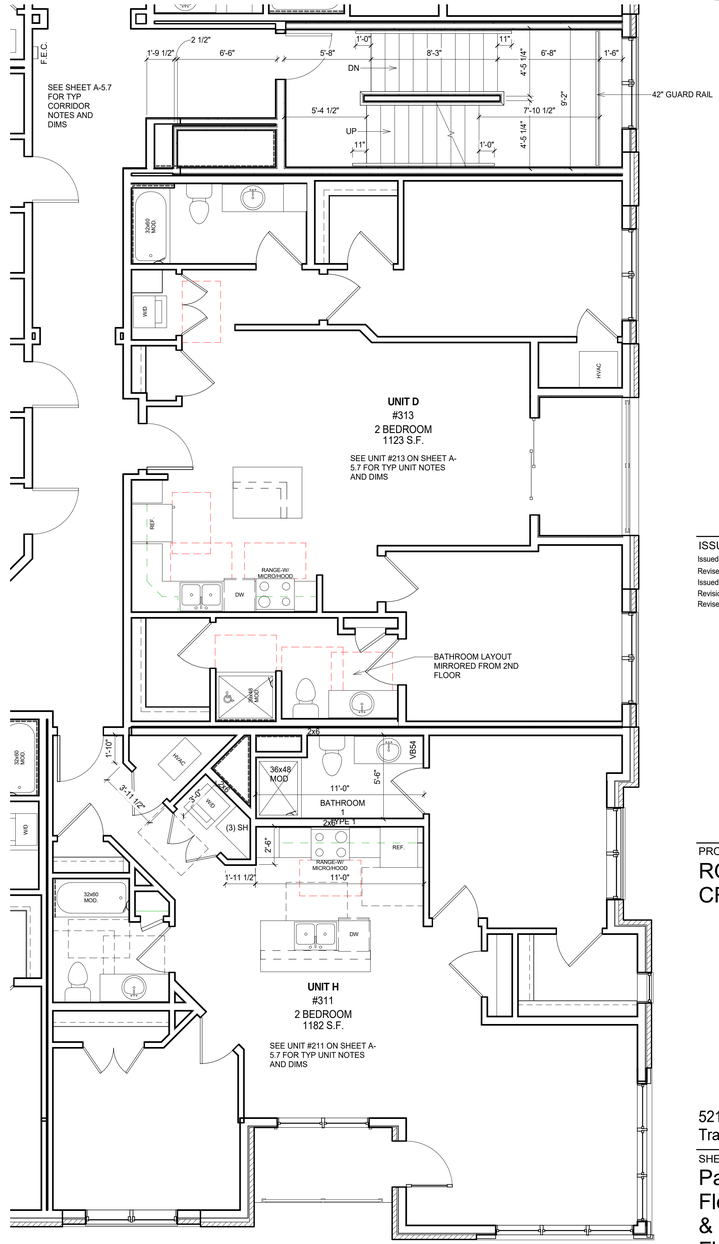
6 A-5.9 4th Floor Stair Plans - Stair B
1/4" = 1'-0"



4 A-5.9 4th Floor Stair Plans - Stair C
1/4" = 1'-0"



1 A-5.9 Partial Third Floor Plan - East 1
1/4" = 1'-0"



2 A-5.9 Partial Third Floor Plan - Units H & D - Stair D
1/4" = 1'-0"

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PROJECT TITLE
ROYSTER CROSSINGS

521-523 Grand Oak Trail MADISON, WI

SHEET TITLE
Partial Third Floor - East & Fourth Floor Stair Plans

SHEET NUMBER
A-5.9

PROJECT NUMBER 1421

Door Schedule

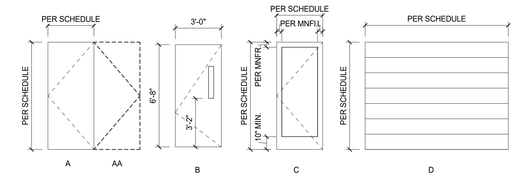
Mark	Location	Door Width	Door Height	Door Material	Door Elevation	Frame Material	Frame Elevation ("A" U.N.O.)	Fire Rating (Minutes)	Notes
BASEMENT - WEST									
B01w	Stair A	3'-0"	6'-8"	HM	B	HM		90 - S	
B02w	Stair B	3'-0"	6'-8"	HM	B	HM		90 - S	
B03w	Elevator Lobby	3'-0"	7'-0"	HM	C	HM	E		
B04w	Exterior Door	3'-0"	7'-0"	IM	A	HM			ELECTRIC STRIKE, PROXIMITY READER
B05w	Overhead Garage	16'-4"	7'-0"	IM	D				RUBBER MOUNTED TRACK & OPERATOR, NYLON ROLLERS
B06w	Overhead Trash	9'-4"	7'-0"	IM	D				RUBBER MOUNTED TRACK & OPERATOR, NYLON ROLLERS
B07w	Trash Room	6'-0"	6'-8"	HM	AA	HM		45	
B08w	Lib. Mechanical	6'-0"	7'-0"	HM	AA	HM		45	SARGENT HARDWARE, CONTINUOUS HINGES (FULL LENGTH), (1) LEAF ACTIVE & (1) LEAF IN-ACTIVE (BOLTED T&B)
B09w	Trash Chute Room	6'-0"	6'-8"	HM	AA	HM		90	
B10w	Mechanical	3'-6"	6'-8"	HM	A	HM		45	
B11w	Gas Meter Room	3'-0"	7'-0"	IM	A	HM			
B12w	A/V Room	3'-0"	6'-8"	HM	A	HM			
BASEMENT - EAST									
B01e	Stair D	3'-0"	6'-8"	HM	B	HM		90 - S	
B02e	Stair C	3'-0"	6'-8"	HM	B	HM		90 - S	
B03e	Elevator Lobby	3'-0"	7'-0"	HM	C	HM	E		
B04e	Mechanical	3'-6"	6'-8"	HM	A	HM		45	
B05e	Trash Chute Room	6'-0"	6'-8"	HM	AA	HM		90	
B06e	Maintenance Room	3'-0"	6'-8"	HM	A	HM			
FIRST FLOOR - WEST									
101w	Stair A	3'-0"	6'-8"	SCW	B	HM		90 - S	EXIT DEVICE W/ ALARM & DELAYED EGRESS, SARGENT HARDWARE, CONTINUOUS HINGE (FULL LENGTH)
102w	Stair B	3'-0"	6'-8"	SCW	B	HM		90 - S	EXIT DEVICE
103w	Loading Dock - Double Door	5'-6"	7'-0"	IM	AA	HM			SARGENT HARDWARE, CONTINUOUS HINGES (FULL LENGTH), (1) LEAF ACTIVE 42" (w) & (1) LEAF IN-ACTIVE 24" (w) (BOLTED T&B)
FIRST FLOOR - EAST									
102e	Stair C	3'-0"	6'-8"	SCW	B	HM		90 - S	EXIT DEVICE
SECOND FLOOR - WEST									
201w	Stair A	3'-0"	6'-8"	SCW	B	HM		90 - S	
202w	Stair B	3'-0"	6'-8"	SCW	B	HM		90 - S	EXIT DEVICE
203w	Storage	3'-0"	6'-8"	SCW	A	WD		20 - S	
204w	Storage	3'-0"	6'-8"	SCW	A	WD		20 - S	
205w	Storage	3'-0"	6'-8"	SCW	A	WD		20 - S	
206w	Storage	3'-0"	6'-8"	SCW	A	WD		20 - S	
207w	Trash	3'-0"	6'-8"	SCW	A	WD		20 - S	
208w	Trash	3'-0"	6'-8"	SCW	A	WD		20 - S	
209w	Parcel Closet	3'-0"	6'-8"	SCW	A	WD		20 - S	
210w	Toilet	3'-0"	8'-0"	SCW	A	WD		20 - S	
211w	Toilet	3'-0"	8'-0"	SCW	A	WD		20 - S	
212w	Fitness Room	3'-0"	8'-0"	SCW	B	KD	B	20 - S	ELECTRIC STRIKE, PROXIMITY READER, SIDELIGHT
213w	2HR Fire Door	6'-0"	8'-0"	SCW	AA	HM		90 - S	MAGNETIC HOLD OPEN, EXIT DEVICE
214w	Community Room	3'-0"	8'-0"	SCW	A	KD	C	20 - S	ELECTRIC STRIKE, PROXIMITY READER, EXIT DEVICE, SIDELIGHT
215w	Community Room	3'-0"	8'-0"	SCW	A	KD	C	20 - S	ELECTRIC STRIKE, PROXIMITY READER, EXIT DEVICE, SIDELIGHT
216w	Mechanical	3'-0"	6'-8"	SCW	A	WD		20 - S	
217w	Plaza Corridor Exit	3'-0"	6'-8"	SCW	B	KD		20 - S	ELECTRIC STRIKE, PROXIMITY READER, EXIT DEVICE
218w	Mechanical	3'-0"	6'-8"	SCW	A	WD			
SECOND FLOOR - EAST									
201e	Stair D	3'-0"	6'-8"	SCW	B	HM		90 - S	
202e	Stair C	3'-0"	6'-8"	SCW	B	HM		90 - S	EXIT DEVICE
203e	Storage	3'-0"	6'-8"	SCW	A	WD		20 - S	
204e	Storage	3'-0"	6'-8"	SCW	A	WD		20 - S	
205e	Storage	3'-0"	6'-8"	SCW	A	WD		20 - S	
206e	Storage	3'-0"	6'-8"	SCW	A	WD		20 - S	
207e	Trash	3'-0"	6'-8"	SCW	A	WD		20 - S	
208e	Trash	3'-0"	6'-8"	SCW	A	WD		20 - S	
209e	Mechanical	3'-0"	6'-8"	SCW	A	WD		20 - S	
210e	Office	3'-0"	8'-0"	SCW	A	KD	D	20 - S	SIDELIGHT
211e	Mechanical	3'-0"	6'-8"	SCW	A	WD			
THIRD FLOOR - WEST									
301w	Stair A	3'-0"	6'-8"	SCW	B	HM		90 - S	
302w	Stair B	3'-0"	6'-8"	SCW	B	HM		90 - S	
303w	Storage	3'-0"	6'-8"	SCW	A	WD		20 - S	
304w	Storage	3'-0"	6'-8"	SCW	A	WD		20 - S	
305w	Storage	3'-0"	6'-8"	SCW	A	WD		20 - S	
306w	Storage	3'-0"	6'-8"	SCW	A	WD		20 - S	
307w	Trash	3'-0"	6'-8"	SCW	A	WD		20 - S	
308w	Trash	3'-0"	6'-8"	SCW	A	WD		20 - S	
309w	Mechanical	3'-0"	6'-8"	SCW	A	WD			
THIRD FLOOR - EAST									
301e	Stair D	3'-0"	6'-8"	SCW	B	HM		90 - S	
302e	Stair C	3'-0"	6'-8"	SCW	B	HM		90 - S	
303e	Storage	3'-0"	6'-8"	SCW	A	WD		20 - S	
304e	Storage	3'-0"	6'-8"	SCW	A	WD		20 - S	
305e	Storage	3'-0"	6'-8"	SCW	A	WD		20 - S	
306e	Storage	3'-0"	6'-8"	SCW	A	WD		20 - S	
307e	Trash	3'-0"	6'-8"	SCW	A	WD		20 - S	
308e	Trash	3'-0"	6'-8"	SCW	A	WD		20 - S	
309e	Mechanical	3'-0"	6'-8"	SCW	A	WD			
FOURTH FLOOR - WEST									
401w	Stair A	3'-0"	6'-8"	SCW	B	HM		90 - S	
402w	Stair B	3'-0"	6'-8"	SCW	B	HM		90 - S	
403w	Storage	3'-0"	6'-8"	SCW	A	WD		20 - S	
404w	Storage	3'-0"	6'-8"	SCW	A	WD		20 - S	
405w	Storage	3'-0"	6'-8"	SCW	A	WD		20 - S	
406w	Storage	3'-0"	6'-8"	SCW	A	WD		20 - S	
407w	Trash	3'-0"	6'-8"	SCW	A	WD		20 - S	
408w	Trash	3'-0"	6'-8"	SCW	A	WD		20 - S	
409w	Mechanical	3'-0"	6'-8"	SCW	A	WD			
410w	Roof Access	3'-0"	6'-8"	SCW	A	HM			
FOURTH FLOOR - EAST									
401e	Stair D	3'-0"	6'-8"	SCW	B	HM		90 - S	
402e	Stair C	3'-0"	6'-8"	SCW	B	HM		90 - S	
403e	Storage	3'-0"	6'-8"	SCW	A	WD		20 - S	
404e	Storage	3'-0"	6'-8"	SCW	A	WD		20 - S	
405e	Storage	3'-0"	6'-8"	SCW	A	WD		20 - S	
406e	Storage	3'-0"	6'-8"	SCW	A	WD		20 - S	
407e	Trash	3'-0"	6'-8"	SCW	A	WD		20 - S	
408e	Trash	3'-0"	6'-8"	SCW	A	WD		20 - S	
409e	Mechanical	3'-0"	6'-8"	SCW	A	WD			
410e	Roof Access	3'-0"	6'-8"	SCW	A	HM			
ALL FLOORS									
S01	Storage Locker	3'-0"	6'-8"	HCW	A	WD			
U01	Unit Entry	3'-0"	6'-8"	SCW	A	WD		20 - S	

DOOR SCHEDULE GENERAL NOTES

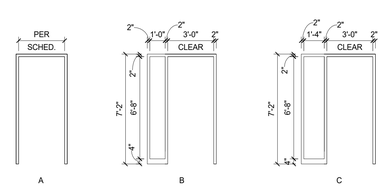
1. ALL RATED DOORS TO BE PART OF A RATED SYSTEM, INCLUDING: DOOR, FRAME, GLAZING, CLOSER & HARDWARE. ALL RATED DOORS TO MEET REQUIREMENTS FOR A SMOKE AND DRAFT CONTROL DOOR PER UL 1784 WITH AN ARTIFICIAL BOTTOM SEAL INSTALLED ACROSS THE FULL WIDTH OF THE DOOR ASSEMBLY (SEE IBC SECTION 715.4.3.1)
2. SEE FLOOR PLANS FOR DOOR HANDING AND SWING.
3. GENERAL CONTRACTOR TO NOTIFY ARCHITECT OF SUBSTITUTIONS OF WINDOW / DOOR MANUFACTURER PRIOR TO ORDERING THE PRODUCT.
4. PROVIDE TEMPERED SAFETY GLAZING AT ALL WINDOWS/DOOR GLAZING WITHIN 24" OF FLOOR AND ANY WINDOW/ SIDELIGHT ADJACENT TO DOORS.
5. ALL SLIDING DOORS BELOW THE SECOND STORY AND ALL OTHER SLIDING DOORS ACCESSIBLE BY BALCONIES/DECKS, FIRE ESCAPES, TREES OR OTHER EXISTING MEANS SHALL BE EQUIPPED WITH APPROVED VENTILATING FASTENERS TO ALLOW DOOR TO BE LOCKED AT ONE (1) TO FIVE (5) INCHES OPEN. SUCH VENTILATING BOLTS OR LOCKS SHALL BE MOVABLE TO PERMIT THE DOOR TO BE FULLY OPENED FROM THE INSIDE OF THE DWELLING UNIT.
6. GENERAL CONTRACTOR TO VERIFY HARDWARE REQUIREMENTS WITH OWNER.
7. ALL DOORS TO HAVE LEVER TYPE HARDWARE.
8. ALL DOORS, INCLUDING BOTH LEAVES OF DOUBLE LEAVE DOORS SHALL HAVE ALL OPERATING HARDWARE BETWEEN 34" & 48" A.F.F.
9. ALL DOORS INTENDED FOR PASSAGE TO HAVE CLEAR OPENING OF 32".
10. ALL PUBLIC USE DOORS TO HAVE 80" MINIMUM CLEAR HEADROOM.
11. FIRE DOORS SHALL HAVE THE MIN. OPENING FORCE ALLOWABLE BY THE APPROPRIATE ADMINISTRATIVE AUTHORITY. THE MAXIMUM OPENING FORCE FOR DOORS OTHER THAN FIRE DOORS SHALL BE 5 LBS.
12. DOOR CLOSERS SHALL BE ADJUSTED SO THAT DOOR TAKES 5 SECONDS MINIMUM TO CLOSE FROM AN OPEN POSITION OF 90 DEGREES TO AN OPEN POSITION OF 12 DEGREES.
13. SPRING HINGES SHALL BE ADJUSTED SO THAT THE DOOR TAKES 1.5 SECONDS MINIMUM TO CLOSE FROM AN OPEN POSITION OF 70 DEGREES.
14. "-S" = SMOKE & DRAFT CONTROL

DOOR SCHEDULE ABBREVIATIONS:

AL - ALUMINUM STOREFRONT SYSTEM
HM - HOLLOW METAL
IM - INSULATED METAL
NO - NO FRAME, DRYWALL RETURNS
KD - KNOCK DOWN (E.G. "TIMELY") - w/ WOOD CASING BOTH SIDES
SCW - SOLID CORE WOOD
HCW - HOLLOW CORE WOOD
ALWD - ALUMINUM CLAD WOOD
WD - WOOD
FB - FIBERGLASS



Door Elevations
1/4" = 1'-0"



Frame Elevations
1/4" = 1'-0"

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KEY PLAN

ISSUED
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3	Revised Door Size	April 9, 2018
2	Revised -	November 18, 2015
1	Implemented City's LOI Clarifications -	August 7, 2017

PROJECT TITLE
ROYSTER CROSSINGS

521-523 Grand Oak Trail MADISON, WI

SHEET TITLE
Door Schedule

SHEET NUMBER
A-6.1

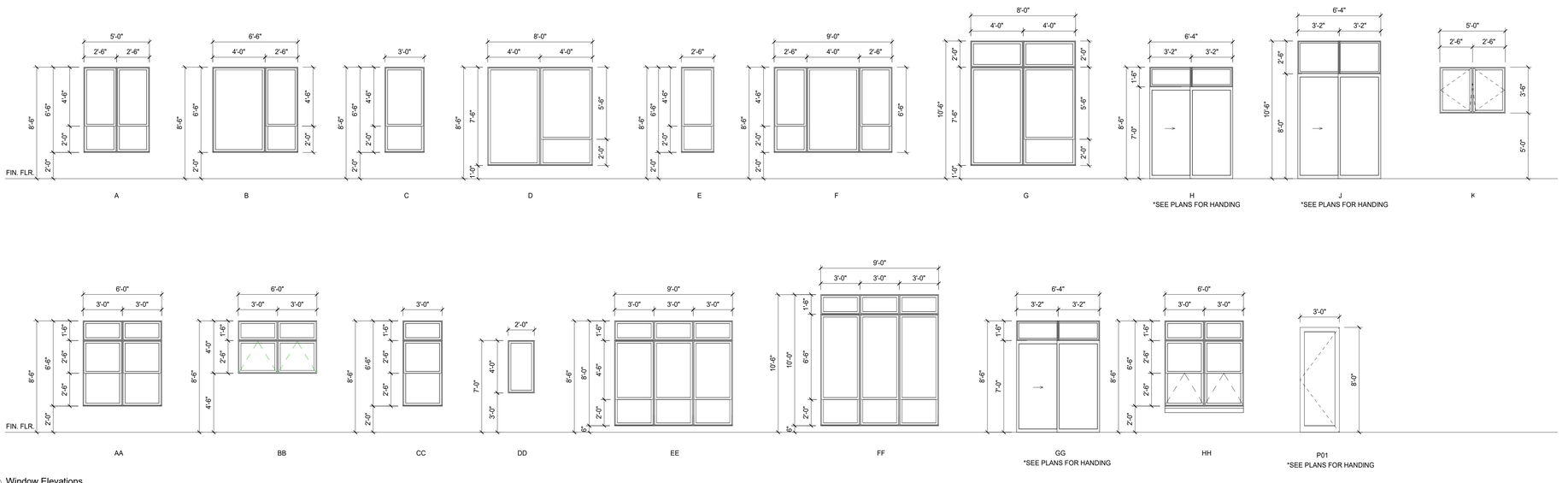
PROJECT NUMBER 1421

COMPOSITE WINDOW SCHEDULE

MARK (X)	TYPE	SIZE (WIDTH x HEIGHT)	DAYLIGHT AREA (S.F.)	VENTILATION AREA (S.F.)	INSTALLED LIMITER (4" MAX. OPENING)	NOTES
A	SINGLE HUNG	(2) 2-6 x 6-6	22.32	10.12		UNEQUAL PANES, 2'-0" TALL LOWER PANE
B	FIXED	4-0 x 6-6	20.41			
	SINGLE HUNG	2-6 x 6-6	11.16	5.06		UNEQUAL PANES, 2'-0" TALL LOWER PANE
C	SINGLE HUNG	3-0 x 6-6	14.03	6.23		UNEQUAL PANES, 2'-0" TALL LOWER PANE
D	FIXED	4-0 x 7-6	23.85			
	SINGLE HUNG	4-0 x 7-6	23.66	10.56		UNEQUAL PANES, 2'-0" TALL LOWER PANE, OPENING LIMITER 4" MAX.
E	SINGLE HUNG	2-6 x 6-6	11.16	5.06		UNEQUAL PANES, 2'-0" TALL LOWER PANE
F	SINGLE HUNG	2-6 x 6-6	11.16	5.06		UNEQUAL PANES, 2'-0" TALL LOWER PANE
	FIXED	4-0 x 6-6	20.41			
	SINGLE HUNG	2-6 x 6-6	11.16	5.06		UNEQUAL PANES, 2'-0" TALL LOWER PANE
G	FIXED	4-0 x 7-6	23.85			
	w/ FIXED TRANSOM	4-0 x 2-0	4.94			
	SINGLE HUNG	4-0 x 7-6	23.66	10.56		UNEQUAL PANES, 2'-0" TALL LOWER PANE, OPENING LIMITER 4" MAX.
	w/ FIXED TRANSOM	4-0 x 2-0	4.94			
H	SLIDER DOOR	6-4 x 7-0	34.19	17.79		SEE PLANS FOR HANDING, 32" CLEAR MIN.
	w/ FIXED TRANSOM	(2) 3-2 x 1-6	5.18			
J	SLIDER DOOR	6-4 x 8-0	39.61	20.45		SEE PLANS FOR HANDING, 32" CLEAR MIN.
	w/ FIXED TRANSOM	(2) 3-2 x 2-6	10.47			
K	CASEMENT	(2) 2-6 x 3-6	11.38	11.84		
AA	SINGLE HUNG	(2) 3-0 x 5-0	20.76	11.58		
	w/ FIXED TRANSOM	(2) 3-0 x 1-6	4.58			
BB	AWNING	(2) 3-0 x 2-6	9.44	3.32		
	w/ FIXED TRANSOM	(2) 3-0 x 1-6	4.58			
CC	SINGLE HUNG	3-0 x 5-0	10.38	5.79		
	w/ FIXED TRANSOM	3-0 x 1-6	2.29			
DD	FIXED	2-0 x 4-0	4.94			
EE	SINGLE HUNG	(3) 3-0 x 6-6	42.09	18.69		UNEQUAL PANES, 2'-0" TALL LOWER PANE, OPENING LIMITER 4" MAX.
	w/ FIXED TRANSOM	(3) 3-0 x 1-6	6.87			
FF	SINGLE HUNG	(3) 3-0 x 8-6	58.02	26.39		UNEQUAL PANES, 2'-0" TALL LOWER PANE, OPENING LIMITER 4"MAX.
	w/ FIXED TRANSOM	(3) 3-0 x 1-6	6.87			
GG	SLIDER DOOR	6-4 x 7-0	34.19	17.79		SEE PLANS FOR HANDING, 32" CLEAR MIN.
	w/ FIXED TRANSOM	(2) 3-2 x 1-6	5.18			
HH	AWNING	(2) 3-0 x 2-6	9.44	3.32		
	FIXED	(2) 3-0 x 2-6	9.44			
	w/ FIXED TRANSOM	(2) 3-0 x 1-6	4.58			
P01	INSWING PATIO DOOR	3-0 x 8-0	17.09	22.30		SEE PLANS FOR HANDING, 32" CLEAR MIN.

GENERAL NOTES:

- ALL DIMENSIONS ARE NOMINAL.
- GENERAL CONTRACTOR TO NOTIFY ARCHITECT OF SUBSTITUTIONS OF WINDOW / DOOR MANUFACTURER PRIOR TO ORDERING THE PRODUCT.
- DAYLIGHT AND VENTILATION AREAS ARE MINIMUM REQUIREMENTS. CONTRACTOR TO VERIFY DOORS AND WINDOWS MEET OR EXCEED THESE VALUES.
- PROVIDE TEMPERED SAFETY GLAZING AT ALL WINDOWS/DOOR GLAZING WITHIN 24" OF FLOOR AND ANY WINDOW/ SIDELIGHT ADJACENT TO DOORS
- ALL BASEMENT, FIRST, AND SECOND STORY WINDOWS AND ALL OTHER WINDOWS ACCESSIBLE BY SHARED BALCONIES/DECKS, TREES OR OTHER EXISTING MEANS SHALL BE PROVIDED WITH SASH FASTENERS
- ALL DOUBLE-HUNG AND SLIDING WINDOWS AND DOORS BELOW THE SECOND STORY AND ALL OTHER DOUBLE-HUNG AND SLIDING WINDOWS AND DOORS ACCESSIBLE BY BALCONIES, FIRE ESCAPES, TREES OR OTHER EXISTING MEANS SHALL BE EQUIPPED WITH APPROVED WINDOW VENTILATING SASH FASTENERS TO ALLOW EACH WINDOW TO BE LOCKED AT ONE (1) TO FIVE (5) INCHES OPEN. SUCH WINDOW VENTILATING BOLTS OR LOCKS SHALL BE MOVABLE TO PERMIT THE WINDOW TO BE FULLY OPENED FROM THE INSIDE OF THE DWELLING UNIT
- SEE PLANS FOR HANDING OF SLIDING PATIO DOORS AND INSWING PATIO DOORS
- ALL OPERABLE WINDOWS LESS THAN 24" ABOVE INTERIOR FINISHED FLOOR TO HAVE LIMITERS INSTALLED TO LIMIT MAXIMUM WINDOW OPENING SO A 4" SPHERE CANNOT PASS THROUGH (WINDOWS AT DECKS, ROOF DECKS, AND AT THE FIRST FLOOR ARE EXEMPT).



Window Elevations
1/4" = 1'-0"

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PROJECT TITLE
ROYSTER CROSSINGS

521-523 Grand Oak Trail MADISON, WI

SHEET TITLE
Window Schedule

SHEET NUMBER
A-6.2

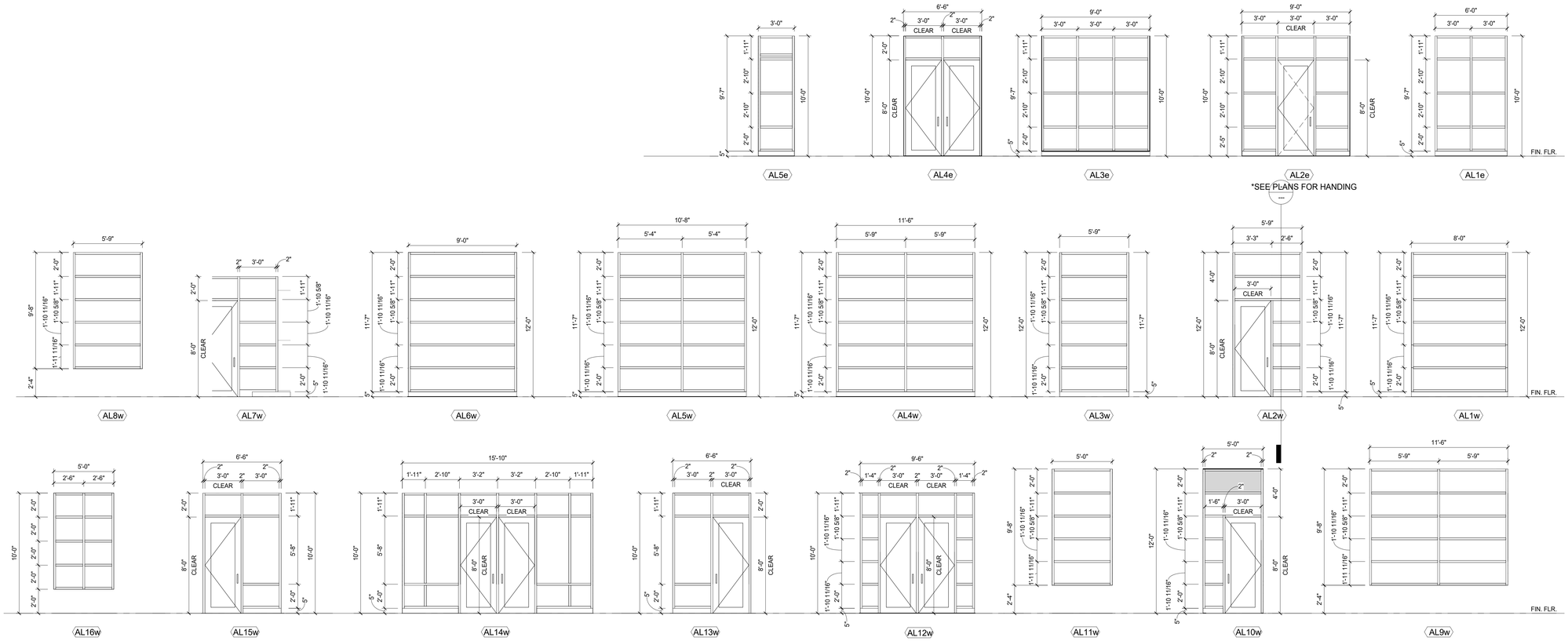
PROJECT NUMBER 1421

ALUMNIMUN WINDOW/DOOR SCHEDULE GENERAL NOTES

- ELEVATIONS ARE SHOWN FROM EXTERIOR SIDE
- PROVIDESAFTEY GLAZING AT ALL WINDOWS/DOOR GLAZING WITHIN 24" OF FLOOR AND ANY WINDOW/SIDELIGHT ADJACENT TO DOORS
- RATED, OPAQUE SPANDREL PANELS WHERE SHOWN ON ELEVATIONS w/SHADED HATCH
- GENERAL CONTRACTOR TO NOTIFY ARCHITECT OF SUBSTITUTION OF WINDOW OR DOOR MANUFACTURER OR MODEL PRIOR TO ORDERING PRODUCT
- GLAZING PANES ARE FIXED UNLESS SHOWN W/DASHED OPENING LINES OR LABELED OTHERWISE
- SEE SHEETS A-2.1E & A-2.1W FOR MATERIAL SCHEDULE INDICATING FRAME COLOR
- SEE ELEVATIONSBELOW FOR ALL DOOR SIZES & FRAME DIMS

ALUMINUM STOREFRONT DOOR SCHEDULE

MARK (X)	LOCATION	NOTES
EAST WING		
AL2e	FIRST FLOOR - COMMERCIAL TENANT SPACES & STAIR D	ELECTRIC STRIKE, PROXIMITY READER. SEE PLANS FOR DOOR HANDING
AL4e	FIRST FLOOR - SE CORNER	ELECTRIC STRIKE, PROXIMITY READER
WEST WING		
AL2w	FIRST FLOOR - SOUTH ELEV. LIBRARY EXIT	EXIT DEVICE W/ALARM & DELAYED EGRESS, SARGENT HARDWARE, CONTINUOUS HINGES (FULL LENGTH)
AL7w	FIRST FLOOR - NORTH LIBRARY ENTRANCE	EXIT DEVICE, ELECTRIC STRIKE, PROXIMITY READER SARGENT HARDWARE, CONTINUOUS HINGES (FULL LENGTH)
AL10w	FIRST FLOOR - STAIR A	EXIT DEVICE, ELECTRIC STRIKE, PROXIMITY READER SARGENT HARDWARE, CONTINUOUS HINGES (FULL LENGTH)
AL12w	FIRST FLOOR - SOUTH ELEV. ANNEX	EXIT DEVICE, ELECTRIC STRIKE, PROXIMITY READER, POWER ASSIST
AL13w	FIRST FLOOR - STAIR C/ELEV. LOBBY EAST	EXIT DEVICE, ELECTRIC STRIKE, PROXIMITY READER, INTERCOM
AL14w	FIRST FLOOR - NORTH ANNEX VESTIBULE	EXIT DEVICE, ELECTRIC STRIKE, PROXIMITY READER, POWER ASSIST
AL15w	FIRST FLOOR - STAIR B/ELEV. LOBBY WEST	EXIT DEVICE, ELECTRIC STRIKE, PROXIMITY READER, INTERCOM
AL17w	SECOND FLOOR - COMMUNITY ROOM	EXIT DEVICE
AL18w	SECOND FLOOR - PLAZA EXIT	EXIT DEVICE
AL29w	FIRST FLOOR - LIBRARY MAIN ENTRANCE	EXIT DEVICE, ELECTRIC STRIKE, PROXIMITY READER, POWER ASSIST, SARGENT HARDWARE, CONTINUOUS HINGES (FULL LENGTH)



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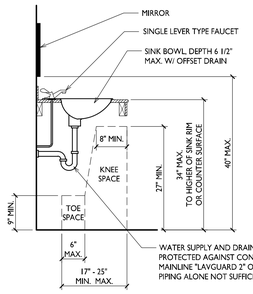
PROJECT TITLE
ROYSTER CROSSINGS

521-523 Grand Oak Trail MADISON, WI

SHEET TITLE
Storefront Elevations

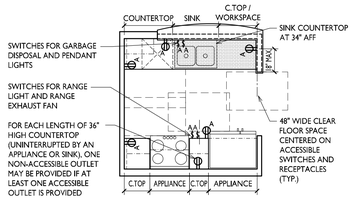
SHEET NUMBER
A-6.3

PROJECT NUMBER 1421



HC5 A-7.1 VANITY SINK CLEARANCES

N.T.S. FRONT APPROACH



ELECTRICAL SYMBOL KEY

ELECTRICAL OUTLETS

GARBAGE DISPOSAL / FAN SWITCHES

"A" INDICATES ELEC. ELEMENTS AT ACCESSIBLE LOCATIONS

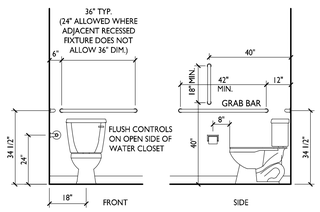
MOUNTING HEIGHTS

- @ KITCHEN COUNTER: BOTTOM FLUSH W/ TOP OF BACKSPLASH
- ON FACE OF KITCHEN COUNTER: TOP FLUSH W/ BOTTOM OF COUNTERTOP (HORIZ.)
- ON BACK OF BREAKFAST BAR: SEE BUILDING DETAILS

HC6 A-7.1 EXAMPLE ALLOWED/REQUIRED KITCHEN RECEPTACLE AND SWITCH LOCATIONS

N.T.S. AT "TYPE A" UNITS & COMMON AREA KITCHENS

GRAB BAR INSTALLATION MANDATORY

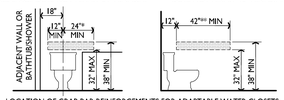


HC7 A-7.1 COMMON AREA TOILET ELEVATIONS

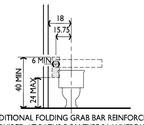
N.T.S.

*12 MIN. ALLOWED WHERE RECESSED FIXTURE ADJACENT TO WATER CLOSET OR LIMITED WALL SPACE DOES NOT PERMIT 24" MIN. DIM.

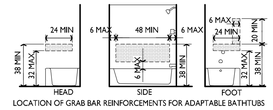
** 18 MIN. ALLOWED AT BATHROOM TYPES 2A, 2B, AND 3 WHERE SIDE WALL DOES NOT PERMIT 42" MIN. DIM.



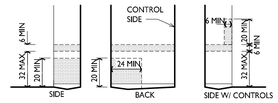
LOCATION OF GRAB BAR REINFORCEMENTS FOR ADAPTABLE WATER CLOSETS



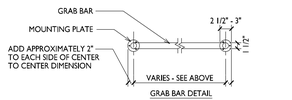
ADDITIONAL FOLDING GRAB BAR REINFORCEMENT REQUIRED AT BATHROOM TYPE 2A WHERE WATER CLOSETS THAT DO NOT HAVE FULL SIDE WALL (56" MIN.)



LOCATION OF GRAB BAR REINFORCEMENTS FOR ADAPTABLE BATHTUBS



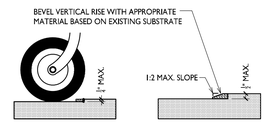
LOCATION OF GRAB BAR AND SEAT REINFORCEMENTS FOR ADAPTABLE SHOWERS



GRAB BAR DETAIL

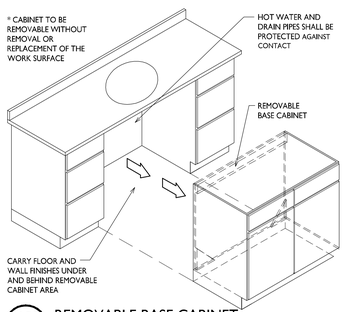
HC1 A-7.1 GRAB BAR BLOCKING

N.T.S.



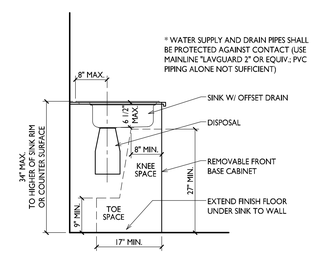
HC2 A-7.1 SMALL CHANGES IN ELEVATION ALONG ACCESSIBLE ROUTE

N.T.S.



HC3 A-7.1 REMOVABLE BASE CABINET

N.T.S.



HC4 A-7.1 KITCHEN SINK CLEARANCES

N.T.S. FRONT APPROACH

BATHROOM REQUIREMENTS SCHEDULE:

BATHROOM TYPE 1:

1. NO ACCESSIBILITY REQUIREMENTS
2. PROVIDE REINFORCING IN WALLS AND/OR TUB/SHOWER UNITS FOR FUTURE GRAB BAR AND SEAT INSTALLATION AT LOCATIONS SHOWN IN DETAIL HC1.

BATHROOM TYPE 2:

1. PROVIDE REINFORCING IN WALLS AND/OR TUB/SHOWER UNITS FOR FUTURE GRAB BAR AND SEAT INSTALLATION AT LOCATIONS SHOWN IN DETAIL HC1.
2. VANITIES AND LAVATORIES SHALL HAVE A MINIMUM OF 24" FROM THE CENTER LINE OF THE FIXTURE TO THE ADJOINING WALL, U.N.O.
3. WATER CLOSETS SHALL HAVE THE FOLLOWING CLEARANCES: 1'-6" EXACTLY FROM THE CENTER LINE OF FIXTURE TO THE BATHTUB OR SHOWER UNIT OR WALL AND 1'-3" MIN. FROM THE CENTER LINE OF FIXTURE TO THE ADJOINING VANITY, U.N.O.
4. INSTALL TOILET PAPER DISPENSER ON SIDE OF ADJACENT VANITY
5. OFFSET BATHTUB & SHOWER CONTROLS REQUIRED. CENTERLINE OF CONTROLS TO BE LOCATED 9" FROM APRON OF TUB OR SHOWER OR ADJOINING HEADWALL (WHICHEVER IS FURTHER.) U.N.O.
6. HAND SHOWER CONTROLS TO BE LOCATED BETWEEN 38" MIN. AND 48" MAX. AFF.
7. BATHTUB CONTROLS TO BE LOCATED BELOW FUTURE HORIZONTAL GRAB BAR.
8. BATHTUBS AND SHOWERS SHALL DELIVER WATER THAT IS 120 DEGREES F MAX.
9. SHOWER COMPARTMENTS SHALL HAVE 9 SF MIN. OF INTERIOR AREA AND 36" MIN. INTERIOR CLEAR DIMENSIONS.
10. LOW FLOW SHOWERHEADS OF 1.75 GPM OR LESS.
11. FAUCET AERATORS OF 1.5 GPM OR LESS.
12. BATHTUBS AND SHOWERS TO HAVE PERMANENT NON-SKID PATTERN COVERING 75% MIN. OF THE TUB/SHOWER FLOOR.
13. BATHROOM TYPE 2A: PROVIDE CLEAR FLOOR SPACE AT BATHTUB
    (A) FOR PARALLEL APPROACH PER ICC/ANSI: 1004.11.3.1.3.1 (SINK/LAVATORY MAY BE PERMITTED WITHIN CLEARANCE AT HEAD OF TUB) OR
    (B) FOR FORWARD APPROACH PER ICC/ANSI: 1004.11.3.1.3.2 (TOILET PERMITTED WITHIN CLEARANCE AT HEAD OF TUB)
14. BATHROOM TYPE 2B: PROVIDE 30" X 48" CLEAR FLOOR SPACE ALONG SIDE OF BATHTUB, ALIGNED WITH CONTROL END OF TUB.

BATHROOM TYPE 3:

1. PROVIDE REINFORCING IN WALLS AND/OR TUB/SHOWER UNITS FOR FUTURE GRAB BAR AND SEAT INSTALLATION AT LOCATIONS SHOWN IN DETAIL HC1.
2. VANITY SINK TO HAVE 30" MIN. WIDE CLEAR FLOOR SPACE BELOW FOR FORWARD APPROACH PER HC5. BASE CABINETRY AT SINK TO BE REMOVABLE WITHOUT REMOVAL OR REPLACEMENT OF THE WORK SURFACE - SEE DETAIL HC3. FINISHED FLOOR AND WALLS EXTEND UNDER REMOVABLE BASE CABINETRY TO WALL.
3. SINK DRAIN TO BE OFFSET. EXPOSED SUPPLY AND DRAIN PIPES UNDER SINK TO BE INSULATED OR OTHERWISE CONFIGURED TO PROTECT AGAINST CONTACT.
4. BATH TUBS AND SHOWERS TO HAVE HAND-HELD SHOWER SPRAY UNIT ON MIN. 60" LONG HOSE WITH NON-OPERATIVE SHUT-OFF FEATURE ON CONTROL HEAD.
5. HAND SHOWER CONTROLS TO BE LOCATED BETWEEN 38" MIN. AND 48" MAX. AFF.
6. BATHTUB CONTROLS TO BE LOCATED BELOW FUTURE HORIZONTAL GRAB BAR.
7. SHOWER THRESHOLD IS 1/2" MAX. AND COMPLIES UNDER "ACCESSIBLE ROUTE" GUIDELINES.
8. ANY SHOWER ENCLOSURE DOES NOT OBSTRUCT SHOWER CONTROLS OR TRANSFER FROM WHEELCHAIR.
9. TOILET SEAT HEIGHT TO BE 17"-19" ABOVE FINISH FLOOR (17" PREFERRED)
10. WATER CLOSETS SHALL HAVE THE FOLLOWING CLEARANCES: 1'-6" EXACTLY FROM CENTER LINE OF FIXTURE TO THE BATHTUB OR SHOWER UNIT OR WALL AND 1'-6" MIN. FROM THE CENTER LINE OF FIXTURE TO THE ADJOINING VANITY.
11. INSTALL TOILET PAPER DISPENSER ON SIDE WALL, 8" MI FRONT OF WATER CLOSET TO CENTER OF DISPENSER, AND 24" AFF TO CENTER OF DISPENSER.
12. MEDICINE CABINET AND MIRROR TO BE ACCESSIBLE: MIRROR TO BE 36" WIDE MIN. WITH BOTTOM AT NO MORE THAN 40" AFF. MEDICINE CABINET AT 40" TO LOWEST SHELF OF CABINET.
13. FLUSH CONTROLS TO BE ON OPEN SIDE OF WATER CLOSET.
14. SHOWER COMPARTMENTS SHALL HAVE INTERIOR CLEAR DIMENSIONS OF 36" X 36" EXACTLY FOR A TRANSFER SHOWER OR 30" MIN. X 60" MIN. FOR A ROLL-IN SHOWER.
15. OFFSET BATHTUB & SHOWER CONTROLS REQUIRED. CENTERLINE OF CONTROLS TO BE LOCATED 9" FROM APRON OF TUB OR SHOWER OR ADJOINING HEADWALL (WHICHEVER IS FURTHER.) U.N.O.
16. BATHTUBS AND SHOWERS SHALL DELIVER WATER THAT IS 120 DEGREES F MAX.
17. LOW FLOW SHOWERHEADS OF 1.75 GPM OR LESS.
18. FAUCET AERATORS OF 1.5 GPM OR LESS.

GENERAL DWELLING UNIT ACCESSIBILITY NOTES:

(APPLIES TO ALL UNITS)

GENERAL:

1. ALL PLUMBING CONTROLS TO HAVE LEVER TYPE HARDWARE.
2. ACCESSIBLE ROUTE CONNECTS ALL SPACES AND ELEMENTS.
3. 1/2" MAX. THRESHOLD, EXCEPT AT SLIDING PATIO/DECK DOORS WHERE 3/4" THRESHOLD IS ALLOWED (SEE HC2)
4. LIGHT SWITCHES AND ENVIRONMENTAL CONTROLS MOUNTED AT 44" MAX TO TOP AFF. WALL OUTLETS MOUNTED AT 18" TO CENTER LINE ABOVE FINISH FLOOR. CIRCUIT BREAKERS MOUNTED AT 48" MAX. AFF. SWITCHES, CONTROLS, AND OUTLETS TO HAVE CLEAR FLOOR SPACE. OUTLETS FOR RANGE, REFRIGERATOR, AND HVAC UNITS ARE EXEMPT FROM THIS REQUIREMENT.
   (PER WISCONSIN DEPARTMENT OF COMMERCE VARIANCE TO ICC/ANSI 2003 SECTION 1004.9: ACCESSIBLE KITCHEN SWITCHES, CONTROLS, AND OUTLETS MAY BE LOCATED BEHIND 36" HIGH KITCHEN COUNTERTOPS THAT ARE 25 1/2" DEEP MAX.)
5. PROVISION FOR VISUAL ALARM TO BE CONNECTED TO BUILDING ALARM SYSTEM IN EACH UNIT AND EACH SLEEPING AREA WITHIN THE UNIT.

KITCHEN:

6. ALL PLUMBING CONTROLS TO HAVE SINGLE LEVER TYPE HARDWARE.
7. 48" WIDE CLEAR FLOOR SPACE REQUIRED AT RANGE, REFRIGERATOR AND SINK.
8. THE DISHWASHER DOOR IN THE OPEN POSITION SHALL NOT OBSTRUCT THE CLEAR FLOOR SPACE FOR THE DISHWASHER OR THE SINK.
9. SLIDE-IN FRONT CONTROL RANGE.

LAUNDRY:

10. WASHERS AND DRYERS TO HAVE FLEXIBLE HOSE AND VENT (METAL) CONNECTIONS ALLOWING UNITS TO SLIDE FORWARD TO BE FLUSH WITH OUTSIDE FACE OF LAUNDRY CLOSET WHERE APPLICABLE.
11. 48" WIDE CLEAR FLOOR SPACE CENTERED AT EACH WASHER AND DRYER (SEE FLOOR PLANS).

BATHROOMS:

12. INDIVIDUAL BATHROOM LABELS REFERENCE BATHROOM SCHEDULE ON THIS SHEET.
3. ALL BATHTUBS AND SHOWERS TO HAVE PERMANENT NON-SKID PATTERN COVERING 75% MIN. OF THE TUB/SHOWER FLOOR.

"TYPE A" ACCESSIBLE UNIT NOTES:

"TYPE A" ACCESSIBLE

(THE FOLLOWING NOTES IN ADDITION TO "GENERAL UNIT ACCESSIBILITY NOTES" APPLY TO UNITS #____)

GENERAL:

1. ALL HARDWARE, INCLUDING INTERIOR DOORS, REQUIRE 5 lbs. OR LESS FORCE TO ACTIVATE.
2. CLOSETS WITH ADJUSTABLE RODS AND SHELVING, MOUNTED @ 48" MAX. AFF.
3. ALL WINDOW & DOOR LOCKS TO HAVE OPENING / CLOSING AND SINGLE POINT LOCKING HARDWARE @ 48" A.F.F. MAX. AND 15" A.F.F. MIN.
4. THERE SHALL BE NO SHARP OR ABRASIVE SURFACES UNDER SINKS & LAVS.

KITCHEN:

5. ELECTRICAL RECEPTACLES, SWITCHES, AND APPLIANCE CONTROLS INCLUDING RANGE HOOD FAN & LIGHT AT KITCHEN COUNTERTOPS MUST BE MOUNTED 1) ON FACE OF CABINETS, 2) ON SIDE WALL 18" FROM CLEAR FLOOR SPACE, OR 3) ON BACK WALL BEHIND 34" HIGH CABINETS. FOR EACH LENGTH OF COUNTERTOP (UNINTERRUPTED BY AN APPLIANCE OR SINK) THAT HAS ACCESSIBLE RECEPTACLES, ONE NON-ACCESSIBLE RECEPTACLE CAN BE ADDED. SEE DETAIL HC6.
6. (IF MICRO HOOD) ELECTRICIAN TO WIRE SWITCHED OUTLET FOR STANDARD RANGE HOOD. SECOND OUTLET TO BE PROVIDED FOR MICROWAVE-HOOD. CONTRACTOR TO PROVIDE OWNER W/ STANDARD HOOD TO KEEP ON SITE FOR FUTURE INSTALLATION IF REQUESTED BY TENANT.
7. COMBINATION REFRIGERATOR FREEZERS SHALL HAVE AT LEAST 50 PERCENT OF THE FREEZER SPACE 54" MAX. ABOVE THE FLOOR. DOOR HANDLES AND AND OPERABLE PARTS (E.G. ICE AND WATER DISPENSERS) TO BE 48" MAX. AFF.
8. FRONT CONTROL RANGES, SELF-CLEANING OVENS.
9. PROVIDE "WORK SURFACE" AREA OF COUNTERTOP THAT IS 30" WIDE MIN. AND 34" MAX. ABOVE FINISH FLOOR WITH CLEARANCES PER DETAIL HC4. PROVIDE REMOVABLE BASE CABINETRY PER DETAIL HC3. FLOOR AND WALL FINISHES TO EXTEND UNDER WORK SURFACE TO WALL.
10. DOOR PULLS AND KNOBS TO BE MOUNTED AS CLOSE TO THE BOTTOM OF WALL CABINETS AS POSSIBLE. DOOR PULLS AND KNOBS TO BE MOUNTED AS CLOSE TO THE TOPS OF BASE CABINETS AS POSSIBLE.
11. KITCHEN CABINETS SHALL HAVE A CLEAR FLOOR SPACE AT LEAST 30" x 48" TO ALLOW EITHER FORWARD OR PARALLEL APPROACH
12. 50% OF SHELF SPACE IN CABINETS HAS CLEAR FLOOR SPACE IN FRONT AND IS WITHIN REACH RANGES PER ICC/ANSI: 905.

KITCHEN SINK:

13. SINK MOUNTED AT 34" MAX. ABOVE FINISH FLOOR. 30" MIN. CLEAR WIDTH UNDER SINK WITH CLEARANCES PER HC4. PROVIDE REMOVABLE BASE CABINETRY PER DETAIL HC3. FLOOR AND WALL FINISHES TO EXTEND UNDER SINK TO WALL.
14. SINK DRAIN AND GARBAGE DISPOSAL TO BE OFFSET TO PROVIDE KNEE CLEARANCES PER DETAIL HC-4.
15. SINK TO HAVE 6 1/2" MAX. BOWL DEPTH.

LAUNDRY:

16. PROVIDE FRONT LOADING WASHERS AND DRYERS WITH FRONT MOUNTED CONTROLS. BOTTOM OF OPENING TO LAUNDRY COMPARTMENT TO BE 15" MIN. AND 34" MAX. ABOVE FINISH FLOOR. ADD PERMANENT BASE TO RAISE APPLIANCES IF NECESSARY.

BATHROOMS:

17. INDIVIDUAL BATHROOM LABELS REFERENCE BATHROOM SCHEDULE ON THIS SHEET.

GENERAL NOTES:

1. "CLEAR FLOOR SPACE": 30" X 48" AREA FOR WHEELCHAIR ACCESS
2. "ICC/ANSI" REFERS TO THE AMERICAN NATIONAL STANDARD: ACCESSIBLE AND USABLE BUILDINGS AND FACILITIES, ICC/ANSI A117.1-2003; PUBLISHED BY THE INTERNATIONAL CODE COUNCIL.

ACCESSIBLE ROUTE NOTES:

1. SLOPE: MAXIMUM 1:20 RUNNING SLOPE / 1:50 CROSS SLOPE.
2. ROUTE IS STABLE, FIRM AND SLIP RESISTANT.
3. VARIATIONS IN FLOOR ELEVATIONS ARE 1/2" OR LESS. CHANGES IN ELEVATION UP TO 1/4" MAY BE VERTICAL. CHANGES IN ELEVATION BETWEEN 1/4" AND 1/2" SHALL BE BEVELED WITH SLOPE OF 1:2ch (SEE DETAIL HC2).
4. OPENINGS IN FLOOR SURFACE DO NOT ALLOW A 1/2" DIA. SPHERE TO PASS. RECTANGULAR OPENINGS SHALL BE PERPENDICULAR TO PATH OF TRAVEL.
5. OBJECTS PROTRUDING INTO THE PATH OF TRAVEL WITH THEIR LEADING EDGES GREATER THAN 27" AND LESS THAN 80" AFF SHALL PROJECT 4" MAX. INTO THE CIRCULATION PATH.
6. ALL DOORS INTENDED FOR USER PASSAGE SHALL HAVE A CLEAR OPENING OF 32".
7. CARPET PILE SHALL BE 1/2" MAX.

COMMON AREA ACCESSIBILITY NOTES:

(APPLIES TO ALL PUBLIC / COMMON SPACES)

GENERAL:

2. AN ACCESSIBLE ROUTE SHALL CONNECT ALL SPACES AND ELEMENTS (SEE ACCESSIBLE ROUTE REQUIREMENTS ABOVE).
3. ALL PLUMBING CONTROLS SHALL HAVE LEVER TYPE HARDWARE.
4. MAXIMUM THRESHOLD / CHANGE IN FLOOR ELEVATION IS 1/2" (SEE DETAIL HC2). STOOPS AT HANDICAP ACCESSIBLE ENTRY MAY SLOPE AWAY FROM BUILDING AT MAXIMUM OF 1/4" PER 1'-0".
5. LIGHT SWITCHES AND ENVIRONMENTAL CONTROLS MOUNTED AT 44" MAX. TO TOP ABOVE FINISH FLOOR. WALL OUTLETS MOUNTED AT 18" TO CENTER LINE ABOVE FINISH FLOOR.
6. BRAILLE LETTERING COMPLYING WITH ICC/ANSI 703.5 SHALL BE USED IN CONJUNCTION WITH VISUAL SIGNAGE OUTSIDE ELEVATOR DOORS AND AT DOORS TO EXIT STAIRWAYS. EACH DOOR TO AN EGRESS STAIRWAY AND EXIT DISCHARGE SHALL HAVE A TACTILE SIGN INCLUDING RAISED LETTERS AND BRAILLE STATING 'EXIT.' STAIR LEVEL IDENTIFICATION W/ TACTILE CHARACTERS PROVIDED AT EACH FLOOR LANDING.
7. THE INTERNATIONAL SYMBOL OF ACCESSIBILITY SHALL BE DISPLAYED AT ACCESSIBLE ENTRANCES, ACCESSIBLE COMMON BATHROOMS, AND ACCESSIBLE PARKING SPACES. THE SIZE, STYLE, LOCATION, AND HEIGHT OF THE SYMBOL SHALL COMPLY WITH ICC/ANSI: 703.
8. DIRECTIONAL SIGNAGE (INCLUDING THE INTERNATIONAL SYMBOL OF ACCESSIBILITY) INDICATING THE ROUTE TO THE NEAREST LIKE ACCESSIBLE ELEMENT WITHIN THE BUILDING SHALL BE PROVIDED AT INACCESSIBLE BUILDING ENTRANCES AND INACCESSIBLE EXITS.
9. STAIR HANDRAILS SHALL BE MOUNTED AT 34" ABOVE FINISH FLOOR. STAIR TREADS TO HAVE BEVELED UNDERSIDE OF NOSING - SEE DETAILS.
10. TWO-WAY COMMUNICATION SYSTEMS (INCLUDING THE BUILDING ENTRY INTERCOM AND THOSE AT AREAS OF REFUGE) SHALL PROVIDE BOTH VISUAL AND AUDIBLE SIGNALS.

TOILET ROOMS (APPLIES TO PUBLIC TOILET ROOMS):

11. INSTALL GRAB BARS PER DETAIL HC7.
12. PROVIDE ANTI-SCALD DEVICES ON ALL SINKS AND LAV FAUCETS. THERE SHALL BE NO SHARP OR ABRASIVE SURFACES UNDER SINKS AND LAVS. EXPOSED SUPPLY AND DRAIN PIPES UNDER LAVS SHALL BE INSULATED OR OTHERWISE CONFIGURED TO PROTECT AGAINST CONTACT.
13. ACCESSIBLE TOILET SEAT HEIGHT TO BE 17"-19" ABOVE FINISH FLOOR.
14. CENTERLINE OF TOILET IS EXACTLY 18" FROM NEAREST SIDE WALL.
15. SINK MOUNTED AT 34" MAX. ABOVE FINISH FLOOR. 30" MIN. CLEAR WIDTH UNDER SINK WITH CLEARANCES PER HC4. BOTTOM OF MIRROR AT 40" MAX. AFF.
16. OPERABLE PARTS ON TOWEL DISPENSERS / HAND DRYERS TO BE 48" MAX. AFF AND COMPLY W/ ICC/ANSI 606.7.
17. FLUSH CONTROLS SHALL BE ON THE APPROACH SIDE OF WATER CLOSET.
13. LOCATE TOILET PAPER DISPENSER AS DETAILED HC7.

KITCHEN (APPLIES TO COMMON KITCHEN IN COMMUNITY ROOM):

14. SINK MOUNTED AT 34" MAX. A.F.F. WITH NO BASE CABINETRY BELOW. SINK AND SURROUNDING COUNTER TO BE 30" WIDE MINIMUM WITH CLEARANCES PER HC4 FOR FORWARD APPROACH.
15. PROVIDE ANTI-SCALD DEVICES ON ALL SINK FAUCETS. THERE SHALL BE NO SHARP OR ABRASIVE SURFACES UNDER SINKS AND COUNTERTOPS. EXPOSED SUPPLY AND DRAIN PIPES UNDER LAVS TO BE INSULATED OR OTHERWISE CONFIGURED TO PROTECT AGAINST CONTACT.
16. PROVIDE MINIMUM 30" WIDE "WORK SURFACE" ADJACENT TO OVEN THAT IS 34" A..F.F. WITH NO BASE CABINETRY BELOW. KNEE CLEARANCE BELOW PER HC4.
17. FRONT CONTROL SLIDE-IN RANGE.
18. COMBINATION REFRIGERATOR FREEZERS SHALL HAVE AT LEAST 50 PERCENT OF THE FREEZER SPACE 54" MAX. ABOVE THE FLOOR. DOOR HANDLES AND AND OPERABLE PARTS (E.G. ICE AND WATER DISPENSERS) TO BE 48" MAX. AFF.
19. COUNTER AND SUPPORTING STRUCTURE TO BE 2" THICK MAX.
20. DOOR PULLS AND KNOBS TO BE MOUNTED AS CLOSE TO THE BOTTOM OF WALL CABINETS AS POSSIBLE. DOOR PULLS AND KNOBS TO BE MOUNTED AS CLOSE TO THE TOP OF BASE CABINETS AS POSSIBLE.
21. ELECTRICAL RECEPTACLES, SWITCHES, AND APPLIANCE CONTROLS AT KITCHEN COUNTERTOPS MUST BE MOUNTED 1) ON FACE OF CABINETS, 2) ON SIDE WALL 18" FROM CLEAR FLOOR SPACE, OR 3) ON BACK WALL AT COUNTERTOPS WITH A FRONT APPROACH. FOR EACH LENGTH OF COUNTERTOP (UNINTERRUPTED BY AN APPLIANCE OR SINK) THAT HAS ACCESSIBLE RECEPTACLES, ONE NON-ACCESSIBLE RECEPTACLE MAY BE INSTALLED. SEE DETAIL HC6.
22. SINGLE-LEVER FAUCET.
23. 50% OF SHELF SPACE IN CABINETS HAS CLEAR FLOOR SPACE IN FRONT AND IS WITHIN REACH RANGES OF ICC/ANSI 905

DRINKING FOUNTAIN:

24. PROVIDE HI-LO DRINKING FOUNTAIN.
25. SPOUT OUTLET IS 36" MAX. AFF FOR WHEELCHAIR ACCESSIBLE FOUNTAIN & 38" MIN. / 43" MAX. FOR STANDING ACCESSIBLE FOUNTAIN; SPOUT LOCATION AND WATER FLOW COMPLY WITH ICC/ANSI:602; OPERABLE PARTS COMPLY WITH ICC/ANSI:309
26. CLEAR FLOOR SPACE PROVIDED FOR EITHER FRONT OR PARALLEL APPROACH (CENTERED ON LOWER FOUNTAIN).
27. CANNOT PROTRUDE MORE THAN 4" INTO CIRCULATION PATH.

AREA OF REFUGE REQUIREMENTS:

(AT LOCATIONS SHOWN ON PLANS)

1. 30" x 48" CLEAR FLOOR SPACE
2. PROVIDE TWO-WAY COMMUNICATION SYSTEM PER IBC 1007.8.1. INSTRUCTIONS ON THE USE OF THE AREA UNDER EMERGENCY CONDITIONS SHALL BE POSTED ADJOINING THE COMMUNICATIONS SYSTEM. THE INSTRUCTIONS SHALL INCLUDE ALL OF THE FOLLOWING:
   - DIRECTIONS FOR USE OF THE EMERGENCY COMMUNICATIONS SYSTEM.
   - WRITTEN IDENTIFICATION OF THE LOCATION
   - DIRECTIONS TO FIND OTHER MEANS OF ACCESSIBLE EGRESS
   - "PERSONS ABLE TO USE THE EXIT STAIRWAY DO SO AS SOON AS POSSIBLE UNLESS THEY ARE ASSISTING OTHERS"
   - INFORMATION ON PLANNED AVAILABILITY OF ASSISTANCE IN THE USE OF STAIRS OR SUPERVISED OPERATION OF ELEVATORS AND HOW TO SUMMON SUCH ASSISTANCE.
3. EACH DOOR PROVIDING ACCESS TO AN AREA OF REFUGE FROM AN ADJACENT FLOOR AREA SHALL HAVE THE FOLLOWING:
   - A SIGN COMPLYING WITH ICC/ANSI STATING: "AREA OF REFUGE", INCLUDING THE INTERNATIONAL SYMBOL OF ACCESSIBILITY
   - AREA OF REFUGE SIGN SHALL BE ILLUMINATED
   - TACTILE SIGNAGE COMPLYING WITH ICC/ANSI

ELEVATOR LANDING TWO-WAY COMMUNICATION:

(AT ALL ELEVATOR LANDINGS EXCEPT FIRST FLOOR)

1. PROVIDE TWO-WAY COMMUNICATION SYSTEM PER IBC 1007.8.1. INSTRUCTIONS ON THE USE OF THE AREA UNDER EMERGENCY CONDITIONS SHALL BE POSTED ADJOINING THE COMMUNICATIONS SYSTEM. THE INSTRUCTIONS SHALL INCLUDE ALL OF THE FOLLOWING:
   - DIRECTIONS FOR USE OF THE EMERGENCY COMMUNICATIONS SYSTEM
   - WRITTEN IDENTIFICATION OF THE LOCATION
   - DIRECTIONS TO FIND OTHER MEANS OF ACCESSIBLE EGRESS

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PROJECT TITLE

ROYSTER CROSSINGS

521-523 Grand Oak Trail
MADISON, WI

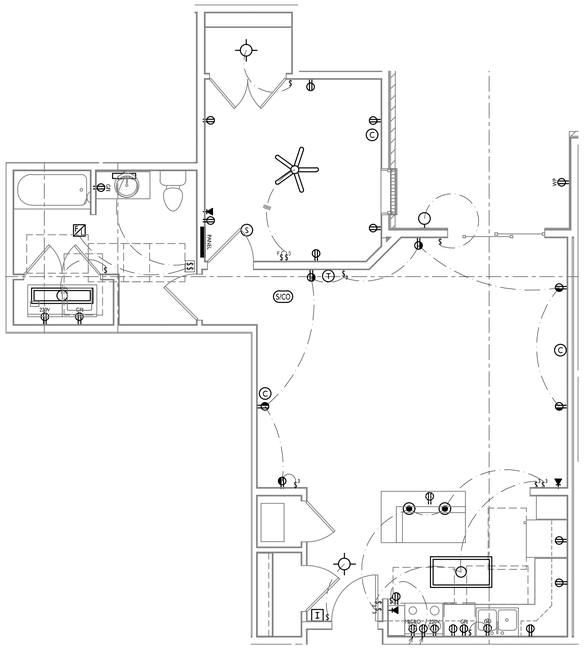
SHEET TITLE

Accessibility Requirements

SHEET NUMBER

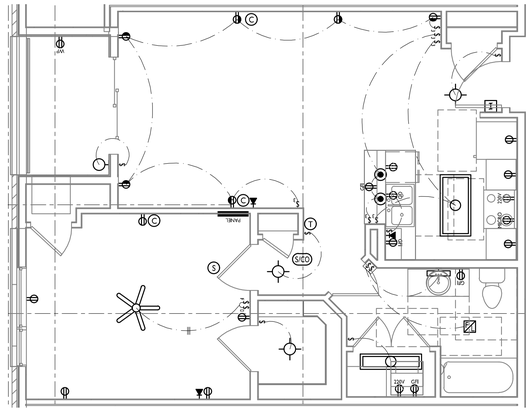
A-7.1

PROJECT NO. 1421



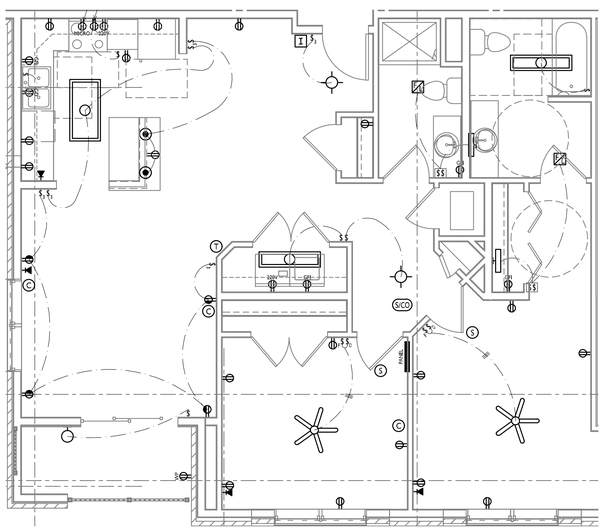
1 A-8.1 ONE BEDROOM ADA DEVICE PLACEMENT PLAN

1/4"=1'-0"



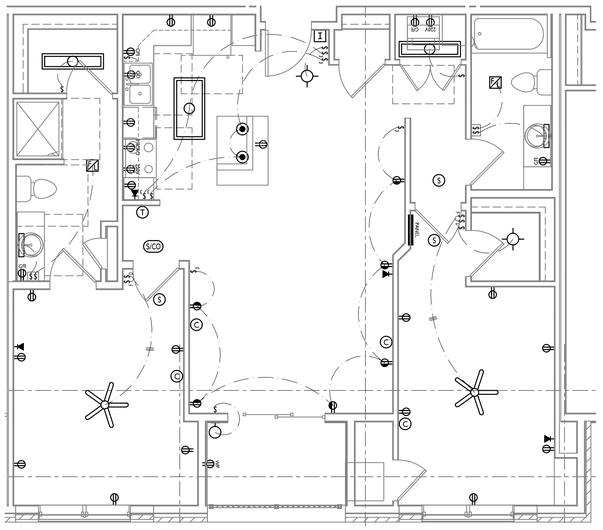
2 A-8.1 TYP. ONE BEDROOM DEVICE PLACEMENT PLAN

1/4"=1'-0"



3 A-8.1 TWO BEDROOM ADA DEVICE PLACEMENT PLAN

1/4"=1'-0"



4 A-8.1 TYP. TWO BEDROOM DEVICE PLACEMENT PLAN

1/4"=1'-0"

ELECTRICAL SYMBOL LEGEND

* ELECTRICAL CONTRACTOR IS RESPONSIBLE FOR SYSTEM DESIGN & COMPLIANCE WITH ALL APPLICABLE CODES.

PANEL	ELECTRICAL PANEL		WALL-MOUNTED LIGHT
	DUPLEX RECEPTACLE		RECESSED LIGHT
	HALF-SWITCHED RECEPTACLE		CEILING-MOUNTED LIGHT
GFI	GFI RECEPTACLE		PENDANT LIGHT
WP	WEATHERPROOF RECEPTACLE		VANITY LIGHT
GD	GARBAGE DISPOSAL RECEPTACLE		UNDERCABINET FLUORESCENT LIGHT
220V	220V RECEPTACLE		SURFACE-MOUNT FLUORESCENT STRIP LIGHT
C	CABLE JACK		CEILING FAN
T	THERMOSTAT		EXIT SIGNS
	PHONE JACK		EXIT SIGN W/ EMERGENCY LIGHTING
F	EXHAUST FAN		EMERGENCY LIGHTING
F/L	EXHAUST FAN / LIGHT	I	INTERCOM
P	PUSH PLATE FOR POWER ACCESS DOOR		1x4 FLUORESCENT LIGHT
S	SMOKE DETECTOR		2x4 FLUORESCENT LIGHT
CO	CARBON MONOXIDE DETECTOR		2x2 FLUORESCENT LIGHT
S/CO	SMOKE & CARBON MONOXIDE DETECTOR		
$	SWITCH		
$OS	OCCUPANCY SENSOR SWITCH		
$3	3-WAY SWITCH		
$D	DIMMER SWITCH		
$F	CEILING FAN CONTROL SWITCH		
$$	BATHROOM SWITCHING: 1ST SWITCH TO OPERATE VANITY LIGHT & BATH FAN/LIGHT. FAN SWITCHED OFF W/ DELAY TIMER. 2ND SWITCH TO OPERATE NIGHT LIGHT ONLY.		
$	SECONDARY BATHROOM SWITCHING: SWITCH TO OPERATE VANITY LIGHT & BATH FAN/LIGHT.		

ELECTRICAL DEVICE MOUNTING HEIGHTS

DESCRIPTION	MOUNTING HEIGHT (A.F.F. U.N.O.)	NOTES
WALL SWITCHES	3'-6" TO CENTERLINE (TYP.)	
THERMOSTATS	4'-0" TO TOP	
HUMIDISTAT	6'-8" TO CENTER	
ELECTRICAL OUTLETS	TYPICAL: 1'-6" TO CENTER AT BATH VANITY: 3'-5" TO CENTER (ON SIDE) AT KITCHEN COUNTER: BOTTOM FLUSH W/ TO OF BACKSPLASH ON FACE OF KITCHEN CABINETS: TOP FLUSH W/ BOTTOM OF COUNTERTOP	
KITCHEN DISPOSAL/FAN SWITCHES	AT KITCHEN COUNTER: BOTTOM FLUSH W/ TOP OF BACKSPLASH ON FACE OF KITCHEN CABINETS: TOP FLUSH W/ BOTTOM OF COUNTERTOP	
PHONE / CABLE JACKS	1'-6" TO CENTERLINE	
CIRCUIT BREAKER BOX	4'-0" TO TOP	

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PROJECT TITLE
ROYSTER CROSSINGS

521-523 Grand Oak Trail
MADISON, WI

SHEET TITLE
Unit Device Placement Plans

SHEET NUMBER
A-8.1

PROJECT NO. 1421

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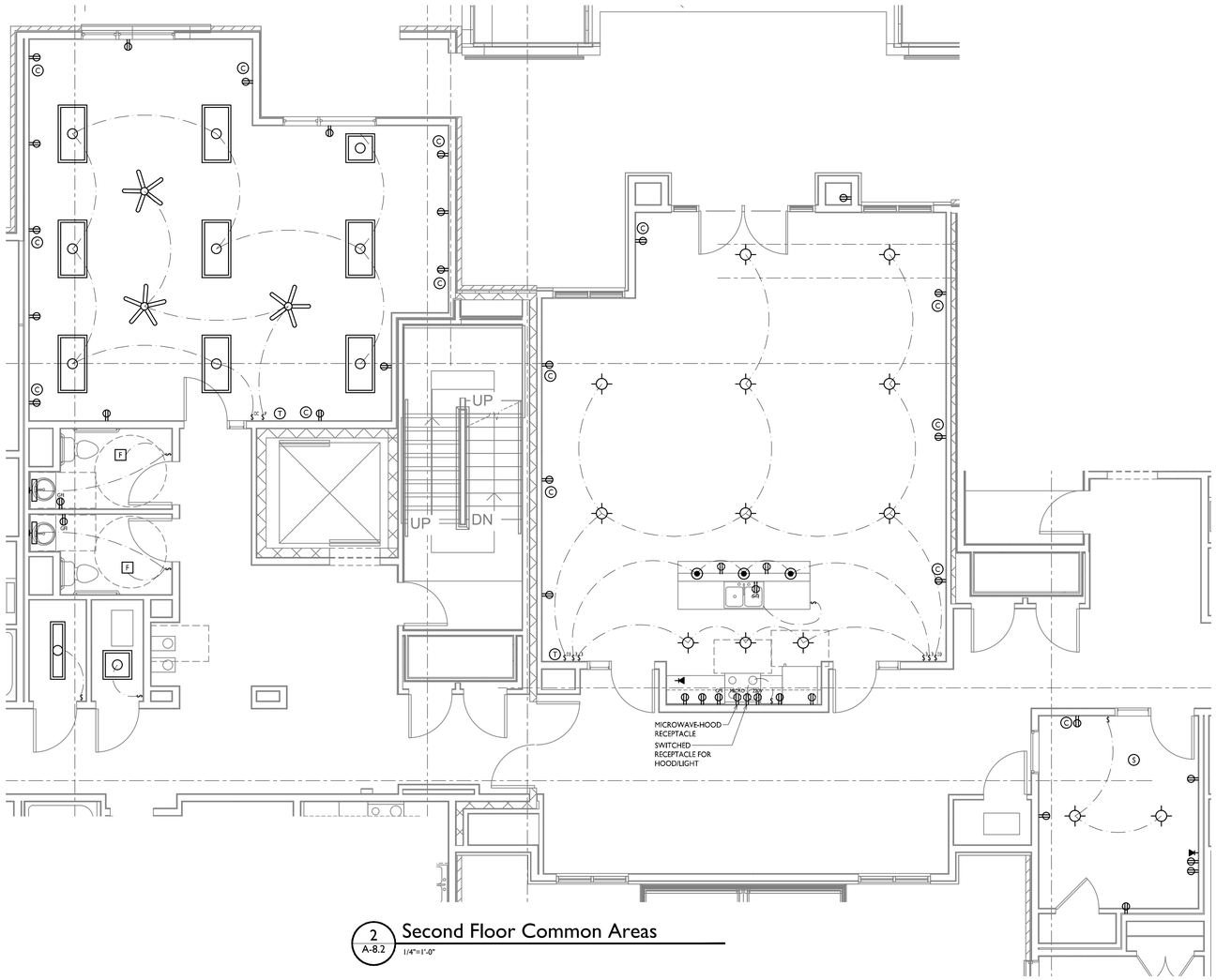

2 A-8.2 Second Floor Common Areas
1/4"=1'-0"

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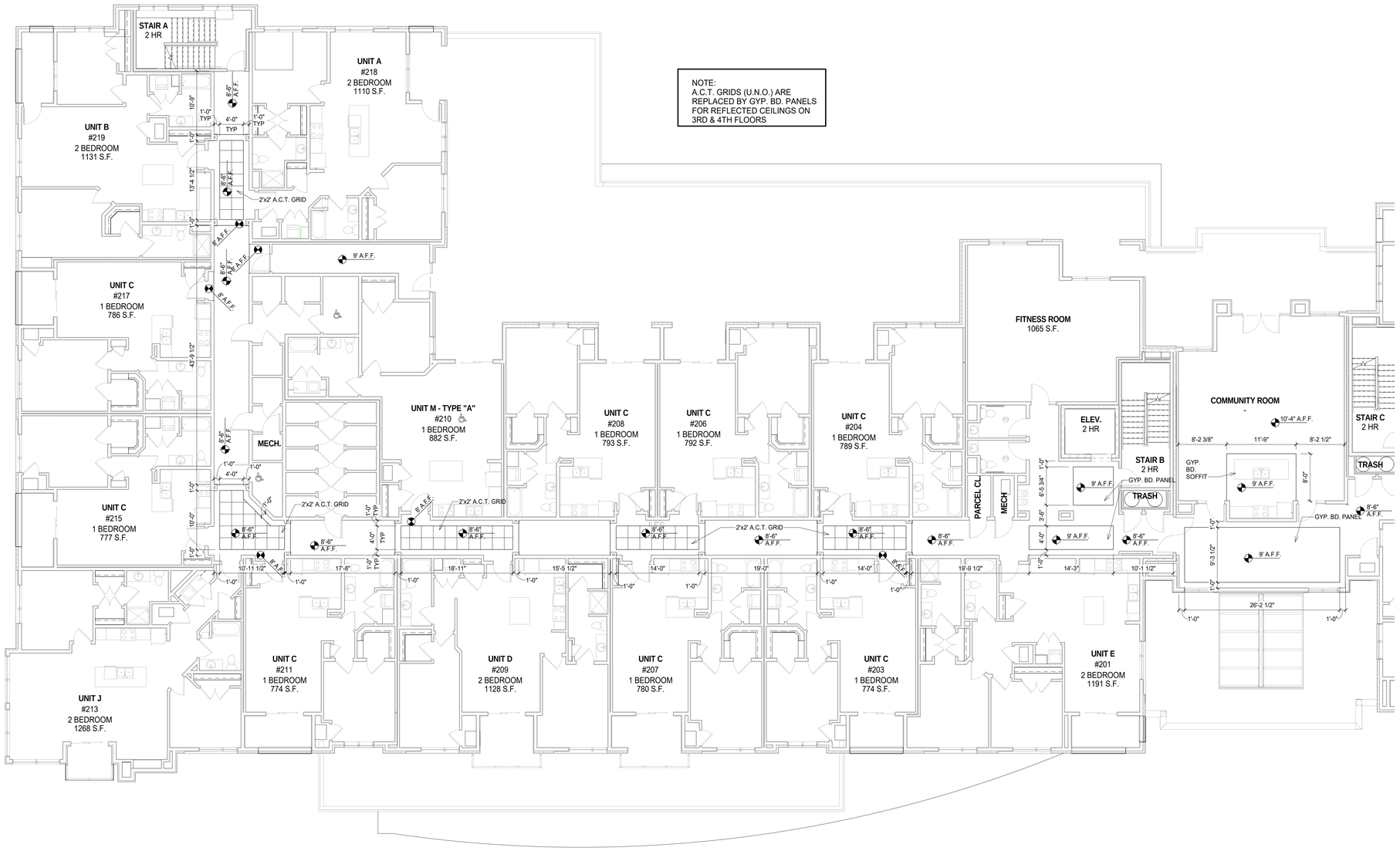
521-523 Grand Oak Trail
MADISON, WI

SHEET TITLE
Common Areas - Device Placement Plans

SHEET NUMBER
A-8.2

PROJECT NO. 1421



1 A-8.3W Second Floor Reflected Ceiling Plan - West
1/8" = 1'-0"
(THIRD & FOURTH FLOORS SIM.)

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KEY PLAN

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ROYSTER CROSSINGS

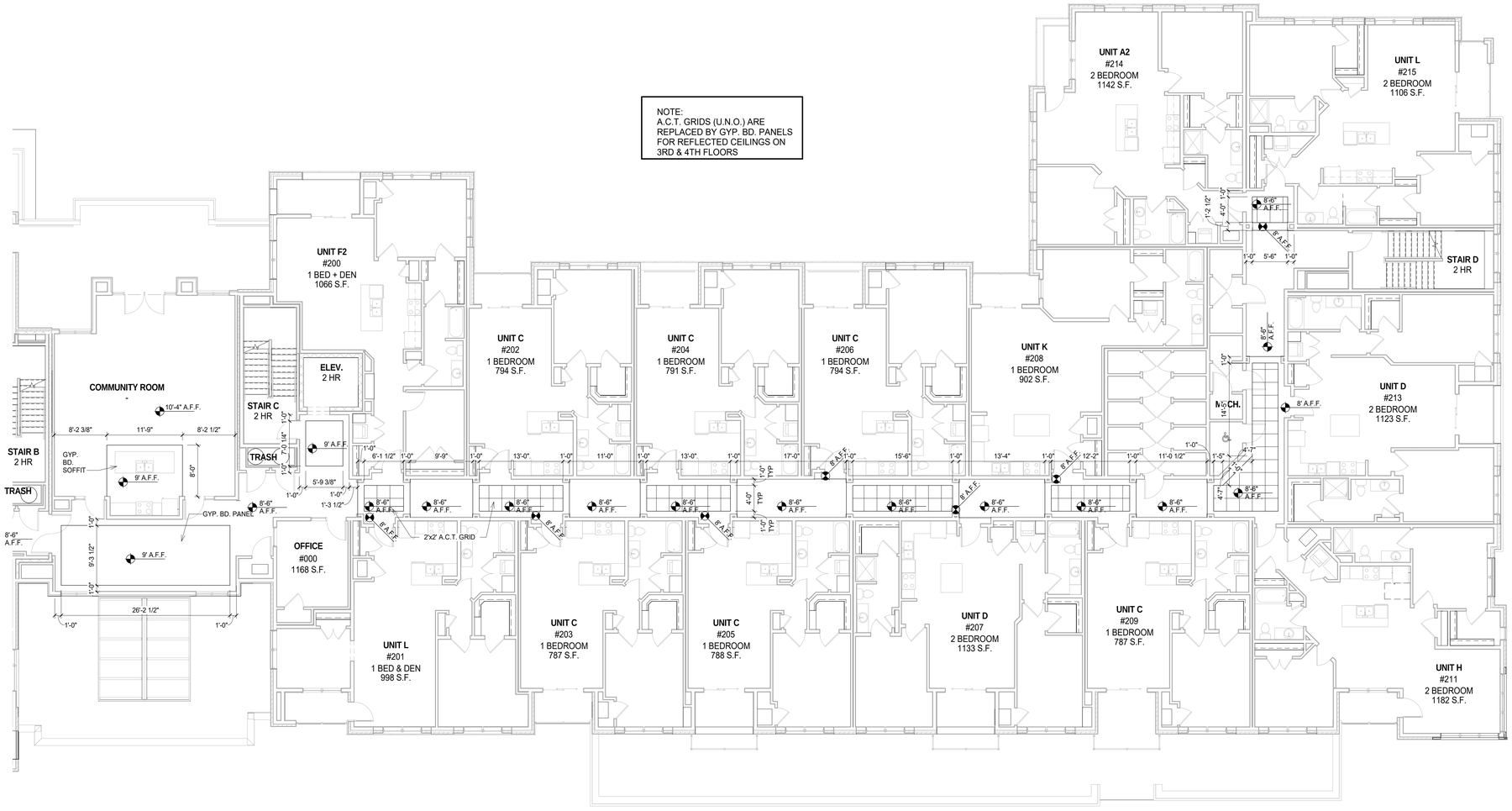
521-523 Grand Oak Trail MADISON, WI

SHEET TITLE
Second Floor Reflected Ceiling Plan - West

SHEET NUMBER
A-8.3W

PROJECT NUMBER 1421

NOTE:
A.C.T. GRIDS (U.N.O.) ARE REPLACED BY GYP. BD. PANELS FOR REFLECTED CEILINGS ON 3RD & 4TH FLOORS



1 A-8.3E Second Floor Reflected Ceiling Plan - East
1/8" = 1'-0"
(THIRD & FOURTH FLOORS SIM.)

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PROJECT TITLE
ROYSTER CROSSINGS

521-523 Grand Oak Trail MADISON, WI

SHEET TITLE
Second Floor Reflected Ceiling Plan - East

SHEET NUMBER
A-8.3E

PROJECT NUMBER 1421

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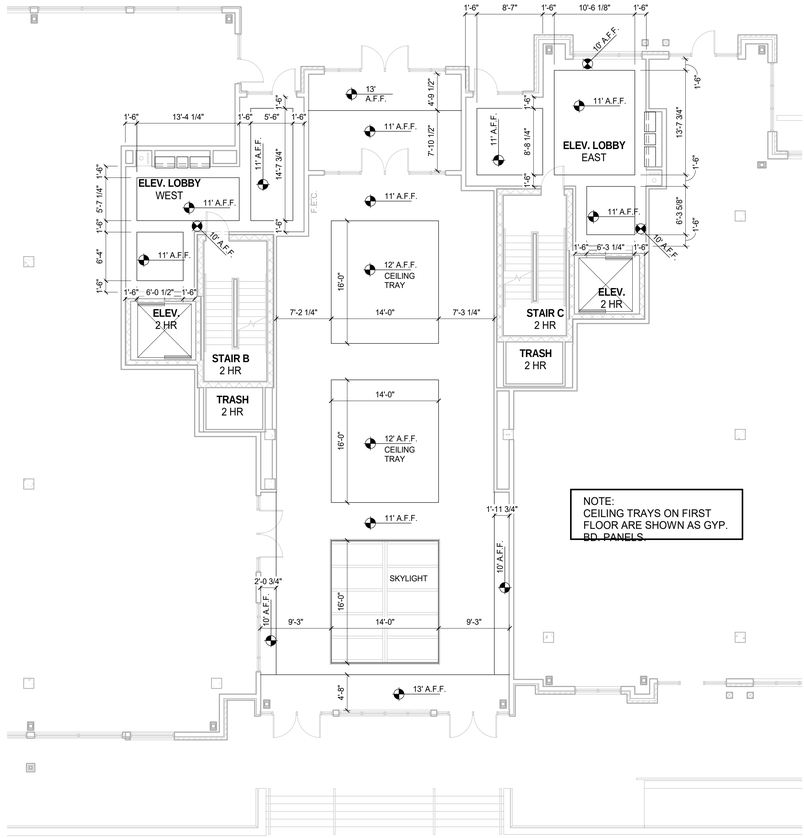
KEY PLAN



1 A-8.4 First Floor - Annex Reflected Ceiling Plan
1/8" = 1'-0"

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PROJECT TITLE
ROYSTER CROSSINGS

521-523 Grand Oak Trail MADISON, WI

SHEET TITLE
First Floor - Annex Reflected Ceiling Plan

SHEET NUMBER
A-8.4

PROJECT NUMBER 1421

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PROJECT TITLE

Lot 2Royster Crossings

86 Unit Apartment, Library & Commercial Space

516-530 Cottage Grove Rd.

Project Manual

PROJECT NO. 1421

TABLE OF CONTENTS

SECTION 00 31 00
AVAILABLE PROJECT INFORMATION

PART 1 GENERAL

1.01 EXISTING CONDITIONS

A. Certain information relating to existing surface and subsurface conditions and structures is available to bidders:

B. Geotechnical Report: Entitled "Geotechnical Exploration Report", dated March 3, 2014.
   1. A copy of this report is attached following this section.
   2. This report identifies properties of below grade conditions and offers recommendations for the design of foundations, prepared primarily for the use of Architect.
   3. This report, by its nature, cannot reveal all conditions that exist on the site. Should subsurface conditions be found to vary substantially from this report, changes in the design and construction of foundations will be made, with resulting credits or expenditures to the Contract Price accruing to Owner.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

CGC, Inc.

Construction • Geotechnical
Consulting Engineering/Testing

March 3, 2014
C14047

Mr. Dave Nelson
Ruedebusch Development and Construction
4605 Dovetail Drivc
Madison, WI 53704

Re: Geotechnical Exploration Report
Proposed Royster Clark Buildings
Cottage Grove Road and Dempsey Road
Madison, Wisconsin

Dear Mr. Nelson:

Construction • Geotechnical Consultants, Inc. (CGC) has completed the geotechnical exploration program for the project referenced above. The purpose of this exploration program was to evaluate the subsurface conditions within the proposed construction area and to provide geotechnical recommendations regarding site preparation, foundation, floor slab, below-grade wall, and asphalt pavement design/construction. An electronic copy of this report is provided for your use, and a paper copy can be provided upon request.

PROJECT DESCRIPTION

We understand that five, three to four-story buildings with underground parking and one single-story slab-on-grade structure are proposed for the southeast quadrant of the Royster Clark site, located northwest of the intersection of Cottage Grove Road and Dempsey Road in Madison, WI. In addition, large surface parking lots are also included in the proposed design, with a pergola-type structure located near the center of the largest lot. Preliminary site grading plans were not available at the time of the report; however, we estimate that lower level slab-on-grade elevations will be about 8 to 10 ft below the existing ground surface, with footing grade a few feet lower.

SITE CONDITIONS

The site is bordered on the east by Dempsey Road and the south by Cottage Grove Road. The western and northern boundaries are future roads within the proposed development, with the western side being Maher Avenue extended north across Cottage Grove Road. The site is gencrally flat due to previous site grading, with about 2 to 5 ft of relief noted between the borings.

SUBSURFACE CONDITIONS

Subsurface conditions on site were explored by drilling 14 Standard Penetration Test (SPT) soil borings (numbered B-23 through B-36) to depths of 15 to 25 ft below existing site grades at

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locations selected by Ruedebusch Development. The borings were located in the field by Williamson Surveying. Williamson Surveying personnel also obtained ground surface elevations at each boring location. The borings were drilled on February 18 and 19, 2014, by Badger State Drilling (under subcontract to CGC) using truck-mounted rotary CME-55 drill rig equipped with hollow-stem augers. The boring locations are shown in plan on the Boring Location Map attached in Appendix B.

CGC has conducted two previous subsurface explorations on the site for the proposed development. In November 2011, a preliminary subsurface exploration consisting of a dozen borings (numbered B-1 through B-12) widely spaced across the entire Royster-Clark property was performed prior to demolition. Several of these borings were located on the periphery of the proposed initial development area but do not reflect the substantial grading and demolition activity that has occurred since then. More recently, CGC completed an additional ten shallow borings (numbered B-13 through B-22) in October 2013 to develop recommendations for pavement design and utility installation for the proposed development. The five borings closest to the initial phase of development are included in Appendix B. Refer to CGC report C13369, dated November 5, 2013 for additional information.

The subsurface profile at the boring locations is fairly uniform and can generally be described by the following strata, in descending order:

- 3 to 11 ft of ***fill/possible fill*** involving loose to very dense sand and/or soft to hard clay with scattered topsoil pockets; followed by

- 3 to 7.5 ft of medium stiff to very stiff ***lean clay*** (encountered in Borings 25, 27, 30, 32, 34, 36); followed by

- Medium dense to very dense ***sand*** strata with varying amounts of silt and gravel, with scattered cobbles/boulders encountered with depth, to the maximum depth explored.

Note that concrete rubble or crushed concrete was encountered in the fill layer in Boring 26 and may be present in other areas of the site due to site grading following building demolition.

Groundwater was encountered in the borings during drilling at depths of 18.5 ft to 23.5 ft below the existing ground surface (approx. EL 841 ft to 848.5 ft). Note that groundwater levels recorded during drilling are considered approximate. More detailed groundwater level measurements were recorded by Resource Engineering Associates (REA) between September 2004 and January 2014. The average high groundwater level reading was at EL 855.2 ft and the

average low was at EL 845.6 ft, during summer and winter months, respectively. The overall average level was determined to be at EL 849.8 ft. The monitoring well locations shown in Table 1 below are located within the southeast quadrant of the Royster Site where proposed initial phase construction will occur. Groundwater levels are expected to fluctuate with seasonal variations in precipitation, infiltration, evapotranspiration, and other factors. A more detailed description of the site soil and groundwater conditions is presented on the Boring Logs attached in Appendix B.

Table 1 - Water Level Elevation (ft)			
Well	**High**	**Low**	**Average**
MW5	858.4	846.2	850.2
MW6	856.2	845.4	848.8
MW6P	852.9	841.9	848.0
MW6PP	851.2	845.1	848.5
PECFA MW1	856.6	847.1	851.3
PECFA MW2	855.9	847.1	850.8
PECFA MW3	855.2	846.7	850.8
Average	**855.2**	**845.6**	**849.8**

DISCUSSION AND RECOMMENDATIONS

Subject to the limitations discussed below and based on the subsurface exploration, it is our opinion that the site is suitable for the proposed construction and that the structures can be supported by conventional spread footing foundations. Our recommendations for site preparation, foundation, floor slab, below-grade wall and asphalt pavement design/construction are presented in the following subsections. Additional information regarding the conclusions and recommendations presented in this report is discussed in Appendix C.

1. Site Preparation

We recommend that the surficial topsoil (if any) be stripped/removed at least 10 ft beyond the proposed construction areas, including areas required for cuts and fills beyond the proposed building footprints or pavement limits. The topsoil can be stockpiled on-site and re-used as fill in landscaped areas.

Following topsoil removal, the exposed subgrades are expected to consist of granular fill and cohesive soils, possibly including and perhaps some construction materials (e.g., crushed concrete). Exposed granular soils in areas to receive fill (if any) should be recompacted with a large vibratory compactor and cohesive soils should be proof-rolled with a loaded tri-axle truck to check for soft/loose or yielding areas. If soft or loose areas are detected, they should be stabilized

with 3-in. dense graded base (DGB) or undercut/removed. Where undercutting is required, grade should be re-established using granular backfill compacted to at least 95% compaction based on modified Proctor methods (ASTM D1557) or 3-in. DGB placed in 10-in. lifts and compacted with heavy equipment until deflection ceases.

We recommend using granular material as structural fill below structures or pavement. The on-site shallow mixed fill soils are generally not acceptable for reuse as fill below structures due to their variability, but may be suitable for use below parking areas if the proportion of clay in the fill is not too high. Otherwise, they should be used in landscaped areas. Additionally, we do not recommend using clay/silt soils as structural fill because moisture conditioning will be required to achieve desired compaction levels, which could delay construction progress. Fill/backfill should be compacted to at least 95% (ASTM D1557) in accordance with our Recommended Compacted Fill Specifications presented in Appendix D. Periodic field density tests should be taken by CGC staff within the fill/backfill to document the adequacy of compactive effort.

Excavation to reach lower-level subgrade elevations can then proceed. The excavation(s) should be sloped in accordance with OSHA sloping guidelines. A significant amount of the soils to be excavated consist of clays or sands with significant silt content, which are generally classified as OSHA "Type B" soils and slopes of 1H:1V or flatter are expected to be at least temporarily stable. Note that some of the in-place variable fill may require landfill disposal if they are to be moved off-site due to the presence of cinders, concrete and other debris. Exposed soils at lower-level parking slab subgrade levels are expected to consist of native granular and cohesive soils, while the exposed soils beneath the single-story slab-on-grade structure are expected to consist of fill sands and clays. The exposed subgrade soils should be proof-rolled/recompacted as described above and stabilized/undercut as needed.

Due to the proximity of some of the building excavations to the adjacent streets, a soil retention system (soldier pile and lagging, sheet pile, soil nailing, etc.) may be required during site development activities, depending on the extent of construction easements that can be obtained. Soil nailing or soldier pile/wood lagging systems are commonly used where excavations are adjacent to pavement areas. Buried utilities such as sewers, water mains, fiber optic cable or gas lines may also require special support if they are close to excavations. The retention system should be designed by a registered professional engineer.

2. Foundation Design

In our opinion, the proposed structures can be supported on reinforced concrete spread footing foundations bearing on the native sand or clay strata, or perhaps granular fill following undercutting/replacement of fill soils in the area of the slab-on-grade structures. The following parameters should be used for foundation design:

- Maximum net allowable bearing pressure: 3,500 psf

- Minimum foundation widths:
  -- Continuous wall footings: 18 in.
  -- Column pad footings: 30 in.

- Minimum footing depths:
  -- Exterior/perimeter footings: 4 ft
  -- Interior footings: no minimum requirement

Undercutting below footing grade will be required if sand or clay fill, native clays with pocket penetrometer readings (an estimate of cohesive soil's unconfined compressive strength) of less than 2.0 ton/sq ft or loose native sand/silt soils are observed at or slightly below footing grade. Based on the presence of mixed fill in the area of the proposed slab-on-grade structure (in the northeast corner near Boring 28), an allowance should be included in the budget for undercutting/replacement of unacceptable fill soils at or near footing grade. The base of the undercut excavations should be widened beyond the footing edges at least 0.5 ft in each direction for each foot of undercut depth for stress distribution purposes. Footings grade should be restored with granular fill compacted to least 95% (ASTM D1557) in accordance with our Recommended Compacted Fill Spccifications presented in Appendix D. Footing grade near the water table should be re-established using clear stone compacted with a hoe-pak until deflection ceases. Note that if the undercut thickness exceeds 1 ft, the clear stone should be enveloped in a non-woven geotextile fabric (Mirafi 140 N or equivalent). CGC should be present during footing excavations to check whether subgrades are satisfactory for the design bearing pressure and to advise on corrective measures, where necessary.

We recommend using a smooth-edged backhoe bucket for footing excavations. For excavations extending less than about 1 to 2 ft below the groundwater table, dewatering can probably be accomplished using sumps operating from filtered sumps. Where excavations extend more than 2 ft below the groundwater table, effective dewatering generally requires a series of deep wells or vacuum well point system. Granular footing subgrade soils at least 2 ft above the water table should be recompacted with a large vibratory compactor to densify soils loosened during excavation. Provided the foundation design/construction recommendations discussed above are followed, we estimate that total and differential settlements should not exceed 1.0 and 0.5 in., respectively.

3. Seismic Design Category

In our opinion, the average soil/rock properties in the upper 100 ft of the site (based on SPT blow counts (N-values) greater than 15 blows/ft on average) can be characterized as a stiff soil profile. This characterization would place the site in Site Class D for seismic design according to the International Building Code (see Table 1613.5.2).

4. Floor Slabs

Lower Level

In our opinion, the lower-level floor slabs for the buildings that will be supported on a compacted stone drainage layer over native granular soils can be designed using a subgrade modulus of 150 pci. Prior to slab construction, the subgrades should be recompacted to densify soils that may become disturbed or loosened during construction activities. The design subgrade modulus is based on a recompacted subgrade such that non-yielding conditions are developed, as described in the Site Preparation section of this report. The stone drainage course should be a minimum of 12 in. thick, using ¾-in. stone satisfying WDOT No. 1 Stone gradation requirements. A non-woven geotextile layer (e.g., Mirafi 140N or equivalent) is required to separate the drainage layer from the subgrade soils. The fabric should be overlapped by at least 24 in. between adjacent sheets and extend up the sides of footings/foundation walls to completely envelope the stone drainage layer. Particular attention is required at the interfaces between the fabric and the structure, including vertical pipe penetrations.

As a minimum, a perimeter drainage system should be installed consisting of perforated drain tile connected to sumps. Depending on the proximity of the floor slab elevation to the average high water level, interior drain lines at 20 to 25 ft on center may also be required. We can provide more detailed recommendations upon request.

Slabs-on-Grade

We anticipate that the floor slabs for the proposed single-story structure will generally be supported on existing fill sand and clay soils or newly-placed compacted granular fill, and in our opinion a subgrade modulus of 100 pci should be used for design. Care should be taken during proof-rolling operations described in the Site Preparation section of this report due to the variability of the mixed on-site fill soils. Soft/yielding soils, or unsuitable fill, should be undercut/replaced prior to slab construction. The design subgrade modulus is based on a recompacted subgrade such that non-yielding conditions are developed. To serve as a capillary break, the final 4 in. of soil placed below the slab should consist of well-graded sand or gravel with no more than 5 percent by weight passing the No. 200 U.S. standard sieve. Note that some

structural engineers prefer to use dense grade base beneath the floor slab (in lieu of the capillary break layer) to improve the subgrade modulus. If 6 in. of well-compacted dense graded base is used below the floor slab, the subgrade modulus can be increased to 150 pci.

The floor slabs should be isolated from the building walls and columns with a compressible filler, and the design should include an adequate number of isolation and contraction joints. A vapor barrier can also be included immediately below the slab to minimize moisture migration.

5. Below-Grade Walls

We anticipate that the below-grade walls for the structure will be supported by the lower-level slab and upper-level framing. Therefore, *at-rest* lateral earth pressures should be used during design. To minimize the buildup of such pressures, high-quality backfill should be placed within 4 to 6 ft of the walls. We recommend that a perimeter drainage system be installed to intercept potential surface water infiltration and that the granular backfill be continuously connected to the drainage system that discharges to a sump. The granular backfill should be imported, well-graded sand or gravel having no more than 12 percent passing the No. 200 U.S. standard sieve. On-site sands with higher silt contents (indicated as SM on soil boring logs) can be used if 3-D drainage board is incorporated into the design. To impede the inflow of surface moisture, the final 2 ft of backfill in unpaved areas should consist of a clayey fill cap. The clayey cap (or pavement) should be graded to promote positive drainage away from the walls. Recommended perimeter drain details are presented in Appendix E.

Before placing the wall backfill, the exterior walls above the water table should be *damp-proofed* with spray-applied or mopped-on rubber or bituminous sealer and portions of walls below the water table should be *water-proofed.* Compaction of the backfill within 3 to 5 ft of the walls should be performed with lightweight equipment to avoid the development of excessive lateral earth pressures. The backfill should be compacted to a minimum of 93 percent modified Proctor following Appendix D guidelines. Lower-level walls constructed above the water table and in accordance with the above recommendations may be designed for an equivalent fluid pressure of 55 psf per ft of depth. Groundwater pressure should be included for walls constructed below the groundwater table. Additionally, the wall design should also account for surcharge effects that could be applied during or after construction.

7. Pavement Design

Depending on final site grades, the subgrade soils within the drive/parking areas will probably consist of variable fill material or compacted granular fill. Pavement subgrades should be proof-rolled/recompacted as described in the Site Preparation section of this report and stabilized as needed with 3-in. DGB or replaced with compacted granular fill. We assume that the pavement

areas will be subjected to mainly automobile traffic with minimal truck traffic (i.e., Traffic Class II, which includes up to five design daily equivalent 18-kip single axle load – ESAL, and parking lots with more than 50 stalls). The variable clay fill soils will control the pavement thickness design. Accordingly, the pavement section tabulated below was selected assuming a CBR value of approximately 1 to 2 and a design life of 20 years.

TABLE 1
RECOMMENDED PAVEMENT SECTIONS

Material	Thickness (in.)	WDOT Specification[1]
Bituminous upper layer	1.75	Section 460, Table 460-1, 12.5 mm
Bituminous lower layer	2.25	Section 460, Table 460-1, 19.0 mm
Crushed aggregate base course	10.0	Sections 301 and 305, 31.5mm and 75 mm
TOTAL THICKNESS	14.0	

Notes:

1. Wisconsin DOT *Standard Specifications for Highway and Structure Construction*, latest Edition, including supplement specifications, but excluding Section 460.3.2 relating layer thickness to aggregate size.

2. Compaction requirements:
   - Bituminous concrete: Refer to Section 460-3.
   - Base course: Refer to Section 301.3.4.2, Standard Compaction

3. Mixture Type E-03 bituminous pavement is recommended; refer to Section 460, Table 460-2 of the *Standard Specifications.*

Note that if traffic volumes are greater than those assumed, CGC should be allowed to review the recommended pavement section and adjust it accordingly. The pavement design assumes a stable/non-yielding subgrade and a regular program of preventative maintenance. Alternative pavement designs may prove applicable and should be reviewed by CGC. If there is a delay between subgrade preparation and placing the base course, the subgrade should be recompacted.

Pavement areas subjected to concentrated wheel loads (i.e., loading docks, dumpster pads, etc.) should be constructed of Portland cement concrete. The slab should be a minimum of 6-in. thick, be underlain by at least 6 in. of dense graded base, and should contain mesh reinforcement for crack control. A subgrade modulus of 150 pci should be used for concrete pavement design on satisfactorily proof-rolled/recompacted soils.

CONSTRUCTION CONSIDERATIONS

Due to variations in weather, construction methods and other factors, specific construction problems are difficult to predict. Soil related difficulties which could be encountered on the site are discussed below:

- Due to the potentially sensitive nature of some of the on-site soils, we recommend that general site grading activities by completed during dry weather, if possible. Construction traffic should be avoided on prepared subgrades to minimize potential disturbance.

- Earthwork construction during the early spring or late fall could be complicated as a result of wet weather and freezing temperatures. During cold weather, exposed subgrades should be protected from freezing before and after footing construction. Fill should never be placed while frozen or on frozen ground.

- Excavations extending greater than 4 ft in depth below the existing ground surface should be sloped or braced in accordance with current OSHA standards.

- Based on observations made during the field exploration, groundwater infiltration into footing excavation may be expected. Additionally, water accumulating at the base of excavations as a result of precipitation should be controlled and quickly removed using pumps operating from filtered sump pits.

RECOMMENDED CONSTRUCTION MONITORING

The quality of the foundation, floor slab and pavement subgrades will be largely determined by the level of care exercised during site development. To check that earthwork and foundation construction proceeds in accordance with our recommendations, the following operations should be monitored by CGC:

- Topsoil stripping/subgrade proof-rolling within the construction areas;
- Fill/backfill placement and compaction;
- Foundation excavation/subgrade preparation; and
- Concrete placement.

* * * * *

It has been a pleasure to serve you on this project. If you have any questions or need additional consultation, please contact us.

Sincerely,

CGC, Inc.

Alex J. Bina, E.I.T
Staff Engineer

William W. Wuellner, P.E.
Senior Geotechnical Engineer

Encl: Appendix A - Field Exploration
Appendix B - Soil Boring Location
Logs of Recent Test Borings (14)
Logs of Previous Test Borings (5)
Log of Test Boring-General Notes
Unified Soil Classification System
Appendix C - Document Qualifications
Appendix D - Recommended Compacted Fill Specifications
Appendix E - Perimeter Drain Details

APPENDIX A

FIELD EXPLORATION

APPENDIX A

FIELD EXPLORATION

Subsurface conditions on site were explored by drilling 14 Standard Penetration Test (SPT) soil borings to depths of 15 to 25 ft (or refusal) below existing site grades at locations selected by Ruedebusch Development. The borings were located in the field by Williamson Surveying. Williamson Surveying personnel also obtained ground surface elevations at each boring location. The borings study were drilled on February 18 and 19, 2014, by Badger State Drilling (under subcontract to CGC) using truck-mounted rotary CME-55 drill rig equipped with hollow-stem augers. The boring locations are shown in plan on the Boring Location Map attached in Appendix B.

In each boring, soil samples were obtained at 2.5 foot intervals to a depth of 10 ft and at 5 ft intervals thereafter. The soil samples were obtained in general accordance with specifications for standard penetration testing, ASTM D 1586. The specific procedures used for drilling and sampling are described below.

1. Boring Procedures Between Samples

   The boring is extended downward, between samples, by a hollow-stem auger.

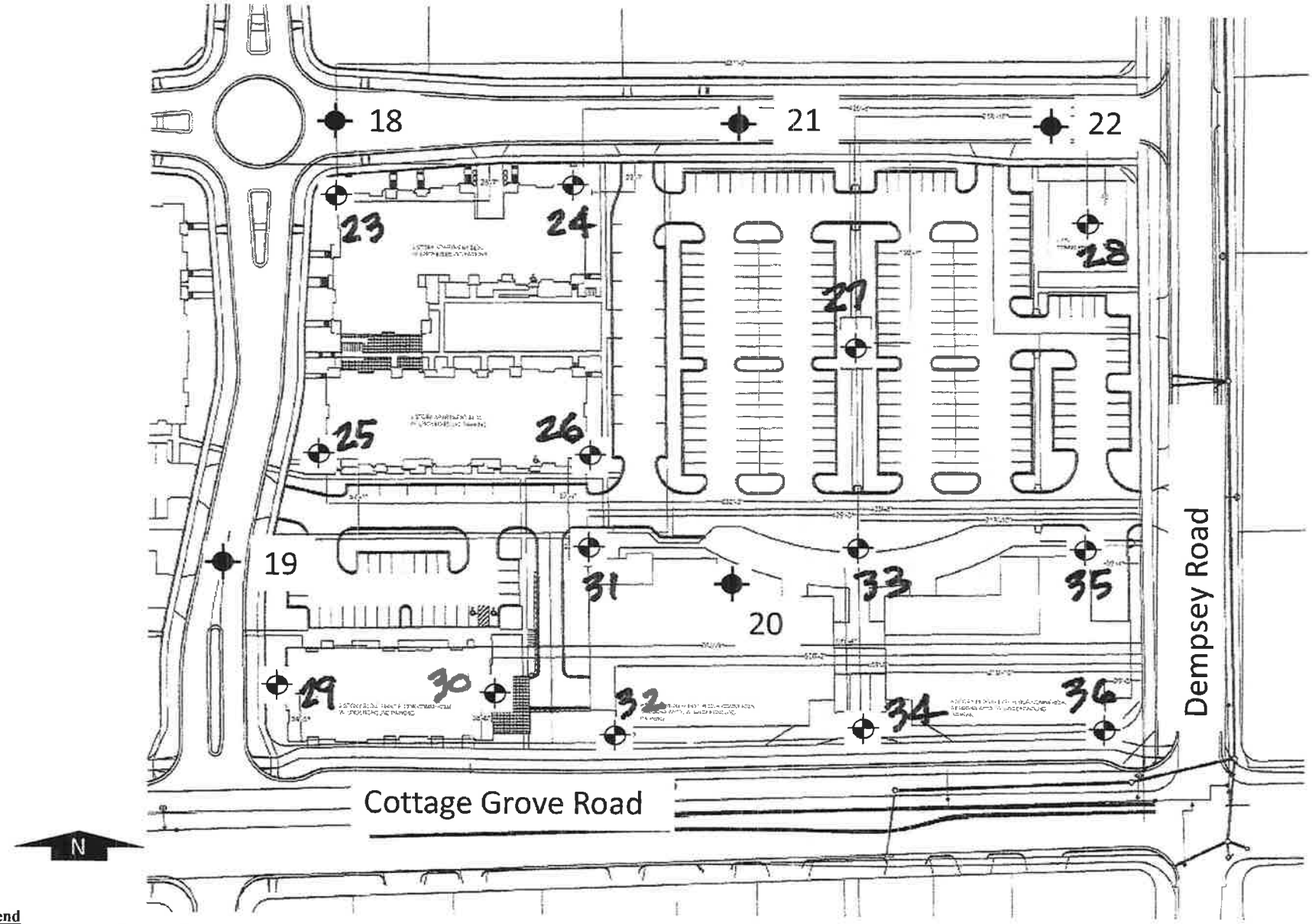
2. Standard Penetration Test and Split-Barrel Sampling of Soils
   (ASTM Designation: D 1586)

   This method consists of driving a 2-inch outside diameter split-barrel sampler using a 140-pound weight falling freely through a distance of 30 inches. The sampler is first seated 6 inches into the material to be sampled and then driven 12 inches. The number of blows required to drive the sampler the final 12 inches is recorded on the log of borings and is known as the Standard Penetration Resistance.

During the field exploration, the driller visually classified the soil and prepared a field log. Water level observations were made in each boring during and after drilling and are shown at the bottom of each boring log. Upon completion of drilling, the borings were backfilled with bentonite (where required) to satisfy WDNR regulations and the soil samples were delivered to our laboratory for visual classification and laboratory testing. The soils were visually classified by a geotechnical engineer using the Unified Soil Classification System. The final logs prepared by the engineer and a description of the Unified Soil Classification System are presented in Appendix B.

APPENDIX B

SOIL BORING LOCATION MAP
LOGS OF RECENT TEST BORINGS (14)
LOGS OF TEST BORINGS (5)
LOG OF TEST BORING - GENERAL NOTES
UNIFIED SOIL CLASSIFICATION SYSTEM



Legend

Denotes Recent Boring Location and Number

Denotes Previous Boring Location and Number (11/2013)

Notes

1. Soil borings performed by Badger State Drilling on February 18 and 19, 2014.
2. Boring locations approximate.
3. Base map provided by Ruedebusch Development and Construction.

Scale: Reduced

Date: 2/2014	CGC, Inc.	**Royster Clark Buildings** **Cottage Grove Road and Dempsey Road** **Madison, WI**
Job No. C14047		

CGC Inc.

LOG OF TEST BORING

Project: Royster Clark Additions
Cottage Grove Road
Location: Madison, Wisconsin

Boring No. 23
Surface Elevation (ft) 863.0
Job No. C14047
Sheet 1 of 1

2921 Perry Street, Madison, WI 53713 (608) 288-4100, FAX (608) 288-7887

SAMPLE No.	TYPE	Rec (in.)	Moist	N	Depth (ft)	VISUAL CLASSIFICATION and Remarks	qu (qa) (tsf)	W	LL	PL	LI
1		18	M	50/5"*		FILL: Very Dense, Brown Fine to Medium Sand, Some Clay and Gravel					
2		18	M	38	5	Dense, Brown Fine to Medium SAND, Some Silt, Little Gravel (SM - Possible Fill)					
3		18	M	42		Medium Dense to Dense, Brown Fine to Medium SAND, Little to Some Silt, Little Gravel (SP-SM/SM)					
4		18	M	40	10						
5		14	M	23	15						
6		18	W	11		Medium Dense, Brown Fine to Medium Silty SAND, Some Gravel, Scattered Cobbles/Boulders (SM)					
7		18	W	14	20						
					25	End Boring at 25 ft Borehole backfilled with bentonite chips * Sample frozen					
					30						

WATER LEVEL OBSERVATIONS

While Drilling ▽ 18.5' Upon Completion of Drilling _____
Time After Drilling _____
Depth to Water _____
Depth to Cave in _____

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

GENERAL NOTES

Start 2/18/14 End 2/18/14
Driller BSD Chief MC Rig CME-55
Logger JM Editor AJB
Drill Method 2 1/4" HSA; Autohammer

CGC Inc.

LOG OF TEST BORING

Project: Royster Clark Additions
Cottage Grove Road
Location: Madison, Wisconsin

Boring No. 24
Surface Elevation (ft) 864.9
Job No. C14047
Sheet 1 of 1

2921 Perry Street, Madison, WI 53713 (608) 288-4100, FAX (608) 288-7887

SAMPLE No.	TYPE	Rec (in.)	Moist	N	Depth (ft)	VISUAL CLASSIFICATION and Remarks	qu (qa) (tsf)	W	LL	PL	LI
1		17	M	22		FILL: Medium Dense, Brown Mix of Lean Clay, Sand and Gravel, Scattered Cinders					
2		14	M	43	5	Medium Dense to Dense, Brown Fine to Medium SAND, Some Silt, Little Gravel (SM)					
3		16	M	16							
4		2	M	10	10						
5		14	M	17		Medium Dense to Dense, Brown Fine to Medium SAND, Little to Some Silt, Little Gravel (SP/SM/SM)					
6		16	W	50/5"	15 ▽	Pushed Stone Near 19 ft					
7		14	W	25	20						
					25	End Boring at 25 ft Borehole backfilled with bentonite chips					
					30						

WATER LEVEL OBSERVATIONS

While Drilling ▽ 18.5' Upon Completion of Drilling _____
Time After Drilling _____
Depth to Water _____ ▼
Depth to Cave in _____

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

GENERAL NOTES

Start 2/19/14 End 2/19/14
Driller BSD Chief MC Rig CME-55
Logger JM Editor AJB
Drill Method 2 1/4" HSA; Autohammer

CGC Inc.

LOG OF TEST BORING

Project: Royster Clark Additions
Cottage Grove Road
Location: Madison, Wisconsin

Boring No. 25
Surface Elevation (ft) 864.3
Job No. C14047
Sheet 1 of 1

2921 Perry Street, Madison, WI 53713 (608) 288-4100, FAX (608) 288-7887

SAMPLE No.	TYPE	Rec (in.)	Moist	N	Depth (ft)	VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES qu (qa) (tsf)	W	LL	PL	LI
1		18	M	44*		FILL: Medium Stiff, Brown Lean Clay, Little Sand, Some Gravel, Scattered Topsoil	(0.5)	18.7			
2		8	M	51	5	FILL: Very Dense, Brown Fine to Medium Sand, Little Silt, Some Gravel					
3		3	M	8		Stiff to Very Stiff, Gray Lean CLAY (CL)	(2.5)				
4		12	M	7	10		(1.5)				
5		14	M	30	15	Medium Dense, Brown Fine to Medium SAND, Little Silt and Gravel (SP-SM)					
6		6	W	16	20	Medium Dense, Brown Fine to Coarse SAND and GRAVEL, Trace Silt (SP/GP)					
7		14	W	12	25	Medium Dense, Brown Fine to Medium Silty SAND, Little Gravel, Scattered Cobbles/Boulders (SM)					
					30	End Boring at 25 ft Borehole backfilled with bentonite chips * Sample frozen					

WATER LEVEL OBSERVATIONS

While Drilling ▽ 18.5' Upon Completion of Drilling _____
Time After Drilling _____
Depth to Water _____
Depth to Cave in _____

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

GENERAL NOTES

Start 2/18/14 End 2/18/14
Driller BSD Chief MC Rig CME-55
Logger JM Editor AJB
Drill Method 2 1/4" HSA; Autohammer

CGC Inc.

LOG OF TEST BORING

Project: Royster Clark Additions
Cottage Grove Road
Location: Madison, Wisconsin

Boring No. 26
Surface Elevation (ft) 864.1
Job No. C14047
Sheet 1 of 1

2921 Perry Street, Madison, WI 53713 (608) 288-4100, FAX (608) 288-7887

SAMPLE No.	TYPE	Rec (in.)	Moist	N	Depth (ft)	VISUAL CLASSIFICATION and Remarks	qu (qa) (tsf)	W	LL	PL	LI
						FILL: Dense, Brown Fine to Medium Sand, Some Clay and Gravel, Scattered Topsoil Pockets					
1		18	M	43*		FILL: Medium Dense, Brown Fine to Medium Sand, Little Silt, Some Gravel, Scattered Concrete Rubble					
2		16	M	15	5						
3		12	M	13		Loose, Light Brown Fine to Medium SAND, Little Silt and Gravel (SP-SM - Possible Fill)					
4		18	M	8	10						
5		18	M	50/3"		Very Dense, Brown Fine to Medium SAND, Little to Some Silt, Some Gravel, Scattered Cobbles/Boulders (SP-SM/SM)					
					15	Pushed Stone Near 15 ft					
6		18	W	20		Medium Dense, Brown Fine to Medium Silty SAND, Some Gravel, Scattered Cobbles/Boulders (SM)					
7		18	W	24	20						
					25	End Boring at 25 ft Borehole backfilled with bentonite chips * Sample frozen					
					30						

WATER LEVEL OBSERVATIONS

While Drilling ▽ 18.5' Upon Completion of Drilling
Time After Drilling
Depth to Water ▼
Depth to Cave in

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

GENERAL NOTES

Start 2/18/14 End 2/18/14
Driller BSD Chief MC Rig CME-55
Logger JM Editor AJB
Drill Method 2 1/4" HSA; Autohammer

CGC Inc.

LOG OF TEST BORING

Project: Royster Clark Additions
Cottage Grove Road
Location: Madison, Wisconsin

Boring No. 27
Surface Elevation (ft) 866.2
Job No. C14047
Sheet 1 of 1

2921 Perry Street, Madison, WI 53713 (608) 288-4100, FAX (608) 288-7887

SAMPLE No.	TYPE	Rec (in.)	Moist	N	Depth (ft)	VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES qu (qa) (tsf)	W	LL	PL	LI
						FILL: Stiff, Brown Lean Clay, Little Sand and Gravel					
1		14	M	4			(1.5)				
						FILL: Loose, Brown Fine to Medium Sand, Little Clay and Gravel					
2		18	M	11	5						
3		12	M	6							
						Stiff to Very Stiff Light Brown/Gray (Mottled) Lean CLAY, Trace Sand (CL)					
4		16	M	9	10		(1.5-2.5)				
						Medium Dense, Brown Fine to Medium SAND, Little Gravel, Trace Silt (SP)					
5		14	M	18	15						
						End Boring at 15 ft					
						Borehole backfilled with bentonite chips					
					20						
					25						
					30						

WATER LEVEL OBSERVATIONS

While Drilling ▽ NW Upon Completion of Drilling _____
Time After Drilling _____
Depth to Water _____ ▼
Depth to Cave in _____

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

GENERAL NOTES

Start 2/19/14 End 2/19/14
Driller BSD Chief MC Rig CME-55
Logger JM Editor AJB
Drill Method 2 1/4" HSA; Autohammer

CGC Inc.

LOG OF TEST BORING

Project: Royster Clark Additions
Cottage Grove Road
Location: Madison, Wisconsin

Boring No. 28
Surface Elevation (ft) 861.8
Job No. C14047
Sheet 1 of 1

2921 Perry Street, Madison, WI 53713 (608) 288-4100, FAX (608) 288-7887

SAMPLE No.	Type	Rec (in.)	Moist	N	Depth (ft)	VISUAL CLASSIFICATION and Remarks	qu (qa) (tsf)	W	LL	PL	LI
						FILL: Brown Mix of Clay, Sand and Gravel, Scattered Topsoil Pockets					
1		18	M	15		Medium Dense, Brown Clayey SAND, Trace Gravel (SC-Possible Fill)					
2		18	M	17		Medium Dense to Dense, Brown Fine to Medium SAND, Little Gravel, Trace Silt (SP)					
					5						
3		4	M	32							
4		7	M	33		Pushed Stone Near 9 ft					
					10						
						Very Dense, Brown Fine to Medium Silty SAND, Some Gravel, Scattered Cobbles/Boulders (SM)					
5		16	M	56							
					15	End Boring at 15 ft Borehole backfilled with bentonite chips					
					20						
					25						
					30						

WATER LEVEL OBSERVATIONS

While Drilling ▽ NW Upon Completion of Drilling _____
Time After Drilling _____
Depth to Water _____ ▼
Depth to Cave in _____

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

GENERAL NOTES

Start 2/19/14 End 2/19/14
Driller BSD Chief MC Rig CME-55
Logger JM Editor AJB
Drill Method 2 1/4" HSA; Autohammer

CGC Inc.

LOG OF TEST BORING

Project: Royster Clark Additions
Cottage Grove Road
Location: Madison, Wisconsin

Boring No. 29
Surface Elevation (ft) 867.0
Job No. C14047
Sheet 1 of 1

2921 Perry Street, Madison, WI 53713 (608) 288-4100, FAX (608) 288-7887

SAMPLE No.	TYPE	Rec (in.)	Moist	N	Depth (ft)	VISUAL CLASSIFICATION and Remarks	qu (qa) (tsf)	W	LL	PL	LI
						14 in. TOPSOIL FILL					
1		13	M	14*		Medium Dense, Brown Clayey SAND, Trace Gravel (SC-Possible Fill)		18.5			
2		14	M	26	5	Medium Dense to Dense, Brown Fine to Medium SAND, Little Silt, Clay and Gravel, (SP-SM - Possible Fill)					
3		14	M	44							
4		16	M	36	10	Medium Dense to Dense, Brown Fine to Medium Silty SAND, Little to Some Gravel, Scattered Cobbles/Boulders (SM)					
5		14	W	30	15						
6		18	W	11	20						
7		14	W	11	25	End Boring at 25 ft					
						Borehole backfilled with bentonite chips					
						* Sample frozen					
					30						

WATER LEVEL OBSERVATIONS

While Drilling ▽ 18.5' Upon Completion of Drilling
Time After Drilling
Depth to Water
Depth to Cave in

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

GENERAL NOTES

Start 2/18/14 End 2/18/14
Driller BSD Chief MC Rig CME-55
Logger JM Editor AJB
Drill Method 2 1/4" HSA; Autohammer

CGC Inc.

LOG OF TEST BORING

Project: Royster Clark Additions
Cottage Grove Road
Location: Madison, Wisconsin

Boring No. 30
Surface Elevation (ft) 865.9
Job No. C14047
Sheet 1 of 1

2921 Perry Street, Madison, WI 53713 (608) 288-4100, FAX (608) 288-7887

SAMPLE No.	TYPE	Rec (in.)	Moist	N	Depth (ft)	VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES qu (qa) (tsf)	W	LL	PL	LI
						FILL: Medium Stiff to Stiff, Brown Lean Clay, Little Sand and Gravel					
1		18	M	20*			(1.0)				
2		16	M	10			(1.0)				
					5						
						Stiff to Very Stiff Light Brown/Gray (Mottled) Lean CLAY, Trace Sand (CL)					
3		14	M	10			(1.5-3.0)	26.0			
4		12	M	10			(1.5-2.0)				
					10						
						Dense, Brown Fine to Medium SAND, Some Gravel, Little Silt (SP)					
5		14	M	38							
					15						
						Medium Dense, Brown Fine to Medium Silty SAND, Some Gravel, Scattered Cobbles/Boulders (SM)					
6		14	M/W	28							
					20						
					▽						
7		14	W	23							
					25						
						End Boring at 25 ft					
						Borehole backfilled with bentonite chips					
						* Sample frozen					
					30						

WATER LEVEL OBSERVATIONS

While Drilling ▽ 23.5' Upon Completion of Drilling _____
Time After Drilling _____
Depth to Water _____ ▼
Depth to Cave in _____

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

GENERAL NOTES

Start 2/19/14 End 2/19/14
Driller BSD Chief MC Rig CME-55
Logger JM Editor AJB
Drill Method 2 1/4" HSA; Autohammer

CGC Inc.

LOG OF TEST BORING

Project: Royster Clark Additions
Cottage Grove Road
Location: Madison, Wisconsin

Boring No. 31
Surface Elevation (ft) 866.6
Job No. C14047
Sheet 1 of 1

2921 Perry Street, Madison, WI 53713 (608) 288-4100, FAX (608) 288-7887

SAMPLE No.	TYPE	Rec (in.)	Moist	N	Depth (ft)	VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES qu (qa) (tsf)	W	LL	PL	LI
1		18	M	55*		FILL: Soft to Medium Stiff, Brown Lean Clay, Little Sand, Some Gravel	(0.5)	17.0			
2		18	M	39	5	FILL: Dense, Brown Fine to Medium Sand, Little Silt, Some Gravel Pushed Stone Near 5 ft					
3		14	M	18		FILL: Medium Dense, Light Brown to Yellow, Fine to Medium Sand, Little Gravel, Trace to Little Silt					
4		16	M	10	10						
5		14	M	17		Medium Dense, Gray Fine to Medium SAND, Little Silt and Gravel (SP-SM)					
6		4	W	29	15	Medium Dense to Dense, Brown Fine to Medium SAND, Some Silt and Gravel (SM)					
7		6	W	42	20						
					25	End Boring at 25 ft Borehole backfilled with bentonite chips * Sample frozen					
					30						

WATER LEVEL OBSERVATIONS

While Drilling ▽ 18.5' Upon Completion of Drilling
Time After Drilling
Depth to Water
Depth to Cave in

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

GENERAL NOTES

Start 2/18/14 End 2/18/14
Driller BSD Chief MC Rig CME-55
Logger JM Editor AJB
Drill Method 2 1/4" HSA; Autohammer

CGC Inc.

LOG OF TEST BORING

Project: Royster Clark Additions
Cottage Grove Road
Location: Madison, Wisconsin

Boring No. 32
Surface Elevation (ft) 866.2
Job No. C14047
Sheet 1 of 1

2921 Perry Street, Madison, WI 53713 (608) 288-4100, FAX (608) 288-7887

SAMPLE No.	TYPE	Rec (in.)	Moist	N	Depth (ft)	VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES qu (qa) (tsf)	W	LL	PL	LI
						FILL: Medium Dense, Mix of Brown Clay, Sand and Gravel					
1		16	M	24							
						FILL: Very Stiff Brown Lean Clay, Little Sand and Gravel					
2		18	M	17	5		(2.5)				
						Stiff to Very Stiff Light Brown/Gray (Mottled) Lean CLAY, Trace Sand (CL)					
3		18	M	12			(3.5)	25.6			
4		18	M	8	10		(1.5-2.5)				
						Dense to Very Dense, Brown Fine to Medium SAND, Some Gravel, Trace to Little Silt, Scattered Cobbles/Boulders (SP/SP-SM)					
5		18	M	42	15						
6		8	M	79	20						
						Very Dense, Brown Fine to Medium Silty SAND, Some Gravel, Scattered Cobbles/Boulders (SM)					
7		12	W	54	25						
						End Boring at 25 ft Borehole backfilled with bentonite chips					
					30						

WATER LEVEL OBSERVATIONS

While Drilling ▽ 23.5' Upon Completion of Drilling
Time After Drilling
Depth to Water
Depth to Cave in

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

GENERAL NOTES

Start 2/19/14 End 2/19/14
Driller BSD Chief MC Rig CME-55
Logger JM Editor AJB
Drill Method 2 1/4" HSA; Autohammer

CGC Inc.

LOG OF TEST BORING

Project: Royster Clark Additions
Cottage Grove Road
Location: Madison, Wisconsin

Boring No. 33
Surface Elevation (ft) 866.4
Job No. C14047
Sheet 1 of 1

2921 Perry Street, Madison, WI 53713 (608) 288-4100, FAX (608) 288-7887

SAMPLE No.	TYPE	Rec (in.)	Moist	N	Depth (ft)	VISUAL CLASSIFICATION and Remarks	qu (qa) (tsf)	W	LL	PL	LI
1		16	M	13		FILL: Stiff, Brown Lean Clay, Little Sand and Gravel, Scattered Cinders	(1.5)				
2		14	M	27	5	Loose, Brown Fine to Medium SAND, Little to Some Silt and Gravel (SP-SM/SM - Possible Fill)					
3		16	M	9							
4		12	M	6	10						
						Medium Dense, Brown Fine to Medium SAND, Little to Some Silt and Gravel (SP-SM/SM)					
5		6	M	24	15						
						Medium Dense, Brown Fine to Medium Silty SAND, Little Gravel, Scattered Cobbles/Boulders (SM)					
6		14	W	15	▽						
					20						
7		18	W	26							
					25	End Boring at 25 ft Borehole backfilled with bentonite chips					
					30						

WATER LEVEL OBSERVATIONS

While Drilling ▽ 18.5' Upon Completion of Drilling _____
Time After Drilling _____
Depth to Water _____
Depth to Cave in _____

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

GENERAL NOTES

Start 2/19/14 End 2/19/14
Driller BSD Chief MC Rig CME-55
Logger JM Editor AJB
Drill Method 2 1/4" HSA; Autohammer

CGC Inc.

LOG OF TEST BORING

Project: Royster Clark Additions
Cottage Grove Road
Location: Madison, Wisconsin

Boring No. 34
Surface Elevation (ft) 864.5
Job No. C14047
Sheet 1 of 1

2921 Perry Street, Madison, WI 53713 (608) 288-4100, FAX (608) 288-7887

SAMPLE No.	TYPE	Rec (in.)	Moist	N	Depth (ft)	VISUAL CLASSIFICATION and Remarks	qu (qa) (tsf)	W	LL	PL	LI
						FILL: Very Dense, Brown Mix of Clay, Sand and Gravel, Scattered Topsoil					
1		14	M	35*							
						Stiff to Very Stiff Gray Lean CLAY, Some Sand (CL)					
2		16	M	20	5		(1.5)	23.2			
						Very Stiff Light Brown/Gray (Mottled) Lean CLAY, Trace Sand (CL)					
3		6	M	8			(2.0-2.5)	24.5			
						Medium Dense, Brown Fine to Medium SAND, Some Silt and Gravel, Seattered Cobbles/Boulders (SM)					
4		14	M	12	10						
5		16	M	30	15						
						Medium Dense to Very Dense, Brown Fine to Medium Silty SAND, Little Gravel, Scattered Cobbles/Boulders (SM)					
6		18	M/W	15	20						
7		18	W	60	▽						
					25	End Boring at 25 ft					
						Borehole backfilled with bentonite chips					
						* Sample possibly frozen					
					30						

WATER LEVEL OBSERVATIONS

While Drilling ▽ 23.5' Upon Completion of Drilling _____
Time After Drilling _____
Depth to Water _____ ▼
Depth to Cave in _____

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

GENERAL NOTES

Start 2/19/14 End 2/19/14
Driller BSD Chief MC Rig CME-55
Logger JM Editor AJB
Drill Method 2 1/4" HSA; Autohammer

CGC Inc.

LOG OF TEST BORING

Project: Royster Clark Additions
Cottage Grove Road
Location: Madison, Wisconsin

Boring No. 35
Surface Elevation (ft) 863.6
Job No. C14047
Sheet 1 of 1

2921 Perry Street, Madison, WI 53713 (608) 288-4100, FAX (608) 288-7887

SAMPLE No.	TYPE	Rec (in.)	Moist	N	Depth (ft)	VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES qu (qa) (tsf)	W	LL	PL	LI
						FILL: Medium Stiff Brown Lean Clay, Some Sand and Gravel					
1		18	M	37*			(1.0)				
						Very Stiff to Hard Light Brown/Gray Lean CLAY, Some Sand, Little Gravel (CL-Possible Fill)					
2		18	M	20	5		(2.0)				
3		12	M	12			(4.0+)				
4		18	M	13		Medium Dense, Brown Fine to Medium Sand, Little to Some Silt, Trace Gravel (SP-SM/SM)					
					10						
5		3	M	4		Stiff Clay Layer Near 13.5 ft Pushed Stone Near 14 ft	(1.5)				
					15						
6		18	M/W	19		Medium Dense to Dense, Gray Fine to Medium Silty SAND, Little Gravel, Scattered Cobbles/Boulders (SM)					
					20						
7		10	M/W	37							
					25	End Boring at 25 ft Borehole backfilled with bentonite chips *Sample possibly frozen					
					30						

WATER LEVEL OBSERVATIONS

	While Drilling	Upon Completion of Drilling			
Time After Drilling					
Depth to Water					▼
Depth to Cave in					

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

GENERAL NOTES

Start 2/19/14 End 2/19/14
Driller BSD Chief MC Rig CME-55
Logger JM Editor AJB
Drill Method 2 1/4" HSA; Autohammer

CGC Inc.

LOG OF TEST BORING

Project: Royster Clark Additions
Cottage Grove Road
Location: Madison, Wisconsin

Boring No. 36
Surface Elevation (ft) 863.6
Job No. C14047
Sheet 1 of 1

2921 Perry Street, Madison, WI 53713 (608) 288-4100, FAX (608) 288-7887

SAMPLE No.	TYPE	Rec (in.)	Moist	N	Depth (ft)	VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES qu (qa) (tsf)	W	LL	PL	LI
1		18	M	13		FILL: Medium Dense, Light Brown to Yellow, Fine to Medium Sand, Little Gravel, Trace to Little Silt					
2		12	M	6	5	Very Stiff Light Brown/Gray (Mottled) Lean CLAY, Trace Sand (CL)	(2.25)				
3		16	M	22		Medium Dense, Brown Fine to Medium SAND, Trace to Little Silt, Some Gravel (SP/SP-SM)					
4		18	M	36	10	Medium Dense to Dense, Brown Fine to Medium Silty SAND, Little Gravel, Scattered Cobbles/Boulders (SM)					
5		16	M/W	11	15						
6		6	W	14	20						
7		18	W	15	25						
					30	End Boring at 25 ft Borehole backfilled with bentonite chips					

WATER LEVEL OBSERVATIONS

While Drilling ▽ 18.5' Upon Completion of Drilling _____
Time After Drilling _____
Depth to Water _____
Depth to Cave in _____

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

GENERAL NOTES

Start 2/19/14 End 2/19/14
Driller BSD Chief MC Rig CME-55
Logger JM Editor AJB
Drill Method 2 1/4" HSA; Autohammer

LOGS OF PREVIOUS BORINGS (5)

CGC Inc.

LOG OF TEST BORING

Project: Royster Site - Street & Utility
Cottage Grove Road
Location: Madison, Wisconsin

Boring No. 18
Surface Elevation (ft) 861.1
Job No. C13369
Sheet 1 of 1

2921 Perry Street, Madison, WI 53713 (608) 288-4100, FAX (608) 288-7887

SAMPLE No.	TYPE	Rec (in.)	Moist	N	Depth (ft)	VISUAL CLASSIFICATION and Remarks	qu (qa) (tsf)	W	LL	PL	LI
						FILL: Brown Fine to Medium Sand, Some Clay and Gravel					
1		11	M	13							
2		9	M	9		Stiff to Very Stiff, Gray/Brown (Mottled) Lean CLAY, Trace Sand (CL)	(1.5-2.5)				
					5						
3		6	M	12			(1.5)				
4		12	M	22		Medium Dense, Light Brown Fine to Medium SAND, Trace to Little Silt (SP-SM)					
					10	End of Boring at 10 ft Borehole backfilled with bentonite chips					
					15						

WATER LEVEL OBSERVATIONS

While Drilling ▽ NW Upon Completion of Drilling
Time After Drilling
Depth to Water ▼
Depth to Cave in

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

GENERAL NOTES

Start 10/29/13 End 10/29/13
Driller Badger Chief KD Rig CME-55
Logger MG Editor AJB
Drill Method 2 1/4" HSA

CGC Inc.

LOG OF TEST BORING

Project: Royster Site - Street & Utility
Cottage Grove Road
Location: Madison, Wisconsin

Boring No. 19
Surface Elevation (ft) 861.9
Job No. C13369
Sheet 1 of 1

2921 Perry Street, Madison, WI 53713 (608) 288-4100, FAX (608) 288-7887

SAMPLE					VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES				
No.	Type	Rec (in.)	Moist	N	Depth (ft)		qu (qa) (tsf)	W	LL	PL	LI
						FILL: Stiff to Very Stiff, Brown Lean Clay, Little Sand and Gravel					
1		9	M	16			(2.0)				
						FILL: Stiff, Gray Mottled Silty Clay, Little Gravel					
2		14	M	13			(2.0)				
					5						
3		8	M	50/3"		Concrete Layer at 6.5 - 7 ft					
						Dense, Brown Fine SAND, Some Gravel, Little Silt with Silty Clay Seams (SP-SM - Possible Fill)					
4		12	M	35							
					10	End of Boring at 10 ft					
						Borehole backfilled with bentonite chips					
					15						

WATER LEVEL OBSERVATIONS

While Drilling ▽ NW — Upon Completion of Drilling
Time After Drilling
Depth to Water ▼
Depth to Cave in

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

GENERAL NOTES

Start 10/29/13 End 10/29/13
Driller Badger Chief KD Rig CME-55
Logger MG Editor AJB
Drill Method 2 1/4" HSA

CGC Inc.

LOG OF TEST BORING

Project: Royster Site - Street & Utility
Cottage Grove Road
Location: Madison, Wisconsin

Boring No. 20
Surface Elevation (ft) 866.8
Job No. C13369
Sheet 1 of 1

2921 Perry Street, Madison, WI 53713 (608) 288-4100, FAX (608) 288-7887

SAMPLE No.	TYPE	Rec (in.)	Moist	N	Depth (ft)	VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES qu (qa) (tsf)	W	LL	PL	LI
						FILL: Very Stiff, Brown Lean Clay, Some Gravel, Little Sand					
1		6	M	11			(2.5)				
2		14	M	10		FILL: Loose, Brown Fine to Medium Sand, Some Silt, Scattered Clay					
					5						
3		9	M	17		Hard, Dark Brown Lean CLAY (CL)	(4.0+)				
4		13	M	8		Very Stiff, Gray to Black Lean CLAY (CL)	(2.5)				
					10	End of Boring at 10 ft Borehole backfilled with bentonite chips					
					15						

WATER LEVEL OBSERVATIONS

While Drilling ▽ NW Upon Completion of Drilling _____
Time After Drilling _____
Depth to Water _____ ▼
Depth to Cave in _____

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

GENERAL NOTES

Start 10/29/13 End 10/29/13
Driller Badger Chief KD Rig CME-55
Logger MG Editor AJB
Drill Method 2 1/4" HSA

CGC Inc.

LOG OF TEST BORING

Project: Royster Site - Street & Utility
Cottage Grove Road
Location: Madison, Wisconsin

Boring No. 21
Surface Elevation (ft) 866.1
Job No. C13369
Sheet 1 of 1

2921 Perry Street, Madison, WI 53713 (608) 288-4100, FAX (608) 288-7887

SAMPLE No.	Rec (in.)	Moist	N	Depth (ft)	VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES qu (qa) (tsf)	W	LL	PL	LI
					FILL: Stiff, Brown Lean Clay, Little Sand and Gravel					
1	7	M	6			(1.5)				
2	14	M	19	5	FILL: Medium Dense, Brown Fine to Medium Sand, Some Silt, Little Gravel, Scattered Clay					
3	13	M	7		FILL: Loose, Brown/Light Brown Fine to Medium Sand, Some Gravel, Little Silt					
4	9	M	10	10						
					End of Boring at 10 ft Borehole backfilled with bentonite chips					
				15						

WATER LEVEL OBSERVATIONS

While Drilling	▽ NW	Upon Completion of Drilling		
Time After Drilling				
Depth to Water				▼
Depth to Cave in				

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

GENERAL NOTES

Start 10/29/13 End 10/29/13
Driller Badger Chief KD Rig CME-55
Logger MG Editor AJB
Drill Method 2 1/4" HSA

CGC Inc.

LOG OF TEST BORING

Project: Royster Site - Street & Utility
Cottage Grove Road
Location: Madison, Wisconsin

Boring No. 22
Surface Elevation (ft) 863.8
Job No. C13369
Sheet 1 of 1

2921 Perry Street, Madison, WI 53713 (608) 288-4100, FAX (608) 288-7887

SAMPLE No.	TYPE	Rec (in.)	Moist	N	Depth (ft)	VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES qu (qa) (tsf)	W	LL	PL	LI
						FILL: Loose, Brown Fine to Medium Sand, Scattered Clay and Silty Topsoil					
1		12	M	9							
2		8	M	14	5	FILL: Hard, Brown Lean Clay, Little Sand and Gravel	(4.0+)				
3		13	M	15		Medium Dense, Light Brown Fine to Medium SAND, Trace Silt (SP)					
4		13	M	43	10	Dense, Brown Fine to Coarse SAND, Some Gravel, Trace Silt (SP)					
						End of Boring at 10 ft Borehole backfilled with bentonite chips					
					15						

WATER LEVEL OBSERVATIONS

While Drilling ▽ NW Upon Completion of Drilling _____
Time After Drilling _____
Depth to Water _____ ▼
Depth to Cave in _____

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

GENERAL NOTES

Start 10/29/13 End 10/29/13
Driller Badger Chief KD Rig CME-55
Logger MG Editor AJB
Drill Method 2 1/4" HSA

CGC, Inc.

LOG OF TEST BORING
General Notes

DESCRIPTIVE SOIL CLASSIFICATION

Grain Size Terminology

Soil Fraction	Particle Size	U.S. Standard Sieve Size
Boulders	Larger than 12"	Larger than 12"
Cobbles	3" to 12"	3" to 12"
Gravel: Coarse	¾" to 3"	¾" to 3"
Fine	4.76 mm to ¾"	#4 to ¾"
Sand: Coarse	2.00 mm to 4.76 mm	#10 to #4
Medium	0.42 to mm to 2.00 mm	#40 to #10
Fine	0.074 mm to 0.42 mm	#200 to #40
Silt	0.005 mm to 0.074 mm	Smaller than #200
Clay	Smaller than 0.005 mm	Smaller than #200

Plasticity characteristics differentiate between silt and clay.

General Terminology

Physical Characteristics
Color, moisture, grain shape, fineness, etc.
Major Constituents
Clay, silt, sand, gravel
Structure
Laminated, varved, fibrous, stratified, cemented, fissured, etc.
Geologic Origin
Glacial, alluvial, eolian, residual, etc.

Relative Density

Term	"N" Value
Very Loose	0 - 4
Loose	4 - 10
Medium Dense	10 - 30
Dense	30 - 50
Very Dense	Over 50

Relative Proportions Of Cohesionless Soils

Proportional Term	Defining Range by Percentage of Weight
Trace	0% - 5%
Little	5% - 12%
Some	12% - 35%
And	35% - 50%

Consistency

Term	q_u-tons/sq. ft
Very Soft	0.0 to 0.25
Soft	0.25 to 0.50
Medium	0.50 to 1.0
Stiff	1.0 to 2.0
Very Stiff	2.0 to 4.0
Hard	Over 4.0

Organic Content by Combustion Method

Soil Description	Loss on Ignition
Non Organic	Less than 4%
Organic Silt/Clay	4 – 12%
Sedimentary Peat	12% - 50%
Fibrous and Woody Peat	More than 50%

Plasticity

Term	Plastic Index
None to Slight	0 - 4
Slight	5 - 7
Medium	8 - 22
High to Very High	Over 22

The penetration resistance, N, is the summation of the number of blows required to effect two successive 6" penetrations of the 2" split-barrel sampler. The sampler is driven with a 140 lb. weight falling 30" and is seated to a depth of 6" before commencing the standard penetration test.

SYMBOLS

Drilling and Sampling

CS – Continuous Sampling
RC – Rock Coring: Size AW, BW, NW, 2"W
RQD – Rock Quality Designation
RB – Rock Bit/Roller Bit
FT – Fish Tail
DC – Drove Casing
C – Casing: Size 2 ½", NW, 4", HW
CW – Clear Water
DM – Drilling Mud
HSA – Hollow Stem Auger
FA – Flight Auger
HA – Hand Auger
COA – Clean-Out Auger
SS - 2" Dia. Split-Barrel Sample
2ST – 2" Dia. Thin-Walled Tube Sample
3ST – 3" Dia. Thin-Walled Tube Sample
PT – 3" Dia. Piston Tube Sample
AS – Auger Sample
WS – Wash Sample
PTS – Peat Sample
PS – Pitcher Sample
NR – No Recovery
S – Sounding
PMT – Borehole Pressuremeter Test
VS – Vane Shear Test
WPT – Water Pressure Test

Laboratory Tests

q_a – Penetrometer Reading, tons/sq ft
q_a – Unconfined Strength, tons/sq ft
W – Moisture Content, %
LL – Liquid Limit, %
PL – Plastic Limit, %
SL – Shrinkage Limit, %
LI – Loss on Ignition
D – Dry Unit Weight, lbs/cu ft
pH – Measure of Soil Alkalinity or Acidity
FS – Free Swell, %

Water Level Measurement

▽- Water Level at Time Shown
NW – No Water Encountered
WD – While Drilling
BCR – Before Casing Removal
ACR – After Casing Removal
CW – Cave and Wet
CM – Caved and Moist

Note: Water level measurements shown on the boring logs represent conditions at the time indicated and may not reflect static levels, especially in cohesive soils.

CGC, Inc.

Madison - Milwaukee

UNIFIED SOIL CLASSIFICATION SYSTEM

UNIFIED SOIL CLASSIFICATION AND SYMBOL CHART

COARSE-GRAINED SOILS (more than 50% of material is larger than No. 200 sieve size.)			
GRAVELS More than 50% of coarse fraction larger than No. 4 sieve size	Clean Gravels (Less than 5% fines)	GW	Well-graded gravels, gravel-sand mixtures, little or no fines
		GP	Poorly-graded gravels, gravel-sand mixtures, little or no fines
	Gravels with fines (More than 12% fines)	GM	Silty gravels, gravel-sand-silt mixtures
		GC	Clayey gravels, gravel-sand-clay mixtures
SANDS 50% or more of coarse fraction smaller than No. 4 sieve size	Clean Sands (Less than 5% fines)	SW	Well-graded sands, gravelly sands, little or no fines
		SP	Poorly graded sands, gravelly sands, little or no fines
	Sands with fines (More than 12% fines)	SM	Silty sands, sand-silt mixtures
		SC	Clayey sands, sand-clay mixtures
FINE-GRAINED SOILS (50% or more of material is smaller than No. 200 sieve size.)			
SILTS AND CLAYS Liquid limit less than 50%		ML	Inorganic silts and very fine sands, rock flour, silty of clayey fine sands or clayey silts with slight plasticity
		CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays
		OL	Organic silts and organic silty clays of low plasticity
SILTS AND CLAYS Liquid limit 50% or greater		MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts
		CH	Inorganic clays of high plasticity, fat clays
		OH	Organic clays of medium to high plasticity, organic silts
HIGHLY ORGANIC SOILS		PT	Peat and other highly organic soils

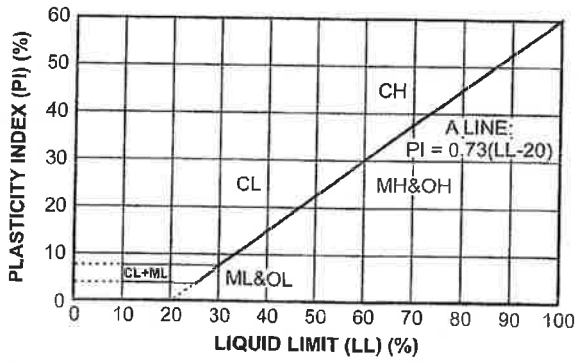
LABORATORY CLASSIFICATION CRITERIA

GW	$C_u = \frac{D_{60}}{D_{10}}$ greater than 4; $C_c = \frac{D_{30}}{D_{10} \times D_{60}}$ between 1 and 3	
GP	Not meeting all gradation requirements for GW	
GM	Atterberg limits below "A" line or P.I. less than 4	Above "A" line with P.I. between 4 and 7 are borderline cases requiring use of dual symbols
GC	Atterberg limits above "A" line with P.I. greater than 7	
SW	$C_u = \frac{D_{60}}{D_{10}}$ greater than 4; $C_c = \frac{D_{30}}{D_{10} \times D_{60}}$ between 1 and 3	
SP	Not meeting all gradation requirements for GW	
SM	Atterberg limits below "A" line or P.I. less than 4	Limits plotting in shaded zone with P.I. between 4 and 7 are borderline cases requiring use of dual symbols.
SC	Atterberg limits above "A" line with P.I. greater than 7	

Determine percentages of sand and gravel from grain-size curve. Depending on percentage of fines (fraction smaller than No. 200 sieve size), coarse-grained soils are classified as follows:

Less than 5 percent ..... GW, GP, SW, SP
More than 12 percent ..... GM, GC, SM, SC
5 to 12 percent ..... Borderline cases requiring dual symbols

PLASTICITY CHART



APPENDIX C

DOCUMENT QUALIFICATIONS

APPENDIX C
DOCUMENT QUALIFICATIONS

I. GENERAL RECOMMENDATIONS/LIMITATIONS

CGC, Inc. should be provided the opportunity for a general review of the final design and specifications to confirm that earthwork and foundation requirements have been properly interpreted in the design and specifications. CGC should be retained to provide soil engineering services during excavation and subgrade preparation. This will allow us to observe that construction proceeds in compliance with the design concepts, specifications and recommendations, and also will allow design changes to be made in the event that subsurface conditions differ from those anticipated prior to the start of construction. CGC does not assume responsibility for compliance with the recommendations in this report unless we are retained to provide construction testing and observation services.

This report has been prepared in accordance with generally accepted soil and foundation engineering practices and no other warranties are expressed or implied. The opinions and recommendations submitted in this report are based on interpretation of the subsurface information revealed by the test borings indicated on the location plan. The report does not reflect potential variations in subsurface conditions between or beyond these borings. Therefore, variations in soil conditions can be expected between the boring locations and fluctuations of groundwater levels may occur with time. The nature and extent of the variations may not become evident until construction.

II. IMPORTANT INFORMATION ABOUT YOUR GEOTECHNICAL ENGINEERING REPORT

Geotcchnical engincers structure their services to meet the specific nceds of their clients. A geotechnical engineering study conducted for a civil engineer may not fulfill the needs of a construction contractor or even another civil engineer. Because each geotechnical engineering study is unique, each geotechnical engineering report is unique, prepared *solely* for the client. *No one except you* should rely on your geotechnical engineering report without first conferring with the geotechnical engineer who prepared it. *And no one - not even you* - should apply the report for any purpose or project except the one originally contemplated.

Serious problems have occurred because those relying on a geotechnieal engineering report did not read it all. Do not rely on an executive summary. Do not read selected elcments only.

A GEOTECHNICAL ENGINEERING REPORT IS BASED ON A UNIQUE SET OF PROJECT-SPECIFIC FACTORS

Geotechnical engineers consider a number of unique, project-specific factors when establishing the scope of a study. Typical factors include: the client's goals, objectives, and risk management preferences; the general nature of the structure involved, its size, and configuration; the location of the structure on the site; and other planned or existing site improvements, such as access roads, parking lots, and underground utilities. Unless the geotechnical engineer who conducted the study specifically indicates otherwise, *do not rely on a geotechnical engineering report* that was:

- not prepared for you,
- not prepared for your project,
- not prepared for the specific site explored, or
- completed before important project changes were made.

Typical changes that can erode the reliability of an existing geotechnical report include those that affect:

- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light industrial plant to a refrigerated warehouse,
- elevation, configuration, location, orientation, or weight of the proposed structure,
- composition of the design team, or project ownership.

As a general rule, , *always* inform your geotechnical engineer of project changes - even minor ones - and request an assessment of their impact. *CGC cannot accept responsibility or liability for problems that occur because our reports do not consider developments of which we were not Informed.*

SUBSURFACE CONDITIONS CAN CHANGE

A geotechnical engineering report is based on conditions that existed at the time the study was performed. *Do not rely on a geotechnical engineering report* whose adequacy may have been affected by: the passage of time; by man-made events, such as construction on or adjacent to the site; or by natural events, such as floods, earthquakes, or groundwater fluctuations. *Always* contact the geotechnical engineer before applying the report to determine if it is still reliable. A minor amount of additional testing or analysis could prevent major problems.

MOST GEOTECHNICAL FINDINGS ARE PROFESSIONAL OPINION

Site exploration identifies subsurface conditions only at those points where surface tests are conducted or samples are taken. Geotechnical engineers review field and laboratory data and then apply their professional judgement to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ - sometimes significantly - from those indicated in your report. Retaining the geotechnical engineer who developed your report to provide construction observation is the most effective method of managing the risks associated with unanticipated conditions.

A REPORT'S RECOMMENDATIONS ARE NOT FINAL

Do not over-rely on the construction recommendations included in your report. *Those recommendations are not final,* because geotechnical engineers develop them principally from judgement and opinion, geotechnical engineers can finalize their recommendations only by observing actual subsurface conditions revealed during construction. *CGC cannot assume responsibility or liability for the report's recommendations if we do not perform construction observation.*

A GEOTECHNICAL ENGINEERING REPORT IS SUBJECT TO MISINTERPRETATION

Other design team members' misinterpretation of geotechnical engineering reports has resulted in costly problems. Lower that risk by having your geotechnical engineer confer with appropriate members of the design team after submitting the report. Also retain your geotechnical engineer to review pertinent elements of the design team's plans and specifications. Contractors can also misinterpret a geotechnical engineering report. Reduce that risk by having CGC participate in prebid and preconstruction conferences, and by providing construction observation.

DO NOT REDRAW THE ENGINEER'S LOGS

Geotechnical engineers prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. To prevent errors or omissions, the logs included in a geotechnical engineering report should *never* be redrawn for inclusion in architectural or other design drawings. Only photographic or electronic reproduction is acceptable, *but recognize that separating logs from the report can elevate risk.*

GIVE CONTRACTORS A COMPLETE REPORT AND GUIDANCE

Some owners and design professionals mistakenly believe they can make contractors liable for unanticipated subsurface conditions by limiting what they provide for bid preparation. To help prevent costly problems, give contractors the complete geotechnical engineering report, *but* preface it with a clearly written letter of transmittal. In that letter, advise contractors that the report was not prepared for purposes of bid development and that the report's accuracy is limited; encourage them to confer with the geotechnical engineer who prepared the report (a modest fee may be required) and/or to conduct additional study to obtain the specific types of information they need or prefer. A prebid conference can also be valuable. *Be sure contractors have sufficient time* to perform additional study. Only then might you be in a position to give contractors the best information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions.

READ RESPONSIBILITY PROVISIONS CLOSELY

Some clients, design professionals, and contractors do not recognize that geotechnical engineering is far less exact than other engineering disciplines. This lack of understanding has created unrealistic expectations that have led to disappointments, claims, and disputes. To help reduce such risks, geotechnical engineers commonly include a variety of explanatory provisions in their reports. Sometimes labeled "limitations," many of these provisions indicate where geotechnical engineer's responsibilities begin and end, to help others recognize their own responsibilities and risks. Read these provisions closely. Ask questions. Your geotechnical engineer should respond fully and frankly.

GEOENVIRONMENTAL CONCERNS ARE NOT COVERED

The equipment, techniques, and personnel used to perform a *geoenvironmental* study differ significantly from those used to perform a *geotechnical* study. For that reason, a geotechnical engineering report does not usually relate any geoenvironmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated environmental problems have led to numerous project failures.* If you have not yet obtained your own geoenvironmental information, ask your geotechnical consultant for risk management guidance. *Do not rely on an environmental report prepared for someone else.*

OBTAIN PROFESSIONAL ASSISTANCE TO DEAL WITH MOLD

Diverse strategies can be applied during building design, construction, operation, and maintenance to prevent significant amounts of mold from growing on indoor surfaces. To be effective, all such strategies should be devised for the *express purpose* of mold prevention, integrated into a comprehensive plan, and executed with diligent oversight by a professional mold prevention consultant. Because just a small amount of water or moisture can lead to the development of severe mold infestations, a number of mold prevention strategies focus on keeping building surfaces dry. While groundwater, water infiltration, and similar issues may have been addressed as part of the geotechnical engineering study whose findings are conveyed in this report, the geotechnical engineer in charge of this project is not a mold prevention consultant; ***none of the services performed in connection with the geotechnical engineer's study were designed or conducted for the purpose of mold prevention. Proper implementation of the recommendations conveyed in this report will not of itself be sufficient to prevent mold from growing in or on the structure involved.***

RELY ON YOUR GEOTECHNICAL ENGINEER FOR ADDITIONAL ASSISTANCE

Membership in ASFE exposes geotechnical engineers to a wide array of risk management techniques that can be of genuine benefit for everyone involved with a construction project. Confer with CGC, a member of ASFE, for more information.

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ASFE/The Best People on Earth
881 Colesville Road, Suite G 106
Silver Spring, MD 20910

APPENDIX D

RECOMMENDED COMPACTED FILL SPECIFICATIONS

APPENDIX D

CGC, INC.

RECOMMENDED COMPACTED FILL SPECIFICATIONS

General Fill Materials

Proposed fill shall contain no vegetation, roots, topsoil, peat, ash, wood or any other non-soil material which by decomposition might cause settlement. Also, fill shall never be placed while frozen or on frozen surfaces. Rock, stone or broken concrete greater than 6 in. in the largest dimension shall not be placed within 10 ft of the building area. Fill used greater than 10 ft beyond the building limits shall not contain rock, boulders or concrete pieces greater than a 2 sq ft area and shall not be placed within the final 2 ft of finish subgrade or in designated utility construction areas. Fill containing rock, boulders or concrete pieces should include sufficient finer material to fill voids among the larger fragments.

Special Fill Materials

In certain cases, special fill materials may be required for specific purposes, such as stabilizing subgrades, backfilling undercut excavations or filling behind retaining walls. For reference, WisDOT gradation specifications for various types of granular fill are attached in Table 1.

Placement Method

The approved fill shall be placed, spread and leveled in layers generally not exceeding 10 in. in thickness before compaction. The fill shall be placed at moisture content capable of achieving the desired compaction level. For clay soils or granular soils containing an appreciable amount of cohesive fines, moisture conditioning will likely be required.

It is the Contractor's responsibility to provide all necessary compaction equipment and other grading equipment that may be required to attain the specified compaction. Hand-guided vibratory or tamping compactors will be required whenever fill is placed adjacent to walls, footings, columns or in confined areas.

Compaction Specifications

Maximum dry density and optimum moisture content of the fill soil shall be determined in accordance with modified Proctor methods (ASTM D1557). The recommended field compaction as a percentage of the maximum dry density is shown in Table 2. Note that these compaction guidelines would generally not apply to coarse gravel/stone fill. Instead, a method specification would apply (e.g., compact in thin lifts with a vibratory compactor until no further consolidation is evident).

Testing Procedures

Representative samples of proposed fill shall be submitted to CGC, Inc. for optimum moisture-maximum density determination (ASTM D1557) prior to the start of fill placement. The sample size should be approximately 50 lb.

CGC, Inc. shall be retained to perform field density tests to determine the level of compaction being achieved in the fill. The tests shall generally be conducted on each lift at the beginning of fill placement and at a frequency mutually agreed upon by the project team for the remainder of the project.

Table 1
Gradation of Special Fill Materials

Material	WisDOT Section 311	WisDOT Section 312	WisDOT Section 305			WisDOT Section 209		WisDOT Section 210
	Breaker Run	Select Crushed Material	3-in. Dense Graded Base	1 1/4-in. Dense Graded Base	3/4-in. Dense Graded Base	Grade 1 Granular Backfill	Grade 2 Granular Backfill	Structure Backfill
Sieve Size	Percent Passing by Weight							
6 in.	100							
5 in.		90-100						
3 in.			90-100					100
1 1/2 in.		20-50	60-85					
1 1/4 in.				95-100				
1 in.					100			
3/4 in.			40-65	70-93	95-100			
3/8 in.				42-80	50-90			
No. 4			15-40	25-63	35-70	100 (2)	100 (2)	25-100
No. 10		0-10	10-30	16-48	15-55	75 (2)		
No. 40			5-20	8-28	10-35	15 (2)	30 (2)	
No. 200			2-12	2-12	5-15	8 (2)	15 (2)	15 (2)

Notes:

1. Reference: Wisconsin Department of Transportation *Standard Specifications for Highway and Structure Construction.*
2. Percentage applies to the material passing the No. 4 sieve, not the entire sample.
3. Per WisDOT specifications, both breaker run and select crushed material can include concrete that is 'substantially free of steel, building materials and other deleterious material'.

Table 2
Compaction Guidelines

Area	Percent Compaction (1)	
	Clay/Silt	Sand/Gravel
Within 10 ft of building lines		
Footing bearing soils	93 - 95	95
Under floors, steps and walks		
- Lightly loaded floor slab	90	90
- Heavily loaded floor slab and thicker fill zones	92	95
Beyond 10 ft of building lines		
Under walks and pavements		
- Less than 2 ft below subgrade	92	95
- Greater than 2 ft below subgrade	90	90
Landscaping	85	90

Notes:

1. Based on Modified Proctor Dry Density (ASTM D 1557)

APPENDIX E

PERIMETER DRAIN DETAILS

General Notes

1. This system's primary function is to intercept infiltrating surface water. These alternates are not appropriate for use in situations of high groundwater (i.e., cases where the water table approaches floor slab elevation).

2. Grade surface cap to slope away from structure.

3. Exterior surface of walls below grade should be damp-proofed.

4. A plastic vapor barrier should be installed below the slab.

5. Recommended types of drain pipes:

Specification	Description
ASTM D2729	Polyvinyl Chloride (PVC) Drain Pipe
ASTM F405	Corrugated Polyethylene Drain Pipe
ASTM D2852	Styrene-Rubber Plastic Drain Pipe
AASHTO M1366	Corrugated Metal Underdrain Pipe

6. Minimum slope of drain pipes should be 2 in. per 100 lin ft.

7. Place drain pipe below basement floor level and orient the perforations toward the bottom.

8. Clean-outs should be provided to service the pipe.

9. Collected field water should be discharged to a sump, storm sewer or drainage field.

10. The geotextile for Alternative Nos. 2 and 3 may be eliminated if filter requirements are satisfied between the wall and pipe backfill, as well as between backfill materials and natural soils.

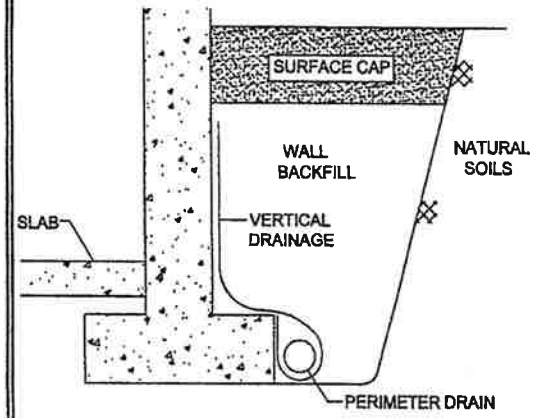
11. Pipe backfill materials should satisfy filter requirements for the slot width or hole diameter of the perforated pipe.

12. Care should be taken during backfilling not to damage the integrity of the system. For compaction requirements, refer to geotechnical report.

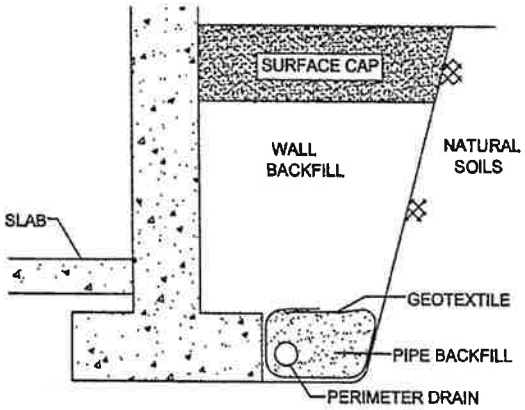
13. Pipe, geotextile, and geocomposite should be installed according to manufacturer specifications.

CGC, Inc.

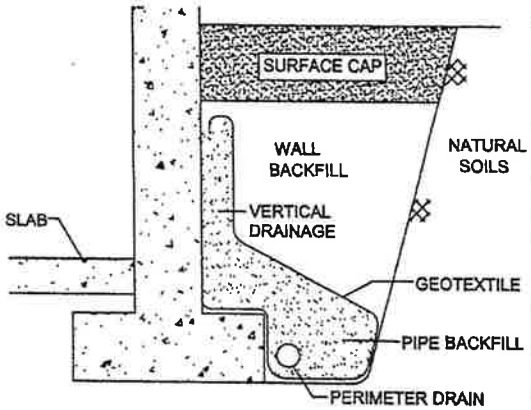
Typical Perimeter Drain Detail
General Notes



ALTERNATE NO. 1



ALTERNATE NO. 2



ALTERNATE NO. 3

DRAINAGE SYSTEM COMPONENTS

Component	Alternate No. 1	Alternate No. 2	Alternate No. 3
Surface Cap	1 to 2 ft. of clayey soils. Minimum 1 ft. thick if overlain by pavement	Refer to Alternate No. 1	Refer to Alternate No. 1
Vertical Drainage	3-dimesional drainage geocomposite hydraulically connected to perimeter drain.	Relatively Free-draining granular soils with P200 (% fines) ≤12%.	Minlmum 6-in. wide zone of free-draining granualr soils with P200 ≤5% hydraulically connected to perimeter drain. Provide geotextile as required (see note 10).
Perimeter Drain	Perforated pipe encapsulated in geocomposite.	Perforated pipe surrounded by free-draining granular pipe backfill with P200≤5%. Provide geotextile as required (See Note 10).	Refer to Alternate No. 2
Wall Backfill	Excavation spoils or imported materials (granular soils preferred).	Relatively Free-draining granular soils with P200≤12%.	Refer to Alternate No. 1

CGC, Inc.

Typical Perimeter Drain Detail

SECTION 00 72 00

GENERAL CONDITIONS

FORM OF GENERAL CONDITIONS

1.01 THE GENERAL CONDITIONS APPLICABLE TO THIS CONTRACT IS ATTACHED FOLLOWING THIS PAGE.

END OF SECTION

AIA® Document A201™ – 2007

General Conditions of the Contract for Construction

for the following PROJECT:
(Name and location or address)
Royster Crossings
516-530 Cottage Grove Road
Madison, WI

THE OWNER:
(Name, legal status and address)
Ruedebusch Development & Construction
4605 Dovetail Drive
Madison, WI 53704

THE ARCHITECT:
(Name, legal status and address)
Knothe & Bruce Architects LLC
7601 University Avenue
Suite 201
Middleton WI 53562

ADDITIONS AND DELETIONS:
The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed. A vertical line in the left margin of this document indicates where the author has added necessary information and where the author has added to or deleted from the original AIA text.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

TABLE OF ARTICLES

Init.
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INDEX

(Topics and numbers in bold are section headings.)

ARTICLE 1 GENERAL PROVISIONS

§ 1.1 BASIC DEFINITIONS

§ 1.1.1 THE CONTRACT DOCUMENTS

The Contract Documents are enumerated in the Agreement between the Owner and Contractor (hereinafter the Agreement) and consist of the Agreement, Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications, Addenda issued prior to execution of the Contract, other documents listed in the Agreement and Modifications issued after execution of the Contract. A Modification is (1) a written amendment to the Contract signed by both parties, (2) a Change Order, (3) a Construction Change Directive or (4) a written order for a minor change in the Work issued by the Architect. Unless specifically enumerated in the Agreement, the Contract Documents do not include the advertisement or invitation to bid, Instructions to Bidders, sample forms, other information furnished by the Owner in anticipation of receiving bids or proposals, the Contractor's bid or proposal, or portions of Addenda relating to bidding requirements.

§ 1.1.2 THE CONTRACT

The Contract Documents form the Contract for Construction. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations or agreements, either written or oral. The Contract may be amended or modified only by a Modification. The Contract Documents shall not be construed to create a contractual relationship of any kind (1) between the Contractor and the Architect or the Architect's consultants, (2) between the Owner and a Subcontractor or a Sub-subcontractor, (3) between the Owner and the Architect or the Architect's consultants or (4) between any persons or entities other than the Owner and the Contractor. The Architect shall, however, be entitled to performance and enforcement of obligations under the Contract intended to facilitate performance of the Architect's duties.

§ 1.1.3 THE WORK

The term "Work" means the construction and services required by the Contract Documents, whether completed or partially completed, and includes all other labor, materials, equipment and services provided or to be provided by the Contractor to fulfill the Contractor's obligations. The Work may constitute the whole or a part of the Project.

§ 1.1.4 THE PROJECT

The Project is the total construction of which the Work performed under the Contract Documents may be the whole or a part and which may include construction by the Owner and by separate contractors.

§ 1.1.5 THE DRAWINGS

The Drawings are the graphic and pictorial portions of the Contract Documents showing the design, location and dimensions of the Work, generally including plans, elevations, sections, details, schedules and diagrams.

§ 1.1.6 THE SPECIFICATIONS

The Specifications are that portion of the Contract Documents consisting of the written requirements for materials, equipment, systems, standards and workmanship for the Work, and performance of related services.

§ 1.1.7 INSTRUMENTS OF SERVICE

Instruments of Service are representations, in any medium of expression now known or later developed, of the tangible and intangible creative work performed by the Architect and the Architect's consultants under their respective professional services agreements. Instruments of Service may include, without limitation, studies, surveys, models, sketches, drawings, specifications, and other similar materials.

§ 1.1.8 INITIAL DECISION MAKER

The Initial Decision Maker is the person identified in the Agreement to render initial decisions on Claims in accordance with Section 15.2 and certify termination of the Agreement under Section 14.2.2.

§ 1.2 CORRELATION AND INTENT OF THE CONTRACT DOCUMENTS

§ 1.2.1 The intent of the Contract Documents is to include all items necessary for the proper execution and completion of the Work by the Contractor. The Contract Documents are complementary, and what is required by one shall be as binding as if required by all; performance by the Contractor shall be required only to the extent consistent with the Contract Documents and reasonably inferable from them as being necessary to produce the indicated results.

§ 1.2.2 Organization of the Specifications into divisions, sections and articles, and arrangement of Drawings shall not control the Contractor in dividing the Work among Subcontractors or in establishing the extent of Work to be performed by any trade.

§ 1.2.3 Unless otherwise stated in the Contract Documents, words that have well-known technical or construction industry meanings are used in the Contract Documents in accordance with such recognized meanings.

§ 1.3 CAPITALIZATION

Terms capitalized in these General Conditions include those that are (1) specifically defined, (2) the titles of numbered articles or (3) the titles of other documents published by the American Institute of Architects.

§ 1.4 INTERPRETATION

In the interest of brevity the Contract Documents frequently omit modifying words such as "all" and "any" and articles such as "the" and "an," but the fact that a modifier or an article is absent from one statement and appears in another is not intended to affect the interpretation of either statement.

§ 1.5 OWNERSHIP AND USE OF DRAWINGS, SPECIFICATIONS AND OTHER INSTRUMENTS OF SERVICE

§ 1.5.1 The Architect and the Architect's consultants shall be deemed the authors and owners of their respective Instruments of Service, including the Drawings and Specifications, and will retain all common law, statutory and other reserved rights, including copyrights. The Contractor, Subcontractors, Sub-subcontractors, and material or equipment suppliers shall not own or claim a copyright in the Instruments of Service. Submittal or distribution to meet official regulatory requirements or for other purposes in connection with this Project is not to be construed as publication in derogation of the Architect's or Architect's consultants' reserved rights.

§ 1.5.2 The Contractor, Subcontractors, Sub-subcontractors and material or equipment suppliers are authorized to use and reproduce the Instruments of Service provided to them solely and exclusively for execution of the Work. All copies made under this authorization shall bear the copyright notice, if any, shown on the Instruments of Service. The Contractor, Subcontractors, Sub-subcontractors, and material or equipment suppliers may not use the Instruments of Service on other projects or for additions to this Project outside the scope of the Work without the specific written consent of the Owner, Architect and the Architect's consultants.

§ 1.6 TRANSMISSION OF DATA IN DIGITAL FORM

If the parties intend to transmit Instruments of Service or any other information or documentation in digital form, they shall endeavor to establish necessary protocols governing such transmissions, unless otherwise already provided in the Agreement or the Contract Documents.

ARTICLE 2 OWNER

§ 2.1 GENERAL

§ 2.1.1 The Owner is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Owner shall designate in writing a representative who shall have express authority to bind the Owner with respect to all matters requiring the Owner's approval or authorization. Except as otherwise provided in Section 4.2.1, the Architect does not have such authority. The term "Owner" means the Owner or the Owner's authorized representative.

§ 2.1.2 The Owner shall furnish to the Contractor within fifteen days after receipt of a written request, information necessary and relevant for the Contractor to evaluate, give notice of or enforce mechanic's lien rights. Such information shall include a correct statement of the record legal title to the property on which the Project is located, usually referred to as the site, and the Owner's interest therein.

§ 2.2 INFORMATION AND SERVICES REQUIRED OF THE OWNER

§ 2.2.1 Prior to commencement of the Work, the Contractor may request in writing that the Owner provide reasonable evidence that the Owner has made financial arrangements to fulfill the Owner's obligations under the Contract. Thereafter, the Contractor may only request such evidence if (1) the Owner fails to make payments to the Contractor as the Contract Documents require; (2) a change in the Work materially changes the Contract Sum; or (3) the Contractor identifies in writing a reasonable concern regarding the Owner's ability to make payment when due. The Owner shall furnish such evidence as a condition precedent to commencement or continuation of the Work or

the portion of the Work affected by a material change. After the Owner furnishes the evidence, the Owner shall not materially vary such financial arrangements without prior notice to the Contractor.

§ 2.2.2 Except for permits and fees that are the responsibility of the Contractor under the Contract Documents, including those required under Section 3.7.1, the Owner shall secure and pay for necessary approvals, easements, assessments and charges required for construction, use or occupancy of permanent structures or for permanent changes in existing facilities.

§ 2.2.3 The Owner shall furnish surveys describing physical characteristics, legal limitations and utility locations for the site of the Project, and a legal description of the site. The Contractor shall be entitled to rely on the accuracy of information furnished by the Owner but shall exercise proper precautions relating to the safe performance of the Work.

§ 2.2.4 The Owner shall furnish information or services required of the Owner by the Contract Documents with reasonable promptness. The Owner shall also furnish any other information or services under the Owner's control and relevant to the Contractor's performance of the Work with reasonable promptness after receiving the Contractor's written request for such information or services.

§ 2.2.5 Unless otherwise provided in the Contract Documents, the Owner shall furnish to the Contractor one copy of the Contract Documents for purposes of making reproductions pursuant to Section 1.5.2.

§ 2.3 OWNER'S RIGHT TO STOP THE WORK

If the Contractor fails to correct Work that is not in accordance with the requirements of the Contract Documents as required by Section 12.2 or repeatedly fails to carry out Work in accordance with the Contract Documents, the Owner may issue a written order to the Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, the right of the Owner to stop the Work shall not give rise to a duty on the part of the Owner to exercise this right for the benefit of the Contractor or any other person or entity, except to the extent required by Section 6.1.3.

§ 2.4 OWNER'S RIGHT TO CARRY OUT THE WORK

If the Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents and fails within a ten-day period after receipt of written notice from the Owner to commence and continue correction of such default or neglect with diligence and promptness, the Owner may, without prejudice to other remedies the Owner may have, correct such deficiencies. In such case an appropriate Change Order shall be issued deducting from payments then or thereafter due the Contractor the reasonable cost of correcting such deficiencies, including Owner's expenses and compensation for the Architect's additional services made necessary by such default, neglect or failure. Such action by the Owner and amounts charged to the Contractor are both subject to prior approval of the Architect. If payments then or thereafter due the Contractor are not sufficient to cover such amounts, the Contractor shall pay the difference to the Owner.

ARTICLE 3 CONTRACTOR

§ 3.1 GENERAL

§ 3.1.1 The Contractor is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Contractor shall be lawfully licensed, if required in the jurisdiction where the Project is located. The Contractor shall designate in writing a representative who shall have express authority to bind the Contractor with respect to all matters under this Contract. The term "Contractor" means the Contractor or the Contractor's authorized representative.

§ 3.1.2 The Contractor shall perform the Work in accordance with the Contract Documents.

§ 3.1.3 The Contractor shall not be relieved of obligations to perform the Work in accordance with the Contract Documents either by activities or duties of the Architect in the Architect's administration of the Contract, or by tests, inspections or approvals required or performed by persons or entities other than the Contractor.

§ 3.2 REVIEW OF CONTRACT DOCUMENTS AND FIELD CONDITIONS BY CONTRACTOR

§ 3.2.1 Execution of the Contract by the Contractor is a representation that the Contractor has visited the site, become generally familiar with local conditions under which the Work is to be performed and correlated personal observations with requirements of the Contract Documents.

§ 3.2.2 Because the Contract Documents are complementary, the Contractor shall, before starting each portion of the Work, carefully study and compare the various Contract Documents relative to that portion of the Work, as well as the information furnished by the Owner pursuant to Section 2.2.3, shall take field measurements of any existing conditions related to that portion of the Work, and shall observe any conditions at the site affecting it. These obligations are for the purpose of facilitating coordination and construction by the Contractor and are not for the purpose of discovering errors, omissions, or inconsistencies in the Contract Documents; however, the Contractor shall promptly report to the Architect any errors, inconsistencies or omissions discovered by or made known to the Contractor as a request for information in such form as the Architect may require. It is recognized that the Contractor's review is made in the Contractor's capacity as a contractor and not as a licensed design professional, unless otherwise specifically provided in the Contract Documents.

§ 3.2.3 The Contractor is not required to ascertain that the Contract Documents are in accordance with applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, but the Contractor shall promptly report to the Architect any nonconformity discovered by or made known to the Contractor as a request for information in such form as the Architect may require.

§ 3.2.4 If the Contractor believes that additional cost or time is involved because of clarifications or instructions the Architect issues in response to the Contractor's notices or requests for information pursuant to Sections 3.2.2 or 3.2.3, the Contractor shall make Claims as provided in Article 15. If the Contractor fails to perform the obligations of Sections 3.2.2 or 3.2.3, the Contractor shall pay such costs and damages to the Owner as would have been avoided if the Contractor had performed such obligations. If the Contractor performs those obligations, the Contractor shall not be liable to the Owner or Architect for damages resulting from errors, inconsistencies or omissions in the Contract Documents, for differences between field measurements or conditions and the Contract Documents, or for nonconformities of the Contract Documents to applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities.

§ 3.3 SUPERVISION AND CONSTRUCTION PROCEDURES

§ 3.3.1 The Contractor shall supervise and direct the Work, using the Contractor's best skill and attention. The Contractor shall be solely responsible for, and have control over, construction means, methods, techniques, sequences and procedures and for coordinating all portions of the Work under the Contract, unless the Contract Documents give other specific instructions concerning these matters. If the Contract Documents give specific instructions concerning construction means, methods, techniques, sequences or procedures, the Contractor shall evaluate the jobsite safety thereof and, except as statcd below, shall be fully and solely responsible for the jobsite safety of such means, methods, techniques, sequences or procedures. If the Contractor determines that such means, methods, techniques, sequences or procedures may not be safe, the Contractor shall give timely written notice to the Owner and Architect and shall not proceed with that portion of the Work without further written instructions from the Architect. If the Contractor is then instructed to proceed with the required means, methods, techniques, sequences or procedures without acceptance of changes proposed by the Contractor, the Owner shall be solely responsible for any loss or damage arising solely from those Owner-required means, methods, techniques, sequences or procedures.

§ 3.3.2 The Contractor shall be responsible to the Owner for acts and omissions of the Contractor's employees, Subcontractors and their agents and employees, and other persons or entities performing portions of the Work for, or on behalf of, the Contractor or any of its Subcontractors.

§ 3.3.3 The Contractor shall be responsible for inspection of portions of Work already performcd to determine that such portions are in proper condition to receive subsequent Work.

§ 3.4 LABOR AND MATERIALS

§ 3.4.1 Unless otherwise provided in the Contract Documents, the Contractor shall provide and pay for labor, materials, equipment, tools, construction equipment and machinery, water, heat, utilities, transportation, and other

facilities and services necessary for proper execution and completion of the Work, whether temporary or permanent and whether or not incorporated or to be incorporated in the Work.

§ 3.4.2 Except in the case of minor changes in the Work authorized by the Architect in accordance with Sections 3.12.8 or 7.4, the Contractor may make substitutions only with the consent of the Owner, after evaluation by the Architect and in accordance with a Change Order or Construction Change Directive.

§ 3.4.3 The Contractor shall enforce strict discipline and good order among the Contractor's employees and other persons carrying out the Work. The Contractor shall not permit employment of unfit persons or persons not properly skilled in tasks assigned to them.

§ 3.5 WARRANTY

The Contractor warrants to the Owner and Architect that materials and equipment furnished under the Contract will be of good quality and new unless the Contract Documents require or permit otherwise. The Contractor further warrants that the Work will conform to the requirements of the Contract Documents and will be free from defects, except for those inherent in the quality of the Work the Contract Documents require or permit. Work, materials, or equipment not conforming to these requirements may be considered defective. The Contractor's warranty excludes remedy for damage or defect caused by abuse, alterations to the Work not executed by the Contractor, improper or insufficient maintenance, improper operation, or normal wear and tear and normal usage. If required by the Architect, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment.

§ 3.6 TAXES

The Contractor shall pay sales, consumer, use and similar taxes for the Work provided by the Contractor that are legally enacted when bids are received or negotiations concluded, whether or not yet effective or merely scheduled to go into effect.

§ 3.7 PERMITS, FEES, NOTICES AND COMPLIANCE WITH LAWS

§ 3.7.1 Unless otherwise provided in the Contract Documents, the Contractor shall secure and pay for the building permit as well as for other permits, fees, licenses, and inspections by government agencies necessary for proper execution and completion of the Work that are customarily secured after execution of the Contract and legally required at the time bids are received or negotiations concluded.

§ 3.7.2 The Contractor shall comply with and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities applicable to performance of the Work.

§ 3.7.3 If the Contractor performs Work knowing it to be contrary to applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, the Contractor shall assume appropriate responsibility for such Work and shall bear the costs attributable to correction.

§ 3.7.4 Concealed or Unknown Conditions. If the Contractor encounters conditions at the site that are (1) subsurface or otherwise concealed physical conditions that differ materially from those indicated in the Contract Documents or (2) unknown physical conditions of an unusual nature, that differ materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for in the Contract Documents, the Contractor shall promptly provide notice to the Owner and the Architect before conditions are disturbed and in no event later than 21 days after first observance of the conditions. The Architect will promptly investigate such conditions and, if the Architect determines that they differ materially and cause an increase or decrease in the Contractor's cost of, or time required for, performance of any part of the Work, will recommend an equitable adjustment in the Contract Sum or Contract Time, or both. If the Architect determines that the conditions at the site are not materially different from those indicated in the Contract Documents and that no change in the terms of the Contract is justified, the Architect shall promptly notify the Owner and Contractor in writing, stating the reasons. If either party disputes the Architect's determination or recommendation, that party may proceed as provided in Article 15.

§ 3.7.5 If, in the course of the Work, the Contractor encounters human remains or recognizes the existence of burial markers, archaeological sites or wetlands not indicated in the Contract Documents, the Contractor shall immediately suspend any operations that would affect them and shall notify the Owner and Architect. Upon receipt of such notice, the Owner shall promptly take any action necessary to obtain governmental authorization required to resume

the operations. The Contractor shall continue to suspend such operations until otherwise instructed by the Owner but shall continue with all other operations that do not affect those remains or features. Requests for adjustments in the Contract Sum and Contract Time arising from the existence of such remains or features may be made as provided in Article 15.

§ 3.8 ALLOWANCES

§ 3.8.1 The Contractor shall include in the Contract Sum all allowances stated in the Contract Documents. Items covered by allowances shall be supplied for such amounts and by such persons or entities as the Owner may direct, but the Contractor shall not be required to employ persons or entities to whom the Contractor has reasonable objection.

§ 3.8.2 Unless otherwise provided in the Contract Documents,

- **.1** Allowances shall cover the cost to the Contractor of materials and equipment delivered at the site and all required taxes, less applicable trade discounts;
- **.2** Contractor's costs for unloading and handling at the site, labor, installation costs, overhead, profit and other expenses contemplated for stated allowance amounts shall be included in the Contract Sum but not in the allowances; and
- **.3** Whenever costs are more than or less than allowances, the Contract Sum shall be adjusted accordingly by Change Order. The amount of the Change Order shall reflect (1) the difference between actual costs and the allowances under Section 3.8.2.1 and (2) changes in Contractor's costs under Section 3.8.2.2.

§ 3.8.3 Materials and equipment under an allowance shall be selected by the Owner with reasonable promptness.

§ 3.9 SUPERINTENDENT

§ 3.9.1 The Contractor shall employ a competent superintendent and necessary assistants who shall be in attendance at the Project site during performance of the Work. The superintendent shall represent the Contractor, and communications given to the superintendent shall be as binding as if given to the Contractor.

§ 3.9.2 The Contractor, as soon as practicable after award of the Contract, shall furnish in writing to the Owner through the Architect the name and qualifications of a proposed superintendent. The Architect may reply within 14 days to the Contractor in writing stating (1) whether the Owner or the Architect has reasonable objection to the proposed superintendent or (2) that the Architect requires additional time to review. Failure of the Architect to reply within the 14 day period shall constitute notice of no reasonable objection.

§ 3.9.3 The Contractor shall not employ a proposed superintendent to whom the Owner or Architect has made reasonable and timely objection. The Contractor shall not change the superintendent without the Owner's consent, which shall not unreasonably be withheld or delayed.

§ 3.10 CONTRACTOR'S CONSTRUCTION SCHEDULES

§ 3.10.1 The Contractor, promptly after being awarded the Contract, shall prepare and submit for the Owner's and Architect's information a Contractor's construction schedule for the Work. The schedule shall not exceed time limits current under the Contract Documents, shall be revised at appropriate intervals as required by the conditions of the Work and Project, shall be related to the entire Project to the extent required by the Contract Documents, and shall provide for expeditious and practicable execution of the Work.

§ 3.10.2 The Contractor shall prepare a submittal schedule, promptly after being awarded the Contract and thereafter as necessary to maintain a current submittal schedule, and shall submit the schedule(s) for the Architect's approval. The Architect's approval shall not unreasonably be delayed or withheld. The submittal schedule shall (1) be coordinated with the Contractor's construction schedule, and (2) allow the Architect reasonable time to review submittals. If the Contractor fails to submit a submittal schedule, the Contractor shall not be entitled to any increase in Contract Sum or extension of Contract Time based on the time required for review of submittals.

§ 3.10.3 The Contractor shall perform the Work in general accordance with the most recent schedules submitted to the Owner and Architect.

§ 3.11 DOCUMENTS AND SAMPLES AT THE SITE

The Contractor shall maintain at the site for the Owner one copy of the Drawings, Specifications, Addenda, Change Orders and other Modifications, in good order and marked currently to indicate field changes and selections made during construction, and one copy of approved Shop Drawings, Product Data, Samples and similar required submittals. These shall be available to the Architect and shall be delivered to the Architect for submittal to the Owner upon completion of the Work as a record of the Work as constructed.

§ 3.12 SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

§ 3.12.1 Shop Drawings are drawings, diagrams, schedules and other data specially prepared for the Work by the Contractor or a Subcontractor, Sub-subcontractor, manufacturer, supplier or distributor to illustrate some portion of the Work.

§ 3.12.2 Product Data are illustrations, standard schedules, performance charts, instructions, brochures, diagrams and other information furnished by the Contractor to illustrate materials or equipment for some portion of the Work.

§ 3.12.3 Samples are physical examples that illustrate materials, equipment or workmanship and establish standards by which the Work will be judged.

§ 3.12.4 Shop Drawings, Product Data, Samples and similar submittals are not Contract Documents. Their purpose is to demonstrate the way by which the Contractor proposes to conform to the information given and the design concept expressed in the Contract Documents for those portions of the Work for which the Contract Documents require submittals. Review by the Architect is subject to the limitations of Section 4.2.7. Informational submittals upon which the Architect is not expected to take responsive action may be so identified in the Contract Documents. Submittals that are not required by the Contract Documents may be returned by the Architect without action.

§ 3.12.5 The Contractor shall review for compliance with the Contract Documents, approve and submit to the Architect Shop Drawings, Product Data, Samples and similar submittals required by the Contract Documents in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule, with reasonable promptness and in such sequence as to cause no delay in the Work or in the activities of the Owner or of separate contractors.

§ 3.12.6 By submitting Shop Drawings, Product Data, Samples and similar submittals, the Contractor represents to the Owner and Architect that the Contractor has (1) reviewed and approved them, (2) determined and verified materials, field measurements and field construction criteria related thereto, or will do so and (3) checked and coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents.

§ 3.12.7 The Contractor shall perform no portion of the Work for which the Contract Documents require submittal and review of Shop Drawings, Product Data, Samples or similar submittals until the respective submittal has been approved by the Architect.

§ 3.12.8 The Work shall be in accordance with approved submittals except that the Contractor shall not be relieved of responsibility for deviations from requirements of the Contract Documents by the Architect's approval of Shop Drawings, Product Data, Samples or similar submittals unless the Contractor has specifically informed the Architect in writing of such deviation at the time of submittal and (1) the Architect has given written approval to the specific deviation as a minor change in the Work, or (2) a Change Order or Construction Change Directive has been issued authorizing the deviation. The Contractor shall not be relieved of responsibility for errors or omissions in Shop Drawings, Product Data, Samples or similar submittals by the Architect's approval thereof.

§ 3.12.9 The Contractor shall direct specific attention, in writing or on resubmitted Shop Drawings, Product Data, Samples or similar submittals, to revisions other than those requested by the Architect on previous submittals. In the absence of such written notice, the Architect's approval of a resubmission shall not apply to such revisions.

§ 3.12.10 The Contractor shall not be required to provide professional services that constitute the practice of architecture or engineering unless such services are specifically required by the Contract Documents for a portion of the Work or unless the Contractor needs to provide such services in order to carry out the Contractor's responsibilities for construction means, methods, techniques, sequences and procedures. The Contractor shall not be

required to provide professional services in violation of applicable law. If professional design services or certifications by a design professional related to systems, materials or equipment are specifically required of the Contractor by the Contract Documents, the Owner and the Architect will specify all performance and design criteria that such services must satisfy. The Contractor shall cause such services or certifications to be provided by a properly licensed design professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, Shop Drawings and other submittals prepared by such professional. Shop Drawings and other submittals related to the Work designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to the Architect. The Owner and the Architect shall be entitled to rely upon the adequacy, accuracy and completeness of the services, certifications and approvals performed or provided by such design professionals, provided the Owner and Architect have specified to the Contractor all performance and design criteria that such services must satisfy. Pursuant to this Section 3.12.10, the Architect will review, approve or take other appropriate action on submittals only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Contractor shall not be responsible for the adequacy of the performance and design criteria specified in the Contract Documents.

§ 3.13 USE OF SITE

The Contractor shall confine operations at the site to areas permitted by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities and the Contract Documents and shall not unreasonably encumber the site with materials or equipment.

§ 3.14 CUTTING AND PATCHING

§ 3.14.1 The Contractor shall be responsible for cutting, fitting or patching required to complete the Work or to make its parts fit together properly. All areas requiring cutting, fitting and patching shall be restored to the condition existing prior to the cutting, fitting and patching, unless otherwise required by the Contract Documents.

§ 3.14.2 The Contractor shall not damage or endanger a portion of the Work or fully or partially completed construction of the Owner or separate contractors by cutting, patching or otherwise altering such construction, or by excavation. The Contractor shall not cut or otherwise alter such construction by the Owner or a separate contractor except with written consent of the Owner and of such separate contractor; such consent shall not be unreasonably withheld. The Contractor shall not unreasonably withhold from the Owner or a separate contractor the Contractor's consent to cutting or otherwise altering the Work.

§ 3.15 CLEANING UP

§ 3.15.1 The Contractor shall keep the premises and surrounding area free from accumulation of waste materials or rubbish caused by operations under the Contract. At completion of the Work, the Contractor shall remove waste materials, rubbish, the Contractor's tools, construction equipment, machinery and surplus materials from and about the Project.

§ 3.15.2 If the Contractor fails to clean up as provided in the Contract Documents, the Owner may do so and Owner shall be entitled to reimbursement from the Contractor.

§ 3.16 ACCESS TO WORK

The Contractor shall provide the Owner and Architect access to the Work in preparation and progress wherever located.

§ 3.17 ROYALTIES, PATENTS AND COPYRIGHTS

The Contractor shall pay all royalties and license fees. The Contractor shall defend suits or claims for infringement of copyrights and patent rights and shall hold the Owner and Architect harmless from loss on account thereof, but shall not be responsible for such defense or loss when a particular design, process or product of a particular manufacturer or manufacturers is required by the Contract Documents, or where the copyright violations are contained in Drawings, Specifications or other documents prepared by the Owner or Architect. However, if the Contractor has reason to believe that the required design, process or product is an infringement of a copyright or a patent, the Contractor shall be responsible for such loss unless such information is promptly furnished to the Architect.

§ 3.18 INDEMNIFICATION

§ 3.18.1 To the fullest extent permitted by law the Contractor shall indemnify and hold harmless the Owner, Architect, Architect's consultants, and agents and employees of any of them from and against claims, damages, losses and expenses, including but not limited to attorneys' fees, arising out of or resulting from performance of the Work, provided that such claim, damage, loss or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), but only to the extent caused by the negligent acts or omissions of the Contractor, a Subcontractor, anyone directly or indirectly employed by them or anyone for whose acts they may be liable, regardless of whether or not such claim, damage, loss or expense is caused in part by a party indemnified hereunder. Such obligation shall not be construed to negate, abridge, or reduce other rights or obligations of indemnity that would otherwise exist as to a party or person described in this Section 3.18.

§ 3.18.2 In claims against any person or entity indemnified under this Section 3.18 by an employee of the Contractor, a Subcontractor, anyone directly or indirectly employed by them or anyone for whose acts they may be liable, the indemnification obligation under Section 3.18.1 shall not be limited by a limitation on amount or type of damages, compensation or benefits payable by or for the Contractor or a Subcontractor under workers' compensation acts, disability benefit acts or other employee benefit acts.

ARTICLE 4 ARCHITECT

§ 4.1 GENERAL

§ 4.1.1 The Owner shall retain an architect lawfully licensed to practice architecture or an entity lawfully practicing architecture in the jurisdiction where the Project is located. That person or entity is identified as the Architect in the Agreement and is referred to throughout the Contract Documents as if singular in number.

§ 4.1.2 Duties, responsibilities and limitations of authority of the Architect as set forth in the Contract Documents shall not be restricted, modified or extended without written consent of the Owner, Contractor and Architect. Consent shall not be unreasonably withheld.

§ 4.1.3 If the employment of the Architect is terminated, the Owner shall employ a successor architect as to whom the Contractor has no reasonable objection and whose status under the Contract Documents shall be that of the Architect.

§ 4.2 ADMINISTRATION OF THE CONTRACT

§ 4.2.1 The Architect will provide administration of the Contract as described in the Contract Documents and will be an Owner's representative during construction until the date the Architect issues the final Certificate for Payment. The Architect will have authority to act on behalf of the Owner only to the extent provided in the Contract Documents.

§ 4.2.2 The Architect will visit the site at intervals appropriate to the stage of construction, or as otherwise agreed with the Owner, to become generally familiar with the progress and quality of the portion of the Work completed, and to determine in general if the Work observed is being performed in a manner indicating that the Work, when fully completed, will be in accordance with the Contract Documents. However, the Architect will not be required to make exhaustive or continuous on-site inspections to check the quality or quantity of the Work. The Architect will not have control over, charge of, or responsibility for, the construction means, methods, techniques, sequences or procedures, or for the safety precautions and programs in connection with the Work, since these are solely the Contractor's rights and responsibilities under the Contract Documents, except as provided in Section 3.3.1.

§ 4.2.3 On the basis of the site visits, the Architect will keep the Owner reasonably informed about the progress and quality of the portion of the Work completed, and report to the Owner (1) known deviations from the Contract Documents and from the most recent construction schedule submitted by the Contractor, and (2) defects and deficiencies observed in the Work. The Architect will not be responsible for the Contractor's failure to perform the Work in accordance with the requirements of the Contract Documents. The Architect will not have control over or charge of and will not be responsible for acts or omissions of the Contractor, Subcontractors, or their agents or employees, or any other persons or entities performing portions of the Work.

§ 4.2.4 COMMUNICATIONS FACILITATING CONTRACT ADMINISTRATION
Except as otherwise provided in the Contract Documents or when direct communications have been specially authorized, the Owner and Contractor shall endeavor to communicate with each other through the Architect about matters arising out of or relating to the Contract. Communications by and with the Architect's consultants shall be through the Architect. Communications by and with Subcontractors and material suppliers shall be through the Contractor. Communications by and with separate contractors shall be through the Owner.

§ 4.2.5 Based on the Architect's evaluations of the Contractor's Applications for Payment, the Architect will review and certify the amounts due the Contractor and will issue Certificates for Payment in such amounts.

§ 4.2.6 The Architect has authority to reject Work that does not conform to the Contract Documents. Whenever the Architect considers it necessary or advisable, the Architect will have authority to require inspection or testing of the Work in accordance with Sections 13.5.2 and 13.5.3, whether or not such Work is fabricated, installed or completed. However, neither this authority of the Architect nor a decision made in good faith either to exercise or not to exercise such authority shall give rise to a duty or responsibility of the Architect to the Contractor, Subcontractors, material and equipment suppliers, their agents or employees, or other persons or entities performing portions of the Work.

§ 4.2.7 The Architect will review and approve, or take other appropriate action upon, the Contractor's submittals such as Shop Drawings, Product Data and Samples, but only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Architect's action will be taken in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule, with reasonable promptness while allowing sufficient time in the Architect's professional judgment to permit adequate review. Review of such submittals is not conducted for the purpose of determining the accuracy and completeness of other details such as dimensions and quantities, or for substantiating instructions for installation or performance of equipment or systems, all of which remain the responsibility of the Contractor as required by the Contract Documents. The Architect's review of the Contractor's submittals shall not relieve the Contractor of the obligations under Sections 3.3, 3.5 and 3.12. The Architect's review shall not constitute approval of safety precautions or, unless otherwise specifically stated by the Architect, of any construction means, methods, techniques, sequences or procedures. The Architect's approval of a specific item shall not indicate approval of an assembly of which the item is a component.

§ 4.2.8 The Architect will prepare Change Orders and Construction Change Directives, and may authorize minor changes in the Work as provided in Section 7.4. The Architect will investigate and make determinations and recommendations regarding concealed and unknown conditions as provided in Section 3.7.4.

§ 4.2.9 The Architect will conduct inspections to determine the date or dates of Substantial Completion and the date of final completion; issue Certificates of Substantial Completion pursuant to Section 9.8; receive and forward to the Owner, for the Owner's review and records, written warranties and related documents required by the Contract and assembled by the Contractor pursuant to Section 9.10; and issue a final Certificate for Payment pursuant to Section 9.10.

§ 4.2.10 If the Owner and Architect agree, the Architect will provide one or more project representatives to assist in carrying out the Architect's responsibilities at the site. The duties, responsibilities and limitations of authority of such project representatives shall be as set forth in an exhibit to be incorporated in the Contract Documents.

§ 4.2.11 The Architect will interpret and decide matters concerning performance under, and requirements of, the Contract Documents on written request of either the Owner or Contractor. The Architect's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness.

§ 4.2.12 Interpretations and decisions of the Architect will be consistent with the intent of, and reasonably inferable from, the Contract Documents and will be in writing or in the form of drawings. When making such interpretations and decisions, the Architect will endeavor to secure faithful performance by both Owner and Contractor, will not show partiality to either and will not be liable for results of interpretations or decisions rendered in good faith.

§ 4.2.13 The Architect's decisions on matters relating to aesthetic effect will be final if consistent with the intent expressed in the Contract Documents.

§ 4.2.14 The Architect will review and respond to requests for information about the Contract Documents. The Architect's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness. If appropriate, the Architect will prepare and issue supplemental Drawings and Specifications in response to the requests for information.

ARTICLE 5 SUBCONTRACTORS

§ 5.1 DEFINITIONS

§ 5.1.1 A Subcontractor is a person or entity who has a direct contract with the Contractor to perform a portion of the Work at the site. The term "Subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Subcontractor or an authorized representative of the Subcontractor. The term "Subcontractor" does not include a separate contractor or subcontractors of a separate contractor.

§ 5.1.2 A Sub-subcontractor is a person or entity who has a direct or indirect contract with a Subcontractor to perform a portion of the Work at the site. The term "Sub-subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Sub-subcontractor or an authorized representative of the Sub-subcontractor.

§ 5.2 AWARD OF SUBCONTRACTS AND OTHER CONTRACTS FOR PORTIONS OF THE WORK

§ 5.2.1 Unless otherwise stated in the Contract Documents or the bidding requirements, the Contractor, as soon as practicable after award of the Contract, shall furnish in writing to the Owner through the Architect the names of persons or entities (including those who are to furnish materials or equipment fabricated to a special design) proposed for each principal portion of the Work. The Architect may reply within 14 days to the Contractor in writing stating (1) whether the Owner or the Architect has reasonable objection to any such proposed person or entity or (2) that the Architect requires additional time for review. Failure of the Owner or Architect to reply within the 14-day period shall constitute notice of no reasonable objection.

§ 5.2.2 The Contractor shall not contract with a proposed person or entity to whom the Owner or Architect has made reasonable and timely objection. The Contractor shall not be required to contract with anyone to whom the Contractor has made reasonable objection.

§ 5.2.3 If the Owner or Architect has reasonable objection to a person or entity proposed by the Contractor, the Contractor shall propose another to whom the Owner or Architect has no reasonable objection. If the proposed but rejected Subcontractor was reasonably capable of performing the Work, the Contract Sum and Contract Time shall be increased or decreased by the difference, if any, occasioned by such change, and an appropriate Change Order shall be issued before commencement of the substitute Subcontractor's Work. However, no increase in the Contract Sum or Contract Time shall be allowed for such change unless the Contractor has acted promptly and responsively in submitting names as required.

§ 5.2.4 The Contractor shall not substitute a Subcontractor, person or entity previously selected if the Owner or Architect makes reasonable objection to such substitution.

§ 5.3 SUBCONTRACTUAL RELATIONS

By appropriate agreement, written where legally required for validity, the Contractor shall require each Subcontractor, to the extent of the Work to be performed by the Subcontractor, to be bound to the Contractor by terms of the Contract Documents, and to assume toward the Contractor all the obligations and responsibilities, including the responsibility for safety of the Subcontractor's Work, which the Contractor, by these Documents, assumes toward the Owner and Architect. Each subcontract agreement shall preserve and protect the rights of the Owner and Architect under the Contract Documents with respect to the Work to be performed by the Subcontractor so that subcontracting thereof will not prejudice such rights, and shall allow to the Subcontractor, unless specifically provided otherwise in the subcontract agreement, the benefit of all rights, remedies and redress against the Contractor that the Contractor, by the Contract Documents, has against the Owner. Where appropriate, the Contractor shall require each Subcontractor to enter into similar agreements with Sub-subcontractors. The Contractor shall make available to each proposed Subcontractor, prior to the execution of the subcontract agreement, copies of the Contract Documents to which the Subcontractor will be bound, and, upon written request of the Subcontractor, identify to the Subcontractor terms and conditions of the proposed subcontract agreement that may

be at variance with the Contract Documents. Subcontractors will similarly make copies of applicable portions of such documents available to their respective proposed Sub-subcontractors.

§ 5.4 CONTINGENT ASSIGNMENT OF SUBCONTRACTS

§ 5.4.1 Each subcontract agreement for a portion of the Work is assigned by the Contractor to the Owner, provided that

.1 assignment is effective only after termination of the Contract by the Owner for cause pursuant to Section 14.2 and only for those subcontract agreements that the Owner accepts by notifying the Subcontractor and Contractor in writing; and

.2 assignment is subject to the prior rights of the surety, if any, obligated under bond relating to the Contract.

When the Owner accepts the assignment of a subcontract agreement, the Owner assumes the Contractor's rights and obligations under the subcontract.

§ 5.4.2 Upon such assignment, if the Work has been suspended for more than 30 days, the Subcontractor's compensation shall be equitably adjusted for increases in cost resulting from the suspension.

§ 5.4.3 Upon such assignment to the Owner under this Section 5.4, the Owner may further assign the subcontract to a successor contractor or other entity. If the Owner assigns the subcontract to a successor contractor or other entity, the Owner shall nevertheless remain legally responsible for all of the successor contractor's obligations under the subcontract.

ARTICLE 6 CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS

§ 6.1 OWNER'S RIGHT TO PERFORM CONSTRUCTION AND TO AWARD SEPARATE CONTRACTS

§ 6.1.1 The Owner reserves the right to perform construction or operations related to the Project with the Owner's own forces, and to award separate contracts in connection with other portions of the Project or other construction or operations on the site under Conditions of the Contract identical or substantially similar to these including those portions related to insurance and waiver of subrogation. If the Contractor claims that delay or additional cost is involved because of such action by the Owner, the Contractor shall make such Claim as provided in Article 15.

§ 6.1.2 When separate contracts are awarded for different portions of the Project or other construction or operations on the site, the term "Contractor" in the Contract Documents in each case shall mean the Contractor who executes each separate Owner-Contractor Agreement.

§ 6.1.3 The Owner shall provide for coordination of the activities of the Owner's own forces and of each separate contractor with the Work of the Contractor, who shall cooperate with them. The Contractor shall participate with other separate contractors and the Owner in reviewing their construction schedules. The Contractor shall make any revisions to the construction schedule deemed necessary after a joint review and mutual agreement. The construction schedules shall then constitute the schedules to be used by the Contractor, separate contractors and the Owner until subsequently revised.

§ 6.1.4 Unless otherwise provided in the Contract Documents, when the Owner performs construction or operations related to the Project with the Owner's own forces, the Owner shall be deemed to be subject to the same obligations and to have the same rights that apply to the Contractor under the Conditions of the Contract, including, without excluding others, those stated in Article 3, this Article 6 and Articles 10, 11 and 12.

§ 6.2 MUTUAL RESPONSIBILITY

§ 6.2.1 The Contractor shall afford the Owner and separate contractors reasonable opportunity for introduction and storage of their materials and equipment and performance of their activities, and shall connect and coordinate the Contractor's construction and operations with theirs as required by the Contract Documents.

§ 6.2.2 If part of the Contractor's Work depends for proper execution or results upon construction or operations by the Owner or a separate contractor, the Contractor shall, prior to proceeding with that portion of the Work, promptly report to the Architect apparent discrepancies or defects in such other construction that would render it unsuitable for such proper execution and results. Failure of the Contractor so to report shall constitute an acknowledgment that

the Owner's or separate contractor's completed or partially completed construction is fit and proper to receive the Contractor's Work, except as to defects not then reasonably discoverable.

§ 6.2.3 The Contractor shall reimburse the Owner for costs the Owner incurs that are payable to a separate contractor because of the Contractor's delays, improperly timed activities or defective construction. The Owner shall be responsible to the Contractor for costs the Contractor incurs because of a separate contractor's delays, improperly timed activities, damage to the Work or defective construction.

§ 6.2.4 The Contractor shall promptly remedy damage the Contractor wrongfully causes to completed or partially completed construction or to property of the Owner or separate contractors as provided in Section 10.2.5.

§ 6.2.5 The Owner and each separate contractor shall have the same responsibilities for cutting and patching as are described for the Contractor in Section 3.14.

§ 6.3 OWNER'S RIGHT TO CLEAN UP

If a dispute arises among the Contractor, separate contractors and the Owner as to the responsibility under their respective contracts for maintaining the premises and surrounding area free from waste materials and rubbish, the Owner may clean up and the Architect will allocate the cost among those responsible.

ARTICLE 7 CHANGES IN THE WORK

§ 7.1 GENERAL

§ 7.1.1 Changes in the Work may be accomplished after execution of the Contract, and without invalidating the Contract, by Change Order, Construction Change Directive or order for a minor change in the Work, subject to the limitations stated in this Article 7 and elsewhere in the Contract Documents.

§ 7.1.2 A Change Order shall be based upon agreement among the Owner, Contractor and Architect; a Construction Change Directive requires agreement by the Owner and Architect and may or may not be agreed to by the Contractor; an order for a minor change in the Work may be issued by the Architect alone.

§ 7.1.3 Changes in the Work shall be performed under applicable provisions of the Contract Documents, and the Contractor shall proceed promptly, unless otherwise provided in the Change Order, Construction Change Directive or order for a minor change in the Work.

§ 7.2 CHANGE ORDERS

§ 7.2.1 A Change Order is a written instrument prepared by the Architect and signed by the Owner, Contractor and Architect stating their agreement upon all of the following:

- **.1** The change in the Work;
- **.2** The amount of the adjustment, if any, in the Contract Sum; and
- **.3** The extent of the adjustment, if any, in the Contract Time.

§ 7.3 CONSTRUCTION CHANGE DIRECTIVES

§ 7.3.1 A Construction Change Directive is a written order prepared by the Architect and signed by the Owner and Architect, directing a change in the Work prior to agreement on adjustment, if any, in the Contract Sum or Contract Time, or both. The Owner may by Construction Change Directive, without invalidating the Contract, order changes in the Work within the general scope of the Contract consisting of additions, deletions or other revisions, the Contract Sum and Contract Time being adjusted accordingly.

§ 7.3.2 A Construction Change Directive shall be used in the absence of total agreement on the terms of a Change Order.

§ 7.3.3 If the Construction Change Directive provides for an adjustment to the Contract Sum, the adjustment shall be based on one of the following methods:

- **.1** Mutual acceptance of a lump sum properly itemized and supported by sufficient substantiating data to permit evaluation;
- **.2** Unit prices stated in the Contract Documents or subsequently agreed upon;
- **.3** Cost to be determined in a manner agreed upon by the parties and a mutually acceptable fixed or percentage fee; or

.4 As provided in Section 7.3.7.

§ 7.3.4 If unit prices are stated in the Contract Documents or subsequently agreed upon, and if quantities originally contemplated are materially changed in a proposed Change Order or Construction Change Directive so that application of such unit prices to quantities of Work proposed will cause substantial inequity to the Owner or Contractor, the applicable unit prices shall be equitably adjusted.

§ 7.3.5 Upon receipt of a Construction Change Directive, the Contractor shall promptly proceed with the change in the Work involved and advise the Architect of the Contractor's agreement or disagreement with the method, if any, provided in the Construction Change Directive for determining the proposed adjustment in the Contract Sum or Contract Time.

§ 7.3.6 A Construction Change Directive signed by the Contractor indicates the Contractor's agreement therewith, including adjustment in Contract Sum and Contract Time or the method for determining them. Such agreement shall be effective immediately and shall be recorded as a Change Order.

§ 7.3.7 If the Contractor does not respond promptly or disagrees with the method for adjustment in the Contract Sum, the Architect shall determine the method and the adjustment on the basis of reasonable expenditures and savings of those performing the Work attributable to the change, including, in case of an increase in the Contract Sum, an amount for overhead and profit as set forth in the Agreement, or if no such amount is set forth in the Agreement, a reasonable amount. In such case, and also under Section 7.3.3.3, the Contractor shall keep and present, in such form as the Architect may prescribe, an itemized accounting together with appropriate supporting data. Unless otherwise provided in the Contract Documents, costs for the purposes of this Section 7.3.7 shall be limited to the following:

.1 Costs of labor, including social security, old age and unemployment insurance, fringe benefits required by agreement or custom, and workers' compensation insurance;

.2 Costs of materials, supplies and equipment, including cost of transportation, whether incorporated or consumed;

.3 Rental costs of machinery and equipment, exclusive of hand tools, whether rented from the Contractor or others;

.4 Costs of premiums for all bonds and insurance, permit fees, and sales, use or similar taxes related to the Work; and

.5 Additional costs of supervision and field office personnel directly attributable to the change.

§ 7.3.8 The amount of credit to be allowed by the Contractor to the Owner for a deletion or change that results in a net decrease in the Contract Sum shall be actual net cost as confirmed by the Architect. When both additions and credits covering related Work or substitutions are involved in a change, the allowance for overhead and profit shall be figured on the basis of net increase, if any, with respect to that change.

§ 7.3.9 Pending final determination of the total cost of a Construction Change Directive to the Owner, the Contractor may request payment for Work completed under the Construction Change Directive in Applications for Payment. The Architect will make an interim determination for purposes of monthly certification for payment for those costs and certify for payment the amount that the Architect determines, in the Architect's professional judgment, to be reasonably justified. The Architect's interim determination of cost shall adjust the Contract Sum on the same basis as a Change Order, subject to the right of either party to disagree and assert a Claim in accordance with Article 15.

§ 7.3.10 When the Owner and Contractor agree with a determination made by the Architect concerning the adjustments in the Contract Sum and Contract Time, or otherwise reach agreement upon the adjustments, such agreement shall be effective immediately and the Architect will prepare a Change Order. Change Orders may be issued for all or any part of a Construction Change Directive.

§ 7.4 MINOR CHANGES IN THE WORK

The Architect has authority to order minor changes in the Work not involving adjustment in the Contract Sum or extension of the Contract Time and not inconsistent with the intent of the Contract Documents. Such changes will be effected by written order signed by the Architect and shall be binding on the Owner and Contractor.

ARTICLE 8 TIME

§ 8.1 DEFINITIONS

§ 8.1.1 Unless otherwise provided, Contract Time is the period of time, including authorized adjustments, allotted in the Contract Documents for Substantial Completion of the Work.

§ 8.1.2 The date of commencement of the Work is the date established in the Agreement.

§ 8.1.3 The date of Substantial Completion is the date certified by the Architect in accordance with Section 9.8.

§ 8.1.4 The term "day" as used in the Contract Documents shall mean calendar day unless otherwise specifically defined.

§ 8.2 PROGRESS AND COMPLETION

§ 8.2.1 Time limits stated in the Contract Documents are of the essence of the Contract. By executing the Agreement the Contractor confirms that the Contract Time is a reasonable period for performing the Work.

§ 8.2.2 The Contractor shall not knowingly, except by agreement or instruction of the Owner in writing, prematurely commence operations on the site or elsewhere prior to the effective date of insurance required by Article 11 to be furnished by the Contractor and Owner. The date of commencement of the Work shall not be changed by the effective date of such insurance.

§ 8.2.3 The Contractor shall proceed expeditiously with adequate forces and shall achieve Substantial Completion within the Contract Time.

§ 8.3 DELAYS AND EXTENSIONS OF TIME

§ 8.3.1 If the Contractor is delayed at any time in the commencement or progress of the Work by an act or neglect of the Owner or Architect, or of an employee of either, or of a separate contractor employed by the Owner; or by changes ordered in the Work; or by labor disputes, fire, unusual delay in deliveries, unavoidable casualties or other causes beyond the Contractor's control; or by delay authorized by the Owner pending mediation and arbitration; or by other causes that the Architect determines may justify delay, then the Contract Time shall be extended by Change Order for such reasonable time as the Architect may determine.

§ 8.3.2 Claims relating to time shall be made in accordance with applicable provisions of Article 15.

§ 8.3.3 This Section 8.3 does not preclude recovery of damages for delay by either party under other provisions of the Contract Documents.

ARTICLE 9 PAYMENTS AND COMPLETION

§ 9.1 CONTRACT SUM

The Contract Sum is stated in the Agreement and, including authorized adjustments, is the total amount payable by the Owner to the Contractor for performance of the Work under the Contract Documents.

§ 9.2 SCHEDULE OF VALUES

Where the Contract is based on a stipulated sum or Guaranteed Maximum Price, the Contractor shall submit to the Architect, before the first Application for Payment, a schedule of values allocating the entire Contract Sum to the various portions of the Work and prepared in such form and supported by such data to substantiate its accuracy as the Architect may require. This schedule, unless objected to by the Architect, shall be used as a basis for reviewing the Contractor's Applications for Payment.

§ 9.3 APPLICATIONS FOR PAYMENT

§ 9.3.1 At least ten days before the date established for each progress payment, the Contractor shall submit to the Architect an itemized Application for Payment prepared in accordance with the schedule of values, if required under Section 9.2, for completed portions of the Work. Such application shall be notarized, if required, and supported by such data substantiating the Contractor's right to payment as the Owner or Architect may require, such as copies of requisitions from Subcontractors and material suppliers, and shall reflect retainage if provided for in the Contract Documents.

§ 9.3.1.1 As provided in Section 7.3.9, such applications may include requests for payment on account of changes in the Work that have been properly authorized by Construction Change Directives, or by interim determinations of the Architect, but not yet included in Change Orders.

§ 9.3.1.2 Applications for Payment shall not include requests for payment for portions of the Work for which the Contractor does not intend to pay a Subcontractor or material supplier, unless such Work has been performed by others whom the Contractor intends to pay.

§ 9.3.2 Unless otherwise provided in the Contract Documents, payments shall be made on account of materials and equipment delivered and suitably stored at the site for subsequent incorporation in the Work. If approved in advance by the Owner, payment may similarly be made for materials and equipment suitably stored off the site at a location agreed upon in writing. Payment for materials and equipment stored on or off the site shall be conditioned upon compliance by the Contractor with procedures satisfactory to the Owner to establish the Owner's title to such materials and equipment or otherwise protect the Owner's interest, and shall include the costs of applicable insurance, storage and transportation to the site for such materials and equipment stored off the site.

§ 9.3.3 The Contractor warrants that title to all Work covered by an Application for Payment will pass to the Owner no later than the time of payment. The Contractor further warrants that upon submittal of an Application for Payment all Work for which Certificates for Payment have been previously issued and payments received from the Owner shall, to the best of the Contractor's knowledge, information and belief, be free and clear of liens, claims, security interests or encumbrances in favor of the Contractor, Subcontractors, material suppliers, or other persons or entities making a claim by reason of having provided labor, materials and equipment relating to the Work.

§ 9.4 CERTIFICATES FOR PAYMENT

§ 9.4.1 The Architect will, within seven days after receipt of the Contractor's Application for Payment, either issue to the Owner a Certificate for Payment, with a copy to the Contractor, for such amount as the Architect determines is properly due, or notify the Contractor and Owner in writing of the Architect's reasons for withholding certification in whole or in part as provided in Section 9.5.1.

§ 9.4.2 The issuance of a Certificate for Payment will constitute a representation by the Architect to the Owner, based on the Architect's evaluation of the Work and the data comprising the Application for Payment, that, to the best of the Architect's knowledge, information and belief, the Work has progressed to the point indicated and that the quality of the Work is in accordance with the Contract Documents. The foregoing representations are subject to an evaluation of the Work for conformance with the Contract Documents upon Substantial Completion, to results of subsequent tests and inspections, to correction of minor deviations from the Contract Documents prior to completion and to specific qualifications expressed by the Architect. The issuance of a Certificate for Payment will further constitute a representation that the Contractor is entitled to payment in the amount certified. However, the issuance of a Certificate for Payment will not be a representation that the Architect has (1) made exhaustive or continuous on-site inspections to check the quality or quantity of the Work, (2) reviewed construction means, methods, techniques, sequences or procedures, (3) reviewed copies of requisitions received from Subcontractors and material suppliers and other data requested by the Owner to substantiate the Contractor's right to payment, or (4) made examination to ascertain how or for what purpose the Contractor has used money previously paid on account of the Contract Sum.

§ 9.5 DECISIONS TO WITHHOLD CERTIFICATION

§ 9.5.1 The Architect may withhold a Certificate for Payment in whole or in part, to the extent reasonably necessary to protect the Owner, if in the Architect's opinion the representations to the Owner required by Section 9.4.2 cannot be made. If the Architect is unable to certify payment in the amount of the Application, the Architect will notify the Contractor and Owner as provided in Section 9.4.1. If the Contractor and Architect cannot agree on a revised amount, the Architect will promptly issue a Certificate for Payment for the amount for which the Architect is able to make such representations to the Owner. The Architect may also withhold a Certificate for Payment or, because of subsequently discovered evidence, may nullify the whole or a part of a Certificate for Payment previously issued, to such extent as may be necessary in the Architect's opinion to protect the Owner from loss for which the Contractor is responsible, including loss resulting from acts and omissions described in Section 3.3.2, because of

.1 defective Work not remedied;

.2 third party claims filed or reasonable evidence indicating probable filing of such claims unless security acceptable to the Owner is provided by the Contractor;

.3 failure of the Contractor to make payments properly to Subcontractors or for labor, materials or equipment;

.4 reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Sum;

.5 damage to the Owner or a separate contractor;

.6 reasonable evidence that the Work will not be completed within the Contract Time, and that the unpaid balance would not be adequate to cover actual or liquidated damages for the anticipated delay; or

.7 repeated failure to carry out the Work in accordance with the Contract Documents.

§ 9.5.2 When the above reasons for withholding certification are removed, certification will be made for amounts previously withheld.

§ 9.5.3 If the Architect withholds certification for payment under Section 9.5.1.3, the Owner may, at its sole option, issue joint checks to the Contractor and to any Subcontractor or material or equipment suppliers to whom the Contractor failed to make payment for Work properly performed or material or equipment suitably delivered. If the Owner makes payments by joint check, the Owner shall notify the Architect and the Architect will reflect such payment on the next Certificate for Payment.

§ 9.6 PROGRESS PAYMENTS

§ 9.6.1 After the Architect has issued a Certificate for Payment, the Owner shall make payment in the manner and within the time provided in the Contract Documents, and shall so notify the Architect.

§ 9.6.2 The Contractor shall pay each Subcontractor no later than seven days after receipt of payment from the Owner the amount to which the Subcontractor is entitled, reflecting percentages actually retained from payments to the Contractor on account of the Subcontractor's portion of the Work. The Contractor shall, by appropriate agreement with each Subcontractor, require each Subcontractor to make payments to Sub-subcontractors in a similar manner.

§ 9.6.3 The Architect will, on request, furnish to a Subcontractor, if practicable, information regarding percentages of completion or amounts applied for by the Contractor and action taken thereon by the Architect and Owner on account of portions of the Work done by such Subcontractor.

§ 9.6.4 The Owner has the right to request written evidence from the Contractor that the Contractor has properly paid Subcontractors and material and equipment suppliers amounts paid by the Owner to the Contractor for subcontracted Work. If the Contractor fails to furnish such evidence within seven days, the Owner shall have the right to contact Subcontractors to ascertain whether they have been properly paid. Neither the Owner nor Architect shall have an obligation to pay or to see to the payment of money to a Subcontractor, except as may otherwise be required by law.

§ 9.6.5 Contractor payments to material and equipment suppliers shall be treated in a manner similar to that provided in Sections 9.6.2, 9.6.3 and 9.6.4.

§ 9.6.6 A Certificate for Payment, a progress payment, or partial or entire use or occupancy of the Project by the Owner shall not constitute acceptance of Work not in accordance with the Contract Documents.

§ 9.6.7 Unless the Contractor provides the Owner with a payment bond in the full penal sum of the Contract Sum, payments received by the Contractor for Work properly performed by Subcontractors and suppliers shall be held by the Contractor for those Subcontractors or suppliers who performed Work or furnished materials, or both, under contract with the Contractor for which payment was made by the Owner. Nothing contained herein shall require money to be placed in a separate account and not commingled with money of the Contractor, shall create any fiduciary liability or tort liability on the part of the Contractor for breach of trust or shall entitle any person or entity to an award of punitive damages against the Contractor for breach of the requirements of this provision.

§ 9.7 FAILURE OF PAYMENT

If the Architect does not issue a Certificate for Payment, through no fault of the Contractor, within seven days after receipt of the Contractor's Application for Payment, or if the Owner does not pay the Contractor within seven days after the date established in the Contract Documents the amount certified by the Architect or awarded by binding

dispute resolution, then the Contractor may, upon seven additional days' written notice to the Owner and Architect, stop the Work until payment of the amount owing has been received. The Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable costs of shut-down, delay and start-up, plus interest as provided for in the Contract Documents.

§ 9.8 SUBSTANTIAL COMPLETION

§ 9.8.1 Substantial Completion is the stage in the progress of the Work when the Work or designated portion thereof is sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work for its intended use.

§ 9.8.2 When the Contractor considers that the Work, or a portion thereof which the Owner agrees to accept separately, is substantially complete, the Contractor shall prepare and submit to the Architect a comprehensive list of items to be completed or corrected prior to final payment. Failure to include an item on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents.

§ 9.8.3 Upon receipt of the Contractor's list, the Architect will make an inspection to determine whether the Work or designated portion thereof is substantially complete. If the Architect's inspection discloses any item, whether or not included on the Contractor's list, which is not sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work or designated portion thereof for its intended use, the Contractor shall, before issuance of the Certificate of Substantial Completion, complete or correct such item upon notification by the Architect. In such case, the Contractor shall then submit a request for another inspection by the Architect to determine Substantial Completion.

§ 9.8.4 When the Work or designated portion thereof is substantially complete, the Architect will prepare a Certificate of Substantial Completion that shall establish the date of Substantial Completion, shall establish responsibilities of the Owner and Contractor for security, maintenance, heat, utilities, damage to the Work and insurance, and shall fix the time within which the Contractor shall finish all items on the list accompanying the Certificate. Warranties required by the Contract Documents shall commence on the date of Substantial Completion of the Work or designated portion thereof unless otherwise provided in the Certificate of Substantial Completion.

§ 9.8.5 The Certificate of Substantial Completion shall be submitted to the Owner and Contractor for their written acceptance of responsibilities assigned to them in such Certificate. Upon such acceptance and consent of surety, if any, the Owner shall make payment of retainage applying to such Work or designated portion thereof. Such payment shall be adjusted for Work that is incomplete or not in accordance with the requirements of the Contract Documents.

§ 9.9 PARTIAL OCCUPANCY OR USE

§ 9.9.1 The Owner may occupy or use any completed or partially completed portion of the Work at any stage when such portion is designated by separate agreement with the Contractor, provided such occupancy or use is consented to by the insurer as required under Section 11.3.1.5 and authorized by public authorities having jurisdiction over the Project. Such partial occupancy or use may commence whether or not the portion is substantially complete, provided the Owner and Contractor have accepted in writing the responsibilities assigned to each of them for payments, retainage, if any, security, maintenance, heat, utilities, damage to the Work and insurance, and have agreed in writing concerning the period for correction of the Work and commencement of warranties required by the Contract Documents. When the Contractor considers a portion substantially complete, the Contractor shall prepare and submit a list to the Architect as provided under Section 9.8.2. Consent of the Contractor to partial occupancy or use shall not be unreasonably withheld. The stage of the progress of the Work shall be determined by written agreement between the Owner and Contractor or, if no agreement is reached, by decision of the Architect.

§ 9.9.2 Immediately prior to such partial occupancy or use, the Owner, Contractor and Architect shall jointly inspect the area to be occupied or portion of the Work to be used in order to determine and record the condition of the Work.

§ 9.9.3 Unless otherwise agreed upon, partial occupancy or use of a portion or portions of the Work shall not constitute acceptance of Work not complying with the requirements of the Contract Documents.

§ 9.10 FINAL COMPLETION AND FINAL PAYMENT

§ 9.10.1 Upon receipt of the Contractor's written notice that the Work is ready for final inspection and acceptance and upon receipt of a final Application for Payment, the Architect will promptly make such inspection and, when the Architect finds the Work acceptable under the Contract Documents and the Contract fully performed, the Architect will promptly issue a final Certificate for Payment stating that to the best of the Architect's knowledge, information and belief, and on the basis of the Architect's on-site visits and inspections, the Work has been completed in accordance with terms and conditions of the Contract Documents and that the entire balance found to be due the Contractor and noted in the final Certificate is due and payable. The Architect's final Certificate for Payment will constitute a further representation that conditions listed in Section 9.10.2 as precedent to the Contractor's being entitled to final payment have been fulfilled.

§ 9.10.2 Neither final payment nor any remaining retained percentage shall become due until the Contractor submits to the Architect (1) an affidavit that payrolls, bills for materials and equipment, and other indebtedness connected with the Work for which the Owner or the Owner's property might be responsible or encumbered (less amounts withheld by Owner) have been paid or otherwise satisfied, (2) a certificate evidencing that insurance required by the Contract Documents to remain in force after final payment is currently in effect and will not be canceled or allowed to expire until at least 30 days' prior written notice has been given to the Owner, (3) a written statement that the Contractor knows of no substantial reason that the insurance will not be renewable to cover the period required by the Contract Documents, (4) consent of surety, if any, to final payment and (5), if required by the Owner, other data establishing payment or satisfaction of obligations, such as receipts, releases and waivers of liens, claims, security interests or encumbrances arising out of the Contract, to the extent and in such form as may be designated by the Owner. If a Subcontractor refuses to furnish a release or waiver required by the Owner, the Contractor may furnish a bond satisfactory to the Owner to indemnify the Owner against such lien. If such lien remains unsatisfied after payments are made, the Contractor shall refund to the Owner all money that the Owner may be compelled to pay in discharging such lien, including all costs and reasonable attorneys' fees.

§ 9.10.3 If, after Substantial Completion of the Work, final completion thereof is materially delayed through no fault of the Contractor or by issuance of Change Orders affecting final completion, and the Architect so confirms, the Owner shall, upon application by the Contractor and certification by the Architect, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed and accepted. If the remaining balance for Work not fully completed or corrected is less than retainage stipulated in the Contract Documents, and if bonds have been furnished, the written consent of surety to payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by the Contractor to the Architect prior to certification of such payment. Such payment shall be made under terms and conditions governing final payment, except that it shall not constitute a waiver of claims.

§ 9.10.4 The making of final payment shall constitute a waiver of Claims by the Owner except those arising from

- **.1** liens, Claims, security interests or encumbrances arising out of the Contract and unsettled;
- **.2** failure of the Work to comply with the requirements of the Contract Documents; or
- **.3** terms of special warranties required by the Contract Documents.

§ 9.10.5 Acceptance of final payment by the Contractor, a Subcontractor or material supplier shall constitute a waiver of claims by that payee except those previously made in writing and identified by that payee as unsettled at the time of final Application for Payment.

ARTICLE 10 PROTECTION OF PERSONS AND PROPERTY

§ 10.1 SAFETY PRECAUTIONS AND PROGRAMS

The Contractor shall be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the performance of the Contract.

§ 10.2 SAFETY OF PERSONS AND PROPERTY

§ 10.2.1 The Contractor shall take reasonable precautions for safety of, and shall provide reasonable protection to prevent damage, injury or loss to

- **.1** employees on the Work and other persons who may be affected thereby;
- **.2** the Work and materials and equipment to be incorporated therein, whether in storage on or off the site, under care, custody or control of the Contractor or the Contractor's Subcontractors or Sub-subcontractors; and

.3 other property at the site or adjacent thereto, such as trees, shrubs, lawns, walks, pavements, roadways, structures and utilities not designated for removal, relocation or replacement in the course of construction.

§ 10.2.2 The Contractor shall comply with and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities bearing on safety of persons or property or their protection from damage, injury or loss.

§ 10.2.3 The Contractor shall erect and maintain, as required by existing conditions and performance of the Contract, reasonable safeguards for safety and protection, including posting danger signs and other warnings against hazards, promulgating safety regulations and notifying owners and users of adjacent sites and utilities.

§ 10.2.4 When use or storage of explosives or other hazardous materials or equipment or unusual methods are necessary for execution of the Work, the Contractor shall exercise utmost care and carry on such activities under supervision of properly qualified personnel.

§ 10.2.5 The Contractor shall promptly remedy damage and loss (other than damage or loss insured under property insurance required by the Contract Documents) to property referred to in Sections 10.2.1.2 and 10.2.1.3 caused in whole or in part by the Contractor, a Subcontractor, a Sub-subcontractor, or anyone directly or indirectly employed by any of them, or by anyone for whose acts they may be liable and for which the Contractor is responsible under Sections 10.2.1.2 and 10.2.1.3, except damage or loss attributable to acts or omissions of the Owner or Architect or anyone directly or indirectly employed by either of them, or by anyone for whose acts either of them may be liable, and not attributable to the fault or negligence of the Contractor. The foregoing obligations of the Contractor are in addition to the Contractor's obligations under Section 3.18.

§ 10.2.6 The Contractor shall designate a responsible member of the Contractor's organization at the site whose duty shall be the prevention of accidents. This person shall be the Contractor's superintendent unless otherwise designated by the Contractor in writing to the Owner and Architect.

§ 10.2.7 The Contractor shall not permit any part of the construction or site to be loaded so as to cause damage or create an unsafe condition.

§ 10.2.8 INJURY OR DAMAGE TO PERSON OR PROPERTY

If either party suffers injury or damage to person or property because of an act or omission of the other party, or of others for whose acts such party is legally responsible, written notice of such injury or damage, whether or not insured, shall be given to the other party within a reasonable time not exceeding 21 days after discovery. The notice shall provide sufficient detail to enable the other party to investigate the matter.

§ 10.3 HAZARDOUS MATERIALS

§ 10.3.1 The Contractor is responsible for compliance with any requirements included in the Contract Documents regarding hazardous materials. If the Contractor encounters a hazardous material or substance not addressed in the Contract Documents and if reasonable precautions will be inadequate to prevent foreseeable bodily injury or death to persons resulting from a material or substance, including but not limited to asbestos or polychlorinated biphenyl (PCB), encountered on the site by the Contractor, the Contractor shall, upon recognizing the condition, immediately stop Work in the affected area and report the condition to the Owner and Architect in writing.

§ 10.3.2 Upon receipt of the Contractor's written notice, the Owner shall obtain the services of a licensed laboratory to verify the presence or absence of the material or substance reported by the Contractor and, in the event such material or substance is found to be present, to cause it to be rendered harmless. Unless otherwise required by the Contract Documents, the Owner shall furnish in writing to the Contractor and Architect the names and qualifications of persons or entities who are to perform tests verifying the presence or absence of such material or substance or who are to perform the task of removal or safe containment of such material or substance. The Contractor and the Architect will promptly reply to the Owner in writing stating whether or not either has reasonable objection to the persons or entities proposed by the Owner. If either the Contractor or Architect has an objection to a person or entity proposed by the Owner, the Owner shall propose another to whom the Contractor and the Architect have no reasonable objection. When the material or substance has been rendered harmless, Work in the affected area shall resume upon written agreement of the Owner and Contractor. By Change Order, the Contract Time shall be

extended appropriately and the Contract Sum shall be increased in the amount of the Contractor's reasonable additional costs of shut-down, delay and start-up.

§ 10.3.3 To the fullest extent permitted by law, the Owner shall indemnify and hold harmless the Contractor, Subcontractors, Architect, Architect's consultants and agents and employees of any of them from and against claims, damages, losses and expenses, including but not limited to attorneys' fees, arising out of or resulting from performance of the Work in the affected area if in fact the material or substance presents the risk of bodily injury or death as described in Section 10.3.1 and has not been rendered harmless, provided that such claim, damage, loss or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), except to the extent that such damage, loss or expense is due to the fault or negligence of the party seeking indemnity.

§ 10.3.4 The Owner shall not be responsible under this Section 10.3 for materials or substances the Contractor brings to the site unless such materials or substances are required by the Contract Documents. The Owner shall be responsible for materials or substances required by the Contract Documents, except to the extent of the Contractor's fault or negligence in the use and handling of such materials or substances.

§ 10.3.5 The Contractor shall indemnify the Owner for the cost and expense the Owner incurs (1) for remediation of a material or substance the Contractor brings to the site and negligently handles, or (2) where the Contractor fails to perform its obligations under Section 10.3.1, except to the extent that the cost and expense are due to the Owner's fault or negligence.

§ 10.3.6 If, without negligence on the part of the Contractor, the Contractor is held liable by a government agency for the cost of remediation of a hazardous material or substance solely by reason of performing Work as required by the Contract Documents, the Owner shall indemnify the Contractor for all cost and expense thereby incurred.

§ 10.4 EMERGENCIES

In an emergency affecting safety of persons or property, the Contractor shall act, at the Contractor's discretion, to prevent threatened damage, injury or loss. Additional compensation or extension of time claimed by the Contractor on account of an emergency shall be determined as provided in Article 15 and Article 7.

ARTICLE 11 INSURANCE AND BONDS

§ 11.1 CONTRACTOR'S LIABILITY INSURANCE

§ 11.1.1 The Contractor shall purchase from and maintain in a company or companies lawfully authorized to do business in the jurisdiction in which the Project is located such insurance as will protect the Contractor from claims set forth below which may arise out of or result from the Contractor's operations and completed operations under the Contract and for which the Contractor may be legally liable, whether such operations be by the Contractor or by a Subcontractor or by anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable:

- **.1** Claims under workers' compensation, disability benefit and other similar employee benefit acts that are applicable to the Work to be performed;
- **.2** Claims for damages because of bodily injury, occupational sickness or disease, or death of the Contractor's employees;
- **.3** Claims for damages because of bodily injury, sickness or disease, or death of any person other than the Contractor's employees;
- **.4** Claims for damages insured by usual personal injury liability coverage;
- **.5** Claims for damages, other than to the Work itself, because of injury to or destruction of tangible property, including loss of use resulting therefrom;
- **.6** Claims for damages because of bodily injury, death of a person or property damage arising out of ownership, maintenance or use of a motor vehicle;
- **.7** Claims for bodily injury or property damage arising out of completed operations; and
- **.8** Claims involving contractual liability insurance applicable to the Contractor's obligations under Section 3.18.

§ 11.1.2 The insurance required by Section 11.1.1 shall be written for not less than limits of liability specified in the Contract Documents or required by law, whichever coverage is greater. Coverages, whether written on an occurrence or claims-made basis, shall be maintained without interruption from the date of commencement of the

Work until the date of final payment and termination of any coverage required to be maintained after final payment, and, with respect to the Contractor's completed operations coverage, until the expiration of the period for correction of Work or for such other period for maintenance of completed operations coverage as specified in the Contract Documents.

§ 11.1.3 Certificates of insurance acceptable to the Owner shall be filed with the Owner prior to commencement of the Work and thereafter upon renewal or replacement of each required policy of insurance. These certificates and the insurance policies required by this Section 11.1 shall contain a provision that coverages afforded under the policies will not be canceled or allowed to expire until at least 30 days' prior written notice has been given to the Owner. An additional certificate evidencing continuation of liability coverage, including coverage for completed operations, shall be submitted with the final Application for Payment as required by Section 9.10.2 and thereafter upon renewal or replacement of such coverage until the expiration of the time required by Section 11.1.2. Information concerning reduction of coverage on account of revised limits or claims paid under the General Aggregate, or both, shall be furnished by the Contractor with reasonable promptness.

§ 11.1.4 The Contractor shall cause the commercial liability coverage required by the Contract Documents to include (1) the Owner, the Architect and the Architect's consultants as additional insureds for claims caused in whole or in part by the Contractor's negligent acts or omissions during the Contractor's operations; and (2) the Owner as an additional insured for claims caused in whole or in part by the Contractor's negligent acts or omissions during the Contractor's completed operations.

§ 11.2 OWNER'S LIABILITY INSURANCE

The Owner shall be responsible for purchasing and maintaining the Owner's usual liability insurance.

§ 11.3 PROPERTY INSURANCE

§ 11.3.1 Unless otherwise provided, the Owner shall purchase and maintain, in a company or companies lawfully authorized to do business in the jurisdiction in which the Project is located, property insurance written on a builder's risk "all-risk" or equivalent policy form in the amount of the initial Contract Sum, plus value of subsequent Contract Modifications and cost of materials supplied or installed by others, comprising total value for the entire Project at the site on a replacement cost basis without optional deductibles. Such property insurance shall be maintained, unless otherwise provided in the Contract Documents or otherwise agreed in writing by all persons and entities who are beneficiaries of such insurance, until final payment has been made as provided in Section 9.10 or until no person or entity other than the Owner has an insurable interest in the property required by this Section 11.3 to be covered, whichever is later. This insurance shall include interests of the Owner, the Contractor, Subcontractors and Sub-subcontractors in the Project.

§ 11.3.1.1 Property insurance shall be on an "all-risk" or equivalent policy form and shall include, without limitation, insurance against the perils of fire (with extended coverage) and physical loss or damage including, without duplication of coverage, theft, vandalism, malicious mischief, collapse, earthquake, flood, windstorm, falsework, testing and startup, temporary buildings and debris removal including demolition occasioned by enforcement of any applicable legal requirements, and shall cover reasonable compensation for Architect's and Contractor's services and expenses required as a result of such insured loss.

§ 11.3.1.2 If the Owner does not intend to purchase such property insurance required by the Contract and with all of the coverages in the amount described above, the Owner shall so inform the Contractor in writing prior to commencement of the Work. The Contractor may then effect insurance that will protect the interests of the Contractor, Subcontractors and Sub-subcontractors in the Work, and by appropriate Change Order the cost thereof shall be charged to the Owner. If the Contractor is damaged by the failure or neglect of the Owner to purchase or maintain insurance as described above, without so notifying the Contractor in writing, then the Owner shall bear all reasonable costs properly attributable thereto.

§ 11.3.1.3 If the property insurance requires deductibles, the Owner shall pay costs not covered because of such deductibles.

§ 11.3.1.4 This property insurance shall cover portions of the Work stored off the site, and also portions of the Work in transit.

§ 11.3.1.5 Partial occupancy or use in accordance with Section 9.9 shall not commence until the insurance company or companies providing property insurance have consented to such partial occupancy or use by endorsement or otherwise. The Owner and the Contractor shall take reasonable steps to obtain consent of the insurance company or companies and shall, without mutual written consent, take no action with respect to partial occupancy or use that would cause cancellation, lapse or reduction of insurance.

§ 11.3.2 BOILER AND MACHINERY INSURANCE

The Owner shall purchase and maintain boiler and machinery insurance required by the Contract Documents or by law, which shall specifically cover such insured objects during installation and until final acceptance by the Owner; this insurance shall include interests of the Owner, Contractor, Subcontractors and Sub-subcontractors in the Work, and the Owner and Contractor shall be named insureds.

§ 11.3.3 LOSS OF USE INSURANCE

The Owner, at the Owner's option, may purchase and maintain such insurance as will insure the Owner against loss of use of the Owner's property due to fire or other hazards, however caused. The Owner waives all rights of action against the Contractor for loss of use of the Owner's property, including consequential losses due to fire or other hazards however caused.

§ 11.3.4 If the Contractor requests in writing that insurance for risks other than those described herein or other special causes of loss be included in the property insurance policy, the Owner shall, if possible, include such insurance, and the cost thereof shall be charged to the Contractor by appropriate Change Order.

§ 11.3.5 If during the Project construction period the Owner insures properties, real or personal or both, at or adjacent to the site by property insurance under policies separate from those insuring the Project, or if after final payment property insurance is to be provided on the completed Project through a policy or policies other than those insuring the Project during the construction period, the Owner shall waive all rights in accordance with the terms of Section 11.3.7 for damages caused by fire or other causes of loss covered by this separate property insurance. All separate policies shall provide this waiver of subrogation by endorsement or otherwise.

§ 11.3.6 Before an exposure to loss may occur, the Owner shall file with the Contractor a copy of each policy that includes insurance coverages required by this Section 11.3. Each policy shall contain all generally applicable conditions, definitions, exclusions and endorsements related to this Project. Each policy shall contain a provision that the policy will not be canceled or allowed to expire, and that its limits will not be reduced, until at least 30 days' prior written notice has been given to the Contractor.

§ 11.3.7 WAIVERS OF SUBROGATION

The Owner and Contractor waive all rights against (1) each other and any of their subcontractors, sub-subcontractors, agents and employees, each of the other, and (2) the Architect, Architect's consultants, separate contractors described in Article 6, if any, and any of their subcontractors, sub-subcontractors, agents and employees, for damages caused by fire or other causes of loss to the extent covered by property insurance obtained pursuant to this Section 11.3 or other property insurance applicable to the Work, except such rights as they have to proceeds of such insurance held by the Owner as fiduciary. The Owner or Contractor, as appropriate, shall require of the Architect, Architect's consultants, separate contractors described in Article 6, if any, and the subcontractors, sub-subcontractors, agents and employees of any of them, by appropriate agreements, written where legally required for validity, similar waivers each in favor of other parties enumerated herein. The policies shall provide such waivers of subrogation by endorsement or otherwise. A waiver of subrogation shall be effective as to a person or entity even though that person or entity would otherwise have a duty of indemnification, contractual or otherwise, did not pay the insurance premium directly or indirectly, and whether or not the person or entity had an insurable interest in the property damaged.

§ 11.3.8 A loss insured under the Owner's property insurance shall be adjusted by the Owner as fiduciary and made payable to the Owner as fiduciary for the insureds, as their interests may appear, subject to requirements of any applicable mortgagee clause and of Section 11.3.10. The Contractor shall pay Subcontractors their just shares of insurance proceeds received by the Contractor, and by appropriate agreements, written where legally required for validity, shall require Subcontractors to make payments to their Sub-subcontractors in similar manner.

§ 11.3.9 If required in writing by a party in interest, the Owner as fiduciary shall, upon occurrence of an insured loss, give bond for proper performance of the Owner's duties. The cost of required bonds shall be charged against proceeds received as fiduciary. The Owner shall deposit in a separate account proceeds so received, which the Owner shall distribute in accordance with such agreement as the parties in interest may reach, or as determined in accordance with the method of binding dispute resolution selected in the Agreement between the Owner and Contractor. If after such loss no other special agreement is made and unless the Owner terminates the Contract for convenience, replacement of damaged property shall be performed by the Contractor after notification of a Change in the Work in accordance with Article 7.

§ 11.3.10 The Owner as fiduciary shall have power to adjust and settlc a loss with insurcrs unless one of the parties in interest shall object in writing within five days after occurrence of loss to the Owner's exercise of this power; if such objection is made, the dispute shall be resolved in the manner selected by the Owner and Contractor as the method of binding dispute resolution in the Agreement. If the Owner and Contractor have selected arbitration as the method of binding dispute resolution, the Owner as fiduciary shall make settlement with insurers or, in the case of a dispute over distribution of insurance proceeds, in accordance with the directions of the arbitrators.

§ 11.4 PERFORMANCE BOND AND PAYMENT BOND

§ 11.4.1 The Owner shall have the right to require the Contractor to furnish bonds covering faithful performance of the Contract and payment of obligations arising thereunder as stipulated in bidding requirements or specifically required in the Contract Documents on the date of execution of the Contract.

§ 11.4.2 Upon the request of any person or entity appearing to be a potential beneficiary of bonds covering payment of obligations arising under the Contract, the Contractor shall promptly furnish a copy of the bonds or shall authorize a copy to be furnished.

ARTICLE 12 UNCOVERING AND CORRECTION OF WORK

§ 12.1 UNCOVERING OF WORK

§ 12.1.1 If a portion of the Work is covered contrary to the Architect's request or to requirements specifically expressed in the Contract Documents, it must, if requested in writing by the Architect, be uncovered for the Architect's examination and be replaced at the Contractor's expense without change in the Contract Time.

§ 12.1.2 If a portion of the Work has been covered that the Architect has not specifically requested to examine prior to its being covered, the Architect may request to see such Work and it shall be uncovered by the Contractor. If such Work is in accordance with the Contract Documents, costs of uncovering and replacement shall, by appropriate Change Order, be at the Owner's expense. If such Work is not in accordance with the Contract Documents, such costs and the cost of correction shall be at the Contractor's expense unless the condition was caused by the Owner or a separate contractor in which event the Owner shall be responsible for payment of such costs.

§ 12.2 CORRECTION OF WORK

§ 12.2.1 BEFORE OR AFTER SUBSTANTIAL COMPLETION

The Contractor shall promptly correct Work rejected by the Architect or failing to conform to the requirements of the Contract Documents, whether discovered before or after Substantial Completion and whether or not fabricated, installed or completed. Costs of correcting such rejected Work, including additional testing and inspections, the cost of uncovering and replacement, and compensation for the Architect's services and expenses made necessary thereby, shall be at the Contractor's expense.

§ 12.2.2 AFTER SUBSTANTIAL COMPLETION

§ 12.2.2.1 In addition to the Contractor's obligations under Section 3.5, if, within one year after the date of Substantial Completion of the Work or designated portion thereof or after the date for commencement of warranties established under Section 9.9.1, or by terms of an applicable special warranty required by the Contract Documents, any of the Work is found to be not in accordance with the requirements of the Contract Documents, the Contractor shall correct it promptly after receipt of written notice from the Owner to do so unless the Owner has previously given the Contractor a written acceptance of such condition. The Owner shall give such notice promptly after discovery of the condition. During the one-year period for correction of Work, if the Owner fails to notify the Contractor and give the Contractor an opportunity to make the correction, the Owner waives the rights to require correction by the Contractor and to make a claim for breach of warranty. If the Contractor fails to correct

nonconforming Work within a reasonable time during that period after receipt of notice from the Owner or Architect, the Owner may correct it in accordance with Section 2.4.

§ 12.2.2.2 The one-year period for correction of Work shall be extended with respect to portions of Work first performed after Substantial Completion by the period of time between Substantial Completion and the actual completion of that portion of the Work.

§ 12.2.2.3 The one-year period for correction of Work shall not be extended by corrective Work performed by the Contractor pursuant to this Section 12.2.

§ 12.2.3 The Contractor shall remove from the site portions of the Work that are not in accordance with the requirements of the Contract Documents and are neither corrected by the Contractor nor accepted by the Owner.

§ 12.2.4 The Contractor shall bear the cost of correcting destroyed or damaged construction, whether completed or partially completed, of the Owner or separate contractors caused by the Contractor's correction or removal of Work that is not in accordance with the requirements of the Contract Documents.

§ 12.2.5 Nothing contained in this Section 12.2 shall be construed to establish a period of limitation with respect to other obligations the Contractor has under the Contract Documents. Establishment of the one-year period for correction of Work as described in Section 12.2.2 relates only to the specific obligation of the Contractor to correct the Work, and has no relationship to the time within which the obligation to comply with the Contract Documents may be sought to be enforced, nor to the time within which proceedings may be commenced to establish the Contractor's liability with respect to the Contractor's obligations other than specifically to correct the Work.

§ 12.3 ACCEPTANCE OF NONCONFORMING WORK

If the Owner prefers to accept Work that is not in accordance with the requirements of the Contract Documents, the Owner may do so instead of requiring its removal and correction, in which case the Contract Sum will be reduced as appropriate and equitable. Such adjustment shall be effected whether or not final payment has been made.

ARTICLE 13 MISCELLANEOUS PROVISIONS

§ 13.1 GOVERNING LAW

The Contract shall be governed by the law of the place where the Project is located except that, if the parties have selected arbitration as the method of binding dispute resolution, the Federal Arbitration Act shall govern Section 15.4.

§ 13.2 SUCCESSORS AND ASSIGNS

§ 13.2.1 The Owner and Contractor respectively bind themselves, their partners, successors, assigns and legal representatives to covenants, agreements and obligations contained in the Contract Documents. Except as provided in Section 13.2.2, neither party to the Contract shall assign the Contract as a whole without written consent of the other. If either party attempts to make such an assignment without such consent, that party shall nevertheless remain legally responsible for all obligations under the Contract.

§ 13.2.2 The Owner may, without consent of the Contractor, assign the Contract to a lender providing construction financing for the Project, if the lender assumes the Owner's rights and obligations under the Contract Documents. The Contractor shall execute all consents reasonably required to facilitate such assignment.

§ 13.3 WRITTEN NOTICE

Written notice shall be deemed to have been duly served if delivered in person to the individual, to a member of the firm or entity, or to an officer of the corporation for which it was intended; or if delivered at, or sent by registered or certified mail or by courier service providing proof of delivery to, the last business address known to the party giving notice.

§ 13.4 RIGHTS AND REMEDIES

§ 13.4.1 Duties and obligations imposed by the Contract Documents and rights and remedies available thereunder shall be in addition to and not a limitation of duties, obligations, rights and remedies otherwise imposed or available by law.

§ 13.4.2 No action or failure to act by the Owner, Architect or Contractor shall constitute a waiver of a right or duty afforded them under the Contract, nor shall such action or failure to act constitute approval of or acquiescence in a breach there under, except as may be specifically agreed in writing.

§ 13.5 TESTS AND INSPECTIONS

§ 13.5.1 Tests, inspections and approvals of portions of the Work shall be made as required by the Contract Documents and by applicable laws, statutes, ordinances, codes, rules and regulations or lawful orders of public authorities. Unless otherwise provided, the Contractor shall make arrangements for such tests, inspections and approvals with an independent testing laboratory or entity acceptable to the Owner, or with the appropriate public authority, and shall bear all related costs of tests, inspections and approvals. The Contractor shall give the Architect timely notice of when and where tests and inspections are to be made so that the Architect may be present for such procedures. The Owner shall bear costs of (1) tests, inspections or approvals that do not become requirements until after bids are received or negotiations concluded, and (2) tests, inspections or approvals where building codes or applicable laws or regulations prohibit the Owner from delegating their cost to the Contractor.

§ 13.5.2 If the Architect, Owner or public authorities having jurisdiction determine that portions of the Work require additional testing, inspection or approval not included under Section 13.5.1, the Architect will, upon written authorization from the Owner, instruct the Contractor to make arrangements for such additional testing, inspection or approval by an entity acceptable to the Owner, and the Contractor shall give timely notice to the Architect of when and where tests and inspections are to be made so that the Architect may be present for such procedures. Such costs, except as provided in Section 13.5.3, shall be at the Owner's expense.

§ 13.5.3 If such procedures for testing, inspection or approval under Sections 13.5.1 and 13.5.2 reveal failure of the portions of the Work to comply with requirements established by the Contract Documents, all costs made necessary by such failure including those of repeated procedures and compensation for the Architect's services and expenses shall be at the Contractor's expense.

§ 13.5.4 Required certificates of testing, inspection or approval shall, unless otherwise required by the Contract Documents, be secured by the Contractor and promptly delivered to the Architect.

§ 13.5.5 If the Architect is to observe tests, inspections or approvals required by the Contract Documents, the Architect will do so promptly and, where practicable, at the normal place of testing.

§ 13.5.6 Tests or inspections conducted pursuant to the Contract Documents shall be made promptly to avoid unreasonable delay in the Work.

§ 13.6 INTEREST

Payments due and unpaid under the Contract Documents shall bear interest from the date payment is due at such rate as the parties may agree upon in writing or, in the absence thereof, at the legal rate prevailing from time to time at the place where the Project is located.

§ 13.7 TIME LIMITS ON CLAIMS

The Owner and Contractor shall commence all claims and causes of action, whether in contract, tort, breach of warranty or otherwise, against the other arising out of or related to the Contract in accordance with the requirements of the final dispute resolution method selected in the Agreement within the time period specified by applicable law, but in any case not more than 10 years after the date of Substantial Completion of the Work. The Owner and Contractor waive all claims and causes of action not commenced in accordance with this Section 13.7.

ARTICLE 14 TERMINATION OR SUSPENSION OF THE CONTRACT

§ 14.1 TERMINATION BY THE CONTRACTOR

§ 14.1.1 The Contractor may terminate the Contract if the Work is stopped for a period of 30 consecutive days through no act or fault of the Contractor or a Subcontractor, Sub-subcontractor or their agents or employees or any other persons or entities performing portions of the Work under direct or indirect contract with the Contractor, for any of the following reasons:

.1 Issuance of an order of a court or other public authority having jurisdiction that requires all Work to be stopped;

.2 An act of government, such as a declaration of national emergency that requires all Work to be stopped;

.3 Because the Architect has not issued a Certificate for Payment and has not notified the Contractor of the reason for withholding certification as provided in Section 9.4.1, or because the Owner has not made payment on a Certificate for Payment within the time stated in the Contract Documents; or

.4 The Owner has failed to furnish to the Contractor promptly, upon the Contractor's request, reasonable evidence as required by Section 2.2.1.

§ 14.1.2 The Contractor may terminate the Contract if, through no act or fault of the Contractor or a Subcontractor, Sub-subcontractor or their agents or employees or any other persons or entities performing portions of the Work under direct or indirect contract with the Contractor, repeated suspensions, delays or interruptions of the entire Work by the Owner as described in Section 14.3 constitute in the aggregate more than 100 percent of the total number of days scheduled for completion, or 120 days in any 365-day period, whichever is less.

§ 14.1.3 If one of the reasons described in Section 14.1.1 or 14.1.2 exists, the Contractor may, upon seven days' written notice to the Owner and Architect, terminate the Contract and recover from the Owner payment for Work executed, including reasonable overhead and profit, costs incurred by reason of such termination, and damages.

§ 14.1.4 If the Work is stopped for a period of 60 consecutive days through no act or fault of the Contractor or a Subcontractor or their agents or employees or any other persons performing portions of the Work under contract with the Contractor because the Owner has repeatedly failed to fulfill the Owner's obligations under the Contract Documents with respect to matters important to the progress of the Work, the Contractor may, upon seven additional days' written notice to the Owner and the Architect, terminate the Contract and recover from the Owner as provided in Section 14.1.3.

§ 14.2 TERMINATION BY THE OWNER FOR CAUSE

§ 14.2.1 The Owner may terminate the Contract if the Contractor

.1 repeatedly refuses or fails to supply enough properly skilled workers or proper materials;

.2 fails to make payment to Subcontractors for materials or labor in accordance with the respective agreements between the Contractor and the Subcontractors;

.3 repeatedly disregards applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of a public authority; or

.4 otherwise is guilty of substantial breach of a provision of the Contract Documents.

§ 14.2.2 When any of the above reasons exist, the Owner, upon certification by the Initial Decision Maker that sufficient cause exists to justify such action, may without prejudice to any other rights or remedies of the Owner and after giving the Contractor and the Contractor's surety, if any, seven days' written notice, terminate employment of the Contractor and may, subject to any prior rights of the surety:

.1 Exclude the Contractor from the site and take possession of all materials, equipment, tools, and construction equipment and machinery thereon owned by the Contractor;

.2 Accept assignment of subcontracts pursuant to Section 5.4; and

.3 Finish the Work by whatever reasonable method the Owner may deem expedient. Upon written request of the Contractor, the Owner shall furnish to the Contractor a detailed accounting of the costs incurred by the Owner in finishing the Work.

§ 14.2.3 When the Owner terminates the Contract for one of the reasons stated in Section 14.2.1, the Contractor shall not be entitled to receive further payment until the Work is finished.

§ 14.2.4 If the unpaid balance of the Contract Sum exceeds costs of finishing the Work, including compensation for the Architect's services and expenses made necessary thereby, and other damages incurred by the Owner and not expressly waived, such excess shall be paid to the Contractor. If such costs and damages exceed the unpaid balance, the Contractor shall pay the difference to the Owner. The amount to be paid to the Contractor or Owner, as the case may be, shall be certified by the Initial Decision Maker, upon application, and this obligation for payment shall survive termination of the Contract.

§ 14.3 SUSPENSION BY THE OWNER FOR CONVENIENCE

§ 14.3.1 The Owner may, without cause, order the Contractor in writing to suspend, delay or interrupt the Work in whole or in part for such period of time as the Owner may determine.

§ 14.3.2 The Contract Sum and Contract Time shall be adjusted for increases in the cost and time caused by suspension, delay or interruption as described in Section 14.3.1. Adjustment of the Contract Sum shall include profit. No adjustment shall be made to the extent

.1 that performance is, was or would have been so suspended, delayed or interrupted by another cause for which the Contractor is responsible; or

.2 that an equitable adjustment is made or denied under another provision of the Contract.

§ 14.4 TERMINATION BY THE OWNER FOR CONVENIENCE

§ 14.4.1 The Owner may, at any time, terminate the Contract for the Owner's convenience and without cause.

§ 14.4.2 Upon receipt of written notice from the Owner of such termination for the Owner's convenience, the Contractor shall

.1 cease operations as directed by the Owner in the notice;

.2 take actions necessary, or that the Owner may direct, for the protection and preservation of the Work; and

.3 except for Work directed to be performed prior to the effective date of termination stated in the notice, terminate all existing subcontracts and purchase orders and enter into no further subcontracts and purchase orders.

§ 14.4.3 In case of such termination for the Owner's convenience, the Contractor shall be entitled to receive payment for Work executed, and costs incurred by reason of such termination, along with reasonable overhead and profit on the Work not executed.

ARTICLE 15 CLAIMS AND DISPUTES

§ 15.1 CLAIMS

§ 15.1.1 DEFINITION

A Claim is a demand or assertion by one of the parties seeking, as a matter of right, payment of money, or other relief with respect to the terms of the Contract. The term "Claim" also includes other disputes and matters in question between the Owner and Contractor arising out of or relating to the Contract. The responsibility to substantiate Claims shall rest with the party making the Claim.

§ 15.1.2 NOTICE OF CLAIMS

Claims by either the Owner or Contractor must be initiated by written notice to the other party and to the Initial Decision Maker with a copy sent to the Architect, if the Architect is not serving as the Initial Decision Maker. Claims by either party must be initiated within 21 days after occurrence of the event giving rise to such Claim or within 21 days after the claimant first recognizes the condition giving rise to the Claim, whichever is later.

§ 15.1.3 CONTINUING CONTRACT PERFORMANCE

Pending final resolution of a Claim, except as otherwise agreed in writing or as provided in Section 9.7 and Article 14, the Contractor shall proceed diligently with performance of the Contract and the Owner shall continue to make payments in accordance with the Contract Documents. The Architect will prepare Change Orders and issue Certificates for Payment in accordance with the decisions of the Initial Decision Maker.

§ 15.1.4 CLAIMS FOR ADDITIONAL COST

If the Contractor wishes to make a Claim for an increase in the Contract Sum, written notice as provided herein shall be given before proceeding to execute the Work. Prior notice is not required for Claims relating to an emergency endangering life or property arising under Section 10.4.

§ 15.1.5 CLAIMS FOR ADDITIONAL TIME

§ 15.1.5.1 If the Contractor wishes to make a Claim for an increase in the Contract Time, written notice as provided herein shall be given. The Contractor's Claim shall include an estimate of cost and of probable effect of delay on progress of the Work. In the case of a continuing delay, only one Claim is necessary.

§ 15.1.5.2 If adverse weather conditions are the basis for a Claim for additional time, such Claim shall be documented by data substantiating that weather conditions were abnormal for the period of time, could not have been reasonably anticipated and had an adverse effect on the scheduled construction.

§ 15.1.6 CLAIMS FOR CONSEQUENTIAL DAMAGES

The Contractor and Owner waive Claims against each other for consequential damages arising out of or relating to this Contract. This mutual waiver includes

.1 damages incurred by the Owner for rental expenses, for losses of use, income, profit, financing, business and reputation, and for loss of management or employee productivity or of the services of such persons; and

.2 damages incurred by the Contractor for principal office expenses including the compensation of personnel stationed there, for losses of financing, business and reputation, and for loss of profit except anticipated profit arising directly from the Work.

This mutual waiver is applicable, without limitation, to all consequential damages due to either party's termination in accordance with Article 14. Nothing contained in this Section 15.1.6 shall be deemed to preclude an award of liquidated damages, when applicable, in accordance with the requirements of the Contract Documents.

§ 15.2 INITIAL DECISION

§ 15.2.1 Claims, excluding those arising under Sections 10.3, 10.4, 11.3.9, and 11.3.10, shall be referred to the Initial Decision Maker for initial decision. The Architect will serve as the Initial Decision Maker, unless otherwise indicated in the Agreement. Except for those Claims excluded by this Section 15.2.1, an initial decision shall be required as a condition precedent to mediation of any Claim arising prior to the date final payment is due, unless 30 days have passed after the Claim has been referred to the Initial Decision Maker with no decision having been rendered. Unless the Initial Decision Maker and all affected parties agree, the Initial Decision Maker will not decide disputes between the Contractor and persons or entities other than the Owner.

§ 15.2.2 The Initial Decision Maker will review Claims and within ten days of the receipt of a Claim take one or more of the following actions: (1) request additional supporting data from the claimant or a response with supporting data from the other party, (2) reject the Claim in whole or in part, (3) approve the Claim, (4) suggest a compromise, or (5) advise the parties that the Initial Decision Maker is unable to resolve the Claim if the Initial Decision Maker lacks sufficient information to evaluate the merits of the Claim or if the Initial Decision Maker concludes that, in the Initial Decision Maker's sole discretion, it would be inappropriate for the Initial Decision Maker to resolve the Claim.

§ 15.2.3 In evaluating Claims, the Initial Decision Maker may, but shall not be obligated to, consult with or seek information from either party or from persons with special knowledge or expertise who may assist the Initial Decision Maker in rendering a decision. The Initial Decision Maker may request the Owner to authorize retention of such persons at the Owner's expense.

§ 15.2.4 If the Initial Decision Maker requests a party to provide a response to a Claim or to furnish additional supporting data, such party shall respond, within ten days after receipt of such request, and shall either (1) provide a response on the requested supporting data, (2) advise the Initial Decision Maker when the response or supporting data will be furnished or (3) advise the Initial Decision Maker that no supporting data will be furnished. Upon receipt of the response or supporting data, if any, the Initial Decision Maker will either reject or approve the Claim in whole or in part.

§ 15.2.5 The Initial Decision Maker will render an initial decision approving or rejecting the Claim, or indicating that the Initial Decision Maker is unable to resolve the Claim. This initial decision shall (1) be in writing; (2) state the reasons therefor; and (3) notify the parties and the Architect, if the Architect is not serving as the Initial Decision Maker, of any change in the Contract Sum or Contract Time or both. The initial decision shall be final and binding on the parties but subject to mediation and, if the parties fail to resolve their dispute through mediation, to binding dispute resolution.

§ 15.2.6 Either party may file for mediation of an initial decision at any time, subject to the terms of Section 15.2.6.1.

§ 15.2.6.1 Either party may, within 30 days from the date of an initial decision, demand in writing that the other party file for mediation within 60 days of the initial decision. If such a demand is made and the party receiving the demand fails to file for mediation within the time required, then both parties waive their rights to mediate or pursue binding dispute resolution proceedings with respect to the initial decision.

§ 15.2.7 In the event of a Claim against the Contractor, the Owner may, but is not obligated to, notify the surety, if any, of the nature and amount of the Claim. If the Claim relates to a possibility of a Contractor's default, the Owner may, but is not obligated to, notify the surety and request the surety's assistance in resolving the controversy.

§ 15.2.8 If a Claim relates to or is the subject of a mechanic's lien, the party asserting such Claim may proceed in accordance with applicable law to comply with the lien notice or filing deadlines.

§ 15.3 MEDIATION

§ 15.3.1 Claims, disputes, or other matters in controversy arising out of or related to the Contract except those waived as provided for in Sections 9.10.4, 9.10.5, and 15.1.6 shall be subject to mediation as a condition precedent to binding dispute resolution.

§ 15.3.2 The parties shall endeavor to resolve their Claims by mediation which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Mediation Procedures in effect on the date of the Agreement. A request for mediation shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the mediation. The request may be made concurrently with the filing of binding dispute resolution proceedings but, in such event, mediation shall proceed in advance of binding dispute resolution proceedings, which shall be stayed pending mediation for a period of 60 days from the date of filing, unless stayed for a longer period by agreement of the parties or court order. If an arbitration is stayed pursuant to this Section 15.3.2, the parties may nonetheless proceed to the selection of the arbitrator(s) and agree upon a schedule for later proceedings.

§ 15.3.3 The parties shall share the mediator's fee and any filing fees equally. The mediation shall be held in the place where the Project is located, unless another location is mutually agreed upon. Agreements reached in mediation shall be enforceable as settlement agreements in any court having jurisdiction thereof.

§ 15.4 ARBITRATION

§ 15.4.1 If the parties have selected arbitration as the method for binding dispute resolution in the Agreement, any Claim subject to, but not resolved by, mediation shall be subject to arbitration which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Arbitration Rules in effect on the date of the Agreement. A demand for arbitration shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the arbitration. The party filing a notice of demand for arbitration must assert in the demand all Claims then known to that party on which arbitration is permitted to be demanded.

§ 15.4.1.1 A demand for arbitration shall be made no earlier than concurrently with the filing of a request for mediation, but in no event shall it be made after the date when the institution of legal or equitable proceedings based on the Claim would be barred by the applicable statute of limitations. For statute of limitations purposes, receipt of a written demand for arbitration by the person or entity administering the arbitration shall constitute the institution of legal or equitable proceedings based on the Claim.

§ 15.4.2 The award rendered by the arbitrator or arbitrators shall be final, and judgment may be entered upon it in accordance with applicable law in any court having jurisdiction thereof.

§ 15.4.3 The foregoing agreement to arbitrate and other agreements to arbitrate with an additional person or entity duly consented to by parties to the Agreement shall be specifically enforceable under applicable law in any court having jurisdiction thereof.

§ 15.4.4 CONSOLIDATION OR JOINDER

§ 15.4.4.1 Either party, at its sole discretion, may consolidate an arbitration conducted under this Agreement with any other arbitration to which it is a party provided that (1) the arbitration agreement governing the other arbitration

permits consolidation, (2) the arbitrations to be consolidated substantially involve common questions of law or fact, and (3) the arbitrations employ materially similar procedural rules and methods for selecting arbitrator(s).

§ 15.4.4.2 Either party, at its sole discretion, may include by joinder persons or entities substantially involved in a common question of law or fact whose presence is required if complete relief is to be accorded in arbitration, provided that the party sought to be joined consents in writing to such joinder. Consent to arbitration involving an additional person or entity shall not constitute consent to arbitration of any claim, dispute or other matter in question not described in the written consent.

§ 15.4.4.3 The Owner and Contractor grant to any person or entity made a party to an arbitration conducted under this Section 15.4, whether by joinder or consolidation, the same rights of joinder and consolidation as the Owner and Contractor under this Agreement.

SECTION 01 20 00
PRICE AND PAYMENT PROCEDURES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Procedures for preparation and submittal of applications for progress payments.

B. Documentation of changes in Contract Sum and Contract Time.

C. Change procedures.

D. Procedures for preparation and submittal of application for final payment.

1.02 RELATED REQUIREMENTS

A. Section 00 50 00 - Contracting Forms and Supplements: Forms to be used.

1.03 SCHEDULE OF VALUES

A. Electronic media printout including equivalent information will be considered in lieu of standard form specified; submit draft to Architect for approval.

B. Forms filled out by hand will not be accepted.

C. Format: Utilize the Table of Contents of this Project Manual. Identify each line item with number and title of the specification Section. Contractor standard cost itemization may be used if approved by Architect. Sufficient detail must be provided to verify application for payment.

1.04 APPLICATIONS FOR PROGRESS PAYMENTS

A. Payment Period: Submit at intervals stipulated in the Agreement.

B. Electronic media printout including equivalent information will be considered in lieu of standard form specified; submit sample to Architect for approval.

C. Forms filled out by hand will not be accepted.

D. Execute certification by signature of authorized officer.

E. Use data from approved Schedule of Values. Provide dollar value in each column for each line item for portion of work performed .

F. List each authorized Change Order as a separate line item, listing Change Order number and dollar amount as for an original item of Work.

G. Submit one copy of each Application for Payment.

H. When Architect requires substantiating information, submit data justifying dollar amounts in question.

1.05 MODIFICATION PROCEDURES

A. For minor changes not involving an adjustment to the Contract Sum or Contract Time, Architect will issue instructions directly to Contractor.

B. For other required changes, the Contractor will issue a document signed by the Owner instructing Contractor to proceed with the change, for subsequent inclusion in a Change Order.
   1. The document will describe the required changes and will designate any change in Contract Sum or Contract Time.
   2. No Change Order will be considered for work that the Owner was not notified of in advance.

C. Contractor may propose a change by submitting a request for change to Architect, describing the proposed change and its full effect on the Work, with a statement describing the reason for the change, and the effect on the Contract Sum and Contract Time with full documentation and a statement describing the effect on Work by separate or other contractors. Document any requested substitutions in accordance with Section 01 60 00.

D. Computation of Change in Contract Amount: As specified in the Agreement and Conditions of the Contract.

E. Substantiation of Costs: Provide full information required for evaluation.
   1. Provide the following data:
      a. Quantities of products, labor, and equipment.
      b. Taxes, insurance, and bonds.
      c. Overhead and profit.
      d. Justification for any change in Contract Time.
      e. Credit for deletions from Contract, similarly documented.
   2. Support each claim for additional costs with additional information:
      a. Origin and date of claim.
      b. Dates and times work was performed, and by whom.
      c. Time records and wage rates paid.
      d. Invoices and receipts for products, equipment, and subcontracts, similarly documented.

F. Execution of Change Orders: Architect will issue Change Orders for signatures of parties as provided in the Conditions of the Contract.

G. After execution of Change Order, promptly revise Schedule of Values and Application for Payment forms to record each authorized Change Order as a separate line item and adjust the Contract Sum.

H. Promptly revise progress schedules to reflect any change in Contract Time, revise sub-schedules to adjust times for other items of work affected by the change, and resubmit.

1.06 APPLICATION FOR FINAL PAYMENT

A. Prepare Application for Final Payment as specified for progress payments, identifying total adjusted Contract Sum, previous payments, and sum remaining due.

B. Application for Final Payment will not be considered until the following have been accomplished:
   1. All closeout procedures specified in Section 01 70 00.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 01 21 00

ALLOWANCES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Cash allowances.

B. Payment and modification procedures relating to allowances.

1.02 CASH ALLOWANCES

A. Costs Included in Cash Allowances: Cost of product to Contractor or subcontractor, less applicable trade discounts .

B. Costs Not Included in Cash Allowances: Product delivery to site and handling at the site, including unloading, uncrating, and storage; protection of products from elements and from damage; and labor for installation and finishing.

C. Architect Responsibilities:
   1. Select products in consultation with Owner and transmit decision to Contractor.

D. Contractor Responsibilities:
   1. Assist Architect in selection of products, suppliers, and installers.
   2. Obtain proposals from suppliers and installers and offer recommendations.
   3. On notification of which products have been selected, execute purchase agreement with designated supplier and installer.
   4. Arrange for and process shop drawings, product data, and samples. Arrange for delivery.
   5. Promptly inspect products upon delivery for completeness, damage, and defects. Submit claims for transportation damage.

E. Differences in costs will be adjusted by Change Order.

1.03 ALLOWANCES SCHEDULE

A. Appliances: Include the stipulated sum of $210,700.00 for purchase and delivery of Section 11450-Residential Equipment. Allowance to include installation of appliances not installed by other trades.

B. Light Fixtures:
   1. Light Fixtures: Include the stipulated sum of $75,000.00 for purchase and delivery of Light Fixtures. Included in this allowance are upper floor common area light fixtures and dwelling unit light fixtures, including those on private balconies.
   2. Site Light Fixtures shown on the drawings shall be included in the Contract Sum.
   3. Basement fixtures, emergency egress lighting and exit lighting shall be included in the Contract Sum and are not part of the light fixture allowance.

C. Security Cameras System: Include the stipulated sum of $15,000.00 for purchase, delivery and installation of Video Security Camera System.

D. Radio Repeater System: Include the stipulated sum of $7,500.00 for purchase, delivery and installation of Emergency Radio Repeater System.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 01 30 00
ADMINISTRATIVE REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Progress meetings.

B. Construction progress schedule.

C. Submittals for review, information, and project closeout.

D. Component submittal for State review.

E. Number of copies of submittals.

F. Submittal procedures.

1.02 RELATED REQUIREMENTS

A. Document 00 72 00 - General Conditions: Dates for applications for payment.

B. Section 01 78 00 - Closeout Submittals: Project record documents.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 PROGRESS MEETINGS

A. Schedule and administer meetings throughout progress of the Work at maximum bi-monthly intervals.

B. Make arrangements for meetings, prepare agenda with copies for participants, preside at meetings.

C. Attendance Required:
   1. Contractor.
   2. Owner.
   3. Architect.
   4. Contractor's Superintendent.
   5. Major Subcontractors.

D. Agenda:
   1. Review minutes of previous meetings.
   2. Review of Work progress.
   3. Field observations, problems, and decisions.
   4. Identification of problems that impede, or will impede, planned progress.
   5. Review of submittals schedule and status of submittals.
   6. Review of off-site fabrication and delivery schedules.
   7. Maintenance of progress schedule.
   8. Corrective measures to regain projected schedules.
   9. Planned progress during succeeding work period.
   10. Coordination of projected progress.
   11. Maintenance of quality and work standards.
   12. Effect of proposed changes on progress schedule and coordination.
   13. Other business relating to Work.

E. Record minutes and distribute copies within two days after meeting to participants, with copies to Architect, Owner, participants, and those affected by decisions made.

3.02 CONSTRUCTION PROGRESS SCHEDULE

A. Within 10 days after date of the Agreement, submit preliminary schedule defining planned operations for the first 60 days of Work, with a general outline for remainder of Work.

B. If preliminary schedule requires revision after review, submit revised schedule within 10 days.

C. Within 20 days after review of preliminary schedule, submit draft of proposed complete schedule for review.
   1. Include written certification that major contractors have reviewed and accepted proposed schedule.

D. Within 10 days after joint review, submit complete schedule.

3.03 SUBMITTALS FOR REVIEW

A. When the following are specified in individual sections, submit them for review:
   1. Product data.
   2. Shop drawings.
   3. Samples for selection.
   4. Samples for verification.

B. Submit to Architect for review for the limited purpose of checking for conformance with information given and the design concept expressed in the contract documents.

C. Samples will be reviewed only for aesthetic, color, or finish selection.

D. After review, provide copies and distribute in accordance with SUBMITTAL PROCEDURES article below and for record documents purposes described in Section 01 78 00 - Closeout Submittals.

3.04 SUBMITTALS FOR INFORMATION

A. When the following are specified in individual sections, submit them for information:
   1. Design data.
   2. Certificates.
   3. Test reports.
   4. Inspection reports.
   5. Manufacturer's instructions.
   6. Manufacturer's field reports.
   7. Other types indicated.

B. Submit for Architect's knowledge as contract administrator or for Owner. No action will be taken.

3.05 SUBMITTALS FOR PROJECT CLOSEOUT

A. Submit Correction Punch List for Substantial Completion.

B. When the following are specified in individual sections, submit them at project closeout:
   1. Project record documents.
   2. Operation and maintenance data.
   3. Warranties.
   4. Bonds.
   5. Other types as indicated.

C. Submit for Owner's benefit during and after project completion.

3.06 COMPONENT SUBMITTAL FOR STATE REVIEW

A. When specified in individual sections, submit component designs for State review.

B. Submittals shall be coordinated for any revisions made and bear the original seal of the responsible design professional.

C. Submit two complete printed copies, one of which will be retained by the architect.

D. Each copy shall be collated, neatly bound and include layout drawings if applicable.

E. Submittals shall be made in a timely manner. Late fees charged by the State will become the responsibility of the Contractor.

F. All required State approvals must be obtained prior to issuance of a Compliance Statement or Certificate of Substantial Completion.

3.07 NUMBER OF COPIES OF SUBMITTALS

A. Electronic Documents: Submit one electronic copy in PDF format; an electronically-marked up file will be returned. Create PDFs at native size and right-side up; illegible files will be rejected.

B. Submittals consisting of multiple sheets or files must be bound as a single, multi-page PDF.

C. The order of files in a multi-page pdf shall be as follows:
   1. Contractor submittal or transmittal sheet.
   2. Subcontractor or supplier transmittal sheet.
   3. Product information.
   4. Layout drawings.

D. Samples: Submit the number specified in individual specification sections; one of which will be retained by Architect.

3.08 SUBMITTAL PROCEDURES

A. Shop Drawing Procedures:
   1. Prepare accurate, drawn-to-scale, original shop drawing documentation by interpreting the Contract Documents and coordinating related Work.
   2. Generic, non-project specific information submitted as shop drawings do not meet the requirements for shop drawings.

B. Transmit each submittal with a copy of the Contractor's submittal form.

C. Sequentially number the transmittal form. Revise submittals with original number and a sequential alphabetic suffix.

D. Identify Project, Contractor, Subcontractor or supplier; pertinent drawing and detail number, and specification section number, as appropriate on each copy.

E. Mark submittal to clearly identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information specific to this Project. **Submittals that do not clearly identify proposed product will be rejected.**

F. Apply Contractor's stamp, signed or initialed certifying that review, approval, verification of Products required, field dimensions, adjacent construction Work, and coordination of information is in accordance with the requirements of the Work and Contract Documents.

G. Deliver submittals to Architect at 7601 University Ave., #201, Middleton, WI 53562.

H. Schedule submittals to expedite the Project, and coordinate submission of related items.

I. For each submittal for review, allow 15 days excluding delivery time to and from the Contractor.

J. Identify variations from Contract Documents and Product or system limitations that may be detrimental to successful performance of the completed Work.

K. Provide space for Contractor and Architect review stamps.

L. When revised for resubmission, identify all changes made since previous submission.

M. Distribute reviewed submittals as appropriate. Instruct parties to promptly report any inability to comply with requirements.

N. **Submittals not requested will not be recognized, processed or returned.**

END OF SECTION

SECTION 01 40 00
QUALITY REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Submittals.

B. Testing and inspection agencies and services.

C. Control of installation.

D. Manufacturers' field services.

E. Defect Assessment.

1.02 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Test Reports: After each test/inspection, promptly submit two copies of report to Architect and to Contractor.
   1. Include:
      a. Date issued.
      b. Project title and number.
      c. Name of inspector.
      d. Date and time of sampling or inspection.
      e. Identification of product and specifications section.
      f. Location in the Project.
      g. Type of test/inspection.
      h. Date of test/inspection.
      i. Results of test/inspection.
      j. Conformance with Contract Documents.
      k. When requested by Architect, provide interpretation of results.
   2. Test report submittals are for Architect's knowledge as contract administrator for the limited purpose of assessing conformance with information given and the design concept expressed in the contract documents, or for Owner's information.

C. Certificates: When specified in individual specification sections, submit certification by the manufacturer and Contractor or installation/application subcontractor to Architect, in quantities specified for Product Data.
   1. Indicate material or product conforms to or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.
   2. Certificates may be recent or previous test results on material or product, but must be acceptable to Architect.

D. Manufacturer's Instructions: When specified in individual specification sections, submit printed instructions for delivery, storage, assembly, installation, start-up, adjusting, and finishing, for the Owner's information. Indicate special procedures, perimeter conditions requiring special attention, and special environmental criteria required for application or installation.

1.03 REFERENCES AND STANDARDS

A. For products and workmanship specified by reference to a document or documents not included in the Project Manual, also referred to as reference standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.

B. Conform to reference standard of date of issue current on date of Contract Documents, except where a specific date is established by applicable code.

C. Obtain copies of standards where required by product specification sections.

D. Should specified reference standards conflict with Contract Documents, request clarification from Architect before proceeding.

E. Neither the contractual relationships, duties, or responsibilities of the parties in Contract nor those of Architect shall be altered from the Contract Documents by mention or inference otherwise in any reference document.

1.04 TESTING AND INSPECTION AGENCIES AND SERVICES

A. Contractor shall employ and pay for services of an independent testing agency to perform other specified testing.

B. Employment of agency in no way relieves Contractor of obligation to perform Work in accordance with requirements of Contract Documents.

C. Contractor Employed Agency:
   1. Testing agency: Comply with requirements of ASTM E329, ASTM E543, ASTM C1021, ASTM C1077, ASTM C1093, ASTM D3740, and _____.
   2. Laboratory Staff: Maintain a full time registered Engineer on staff to review services.
   3. Testing Equipment: Calibrated at reasonable intervals either by NIST or using an NIST established Measurement Assurance Program, under a laboratory measurement quality assurance program.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 CONTROL OF INSTALLATION

A. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce Work of specified quality.

B. Comply with manufacturers' instructions, including each step in sequence.

C. Should manufacturers' instructions conflict with Contract Documents, request clarification from Architect before proceeding.

D. Comply with specified standards as minimum quality for the Work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.

E. Have Work performed by persons qualified to produce required and specified quality.

F. Verify that field measurements are as indicated on shop drawings or as instructed by the manufacturer.

G. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, and disfigurement.

3.02 TESTING AND INSPECTION

A. See individual specification sections for testing required.

B. Testing Agency Duties:
   1. Provide qualified personnel at site. Cooperate with Architect and Contractor in performance of services.
   2. Perform specified sampling and testing of products in accordance with specified standards.
   3. Ascertain compliance of materials and mixes with requirements of Contract Documents.
   4. Promptly notify Architect and Contractor of observed irregularities or non-conformance of Work or products.
   5. Perform additional tests and inspections required by Architect.
   6. Submit reports of all tests/inspections specified.

C. Limits on Testing/Inspection Agency Authority:
   1. Agency may not release, revoke, alter, or enlarge on requirements of Contract Documents.
   2. Agency may not approve or accept any portion of the Work.
   3. Agency may not assume any duties of Contractor.
   4. Agency has no authority to stop the Work.

D. Contractor Responsibilities:

1. Deliver to agency at designated location, adequate samples of materials proposed to be used that require testing, along with proposed mix designs.
2. Cooperate with laboratory personnel, and provide access to the Work and to manufacturers' facilities.
3. Provide incidental labor and facilities:
    a. To provide access to Work to be tested/inspected.
    b. To obtain and handle samples at the site or at source of Products to be tested/inspected.
    c. To facilitate tests/inspections.
    d. To provide storage and curing of test samples.
4. Notify Architect and laboratory 24 hours prior to expected time for operations requiring testing/inspection services.
5. Employ services of an independent qualified testing laboratory and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.
6. Arrange with Owner's agency and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.

E. Re-testing required because of non-conformance to specified requirements shall be performed by the same agency on instructions by Architect.

F. Re-testing required because of non-conformance to specified requirements shall be paid for by Contractor.

G. Re-testing required because of non-conformance to specified requirements shall be performed by the same agency on instructions by Architect. Payment for re testing will be charged to the Contractor by deducting testing charges from the Contract Price.

3.03 MANUFACTURERS' FIELD SERVICES

A. When specified in individual specification sections, require material or product suppliers or manufacturers to provide qualified staff personnel to observe site conditions, conditions of surfaces and installation, quality of workmanship, test, adjust and balance of equipment as applicable, and to initiate instructions when necessary.

B. Report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturers' written instructions.

3.04 DEFECT ASSESSMENT

A. Replace Work or portions of the Work not conforming to specified requirements.

END OF SECTION

SECTION 01 50 00
TEMPORARY FACILITIES AND CONTROLS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Temporary telecommunications services.

B. Temporary sanitary facilities.

C. Temporary Controls: Barriers, enclosures, and fencing.

D. Security requirements.

E. Vehicular access and parking.

F. Waste removal facilities and services.

G. Field offices.

1.02 RELATED REQUIREMENTS

A. Section 01 51 00 - Temporary Utilities.

1.03 TELECOMMUNICATIONS SERVICES

A. Provide, maintain, and pay for telecommunications services to field office at time of project mobilization.

B. Telecommunications services shall include:
   1. Personal computer dedicated to project telecommunications, with necessary software and laser printer.
   2. Telephone Land Lines: One line, minimum; one handset per line.
   3. Internet Connections: Minimum of one; DSL modem or faster.
   4. Email: Account/address reserved for project use.
   5. Facsimile Service: Minimum of one dedicated fax machine/printer.

1.04 TEMPORARY SANITARY FACILITIES

A. Provide and maintain required facilities and enclosures. Provide at time of project mobilization.

B. Maintain daily in clean and sanitary condition.

1.05 BARRIERS

A. Provide barriers to prevent unauthorized entry to construction areas, to prevent access to areas that could be hazardous to workers or the public and to protect existing facilities and adjacent properties from damage from construction operations and demolition.

B. Provide barricades and covered walkways required by governing authorities for public rights-of-way .

C. Provide protection for plants designated to remain. Replace damaged plants.

D. Protect non-owned vehicular traffic, stored materials, site, and structures from damage.

1.06 FENCING

A. Construction: Commercial grade chain link fence.

B. Provide 6 foot high fence around construction site; equip with vehicular gates with locks.

1.07 EXTERIOR ENCLOSURES

A. Provide temporary weather tight enclosures to accommodate acceptable working conditions and protection for Products, to allow for temporary heating and maintenance of required ambient temperatures identified in individual specification sections, and to prevent entry of unauthorized persons. Provide access doors with self-closing hardware and locks.

1.08 SECURITY

A. Provide security and facilities to protect Work, existing facilities, and Owner's operations from unauthorized entry, vandalism, or theft.

1.09 VEHICULAR ACCESS AND PARKING

A. Comply with regulations relating to use of streets and sidewalks, access to emergency facilities, and access for emergency vehicles.

B. Coordinate access and haul routes with governing authorities and Owner.

C. Provide and maintain access to fire hydrants, free of obstructions.

D. Provide means of removing mud from vehicle wheels before entering streets.

E. Provide temporary parking areas to accommodate construction personnel. When site space is not adequate, provide additional off-site parking.

1.10 WASTE REMOVAL

A. See Section 01 74 19 - Construction Waste Management and Disposal, for additional requirements.

B. Provide waste removal facilities and services as required to maintain the site in clean and orderly condition.

C. Provide containers with lids. Remove trash from site weekly.

D. If materials to be recycled or re-used on the project must be stored on-site, provide suitable non-combustible containers; locate containers holding flammable material outside the structure unless otherwise approved by the authorities having jurisdiction.

E. Open free-fall chutes are not permitted. Terminate closed chutes into appropriate containers with lids.

1.11 FIELD OFFICES

A. Provide space for Project meetings, with table and chairs to accommodate 6 persons.

B. Locate offices a minimum distance of 30 feet from existing and new structures.

1.12 REMOVAL OF UTILITIES, FACILITIES, AND CONTROLS

A. Remove temporary utilities, equipment, facilities, materials, prior to Date of Substantial Completion inspection.

B. Clean and repair damage caused by installation or use of temporary work.

C. Restore existing facilities used during construction to original condition.

D. Restore new permanent facilities used during construction to specified condition.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 01 51 00

TEMPORARY UTILITIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Temporary Utilities: Electricity, lighting, heat, ventilation, and water.

1.02 RELATED REQUIREMENTS

A. Section 01 50 00 - Temporary Facilities and Controls:
   1. Temporary telecommunications services for administrative purposes.
   2. Temporary sanitary facilities required by law.

1.03 TEMPORARY ELECTRICITY

A. Cost: By Contractor.

B. Provide power service required from utility source.

C. Provide power outlets for construction operations, with branch wiring and distribution boxes located as required. Provide flexible power cords as required.

D. Provide main service disconnect and over-current protection at convenient location and meter.

E. Permanent convenience receptacles may be utilized during construction.

F. Provide adequate distribution equipment, wiring, and outlets to provide single phase branch circuits for power and lighting.

1.04 TEMPORARY LIGHTING FOR CONSTRUCTION PURPOSES

A. Provide and maintain lighting for construction operations to achieve a minimum lighting level of 2 watt/sq ft .

B. Provide branch wiring from power source to distribution boxes with lighting conductors, pigtails, and lamps as required.

C. Maintain lighting and provide routine repairs.

1.05 TEMPORARY HEATING

A. Cost of Energy: By Contractor.

B. Provide heating devices and heat as needed to maintain specified conditions for construction operations.
   1. Use exterior combustion type heaters with remote indoor heat exchangers to limit amount of moisture introduced to building interior.

C. Maintain minimum ambient temperature of 50 degrees F in areas where construction is in progress, unless indicated otherwise in specifications.

1.06 TEMPORARY VENTILATION

A. Existing ventilation equipment may not be used.

1.07 TEMPORARY WATER SERVICE

A. Cost of Water Used: By Contractor.

B. Provide and maintain suitable quality water service for construction operations at time of project mobilization.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 01 57 13

TEMPORARY EROSION AND SEDIMENT CONTROL

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Prevention of erosion due to construction activities.

B. Prevention of sedimentation of waterways, open drainage ways, and storm and sanitary sewers due to construction activities.

C. Restoration of areas eroded due to insufficient preventive measures.

D. Compensation of Owner for fines levied by authorities having jurisdiction due to non-compliance by Contractor.

1.02 RELATED REQUIREMENTS

A. Section 31 10 00 - SITE CLEARING: Limits on clearing; disposition of vegetative clearing debris.

B. Section 32 11 23 - Aggregate Base Courses: Temporary and permanent roadways.

C. Section 32 92 19 - Seeding: Permanent turf for erosion control.

D. Section 32 92 23 - Sodding: Permanent turf for erosion control.

PART 2 PRODUCTS

2.01 MATERIALS

A. Mulch: Use one of the following:
   1. Straw or hay.
   2. Wood waste, chips, or bark.
   3. Erosion control matting or netting.
   4. Cutback asphalt.
   5. Polyethylene film, where specifically indicated only.

B. Grass Seed For Temporary Cover: Select a species appropriate to climate, planting season, and intended purpose. If same area will later be planted with permanent vegetation, do not use species known to be excessively competitive or prone to volunteer in subsequent seasons.

C. Bales: Air dry, rectangular straw bales.
   1. Cross Section: 14 by 18 inches, minimum.
   2. Bindings: Wire or string, around long dimension.

D. Bale Stakes: One of the following, minimum 3 feet long:
   1. Steel U- or T-section, with minimum mass of 1.33 lb per linear foot.
   2. Wood, 2 by 2 inches in cross section.

E. Silt Fence Fabric: Polypropylene geotextile resistant to common soil chemicals, mildew, and insects; non-biodegradable; in longest lengths possible; fabric including seams with the following minimum properties:
   1. Average Opening Size: 30 U.S. Std. Sieve, maximum, when tested in accordance with ASTM D4751.
   2. Permittivity: 0.05 sec^-1, minimum, when tested in accordance with ASTM D4491.
   3. Ultraviolet Resistance: Retaining at least 70 percent of tensile strength, when tested in accordance with ASTM D4355 after 500 hours exposure.
   4. Tensile Strength: 100 lb-f, minimum, in cross-machine direction; 124 lb-f, minimum, in machine direction; when tested in accordance with ASTM D4632/D4632M.
   5. Elongation: 15 to 30 percent, when tested in accordance with ASTM D4632/D4632M.
   6. Tear Strength: 55 lb-f, minimum, when tested in accordance with ASTM D4533.
   7. Color: Manufacturer's standard, with embedment and fastener lines preprinted.

F. Silt Fence Posts: One of the following, minimum 3 feet long:
   1. Hardwood, 2 by 2 inches in cross section.

G. Gravel: See Section 32 11 23 for aggregate.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine site and identify existing features that contribute to erosion resistance; maintain such existing features to greatest extent possible.

3.02 PREPARATION

A. Schedule work so that soil surfaces are left exposed for the minimum amount of time.

3.03 SCOPE OF PREVENTIVE MEASURES

A. In all cases, if permanent erosion resistant measures have been installed temporary preventive measures are not required.

B. Construction Entrances: Traffic-bearing aggregate surface.
   1. Width: As required; 20 feet, minimum.
   2. Length: 50 feet, minimum.
   3. Provide at each construction entrance from public right-of-way.

C. Linear Sediment Barriers: Made of silt fences.
   1. Provide linear sediment barriers:
      a. As indicated on Erosion Control Plan.
   2. Space sediment barriers with the following maximum slope length upslope from barrier:
      a. Slope of Less Than 2 Percent: 100 feet..
      b. Slope Between 2 and 5 Percent: 75 feet.
      c. Slope Between 5 and 10 Percent: 50 feet.
      d. Slope Between 10 and 20 Percent: 25 feet.
      e. Slope Over 20 Percent: 15 feet.

D. Storm Drain Curb Inlet Sediment Trap: Protect each curb inlet using one of the following measures:
   1. Filter fabric wrapped around hollow concrete blocks blocking entire inlet face area; use one piece of fabric wrapped at least 1-1/2 times around concrete blocks and secured to prevent dislodging; orient cores of blocks so runoff passes into inlet.
   2. Straw bale row blocking entire inlet face area; anchor into pavement.

E. Storm Drain Drop Inlet Sediment Traps: As detailed on drawings.

F. Mulching: Use only for areas that may be subjected to erosion for less than 6 months.
   1. Wood Waste: Use only on slopes 3:1 or flatter; no anchoring required.
   2. Asphalt: Use only where no traffic, either vehicular or pedestrian, is anticipated.

G. Temporary Seeding: Use where temporary vegetated cover is required.

3.04 INSTALLATION

A. Install erosion control measures indicated on erosion control plan and as required to comply with codes and ordinances of the municipality having jurisdiction.

B. Traffic-Bearing Aggregate Surface:
   1. Excavate minimum of 6 inches.
   2. Place geotextile fabric full width and length, with minimum 12 inch overlap at joints.
   3. Place and compact at least 6 inches of 1.5 to 3.5 inch diameter stone.

C. Silt Fences:
   1. Store and handle fabric in accordance with ASTM D4873.
   2. Where slope gradient is less than 3:1 or barriers will be in place less than 6 months, use nominal 16 inch high barriers with minimum 36 inch long posts spaced at 6 feet maximum, with fabric embedded at least 4 inches in ground.
   3. Where slope gradient is steeper than 3:1 or barriers will be in place over 6 months, use nominal 28 inch high barriers, minimum 48 inch long posts spaced at 6 feet maximum, with fabric embedded at least 6 inches in ground.

4. Where slope gradient is steeper than 3:1 and vertical height of slope between barriers is more than 20 feet, use nominal 32 inch high barriers with woven wire reinforcement and steel posts spaced at 4 feet maximum, with fabric embedded at least 6 inches in ground.
5. Install with top of fabric at nominal height and embedment as specified.
6. Do not splice fabric width; minimize splices in fabric length; splice at post only, overlapping at least 18 inches, with extra post.
7. Fasten fabric to wood posts using one of the following:
   a. Four nails per post with 3/4 inch diameter flat or button head, 1 inch long, and 14 gage, 0.083 inch shank diameter.
   b. Five staples per post with at least 17 gage, 0.0453 inch wire, 3/4 inch crown width and 1/2 inch long legs.
8. Wherever runoff will flow around end of barrier or over the top, provide temporary splash pad or other outlet protection; at such outlets in the run of the barrier, make barrier not more than 12 inches high with post spacing not more than 4 feet.

D. Straw Bale Rows:
1. Install bales in continuous rows with ends butting tightly, with one bale at each end of row turned uphill.
2. Install bales so that bindings are not in contact with the ground.
3. Embed bales at least 4 inches in the ground.
4. Anchor bales with at least two stakes per bale, driven at least 18 inches into the ground; drive first stake in each bale toward the previously placed bale to force bales together.
5. Fill gaps between ends of bales with loose straw wedged tightly.
6. Place soil excavated for trench against bales on the upslope side of the row, compacted.

E. Temporary Seeding:
1. When hydraulic seeder is used, seedbed preparation is not required.
2. When surface soil has been sealed by rainfall or consists of smooth undisturbed cut slopes, and conventional or manual seeding is to be used, prepare seedbed by scarifying sufficiently to allow seed to lodge and germinate.
3. If temporary mulching was used on planting area but not removed, apply nitrogen fertilizer at 1 pound per 1000 sq ft.
4. On soils of very low fertility, apply 10-10-10 fertilizer at rate of 12 to 16 pounds per 1000 sq ft.
5. Incorporate fertilizer into soil before seeding.
6. Apply seed uniformly; if using drill or cultipacker seeders place seed 1/2 to 1 inch deep.
7. Irrigate as required to thoroughly wet soil to depth that will ensure germination, without causing runoff or erosion.
8. Repeat irrigation as required until grass is established.

3.05 MAINTENANCE

A. Inspect preventive measures weekly, within 24 hours after the end of any storm that produces 0.5 inches or more rainfall at the project site, and daily during prolonged rainfall.

B. Repair deficiencies immediately.

C. Silt Fences:
1. Promptly replace fabric that deteriorates unless need for fence has passed.
2. Remove silt deposits that exceed one-third of the height of the fence.
3. Repair fences that are undercut by runoff or otherwise damaged, whether by runoff or other causes.

D. Straw Bale Rows:
1. Promptly replace bales that fall apart or otherwise deteriorate unless need has passed.
2. Remove silt deposits that exceed one-half of the height of the bales.
3. Repair bale rows that are undercut by runoff or otherwise damaged, whether by runoff or other causes.

E. Place sediment in appropriate locations on site; do not remove from site.

3.06 CLEAN UP

A. Remove temporary measures after permanent measures have been installed, unless permitted to remain by Architect.

B. Clean out temporary sediment control structures that are to remain as permanent measures.

C. Where removal of temporary measures would leave exposed soil, shape surface to an acceptable grade and finish to match adjacent ground surfaces.

END OF SECTION

SECTION 01 60 00
PRODUCT REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. General product requirements.

B. Transportation, handling, storage and protection.

C. Product option requirements.

D. Substitution limitations and procedures.

E. Maintenance materials, including extra materials, spare parts, tools, and software.

1.02 RELATED REQUIREMENTS

A. Section 01 61 16 - Volatile Organic Compound (VOC) Content Restrictions: Requirements for VOC-restricted product categories.

B. Section 01 74 19 - Construction Waste Management and Disposal: Waste disposal requirements potentially affecting packaging and substitutions.

1.03 SUBMITTALS

A. Product Data Submittals: Submit manufacturer's standard published data. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information specific to this Project.

B. Shop Drawing Submittals: Prepared specifically for this Project; indicate utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.

C. Sample Submittals: Illustrate functional and aesthetic characteristics of the product, with integral parts and attachment devices. Coordinate sample submittals for interfacing work.
   1. For selection from standard finishes, submit samples of the full range of the manufacturer's standard colors, textures, and patterns.

PART 2 PRODUCTS

2.01 NEW PRODUCTS

A. Provide new products unless specifically required or permitted by the Contract Documents.

B. DO NOT USE products having any of the following characteristics:
   1. Made of wood from newly cut old growth timber.
   2. Containing lead, cadmium, asbestos.

C. Where all other criteria are met, Contractor shall give preference to products that:
   1. If used on interior, have lower emissions, as defined in Section 01 61 16.
   2. If wet-applied, have lower VOC content, as defined in Section 01 61 16.
   3. Are extracted, harvested, and/or manufactured closer to the location of the project.
   4. Have longer documented life span under normal use.
   5. Result in less construction waste.
   6. Are made of vegetable materials that are rapidly renewable.
   7. Have a published GreenScreen Chemical Hazard Analysis.

2.02 PRODUCT OPTIONS

A. Products Specified by Reference Standards or by Description Only: Use any product meeting those standards or description.

B. Products Specified by Naming One or More Manufacturers: Use a product of one of the manufacturers named and meeting specifications, no options or substitutions allowed.

C. Products Specified by Naming One or More Manufacturers with a Provision for Substitutions: Submit a request for substitution for any manufacturer not named.

2.03 MAINTENANCE MATERIALS

A. Furnish extra materials, spare parts, tools, and software of types and in quantities specified in individual specification sections.

B. Deliver to Project site; obtain receipt prior to final payment.

PART 3 EXECUTION

3.01 SUBSTITUTION PROCEDURES

A. Document each request with complete data substantiating compliance of proposed substitution with Contract Documents.

B. A request for substitution constitutes a representation that the submitter:
   1. Has investigated proposed product and determined that it meets or exceeds the quality level of the specified product.
   2. Agrees to provide the same warranty for the substitution as for the specified product.
   3. Agrees to coordinate installation and make changes to other Work that may be required for the Work to be complete with no additional cost to Owner.
   4. Waives claims for additional costs or time extension that may subsequently become apparent.

C. Substitutions will not be considered when they are indicated or implied on shop drawing or product data submittals, without separate written request, or when acceptance will require revision to the Contract Documents.

3.02 TRANSPORTATION AND HANDLING

A. Package products for shipment in manner to prevent damage; for equipment, package to avoid loss of factory calibration.

B. If special precautions are required, attach instructions prominently and legibly on outside of packaging.

C. Coordinate schedule of product delivery to designated prepared areas in order to minimize site storage time and potential damage to stored materials.

D. Transport and handle products in accordance with manufacturer's instructions.

E. Transport materials in covered trucks to prevent contamination of product and littering of surrounding areas.

F. Promptly inspect shipments to ensure that products comply with requirements, quantities are correct, and products are undamaged.

G. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, or damage, and to minimize handling.

H. Arrange for the return of packing materials, such as wood pallets, where economically feasible.

3.03 STORAGE AND PROTECTION

A. Designate receiving/storage areas for incoming products so that they are delivered according to installation schedule and placed convenient to work area in order to minimize waste due to excessive materials handling and misapplication.

B. Store and protect products in accordance with manufacturers' instructions.

C. Store with seals and labels intact and legible.

D. Store sensitive products in weather tight, climate controlled, enclosures in an environment favorable to product.

E. For exterior storage of fabricated products, place on sloped supports above ground.

F. Protect products from damage or deterioration due to construction operations, weather, precipitation, humidity, temperature, sunlight and ultraviolet light, dirt, dust, and other contaminants.

G. Comply with manufacturer's warranty conditions, if any.

H. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to prevent condensation and degradation of products.

I. Prevent contact with material that may cause corrosion, discoloration, or staining.

J. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.

K. Arrange storage of products to permit access for inspection. Periodically inspect to verify products are undamaged and are maintained in acceptable condition.

END OF SECTION

SECTION 01 70 00

EXECUTION AND CLOSEOUT REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Examination, preparation, and general installation procedures.

B. Pre-installation meetings.

C. Cutting and patching.

D. Cleaning and protection.

E. Starting of systems and equipment.

F. Demonstration and instruction of Owner personnel.

G. Closeout procedures, including Contractor's Correction Punch List, except payment procedures.

1.02 PROJECT CONDITIONS

A. Grade site to drain. Maintain excavations free of water. Provide, operate, and maintain pumping equipment.
   1. Install sumps, pumps and piping required to lower water table a minimum of 2 feet below lowest footing elevation.
   2. Maintain drawdown of water table until permanent dewatering system is operational.

B. Protect site from puddling or running water. Provide water barriers as required to protect site from soil erosion.

C. Ventilate and dehumidify enclosed areas to assist cure of materials, to dissipate humidity, and to prevent accumulation of dust, fumes, vapors, or gases, and prevent the growth of mold.

D. Dust Control: Execute work by methods to minimize raising dust from construction operations. Provide positive means to prevent air-borne dust from dispersing into atmosphere and over adjacent property.

E. Erosion and Sediment Control: Plan and execute construction by methods to control surface drainage from cuts and fills, from borrow and waste disposal areas. Prevent erosion and sedimentation; comply with State and local regulations.
   1. Minimize amount of bare soil exposed at one time.
   2. Provide temporary measures such as berms, dikes, and drains, to prevent water flow.
   3. Construct fill and waste areas by selective placement to avoid erosive surface silts or clays.
   4. Periodically inspect earthwork to detect evidence of erosion and sedimentation; promptly apply corrective measures.

F. Pest and Rodent Control: Provide methods, means, and facilities to prevent pests and insects from damaging the work.

G. Pollution Control: Provide methods, means, and facilities to prevent contamination of soil, water, and atmosphere from discharge of noxious, toxic substances, and pollutants produced by construction operations. Comply with federal, state, and local regulations.

1.03 COORDINATION

A. Coordinate scheduling, submittals, and work of the various sections of the Project Manual to ensure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items installed later.

B. Notify affected utility companies and comply with their requirements.

C. Verify that utility requirements and characteristics of new operating equipment are compatible with building utilities. Coordinate work of various sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.

D. Coordinate space requirements, supports, and installation of mechanical and electrical work that are indicated diagrammatically on Drawings. Follow routing shown for pipes, ducts, and

conduit, as closely as practicable; place runs parallel with lines of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.

E. In finished areas except as otherwise indicated, conceal pipes, ducts, and wiring within the construction. Coordinate locations of fixtures and outlets with finish elements.

F. Coordinate completion and clean-up of work of separate sections.

G. After Owner occupancy of premises, coordinate access to site for correction of defective work and work not in accordance with Contract Documents, to minimize disruption of Owner's activities.

PART 2 PRODUCTS

2.01 PATCHING MATERIALS

A. New Materials: As specified in product sections; match existing products and work for patching and extending work.

B. Type and Quality of Existing Products: Determine by inspecting and testing products where necessary, referring to existing work as a standard.

C. Product Substitution: For any proposed change in materials, submit request for substitution described in Section 01 60 00 - Product Requirements.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that existing site conditions and substrate surfaces are acceptable for subsequent work. Start of work means acceptance of existing conditions.

B. Verify that existing substrate is capable of structural support or attachment of new work being applied or attached.

C. Examine and verify specific conditions described in individual specification sections.

D. Take field measurements before confirming product orders or beginning fabrication, to minimize waste due to over-ordering or misfabrication.

E. Verify that utility services are available, of the correct characteristics, and in the correct locations.

F. Prior to Cutting: Examine existing conditions prior to commencing work, including elements subject to damage or movement during cutting and patching. After uncovering existing work, assess conditions affecting performance of work. Beginning of cutting or patching means acceptance of existing conditions.

3.02 PREPARATION

A. Clean substrate surfaces prior to applying next material or substance.

B. Seal cracks or openings of substrate prior to applying next material or substance.

C. Apply manufacturer required or recommended substrate primer, sealer, or conditioner prior to applying any new material or substance in contact or bond.

3.03 PREINSTALLATION MEETINGS

A. When required in individual specification sections, convene a preinstallation meeting at the site prior to commencing work of the section.

B. Require attendance of parties directly affecting, or affected by, work of the specific section.

C. Notify Architect four days in advance of meeting date.

D. Prepare agenda and preside at meeting:
   1. Review conditions of examination, preparation and installation procedures.
   2. Review coordination with related work.

E. Record minutes and distribute copies within two days after meeting to participants, with two copies to Architect, Owner, participants, and those affected by decisions made.

3.04 GENERAL INSTALLATION REQUIREMENTS

A. Install products as specified in individual sections, in accordance with manufacturer's instructions and recommendations, and so as to avoid waste due to necessity for replacement.

B. Make vertical elements plumb and horizontal elements level, unless otherwise indicated.

C. Install equipment and fittings plumb and level, neatly aligned with adjacent vertical and horizontal lines, unless otherwise indicated.

D. Make consistent texture on surfaces, with seamless transitions, unless otherwise indicated.

E. Make neat transitions between different surfaces, maintaining texture and appearance.

3.05 CUTTING AND PATCHING

A. Whenever possible, execute the work by methods that avoid cutting or patching.

B. Perform whatever cutting and patching is necessary to:
   1. Complete the work.
   2. Fit products together to integrate with other work.
   3. Provide openings for penetration of mechanical, electrical, and other services.
   4. Match work that has been cut to adjacent work.
   5. Repair areas adjacent to cuts to required condition.
   6. Repair new work damaged by subsequent work.
   7. Remove samples of installed work for testing when requested.
   8. Remove and replace defective and non-conforming work.

C. Execute cutting and patching including excavation and fill to complete the work, to uncover work in order to install improperly sequenced work, to remove and replace defective or non-conforming work, to remove samples of installed work for testing when requested, to provide openings in the work for penetration of mechanical and electrical work, to execute patching to complement adjacent work, and to fit products together to integrate with other work.

D. Execute work by methods that avoid damage to other work and that will provide appropriate surfaces to receive patching and finishing. In existing work, minimize damage and restore to original condition.

E. Employ original installer to perform cutting for weather exposed and moisture resistant elements, and sight exposed surfaces.

F. Cut rigid materials using masonry saw or core drill. Pneumatic tools not allowed without prior approval.

G. Restore work with new products in accordance with requirements of Contract Documents.

H. Fit work air tight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.

I. At penetrations of fire rated walls, partitions, ceiling, or floor construction, completely seal voids with fire rated material in accordance with Section 07 84 00, to full thickness of the penetrated element.

J. Patching:
   1. Finish patched surfaces to match finish that existed prior to patching. On continuous surfaces, refinish to nearest intersection or natural break. For an assembly, refinish entire unit.
   2. Match color, texture, and appearance.
   3. Repair patched surfaces that are damaged, lifted, discolored, or showing other imperfections due to patching work. If defects are due to condition of substrate, repair substrate prior to repairing finish.

K. Refinish surfaces to match adjacent finish. For continuous surfaces, refinish to nearest intersection or natural break. For an assembly, refinish entire unit.

L. Make neat transitions. Patch work to match adjacent work in texture and appearance. Where new work abuts or aligns with existing, perform a smooth and even transition.

3.06 PROGRESS CLEANING

A. Maintain areas free of waste materials, debris, and rubbish. Maintain site in a clean and orderly condition.

B. Remove debris and rubbish from pipe chases, plenums, attics, crawl spaces, and other closed or remote spaces, prior to enclosing the space.

C. Broom and vacuum clean interior areas prior to start of surface finishing, and continue cleaning to eliminate dust.

D. Collect and remove waste materials, debris, and trash/rubbish from site periodically and dispose off-site; do not burn or bury.

3.07 PROTECTION OF INSTALLED WORK

A. Protect installed work from damage by construction operations.

B. Provide special protection where specified in individual specification sections.

C. Provide temporary and removable protection for installed products. Control activity in immediate work area to prevent damage.

D. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings.

E. Protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by protecting with durable sheet materials.

F. Prohibit traffic or storage upon waterproofed or roofed surfaces. If traffic or activity is necessary, obtain recommendations for protection from waterproofing or roofing material manufacturer.

G. Remove protective coverings when no longer needed; reuse or recycle plastic coverings if possible.

3.08 SYSTEM STARTUP

A. Coordinate schedule for start-up of various equipment and systems.

B. Verify that each piece of equipment or system has been checked for proper lubrication, drive rotation, belt tension, control sequence, and for conditions that may cause damage.

C. Verify tests, meter readings, and specified electrical characteristics agree with those required by the equipment or system manufacturer.

D. Verify that wiring and support components for equipment are complete and tested.

E. Execute start-up under supervision of applicable Contractor personnel in accordance with manufacturers' instructions.

F. Submit a written report that equipment or system has been properly installed and is functioning correctly.

3.09 DEMONSTRATION AND INSTRUCTION

A. Demonstrate start-up, operation, control, adjustment, trouble-shooting, servicing, maintenance, and shutdown of each item of equipment at scheduled time, at equipment location.

B. For equipment or systems requiring seasonal operation, perform demonstration for other season within six months.

C. Provide a qualified person who is knowledgeable about the Project to perform demonstration and instruction of owner personnel.

3.10 ADJUSTING

A. Adjust operating products and equipment to ensure smooth and unhindered operation.

3.11 FINAL CLEANING

A. Execute final cleaning prior to Substantial Completion.

B. Use cleaning materials that are nonhazardous.

C. Clean interior and exterior glass, surfaces exposed to view; remove temporary labels, stains and foreign substances, polish transparent and glossy surfaces, vacuum carpeted and soft surfaces.

D. Remove all labels that are not permanent. Do not paint or otherwise cover fire test labels or nameplates on mechanical and electrical equipment.

E. Clean equipment and fixtures to a sanitary condition with cleaning materials appropriate to the surface and material being cleaned.

F. Clean filters of operating equipment.

G. Clean debris from roofs, gutters, downspouts, scuppers, overflow drains, area drains, drainage systems, and _____.

H. Clean site; sweep paved areas, rake clean landscaped surfaces.

I. Remove waste, surplus materials, trash/rubbish, and construction facilities from the site; dispose of in legal manner; do not burn or bury.

3.12 CLOSEOUT PROCEDURES

A. Make submittals that are required by governing or other authorities.
   1. Provide copies to Architect.

B. Accompany Project Coordinator on preliminary inspection to determine items to be listed for completion or correction in the Contractor's Correction Punch List for Contractor's Notice of Substantial Completion.

C. Notify Architect when work is considered ready for Architect's Substantial Completion inspection.

D. Submit written certification containing Contractor's Correction Punch List, that Contract Documents have been reviewed, work has been inspected, and that work is complete in accordance with Contract Documents and ready for Architect's Substantial Completion inspection.

E. Conduct Substantial Completion inspection and create Final Correction Punch List containing Architect's and Contractor's comprehensive list of items identified to be completed or corrected and submit to Architect.

F. Correct items of work listed in Final Correction Punch List and comply with requirements for access to Owner-occupied areas.

G. Notify Architect when work is considered finally complete and ready for Architect's Substantial Completion final inspection.

H. Complete items of work determined by Architect listed in executed Certificate of Substantial Completion.

END OF SECTION

SECTION 01 78 00
CLOSEOUT SUBMITTALS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Project Record Documents.

B. Operation and Maintenance Data.

C. Warranties and bonds.

1.02 RELATED REQUIREMENTS

A. Section 00 72 00 - General Conditions: Performance bond and labor and material payment bonds, warranty, and correction of work.

B. Section 01 30 00 - Administrative Requirements: Submittals procedures, shop drawings, product data, and samples.

C. Section 01 70 00 - Execution and Closeout Requirements: Contract closeout procedures.

D. Individual Product Sections: Specific requirements for operation and maintenance data.

E. Individual Product Sections: Warranties required for specific products or Work.

1.03 SUBMITTALS

A. Project Record Documents: Submit documents to Architect with claim for final Application for Payment.

B. Operation and Maintenance Data:
   1. Submit two sets of revised final documents in final form within 10 days after final inspection.

C. Warranties and Bonds:
   1. For equipment or component parts of equipment put into service during construction with Owner's permission, submit documents within 10 days after acceptance.
   2. Make other submittals within 10 days after Date of Substantial Completion, prior to final Application for Payment.
   3. For items of Work for which acceptance is delayed beyond Date of Substantial Completion, submit within 10 days after acceptance, listing the date of acceptance as the beginning of the warranty period.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 PROJECT RECORD DOCUMENTS

A. Maintain on site one set of the following record documents; record actual revisions to the Work:
   1. Drawings.
   2. Specifications.
   3. Addenda.
   4. Change Orders and other modifications to the Contract.

B. Ensure entries are complete and accurate, enabling future reference by Owner.

C. Store record documents separate from documents used for construction.

D. Record information concurrent with construction progress.

E. Specifications: Legibly mark and record at each product section description of actual products installed, including the following:
   1. Manufacturer's name and product model and number.
   2. Product substitutions or alternates utilized.
   3. Changes made by Addenda and modifications.

F. Record Drawings : Legibly mark each item to record actual construction including:
   1. Field changes of dimension and detail.

2. Details not on original Contract drawings.

3.02 OPERATION AND MAINTENANCE DATA

A. Source Data: For each product or system, list names, addresses and telephone numbers of Subcontractors and suppliers, including local source of supplies and replacement parts.

B. Product Data: Mark each sheet to clearly identify specific products and component parts, and data applicable to installation. Delete inapplicable information.

C. Drawings: Supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams. Do not use Project Record Documents as maintenance drawings.

D. Typed Text: As required to supplement product data. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions.

3.03 OPERATION AND MAINTENANCE DATA FOR MATERIALS AND FINISHES

A. For Each Product, Applied Material, and Finish:

B. Instructions for Care and Maintenance: Manufacturer's recommendations for cleaning agents and methods, precautions against detrimental cleaning agents and methods, and recommended schedule for cleaning and maintenance.

C. Where additional instructions are required, beyond the manufacturer's standard printed instructions, have instructions prepared by personnel experienced in the operation and maintenance of the specific products.

3.04 OPERATION AND MAINTENANCE DATA FOR EQUIPMENT AND SYSTEMS

A. For Each Item of Equipment and Each System:
   1. Description of unit or system, and component parts.
   2. Identify function, normal operating characteristics, and limiting conditions.
   3. Include performance curves, with engineering data and tests.
   4. Complete nomenclature and model number of replaceable parts.

B. Where additional instructions are required, beyond the manufacturer's standard printed instructions, have instructions prepared by personnel experienced in the operation and maintenance of the specific products.

C. Operating Procedures: Include start-up, break-in, and routine normal operating instructions and sequences. Include regulation, control, stopping, shut-down, and emergency instructions. Include summer, winter, and any special operating instructions.

D. Maintenance Requirements: Include routine procedures and guide for preventative maintenance and trouble shooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.

E. Provide servicing and lubrication schedule, and list of lubricants required.

F. Include manufacturer's printed operation and maintenance instructions.

G. Include sequence of operation by controls manufacturer.

H. Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.

I. Additional Requirements: As specified in individual product specification sections.

3.05 ASSEMBLY OF OPERATION AND MAINTENANCE MANUALS

A. Assemble operation and maintenance data into durable manuals for Owner's personnel use, with data arranged in the same sequence as, and identified by, the specification sections.

B. Where systems involve more than one specification section, provide separate tabbed divider for each system.

C. Prepare instructions and data by personnel experienced in maintenance and operation of described products.

D. Prepare data in the form of an instructional manual.

E. Binders: Commercial quality, 8-1/2 by 11 inch three D side ring binders with durable plastic covers; 2 inch maximum ring size. When multiple binders are used, correlate data into related consistent groupings.

F. Cover: Identify each binder with typed or printed title OPERATION AND MAINTENANCE INSTRUCTIONS; identify title of Project; identify subject matter of contents.

G. Project Directory: Title and address of Project; names, addresses, and telephone numbers of Architect, Consultants, Contractor and subcontractors, with names of responsible parties.

H. Tables of Contents: List every item separated by a divider, using the same identification as on the divider tab; where multiple volumes are required, include all volumes Tables of Contents in each volume, with the current volume clearly identified.

I. Dividers: Provide tabbed dividers for each separate product and system; identify the contents on the divider tab; immediately following the divider tab include a description of product and major component parts of equipment.

J. Text: Manufacturer's printed data, or typewritten data on 24 pound paper.

K. Drawings: Provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages.

L. Arrange content by systems under section numbers and sequence of Table of Contents of this Project Manual.
   1. Operating instructions.
   2. Maintenance instructions for equipment and systems.
   3. Maintenance instructions for special finishes, including recommended cleaning methods and materials, and special precautions identifying detrimental agents.

3.06 WARRANTIES AND BONDS

A. Obtain warranties and bonds, executed in duplicate by responsible Subcontractors, suppliers, and manufacturers, within 10 days after completion of the applicable item of work. Except for items put into use with Owner's permission, leave date of beginning of time of warranty until Date of Substantial completion is determined.

B. Verify that documents are in proper form, contain full information, and are notarized.

C. Co-execute submittals when required.

D. Retain warranties and bonds until time specified for submittal.

END OF SECTION

SECTION 03 30 00
CAST-IN-PLACE CONCRETE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Concrete formwork.

B. Concrete foundation walls.

C. Concrete topping on precast plank where indicated.

D. Concrete reinforcement.

E. Joint devices associated with concrete work.

F. Miscellaneous concrete elements, including light pole bases.

G. Concrete curing.

1.02 RELATED REQUIREMENTS

A. Section 07 21 00 - Thermal Insulation: High density rigid insulation below concrete slabs.

B. Section 07 92 00 - Joint Sealants: Products and installation for sealants for saw cut joints and isolation joints in slabs.

C. Section 32 13 13 - Concrete Paving: Sidewalks, curbs and gutters.

1.03 REFERENCE STANDARDS

A. ACI 211.1 - Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete; American Concrete Institute International; 1991 (Reapproved 2009).

B. ACI 301 - Specifications for Structural Concrete; American Concrete Institute International; 2010 (Errata 2012).

C. ACI 302.1R - Guide for Concrete Floor and Slab Construction; American Concrete Institute International; 2004 (Errata 2007).

D. ACI 304R - Guide for Measuring, Mixing, Transporting, and Placing Concrete; American Concrete Institute International; 2000.

E. ACI 305R - Hot Weather Concreting; American Concrete Institute International; 2010.

F. ACI 306R - Cold Weather Concreting; American Concrete Institute International; 2010.

G. ACI 308R - Guide to Curing Concrete; American Concrete Institute International; 2001 (Reapproved 2008).

H. ACI 318 - Building Code Requirements for Structural Concrete and Commentary; American Concrete Institute International; 2011.

I. ASTM A615/A615M - Standard Specification for Deformed and Plain Carbon Billet-Steel Bars for Concrete Reinforcement; 2015.

J. ASTM A1064/A1064M - Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete; 2015.

K. ASTM C33/C33M - Standard Specification for Concrete Aggregates; 2013.

L. ASTM C39/C39M - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens; 2014.

M. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete; 2015.

N. ASTM C143/C143M - Standard Test Method for Slump of Hydraulic-Cement Concrete; 2012.

O. ASTM C150/C150M - Standard Specification for Portland Cement; 2012.

P. ASTM C173/C173M - Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method; 2014.

Q. ASTM C260/C260M - Standard Specification for Air-Entraining Admixtures for Concrete; 2010a.

R. ASTM C494/C494M - Standard Specification for Chemical Admixtures for Concrete; 2013.

S. ASTM C618 - Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete; 2015.

T. ASTM C979/C979M - Standard Specification for Pigments for Integrally Colored Concrete; 2010.

U. ASTM C1059/C1059M - Standard Specification for Latex Agents for Bonding Fresh to Hardened Concrete; 2013.

V. ASTM D1751 - Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types); 2004 (Reapproved 2013).

W. ASTM E1745 - Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs; 2011.

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Submit manufacturers' data on manufactured products showing compliance with specified requirements and installation instructions.

C. Mix Design: Submit proposed concrete mix design.

D. Samples for Pigment Color Selection: Submit manufacturer's complete sample chip set, including pigment number and required dosage rate for each color.

E. Sustainable Design Submittal: If any fly ash, ground granulated blast furnace slag, silica fume, rice hull ash, or other waste material is used in mix designs to replace Portland cement, submit the total volume of concrete cast in place, mix design(s) used showing the quantity of portland cement replaced, reports showing successful cylinder testing, and temperature on day of pour if cold weather mix is used; use LEED New Product Content Form.

F. Project Record Documents: Accurately record actual locations of embedded utilities and components that will be concealed from view upon completion of concrete work.

1.05 QUALITY ASSURANCE

A. Perform work of this section in accordance with ACI 301 and ACI 318.

B. Follow recommendations of ACI 305R when concreting during hot weather.

C. Follow recommendations of ACI 306R when concreting during cold weather.

PART 2 PRODUCTS

2.01 FORMWORK

A. Form Materials: Contractor's choice of standard products with sufficient strength to withstand hydrostatic head without distortion in excess of permitted tolerances.
   1. Form Facing for Exposed Finish Concrete: Contractor's choice of materials that will provide smooth, stain-free final appearance.
   2. Form Coating: Release agent that will not adversely affect concrete or interfere with application of coatings.
   3. Form Ties: Cone snap type that will leave no metal within 1-1/2 inches of concrete surface.

2.02 REINFORCEMENT

A. Reinforcing Steel: ASTM A615/A615M, Grade 60 (60,000 psi).
   1. Type: Deformed billet-steel bars.
   2. Finish: Unfinished, unless otherwise indicated.

B. Steel Welded Wire Reinforcement (WWR): Plain type, ASTM A1064/A1064M.
   1. Form: Flat Sheets.
   2. WWR Style: 6x6 W1.4xW1.4.

C. Reinforcement Accessories:
   1. Tie Wire: Annealed, minimum 16 gage, 0.0508 inch.

2. Chairs, Bolsters, Bar Supports, Spacers: Sized and shaped for adequate support of reinforcement during concrete placement.
3. Provide stainless steel, galvanized, plastic, or plastic coated steel components for placement within 1-1/2 inches of weathering surfaces.

2.03 CONCRETE MATERIALS

A. Cement: ASTM C150, Type I - Normal Portland type.

B. Fine and Coarse Aggregates: ASTM C 33.

C. Fly Ash: ASTM C618, Class C or F.

D. Color Additives: Pure, concentrated mineral pigments specifically intended for mixing into concrete and complying with ASTM C979.
1. Color(s): As selected by Architect from manufacturer's full range.
2. Products:
a. BRICKFORM: BRICKFORM Powdered Integral Color: www.brickform.com.
b. Butterfield Color: www.butterfieldcolor.com.
c. L.M. Scofield Company; CHROMIX® Admixtures for Color-Conditioned® Concrete: www.scofield.com.
d. Solomon Colors; Solomon Dry Integral Colors: www.solomoncolors.com.

E. Water: Clean and not detrimental to concrete.

2.04 ADMIXTURES

A. Do not use chemicals that will result in soluble chloride ions in excess of 0.1 percent by weight of cement.

B. Air Entrainment Admixture: ASTM C260/C260M.
1. Products:
a. "MB-VR" by BASF.
b. "Polychem AE" by General Resource Technology.
c. Substitutions: See Section 01 60 00 - Product Requirements.

C. High Range Water Reducing and Retarding Admixture: ASTM C494/C494M Type G.
1. Products:
a. "Daracem 100" by Grace Construction Products.
b. Substitutions: See Section 01 60 00 - Product Requirements.

D. High Range Water Reducing Admixture: ASTM C494/C494M Type F.
1. Products:
a. "Daracem 19" by Grace Construction Products.
b. Substitutions: See Section 01 60 00 - Product Requirements.

E. Water Reducing Admixture: ASTM C494/C494M Type A.
1. Products:
a. "KB-1000" by General Resource Technology.
b. "WRDA" by Grace Construction Materails.
c. Substitutions: See Section 01 60 00 - Product Requirements.

2.05 ACCESSORY MATERIALS

A. Underslab Vapor Retarder:
1. Parking Garage Slabs: 6 mil thick clear polyethylene film, type recommended for below grade application.

2.06 BONDING AND JOINTING PRODUCTS

A. Latex Bonding Agent: Non-redispersable acrylic latex, complying with ASTM C1059/C1059M, Type II.

B. Slab Isolation Joint Filler: 1/2 inch thick, height equal to slab thickness, with removable top section that will form 1/2 inch deep sealant pocket after removal.
1. Material: ASTM D1751, cellulose fiber.

2. Products:
    a. W.R. Meadows, Inc; Fiber Expansion Joint Filler with Snap-Cap: www.wrmeadows.com.
    b. Substitutions: See Section 01 60 00 - Product Requirements.

C. Slab Construction Joint Devices: Positive load transfer slip dowel.
1. Provide plastic dowel sleeve for attachment to edge form, space at 24 inches on center, unless noted otherwise on Drawings.
2. Size: Sleeve length 9 inches long to accept #4 rebar x 18 inches long.
3. Manufacturers:
    a. Sika Greenstreak "Speed Dowel".
    b. Substitutions: See Section 01 60 00 - Product Requirements.

D.

2.07 CURING MATERIALS

A. Curing and Sealing Compound, Low Gloss: Liquid, membrane-forming, clear, non-yellowing acrylic; complying with ASTM C1315 Type 1 Class A.
1. Application: Use at uncolored concrete and concrete in unfinished areas.
2. Solids by Mass: 25 percent, minimum.
3. Products:
    a. SpecChem, LLC; Cure and Seal WB 25: www.specchemllc.com.
    b. W.R. Meadows, Inc.; VOCOMP-25: www.wrmeadows.com.
    c. W.R. Meadows, Inc.; CS-309-25 OTC: www.wrmeadows.com.
    d. TK Products; AS-1 Achro Seal 1315.
    e. Substitutions: See Section 01 60 00 - Product Requirements.

B. Curing and Sealing Compound, High Gloss: Liquid, membrane-forming, clear, non-yellowing acrylic; complying with ASTM C1315 Type 1 Class A.
1. Application: Use at colored concrete and concrete within finished areas (mechanical spaces, etc.).
2. Vehicle: Solvent-based.
3. Solids by Mass: 25 percent, minimum.
4. Products:
    a. SpecChem, LLC; Cure and Seal WB 30: www.specchemllc.com.
    b. W.R. Meadows, Inc.; VOCOMP-30: www.wrmeadows.com.
    c. W.R. Meadows, Inc.; Decra-Seal: www.wrmeadows.com.
    d. W.R. Meadows, Inc.; Decra-Seal OTC: www.wrmeadows.com.

2.08 CONCRETE MIX DESIGN

A. Proportioning Normal Weight Concrete: Comply with ACI 211.1 recommendations.
1. Replace as much Portland cement as possible with fly ash, ground granulated blast furnace slag, silica fume, or rice hull ash as is consistent with ACI recommendations.

B. Admixtures: Add acceptable admixtures as recommended in ACI 211.1 and at rates recommended or required by manufacturer.

C. Normal Weight Concrete:
1. Compressive Strength, when tested in accordance with ASTM C39/C39M at 28 days: As indicated on drawings.
2. Fly Ash Content: Maximum 20 percent of cementitious materials by weight.
3. Water-Cement Ratio: Maximum 40 percent by weight.
4. Total Air Content: 6 percent, determined in accordance with ASTM C173/C173M.
5. Maximum Slump: 3 +/- 1 inches.

2.09 CONCRETE MIX DESIGN - TOPPING SLABS

A. Normal Weight Concrete: Comply with ACI 211.1 recommendations.
1. Compressive Strength, when tested in accordance with ASTM C 39/C 39M at 28 days: 4,000 psi.

2. Total Air Content: 6 percent, determined in accordance with ASTM C 173/C 173M.
3. Maximum Slump: 3 inches. 6 inches max. with addition of superplasticizer.
4. Maximum Aggregate Size: 1/2 inch.

B. Welded wire reinforcement specified above.

2.10 MIXING

A. Transit Mixers: Comply with ASTM C94/C94M.

PART 3 EXECUTION

3.01 PREPARATION

A. Formwork: Comply with requirements of ACI 301. Design and fabricate forms to support all applied loads until concrete is cured, and for easy removal without damage to concrete.

B. Verify that forms are clean and free of rust before applying release agent.

C. Coordinate placement of embedded items with erection of concrete formwork and placement of form accessories.

D. Where new concrete is to be bonded to previously placed concrete, prepare existing surface by cleaning with steel brush and applying bonding agent in accordance with manufacturer's instructions.
1. Use latex bonding agent only for non-load-bearing applications.

E. Install vapor retarder under interior slabs on grade. Lap joints minimum 6 inches and seal watertight by taping edges and ends. Repair damaged vapor retarder before covering.

3.02 INSTALLING REINFORCEMENT AND OTHER EMBEDDED ITEMS

A. Comply with requirements of ACI 301. Clean reinforcement of loose rust and mill scale, and accurately position, support, and secure in place to achieve not less than minimum concrete coverage required for protection.

B. Install welded wire reinforcement in maximum possible lengths, and offset end laps in both directions. Splice laps with tie wire.

C. Verify that anchors, seats, plates, reinforcement and other items to be cast into concrete are accurately placed, positioned securely, and will not interfere with concrete placement.

D. Repair underslab vapor retarder damaged during placement of concrete reinforcing. Repair with vapor retarder material; lap over damaged areas minimum 12 inches and seal watertight.

3.03 PLACING CONCRETE

A. Place concrete in accordance with ACI 304R.

B. Place concrete for floor slabs in accordance with ACI 302.1R.

C. Maintain records of concrete placement. Record date, location, quantity, air temperature, and test samples taken.

D. Ensure reinforcement, inserts, embedded parts, and formed construction joint devices will not be disturbed during concrete placement.

E. Place concrete continuously without construction (cold) joints wherever possible; where construction joints are necessary, before next placement prepare joint surface by removing laitance and exposing the sand and sound surface mortar, by sandblasting or high-pressure water jetting.

F. Finish floors level and flat, unless otherwise indicated, within the tolerances specified below.

G. Protect and clean off adjacent materials from concrete placement.

H. Remove excess concrete spoils from site.

3.04 SLAB JOINTING

A. Locate joints as indicated on the drawings or as required at maximum 200 sq. ft.

B. Anchor joint fillers and devices to prevent movement during concrete placement.

C. Isolation Joints: Use preformed joint filler with removable top section for joint sealant, total height equal to thickness of slab, set flush with top of slab.
   1. Install wherever necessary to separate slab from other building members, including columns, walls, equipment foundations, footings, stairs, manholes, sumps, and drains.

D. Saw Cut Contraction Joints: Saw cut joints before concrete begins to cool, within 4 to 12 hours after placing; use 3/16 inch thick blade and cut at least 1 inch deep but not less than one quarter (1/4) the depth of the slab.

E. Construction Joints: Where not otherwise indicated, use slip dowels.

3.05 FLOOR TOPPINGS

A. Prior to placing floor topping, roughen substrate concrete surface and remove deleterious material. Broom and vacuum clean.

B. Place required dividers, edge strips, reinforcing, and other items to be cast in.

C. Place concrete floor toppings to required lines and levels.
   1. Place topping in checkerboard panels not to exceed 20 feet in either direction.

D. Screed toppings level, maintaining surface flatness of maximum 1:1000.

3.06 FLOOR FLATNESS AND LEVELNESS TOLERANCES

A. Maximum Variation of Surface Flatness:
   1. Exposed Concrete Floors: 1/4 inch in 10 feet.
   2. Under Seamless Resilient Flooring: 1/4 inch in 10 feet.
   3. Under Carpeting: 1/4 inch in 10 feet.

B. Correct the slab surface if tolerances are less than specified.

C. Correct defects by grinding or by removal and replacement of the defective work. Areas requiring corrective work will be identified. Re-measure corrected areas by the same process.

3.07 CONCRETE FINISHING

A. Repair surface defects, including tie holes, immediately after removing formwork.

B. Unexposed Form Finish: Rub down or chip off fins or other raised areas 1/4 inch or more in height.

C. Concrete Slabs: Finish to requirements of ACI 302.1R, and as follows:
   1. Surfaces to Receive Thin Floor Coverings: "Steel trowel" as described in ACI 302.1R; thin floor coverings include carpeting, resilient flooring, seamless flooring, thin set quarry tile, and thin set ceramic tile.
   2. Other Surfaces to Be Left Exposed: Trowel as described in ACI 302.1R, minimizing burnish marks and other appearance defects.

3.08 CURING AND PROTECTION

A. Comply with requirements of ACI 308R. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, and mechanical injury.

B. Maintain concrete with minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of concrete.
   1. Normal concrete: Not less than 7 days.

C. Surfaces Not in Contact with Forms:
   1. Slabs and Floors To Receive Adhesive-Applied Flooring: Curing compounds and other surface coatings are usually considered unacceptable by flooring and adhesive manufacturers. If such materials must be used, either obtain the approval of the flooring and adhesive manufacturers prior to use or remove the surface coating after curing to flooring manufacturer's satisfaction.
   2. Initial Curing: Start as soon as free water has disappeared and before surface is dry. Keep continuously moist for not less than three days by water ponding, water-saturated sand, water-fog spray, or saturated burlap.
   3. Final Curing: Begin after initial curing but before surface is dry.

a. Curing Compound: Apply in two coats at right angles, using application rate recommended by manufacturer.

3.09 FIELD QUALITY CONTROL

A. An independent testing agency will perform field quality control tests, as specified in Section 01 40 00 - Quality Requirements.

B. Provide free access to concrete operations at project site and cooperate with appointed firm.

C. Submit proposed mix design of each class of concrete to inspection and testing firm for review prior to commencement of concrete operations.

D. Tests of concrete and concrete materials may be performed at any time to ensure conformance with specified requirements.

E. Compressive Strength Tests: ASTM C39/C39M. For each test, mold and cure three concrete test cylinders. Obtain test samples for every 100 cubic yards or less of each class of concrete placed.

F. Take one additional test cylinder during cold weather concreting, cured on job site under same conditions as concrete it represents.

G. Perform one slump test for each set of test cylinders taken, following procedures of ASTM C143/C143M.

3.10 DEFECTIVE CONCRETE

A. Test Results: The testing agency shall report test results in writing to Architect and Contractor within 24 hours of test.

B. Defective Concrete: Concrete not conforming to required lines, details, dimensions, tolerances or specified requirements.

C. Repair or replacement of defective concrete will be determined by the Architect. The cost of additional testing shall be borne by Concrete Contractor when defective concrete is identified.

D. Do not patch, fill, touch-up, repair, or replace exposed concrete except upon express direction of Architect for each individual area.

END OF SECTION

SECTION 03 41 00
PRECAST STRUCTURAL CONCRETE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Columns.

B. Beams, spandrels, girders, purlins.

C. Grout packing.

D. Connection and supporting devices.

E. Lintels and bond beams.

1.02 REFERENCE STANDARDS

A. ACI 318 - Building Code Requirements for Structural Concrete and Commentary; American Concrete Institute International; 2011.

B. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2014.

C. ASTM A416/A416M - Standard Specification for Steel Strand, Uncoated Seven-Wire for Prestressed Concrete; 2012a.

D. ASTM A615/A615M - Standard Specification for Deformed and Plain Carbon Steel Bars for Concrete Reinforcement; 2015.

E. ASTM C150/C150M - Standard Specification for Portland Cement; 2012.

F. AWS D1.1/D1.1M - Structural Welding Code - Steel; American Welding Society; 2011 w/Errata.

G. PCI MNL-116 - Manual for Quality Control for Plants and Production of Structural Precast Concrete Products; Precast/Prestressed Concrete Institute; 1999, Fourth Edition.

H. PCI MNL-123 - Design and Typical Details of Connections for Precast and Prestressed Concrete; Precast/Prestressed Concrete Institute; 1988, Second Edition.

I. PCI MNL-135 - Tolerance Manual for Precast and Prestressed Concrete Construction; Precast/Prestressed Concrete Institute; 2000.

1.03 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Shop Drawings: Indicate layout, unit locations, fabrication details, unit identification marks, reinforcement, integral insulation, insulated panel system connectors, connection details, support items, dimensions, openings, and relationship to adjacent materials. Indicate design loads, deflections, cambers, bearing requirements, and special conditions.
   1. Submit reviewed shop drawings and design data to authorities having jurisdiction for approval.

C. Design Data: Submit design data reports indicating calculations for loadings and stresses of fabricated, designed framing.

1.04 QUALITY ASSURANCE

A. Designer Qualifications: Design precast concrete members under direct supervision of a Professional Structural Engineer experienced in design of precast concrete and licensed in Wisconsin.

PART 2 PRODUCTS

2.01 PRECAST UNITS

A. Precast Structural Concrete Units: Comply with PCI MNL-116, PCI MNL-120, PCI MNL-123, PCI MNL-135, ACI 318 and applicable codes.
   1. Design components to withstand dead loads and design loads in the configuration indicated on the drawings and structural calculations.
   2. Calculate structural properties of framing members in accordance with ACI 318.

3. Replace as much Portland cement as possible with fly ash, ground granulated blast furnace slag, silica fume, or rice hull ash as is consistent with strength requirements.
4. Fire Resistance: Provide designs tested to provide ratings indicated on Drawings.
5. Design system to accommodate construction tolerances, deflection of other building structural members and clearances of intended openings.

2.02 MATERIALS

A. Cement: White Portland type, conforming to ASTM C150/C150M, Type I.

B. Aggregate, Sand, Water, Admixtures: Determined by precast fabricator as appropriate to design requirements and PCI MNL-116.

2.03 REINFORCEMENT

A. Tensioning Steel Tendons: ASTM A416/A416M, Grade 250 (1725); seven-wire stranded steel cable; low-relaxation type; full length without splices; weldless; uncoated.

B. Reinforcing Steel: ASTM A615/A615M, Grade 40 (40,000 psi).

2.04 ACCESSORIES

A. Connecting and Supporting Devices; Anchors and Inserts: Plates, angles, items cast into concrete, items connected to steel framing members, and inserts conforming to PCI MNL-123, and as follows:
   1. Material: Carbon steel conforming to ASTM A 36/A 36M.
   2. Finish: Prime painted, except where device surfaces will be in contact with concrete or will require field welding.

B. Grout:
   1. Non-shrink, non-metallic, minimum yield strength of 10,000 psi at 28 days.

C. Bearing Pads: High density plastic, Vulcanized elastomeric compound molded to size, or Neoprene (Chloroprene); 3/8 inch thick.

D. Bolts, Nuts and Washers: High strength steel type recommended for structural steel joints.

E. Prime Paint: Zinc rich alkyd type.

2.05 FABRICATION

A. Conform to fabrication procedures specified in PCI MNL-116.

B. Maintain plant records and quality control program during production of precast members. Make records available upon request.

C. Ensure reinforcing steel, anchors, inserts, plates, angles, and other cast-in items are embedded and located as indicated on shop drawings.

D. Tension reinforcement tendons as required to achieve design load criteria.

E. Provide required openings with a dimension larger than 10 inches and embed accessories provided under other sections of the specifications, at indicated locations.

F. Exposed Ends at Stressing Tendons: Fill recess with non-shrink grout, trowel flush.

2.06 FINISHES

A. Ensure exposed-to-view finish surfaces of precast concrete members are uniform in color and appearance.

B. Cure members under identical conditions to develop required concrete quality, and minimize appearance blemishes such as non-uniformity, staining, or surface cracking.

C. Finish members to PCI MNL-116 Standard grade.

2.07 FABRICATION TOLERANCES

A. Conform to fabrication tolerances specified in PCI MNL-135, except as specifically amended below.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that site conditions are ready to receive work and field measurements are as shown on Drawings.

3.02 ERECTION

A. Erect members without damage to structural capacity, shape, or finish. Replace or repair damaged members.

B. Align and maintain uniform horizontal and vertical joints, as erection progresses.

C. Maintain temporary bracing in place until final support is provided. Protect members from staining.

D. Provide temporary lateral support to prevent bowing, twisting, or warping of members.

E. Adjust differential camber between precast members to tolerance before final attachment.

F. Install bearing pads.

G. Level differential elevation of adjoining horizontal members with grout to maximum slope of 1:12.

H. Set vertical units dry, without grout, attaining joint dimension with lead or plastic spacers.

I. Grout underside of column bearing plates.

J. Secure units in place. Perform welding in accordance with AWS D1.1/D1.1M.

3.03 TOLERANCES

A. Erect members level and plumb within allowable tolerances.

B. Conform to PCI MNL-135 for erection tolerances.

C. When members cannot be adjusted to conform to design or tolerance criteria, cease work and advise Architect. Execute modifications as directed.

3.04 PROTECTION

A. Protect members from damage caused by field welding or erection operations.

B. Provide non-combustible shields during welding operations.

3.05 CLEANING

A. Clean weld marks, dirt, or blemishes from surface of exposed members.

END OF SECTION

SECTION 03 41 13
PRECAST CONCRETE HOLLOW CORE PLANKS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Precast floor planks.

B. Connection plates with brackets and hangers.

C. Grouting plank joint keys.

1.02 RELATED REQUIREMENTS

A. Section 03 41 00 Precast Structural Concrete.

1.03 REFERENCE STANDARDS

A. ACI 301 - Specifications for Structural Concrete for Buildings; American Concrete Institute International; 2010.

B. ACI 318 - Building Code Requirements for Structural Concrete and Commentary; American Concrete Institute International; 2011.

C. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2014.

D. ASTM A416/A416M - Standard Specification for Steel Strand, Uncoated Seven-Wire for Prestressed Concrete; 2012a.

E. ASTM A615/A615M - Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement; 2015.

F. AWS D1.1/D1.1M - Structural Welding Code - Steel; American Welding Society; 2011 w/Errata.

G. PCI MNL-116 - Manual for Quality Control for Plants and Production of Structural Precast Concrete Products; Precast/Prestressed Concrete Institute; 1999, Fourth Edition.

H. PCI MNL-120 - PCI Design Handbook - Precast and Prestressed Concrete; Precast/Prestressed Concrete Institute; Seventh Edition, 2010.

I. PCI MNL-123 - Design and Typical Details of Connections for Precast and Prestressed Concrete; Precast/Prestressed Concrete Institute; 1988, Second Edition.

J. PCI MNL-124 - Design for Fire Resistance of Precast Prestressed Concrete; Precast/Prestressed Concrete Institute; 1989, Second Edition.

K. PCI MNL-126 - Manual For The Design of Hollow Core Slabs; Precast/Prestressed Concrete Institute; 1998.

L. PCI MNL-135 - Tolerance Manual For Precast and Prestressed Concrete Construction; Precast/Prestressed Concrete Institute; 2000.

1.04 SUBMITTALS

A. See Section 03 41 00 - Precast Structural Concrete, for requirements.

PART 2 PRODUCTS

2.01 PRECAST UNITS

A. Precast Hollow Core Planks: Comply with PCI MNL-120, PCI MNL 126, PCI MNL-124, ACI 318, and ACI 301.
   1. Design components to withstand dead loads and design loads in the configuration indicated on the drawings and as follows and structural calculations.
   2. Replace as much Portland cement as possible with fly ash, ground granulated blast furnace slag, silica fume, or rice hull ash as is consistent with strength requirements.
   3. Design connections in accordance with PCI MNL-123.
   4. Design components to accommodate construction tolerances, deflection of other building structural members and clearances of intended openings.
   5. Fire Resistance: Design planks in accordance with PCI MNL-124 to achieve hourly ratings indicated on Drawings.

2.02 MATERIALS

A. Concrete Materials: ACI 301.

B. Tensioning Steel Tendons: ASTM A416/A416M, Grade 250 - 250K psi; seven-wire stranded steel cable; low-relaxation type; full length without splices; weldless; uncoated.

C. Reinforcing Steel: ASTM A615/A615M, Grade 40 (40,000 psi) deformed steel bars.

D. Non-Shrink Grout: Non-metallic, minimum compressive strength of 10,000 psi at 28 days.

E. Cement Grout: Minimum compressive strength of 3,000 psi at 28 days.

2.03 ACCESSORIES

A. Connecting and Supporting Devices: Plates, angles, items cast into concrete, items connected to steel framing members, and inserts: ASTM A36/A36M carbon steel; prime painted.

B. Core Hole End Plugs: Foamed-in-place insulation.

C. Bearing Pads: High density plastic, 1/8 inch thick, smooth on one side. Neoprene (Chloroprene).

D. Sill Seal: Compressible glass fiber strips.

2.04 FABRICATION

A. Planks: Plant cast, prestressed, hollow core.
   1. Dimensions as indicated on drawings.

B. Embed anchors, inserts, plates, angles, and other items at locations indicated.

C. Provide openings required by other sections, at locations indicated.

D. Cut exposed ends flush.

E. Plant Finish: Finish members to PCI MNL-116 Standard Grade.

F. Connecting and Supporting Steel Devices: Do not paint surfaces in contact with concrete or surfaces requiring field welding.

G. Planks to have cores factory drilled at each end for drainage.

2.05 FABRICATION TOLERANCES

A. Conform to PCI MNL-116 and PCI MNL-135.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that site conditions are ready to receive work and field measurements are as indicated on shop drawings.

3.02 PREPARATION

A. Prepare support devices for the erection procedure and temporary bracing.

3.03 ERECTION

A. Erect members without damage to structural capacity, shape, or finish. Replace or repair damaged members.

B. Install bearing pads and sill seal as indicated.

C. Align and maintain uniform horizontal and end joints, as erection progresses.

D. Maintain temporary bracing in place until final connection is made. Protect members from staining.

E. Secure units in place as indicated on drawings.

F. Grout longitudinal keys as indicated.

G. Seal plank lap on foundation with expanding foam (typical) or non-shrink grout (fire rated and edge loaded conditions).

3.04 TOLERANCES

A. Erect members level and plumb within allowable tolerances. Conform to PCI MNL-135 .

3.05 CLEANING

A. Clean weld marks, dirt, and blemishes from surface of exposed members.

END OF SECTION

SECTION 03 54 00
CAST UNDERLAYMENT

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Liquid applied, gypsum based self-leveling floor topping.

B. Sound control underlayment.

1.02 RELATED REQUIREMENTS

1.03 REFERENCE STANDARDS

A. ASTM C472 - Standard Test Methods for Physical Testing of Gypsum, Gypsum Plasters and Gypsum Concrete; 1999 (Reapproved 2014).

B. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2015a.

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide manufacturer's data sheets documenting physical characteristics and product limitations of underlayment materials. Include information on installation instructions.

C. Certificate: Certify that products meet or exceed specified STC and IIC requirements.add.

1.05 QUALITY ASSURANCE

A. Applicator Qualifications: Company specializing in performing the work of this section, and approved by manufacturer.

1.06 FIELD CONDITIONS

A. Do not install underlayment until floor penetrations and peripheral work are complete.

B. Maintain minimum ambient temperatures of 50 degrees F 24 hours before, during and 72 hours after installation of underlayment.

C. During the curing process, ventilate spaces to remove excess moisture.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Gypsum Underlayment:
   1. Dependable Chemical Co., Inc: www.floorprep.com.
   2. Hacker Industries, Inc: www.hackerindustries.com.
   3. Maxxon Corporation: www.maxxon.com.
   4. United States Gypsum : www.levelrock.com
   5. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 DESIGN CRITERIA:

A. Provide a complete gypsum underlayment system including sound reduction board or mat and accessories. System shall be part of a tested floor assembly meeting the performance requirements listed. Submit documentation of manufacturer testing.

B. Performance:
   1. Minimum Impact Isolation Class (IIC): 50.
   2. Minimum Sound Transmission Class (STC): 50.
   3. Fire Rating: As indicated on drawings.

2.03 MATERIALS

A. Gypsum-Based Underlayment: Gypsum based mix, that when mixed with water in accordance with manufacturer's directions will produce self-leveling underlayment with the following properties:
   1. Compressive Strength: Minimum 2500 psi, tested per ASTM C472.

2. Density: Maximum 115 lb/cu ft.
3. Final Set Time: 1 to 2 hours, maximum.
4. Thickness: As indicated on Drawings.
5. Surface Burning Characteristics: Flame spread/Smoke developed index of 0/0 in accordance with ASTM E84.

B. Water: Potable and not detrimental to underlayment mix materials.

C. Primer: Manufacturer's recommended type.

D. Joint and Crack Filler: Latex based filler, as recommended by manufacturer.

E. Sound Control Underlayment: **As specified in submitted acoustic test documentation.**
1. Acceptable manufacturers:
   a. "Duracoustic" by Dura Undercushions, Ltd.
   b. Quiet Qurl 55/025 by Keene Building Products.
   c. Levelrock SRB Sound Reduction Board by United States Gypsum.
2. Provide at hard surface floor finishes where dwelling units are located below.

F. Accessories:
1. Perimeter isolation and seaming materials as specified by sound control underlayment manufacturer.

2.04 MIXING

A. Site mix materials in accordance with manufacturer's instructions.

B. Mix to self-leveling consistency without over-watering.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that substrate surfaces are clean, dry, unfrozen, do not contain petroleum byproducts, or other compounds detrimental to underlayment material bond to substrate.

3.02 PREPARATION

A. Remove substrate surface irregularities. Fill voids and deck joints with filler. Finish smooth.

B. Vacuum clean surfaces.

C. Prime substrate in accordance with manufacturer's instructions. Allow to dry.

D. Close floor openings.

3.03 UNDERLAYMENT INSTALLATION

A. Underlayment is required under all hard surface floor finishes.

B. Install underlayment, including perimeter isolation and seaming, in accordance with manufacturer's instructions and details of submitted acoustical test.

3.04 APPLICATION

A. Pump or pour material onto substrate. Do not retemper or add water.
1. Pump, move, and screed while the material is still highly flowable.
2. Be careful not to create cold joints.
3. Wear spiked shoes while working in the wet material to avoid leaving marks.

B. Place to indicated thickness, with top surface level to 1/8 inch in 10 ft.

C. Place after partition installation.

3.05 CURING

A. Once underlayment starts to set, prohibit foot traffic until final set has been reached.

B. Air cure in accordance with manufacturer's instructions.

3.06 PROTECTION

A. Protect against direct sunlight, heat, and wind; prevent rapid drying to avoid shrinkage and cracking.

B. Do not permit traffic over unprotected floor underlayment surfaces.

END OF SECTION

SECTION 04 20 00

UNIT MASONRY

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Concrete Block.

B. Calcium-silicate Masonry Units: Renaissance Cast Stone.

C. Natural Cut Stone: Adair Stone Masonry Units.

D. Clay Facing Brick.

E. Mortar and Grout.

F. Reinforcement and Anchorage.

G. Flashings.

H. Accessories.

1.02 RELATED REQUIREMENTS

A. Section 05 50 00 - Metal Fabrications: Loose steel lintels.

B. Section 07 21 00 - Thermal Insulation: Insulation for cavity spaces.

C. Section 07 92 00 - Joint Sealants: Sealing control and expansion joints.

1.03 PRICE AND PAYMENT PROCEDURES

A. See Section 01 21 00 - Allowances, for cash allowances affecting this section.

B. This allowance includes purchase and delivery of Brick. Installation is not included in the allowance but is specified in this section and is part of the Contract Sum/Price.

1.04 REFERENCE STANDARDS

A. ACI 530/530.1/ERTA - Building Code Requirements and Specification for Masonry Structures and Related Commentaries; American Concrete Institute International; 2011.

B. ASTM A82/A82M - Standard Specification for Steel Wire, Plain, for Concrete Reinforcement; 2007.

C. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2009.

D. ASTM A615/A615M - Standard Specification for Deformed and Plain Carbon Steel Bars for Concrete Reinforcement; 2015.

E. ASTM A641/A641M - Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire; 2009a.

F. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2015.

G. ASTM A1064/A1064M - Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete; 2015.

H. ASTM C67 - Standard Test Methods for Sampling and Testing Brick and Structural Clay Tile; 2014.

I. ASTM C73 - Standard Specification for Calcium Silicate Brick (Sand-Lime Brick); 2010.

J. ASTM C90 - Standard Specification for Loadbearing Concrete Masonry Units; 2014.

K. ASTM C144 - Standard Specification for Aggregate for Masonry Mortar; 2011.

L. ASTM C150/C150M - Standard Specification for Portland Cement; 2012.

M. ASTM C207 - Standard Specification for Hydrated Lime for Masonry Purposes; 2006 (Reapproved 2011).

N. ASTM C216 - Standard Specification for Facing Brick (Solid Masonry Units Made From Clay or Shale); 2014.

O. ASTM C270 - Standard Specification for Mortar for Unit Masonry; 2014a.

P. ASTM C404 - Standard Specification for Aggregates for Masonry Grout; 2011.

Q. ASTM C476 - Standard Specification for Grout for Masonry; 2010.

R. ASTM C979/C979M - Standard Specification for Pigments for Integrally Colored Concrete; 2010.

S. ASTM D226/D226M - Standard Specification for Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing; 2009.

1.05 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data for masonry units, fabricated wire reinforcement, mortar, and masonry accessories.

1.06 MOCK-UP

A. Construct a masonry wall as a mock-up panel sized 8 feet long by 6 feet high; include mortar, accessories, structural backup, and flashings (with lap joint, corner, and end dam) in mock-up.

B. Locate mock-up to include all masonry elements of facade, including each type and color brick with selected mortar color. Mock-up may be constructed adjacent to building or off site to facilitate construction schedule.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Deliver, handle, and store masonry units by means that will prevent mechanical damage and contamination by other materials.

PART 2 PRODUCTS

2.01 CONCRETE MASONRY UNITS

A. Concrete Block: Comply with referenced standards and as follows:
   1. Size: Standard units with nominal face dimensions of 16 x 8 inches and nominal depths as indicated on the drawings for specific locations.
   2. Special Shapes: Provide non-standard blocks configured for corners, lintels, and headers.
   3. Load-Bearing Units: ASTM C90, normal weight.

2.02 CALCIUM-SILICATE MASONRY UNITS:

A. Use at locations indicated on Drawings as "Renaissance", "Cast Stone" or "Precast".

B. ASTM C73, Grade SW; solid units that have been pressure formed and autoclaved; 3 5/8 inch bed depth, special shapes as indicated.

C. Color and texture: Sanddrft, sandblasted texture.

D. Nominal size: 8 x 24 inches with 4 x 24 bands.

E. Manufacturers:
   1. Arriscraft International; Product Renaissance Masonry Units.
   2. Substitutions: Not permitted.

F. Mortar for masonry units:
   1. As specified this section.
   2. Color: As selected by Architect.

2.03 NATURAL STONE

A. Use natural stone resistant to de-icing salts for base course of all masonry in contact with slab-on-grade and for all masonry that will be installed at or below grade.

B. Arriscraft International; Product: Adair Limestone.

C. Color: Sepia, variegated pattern.

D. Texture: Medium Dressed.

E. Substitutions: See Section 01 60 00 - Product Requirements.

F. Mortar for cast stone:
   1. Type N, as specified this section.
   2. Color: As scheduled.

2.04 BRICK UNITS

A. Facing Brick: ASTM C216, Type FBS, Grade SW.
   1. Manufacturer and color: Sioux City Brick "Cranberry" / Sioux City Brick "Sedona Ironspot" as indicated on Drawings.
   2. Nominal size: Utility.
   3. Special shapes: Molded units as required by conditions indicated, unless standard units can be sawn to produce equivalent effect.
   4. Compressive strength: 8,000 psi, measured in accordance with ASTM C67.

B. Mortar for facing brick:
   1. As specified this section.
   2. Color: As selected by Architect.

2.05 MORTAR AND GROUT MATERIALS

A. Portland Cement: ASTM C150/C150M, Type I; color as required to produce approved color sample.
   1. Not more than 0.60 percent alkali.

B. Hydrated Lime: ASTM C207, Type S.

C. Mortar Aggregate: ASTM C144.

D. Grout Aggregate: ASTM C404.

E. Pigments for Colored Mortar: Pure, concentrated mineral pigments specifically intended for mixing into mortar and complying with ASTM C979.
   1. Color(s): As selected by Architect from manufacturer's full range.
   2. Manufacturers:
      a. Quickrete Wisconsin, Inc.
      b. Prism Pigments.
      c. Mortar Technologies.

F. Water: Clean and potable.

G. Accelerating Admixture: Nonchloride type for use in cold weather.

H. Integral Water Repellent Admixture for Mortar and Grout: Polymeric liquid or powder admixture added to mortar and grout at the time of manufacture.
   1. Use only in combination with masonry units manufactured with integral water repellent admixture.
   2. Use only water repellent admixture for mortar and grout from the same manufacturer as water repellent admixture in masonry units.
   3. Meet or exceed performance specified for water repellent admixture used in masonry units.

2.06 REINFORCEMENT AND ANCHORAGE

A. Manufacturers of Joint Reinforcement and Anchors:
   1. Blok-Lok Limited: www.blok-lok.com.
   2. Hohmann & Barnard, Inc (including Dur-O-Wal brand): www.h-b.com.
   3. WIRE-BOND: www.wirebond.com.
   4. Substitutions: See Section 01 60 00 - Product Requirements.

B. Reinforcing Steel: ASTM A615/A615M, Grade 40 (40,000 psi), deformed billet bars; galvanized.

C. Joint Reinforcement: Use ladder type joint reinforcement where vertical reinforcement is involved and truss type elsewhere, unless otherwise indicated.

D. Single Wythe Joint Reinforcement: Truss or ladder type; ASTM A1064/A1064M steel wire, mill galvanized to ASTM A641/A641M, Class 3; 0.1483 inch side rods with 0.1483 inch cross rods; width as required to provide not more than 1 inch and not less than 1/2 inch of mortar coverage on each exposure.

E. Masonry Veneer Anchors: 2-piece anchors that permit differential movement between masonry veneer and structural backup, hot dip galvanized to ASTM A 153/A 153M, Class B.
   1. Anchor plates: Not less than 0.075 inch thick, designed for fastening to structural backup through sheathing by two fasteners; provide design with legs that penetrate sheathing and insulation to provide positive anchorage.
   2. Wire ties: Manufacturer's standard shape, 0.1875 inch thick.
   3. Vertical adjustment: Not less than 2 inches.

2.07 FLASHINGS

A. Membrane Flashing: 40 mil thick, non-asphalt composite membrane with clear adhesive laminated to polyethylene sheathing.
   1. Manufacturers:
      a. Sandell; Textroflash.
      b. Substitutions: See Section 01 60 00 - Product Requirements.

B. Termination Bar: Minimum 1/8"x1"x12' extruded aluminum bar with prepunched holes for fasteners.

C. Pre-Coated Galvanized Steel Flashing: ASTM A653/A653M, with G90/Z275 coating, 24 gage, 0.0239 inch base metal thickness, shop precoated with fluoropolymer coating in color selected.

2.08 ACCESSORIES

A. Preformed Control Joints: Neoprene material. Provide with corner and tee accessories, fused joints.
   1. Manufacturers:
      a. Blok-Lok Limited; NS: www.blok-lok.com.
      b. Hohmann & Barnard, Inc (including Dur-O-Wal brand); NS: www.h-b.com.
      c. WIRE-BOND: www.wirebond.com.
      d. Substitutions: See Section 01 60 00 - Product Requirements.

B. Joint Filler: Closed cell neoprene; oversized 50 percent to joint width; self expanding; 3 inch wide x by maximum lengths available.
   1. Manufacturers:
      a. Hohmann & Barnard, Inc (including Dur -O-Wal brand); NS: www.h-b.com.
      b. WIRE-BOND: www.wirebond.com.
      c. Substitutions: See Section 01 60 00 - Product Requirements.

C. Cavity Mortar Control: Semi-rigid polyethylene or polyester mesh panels, sized to thickness of wall cavity, and designed to prevent mortar droppings from clogging weeps and cavity vents and allow proper cavity drainage.
   1. Mortar Diverter: Semi-rigid mesh designed for installation at flashing locations.
      a. Manufacturers:
         1) Advanced Building Products Inc; Mortar Break: www.advancedflashing.com.
         2) Mortar Net Solutions; MortarNet: www.mortarnet.com.
         3) _____.
         4) Substitutions: Not permitted.

D. Building Paper: ASTM D226/D226M, Type I ("No.15") asphalt felt.

E. Weeps and Vents:
   1. Type: Molded polyethylene.
      a. Manufacturers:
         1) Blok-Lok Limited; Cellvent: www.blok-lok.com.
         2) Hohmann & Barnard, Inc; Quadrovent: www.h-b.com.
         3) WIRE-BOND; Cell Vent: www.wirebond.com.

4) Substitutions: Not permitted.

F. Cleaning Solution: Factory formulated brick washing solution of type recommended by brick manufacturer. Dilutions of plain muriatic acid are not acceptable.
1. Prosoco; product "Sure Klean 600". Use "Vana Trol" on stain sensitive brick.
2. EaCo Chem; product "NMD80".
3. Diedrich Technologies, Inc.; product "202 Detergent." Use "202V Vana Stop" on stain sensitive brick.

G. Stone Cleaning Products: Factory formulated washing solution recommended for use with natural stone masonry.
1. Masonry Pre-Wash: 707X Limestone Cleaner Pre-Rinse by Diedrich Technologies or 766 Limestone and Masonry Pre-Wash by ProSoCo.
2. Masonry Cleaner: SureKlean Limestone Restorer by ProSoCo.
3. Masonry Neutralizer: 707N Limestone Neutralizer After-Rinse by Diedrich Technologies or SureKlean Limestone & Masonry After-Wash by ProSoCo.
4. Substitutions: See Section 01 60 00 - Product Requirements.

2.09 LINTELS

A. Steel lintels as specified in section 05 50 00 - Metal Fabrications.

2.10 MORTAR AND GROUT MIXES

A. Mortar for Unit Masonry: ASTM C270, using the Proportion Specification.
1. Exterior, loadbearing masonry: Type N.
2. Exterior, non-loadbearing masonry: Type N.
3. Interior, loadbearing masonry: Type N.

B. Colored Mortar: Provide colored mortar for all exposed to view masonry. Proportion selected pigments and other ingredients to match Architect's sample, without exceeding manufacturer's recommended pigment-to-cement ratio.

C. Grout: ASTM C476; consistency required to fill completely volumes indicated for grouting; fine grout for spaces with smallest horizontal dimension of 2 inches or less; coarse grout for spaces with smallest horizontal dimension greater than 2 inches.

D. Admixtures: Add to mixture at manufacturer's recommended rate and in accordance with manufacturer's instructions; mix uniformly.

E. Mixing: Use mechanical batch mixer and comply with referenced standards.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that field conditions are acceptable and are ready to receive masonry.

B. Verify that related items provided under other sections are properly sized and located.

C. Verify that built-in items are in proper location, and ready for roughing into masonry work.

3.02 PREPARATION

A. Direct and coordinate placement of metal anchors supplied for installation under other sections.

3.03 COLD AND HOT WEATHER REQUIREMENTS

A. Comply with requirements of ACI 530/530.1/ERTA or applicable building code, whichever is more stringent.

3.04 COURSING

A. Establish lines, levels, and coursing indicated. Protect from displacement.

B. Maintain masonry courses to uniform dimension. Form vertical and horizontal joints of uniform thickness.

C. Concrete Masonry Units:
1. Bond: Stack or Running, as indicated and as appropriate for reinforcting.

2. Mortar Joints: Flush.

D. Brick Units:
1. Bond: As indicated for different locations.
2. Mortar Joints: Concave.

3.05 PLACING AND BONDING

A. Lay solid masonry units in full bed of mortar, with full head joints, uniformly jointed with other work.

B. Buttering corners of joints or excessive furrowing of mortar joints is not permitted.

C. Remove excess mortar and mortar smears as work progresses.

D. Remove excess mortar with water repellent admixture promptly. Do not use acids, sandblasting or high pressure cleaning methods.

E. Interlock intersections and external corners.

F. Return veneer to within 1/2" of exterior sheathing at window and door openings.

G. Do not shift or tap masonry units after mortar has achieved initial set. Where adjustment must be made, remove mortar and replace.

H. Perform job site cutting of masonry units with proper tools to provide straight, clean, unchipped edges. Prevent broken masonry unit corners or edges.

I. Isolate masonry partitions from vertical structural framing members with a control joint as indicated.

J. Isolate top joint of masonry partitions from horizontal structural framing members and concrete slabs or decks with compressible joint filler.

K. Isolate horizontal elements that project through the plane of the masonry with compressible joint filler.

3.06 WEEPS/CAVITY VENTS

A. Install weeps in veneer and cavity walls at 24 inches on center horizontally above through-wall flashing, above shelf angles and lintels, and at bottom of walls.

3.07 CAVITY MORTAR CONTROL

A. Do not permit mortar to drop or accumulate into cavity air space or to plug weep/cavity vents.

B. Install cavity mortar diverter at base of cavity and at other flashing locations as recommended by manufacturer to prevent mortar droppings from blocking weep/cavity vents.

3.08 REINFORCEMENT AND ANCHORAGE - GENERAL

A. Unless otherwise indicated on drawings or specified under specific wall type, install horizontal joint reinforcement 16 inches on center.

B. Place masonry joint reinforcement in first and second horizontal joints above and below openings. Extend minimum 16 inches each side of opening.

C. Place continuous joint reinforcement in first and second joint below top of walls.

D. Lap joint reinforcement ends minimum 6 inches.

3.09 REINFORCEMENT AND ANCHORAGE - MASONRY VENEER

A. Stud Back-Up: Secure veneer anchors to stud framed back-up and embed into masonry veneer at maximum 16 inches on center vertically and 16 inches on center horizontally. Place additional anchors at perimeter of openings and ends of panels, so maximum spacing of anchors is 8 inches on center.

3.10 MASONRY FLASHINGS

A. Whether or not specifically indicated, install masonry flashing to divert water to exterior at all locations where downward flow of water will be interrupted.

1. Extend flashings full width at such interruptions and at least 6 inches into adjacent masonry or turn up at least 8 inches to form watertight pan at non-masonry construction.
2. Remove or cover protrusions or sharp edges that could puncture flashings.
3. Seal lapped ends and penetrations of flashing before covering with mortar.

B. Extend metal flashings through exterior face of masonry and turn down to form drip. Install joint sealer below drip edge to prevent moisture migration under flashing.

C. Lap rubberized asphalt flashing over metal flashing and extend up wall 4" minimum.
1. Cut back 3/4" from exterior face of wall to prevent asphalt from extruding through wall.
2. Terminate turned up edges of membrane on vertical walls under building wrap and secure with cap nails.
3. Where building wrap does not occur, use termination bar with bead of mastic.

D. Lap end joints of flashings at least 6 inches and seal watertight with flashing sealant/adhesive.

3.11 LINTELS

A. Install loose steel lintels over openings.

B. Maintain minimum 8 inch bearing on each side of opening.

3.12 GROUTED COMPONENTS

A. Lap splices minimum 24 bar diameters.

B. Support and secure reinforcing bars from displacement. Maintain position within 1/2 inch of dimensioned position.

C. Place and consolidate grout fill without displacing reinforcing.

3.13 CONTROL AND EXPANSION JOINTS

A. Whether or not specifically indicated, install control and expansion joints in accordance with the following, and as recommended by the National Concrete Masonry Association and the Brick Industry Association.

B. Do not continue horizontal joint reinforcement through control or expansion joints.

C. At CMU construction install preformed control joint device in continuous lengths. Seal butt and corner joints in accordance with manufacturer's instructions.

D. Control joint locations:
1. At changes in wall height.
2. At movement joints in adjacent foundations, floors and roofs.
3. At door and window openings:
   a. On one side of openings less than 6 feet wide.
   b. On both sides of openings wider than 6 feet.
4. Place at a spacing of 1 1/2 times the wall height for walls without openings.
5. For walls less than 4 feet high place at 12-14 feet on center.

E. At brick veneer form joint as follows:
1. Form expansion joints as wall is built. Extend to top of brickwork, including parapets.
2. Install preformed foam or neoprene pad full depth of wythe; hold back from outer face of veneer 3/8" for sealant.
3. Install sealant. Minimum sealant depth 1/4".

F. Vertical Expansion joint locations:
1. At or near corners.
2. At offsets and setbacks.
3. At wall intersections.
4. At changes in wall height.
5. Where wall backing system changes.
6. Where support of brick veneer changes.

G. Horizontal Expansion joint locations:
1. At elements that are rigidly attached to the structural frame and project into the veneer.

H. Install sheet building paper or polyethylene bond breaker at horizontal junction of dissimilar masonry materials; i.e. between clay masonry and concrete masonry units.

3.14 BUILT-IN WORK

A. As work progresses, install built-in metal door frames and other items to be built into the work and furnished under other sections.

B. Install built-in items plumb, level, and true to line.

3.15 TOLERANCES

A. Maximum Variation from Alignment of Columns: 1/4 inch.

B. Maximum Variation From Unit to Adjacent Unit: 1/16 inch.

C. Maximum Variation from Plane of Wall: 1/4 inch in 10 ft and 1/2 inch in 20 ft or more.

D. Maximum Variation from Plumb: 1/4 inch per story non-cumulative; 1/2 inch in two stories or more.

E. Maximum Variation from Level Coursing: 1/8 inch in 3 ft and 1/4 inch in 10 ft; 1/2 inch in 30 ft.

F. Maximum Variation of Mortar Joint Thickness: Head joint, minus 1/4 inch, plus 3/8 inch.

G. Maximum Variation from Cross Sectional Thickness of Walls: 1/4 inch.

3.16 CLEANING

A. Remove excess mortar and mortar droppings.

B. Replace defective mortar. Match adjacent work.

C. Clean soiled surfaces with cleaning solution.

D. Use non-metallic tools in cleaning operations.

END OF SECTION

SECTION 05 12 00
STRUCTURAL STEEL

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Structural steel framing members, support members.

B. Grouting under base plates.

1.02 RELATED REQUIREMENTS

A. Section 05 50 00 - Metal Fabrications: Steel fabrications and loose lintels.

B. Section 07 81 00 - Applied Fireproofing: Alternate fireproof protection to framing systems.

C. Section 09 21 16 - Gypsum Board Assemblies: Fire protection of steel framing.

1.03 REFERENCE STANDARDS

A. AISC (MAN) - Steel Construction Manual; American Institute of Steel Construction, Inc.; 2011.

B. AISC S303 - Code of Standard Practice for Steel Buildings and Bridges; American Institute of Steel Construction, Inc.; 2010.

C. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2014.

D. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless; 2012.

E. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2015.

F. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2009.

G. ASTM A307 - Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength; 2014.

H. ASTM A325 - Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength; 2014.

I. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes; 2013.

J. ASTM A563 - Standard Specification for Carbon and Alloy Steel Nuts; 2007a (Reapproved 2014).

K. ASTM A992/A992M - Standard Specification for Structural Steel Shapes; 2011 (Reapproved 2015).

L. ASTM C1107/C1107M - Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink); 2014.

M. ASTM F436 - Standard Specification for Hardened Steel Washers; 2011.

N. ASTM F1554 - Standard Specification for Anchor Bolts, Steel, 36, 55, and 105-ksi Yield Strength; 2007a.

O. AWS D1.1/D1.1M - Structural Welding Code - Steel; American Welding Society; 2011 w/Errata.

P. RCSC (HSBOLT) - Specification for Structural Joints Using High-Strength Bolts; Research Council on Structural Connections; 2009.

Q. SSPC-Paint 20 - Zinc-Rich Primers (Type I, "Inorganic," and Type II, "Organic"); Society for Protective Coatings; 2002 (Ed. 2004).

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Shop Drawings:

1. Indicate profiles, sizes, spacing, locations of structural members, openings, attachments, and fasteners.
2. Connections not detailed.

1.05 QUALITY ASSURANCE

A. Fabricate structural steel members in accordance with AISC "Steel Construction Manual."

B. Comply with Section 10 of AISC "Code of Standard Practice for Steel Buildings and Bridges" for architecturally exposed structural steel.

C. Fabricator: Company specializing in performing the work of this section with minimum three years of documented experience.

PART 2 PRODUCTS

2.01 MATERIALS

A. Steel Angles, Plates, and Channels: ASTM A36/A36M.

B. Steel W Shapes and Tees: ASTM A992/A992M.

C. Rolled Steel Structural Shapes: ASTM A992/A992M.

D. Cold-Formed Structural Tubing: ASTM A500/A500M, Grade B.

E. Pipe: ASTM A53/A53M, Grade B, Finish galvanized.

F. Structural Bolts and Nuts: Carbon steel, ASTM A307, Grade A galvanized to ASTM A 153/A 153M, Class C. Use at wood construction or temporary connections only.

G. High-Strength Structural Bolts, Nuts, and Washers: ASTM A325 or ASTM A325M, Type 1, medium carbon, galvanized, with matching compatible ASTM A563 or ASTM A563M nuts and ASTM F436 washers.

H. Welding Materials: AWS D1.1/D1.1M; type required for materials being welded.

I. Grout: Non-shrink, non-metallic aggregate type, complying with ASTM C1107/C1107M and capable of developing a minimum compressive strength of 7,000 psi at 28 days.

J. Shop and Touch-Up Primer: Fabricator's standard, complying with VOC limitations of authorities having jurisdiction.

K. Touch-Up Primer for Galvanized Surfaces: Fabricator's standard, complying with VOC limitations of authorities having jurisdiction.

2.02 FABRICATION

A. Shop fabricate to greatest extent possible.

B. Fabricate connections for bolt, nut, and washer connectors.

2.03 FINISH

A. Prepare structural component surfaces in accordance with SSPC SP 3.

B. Interior Members: Shop prime. Do not prime surfaces that will be field welded or in contact with concrete.

C. Exterior Members: Galvanize structural steel members to comply with ASTM A123/A123M. Provide minimum 1.7 oz/sq ft galvanized coating.

PART 3 EXECUTION

3.01 ERECTION

A. Erect structural steel in compliance with AISC "Code of Standard Practice for Steel Buildings and Bridges".

B. Allow for erection loads, and provide sufficient temporary bracing to maintain structure in safe condition, plumb, and in true alignment until completion of erection and installation of permanent bracing.

C. Field weld components indicated on shop drawings.

D. Use carbon steel bolts only for temporary bracing during construction, unless otherwise specifically permitted on drawings. Install high-strength bolts in accordance with RCSC "Specification for Structural Joints Using High-Strength Bolts".

E. Do not field cut or alter structural members without approval of Architect.

F. After erection, prime welds, abrasions, and surfaces not shop primed, except surfaces to be in contact with concrete.

G. Grout solidly between column plates and bearing surfaces, complying with manufacturer's instructions for nonshrink grout. Trowel grouted surfaces smooth, splaying neatly to 45 degrees.

3.02 TOLERANCES

A. Maximum Variation From Plumb: 1/4 inch per story, non-cumulative.

B. Maximum Offset From True Alignment: 1/4 inch.

END OF SECTION

SECTION 05 40 00
COLD-FORMED METAL FRAMING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Formed steel stud exterior wall framing.

1.02 RELATED REQUIREMENTS

A. Section 07 25 00 - Weather Barriers: Weather barrier over sheathing.

B. Section 09 21 16 - Gypsum Board Assemblies: Gypsum-based sheathing.

1.03 REFERENCE STANDARDS

A. AISI S100-12 - North American Specification for the Design of Cold-Formed Steel Structural Members; American Iron and Steel Institute; 2012.

B. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2009.

C. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2015.

D. ASTM C955 - Standard Specification for Load-Bearing (Transverse and Axial) Steel Studs, Runners (Tracks), and Bracing or Bridging for Screw Application of Gypsum Panel Products and Metal Plaster Bases; 2011c.

E. ASTM C1007 - Standard Specification for Installation of Load Bearing (Transverse and Axial) Steel Studs and Related Accessories; 2011a.

F. SSPC-Paint 20 - Zinc-Rich Primers (Type I, "Inorganic," and Type II, "Organic"); Society for Protective Coatings; 2002 (Ed. 2004).

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordinate with work of other sections that is to be installed in or adjacent to the metal framing system, including but not limited to structural anchors, cladding anchors, utilities, insulation, and firestopping.

1.05 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data on standard framing members; describe materials and finish, product criteria, limitations .

C. Product Data: Provide manufacturer's data on factory-made framing connectors, showing compliance with requirements.

D. Shop Drawings: Indicate component details, framed openings, bearing, anchorage, loading, welds, and type and location of fasteners, and accessories or items required of related work.
   1. Provide design engineer's stamp on shop drawings.
   2. Provide calculations for loadings and stresses of specially fabricated framing, stamped by a Professional Structural Engineer.

E. Manufacturer's Installation Instructions: Indicate special procedures, conditions requiring special attention .

1.06 QUALITY ASSURANCE

A. Designer Qualifications: Design framing system under direct supervision of a Professional Structural Engineer experienced in design of this Work and licensed in Wisconsin.

PART 2 PRODUCTS

2.01 FRAMING SYSTEM

A. Provide primary and secondary framing members, bridging, bracing, plates, gussets, clips, fittings, reinforcement, and fastenings as required to provide a complete framing system.

B. Design Criteria: Provide completed framing system having the following characteristics:
   1. Design: Calculate structural characteristics of cold-formed steel framing members according to AISI S100-12.
   2. Structural Performance: Design, engineer, fabricate, and erect to withstand specified design loads for project conditions within required limits.
   3. Design Loads: As indicated on Drawings and in accordance with applicable codes.
   4. Live load deflection meeting the following, unless otherwise indicated:
      a. Floors: Maximum vertical deflection under live load of 1/480 of span.
      b. Roofs: Maximum vertical deflection under live load of 1/240 of span.
      c. Exterior Walls: Maximum horizontal deflection under 70% of design service wind load of l/600 for brick backing up brick; l/360 for brick backing up other materials.
      d. Design non-axial loadbearing framing to accommodate not less than 1/2 in vertical deflection.
   5. Able to tolerate movement of components without damage, failure of joint seals, undue stress on fasteners, or other detrimental effects when subject to seasonal or cyclic day/night temperature ranges.
   6. Able to accommodate construction tolerances, deflection of building structural members, and clearances of intended openings.

2.02 FRAMING MATERIALS

A. Studs and Track: ASTM C955; studs formed to channel, "C", or "Sigma" shape with punched web; U-shaped track in matching nominal width and compatible height.
   1. Gage and Depth: As required to meet specified performance levels while maintaining maximum depths indicated on Drawings.
      a. The following minimum thicknesses shall be maintained:
         1) Studs backing brick: 18 ga. (43 mils).
         2) Studs providing vertical support of brick with welded brick ledges: 12 ga. (97 mil).
         3) Studs backing other materials: 20 ga. (33 mil).
   2. Galvanized in accordance with ASTM A653/A653M, G90/Z275 coating.

B. Joists and Purlins: Fabricated from ASTM A653/A653M steel sheet, with G90/Z275 hot dipped galvanized coating.
   1. Base Metal: As required to meet specified performance levels within maximum depths indicated.
   2. Gage and Depth: As required to meet specified performance levels within maximum depths indicated.

C. Composite Floor Deck: Fluted steel sheet embossed to interlock with concrete:
   1. Galvanized Steel Sheet: ASTM A653/A653M, Structural Steel (SS) Grade 33/230, with G90/Z275 galvanized coating.
   2. Minimum Base Metal Thickness: 22 gage, 0.0299 inch.
   3. Nominal Height: 1-1/2 inches.

D. Framing Connectors: Factory-made, formed steel sheet.
   1. Material: ASTM A653/A653M SS Grade 33 and 40 (minimum), with G90/Z275 hot dipped galvanized coating for base metal thickness less than 10 gage, 0.1345 inch, and factory punched holes and slots.
   2. Structural Performance: Maintain load and movement capacity required by applicable code, when evaluated in accordance with AISI S100-12.
   3. Movement Connections: Provide mechanical anchorage devices that accommodate movement using slotted holes, shouldered screws or screws and anti-friction or stepped bushings, while maintaining structural performance of framing. Provide movement connections where indicated on drawings.
   4. Fixed Connections: Provide non-movement connections for tie-down to foundation, floor-to-floor tie-down, roof-to-wall tie-down, joist hangers, gusset plates, and stiffeners.

2.03 WALL SHEATHING

A. As specified in Section 09 21 16 - Gypsum Board Assemblies.

2.04 ACCESSORIES

A. Bracing, Furring, Bridging: Formed sheet steel, thickness determined for conditions encountered; finish to match framing components.

B. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20, Type I - Inorganic, complying with VOC limitations of authorities having jurisdiction.

C. Water-Resistive Barrier: As specified in Section 07 25 00.

2.05 FASTENERS

A. Self-Drilling, Self-Tapping Screws, Bolts, Nuts and Washers: Hot dip galvanized per ASTM A153/A153M.

B. Anchorage Devices: Powder actuated, Drilled expansion bolts, and Screws with sleeves.

PART 3 EXECUTION

3.01 INSTALLATION OF STUDS

A. Install components in accordance with manufacturers' instructions and ASTM C1007 requirements.

B. Align floor and ceiling tracks; locate to wall layout. Secure in place with fasteners at maximum 24 inches on center. Coordinate installation of sealant with floor and ceiling tracks.

C. Place studs at 16 inches on center; not more than 2 inches from abutting walls and at each side of openings. Connect studs to tracks using clip and tie, fastener or welding method.

D. Construct corners using minimum of three studs. Install double studs at wall openings, door and window jambs.

E. Install studs full length in one piece. Splicing of studs is not permitted.

F. Install load bearing studs, brace, and reinforce to develop full strength and achieve design requirements.

G. Coordinate placement of insulation in multiple stud spaces made inaccessible after erection.

H. Install intermediate studs above and below openings to align with wall stud spacing.

I. Provide deflection allowance in stud track, directly below horizontal building framing at non-load bearing framing.

J. Attach cross studs to studs for attachment of fixtures anchored to walls.

K. Install framing between studs for attachment of mechanical and electrical items, and to prevent stud rotation.

3.02 WALL SHEATHING

A. Wall Sheathing: Secure with long dimension perpendicular to wall studs, with ends over firm bearing and staggered, using self-tapping screws.

3.03 TOLERANCES

A. Maximum Variation from True Position: 1/8 inch.

B. Maximum Variation of any Member from Plane: 1/8 inch.

END OF SECTION

SECTION 05 50 00
METAL FABRICATIONS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Shop fabricated steel items, including:
   1. Loose lintels.
   2. Bollards.
   3. Grating.
   4. Ladders.
   5. Alternating tread devices.
   6. Canopy frames.

1.02 RELATED REQUIREMENTS

A. Section 09 91 13 - Exterior Painting: Paint finish.

1.03 REFERENCE STANDARDS

A. ANSI A14.3 - American National Standard for Ladders -- Fixed -- Safety Requirements; 2008.

B. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2014.

C. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless; 2012.

D. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2015.

E. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2009.

F. ASTM A283/A283M - Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates; 2013.

G. ASTM A325 - Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength; 2014.

H. ASTM A325M - Standard Specification for Structural Bolts, Steel, Heat Treated 830 MPa Minimum Tensile Strength (Metric); 2014.

I. ASTM A501/A501M - Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing; 2014.

J. ASTM A1011/A1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength; 2014.

K. AWS D1.1/D1.1M - Structural Welding Code - Steel; American Welding Society; 2011 w/Errata.

L. SSPC-Paint 15 - Steel Joist Shop Primer/Metal Building Primer; Society for Protective Coatings; 1999 (Ed. 2004).

M. SSPC-Paint 20 - Zinc-Rich Primers (Type I, "Inorganic," and Type II, "Organic"); Society for Protective Coatings; 2002 (Ed. 2004).

N. SSPC-SP 2 - Hand Tool Cleaning; Society for Protective Coatings; 1982 (Ed. 2004).

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Shop Drawings: Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories. Include erection drawings, elevations, and details where applicable.

PART 2 PRODUCTS

2.01 MATERIALS - STEEL

A. Steel Sections: ASTM A 36/A 36M.

B. Steel Tubing: ASTM A501/A501M hot-formed structural tubing.

C. Plates: ASTM A 283.

D. Pipe: ASTM A 53/A 53M, Grade B Schedule 40, black finish.

E. Bolts, Nuts, and Washers: ASTM A 325 (ASTM A 325M), Type 1, galvanized to ASTM A 153/A 153M where connecting galvanized components.

F. Welding Materials: AWS D1.1/D1.1M; type required for materials being welded.

G. Shop and Touch-Up Primer: SSPC-Paint 15, complying with VOC limitations of authorities having jurisdiction.

H. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20, Type I - Inorganic, complying with VOC limitations of authorities having jurisdiction.

2.02 FABRICATION

A. Fit and shop assemble items in largest practical sections, for delivery to site.

B. Fabricate items with joints tightly fitted and secured.

C. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.

D. Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.

2.03 FABRICATED ITEMS

A. Grating: Welded steel; 1 1/4 inch x 3/16 inch, with steel angle supports, prime paint finish.

B. Ladders: Steel; in compliance with ANSI A14.3; with mounting brackets and attachments; prime paint finish.
   1. Side Rails: 3/8 x 2 inches members spaced at 20 inches.
   2. Rungs: one inch diameter solid round bar spaced 12 inches on center.
   3. Space rungs 7 inches from wall surface.

C. Bollards: Steel pipe, concrete filled, crowned cap, with bolt down base plate; prime paint finish.

D. Loose Lintels: As scheduled; galvanized finish.

E. Elevator Hoistway Beams: Beam sections; prime paint finish.

2.04 DECORATIVE BALCONY FRAMES

A. Fabricated decorative steel balcony frames: As detailed on Drawings.
   1. Channels: MC12x10.6

B. Associated fasteners and anchors.

C. Finish: Galvanized.

2.05 ROOF AND CANOPY FABRICATIONS

A. Trash enclosure(s) support structure, columns and door frames.

B. Building canopy frames.

C. Shapes: As detailed on Drawings.

D. Associated knife plates, fasteners and anchors.

E. Finish: Galvanized.

2.06 PREFABRICATED LADDERS

A. Prefabricated Alternating Tread Device: Welded metal unit complying with ANSI A14.3; factory fabricated to greatest degree practical and in the largest components possible.
   1. Components: Manufacturer's standard rails, rungs, treads, handrails. returns, platforms and safety devices complying with the requirements of the MATERIALS article of this section.
   2. Materials: Carbon steel; ASTM A1011/A1011M, Grade 36, minimum.
   3. Finish: Powder coat; color to be selected by Architect from manufacturer's standard range.
   4. Products:
      a. Lapayre Stair, Inc..
      b. Substitutions: See Section 01 60 00 - Product Requirements.

2.07 FINISHES - STEEL

A. Prime paint steel items.

B. Prepare surfaces to be primed in accordance with SSPC-SP2.

C. Clean surfaces of rust, scale, grease, and foreign matter prior to finishing.

D. Prime Painting: One coat.

E. Galvanizing of Exterior Steel Members: Galvanize after fabrication to ASTM A123/A123M requirements. Provide minimum 1.7 oz/sq ft galvanized coating.

END OF SECTION

SECTION 05 51 00
METAL STAIRS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Stairs with concrete treads.

B. Structural steel stair framing and supports.

1.02 RELATED REQUIREMENTS

A. Section 03 30 00 - Cast-in-Place Concrete: Concrete fill in stair pans; mesh reinforcement for landings.

B. Section 06 20 00 - Finish Carpentry: Wood handrails.

C. Section 09 91 13 - Exterior Painting: Paint finish.

1.03 REFERENCE STANDARDS

A. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2014.

B. ASTM A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Solution Hardened, and Bake Hardenable; 2015.

C. ASTM A1011/A1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength; 2014.

D. AWS D1.1/D1.1M - Structural Welding Code - Steel; American Welding Society; 2011 w/Errata.

E. SSPC-SP 2 - Hand Tool Cleaning; Society for Protective Coatings; 1982 (Ed. 2004).

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Shop Drawings: Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories.
   1. Include the design engineer's stamp or seal on each sheet of shop drawings.

C. Delegated Design Data: As required by authorities having jurisdiction.

1.05 QUALITY ASSURANCE

A. Structural Designer Qualifications: Professional Structural Engineer experienced in design of this work and licensed in Wisconsin, or personnel under direct supervision of such an engineer.

PART 2 PRODUCTS

2.01 METAL STAIRS - GENERAL

A. Metal Stairs: Provide stairs of the design specified, complete with landing platforms, vertical and horizontal supports, railings, and guards, fabricated accurately for anchorage to each other and to building structure.
   1. Regulatory Requirements: Provide stairs and railings complying with the most stringent requirements of local, state, and federal regulations; where requirements of the contract documents exceed those of regulations, comply with the contract documents.
   2. Structural Design: Provide complete stair and railing assemblies complying with the applicable local code.
   3. Dimensions: As indicated on drawings.
   4. Shop assemble components; disassemble into largest practical sections suitable for transport and access to site.
   5. No sharp or rough areas on exposed travel surfaces and surfaces accessible to touch.
   6. Separate dissimilar metals using paint or permanent tape.

B. Metal Jointing and Finish Quality Levels:

1. Commercial: Exposed joints as inconspicuous as possible, whether welded or mechanical; underside of stair not covered by soffit IS considered exposed to view.
    a. Welded Joints: Intermittently welded on back side, filled with body putty, and sanded smooth and flush.
    b. Welds Exposed to View: Ground smooth and flush.
    c. Mechanical Joints: Butted tight, flush, and hairline.
    d. Bolts Exposed to View: Countersunk flat or oval head bolts; no exposed nuts.
    e. Exposed Edges and Corners: Eased to small uniform radius.
    f. Metal Surfaces to be Painted: Sanded or ground smooth, suitable for satin or matte finish.

C. Fasteners: Same material or compatible with materials being fastened; type consistent with design and specified quality level.

D. Anchors and Related Components: Same material and finish as item to be anchored, except where specifically indicated otherwise; provide all anchors and fasteners required.

2.02 METAL STAIRS WITH CONCRETE TREADS

A. Jointing and Finish Quality Level: Commercial, as defined above.

B. Risers: Closed.

C. Treads: Metal pan with field-installed concrete fill.
1. Concrete Depth: 1-1/2 inches, minimum.
2. Tread Pan Material: Steel sheet.
3. Tread Pan Thickness: As required by design; 14 gage, 0.075 inch minimum.
4. Concrete Reinforcement: None.
5. Concrete Finish: For resilient floor covering.

D. Risers: Same material and thickness as tread pans.
1. Nosing Depth: Not more than 1-1/2 inch overhang.
2. Nosing Return: Flush with top of concrete fill, not more than 1/2 inch wide.

E. Stringers: Rolled steel channels.
1. Stringer Depth: 10 inches.
2. End Closure: Sheet steel of same thickness as risers welded across ends.

F. Landings: Same construction as treads, supported and reinforced as required to achieve design load capacity.

G. Finish: Shop- or factory-prime painted.

H. Under Side of Stair: Exposed to view, to be finished same as specified for other exposed to view surfaces.

2.03 HANDRAILS

A. Wall-Mounted Rails: Wood as specified in Section 06 20 00.

2.04 MATERIALS

A. Steel Sections: ASTM A 36/A 36M.

B. Ungalvanized Steel Sheet: Hot- or cold-rolled, except use cold-rolled where finished work will be exposed to view.
1. Hot-Rolled Steel Sheet: ASTM A1011/A1011M, Designation CS (commercial steel).
2. Cold-Rolled Steel Sheet: ASTM A1008/A1008M, Designation CS (commercial steel).

C. Concrete Fill: Portland cement Type I, 3000 psi 28 day strength, 2 to 3 inch slump.

2.05 SHOP FINISHING

A. Clean surfaces of rust, scale, grease, and foreign matter prior to finishing.

B. Do not prime surfaces in direct contact with concrete or where field welding is required.

C. Prime Painting: Use specified shop- and touch-up primer.
1. Preparation of Steel: In accordance with SSPC-SP 2, Hand Tool Cleaning.

2. Number of Coats: One.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install components plumb and level, accurately fitted, free from distortion or defects.

B. Allow for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.

C. Provide welded field joints where specifically indicated on drawings. Perform field welding in accordance with AWS D1.1/D1.1M.

D. Other field joints may be either welded or bolted provided the result complies with the limitations specified for jointing quality levels.

E. Obtain approval prior to site cutting or creating adjustments not scheduled.

F. After erection, prime welds, abrasions, and surfaces not shop primed or galvanized, except surfaces to be in contact with concrete.

G. Paint all surfaces.

END OF SECTION

SECTION 05 73 00
DECORATIVE METAL RAILINGS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Cable railing and guardrail assemblies.

1.02 REFERENCE STANDARDS

A. ASTM A555/A555M - Standard Specification for General Requirements for Stainless Steel Wire and Wire Rods; 2005 (Reapproved 2009).

B. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2010.

C. ASTM E935 - Standard Test Methods for Performance of Permanent Metal Railing Systems and Rails for Buildings; 2000 (Reapproved 2006).

D. AWS C 3.4/C3.4M - Specification for Torch Brazing; 2007.

E. AWS C 3.5/C 3.5M - Specification for Induction Brazing; 2007.

F. AWS C 3.9/C 3.9M - Specification for Resistance Brazing; 2009.

G. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2010.

H. AWS D1.6 - Structural Welding Code - Stainless Steel; 1999.

1.03 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Submit manufacturer's product data including description of materials, components, finishes, fabrication details, glass, anchors, and accessories.

C. Shop Drawings: Indicate railing system elevations and sections, details of profile, dimensions, sizes, connection attachments, anchorage, size and type of fasteners, and accessories. Indicate anchor and joint locations, brazed connections, transitions, and terminations.

D. Test Reports: Submit test reports from an independent testing agency showing compliance with specified design and performance requirements.

PART 2 PRODUCTS

2.01 RAILING SYSTEMS

A. Railings - General: Factory or shop-fabricated in design indicated, to suit specific project conditions, and for proper connection to building structure, and in largest practical sizes for delivery to site.
   1. Design Criteria: Design and fabricate railings and anchorages to resist the following loads without failure, damage, or permanent set; loads do not need to be applied simultaneously.
      a. Lateral Force: 75 lb minimum, at any point, when tested in accordance with ASTM E935.
      b. Distributed Load: 50 pounds per foot minimum, applied in any direction at the top of the handrail, when tested in accordance with ASTM E935.
      c. Concentrated Loads on Intermediate Rails: 50 pounds per square ft, minimum.
      d. Concentrated Load: 200 pounds minimum, applied in any direction at any point along the handrail system, when tested in accordance with ASTM E935.
   2. Welded Joints: Make exposed joints butt tight, flush, and hairline; use methods that avoid discoloration and damage of finish; grind smooth, polish, and restore to required finish.
      a. Ease exposed edges to small uniform radius.
      b. Welded Joints:

B. Cable Railing System:
   1. Description: Post and cable railing system with top bottom and mid-rail as shown on drawings.

2. Aluminum Tube Frame: Minimum wall thickness of 0.127 inch; ASTM B429/B429M, ASTM B241/B241M, or ASTM B483/B483M.
    a. Corner and Intermediate Post: 2 inch square tube.
    b. Handrail (where required): 1-1/2 inch outside diameter.
    c. Top Rail: 2 inch square.
    d. Bottom Rail: 2 inch x 1 1/2" tube.
3. Cable: ASTM A555/555M.
    a. Fabricate from ASTM A666 stainless steel, Type 316.
    b. Size: 3/16 inch diameter.
    c. Type: 1x19.
4. Fittings: Type 316 stainless steel.
    a. Ronstan type ABS1 threaded terminal adjusters.
    b. Type A double adjustable or Type B single adjustable as appropriate for cable length.
    c. Bushings and angled bushings as required at intermediate posts and stair railings.
    d. Substitutions: See Section 01 60 00 - Product Requirements.
5. Fasteners: Stainless steel.
6. Finishes:
    a. Aluminum Pipe and Tubing: Powder coated, color as selected from full range.

2.02 ACCESSORIES

A. Anchors and Fasteners: Provide anchors and other materials as required to attach to structure, made of same materials as railing components unless otherwise indicated; where exposed fasteners are unavoidable provide flush countersunk fasteners.
    1. For anchorage to concrete, provide inserts to be cast into concrete for bolting anchors.
    2. For anchorage to masonry, provide brackets to be embedded in masonry for bolting anchors.

B. Finish Touch-Up Materials: As recommended by manufacturer for field application.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that substrate and site conditions are acceptable and ready to receive work.

B. Verify field dimensions of locations and areas to receive work.

C. Notify Architect immediately of conditions that would prevent satisfactory installation.

D. Do not proceed with work until detrimental conditions have been corrected.

E. Furnish components to be installed in other work to installer of that other work, including but not limited to blocking, sleeves, inserts, anchor bolts, embedded plates and supports for attachment of anchors.

3.02 PREPARATION

A. Locate required blocking in wood framing for installation by others.

B. Review installation drawings before beginning installation. Coordinate diagrams, templates, instructions and directions for installation of anchorages and fasteners.

C. Clean surfaces to receive units. Remove materials and substances detrimental to the installation.

3.03 INSTALLATION

A. Install components plumb and level, accurately fitted, free from distortion or defects and with tight joints, except where necessary for expansion.

B. Anchor securely to structure.

C. Conceal anchor bolts and screws whenever possible. Where not concealed, use flush countersunk fastenings.

3.04 CLEANING

A. Remove protective film from exposed metal surfaces.

B. Metal: Clean exposed metal finishes with potable water and mild detergent, in accordance with manufacturer recommendations; do not use abrasive materials or chemicals, detergents or other substances that may damage the material or finish.

3.05 PROTECTION

A. Protect installed components and finishes from damage after installation.

B. Repair damage to exposed finishes to be indistinguishable from undamaged areas.
   1. If damage to finishes and components cannot be repaired to be indistinguishable from undamaged finishes and components, replace damaged items.

END OF SECTION

SECTION 05 73 10

ALUMINUM PICKET RAILINGS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Aluminum picket guard rails at locations indicated on Drawings.

RELATED SECTIONS

A. Section 05 73 00 - Decorative Metal Railings: Cable railings.

1.02 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Shop Drawings: Show layout, dimension, spacings, and anchorage; include field measured dimensions of spaces where railings are to be installed, if critical to proper fit.

1.03 DELIVERY, STORAGE, AND HANDLING

A. Store products in manufacturer's unopened packaging until ready for installation.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Acceptable Manufacturer: Superior Aluminum Products.

B. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 HANDRAILS AND GUARDS

A. Guard Rails: Extruded aluminum, picket style with intermediate rail(s) as shown on Drawings.
   1. Design Criteria: ICC International Building Code, 2009.
   2. Style: Vertical picket style with three top rails, as shown on Drawings.
   3. Posts: 2-1/2 inches square, 1/8 inch wall thickness.
   4. Top Rail: 2 1/2 inches wide x 1 5/8" high..
   5. Bottom Rail: 1 5/8" wide x 3/4" high.
   6. Intermediate Rails: 1 5/8" wide x 3/4" high.
   7. Pickets: 3/4 inch square.
   8. Picket Spacing: 4 1/2 inches on center.

B. At exterior stairs provide handrail of same construction as guard mounted at 34" above plane of stair nosings. Where adjacent grade is more than 30" below the walking surface, provide guard at 42" high.

C. At retaining walls indicated on site plan, provide guard of construction specified above, min. 42 inches high.

PART 3 EXECUTION

3.01 PREPARATION

A. Clean surfaces thoroughly prior to installation.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

C. Install additional blocking as required to secure assembly.

3.02 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Anchor railings securely, in accordance with conditions of design criteria.

3.03 PROTECTION

A. Protect installed products until completion of project.

B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION

SECTION 06 10 00
ROUGH CARPENTRY

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Structural dimension lumber framing.

B. Exposed timber canopy framing.

C. Tongue and groove wood soffit boards.

D. Tongue and groove wood decking.

E. Non-structural dimension lumber framing.

F. Rough opening framing for doors, windows, and roof openings.

G. Sheathing.

H. Alternate: Zip System wall sheating and tape as an alternate to standard sheathing and mechanically fastened weather barrier.

I. Roof-mounted curbs.

J. Roofing nailers.

K. Preservative treated wood materials.

L. Fire retardant treated wood materials. (Use where indicated on Drawings.)

M. Miscellaneous framing and sheathing.

N. Communications and electrical room mounting boards.

O. Concealed wood blocking, nailers, and supports.

1.02 RELATED REQUIREMENTS

A. Section 06 15 10 - Wood-Polymer Composite Decking.

B. Section 06 17 53 - Shop-Fabricated Wood Trusses.

C. Section 07 25 00 - Weather Barriers: Water-resistive barrier over sheathing.

1.03 REFERENCE STANDARDS

A. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2009.

B. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2015.

C. ASTM D2898 - Standard Test Methods for Accelerated Weathering of Fire-Retardant-Treated Wood for Fire Testing; 2010.

D. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2015a.

E. AWPA U1 - Use Category System: User Specification for Treated Wood; American Wood Protection Association; 2012.

F. PS 2 - Performance Standard for Wood-Based Structural-Use Panels; National Institute of Standards and Technology, U.S. Department of Commerce; 2010.

G. PS 20 - American Softwood Lumber Standard; National Institute of Standards and Technology, Department of Commerce; 2010.

H. SPIB (GR) - Grading Rules; Southern Pine Inspection Bureau, Inc.; 2014.

I. WWPA G-5 - Western Lumber Grading Rules; Western Wood Products Association; 2011.

1.04 DELIVERY, STORAGE, AND HANDLING

A. General: Cover wood products to protect against moisture. Support stacked products to prevent deformation and to allow air circulation.

B. Fire Retardant Treated Wood: Prevent exposure to precipitation during shipping, storage, or installation.

PART 2 PRODUCTS

2.01 GENERAL REQUIREMENTS

A. Dimension Lumber: Comply with PS 20 and requirements of specified grading agencies.
   1. If no species is specified, provide any species graded by the agency specified; if no grading agency is specified, provide lumber graded by any grading agency meeting the specified requirements.
   2. Grading Agency: Any grading agency whose rules are approved by the Board of Review, American Lumber Standard Committee (www.alsc.org) and who provides grading service for the species and grade specified; provide lumber stamped with grade mark unless otherwise indicated.

B. **Engineered Wall Plates**:
   1. Use engineered (LSL) wall plates for all walls indicated on Wood Bearing Wall Schedule.
   2. Kneewalls used to extend walls at dropped precast plank shall use LSL plates.
   3. All LSL plates installed before building enclosure is complete shall be treated or coated to prevent moisture absorption.
   4. All LSL plates installed in contact with concrete shall be zinc-borate treated.

2.02 DIMENSION LUMBER FOR CONCEALED APPLICATIONS

A. Sizes: Nominal sizes as indicated on drawings, S4S.

B. Moisture Content: Kiln-dry or MC15.

C. Stud Framing (2 by 2 through 2 by 6):
   1. Species: SPF, unless otherwise scheduled.
   2. Grade: As indiated on Wood Bearing Wall Schedule.

D. Joist, Rafter, Small Beam, and wall plates Framing (2 by 6 through 4 by 16):
   1. Species: SPF, unless otherwise scheduled.
   2. Grade: No. 2.

E. Miscellaneous Framing, Blocking, Nailers, Grounds, and Furring:
   1. Lumber: S4S, No. 2 or Standard Grade.
   2. Boards: Standard or No. 3.

2.03 EXPOSED DIMENSION LUMBER

A. Grading Agency: Southern Pine Inspection Bureau, Inc. (SPIB).

B. Sizes: Nominal sizes as indicated on drawings.

C. Surfacing: S4S.

D. Sizes: Nominal sizes as indicated on drawings, S4S.

E. **Moisture Content:** KDAT - Kiln Dried After Treatment; MC19**.**

F. Joist, Rafter, and Small Beam Framing (2 by 6 through 4 by 16):
   1. Species: SYP.
   2. Grade: No. 1.

2.04 LAMINATED VENEER LUMBER (LVL)

A. Laminated Veneer Lumber is indicated on drawings as LVL or Microlam.

B. Laminated Veneer Lumber shall conform to the following design stresses:
   1. Modulus of elasticity: E= 1.9 x 10^6 psi.
   2. Flexural stress: Fb= 2600 psi
   3. Tension parallel to grain: Ft= 1550 psi
   4. Compression perpendicular to grain: Fc= 750 psi
   5. Compression parallel to grain: Fcll= 2510 psi
   6. Horizontal shear: Fv= 285 psi

2.05 LAMINATED STRAND LUMBER (LSL)

A. Laminated Strand Lumber is indicated on drawings as LSL or Timberstrand.

B. Laminated Strand Lumber shall conform to the following design stresses:
   1. Modulus of elasticity: E= 1.3 x 106 psi.
   2. Flexural stress: Fb= 1700
   3. Compression perpendicular to grain: Fc= 750 psi
   4. Compression parallel to grain: Fcll= 2350 psi
   5. Horizontal shear: Fv= 250 psi

2.06 PARALLEL STRAND LUMBER (PSL)

A. Parallel Strand Lumber is indicated on drawings as PSL or Parallam.

B. Parallel Strand Lumber shall conform to the following design stresses:
   1. Modulus of elasticity: E= 2.0 x 106 psi.
   2. Flexural stress: Fb= 2900 psi
   3. Tension parallel to grain: Ft= 2025 psi
   4. Compression perpendicular to grain: Fc= 750 psi
   5. Compression parallel to grain: Fcll= 2900 psi
   6. Horizontal shear: Fv= 290 psi

2.07 TIMBERS

A. Grading Agency: Western Wood Products Association (WWPA).

B. Sizes: Nominal sizes as indicated on drawings, S4S.

C. Moisture Content: Kiln-dry (15 percent maximum).

D. Beams and Posts 5 inches and over in thickness:
   1. Species: Western Cedars.
   2. Grade: No. 2 and Better Structural.

2.08 SOFFIT BOARDS

A. Moisture Content: Kiln-dry (15 percent maximum).

B. Surfacing: S4S.

C. Species: Western Cedar.

D. Grade: Appearance B Clear.

2.09 EXPOSED DECK BOARDS

A. Submit manufacturer's certificate that products meet or exceed specified requirements, in lieu of grade stamping.

B. Moisture Content: Kiln-dry (15 percent maximum).

C. Surfacing: S4S.

D. Species: Douglas Fir or Southern Pine.

E. Grade: Select.

2.10 CONSTRUCTION PANELS

A. Subfloor/Underlayment Combination: Any PS 2 type, rated Single Floor.
   1. Bond Classification: Exposure 1.
   2. Span Rating: 24.
   3. Performance Category: 23/32 PERF CAT.
   4. Edges: Tongue and groove.

B. Roof Sheathing: Oriented strand board wood structural panel; PS 2.
   1. Grade: Sheathing.
   2. Bond Classification: Exposure 1.
   3. Thickness and Span Rating: As indicated on Drawings.

C. Wall Sheathing, For General Applications: Any PS 2 type.
   1. Bond Classification: Exposure 1.
   2. Grade: Sheathing.
   3. Span Rating: 24.
   4. Performance Category: 7/16 PERF CAT.
   5. Edge Profile: Square edge.

D. Wall Sheathing, For Shear Walls: Oriented strand board wood structural panel; PS 2.
   1. Grade: Structural 1 Sheathing.
   2. Bond Classification: Exposure 1.
   3. Performance Category: 7/16.
   4. Span Rating: 24/16.
   5. Edges: Square.
   6. Provide fastening guide on top panel surface with separate markings indicating fastener spacing for 16 inches and 24 inches on center, respectively.

2.11 ACCESSORIES

A. Fasteners and Anchors:
   1. Metal and Finish: Hot-dipped galvanized steel per ASTM A 153/A 153M for high humidity and preservative-treated wood locations, unfinished steel elsewhere.
   2. For contact with preservative treated wood in exposed locations, fasteners shall be stainless steel or G-185 galvanized steel per ASTM A-153.

B. Die-Stamped Connectors: Hot dipped galvanized steel, sized to suit framing conditions.
   1. For contact with preservative treated wood in exposed locations, provide minimum G185 galvanizing per ASTM A653/A653M.

C. Joist Hangers: Hot dipped galvanized steel, sized to suit framing conditions.
   1. For contact with preservative treated wood in exposed locations, provide minimum G185 galvanizing per ASTM A653/A653M.

D. Sill Gasket: 1/4 inch thick, plate width, closed cell plastic foam from continuous rolls.

E. Subfloor Glue: Waterproof, air cure type, cartridge dispensed.

2.12 FACTORY WOOD TREATMENT

A. Treated Lumber and Plywood: Comply with requirements of AWPA U1 - Use Category System for wood treatments determined by use categories, expected service conditions, and specific applications.
   1. Fire-Retardant Treated Wood: Mark each piece of wood with producer's stamp indicating compliance with specified requirements.
   2. Preservative-Treated Wood: Provide lumber and plywood marked or stamped by an ALSC-accredited testing agency, certifying level and type of treatment in accordance with AWPA standards.

B. Fire Retardant Treatment:
   1. Manufacturers:
      a. Arch Wood Protection, Inc: www.wolmanizedwood.com.
      b. Hoover Treated Wood Products, Inc: www.frtw.com.
      c. Osmose, Inc: www.osmose.com.
   2. Exterior Type: AWPA U1, Category UCFB, Commodity Specification H, chemically treated and pressure impregnated; capable of providing a maximum flame spread index of 25 when tested in accordance with ASTM E84, with no evidence of significant combustion when test is extended for an additional 20 minutes both before and after accelerated weathering test performed in accordance with ASTM D2898.
      a. Kiln dry wood after treatment to a maximum moisture content of 19 percent for lumber and 15 percent for plywood.
      b. Do not use treated wood in direct contact with the ground.
      c. Use only where designated on Drawings.

3. Interior Type A: AWPA U1, Use Category UCFA, Commodity Specification H, low temperature (low hygroscopic) type, chemically treated and pressure impregnated; capable of providing a maximum flame spread index of 25 when tested in accordance with ASTM E84, with no evidence of significant combustion when test is extended for an additional 20 minutes.
    a. Kiln dry wood after treatment to a maximum moisture content of 19 percent for lumber and 15 percent for plywood.
    b. Treat rough carpentry items as indicated .
    c. Do not use treated wood in applications exposed to weather or where the wood may become wet.

C. Preservative Treatment:
1. Manufacturers:
    a. Arch Wood Protection, Inc: www.wolmanizedwood.com.
    b. Koppers Performance Chemicals, Inc: www.koppersperformancechemicals.com.
    c. Viance, LLC: www.treatedwood.com.
2. Preservative Pressure Treatment of Lumber Above Grade: AWPA U1, Use Category UC3B, Commodity Specification A using waterborne preservative to 0.25 lb/cu ft retention.
    a. Kiln dry lumber after treatment to maximum moisture content of 19 percent.
        1) Treat lumber exposed to weather.
    b. Treat lumber in contact with masonry or concrete.
3. Preservative Pressure Treatment of Lumber in Contact with Soil: AWPA U1, Use Category UC4A, Commodity Specification A using waterborne preservative to 0.4 lb/cu ft retention.
    a. Preservative for Field Application to Cut Surfaces: As recommended by manufacturer of factory treatment chemicals for brush-application in the field.

PART 3 EXECUTION

3.01 PREPARATION

A. Install sill gasket under sill plate of framed walls bearing on foundations; puncture gasket cleanly to fit tightly around protruding anchor bolts.

B. Coordinate installation of rough carpentry members specified in other sections.

3.02 INSTALLATION - GENERAL

A. Select material sizes to minimize waste.

B. Reuse scrap to the greatest extent possible; clearly separate scrap for use on site as accessory components, including: shims, bracing, and blocking.

C. Where treated wood is used on interior, provide temporary ventilation during and immediately after installation sufficient to remove indoor air contaminants.

3.03 FRAMING INSTALLATION

A. Set structural members level, plumb, and true to line. Discard pieces with defects that would lower required strength or result in unacceptable appearance of exposed members.

B. Make provisions for temporary construction loads, and provide temporary bracing sufficient to maintain structure in true alignment and safe condition until completion of erection and installation of permanent bracing.

C. Install structural members full length without splices unless otherwise specifically detailed.

D. Comply with member sizes, spacing, and configurations indicated, and fastener size and spacing indicated, but not less than required by applicable codes.

E. Install horizontal spanning members with crown edge up and not less than 1-1/2 inches of bearing at each end.

F. Construct double joist headers at floor and ceiling openings and under wall stud partitions that are parallel to floor joists; use metal joist hangers unless otherwise detailed.

G. Provide bridging at joists in excess of 8 feet span as detailed. Fit solid blocking at ends of members.

H. Frame wall openings with two or more studs at each jamb; support headers on cripple studs.

3.04 BLOCKING, NAILERS, AND SUPPORTS

A. Provide framing and blocking members as indicated or as required to support finishes, fixtures, specialty items, and trim.

B. In framed assemblies that have concealed spaces, provide solid wood fireblocking as required by applicable local code, to close concealed draft openings between floors and between top story and roof/attic space; other material acceptable to code authorities may be used in lieu of solid wood blocking.

C. In metal stud walls, provide continuous blocking around door and window openings for anchorage of frames, securely attached to stud framing.

D. In walls, provide blocking attached to studs as backing and support for wall-mounted items, unless item can be securely fastened to two or more studs or other method of support is explicitly indicated.

E. Where ceiling-mounting is indicated, provide blocking and supplementary supports above ceiling, unless other method of support is explicitly indicated.

F. Provide the following specific non-structural framing and blocking:
   1. Cabinets and shelf supports.
   2. Handrails.
   3. Grab bars.
   4. Towel and bath accessories.
   5. Wall-mounted door stops.
   6. Joints of rigid wall coverings that occur between studs.

3.05 ROOF-RELATED CARPENTRY

A. Coordinate installation of roofing carpentry with deck construction, framing of roof openings, and roofing assembly installation.

B. Provide wood curb at all roof openings except where specifically indicated otherwise. Form corners by alternating lapping side members.

3.06 INSTALLATION OF CONSTRUCTION PANELS

A. Subflooring/Underlayment Combination: Glue and nail to framing; staples are not permitted.

B. Wall Sheathing: Secure with long dimension perpendicular to wall studs, with ends over firm bearing and staggered, using nails, screws, or staples.
   1. At shear walls all panel joints must occur over stud, wall plate or blocking.

C. Communications and Electrical Room Mounting Boards: Secure with concrete anchors to foundation wall; space fasteners at maximum 24 inches on center on all edges and in field of board.
   1. At fire-rated wood frame walls, install board over wall board indicated as part of the fire-rated assembly.
   2. Install adjacent boards without gaps.

3.07 TOLERANCES

A. Framing Members: 1/4 inch from true position, maximum.

B. Surface Flatness of Floor: 1/8 inch in 10 feet maximum, and 1/4 inch in 30 feet maximum.

C. Variation from Plane (Other than Floors): 1/4 inch in 10 feet maximum, and 1/4 inch in 30 feet maximum.

3.08 CLEANING

A. Waste Disposal: Comply with the requirements of Section 01 74 19 - Construction Waste Management and Disposal.
   1. Comply with applicable regulations.
   2. Do not burn scrap on project site.

3. Do not burn scraps that have been pressure treated.
4. Do not send materials treated with pentachlorophenol, CCA, or ACA to co-generation facilities or “waste-to-energy” facilities.

B. Do not leave any wood, shavings, sawdust, etc. on the ground or buried in fill.

C. Prevent sawdust and wood shavings from entering the storm drainage system.

END OF SECTION

SECTION 06 15 10
WOOD-POLYMER COMPOSITE DECKING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Wood-polymer composite deck planks.

1.02 RELATED SECTIONS

A. Section 06 10 00 - Rough Carpentry: Joists and structural framing.

1.03 DELIVERY, STORAGE, AND HANDLING

A. Store products off the ground, on a flat surface or on blocking spaced not more than 24 inches apart.

PART 2 PRODUCTS

2.01 MANUFACTURER

A. Trex Company, Inc.; Product: Select Decking.

B. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 APPLICATIONS

A. Decking: Wood-composite lumber planks as specified below.
   1. Size: 5/4 inches by 6 inches nominal; 1 inch by 5-1/2 inches actual.
   2. Where framing support spacing is greater than 16 inches on center, use 2x6 nominal decking.
   3. Use the longest lengths available and avoid splicing wherever possible.

2.03 MATERIALS

A. Wood-Polymer Composite Planks:
   1. Color: As selected from manufacturers standard colors.
   2. Shear Strength (ultimate): 1761 psi minimum, when tested in accordance with ASTM D 143.
   3. Compressive Strength Perpendicular (ultimate): 1437 psi minimum, when tested in accordance with ASTM D 198.
   4. Modulus of Elasticity (ultimate): 495,000 psi minimum, when tested in accordance with ASTM D 198.
   5. Nail Pullout Resistance: 163 lbs/in minimum, when tested in accordance with ASTM D 1761 using 2 inch 6d galvanized spiral nails.
   6. Screw Pullout Resistance: 558 lbs/in minimum, when tested in accordance with ASTM D 1761 using 2 inch galvanized self-tapping deck screws with 10 threads per inch.
   7. Flame Spread Index: 60, maximum, when tested in accordance with ASTM E 84.
   8. Flammability: Self ignition temperature of at least 650 degrees F; flash ignition temperature of at least 680 degrees F; when tested in accordance with ASTM D 1929.
   9. Static Coefficient of Friction: 0.52 to 0.54 when dry, and 0.87 to 0.88 when wet; when tested in accordance with ASTM D 2047.
   10. Slip Resistance: 0.70 when dry and 0.64 when wet; when tested in accordance with ASTM F 1679.
   11. Decay Resistance: No decay, when tested in accordance with ASTM D 1413.
   12. Termite Resistance: Rating A, when tested in accordance with AWPA E1.
   13. Water Absorption: 1.3 percent, maximum, when unabraded; 4.6 percent, maximum, when abraded; when tested in accordance with ASTM D 570.
   14. Abrasion Resistance: Maximum of 2.98 grams weight loss when tested in accordance with ASTM D 4060 for 5000 cycles.
   15. Coefficient of Thermal Expansion: 0.000024 inch/inch/degree F, maximum, when tested in accordance with ASTM D 696.

B. Screws: Length as required to penetrate at least 1-1/2 inch into solid backing, except where otherwise required by manufacturer; high quality, hot-dipped galvanized or stainless steel.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install in accordance with manufacturer's instructions, drawing details, and as follows:
   1. Read warranty and comply with all terms necessary to maintain warranty coverage.
   2. Use construction details indicated on drawings.

B. Allow space as specified by manufacturer between planks and ends of planks that butt against structure for thermal movement.

3.02 CLEANING

A. At completion of work, remove debris caused by installation from project site.

B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION

SECTION 06 17 53
SHOP-FABRICATED WOOD TRUSSES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Shop fabricated wood trusses for roof and floor framing.

B. Bridging, bracing, and anchorage.

1.02 RELATED REQUIREMENTS

A. Section 06 10 00 - Rough Carpentry: Installation requirements for miscellaneous framing.

B. Section 06 10 00 - Rough Carpentry: Material requirements for blocking, bridging, plates, and miscellaneous framing.

1.03 REFERENCE STANDARDS

A. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2015.

B. TPI 1 - National Design Standard for Metal Plate Connected Wood Truss Construction; Truss Plate Institute; 2007 and errata (ANSI/TPI 1).

C. TPI DSB-89 - Recommended Design Specification for Temporary Bracing of Metal Plate Connected Wood Trusses; Truss Plate Institute; 1989.

1.04 DESIGN REQUIREMENTS

A. Comply with applicable code for structural loading criteria .

1.05 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Shop Drawings: Show truss configurations, sizes, spacing, size and type of plate connectors, cambers, framed openings, bearing and anchor details, and bridging and bracing.
   1. Include identification of engineering software used for design.
   2. Provide shop drawings stamped or sealed by design engineer.

1.06 QUALITY ASSURANCE

A. Designer Qualifications: Perform design by or under direct supervision of a Professional Structural Engineer experienced in design of this Work and licensed in Wisconsin.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Handle and erect trusses in accordance with TPI BCSI 1.

B. Store trusses in vertical position resting on bearing ends.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Truss Plate Connectors:
   1. Alpine Engineered Products, Inc: www.alpeng.com.
   2. MiTek Industries, Inc: www.mii.com.
   3. Truswal Systems: www.truswal.com.
   4. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 TRUSSES

A. Wood Trusses: Designed and fabricated in accordance with TPI 1 and TPI DSB-89 to achieve structural requirements indicated.

2.03 MATERIALS

A. Lumber:
   1. Moisture Content: Between 7 and 9 percent.
   2. Lumber fabricated from old growth timber is not permitted.

B. Steel Connectors: Hot-dipped galvanized steel sheet, ASTM A653/A653M Structural Steel (SS) Grade 33/230, with G60/Z180 coating; die stamped with integral teeth; thickness as indicatedas required.

C. Truss Bridging: Type, size and spacing recommended by truss manufacturer.

2.04 ACCESSORIES

A. Wood Blocking and Framing for Openings: Softwood lumber, S/P/F species, construction grade, 19 percent maximum and 7 percent minimum moisture content.

B. Fasteners: Plain steel, type to suit application.

2.05 FABRICATION

A. Fabricate trusses to achieve structural requirements specified.

B. Brace wood trusses in accordance with TPI DSB-89 and BCSI 1.

C. Build in flat roof pitches and parapet conditions as detailed on Drawings.

PART 3 EXECUTION

3.01 ERECTION

A. Install trusses in accordance with manufacturer's instructions and TPI DSB-89 and TPI BCSI 1; maintain a copy of each TPI document on site until installation is complete.

B. Set members level and plumb, in correct position.

C. Make provisions for erection loads, and for sufficient temporary bracing to maintain structure plumb, and in true alignment until completion of erection and installation of permanent bracing.

D. Do not field cut or alter structural members without approval of Architect.

E. Install permanent bridging and bracing.

F. Install headers and supports to frame openings required.

G. Frame openings between trusses with lumber in accordance with Section 06 10 00.

H. Coordinate placement of decking with work of this section.

END OF SECTION

SECTION 06 20 00
FINISH CARPENTRY

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Finish carpentry items.

B. Wood casings and moldings.

1.02 RELATED REQUIREMENTS

A. Section 08 11 13 - Hollow Metal Doors and Frames.

B. Section 08 14 16 - Flush Wood Doors.

C. Section 08 71 00: Door Hardware.

D. Section 10 28 00 - Toilet, Bath and Laundry Accessories.

E. Section 12 35 30 - Residential Casework: Shop fabricated cabinet work.

F. Section 12 36 00 - Countertops: Vanity tops and window sills.

1.03 DELIVERY, STORAGE, AND HANDLING

A. Protect work from moisture damage.

PART 2 PRODUCTS

2.01 CASING & BASE MATERIALS

A. Casing: ;
   1. Common Areas: Veneered (Legacy) maple.
      a. Profile: Square; 2 1/4 inches x 9/16 inches.
   2. Within Dwelling Units: Veneered (Legacy) maple.
      a. Profile: Square; 2 1/4 inches x 9/16 inches.
   3. Bifolding Doors: Provide half jamb and casing.

B. Base:
   1. Common Areas: Veneered (Legacy) maple.
      a. Profile: Square; 3 1/4 inches x 7/16 inch.
   2. Within Dwelling Units: Veneered (Legacy) maple.
      a. Profile: Square; 3 1/4 inches x 7/16 inches.

2.02 STAIR STRINGERS

A. Maple (wood) veneered.

2.03 WALL CAPS

A. Wall Caps: Solid maple.

2.04 HANDRAILS

A. Stair Handrails: Maple; 1 5/8 inch x 1 3/4 inch; similar to Ferche F901.

B. Handrail Brackets:
   1. Brackets at stairs shall provide 1 1/2 inch clearance between handrail and wall.
   2. Finish: Match finish specified in section 08 71 00.

2.05 ACCESSORIES

A. Lumber for Shimming, Blocking, and Backing: Softwood lumber of cedar species.

B. Wood Filler: Solvent base, tinted to match surface finish color.

2.06 SHOP FINISHING

A. Sand work smooth.

B. Finish work in accordance with AWI/AWMAC/WI (AWS), Section 5 - Finishing for grade specified and as follows:

1. Transparent:
   a. System - 11, Polyurethane, Catalyzed.
   b. Sheen: Satin.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify adequacy of backing and support framing.

3.02 INSTALLATION

A. Set and secure materials and components in place, plumb and level.

B. Carefully scribe work abutting other components, with maximum gaps of 1/32 inch. Do not use additional overlay trim to conceal larger gaps.

C. Install hardware in accordance with manufacturer's instructions.

D. Set exposed fasteners. Apply wood filler in exposed fastener indentations. Sand work smooth.

3.03 TOLERANCES

A. Maximum Variation from True Position: 1/16 inch.

B. Maximum Offset from True Alignment with Abutting Materials: 1/32 inch.

END OF SECTION

SECTION 07 11 13
BITUMINOUS DAMPPROOFING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Bituminous dampproofing.

B. Drainage panels.

1.02 RELATED REQUIREMENTS

A. 07 13 00 - Sheet Waterproofing: Elevator pit waterproofing.

B. Section 33 46 00 - Subdrainage.

C. Section 07 21 00 - Thermal Insulation: Foundation insulation where drainage panels do not occur.

1.03 REFERENCE STANDARDS

A. ASTM D1187/D1187M - Standard Specification for Asphalt-Base Emulsions for Use as Protective Coatings for Metal; 1997 (Reapproved 2011).

B. ASTM D1227 - Standard Specification for Emulsified Asphalt Used as a Protective Coating for Roofing; 2013.

C. NRCA ML104 - The NRCA Roofing and Waterproofing; National Roofing Contractors Association; Fifth Edition, with interim updates.

1.04 QUALITY ASSURANCE

A. Perform work in accordance with NRCA Roofing and Waterproofing Manual.

B. Installer Qualifications: Company specializing in performing the work of this section with minimum 3 years experience.

PART 2 PRODUCTS

2.01 DAMPPROOFING PRODUCTS

A. Bituminous Dampproofing: Cold-applied water-based emulsion; asphalt with mineral colloid or chemical emulsifying agent; with or without fiber reinforcement; asbestos-free; suitable for application on vertical and horizontal surfaces.
   1. Composition - Vertical Application: ASTM D1227 Type III or ASTM D1187 Type I.
   2. Composition - Horizontal and Low-Slope Application: ASTM D1227 Type II or III.
   3. VOC Content: Not more than permitted by local, State, and federal regulations.
   4. Applied Thickness: 1/16 inch, minimum, wet film.
   5. Products:
      a. W.R. Meadows, Inc.; Sealmastic Emulsion Type I (spray-grade): www.wrmeadows.com.
      b. Tremco Tough-N-Dry H8.
      c. Mar-flex Waterproofing & Building Products; Mar-Flex 5000 WB.
      d. Substitutions: See Section 01 60 00 - Product Requirements.

B. Primers, Mastics, and Related Materials: Type as recommended by dampproofing manufacturer.

2.02 ACCESSORIES

A. Drainage Panel: 2-3/8" R10 fiberglass drain board. Use for below grade application.
   1. Product: WARM-N-DRI manufactured by Owens-Corning.
   2. Thickness: To achieve R value listed on drawings.
   3. Substitutions: See Section 01 60 00 - Product Requirements.

B. Insulation Board: Rigid insulation specified in Section 07 21 00. Use for above grade application in lieu of drainage panel, and on foundation behind masonry veneer.
   1. Extruded polystyrene, thickness indicated on Drawings.

PART 3 EXECUTION

3.01 PREPARATION

A. Protect adjacent surfaces not designated to receive dampproofing.

B. Clean and prepare surfaces to receive dampproofing in accordance with manufacturer's instructions.

C. Do not apply dampproofing to surfaces unacceptable to manufacturer.

D. Apply mastic to seal penetrations, small cracks, or minor honeycomb in substrate.

3.02 APPLICATION

A. Seal tie holes with asphalt based mastic.

B. Patch all voids, cracks and honeycombed areas with non-shrink grout.

C. Prime surfaces in accordance with manufacturer's instructions.

D. Apply bitumen by spray application.

E. Apply from 2 inches below finish grade elevation down to top of footings.

F. Seal items projecting through dampproofing surface with mastic. Seal watertight.

G. Place drainage panel directly over dampproofing, butt joints, place to encourage drainage downward.

H. Scribe and cut around projections, penetrations, and interruptions.

I. Install rigid insulation on foundation stem wall above grade.

END OF SECTION

SECTION 07 13 00
SHEET WATERPROOFING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Sheet membrane waterproofing at elevator pit.

B. Protection boards.

1.02 RELATED REQUIREMENTS

1.03 REFERENCE STANDARDS

A. ASTM D412 - Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers-Tension; 2006a (Reapproved 2013).

B. ASTM D570 - Standard Test Method for Water Absorption of Plastics; 1998 (Reapproved 2010).

C. ASTM D882 - Standard Test Method for Tensile Properties of Thin Plastic Sheeting; 2012.

D. ASTM D903 - Standard Test Method for Peel or Stripping Strength of Adhesive Bonds; 1998 (Reapproved 2010).

E. ASTM D1876 - Standard Test Method for Peel Resistance of Adhesives (T-Peel Test); 2008,

F. ASTM D1970/D1970M - Standard Specification for Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection; 2013.

G. ASTM D5385/D5385M - Standard Test Method for Hydrostatic Pressure Resistance of Waterproofing Membranes; 1993 (Reapproved 2014).

H. ASTM D6506 - Standard Specification for Asphalt Based Protection for Below-Grade Waterproofing; 2001 (Reapproved 2009).

I. ASTM E96/E96M - Standard Test Methods For Water Vapor Transmission of Materials; 2014.

J. ASTM E154/E154M - Standard Test Methods for Water Vapor Retarders Used in Contact with Earth Under Concrete Slabs, on Walls, or as Ground Cover; 2008a (Reapproved 2013).

1.04 FIELD CONDITIONS

A. Maintain ambient temperatures above 40 degrees F for 24 hours before and during application and until liquid or mastic accessories have cured.

PART 2 PRODUCTS

2.01 MEMBRANE MATERIALS

A. Self-Adhered Modified Bituminous Membrane:
   1. Thickness: 60 mil (0.060 inch).
   2. Tensile Strength:
      a. Film: 5000 pounds per square inch, minimum, measured according to ASTM D882 and at grip-separation rate of 2 inches per minute.
      b. Membrane: 325 pounds per square inch, minimum, measured according to ASTM D412 Method A, using die C and at spindle-separation rate of 2 inches per minute.
   3. Elongation at Break: 300 percent, minimum, measured according to ASTM D412.
   4. Water Vapor Permeance: 0.05 perm, maximum, measured in accordance with ASTM E96/E96M.
   5. Low Temperature Flexibility: Unaffected when tested according to ASTM D1970 at minus 20 degrees F, 180 degree bend on 1 inch mandrel.
   6. Peel Strength: 7 pounds per inch, minimum, when tested according to ASTM D903.
   7. Lap Adhesion Strength: 5 pounds per inch, minimum, when tested according to ASTM D1876.
   8. Puncture Resistance: 50 pounds, minimum, measured in accordance with ASTM E154/E154M.

9. Water Absorption: 0.1 percent increase in weight, maximum, measured in accordance with ASTM D570, 24 hour immersion.
10. Hydrostatic Resistance: Resists the weight of 200 feet when tested according to ASTM D5385/D5385M.
11. Adhesives, Sealants, Tapes, and Accessories: As recommended by membrane manufacturer.
12. Manufacturers:
    a. Carlisle Coatings & Waterproofing Incorporated; MiraDRI 860/861: www.carlisle-ccw.com.
    b. Grace Construction Products; Bituthene 3000: www.na.graceconstruction.com.
    c. Henry Company; Blueskin WP 200: www.henry.com.
    d. W.R. Meadows, Inc; MEL-ROL: www.wrmeadows.com.
    e. Substitutions: See Section 01 60 00 - Product Requirements.

B. Self-Adhered HDPE Sheet Membrane with Weather-Resistant Coating: Recommended by manufacturer for placement below concrete slabs and on outside face of below grade walls before placement of concrete.
1. Adhesives, Sealants, Tapes, and Accessories: As recommended by membrane manufacturer.
2. Manufacturers:
    a. Grace Construction Products; Preprufe 300R: www.na.graceconstruction.com.

2.02 ACCESSORIES

A. Protection Board: Type capable of preventing damage to waterproofing due to backfilling and construction traffic.
1. Use one of the following:
    a. Polystyrene foam board, 1/4 inch thick.
    b. Multi-layer internally-reinforced asphaltic panels, 1/8 inch thick, nominal, complying with ASTM D6506.

PART 3 EXECUTION

3.01 PREPARATION

A. Do not apply waterproofing to surfaces unacceptable to membrane manufacturer.

B. Fill non-moving joints and cracks with a filler compatible with waterproofing materials.

C. Surfaces for Adhesive Bonding: Apply surface conditioner at a rate recommended by manufacturer. Protect conditioner from rain or frost until dry.

3.02 INSTALLATION - MEMBRANE

A. Install membrane waterproofing in accordance with manufacturer's instructions.

B. Roll out membrane. Minimize wrinkles and bubbles.

C. Blind-side waterproofing: Install on prepared surface in accordance with manufacturer's instructions.

D. Self-Adhering Membrane: Remove release paper layer. Roll out on substrate with a mechanical roller to encourage full contact bond.

E. Overlap edges and ends and seal by method recommended by manufacturer, minimum 3 inches. Seal permanently waterproof.

F. Reinforce membrane with multiple thickness of membrane material over joints, whether joints are static or dynamic.

G. Weather lap joints on sloped substrate in direction of drainage. Seal joints and seams.

H. Install flexible flashings. Seal items penetrating through membrane with flexible flashings. Seal watertight to membrane.

I. Seal membrane and flashings to adjoining surfaces. Install termination bar at all edges. Install counterflashing over all exposed edges.

END OF SECTION

SECTION 07 14 00
HOT FLUID-APPLIED WATERPROOFING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Hot fluid applied fabric reinforced membrane waterproofing.

B. Protection course.

C. Drainage course.

1.02 RELATED REQUIREMENTS

A. Section 03 30 00 - Cast-in-Place Concrete: Split slab concrete sloping slab and topping.

B. Section 07 21 00 - Thermal Insulation: Rigid insulation over waterproofing.

1.03 REFERENCE STANDARDS

A. ASTM D412 - Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers-Tension; 2006a (Reapproved 2013).

B. ASTM D746 - Standard Test Method for Brittleness Temperature of Plastics and Elastomers by Impact; 2013.

C. ASTM D4541 - Standard Test Method for Pull-Off Strength of Coatings Using Portable Adhesion Testers; 2009.

D. ASTM E96/E96M - Standard Test Methods For Water Vapor Transmission of Materials; 2014.

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data for membrane and flexible flashings.

C. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

1.05 QUALITY ASSURANCE

A. Membrane Manufacturer Qualifications: Company specializing in waterproofing with 5 years experience.

B. Installer Qualifications: Company specializing in installation of fluid-applied waterproofing with minimum 5 years experience.

1.06 WARRANTY

A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.

B. Provide 10 year manufacturer warranty for waterproofing failing to resist penetration of water .

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Hot-Applied Rubberized Asphalt Waterproofing Manufacturers:
   1. American Hydrotech, Inc: www.hydrotechusa.com.
   2. Barrett Company: www.barrettroofs.com.
   3. Carlisle Coatings & Waterproofing, Inc: www.carlisle-ccw.com.
   4. Henry Company: www.henry.com.
   5. W.R. Meadows, Inc: www.wrmeadows.com.
   6. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 MEMBRANE AND FLASHING MATERIALS

A. Hot-Applied Rubberized Asphalt Waterproofing: Elasticized rubberized asphaltic compound, hot-applied and quick setting.
   1. Suitable for installation over concrete, gypsum board, and plywood substrates.
   2. Ultimate Elongation: 500 percent, minimum, measured in accordance with ASTM D412.

3. Water Vapor Permeance: 0.2 perms, maximum, measured in accordance with ASTM E96/E96M.
4. Reinforcing: Continuous; manufacturer's standard reinforcing fabric, approved for use with specified product.
5. Finished Coating Thickness: 215 mils (0.215 inch), minimum.
6. Adhesion: Greater than 150 psi, measured in accordance with ASTM D4541.
7. Brittleness Temperature: -40 F, measured in accordance with ASTM D746.
8. Provide product with maximum post consumer recycled content permitted by manufacturer.

B. Flexible Flashings: Type recommended by membrane manufacturer.

2.03 ACCESSORIES

A. Surface Conditioner: Asphaltic type, compatible with membrane compound; as recommended by membrane manufacturer.

B. Sealant for Joints and Cracks in Substrate: Type compatible with waterproofing material and as recommended by waterproofing manufacturer.

C. Protection Course: Fiberglass reinforced rubberized asphalt sheet.

D. Drainage Composite: Composite drainage system consisting of a three-dimensional, crush-proof, drainage core and a filter fabric.
1. Product: MiraDrain 9000 manufactured by Carlisle.

E. Filter Fabric: UV stabilized, woven, high density polyethylene mat.
1. Roll Width: 12' wide.
2. Unit Weight: 2.5 oz./sq. yd. per ASTM D3775.
3. Tensile Strength Warp/Weft: 110/105 per ASTM D751.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify substrate surfaces are free of frozen matter, dampness, loose particles, cracks, pits, projections, penetrations, or foreign matter detrimental to adhesion or application of waterproofing system.

C. Verify that substrate surfaces are smooth, free of honeycomb or pitting, and not detrimental to full contact bond of waterproofing materials.

3.02 PREPARATION

A. All surfaces shall be dry, smooth, free of depressions, voids, protrusions, clean and free of unapproved curing compounds, form release agents and other surface contaminants.

B. Cast in-place concrete (slab or wall)/Composite deck
1. Poured in place concrete shall be monolithic, smooth, free of voids, spalled areas, laitance, honeycombs, and sharp protrusions.

C. Precast concrete decks
1. Precast units shall be mechanically secured to minimize differential movement and all joints between units shall be grouted.
2. Joints shall be pre-detailed with membrane and fabric reinforcing prior to full membrane application.

D. Substrate cleaning
1. Thoroughly sweep the substrate which is to receive the waterproofing membrane.
2. Substrate shall also be blown clean using an air compressor to remove any remaining loose debris.
3. Final check to determine if concrete has been properly cleaned is to apply a test patch of Monolithic Membrane 6125 to the surface and check its adhesion.

3.03 INSTALLATION

A. Surface conditioner application
   1. Apply the surface conditioner to the concrete using a hand held sprayer evenly at a rate of 300 to 600 SF/gallon (7.4 - 14.7 m2/L) depending on surface texture. Surface conditioner shall "tan" the surface, not blacken it.
   2. Allow sufficient time for the surface conditioner to thoroughly dry prior to the membrane application.

B. Membrane preparation
   1. The membrane shall be heated in double jacketed, oil bath or air jacketed melter with mechanical agitation, specifically designed for the preparation of a rubberized asphalt membrane.

C. Detailing/Flashing
   1. All detailing and flashing shall be done in accordance with the manufacturer's standard guideline details.
   2. All detailing and flashing shall be completed before installing the membrane over the field of the substrate.
   3. Substrate board joints shall be pre-detailed with membrane and fabric reinforcing prior to full membrane application.

D. Membrane Application
   1. Apply the rubberized asphalt membrane at a rate to provide a continuous, monolithic coat of 90 mil minimum (approximately 2.3 mm), into which is fully embedded a layer of the spunbonded polyester fabric reinforcing sheet, followed by another continuous monolithic coat of membrane at an average thickness of 125 mil (approx. 3.2 mm). Total membrane thickness shall be 215 mils average (approx. 5.5 mm), 180 mils minimum.
   2. Overlap fabric reinforcing sheet 1-2 inches (25.4 mm - 50.8 mm) with membrane between sheets.

3.04 PROTECTION LAYER INSTALLATION

A. Protection layer shall be installed as follows:
   1. Embed the protection sheet/ board into the membrane while it is still hot to insure a good bond.
   2. Overlap adjoining sheet edges (dry) a minimum of 2"-3" (50.8 mm - 76.2 mm) to insure complete coverage. Board materials shall not to be overlapped.
   3. The completed membrane/protection assembly shall be covered with subsequent topping materials as soon as possible, within 30 days of membrane installation.

3.05 WATER TEST

A. The deck area or portions thereof shall be water tested by means of electric testing or ponding water to a minimum depth of 2" (50.8 mm) for a period of 48 hours to check the integrity of the membrane installation.

B. VERIFY that the structure can support the deadload weight of a water test before testing.

C. If leaks should occur, the water shall be drained completely and the membrane installation repaired.

3.06 DRAINAGE COURSE

A. General
   1. Contractor shall examine the deck area to be covered with subsequent topping materials in order to insure that all deck areas have received the membrane, the membrane is free of damage, it is properly protected, and all flashing has been properly installed, before placing the insulation.
   2. The drainage course, insulation , and other subsequent topping materials shall be installed as each section is completed.

B. Drainage Course Placement

1. Install drainage course on horizontal and vertical surfaces in accordance with the manufacturer's recommendations.
2. Layout and position drainage course and allow to lay flat. Cut and fit drainage course to perimeter and penetrations.
3. Bond all geotextile overlap edges to adjacent drainage course geotextile with an acceptable adhesive to insure geotextile integrity.
4. Place subsequent topping materials as soon as possible.

C. Insulation Placement
1. Loose lay (horizontal applications) in a staggered manner and tightly butt together all insulation boards. The maximum acceptable opening between insulation boards is 3/8" (9.5 mm). Insulation shall be installed within 3/4" (19 mm) of all projections, penetrations, etc.
2. When multi-layer insulation applications are involved the bottom layer of insulation shall be the thickest layer and shall be a minimum of 2" thick (50.8 mm). All layers shall be installed unadhered to each other and all joints in relation to underlying layers staggered.
3. For vertical, multi-layer applications, second layer of insulation board shall be spot adhered to the protection layer with appropriate adhesive or additional rubberized asphalt membrane.

D. Filter Fabric (Install over rigid insulation at vegetated deck)
1. Install black filter fabric over rigid insulation.
2. Rigid insulation boards shall not be visible through pavers.
3. Black, fabric-covered insulation shall not be left exposed in ambient temperatures greater than or equal to 90°F. Measures to maintain temperatures at insulation surface below 165°F shall be implemented.

3.07 CONCRETE TOPPING INSTALLATION

A. Install concrete topping system to slopes indicated on Drawings.

B. Verify scoring pattern and concrete color(s) prior to installation.

3.08 JOB COMPLETION

A. Contractor and a representative of the membrane manufacturer shall inspect the waterproofing assembly and notify the Architect of any defects. All defects shall be corrected.

B. Clean up all debris and equipment.

END OF SECTION

SECTION 07 21 00
THERMAL INSULATION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Board insulation at cavity wall construction, perimeter foundation wall, and in split-slab construction.

B. Glass fiber batt insulation and vapor retarder in exterior wall construction.

C. Glass fiber batt acoustic insulation.

D. Mineral fiber batt for use as a fireblock where indicated on Drawings.

1.02 RELATED REQUIREMENTS

A. Section 07 11 13 - Bituminous Dampproofing: Fiberglass drainage board on foundation below grade.

B. Section 07 21 19 - Foamed-In-Place Insulation: Wall and box sill insulation; filling of shim spaces and crevices in exterior wall and roof.

C. Section 07 21 26 - Blown Insulation: Blown-in, fibrous insulation in floor and ceiling cavities.

D. Section 07 53 00 - Elastomeric Membrane Roofing: Insulation specified as part of roofing system.

E. Section 07 54 00 - Thermoplastic Membrane (PVC) Roofing: Insulation specified as part of roofing system.

F. Section 07 84 00 - Firestopping: Insulation as part of fire-rated through-penetration assemblies.

G. Section 09 21 16 - Gypsum Board Assemblies: Acoustic insulation inside walls and partitions.

H. Section 22 00 00 - Plumbing: Acoustic insulation at walls containing DWV and roof drain piping.

I. Section 23 00 00 - HVAC: Acoustic insulation in walls enclosing HVAC equipment.

1.03 REFERENCE STANDARDS

A. ASTM C578 - Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation; 2015a.

B. ASTM C665 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing; 2012.

C. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2015a.

D. ASTM E136 - Standard Test Method for Behavior of Materials in a Vertical Tube Furnace At 750 Degrees C; 2012.

1.04 SEQUENCING

A. Sequence work to ensure fireproofing and firestop materials are in place before beginning work of this section.

PART 2 PRODUCTS

2.01 FOAM BOARD INSULATION MATERIALS

A. Extruded Polystyrene Board Insulation: Extruded polystyrene board; ASTM C578; with either natural skin or cut cell surfaces, and the following characteristics:
   1. Flame Spread Index: 75 or less, when tested in accordance with ASTM E84.
   2. Smoke Developed Index: 450 or less, when tested in accordance with ASTM E84.
   3. R-value; 1 inch of material at 72 degrees F: 5, minimum.
   4. Board Thickness: As indicated on Drawings.
   5. Board Edges: Square.
   6. Extruded Polystyrene Insulation Schedule:

Location	Type	Compressive Strength (min.)
Foundation Stem Walls	X	15
Interior SOG	IV	25
Parking Split Slabs	VI	40
Filler at Dropped Plank	IV	25
Pavers on Pedestals	VII	60
Loading Dock Slab	V	100

7. Water Absorption, Maximum: 0.3 percent, by volume.
8. Manufacturers:
   a. Dow Chemical Co: www.dow.com.
   b. Owens Corning Corporation: www.ocbuildingspec.com.
9. Substitutions: See Section 01 60 00 - Product Requirements.

B. Cavity Wall Insulation: Extruded polystyrene board; ASTM C578; with either natural skin or cut cell surfaces, and the following characteristics:
1. Type: ASTM C578, Type IV.
2. Flame Spread Index: 75 or less, when tested in accordance with ASTM E84.
3. Smoke Developed Index: 450 or less, when tested in accordance with ASTM E84.
4. R-value; 1 inch of material at 72 degrees F: 5.6, minimum.
5. Board Size: 15 3/4 x 96 inches.
6. Board Thickness: As indicated on Drawings.
7. Board Edges: Square.
8. Water Absorption, Maximum: 0.1 percent, by volume.
9. Manufacturers:
   a. Dow Chemical Co: Styrofoam Brand Cavitymate Ultra Extruded Polystyrene Foam Insulation: www.dow.com.
10. Substitutions: Not permitted.

2.02 BATT INSULATION MATERIALS

A. Glass Fiber Batt Insulation: Flexible preformed batt or blanket, complying with ASTM C665; friction fit.
1. Combustibility: Non-combustible, when tested in accordance with ASTM E136.
2. Formaldehyde Content: Zero.
3. Thickness:
   a. Exterior Walls: 5 1/2" / R21.
   b. Interior Partitions (Acoustic): Match partition thickness.
4. Facing: Unfaced.
5. Manufacturers:
   a. CertainTeed Corporation: www.certainteed.com.
   b. Johns Manville: www.jm.com.
   c. Knauf Insulation GmbH: www.knaufinsulation.us.
6. Substitutions: See Section 01 60 00 - Product Requirements.

B. Mineral Fiber Batt Insulation: Flexible preformed batt or blanket, complying with ASTM C665; friction fit; unfaced flame spread index of 0 (zero) when tested in accordance with ASTM E84.
1. Smoke Developed Index: 0 (zero), when tested in accordance with ASTM E84.
2. Manufacturers:
   a. Thermafiber, Inc.; SAFB: www.thermafiber.com.

2.03 ACCESSORIES

A. Sheet Vapor Retarder: Clear polyethylene film for above grade application, 6 mil thick.

B. Tape: Bright aluminum self-adhering type, mesh reinforced, 2 inch wide.

C. Adhesive and Sealant for Cavity Wall Insulation: Dow; Great Stuff Pro Gaps & Cracks insulating foam sealant.

PART 3 EXECUTION

3.01 BOARD INSTALLATION AT FOUNDATION PERIMETER

A. Install boards vertically on foundation perimeter.
   1. Butt edges and ends tightly to adjacent boards and to protrusions.

B. Cut and fit insulation tightly to protrusions or interruptions to the insulation plane.

C. Fasten to foundation with powder actuated fasteners.

3.02 BOARD INSTALLATION AT CAVITY WALLS (STYROFOAM ULTRA AIR BARRIER SYSTEM)

A. Apply 2 inch diameter daubs of adhesive at each of the 4 corners of the board with one approximately in the middle of the board.

B. Fit insulation between wall ties and other obstructions with joints staggered providing 1/4 to 1/2 inch spacing at end joints.
   1. Press units firmly against inside wythe of masonry.
   2. Make insulation continuous.

C. Fill all voids between insulation boards with single component insulating foam sealant to provide continuous weather barrier.

D. Cut and fit insulation tightly to protrusions or interruptions to the insulation plane. Remove projections that interfere with placement.

E. Comply with insulation manufacturer's written instructions applicable to products and applications indicated.

F. Install insulation that is undamaged, dry and unsoiled and that has not been left exposed to ice, rain or snow at any time.

G. Extend insulation to envelop entire area to be insulated.

3.03 BATT INSTALLATION

A. Install insulation and vapor retarder in accordance with manufacturer's instructions.

B. Install in exterior wall spaces without gaps or voids. Do not compress insulation.

C. Trim insulation neatly to fit spaces. Insulate miscellaneous gaps and voids.

D. Fit insulation tightly in cavities and tightly to exterior side of mechanical and electrical services within the plane of the insulation.

E. At wood framing, place vapor retarder on warm side of insulation by stapling at 6 inches on center. Lap and seal sheet retarder joints over member face.

F. Tape seal tears or cuts in vapor retarder.

G. Extend vapor retarder tightly to full perimeter of adjacent window and door frames and other items interrupting the plane of the membrane. Tape seal in place.

3.04 ACOUSTIC BATT CEILING INSULATION

A. Completely wrap hvac diffusers, fan boxes, etc. with insulation prior to installing ceiling insulation.

END OF SECTION

SECTION 07 21 19
FOAMED-IN-PLACE INSULATION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Foamed-in-place insulation.
   1. Residential Spaces:
      a. In exterior wall crevices.
      b. In exterior wall at edge of floor and roof trusses.
   2. Commercial Spaces (all first floor exterior walls):
      a. Exterior walls fully insulated with spray foam.
   3. At exposed ends of precast plank of roof deck at roof plaza as detailed.

1.02 REFERENCE STANDARDS

A. ASTM C518 - Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus; 2010.

B. ASTM D2842 - Standard Test Method for Water Absorption of Rigid Cellular Plastics; 2012.

C. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2015a.

D. ASTM E96/E96M - Standard Test Methods for Water Vapor Transmission of Materials; 2014.

E. ASTM E283 - Standard Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen; 2004 (Reapproved 2012).

F. ASTM E2178 - Standard Test Method for Air Permeance of Building Materials; 2013.

1.03 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide product description, insulation properties, overcoat properties, and preparation requirements.

1.04 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products of the type specified in this section, with not less than three years of documented experience.

B. Applicator Qualifications: Company specializing in performing work of the type specified, with minimum three years documented experience.

1.05 REGULATORY REQUIREMENTS

A. Conform to applicable code for flame and smoke limitations.

1.06 FIELD CONDITIONS

A. Do not apply foam when temperature is below that specified by the manufacturer for ambient air and substrate.

PART 2 PRODUCTS

2.01 MATERIALS

A. Foamed-In-Place Insulation: Medium-density, rigid or semi-rigid, closed cell polyurethane foam; foamed on-site, using blowing agent of water or non-ozone-depleting gas.
   1. Aged Thermal Resistance: R-value of 5 (deg F hr sq ft)/Btu, minimum, when tested at 1 inch thickness in accordance with ASTM C518 after aging for 180 days at 41 degrees F.
   2. Water Vapor Permeance: Vapor retarder; 1 perm, maximum, when tested at intended thickness in accordance with ASTM E96/E 96M, desiccant method.
   3. Water Absorption: Less than 2 percent by volume, maximum, when tested in accordance with ASTM D2842.

4. Water Absorption: 1 percent by volume, maximum, when tested in accordance with ASTM D2842.
5. Air Permeance: 0.004 cfm/sq ft, maximum, when tested at intended thickness in accordance with ASTM E2178 or ASTM E283 at 1.5 psf.
6. Compressive Strength: 18-27 psi, when tested in accordance with ASTM D 1621.
7. Density: 1.8-2.2 lb/cu ft, when tested in accordance with ASTM D 1622.
8. Closed Cell Content: At least 90 percent.
9. Surface Burning Characteristics: Flame spread/Smoke developed index of 25/450, maximum, when tested in accordance with ASTM E84.
10. Products:
    a. BASF Corporation; WALLTITE US: www.spf.basf.com.
    b. Bayer MaterialScience; EcoBay CC: www.spf.bayermaterialscience.com.
    c. Demilec LLC; HEATLOK SOY 200: www.demilec.com.
    d. Icynene Inc; Icynene ProSeal MD-C-200v3: www.icynene.com.
    e. Johns Manville; JM Corbond III Closed Cell Spray Polyurethane Foam: www.jm.com.
    f. Rhino Linings Corporation; DuraTite 2.0: www.biobased.rhinolinings.com.
    g. Substitutions: See Section 01 60 00 - Product Requirements.

B. Miscellaneous and small area applicaitons: Froth-pak polyurethane foam by Dow Chemical.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify work within construction spaces or crevices is complete prior to insulation application.

B. Verify that surfaces are clean, dry, and free of matter that may inhibit insulation adhesion.

C. **Verify that water distribution and fire suppression system piping will not be encased in spray foam insulation. If pipes will be located within the spray foam insulation, consult with the Architect before proceeding with installation.**

3.02 PREPARATION

A. Mask and protect adjacent surfaces from over spray or dusting.

B. Warning: Low voltage wiring may be damaged by the insulation curing process. Protect wiring or take other precautions to prevent damage.

C. Determine if manufacturer requires a primer for substrate insulation is to be applied to. Apply primer in accordance with manufacturer's instructions.

3.03 APPLICATION

A. Apply insulation in accordance with manufacturer's instructions.

B. Apply insulation by spray method, to a uniform monolithic density without voids.

C. Apply to thickness required to achieve R value listed on drawings.

D. Apply thermal barrier to cured foam where exposed to occupied space.

END OF SECTION

SECTION 07 21 26
BLOWN INSULATION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Ceiling: Loose insulation pneumatically placed .

1.02 REFERENCE STANDARDS

A. ASTM C764 - Standard Specification for Mineral Fiber Loose-Fill Thermal Insulation; 2011.

B. ASTM C1015 - Standard Practice for Installation of Cellulosic and Mineral Fiber Loose-Fill Thermal Insulation; 2006 (Reapproved 2011)e1.

1.03 SYSTEM DESCRIPTION

A. Materials of This Section: Provide continuity of acoustic isolation at floor/ceiling between dwelling units.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Blown Insulation:
   1. CertainTeed Corporation: www.certainteed.com.
   2. Johns Manville: www.jm.com.
   3. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 MATERIALS

A. Loose Fill Insulation: ASTM C764, glass fiber type, bulk for pneumatic placement.
   1. Installed Thickness: Full depth of truss cavity.

B. Depth Markers: Commercially available depth markers for attachment to trusses.

C. Insulation Netting: Polypropylene fabric mesh, InsulWeb or similar.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that substrate, adjacent materials, and insulation are dry and ready to receive insulation.

B. Verify spaces are unobstructed to allow placement of insulation.

C. Verify that all holes and penetrations in top plates of walls have been sealed.

3.02 PREPARATION

A. Floor Truss Cavities: **Wrap diffuser boxes, fan boxes and other items that will penetrate the ceiling membrane with acoustic insulation; fasten securely in place with tape or adhesive.**

B. Install netting on underside of floor trusses to retain insulation in place.

3.03 INSTALLATION

A. Install insulation and ventilation baffle in accordance with ASTM C1015 and manufacturer's instructions.

B. Completely fill intended spaces. Leave no gaps or voids.

3.04 CLEANING

A. Remove loose insulation residue.

END OF SECTION

SECTION 07 24 00
EXTERIOR INSULATION AND FINISH SYSTEMS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Incidental uses of finish coating applied directly to concrete: Finish on exposed concrete site walls.

1.02 REFERENCE STANDARDS

A. ASTM C1397 - Standard Practice for Application of Class PB Exterior Insulation and Finish Systems (EIFS) and EIFS with Drainage; 2013.

1.03 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data on system materials, product characteristics, performance criteria, and system limitations.

C. Selection Samples: Submit manufacturer's standard range of samples illustrating available coating colors and textures.

D. Manufacturer's Installation Instructions: Indicate preparation required, installation techniques, and jointing requirements.

1.04 QUALITY ASSURANCE

A. Maintain copy of specified installation standard and manufacturer's installation instructions at project site at all times during installation.

B. Installer Qualifications: Company specializing in EIFS work, with minimum three years of documented experience, and approved by manufacturer.

1.05 FIELD CONDITIONS

A. Do not prepare materials or apply EIFS under conditions other than those described in the manufacturer's written instructions.

B. Do not install coatings or sealants when ambient temperature is below 50 degrees F.

1.06 WARRANTY

A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.

B. Provide manufacturer's standard material warranty, covering a period of not less than 5 years.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Basis of Design: Sto Corporation; Stolit Acrylic Textured Finish.

B. Manufacturers:
   1. Parex USA, Inc.: www.parex.com.
   2. Sto Corp: www.stocorp.com.
   3. Dryvit Systems, Inc.: www.dryvit.com.

2.02 MATERIALS

A. Finish Coating Top Coat: Water-based, air curing, acrylic or polymer-based finish with integral color and texture.

PART 3 EXECUTION

3.01 GENERAL

A. Install in accordance with EIFS manufacturer's instructions and ASTM C1397.

B. Where different requirements appear in either document, comply with the most stringent.

C. Neither of these documents supercedes the provisions of the Contract Documents that define the contractual relationships between the parties or the scope of work.

3.02 EXAMINATION

A. Verify that substrate is sound and free of oil, dirt, other surface contaminants, efflorescence, loose materials, or protrusions that could interfere with EIFS installation and is of a type and construction that is acceptable to EIFS manufacturer. Do not begin work until substrate and adjacent materials are complete and thoroughly dry.

B. Verify that substrate surface is flat, with no deviation greater than 1/4 in when tested with a 10 ft straightedge.

3.03 PREPARATION

A. Apply primer to substrate as recommended by EIFS manufacturer for project conditions.

3.04 INSTALLATION - FINISH

A. Apply finish coat after primer coat has dried and finish to a uniform texture and color.

B. Finish Coat Thickness: As recommended by manufacturer.

C. Seal control and expansion joints within the field of exterior finish and insulation system, using procedures recommended by sealant and finish system manufacturers.

END OF SECTION

SECTION 07 25 00
WEATHER BARRIERS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Mechanically fastened sheet weather barrier at wood stud wall construction.

B. Liquid or self adhered sheet weather barrier at steel stud wall construction and masonry cavity walls.

1.02 RELATED REQUIREMENTS

A. Section 06 10 00 - Rough Carpentry: Factory applied weather barrier on sheathing as an alternate to mechanically fastened sheet weather barrier specified in this section.

B. Section 07 21 00 - Thermal Insulation: Rigid insulation weather barrier at cavity wall construction.

1.03 REFERENCE STANDARDS

A. AATCC Test Method 127 - Water Resistance: Hydrostatic Pressure Test; 2014.

B. ASTM D1970/D1970M - Standard Specification for Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection; 2013.

C. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2015a.

D. ASTM E96/E96M - Standard Test Methods for Water Vapor Transmission of Materials; 2014.

E. ASTM E2178 - Standard Test Method for Air Permeance of Building Materials; 2013.

F. ICC-ES AC38 - Acceptance Criteria for Water-Resistive Barriers; ICC Evaluation Service, Inc.; 2013.

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Manufacturer's Field Service Reports: Provide site reports from authorized field service representative, indicating observation of weather barrier assembly installation.

1.05 PRE-INSTALLATION MEETING

A. Hold a pre-installation conference, two weeks prior to start of weather barrier installation. Attendees shall include Contractor, Architect, Installer, and Weather Barrier Manufacturer's Designated Representative.

B. Review all related project requirements and submittals, status of substrate work and preparation, areas of potential conflict and interface, availability of weather barrier assembly materials and components, installer's training requirements, equipment, facilities and scaffolding, and coordinate methods, procedures and sequencing requirements for full and proper installation, integration and protection.

PART 2 PRODUCTS

2.01 WEATHER BARRIER MATERIALS (WATER VAPOR PERMEABLE AND AIR AND WATER-RESISTIVE)

A. Weather Barrier Sheet, Mechanically Fastened:
   1. Air Permeance: 0.004 cubic feet per minute per square foot, maximum, when tested in accordance with ASTM E2178.
   2. Water Vapor Permeance: 5 perms, minimum, when tested in accordance with ASTM E96/E96M Procedure A (desiccant procedure).
   3. Water Penetration Resistance: Withstand a water head of 21 inches, minimum, for minimum of 5 hours, when tested in accordance with AATCC 127.
   4. Ultraviolet and Weathering Resistance: Approved in writing by manufacturer for minimum of 6 months weather exposure.

5. Surface Burning Characteristics: Flame spread index of 25 or less, and smoke developed index of 50 or less, when tested in accordance with ASTM E84.
6. Products:
   a. DuPont Building Innovations; Tyvek Commercial Wrap with FlexWrap NF and StraightFlash: www.dupont.com.
   b. Fiberweb, Inc; Typar MetroWrap: www.typar.com.
   c. National Shelter Products, Inc.; DRYLine RainDrain: www.drylinewrap.com.
   d. Kingspan Insulation LLC; GreenGuard MAX Building Wrap: www.trustgreenguard.com.
   e. Substitutions: Not permitted.

B. Air Barrier Sheet, Self-Adhered:
1. Air Permeance: 0.004 cubic feet per minute per square foot, maximum, when tested in accordance with ASTM E2178.
2. Water Vapor Permeance: 10 perms, minimum, when tested in accordance with ASTM E96/E96M Procedure A (desiccant procedure).
3. Water Penetration Resistance Around Nails: Pass, when tested in accordance with ASTM D1970/D1970M (modified).
4. Ultraviolet and Weathering Resistance: Approved in writing by manufacturer for maximum of 150 days weather exposure.
5. Surface Burning Characteristics: Flame spread index of 25 or less, smoke developed index of 450 or less (Class A), when tested in accordance with ASTM E84.
6. Water Resistance: Comply with applicable water-resistive requirements of ICC-ES Acceptance Criteria AC38.
7. Seam and Perimeter Tape: As recommended by sheet manufacturer.
8. Products:
   a. Carlisle Coatings and Waterproofing, Inc.; Fire Resist 705 VP: www.carlisle-ccw.com.
   b. Henry Company; Blueskin VP160: www.henry.com.
   c. Substitutions: See Section 01 60 00 - Product Requirements.

C. Air Barrier Coating:
1. Air Permeance: 0.004 cubic feet per minute per square foot, maximum, when tested in accordance with ASTM E2178.
2. Water Vapor Permeance: 5 perms, minimum, when tested in accordance with ASTM E96/E96M, Procedure B.
3. Ultraviolet and Weathering Resistance: Approved in writing by manufacturer for minimum of 6 months weather exposure.
4. Surface Burning Characteristics: Flame spread index of 25 or less, smoke developed index of 450 or less, when tested in accordance with ASTM E84.
5. Nail Sealability: Pass, when tested in accordance with ASTM D1970/D1970M.
6. Sealants, Tapes and Accessories: As recommended by coating manufacturer.
7. Products:
   a. 3M Company; 3M Liquid Air Barrier 2085VP: www.3M.com/construction.
   b. BASF Corporation; ENERSHIELD-HP: www.enershield.basf.com.
   c. Dow Corning Corporation; Defend Air 200: www.dowcorning.com/construction.
   d. DuPont Building Innovations; Tyvek Fluid Applied WB with Tyvek Fluid Applied Flashing and Joint Compound, Sealant for Tyvek Fluid Applied System and StraightFlash: www.dupont.com.

D. Air Barrier Membrane: (Acceptable alternate to air barrier coating, above)
1. Air Permeance: 0.004 cubic feet per minute per square foot, maximum, when tested in accordance with ASTM E2178.
2. Water Vapor Permeance: 5 perms, minimum, when tested in accordance with ASTM E96/E96M, Procedure B.
3. Ultraviolet and Weathering Resistance: Approved in writing by manufacturer for minimum of 6 months weather exposure.

4. Sealants, Tapes and Accessories: As recommended by coating manufacturer.
5. Products:
   a. Carlisle Coatings and Waterproofing, Inc.; Barritech-VP: www.carlisle-ccw.com.
   b. Grace Construction Products; Perm-A-Barrier VPL: www.graceconstruction.com.
   c. Henry Company; Air-Bloc 33MR: www.henry.com.
   d. Mar-flex Waterproofing & Building Products; Air Barrier 1200VP: www.mar-flex.com.
   e. W.R. Meadows, Inc.; Air-Shield LMP: www.wrmeadows.com.

2.02 ACCESSORIES

A. All accessory materials as specified by weather barrier manufacturer.

B. Flexible Flashing: Self-adhesive sheet flashing complying with ASTM D1970/D1970M, except slip resistance requirement is waived if not installed on a roof.

C. Primers: As recommended by material manufacturer.

D. Fasteners: Cap nails or as recommended by weather barrier manufacturer.

E. Seam Sealing Tape: Adhesive coated polypropylene film.
   1. Products:
      a. Dupont Building Innovations; Tyvek Tape.
      b. Typar; Construction Tape.

PART 3 EXECUTION

3.01 PREPARATION

A. Remove projections, protruding fasteners, and loose or foreign matter that might interfere with proper installation.

B. Clean and prime substrate surfaces to receive flashing in accordance with manufacturer's instructions.

3.02 INSTALLATION

A. Install materials in accordance with manufacturer's instructions.

B. Install continuous water and air tight barrier over surfaces indicated, with sealed seams and with sealed joints to adjacent surfaces.

C. Apply sealants and adhesives within recommended application temperature ranges. Consult manufacturer if temperature is out of this range.

D. Mechanically Fastened Sheets - On Exterior:
   1. Install sheets shingle-fashion to shed water, with seams generally horizontal.
   2. Overlap seams as recommended by manufacturer but at least 6 inches.
   3. Overlap at outside and inside corners as recommended by manufacturer but at least 12 inches.
   4. Attach to framed construction with fasteners extending through sheathing into framing. Space fasteners at 12 to 18 inches on center along each framing member supporting sheathing.
   5. Seal seams, laps, penetrations, tears, and cuts with self-adhesive tape; use only large-headed, gasketed fasteners recommended by the manufacturer.
   6. Where stud framing rests on concrete or masonry, extend lower edge of sheet at least 4 inches below bottom of framing and seal to foundation with sealant.
   7. Install UNDER jamb flashings.
   8. Install head flashings under weather barrier.
   9. At openings to be filled with frames having nailing flanges, wrap excess sheet into opening; at head, seal sheet over flange and flashing.

E. Coatings:
   1. Prepare substrate in manner recommended by coating manufacturer; treat joints in substrate and between dissimilar materials as recommended by manufacturer.
   2. Use flashing to seal to adjacent construction and to bridge joints.

F. Openings and Penetrations in Exterior Weather Barriers:
   1. Install flashing over sills, covering entire sill frame member, extending at least 5 inches onto weather barrier and at least 6 inches up jambs; mechanically fasten stretched edges.
   2. At openings to be filled with frames having nailing flanges, seal head and jamb flanges using a continuous bead of sealant compressed by flange and cover flanges with at least 4 inches wide; do not seal sill flange.
   3. At openings to be filled with non-flanged frames, seal weather barrier to all sides of opening framing, using flashing at least 9 inches wide, covering entire depth of framing.
   4. At head of openings, install flashing under weather barrier extending at least 2 inches beyond face of jambs; seal weather barrier to flashing.
   5. At interior face of openings, seal gap between window/door frame and rough framing, using joint sealant over backer rod.
   6. Service and Other Penetrations: Form flashing around penetrating item and seal to weather barrier surface.

3.03 FIELD QUALITY CONTROL

A. Do not cover installed weather barriers until required inspections have been completed.

B. Obtain approval of installation by the weather barrier manufacturer prior to covering up.

3.04 PROTECTION

A. Do not leave materials exposed to weather longer than recommended by manufacturer.

END OF SECTION

SECTION 07 42 13
METAL WALL PANELS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Manufactured metal panels for walls, with related flashings and accessory components.

1.02 REFERENCE STANDARDS

A. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2015.

1.03 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Shop Drawings: Indicate dimensions, layout, joints, construction details, methods of anchorage.

C. Samples: Submit two samples of wall panel and soffit panel, 18 inch by 24 inch in size illustrating finish color, sheen, and texture.

1.04 MOCK-UP

A. Construct mock-up, 6 feet long by 4 feet high; include panel system, , attachments to building frame, associated vapor retarder and air seal materials, weep drainage system, sealants and seals, related insulation in mock-up.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Protect panels from accelerated weathering by removing or venting sheet plastic shipping wrap.

B. Store prefinished material off ground and protected from weather. Prevent twisting, bending, or abrasion, and provide ventilation to stored materials. Slope metal sheets to ensure drainage.

C. Prevent contact with materials that may cause discoloration or staining of products.

1.06 WARRANTY

A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.

B. Correct defective work within a five year period after the Date of Substantial Completion for degradation of panel finish, including color fading caused by exposure to weather.

PART 2 PRODUCTS

2.01 MANUFACTURED METAL PANELS

A. Wall Panel System: Factory fabricated prefinished metal panel system, site assembled.
   1. Design and size components to withstand dead and live loads caused by positive and negative wind pressure acting normal to plane of wall.
   2. Design Pressure: In accordance with applicable codes.
   3. Movement: Accommodate movement within system without damage to components or deterioration of seals, movement within system; movement between system and perimeter components when subject to seasonal temperature cycling; dynamic loading and release of loads; and deflection of structural support framing.
   4. Sealed joints shall allow free and silent movement of panels during expansion and contraction while preventing uncontrolled penetration of moisture.
   5. Not Permitted: Vibration harmonics; wind whistles; noises caused by thermal movement; thermal movement transmitted to other building elements; loosening, weakening or fracturing of attachments or components of system.
   6. Drainage: Provide positive drainage to exterior for moisture entering or condensation occurring within panel system.
   7. Fabrication: Formed true to shape, accurate in size, square, and free from distortion or defects; pieces of longest practical lengths.

B. Vertical Panels:
   1. Profile: Corrugated; Concealed fastener style.

2. Material: Precoated steel sheet, 22 gage, 0.0299 inch minimum thickness.
3. Panel Coverage: 16 inches.
4. Color: As selected by Architect from manufacturer's standard line.
5. Manufacturer: Morin; Product: Integrity Series, profile S-16.
6. Substitutions: See Section 01 60 00 - Product Requirements.

C. Horizontal Panels:
1. Profile: Horizontal; Concealed fastener style.
2. Material: Precoated steel sheet, 22 gage, 0.0299 inch minimum thickness.
3. Panel Coverage: 12 inches.
4. Color: As selected by Architect from manufacturer's standard line.
5. Manufacturer: Fabral; Product: Silhouette HCF Series, 12 inch series with two unequal ribs.
6. Substitutions: See Section 01 60 00 - Product Requirements.

D. Soffit Panels:
1. Profile: Flush.
2. Material: Precoated steel sheet, 24 gage, .0239 inch minimum thickness.
3. Color: As selected by Architect from manufacturer's standard line.
4. Manufacturer: Fabral; Product: Decor-Flush.
5. Substitutions: See Section 01 60 00 - Product Requirements.

E. Subgirts at Vertical Siding:
1. Minimum 20 ga. steel strapping or hat or z channel as required.
2. Galvanized steel with G90 coating.
3. Spacing as required to meet panel structural requirements.

F. Internal and External Corners: Same material, thickness, and finish as exterior sheets; profile to suit system; shop cut and factory mitered to required angles.

G. Trim: Same material, thickness and finish as exterior sheets; brake formed to required profiles.

H. Anchors: Galvanized steel.

2.02 MATERIALS

A. Precoated Steel Sheet: Hot-dipped galvanized steel sheet, ASTM A653/A653M Structural Steel (SS) or Forming Steel (FS), with G90/Z275 coating; continuous coil-coated on exposed surfaces with specified finish coating and on panel back with specified panel back coating.

2.03 ACCESSORIES

A. Gaskets: Manufacturer's standard type suitable for use with system, permanently resilient; ultraviolet and ozone resistant.

B. Sealants:
1. Exposed Sealant: Elastomeric; silicone, polyurethane, or silyl-terminated polyether/polyurethane.
2. Concealed Sealant: Non-curing butyl sealant or tape sealant.

C. Hidden Joint Sealant: Pressure-sensitive, gray isobutylene compound sealant tape with release-paper backing. Provide permanently elastic, non-sag, non-toxic, non-staining tape 1/8” (3mm) thick and 1” (25mm) wide

D. Butyl Flashing: Dupont StraightFlash; 6" wide rolls.

E. Fasteners: Manufacturer's standard type to suit application; with soft neoprene washers, steel, hot dip galvanized. Fastener cap same color as exterior panel.
1. Metal-to-Metal Fasteners: Self-drilling, self-tapping screws.
2. Products:
a. ITW Commercial Construction North America; Teks Select Series: www.ITWBuildex.com.

F. Field Touch-up Paint: As provided by panel manufacturer.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that building framing members are ready to receive panels.

B. Verify that weather barrier has been installed over substrate completely and correctly.

3.02 PREPARATION

A. At vertical siding, install subgirts or strapping perpendicular to panel length, securely fastened to substrates and shimmed and leveled to uniform plane. Space at intervals indicated.

B. Install butyl flashing tape over subgirts.

3.03 INSTALLATION

A. Install panels on walls in accordance with manufacturer's instructions.

B. Erect panel level and plumb, in proper alignment in relation to substructure framing and established lines; follow SMACNA Architectural Sheet Metal manual and standard practices.

C. Panel anchorage shall be structurally sound

D. Protect surfaces in contact with dissimilar metals with an isolation shim or butyl tape.

E. Fasten panels to structural supports; aligned, level, and plumb.

F. Locate joints over supports. Lap panel ends minimum 2 inches.

G. Seal and place gaskets to prevent weather penetration. Maintain neat appearance.

3.04 CLEANING

A. Remove protective film immediately after installation.

B. Remove site cuttings from finish surfaces.

C. Clean exposed surfaces of panels that are not protected by temporary covering to remove fingerprints and soil during construction period.

D. Clean and wash prefinished surfaces with mild soap and water; rinse with clean water.

E. Protect panels from damage during construction. Use temporary protective coverings where needed as approved by the panel manufacturer.

F. Clean and touch up minor abrasions in finish with air-dried coating that matches color and gloss, and is compatible with, factory–applied finish coating.

END OF SECTION

SECTION 07 53 00
ELASTOMERIC MEMBRANE ROOFING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Elastomeric roofing membrane, adhered conventional application at flat roof.

B. Insulation, flat and tapered.

C. Vapor retarder.

D. Flashings.

E. Roofing stack boots.

1.02 RELATED REQUIREMENTS

A. Section 06 10 00 - Rough Carpentry: Wood nailers and curbs.

B. Section 07 62 00 - Sheet Metal Flashing and Trim: Counterflashings and Coping.

C. Section 07 72 00 - Roof Accessories: Roof hatches.

D. Section 07 54 00 - Thermoplastic Membrane (PVC) Roofing.

E. Section 22 00 00 - Plumbing: Roof Drains.

1.03 REFERENCE STANDARDS

A. ASTM C1289 - Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board; 2014.

B. ASTM D412 - Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers-Tension; 2006a (Reapproved 2013).

C. ASTM D570 - Standard Test Method for Water Absorption of Plastics; 1998 (Reapproved 2010).

D. ASTM D746 - Standard Test Method for Brittleness Temperature of Plastics and Elastomers by Impact; 2013.

E. ASTM D4637/D4637M - Standard Specification for EPDM Sheet Used in Single-Ply Roof Membrane; 2013.

F. FM DS 1-28 - Wind Design; Factory Mutual Research Corporation; 2007.

G. NRCA ML104 - The NRCA Roofing and Waterproofing Manual; National Roofing Contractors Association; Fifth Edition, with interim updates.

H. UL (RMSD) - Roofing Materials and Systems Directory; Underwriters Laboratories Inc.; current edition.

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data indicating membrane materials, flashing materials, insulation, and fasteners.

C. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

1.05 QUALITY ASSURANCE

A. Perform work in accordance with NRCA Roofing and Waterproofing Manual and manufacturer's instructions.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Deliver products in manufacturer's original containers, dry, undamaged, with seals and labels intact.

B. Store products in weather protected environment, clear of ground and moisture.

C. Protect foam insulation from direct exposure to sunlight.

1.07 FIELD CONDITIONS

A. Do not apply roofing membrane during unsuitable weather.

B. Do not apply roofing membrane to damp or frozen deck surface or when precipitation is expected or occurring.

C. Do not expose materials vulnerable to water or sun damage in quantities greater than can be weatherproofed the same day.

1.08 WARRANTY

A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.

B. Provide ten year manufacturer's material and labor warranty to cover failure to prevent penetration of water.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. EPDM Membrane Materials:
   1. Carlisle Roofing Systems, Inc; Sure-Seal EPDM: www.carlisle-syntec.com.
   2. Firestone Building Products, LLC: www.firestonebpco.com.
   3. Versico, a division of Carlisle Construction Materials Inc; VersiGard EPDM: www.versico.com.
   4. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 ROOFING

A. Elastomeric Membrane Roofing: One ply membrane, fully adhered, over insulation.

B. Roofing Assembly Requirements:
   1. Roof Covering External Fire Resistance Classification: UL Class A.
   2. Insulation Thermal Value (R), minimum: 35; provide insulation of thickness required.

C. Acceptable Insulation Types - Constant Thickness Application:
   1. Minimum 2 layers of polyisocyanurate board.

2.03 ROOFING MEMBRANE AND ASSOCIATED MATERIALS

A. Membrane: Ethylene-propylene-diene-terpolymer (EPDM); externally reinforced with fabric; complying with minimum properties of ASTM D4637.
   1. Thickness: 0.060 inch.
   2. Sheet Width: Use largest sheets possible to minimize seams.
   3. Tensile Strength: 1550 psi, measured in accordance with ASTM D412.
   4. Ultimate Elongation: 480 percent, measured in accordance with ASTM D412.
   5. Water Absorption: 2 percent increase in weight, maximum, measured in accordance with ASTM D570, 24 hour immersion.
   6. Brittleness Temperature: -67 deg F., measured in accordance with ASTM D746.

B. Seaming Materials: As recommended by membrane manufacturer.

C. Vapor Retarder: Reinforced Kraft paper laminate complying with requirements of fire rating classification; compatible with roofing and insulation materials.
   1. Vapor retarder required where adhered system installed over concrete substrate.
   2. Fire-retardant adhesive.

D. Flexible Flashing Material: Same material as membrane; conforming to the following:
   1. Thickness: 60 mil.
   2. Tensile Strength: 1,200 psi.
   3. Elasticity: 50 percent with full recovery without set.

2.04 INSULATION

A. Polyisocyanurate cellular foam, complying with ASTM C 1289, Type II, Class 1, cellulose felt or glass fiber mat both faces; Grade 2 and with the following characteristics:

1. Compressive Strength: 20 psi, min.
2. Board Size: 48 x 48 inch for adhered boards; 48 x 96 inch for mechanically attached boards.
3. Tapered Board: Slope as indicated; minimum thickness 1/2 inch; fabricate of fewest layers possible. Maximum thickness 2 1/2". 48 x 48 inch board size.
4. Board Edges: Square.
5. Manufacturers:
   a. GAF; EnergyGuard PolyIso Insulation: www.gaf.com.
   b. Hunter Panels, LLC; H-Shield: www.hpanels.com.
   c. Versico, a division of Carlisle Construction Materials Inc; SecurShield Insulation: www.versico.com.
   d. Johns Maniville: www.jm.com.

2.05 ACCESSORIES

A. Stack Boots: Prefabricated flexible boot and collar for pipe stacks through membrane; same material as membrane.

B. Insulation Fasteners: Appropriate for purpose intended and approved by roofing manufacturer.
   1. Length as required for thickness of insulation material and penetration of deck substrate, with metal washers.

C. Membrane Adhesive: As recommended by membrane manufacturer.

D. Surface Conditioner for Adhesives: Compatible with membrane and adhesives.

E. Thinners and Cleaners: As recommended by adhesive manufacturer, compatible with membrane.

F. Insulation Adhesive: As recommended by insulation manufacturer.

G. Sealants: As recommended by membrane manufacturer.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that surfaces and site conditions are ready to receive work.

B. Verify deck is supported and secure.

C. Verify deck is clean and smooth, flat, free of depressions, waves, or projections, properly sloped and suitable for installation of roof system.

D. Verify deck surfaces are dry and free of snow or ice.

E. Verify that roof openings, curbs, and penetrations through roof are solidly set, and cant strips are in place.

3.02 WOOD DECK PREPARATION

A. Verify flatness and tightness of joints of wood decking. Fill knot holes and surface irregularities with latex filler.

B. Confirm dry deck by moisture meter with 12 percent moisture maximum.

3.03 CONCRETE DECK PREPARATION

A. Verify adjacent precast concrete members do not vary more than 1/4 inch in height. Verify grout keys are filled flush.

B. Fill surface honeycomb and variations with latex filler.

C. Confirm dry deck by moisture meter with 12 percent moisture maximum.

D. Apply vapor retarder to deck surface with adhesive in accordance with manufacturer's instructions.

3.04 INSULATION - UNDER MEMBRANE

A. Apply vapor retarder to deck surface with adhesive in accordance with manufacturer's instructions.

1. Extend vapor retarder under cant strips and blocking to deck edge.
2. Install flexible flashing from vapor retarder to air seal material of wall construction, lap and seal to provide continuity of the air barrier plane.

B. Ensure vapor retarder is clean and dry, continuous, and ready for application of insulation.

C. Attachment of Insulation at wood deck:
1. Mechanically fasten first layer of insulation to deck in accordance with roofing manufacturer's instructions and Factory Mutual requirements.
2. Embed second layer of insulation into full bed of adhesive in accordance with roofing and insulation manufacturers' instructions.

D. Lay subsequent layers of insulation with joints staggered minimum 6 inch from joints of preceding layer.

E. Place tapered insulation to the required slope pattern in accordance with manufacturer's instructions.

F. Lay boards with edges in moderate contact without forcing. Cut insulation to fit neatly to perimeter blocking and around penetrations through roof.

G. Do not apply more insulation than can be covered with membrane in same day.

3.05 MEMBRANE APPLICATION

A. Roll out membrane, free from wrinkles or tears. Place sheet into place without stretching.

B. Shingle joints on sloped substrate in direction of drainage.

C. Fully Adhered Application: Apply adhesive to substrate at rate recommended by manufacturer. Fully embed membrane in adhesive except in areas directly over or within 3 inches of expansion joints. Fully adhere one roll before proceeding to adjacent rolls.

D. Overlap edges and ends and seal seams by contact adhesive, minimum 3 inches. Seal permanently waterproof. Apply uniform bead of sealant to joint edge.

E. At intersections with vertical surfaces:
1. Extend membrane up a minimum of 12 inches or as detailed on drawings onto vertical surfaces.
2. Fully adhere flexible flashing over membrane and up to coping.

F. At gravel stops, extend membrane under gravel stop and to the outside face of the wall.

G. Around roof penetrations, seal flanges and flashings with flexible flashing.

H. Install roofing expansion joints where indicated. Make joints watertight.
1. Install prefabricated joint components in accordance with manufacturer's instructions.

I. Coordinate installation of roof drains and sumps and related flashings.

J. Coordinate installation of associated counterflashings installed under other sections.

3.06 CLEANING

A. Remove bituminous markings from finished surfaces.

B. In areas where finished surfaces are soiled by work of this section, consult manufacturer of surfaces for cleaning advice and conform to their documented instructions.

C. Repair or replace defaced or damaged finishes caused by work of this section.

3.07 PROTECTION

A. Protect installed roofing and flashings from construction operations.

B. Where traffic must continue over finished roof membrane, protect surfaces using durable materials.

C. Maintain roof free of nails, metal flashing clippings and other debris that could damage membrane.

END OF SECTION

SECTION 07 54 00

THERMOPLASTIC MEMBRANE (PVC) ROOFING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Adhered system with PVC roofing membrane at low roof canopies.

B. Insulation, flat and tapered.

C. Flashings.

1.02 RELATED REQUIREMENTS

A. Section 07 62 00 - Sheet Metal Flashing and Trim: Counterflashings and roof edge metal.

1.03 REFERENCE STANDARDS

A. ASTM D4434/D4434M - Standard Specification for Poly(Vinyl Chloride) Sheet Roofing; 2012.

B. FM DS 1-28 - Wind Design; Factory Mutual Research Corporation; 2007.

C. NRCA ML104 - The NRCA Roofing and Waterproofing Manual; National Roofing Contractors Association; Fifth Edition, with interim updates.

D. UL (RMSD) - Roofing Materials and Systems Directory; Underwriters Laboratories Inc.; current edition.

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data indicating membrane materials, flashing materials, insulation, and fasteners.

C. Shop Drawings: Indicate joint or termination detail conditions, conditions of interface with other materials, and setting plan for tapered insulation.

D. Warranty:
   1. Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.
   2. Submit installer's certification that installation complies with all warranty conditions for the waterproof membrane.

E. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

1.05 QUALITY ASSURANCE

A. Perform work in accordance with NRCA Roofing and Waterproofing Manual.

B. Installer Qualifications: Company specializing in performing the work of this section:
   1. Approved by membrane manufacturer.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Deliver products in manufacturer's original containers, dry, undamaged, with seals and labels intact.

B. Store products in weather protected environment, clear of ground and moisture.

C. Protect foam insulation from direct exposure to sunlight.

1.07 FIELD CONDITIONS

A. Do not apply roofing membrane during unsuitable weather.

B. Do not apply roofing membrane to damp or frozen deck surface or when precipitation is expected or occurring.

C. Do not expose materials vulnerable to water or sun damage in quantities greater than can be weatherproofed the same day.

1.08 WARRANTY

A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.

B. System Warranty: Provide manufacturer's system warranty agreeing to repair or replace roofing that leaks or is damaged due to wind or other natural causes.
   1. Warranty Term: 10 years.
   2. For repair and replacement include costs of both material and labor in warranty.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. PVC Membrane Materials:
   1. Carlisle Roofing Systems, Inc: www.carlisle-syntec.com.
   2. Johns Manville; JM PVC: www.jm.com.
   3. Sika Corporation – Roofing; Sarnafil PVC: usa.sarnafil.sika.com.
   4. Versico, a division of Carlisle Construction Materials Inc; VersiFlex PVC: www.versico.com.
   5. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 ROOFING - ADHERED APPLICATIONS

A. Thermoplastic Membrane Roofing: One ply membrane, fully adhered, over insulation.

B. Roofing Assembly Requirements:
   1. Roofing Color: Tan.
   2. Roof Covering External Fire Resistance Classification: UL Class A.

C. Acceptable Insulation Types - Constant Thickness Application: Any type that meets requirements and is approved by membrane manufacturer for application.
   1. Extruded and expanded polystyrene insulation must have a separation layer between the membrane and insulation to prevent contact between membrane and insulation.

2.03 ROOFING MEMBRANE AND ASSOCIATED MATERIALS

A. Membrane:
   1. Material: Polyvinyl chloride complying with ASTM D4434/D4434M.
   2. Reinforcing: Internal fabric.
   3. Thickness: 0.040 inch, minimum.
   4. Sheet Width: Factory fabricated into largest sheets possible.

B. Flexible Flashing Material: Same material as membrane.

2.04 INSULATION

A. Insulation shall be a type specified by membrane manufacturer for installation type.
   1. Flat and tapered to achieve roof slopes indicated on drawings.
   2. Provide 2 layers with joints offset.

2.05 ACCESSORIES

A. Insulation Fasteners: Appropriate for purpose intended and approved by roofing manufacturer.

B. Membrane Adhesive: Manufacturers one-part, solvent-borne contact adhesive for adhering membrane to porous substrates. Adhesive not manufactured or supplied by membrane manufacturer is cause for rejection of work. Water based adhesives are not acceptable.

C. Splice / Lap Cleaner / Weathered Membrane Cleaner: Manufacturer's solvent mixture for cleaning / preparing seams, laps, joints, etc. Use of gasoline or materials other than manufacturer's cleaner will be cause for rejection of work.

D. Insulation Adhesive: As recommended by insulation manufacturer.

E. Roofing Nails: Galvanized, hot dipped type, size and configuration as required to suit application.

F. Strip Reglet Devices: Galvanized steel, maximum possible lengths per location, with attachment flanges.

G. Sealants: As recommended by membrane manufacturer.

PART 3 EXECUTION

3.01 INSTALLATION - GENERAL

A. Perform work in accordance with NRCA Roofing and Waterproofing Manual and manufacturer's instructions.

B. Do not apply roofing membrane during unsuitable weather.

C. Do not apply roofing membrane when ambient temperature is outside the temperature range recommended by manufacturer.

D. Do not apply roofing membrane to damp or frozen deck surface or when precipitation is expected or occurring.

E. Do not expose materials vulnerable to water or sun damage in quantities greater than can be weatherproofed the same day.

F. Coordinate work with the installation of ballast materials. Do not allow loose laid membrane to be exposed without ballast. Provide temporary ballast if permanent ballast cannot be immediately installed.

3.02 WOOD DECK PREPARATION

A. Verify flatness and tightness of joints of wood decking. Fill knot holes with latex filler.

B. Confirm dry deck by moisture meter with 12 percent moisture maximum.

3.03 VAPOR RETARDER AND INSULATION - UNDER MEMBRANE

A. Attachment of Insulation:
   1. Mechanically fasten insulation to deck in accordance with roofing manufacturer's instructions and Factory Mutual requirements.
   2. Embed second layer of insulation into adhesive in accordance with roofing and insulation manufacturer's instructions.

B. Lay subsequent layers of insulation with joints staggered minimum 6 inch from joints of preceding layer.

C. Lay boards with edges in moderate contact without forcing. Cut insulation to fit neatly to perimeter blocking and around penetrations through roof.

D. Do not apply more insulation than can be covered with membrane in same day.

3.04 MEMBRANE APPLICATION

A. Roll out membrane, free from wrinkles or tears. Place sheet into place without stretching. Allow sheet to relax for 30 minutes, minimum.

B. Shingle joints on sloped substrate in direction of drainage.

C. Fully Adhered Application: Apply adhesive to substrate at manufacturer's specified rate. Fully embed membrane in adhesive except in areas directly over or within 3 inches of expansion joints. Fully adhere one roll before proceeding to adjacent rolls.

D. Loose Laid Application: Roll out membrane, free from wrinkles or tears. Place sheet into place without stretching. Allow sheet to relax for 30 minutes, minimum

E. Eliminate air bubbles, wrinkles and fish mouths.

F. Clean membrane lap seams as necessary to remove dirt and debris from the lap area.

G. Bond adjoining sheets by heat-welding. Use manufacturer approved heat-welding equipment. Field laps joined with adhesive will not be accepted.

H. All "T" joints shall be covered with heat welded patch.

I. Check all seams with probe. Ensure that sheets are fully bonded.

J. Seal exposed edges of each membrane sheet with a fillet of cut edge sealant.

K. At intersections with vertical surfaces:

1. Extend membrane up a minimum of 6 inches onto vertical surfaces.
2. At walls fully adhere flexible flashing over membrane and up to reglets.
3. At parapets extend flashing over top of parapet and secure.

L. At gravel stops, extend membrane under gravel stop and to the outside face of the wall.

M. Around roof penetrations, seal flanges and flashings with flexible flashing.

N. Coordinate installation of roof drains and related flashings.

3.05 CLEANING

A. See Section 01 74 19 - Construction Waste Management and Disposal, for additional requirements.

B. Remove bituminous markings from finished surfaces.

C. In areas where finished surfaces are soiled by work of this section, consult manufacturer of surfaces for cleaning advice and conform to their documented instructions.

D. Repair or replace defaced or damaged finishes caused by work of this section.

3.06 PROTECTION

A. Protect installed roofing and flashings from construction operations.

B. Where traffic must continue over finished roof membrane, protect surfaces using durable materials.

END OF SECTION

SECTION 07 62 00
SHEET METAL FLASHING AND TRIM

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Fabricated sheet metal items, including flashings, counterflashings, gutters, and downspouts.

B. Sealants for joints within sheet metal fabrications.

C. Copings on parapet walls.

1.02 RELATED REQUIREMENTS

A. Section 04 20 00 - UNIT MASONRY: Metal flashings embedded in masonry.

1.03 REFERENCE STANDARDS

A. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels; 2013.

B. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2015.

C. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2014.

D. ASTM D226/D226M - Standard Specification for Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing; 2009.

E. ASTM D4586/D4586M - Standard Specification for Asphalt Roof Cement, Asbestos-Free; 2007 (Reapproved 2012)e1.

F. SMACNA (ASMM) - Architectural Sheet Metal Manual; Sheet Metal and Air Conditioning Contractors' National Association; 2012.

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Coping Shop Drawings: Indicate material profile, jointing details, fastening methods, flashings and terminations.

C. Samples: Submit two samples 2x2 inch in size illustrating metal finish color.

1.05 QUALITY ASSURANCE

A. Perform work in accordance with SMACNA (ASMM) and CDA A4050 requirements and standard details, except as otherwise indicated.

B. Fabricator and Installer Qualifications: Company specializing in sheet metal work with 3 years of documented experience.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Stack material to prevent twisting, bending, and abrasion, and to provide ventilation. Slope metal sheets to ensure drainage.

B. Prevent contact with materials that could cause discoloration or staining.

PART 2 PRODUCTS

2.01 SHEET MATERIALS

A. Galvanized Steel: ASTM A653/A653M, with G90/Z275 zinc coating; minimum 24 gage (0.0239 inch) thick base metal.
   1. Where in contact with preservative treated lumber provide G180 zinc coating.

B. Pre-Finished Galvanized Steel: ASTM A653/A653M, with G90/Z275 zinc coating; minimum 24 gage (0.0239) inch thick base metal, shop pre-coated with PVDF coating.
   1. PVDF (Polyvinylidene Fluoride) Coating: Superior Performance Organic Finish, AAMA 2605; multiple coat, thermally cured fluoropolymer finish system.

2.02 ACCESSORIES

A. Fasteners: Galvanized steel, or type 304/316 stainless steel where indicated. .

B. Underlayment: ASTM D226/D226M, organic roofing felt, Type I ("No. 15").

C. Slip Sheet: Rosin sized building paper.

D. Primer: Zinc chromate type.

E. Sealant to be Concealed in Completed Work: Non-curing butyl sealant.

F. Sealant to be Exposed in Completed Work: ASTM C920; elastomeric sealant, 100 percent silicone with minimum movement capability of plus/minus 25 percent and recommended by manufacturer for substrates to be sealed; clear.

G. Plastic Cement: ASTM D4586, Type I.

2.03 FABRICATION - GENERAL

A. Form sections true to shape, accurate in size, square, and free from distortion or defects.

B. Form pieces in longest possible lengths.

C. Hem exposed edges on underside 1/2 inch; miter and seam corners.

D. Form material with flat lock seams, except where otherwise indicated. At moving joints, use sealed lapped, bayonet-type or interlocking hooked seams.

E. Fabricate corners from one piece with minimum 18 inch long legs; seam for rigidity, seal with sealant.

F. Fabricate vertical faces with bottom edge formed outward 1/4 inch and hemmed to form drip.

G. Fabricate flashings to allow toe to extend 2 inches over roofing membrane. Return and brake edges.

2.04 COPING

A. Factory fabricated metal coping with sheet metal hold down cleats and splice plates. Coping to have internal drainage system to eliminate caulked joints.

B. Form coping from 24 ga. prefinished galvanized sheet metal.

C. Splice plates same material and color as coping.

D. Cleats formed from 20 ga. galvanized sheet metal. Cleat spacing as specified by manufacturer.

E. Coping Width: As indicated on drawings.

F. Face and Back Leg: 4 inches unless detailed otherwise.

G. Fabricate corners from one piece with minimum 18 inch long legs; seam for rigidity, seal with sealant.

H. Fabricate vertical faces with bottom edge formed outward 1/4 inch (6 mm) and hemmed to form drip.

I. Manufacturers:
   1. W.P. Hickman Company; Product: Permasnap.
   2. Metal-Era; Product: Prema-Tite.
   3. Substitutions: See Section 01 60 00 - Product Requirements.

2.05 GUTTER AND DOWNSPOUT FABRICATION

A. Gutters: SMACNA (ASMM), Rectangular profile.

B. Downspouts: Rectangular profile.

C. Gutters and Downspouts: Size for rainfall intensity determined by a storm occurrence of 1 in 10 years in accordance with SMACNA (ASMM).

D. Accessories: Profiled to suit gutters and downspouts.
   1. Anchorage Devices: In accordance with SMACNA requirements.

E. Seal metal joints.

PART 3 EXECUTION

3.01 INSTALLATION

A. Secure flashings in place using concealed fasteners.

B. Lap all flashings shingle style to shed water away from building.

C. Fit flashings tight in place. Make corners square, surfaces true and straight in planes, and lines accurate to profiles.

D. Seal metal joints watertight.

E. Secure gutters and downspouts in place using concealed fasteners.

F. Slope gutters 1/4 inch per 10 feet, minimum.

3.02 SCHEDULE

A. Through-Wall Flashing in Masonry: Pre-Finished galvanized steel.

B. Gutters and Downspouts: Pre-finished galvanized steel.

C. Flashings Associated with Siding: Pre-finished galvanized steel.

D. Scuppers: Pre-finished galvanized steel.

E. Coping, Cap and all flashings exposed to view: Pre-finished galvanized steel.

F. Counterflashings at Roofing Terminations (Not Exposed to View): Galvanized steel.

G. Counterflashings at Curb-Mounted Roof Items: Galvanized steel.

END OF SECTION

SECTION 07 72 00

ROOF ACCESSORIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Roof hatches, manual and automatic operation, including smoke vents.

1.02 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Manufacturer's data sheets on each product to be used.

PART 2 PRODUCTS

2.01 ROOF HATCHES

A. Manufacturers - Roof Hatches:
   1. Bilco Company; Type L-50T: www.bilco.com.

B. Roof Hatches: Factory-assembled aluminum frame and cover, complete with operating and release hardware.
   1. Style: Provide flat metal covers unless otherwise indicated.
   2. Mounting: Provide frames and curbs suitable for mounting on flat roof deck.
   3. For Access Via Alternating Tread Device: Single leaf; 30 by 96 inches.

C. Frames/Curbs: One-piece curb and frame with integral cap flashing to receive roof flashings; extended bottom flange to suit mounting.
   1. Material: Mill finished aluminum, 11 gage, 0.0907 inch thick.
   2. Insulation: 2 inches rigid polyisocyanurate, located on inside hollow curb.
   3. Curb Height: 12 inches from surface of roof deck, minimum.

D. Metal Covers: Flush, insulated, hollow metal construction.
   1. Capable of supporting 40 psf live load.
   2. Material: Mill finished aluminum; outer cover 11 gage, 0.0907 inch thick, liner 0.04 inch thick.
   3. Insulation: 2 inches rigid _ polyisocyanurate.
   4. Gasket: EPDM, continuous around cover perimeter.

E. Hardware: Steel, zinc coated and chromate sealed, unless otherwise indicated or required by manufacturer.
   1. Lifting Mechanisms: Compression or torsion spring operator that automatically opens upon release of latch; capable of lifting covers despite 10 psf load.
   2. Hinges: Heavy duty pintle type.
   3. Hold open arm with vinyl-coated handle for manual release.
   4. Latch: Upon closing, engage latch automatically and reset manual release.
   5. Manual Release: Pull handle on interior.
   6. Locking: Padlock hasp on interior.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install in accordance with manufacturer's instructions, in manner that maintains roofing weather integrity.

END OF SECTION

SECTION 07 84 00
FIRESTOPPING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Firestopping of all joints and penetrations in fire resistance rated and smoke resistant assemblies, whether indicated on drawings or not, and other openings indicated.

B. Sealing of penetrations in fireblocking.

1.02 REFERENCE STANDARDS

A. ASTM E814 - Standard Test Method for Fire Tests of Penetration Firestop Systems; 2013a.

B. ITS (DIR) - Directory of Listed Products; Intertek Testing Services NA, Inc.; current edition.

C. FM P7825 - Approval Guide; Factory Mutual Research Corporation; current edition.

D. UL (FRD) - Fire Resistance Directory; Underwriters Laboratories Inc.; current edition.

1.03 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Schedule of Firestopping: List each type of penetration, fire rating of the penetrated assembly, and firestopping test or design number.

C. Product Data: Provide data on product characteristics.

1.04 QUALITY ASSURANCE

A. Fire Testing: Provide firestopping assemblies of designs that provide the scheduled fire ratings when tested in accordance with methods indicated.
   1. Listing in the current-year classification or certification books of UL, FM, or ITS (Warnock Hersey) will be considered as constituting an acceptable test report.
   2. Valid evaluation report published by ICC Evaluation Service, Inc. (ICC-ES) at www.icc-es.org will be considered as constituting an acceptable test report.
   3. Submission of actual test reports is required for assemblies for which none of the above substantiation exists.

B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

1.05 FIELD CONDITIONS

A. Comply with firestopping manufacturer's recommendations for temperature and conditions during and after installation. Maintain minimum temperature before, during, and for 3 days after installation of materials.

PART 2 PRODUCTS

2.01 FIRESTOPPING SYSTEMS

A. Firestopping: Complete listed, rated assembly.
   1. Fire Ratings: Use any system listed by UL or tested in accordance with ASTM E 814 that has F Rating equal to fire rating of penetrated assembly.
   2. Firestopping systems installed in rated floor-ceiling assemblies shall have a T rating equal to the required F rating.
   3. See Drawings for required ratings.

2.02 FIREBLOCKING IN CONCEALED SPACES

A. At concealed wall spaces at intersection of double stud wall and ceiling:
   1. Mineral wool as specified in Section 07 21 00 - Thermal Insulation.

B. Sealing of penetrations in wall plates: Firestopping Sealant.

C. Sealing of penetrations in fireblocking: Firestopping Sealant.

2.03 MATERIALS

A. Firestopping Sealants: Provide only products having lower volatile organic compound (VOC) content than required by South Coast Air Quality Management District Rule No.1168.
   1. Manufacturers:
      a. RectorSeal: www.rectorseal.com.
      b. 3M Fire Protection Products: www.3m.com/firestop.
      c. Hilti, Inc: www.us.hilti.com.
      d. Specified Technologies, Inc: www.stifirestop.com.

B. Firestop Devices - Wrap Type: Mechanical device with incombustible filler and sheet stainless steel jacket, intended to be installed after penetrating item has been installed:
   1. Manufacturers:
      a. RectorSeal: www.rectorseal.com.
      b. 3M Fire Protection Products: www.3m.com/firestop.
      c. Hilti, Inc: www.us.hilti.com.
      d. Specified Technologies, Inc: www.stifirestop.com.

C. Intumescent Putty: Compound that expands on exposure to surface heat gain; conforming to the following:
   1. Potential Expansion: Minimum 1000 percent.
   2. Durability and Longevity: Permanent.
   3. Manufacturers:
      a. RectorSeal: www.rectorseal.com.
      b. 3M Fire Protection Products: www.3m.com/firestop.
      c. Hilti, Inc: www.us.hilti.com.
      d. Specified Technologies, Inc: www.stifirestop.com.

D. Primers, Sleeves, Forms, Insulation, Packing, Stuffing, and Accessories: Type required for tested assembly design.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install materials in manner described in fire test report and in accordance with manufacturer's instructions, completely closing openings.

B. Do not cover installed firestopping until inspected by authority having jurisdiction.

C. Install labeling required by code.

3.02 FIELD QUALITY CONTROL

A. Repair or replace penetration firestopping and joints at locations where inspection results indicate firestopping or joints do not meet specified requirements.

3.03 PROTECTION

A. Protect adjacent surfaces from damage by material installation.

END OF SECTION

SECTION 07 90 05
JOINT SEALERS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Sealants and joint backing.

1.02 RELATED REQUIREMENTS

A. Section 07 84 00 - Firestopping: Firestopping sealants.

B. Section 08 80 00 - Glazing: Glazing sealants and accessories.

1.03 REFERENCE STANDARDS

A. ASTM C834 - Standard Specification for Latex Sealants; 2014.

B. ASTM C919 - Standard Practice for Use of Sealants in Acoustical Applications; 2012.

C. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2014.

D. ASTM C1193 - Standard Guide for Use of Joint Sealants; 2013.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordinate the work with other sections referencing this section.

1.05 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data indicating sealant chemical characteristics and MSDS.

C. Samples: Submit two samples, 1/4 x 2 inch in size illustrating sealant colors for selection.

D. Wisconsin Green Built Report: Submit VOC content documentation for all performed and non-preformed sealants and primers.

1.06 FIELD CONDITIONS

A. Maintain temperature and humidity recommended by the sealant manufacturer during and after installation.

PART 2 PRODUCTS

2.01 SEALANTS

A. Type E1 - General Purpose Exterior Sealant: Polyurethane; ASTM C920, Grade NS, Class 25 minimum; Uses M, G, and A; single component.
   1. Color: color as selected.
   2. Product: Sonnolastic NP1 manufactured by BASF.
   3. Applications: Use for:
      a. Control, expansion, and soft joints in masonry.
      b. Joints between concrete and other materials.
      c. Joints between metal frames and other materials.
      d. Other exterior joints for which no other sealant is indicated.

B. Type B1 - Exterior Metal Lap Joint Sealant: Butyl or polyisobutylene, nondrying, nonskinning, noncuring.
   1. Product: Chem-Calk 300 manufactured by Bostik.
   2. Applications: Use for:
      a. Concealed sealant bead in sheet metal work.
      b. Under thresholds.

C. Type A1 - General Purpose Interior Sealant: Acrylic emulsion latex; ASTM C834, Type OP, Grade NF single component, paintable.
   1. Color: Match adjacent finished surfaces.
   2. Applications: Use for:
      a. Interior wall and ceiling control joints.

b. Joints between window frames and wall surfaces.
c. Other interior joints for which no other type of sealant is indicated.

3. Products:
   a. Pecora Corporation; AC-20 + Silicone Acrylic Latex Caulking Compound: www.pecora.com.
   b. Red Devil; Siliconized Acrylic Construction Grade (35 Year) Sealant: www.reddevil.com.
   c. Sherwin-Williams Company; White Lightning 3006 Siliconized Acrylic Latex Caulk: www.sherwin-williams.com.
   d. Sherwin-Williams Company; 850A Acrylic Latex Caulk: www.sherwin-williams.com.

D. Type E2 - Bathtub/Tile Sealant: White silicone; ASTM C920, Uses I, M and A; single component, mildew resistant.
   1. Product: Siliconized Acrylic Caulk manufactured by Bostik.
   2. Applications: Use for:
      a. Joints between plumbing fixtures and floor and wall surfaces.

E. Type E3 - Bathtub/Tile Sealant: Clear silicone; ASTM C 920, Uses M and A; single component, mildew resistant.
   1. Product: 898 manufactured by Pecora.
   2. Applications: Use for:
      a. Joints between countertops and wall surfaces.

F. Type A2 - Acoustical Sealant for Concealed Locations:
   1. Composition: Acrylic latex emulsion sealant.
   2. Product: GREENchoice Acoustical Sealant manufactured by Titebond.
   3. Applications: Use for concealed locations only:
      a. Base Bid:
         1) Apply a continuous bead per manufacturers instructions at the ceiling and floor line prior to installation of wall board on partitions.
         2) Fully coat back and sides of all electrical outlets, etc. in demising walls that do not receive fire stopping putty pads.

G. Type E5 - Concrete Paving Joint Sealant: Polyurethane, self-leveling; ASTM C920, Class 25, Uses T, I, M and A; single component.
   1. Color: Color as selected.
   2. Product: 955SL manufactured by Bostik.
   3. Applications: Use for:
      a. Joints in sidewalks and vehicular paving.

2.02 ACCESSORIES

A. Primer: Non-staining type, recommended by sealant manufacturer to suit application.

B. Joint Backing: Round foam rod compatible with sealant; ASTM D 1667, closed cell PVC; oversized 30 to 50 percent larger than joint width.

C. Bond Breaker: Pressure sensitive tape recommended by sealant manufacturer to suit application.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that substrate surfaces are ready to receive work.

B. Verify that joint backing and release tapes are compatible with sealant.

3.02 PREPARATION

A. Remove loose materials and foreign matter that could impair adhesion of sealant.

B. Clean and prime joints in accordance with manufacturer's instructions.

C. Perform preparation in accordance with manufacturer's instructions and ASTM C1193.

D. Protect elements surrounding the work of this section from damage or disfigurement.

3.03 INSTALLATION

A. Perform work in accordance with sealant manufacturer's requirements for preparation of surfaces and material installation instructions.

B. Perform installation in accordance with ASTM C1193.

C. Perform acoustical sealant application work in accordance with ASTM C919.

D. Measure joint dimensions and size joint backers to achieve width-to-depth ratio, neck dimension, and surface bond area as recommended by manufacturer, except where specific dimensions are indicated.

E. Install bond breaker where joint backing is not used.

F. Install sealant free of air pockets, foreign embedded matter, ridges, and sags.

G. Apply sealant within recommended application temperature ranges. Consult manufacturer when sealant cannot be applied within these temperature ranges.

H. Tool joints concave.

3.04 CLEANING

A. Clean adjacent soiled surfaces.

3.05 PROTECTION

A. Protect sealants until cured.

END OF SECTION

SECTION 08 11 13
HOLLOW METAL DOORS AND FRAMES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Non-fire-rated hollow metal doors and frames.

B. Hollow metal frames for wood doors.

C. Fire-rated hollow metal doors and frames.

D. Thermally insulated hollow metal doors with frames.

E. Hollow metal borrowed lites glazing frames.

1.02 RELATED REQUIREMENTS

A. Section 08 71 00 - Door Hardware.

B. Section 08 80 00 - Glazing: Glass for doors and borrowed lites.

C. Section 09 91 13 - Exterior Painting: Field painting.

1.03 REFERENCE STANDARDS

A. ADA Standards - Americans with Disabilities Act (ADA) Standards for Accessible Design; 2010.

B. ANSI/SDI A250.3 - Test Procedure and Acceptance Criteria for Factory Applied Finish Coatings for Steel Doors and Frames; 2007 (R2011).

C. ANSI/SDI A250.4 - Test Procedure and Acceptance Criteria for Physical Endurance for Steel Doors, Frames and Frame Anchors; 2011.

D. ANSI/SDI A250.8 - Specifications for Standard Steel Doors and Frames (SDI-100); 2014.

E. ANSI/SDI A250.10 - Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames; 2011.

F. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2015.

G. ASTM A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength, Low Alloy, and High-Strength Low-Alloy with Improved Formability, Solution Hardened, and Bake Hardenable; 2015.

H. ASTM A1011/A1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength; 2014.

I. ICC A117.1 - Accessible and Usable Buildings and Facilities; International Code Council; 2009 (ANSI).

J. NAAMM HMMA 840 - Guide Specifications for Installation and Storage of Hollow Metal Doors and Frames; 2007.

K. NFPA 80 - Standard for Fire Doors and Other Opening Protectives; 2016.

L. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies; 2012.

M. UL 10C - Standard for Positive Pressure Fire Tests of Door Assemblies; Current Edition, Including All Revisions.

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Materials and details of design and construction, hardware locations, reinforcement type and locations, anchorage and fastening methods, and finishes; and one copy of referenced standards/guidelines.

C. Shop Drawings: Details of each opening, showing elevations, glazing, frame profiles, and any indicated finish requirements.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Comply with NAAMM HMMA 840 or ANSI/SDI A250.8 (SDI-100) in accordance with specified requirements.

B. Protect with resilient packaging; avoid humidity build-up under coverings; prevent corrosion and adverse effects on factory applied painted finish.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Hollow Metal Doors and Frames:
   1. Ceco Door; _____, an Assa Abloy Group company: www.assaabloydss.com.
   2. De La Fontaine Inc; Hollow Metal Door Model _____: www.delafontaine.com.
   3. De La Fontaine Inc; Windstorm-Resistant Steel Door and Frame; door style ____: www.delafontaine.com.
   4. De La Fontaine Inc: www.delafontaine.com.
   5. Republic Doors; ____: www.republicdoor.com.
   6. Steelcraft; ____, an Allegion brand: www.allegion.com/us.
   7. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 DESIGN CRITERIA

A. Requirements for Hollow Metal Doors and Frames:
   1. Steel used for fabrication of doors and frames shall comply with one or more of the following requirements; Galvannealed steel conforming to ASTM A653/A653M, cold-rolled steel conforming to ASTM A1008/A1008M, or hot-rolled pickled and oiled (HRPO) steel conforming to ASTM A1011/A1011M, Commercial Steel (CS) Type B for each.
   2. Accessibility: Comply with ICC A117.1 and ADA Standards.

B. Combined Requirements: If a particular door and frame unit is indicated to comply with more than one type of requirement, comply with the specified requirements for each type; for instance, an exterior door that is also indicated as being sound-rated must comply with the requirements specified for exterior doors and for sound-rated doors; where two requirements conflict, comply with the most stringent.

2.03 HOLLOW METAL DOORS

A. Type ___, Exterior Doors: Thermally insulated.
   1. Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).
      a. Level 1 - Standard-duty.
      b. Physical Performance Level C, 250,000 cycles; in accordance with ANSI/SDI A250.4.
      c. Model 1 - Full Flush.
      d. Door Face Metal Thickness: 20 gage, 0.032 inch, minimum.
   2. Core Material: Manufacturers standard core material/construction and in compliance with requirements.
   3. Door Thickness: 1-3/4 inch, nominal.
   4. Top Closures for Outswinging Doors: Flush with top of faces and edges.
   5. Door Finish: Factory finished.

B. Type ___, Interior Doors, Non-Fire Rated:
   1. Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).
      a. Level 1 - Standard-duty.
      b. Physical Performance Level C, 250,000 cycles; in accordance with ANSI/SDI A250.4.
      c. Model 1 - Full Flush.
      d. Door Face Metal Thickness: 20 gage, 0.032 inch, minimum.
   2. Door Thickness: 1-3/4 inch, nominal.
   3. Door Finish: Factory finished.

C. Type ___, Fire-Rated Doors:
   1. Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).

a. Level 1 - Standard-duty.
b. Physical Performance Level C, 250,000 cycles; in accordance with ANSI/SDI A250.4.
c. Model 1 - Full Flush.
d. Door Face Metal Thickness: 20 gage, 0.032 inch, minimum.

2. Fire Rating: As indicated on Door Schedule, tested in accordance with UL 10C and NFPA 252 ("positive pressure fire tests").
   a. Rate of Temperature Rise Across Door Thickness for Stair Enclosure Doors: 450 F degrees. Note: Temperature rise doors not required in buildings equipped throughout with an automatic sprinkler system installed in accordance with IBC 903.3.1.1 or 903.3.1.2.
3. Core Material: Manufacturers standard core material/construction in compliance with requirements.
4. Door Thickness: 1-3/4 inch, nominal.
5. Door Finish: Factory finished.

2.04 HOLLOW METAL FRAMES

A. Comply with standards and/or custom guidelines as indicated for corresponding door in accordance with applicable door frame requirements.

B. Exterior and Basement Door Frames: Fully welded. (HM on schedule)
   1. Galvanizing: Components hot-dipped zinc-iron alloy-coated (galvannealed) in accordance with ASTM A653/A653M, with A40/ZF120 coating.
   2. Frame Finish: Factory primed and field finished.
   3. Weatherstripping: Separate, see Section 08 71 00.

C. Interior Door Frames: Fully welded type. (HM on schedule)
   1. Fire Rating: Same as door, labeled.
   2. Frame Finish: Factory finished.
   3. Frames for Wood Doors: Comply with frame requirements in accordance with corresponding door.

D. Borrowed Lites Glazing Frames: Construction and face dimensions to match door frames, and as indicated on drawings.

2.05 ACCESSORIES

A. Glazing: As specified in Section 08 80 00, factory installed.

B. Astragals for Double Doors: Specified in Section 08 71 00.
   1. Exterior Doors: Steel, Z-shaped.

C. Silencers: Resilient rubber, fitted into drilled hole; 3 on strike side of single door, 3 on center mullion of pairs, and 2 on head of pairs without center mullions.

D. Temporary Frame Spreaders: Provide for factory- or shop-assembled frames.

2.06 FINISHES

A. Primer: Rust-inhibiting, complying with ANSI/SDI A250.10, door manufacturer's standard.

B. Factory Finish: Complying with ANSI/SDI A250.3, manufacturer's standard coating.
   1. Color: As selected by Architect from manufacturer's standard range.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify that opening sizes and tolerances are acceptable.

C. Verify that finished walls are in plane to ensure proper door alignment.

3.02 INSTALLATION

A. Install doors and frames in accordance with manufacturer's instructions and related requirements of specified door and frame standards or custom guidelines indicated.

B. Install fire rated units in accordance with NFPA 80.

C. Coordinate frame anchor placement with wall construction.

D. Coordinate installation of hardware.

E. Coordinate installation of glazing.

F. Coordinate installation of electrical connections to electrical hardware items.

G. Touch up damaged factory finishes.

3.03 TOLERANCES

A. Clearances Between Door and Frame: Comply with related requirements of specified door and frame standards or custom guidelines indicated.

B. Maximum Diagonal Distortion: 1/16 in measured with straight edge, corner to corner.

3.04 ADJUSTING

A. Adjust for smooth and balanced door movement.

B. Test doors for force to close, latch, and unlatch; adjust as required to comply.

END OF SECTION

SECTION 08 14 16
FLUSH WOOD DOORS

PART 1 GENERAL

1.01 RELATED REQUIREMENTS

A. Section 06 20 00 - Finish Carpentry: Wood door frames.

B. Section 08 11 13 - Hollow Metal Doors and Frames. Frames for wood doors.

C. Section 08 71 00 - Door Hardware.

D. Section 08 80 00 - Glazing.

1.02 REFERENCE STANDARDS

A. ANSI A135.4 - American National Standard for Basic Hardboard; 2012.

B. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards; 2014.

C. ICC (IBC) - International Building Code; 2015.

D. NFPA 80 - Standard for Fire Doors and Other Opening Protectives; National Fire Protection Association; 2016.

E. UL 10B - Standard for Fire Tests of Door Assemblies; Current Edition, Including All Revisions.

F. UL 10C - Standard for Positive Pressure Fire Tests of Door Assemblies; Current Edition, Including All Revisions.

G. UL 1784 - Standard for Air Leakage Tests of Door Assemblies; Current Edition, Including All Revisions.

1.03 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Indicate door core materials and construction; veneer species, type and characteristics.

C. Shop Drawings: Show doors and frames, elevations, sizes, types, swings, undercuts, beveling, blocking for hardware, factory machining, factory finishing, cutouts for glazing and other details.

D. Warranty, executed in Owner's name.

1.04 QUALITY ASSURANCE

A. Installed Fire Rated Door and Transom Panel Assembly: Conform to NFPA 80 for fire-rating as indicated.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Package, deliver and store doors in accordance with specified quality standard.

B. Accept doors on site in manufacturer's packaging. Inspect for damage.

C. Protect doors with resilient packaging sealed with heat shrunk plastic. Do not store in damp or wet areas; or in areas where sunlight might bleach veneer. Seal top and bottom edges with tinted sealer if stored more than one week. Break seal on site to permit ventilation.

1.06 WARRANTY

A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.

B. Interior Doors: Provide manufacturer's warranty for the life of the installation.

C. Include coverage for delamination of veneer, warping beyond specified installation tolerances, defective materials, and telegraphing core construction.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Factory Finished Hardboard Doors:
   1. Lynden Door; Product "Albany Maple".

2. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 DOORS

A. All Doors: See drawings for locations and additional requirements.

B. Unit Entry Doors: Solid core; 1 3/4 inches thick; flush construction.
   1. 20 minute rated tested per UL 10-C without the hose stream test.
   2. Assembly shall meet the requirements for a smoke and draft control door assembly tested in accordance with UL 1784.
   3. Molded hardboard with simulated maple finish.
   4. Frames: Engineered wood jambs finished to match door face.

C. Interior Doors (within units): Hollow core; 1-3/8 inches thick; flush construction.
   1. Provide solid core door at unit HVAC closet.
   2. Pre-hung doors complete with hinges, matching jambs and stops, factory machined.
   3. Bi-Fold doors complete with hinges, mounting hardware and pulls.
      a. Provide half-jambs and casing at bi-fold doors.
   4. Molded hardboard with simulated maple finish.

D. Interior Doors (common area and corridor doors): Solid core; 1-3/4 inches thick, flush construction.
   1. Provide solid core doors at all locations.
   2. Fire Rated Doors: Tested to ratings indicated on drawings in accordance with ICC (IBC) - Positive Pressure; Underwriters Laboratories Inc. (UL) or Intertek/Warnock Hersey (WHI) labeled without any visible seals when door is open.
   3. Smoke and Draft Control Doors (Indicated as "S" on Drawings): In addition to required fire rating, provide door assemblies tested in accordance with UL 1784 with maximum air leakage of 3.0 cfm per sq ft of door opening at 0.10 inch w.g. pressure at both ambient and elevated temperatures for "S" label; if necessary, provide additional gasketing or edge sealing.
   4. Molded hardboard with simulated maple finish.
   5. Frames: As scheduled.

E. Storage Locker Doors (Basement): Hollow core; 1 3/8 inches thick, flush with wood jambs.

2.03 DOOR AND PANEL CORES

A. Non-Rated Solid Core and 20 Minute Rated Doors: Type particleboard core (PC), plies and faces as indicated.

B. Fire Rated Doors: Mineral core type, with fire resistant composite core (FD), plies and faces as indicated above; with core blocking as required to provide adequate anchorage of hardware without through-bolting.

2.04 DOOR FACINGS

A. Hardboard Facing: AHA A135.4, Class 1 - Tempered, S2S (smooth two sides) hardboard, composition face, 1/8 inch thick.

B. Facing Adhesive: Type I - waterproof.

2.05 ACCESSORIES

A. Glazing Stops: Rolled steel channel shape, mitered corners; prepared for countersink style tamper proof screws.

B. Astragals for Fire Rated Double Doors: Steel, T shaped, overlapping and recessed at face edge, specifically for double doors.

2.06 DOOR CONSTRUCTION

A. Fabricate doors in accordance with door quality standard specified.

B. Cores Constructed with stiles and rails:

C. Provide solid blocks at lock edge for hardware reinforcement.

D. Factory machine doors for hardware other than surface-mounted hardware, in accordance with hardware requirements and dimensions.

E. Factory fit doors for frame opening dimensions identified on shop drawings, with edge clearances in accordance with specified quality standard.
   1. Exception: Doors to be field finished.

F. Provide edge clearances in accordance with the quality standard specified.

2.07 FACTORY FINISHING - WOOD VENEER DOORS

A. Finish work in accordance with AWI/AWMAC/WI (AWS), Section 5 - Finishing for grade specified and as follows:
   1. Transparent:
      a. System - 11, Polyurethane, Catalyzed.
      b. Sheen: Flat.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install doors in accordance with manufacturer's instructions and specified quality standard.

B. Factory-Finished Doors: Do not field cut or trim; if fit or clearance is not correct, replace door.

C. Field-Finished Doors: Trimming to fit is acceptable.

D. Adjust width of non-rated doors by cutting equally on both jamb edges.
   1. Trim maximum of 3/4 inch off bottom edges.
   2. Trim fire-rated doors in strict compliance with fire rating limitations.
   3. Unrated Doors: Maximum undercut 3/4 inches unless authorized by Architect in writing.

E. Use machine tools to cut or drill for hardware.

F. Coordinate installation of doors with installation of frames and hardware.

G. Coordinate installation of glazing.

3.02 TOLERANCES

A. Conform to specified quality standard for fit and clearance tolerances.

3.03 ADJUSTING

A. Adjust doors for smooth and balanced door movement.

B. Adjust closers for full closure.

C. See Accessibility Notes on Drawings for door closing force requirements.

3.04 SCHEDULE - SEE DRAWINGS

END OF SECTION

SECTION 08 31 00
ACCESS DOORS AND PANELS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Access door and frame units, fire-rated and non-fire-rated, in wall and ceiling locations.

1.02 RELATED REQUIREMENTS

A. Section 09 91 13 - Exterior Painting: Field paint finish.

1.03 REFERENCE STANDARDS

A. ITS (DIR) - Directory of Listed Products; Intertek Testing Services NA, Inc.; current edition.

B. UL (FRD) - Fire Resistance Directory; Underwriters Laboratories Inc.; current edition.

1.04 PROJECT CONDITIONS

A. Coordinate the work with other work requiring access doors.

PART 2 PRODUCTS

2.01 ACCESS DOOR AND PANEL APPLICATIONS

2.02 ACCESS DOORS AND PANELS

A. All Units: Factory fabricated, fully assembled units with corner joints welded, filled, and ground flush; square and without rack or warp; coordinate requirements with assemblies units are to be installed in.

2.03 ACCESS DOOR UNITS - WALLS AND CEILINGS

A. Fire Rated Door and Frame Units in Walls:
   1. Barco Model FR.
   2. Cesco Model FB.
   3. J.L. Industries Model FD.
   4. Karp Associates Model KRP-150 FR.
   5. Milcor Incorporated Model FR.
   6. Nystrom Model FRT.
   7. Willaims Brothers Model WB-FR.

B. Fire Rated Door and Frame Units in Ceilings:
   1. In Gypsum Board Ceiling: Flush access door and frame painted to match ceiling finish.
      a. Model KRP-150FR manufactured by Karp Associates, Inc.
      b. Model FW-5050DW manufactured by Acudor Products, Inc.
      c. Model FD Series manufactured by JL Industries.
   2. JL Industries.
   3. Acudor Products, Inc.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install units in accordance with manufacturer's instructions.

B. Install frames plumb and level in openings. Secure rigidly in place.

C. Position units to provide convenient access to the concealed work requiring access.

END OF SECTION

SECTION 08 36 13
SECTIONAL DOORS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Steel overhead sectional doors, electrically operated.

B. Operating hardware and supports.

C. Electrical controls.

1.02 RELATED REQUIREMENTS

A. Section 26 27 17 - Equipment Wiring.

1.03 REFERENCE STANDARDS

A. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2015.

B. DASMA 102 - American National Standard Specifications for Sectional Overhead Type Doors; Door & Access Systems Manufacturers' Association, International; 2011.

C. NEMA MG 1 - Motors and Generators; National Electrical Manufacturers Association; 2014.

D. NFPA 70 - National Electrical Code; National Fire Protection Association; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

E. UL 325 - Standard for Door, Drapery, Gate, Louver, and Window Operators and Systems; Current Edition, Including All Revisions.

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Shop Drawings: Indicate opening dimensions and required tolerances, connection details, anchorage spacing, hardware locations, and installation details.

C. Product Data: Show component construction, anchorage method, and hardware.

D. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

1.05 WARRANTY

A. See Section 01 78 00 - Closeout Submittals for warranty requirements.

B. Correct defective Work within a five year period after Date of Substantial Completion.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. C.H.I. Overhead Doors.

B. Wayne Dalton.

C. Clopay Corporation.

D. Overhead Door Corporation.

2.02 STEEL DOOR COMPONENTS

A. Steel Doors: Flush steel, insulated; standard lift operating style with track and hardware; complying with DASMA 102, Commercial application.
   1. Door Nominal Thickness: 2 inches thick.
   2. Exterior Finish: Factory finished with acrylic baked enamel; color as selected by Architect.

B. Door Panels: Flush steel construction; outer steel sheet of.018 inch thick, flat profile; inner steel sheet of.015 inch thick, flat profile; core reinforcement of 20 ga. sheet steel roll formed to channel shape, rabbeted weather joints at meeting rails; insulated.

2.03 DOOR COMPONENTS

A. Track: Rolled galvanized steel, 0.090 inch thick; 2 inch wide, continuous one piece per side; galvanized steel mounting brackets 1/4 inch thick. Neoprene isolation mounts.

B. Struts: 2" x 20 ga.; Provide three on doors over 14 feet wide, one on doors under 14 feet wide.

C. Stiles: 20 ga.; Provide double end stiles on doors over 14 feet wide.

D. Hinge and Roller Assemblies: Heavy duty hinges and adjustable roller holders of galvanized steel; floating hardened steel bearing rollers, located at top and bottom of each panel, each side.
   1. Provide double end hinges on doors over 14 feet wide.

E. Lift Mechanism: Torsion spring on cross head shaft, with braided galvanized steel lifting cables.
   1. 50,000 cycle rated spring.

F. Sill Weatherstripping: Resilient hollow rubber strip, one piece; fitted to bottom of door panel, full length contact.

G. Jamb Weatherstripping: Roll formed steel section full height of jamb, fitted with resilient weatherstripping, placed in moderate contact with door panels.

H. Head Weatherstripping: EPDM rubber seal, one piece full length.

I. Panel Joint Weatherstripping: Neoprene foam seal, one piece full length.

2.04 MATERIALS

A. Sheet Steel: Hot-dipped galvanized steel sheet, ASTM A653/A653M, with G90/Z275 coating, plain surface.

B. Insulation: Foamed-in-place polyurethane, bonded to facing.

C. Sound isolation material: Neoprene mat.

2.05 ELECTRICAL OPERATION

A. Operator, Controls, Actuators, and Safeties: Comply with UL 325; provide products listed by a testing agency acceptable to authorities having jurisdiction.

B. Electric Operator:
   1. APT by Liftmaster.
   2. Substitutions: See Section 01 60 00 - Product Requirements.

C. Electrical Characteristics:
   1. 1/2 hp; 4.8 rated load amperes; manually operable in case of power failure, transit speed of 12 inches per second.
   2. 115 volts, single phase, 60 Hz.

D. Motor: NEMA MG 1, Type 1.

E. Wiring Terminations: Provide terminal lugs to match branch circuit conductor quantities, sizes, and materials indicated. Enclose terminal lugs in terminal box sized to NFPA 70.

F. Disconnect Switch: Factory mount disconnect switch in control panel.

G. Electric Operator: Center mounted draw bar assembly, adjustable safety friction clutch; brake system actuated by independent voltage solenoid controlled by motor starter; enclosed gear driven limit switch; enclosed magnetic cross line reversing starter; mounting brackets and hardware.

H. Safety Edge: At bottom of door panel, full width; pneumatic sensitized type, wired to reverse door upon striking object; hollow neoprene covered to provide weatherstrip seal.

I. Control Station: Standard three button (open-close-stop) momentary type control for each electric operator.
   1. 24 volt circuit.
   2. Surface mounted.
   3. Locate at inside door jamb.

J. Radio Control Antenna Detector.

K. Pneumatic Floor Treadle.

L. Hand Held Transmitter: Digital control, resettable. Provide one transmitter for every underground parking stall, plus two.

M. Neoprene isolation mount operator.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that wall openings are ready to receive work and opening dimensions and tolerances are within specified limits.

B. Verify that electric power is available and of the correct characteristics.

3.02 PREPARATION

A. Prepare opening to permit correct installation of door unit to perimeter air and vapor barrier seal.

3.03 INSTALLATION

A. Install door unit assembly in accordance with manufacturer's instructions.

B. Anchor assembly to wall construction and building framing without distortion or stress.

C. Securely brace door tracks suspended from structure. Secure tracks to structural members only.

D. Fit and align door assembly including hardware.

E. Coordinate installation of electrical service. Complete power and control wiring from disconnect to unit components.

3.04 ADJUSTING

A. Adjust door assembly for smooth operation and full contact with weatherstripping.

3.05 PROTECTION

A. Protect installed products from damage until Date of Substantial Completion.

B. Clean doors, frames .

C. Remove temporary labels and visible markings.

END OF SECTION

SECTION 08 43 13

ALUMINUM-FRAMED STOREFRONTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Aluminum-framed storefront, with vision glass.

B. **West Wing Library Space: All aluminum framing to be 1" Kawneer 451UT.**

C. Aluminum doors and frames.

D. Weatherstripping.

E. Door hardware.

F. **West Wing Library Space: General Contractor to provide exterior pulls and Sargent lock cylinders only. All other hardware provided and installed by the City.**

1.02 RELATED REQUIREMENTS

A. Section 08 71 00 - Door Hardware: Cylinders.

B. Section 08 80 00 - Glazing: Glass and glazing accessories.

1.03 REFERENCE STANDARDS

A. AAMA CW-10 - Care and Handling of Architectural Aluminum From Shop to Site; 2015.

B. AAMA 611 - Voluntary Specification for Anodized Architectural Aluminum; 2012.

C. AAMA 1503 - Voluntary Test Method for Thermal Transmittance and Condensation Resistance of Windows, Doors and Glazed Wall Sections; 2009.

D. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels; 2013.

E. ASCE 7 - Minimum Design Loads for Buildings and Other Structures; 2010, with 2013 Supplements and Errata.

F. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2014.

G. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes [Metric]; 2013.

H. ASTM E283 - Standard Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen; 2004 (Reapproved 2012).

I. ASTM E330/E330M - Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference; 2014.

J. ASTM E331 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference; 2000 (Reapproved 2009).

K. ASTM E331 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference; 2000 (Reapproved 2009).

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordinate with installation of other components that comprise the exterior enclosure.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in performing work of type specified and with at least three years of documented experience.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Handle products of this section in accordance with AAMA CW-10.

B. Protect finished aluminum surfaces with wrapping. Do not use adhesive papers or sprayed coatings that bond to aluminum when exposed to sunlight or weather.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Aluminum-Framed Storefront and Doors:
   1. EFCO Corporation: www.efcocorp.com.
   2. Kawneer North America: www.kawneer.com.
   3. Manko Window Systems, Inc: www.mankowindows.com.

2.02 STOREFRONT

A. Aluminum-Framed Storefront: Factory fabricated, factory finished aluminum framing members with infill, and related flashings, anchorage and attachment devices.
   1. Unitized, shop assembly.
   2. Glazing Rabbet (exterior): For 1 inch insulating glazing.
   3. Glazing Position: Centered (front to back).
   4. Vertical Mullion Dimensions: 2 inches wide by 4-1/2 inches deep.
   5. Finishes: Anodized or painted, as scheduled.
   6. Anodized Finish: Class II natural anodized.
      a. Factory finish all surfaces that will be exposed in completed assemblies.
   7. Painted Finish: Superior performing organic coatings.
      a. Factory finish all surfaces that will be exposed in completed assemblies.
      b. Touch-up surfaces cut during fabrication so that no natural aluminum is visible in completed assemblies, including joint edges.
      c. Finish Color: As selected by Architect from manufacturer's standard line.
   8. Fabrication: Joints and corners flush, hairline, and weatherproof, accurately fitted and secured; prepared to receive anchors and hardware; fasteners and attachments concealed from view; reinforced as required for imposed loads.
   9. Construction: Eliminate noises caused by wind and thermal movement, prevent vibration harmonics, and prevent "stack effect" in internal spaces.
   10. System Internal Drainage: Drain to the exterior by means of a weep drainage network any water entering joints, condensation occurring in glazing channel, and migrating moisture occurring within system.
   11. Expansion/Contraction: Provide for expansion and contraction within system components caused by cycling temperature range of 170 degrees F over a 12 hour period without causing detrimental effect to system components, anchorages, and other building elements.
   12. Movement: Allow for movement between storefront and adjacent construction, without damage to components or deterioration of seals.
   13. Perimeter Clearance: Minimize space between framing members and adjacent construction while allowing expected movement.

B. Performance Requirements:
   1. Wind Loads: Design and size components to withstand the specified load requirements without damage or permanent set, when tested in accordance with ASTM E330/E330M, using loads 1.5 times the design wind loads and 10 second duration of maximum load.
      a. Design Wind Loads: Comply with requirements of ASCE 7.
      b. Member Deflection: Limit member deflection to flexure limit of glass in any direction, with full recovery of glazing materials.
   2. Water Penetration Resistance: No uncontrolled water on interior face, when tested in accordance with ASTM E331 at pressure differential of 8 psf.
   3. Air Leakage: Maximum of 0.06 cu ft/min sq ft of wall area, when tested in accordance with ASTM E283 at 6.27 psf pressure differential across assembly.
   4. Condensation Resistance Factor of Framing: 50, minimum, measured in accordance with AAMA 1503.
   5. Overall U-value Including Glazing:.38 Btu/(hr sq ft deg F), maximum.

2.03 COMPONENTS

A. Aluminum Framing Members: Tubular aluminum sections, thermally broken with interior section insulated from exterior, drainage holes and internal weep drainage system.
   1. Framing members for interior applications need not be thermally broken.
   2. Glazing Stops: Flush.

B. Glazing: As specified in Section 08 80 00.

C. Swing Doors: Glazed aluminum.
   1. Thickness: 1-3/4 inches.
   2. Top Rail: 4 inches wide.
   3. Vertical Stiles: 4-1/2 inches wide.
   4. Bottom Rail: 10 inches wide.
   5. Finish: Same as storefront.

2.04 MATERIALS

A. Extruded Aluminum: ASTM B221 (ASTM B221M).

B. Fasteners: Stainless steel.

C. Exposed Flashings: Aluminum sheet, 20 gage, 0.032 inch minimum thickness; finish to match framing members.

D. Glazing Gaskets: Type to suit application to achieve weather, moisture, and air infiltration requirements.

2.05 FINISHES

A. Class I Natural Anodized Finish: AAMA 611 AA-M12C22A41 Clear anodic coating not less than 0.7 mils thick.

B. Superior Performing Organic Coatings: AAMA 2605 multiple coat, thermally cured polyvinylidene fluoride (PVDF) system.

2.06 HARDWARE

A. For each door, include weatherstripping, sill sweep strip, and threshold.

B. Other Door Hardware: Storefront manufacturer's standard type to suit application.
   1. Finish on Hand-Contacted Items: Polished chrome.
   2. For each door, include butt hinges, push handle, pull handle, exit device, and closer.
   3. See door schedule for power operated and access controlled doors.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify dimensions, tolerances, and method of attachment with other work.

B. Verify that wall openings and adjoining air and vapor seal materials are ready to receive work of this section.

3.02 INSTALLATION

A. Install wall system in accordance with manufacturer's instructions.

B. Attach to structure to permit sufficient adjustment to accommodate construction tolerances and other irregularities.

C. Provide alignment attachments and shims to permanently fasten system to building structure.

D. Align assembly plumb and level, free of warp or twist. Maintain assembly dimensional tolerances, aligning with adjacent work.

E. Provide thermal isolation where components penetrate or disrupt building insulation.

F. Install sill flashings. Turn up ends and edges; seal to adjacent work to form water tight dam.

G. Where fasteners penetrate sill flashings, make watertight by seating and sealing fastener heads to sill flashing.

H. Pack fibrous insulation in shim spaces at perimeter of assembly to maintain continuity of thermal barrier.

I. Set thresholds in bed of sealant and secure.

J. Install hardware using templates provided.

K. Touch-up minor damage to factory applied finish; replace components that cannot be satisfactorily repaired.

3.03 ADJUSTING

A. Adjust operating hardware and sash for smooth operation.

3.04 CLEANING

A. Remove protective material from pre-finished aluminum surfaces.

3.05 PROTECTION

A. Protect installed products from damage until Date of Substantial Completion.

END OF SECTION

SECTION 08 54 14
COMPOSITE WINDOWS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Factory glazed windows and patio doors.

B. Operating hardware.

C. Insect screens.

1.02 RELATED REQUIREMENTS

A. Section 07 90 05 - Joint Sealers: Perimeter sealant and back-up materials.

1.03 REFERENCE STANDARDS

A. ASTM E283 - Standard Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen; 2004 (Reapproved 2012).

B. ASTM E330/E330M - Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference; 2014.

C. ASTM E331 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference; 2000 (Reapproved 2009).

1.04 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Convene one week week before starting work of this section.

1.05 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide unit U value, solar heat gain coefficient, visible transmittance, daylight area, ventilation area and structural performance information.

C. Warranty: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Protect finished surfaces with wrapping. Do not use adhesive papers or sprayed coatings that bond when exposed to sunlight or weather.

B. Jig, brace, and box the window frame assemblies for transport to minimize flexing of members or joints.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Composite Windows and Patio Doors:
   1. Anderson; Product 100 Series.
   2. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 WINDOW AND PATIO DOOR UNITS

A. Performance Requirements:
   1. System Design: Design and size components to withstand dead and live loads caused by pressure and suction of wind acting normal to plane of window.
      a. Design pressure 30 lb/sq ft acting inwards, and 30 lb/sq ft acting outwards.
      b. Calculate design pressures in accordance with IBC 2009
      c. Measure performance of units by testing in accordance with ASTM E330/E330M, using test pressure equal to 1.5 times the design wind pressure and 10 second duration of maximum load.
   2. Deflection: Limit member deflection to 1/200 of the longer dimension with full recovery of glazing materials.

3. Assembly: To accommodate, without damage to components or deterioration of seals, movement between window and perimeter framing, deflection of lintel.
4. Air Infiltration: Limit air infiltration through assembly to 0.3 cu ft/min/sq ft of wall area, measured at a reference differential pressure across assembly of 6.24 psf as measured in accordance with ASTM E283.
5. Vapor Seal: No vapor seal failure at interior static pressure of 1 inch, 72 degrees F, and 40 percent relative humidity.
6. Water Leakage: None, when measured in accordance with ASTM E331.
7. System Internal Drainage: Drain water entering joints, condensation occurring in glazing channels, or migrating moisture occurring within system, to the exterior by a weep drainage network.
8. Air and Vapor Seal: Maintain continuous air barrier and vapor retarder throughout assembly, primarily in line with inside pane of glass and heel bead of glazing compound.
9. Thermal Movement: Design sections to permit movement caused by thermal expansion and contraction of fiberglass to suit glass, infill, and perimeter opening construction.

2.03 GLASS AND GLAZING MATERIALS

A. Glazing: Insulating glass - low E with argon.

B. Windows:
   1. Unit U-value: .29 max.
   2. Unit SHGC: .32 max.
   3. Visible Light Transmittance: .54 min.

C. Sliding Patio Doors:
   1. Unit U-value: .30 max.
   2. Unit SHGC: .32 max.
   3. Visible Light Transmittance: .54 min.

2.04 SEALANT MATERIALS

A. Perimeter Sealant and Backing Materials: E1 Type as specified in Section 07 90 05.

2.05 HARDWARE

A. Manufacturer's standard operating hardware.

B. Provide special egress hinges or hardware where necessary to meet opening requirements.

C. Provide vent lock hardware to allow window to be locked partially open for ventilation. Required on all windows accessible from grade.

D. Provide auxiliary locks on windows with lower sash within 24 inches above finish floor.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify wall openings and adjoining air and vapor seal materials are ready to receive work of this Section.

3.02 INSTALLATION

A. Install window units in accordance with manufacturers instructions.

B. Attach window frame and shims to perimeter opening to accommodate construction tolerances and other irregularities.

C. Align window plumb and level, free of warp or twist. Maintain dimensional tolerances and alignment with adjacent work.

D. Install perimeter sealant and interface with weather barrier.

E. Provide thermal isolation where components penetrate or disrupt building insulation. Pack fibrous insulation in shim spaces at perimeter of assembly to maintain continuity of thermal barrier.

3.03 CLEANING

A. Remove protective material from pre-finished surfaces.

B. Wash surfaces by method recommended and acceptable to sealant and window manufacturer; rinse and wipe surfaces clean.

C. Remove excess sealant by moderate use of mineral spirits or other solvent acceptable to sealant manufacturer.

END OF SECTION

SECTION 08 63 00
METAL-FRAMED SKYLIGHTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Aluminum skylight framing system.

B. Skylight glazing.

C. Fasteners, anchors, reinforcement, and flashings.

1.02 REFERENCE STANDARDS

A. AAMA 611 - Voluntary Specification for Anodized Architectural Aluminum; American Architectural Manufacturers Association; 2012.

B. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2014.

C. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2015.

D. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2014.

E. ASTM B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate [Metric]; 2014.

F. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2013.

G. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes [Metric]; 2013.

H. ASTM C794 - Standard Test Method for Adhesion-in-Peel of Elastomeric Joint Sealants; 2015.

I. ASTM E283 - Standard Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen; 2004 (Reapproved 2012).

J. ASTM E330/E330M - Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference; 2014.

1.03 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide manufacturer's specifications, standard details, and installation requirements.

C. Shop Drawings: Indicate framed opening requirements and tolerances, spacing of all members, anticipated deflection under load, affected related work, expansion and contraction joint locations and details, and sizes and locations for field welding.

D. Selection Samples: Submit full range of aluminum finish samples for Architect's color selection.

1.04 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with not fewer than three years of documented experience.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Provide wrapping to protect prefinished aluminum surfaces. Do not use adhesive papers or spray coatings that bond when exposed to sunlight or weather.

1.06 WARRANTY

A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.

B. Correct defective work, including leaks, discoloration, failure of seal at insulated glazing units, and excessive thermal or structural movement, within a five year period after Date of Substantial Completion.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Metal-Framed Skylights:
   1. Bristolite Daylighting Systems. Inc; Custom Metal Framed Skylights: www.bristolite.com.
   2. Oldcastle Building Envelope: www.oldcastlebe.com.
   3. United Skys, Inc.: www.unitedskys.com.

2.02 METAL-FRAMED SKYLIGHTS

A. Metal Framed Skylights: Factory-fabricated, glazed.
   1. Frame: Extruded aluminum structural members with integral condensation collection and guttering system thermally separated from exterior pressure bar.
   2. Glazing System: Pressure glazing bar system for sloped joints and two (2)-sided structural sealant glazing (SSG) for horizontal joints.
   3. Glazing: Insulating glass.
   4. Aluminum Finish: Natural anodized.
   5. Fabricate to prevent harmonic vibration, wind whistles, noises caused by thermal movement, thermal movement transmitted to other building elements, loosening, weakening, or fracturing of attachments or components of system.

B. Performance Requirements: Provide products that comply with the following:
   1. Structural Design: Design and size components to withstand dead loads and specified live loads without damage or permanent set.
   2. Wind Loads: Test in accordance with ASTM E330/E330M, using loads 1.5 times the specified design pressures and 10 second duration of maximum load.
   3. Glazing Support Member Deflection Under Wind Load: 1/180 of span, maximum.
   4. Thermal Movement: Design system to accommodate thermal expansion and contraction over ambient temperature range of 100 degrees F, dynamic loading and release of loads, creep of concrete structural members, and deflection of structural support framing without damage to skylight system components or loss of weathertightness.
   5. Air Leakage: Limit air infiltration through assembly to 0.06 cu ft/min/sq ft for glazed area, measured at a reference differential pressure across assembly of 1.57 psf in accordance with ASTM E283.

2.03 MATERIALS

A. Aluminum Extrusions: 6005-T5 or 6061-T6 members complying with ASTM B221 (ASTM B221M). Minimum thickness 0.125 inch for structural members and 0.062 inch for non-structural members.

B. Formed Aluminum: Sheet material of alloy 5052, 5005, or 6061-T651 members complying with ASTM B209 (ASTM B209M), with minimum thickness 1/8 inch for structural members and 1/16 inch for non-structural members.

C. Internal Reinforcement: ASTM A36/A36M; steel shapes as required for strength and mullion size limitations, hot-dip galvanized after fabrication in accordance with ASTM A123/A123M.

D. Insulating Glass: Sealed insulated units, outer pane of clear transparent, laminated glass; inner pane of clear transparent, laminated glass; space of sealed air, metal edge frame.

E. Weatherseal Sealant: Silicone, with adhesion in compliance with ASTM C794; compatible with glazing accessories.

F. Touch-Up Primer for Galvanized Steel Surfaces: Zinc rich type.

2.04 FABRICATION

A. Fabricate components to allow for expansion and contraction with minimum clearance and shim spacing around perimeter of assembly.

B. Maintain continuous air and vapor barrier throughout assembly, with the barrier plane aligned with inside pane of glazing continuing to a heel bead of glazing sealant.

C. Drain to exterior any water entering exterior joints, condensation occurring in glazing channels, or migrating moisture occurring within system.

D. Prepare components to receive concealed anchorage devices. Ensure that fasteners and anchorage devices will be concealed upon completion of installation.

2.05 FINISHES

A. Class I Natural Anodized Finish: AAMA 611 AA-M12C22A41 Clear anodic coating not less than 0.7 mils thick; exterior surfaces only.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that structural curb is ready to receive skylight system. Coordinate installation of roofing and other adjacent work to ensure weathertight construction.

3.02 INSTALLATION

A. Install metal-framed skylights in accordance with manufacturer's instructions.

B. Set skylight structure plumb, level, and true to line, without warp or rack of frames or glazing panels. Anchor securely in place in accordance with approved shop drawings.

C. Maintain assembly dimensional tolerances, aligning with adjacent work.

D. Install base flashings in accordance with Section 07 62 00.

E. Touch up damaged finishes so repair is imperceptible from 6 feet. Remove and replace components that cannot be satisfactorily touched up.

3.03 CLEANING

A. Remove protective material from prefinished aluminum surfaces.

B. Wash down exposed surfaces; wipe surfaces clean.

C. Remove excess sealant by methods recommended by skylight manufacturer.

END OF SECTION

SECTION 08 71 00

DOOR HARDWARE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Hardware for wood and hollow metal doors.

B. Hardware for fire-rated doors.

C. Electrically operated and controlled hardware.

D. Lock cylinders for doors that hardware is specified in other sections.

E. Thresholds.

F. Weatherstripping, seals and door gaskets.

G. Key Controls and Knox Box.

H. **Library Hardware: West wing library space and library basement mechanical room: All man doors to have continuous hinges (full length) & "Sargent" hardware – see floor plans and door schedule for specific doors and locations.**

1.02 RELATED REQUIREMENTS

A. Section 08 11 13 - Hollow Metal Doors and Frames.

B. Section 08 14 16 - Flush Wood Doors.

C. Section 08 43 13 - Aluminum-Framed Storefronts: Hardware for doors in storefront, including:
   1. Integral weatherstripping.
   2. Hinges.
   3. Exit devices.
   4. Push bars and pull handles.
   5. Thresholds.
   6. Installation of lock cylinders provided under this section.

1.03 REFERENCE STANDARDS

A. ADA Standards - Americans with Disabilities Act (ADA) Standards for Accessible Design; 2010.

B. BHMA A156.1 - American National Standard for Butts and Hinges; 2013.

C. BHMA A156.3 - American National Standard for Exit Devices; 2014.

D. BHMA A156.4 - American National Standard for Door Controls - Closers; 2013.

E. BHMA A156.7 - American National Standard for Template Hinge Dimensions; 2014.

F. BHMA A156.8 - American National Standard for Door Controls - Overhead Stops and Holders; 2010.

G. BHMA A156.15 - American National Standard for Release Devices - Closer Holder, Electromagnetic and Electromechanical; 2011.

H. BHMA A156.18 - American National Standard for Materials and Finishes; 2012.

I. BHMA A156.23 - American National Standard for Electromagnetic Locks; 2010.

J. DHI A115 Series - Specifications for Steel Doors and Frame Preparation for Hardware; Door and Hardware Institute; 2000.

K. DHI A115W Series - Specifications for Wood Door and Frame Preparation for Hardware; Door and Hardware Institute; 2000.

L. DHI (LOCS) - Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames; 2004.

M. DHI WDHS.3 - Recommended Locations for Architectural Hardware for Flush Wood Doors; 1993; also in WDHS-1/WDHS-5 Series, 1996.

N. ICC A117.1 - Accessible and Usable Buildings and Facilities; 2009.

O. NFPA 80 - Standard for Fire Doors and Other Opening Protectives; 2016.

P. NFPA 101 - Life Safety Code; 2015.

Q. UL (DIR) - Online Certifications Directory; current listings at database.ul.com.

R. UL 10C - Standard for Positive Pressure Fire Tests of Door Assemblies; Current Edition, Including All Revisions.

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Manufacturer's catalog literature for each type of hardware, marked to clearly show products to be furnished for this project.

C. Hardware Schedule: Detailed listing of each item of hardware to be installed on each door. Identify electrically operated items and include power requirements.

D. Keying Schedule: Submit for approval of Owner.

E. Warranty: Submit manufacturer's warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Package hardware items individually; label and identify each package with door opening code to match hardware schedule.

PART 2 PRODUCTS

2.01 DOOR HARDWARE - GENERAL

A. Provide hardware specified or required to make doors fully functional, compliant with applicable codes, and secure to the extent indicated.

B. Provide items of a single type of the same model by the same manufacturer.

C. Provide products that comply with the following:
   1. Applicable provisions of federal, state, and local codes.
   2. Accessibility: ADA Standards and ICC A117.1.
   3. Applicable provisions of NFPA 101, Life Safety Code.
   4. Fire-Rated Doors: NFPA 80.
   5. Hardware on Fire-Rated Doors, Except Hinges: Listed and classified by UL (DIR) as suitable for the purpose specified and indicated.
   6. Hardware for Smoke and Draft Control Doors (Indicated as "S" on Drawings): Provide hardware that enables door assembly to comply with air leakage requirements of the applicable code.
   7. Products Requiring Electrical Connection: Listed and classified by UL (DIR) as suitable for the purpose specified and indicated.

D. Electrically Operated and/or Controlled Hardware: Provide all power supplies, power transfer hinges, relays, and interfaces required for proper operation; provide wiring between hardware and control components and to building power connection.

E. Finishes: Provide door hardware of the same finish unless otherwise indicated.
   1. Primary Finish: Satin chrome plated over nickel on brass or bronze, 626 (approx US26D).
   2. Finish Definitions: BHMA A156.18.
   3. Exceptions:
      a. Where base metal is specified to be different, provide finish that is an appearance equivalent according to BHMA A156.18.
      b. Hinges for Fire-Rated Doors: Steel base metal with painted finish.

2.02 LOCKS AND LATCHES

A. Locks: Provide a lock for every door, unless specifically indicated as not requiring locking.
   1. If no hardware set is indicated for a swinging door provide an office lockset.

2. Trim: Provide lever handle or pull trim on outside of all locks unless specifically stated to have no outside trim.
3. Lock Cylinders: Provide key access on outside of all locks unless specifically stated to have no locking or no outside trim.

B. Lock Cylinders: Manufacturer's standard tumbler type, six-pin standard core.
1. Provide cams and/or tailpieces as required for locking devices required.

C. Keying: Grand master keyed.
1. Supply keys in the following quantities:
a. 4 master keys.
b. 2 grand master keys.
c. 2 great grand master keys.
d. 2 change keys for each lock.

D. Latches: Provide a latch for every door that is not required to lock, unless specifically indicated "push/pull" or "not required to latch".

2.03 HINGES

A. Hinges: Provide hinges on every swinging door.
1. Provide five-knuckle full mortise butt hinges unless otherwise indicated.
2. Provide ball-bearing hinges at all doors having closers.
3. Provide hinges in the quantities indicated.
4. Provide non-removable pins on exterior outswinging doors.
5. Where electrified hardware is mounted in door leaf, provide power transfer hinges.

B. Butt Hinges: Comply with BHMA A156.1 and BHMA A156.7; standard weight, unless otherwise indicated.
1. Provide hinge width required to clear surrounding trim.

C. Quantity of Hinges Per Door:
1. Doors up to 60 inches High: Two hinges.
2. Doors From 60 inches High up to 90 inches High: Three hinges.
3. Doors 90 inches High up to 120 inches High: Four hinges.

D. Manufacturers - Hinges:
1. Assa Abloy Brands; McKinney: www.assaabloydss.com.
2. Bommer Industries, Inc: www.bommer.com.
3. C. R. Laurence Co., Inc: www.crl-arch.com.
4. Hager Companies: www.hagerco.com.
5. Stanley Black & Decker: www.stanleyblackanddecker.com.
6. Substitutions: See Section 01 60 00 - Product Requirements.

2.04 FLUSHBOLTS AND COORDINATORS

A. Flushbolts: Lever extension bolts in leading edge of door into top of frame.

B. Manual Flushbolts: Provide lever extensions for top bolt at over-size doors.

C. Self-Latching Flushbolts: Automatically latch upon closing of door; manually retracted.

D. Coordinators: Provide on doors having closers and self-latching or automatic flushbolts to ensure that leaves close in proper order.

2.05 MAGNETIC LOCKS

A. Magnetic Locks: Complying with BHMA A156.23 - Grade 1, and UL 10C listed for fire doors.

2.06 ELECTRIC STRIKES

A. Manufacturers - Electric Strikes:
1. Assa Abloy Brands; Folger Adam EDC, HES, or Securitron: www.assaabloydss.com.
2. Substitutions: See Section 01 60 00 - Product Requirements.

2.07 EXIT DEVICES

A. Locking Functions: Functions as defined in BHMA A156.3, and as follows:
   1. Entry/Exit, Always-Unlocked: Outside lever unlocked, no outside key access, no latch holdback.
   2. Entry/Exit, Free Swing: Key outside retracts latch, latch holdback (dogging) for free swing during occupied hours, not fire-rated; outside trim must be specified as lever or pull.
   3. Entry/Exit, Always-Latched: Key outside locks and unlocks lever, no latch holdback (dogging).
   4. Entry/Exit, Always-Latched, With Alarm: Key outside locks and unlocks lever, no latch holdback (dogging). Key inside unlatches without sounding alarm, push bar exit sounds alarm with 15 second delayed egress.

B. Manufacturers - Exit Devices:
   1. Assa Abloy Brands; Corbin Russwin, Sargent, or Yale: www.assaabloydss.com.
   2. C. R. Laurence Co., Inc: www.crl-arch.com.
   3. Detex Corporation; ADVANTEX Series: www.detex.com/sle.
   4. DORMA USA, Inc; 8000 Series, 9000 Series, DG1000 Series, and DG1100 Series: www.dorma.com.
   5. Hager Companies: www.hagerco.com.
   6. Von Duprin, an Allegion brand: www.allegion.com/us.
   7. Substitutions: See Section 01 60 00 - Product Requirements.

2.08 CLOSERS

A. Hydraulic Closers: Complying with BHMA A156.4 Grade 1.
   1. Provide surface-mounted, door-mounted closers unless otherwise indicated.
   2. Provide a door closer on every exterior door.
   3. Provide a door closer on every fire- and smoke-rated door. Spring hinges are not an acceptable self-closing device unless specifically so indicated.
   4. On pairs of swinging doors, if an overlapping astragal is present, provide coordinator to ensure the leaves close in proper order.
   5. At corridors, locate door-mounted closer on room side of door.
   6. At outswinging exterior doors, mount closer in inside of door.

B. Manufacturers - Surface Mounted Closers:
   1. Assa Abloy Norton: www.assaabloydss.com.
   2. C. R. Laurence Company, Inc: www.crl-arch.com.
   3. DORMA USA, Inc; 7400 Series, 8600 Series, 8900 Series, and TS93: www.dorma.com.
   4. Hager Companies: www.hagerco.com.
   5. LCN, an Allegion brand: www.allegion.com/us.
   6. Substitutions: See Section 01 60 00 - Product Requirements.

C. Spring Hinge Closers: UL listed for application.

2.09 STOPS AND HOLDERS

A. Stops: Complying with BHMA A156.8; provide a stop for every swinging door, unless otherwise indicated.
   1. Provide wall stops, unless otherwise indicated.
   2. If wall stops are not practical, due to configuration of room or furnishings, provide overhead stop.
   3. Provide spring bumpers for doors within units, where spring bumpers are not practical due to configuration of doors, provide hinge pin stops.

B. Magnetic Holder/Releases: Complying with BHMA A156.15; fail safe; doors release to close automatically when electrical current is interrupted; holding force: 25 to 40 pounds-force.

C. Manufacturers - Wall and Floor Stops/Holders:
   1. Assa Abloy Brands; McKinney: www.assaabloydss.com.
   2. C. R. Laurence Company, Inc: www.crl-arch.com.

3. Hager Companies: www.hagerco.com.
4. Hiawatha, Inc, division of Activar Construction Products Group, Inc: www.activarcpg.com/hiawatha.
5. Trimco Hardware: www.trimcohardware.com.
6. Substitutions: See Section 01 60 00 - Product Requirements.

D. Manufacturers - Magnetic Holder/Releases:
1. Hager Companies: www.hagerco.com.
2. Substitutions: See Section 01 60 00 - Product Requirements.

2.10 GASKETING AND THRESHOLDS

A. Automatic Door Bottoms: At unit entry doors provide surface mounted automatic door bottom.

B. Thresholds: Provide for all doors scheduled.
1. Field cut threshold to frame for tight fit.

C. Fasteners At Exterior Locations: Non-corroding.

D. Manufacturers - Gasketing and Thresholds:
1. Assa Abloy Brands; McKinney: www.assaabloydss.com.
2. Hager Companies: www.hagerco.com.
3. National Guard Products, Inc: www.ngpinc.com.
4. Pemko Manufacturing Co: www.pemko.com.
5. Zero International, Inc: www.zerointernational.com.
6. Substitutions: See Section 01 60 00 - Product Requirements.

2.11 SLIDING AND BIFOLDING DOOR HARDWARE

A. Bifolding Door Hardware: Track, hanger fasteners, guides, and pulls; size track and hangers according to manufacturer's recommendations for weight of doors.
1. Provide one pull for each pair of panels hinged together, same pull as cabinetry.

B. Manufacturers - Sliding and Bifolding Hardware:
1. Hager Companies: www.hagerco.com.
2. Hettich America, LP; Grant Folding and Sliding Door Hardware: www.hettich.com/sle.
3. Johnson Hardware: www.johnsonhardware.com.
4. Stanley Black & Decker: www.stanleyblackanddecker.com.

2.12 PROTECTION PLATES AND ARCHITECTURAL TRIM

A. Protection Plates:
1. Kickplate: Provide on push side of doors as scheduled.
2. Armor Plates: Provide on exterior side of all service doors.

B. Viewer: Provide on all dwelling unit entry doors.

C. Manufacturers - Protection Plates and Architectural Trim:
1. Assa Abloy Brands; McKinney: www.assaabloydss.com.
2. C. R. Laurence Co., Inc: www.crl-arch.com.
3. Hager Companies: www.hagerco.com.
4. Hiawatha, Inc, division of Activar Construction Products Group, Inc: www.activarcpg.com/hiawatha.
5. Trimco Hardware: www.trimcohardware.com.
6. Substitutions: See Section 01 60 00 - Product Requirements.

2.13 KEY CONTROLS

A. Facility Manager's Key Cabinet: Sheet steel construction, piano hinged door with key lock.
1. Mounting: Wall-mounted.
2. Capacity: Actual quantity of keys, plus 25 percent additional capacity.
3. Size key hooks to hold 6 keys each.
4. Finish: Baked enamel, manufacturer's standard color.
5. Key cabinet lock to building keying system.
6. Manufacturers - Key Controls:

a. Lund; 1200 Series Deluxe Wall Cabinet.
b. MMF Industries; Steelmaster Dupli-Key.
c. Substitutions: See Section 01 60 00 - Product Requirements.

2.14 FIRE DEPARTMENT LOCK BOX

A. Fire Department Lock Box: Heavy-duty, recessed, solid stainless-steel box with lift off door and interior gasket seal; single drill resistant lock with dust covers.
   1. Capacity: Holds 2 keys.
   2. Finish: Manufacturer's standard dark bronze.
   3. Manufacturers - Fire Department Lock Box:
      a. Knox Company; Knox-Box Rapid Entry System: www.knoxbox.com.
      b. Substitutions: See Section 01 60 00 - Product Requirements.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that doors and frames are ready to receive work; labeled, fire-rated doors and frames are present and properly installed, and dimensions are as indicated on shop drawings.

B. Verify that electric power is available to power operated devices and of the correct characteristics.

3.02 INSTALLATION

A. Install hardware in accordance with manufacturer's instructions and applicable codes.

B. Use templates provided by hardware item manufacturer.

C. Do not install surface mounted items until finishes applied to substrate are complete.

D. Install hardware on fire-rated doors and frames in accordance with code and NFPA 80.

E. Mounting heights for hardware from finished floor to center line of hardware item.
   1. For steel doors and frames: Comply with DHI (LOCS) "Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames".
   2. For Wood Doors: Comply with DHI WDHS.3 "Recommended Locations for Architectural Hardware for Flush Wood Doors".

3.03 CLEANING

A. Clean adjacent surfaces soiled by hardware installation. Clean finished hardware per manufacturer's instructions after final adjustments has been made. Replace items that cannot be cleaned to manufacturer's level of finish quality at no additional cost.

3.04 HARDWARE SETS

A. Provide electric strikes for FOB / intercom access at doors indicated on door schedule.

B. All Rated Doors:
   1. Gasketing: Smoke gaskets or intumescent gaskets as required to achieve rating, unless specifically not required by listing.
   2. Listed closer and latch.
   3. All hardware as required to achieve required fire label.

C. Interior Unit Doors (prehung) :
   1. Hinges: 3 1/2 x 3 1/2; match hardware color.
   2. Latch: Schlage F series.
      a. Privacy latch on bedroom, bathrooms, dens and studies.
      b. Passage latch on all other doors.
   3. Spring bumper or hinge stop as appropriate.

D. Unit Entry Door (Corridor):
   1. Hinges: 4 1/2 x 4 1/2
   2. Latch: Schlage AL series passage latch.
   3. Deadbolt: Schlage B60 series.

4. Closer: Spring hinge closer. Provide two for each door.
    a. Provide hydraulic closer at Type A Accessible Units.
5. Automatic Door Bottom: Drop down seal activated by closing force of door.
    a. Reese 320D-36. (Verify Color)
    b. Hardwood ADA profile threshold.
6. Gasketing: Smoke gasket.
7. Viewer @ 57" a.f.f.
8. Additional Viewer @ 43" a.f.f. at Type A Accessible Units.
9. Spring bumper or hinge stop as appropriate.

E. Stair Enclosure Door (Typical):
1. Hinges: 4 1/2 x 4 1/2 BB
2. Latch: Schlage AL series.
3. Closer: Hydraulic type.
4. Wall Stop: DCI 3211
5. Gasketing: Smoke seal.

F. Stair Enclosure Door (Commercial):
1. Hinges: 4 1/2 x 4 1/2 BB
2. Exit device with alarm and delayed egress.
3. Closer: Hydraulic type.
4. Wall Stop: DCI 3211
5. Gasketing: Smoke seal.

G. Basement Elevator Lobby Door:
1. Hinges: 4 1/2 x 4 1/2 BB
2. Latch: Schlage AL series.
3. Closer: Hydraulic type.
4. Wall Stop: DCI 3211
5. Gasketing: Smoke seal.

H. Fire Doors (Double):
1. Hinges: 4 1/2 x 4 1/2 BB
2. Latch: Vertical rod push bar fire exit device on each leaf.
3. Closer: Hydraulic type.
4. Astragal.
5. Coordinator (where doors are not double egress).
6. Gasketing: As required by listing agency.
7. Magnetic hold-open.

I. Community Room Door:
1. Hinges: 4 1/2 x 4 1/2 BB
2. Exit device.
3. Closer: Hydraulic type. Active leaf only.
4. Gasketing: Smoke gasket.
5. Surface mounted wall bumper.

J. Community Room Door(s): (Exterior)
1. Exit device.
2. Cylinder.
3. Balance of hardware by door supplier.

K. Fitness Room Door:
1. Hinges (1 1/2 pair): 4 1/2 x 4 1/2 BB
2. Latch: Schlage AL series.
3. Closer: Hydraulic type.
4. Kick Plate: Hager 190s.

L. Office Door:
1. Hinges (1 1/2 pair): 4 1/2 x 4 1/2 BB

2. Latch: Schlage AL series.
3. Closer: Hydraulic type.
4. Gasketing: Smoke Gasket.

M. Mechanical Room Doors:
1. Hinges: 4 1/2 x 4 1/2 BB
2. Latch: Schlage AL series.
3. Closer: Hydraulic type.
4. Gasketing:
    a. Smoke Gasket.

N. Trash Chute Access Room Doors:
1. Hinges: 4 1/2 x 4 1/2 BB
2. Latch: Schlage AL series.
3. Closer: Hydraulic type.
4. Gasketing: Smoke Gasket.

O. Storage Area Access Doors:
1. Hinges: 4 1/2 x 4 1/2 BB
2. Latch: Schlage AL series.
3. Closer: Hydraulic type.
4. Gasketing:
    a. Smoke Gasket.

P. Tenant Storage Cubicle Door (prehung):
1. Hinges: 3 1/2 x 3 1/2
2. Latch: Padlock hasp only.
3. Closer: N/A.

Q. Basement Walk Door:
1. Hinges: 4 1/2 x 4 1/2 BB NRP
2. Latch: Schlage AL series.
3. Closer: Hydraulic type.
4. Gasketing: Weatherstripping.
5. Threshold and sweep.
6. Latch guard.

R. Basement Trash Room and Trash Chute Room Doors (Double):
1. Hinges: 4 1/2 x 4 1/2 BB
2. Latch: Schlage AL series.
3. Closer: Hydraulic type.
4. Flush bolt.
5. Kick Plates push side.

S. Aluminum Doors:
1. Lock cylinder.
2. Remaining hardware by door manufacturer.

T. All Other Common Doors:
1. Hinges: 4 1/2 x 4 1/2 BB
2. Latch: Schlage AL series.
3. Closer: Hydraulic type.

END OF SECTION

SECTION 08 74 60
LOW-ENERGY DOOR OPERATORS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Electro-mechanical low energy powered door operators, opening force not exceeding 14 lb-force.

1.02 REFERENCES

A. BHMA A156.19 - American National Standard for Power Assist and Low Energy Power Operated Doors; Builders Hardware Manufacturers Association; 2002 (ANSI/BHMA A156.19).

B. UL 325 - Standard for Door, Drapery, Gate, Louver, and Window Operators and Systems; Underwriters Laboratories Inc.; 2002.

1.03 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Manufacturer's catalog data, detail sheets, and specifications.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Tormax Technologies, Inc.

B. LCN

C. Substitutions: See Section 01 60 00 - Product Requirements.

D. Provide all door operators from a single manufacturer.

2.02 OPERATORS

A. Provide on both doors at main entrance to building.

B. Operators: Comply with BHMA A156.19 and UL 325.
   1. Operation: Push button, push plate, switch actuator, or manual opening with power boost closing and holding.
   2. Close and center door against stop after each cycle, and hold against drafts, winds, and stack pressure.
   3. Make door safely stop and reverse if an object is encountered in the opening or closing cycle.
   4. Manual opening force: 14 lb-force maximum.
   5. Closing force: 6 lb-force.
   6. Factory-set door hold-open voltage.
   7. Manual "On-Off-Hold Open" switch.
   8. Fail safe: In event of power failure, make door operate manually with controlled spring close as though equipped with a manual door closer, without damage to operator components.
   9. Provide adjustment by microprocessor control for opening speed, back check, hold open, from 5 to 30 seconds, closing speed, opening force (torque limiting), and acceleration during opening and recycling, for soft start.

C. Equipment: Completely electro-mechanical; comply with BHMA A156.19 and UL 325.
   1. Control box and motor/gear box: Contained in aluminum housing; precision-machined gears and bearing seats and all-weather lubricant, mounted on vibration isolators.
   2. Gears: Manufactured by operator manufacturer specifically for operators.
   3. Motor: DC permanent magnet motor with shielded ball bearings. Stop motor when door stops or is fully open and when break-away is operated.
   4. Door operating arm: Forged steel, attached at natural pivot point of door; do not use slide block in top of door.
   5. "On-Off-Hold Open" switch: Three-position toggle or rocker type.

6. Control circuits for actuators and safeties: Low voltage, NEC Class II.
7. Service conditions: Satisfactory operation between minus 30 degrees F and 160 degrees F.
8. Power supply required: 115 VAC.
9. Microprocessor control: 115 VAC. Do not use microswitches. Mount control in snap-in type control box.

D. Enclosure: Extruded aluminum header concealing all operating parts except arms and manual control switches.
1. Provide bottom loading header for access to controls and removable components without removal of door or operator.
2. No exposed fasteners.
3. Finish of Exposed Headers: Anodized aluminum.
4. Color: To match door.

2.03 ACTIVATORS

A. Wall-Mounted Push Button Switch: No. 1204-900; two required per opening.

B. Push Plate: Formed metal plate, satin finish; approximately 5 inches square with depressed marking; two required per opening.
1. Material: Stainless steel.

C. RF Id Reader: Proximity reader specified in Section 26 00 00 - Electrical: Entrance Security/Communication System.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install in accordance with manufacturer's instructions; comply with BHMA A156.19.

B. Verify that electrical connections are made correctly and with dedicated grounding.

3.02 ADJUST AND CLEAN

A. Adjust door operators for proper operation, without binding or scraping and without excessive noise.

END OF SECTION

SECTION 08 80 00

GLAZING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Glazing in aluminum framed storefront units, interior doors and borrowed lites.

B. Glazing compounds and accessories.

C. **West Wing Library Space: All glazing to be 1" thick clear tempered with Solarban 60 low E #2 surface with argon fill.**

1.02 RELATED REQUIREMENTS

A. Section 08 53 13 - Vinyl Windows: Glazing furnished by window manufacturer.

B. Section 08 83 00 - Mirrors.

1.03 REFERENCE STANDARDS

A. 16 CFR 1201 - Safety Standard for Architectural Glazing Materials; current edition.

B. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2014.

C. ASTM C1036 - Standard Specification for Flat Glass; 2011.

D. ASTM C1048 - Standard Specification for Heat-Strengthened and Fully Tempered Flat Glass; 2012.

E. ASTM C1193 - Standard Guide for Use of Joint Sealants; 2013.

F. ASTM E2190 - Standard Specification for Insulating Glass Unit Performance and Evaluation; 2010.

G. GANA (SM) - GANA Sealant Manual; 2008.

H. ICC (IBC) - International Building Code; 2015.

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data on Glass Types: Provide structural, physical and environmental characteristics, size limitations, special handling or installation requirements.

C. Samples: Submit two samples 12 by 12 inch in size of glass units.

D. Samples: Submit selection samples for colored glazing film.

PART 2 PRODUCTS

2.01 INSULATING GLASS UNITS

A. Type IG-1 - Sealed Insulating Glass Units: Vision glass, double glazed.
   1. Application: All exterior glazing unless otherwise indicated.
   2. Outboard Lite: Annealed float glass, 1/4 inch thick, minimum.
      a. Tint: Clear.
      b. Coating: Low-E (passive type), on #2 surface.
   3. Inboard Lite: Annealed float glass, 1/4 inch thick, minimum.
      a. Tint: Clear.
   4. Total Thickness: 1 inch.
   5. Total Visible Light Transmittance: 54 percent, minimum.
   6. Total Solar Heat Gain Coefficient: 40 percent, nominal.

B. Type IG-1 - Sealed Insulating Glass Units: Vision glazing, with Low-E coating.
   1. Application: All exterior glazing unless otherwise indicated.
   2. Between-lite space filled with argon.
   3. Thermal Resistance (U-Value): .35, maximum.
   4. Total Solar Heat Gain Coefficient: .35, nominal.
   5. Total Thickness: 1 inch.

C. Type IG-2 - Sealed Insulating Glass Units: Spandrel glazing.
   1. Outboard Lite: Annealed float glass, 1/4 inch thick, minimum.
      a. Tint: Clear.
      b. Coating: Same as on vision units, on #2 surface.
   2. Inboard Lite: Heat-strengthened float glass, 1/4 inch thick.
      a. Tint: Clear.
      b. Opacifier: Ceramic frit, on #4 surface.
   3. Total Thickness: 1 inch.

D. Type IG-3 - Sealed Insulating Glass Units: Safety glazing.
   1. Application: Provide this type of glazing in the following locations:
      a. Glazed lites in exterior doors.
      b. Glazed sidelights and panels next to doors.
      c. Other locations required by applicable federal, state, and local codes and regulations.
      d. Other locations indicated on the drawings.
   2. Type: Same as Type IG-1 except use fully tempered float glass for both outboard and inboard lites.
   3. Tint: Clear.

E. Type S-2 - Fire-Protection-Rated Safety Glazing:
   1. IBC Fire Protection Rating: As indicated on drawings.
   2. Safety Certification: 16 CFR 1201 Category II.
   3. Application: Provide this type of glazing in the following locations:
      a. Glazed lites in rated doors.
      b. Fire windows.
      c. Sidelights, borrow lites, and other glazed openings in partitions indicated as having an hourly fire rating.
      d. Other locations indicated on the drawings.
   4. Type: Glass-ceramic safety glazing; laminated wired glass is not acceptable.
   5. Thickness: 1/4 inch.
   6. Glazing Method: As required for fire rating.

F. Type S-3 - Single Safety Glazing: Non-fire-rated.
   1. Application: Provide this type of glazing in the following locations:
      a. Glazed lites in interior doors, except fire doors.
      b. Shower and bathtub enclosures and doors.
      c. Glazed sidelights to interior doors, except in fire-rated walls and partitions.
      d. Other locations required by applicable federal, state, and local codes and regulations.
      e. Other locations indicated on the drawings.
   2. Type: Fully tempered float glass as specified.
   3. Tint: Clear.
   4. Thickness: 1/4 inch.

2.02 GLASS MATERIALS

A. Float Glass Manufacturers:
   1. AGC Glass Company North America, Inc: www.us.agc.com.
   2. Cardinal Glass Industries: www.cardinalcorp.com.
   3. Guardian Industries Corp: www.sunguardglass.com.
   4. Pilkington North America Inc: www.pilkington.com/na.
   5. PPG Industries, Inc: www.ppgideascapes.com.
   6. Substitutions: Refer to Section 01 60 00 - Product Requirements.

B. Float Glass: Provide float glass based glazing unless noted otherwise.
   1. Annealed Type: ASTM C1036, Type I - Transparent Flat, Class 1 - Clear, Quality-Q3.
   2. Heat-Strengthened and Fully Tempered Types: ASTM C1048, Kind HS and Kind FT.
   3. Tinted Types: ASTM C1036, Class 2 - Tinted, color and performance characteristics as indicated.

4. Thicknesses: As indicated; for exterior glazing comply with requirements indicated for wind load design regardless of thickness indicated.

C. Fire-Protection-Rated Glazing: Type, thickness, and configuration as required to achieve indicated ratings.
   1. IBC Fire Protection Rating: As indicated on drawings.
   2. Provide products listed by Underwriters Laboratories or Intertek Warnock Hersey.
   3. Safety Certification: 16 CFR 1201 Category II.
   4. Labeling: Provide permanent label on each piece giving the IBC rating and other information required by the applicable code.

2.03 SEALED INSULATING GLASS UNITS

A. Sealed Insulating Glass Units: Types as indicated.
   1. Durability: Certified by an independent testing agency to comply with ASTM E2190.
   2. Edge Seal: Glass to elastomer with supplementary silicone sealant.

2.04 PLASTIC FILMS

A. Manufacturers:
   1. Flexvue Films: www.flexvuefilms.com.
   2. 3M Window Film: www.3m.com/US/arch_construct/scpd/windowfilm.
   3. Substitutions: Refer to Section 01 60 00 - Product Requirements.

2.05 GLAZING COMPOUNDS

A. Glazing Putty: Polymer modified latex recommended by manufacturer for outdoor use, knife grade consistency; grey color.

B. Butyl Sealant: Single component; ASTM C920, Grade NS, Class 12-1/2, Uses M and A, Shore A hardness of 10 to 20; black color.

C. Polysulfide Sealant: Two component; chemical curing, non-sagging type; ASTM C920, Type M, Grade NS, Class 25, Uses M, A, and G; with cured Shore A hardness range of 15 to 25; color as selected.

D. Polyurethane Sealant: Single component, chemical curing, non-staining, non-bleeding; ASTM C920, Type S, Grade NS, Class 25, Uses M, A, and G; with cured Shore A hardness range of 20 to 35; color as selected.

E. Silicone Sealant: Single component; neutral curing; capable of water immersion without loss of properties; non-bleeding, non-staining; ASTM C920, Type S, Grade NS, Class 25, Uses M, A, and G; with cured Shore A hardness range of 15 to 25; color as selected.

2.06 GLAZING ACCESSORIES

A. Setting Blocks: Neoprene, 80 to 90 Shore A durometer hardness; ASTM C864 Option II. Length of 0.1 inch for each square foot of glazing or minimum 4 inch x width of glazing rabbet space minus 1/16 inch x height to suit glazing method and pane weight and area.

B. Spacer Shims: Neoprene, 50 to 60 Shore A durometer hardness; ASTM C864 Option II. Minimum 3 inch long x one half the height of the glazing stop x thickness to suit application, self adhesive on one face.

C. Glazing Tape, Back Bedding Mastic Type: Preformed, butyl-based, 100 percent solids compound with integral resilient spacer rod applicable to application indicated; hardness range of 5 to 30 cured Shore A durometer; coiled on release paper; black color.

D. Glazing Clips: Manufacturer's standard type.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that openings for glazing are correctly sized and within tolerance.

B. Verify that surfaces of glazing channels or recesses are clean, free of obstructions that may impede moisture movement, weeps are clear, and ready to receive glazing.

3.02 PREPARATION

A. Clean contact surfaces with solvent and wipe dry.

B. Seal porous glazing channels or recesses with substrate compatible primer or sealer.

C. Prime surfaces scheduled to receive sealant.

D. Install sealants in accordance with ASTM C1193 and GANA Sealant Manual.

E. Install sealants in accordance with manufacturer's instructions.

3.03 INSTALLATION - EXTERIOR WET/DRY METHOD (PREFORMED TAPE AND SEALANT)

A. Cut glazing tape to length and set against permanent stops, 3/16 inch below sight line. Seal corners by butting tape and dabbing with butyl sealant.

B. Apply heel bead of butyl sealant along intersection of permanent stop with frame ensuring full perimeter seal between glass and frame to complete the continuity of the air and vapor seal.

C. Place setting blocks at 1/4 points with edge block no more than 6 inch from corners.

D. Rest glazing on setting blocks and push against tape and heel bead of sealant with sufficient pressure to attain full contact at perimeter of pane or glass unit.

E. Install removable stops, with spacer strips inserted between glazing and applied stops 1/4 inch below sight lines.
   1. Place glazing tape on glazing pane of unit with tape flush with sight line.

F. Fill gap between glazing and stop with butyl type sealant to depth equal to bite of frame on glazing, but not more than 3/8 inch below sight line.

G. Apply cap bead of silicone type sealant along void between the stop and the glazing, to uniform line, flush with sight line. Tool or wipe sealant surface smooth.

3.04 INSTALLATION - INTERIOR WET/DRY METHOD (TAPE AND SEALANT)

A. Cut glazing tape to length and install against permanent stops, projecting 1/16 inch above sight line.

B. Place setting blocks at 1/4 points with edge block no more than 6 inch from corners.

C. Rest glazing on setting blocks and push against tape to ensure full contact at perimeter of pane or unit.

D. Install removable stops, spacer shims inserted between glazing and applied stops at 24 inch intervals, 1/4 inch below sight line.

E. Fill gaps between pane and applied stop with _____ type sealant to depth equal to bite on glazing, to uniform and level line.

F. Trim protruding tape edge.

3.05 INSTALLATION - INTERIOR WET METHOD (COMPOUND AND COMPOUND)

A. Install glazing resting on setting blocks. Install applied stop and center pane by use of spacer shims at 24 inch centers, kept 1/4 inch below sight line.

B. Locate and secure glazing pane using glazers' clips.

C. Fill gaps between glazing and stops with glazing compound until flush with sight line. Tool surface to straight line.

3.06 INSTALLATION - PLASTIC FILM

A. Install plastic film in accordance with film manufacturer's instructions.

B. Place without air bubbles, creases or visible distortion.

C. Fit tight to glass perimeter with razor cut edge.

3.07 CLEANING

A. Remove glazing materials from finish surfaces.

B. Remove labels after Work is complete.

C. Clean glass and adjacent surfaces.

3.08 PROTECTION

A. After installation, mark pane with an 'X' by using removable plastic tape or paste; do not mark heat absorbing or reflective glass units.

3.09 SCHEDULE

A. Exterior Doors and Windows: Type IG-1 / IG-3 as required.

B. Fire-rated Interior Doors and Borrowed Lites: Type S-2.

C. Non-rated Interior Doors and Borrowed Lites: Type S-3.

END OF SECTION

SECTION 08 83 00
MIRRORS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Glass mirrors.

1.02 REFERENCE STANDARDS

A. GANA (GM) - GANA Glazing Manual; Glass Association of North America; 2009.

B. GANA (SM) - GANA Sealant Manual; Glass Association of North America; 2008.

C. GANA (TIPS) - Mirrors: Handle with Extreme Care (Tips for the Professional on the Care and Handling of Mirrors); Glass Association of North America; 2011.

1.03 QUALITY ASSURANCE

A. Perform Work in accordance with GANA (GM), GANA (SM), and _____ for glazing installation methods.

1.04 FIELD CONDITIONS

A. Do not install mirrors when ambient temperature is less than 50 degrees F.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Mirrors:
   1. Trulite Glass and Aluminum Solutions: www.trulite.com.
   2. Binswanger Mirror/ACI Distribution: www.binswangerglass.com.
   3. PPG Industries.
   4. Lenoir Mirror Co: www.lenoirmirror.com.
   5. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 MATERIALS

A. Mirror Design Criteria: Select materials and/or provide supports as required to limit mirror material deflection to 1/200, or to the flexure limit of glass, with full recovery of glazing materials, whichever is less.

B. Residential Mirrors: Clear float type with copper and silver coating, organic overcoating, arrised edges, 3 mm thick minimum.

C. Other Mirrors: Same as above, 6 mm thick minimum.

2.03 ACCESSORIES

A. Mirror Attachment Accessories: Stainless steel clips.

B. Mirror Adhesive: Chemically compatible with mirror coating and wall substrate.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install mirrors in accordance with GANA (TIPS) and manufacturers recommendations.

B. Set mirrors plumb and level, and free of optical distortion.

C. Set mirrors with edge clearance free of surrounding construction including countertops or backsplashes.

D. Exercise Room Frameless Mirrors: Set mirrors with adhesive, applied in accordance with adhesive manufacturer's instructions. Provide continuous channel support at bottom of mirrors. Anchor channels rigidly to wall construction.

E. Bathroom Frameless Mirrors: Set mirrors with clips, and anchor rigidly to wall construction.

3.02 SCHEDULE

A. Bathrooms: Provide mirror full width of lavatory top.

B. Exercise Room: Provide 8 foot tall x 24 foot long mirror on north wall.
   1. Allow for a minimum of (4) duplex outlets cut into mirror.

END OF SECTION

SECTION 09 21 16
GYPSUM BOARD ASSEMBLIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Performance criteria for gypsum board assemblies.

B. Metal stud wall framing.

C. Suspended gypsum ceiling framing.

D. Resilient furring channels.

E. Gypsum sheathing.

F. Gypsum wallboard.

G. Joint treatment and accessories.

H. Textured finish system.

I. Commercial spaces: Work in commercial spaces on first floor will consist of fire protection of structural steel components and rock and firetape all exterior walls.

1.02 RELATED REQUIREMENTS

A. Section 07 21 00 - Thermal Insulation: Acoustic insulation.

B. Section 07 25 00 - Weather Barriers: Water-resistive barrier over sheathing.

1.03 REFERENCE STANDARDS

A. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2015.

B. ASTM C475/C475M - Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board; 2015.

C. ASTM C645 - Standard Specification for Nonstructural Steel Framing Members; 2014.

D. ASTM C754 - Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products; 2015.

E. ASTM C840 - Standard Specification for Application and Finishing of Gypsum Board; 2013.

F. ASTM C954 - Standard Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs From 0.033 in. (0.84 mm) to 0.112 in. (2.84 mm) in Thickness; 2015.

G. ASTM C1002 - Standard Specification for Steel Self-Piercing Tapping Screws for Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs; 2014.

H. ASTM C1047 - Standard Specification for Accessories for Gypsum Wallboard and Gypsum Veneer Base; 2014a.

I. ASTM C1177/C1177M - Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing; 2013.

J. ASTM C1280 - Standard Specification for Application of Gypsum Sheathing; 2013.

K. ASTM C1396/C1396M - Standard Specification for Gypsum Board; 2014.

L. ASTM D3273 - Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber; 2012.

M. GA-216 - Application and Finishing of Gypsum Board; Gypsum Association; 2013.

N. GA-600 - Fire Resistance Design Manual; Gypsum Association; 2015.

O. UL (FRD) - Fire Resistance Directory; Underwriters Laboratories Inc.; current edition.

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data on metal framing, gypsum board, accessories, joint finishing system, and acoustic sealant.

PART 2 PRODUCTS

2.01 GYPSUM BOARD ASSEMBLIES

A. Provide completed assemblies complying with ASTM C840 and GA-216.
   1. See PART 3 for finishing requirements.

B. Fire Rated Assemblies: Provide completed assemblies with the following characteristics:
   1. Gypsum Association File Numbers: Comply with requirements of GA-600 for the particular assembly.
   2. UL Assembly Numbers: Provide construction equivalent to that listed for the particular assembly in the current UL (FRD).

2.02 METAL FRAMING MATERIALS

A. Suspended Gypsum Ceiling Framing: Galvanized steel complying with ASCM A653 / A653M.
   1. Non-Fire Rated Suspended Corridor Ceiling: Chicago Metallic "SpanFast".
   2. Non-Fire Rated Suspended Ceiling: Chicago Metallic Type 640/660.
   3. Fire Rated Suspended Ceiling: Chicago Metallic Type 650/670.
   4. Substitutions: See Section 01 60 00 - Product Requirements.

B. **Resilient Furring Channels: RCSD manufactured by Clark Dietrich Building Systems.**
   1. **Substitutions: Not permitted.**

C. Non-Loadbearing Framing System Components: ASTM C645; galvanized sheet steel, of size and properties necessary to comply with ASTM C754 for the spacing indicated, with maximum deflection of wall framing of L/240 at 5 psf.
   1. Studs: "C" shaped with flat or formed webs with knurled faces.
   2. Runners: U shaped, sized to match studs.
   3. Ceiling Channels: C-shaped.
   4. Furring: Hat-shaped sections, minimum depth of 7/8 inch.

2.03 BOARD MATERIALS

A. Gypsum Wallboard: Paper-faced gypsum panels as defined in ASTM C1396/C1396M; sizes to minimize joints in place; ends square cut.
   1. Application: Use for all applications, unless otherwise indicated below.
   2. **Glass Mat Gypsum Board is required for all gypsum board installed on the exterior of the building, and whenever interior gypsum board is installed before the building is enclosed from weather.**
   3. Mold resistant board is required at damp locations, and for all gypsum board installed below grade.
   4. At Assemblies Indicated with Fire-Rating: Use type required by indicated tested assembly; if no tested assembly is indicated, use Type X board, UL or WH listed.
   5. Thickness:
      a. Vertical Surfaces: 5/8 inch.
      b. Ceilings: 5/8 inch.
      c. Multi-Layer Assemblies: Thicknesses as indicated on drawings.
   6. Paper-Faced Products:
      a. Georgia-Pacific Gypsum; ToughRock Fireguard X.
      b. Georgia-Pacific Gypsum; ToughRock Fireguard C.
   7. Mold Resistant Paper Faced Products:
      a. American Gypsum Company; M-Bloc Type X.
      b. Continental Building Products; Mold Defense Type X.
      c. Georgia-Pacific Gypsum; ToughRock Fireguard X Mold-Guard.
      d. National Gypsum Company; Gold Bond XP Gypsum Board .
   8. Glass Mat Faced Products: Comply with ASTM C1177/C1177M, use where indicated or where exposed to weather.

a. Georgia-Pacific Gypsum; DensArmor Plus Fireguard C.
b. National Gypsum Company; Gold Bond eXP Fire-Shield Interior Extreme Gypsum Panel.
c. USG Corporation; USG Sheetrock Brand Glass-Mat Panels Mold Tough.
d. CertainTeed Corporation; GlasRoc Sheathing Type X (Vertical surfaces only).

B. Exterior Sheathing Board: Sizes to minimize joints in place; ends square cut.
1. Application: Exterior sheathing, where indicated on drawings and interior gypsum board exposed to weather.
2. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
3. Glass Mat Faced Sheathing: Glass mat faced gypsum substrate as defined in ASTM C1177/C1177M.
4. Core Type: Type X.
5. Type X Thickness: 5/8 inch.
6. Edges: Square.
7. Glass Mat Faced Products:
a. Georgia-Pacific Gypsum; DensGlass Fireguard Sheathing.
b. National Gypsum Company; Gold Bond eXP Sheathing.
c. Temple-Inland Building Products by Georgia-Pacific, LLC; GreenGlass Exterior Sheathing.

2.04 ACCESSORIES

A. Acoustic Insulation: As specified in Section 07 21 00.

B. Water-Resistive Barrier: As specified in Section 07 25 00.

C. Finishing Accessories: ASTM C1047, galvanized steel or rolled zinc, unless noted otherwise.
1. Types: As detailed or required for finished appearance.
2. Special Shapes: In addition to conventional corner bead and control joints, provide U-bead at exposed panel edges.

D. Joint Materials: ASTM C475 and as recommended by gypsum board manufacturer for project conditions.
1. Tape: 2 inch wide, creased paper tape for joints and corners.
2. Ready-mixed vinyl-based joint compound.

E. Primer-Texture: Acceptable Products: Hallman-Lindsay #351-2 Master Builder High-Build Smooth/Orange Peel

F. Screws for Fastening of Gypsum Panel Products to Cold-Formed Steel Studs Less than 0.033 inch in Thickness and Wood Members: ASTM C1002; self-piercing tapping screws, corrosion resistant.

G. Screws for Fastening of Gypsum Panel Products to Steel Members from 0.033 to 0.112 inch in Thickness: ASTM C954; steel drill screws, corrosion resistant.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that project conditions are appropriate for work of this section to commence.

3.02 FRAMING INSTALLATION

A. Metal Framing: Install in accordance with ASTM C754 and manufacturer's instructions.

B. Suspended Ceilings and Soffits: Space framing and furring members as permitted by standard.
1. Level ceiling system to a tolerance of 1/1200.

C. Studs: Space studs at 16 inches on center.
1. Extend partition framing to structure where indicated and to ceiling in other locations.
2. Partitions Terminating at Ceiling: Attach ceiling runner securely to ceiling track in accordance with manufacturer's instructions.

D. Resilient Channel: Install resilient channels at maximum 24 inches on center or as indicated by listed system or indicated on drawings. Locate joints over framing members.
   1. On walls Install resilient channel with flange down.
   2. Install board to resilient channel with maximum 1" long screws or as indicated for listed system.

E. Furring for Fire Ratings: Install as required for fire resistance ratings indicated and to GA-600 requirements.

3.03 ACOUSTIC ACCESSORIES INSTALLATION

A. Acoustic Insulation: Place tightly within spaces, around cut openings, behind and around electrical and mechanical items within partitions, and tight to items passing through partitions.
   1. Extend to underside of roof sheathing where attic insulation is above roof deck (flat roof with rigid insulation). Strap or otherwise secure in place.
   2. Install batt insulation to fully encapsulate HVAC diffusers and bath fans located in the ceiling.

B. Acoustic Sealant: Install in accordance with manufacturer's instructions. Acoustic sealant is required at all wall and floor-ceiling assemblies separating dwelling units.
   1. Place continuous bead at perimeter of each layer of gypsum board.
   2. Seal around all penetrations by conduit, pipe, ducts, and rough-in boxes. **Completely coat back and sides of electrical rough-in boxes in demising walls that do not receive fire protective putty pads.**
   3. After installation of gypsum board, place a continuous bead of acoustic sealant at annular space around all items penetrating demising wall and ceiling membranes, including electrical boxes, bath fans, HVAC diffusers, etc.

3.04 BOARD INSTALLATION

A. All board installed prior to installation of roofing to be glass mat faced gypsum board.

B. Comply with ASTM C 840, GA-216, and manufacturer's instructions. Install to minimize butt end joints, especially in highly visible locations.

C. Single-Layer Non-Rated: Install gypsum board in most economical direction, with ends and edges occurring over firm bearing.
   1. Exception: Tapered edges to receive joint treatment at right angles to framing.

D. Fire-Rated Construction: Install gypsum board in strict compliance with requirements of assembly listing.

E. Exterior Sheathing: Comply with ASTM C1280. Install sheathing vertically, with edges butted tight and ends occurring over firm bearing. Use glass mat faced gypsum only.

F. Installation on Metal Framing: Use screws for attachment of gypsum board except face layer of non-rated double-layer assemblies, which may be installed by means of adhesive lamination.

G. Installation on Wood Framing: For rated assemblies, comply with requirements of listing authority. For non-rated assemblies, install as follows:
   1. Single-Layer Applications: Screw attachment.
   2. Double-Layer Application: Install base layer using screws or nails. Install face layer using screws.

H. Moisture Protection: Treat cut edges and holes in moisture resistant gypsum board with sealant.

3.05 INSTALLATION OF TRIM AND ACCESSORIES

A. Control Joints: Place control joints consistent with lines of building spaces and as follows:
   1. Not more than 30 feet apart on walls and ceilings over 50 feet long.

B. Corner Beads: Install at external corners, using longest practical lengths.

C. Edge Trim: Install at locations where gypsum board abuts dissimilar materials.

3.06 JOINT TREATMENT

A. Paper Faced Gypsum Board: Use paper joint tape, bedded with ready-mixed vinyl-based joint compound and finished with ready-mixed vinyl-based joint compound.

B. Finish gypsum board in accordance with levels defined in ASTM C840, as follows:
   1. Level 5: Walls and ceilings to receive semi-gloss or gloss paint finish and other areas specifically indicated.
   2. Level 3: Walls to receive textured wall finish.
   3. Level 1: Fire rated wall areas above finished ceilings, whether or not accessible in the completed construction.

C. Tape, fill, and sand exposed joints, edges, and corners to produce smooth surface ready to receive finishes.
   1. Feather coats of joint compound so that camber is maximum 1/32 inch.
   2. Taping, filling and sanding is not required at base layer of double layer applications.

3.07 TEXTURE FINISH

A. Texture Required: Medium orange peel.
   1. Apply at 160-200 s.f. per gallon to achieve 10-7.5 mils wet and 3.3-2.5 mils dry.
   2. Apply finish texture coating by means of spraying apparatus in accordance with manufacturer's instructions .

3.08 TOLERANCES

A. Maximum Variation of Finished Gypsum Board Surface from True Flatness: 1/8 inch in 10 feet in any direction.

END OF SECTION

SECTION 09 65 00
RESILIENT FLOORING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Luxury Vinyl Tile and Strip flooring (LVT).

B. Resilient tile flooring (VCT).

1.02 REFERENCE STANDARDS

A. ASTM F1700 - Standard Specification for Solid Vinyl Floor Tile; 2013a.

B. ASTM F1913 - Standard Specification for Vinyl Sheet Floor Covering Without Backing; 2004 (Reapproved 2014).

C. NFPA 253 - Standard Method of Test for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source; National Fire Protection Association; 2015.

1.03 FIELD CONDITIONS

A. Store materials for not less than 48 hours prior to installation in area of installation at a temperature of 70 degrees F to achieve temperature stability. Thereafter, maintain conditions above 55 degrees F.

1.04 EXTRA MATERIALS

A. See Section 01 60 00 - Product Requirements, for additional provisions.

B. Provide 1 percent of installed materials of each type and color, packaged and marked for identification.

PART 2 PRODUCTS

2.01 LUXURY VINYL TILE AND STRIP FLOORING

A. Vinyl Tile: Glue down vinyl tile flooring.
   1. Minimum Requirements: Comply with ASTM F1700, Class III, Type B.
   2. Thickness: 3 mm
   3. Size: 16x16 inch.
   4. Manufacturers:
      a. Karndean; Product Da Vinci
      b. Substitutions: See Section 01 60 00 - Product Requirements.

B. Vinyl Plank: Glue down vinyl strip flooring.
   1. Minimum Requirements: Comply with ASTM F1700, Class III, Type B.
   2. Thickness: 3.0 mm / 1/8 inch.
   3. Wear Layer: .5 mm / 20 mil.
   4. Size: 7x48 inch.
   5. Manufacturers:
      a. Karndean; Product Van Gogh
      b. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 TILE FLOORING

A. Vinyl Composition Tile: Homogeneous, with color extending throughout thickness.
   1. Minimum Requirements: Comply with ASTM F1066, of Class corresponding to type specified.
   2. Size: 12 by 12 inch.
   3. Thickness: 0.125 inch.
   4. Pattern: Marbleized.
   5. Manufacturers:
      a. Armstrong World Industries, Inc; Excelon Stonetex: www.armstrong.com.
      b. Johnsonite, a Tarkett Company: www.johnsonite.com.
      c. Mannington Mills, Inc: www.mannington.com.

2.03 ACCESSORIES

A. Subfloor Filler: White premix latex; type recommended by adhesive material manufacturer.

B. Primers, Adhesives, and Seaming Materials: Waterproof; types recommended by flooring manufacturer.

C. Moldings, Transition and Edge Strips: Same material as flooring.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that surfaces are flat to tolerances acceptable to flooring manufacturer, free of cracks that might telegraph through flooring, clean, dry, and free of curing compounds, surface hardeners, and other chemicals that might interfere with bonding of flooring to substrate.

B. Verify that self leveling underlayment surfaces are dry enough and ready for resilient flooring installation by testing for moisture emission rate and alkalinity in accordance with ASTM F710; obtain instructions if test results are not within limits recommended by resilient flooring manufacturer and adhesive materials manufacturer.

3.02 PREPARATION

A. Remove sub-floor ridges and bumps. Fill minor low spots, cracks, joints, holes, and other defects with sub-floor filler to achieve smooth, flat, hard surface.

B. Prohibit traffic until filler is cured.

C. Clean substrate.

D. Apply primer as required to prevent "bleed-through" or interference with adhesion by substances that cannot be removed.

3.03 INSTALLATION

A. Starting installation constitutes acceptance of sub-floor conditions.

B. Install in accordance with manufacturer's instructions.

C. Spread only enough adhesive to permit installation of materials before initial set.

D. Fit joints tightly.

E. Set flooring in place, press with heavy roller to attain full adhesion.

F. Where type of floor finish, pattern, or color are different on opposite sides of door, terminate flooring under centerline of door.

G. Install edge strips at unprotected or exposed edges, where flooring terminates, and where indicated.

H. Scribe flooring to walls, columns, cabinets, floor outlets, and other appurtenances to produce tight joints.

3.04 TILE AND PLANK FLOORING

A. Install in accordance with manufacturer's instructions.

B. Mix tile from container to ensure shade variations are consistent when tile is placed, unless manufacturer's instructions say otherwise.

C. Spread only enough adhesive to permit installation of materials before initial set.

D. Set flooring in place, press with heavy roller to attain full adhesion.

3.05 PROTECTION

A. Prohibit traffic on resilient flooring for 48 hours after installation.

END OF SECTION

SECTION 09 65 66
RESILIENT ATHLETIC FLOORING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Interlocking, loose-laid rubber tile.

1.02 REFERENCE STANDARDS

A. ASTM D412 - Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers--Tension; 2006a (Reapproved 2013).

1.03 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Verification Samples: Actual flooring material specified, not less than 12 inch square, mounted on solid backing.

1.04 QUALITY ASSURANCE

A. Installer Qualifications: An experienced installer certified in writing by the flooring manufacturer to be qualified for installation of specified flooring system.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to project site in unopened containers clearly labeled with manufacturer's name and identification of contents.

B. Store materials in dry and clean location until needed for installation. During installation, handle in a manner that will prevent marring and soiling of finished surfaces.

PART 2 PRODUCTS

2.01 PREFORMED ATHLETIC FLOORING

A. Manufacturers: All products by the same manufacturer.
   1. American Floor Products Company, Inc; "Omni": www.afco-usa.com.
   2. Pawling Corporation; "FL-150": www.pawling.com.
   3. Roppe Corporation; "Recoil".

B. Rubber Tile Flooring: Recycled rubber material formed into square tiles with invisible interlocking tabs, free-laid without adhesive.
   1. Thickness: Minimum 1/4 in.
   2. Size: Nominal 24 in square.
   3. Tensile Strength: Minimum 150 psi, per ASTM D412.
   4. Surface Texture: Smooth.
   5. Color: As selected from manufacturer's standards.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine substrates for conditions detrimental to installation of athletic flooring. Proceed with installation only after unsatisfactory conditions have been corrected.

B. Verify that surfaces are flat to tolerances acceptable to flooring manufacturer, free of cracks that might telegraph through flooring, clean, dry, and free of curing compounds, surface hardeners, and other chemicals that might interfere with bonding of athletic flooring to substrate.

3.02 PREPARATION

A. Broom clean areas to receive athletic flooring immediately before beginning installation.

3.03 INSTALLATION

A. Starting installation constitutes acceptance of sub-floor conditions.

B. Comply with manufacturer's recommendations .

C. Rubber Tile Flooring:

1. Lay out center lines in spaces to receive tile flooring, based on location of principal walls. Start tile installation from center, and adjust as necessary to avoid tiles less than one-half width at perimeter.
2. Lay tiles square with room axis, matching for color and pattern by selecting from cartons and mixing as recommended by manufacturer.

END OF SECTION

SECTION 09 68 00

CARPETING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Carpet, stretched-in with cushion underlay and direct-glued.

B. Accessories.

1.02 REFERENCE STANDARDS

A. ASTM D2859 - Standard Test Method for Ignition Characteristics of Finished Textile Floor Covering Materials; 2006 (Reapproved 2011).

B. ASTM E648 - Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source; 2014c.

C. CRI 104 - Standard for Installation of Commercial Carpet; Carpet and Rug Institute; 2015.

D. CRI (GLP) - Green Label Plus Testing Program - Certified Products; Carpet and Rug Institute; Current Edition.

E. NFPA 253 - Standard Method of Test for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source; National Fire Protection Association; 2015.

1.03 QUALITY ASSURANCE

A. Installer Qualifications: Company specializing in installing carpet with minimum three years documented experience.

1.04 FIELD CONDITIONS

A. Store materials in area of installation for minimum period of 24 hours prior to installation.

B. Maintain minimum 70 degrees F ambient temperature 24 hours prior to, during and 24 hours after installation.

C. Ventilate installation area during installation and for 72 hours after installation.

1.05 REGULATORY REQUIREMENTS

A. Provide carpet complying with HUD Standard UM 44d and certified by an independent testing agency

PART 2 PRODUCTS

2.01 CARPET

A. Carpet: Direct glued.
   1. Product: Style "Road Trip"; Color RTR12 Adventure manufactured by Boylu.
   2. Critical Radiant Flux: Minimum of 0.22 watts/sq cm, when tested in accordance with ASTM E648 or NFPA 253.
   3. Surface Flammability Ignition: Pass ASTM D2859 (the "pill test").
   4. VOC Content: Provide CRI (GLP) certified product; in lieu of labeling, independent test report showing compliance is acceptable.

B. Carpet: Stretched-in.
   1. Product: Style XV805; Color 103 Crisp Muslin manufactured by Shaw.
   2. Surface Flammability Ignition: Pass ASTM D 2859 (the "pill test").
   3. VOC Content: Provide CRI Green Label Plus certified product.

2.02 CUSHION

A. Cushion: Cellular rubberModified polyurethaneDouble bond rubber carpet pad.
   1. Nominal Thickness: 3/8 inch.
   2. Density: 6.0 lb/cu ft.

2.03 ACCESSORIES

A. Sub-Floor Filler: Type recommended by carpet manufacturer.

B. Tackless Strip: Carpet gripper, of type recommended by carpet manufacturer to suit application, with attachment devices.

C. Moldings and Edge Strips: Embossed aluminum, natural color.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that sub-floor surfaces are smooth and flat within the tolerances specified for that type of work and are ready to receive carpet.

3.02 PREPARATION

A. Remove sub-floor ridges and bumps. Fill minor or local low spots, cracks, joints, holes, and other defects with sub-floor filler.

B. Apply, trowel, and float filler to achieve smooth, flat, hard surface. Prohibit traffic until filler is cured.

C. Clean substrate.

3.03 INSTALLATION - GENERAL

A. Starting installation constitutes acceptance of sub-floor conditions.

B. Install carpet and cushion in accordance with manufacturer's instructions and CRI 104 (Commercial).

C. Verify carpet match before cutting to ensure minimal variation between dye lots.

D. Lay out carpet and locate seams in accordance with shop drawings.
   1. Locate change of color or pattern between rooms under door centerline.
   2. Provide monolithic color, pattern, and texture match within any one area.

E. Install carpet tight and flat on subfloor, well fastened at edges, with a uniform appearance.

3.04 STRETCHED-IN CARPET

A. Install tackless strips with pins facing the wall around entire perimeter, except across door openings. Use edge strip where carpet terminates at other floor coverings.

B. Space tackless strips slightly less than carpet thickness away from vertical surfaces, but not more than 3/8 inch.

C. Install cushion in maximum size pieces using spot adhesive to adhere to sub-floor.

D. Lay out cushion so that seams will be perpendicular to, or offset from, minimum 6 inches from carpet seams.

E. Butt cushion edges together and tape seams.

F. Trim cushion tight to edge of tackless strip and around projections and contours.

G. Double cut carpet seams, with accurate pattern match. Make cuts straight, true, and unfrayed. Apply seam adhesive to all cut edges immediately.

H. Join seams by hand sewing. Form seams straight, not overlapped or peaked, and free of gaps.

I. Following seaming, hook carpet onto tackless strip at one edge, power stretch, and hook firmly at other edges. Follow manufacturer's recommendations for method and amount of stretch.

J. Trim carpet neatly at walls and around interruptions. Tuck edges into space between tackless strip and wall.

3.05 DIRECT-GLUED CARPET

A. Double cut carpet seams, with accurate pattern match. Make cuts straight, true, and unfrayed. Apply seam adhesive to cut edges of woven carpet immediately.

B. Apply contact adhesive to floor uniformly at rate recommended by manufacturer. After sufficient open time, press carpet into adhesive.

C. Apply seam adhesive to the base of the edge glued down. Lay adjoining piece with seam straight, not overlapped or peaked, and free of gaps.

D. Roll with appropriate roller for complete contact of adhesive to carpet backing.

E. Trim carpet neatly at walls and around interruptions.

3.06 INSTALLATION ON STAIRS (COMMON)

A. Use one piece of carpet for each tread and the riser below. Apply seam adhesive to all cut edges.

B. Install carpet with pile direction in the length of the stair.

C. Adhere carpet tight to stair treads and risers.

3.07 CLEANING

A. Remove excess adhesive from floor and wall surfaces without damage.

END OF SECTION

SECTION 09 90 00
PAINTING AND COATING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Surface preparation.

B. Field application of paints, stains, varnishes, and other coatings.

C. Scope: Finish all interior and exterior surfaces exposed to view, unless fully factory-finished and unless otherwise indicated, including the following:
   1. Both sides and edges of plywood backboards for electrical and telecom equipment before installing equipment.
   2. Elevator pit ladders.
   3. Steel stairs.
   4. Exposed surfaces of steel lintels and ledge angles.
   5. Exposed surfaces of exterior steel trim and fabrications.
   6. All exposed wood deck framing; solid color stain.
   7. Exterior heavy timber framing; transparent wood toner.
   8. Mechanical and Electrical:
      a. In finished areas, paint all insulated and exposed pipes and hangers, brackets, collars and supports, unless otherwise indicated.
      b. In all areas, paint shop-primed items.
      c. Paint interior surfaces of air ducts and convector and baseboard heating cabinets that are visible through grilles and louvers with one coat of flat black paint to visible surfaces.

D. Do Not Paint or Finish the Following Items:
   1. Items fully factory-finished unless specifically so indicated; materials and products having factory-applied primers are not considered factory finished.
   2. Items indicated to receive other finishes.
   3. Items indicated to remain unfinished.
   4. Fire rating labels, equipment serial number and capacity labels, and operating parts of equipment.
   5. Non-metallic roofing and flashing.
   6. Stainless steel, anodized aluminum, bronze, terne, and lead items.
   7. Marble, granite, slate, and other natural stones.
   8. Floors, unless specifically so indicated.
   9. Ceramic and other tiles.
   10. Brick, architectural concrete, cast stone, integrally colored plaster and stucco.
   11. Exterior insulation and finish system (EIFS).
   12. Glass.
   13. Concrete masonry in utility, mechanical, and electrical spaces.
   14. Concealed pipes, ducts, and conduits.

1.02 RELATED REQUIREMENTS

A. Section 05 50 00 - Metal Fabrications: Shop-primed items.

B. Section 07 46 46 - Fiber Cement Siding: Touch-up of pre-finished siding and shop painting aluminum trims for panel siding.

C. Section 08 11 13 - Hollow Metal Doors and Frames: Shop-primed metal doors and frames.

D. Section 09 21 16 - Gypsum Board Assemblies: Texture Finish.

1.03 REFERENCE STANDARDS

A. 40 CFR 59, Subpart D - National Volatile Organic Compound Emission Standards for Architectural Coatings; U.S. Environmental Protection Agency; current edition.

B. ASTM D16 - Standard Terminology for Paint, Related Coatings, Materials, and Applications; 2014.

C. ASTM D4442 - Standard Test Methods for Direct Moisture Content Measurement of Wood and Wood-Base Materials; 2007.

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Samples: Submit two paper chip samples, 12 x 12 inch in size illustrating range of colors and textures available for each surface finishing product scheduled.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified, with minimum three years documented experience.

B. Applicator Qualifications: Company specializing in performing the type of work specified with minimum 3 years experience.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to site in sealed and labeled containers; inspect to verify acceptability.

B. Container Label: Include manufacturer's name, type of paint, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and reducing.

C. Paint Materials: Store at minimum ambient temperature of 45 degrees F and a maximum of 90 degrees F, in ventilated area, and as required by manufacturer's instructions.

1.07 FIELD CONDITIONS

A. Do not apply materials when surface and ambient temperatures are outside the temperature ranges required by the paint product manufacturer.

B. Follow manufacturer's recommended procedures for producing best results, including testing of substrates, moisture in substrates, and humidity and temperature limitations.

C. Do not apply exterior coatings during rain or snow, or when relative humidity is outside the humidity ranges required by the paint product manufacturer.

D. Minimum Application Temperatures for Latex Paints: 45 degrees F for interiors; 50 degrees F for exterior; unless required otherwise by manufacturer's instructions.

E. Provide lighting level of 80 ft candles measured mid-height at substrate surface.

1.08 EXTRA MATERIALS

A. See Section 01 60 00 - Product Requirements, for additional provisions.

B. Supply 5 gallons of each color; store where directed.

C. Label each container with color in addition to the manufacturer's label.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Provide all paint and coating products from the same manufacturer to the greatest extent possible.

B. Paints:
   1. Hallman-Lindsay Paints.
   2. Sherwin Williams products meeting the requirements of specified Hallman-Lindsay paints may be substituted.

C. Stains:
   1. Sherwin-Williams Company: www.sherwin-williams.com.
   2. Cabot.

D. Substitutions: Not permitted.

2.02 PAINTS AND COATINGS - GENERAL

A. Paints and Coatings: Ready mixed, unless intended to be a field-catalyzed coating.
   1. Provide paints and coatings of a soft paste consistency, capable of being readily and uniformly dispersed to a homogeneous coating, with good flow and brushing properties, and capable of drying or curing free of streaks or sags.
   2. Supply each coating material in quantity required to complete entire project's work from a single production run.
   3. Do not reduce, thin, or dilute coatings or add materials to coatings unless such procedure is specifically described in manufacturer's product instructions.

B. Primers: As follows unless other primer is required or recommended by manufacturer of top coats; where the manufacturer offers options on primers for a particular substrate, use primer categorized as "best" by the manufacturer.

C. Volatile Organic Compound (VOC) Content:
   1. Provide coatings that comply with the most stringent requirements specified in the following:
      a. 40 CFR 59, Subpart D--National Volatile Organic Compound Emission Standards for Architectural Coatings.
   2. Determination of VOC Content: Testing and calculation in accordance with 40 CFR 59, Subpart D (EPA Method 24), exclusive of colorants added to a tint base and water added at project site; or other method acceptable to authorities having jurisdiction.

D. Colors: To be selected from manufacturer's full range of available colors.
   1. In finished areas, finish pipes, ducts, conduit, and equipment the same color as the wall/ceiling they are mounted on/under.

2.03 PAINT SYSTEMS - EXTERIOR

A. Stain on Wood:
   1. 2 coats stain.
   2. Stain Product(s):
      a. Solid Stain: Cabot #1800 Solid Color Acrylic Deck Stain.
      b. Wood Toner: Cabot #3400 Australian Timber Oil.

B. Ferrous Metals, Unprimed: Latex, 3 Coat.
   1. One coat of latex primer. Hallman-Lindsay #338 MetalGuard Acrylic Metal Primer.
   2. Gloss: Two coats of latex enamel; Hallman-Lindsey #317 Duratech 100% Acrylic Gloss Enamel.

C. Ferrous Metals, Primed: Latex, 2 Coat.
   1. Touch-up with rust-inhibitive primer. Hallman-Lindsay #338 MetalGuard Acrylic Metal Primer.
   2. Gloss: Two coats of latex enamel; Hallman-Lindsey #317 Duratech 100% Acrylic Gloss Enamel.

D. Galvanized Metals: Latex, 3 Coat.
   1. One coat Hallman-Lindsey #338 Metalguard Acrylic Metal Primer..
   2. Gloss: Two coats of latex enamel; Hallman-Lindsey #317 Duratech 100% Acrylic Gloss Enamel.

2.04 PAINT SYSTEMS - INTERIOR

A. Unfinished Wood: Stain with transparent varnish.
   1. One coat of stain.
   2. One coat sealer .
   3. Satin: Two coats of varnish.

B. Ferrous Metals, Unprimed: Latex, 3 Coat.
   1. One coat of latex primer. Hallman-Lindsay #338 MetalGuard Acrylic Metal Primer.
   2. Gloss: Two coats of latex enamel; Hallman-Lindsey #317 Duratech 100% Acrylic Gloss Enamel.

C. Ferrous Metals, Primed: Latex, 2 Coat.
   1. Touch-up with latex primer. Hallman-Lindsay #338 MetalGuard Acrylic Metal Primer.
   2. Gloss: Two coats of latex enamel; Hallman-Lindsey #317 Duratech 100% Acrylic Gloss Enamel.

D. Paint MgI-OP-3L - Galvanized Metal: Latex, 3 Coat.
   1. One coat galvanize primer. Hallman-Lindsay #338 MetalGuard Acrylic Metal Primer.
   2. Gloss: Two coats of latex enamel; Hallman-Lindsey #317 Duratech 100% Acrylic Gloss Enamel.

E. Gypsum Board: Latex, 2 Coat: .
   1. One coat of latex primer texture.
      a. #351-2 Master Builder High-Build Smooth/Orange Peel.
      b. Apply at a rate of 160 s.f./gallon to achieve 10 mils wet / 3.8 mils dry film thickness.
      c. Spray to a medium orange peel texture.
   2. Eggshell: One coat of latex enamel; Hallman-Lindsay Master Kote 279-1.
      a. Apply at rate of 250 s.f./gallon to achieve 6 mils wet / 2.1 mills dry film thickness.
   3. Flat: One coat of latex enamel; Hallman-Lindsay Master Kote 267-1.
      a. Apply at rate of 250 s.f./gallon to achieve 6 mils wet / 1.9 mils dry film thickness.
   4. Back-roll finish coat(s).
   5. Color: As selected by Owner.
   6. See schedule at end of section for additional coat/color/sheen requirements.

2.05 ACCESSORY MATERIALS

A. Accessory Materials: Provide all primers, sealers, cleaning agents, cleaning cloths, sanding materials, and clean-up materials required to achieve the finishes specified whether specifically indicated or not; commercial quality.

B. Patching Material: Latex filler.

C. Fastener Head Cover Material: Latex filler.

PART 3 EXECUTION

3.01 EXAMINATION

A. Do not begin application of coatings until substrates have been properly prepared.

B. Verify that surfaces are ready to receive work as instructed by the product manufacturer.

C. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially affect proper application.

D. Test shop-applied primer for compatibility with subsequent cover materials.

E. Measure moisture content of surfaces using an electronic moisture meter. Do not apply finishes unless moisture content of surfaces are below the following maximums:
   1. Gypsum Wallboard: 12 percent.
   2. Masonry, Concrete, and Concrete Unit Masonry: 12 percent.
   3. Interior Wood: 15 percent, measured in accordance with ASTM D4442.
   4. Exterior Wood: 15 percent, measured in accordance with ASTM D4442.
   5. Concrete Floors and Traffic Surfaces: 8 percent.

3.02 PREPARATION

A. Clean surfaces thoroughly and correct defects prior to coating application.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

C. Remove surface appurtenances, including electrical plates, hardware, light fixture trim, escutcheons, and fittings, prior to preparing surfaces or finishing.

D. Seal surfaces that might cause bleed through or staining of topcoat.

E. Remove mildew from impervious surfaces by scrubbing with solution of tetra-sodium phosphate and bleach. Rinse with clean water and allow surface to dry.

F. Concrete and Unit Masonry Surfaces to be Painted: Remove dirt, loose mortar, scale, salt or alkali powder, and other foreign matter. Remove oil and grease with a solution of tri-sodium phosphate; rinse well and allow to dry. Remove stains caused by weathering of corroding metals with a solution of sodium metasilicate after thoroughly wetting with water. Allow to dry.

G. Gypsum Board Surfaces to be Painted: Fill minor defects with filler compound. Spot prime defects after repair.

H. Galvanized Surfaces to be Painted: Remove surface contamination and oils and wash with solvent. Apply coat of etching primer.

I. Corroded Steel and Iron Surfaces to be Painted: Prepare using at least SSPC-SP 2 (hand tool cleaning) or SSPC-SP 3 (power tool cleaning) followed by SSPC-SP 1 (solvent cleaning).

J. Uncorroded Uncoated Steel and Iron Surfaces to be Painted: Remove grease, mill scale, weld splatter, dirt, and rust. Where heavy coatings of scale are evident, remove by hand wire brushing or sandblasting; clean by washing with solvent. Apply a treatment of phosphoric acid solution, ensuring weld joints, bolts, and nuts are similarly cleaned. Prime paint entire surface; spot prime after repairs.

K. Shop-Primed Steel Surfaces to be Finish Painted: Sand and scrape to remove loose primer and rust. Feather edges to make touch-up patches inconspicuous. Clean surfaces with solvent. Prime bare steel surfaces.

L. Interior Wood Surfaces to Receive Transparent Finish: Wipe off dust and grit prior to sealing, seal knots, pitch streaks, and sappy sections with sealer. Fill nail holes and cracks after sealer has dried; sand lightly between coats. Prime concealed surfaces with gloss varnish reduced 25 percent with thinner.

M. Exterior Wood Surfaces to Receive Opaque Finish: Remove dust, grit, and foreign matter. Seal knots, pitch streaks, and sappy sections. Fill nail holes with tinted exterior calking compound after prime coat has been applied. Back prime concealed surfaces before installation.

N. Exterior Wood to Receive Transparent Finish: Remove dust, grit, and foreign matter; seal knots, pitch streaks, and sappy sections with sealer. Fill nail holes with tinted exterior calking compound after sealer has been applied. Prime concealed surfaces.

O. Metal Doors to be Painted: Prime metal door top and bottom edge surfaces.

3.03 APPLICATION

A. Remove unfinished louvers, grilles, covers, and access panels on mechanical and electrical components and paint separately.

B. Exterior Wood to Receive Opaque Finish: If final painting must be delayed more than 2 weeks after installation of woodwork, apply primer within 2 weeks and final coating within 4 weeks.

C. Apply products in accordance with manufacturer's instructions.

D. Do not apply finishes to surfaces that are not dry. Allow applied coats to dry before next coat is applied.

E. Apply each coat to uniform appearance.

F. Sand wood and metal surfaces lightly between coats to achieve required finish.

G. Vacuum clean surfaces of loose particles. Use tack cloth to remove dust and particles just prior to applying next coat.

H. Wood to Receive Transparent Finishes: Tint fillers to match wood. Work fillers into the grain before set. Wipe excess from surface.

I. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing.

3.04 SCHEDULE

A. Within Dwelling Units:
   1. One coat, one color, walls and ceilings; flat.
   2. Accent color; one wall in living room; flat.
   3. Bath walls and ceilings; eggshell.
   4. Kitchen walls; eggshell.

B. Common Area Rooms:
   1. One coat, one color, walls and ceilings; flat.

C. Common Corridors:
   1. One coat, one color; walls and ceilings; flat.

END OF SECTION

SECTION 10 14 24

SIGNAGE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Engraved plastic signs.

B. Raised letter plastic signs.

C. Silk screened signs.

1.02 REFERENCES

A. ANSI/ICC A117.1 - American National Standard for Accessible and Usable Buildings and Facilities; International Code Council; 1998.

1.03 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Manufacturer's printed product literature for each type of sign, indicating sign styles, font, foreground and background colors, locations, overall dimensions of each sign.

C. Signage Schedule: Provide information sufficient to completely define each sign for fabrication, including room number, room name, other text to be applied, sign and letter sizes, fonts, and colors.

1. When room numbers to appear on signs differ from those on the drawings, include the drawing room number on schedule.
2. Submit for approval by Owner and Architect prior to fabrication.

1.04 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years of documented experience.

PART 2 PRODUCTS

2.01 ALL SIGNS

A. Visual characters shall comply with ICC/ANSI 117.1 section 703.2.

B. Where specified, tactile (raised) characters shall comply with ICC/ANSI 117.1 section 703.3.

C. Where specified, Braille shall comply with ICC/ANSI 117.1 section 703.4.

1. Braille shall be applied bead or polymer type - labeling tape is not acceptable.

2.02 ENGRAVED PLASTIC SIGNS

A. Engraved Panels: Laminated colored plastic; engraved through face to expose core color. Not acceptable where tactile characters are specified unless reverse engraved.

1. Face Color: As selected by owner.
2. Core Color: As selected by owner.
3. Total Thickness: 1/16 inch.
4. Height: 2 inches.
5. Edges: Radiused.
6. Character Font: Helvetica.

B. **Engraved plastic signs may not be used where tactile characters are specified, unless sign is reverse-engraved to raise characters 1/32" minimum above background.**

2.03 RAISED LETTER SIGNS

A. Base Material: Solid color plastic:

1. Total Thickness: 1/16 inch.
2. Height: 2 inches.
3. Edges: Radiused

B. Raised Character Size and Style: Acrylic plastic, character adhered to base material:

1. Character Color: As selected.
2. Character Thickness: 1/8 inch.
3. Height: 1 inch.
4. Edges: Square.
5. Character Font: Helvetica.
6. Character Case: Upper case only.

C. Raised Letter signs may be installed in lieu of Engraved Plastic signs at all locations.

2.04 SILK SCREENED SIGNS

A. Accessible Parking Sign:
1. 12" x 18" size.
2. Silk screened onto reflective vinyl over .080" aluminum base.
3. Sign design to comply with WECC and ANSI A-117.1.

2.05 ACCESSORIES

A. Tape Adhesive: Double sided tape, permanent adhesive.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install signs after surfaces are finished, in locations as directed.

3.02 SCHEDULE

A. Room Identification Signage: Provide at every permanent room as identified on drawings; "MECHANICAL ROOM", "ELEVATOR EQUIPMENT", "COMMUNITY ROOM" , etc.
1. Raised Letter type.
2. Visual, tactile and braille characters required.
3. Verify room names with Owner prior to ordering signs.

B. Unit Number Signage:
1. Engraved Plastic style.
2. Visual characters.
3. Mount at 60" to top of sign above floor, on wall adjacent to latch side of door.

C. Exit Signage:
1. Raised Letter style.
2. "EXIT" in visual, tactile and Braille characters.
3. Post on latch side of doors exiting building.
4. Post on doors in fire walls.

D. Stair Signage:
1. Stair Enclosure Identification Signs: At the door entering each stair enclosure.
   a. Raised Letter style.
   b. "STAIRWAY" in visual, tactile and Braille characters.
2. Landing Identification Signs: Provide at each floor landing within stair enclosures connecting 4 or more floor levels.
   a. Raised Letter style, minimum sign size 12 x 18 inches.
   b. Visual, tactile and Braille characters required:
      1) Identify stairway; minimum character height 1 1/2 inches.
      2) Identify floor level; minimum character height 5 inches and located in center of sign.
      3) Identify terminus of top and bottom of stair, availability of roof access, and level of and direction to the exit discharge; minimum character height 1".
   c. Locate sign 5 feet above the floor adjacent to the latch side of the door.

E. Elevator Signage:
1. Raised Letter style.
2. "ELEVATOR" in visual, tactile and Braille characters.
3. Post next to each elevator call station.

F. Accessible Parking Signs:
   1. Silk Screened style.
   2. Mount at 60" to bottom of sign.
   3. Include 6 inch x 12 inch "Van Accessible" sign at van stalls.

G. Directional Signage: Signage directing occupants to or providing information about permanent rooms or spaces within the building.
   1. Engraved Plastic style.
   2. Visual characters only.

H. Directional Signage To Accessible Building Elements: Signage indicating the route to the nearest like accessible element - i.e. building entrances, etc.
   1. International symbol of accessibility.
   2. Provide at inaccessible building elements (entrances, etc.) directing users to accessible elements.

I. Area Of Refuge and Exterior Area For Assisted Rescue Signage:
   1. Raised Letter style.
   2. "AREA OF REFUGE" in visual, tactile and Braille characters at door leading to area of refuge.
   3. Sign shall be illuminated.
   4. International symbol of accessibility.
   5. Signage for two-way communication system by system provider.

END OF SECTION

SECTION 10 28 00
TOILET, BATH, AND LAUNDRY ACCESSORIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Accessories for toilet rooms, showers, and residential bathrooms.

B. Grab bars.

1.02 RELATED REQUIREMENTS

A. Section 06 10 00 - Rough Carpentry: Concealed supports for accessories, including in wall framing and plates.

B. Section 08 83 00 - Mirrors: Other mirrors.

1.03 REFERENCE STANDARDS

A. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2015.

B. ASTM A167 - Standard Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip; 1999 (Reapproved 2009).

C. ASTM A269/A269M - Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service; 2015.

D. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2015.

E. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2015.

F. ASTM B456 - Standard Specification for Electrodeposited Coatings of Copper Plus Nickel Plus Chromium and Nickel Plus Chromium; 2011e1.

G. ASTM C1036 - Standard Specification for Flat Glass; 2011e1.

H. ASTM F2285 - Standard Consumer Safety Performance Specification for Diaper Changing Tables for Commercial Use; 2004 (Reapproved 2010).

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Submit data on accessories describing size, finish, details of function, and attachment methods.

1.05 COORDINATION

A. Coordinate the work with the placement of internal wall reinforcement to receive anchor attachments.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Toilet Accessories:
   1. Taymor Industries, Inc.
   2. Basco.
   3. Bobrick.
   4. General Accessory Manufacturing Company (GAMCO).
   5. ASI - American Specialties, Inc: www.americanspecialties.com.
   6. Bradley Corporation: www.bradleycorp.com.
   7. Franklin Brass.
   8. Substitutions: Section 01 60 00 - Product Requirements.

B. All items of each type to be made by the same manufacturer.

2.02 FINISHES

A. Stainless Steel: No. 4 Brushed finish, unless otherwise noted.

B. Chrome/Nickel Plating: ASTM B456, SC 2, satin finish, unless otherwise noted.

C. Baked Enamel: Pretreat to clean condition, apply one coat primer and minimum two coats epoxy baked enamel.

D. Back paint components where contact is made with building finishes to prevent electrolysis.

2.03 TOILET ROOM ACCESSORIES

A. Toilet Paper Dispenser: Single roll, surface mounted bracket type, chrome-plated zinc alloy brackets .
   1. Product: 01-301s BWW manufactured by Taymor.
   2. Provide one in each apartment bathroom.
   3. Provide one in each common toilet room.

B. Combination Towel Dispenser/Waste Receptacle: Recessed with projecting waste receptacle, stainless steel; seamless wall flanges, continuous piano hinges, tumbler locks on upper and lower doors.
   1. Waste receptacle liner: Reusable, heavy-duty vinyl.
   2. Towel dispenser capacity: 400 C-fold.
   3. Waste receptacle capacity: 12 gallons.
   4. Provide one in each common toilet room.

C. Mirrors: As specified in Section 08 83 00.

D. Grab Bars: Stainless steel, nonslip grasping surface finish.
   1. Standard Duty Grab Bars:
      a. Push/Pull Point Load: 250 pound-force, minimum.
      b. Dimensions: 1-1/4 inch outside diameter, minimum 0.05 inch wall thickness, exposed flange mounting, 1-1/2 inch clearance between wall and inside of grab bar.
      c. Length and Configuration: As indicated on drawings.

2.04 SHOWER AND TUB ACCESSORIES

A. Shower Curtain Rod: Stainless steel tube, 1 inch outside diameter, 0.04 inch wall thickness, satin-finished, with 3 inch outside diameter, minimum 0.04 inch thick satin-finished stainless steel flanges, for concealed mounting.

B. Towel Bars: Chrome, 3/4 inch square tubular bar; rectangular brackets, concealed attachment, bright polished finish.
   1. Length: 18 and 24 inches.
   2. Product: 01-930018 BWW and 01-930024 BWW manufactured by Taymor
   3. One 18 inch and one 24 inch towel bar per apartment bathroom.

C. Robe Hook: Heavy-duty stainless steel, single-prong, rectangular-shaped bracket and backplate for concealed attachment, bright polished finish.
   1. Product: Sunrise Collection 01-322 manufactured by Taymor.
   2. Provide one at each apartment bathroom.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify exact location of accessories for installation.

3.02 PREPARATION

A. Deliver inserts and rough-in frames to site for timely installation.

B. Provide templates and rough-in measurements as required.

3.03 INSTALLATION

A. Install accessories in accordance with manufacturers' instructions in locations indicated on the drawings.

B. Install plumb and level, securely and rigidly anchored to substrate.

C. Mounting Heights and Locations: As required by accessibility regulations and as indicated on drawings

END OF SECTION

SECTION 10 44 00
FIRE PROTECTION SPECIALTIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Fire extinguishers.

B. Fire extinguisher cabinets.

1.02 REFERENCE STANDARDS

A. NFPA 10 - Standard for Portable Fire Extinguishers; 2013.

1.03 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Shop Drawings: Indicate cabinet physical dimensions.

C. Product Data: Provide extinguisher operational features and color and finish.

D. Maintenance Data: Include test, refill or recharge schedules and re-certification requirements.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Fire Extinguishers:
   1. Ansul, a Tyco Business; Cleanguard: www.ansul.com.
   2. Nystrom, Inc: www.nystrom.com.
   3. Pyro-Chem, a Tyco Business: www.pyrochem.com.

B. Fire Extinguisher Cabinets and Accessories:
   1. JL Industries, Inc: www.jlindustries.com.
   2. Larsen's Manufacturing Co: www.larsensmfg.com.
   3. Potter-Roemer: www.potterroemer.com.
   4. Substitutions: Not permitted.

2.02 FIRE EXTINGUISHERS

A. Fire Extinguishers - General: Comply with product requirements of NFPA 10 and applicable codes, whichever is more stringent.

B. Dry Chemical Type Fire Extinguishers: Carbon steel tank, with pressure gage.
   1. Class: A:B:C.
   2. Size: 10 pound.
   3. Finish: Baked polyester powder coat, red color.

2.03 FIRE EXTINGUISHER CABINETS

A. Metal: Formed primed steel sheet; 0.036 inch thick base metal.

B. Cabinet Configuration: Semi-recessed type. Use stud wall construction.
   1. Approved for installation in 1-hour fire resistance rated wall construction.
   2. Sized to accommodate accessories.
   3. Trim: Returned to wall surface, with 2-1/2 inch projection, 1-1/4 inch wide face.

C. Cabinet Configuration: Surface type. Use at concrete or c.m.u. walls.
   1. Sized to accommodate accessories.

D. Door: 0.036 inch thick, reinforced for flatness and rigidity; latch. Hinge doors for 180 degree opening with continuous piano hinge. Provide nylon catch.

E. Door Glazing: Glass, clear, 1/8 inch thick tempered. Set in resilient channel gasket glazing.

F. Cabinet Mounting Hardware: Appropriate to cabinet. Pre-drill for anchors.

G. Weld, fill, and grind components smooth.

H. Finish of Cabinet Exterior Trim and Door: Baked enamel, white color.

I. Finish of Cabinet Interior: White enamel.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Install cabinets plumb and level, 48 inches from finished floor to top of cabinet.

C. Secure rigidly in place.

D. Place extinguishers in cabinets.

END OF SECTION

SECTION 10 55 23

MAIL BOXES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Multiple mail boxes with hinged and locked doors.

1.02 REFERENCE STANDARDS

A. 39 CFR 111 - U.S. Postal Service Standard 4C; effective date September 3, 2006.

1.03 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data for components.

C. Shop Drawings: Indicate locations, construction and anchorage details, dimensions, rough-in openings sizes, quantity and arrangement of box sizes.

D. Manufacturer's Instructions: Include installation procedures, special considerations, and maintenance information.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Mail Boxes:
   1. Auth-Florence Manufacturing Company: www.authflorence.com.
   2. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 MAIL BOXES SERVED BY U.S. POSTAL SERVICE

A. Comply with U.S. Postal Service Standard 4C.

2.03 COMPONENTS

A. Front Loading Panel Frame:
   1. Aluminum with anodized finish.
   2. Edges beveled, piano hinged jamb, prepared for Post Office lock cylinder.

B. Box Door:
   1. Aluminum with anodized finish.
   2. 1/2" high engraved numbers with black fill.
   3. Edges beveled, with manufacturers standard hinge, prepared for lock cylinder.

C. Box Construction: Mail compartment shall be double wall type, made of sheet aluminum. Frame members shall be heavy gauge extruded aluminum sections.

D. Box Sizes: Configured as follows:
   1. Horizontal: 3 x 12 x 15 inches (H x W x D).

E. Postal Box Locks: USPS standard, two keys per box.

F. "Out-Going Mail" Lock Box: Construction & finish to match front loading panel frame, lockable with cylinder provided by Post Office .

G. "Building Mail" Lock Box: Construction & finish to match front loading panel frame, lockable with cylinder and 2 keys included.

H. "Parcel Locker": Provide one parcel locker for every ten tenant compartments.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install in accordance with manufacturer's instructions and U.S. Postal Service regulations.

B. Install and secure boxes in position, neatly, and accurately stacked.

C. Install doors and adjust to operate smoothly.

END OF SECTION

SECTION 10 56 10
STORAGE SHELVING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Vinyl-coated steel ventilated shelving.

B. Closet shelving.

C. Adjustable shelf systems.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. ClosetMaid (Clairson International).

B. Lee Rowan.

C. Substitutions: See Section 01 60 00 - Product Requirements.

D. Provide all storage shelving and accessories from a single manufacturer.

2.02 MANUFACTURED UNITS

A. Wire Shelving: Coated steel wire, 1/2 to 1 inch incremental cross-deck spacings.
   1. Closet rod and shelf: Easy slide type.
   2. Pantry, Linen and Laundry Shelves: "Tight Mesh", maximum 1/2" wire spacing.

2.03 ACCESSORIES

A. Wall Clips.

B. End Brackets.

C. Support Brackets.

D. Poles.

E. Standards.

F. Shelf Brackets.

G. Pole Clips.

PART 3 EXECUTION

3.01 EXAMINATION

A. Installation indicates installer's acceptance of conditions.

3.02 INSTALLATION

A. Provide adjustable shelving at Accesseble and WHEDA units.

B. Cut shelves 1/2 inch shorter than actual wall measurements; cap all exposed ends.

C. Install shelving plumb and level at heights indicated in accordance with shop drawings and manufacturer's printed installation instructions.

D. Place wall clips every 10 to 12 inches on level line.

E. Install end brackets on same level line as wall clips, centered on the front rods of shelves. Support shelves 36 inches maximum with end brackets, support brackets, or poles.

F. Drill holes where required using sharp bit; do not punch.

G. Drywall: Drill 1/4 inch hole, insert No. 970 or 971 wall clip. Use No. 8 pin to expand anchor.

H. Wood: Drill 1/4 inch hole into wood, secure wall clip with No. 8 x 1 inch screw or secure pole clip No. 978 directly to wood with No. 8 x 1-1/4 inch screws.

I. Adjustable Standards:
   1. Install standards vertically every 16 inches on studs.

2. Install horizontal tracks level, secured with screws or mollies in studs or drywall; use hanging adapters to connect wall standards for hanging.
3. Attach shelf brackets with SuperSlide, Heavy Duty, Linen Shelf and Rod and Close Mesh 12-inch or 16-inch decking.

J. Shelf Supports:
1. Place shelf support brackets per manufacturers specifications.
2. 36 inches o.c. maximum.

K. Attach pole clips at same elevations as wall clips for a given shelf.

L. Use corner support brackets on all corner "butt" joints.

M. Repair walls and fill in holes not used for shelving that were drilled by this subcontractor.

3.03 SCHEDULE

A. Coat Closets: Single shelf and rod.

B. Bedroom Closets:
1. Double shelf and rod in 50% of closet, single shelf and rod in balance of closet.

C. Linen Closets: Install five shelves.

D. Pantry: Install five shelves.

E. Laundry Rooms:
1. At stacked washer and dryer install five shelf stand.
2. At side by side washer and dryer install two 12 inch deep shelves full width above laundry equipment.
3. "Tight mesh" shelving at laundry rooms.

F. At Accessible and WHEDA units install adjustable shelving at bedroom and coat closets.

END OF SECTION

SECTION 11 31 00
RESIDENTIAL APPLIANCES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Kitchen appliances.

B. Laundry appliances.

1.02 ALLOWANCES

A. See Section 01 21 00 - Allowances, for cash allowances affecting this section.

1.03 REFERENCE STANDARDS

A. UL (EAUED) - Electrical Appliance and Utilization Equipment Directory; Underwriters Laboratories Inc.; current edition.

1.04 QUALITY ASSURANCE

A. Electric Appliances: Listed and labeled by UL and complying with NEMA standards.

1.05 WARRANTY

A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.

B. Provide five (5) year manufacturer warranty on refrigeration system of refrigerators.

C. Provide ten (10) year manufacturer warranty on magnetron tube of microwave ovens.

D. Provide ten (10) year manufacturer warranty on tub and door liner of dishwashers.

PART 2 PRODUCTS

2.01 KITCHEN APPLIANCES

A. Refrigerator, Type 1: Free-standing, side-by-sidetop-mounted freezer, and frost-free.
   1. Capacity: Total minimum storage of 18 cubic ft; minimum 15 percent freezer capacity.
   2. Energy Usage: Energy Star Compliant.
   3. Features: Include glass shelves, automatic icemaker, and light in freezer compartment.
   4. Exterior Finish: Stainless steel.

B. Refrigerator Type 2; at Type A Accessible units: Free-standing, top-mounted freezer, frost-free.
   1. **50% of freezer shelves, including the bottom of the freezer must be within 54" maximum off of the floor.**
   2. Capacity: Total minimum storage of 18 cubic ft; minimum 25 percent freezer capacity.
   3. Energy Usage: Energy Star Compliant.
   4. Features: Include glass shelves, automatic icemaker, and light in freezer compartment.
   5. Finish: Stainless steel .

C. Range, Type 1: Electric, free-standing, with plug-in heating elements and removable drip pans.
   1. Size: 30 inches wide.
   2. Oven: Self-cleaning.
   3. Elements: Four (4).
   4. Controls: Push-to-turn knobs with electronic clock and timer.
   5. Features: Include storage drawer, oven door window, broiler pan and grid, and oven light.
   6. Exterior Finish: Stainless steel.

D. Range Type 2; At Type A Accessible Units: Electric, free-standing, with plug-in heating elements and removable drip pans.
   1. Size: 30 inches.
   2. Oven: Self-cleaning .
   3. Elements: 4.
   4. Controls: Front Controls. Push-to-turn knobs with electronic clock and timer.
   5. Features: Include storage drawer, oven door window, broiler pan and grid, and oven light.
   6. Finish: Stainless steel .

E. Microwave : Over-the-range.
   1. Note: Provide counter microwave meeting these specifications at Type A Accessible units.
   2. Capacity: 1.3 cubic ft.
   3. Power: 900 watts, minimum.
   4. Features: Include turntable, cooktop light, night light, and recirculating exhaust.
   5. Exterior Finish: Stainless steel.

F. Dishwasher: Undercounter.
   1. **Note: Provide 32" high dishwasher meeting these specifications for installation under dropped countertop at Type A Accessible units.**
   2. Controls: Solid state electronic.
   3. Energy Usage: Energy Star Compliant.
   4. Cycles: Five (5), including normal, rinse and hold, short, china/crystal, and pot and pan.
   5. Features: Include rinse aid dispenser, optional no-heat dry, and optional water temperature boost.
   6. Finish: Stainless steel .

2.02 LAUNDRY APPLIANCES

A. Unitized Laundry Center:
   1. Size: 27 x 32 inches.
   2. Energy Star rated.
   3. Washer with stainless steel basket, 2 speeds and 4 cycles, minimum 3.2 cubic feet.
   4. Electric dryer, minimum 5.4 cubic feet.
   5. Finish: Painted steel, color white.

B. Clothes Washer, Type 1: Top-loading stationary.
   1. Size: Full-size.
   2. Energy Usage: Energy Star Compliant.
   3. Cycles: Include normal, permanent press, delicate, and soak.
   4. Motor Speed: Single-speed.
   5. Features: Include optional second rinse, bleach dispenser, fabric softener dispenser, self-cleaning lint filter, sound insulation, and end of cycle signal.
   6. Finish: Painted steel with porcelain enamel top, color white.

C. Clothes Washer Type 2; at Type A Accessible units: Front-loading.
   1. Size: Full-size.
   2. Energy Usage: Energy Star Compliant.
   3. Cycles: Include normal, permanent press, delicate, and soak.
   4. Features: Include optional second rinse, bleach dispenser, fabric softener dispenser, self-cleaning lint filter, sound insulation, and end of cycle signal.
   5. Finish: Painted steel with porcelain enamel top, color white.

D. Clothes Dryer, Type 1: Electric, stationary.
   1. Size: Full-size.
   2. Controls: Rotary, with electronic moisture-sensing dry control.
   3. Temperature Selections: Three.
   4. Cycles: Include normal, permanent press, knit/delicate, and air only.
   5. Features: Include reversible door, sound insulation, and end of cycle signal.
   6. Finish: Painted steel with porcelain enamel top, color white.

E. Clothes Dryer Type 2; at Type A Accessible units: Electric, stationary.
   1. Size: Full-size.
   2. Controls: Rotary, with electronic moisture-sensing dry control.
   3. Temperature Selections: Three.
   4. Cycles: Include normal, permanent press, knit/delicate, and air only.
   5. Features: Include reversible door, sound insulation, and end of cycle signal.
   6. Finish: Painted steel with porcelain enamel top, color white.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Anchor built-in equipment in place.

C. Install anti-tip bracket on range.

3.02 CLEANING

A. Remove packing materials from equipment and remove debris to provided dumpster.

B. Wash and clean equipment.

END OF SECTION

SECTION 12 21 13
HORIZONTAL LOUVER BLINDS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Horizontal slat louver blinds.

B. Operating hardware.

1.02 RELATED REQUIREMENTS

A. Section 06 10 00 - Rough Carpentry: Concealed wood blocking for attachment of headrail brackets.

1.03 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Samples: Submit two samples, 3 inch long illustrating slat materials and finish, cord type and color.

1.04 PROJECT CONDITIONS

A. Coordinate the work with window installation and placement of concealed blocking to support blinds.

B. Take field measurements to determine sizes required.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Horizontal Louver Blinds Without Side Guides:
   1. Levolor Contract: www.levolorcontract.com.
   2. SWFcontract, a division of Spring Window Fashions, LLC.: www.swfcontract.com.
   3. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 BLINDS WITHOUT SIDE GUIDES

A. Description: Horizontal slat louvers hung from full-width headrail with full-width bottom rail.

B. Metal Slats: Spring tempered pre-finished aluminum; square slat corners, with manufacturing burrs removed.
   1. Width: 1 inch.
   2. Thickness: 0.008 inch.
   3. Color: As selected by Architect.

C. Slat Support: Woven polypropylene cord, ladder configuration.

D. Head Rail: Pre-finished, formed aluminum box, with end caps; internally fitted with hardware, pulleys, and bearings for operation; same depth as width of slats.

E. Control Wand: Extruded hollow plastic; hexagonal shape.
   1. Removable type.
   2. Length of window opening height less 3 inch.

F. Headrail Attachment: Wall brackets.

2.03 FABRICATION

A. Fabricate blinds to fit within openings with uniform edge clearance of 1/4 inch.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that openings are ready to receive the work.

3.02 INSTALLATION

A. Install blinds in accordance with manufacturer's instructions.

B. Secure in place with flush countersunk fasteners.

3.03 TOLERANCES

A. Maximum Variation of Gap at Window Opening Perimeter: 1/4 inch.

B. Maximum Offset From Level: 1/8 inch.

3.04 ADJUSTING

A. Adjust blinds for smooth operation.

3.05 CLEANING

A. Clean blind surfaces just prior to occupancy.

END OF SECTION

SECTION 12 21 16
VERTICAL LOUVER BLINDS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Vertical louver blinds at all sliding doors and adjacent fixed glazing.

1.02 RELATED REQUIREMENTS

A. Section 12 21 13 - Horizontal Louver Blinds.

1.03 REFERENCE STANDARDS

A. WCMA A100.1 - Safety of Corded Window Covering Products; Window Covering Manufacturers Association; 2014. (ANSI/WCMA A100.1)

B. NFPA 701 - Standard Methods of Fire Tests for Flame Propagation of Textiles and Films; National Fire Protection Association; 2015.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Vertical Louver Blinds:
   1. Hunter Douglas; _____: www.hunterdouglas.com.
   2. Levolor Contract; _____: www.levolorcontract.com.
   3. Graber, division of Springs Window Fashions; _____: www.graberblinds.com.

2.02 BLINDS AND BLIND COMPONENTS

A. Vertical Louver Blinds: Horizontal travel, vertical vane louver units complete with tracks, pivot and traversing mechanisms, and accessories, as follows:
   1. Vanes: PVC vanes of the size indicated.
   2. Operation: Manual.
   3. Mounting: Inside (between jambs).
   4. Cord and Chain Operation: Comply with WCMA A100.1.

B. Tracks: Channel tracks as required for type of operation, extruded aluminum with clear anodized finish, with end caps.
   1. Vane Rotation: Chain driven direct rotation by activating tilt gear within end cap assembly in turn actuating tilt rod and worm-and-spur gears in carrier trucks.
   2. Operating Components: Internally mounted heavy-duty extruded aluminum tilt rod, vane carriers, and other components required for proper performance and designed for smooth, quiet, trouble free operation.
   3. Pivot Mechanism: Geared for synchronous 180 degrees rotation of vanes and type of operation indicated.
   4. Vane Carriers: Metal carriers with ball-bearing wheels or thermoplastic trucks, equipped with linkages or other devices to ensure positive spacing of vanes.
   5. Tilt Chain: Nickel plated brass beaded ball chain, minimum 1/8 inch diameter; locate at drawback side of units as indicated.

C. PVC Vanes: Integrally colored, extruded PVC; flat, 3-1/2 inches (80mm) wide.
   1. Thickness: 0.030 inch, minimum.
   2. Flammability: Comply with NFPA 701.
   3. Color: As selected by Owner from manufacturer’s full range of colors.
   4. Texture: Smooth.

D. Brackets and Mounting Hardware: As recommended by manufacturer for the mounting configuration and span indicated; provide manufacturer’s standard L- bracket with clip for outside mounting and clip only for inside mounting.

2.03 FABRICATION

A. Field measure finished openings prior to ordering or fabrication.

B. Fabricate blinds to fit openings within specified tolerances.
   1. Vertical Dimensions: Fill openings from head to sill with 1/2 inch space between bottom of vanes and finish floor.
   2. Horizontal Dimensions - Inside Mounting: Fill openings from jamb to jamb.

C. Dimensional Tolerances: Fabricate blinds to within plus/minus 1/8 inch of intended dimensions.

END OF SECTION

SECTION 12 35 30
RESIDENTIAL CASEWORK

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Kitchen cabinets.

B. Vanity cabinets.

C. Casework hardware.

1.02 RELATED REQUIREMENTS

A. Section 12 36 00 - Countertops.

1.03 REFERENCE STANDARDS

A. BHMA A156.9 - American National Standard for Cabinet Hardware; Builders Hardware Manufacturers Association; 2010 (ANSI/BHMA A156.9).

B. KCMA A161.1 - Performance and Construction Standard for Kitchen and Vanity Cabinets; Kitchen Cabinet Manufacturers Association; 2012 (ANSI/KCMA A161.1).

C. KCMA (DIR) - Directory of Certified Cabinet Manufacturers; Kitchen Cabinet Manufacturers Association; current edition, online.

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide construction details and product information.

C. Shop Drawings: Indicate casework locations, scale plans, elevations, clearances required, rough-in and anchor placement dimensions and tolerances.

1.05 QUALITY ASSURANCE

A. Products: Complying with KCMA A161.1 and KCMA Certified.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Residential Casework:
   1. Armstrong; Product (match Smart Cabinetry specifications). www.armstrong.com
   2. Smart Cabinetry; Product: Standard construction; Standard overlay; Rockport door style.
   3. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 GENERAL

A. Provide one drawer base per kitchen.

B. Provide minimum of two drawers in vanity cabinets.

C. Provide base cabinetry in kitchen corners. Where possible, use base corner cabinet in lieu of blind corner cabinet.

D. Removable front & base at kitchen sinks, work areas and vanities in Type A Accessible units.

2.03 COMPONENTS

A. Cabinet Construction:
   1. Modified full overlay construction.
   2. Hardwood flush flat panel doors.
   3. Solid hardwood drawer front.
   4. Face Frame: Solid hardwood.
   5. Side and End Panels: 1/2 inch mdf.
   6. Drawer Construction: Dovetail plywood.

2.04 ACCESSORIES

A. Provide fillers, toe-kick and scribe molding.

2.05 HARDWARE

A. **Drawer and Door Pulls: Brushed chrome wire pulls, 4 inches wide.**

B. Hinges: European, 110 degrees, self-closing, 6 way adjustable.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install casework, components and accessories in accordance with manufacturer's instructions.

B. Use anchoring devices to suit conditions and substrate materials encountered.

C. Set casework items plumb and square, securely anchored to building structure.

D. Carefully scribe casework abutting other components, with maximum gaps of 1/32 inch. Use filler strips; not additional overlay trim for this purpose.

3.02 ADJUSTING

A. Adjust doors, drawers, hardware, fixtures, and other moving or operating parts to function smoothly. Adjust cabinet doors to align.

END OF SECTION

SECTION 12 36 00
COUNTERTOPS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Countertops for manufactured casework.

B. Window sills.

1.02 RELATED REQUIREMENTS

A. Section 12 35 30 - Residential Casework.

B. Section 22 40 00 - Plumbing Fixtures: Sinks.

1.03 REFERENCE STANDARDS

A. ANSI Z124.3 - American National Standard for Plastic Lavatories; 2005.

B. ISFA 2-01 - Classification and Standards for Solid Surfacing Material; International Surface Fabricators Association; 2013.

C. NEMA LD 3 - High-Pressure Decorative Laminates; 2005.

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Selection Samples: For each finish product specified, color chips representing manufacturer's full range of available colors and patterns.

C. Test Reports: Chemical resistance testing, showing compliance with specified requirements.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Store products in manufacturer's unopened packaging until ready for installation.

B. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

PART 2 PRODUCTS

2.01 COUNTERTOP ASSEMBLIES

A. Plastic Laminate Countertops: High pressure decorative laminate sheet bonded to substrate.
   1. Laminate Sheet, Unless Otherwise Indicated: NEMA LD 3, Grade HGS, 0.048 inch nominal thickness.
      a. Finish: Matte or suede, gloss rating of 5 to 20.
      b. Surface Color and Pattern: To be selected from manufacturer's full line.
      c. Manufacturers:
         1) Formica Corporation: www.formica.com.
         2) Lamin-Art, Inc: www.laminart.com.
         3) Panolam Industries International, Inc\Pionite: www.pionitelaminates.com.
         4) Wilsonart, LLC: www.wilsonart.com.
   2. Back and End Splashes: Same material, same construction, 4 inches high, or as shown on Drawings.

B. Cultured granite/marble: Plastic resin casting with simulated stone surfacing.
   1. Flat Sheet Thickness: 3/4 inch, minimum.
   2. Acrylic or polyester resin, mineral surfacing and pigments; non-porous.
      a. Sinks and Bowls: Integral castings; minimum 3/4 inch wall thickness; comply with ANSI Z124.3. Bowl shape as selected from manufacturer's standard offerings.
      b. Finish on Exposed Surfaces: Matte, gloss rating of 5 to 20.
      c. Color and Pattern: Low sheen granite or pattern or solid - color to be selected.
      d. Manufacturers:
         1) SFI Inc.; Product: Roma: www.sinksbysfi.com
         2) Elite Marble Company; Product: Granite.

3) Substitutions: See Section 01 60 00 - Product Requirements.

3. Other Components Thickness: 1/2 inch, minimum.
4. Exposed Edge Treatment: Minimum 3/4 inch thick; square edge .
5. Back and End Splashes: Same sheet material, square top; minimum 3-1/2 inches high. Backsplash integral to top.

C. Natural Stone Countertops: Stone slabs; use as large pieces as possible with inconspicuous adhesive joints.
1. Stone: Granite without cracks, voids, or pin holes .
2. Color: As selected from price tier 1 - Uba Tuba or similar.
3. Stone Thickness: 3 cm tops with 4" tall 2 cm thick splashes.
4. Surface Finish: Polished.
5. Exposed Edge Treatment: Stone bullnose, 1 inch radius.
6. Back and End Splashes: Same material, same thickness; for field attachment.
7. Sealant for granite tops: As recommended by granite supplier.

2.02 ACCESSORY MATERIALS

A. Adhesives: Chemical resistant waterproof adhesive as recommended by manufacturer of materials being joined.

B. Joint Sealant: Mildew-resistant silicone sealant, clear.

2.03 FABRICATION

A. Fabricate tops and splashes in the largest sections practicable, with top surface of joints flush.
1. Join lengths of tops using best method recommended by manufacturer.
2. Fabricate to overhang fronts and ends of cabinets 1 inch except where top butts against cabinet or wall.
3. Prepare all cutouts accurately to size; replace tops having improperly dimensioned or unnecessary cutouts or fixture holes.
4. Note: Vanity tops less than 48" wide may require an offset bowl - see Drawings.

B. Provide back/end splash wherever counter edge abuts vertical surface unless otherwise indicated.
1. Secure to countertop with concealed fasteners and with contact surfaces set in waterproof glue.
2. Height: 4 inches, unless otherwise indicated.

PART 3 EXECUTION

3.01 INSTALLATION

A. Securely attach countertops to cabinets using concealed fasteners. Make flat surfaces level; shim where required.

B. Attach plastic laminate countertops using screws with minimum penetration into substrate board of 5/8 inch.

C. Cut kitchen outlets into backsplash at snack counter.

D. Seal joint between back/end splashes and vertical surfaces.

E. Seal granite tops.

3.02 SCHEDULES

A.	Kitchen Tops:	Plastic Laminate.
B.	Kitchen Island Tops :	Granite.
C.	Community Room Tops:	Granite.
D.	Vanity Tops:	Cultured Granite.
E.	Window Sills:	Cultured Granite.

END OF SECTION

SECTION 12 93 13
BICYCLE RACKS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Bicycle racks.

1.02 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Manufacturer's data sheets on each product to be used, including:
   1. Preparation instructions and recommendations.
   2. Storage and handling requirements and recommendations.
   3. Installation methods.

1.03 DELIVERY, STORAGE, AND HANDLING

A. Store products in manufacturer's unopened packaging until ready for installation.

B. Handle racks with sufficient care to prevent scratches and other damage to the finish.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Madrax; www.madrax.com

B. Saris; www.saris.com

2.02 MATERIALS

A. Bicycle Racks: Tubular steel pipe formed to allow at least one bicycle to lock simultaneously on each side, securing one or both wheels and part of the frame.
   1. Style: Inverted horseshoe rack formed by one u-shaped bend.
   2. Materials: 2 inch x 2 inch 7 ga.(.188") square steel tubing or 2 3/8" outside diameter schedule 40 pipe.
   3. Finish:
      a. Interior racks: Galvanized steel.
      b. Exterior racks: Powder coated steel, color as selected.
   4. Mounting: Surface flange.
      a. Multiple racks may be rail mounted.
   5. Accessories: Surface flange cover.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine surfaces to receive bicycle racks.

B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

C. Do not begin installation until unsatisfactory substrates have been properly repaired.

3.02 PREPARATION

A. Ensure surfaces to receive bicycle racks are clean, flat, and level.

3.03 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Install bicycle racks level, plumb, square, and correctly located as indicated on the drawings.

C. Surface Flange Installation: Anchor bicycle racks securely in place with 1/2 inch by 4 inch anchor bolts through flange holes.

3.04 CLEANING

A. Clean installed work to like-new condition. Do not use cleaning materials or methods that could damage finish.

END OF SECTION

SECTION 14 20 10
PASSENGER ELEVATORS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Complete elevator systems.

1.02 RELATED REQUIREMENTS

A. Section 04 20 00 - UNIT MASONRY: Masonry hoistway enclosure; building-in and grouting hoistway door frames.

B. Section 05 50 00 - Metal Fabrications: Includes pit ladder, sill supports, divider beams, and overhead hoist beams.

C. Section 21 13 00 - Fire Suppression Sprinklers: Sprinkler heads in hoistway.

D. Section 22 00 00 - Plumbing: Pit sump and pump.

E. Section 23 00 00 - HVAC: Ventilation of elevator hoistway.

F. Section 26 00 00 - Electrical: Equipment wiring.

1.03 REFERENCE STANDARDS

A. ASME A17.1 - Safety Code for Elevators and Escalators; The American Society of Mechanical Engineers; 2013.

B. ASME A17.2 - Guide for Inspection of Elevators, Escalators, and Moving Walks; The American Society of Mechanical Engineers; 2014.

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Shop Drawings: Indicate the following information:
   1. Locations of Machine Room Equipment: Driving machines, controllers, governors and other components.
   2. Hoistway Components: Car, counterweight, sheaves, machine and sheave beams, guide rails, buffers, ropes, and other components.
   3. Rail bracket spacing; maximum loads imposed on guide rails requiring load transfer to building structural framing.
   4. Individual weight of principal components; load reaction at points of support.
   5. Loads on hoisting beams and location of trolley beams.
   6. Clearances and over-travel of car and counterweight.
   7. Location and sizes of access doors, doors, and frames.
   8. Electrical characteristics and connection requirements.

C. Maintenance Data: Include:
   1. Parts catalog with complete list of equipment replacement parts; identify each entry with equipment description and identifying code.
   2. Technical information for servicing operating equipment.
   3. Legible schematic of hydraulic piping and wiring diagrams of installed electrical equipment and changes made in the Work. List symbols corresponding to identity or markings on machine room and hoistway apparatus.

1.05 QUALITY ASSURANCE

A. Perform Work in accordance with applicable code and as supplemented in this section.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Otis Elevator Co; Product GenII: www.otis.com.

B. Kone; Ecospace.

C. Schindler Elevator Corp; Product 3300 MRL: www.us.schindler.com.

D. Substitutions: See Section 01 60 00 - Product Requirements.

E. All components to be manufactured by same entity, unless otherwise indicated.

2.02 ELEVATORS

A. Elevator No.1: Passenger, gearless electric.
   1. Operation and Controls: Automatic.
      a. Elevator shall comply with the emergency operation and signaling device requirements of Section 2.27 of ASME A17.1
   2. Cab Design: Model Standard by Elevator Manufacturer.
      a. Walls: 3/4 inch wood core fire retardant treated. Inside finish plastic laminate.
      b. Ceiling: Satin stainless steel.
      c. Lighting: Round LED.
      d. Ventilation Fan: Two speed exhaust, with aluminum grill.
      e. Controls: The main car operating panel shall be mounted in the return and comply with handicap requirements. Pushbuttons and illuminating indications shall be included for each floor served, and emergency buttons and switches shall be provided per code. Switches for car light and accessories shall be provided.
      f. The following cab fixtures shall also be provided:
         1) Car Lantern(s)
         2) Digital Car Position Indicator
         3) Locking Service Panel in Car Operating Panel
         4) Telephone (ADA compliant)
         5) **Traveling Cable: Include cable to allow installation of in-cab security camera and interface with building access control system.**
      g. Hand Rail: 1/2" x 2 1/2" no. 4 stainless steel.
      h. Protection Pads: Manufacturers standard pads and wall hooks.
   3. Hoistway Doors and Frames: Stainless steel.
   4. Ceiling Height: 96 inches.
   5. Hoistway and Cab Entrance Frame Opening Size: 42 x 84 inches.
   6. Door Operation: Side opening, single speed.
   7. Rated Net Capacity: 3500 lbs.
   8. Rated Speed: 200 ft/min.
   9. Clear Net Platform Size: 80 x 51 inches.
   10. Travel Distance: As indicated on drawings.
   11. Number of Stops: 5.
   12. Number of Openings: 2 Front; 3 Rear.
   13. Traction Machine Location: In Hoistway.

B. Elevator No. 2: Same requirements as Elevator 1.

2.03 CONTROLS

A. Elevator Controls: Provide landing buttons.

B. Door Controls:
   1. Program door control to open doors automatically when car arrives at floor.
   2. Render "Door Close" button inoperative when car is standing at dispatching terminal with doors open.
   3. If doors are prevented from closing for approximately ten seconds because of an obstruction, automatically disconnect door reopening devices, close doors more slowly until obstruction is cleared. Sound buzzer.
   4. Door Safety Devices: Moveable, retractable safety edges, quiet in operation; equip with photo-electric light rays.

C. Landing Buttons: Stainless steel type, one for originating UP and one for originating DOWN calls, one button only at terminating landings; marked with arrows.

D. Interconnect elevator control system with building fire alarm systems.

E. Provide "Firefighter's Operation" in accordance with applicable code. Designated Landing: First Floor.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify that hoistway, pit, and machine room are ready for work of this section.

C. Verify hoistway shaft and openings are of correct size and within tolerance.

D. Verify location and size of machine foundation and position of machine foundation bolts.

E. Verify that electrical power is available and of the correct characteristics.

3.02 INSTALLATION

A. Install system components. Connect equipment to building utilities.

B. Provide conduit, boxes, wiring, and accessories.

C. Install hydraulic piping between cylinder and pump unit.

D. Mount machines on vibration and acoustic isolators, on bed plate and concrete pad. Place on structural supports and bearing plates. Securely fasten to building supports. Prevent lateral displacement.

E. Accommodate equipment in space indicated.

F. Install guide rails using threaded bolts with metal shims and lock washers under nuts. Compensate for expansion and contraction movement of guide rails.

G. Accurately machine and align guide rails. Form smooth joints with machined splice plates.

H. Coordinate installation of hoistway wall construction.

I. Install hoistway door sills, frames, and headers in hoistway walls. Grout sills in place. Set entrances in vertical alignment with car openings and aligned with plumb hoistway lines.

J. Structural Metal Surfaces: Clean surfaces of rust, oil or grease; wipe clean with solvent; prime two coats.

K. Machine Room Components: Clean and degrease; prime one coat, finish with one coat of enamel.

L. Adjust equipment for smooth and quiet operation.

3.03 ERECTION TOLERANCES

A. Guide Rail Alignment: Plumb and parallel to each other in accordance with ASME A17.1 .

B. Cab Movement on Aligned Guide Rails: Smooth movement, with no objectionable lateral or oscillating movement or vibration.

3.04 FIELD QUALITY CONTROL

A. Testing and inspection by regulatory agencies will be performed at their discretion.
   1. Schedule tests with agencies and notify Owner and Architect.
   2. Obtain permits required to perform tests.
   3. Document regulatory agency tests and inspections in accordance with the requirements of Section 01 40 00.
   4. Perform tests required by regulatory agencies.
   5. Furnish test and approval certificates issued by authorities having jurisdiction.

B. Perform testing and inspection in accordance with requirements of Section 01 40 00.
   1. Perform tests as required by ASME A17.2.
   2. Provide two weeks written notice of date and time of tests.
   3. Supply instruments and execute specific tests.

3.05 ADJUSTING

A. Adjust for smooth acceleration and deceleration of car so not to cause passenger discomfort.

B. Adjust automatic floor leveling feature at each floor to achieve 1/4 inch from flush.

3.06 CLEANING

A. Remove protective coverings from finished surfaces.

B. Clean surfaces and components ready for inspection.

3.07 PROTECTION

A. Do not permit construction traffic within cab after cleaning.

B. Protect installed products until project completion.

C. Touch-up, repair, or replace damaged products before Date of Substantial Completion.

END OF SECTION

SECTION 14 91 00
FACILITY CHUTES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Gravity chutes for waste (trash, refuse) and recyclables.

1.02 RELATED REQUIREMENTS

A. Section 21 13 00 - Fire Suppression Sprinklers: Connection to sprinklers inside chute.

B. Section 22 10 05 - Plumbing Piping:
   1. Water piping connections to spray cleaning equipment.

C. Section 26 27 17 - Equipment Wiring:
   1. Wiring and conduit between discharge room spray cleaning switch and flushing spray head.

1.03 REFERENCE STANDARDS

A. ASTM A463/A463M - Standard Specification for Steel Sheet, Aluminum-Coated, by the Hot-Dip Process; 2010.

B. NFPA 13 - Standard for the Installation of Sprinkler Systems; National Fire Protection Association; 2016.

C. NFPA 82 - Standard on Incinerators and Waste and Linen Handling Systems and Equipment; National Fire Protection Association; 2014.

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for additional requirements.

B. Product Data: Manufacturer's printed data sheets on each component, indicating which options are provided.

C. Shop Drawings: Detailed layout of chute and components, indicating interface with structure, enclosing walls, and utilities; show:
   1. Openings in floors and required clearances.
   2. Location and size of each field connection to structure.
   3. Pipe sizes and locations.
   4. Clearly indicate components required but not furnished by chute installer.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Chutes and Chute Components:
   1. Wilkinson-Hi-Rise LLC: www.whrise.com.
   2. U. S. Chutes Corp: www.uschutes.com.
   3. Valiant Products, Inc: www.linenchutes.com.
   4. Substitutions: See Section 01 60 00 - Product Requirements.

B. All components need not be made by the same manufacturer, provided manufacturer providing assembled units assumes responsibility for all components.

2.02 CHUTES

A. Waste and Recyclables Chutes: Sheet metal, round, constant diameter extending from above roof to lowest floor, with intake doors at each floor and bottom outlet into room designated on drawings; complying with requirements of NFPA 82 and local code.
   1. Diameter: 30 inches inside.
   2. Intake Doors: Hopper type, no locks.
   3. Intake Door Size: 15 by 18 inches wide by high.

2.03 COMPONENTS

A. Chute: Factory-fabricated to the greatest extent possible, with continuously welded or lock-seamed joints and smooth, non-snag interior (no protruding bolts, rivets, hardware, sharp edges or corners).
   1. Material: Aluminum-coated steel sheet complying with ASTM A463/A463M CS Type B, with minimum T1-40/T1M-120 coating.
   2. Sheet Metal Thickness: 16 gage, 0.06 inch.
   3. Throat Sections: Provide sloped throat sections for intake doors, of same material and construction as chute.
   4. Fabricate with support frames at each floor with sound isolator pads and expansion joints in chute between each support point.

B. Intake Doors: Factory-assembled door and frame, self-closing and positive-latching; frame designed for chase construction, flush-mounted.
   1. Material: Stainless steel, brushed or satin finish.
   2. Fire Rating: 1-1/2 hour ("B" label) with 30-minute temperature rise of 250 degrees F.
   3. Pulls: T-handle or lever handle latch; polished stainless steel.
   4. Signs: Mark on frame or door face the purpose of the chute, using engraving, integral raised lettering, or other permanent signs.

C. Discharge Doors: Aluminum-coated steel; normally-open, 1 1/2-hour ("B" label) fire rated, with fusible link closing; style as required by chute configuration.
   1. Vertical Discharge Style: Inclined horizontally rolling shutter, closing by gravity.

D. Access Doors: Same construction and fire rating as intake doors, with locks; provide wherever equipment requiring maintenance is located inside chute, including sprinklers and plumbing and electrical connections.

E. Roof Vent: Full diameter, extending minimum 48 inches above roof level, with roof deck flange.
   1. Material: Manufacturer's standard.
   2. Counterflashing and clamping ring of non-ferrous metal compatible with chute material.
   3. Top Unit: Screened vent.

F. Fire Sprinklers: Comply with NFPA 82 and NFPA 13, refer to Section 21 13 00; provide 1/2 inch NPS sprinkler heads mounted inside chute intake throats at following locations:
   1. At or above the top intake opening.
   2. At the lowest intake opening.
   3. In buildings of more than two stories, at every other floor.

G. Spray Cleaning Equipment:
   1. Flushing Spray: Solenoid controlled 3/4 inch NPS spray head mounted above top intake door.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install chutes and equipment in accordance with NFPA 82 requirements and manufacturer's instructions.

B. Maintain fire-resistive capacity of enclosing walls.

C. Install chute plumb and without offsets or obstructions that might prevent free fall of materials, except where indicated on drawings.

D. Anchor securely in manner required to withstand impact and weight of materials in chute.

E. Install roof vent flange to roof deck prior to installation of roofing.

F. Install counterflashing after roofing installation.

G. Adjust doors and other operating components for smooth operation.

END OF SECTION

SECTION 21 00 00

FIRE SUPPRESSION SYSTEMS

PART I GENERAL:

1.01 SCOPE OF WORK

A. These Scope Specifications are to give a minimum level of Work required. Additional Work (materials and labor) may be required by local and/or state requirements. The Contractor shall verify and include any additionally required work as part of his bid.

B. The requirements of Divisions 0 and 1 apply to this section.

C. Provide Design-Build service to install an automatic wet pipe sprinkler system per NFPA 13/13R and IBC/IFC 2009 requirements for the proposed building.

D. Obtain all local, State and insurance company rating bureau approvals prior to installation.

E. All permit fees to be included.

F. A combination water service will be located in the basement.

G. Coordinate installation with other Trades.

H. Include required valving, fire department Siamese connection(s), alarm(s), sprinklers, piping, hangers, flow switch, pressure gauge, ball drip, correct hose threads, signs, spare sprinkler head cabinet, testing, shop drawings, etc.

I. Provide supervisory switch at all control valves.

J. Provide sprinkler protection to balconies of combustible construction.

K. Provide alternate for sprinkler heads in finished areas (within dwelling units, corridors, stairs, common rooms, etc.) to be recessed or concealed type.

L. Include dry system at locations susceptible to freezing that cannot be adequately protected with dry sidewall heads.

M. Basement parking garage is heated to 50 degrees.

N. Include standpipes as required by code.

O. Commercial space to be finished to "white box" with exposed precast ceiling. Allow for future expansion and installation of additional heads during build-out.

P. Do not install sprinkler pipes where they will be encased in insulation. All pipes must be located on warm side of insulation.

Q. See Section 01 78 00 Closeout Submittals for additional requirements.

END OF SECTION

SECTION 22 00 00

PLUMBING

PART 1 GENERAL

1.01 SCOPE OF WORK

A. These Scope Specifications are to give a minimum level of work required. Additional Work (materials and labor) may be required by local and/or state requirements. The Contractor shall verify and include any additionally required work as part of his bid.

B. This is a Design-Build Project; design, fixtures, layouts and materials must be approved by Architect and Owner prior to start.

C. The requirements of Divisions 0 and 1 apply to this Section.

D. Design must comply with all State and Local codes, and requirements of local fire, water and sewer departments.

E. Include all plan approvals, submittals and review fees.

F. Include design of all plumbing systems for project:
   1. Calculating and sizing of all equipment.
   2. Verify all invert elevations and connection points prior to starting construction.
   3. Submit State of Wisconsin Department of Commerce approved plan and shop drawings to Architect for review.

G. Perform required excavation and trenching, associated shoring, bailing, and pumping, backfill and compaction required for underground piping.

H. Coordinate with other trades.

I. Special Note Regarding Penetrating Fire Rated Walls & Floor Assemblies: This Contractor must penetrate all fire rated construction in an approved and listed manner consistent with maintaining the fire rating. At the beginning of the project, the Contractor is to meet with the Building Inspector and review all penetrations through rated assemblies.

J. Provide as-built drawings, maintenance data and operating instructions. See Section 01 78 00 - Closeout Submittals for requirements.

K. Provide all clean up associated with this part of the Work.

L. Commercial space will be "white box". Water and DWV shall be stubbed to allow future rough-in of plumbing in each space as delineated on drawings. Install condensate drains for installed split system furnaces.

PART 2 PRODUCTS

2.01 WATER DISTRIBUTION SYSTEM

A. Confirm available water pressure. Provide pressure reducing valves if pressure exceeds 80 psi.

B. Provide necessary valving.

C. Determine requirement, type and location of fire hydrant(s) on site.

D. Water service to be ductile iron pipe. Determine need for Class 52 ductile iron. Bury depth to be seven feet or local standard.

E. Buried water distribution piping to be type K copper.

F. Above grade water distribution piping to be type L copper.
   1. Provide Alternate to substitute PEX or CPVC for above grade distribution piping.

G. Protect domestic water from possible contamination by using appropriate backflow prevention devices. File necessary paperwork for Owner for necessary approvals and yearly inspections.

H. Piping to be installed above floor, above suspended ceilings where possible, and extended to fixtures and equipment as required.

I. Provide and install water hammer arrestors at washer connection and dishwasher connection and where required by code and local inspector.

J. Determine requirement for, type and location for domestic water pressure booster system and provide as required, if applicable.

K. Water Meter: Provide house water meter.

2.02 PIPING SUPPORT DEVICES:

A. B-Line, Grinnell, Fee and Mason, Elcen.

B. Provide physical isolation between all piping and the structure.

C. Hangers: Carbon steel, adjustable clevis.

D. Multiple Hangers: Steel channels with welded spacers and hanger rods.

E. Vertical Support: Steel riser clamp.

F. Floor Support: Painted steel pipe saddle, stand and bolted floor flange.

G. Copper clad hangers for copper tubing.

H. The use of wood shims or wood blocks to support pipe is prohibited.

I. Contractor to review installation and eliminate any creaking at pipe supports.

2.03 PIPE INSULATION

A. Manville, Armstrong, Owens-Corning, Rubatex or Certainteed.

B. Materials:
   1. Rigid fiberglass with fire-safe jacket (flame spread not over 25, smoke developed not over 50).
   2. Flexible elastomeric expanded closed-cell thermal insulation.

C. Installation Schedule:
   1. Domestic cold water - 1/2 inch thick, on piping where condensation may occur and on piping serving exterior wall hydrants.
   2. Domestic hot water circulating piping, thickness as required to limit heat loss to no more than 25 BTU's per hour per square foot of surface area for above ground piping determined at a temperature differential equal to maximum water temperature minus design ambient temperature no higher than 65 degrees F.
   3. Piping in interior insulated walls does not require additional insulation unless required by local inspector or State energy codes.

2.04 SANITARY WASTE AND VENT PIPING, AND STORM WASTE PIPING

A. Confirm municipal sewer main elevations.

B. Provide frost protection for building sewer where the top of the building sewer is installed less than 60 inches below grade where snow will be cleared, or less than 48" below a surface where snow will not be cleared.

C. Building sewer may be either PVC sewer pipe, cast iron soil pipe or ABS truss pipe.

D. DWV Piping:
   1. At Basement and Residential Floors:
      a. Schedule 40, Class 12454-B (PVC-1120), ASTM D1785, ASTM D2554.
      b. PVC plastic DWV fittings ASTM D3311.
      c. Primer: ASTM F656.
      d. Solvent: ASTM D2564.
   2. All soil pipe passing through first floor shall be cast iron.
      a. Hub and spigot or hubless service weight cast iron pipe and fittings complying with applicable ASTM and CISPI standards.
      b. Test cast iron soil pipe with a 10 foot hydrostatic head - do not use compressed air.

E. Maintain minimum vertical clearance of 84" in all areas in Basement. Drops shall occur on back sides of precast columns.

2.05 ROOF DRAINS

A. Roof and plaza Drains and Piping: Provide drains as shown on plan or required by code.
   1. Verify invert elevation at discharge location. Hang or bury storm pipe in basement as required.
   2. Provide pipe insulation on roof drain piping in attic. Provide acoustic insulation in wall cavity with drain. Insulate traps of plaza drains.
   3. Provide dual stage drains where waterproofing is below concrete topping.
   4. Roof overflow drains to be piped through wall or discharge through scuppers as shown on drawings.
      a. Through wall discharge nozzle: Solid bronze.
         1) Glue on Nozzle by G-O-N, LLC, Scottsdale, AZ www.g-o-n.net
         2) Zurn Z-199 by Zurn Industries, LLC.

2.06 DRAINS AND CLEANOUTS

A. Josam, Smith, Wade, Zurn or Schier are acceptable.

B. Exterior Cleanouts: Smith #4253 or Josam #8860 with XH cast iron top in 24" x 24" x 4" concrete pad.

C. Interior Floor Cleanouts:
   1. Finished Areas: Smith #4023 or Josam #8330 round nickel-bronze top.
   2. Basement: Smith #4253 or Josam #8860 with XH cast iron top.

D. Finished Wall Cleanouts: Smith #4532 or Josam #8790-4 with access plate and screw. Match wall color.

E. Floor drains to have round nickel bronze adjustable strainer and ring. Provide flashing collar where appropriate.

F. Provide frost sleeve on exterior cleanouts as required.

G. Locate cleanouts per code, industry standards and service convenience.

H. Safings: Properly safe floor drains on upper floor levels.
   1. Noble or Oatey.
   2. Polyethylene sheeting 40 mils thick, ASTM D4068, with CPE solvent. Provide at all drains above grade.

I. Provide vegetable oil seal in traps of low usage.

J. A floor drain is required in an elevator pit when fire sprinklers are provided in the shaft.

K. Provide floor drains and hub drains in mechanical rooms, trash room, and parking garage. Coordinate location of floor drains and hub drains with Heating Contractor.

2.07 GARAGE DRAINS

A. Install floor drains in basement as shown.

B. Provide 12" heavy duty drain with solid bottom sediment bucket Zurn Z7539 or equal.

C. Provide dual level drains at upper level parking.

D. Provide a backwater valve at connection with municipal sewer.

E. Pump as required to discharge elevation.

2.08 CLEAR WATER SUMP PUMPS AND BASINS

A. Drain Tile Pump and Basin:
   1. Zoeller, Chicago, Enpo, Sta-Rite, Hydromatic, Myers and Weil are acceptable Manufacturers.
   2. Submersible sump pump, simplex, automatic sized appropriately for the intended use.
   3. Discharge where shown on grading or utility plan. Provide engineered fabric, rip-rap and splash block as required to prevent erosion when discharged to grade.
   4. Provide alarm to sound in the event of pump failure.
   5. Coordinate with waterproofing contractor to determine the number and location of pumps.

B. Duplex Storm Water Pump and Basin:
   1. Include design and installation of duplex storm basin where parking garage entrance drain will not gravity flow to discharge.
   2. Parking garage entrance sump, basin and piping to be designed based on flow from drain at parking garage entrance produced during a 25 year event. The design shall take into consideration the actual head based on the depth of the sump pit and the discharge location shown on the grading plan.
   3. Sump Basin:
      a. Ejector basin sizing based on calculated inflow with minimum 1 minute holding capacity. Allow additional .5' for pump suction, .25' for "High Water Alarm", and .25' for lowest invert inlet.
      b. Basin to be constructed of concrete or fiberglass. Size per manufacturer's recommendations based on flow calculations. Coordinate with pump size. Include solid cover with appropriate openings. Install top of basin 1" above floor.
   4. Pumps:
      a. Provide (2) pumps each with rated capacity equal to design flow. 3" discharge with check valves.
      b. Manufacturer: Gould.
   5. Controls: Package to include (3) mercury float switches for pumping sequence as described, wall mounted NEMA 3x panel with audible "High Water Alarm", pump alternator, and manual pump override control.
   6. Discharge where shown on grading or utility plan. Provide engineered fabric, rip-rap and splash block as required to prevent erosion when discharged to grade.
   7. Building drain tile may be connected to trench drain sump if additional flow is considered in sump calculations.

C. Extend discharge from the drain tile around the elevator pit to a sump/pump. Coordinate location of sump and sump pump with elevator supplier. Discharge through indirect waste piping to storm sewer or grade as required.

2.09 RESIDENTIAL EQUIPMENT

A. Kitchen Sink:
   1. Standard Units:
      a. 20 gauge stainless steel two compartment drop-in sink, similar to Dayton DSE 23322.
      b. 8 inch bowl depth.
      c. Faucet: American Standard 4175.203.002.
         1) Single lever with hose and spray.
      d. Dayton D-1125 basket strainer.
   2. Type A Accessible Units:
      a. 22 gauge stainless steel two compartment drop-in sink, similar to Dayton GE23321.
      b. 6 1/2 inch maximum bowl depth.
      c. Drain offset to back of bowl.
      d. Sound deadening coating on underside.
      e. Faucet: American Standard 4175.203.002.
         1) Single lever with hose and spray.
      f. Dayton D-1125 basket strainer.
      g. Pipe covers: TruBro Lav-Guard #102 or approved.

B. Garbage Disposal:
   1. In-Sink-Erator Badger 5 XP disposal with cord and plug, 3/4 hp.

C. Water Closet:
   1. ASME A112.19.2; floor mounted, siphon jet, vitreous china, min. 16.5 inches high, close-coupled closet combination with elongated rim, vitreous china closet tank with fittings and lever flushing valve, bolt caps.
   2. Standard and Accessible Dwelling Units:
      a. American Standard Cadet 3 FloWise Right Height EL (WaterSense labeled).

b. Bemis 170 plastic elongated closed front seat.

3. Common Toilet Room:
   a. American Standard Cadet 3 FloWise Right Height EL (WaterSense labeled).
   b. Bemis #1955-SSC plastic seat and cover.

D. Tub & Shower Modules:
1. General requirements - all modules:
   a. Gelcoat fiberglass modules with integral reinforcement for installation of grab bars.
2. Tub-shower module:
   a. Aker OPTS 6032.
   b. 32 inches wide x 60 inches long.
   c. Offset controls required.
   d. American Standard No. T375.120 pressure balanced bath/shower valve with Colony trim, spout and shower head.
   e. Lever operated pop up waste and overflow.
   f. At Type A Accessible Units add:
      1) Alson's No. 1521PB-AH personal shower with 24" adjustable bar, 69" voral hose, head push button, swivel, vacuum breaker, supply elbow and flange.
      2) Provide seat for future installation.
      3) Provide grab bars for future installation as detailed.
3. 48" Standard Shower Module (Noted as 48" Module on Drawings):
   a. Aker SHW-48 module.
   b. American Standard No. T372.120 valve with Colony trim and shower head.
4. 48" Adaptable Shower Module (Noted as 38x48 on Drawings):
   a. Aquatic 1483-EN 48" wide x 38 3/4" deep x 77 1/4" high module.
   b. American Standard No. T372.120 valve with Colony trim and shower head.
5. At Type A Accessible Units add:
   a. Alson's No. 1521PB-AH personal shower with 24" adjustable bar, 69" voral hose, head push button, swivel, vacuum breaker, supply elbow and flange.
   b. Provide fold-up seat for future installation.
   c. Provide grab bars for future installation as detailed.

E. Lavatories:
1. Vanity top as specified in section 12 36 00 - Countertops.
2. Supply Faucet:
   a. ASME A112.18.1; chrome plated combination supply fitting with pop-up waste, single lever handle.
   b. American Standard No. 2175.200.002.
3. TruBro Lav-Guard #102 pipe covers at Type A Accessible Unit lavatories.

F. Laundry Connection:
1. Guy Gray No. B-200 with 2" drain. Provide mechanical shock arrestor at hose connections.
2. Provide Guy Gray "FR" series box at rated walls.

2.10 OTHER PROVISIONS

A. Water Heater: Sized for building demand, minimum 95% efficient sealed combustion commercial natural gas water heater.

B. Provide hot water recirculation system.

C. Water Softener: Sized for building demand, metered. Hellenbrand or equal.

D. Janitor Sink:
1. Mustee 63M 24"x24" mop basin.
2. Proflo PF1118 two handle service sink faucet.
3. Wall mounted mop holder.
4. Coordinate location with Owner.

E. Outside Faucets: Provide (6) outside frost proof hose bibs at locations determined by owner.

1. Automatic draining, freeze-less type wall hydrant with backflow preventer and loose key handle.
2. Provide (1) additional hose bib at second floor roof plaza.
3. Woodford Model 25.

F. Basement Faucets: Provide (3) hose bibs in parking garage at locations determined by owner.
1. Chicago No. 387 or 387–LF with ¾" hose thread. Include No. E27 vacuum breaker.

G. Hub drains: Provide as required for mechanical equipment.

H. Trench Drains: As specified on Utility plan.

I. Air Admittance Valves: Proflo PFAAV6 (where required).

END OF SECTION

SECTION 23 00 00

HVAC

PART 1 GENERAL

1.01 GENERAL PROVISIONS

A. Contractor shall provide complete construction documents and HVAC calculations and submit to appropriate state and/or local agencies for approval.

B. Contractor shall include all fees required for approval, permits, etc.

C. Seal and caulk all penetrations as soon as they are made through exterior walls (i.e. dryer vents and bath exhaust fans).

1.02 SCOPE:

A. The Drawings and these Scope Specifications are to give a minimum level of work required. Additional Work (materials and labor) may be required by local and/or state requirements. The HVAC Contractor shall verify and include any additionally required work as part of his bid.

B. Provide complete heating, ventilating and air conditioning system. The Mechanical Trade shall make full allowance to cover such contingencies as actual length and routing of ductwork, equipment locations, etc. Coordinate with other Trades for exact location of walls, beams, shafts, pipes, lights, etc.

C. Heating and Cooling:
   1. Dwelling Units:
      a. Provide ducted split system heating and cooling at units indicated on Drawings.
      b. Provide packaged through-wall HVAC systems at units indicated on Drawings.
      c. Provide ductless mini-split systems at units indicated on Drawings.
   2. Corridors: Ducted Split system heating and cooling with fresh air.
   3. Common Rooms on Second Floor: Ductless Split system heating and cooling.
   4. Parking Garages: Gas-fired unit heaters with thermostatic control.
   5. Vestibules: Provide electric cabinet heaters in all entry vestibules.
   6. Stair Enclosures: Provide electric cabinet heaters in all stair enclosures at the level which exits to the exterior.
   7. Commercial Spaces: Provide furnace with minimal supply and return ductwork to temper space and prevent condensation on windows.

D. Ventilation:
   1. Furnaces / Air Handling Units: Provide outside air as required per applicable codes, as recommended by latest ASHRAE standards and as required to make up for exhaust fan systems.
      a. Corridors: Provide furnace for heating, ventilation, air conditioning corridors with minimum 15% outdoor air.
      b. Dwelling Units: Provide 15% outdoor air at dwelling units with interior (windowless) bedroom/study/den.
   2. Bathroom Exhaust:
      a. Energy Star listed bath fans.
   3. Provide dryer exhaust ductwork for all clothes dryers.
   4. Provide parking garage ventilation.
   5. Provide elevator hoistway ventilation with duct to the roof and a motorized damper that is 24v power close and spring open when power is cut for connection to fire alarm panel.
   6. Trash Rooms: Provide an exhaust fan system for trash room with ductwork, exhaust fan and necessary controls.

E. Miscellaneous:
   1. Natural gas piping:
      a. All furnaces, unit heaters, and hot water heaters.
      b. Fireplaces.
      c. Outdoor grilling area - two locations on second floor plaza.

1.03 DESIGN REQUIREMENTS

A. Performance: HVAC system shall be designed to maintain the following indoor temperatures, based upon design outdoor air temperatures as required by the State Energy Code.
   1. Corridors and other common areas: 74 degrees F cooling, 75 degrees F heating.
   2. Dwelling Units: 72 degrees cooling and 80 degrees heating.
   3. Parking Garage: 50 degrees F heating. (Verify)

1.04 REGULATORY REQUIREMENTS

A. All work shall comply with all Federal, State and local codes.

B. Pay fees for all plan review, permits and inspections.

C. Special Note Regarding Penetrating Fire Rated Walls & Floor Assemblies: Penetrate all fire rated construction in an approved and listed manner consistent with maintaining the fire rating. At the beginning of the project, the Contractor is to meet with the Building Inspector and review all penetrations through rated assemblies. Provide Architect with design for each penetration of each rated system type.

1.05 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Working Drawings: Provide Architect and Owner with complete working drawings and proposed product data. Include detail drawings for all exterior terminations.

C. Provide location and weight of all equipment proposed for installation on roof for coordination with roof structure.

D. Exterior Penetrations: Provide Architect with building elevation drawings marked with exact location and type of all wall caps, exhausts and louvers.

E. Plan Approval: Submit for State or local plan review. Include all required drawings and calculations. Provide Architect with copy of approved plans and approval letter.

F. Close Out: Provide Owner with complete As Built drawings and bound Operations and Maintenance Manual.

PART 2 PRODUCTS

2.01 DUCT INSULATION

A. Insulate all outdoor air ducts and any ducts located in unheated areas per State code.

B. Insulate relief ducts in unheated attic space between the back-draft or motorized damper and the discharge to the outside per State code.

C. Supply air ducts shall be insulated where required by State or local codes and as required to prevent condensation on ductwork.

D. Duct insulation on cold surfaces shall have vapor barrier.

E. Insulation thickness shall satisfy State and local code requirements.

2.02 AUTOMATIC TEMPERATURE CONTROLS

A. Corridors: Provide thermostatic control for the heating/cooling units.

B. Units: Provide electronic 7-day programmable single zone thermostat.

C. Parking Garage Heating Units: Provide temperature control for unit heaters.

D. Entry and Stair Vestibule Heating Units: Provide individual thermostatic control.

E. Provide tamper resistant cover for all controls in public areas.

2.03 CO/NO2 DETECTION/FAN CONTROL

A. Manufacturers: Brasch, Tox-Alert or equal.

B. Locate units as recommended by manufacturer to completely protect the parking garage area. Do not locate where subject to damage from vehicles or tampering.

C. When the CO level reaches the low level set point, the outside air intake shall open and the garage exhaust fan shall start. When CO level drops to below set-point the outside air damper shall close and fan shut off.

D. Unit shall be factory calibrated.

2.04 NATURAL GAS PIPING

A. Coordinate location of each gas service, meter and regulatory assembly with Owner and local Gas Company. Confirm supply and distribution pressures.

B. Provide a separate gas meter for the gas piping serving each apartment and for the gas piping serving all common areas.

C. All utility connection charges paid by owner, permit fees by contractor.

D. Piping above floor or grade. Schedule 40 black steel or as permitted by local authority.

E. Exterior piping to be provided with rust protection and painted to match exterior building finishes.

F. Sleeve piping where required. Vent and seal where appropriate.

G. If gas piping is exposed at the garage ceiling, provide protection from vehicle traffic.

H. Valves:
   1. Apollo, Crane, Nibco, Milwaukee, Watts
   2. Ball valves. Full port.
   3. Provide a 1-1/2" minimum diameter polished brass tag labeled with a M# at each ball or butterfly valve. Provide a schedule of all valves, locations and normal position.

I. Piping Support Devices:
   1. B-Line, Grinnell, Fee and Mason, Elcen.
   2. Provide physical isolation between all piping and the structure.
   3. Hangers, clamps and supports.
   4. Copper clad hangers for copper tubing.
   5. The use of wood shims or wood blocks to support pipe is prohibited.
   6. Control exhaust fan and intake damper with continuous monitoring and detection system which can maintain CO levels below 35 PPM and nitrogen dioxide levels below 1 PPM. Provide over-ride time clock to provide minimum 5 hours of operation in each 24 hour period.
   7. Contractor to review installation and eliminate any creaking at pipe supports.

2.05 DUCTWORK

A. Ductwork to be constructed and installed as per ASHRAE and SMACNA Standards low pressure (1” WG and Class B seal – transverse and longitudinal joints)

B. Provide dampers, air turns etc.

C. UL Listed flexible ductwork will be permitted for final diffuser terminations only. Maximum length of 5 feet.

D. Provide a minimum of two offsets in the return air ductwork serving each furnace or fan coil unit system, between the main return air grille and the connection to the furnace.

E. For units serving common corridors, provide supply air ductwork and air outlets to within 10 feet of the end of each corridor. A central return air inlet at one central location near a mechanical room is permissible for each system.

F. Individual Apartment Dryer Vents:
   1. Duct to exterior of building. Terminate with wall cap and back-draft damper. Do not crush duct in walls.
   2. Terminate in laundry room at recessed sheet metal "Dryer Box". Locate in unrated wall or firestop installation per manufacturer's instructions.
   3. All dryer and exhaust fan ductwork installed within attics or unheated space shall be insulated. Exhaust ductwork shall not be discharged into attic or soffit space.

4. All dryer vents and exhaust ductwork to be rigid metal ductwork (flexible duct is not acceptable).

2.06 AIR DUCT ACCESSORIES

A. Louvers: Provide wall louvers as required to serve parking garage ventilation system, and other required locations.

B. Louvers shall be of weatherproof design (AMCA rated).

C. Paint louvers to match surrounding materials.

2.07 EXTERIOR WALL CAPS

A. Provide bird proof exterior wall cap with backdraft damper at all wall penetrations.

B. Use vinyl caps at vinyl siding, color to match siding.

C. Use metal caps at all other locations, powder coated to match material penetrated.

2.08 FIRE DAMPERS

A. Provide fire dampers and access thereto as required by applicable codes and UL Code 555.

B. Provide ceiling radiation dampers as required in U.L. listed assemblies.

2.09 GRILLES, REGISTERS AND DIFFUSERS

A. Provide grilles, registers and diffusers required. Units to be applicable to systems served.

B. Supply air grilles registers and diffusers shall be provided with deflection vanes and volume dampers.

C. Return air and exhaust grilles shall be provided with volume dampers where required for balancing.

D. Diffusers shall be square plaque style. Transfer ceiling grilles shall be ½" x ½" x 1" lattice – type and sidewall transfer grilles shall be 45 degrees fixed blade grille.

2.10 ELECTRIC HEATING TERMINALS

A. Manufacturers: Qmark, Chromalox, Marley or equal.

B. Unit shall be furnished and installed by this contractor, wired by the Electric Contractor.

C. Electric wall heaters located in public areas shall be equal to Qmark model AWH series or equal. Heavy duty 16 gauge louvered face panel with aluminum frame. Finned metal sheath electric element, cabinet fan, automatic thermal overheat protection, integral thermostat. Recessed or surface mounting. UL listed.

D. Electric wall heaters located in storage rooms and mechanical space shall be equal to Qmark model CHW series or equal. Heavy duty 16 gauge louvered face panel frame. Finned metal sheath electric element, cabinet fan, automatic thermal overheat protection, integral thermostat. Recessed or surface mounting. UL listed.

E. Electric wall heaters located in toilet rooms shall be equal to Qmark model QTS series or equal. Provide unit with finned metal sheath electric element, cabinet, fan, automatic thermal overheat protection, remote mounted thermostat and adjustable discharge louver. Provide all mounting hardware required to mount unit in toe space. UL listed.

2.11 GAS-FIRED UNIT HEATERS

A. Manufacturers: Modine, Sterling, Trane or equal.

B. Install indirect fired unit heaters in basement parking garage. Coordinate unit location with parking layout to avoid conflict.

C. Units shall be sized to overcome the outdoor air ventilation load.

D. Horizontal throw with adjustable louver blades.

E. Construct casing of 18-gauge steel with baked enamel finish, copper tube with aluminum fin heating elements. Aluminum blade fan with OSHA approved guards.

F. Provide tamper resistant thermostat set at 50. Locate thermostat in remote location from unit heater and mount at 48" above floor.

G. Venting of unit heaters shall be up through roof. Provide for necessary flashing and counter flashing and bird proof cap.

2.12 FANS

A. Bathroom Exhaust:
   1. Provide ceiling exhaust fan, with minimum 80 CFM exhaust air at 2.5 sones maximum, with night and fluorescent light.
   2. Fan to be Energy Star listed.

B. Trash Room Exhaust:
   1. Provide exhaust fan, sized for minimum ½ CFM of exhaust air per square foot of floor area, for each trash room. Duct to exterior. Provide ducted transfer air to the trash room from adjacent garage or nearest space approved by State code. Fan shall not exceed 3.0 Sones at design conditions. Fan shall run continuously.

C. Parking Garage Exhaust Fan(s):
   1. Provide resilient mounted, belt driven propeller type, wall exhaust fan(s) with gravity back-draft damper. Fan shall not exceed 9 Sones at .125" w.c. Bottom of fan inlet to be within 18" of the floor.
   2. Provide fan and motor with wire protection guards or with access panel when covered with sheet metal duct.
   3. Control by CO/NO2 sensor and programmable timer.

2.13 FURNACES

A. Packaged furnaces shall contain sealed combustion gas-fired furnace, an evaporator coil, a drain pan, a supply fan and filter mixing box. Minimum 94% efficient.

B. Provide outside air ducted to unit with an electrically operated damper.

C. Run PVC vent and combustion air piping to exterior and terminate as per manufacturer's recommendations.

D. Include filter rack and 1 inch pleated fiberglass throwaway filters. Provide an extra set of filters for temporary use during construction.

E. Connect supply and return air ducts to unit with flexible connectors. Set furnace unit on rubber waffle type pads.

F. All gas piping by HVAC Contractor.

G. Pipe to nearest open site drain utilizing PVC piping, pitched down a minimum of 1 inch per 10 feet in the direction of flow. Open site drains are provided by the Plumbing Contractor. Use minimum 1 inch diameter PVC pipe from each furnace.

H. For condensing unit see Air Cooled Condensing Units.

2.14 THROUGH WALL PACKAGED HVAC SYSTEMS

A. Gas heating / electric cooling packaged through wall system.

B. Stainless steel heat exchanger.

C. Provide fresh air as required by code for interior bedroom/study/den.

D. Minimum 10 EER cooling efficiency.

E. Minimum 80% heating efficiency.

F. Manufacturers:
   1. Armstrong Air Conditioning, Inc; Product Magic-pak MGE4.

G. Substitutions: See Section 01 60 00 - Product Requirements.

2.15 AIR COOLED CONDENSING UNITS

A. Condensing unit to be air cooled, factory assembled in a weatherproof cabinet with common base.

B. Casings are heavy gauge, zinc-coated steel, painted with epoxy resin primer and finished with baked-on enamel.

C. Provide condenser fan of aluminum construction having direct drive heavy duty, permanently lubricated motors with wire-type grille.

D. Compressor to be hermetic reciprocating or scroll type.

E. Condenser coil, two-row seamless copper tubes and aluminum fins.

F. Provide minimum SEER of 13 or higher if required by code.

G. Provide refrigerant piping with insulated suction line.

H. Provide low ambient controls to allow units to operate down to 0 degrees F. ambient temperature for units located in common areas.

I. Provide five (5) year extended compressor warranty.

J. Comply with manufacturer's written installation instructions.

2.16 DUCTLESS SPLIT HEATING AND COOLING UNITS

A. Heat pump heating / cooling.

B. All ductless split air conditioners shall be 19 SEER minimum.

C. Mitsubishi M series or approved.

D. Provide remote where controls are mounted more than 48" above floor level within dwelling units.

PART 3 EXECUTION

3.01 LAYOUT OF THE WORK

A. All penetrations through exterior skin of building must be coordinated with Architect and Owner. Penetrations installed in unapproved locations may be rejected at Contractors expense.

B. Penetrations to align vertically and horizontally.

3.02 INSTALLATION

A. Coordinate with other trades.

B. Firestop all penetrations in rated assemblies with listed system.

C. Draftstop all penetrations in wall plates and draftstopping.

D. Seal all joints in ductwork with mastic.

E. Provide all cleanup associated with the Work.

3.03 BALANCING SYSTEMS

A. Pressure test installed systems prior to insulating or concealing. All leaks shall be corrected.

B. Balance all air systems. Ventilating systems shall operate without vibration or excessive equipment noise. Adjust dampers, grilles and fans to design airflow. Air systems serving multiple rooms to be balanced to within plus 10% to minus 5% of the design CFM listed on the plan.

C. Provide copies of test and balance reports to Owner/Architect and General Contractor.

3.04 OWNER TRAINING

A. Instruct the Owner in the care and operation of systems supplied by this contractor.

B. Provide Operating and Maintenance manuals that include shop drawing of all equipment provided and proper maintenance schedules.

END OF SECTION

SECTION 26 00 00

ELECTRICAL

PART 1 GENERAL

1.01 GENERAL REQUIREMENTS

A. The requirements of Divisions 0 and 1 apply to this Division.

B. This Contractor is to assume full responsibility for engineering and design of the entire electrical system, including fire detection and alarm systems. This Contractor shall consult with the Owner, review plans from the Owners previous projects, meet with utilities, and provide all other services of a design nature necessary to determine and implement the Owners requirements.

C. The Drawings and these Scope Specifications are to establish a minimum level of work required. Additional work, including both labor and materials, may be required by local and state authorities and the Electrical Contractor is to verify and include any additional work required as part of his Bid.

D. This Contractor is responsible for conforming to all local and state code requirements. He is also responsible for conforming to all utility requirements. Obtain and pay for all permits required for electrical work.

E. Verify exact locations of television, phone and data jacks prior to rough-in.

F. Electrical systems materials and equipment shall be installed in a neat and workmanlike manner.

G. All materials shall be new.

H. Structural Members:
   1. Repair, reinforce or replace structural members whose strength is impaired by cutting, drilling and installation of electrical equipment. No structural beams, headers or truss members may be cut without written authorization of the Architect.
   2. Penetrations of structural members shall be in accordance with HUD Minimum Property Standards.

I. Fire Rated Construction: Penetrations of all fire rated construction shall be protected with a listed system consistent with maintaining the fire rating. At the beginning of the project, the Contractor is to meet with the Building Inspector and review all penetrations through rated construction.

1.02 SUBMITTALS

A. Drawings: Furnish a complete set of working drawings within 20 business days of award of contract. Included locations of fixtures, outlets, controls and panels, including proposed electric service location and requirements.

B. Product Data: Provide information for all fixtures and equipment used.

C. Provide as-built drawings, maintenance data and operating instructions. See Section 01 78 00 - Closeout Submittals for requirements. Instruct Owners' personnel as to proper operating procedures.

D. Provide all drawings and engineering calculations as required to meet all State and Local Codes. This includes photometric calculations as required by local ordinances and lighting density calculations as required by State Energy Codes. Make State submittal and provide Architect with copy of State approved drawings and approval letter.

E. Emergency lighting plans: Provide all drawings, calculations, signatures, professional supervision, and fees. Make State submittal and provide Architect with copy of State approved drawings and approval letter.

PART 2 PRODUCTS

2.01 WIRES AND CABLES

A. All conductors shall be copper; however, in sizes #1 AWG copper and larger, equal ampacity aluminum conductors may be used; except that, only copper conductors shall be run to motors.

B. Wire #10 AWG and smaller, unless indicated otherwise, shall be solid with TW or THHN insulation.

C. Wire #8 AWG and larger shall be stranded with THW or THHN insulation.

D. Service Entrance Cable, Type SE, Style SER (U), 3-aluminum conductors with ground and overall plastic jacket, may be used in lieu of conduit and single conductors for interior "service runs" from the modular meter center to the individual apartment panelboards where allowed by NFPA 70, and all State and Local codes.

E. Type "NM" and "NMC" cable may be used for branch circuit wiring where allowed by NFPA 70, and all State and Local codes.

2.02 GROUNDING

A. Ground all components of the electrical system in accordance with NFPA 70 and all State and Local codes, and as indicated on the Drawings.

B. All grounding conductors shall be copper.

C. Coordinate grounding with placement of footings.

2.03 RACEWAYS AND BOXES

A. Provide raceways where required by NFPA 70 and all State and Local codes.

B. Provide Heavy Wall PVC conduit (1 1/4" minimum) to site lighting fixtures.

C. Provide metal raceways for all circuits in walls greater than one-hour rated.

D. All underground conduit and building penetrations must be inspected by General Contractor prior to enclosure. All sealing of building penetrations at foundations must be completed by waterproof contractor established by General Contractor.

E. Nonmetallic boxes may be used where allowed by NFPA 70 and all State and Local codes.

F. Thru-wall or back-to-back boxes shall not be used.

G. Boxes shall be staggered in a common wall between two adjoining rooms.

H. Locate all cable TV, electric and phone boxes at the same elevation.

2.04 IDENTIFICATION

A. Install embossed 3/8" plastic labels by Dymo or Brady on motor and equipment disconnects, motor starters, pull and junction boxes, terminal cabinets, contactors, relays, time controls, meter sockets, etc.

B. Provide typewritten card in each panelboard identifying each circuit. In Load Centers, card shall be glued to inside of door.

2.05 LIGHTING CONTROL

A. Line voltage switches:
   1. Provide toggle switches.

B. Provide passive occupancy sensor control for the following:
   1. Parking Garage: Outer bay lights timer controlled with occupancy sensor override. Lights over drive aisle always on.
   2. Corridors: 2/3 timer controlled with occupancy sensor override.
   3. Stairwells:
      a. Inboard fixtures (adjacent to corridor) occupancy sensor control.
      b. Outboard fixtures (adjacent to glazing) photocell control - always on at night.
   4. Equipment, Mechanical, Storage and Trash Rooms.
   5. Common Toilet Room(s).
   6. Community Room.
   7. Exercise Room.

C. Provide daylighting controls for the following:
   1. Stairwells - see occupancy sensor section above.

2. Vestibules.

D. Provide photocell on/off for the following:
   1. Exterior site and building entrance fixtures.
   2. Stairwell fixtures (outboard).

E. Provide additional reduction controls where required by Code.

2.06 ELECTRIC SERVICES

A. Provide modular meter center for tenant metering, and house panel with separate metering as applicable to this building.

B. Provide all other required components for the electrical service.

C. Modular Meter Center:
   1. NEMA 3 indoor enclosure.
   2. U.L. Listed RMS symmetrical short circuit rating sufficient to exceed utility available short circuit current.
   3. Main fusible switch, quick-make, quick-break type, horsepower rated.
   4. Meter sockets - type approved by the Public Utility supply power in ampacity adequate for calculated apartment feeder capacity.
   5. Adjacent to each socket shall be a 2-pole branch circuit breaker to serve as a main breaker for an Apartment panelboard.
   6. Equipment ground terminal.
   7. Provide all components/necessary accessories for a complete system.
   8. Manufacturers: Square D, or equal by Cutler-Hammer, General Electric, Siemens, or Westinghouse.

D. Temporary Service: Provide 120/240 volt temporary service for small hand tools and construction site lighting. Provide adequate temporary lighting in all corridors to maintain an even level of illumination, and replace lamps immediately upon failure. Energize job trailers. Pay utility charges for installation. Comply with OSHA and all Codes. Monthly energy costs by General Contractor.

E. Surge Protection – Main house panel: Provide industrial grade surge protection with a maximum surge rating of 200,000 amps at the house main distribution panel. Unit shall be housed in a NEMA 1 enclosure with indicator lights and an audible alarm. Unit shall protect L-N, L-G & N-G from a maximum surge of 100,000 amps. Approved Manufacturers: Leviton, Cutler Hammer, or MCG.

F. Surge Protection – Fire Alarm Panel: Provide industrial grade surge protection with a maximum surge rating of 65,000 amps. Unit shall be housed in a NEMA 1 enclosure with indicator lights and an audible alarm. Unit shall protect L-N & L-G from a maximum surge of 32,000 amps and N-G from a maximum surge of 16,000 amps. Approved Manufacturers: Leviton, Cutler Hammer, or MCG.

2.07 PANELBOARDS

A. General:
   1. Panelboards shall use standard single pole breakers; not tandem, dual or half-size type.
   2. Where nonmetallic sheathed cable is used, panelboards shall contain an equipment-grounding bar, in addition to the neutral bar.
   3. Circuit breakers shall have a minimum U.L. listed interrupting capacity rating of 10,000 amperes (symmetrical).

B. Circuit Breaker "Load Center' Panelboards:
   1. All panelboards shall have hinged covers.
   2. All circuits in bedrooms shall be protected with arc-fault type breaker.
   3. Manufacturer: Square D type QO, or equal by Cutler-Hammer, General Electric, Siemens, or Westinghouse.

C. Circuit Breaker Panelboards:
   1. All panelboards shall have hinged covers with keyed locks.

2. Manufacturer: Square D type NQOD, or equal by Cutler-Hammer, General Electric, Siemens, or Westinghouse.
3. Provide for all common panels.

2.08 WIRING DEVICES

A. Residential grade devices are acceptable in apartments.

B. Specification grade devices shall be used everywhere else.

2.09 MOTOR AND CIRCUIT DISCONNECTS

A. Provide motor/controller disconnects where required by NFPA 70 and all State and Local codes.

B. Provide and label orange toggle switch to serve as dishwasher disconnect located within kitchen base cabinet adjacent to dishwasher.

2.10 MOTOR STARTERS

A. Furnish all starters required for the project.

2.11 EMERGENCY LIGHT AND ALARM SYSTEMS

A. Emergency Systems include: Exit lights, emergency egress fixtures and the fire alarm system.

B. Emergency light and alarm systems powered by battery packs.

C. Locations as required by local code and inspectors. Submit to State as required.

D. Provide all emergency wiring in accordance with NFPA 70 and all State and Local codes.

2.12 LIGHTING FIXTURES

A. Provide site, sign, parking garage, basement, and exit fixtures as indicated in the Scope Specifications and/or shown on the Drawings or required by code. Cost of these fixtures to be included in contract.

B. All dwelling unit and common area lighting fixtures and associated lamps shall be supplied by the General Contractor, received, and installed by this contractor. Cost of these fixtures by allowance as specified in Section 01 21 00 Allowances, installation included in Contract Sum.

2.13 LAMPS

A. Tubular Fluorescent Lamps: High performance T8 lamps.
1. 3100 or higher initial lumens; 2915 or greater mean lumens.
2. Color Rendering Index (CRI) of 82 or higher.
3. Rated Life: 24,000 hours or greater.

B. Replace all lamps burned out at date of Substantial Completion.

C. All lamps shall be guaranteed for one (1) year from the date of Substantial Completion.

D. All exit signs shall use LED's.

E. All lamps shall be provided by the Contractor who is providing the associated light fixture.

2.14 BALLASTS AND ACCESSORIES

A. Fluorescent:
1. U.L. Listed, CBM Certified, high power factor.
2. Electronic high frequency full output type.
3. Ballasts controlled by occupancy sensors to be "instant start" type.
4. Manufacturers: Motorola or Magnetek.

B. High Intensity Discharge:
1. U.L. Listed, high power factor, constant wattage autotransformer type.
2. Ballasts installed outdoors shall have a minimum starting temperature of -20 degrees F.

2.15 FIRE ALARM AND DETECTION SYSTEM

A. Provide complete Fire Alarm System(s) in compliance with applicable Local Codes, Wisconsin State Codes, with the ADA where applicable, with applicable Articles in the NFPA 72 Series Codes, and with requirements of the Local Fire Department.

1. Fire Alarm System shall monitor common area smoke detectors, heat detectors, and sprinkler system.
2. Provide a minimum of one zone per floor and one zone for the sprinkler system, or more if required by Code.
3. Alarms in all public spaces and accessible units to be audio-visual. Alarms within dwelling units and sleeping areas to have ability to be converted to audio-visual.
4. Detectors in lower level parking to be heat detectors.

B. Provide integral non-proprietary auto-dialer for use with two (2) phone lines. Unit to be supervised and have battery backup. Unit to be Faraday 401341A or equivalent. Provide four (4) twisted pair from telephone backboard to two (2) RJ31X jacks at the fire alarm panel for use by monitoring services.

2.16 EMERGENCY COMMUNICATION SYSTEMS

A. Provide code compliant two-way communication system at the following locations, as identified on Drawings:
1. Interior Area of Refuge.
2. Exterior Area of Rescue Assistance.
3. Elevator Landing.

B. Coordinate locations with local AHJ.

C. Provide required instructional signage.

2.17 VOICE, DATA AND CABLE TV

A. General:
1. It shall be the Contractors responsibility to coordinate the installation of the voice, data and cable systems with the service providers.
2. Outlet boxes shall be flush, single gang, with plastic cover plates. Locate at same elevation as adjacent receptacles.
3. Systems shall terminate in designated service area in basement.
4. At each dwelling unit, terminate in "media center" within designated closet.
   a. Suttle 42 x 14.25 inch SOHO Access Enclosure.
   b. Provide duplex outlet adjacent to media center.
5. All systems home run from each unit, no looping.
6. Verify locations with Owner prior to pulling cable.

B. Voice and Data:
1. Provide (1) outlet in each living room and bedroom.
2. All cable to be Category 6.

C. Cable TV:
1. Provide (1) outlet in each living room and bedroom.
2. Cable shall be RG-6 Quad-Shielded.
3. Install compression fittings only.

2.18 ACCESS CONTROL / ENTRANCE COMMUNICATION SYSTEM

A. Intercom system:
1. System shall provide full duplex voice communication and door control from building entrance to each resident unit by using existing telephone lines in the building. System shall not require tenant to have phone service.
2. Acceptable manufacturer: Door King.
3. Include installation and initial programming.
4. System to be flush mounted.
5. Provide 120VAC outlets at Main Control Cabinet for plug-in transformers.

B. Proximity Readers:
1. Card reader with minimum 6' range and passive key fob transmitters.
2. Acceptable manufacturer: Door King.
3. Acceptable product: DKS 30 card reader; DKS 50 transmitter.

4. Install at doors indicated on Door Schedule.
5. System to be flush mounted.
6. Locations:
    a. Doors as scheduled.

2.19 VIDEO SURVEILLANCE SYSTEM

A. See Section 01 21 00 - Allowances for surveillance system allowance.

2.20 NON-SYSTEM SMOKE DETECTORS (APARTMENT)

A. Provide Smoke Detectors in compliance with applicable Local Standards and Wisconsin Codes, with the ADA where applicable, with applicable Articles in the NFPA 72 Series Codes, and with requirements of the Local Fire Department.

B. Include CO detection where required by code.

C. Include operating and maintenance instructions.

D. Powered directly from 120 VAC.

E. All dwelling units and sleeping areas to support installation of visual alarms.

2.21 SPECIAL REQUIREMENTS

A. Site Lighting:
    1. Provide and install all site lighting fixtures as located on drawings. This includes pole mounted luminaries and wall/building mounted fixtures as shown on drawings.
    2. Provide reinforced concrete bases for all pole mounted fixtures.
    3. Provide connection of all site lighting to house meter. Parking lot lighting to be photocell on, time clock off. Building mounted are to be photocell on, photocell off.
    4. Provide installation and controls for 1 floodlight at project sign.

B. Canopy Lighting:
    1. Provide LED canopy lights Ligman U50185 Mic1 floodlight at steel canopies over commercial entrances.
    2. Provide 70 watt metal halide, cut-off type cast aluminum wall brackets above exterior entry or exit doors, and above overhead garage door as located on drawings.

C. Parking Garage Lighting:
    1. Design for average of 5 footcandles and 5:1 uniformity.
    2. Provide 8', 4-lamp enclosed and gasketed surface mounted fluorescent fixtures. Approved manufacturers are Day-Brite, Lithonia, Metalux and Lumax.
    3. Provide emergency egress fixtures to meet code.

D. Elevator Equipment, Mechanical / Water, ELEC/TEL/TV, Trash/Recycling Rooms and Building Storage:
    1. Provide enclosed and gasketed surface mounted fluorescent fixtures. Approved manufacturers are Day-Brite, Lithonia, Metalux and Lumax.

E. All other Common Areas:
    1. Design-build to meet code, and as specified above.

F. Commercial Spaces:
    1. Provide individual meter for each space.
    2. Provide temporary fluorescent light fixtures. Design for an average of 5 footcandles and 3:1 uniformity.

G. Dwelling Units
    1. Design-build to meet code.
    2. Provide ceiling light in all bedrooms.
    3. Provide a ceiling fan junction box in Master Bedroom for ceiling fan/light. Run 3-wire to wall switch for future installation of combination fan-light switch.
    4. Provide circuit to bath fans.
    5. Wire all appliances shown on Drawings or listed in Specifications.
    6. Provide wiring and installation of range hood/space saver microwave.

7. Provide weatherproof GFI outlet on all patios and balconies.
8. Provide switched wall light at all patios and balconies.
9. **Alternate:** Provide circuit and installation of under-cabinet lighting in all kitchens. Allow (3) lights per kitchen (fixtures in lighting allowance).

H. Provide receptacles in corridors, stairways, public spaces, etc. per code. Provide a minimum of one per room in trash/storage/mechanical/electrical rooms, minimum of one each wall in offices, minimum of six in garage, or more if shown on Device Placement Drawings. Provide GFI protected receptacles where required by code.

I. Provide one (1) weatherproof GFI receptacle at each building entrance.

J. Provide power for elevator motor and cab lights. Route each feed through individual fused disconnects at the lock jamb side of the elevator equipment room door. Extend circuits to the elevator controller. Provide smoke detectors in the elevator lobbies and the elevator machine room wired to the fire alarm system and the elevator controller for elevator recall. Install and wire elevator phone. Where the elevator hoistway is sprinkled provide required heat detectors in hoistway and equipment room as well as shunt trip devices to automatically disconnect power. Coordinate requirements with elevator equipment supplier, and local inspector.

K. Provide power to door operators and controls as required.

L. Provide power to sump pump for elevator and building sumps. Verify pump electrical requirements.

M. Provide circuit to electric wall heaters.

N. Wire garage door operators and control stations, garage exhaust fans, unit heaters, and all other equipment shown on drawings and equipment furnished and installed by other trades.

O. Provide a circuit to a designated location for security camera equipment.

P. Provide wiring for Parking Garage CO sensor and fan system. Coordinate with HVAC contractor.

Q. Provide circuit and wiring to water heater.

R. Provide circuit and wiring to circulation pumps.

END OF SECTION

SECTION 31 22 00

GRADING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Removal of topsoil.

B. Rough grading the site .

C. Topsoil and finish grading .

1.02 RELATED REQUIREMENTS

A. Section 31 10 00 - SITE CLEARING.

B. Section 31 23 16 - Excavation.

C. Section 31 23 23 - Fill: Filling and compaction.

1.03 SUBMITTALS

A. Project Record Documents: Accurately record actual locations of utilities remaining by horizontal dimensions, elevations or inverts, and slope gradients.

PART 2 PRODUCTS

2.01 MATERIALS

A. Topsoil: Fertile, agricultural soil, capable of sustaining vigorous plant growth, taken from drained site; free of subsoil, clay or impurities, plants, weeds and roots.
   1. Soil Type: Topsoil shall be a loamy sand, sandy loam, clay loam, loam, silt loam, sandy clay loam or other soil approved by the architect.
   2. Graded.
   3. Free of roots, rocks larger than 1/2 inch, subsoil, debris, large weeds and foreign matter.
   4. Acidity range (pH) of 5.5 to 7.5.
   5. Containing a minimum of 4 percent and a maximum of 25 percent inorganic matter.

B. Other Fill Materials: See Section 31 23 23.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that survey bench mark and intended elevations for the Work are as indicated.

3.02 PREPARATION

A. Identify required lines, levels, contours, and datum.

B. Stake and flag locations of known utilities.

C. Locate, identify, and protect from damage above- and below-grade utilities to remain.

D. Protect trees to remain by providing substantial fencing around entire tree at the outer tips of its branches; no grading is to be performed inside this line.

3.03 ROUGH GRADING

A. Remove topsoil from areas to be further excavated, re-landscaped, or re-graded, without mixing with foreign materials.

B. Do not remove topsoil when wet.

C. Remove subsoil from areas to be further excavated, re-landscaped, or re-graded.

D. Do not remove wet subsoil, unless it is subsequently processed to obtain optimum moisture content.

E. When excavating through roots, perform work by hand and cut roots with sharp axe.

F. See Section 31 23 23 for filling procedures.

G. Stability: Replace damaged or displaced subsoil to same requirements as for specified fill.

3.04 SOIL STOCKPILING

A. Stockpile topsoil to be re-used on site; remove remainder from site.

B. Stockpile subsoil to be re-used on site; remove remainder from site.

C. Stockpiles: Use areas designated on site; pile depth not to exceed 8 feet; protect from erosion.
   1. Grade stockpiles to prevent ponding of water.

3.05 FINISH GRADING

A. Before Finish Grading:
   1. Verify building and trench backfilling have been inspected.
   2. Verify subgrade has been contoured and compacted.

B. Remove debris, roots, branches, stones, in excess of 1/2 inch in size. Remove soil contaminated with petroleum products.

C. Where topsoil is to be placed, scarify surface to depth of 3 inches.

D. In areas where vehicles or equipment have compacted soil, scarify surface to depth of 3 inches.

E. Place topsoil in areas where sodding and planting are indicated.

F. Place topsoil to the following compacted thicknesses:
   1. Areas to be Sodded: 4 inches.
   2. Shrub Beds: 18 inches.

G. Place topsoil during dry weather.

H. Remove roots, weeds, rocks, and foreign material while spreading.

I. Near plants spread topsoil manually to prevent damage.

J. Fine grade topsoil to eliminate uneven areas and low spots. Maintain profiles and contour of subgrade.

K. Lightly compact placed topsoil.

3.06 TOLERANCES

A. Top Surface of Subgrade: Plus or minus 0.10 foot (1-3/16 inches) from required elevation.

B. Top Surface of Finish Grade: Plus or minus 0.04 foot (1/2 inch).

C. Top Surface of Subgrade: Plus or minus 1/10 foot from required elevation.

D. Top Surface of Finish Grade: Plus or minus 1/2 inch.

3.07 CLEANING

A. Remove unused stockpiled topsoil and subsoil. Grade stockpile area to prevent standing water.

B. Leave site clean and raked, ready to receive landscaping.

END OF SECTION

SECTION 31 23 16

EXCAVATION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Excavating for building volume below grade, slabs-on-grade, paving, and utilities within the building.

B. Trenching for utilities outside the building to utility main connections.

1.02 RELATED REQUIREMENTS

A. Section 01 70 00 - Execution and Closeout Requirements: General requirements for dewatering of excavations and water control.

B. Section 31 22 00 - Grading: Soil removal from surface of site.

C. Section 31 22 00 - Grading: Grading.

D. Section 31 23 23 - Fill: Fill materials, filling, and compacting.

PART 3 EXECUTION

2.01 PREPARATION

A. Identify required lines, levels, contours, and datum locations.

B. See Section 31 22 00 for additional requirements.

2.02 EXCAVATING

A. Excavate to accommodate new structures and construction operations.

B. Notify Architect of unexpected subsurface conditions and discontinue affected Work in area until notified to resume work.

C. Slope banks of excavations deeper than 4 feet to angle of repose or less until shored.

D. Do not interfere with 45 degree bearing splay of foundations.

E. Cut utility trenches wide enough to allow inspection of installed utilities.

F. Hand trim excavations. Remove loose matter.

G. Correct areas that are over-excavated and load-bearing surfaces that are disturbed; see Section 31 23 23.

H. Grade top perimeter of excavation to prevent surface water from draining into excavation.

I. Remove excavated material that is unsuitable for re-use from site.

J. Remove excess excavated material from site.

2.03 PROTECTION

A. Prevent displacement of banks and keep loose soil from falling into excavation; maintain soil stability.

B. Protect bottom of excavations and soil adjacent to and beneath foundation from freezing.

END OF SECTION

SECTION 31 23 23

FILL

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Filling, backfilling, and compacting for building volume below grade, footings, slabs-on-grade, paving, and utilities within the building.

B. Bedding, backfilling and compacting for utilities outside the building to utility main connections.

C. Filling holes, pits, and excavations generated as a result of removal (demolition) operations.

1.02 RELATED REQUIREMENTS

A. Section 31 22 00 - Grading: Site grading and topsoil.

B. Section 32 12 16 - Asphalt Paving: Aggregate base course under asphalt paving.

1.03 REFERENCE STANDARDS

A. Wisconsin DOT Standard Specifications for Highway and Structure Construction, latest addition, with supplementals; excluding limitations in section 460.3.2 restricting layer thickness by aggregate size. Hereinafter designated "Standard Specifications".

B. AASHTO T 180 - Standard Specification for Moisture-Density Relations of Soils Using a 4.54 kg (10-lb) Rammer and a 457 mm (18 in.) Drop; American Association of State Highway and Transportation Officials; 2010

C. ASTM C136 - Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates; 2006.

D. ASTM D698 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft3 (600 kN-m/m3)); 2012.

E. ASTM D1556 - Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method; 2007.

F. ASTM D1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft3 (2,700 kN m/m3)); 2012.

G. ASTM D2167 - Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method; 2008.

H. ASTM D3017 - Standard Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth); 2005.

1.04 DELIVERY, STORAGE, AND HANDLING

A. When necessary, store materials on site in advance of need.

B. When fill materials need to be stored on site, locate stockpiles where protected from construction operations.
   1. Separate differing materials with dividers or stockpile separately to prevent intermixing.
   2. Prevent contamination.
   3. Protect stockpiles from erosion and deterioration of materials.

PART 2 PRODUCTS

2.01 FILL TYPES

A. General Fill: Subsoil excavated on-site.
   1. Shall contain no vegetation, roots, topsoil, peat, ash, wood or any other non soil material which by decomposition might cause settlement.
   2. Rock, stone or broken concrete greater than 6 in. in the largest dimension shall not be placed within 10 ft. of the building.
   3. Fill greater than 10 ft. from the building shall not contain rock, boulders or concrete pieces greater than 2 sq. ft. and shall not be placed within the final 2 ft. of finish subgrade or in designated utility construction areas.

4. Fill containing rock, boulders or concrete pieces should include sufficient fines to fill voids among the larger fragments.

B. Structural Fill: Standard Specifications Section 305 3" Dense Graded Base .
   1. Graded in accordance with ASTM C136, within the following limits:
      a. 3 inch sieve: 90-100 percent passing.
      b. 1 1/2 inch sieve: 60-85 percent passing.
      c. 3/4 inch sieve: 40 to 65 percent passing.
      d. No. 4 sieve: 15 to 40 percent passing.
      e. No. 10 sieve: 10 to 30 percent passing.
      f. No. 40: 5 to 20 percent passing.
      g. No. 200: 2 to 12 percent passing.

C. Lean Concrete Fill: Lean concrete; 500 psi 28 day strength.

D. Granular Fill : Standard Specifications Section 209 Grade 1 Granular Backfill ; free of shale, clay, friable material and debris.
   1. Graded in accordance with ASTM C136, within the following limits:
      a. 3 inch sieve: 100 percent passing.
      b. No. 4 sieve: 35 to 60 percent passing.
      c. No. 16 sieve: 15 to 35 percent passing.
      d. No. 40: 10 to 25 percent passing.
      e. No. 200: 5 to 10 percent passing.

E. Drainage Fill : 3/4 inch washed stone; free of clay, shale, organic matter.

2.02 ACCESSORIES

A. Geotextile Fabric: Non-biodegradable, non-woven, needlepunched polypropylene; 160N manufactured by Mirafi.

PART 3 EXECUTION

3.01 EXAMINATION

A. Identify required lines, levels, contours, and datum locations.

B. See Section 31 22 00 for additional requirements.

C. Verify subdrainage, dampproofing, or waterproofing installation has been inspected.

3.02 PREPARATION

A. Scarify subgrade surface to a depth of 6 inches to identify soft spots.

B. Cut out soft areas of subgrade not capable of compaction in place. Backfill with general fill.

C. Compact subgrade to density equal to or greater than requirements for subsequent fill material.

D. Until ready to fill, maintain excavations and prevent loose soil from falling into excavation.

3.03 FILLING

A. Fill to contours and elevations indicated using unfrozen materials.

B. Employ a placement method that does not disturb or damage other work.

C. Systematically fill to allow maximum time for natural settlement. Do not fill over porous, wet, frozen or spongy subgrade surfaces.

D. Maintain optimum moisture content of fill materials to attain required compaction density.

E. Granular Fill: Place and compact materials in equal continuous layers not exceeding 6 inches compacted depth.

F. Soil Fill: Place and compact material in equal continuous layers not exceeding 8 inches compacted depth.

G. Slope grade away from building minimum 6 inches in 10 ft, unless noted otherwise. Make gradual grade changes. Blend slope into level areas.

H. Correct areas that are over-excavated.

1. Load-bearing foundation surfaces: Use structural fill, flush to required elevation, compacted to 100 percent of maximum dry density.
2. Other areas: Use general fill, flush to required elevation, compacted to minimum 95 percent of maximum dry density.

I. Compaction Density Unless Otherwise Specified or Indicated:
1. Under paving, slabs-on-grade, and similar construction: 97 percent of maximum dry density.
2. At other locations: 95 percent of maximum dry density.

J. Reshape and re-compact fills subjected to vehicular traffic.

3.04 FILL AT SPECIFIC LOCATIONS

A. General Fill: General Fill may be used in any location approved in writing by the Soils Engineer.

B. Fill at Undercuts:
1. Use Structural Fill.
2. Fill up to subgrade elevations.

C. Under Interior Slabs-On-Grade:
1. Use Granular Fill.
2. Depth: 4 inches deep.
3. Compact to 95 percent of maximum dry density.

D. Backfill At Foundation Walls:
1. Use Granular Fill.
2. Compact each lift to 95 percent of maximum dry density.
3. Do not backfill against unsupported foundation walls.
4. Backfill simultaneously on each side of unsupported foundation walls until supports are in place.

E. Over Subdrainage Piping at Foundation Perimeter:
1. Use Drainage Fill. Fill to a minimum depth of 12 inches above subdrainage pipe.
2. Cover with Granular Fill.
3. Compact to 95 percent of maximum dry density.

F. Over Buried Utility Piping, Conduits, and Duct Bank in Trenches :
1. Bedding: Use granular fill.
2. Cover with Granular Fill.
3. Compact in maximum 8 inch lifts to 95 percent of maximum dry density.

G. Under Exterior Paving :
1. Proof-roll subsoil before placing fill. Excavate soft or yielding areas and correct with Structural Fill.
2. Compact subsoil to 95 percent of its maximum dry density before placing fill.
3. Fill to subgrade using Granular Fill.
4. Compact to 95 percent of maximum dry density.
5. See Section 32 11 23 for aggregate base course placed over fill.

3.05 FIELD QUALITY CONTROL

A. See Section 01 40 00 - Quality Requirements, for general requirements for field inspection and testing.

B. Perform compaction density testing on compacted fill in accordance with ASTM D1556, ASTM D2167, ASTM D3017, or ASTM D6938.

C. Evaluate results in relation to compaction curve determined by testing uncompacted material in accordance with ASTM D 698 ("standard Proctor"), ASTM D 1557 ("modified Proctor"), or AASHTO T 180.

D. If tests indicate work does not meet specified requirements, remove work, replace and retest.

E. Proof roll compacted fill at surfaces that will be under slabs-on-grade.

3.06 CLEANING

A. Remove unused stockpiled materials, leave area in a clean and neat condition. Grade stockpile area to prevent standing surface water.

END OF SECTION

SECTION 32 12 16
ASPHALT PAVING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Aggregate base course.

B. Double course bituminous concrete paving.

1.02 RELATED REQUIREMENTS

A. Section 31 22 00 - Grading: Preparation of site for paving and base.

B. Section 31 23 23 - Fill: Compacted subgrade for paving.

1.03 REFERENCE STANDARDS

A. Wisconsin DOT Standard Specifications for Highway and Structure Construction, latest addition, with supplementals; excluding limitations in section 460.3.2 restricting layer thickness by aggregate size. Hereinafter designated "Standard Specifications".

B. ASTM D946 - Standard Specification for Penetration-Graded Asphalt Cement for Use in Pavement Construction; 2009a.

1.04 FIELD CONDITIONS

A. Do not place asphalt when ambient air or base surface temperature is less than 40 degrees F, or surface is wet or frozen.

B. Place bitumen mixture when temperature is not more than 15 F degrees below bitumen supplier's bill of lading and not more than maximum specified temperature.

PART 2 PRODUCTS

2.01 MATERIALS

A. Asphalt Cement: Standard Specification Type PG 58-28.

B. Aggregate for Base Course : 31.5 mm Dense Graded Base, in accordance with Sections 301 and 305 of the Standard Specifications ; free of shale, clay, friable material and debris.

1. Graded in accordance with ASTM C136, within the following limits:
    a. 1 1/4 inch sieve: 95-100 percent passing.
    b. 3/4 inch sieve: 70 to 93 percent passing.
    c. 3/8 inch sieve: 42 to 80 percent passing.
    d. No. 4 sieve: 25 to 63 percent passing.
    e. No. 10 sieve: 16 to 48 percent passing.
    f. No. 40: 8 to 28 percent passing.
    g. No. 200: 4 to 10 percent passing.

C. Aggregate for Binder Course: 19.0 mm, in accordance with Section 460, Table 460-1 of the Standard Specifications.

D. Aggregate for Wearing Course: 12.5 mm, in accordance with Section 460, Table 460-1 of the Standard Specifications.

2.02 ASPHALT PAVING MIXES AND MIX DESIGN

A. Use dry material to avoid foaming. Mix uniformly.

B. Mixture type E-0.3 bituminous pavement, Section 460, Table 460-2 of the Standard Specifications.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that compacted subgrade is dry and ready to support paving and imposed loads.

B. Correct unsuitable subgrade with 3" Structural Fill, as specified in Section 31 23 23 - Fill.

C. Verify gradients and elevations of base are correct.

3.02 BASE COURSE

A. Place and compact base course.

B. Place base course to 10.0" compacted thickness.

3.03 PLACING ASPHALT PAVEMENT - DOUBLE COURSE

A. Place asphalt binder course within 24 hours of applying primer or tack coat.

B. Place binder course to thickness identified in schedule at end of section.

C. Place wearing course within two hours of placing and compacting binder course.

D. Place wearing course to thickness identified in schedule at end of section.

E. Compact pavement by rolling to specified density. Do not displace or extrude pavement from position. Hand compact in areas inaccessible to rolling equipment.

F. Perform rolling with consecutive passes to achieve even and smooth finish, without roller marks.

3.04 TOLERANCES

A. Flatness: Maximum variation of 1/4 inch measured with 10 foot straight edge.

B. Compacted Thickness: Within 1/4 inch of specified or indicated thickness.

C. Variation from True Elevation: Within 1/2 inch.

3.05 SCHEDULE

A. Two courses; binder course of 2 1/4" compacted thickness and wearing course of 1 3/4" compacted thickness. (4" total paving thickness)

END OF SECTION

SECTION 32 13 13
CONCRETE PAVING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Concrete sidewalks, stair steps, integral curbs, gutters, and patios.

1.02 RELATED REQUIREMENTS

A. Section 03 30 00 - Cast-in-Place Concrete.

B. Section 31 22 00 - Grading: Preparation of site for paving and base and preparation of subsoil at pavement perimeter for planting.

C. Section 31 23 23 - Fill: Compacted subbase for paving.

1.03 REFERENCE STANDARDS

A. ACI 211.1 - Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete; American Concrete Institute International; 1991 (Reapproved 2009).

B. ACI 301 - Specifications for Structural Concrete; American Concrete Institute International; 2010 (Errata 2012).

C. ACI 305R - Hot Weather Concreting; American Concrete Institute International; 2010.

D. ACI 306R - Cold Weather Concreting; American Concrete Institute International; 2010.

E. ASTM A615/A615M - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement; 2015.

F. ASTM C39/C39M - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens; 2014.

G. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete; 2015.

H. ASTM C173/C173M - Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method; 2014.

I. ASTM C309 - Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete; 2011.

J. ASTM D1751 - Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types); 2004 (Reapproved 2013).

K. ASTM D1752 - Standard Specification for Preformed Sponge Rubber Cork and Recycled PVC Expansion Joint Fillers for Concrete Paving and Structural Construction; 2004a (Reapproved 2013).

PART 2 PRODUCTS

2.01 FORM MATERIALS

A. Form Materials: Conform to ACI 301.

B. Joint Filler: Preformed; non-extruding bituminous type (ASTM D1751) or sponge rubber or cork (ASTM D1752).
   1. Thickness: 1/2 inch.

2.02 REINFORCEMENT

A. Reinforcing Steel and Welded Wire Reinforcement: Types specified in Section 03 30 00.

B. Dowels: ASTM A615/A615M, Grade 40 - 40,000 psi yield strength; deformed billet steel bars; unfinished finish.

2.03 CONCRETE MATERIALS

A. Concrete Materials: As specified in Section 03 30 00.

2.04 ACCESSORIES

A. Curing Compound: ASTM C309, Type 1, Class A.
   1. Acceptable Products:
      a. Dress and Seal 18 by L&M Construction Chemicals, Inc.
      b. MB-429 by Master Builders, Inc. (BASF)
      c. CS-309 by W.R. Meadows.
      d. Tri-Kote 18 by T.K. Products.
      e. Substitutions: See Section 01 60 00 - Product Requirements.

B. Detectable Warning Inserts: Detectable warning inserts for placement in wet concrete.
   1. Size: Modular 24x24, 24x30 or 24x36. Install full width of ramp x 24" long in direction of travel.
   2. Surface: Standard truncated dome with non skid texture.
   3. Material: Grey cast iron.
   4. Product: Neenah Foundry Company R4984.
   5. Substitutions: See Section 01 60 00 - Product Requirements.
   6. Install at each sidewalk curb ramp.

2.05 CONCRETE MIX DESIGN

A. Proportioning Normal Weight Concrete: Comply with ACI 211.1 recommendations.

B. Admixtures: Add acceptable admixtures as recommended in ACI 211.1 and at rates recommended by manufacturer.

C. Concrete Properties:
   1. Compressive strength, when tested in accordance with ASTM C39/C39M at 28 days; 4000 psi.
   2. Fly Ash Content: Maximum 15 percent of cementitious materials by weight.
   3. Water-Cement Ratio: Maximum 40 percent by weight.
   4. Total Air Content: 4 percent, determined in accordance with ASTM C173/C173M.
   5. Maximum Slump: 3 inches.
   6. Maximum Aggregate Size: 3/4 inch.

2.06 MIXING

A. Transit Mixers: Comply with ASTM C94/C94M.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify compacted subgrade is acceptable and ready to support paving and imposed loads.

B. Verify gradients and elevations of base are correct.

3.02 PREPARATION

A. Moisten base to minimize absorption of water from fresh concrete.

B. Notify Architect minimum 24 hours prior to commencement of concreting operations.

3.03 FORMING

A. Place and secure forms to correct location, dimension, profile, and gradient.

B. Assemble formwork to permit easy stripping and dismantling without damaging concrete.

C. Place joint filler vertical in position, in straight lines. Secure to formwork during concrete placement.

3.04 REINFORCEMENT

A. Minimum reinforcement for slabs on grade is 6x6 W1.4xW1.4 WWF unless detailed otherwise. Fibermesh is not an acceptable substitute for WWF.

B. Place reinforcement at midheight of slabs-on-grade.

C. Interrupt reinforcement at expansion joints.

D. Place dowels to achieve pavement and curb alignment as detailed.

3.05 COLD AND HOT WEATHER CONCRETING

A. Follow recommendations of ACI 305R when concreting during hot weather.

B. Follow recommendations of ACI 306R when concreting during cold weather.

C. Do not place concrete when base surface temperature is less than 40 degrees F, or surface is wet or frozen.

3.06 PLACING CONCRETE

A. Place concrete as specified in Section 03 30 00.

B. Ensure reinforcement, inserts, embedded parts, formed joints are not disturbed during concrete placement.

C. Place concrete continuously over the full width of the panel and between predetermined construction joints. Do not break or interrupt successive pours such that cold joints occur.

3.07 JOINTS

A. Align curb, gutter, and sidewalk joints.

B. Place 3/8 inch wide expansion joints at 20 foot intervals and to separate paving from vertical surfaces and other components and in pattern indicated.
   1. Form joints with joint filler extending from bottom of pavement to within 1/2 inch of finished surface.
   2. Secure to resist movement by wet concrete.

C. Provide scored joints.
   1. At 4 feet intervals or as indicated on drawings or good practice.

D. Provide keyed joints as indicated.

E. Saw cut contraction joints 3/16 inch wide at an optimum time after finishing. Cut 1/3 into depth of slab.

3.08 FINISHING

A. Area Paving: Light broom, texture perpendicular to pavement direction.

B. Sidewalk Paving: Light broom, texture perpendicular to direction of travel with troweled and radiused edge 1/4 inch radius.

C. Curbs and Gutters: Light broom, texture parallel to pavement direction.

D. Inclined Vehicular Ramps: Broomed perpendicular to slope.

E. Place curing compound on exposed concrete surfaces immediately after finishing. Apply in accordance with manufacturer's instructions.

3.09 TOLERANCES

A. Maximum Variation of Surface Flatness: 1/4 inch in 10 ft.

B. Maximum Variation From True Position: 1/4 inch.

3.10 FIELD QUALITY CONTROL

A. An independent testing agency will perform field quality control tests, as specified in Section 01 40 00 - Quality Requirements.
   1. Provide free access to concrete operations at project site and cooperate with appointed firm.
   2. Submit proposed mix design of each class of concrete to inspection and testing firm for review prior to commencement of concrete operations.

B. Compressive Strength Tests: ASTM C39/C39M; for each test, mold and cure three concrete test cylinders. Obtain test samples for every 100 cu yd or less of each class of concrete placed.
   1. Take one additional test cylinder during cold weather concreting, cured on job site under same conditions as concrete it represents.

2. Perform one slump test for each set of test cylinders taken.

C. Maintain records of placed concrete items. Record date, location of pour, quantity, air temperature, and test samples taken.

3.11 PROTECTION

A. Immediately after placement, protect pavement from premature drying, excessive hot or cold temperatures, and mechanical injury.

B. Do not permit vehicular traffic over pavement for 7 days minimum after finishing.

END OF SECTION

SECTION 32 17 23.13
PAINTED PAVEMENT MARKINGS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Parking lot markings, including parking bays, crosswalks, and handicapped symbols.

1.02 RELATED REQUIREMENTS

A. Section 32 12 16 - Asphalt Paving.

1.03 REFERENCE STANDARDS

A. MPI (APL) - Master Painters Institute Approved Products List; Master Painters and Decorators Association; current edition, www.paintinfo.com.

B. FHWA MUTCD - Manual on Uniform Traffic Control Devices for Streets and Highways; U.S. Department of Transportation, Federal Highway Administration; http://mutcd.fhwa.dot.gov; current edition.

1.04 FIELD CONDITIONS

A. Do not install products under environmental conditions outside manufacturer's absolute limits.

PART 2 PRODUCTS

2.01 MATERIALS

A. Line and Zone Marking Paint: MPI No. 97 Latex Traffic Marking Paint; white and yellow.
   1. Basement Parking Garage: Yellow.
   2. Surface Parking Lots: White.

PART 3 EXECUTION

3.01 PREPARATION

A. Allow new pavement surfaces to cure for a period of not less than 14 days before application of marking materials.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

C. Clean surfaces thoroughly prior to installation.
   1. Remove dust, dirt, and other granular surface deposits by sweeping, blowing with compressed air, rinsing with water, or a combination of these methods.

D. Where oil or grease are present, scrub affected areas with several applications of trisodium phosphate solution or other approved detergent or degreaser, and rinse thoroughly after each application; after cleaning, seal oil-soaked areas with cut shellac to prevent bleeding through the new paint.

3.02 INSTALLATION

A. Begin pavement marking as soon as practicable after surface has been cleaned and dried.

B. Do not apply paint if temperature of surface to be painted or the atmosphere is less than 50 degrees F or more than 95 degrees F.

C. Apply in accordance with manufacturer's instructions using an experienced technician that is thoroughly familiar with equipment, materials, and marking layouts.

D. Comply with FHWA MUTCD manual (http://mutcd.fhwa.dot.gov) for details not shown.

E. Apply markings in locations determined by measurement from survey control points; preserve control points until after markings have been accepted.

F. Apply uniformly painted markings of color(s), lengths, and widths as indicated on the drawings true, sharp edges and ends.
   1. Apply paint in one coat only.
   2. Wet Film Thickness: 0.015 inch, minimum.

3. Width Tolerance: Plus or minus 1/8 inch.

G. Parking Lots: Apply parking space lines, entrance and exit arrows, painted curbs, and other markings indicated on drawings.
   1. Mark the International Handicapped Symbol at indicated parking spaces.
   2. Hand application by pneumatic spray is acceptable.

H. Symbols: Use a suitable template that will provide a pavement marking with true, sharp edges and ends, of the design and size indicated.

I. Allow two trips for painting.

END OF SECTION

SECTION 32 32 23
SEGMENTAL RETAINING WALLS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Segmental retaining walls made of modular concrete units with soil reinforcement.

1.02 REFERENCE STANDARDS

A. AASHTO M 288 - Standard Specification for Geotextiles; American Association of State Highway and Transportation Officials; 2006.

B. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2014.

C. ASTM C1372 - Standard Specification for Dry-Cast Segmental Retaining Wall Units; 2011.

D. ASTM D422 - Standard Test Method for Particle-Size Analysis of Soils; 1963 (Reapproved 2007).

E. ASTM D448 - Standard Classification for Sizes of Aggregate for Road and Bridge Construction; 2012.

F. ASTM D698 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lb/ft3 (600 kN-m/m3)); 2012.

G. ASTM D1241 - Standard Specification for Materials for Soil-Aggregate Subbase, Base, and Surface Courses; 2007.

H. ASTM D2487 - Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System); 2011.

I. ASTM D3034 - Standard Specification for Type PSM Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings; 2014.

J. ASTM D4318 - Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils; 2010.

K. ASTM D4355 - Standard Test Method for Deterioration of Geotextiles by Exposure to Light, Moisture, and Heat in a Xenon Arc Type Apparatus; 2007.

L. ASTM D4491 - Standard Test Methods for Water Permeability of Geotextiles by Permittivity; 1999a (Reapproved 2014).

M. ASTM D4751 - Standard Test Method for Determining Apparent Opening Size of a Geotextile; 2012.

N. ASTM F405 - Standard Specification for Corrugated Polyethylene (PE) Pipe and Fittings; 2013.

1.03 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Concrete Units:
   1. Manufacturer's product data.
   2. Test data on unit strength and shear resistance between units.
   3. Test data on soil reinforcement connection.
   4. Manufacturer's certification that units meet requirements of specification.
   5. Storage and handling requirements and recommendations.
   6. Installation methods.

C. Soil Reinforcement:
   1. Manufacturer's product data.
   2. Manufacturer's certification that product meets requirements of specification.
   3. Preparation instructions and recommendations.
   4. Storage and handling requirements and recommendations.
   5. Installation methods.

D. Shop Drawings: Engineering drawings for installation, including elevations, large-scale details of elevations, typical sections, details, and connections, soil reinforcement, and drainage provisions.
   1. Include marked up contract drawings showing exact dimensions for blocks, required coping, and other minor revisions.
   2. Include design data: Detailed design calculations showing compliance with specified design criteria and material evaluations performed in accordance with specified design standard, signed and sealed by Design Engineer.

E. Soil Reinforcement to Unit Connector: One connector.

1.04 QUALITY ASSURANCE

A. Product Testing: Performed by qualified independent testing agency or by manufacturer and witnessed by qualified independent testing agency.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Segmental Concrete Units:
   1. County Materials Corporation; Product: County Block Retaining Wall System.
   2. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 MATERIALS

A. Retaining Wall Units: Machine-formed concrete blocks of shapes and sizes suitable for the retaining wall configuration required and complying with ASTM C1372 and the following:
   1. Face Color: Natural cement gray.
   2. Texture: Split face, on all exposed surfaces.
   3. Face Shape: Straight (flat).
   4. Curved Walls: Provide unit shapes that accommodate the required curves without cutting and with gaps between faces of adjacent units of not more than 1/8 inch.
   5. Corners: Provide special shapes to form corners without cutting; exposed faces finished to match.
   6. Unit Face Area: 2/3 sq ft, minimum.
   7. Height: 8 inches .
   8. Length (Face Width): 12 inches, minimum.
   9. Width (Depth from Face): 11 inches, minimum, not including textured finish.
   10. Batter Dimensional Control: Provide integral positive control to maintain consistent batter dimension.
   11. Moisture Absorption: 8 percent, maximum.

B. Cap Units: Portland cement concrete machine-formed solid blocks, matching segmental concrete units, complying with ASTM C1372, with abutting edges saw cut or formed to provide tight fitting, flush end-to-end joints.
   1. Height: 4 inches .
   2. Depth: To fully cover wall units.
   3. Masonry Adhesive: To secure cap units as top course of wall.
      a. Provide adhesive conforming to ASTM C920, Type S, Grade NS, Class 25, and as approved by unit manufacturer.

C. Shear Connectors: Connection method to withstand design stresses and prevent movement of segmental units, and to hold soil reinforcement in proper design position during grid pre-tensioning and backfilling.
   1. Maintain strength over design temperature range of minus 10 degrees F to plus 100 degrees F.

D. Soil Reinforcement: Polymeric geosynthetic specifically fabricated for use as soil reinforcement, dimensionally stable and able to retain geometry under manufacture, transport, and installation.
   1. Polymeric Material: 100 percent virgin resin with maximum of 5 percent in-plant regrind material; polypropylene, polyethylene, or polyester.

a. Polyethylene and Polypropylene: Stabilized with long term antioxidants.
b. Polyester: Minimum molecular weight of 25,000 and carboxyl end group number less than 30.

2. Permittivity: 0.5 per second, minimum, when tested in accordance with ASTM D4491.
3. UV Resistance: 70 percent after 500 hours, when tested in accordance with ASTM D4355.
4. Durability: Comply with minimum requirements of AASHTO M 288 Class 1; minimum mass of 8 oz/sq yard.

E. Drainage Filter: Geosynthetic textile.
1. Apparent Opening Size: 70 to 100 U.S. Sieve size, when tested in accordance with ASTM D4751.
2. Permittivity: 0.5 per second, minimum, when tested in accordance with ASTM D4491.
3. Durability: Comply with minimum requirements of AASHTO M 288 Class 1; minimum mass of 8 oz/sq yard.

F. Aggregate for Leveling Pad: Compacted sand, gravel, or crushed rock complying with one of the following:
1. Meeting requirements of ASTM D1241, Gradation C.
2. Do not use pea gravel.

G. Drainage Fill: Clean, freely draining aggregate placed within, between, or immediately behind segmental units; do not use pea gravel; use one of the following:
1. Aggregate meeting requirements of ASTM D448, Size No. 57.
2. Crushed stone or coarse gravel, 3/8 to; no more than 5 percent passing No. 200 sieve.
3. Crushed stone or coarse gravel, meeting requirements of ASTM D422.

H. Reinforced Backfill: Compacted soil placed behind drainage fill; do not use heavy clay or organic soils; comply with one of the following:
1. Granular soil with less than 5 percent passing No. 200 sieve.
2. Inorganic ASTM D2487 soil types GP, GW, SP, or SM, free of debris.
a. Maximum Size: 3/4 inch, unless approved by Design Engineer, and design strength reduced to account for additional installation damage.
b. Plasticity of Fines: Less than 10. Liquid Limit: Less than 40, when tested in accordance with ASTM D4318.

I. Drainage Pipe: Perforated PVC, complying with ASTM D3034; or corrugated PE complying with ASTM F405; with geotextile filter wrap.

PART 3 EXECUTION

3.01 PREPARATION

A. Excavation:
1. Excavate to lines and grades shown on drawings.
2. Do not disturb embankment or foundation beyond lines. Minimize over-excavation; fill over-excavated areas with compacted reinforced backfill or leveling pad material at Contractor's expense.
3. After excavation, and prior to placement of leveling materials, Geotechnical Engineer will examine bearing soil surface to verify strength meets or exceeds design requirements and assumptions.
4. Replace unsuitable bearing soil as directed by Geotechnical Engineer.

B. Leveling Pad:
1. Width: 6 inches minimum extension beyond front and back faces of units.
2. In lieu of pad made solely of aggregate or concrete, pad may be 3 inches, minimum, of thick compacted sand or crushed rock, covered with 2 inches to 3 inches of unreinforced concrete.
3. Location: Top of pad at 1 inch below grade for each 8 inches that wall extends above grade.
4. Compact aggregate to lines and grades on drawings, in lifts 6 inches thick, maximum.
5. Use only hand-operated compaction equipment within 36 inches of back of wall.

C. Verify level grade before proceeding.

D. Install drainage collection pipe with a continuous fall in the direction of flow. Cap open ends as necessary to prevent soil and debris from entering.

3.02 INSTALLATION

A. Install in accordance with drawings, manufacturer instructions, and applicable codes and regulations.

B. Segmental Concrete Units:
   1. Place first course of units on leveling pad; check alignment and level. Check for full contact with base and for stability.
   2. Place units side by side for full length of wall, aligning back face of straight walls using string line or offset from base line and back face of curved walls using flexible pipe or other method recommended by manufacturer
   3. Do not leave gaps between units.
   4. Lay out corners and curves in accordance with manufacturer's instructions. Do not leave gaps to produce wall batter or curvature.
   5. Cut blocks with saw; do not split units.
   6. Sweep excess material from tops of units before laying succeeding courses.
   7. Place succeeding courses. Check for proper alignment and batter.
   8. Where top of wall changes elevation, step units to match grade or turn top course into embankment.
   9. Where bottom of wall changes elevation, step base leveling pad and extend lowest course a minimum of two units into slope.

C. Soil Reinforcement: Install each layer on fully compacted fill.
   1. Orient soil reinforcement material with highest strength axis perpendicular to wall alignment.
   2. Attach to top of wall units and extend horizontally, full length, over compacted backfill.
   3. Install in one piece lengths with 100 percent coverage in each layer at each level. Do not splice or leave gaps between panels or ends of pieces.

D. Drainage Fill: Place drainage fill in, between, and behind units.
   1. Compact to lines and grades on drawings, in lifts 6 inches thick, maximum; decrease lift thickness where necessary to achieve required density.
   2. Extend drainage fill 6 inches beyond back face of units.

E. Backfill: Place, spread, and compact backfill from behind drainage fill to undisturbed soil.
   1. Use only lightweight hand-operated compaction equipment within 3 ft from back wall face, or one half of wall height, whichever is greater.
   2. Place backfill in lifts of maximum 6 inches to 8 inches loose thickness where hand compaction is used and 8 inches to 10 inches
   3. Compact backfill to 95 percent of maximum density, standard Proctor, as determined in accordance with ASTM D698, or as recommended by Geotechnical Engineer.
   4. Moisture content of backfill prior to and during compaction to be within plus 1 or minus 3 percentage points dry of optimum and uniform throughout each layer.
   5. Do not operate tracked construction equipment directly upon soil reinforcement.
   6. At end of each day, slope top of backfill away from wall to direct runoff away from wall face. Prevent runoff from adjacent areas from entering wall site.
   7. At completion, if other work adjacent to wall is not to be done immediately (paving, landscaping, etc), grade top of backfill and provide temporary drainage to prevent water runoff toward the wall.

F. Cap Units: Install and top two courses of units with masonry adhesive.
   1. Clear cap units and top course of segmental concrete units of debris and standing water before applying adhesive.
   2. Apply masonry adhesive to top surface of top unit and place cap into position over projecting pins. Protect wall face from masonry adhesive.

3.03 PROTECTION

A. Prevent damage to wall and earthwork by subsequent construction and uncontrolled runoff until substantial completion; repair damage due to failure to protect wall or earthwork.

B. Do not operate heavy paving or grading equipment within 36 inches from the back of the wall face.

C. Do not operate equipment with wheel loads in excess of 150 psf live load within 10 feet from the wall face.

D. Do not place temporary soil or fill stockpiles adjacent to wall.

E. Replace damaged units prior to substantial completion.

END OF SECTION

SECTION 32 92 19
SEEDING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Seeding, mulching and fertilizer.

B. Maintenance.

1.02 RELATED REQUIREMENTS

A. Section 31 22 00 - Grading: Topsoil material.

B. Section 31 22 00 - Grading: Preparation of subsoil and placement of topsoil in preparation for the work of this section.

1.03 SUBMITTALS

A. Maintenance Data: Include maintenance instructions, cutting method and maximum grass height; types, application frequency, and recommended coverage of fertilizer .

1.04 REGULATORY REQUIREMENTS

A. Comply with regulatory agencies for fertilizer and herbicide composition.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Deliver grass seed mixture in sealed containers. Seed in damaged packaging is not acceptable. Deliver seed mixture in containers showing percentage of seed mix, year of production, net weight, date of packaging, and location of packaging.

B. Deliver fertilizer in waterproof bags showing weight, chemical analysis, and name of manufacturer.

PART 2 PRODUCTS

2.01 SEED MIXTURE

A. Seed Mixtures: Use mixture indicated on Landscape Drawings. Where no mixture is listed on Drawings, use mixture specified below.

B. Grass Seed Mixture for Sun and Partial Shade:
   1. Kentucky Blue Grass: 50 percent. (minimum 4 improved cultivars).
   2. Creeping Red Fescue Grass: 25 percent.
   3. Turf-type Perennial Rye Grass: 25 percent.

C. Grass Seed Mixture for Shade:
   1. Kentucky Blue Grass: 35 percent. (minimum 4 improved cultivars).
   2. Creeping Red Fescue Grass: 20 percent.
   3. Hard Fescue Grass: 10 percent.
   4. Chewings Fescue Grass: 10 percent.
   5. Turf-type Perennial Rye Grass: 20 percent.

2.02 SOIL MATERIALS

A. Topsoil: As specified in Section 31 22 00.

2.03 ACCESSORIES

A. Mulching Material: Conforming to WDNR Specification S100. Oat or wheat straw, free from weeds, foreign matter detrimental to plant life, and dry. Hay or chopped cornstalks are not acceptable.

B. Fertilizer: As recommended by seed supplier.

C. Water: Clean, fresh and free of substances or matter that could inhibit vigorous growth of grass.

D. Erosion Fabric: Jute or straw matting, open weave, with metal staples.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that prepared soil base is ready to receive the work of this Section.

B. Remove any foreign or deleterious materials, such as paint, paint washout, concrete slurry or chunks, petroleum, wood scraps that have been deposited in soil within the planting area.

C. Verify soil depth is adequate.

3.02 PREPARATION

A. Fine grade topsoil as required, fill any depressions or surface abnormalities.

B. Remove any existing grass and weed growth, do not mix into topsoil.

C. Work topsoil into a loose, friable state.

3.03 FERTILIZING

A. Apply fertilizer in accordance with manufacturer's instructions.

B. Apply after smooth raking of topsoil .

C. Do not apply fertilizer at same time or with same machine as will be used to apply seed.

D. Mix thoroughly into upper 2 inches of topsoil.

E. Lightly water to aid the dissipation of fertilizer.

3.04 SEEDING

A. Apply seed at a rate of 5-6 lbs per 1000 sq ft evenly in two intersecting directions. Rake in lightly.

B. Do not seed areas in excess of that which can be mulched on same day.

C. Planting Season: April 15 - October 15.

D. Do not sow immediately following rain, when ground is too dry, or during windy periods.

E. Lightly roll seeded area with roller not exceeding 112 lbs.

F. Immediately following seeding , apply mulch to a thickness of 1/8 inches. Maintain clear of shrubs and trees.

G. Apply water with a fine spray immediately after each area has been mulched. Saturate to 4 inches of soil.

H. Following germination, immediately re-seed areas without germinated seeds that are larger than 4 by 4 inches.

3.05 PROTECTION

A. Cover seeded slopes where grade is 4 inches per foot or greater with erosion fabric. Roll fabric onto slopes without stretching or pulling.

3.06 MAINTENANCE

A. Provide maintenance at no extra cost to Owner; Owner will pay for water.

B. Provide maintenance of seeded areas for 2 months from Date of Substantial Completion. Grass seeded after October 1 shall be maintained for 30 days after March 15.

C. Mow grass at regular intervals to maintain at a maximum height of 2-1/2 inches. Do not cut more than 1/3 of grass blade at any one mowing.

D. Neatly trim edges and hand clip where necessary.

E. Immediately remove clippings after mowing and trimming.

F. Water to prevent grass and soil from drying out.

G. Roll surface to remove minor depressions or irregularities.

H. Control growth of weeds. Apply herbicides and fertilizer in accordance with manufacturer's instructions. Remedy damage resulting from improper use of herbicides and fertilizer.

I. Repair washouts and areas damaged by erosion.

J. Immediately reseed areas that show bare spots.

K. Protect seeded areas with warning signs during maintenance period.

3.07 ACCEPTANCE OF SEEDED LAWN

A. At end of maintenance period, a healthy, uniform, close stand of grass shall be established, free of weeds and surface irregularities, with coverage exceeding 90 percent over any 10 sq. ft. area and bare spots not exceeding 4 inches by 4 inches.

END OF SECTION

SECTION 32 92 23
SODDING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Fertilizing.

B. Sod installation.

C. Maintenance.

1.02 RELATED REQUIREMENTS

A. Section 31 22 00 - Grading: Topsoil material.

B. Section 31 22 00 - Grading: Preparation of subsoil and placement of topsoil in preparation for the work of this section.

1.03 REFERENCE STANDARDS

A. TPI (SPEC) - Guideline Specifications to Turfgrass Sodding; Turfgrass Producers International; 2006.

B. Wisconsin Department of Natural Resources - Specification S100 Compost.

1.04 QUALITY ASSURANCE

A. Sod Producer: Company specializing in sod production and harvesting with minimum 3 years experience, and certified by the State of Wisconsin.

B. Installer Qualifications: Company approved by the sod producer.

PART 2 PRODUCTS

2.01 MATERIALS

A. Sod: TPI, Certified Turfgrass Sod quality; cultivated grass sod; type indicated below; with strong fibrous root system, free of stones, burned or bare spots; containing no more than 5 weeds per 1000 sq ft. Minimum age of 18 months, with root development that will support its own weight without tearing, when suspended vertically by holding the upper two corners.
   1. Kentucky Blue Grass Type: 50 percent.
   2. Creeping Red Fescue: 30 percent.
   3. Red Top: 5 percent.
   4. Perennial Ryegrass: 10 percent.
   5. Annual Ryegrass: 10 percent.
   6. Machine cut sod and load on pallets in accordance with TPI Guidelines.

B. Sod shall be of uniform density, color and texture, and capable of vigorous growth and development when planted.

C. Topsoil: As specified in Section 31 22 00.

D. Fertilizer: Provide fertilizers deemed necessary by soil test.

E. Pesticides: Registered and approved by EPA, and of type recommended by manufacturer for each specific problem and as required for project conditions.

F. Water: Clean, fresh and free of substances or matter that could inhibit vigorous growth of grass.

PART 3 EXECUTION

3.01 SCHEDULING

A. Installation Restrictions: Install sod during one of the following periods.
   1. Spring Planting: April 1 to June 15.
   2. Fall Planting: August 15 to October 15.

B. Weather Limitations: Proceed with sodding only when existing and forecasted weather conditions permit planting to be performed when optimal results may be obtained. Apply products during favorable weather conditions according to manufacturer's written instructions.

3.02 EXAMINATION

A. Verify that prepared soil base is ready to receive the work of this section.

B. Remove any foreign or deleterious materials, such as paint, paint washout, concrete slurry or chunks, petroleum, wood scraps that have been deposited in soil within the planting area.

C. Verify soil depth is adequate.

3.03 PREPARATION

A. Fine grade topsoil as required, fill any depressions or surface abnormalities.

B. Remove any existing grass and weed growth, do not mix into topsoil.

C. Work topsoil into a loose, friable state.

3.04 FERTILIZING

A. Apply fertilizer in accordance with manufacturer's instructions.

B. Apply after smooth raking of topsoil and prior to installation of sod.

C. Apply fertilizer no more than 48 hours before laying sod.

D. Mix thoroughly into upper 2 inches of topsoil.

E. Lightly water to aid the dissipation of fertilizer.

3.05 LAYING SOD

A. Moisten prepared surface immediately prior to laying sod.

B. Lay sod immediately after delivery to site to prevent deterioration.

C. Lay sod smooth and tight with no open joints visible, and no overlapping; stagger end joints 12 inches minimum. Do not stretch or overlap sod pieces.

D. Lay smooth. Align with adjoining grass areas.

E. Water sodded areas immediately after installation. Saturate sod to 4 inches of soil.

F. After sod and soil have dried, roll sodded areas to ensure good bond between sod and soil and to remove minor depressions and irregularities.

3.06 MAINTENANCE

A. Provide maintenance at no extra cost to Owner; Owner will pay for water.

B. Provide maintenance of sodded areas for 2 months from Date of Substantial Completion. Sod laid after October 1 shall be maintained for 30 days after March 15.

C. Mow grass at regular intervals to maintain at a maximum height of 2-1/2 inches. Do not cut more than 1/3 of grass blade at any one mowing.

D. Neatly trim edges and hand clip where necessary.

E. Immediately remove clippings after mowing and trimming.

F. Water to prevent grass and soil from drying out.

G. Roll surface to remove irregularities.

H. Control growth of weeds. Apply herbicides and fertilizer in accordance with manufacturer's instructions. Remedy damage resulting from improper use of herbicides and fertilizer.

I. Immediately replace sod to areas that show deterioration or bare spots.

J. Protect sodded areas with warning signs during maintenance period.

3.07 ACCEPTANCE OF SOD

A. At end of maintenance period, a healthy, well-rooted, even-colored, viable turf shall be established, free of weeds, open joints, bare areas, and surface irregularities.

END OF SECTION

SECTION 32 93 00
PLANTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Planting soil mix for planters (when shown on Drawings).

B. New trees, plants, and ground cover.

C. Edging, decorative cover and weed barrier.

D. Maintenance.

E. Tree Pruning.

1.02 REFERENCE STANDARDS

A. ANSI/ANLA Z60.1 - American Standard for Nursery Stock; 2004.

B. ANSI A300 Part 1 - American National Standard for Tree Care Operations -- Tree, Shrub and Other Woody Plant Maintenance -- Standard Practices; 2008.

1.03 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Maintenance Data: Include cutting and trimming method; types, application frequency, and recommended coverage of fertilizer .

1.04 QUALITY ASSURANCE

A. Nursery Qualifications: Company specializing in growing and cultivating the plants with three years documented experience.

B. Installer Qualifications: Company specializing in installing and planting the plants approved by nursery.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Protect and maintain plant life until planted.

B. Deliver plant life materials immediately prior to placement. Keep plants moist.

1.06 FIELD CONDITIONS

A. Do not install plant life when ambient temperatures may drop below 35 degrees F or rise above 90 degrees F.

1.07 WARRANTY

A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.

B. Provide one year warranty.

C. Replacements: Plants of same size and species as specified, planted in the next growing season, with a new warranty commencing on date of replacement.

PART 2 PRODUCTS

2.01 PLANTS

A. Plants: Species and size identified in plant schedule, grown in climatic conditions similar to those in locality of the work.

2.02 ACCESSORIES

A. Wrapping Materials: Burlap.

B. Stakes: Hardwood lumber with pointed end, 2x2 nominal.

C. Cable, Wire, Eye Bolts and Turnbuckles: Non-corrosive, of sufficient strength to withstand wind pressure and resulting movement of plant life.

D. Plant Protectors: Rubber sleeves over cable to protect plant stems, trunks, and branches.

E. Vinyl Edging: Valley View Industries "Black Diamond", 5.5 inch x 20 feet long.

F. Decorative Cover: Twice shredded hardwood or washed stone, as indicated on Landscape Drawings,

G. Weed-Control Barrier: Spun-bonded, rot-resistant polypropylene fabric, air and water permeable, unaffected by freezing and thawing, or by deterioration from fertilizers or pesticides.

2.03 PLANT SOIL MIX

A. Planter Soil: White Oak Farm Raised Bed Mix, or 1 part topsoil, 1 part sand and 1 part leaf compost. www.whiteoakfarmorganics.com

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that prepared subsoil and planters are ready to receive work.

B. Saturate soil with water to test drainage.

3.02 EXCAVATION FOR TREES AND SHRUBS

A. Excavate circular planting pits with sides sloping at a 45 degree angle. Excavations with vertical sides are not acceptable.

B. Trim bottom of excavation leaving center slightly raised to support root ball and assist in drainage away from the center. Ensure root ball will sit on undisturbed soil to prevent settling.

C. For trees and shrub planting in turf areas, excavate approximately three times as wide as ball diameter.

D. For tree and shrub planting in prepared plant beds, excavate approximately 12 inches wider than the ball.

E. Do not excavate deeper than the root ball, measured from the root flair to the bottom of the ball.

F. If excavation is too deep, add soil to raise and thoroughly tamp to prevent settling.

3.03 PLANTING

A. Verify that root flare is visible at top of root ball. If root flare is not visible, remove soil in a level manner to where the topmost root emerges from the trunk.

B. Remove stem girdling roots and kinked roots. Remove injured roots by cutting cleanly, do not break.

C. Set plant plumb and in center of pit or trench with root flare 1 inch above adjacent finish grades.

D. Carefully cut and remove burlap, rope and wire baskets completely from root ball.

E. For container stock, loosen roots of plant after removal from container to break up any encircling roots.

F. Backfill around root ball in layers, tamping to settle soil and eliminate voids and air pockets. When planting pit is approximately one-half filled, water thoroughly before placing remainder of backfill. Repeat watering until no more water is absorbed.

G. Replace planting stock if root ball is cracked or broken before or during planting operation.

3.04 INSTALLATION OF ACCESSORIES

A. Install edging to separate mulched areas from turf areas.
   1. Cut trench at 45 degree angle toward mulched area.
   2. Install metal stakes toward turf area through vee at bottom of edging.
   3. Cut edging to overlap and join with supplied connectors, install stake through overlap.
   4. Backfill and tamp.

B. Place decorative cover and membrane, where indicated on drawings.

3.05 PLANT SUPPORT

A. Brace plants vertically with plant protector wrapped guy wires and stakes to the following:
   1. Tree Caliper: 1 inch; Tree Support Method: 1 stake with one tie
   2. Tree Caliper: 1 to 2 inches; Tree Support Method: 2 stakes with two ties

3. Tree Caliper: 2 to 4 inches; Tree Support Method: 3 guy wires with eye bolts and turn buckles
4. Tree Caliper: Over 4 inches; Tree Support Method: 4 guy wires with eye bolts and turn buckles

3.06 TREE PRUNING

A. Perform pruning of trees as recommended in ANSI A300.

B. Prune newly planted trees as required to remove dead, broken, and split branches, do not prune for shape.

3.07 MAINTENANCE

A. Provide maintenance at no extra cost to Owner; Owner will pay for water.

B. Irrigate sufficiently to saturate root system and prevent soil from drying out.

C. Remove dead or broken branches and treat pruned areas or other wounds.

D. Neatly trim plants where necessary.

E. Immediately remove clippings after trimming.

F. Control growth of weeds. Apply herbicides in accordance with manufacturer's instructions.

G. Control insect damage and disease. Apply pesticides in accordance with manufacturers instructions.

H. Remedy damage from use of herbicides and pesticides.

I. Maintain wrappings, guys, turnbuckles, and stakes. Adjust turnbuckles to keep guy wires tight. Repair or replace accessories when required.

END OF SECTION

SECTION 33 11 16
SITE WATER UTILITY DISTRIBUTION PIPING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Pipe and fittings for site water lines including domestic water lines and fire water lines.

B. Valves and Fire hydrants.

1.02 RELATED REQUIREMENTS

A. Section 09 91 13 - Exterior Painting.

B. Section 31 23 16 - Excavation: Excavating of trenches.

C. Section 31 23 23 - Fill: Bedding and backfilling.

D. Section 09 90 00 - Painting and Coating.

1.03 REFERENCES

A. ASME B16.18 - Cast Copper Alloy Solder Joint Pressure Fittings; The American Society of Mechanical Engineers; 2012 (ANSI B16.18).

B. ASME B16.22 - Wrought Copper and Copper Alloy Solder-Joint Pressure Fittings; The American Society of Mechanical Engineers; 2013.

C. ASTM B88 - Standard Specification for Seamless Copper Water Tube; 2014.

D. AWS A5.8M/A5.8 - Specification for Filler Metals for Brazing and Braze Welding; American Welding Society; 2011-AMD 1.

E. AWWA C105/A21.5 - Polyethylene Encasement for Ductile-Iron Pipe Systems; American Water Works Association; 2010 (ANSI/AWWA C105/A21.5).

F. AWWA C111/A21.11 - Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings; American Water Works Association; 2012 (ANSI/AWWA C111/A21.11).

G. AWWA C151/A21.51 - Ductile-Iron Pipe, Centrifugally Cast; American Water Works Association; 2009 (ANSI/AWWA C151/A21.51).

H. AWWA C509 - Resilient-Seated Gate Valves for Water Supply Service; American Water Works Association; 2009 (ANSI/AWWA C509).

I. AWWA C600 - Installation of Ductile-Iron Water Mains and Their Appurtenances; American Water Works Association; 2010 (ANSI/AWWA C600).

PART 2 PRODUCTS

2.01 WATER PIPE

A. Ductile Iron Pipe: AWWA C151:
   1. Fittings: Ductile iron, standard thickness.
   2. Joints: AWWA C111, rubber gasket with rods.
   3. Jackets: AWWA C105/A21.5 polyethylene jacket.

B. Copper Tubing: ASTM B88, Type K, annealed:
   1. Fittings: ASME B16.18, cast copper, or ASME B16.22, wrought copper.
   2. Joints: Compression connection or AWS A5.8M/A5.8, BCuP silver braze.

2.02 VALVES

A. Valves: Manufacturer's name and pressure rating marked on valve body.

B. Gate Valves Up To 3 Inches:
   1. Brass or Bronze body, non-rising stem, inside screw, single wedge or disc, compression ends, with control rod, post indicator, valve key, and extension box.

C. Gate Valves 3 Inches and Over:
   1. AWWA C509, iron body, bronze trim, non-rising stem with square nut, single wedge, resilient seat, flanged ends, control rod, post indicator, valve key, and extension box.

2.03 HYDRANTS

A. Hydrants: Type as required by utility company.

2.04 BEDDING AND COVER MATERIALS

A. Bedding: As specified in Section 31 23 23.

B. Cover: As specified in Section 31 23 23.

PART 3 EXECUTION

3.01 TRENCHING

A. See the sections on excavation and fill for additional requirements.

B. See Section 31 23 16.13 for additional requirements.

C. Hand trim excavation for accurate placement of pipe to elevations indicated.

D. Backfill around sides and to top of pipe with cover fill, tamp in place and compact, then complete backfilling.

3.02 INSTALLATION - PIPE

A. Install ductile iron piping and fittings to AWWA C600.

B. Route pipe in straight line.

C. Install pipe to allow for expansion and contraction without stressing pipe or joints.

D. Slope water pipe and position drains at low points.

3.03 INSTALLATION - VALVES AND HYDRANTS

A. Set valves on solid bearing.

B. Center and plumb valve box over valve. Set box cover flush with finished grade.

C. Set hydrants plumb; locate pumper nozzle perpendicular to and facing roadway.

D. Set hydrants to grade, with nozzles at least 20 inches above ground.

E. Locate control valve 4 inches away from hydrant.

F. Provide a drainage pit 36 inches square by 24 inches deep filled with 2 inches washed gravel. Encase elbow of hydrant in gravel to 6 inches above drain opening. Do not connect drain opening to sewer.

G. Paint hydrants in accordance with Section 09 91 13.

END OF SECTION

SECTION 33 31 11

SITE SANITARY UTILITY SEWERAGE PIPING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Sanitary sewerage drainage piping, fittings, and accessories.

B. Connection of building sanitary drainage system to municipal sewers.

1.02 RELATED REQUIREMENTS

A. Section 31 23 16 - Excavation: Excavating of trenches.

B. Section 31 23 16.13 - Trenching: Excavating, bedding, and backfilling.

C. Section 31 23 23 - Fill: Bedding and backfilling.

1.03 REFERENCE STANDARDS

A. ASTM D2321 - Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications; 2011.

B. ASTM D3034 - Standard Specification for Type PSM Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings; 2014.

1.04 REGULATORY REQUIREMENTS

A. Conform to applicable code for materials and installation of the Work of this section.

PART 2 PRODUCTS

2.01 SEWER PIPE MATERIALS

A. Plastic Pipe: ASTM D3034, Type PSM, Poly(Vinyl Chloride) (PVC) material; inside nominal diameter of 6 and 8 inches, bell and spigot style solvent sealed joint end.

B. Fittings: Same material as pipe molded or formed to suit pipe size and end design, in required tee, bends, elbows, cleanouts, reducers, traps and other configurations required.

2.02 BEDDING AND COVER MATERIALS

A. Pipe Bedding Material: As specified in Section 31 23 23.

B. Pipe Cover Material: As specified in Section 31 23 23.

PART 3 EXECUTION

3.01 TRENCHING

A. See Section 31 23 16.13 for additional requirements.

B. Backfill around sides and to top of pipe with cover fill, tamp in place and compact, then complete backfilling.

3.02 INSTALLATION - PIPE

A. Install pipe, fittings, and accessories in accordance with manufacturer's instructions. Seal watertight.
   1. Plastic Pipe: Also comply with ASTM D2321.

B. Lay pipe to slope gradients noted on layout drawings; with maximum variation from true slope of 1/8 inch in 10 feet.

C. Connect to building sanitary sewer outlet and municipal sewer system, through installed sleeves.

END OF SECTION

SECTION 33 41 11
SITE STORM UTILITY DRAINAGE PIPING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Storm drainage piping, fittings, and accessories.

B. Connection of drainage system to municipal sewers.

C. Catch basins, Paved area drainage, and Site surface drainage.

1.02 RELATED REQUIREMENTS

A. Section 31 23 16 - Excavation: Excavating of trenches.

B. Section 31 23 23 - Fill: Bedding and backfilling.

1.03 REFERENCE STANDARDS

A. ASTM C14 - Standard Specification for Nonreinforced Concrete Sewer, Storm Drain, and Culvert Pipe; 2015.

B. ASTM C14M - Standard Specification for Nonreinforced Concrete Sewer, Storm Drain, and Culvert Pipe [Metric]; 2015.

C. ASTM C76 - Standard Specification for Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe; 2014.

D. ASTM C76M - Standard Specification for Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe [Metric]; 2014.

E. ASTM C443 - Standard Specification for Joints for Concrete Pipe and Manholes, Using Rubber Gaskets; 2012.

F. ASTM C443M - Standard Specification for Joints for Concrete Pipe and Manholes, Using Rubber Gaskets (Metric); 2011.

G. ASTM D1785 - Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120; 2015.

H. ASTM D2321 - Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications; 2011.

I. ASTM D3034 - Standard Specification for Type PSM Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings; 2014.

PART 2 PRODUCTS

2.01 SEWER PIPE MATERIALS

A. Concrete Pipe: Nonreinforced, ASTM C14 (ASTM C14M), Class 1; inside nominal diameter of (as shown on drawings) inches, bell and spigot end joints.

B. Concrete Pipe Joint Devices: ASTM C443 (ASTM C443M) rubber compression gasket joint.

C. Concrete Pipe: Reinforced, ASTM C76 (ASTM C76M), Class II with Wall type A; mesh reinforcement; inside nominal diameter of (as shown on drawings) inches, bell and spigot end joints.

D. Reinforced Concrete Pipe Joint Device: ASTM C443 (ASTM C443M) rubber compression gasket joint.

E. Plastic Pipe: ASTM D 3034, Type PSM, Poly(Vinyl Chloride) (PVC) material, bell and spigot style solvent sealed joint end.

F. Plastic Pipe: ASTM D1785, Schedule 40, Poly Vinyl Chloride (PVC) material; inside nominal diameter of (as shown on drawings) inches, bell and spigot style solvent sealed joint end.

2.02 PIPE ACCESSORIES

A. Fittings: Same material as pipe molded or formed to suit pipe size and end design, in required tee, bends, elbows, cleanouts, reducers, traps and other configurations required.

2.03 CATCH BASIN, TRENCH DRAIN, CLEANOUT, AND AREA DRAIN COMPONENTS

A. Lids and Drain Covers: Cast iron, hinged to cast iron frame.
   1. Catch Basin:
      a. As shown on drawings.
   2. Area Drain:
      a. As shown on drawings.

B. Trench Drain System: Trench drain system assembled from factory fabricated, polymer concrete castings in standard lengths and variable depths, with integral joint flanges and integral grating support rails; includes joint gaskets and grating.
   1. Trench Width: (As shown on Drawings) inches.

C. Shaft Construction and Concentric Cone Top Section: Reinforced precast concrete pipe sections, lipped male/female dry joints, nominal shaft diameter of (as detailed) inches.

2.04 BEDDING AND COVER MATERIALS

A. Bedding: As specified in Section 31 23 23.

B. Cover: As specified in Section 31 23 23.

PART 3 EXECUTION

3.01 TRENCHING

A. Hand trim excavation for accurate placement of pipe to elevations indicated.

B. Backfill around sides and to top of pipe with cover fill, tamp in place and compact, then complete backfilling.

3.02 INSTALLATION - PIPE

A. Install pipe, fittings, and accessories in accordance with manufacturer's instructions. Seal watertight.
   1. Plastic Pipe: Also comply with ASTM D2321.

B. Lay pipe to slope gradients noted on layout drawings; with maximum variation from true slope of 1/8 inch in 10 feet.

C. Connect to building storm drainage system, foundation drainage system, and utility/municipal sewer system.

D. Make connections through walls through sleeved openings, where provided.

3.03 INSTALLATION - CATCH BASINS, TRENCH DRAINS AND CLEANOUTS

A. Form bottom of excavation clean and smooth to correct elevation.

B. Form and place cast-in-place concrete base pad, with provision for sanitary sewer pipe end sections.

C. Establish elevations and pipe inverts for inlets and outlets as indicated.

D. Mount lid and frame level in grout, secured to top cone section to elevation indicated.

E. Prefabricated trench drains:
   1. Excavate; prepare substrate and supports according to the manufacturer's printed installation instructions.
   2. Install prefabricated trench drain system according to the manufacturer's printed installation instructions.
   3. Expansion, Construction, and Control Joints: Do not locate trench drain system on an expansion, construction or control joint in concrete or pavement. Where concrete or pavement joints running transverse to direction of flow cross the trench drain system, locate concrete or pavement joints and trench drain system joints so that both coincide.
   4. Concrete Trench Support: 3000 pounds per square inch compressive strength, minimum.
      a. Provide support on all sides of trench in minimum thickness recommended by trench drain system manufacturer.
      b. Screed and finish top edge of concrete flush with top surface of trench drain system.

c. Do not use secondary edge finishing tools.

END OF SECTION

SECTION 33 46 00
SUBDRAINAGE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Building Perimeter and Under-Slab Drainage Systems.

1.02 RELATED REQUIREMENTS

A. Section 31 23 23 - Fill: Drainage course fill and geotextile fabric.

PART 2 PRODUCTS

2.01 PIPE MATERIALS

A. Corrugated Plastic Tubing: Flexible type; 4 inch diameter, with polyester filter sock and required fittings.

B. Use perforated pipe at subdrainage system; unperforated through sleeved walls.

2.02 AGGREGATE AND BEDDING

A. Filter Aggregate and Bedding Material: Granular fill as specified in Section 31 23 23.

2.03 ACCESSORIES

A. Pipe Couplings: Solid plastic.

B. Geotextile Fabric: As specified in Section 31 23 23.

C. Sleeve: PVC pipe type for bleeders through footing and foundation wall.

PART 3 EXECUTION

3.01 PREPARATION

A. Hand trim excavations to required elevations. Correct over-excavation with granular fill..

B. Remove large stones or other hard matter that could damage drainage piping or impede consistent backfilling or compaction.

3.02 INSTALLATION

A. Proceed in sections to prevent damage to pipe.

B. Install and join pipe and pipe fittings in accordance with pipe manufacturer's instructions.

C. Place drainage pipe on geotextile fabric over clean cut subsoil.

D. Install pipe couplings.

E. Install Drainage Fill at sides, over joint and top of pipe. Provide total compacted thickness of 12 inches.

F. Connect to sump pits with unperforated pipe, through installed sleeves.

3.03 PROTECTION

A. Protect pipe and aggregate cover from damage or displacement until backfilling operation begins.

3.04 SCHEDULE

A. Foundation Perimeter Drainage: 4" corrugated drain tile at interior and exterior.
   1. Connect interior and exterior drain tile through footing at 10 ft. o.c.

B. Interior Drainage Grid: 4" corrugated drain tile grid at maximum 25 foot spacing.

C. Underslab Drainage Course: 12 inch bed of 3/4 inch clear stone under basement slab. Separate drainage course from subgrade with geotextile fabric.

END OF SECTION

DESIGN DATA

DESIGN CODE:
2011 WISCONSIN COMMERCIAL BUILDING CODE (2009 IBC)

WIND LOAD INFORMATION:

BASIC WIND SPEED	90 MPH		
BUILDING OCCUPANCY CATEGORY	II		
WIND LOAD IMPORTANCE FACTOR (Iw)	1.0		
WIND EXPOSURE	C		
INTERNAL PRESSURE COEFFICIENTS	± .18		

COMPONENTS AND CLADDING (GROSS WIND PRESSURES):
(FOR ZONE DEFINITIONS & DIAGRAMS SEE DESIGN GUIDE ASCE/SEI 7 SECTION 6) BASED ON EXPOSURE D.
WIDTH OF PRESSURE COEFFICIENT ZONE (a) 8 ft

TRIBUTARY WIND LOAD AREAS:	10 ft²	50 ft²	100 ft²
ROOF (MONOSLOPE):			
NEGATIVE ZONE 1	-22.9 psf	-21.6 psf	-21.0 psf
NEGATIVE ZONE 2	-38.5 psf	-29.0 psf	-24.9 psf
NEGATIVE ZONE 3	-38.5 psf	-29.0 psf	-24.9 psf
POSITIVE (ALL ZONES)	10.0 psf	10.0 psf	10.0 psf
WALLS:			
NEGATIVE ZONE 4	-22.7 psf	-19.7 psf	-17.5 psf
NEGATIVE ZONE 5	-28.0 psf	-21.8 psf	-17.5 psf
PARAPETS:			
CORNER ZONE	53.1 psf	36.2 psf	34.0 psf
INTERIOR ZONE	53.1 psf	36.2 psf	34.0 psf
OVERHANGS/ CANOPIES:			
CORNER ZONE	-33.0 psf	-31.7 psf	-31.1 psf
INTERIOR ZONE	-33.0 psf	-31.7 psf	-31.1 psf

SEISMIC LOAD INFORMATION - LIGHT FRAMING (FLOORS 3 THRU ROOF):

SEISMIC OCCUPANCY CATEGORY	II
SEISMIC LOAD IMPORTANCE FACTOR (Ie)	1.00
SEISMIC SITE CLASS	D
MAPPED SPECTRAL RESPONSE ACCELERATION (Ss)	0.106g
MAPPED SPECTRAL RESPONSE ACCELERATION (S1)	0.044g
SPECTRAL RESPONSE COEFFICIENT (Sds)	0.113g
SPECTRAL RESPONSE COEFFICIENT (Sd1)	0.070g
SEISMIC DESIGN CATEGORY	A
BASIC SEISMIC FORCE RESISTING SYSTEM	LIGHT FRAME WALLS w/ SHEAR PANELS
RESPONSE MODIFICATION FACTOR (R)	2.0
SEISMIC RESPONSE COEFFICIENT (Cs)	0.057
DESIGN BASE SHEAR	0.057W
ANALYSIS PROCEDURE	EQUIVALENT LATERAL FORCE

SEISMIC LOAD INFORMATION - FLOORS 1&2:

SEISMIC OCCUPANCY CATEGORY	II
SEISMIC LOAD IMPORTANCE FACTOR (Ie)	1.00
SEISMIC SITE CLASS	D
MAPPED SPECTRAL RESPONSE ACCELERATION (Ss)	0.106g
MAPPED SPECTRAL RESPONSE ACCELERATION (S1)	0.044g
SPECTRAL RESPONSE COEFFICIENT (Sds)	0.113g
SPECTRAL RESPONSE COEFFICIENT (Sd1)	0.071g
SEISMIC DESIGN CATEGORY	B
BASIC SEISMIC FORCE RESISTING SYSTEM	INTERMEDIATE REINFORCED MASONRY SHEAR WALLS
RESPONSE MODIFICATION FACTOR (R)	4
SEISMIC RESPONSE COEFFICIENT (Cs)	0.028
ANALYSIS PROCEDURE	EQUIVALENT LATERAL FORCE

SNOW LOAD INFORMATION:

GROUND SNOW LOAD (Pg)	30 psf
SNOW EXPOSURE FACTOR (Ce)	1.00
SNOW LOAD IMPORTANCE FACTOR (Is)	1.00
THERMAL FACTOR (Ct)	1.00
FLAT ROOF SNOW LOAD (Pf)	21 psf + DRIFT OR 30 psf UNIFORM (SEE SNOW DRIFT PLAN, S-0.2)

SOIL LOAD INFORMATION:

COEFFICIENT OF SLIDING FRICTION (μ)	0.30 (ASSUMED)
LATERAL EARTH PRESSURE:	
ACTIVE	35 pcf
AT-REST	55 pcf
PASSIVE	200 pcf
ALLOWABLE NET SOIL BEARING PRESSURE	Qa = 3,500 psf

LIVE LOADS:

RESIDENTIAL:	
UNITS	40 psf
BALCONIES NOT EXCEEDING 100ft²	60 psf
BALCONIES OVER 100ft²	100 psf
STAIRWAYS, LOBBIES, COMMON AREAS	100 psf
LIBRARY	150 psf
CORRIDORS	80 psf
COMMERCIAL / RETAIL	100 psf
STORAGE	125 psf
ROOF	SEE SNOW LOAD INFO

MATERIAL DESIGN PROPERTIES

CIP CONCRETE STRENGTHS:

SPREAD FOOTINGS	f'c = 3000 psi
WALLS / PIERS	f'c = 4000 psi
SLAB ON GRADE	f'c = 4000 psi
EXTERIOR SLAB ON GRADE	f'c = 4500 psi

REINFORCING STEEL STRENGTHS:

BARS (ASTM A 615, grade 60)	Fy = 60,000 psi
WWF (ASTM A 185)	Fy = 65,000 psi

STRUCTURAL MASONRY STRENGTHS:

ASTM C 90, grade N (CMU)	f'm = 1900 psi
MORTAR (ASTM C270)	
TYPE S (ABOVE GRADE)	fu = 1800 psi
GROUT (ASTM C476)	
BOND BEAMS (pea gravel)	f'c = 3000 psi
MASONRY WALLS & PIERS (pea gravel)	f'c = 3000 psi

STRUCTURAL STEEL STRENGTHS:

WF SHAPES (ASTM A992)	Fy = 50,000 psi
ANGLES, CHANNELS, PLATES, & BARS (ASTM A36)	Fy = 36,000 psi
SQUARE & RECTANGULAR TS OR HSS SECTIONS	Fy = 46,000 psi
ROUND HSS SECTIONS (ASTM A500, grade B)	Fy = 42,000 psi
STEEL PIPE (ASTM A53, grade B)	Fy = 35,000 psi
HIGH STRENGTH BOLTS (ASTM A325)	(ASTM A500, Grade B)
ANCHOR BOLTS (ASTM F1554)	Fy = 36,000 psi
WELD ELECTRODES	E70 XX
HEADED WELDED STUDS (ASTM A108)	Fu = 55,000 psi

WOOD STRENGTHS:
DIMENSIONAL LUMBER (SEE PLANS & WOOD FRAMING NOTES)

LAMINATED VENEER LUMBER, (LVL):	E = 1,900 ksi Fb = 2,600 psi Fv = 285 psi Fc(perp) = 750 psi Fc(para) = 2,510 psi
PARALLEL STRAND LUMBER (PSL):	E = 2,000 ksi Fb = 2,900 psi Fv = 290 psi Fc(perp) = 750 psi Fc(para) = 2,900 psi
LAMINATED STRAND LUMBER (LSL):	E = 1,300 ksi Fb = 1,700 psi Fv = 400 psi Fc(perp) = 680 psi Fc(para) = 1,400 psi

EARTHWORK NOTES

1. FOR DETAILED DESCRIPTION OF EXISTING SOILS AND BORING LOGS, REFER TO REPORT OF GEOTECHNICAL EXPLORATION DATED MARCH 3, 2014 FROM CGC, INC. (C14047).
2. COMPLIANCE OF SOIL COMPACTION AND MEASURES TAKEN TO ACHIEVE ALLOWABLE BEARING PRESSURE SHALL BE FIELD VERIFIED BY A QUALIFIED SOILS ENGINEER PRIOR TO PLACEMENT OF SLAB OR FOUNDATIONS.
3. ALL TOPSOIL, DEBRIS, SILTS, AND ORGANIC MATERIAL SHALL BE STRIPPED AND REMOVED FROM LIMITS OF EXCAVATIONS AND EXISTING SUBGRADE SHALL BE COMPACTED TO 95% STANDARD PROCTOR MAXIMUM DRY DENSITY PRIOR TO PLACEMENT OF FILL MATERIAL
4. FILL MATERIAL SHALL BE PLACED AND COMPACTED IN LIFTS NO THICKER THAN 8". EACH LIFT SHALL MEET COMPACTION REQUIREMENTS PRIOR TO PLACEMENT AND COMPACTION OF ADDITIONAL LIFTS.
5. FILL MATERIAL SHALL BE PLACED AND COMPACTED AT +1% TO -4% OPTIMUM MOISTURE CONTENT TO 95% STANDARD PROCTOR MAXIMUM DRY DENSITY, UNLESS RECOMMENDED OTHERWISE BY A QUALIFIED SOILS ENGINEER.
6. UNSATISFACTORY SOILS LOCATED BELOW FOUNDATIONS SHALL BE REMOVED AND REPLACED AS DIRECTED BY THE SOILS ENGINEER.

GENERAL FOUNDATION NOTES

1. ANCHOR BOLTS AND/OR EMBEDMENTS SHALL BE SET TO THE FOLLOWING TOLERANCES:
   TOP ELEVATION +1" TO - 3/8"
   OUT OF POSITION ± 1/8"
2. PROTECT IN-PLACE FOUNDATIONS AND SLABS ON GRADE FROM FROST PENETRATION UNTIL PROJECT COMPLETION
3. WHERE FILL MATERIAL IS REQUIRED ON BOTH SIDES OF GRADE BEAMS OR WALLS, IT SHALL BE PLACED SIMULTANEOUSLY. REFER TO PLANS AND SPECIFICATIONS FOR TYPE AND PLACING OF BACKFILL.
4. WHERE FILL MATERIAL IS PLACED ON ONE SIDE OF A WALL (OR GRADE BEAM), THE WALL (OR BEAM) SHALL BE ADEQUATELY SHORED AND BRACED OR THE MATERIAL SHALL NOT BE PLACED UNTIL SUPPORTING FLOOR SLABS HAVE BEEN POURED AND SET.
5. REFER TO ARCHITECTURAL DRAWINGS OR PLUMBING DRAWINGS FOR SPECIFIC FLOOR DRAIN LOCATIONS & ELEVATIONS.
6. COORDINATE STOOP DIMENSIONS WITH ARCHITECTURAL DRAWINGS.

CAST-IN-PLACE CONCRETE NOTES

1. DESIGN AND CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE LATEST PROVISIONS OF ACI 318.
2. CONTRACTOR SHALL NOTIFY THE ARCHITECT/ENGINEER AT LEAST 48 HOURS PRIOR TO PLACING CONCRETE TO FACILITATE ON SITE OBSERVATION OF REBAR.
3. ARRANGEMENT AND BENDING OF REINFORCING STEEL SHALL BE IN ACCORDANCE WITH ACI DETAILING MANUAL (ACI SP-66), LATEST EDITION.
4. WHEN THE AVERAGE TEMPERATURE FROM MIDNIGHT TO MIDNIGHT IS EXPECTED TO DROP BELOW 40 DEGREES FAHRENHEIT FOR THREE SUCCESSIVE DAYS, COLD WEATHER CONCRETING REQUIREMENTS MUST BE FOLLOWED.
5. WHEN AMBIENT AIR OR CONCRETE TEMPERATURES EXCEED 90 DEGREES FAHRENHEIT, STEEL REINFORCING AND/OR FORMING SURFACES ARE ABOVE 120 DEGREES, OR WHEN WIND VELOCITY, HUMIDITY, OR SOLAR RADIATION CREATE CONDITIONS OF ACCELERATED MOISTURE LOSS AND INCREASED RATE OF HYDRATION, HOT WEATHER CONCRETING REQUIREMENTS SHALL BE FOLLOWED.
6. ALL HOOKS IN STEEL REINFORCING SHALL BE ACI STANDARD HOOKS, UNLESS NOTED OTHERWISE IN CONSTRUCTION DOCUMENTS.
7. ALL CONCRETE SURFACES SHALL BE FORMED, UNLESS OTHERWISE NOTED.
8. CONTROL JOINTS SHALL BE PLACED IN SLAB ON GRADE AND SLAB ON METAL DECK CONSTRUCTION WITHIN 24 HOURS OF INITIAL POUR.
9. WIRE SPACERS, CHAIRS, TIES, ETC., FOR SUPPORT OF STEEL REINFORCING SHALL BE PROVIDED BY THE CONTRACTOR TO ENSURE REINFORCING IS PLACED IN THE PROPER POSITION DURING CONCRETE PLACEMENT.
10. STEEL REINFORCING SPLICES OF ADJACENT BARS SHALL BE STAGGERED SUCH THAT SPLICES ARE 4 FEET APART, MINIMUM.
11. PROVIDE (2) #5 BARS AROUND ALL OPENINGS AND (2) #5 DIAGONALLY AT ALL OPENING CORNERS UNLESS OTHERWISE SPECIFIED. EXTEND 2'-6" PAST OPENING TYPICALLY.
12. WELDED WIRE REINFORCING SHALL BE IN FLAT SHEETS ONLY, AND LAPPED A MINIMUM OF 6 INCHES.
13. WELDING OF STEEL REINFORCING IS NOT PERMITTED.
14. SLEEVES, CONDUITS, OR PIPES THROUGH SLABS AND WALLS SHALL BE PLACED AT THREE DIAMETERS ON CENTER, OR 4 INCHES MINIMUM.
15. ALUMINUM CONDUIT OR PIPING SHALL NOT BE CAST IN CONCRETE.
16. PROVIDE A ¾" CHAMFER ON EXPOSED CORNERS OF CONCRETE UNO. TOP EDGES OF WALLS SHALL BE TOOLED UNO.
17. FINISH & COVER CONCRETE SLABS w/ FILM FORMING CURING COMPOUND OR VAPOR RETARDER UNO OR SPECIFIED OTHERWISE.

CAST-IN-PLACE CONCRETE TOLERANCES

1. CONCRETE COVER MEASURED PERPENDICULAR FROM THE SURFACE IN DIRECTION OF TOLERANCES:
   MEMBERS 12" OR LESS ±3/8"
   MEMBERS OVER 12" ±1/2"
2. STEEL REINFORCEMENT SPACING SHALL BE WITHIN THE FOLLOWING TOLERANCES:
   ¼" SPACING DISTANCE, NOT TO EXCEED 1"
3. PLACEMENT OF EMBEDDED ITEMS SHALL BE WITHIN THE FOLLOWING TOLERANCES:
   VERTICAL ALIGNMENT ±1"
   LATERAL ALIGNMENT ±1"
   LEVEL ALIGNMENT ±1"
4. PLACEMENT OF FOOTINGS SHALL BE WITHIN THE FOLLOWING TOLERANCES:
   LATERAL ALIGNMENT ±2"
   LEVEL ALIGNMENT +1/2" TO -2"
   (LEVEL ALIGNMENT SUPPORTING MASONRY) ±1/2"
5. CROSS-SECTIONAL DIMENSION OF FOUNDATIONS SHALL BE WITHIN THE FOLLOWING TOLERANCES:
   SPREAD FOOTINGS / PILE CAPS +2" TO -1/2"
   FOUNDATION THICKNESS ±5%
6. TOP OF FOOTING SLOPE 1" IN 10'

COLD WEATHER CONCRETING NOTES

1. SNOW, FROST, AND ICE SHALL BE REMOVED FROM ALL SURFACES, INCLUDING REINFORCING, AGAINST WHICH THE CONCRETE IS TO BE PLACED
2. DO NOT PLACE CONCRETE ON FROZEN SUBGRADE.
3. THE MINIMUM PLACEMENT AND PROTECTION TEMPERATURE OF CONCRETE SHALL BE AS FOLLOWS:

LEAST DIMENSION OF SECTION	MINIMUM TEMP OF CONCRETE AS PLACED AND MAINTAINED DURING PROTECTION PERIOD (DEGREES FAHRENHEIT)
LESS THAN 12"	55
12" TO LESS THAN 36	50
36" TO 72"	45
GREATER THAN 72"	40

4. TEMPERATURES OF CONCRETE SHALL BE MEASURED AT THE CONCRETE SURFACE.
5. CONCRETE TEMPERATURES SHALL BE MEASURED AND RECORDED FOR THE FIRST 3 DAYS UPON PLACEMENT OF CONCRETE, AT THE BEGINNING, MIDDLE, AND END OF EACH WORK DAY AT 4 HOUR INTERVALS. OVERNIGHT TEMPERATURE MEASUREMENTS ARE NOT REQUIRED.
6. HEATED AIR TEMPERATURES SHALL NOT EXCEED THE REQUIRED CONCRETE TEMPERATURES LISTED IN TABLE ABOVE BY MORE THAN 20 DEGREES.
7. CONCRETE SHALL BE CURED AND PROTECTED AGAINST DAMAGE FROM FREEZING FOR A MINIMUM PERIOD OF 3 DAYS.
8. DURING PERIODS NOT DEFINED AS COLD WEATHER, BUT WHEN FREEZING TEMPERATURES MAY OCCUR, PROTECT CONCRETE SURFACES FROM FREEZING THE FIRST 24 HOURS AFTER PLACEMENT.
9. IF TEMPERATURE REQUIREMENTS DURING PROTECTION PERIOD ARE NOT MET, BUT CONCRETE WAS PREVENTED FROM FREEZING, CONTACT ARCHITECT/ENGINEER FOR EXTENT OF ADDITIONAL PROTECTION TIME REQUIRED.

HOT WEATHER CONCRETING NOTES

1. CONCRETE MIXES TO BE PLACED DURING DRY AND WINDY CONDITIONS SHALL BE MODIFIED BY THE ADDITION OF RETARDING ADMIXTURES OR SLOWER CURING CEMENT SUBSTITUTES TO MINIMIZE THE EFFECTS OF ACCELERATED CURING.
2. WATER SHALL NOT BE ADDED TO CONCRETE MIXES ON SITE FOR WORKABILITY. MID OR HIGH RANGE WATER REDUCERS SHALL BE APPROVED BY ENGINEER BEFORE ADDING TO CONCRETE MIX FOR INCREASED WORKABILITY.
3. INGREDIENTS USED IN CONCRETE MIXES SHALL BE COOLED TO MAINTAIN A CONCRETE TEMPERATURE BELOW 90 DEGREES FAHRENHEIT AT TIME OF PLACEMENT.
4. CHILLED WATER AND CHOPPED ICE MAY BE USED IN CONCRETE MIXTURES TO CONTROL CONCRETE TEMPERATURES. AMOUNT OF CHOPPED ICE SHALL NOT EXCEED THE EQUIVALENT AMOUNT OF MIXING WATER REQUIRED FOR THE DESIGN MIX.
5. RETARDING ADMIXTURES SHALL NOT BE USED IN CONCRETE MIXES WITHOUT THE APPROVAL OF THE ENGINEER.

CLASS 'B' TENSION LAP SPLICE LENGTHS (INCHES)

BAR SIZE	f'c = 3000		f'c = 4000	
	BOT	TOP	BOT	TOP
#3	22	28	19	24
#4	29	37	25	33
#5	36	47	31	41
#6	43	56	37	49
#7	63	81	54	71
#8	72	93	62	81
#9	81	105	70	91
#10	91	118	79	102
#11	101	131	87	113

NOTES (d_b = BAR DIAMETER, C-C = CENTER TO CENTER):

1. SCHEDULE BASED ON CLEAR COVER >1 d_b AND C-C > 2d_b
2. TOP BARS OF BEAMS AND JOIST AND HORIZONTAL WALL REINFORCING

THIS SCHEDULE IS PROVIDED FOR THE CONVENIENCE OF THE CONTRACTOR AND IS NOT INTENDED TO COVER ALL SITUATIONS. SHOP DRAWINGS SHALL CLEARLY INDICATE ALL REQUIRED LAP LENGTHS

MILD STEEL PROTECTION

FOOTINGS / PILE CAPS - BOTTOM & SIDES	3"
FOOTING - TOP	2"
PERIMETER WALLS - #5 & SMALLER	1 1/2"
PERIMETER WALLS - #6 & LARGER	2"
INTERIOR WALLS	3/4"
BEAMS, PIERS, & COLUMNS	1 1/2"
SLABS - BOTTOM & SIDES	3/4"
SLABS - TOP	3/4"
PARKING SLABS - TOP & CORROSIVE ENVIRONMENTS	1 1/2"

CMU WALL CONSTRUCTION NOTES

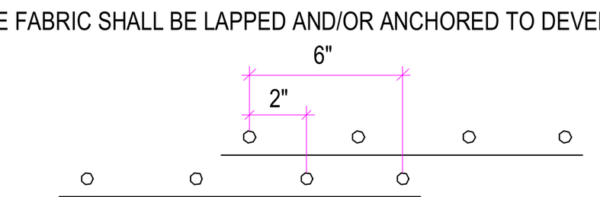
1. IN ACCORDANCE WITH "ACI 530-05/ASCE 6-05/TMS 402-05 BUILDING CODE FOR MASONRY STRUCTURES" PROVIDE LEVEL B QUALITY ASSURANCE PER TABLE 1.15.2 AND AS REQUIRED IN CHAPTER 1. VERIFY f'm REQUIRED USING THE UNIT STRENGTH METHOD.
2. CMU SHALL BE LAID IN RUNNING BOND WITH TYPE S MORTAR (TYPE M BELOW GRADE).
3. PROVIDE MINIMUM 1- #5 VERTICAL BAR AT ALL WALL CORNERS, ENDS OF WALLS, & EACH SIDE OF CONTROL JOINTS.
4. ALL REINFORCED CELLS SHALL BE GROUTED WITH PEA GRAVEL CONCRETE HAVING A MIN. COMPRESSIVE STRENGTH OF 3,000psi.
5. HORIZONTAL REINFORCING AND BOND BEAM REINFORCING AT CORNERS SHALL BE LAPPED A MINIMUM OF 48 BAR DIAMETERS, OR 24" INCHES, WHICHEVER IS LARGER.
6. CLEANOUTS SHALL BE PROVIDED IN THE BOTTOM COURSE OF MASONRY FOR EACH GROUT POUR, WHEN THE POUR HEIGHT EXCEEDS 5 FEET.
7. FACE SHELLS AND WEB FORMING CELLS SHALL BE FULL-BEDDED IN THE STARTING COURSE ON FOUNDATIONS, AND IN ALL COURSES OF PIERS AND PILASTERS.
8. PROVIDE HORIZONTAL JOINT REINFORCING AT 16" O.C. VERTICALLY (8" O.C. IN PARAPET WALLS) U.N.O.
9. HORIZONTAL JOINT REINFORCING SHALL BE TERMINATED AT CONTROL JOINTS. BOND BEAM REINFORCING SHALL BE CONTINUOUS.
10. REFER TO ARCHITECTURAL DRAWINGS FOR CONTROL JOINT SPACINGS, COURSING AND MORTAR JOINT DETAILING.
11. SOLID OR SOLID GROUTED CMU SHALL BE PROVIDED IN COURSES IMMEDIATELY ABOVE AND BELOW ANY CHANGES IN WYTHE THICKNESS.

NON-LOAD BEARING CMU PARTITION WALLS

1. NON-LOAD BEARING CMU PARTITION WALLS ARE NOT SHOWN ON STRUCTURAL PLANS.
2. REFER TO ARCHITECTURAL DRAWINGS FOR ALL WALL LOCATIONS & DIMENSIONS.
3. PROVIDE HORIZONTAL JOINT REINFORCING, (2) LONGITUDINAL W1.7 WIRES AT 16"OC VERTICALLY.
4. PROVIDE 8" HIGH BOND BEAM w/ 2- #5 x CONT AT TOP OF WALLS AND AT FLOOR LINES FOR MULTI-STORY WALLS. SEE DETAIL 6/S502 FOR TOP OF WALL STABILITY CONNECTIONS.
5. CELLS DO NOT REQUIRE GROUT EXCEPT AT BOND BEAM LINTEL BEARING LOCATIONS.
6. AT PARTITION WALL MASONRY OPENINGS (M.O.), PROVIDE THE FOLLOWING MASONRY BOND BEAMS:
   M.O. < 6' 8" HIGH w/ 2- #5 8" BRG EACH END, GROUT 2 CELL COURSES SOLID BENEATH
   6' < M.O. < 10' 16" HIGH w/ 2- #5 8" BRG EACH END, GROUT CELL SOLID FULL HEIGHT
   SHORE LINTELS UNTIL GROUT HAS FULLY CURED.
7. SEE CMU WALL CONSTRUCTION NOTES FOR GROUT STRENGTH.
8. NON-LOAD BEARING PARTITION WALLS MAY BE PLACED DIRECTLY ON UNTHICKENED SLAB ON GRADE.

CONCRETE REINFORCING NOTES

1. REINFORCING SHALL BE DETAILED IN ACCORDANCE WITH ACI 315 (CURRENT EDITION). ARRANGEMENT AND BENDING OF REINFORCING STEEL SHALL BE IN ACCORDANCE WITH ACI DETAILING MANUAL (ACI SP-66), LATEST EDITION.
2. ALL LAPS SHALL BE CLASS "B" PER ACI 318 UNLESS OTHERWISE NOTED ON THE DESIGN DRAWINGS, OR UNLESS THE DETAILER TAKES SPECIAL CARE TO PROVIDE STAGGERED LAPS. USE TOP BAR LAP LENGTHS FOR ALL HORIZONTAL WALL BARS AND FOR TOP BARS IN SLABS AND BEAMS OVER 12" DEEP.
3. LAP LENGTH SHALL BE SPECIFICALLY NOTED ON PLACING DRAWINGS WHERE MORE THAN ONE BAR MAKES UP A CONTINUOUS STRING.
4. CORNER BARS WITH CLASS "B" PER ACI 318 LAPS SHALL BE PROVIDED AT ALL WALL CORNERS AND INTERSECTIONS.
5. HORIZONTAL BARS, EXCEPT FOR CONTINUOUS STRINGS FROM ONE CORNER OF OPENING TO ANOTHER, SHALL BE DETAILED TO SHOW THE DISTANCE FROM AT LEAST ONE END OF THE BAR TO THE NEAREST BUILDING GRID LINE OR WALL.
6. WELDED WIRE FABRIC SHALL BE LAPPED AND/OR ANCHORED TO DEVELOP Fy PER ACI 315.



7. PROVIDE MINIMUM COVER PER ACI 318, 7.7.1 (AS SHOWN ON THIS SHEET)
8. ARRANGEMENT AND BENDING OF REINFORCING STEEL SHALL BE IN ACCORDANCE WITH ACI DETAILING MANUAL (ACI SP-66), LATEST EDITION.
9. ALL HOOKS IN STEEL REINFORCING SHALL BE ACI STANDARD HOOKS, UNLESS NOTED OTHERWISE IN CONSTRUCTION DOCUMENTS.
10. WIRE SPACERS, CHAIRS, TIES, ETC., FOR SUPPORT OF STEEL REINFORCING SHALL BE PROVIDED BY THE CONTRACTOR TO ENSURE REINFORCING IS PLACED IN THE PROPER POSITION DURING CONCRETE PLACEMENT.
11. STEEL REINFORCING SPLICES OF ADJACENT BARS SHALL BE STAGGERED SUCH THAT SPLICES ARE 4 FEET APART, MINIMUM.
12. WELDING OF STEEL REINFORCING IS NOT PERMITTED.

STRUCTURAL STEEL NOTES

1. FABRICATION AND ERECTION OF STRUCTURAL STEEL SHALL CONFORM WITH THE AISC (AMERICAN INSTITUTE OF STEEL CONSTRUCTION), "MANUAL OF STEEL CONSTRUCTION", LATEST EDITION.
2. ALL STEEL DETAILS AND CONNECTIONS SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE AISC "SPECIFICATIONS FOR STRUCTURAL STEEL BUILDINGS, ALLOWABLE STRESS DESIGN AND PLASTIC DESIGN", LATEST EDITION.
3. FABRICATORS SHALL DESIGN CONNECTIONS NOT SPECIFICALLY DETAILED ON PLANS AS FOLLOWS:
   A. GENERAL: MEMBERS REQUIRING END MOMENT CONNECTIONS SHALL MEET THE REQUIREMENTS OF TYPE 1 "RIGID FRAME" CONSTRUCTION INCLUDING FRICTION BOLTS IF UTILIZED. ALL OTHER MEMBERS SHALL FOLLOW THE REQUIREMENTS OF TYPE 2 "SIMPLE" CONSTRUCTION.
   B. MEMBER SHEAR CONNECTIONS: UNLESS A LARGER END VERTICAL REACTION IS SHOWN OTHERWISE ON THE DRAWINGS (IE R = 85k), MINIMUM DESIGN SHEAR FORCES SHALL BE AS FOLLOWS:
      I. NON-COMPOSITE BEAMS: SUPPORT A REACTION "R" EQUAL TO ONE HALF THE TOTAL UNIFORM LOAD CAPACITY FROM THE TABLE OF UNIFORM LOAD CONSTANTS IN THE AISC MANUAL PART 2 FOR GIVEN SHAPE, SPAN, AND GRADE OF STEEL.
4. USE A325N BOLTS UNLESS NOTED OTHERWISE.
5. SPLICES SHALL BE ALLOWED ONLY AT LOCATIONS SPECIFICALLY INDICATED ON THE STRUCTURAL DRAWINGS UNLESS APPROVED OTHERWISE BY THE ENGINEER.
6. OVERSIZED OR SLOTTED HOLES SHALL NOT BE USED FOR ANY CONNECTIONS UNLESS SPECIFICALLY INDICATED ON THE DRAWINGS OR APPROVED BY THE ENGINEER.
7. BEAM AND GIRDER CONNECTIONS SHALL BE AS NOTED ON PLANS AND IN DETAILS.
8. PROVIDE HOLES IN ALL STEEL AS REQUIRED TO PREVENT ANY ACCUMULATION OF WATER DURING ERECTION. ALL PENETRATIONS THROUGH MAIN MEMBERS SHALL NOT EXCEED 1 1/2" IN DIAMETER AND SHALL BE GROUND SMOOTH.
9. CUTS, HOLES, COPING, ETC. REQUIRED FOR WORK OF OTHER TRADES SHALL BE SHOWN ON THE SHOP DRAWINGS AND MADE IN THE SHOP. CUTS OR BURNING OF HOLES IN STRUCTURAL STEEL MEMBERS IN THE FIELD WILL NOT BE PERMITTED.
10. PROVIDE ANY NECESSARY TEMPORARY BRACING OR GUYS TO PROVIDE LATERAL SUPPORT OF THE BUILDING UNTIL PERMANENT FRAME IS COMPLETELY INSTALLED.
11. STRUCTURAL STEEL FRAMING SHALL BE TRUE AND PLUMB BEFORE CONNECTIONS ARE FINALLY BOLTED OR WELDED.

COLD-FORMED METAL MATERIAL NOTES

1. ALL COLD-FORMED METAL FRAMING SHALL CONFORM TO:
   PAINTED SECTIONS: 10, 12, 14 & 16 GA - A570 Fy=50,000 PSI
   PAINTED SECTIONS: 18 & 20 GA - A611 GD C Fy=33,000 PSI
   GALVANIZED SECTIONS: 10, 12, 14 & 16 GA - A446 GD D Fy=50,000 PSI
   GALVANIZED SECTIONS: 18 & 20 GA - A446 GD A Fy=33,000 PSI
2. REFER TO PLANS AND DETAILS FOR GAUGE AND SIZE REQUIREMENTS OF COLD-FORMED METAL FRAMING MEMBERS.
3. ALL FRAMING PRODUCTS SHALL BE FORMED FROM STEEL POSSESSING A COATING CORRESPONDING TO THE MINIMUM REQUIREMENTS OF ASTM C955.
4. ALL SIDE CLIPS, SUPPORT CLIPS, AND CLIP ANGLES ARE 50 ksi, UNLESS NOTED OTHERWISE.
5. NOMENCLATURE: CONFORMS TO SSMA STANDARDS, PRODUCT TECHNICAL INFORMATION, PAGE 5 (www.SSMA.com), FOR "GENERIC" FRAMING MANUFACTURER.
6. GALVANIZING: ALL FRAMING TO BE GALVANIZED, G60 COATING MINIMUM, UNLESS NOTED OTHERWISE.
7. SUGGESTED WELD METAL AND PROCESS FOR SHOP WELDING ARE: 60 ksi WELD MATERIAL STRENGTH (MINIMUM). SUGGESTED METHODS FOR FIELD WELDING: 1/8" UNLESS NOTED OTHERWISE, E60XX (MINIMUM) ELECTRODE- SMAW - OR "GASLESS" MIG. MINIMUM WELD THROAT THICKNESS (t) MUST MATCH OR EXCEED THE BASE STEEL THICKNESS OF THE THINNEST CONNECTED PART UNLESS NOTED OTHERWISE.
8. ZINC RICH PAINT: FOR WELD TOUCH-UP USE PAINT 20 TYPE II ORGANIC ZINC RICH.
9. FASTENERS: SHALL BE CORROSION-RESISTANT CADMIUM OR ZINC PLATED SCREWS, NUTS, BOLTS, WASHERS AND OTHER FASTENERS.
10. UNLESS NOTED OTHERWISE, REFER TO LITERATURE PUBLISHED BY HILTI FASTENING SYSTEMS, INC. FOR EXPANSION BOLT, OR POWDER ACTUATED FASTENER (P.A.F.) INFORMATION, AND ITW BUILDEX, INC. FOR TEKS SCREW DATA. ALTERNATE MANUFACTURER'S FASTENERS OF COMPARABLE SPECIFICATIONS AND LOAD CAPACITIES ARE ACCEPTABLE WITH APPROVAL. ALL FASTENER'S SUBJECT TO TENSION SHALL HAVE 15MM (MINIMUM) DIAMETER STEEL WASHERS.

COLD-FORMED METAL FRAMING NOTES

1. HEADERS AND JAMBS AT OPENINGS MAY CONSIST OF BUILT-UP COLD-FORMED METAL SECTIONS OR HOT ROLLED STEEL SECTIONS (TUBES, ANGLES, ETC.) SOME CONDITIONS MAY NECESSITATE HOT-ROLLED STEEL SECTIONS, AND ARE TO BE SUPPLIED AND INSTALLED BY THE COLD-FORMED METAL CONTRACTOR.
2. MECHANICAL BRIDGING SHALL BE INSTALLED PRIOR TO THE ATTACHMENT OF FACING MATERIALS AND SHALL BE SECURED IN A MANNER TO PREVENT STUD ROTATION AND BE SPACED ACCORDING TO THE MANUFACTURER'S RECOMMENDATIONS. MAXIMUM SPACING SHALL BE 6'-0" ON CENTER FOR LATERALLY LOADED WALLS AND 4'-0" ON CENTER FOR AXIALLY LOADED WALLS.
3. PROVIDE WEB STIFFENERS AT HORIZONTAL AND VERTICAL REACTION POINTS.
4. PROVIDE ALL HORIZONTAL AND VERTICAL ATTACHMENT MECHANISMS WHERE REQUIRED.
5. PROVIDE JACK STUDS OR CRIPPLES BELOW WINDOW SILLS, AND ABOVE WINDOW AND DOOR HEADS. THESE SHALL BE SECURELY ATTACHED TO SUPPORTING MEMBERS.
6. ALL WELDING SHALL BE PERFORMED BY AWS D1.3 CERTIFIED WELDERS IN ACCORDANCE WITH THE PROVISIONS OF THE LATEST EDITION OF AWS D1.3, "SPECIFICATIONS FOR WELDING SHEET STEEL IN STRUCTURES."
7. TEMPORARY BRACING SHALL BE PROVIDED AND REMAIN IN PLACE UNTIL THE STRUCTURE IS COMPLETELY STABILIZED. PRIOR TO ATTACHMENT OF WALL SHEATHING, PROVIDE TEMPORARY BRACING TO RESIST BUCKLING OF LOAD-BEARING STUDS, TEMPORARY X-BRACING TO RESIST LATERAL WIND AND SEISMIC LOADS AND ANY OTHER TEMPORARY BRACING DEEMED NECESSARY DURING CONSTRUCTION. TEMPORARY BRACING IS THE RESPONSIBILITY OF THE COLD-FORMED METAL INSTALLER.
8. ALL FIELD CUTTING OF STUDS MUST BE DONE BY SAWING OR SHEARING. TORCH CUTTING OF COLD-FORMED MEMBERS IS UNACCEPTABLE.
9. STUDS SHALL NOT DEVIATE FROM PLUMB, LEVEL AND TRUE TO LINE OF 1/8" IN 10'-0" OR IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.

COLD-FORMED METAL PRODUCT IDENTIFICATION

PRODUCT GEOMETRIES MUST MEET OR EXCEED THE MINIMUM PROPOSED BY THE STEEL STUD MANUFACTURERS ASSOCIATION FOR INDUSTRY STANDARDIZATION. FOR SSMA DESIGNATIONS SEETABLES BELOW.

MEMBER SECTION TABLE

SECTION	SSMA IDENTIFICATION	FLANGE WIDTH
S-SECTIONS (STUDS)	S137	1 3/8"
	S162	1 5/8"
	S200	2"
	S250	2 1/2"
T-SECTIONS (TRACKS)	T125	1 1/4"
	T200	2"

MEMBER THICKNESS TABLE

MILS	GAUGE	MINIMUM DELIVERED THICKNESS	DESIGN THICKNESS
33	20	0.0329"	0.0346"
43	18	0.0428"	0.0451"
54	16	0.0538"	0.0566"
68	14	0.0677"	0.0713"
97	12	0.0966"	0.1017"
118	10	0.1180"	0.1242"

MEMBER DEPTH (WEB SIZE) TABLE

SSMA IDENTIFICATION	MEMBER DEPTH
600	6"
362	3 5/8"
800	8"
1000	10"

SSMA PRODUCT IDENTIFICATION
800S162-43 (50ksi)
DEPTH
SHAPE
FLANGE WIDTH
MIL THICKNESS
YIELD STRENGTH (IF GREATER THAN 33ksi)

dfgfdg

WOOD FRAMING NOTES

1. ARCHITECT & CONTRACTOR SHALL DETAIL & CONSTRUCT BUILDING FINISHES TO ACCOMMODATE AN EXPECTED BUILDING SHRINKAGE OF APPROXIMATELY 3/16" TO 3/8" PER FLOOR OF WOOD CONSTRUCTION. PROPER CARE SHALL BE TAKEN TO PREVENT STORED & INSTALLED LUMBER FROM THE ELEMENTS. DO NOT ALLOW LUMBER TO REST IN STANDING WATER.
2. FRAMING MEMBERS:
   VERTICAL MEMBERS: SEE BEARING WALL SCHEDULE, KILN DRIED, MOISTURE CONTENT SHALL BE BETWEEN 15% AND 19%
   JOISTS: 2x NO. 1 / NO. 2 SPF U.N.O. SIZE & SPACING PER PLANS
   JOISTS (EXPOSED TO WEATHER): 2x NO. 1 / NO.2 TREATED SOUTHERN YELLOW PINE U.N.O. SIZE & SPACING PER PLANS.
   POSTS: SEE FRAMING PLANS & POST SCHEDULE
3. TOP & BOTTOM PLATES OF STUD WALLS SHALL BE AS INDICATED IN THE BEARING WALL SCHEDULE.
4. FLOOR SHEATHING SHALL BE 3/4" APA RATED, T&G SHEATHING, GLUED & NAILED TO FLOOR FRAMING w/ 8d RING SHANK NAILS @ 6" O.C. ALONG EDGES AND 12" O.C. ALONG INTERMEDIATE MEMBERS. STAGGER PANEL EDGES.
5. ROOF SHEATHING SHALL BE 3/4" T&G APA RATED SHEATHING ATTACHED TO THE ROOF FRAMING MEMBERS w/ 8d RING SHANK NAILS @ 6" O.C. ALONG EDGES AND 12" O.C. ALONG INTERMEDIATE MEMBERS. STAGGER PANEL EDGES. (1" MIN. EMBED. INTO FRAMING MEMBER).
6. EXTERIOR WALLS SHALL BE SHEATHED w/ 7/16" APA RATED SHEATHING. ATTACH DIRECTLY TO THE OUTSIDE FACE OF EXTERIOR STUD WALLS WITH 8d COMMON OR BOX NAILS @ 6"O.C. ALONG EDGES AND 12" O.C. ALONG INTERMEDIATE MEMBERS. U.N.O.
7. ALL INTERIOR LOAD BEARING WALLS NOT SPECIFICALLY DESIGNATED AS A SHEAR WALL, SHALL BE CONSTRUCTED WITH A MINIMUM OF 1 LAYER 5/8" GYPSUM BOARD ATTACHED W/ 6d COOLER NAILS @ 8" O.C. ALONG EDGES & 12" O.C. AT INTERMEDIATE MEMBERS, U.N.O. SEE ARCHITECTURAL DRAWINGS FOR NON-LOAD BEARING WALL CONFIGURATIONS.
8. COORDINATE WALL STUD LOCATIONS TO ALIGN WITH TRUSS BEARING LOCATIONS @ ALL WALLS.
9. PROVIDE EQUIVALENT SIZE SOLID BLOCKING & VERTICAL MEMBERS THROUGH UNDERLYING FLOORS/WALLS BELOW MULTIPLE MEMBERS OR POSTS CARRYING CONCENTRATED LOADS.
10. COLUMN SIZES SHOWN ARE MINIMUM. CONTRACTOR MAY USE LARGER SECTION IF REQUIRED TO FULLY SUPPORT MEMBERS. LARGER COLUMNS MUST FIT INTO WALLS THEY ARE INTENDED TO FIT IN.
11. AS A MINIMUM, ALL CONNECTIONS SHALL CONFORM TO IBC 2009 TABLE 2304.9.1 FASTENING SCHEDULE (SEE SHEET S002 FOR SCHEDULE). DRAWING DETAILS SHALL GOVERN IF THEIR CONNECTION CAPACITY IS GREATER THAN THOSE SPECIFIED IN TABLE 2304.9.1.
12. WHERE BUILT-UP/MULTI-PLY BEAMS AND HEADERS OF DIMENSIONAL LUMBER OR LVL MATERIAL ARE INDICATED, SEE DETAIL 2/S5.0 FOR SIDE LOADED MEMBERS AND SEE DETAIL 4/S500 FOR TOP LOADED MEMBERS FOR MINIMUM FASTENING REQUIREMENTS. ALSO SEE MANUFACTURER'S MINIMUM FASTENING REQUIREMENTS.
13. WHERE BUILT-UP/MULTI-PLY POSTS AND COLUMNS ARE INDICATED, FASTENING SHALL BE IN ACCORDANCE WITH NATIONAL DESIGN SPECIFICATION SECTION 15.3.3.
14. USE JOIST HANGERS DESIGNED FOR GIVEN MEMBER SIZE TO SUPPORT ALL JOISTS/HEADERS FRAMING INTO SIDES OF OTHER MEMBERS.
15. PROVIDE CROSS BRIDGING/BLOCKING BETWEEN FLOOR JOISTS PER NATIONAL DESIGN SPECIFICATION 4.4.1.
16. DO NOT CUT, NOTCH, OR DRILL HOLES IN LVL OR PSL BEAMS OR JOISTS WITHOUT ENGINEER APPROVAL. AT ENGINEERED APPROVED LOCATIONS, SEE DETAIL 4/S5.0 FOR LIMITS ON FIELD CUT HOLES IN LVL HEADERS AND BEAMS. VERIFY WITH MANUFACTURER'S REQUIREMENTS.
17. SEE SHEET S5.0 FOR DETAILS NOT CUT ON PLAN.
18. COORDINATE WALL & FACE BRICK DIMENSIONS W/ ARCHITECTURAL DRAWINGS.

ROOF & FLOOR TRUSS BRACING NOTES

1. ALL BRACING SHOWN OR DESCRIBED SHALL BE MINIMUM 2x4 WITH 2- 16d IN EVERY TRUSS IT CROSSES.
2. ALL TRUSS TOP CHORDS SHALL BE CONTINUOUSLY BRACED BY THE ROOF OR FLOOR DECKING.
3. ALL TRUSS WEB MEMBERS SHALL BE BRACED @ 4'-0" O.C. UNLESS CALCULATIONS SHOW OTHERWISE.
4. ALL ROOF TRUSS HORIZONTAL BRACING SHALL BE STIFFENED @ 20'-0" O.C. WITH EITHER:
   a. DIAGONAL BRACING EXTENDED TO A SHEAR WALL PARALLEL TO THE ORIGINAL BRACING. SEE BRACING DETAILS 3/S600 FIG. 1(a)-1(d).
   b. 1/2" APA RATED SHEATHING EXTENDED TO ROOF DECK OR SHEAR WALL.
5. ALL TRUSS BOTTOM CHORDS SHALL BE BRACED @ 6'-0" O.C. UNLESS CALCULATIONS SHOW OTHERWISE. CONTINUOUS SHEETING APPLIED TO BOTTOM CHORD WILL SATISFY THIS BRACING REQUIREMENT.

ROOF & FLOOR TRUSS SUBMITTAL NOTES

NOTE: TRUSS MANUFACTURER MAY NOT DEVIATE FROM THE FRAMING PLANS UNLESS PRIOR APPROVAL FROM THE STRUCTURAL ENGINEER HAS BEEN GIVEN. IT IS THE TRUSS MANUFACTURER'S RESPONSIBILITY TO SEEK SUCH APPROVAL PRIOR TO MANUFACTURE AND INSTALLATION OF FRAMING MEMBERS.

WOOD TRUSS SHOP DRAWINGS SHALL SHOW THE FOLLOWING INFO:

a. ERECTION PLAN: SHOWING DIMENSIONED LOCATIONS AND TRUSS IDENTIFICATION.
b. BEARING DETAILS: SHOWING BEARING LENGTH, WIDTH, AND DEPTH INDICATING CONFORMANCE TO DESIGN CALCULATIONS.
c. DESIGN LOADS: ALL DEAD AND LIVE LOADS SHALL BE SHOWN ON THE FRAMING PLAN OR TRUSS ELEVATION INDICATING CONFORMANCE TO TRUSS CALCULATIONS.
d. ALL PERMANENT BRACING: SHOW TOP CHORD, BOTTOM CHORD, & WEB MEMBER BRACING ON FRAMING PLAN AND TRUSS ELEVATION. SUPPLIER AND INSTALLER OF THIS BRACING SHALL ALSO BE INDICATED.
e. TRUSS DIMENSIONS: SHOW DEPTH, SPAN BEARING, HEIGHT, AND SLOPES AT ALL CRITICAL POINTS.
f. TRUSS DEFLECTIONS: SHOW LIVE LOAD AND TOTAL LOAD DEFLECTION BASED UPON DESIGN LOADS.
g. MEMBER DESIGN: INCLUDING WEB CONFIGURATION, MEMBER SIZE, GRADE OF LUMBER, FABRICATED SPLICES, AND MEMBER BRACING REQUIRED BY TRUSS DESIGN. MEMBER CONNECTIONS: DESIGN AND INDICATE ALL NECESSARY HARDWARE FOR PROPER
h. INSTALLATION OF TRUSSES INCLUDING, BUT NOT LIMITED TO, GIRDER PLY CONNECTIONS, TRUSS-TO-GIRDER CONNECTIONS, TIE-DOWNS, AND FIELD SPLICES. INTERIOR CONNECTIONS: DESIGN AND SHOW DETAIL OF WEB AND CHORD CONNECTIONS, INCLUDING CONNECTOR PLATE SIZES, CAPACITIES, AND BOLT SIZES.
i. ERECTION PLAN: SHOW SPACING AND LAYOUT OF ANY TEMPORARY BRACING REQUIRED FOR ERECTION.
j. STRUCTURAL DESIGN OF TRUSSES: SUBMIT COMPLETE TRUSS CALCULATIONS STAMPED AND SIGNED BY A PROFESSIONAL ENGINEER IN THE STATE OF WISCONSIN AND OBTAIN ALL
k. APPROVALS NECESSARY FOR CONFORMANCE TO BUILDING CODE. VERIFY SUBMITTAL AND APPROVAL BY SENDING A COPY TO THE BUILDING DESIGN PROFESSIONAL.
l. PROVIDE CONTRACTOR/INSTALLER WITH ALL DATA NECESSARY FOR PROPER INSTALLATION.

DESIGN NOTES

1. ROOF TRUSS DESIGNER TO VERIFY MINIMUM DESIGN LOADS.
2. DESIGN UPLIFT ON ROOF TRUSSES AS INDICATED IN THE DESIGN DATA. PROVIDE A TIE DOWN CLIP AT EACH TRUSS, AT EVERY POINT OF BEARING.
3. UNBALANCED SNOW LOAD SHALL BE TAKEN ON EITHER SIDE OF RIDGE AND SHALL BE CONSIDERED CUMULATIVE @ VALLEY LOCATIONS. APPLY DESIGN DRIFT LOADS TO ROOF TRUSSES WHERE REQUIRED BY THE APPLICABLE BUILDING CODE, CURRENT EDITION.

DEFLECTION LIMITS:

ROOF	LIVE LOAD	L/360
	TOTAL LOAD	L/240
FLOOR	LIVE LOAD	L/480
	TOTAL LOAD	L/240

LOADS:
SEE DRAWINGS FOR TRUSS LOADS

STRUCTURAL ABBREVIATIONS

ABBRV.	WORD OR PHRASE	ABBRV.	
@	AT	LL	LIVE LOAD
&	AND	LLH	LONG LEG HORIZONTAL
AB	ANCHOR BOLT	LLV	LONG LEG VERTICAL
ALT	ALTERNATE	LSL	LAMINATED STRAND LUMBER
APA	AMERICAN PLYWOOD ASSOC.	LVL	LAMINATED VENEER LUMBER
ARCH	ARCHITECT(URAL)	LW	LONG WAY
BC	BOTTOM CHORD	MFR	MANUFACTURER
BLDG	BUILDING	MAX	MAXIMUM
BLKG	BLOCKING	MECH	MECHANICAL
BM	BEAM	MIN	MINIMUM
BOT	BOTTOM	MISC	MISCELLANEOUS
BRG	BEARING	NIC	NOT IN CONTRACT
℄	CENTERLINE	NTS	NOT TO SCALE
CB	COLUMN BASE	OC	ON CENTER
CIP	CAST-IN-PLACE	O.F.	OUTSIDE FACE
CL	CENTERLINE	OPP	OPPOSITE
CLR	CLEAR	PARA	PARALLEL
CJ	CONTROL OR CONSTRUCTION JOINT	P/C	PRECAST CONCRETE
CMU	CONCRETE MASONRY UNIT	PCF	POUNDS PER CUBIC FOOT
COL	COLUMN	PERP	PERPENDICULAR
CONC	CONCRETE OR CONCENTRATED	℘	STEEL PLATE
CONT	CONTINUOUS	PLY	PLYWOOD
DBA	DECK BEARING ANGLE	PSI	POUNDS PER SQUARE INCH
DEFL	DEFLECTION	PSF	POUNDS PER SQUARE FOOT
DEMO	DEMOLITION	PSL	PARALLEL STRAND LUMBER
DFL	DOUGLAS FIR LARCH	P/T	POST TENSIONED CONCRETE
DIA (Ø)	DIAMETER	PT	PRESSURE TREATED
DIM	DIMENSION	REINF	REINFORCEMENT
DL	DEAD LOAD	REQD	REQUIRED
DTL	DETAIL	RTU	ROOF TOP UNIT
DWL	DOWEL	SCHD	SCHEDULE
DWG	DRAWING	SHT	SHEET
EA	EACH	SIM	SIMILAR
EF	EACH FACE	SMS	SHEET METAL SCREWS
EJ	EXPANSION JOINT	SOG	SLAB ON GRADE
EL	ELEVATION	SPEC	SPECIFICATION
EMBED	EMBEDMENT	SPF	SPRUCE-PINE-FIR
EOSL	EDGE OF SLAB	SQ	SQUARE
EOS	EDGE OF STEEL	SS	STAINLESS STEEL
EQ	EQUAL	STL	STEEL
EW	EACH WAY	STR	STRUCTURAL
EXIST	EXISTING	SW	SHORT WAY
EXP	EXPANSION	SYM	SYMMETRICAL
EXT	EXTERIOR	SYP	SOUTHERN YELLOW PINE
FD	FLOOR DRAIN	T&B	TOP AND BOTTOM
FND	FOUNDATION	TC	TOP CHORD
FF	FINISH FLOOR	T&G	TONGUE AND GROOVE
FIN	FINISH	TF	TOP OF FOOTING ELEVATION
FLR	FLOOR	TL	TOP OF LEDGE ELEVATION
FRMG	FRAMING	TOC	TOP OF CONCRETE ELEVATION
FTG	FOOTING	TOSL	TOP OF SLAB ELEVATION
GA	GAGE	TOS	TOP OF STRUCTURAL SLAB ELEVATION
GALV.	GALVANIZED	TP	TOP OF PIER ELEVATION
GB	GRADE BEAM	TPC	TOP OF PILE CAP
GC	GENERAL CONTRACTOR	TRANS	TRANSVERSE
GT	GIRDER TRUSS	TS	TUBE STEEL
GYP	GYPSUM	TW	TOP OF WALL ELEVATION
HORIZ	HORIZONTAL	TYP	TYPICAL
HIF	HORIZONTAL INSIDE FACE	UNO	UNLESS NOTED OTHERWISE
HOF	HORIZONTAL OUTSIDE FACE	VERT	VERTICAL
HSS	HOLLOW STRUCTURAL SECTION	VIF	VERTICAL INSIDE FACE
HT	HEIGHT	VOF	VERTICAL OUTSIDE FACE
HVAC	HEATING, VENTILATING & AIR COND.	w/	WITH
HWS	HEADED WELD STUD	WF	WIDE FLANGE
I.F.	INSIDE FACE	w/o	WITHOUT
INFO	INFORMATION	WP	WORKPOINT
JST	JOIST	WT	WEIGHT
KSI	KIPS PER SQUARE INCH	WWF	WELDED WIRE FABRIC
L	ANGLE	SLRS	SEISMIC LOAD RESISTING SYSTEM
		SMF	SPECIAL MOMENT FRAME
		SCBF	SPECIAL CONCENTRIC BRACED FRAME

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KEY PLAN

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ISSUED

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Issued for Plan Review	February 8, 2016
2 CB #1	December 7, 2017

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1/12/18

PROJECT TITLE
ROYSTER CROSSINGS LOT 2

521-523 GRAND OAK TRL, MADISON, WI

SHEET TITLE
STRUCTURAL NOTES

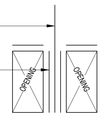
SHEET NUMBER
S-0.0

PROJECT NUMBER 1421

MASONRY WALL & PIER REINFORCEMENT SCHEDULE

MARK	SIZE / REINFORCEMENT	CONFIGURATION	REMARKS
1	8" CMU w/ #5 @ 32"OC	PROVIDE AS REINFORCING CENTERED IN WALLS EXCEPT WHERE OTHERWISE NOTED	NOTE 7
2	8" x 8" CMU PIER w/ 2 - #5 x CONT	BAR BETWEEN LINTEL BEARING & FOUNDATION	
3	8" x 24" CMU PIER w/ 6 - #5 x CONT FULL HEIGHT	6 - #5 BARS, FULL HEIGHT	
4	8" x 48" CMU PIER w/ 12 - #5 x CONT FULL HEIGHT	12 - #5 BARS, FULL HEIGHT	

MASONRY WALL & PIER REINFORCEMENT SCHEDULE NOTES:
1. PROVIDE MATCHING DOWELS w/ STANDARD 90° HOOK INTO FOUNDATION WALL FOR ALL REINFORCED WALLS & PIERS. LAP 48 BAR DIAMETERS w/ VERTICALS.
2. ALL REINFORCING SHALL EXTEND FULL HEIGHT, UNLESS NOTED OTHERWISE.
3. PROVIDE 1 - VERTICAL BAR AT CORNERS, AND ON EACH SIDE OF CONTROL JOINTS.
4. EXCEPT WHERE NOTED OTHERWISE, PROVIDE 1 - VERTICAL BAR IN THE CELL ADJACENT TO LINTEL BEARING AT ALL OPENINGS.
5. REFER TO ARCHITECTURAL DRAWINGS FOR ADDITIONAL GROUTING REQUIREMENTS.
6. 2 - #5 IN GROUTED CELLS ADJACENT TO LINTEL BEARING FROM FOUNDATION TO ROOF BEARING
   1 - #6 IN GROUTED CELL ADJACENT TO M.O. FROM FOUNDATION TO LINTEL BEARING
7. SEE SHEARWALL ELEVATIONS FOR ADDITIONAL CORNER BARS AND GROUT INFORMATION.



POINT LOAD SCHEDULE

MARK	SNOW LOAD (k)	LIVE LOAD (k)	DEAD LOAD (k)
PL-1	0.0	7.2	6.3
PL-2	0.0	14.4	12.6
PL-3	0.0	8.6	7.6
PL-4	1.5	3.3	3.3
PL-5	0.0	7.4	3.9
PL-6	0.0	2.8	2.6
PL-7	0.0	1.3	0.5
PL-8	2.3	4.3	5.7
PL-9	2.2	7.4	3.3

LINE LOAD SCHEDULE

MARK	SNOW LOAD (k/ft)	LIVE LOAD (k/ft)	DEAD LOAD (k/ft)
LL-1	0.8	2.0	1.3
LL-2	0.0	0.3	0.8
LL-3	0.0	1.9	1.7
LL-4	0.8	2.1	1.1
LL-5	0.8	0.8	1.1
LL-6	0.1	0.2	0.6
LL-7	0.1	1.7	0.6
LL-8	0.8	1.4	1.1
LL-9	0.2	2.4	0.4
LL-10	0.1	0.5	0.2
LL-11	0.5	4.2	1.1
LL-12	0.0	2.0	0.4
LL-13	0.1	0.5	0.2
LL-14	1.2	1.2	1.8
LL-15	1.0	0.0	0.8
LL-16	0.2	0.0	0.1
LL-17	0.3	1.0	0.8
LL-18	0.0	0.0	0.5

LINE LOAD SCHEDULE NOTE:
1. LIVE LOAD LINE LOAD INCLUDES BRICK LOAD AT BRICK WALL LOCATIONS.

PRECAST PLANK SCHEDULE

MARK	PLANK DEPTH	TOPPING	DEAD LOAD	LIVE LOAD	FIRE RATING	REMARKS
PC-1	8"	NONE	SELF WT + 20 psf	150 psf	2 HR	
PC-2	12"	NONE	SELF WT + 20 psf	150 psf	2 HR	
PC-3	8"	3"	SELF WT + 15 psf	100 psf	2 HR	
PC-4	12"	3"	SELF WT + 15 psf	100 psf	2 HR	
PC-5	8"	NONE	SELF WT + 20 psf	NOTE 5	3 HR	
PC-6	12"	NONE	SELF WT + 20 psf	NOTE 5	3 HR	
PC-7	8"	NONE	SELF WT + 60 psf	NOTE 5	3 HR	NOTE 8
PC-8	12"	NONE	SELF WT + 60 psf	NOTE 5	3 HR	
PC-9	12"	NONE	SELF WT + 35 psf	30 psf	3 HR	
PC-11	12"	NONE	SELF WT + 30 psf	100 psf	3 HR	
PC-12	12"	NONE	SELF WT + 30 psf	NOTE 7	3 HR	
PC-13	12"	NONE	SELF WT + 100 psf	250 psf	2 HR	
PC-14	12"	NONE	SELF WT + 100 psf	NOTE 6	2 HR	

PRECAST PLANK SCHEDULE NOTES:
1. VERIFY FIRE RATING w/ ARCHITECTURAL.
2. ALL TOPPING (BONDED OR NON-BONDED) TO BE REINFORCED w/ 6x6 - W1.4xW1.4 WWF.
3. AT BONDED TOPPING AREAS THE SELF WT NOTED AS DEAD LOAD IS THE WEIGHT OF THE PLANK PLUS THE BONDED TOPPING.
4. IN ADDITION TO THE LOADS NOTED IN THE SCHEDULE, THE PLANK IS TO BE DESIGNED FOR LINE LOADS AND POINT LOADS FROM WOOD BEARING WALLS, POINT LOADS AND EXTERIOR CLADDING MATERIALS.
5. LIVE LOAD = 40 psf @ UNIT AREAS AND 80 psf AT CORRIDOR, 100 psf @ ELEVATOR LOBBY AREAS, 70 psf @ BALCONIES, 55 psf @ ROOF AREAS AND 100 psf @ EXTERIOR. SEE ARCHITECTURAL FOR LOCATIONS.
6. LIVE LOAD = 150 psf @ FLOOR AREA
   LIVE LOAD = 250 psf @ EXTERIOR AREA
7. LIVE LOAD = 100 psf @ FLOOR AREA
   LIVE LOAD = 75 psf @ ROOF AREA
8. 2 HOUR AT FIRST FLOOR. 3 HOUR AT SECOND FLOOR.

STRIP FOOTING SCHEDULE

MARK	WIDTH	THICKNESS	REINFORCING	REMARKS
W1	1'-4"	1'-0"	NONE	
W2	2'-0"	1'-0"	NONE	
W3	3'-0"	1'-0"	NONE	
WALL A	3'-0"	1'-0"	NONE	
WALL B	4'-4"	1'-0"	NONE	
WALL C	5'-6"	1'-0"	NONE	

SPREAD FOOTING SCHEDULE

MARK	WIDTH	LENGTH	THICKNESS	REINFORCING	REMARKS
F1	3'-6"	3'-6"	1'-0"	5 - #4	
F2	4'-6"	4'-6"	1'-3"	4 - #5 EW	
F3	7'-0"	7'-0"	1'-6"	7 - #6 EW	
F4	9'-0"	9'-0"	1'-11"	8 - #7 EW	
F4a	10'-0"	9'-0"	1'-11"	8 - #7 EW	
F5	10'-0"	10'-0"	2'-2"	8 - #8 EW	
F5a	11'-0"	10'-0"	2'-2"	8 - #8 EW	
F6	11'-6"	11'-6"	2'-5"	10 - #8 EW	
F6a	12'-6"	11'-6"	2'-5"	10 - #8 EW	
F7	12'-6"	12'-6"	2'-8"	12 - #8 EW	
F7a	13'-6"	12'-6"	2'-8"	12 - #8 EW	
F8	6'-0"	6'-0"	1'-5"	5 - #6 EW	
F9	13'-6"	13'-6"	2'-8"	13 - #8 EW TOP & BOTTOM	
F14070	14'-0"	7'-0"	1'-6"	10 - #7 EW	

STEEL COLUMN SCHEDULE

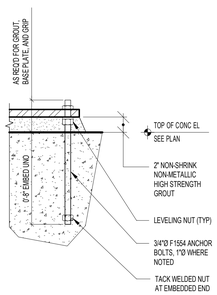
MARK	COLUMN SIZE	TYPE (SEE 1/S-0.1)	BASEPLATE SIZE	ANCHOR BOLTS	REMARKS
C1	HSS6x6x1/4	TYPE 1	3/4" x 14" x 1'-2"	4 - 3/4"Ø (8" EMBED)	
C1-A	HSS6x6x1/4	TYPE 2	3/4" x 6'-1/2" x 1'-2"	NOTE 1	
C2	HSS6x6x1/4	N/A	3/4" x 10" x 1'-0"	NOTE 1	
C3	HSS8x6x1/2	TYPE 1	3/4" x 7" x 1'-0"	4 - 3/4"Ø (8" EMBED)	
C4	HSS6x6x1/2	N/A	3/4" x 10" x 1'-0"	NOTE 1	
C5	HSS5x5x1/4	TYPE 1	3/4" x 14" x 1'-2"	4 - 3/4"Ø (8" EMBED)	

STEEL COLUMN SCHEDULE NOTES:
1. COLUMN SITS ON TOP PRECAST BEAM. SEE SECTION FOR INFORMATION.
2. COLUMN SITS ON TOP OF PRECAST BEAM. BOTTOM OF BASEPLATE IS FLUSH w/ TOP OF BEAM. SEE SECTION FOR INFORMATION.

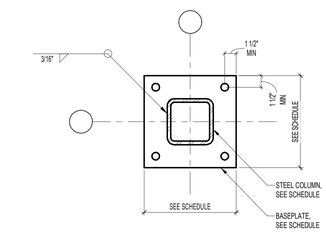
LINTEL SCHEDULE

MARK	SIZE	CONFIGURATION	REMARKS
L1	8"x8" CMU BOND BEAM w/ 2 - #5 x CONT	GROUT SOLID OVER OPENING WIDTH PLUS 8" EACH END	6" BEARING
L2	W16x45	EQUAL — INFILL FOLLOWING ERECTION	
L3	L8x4x1/2 (LLV)		

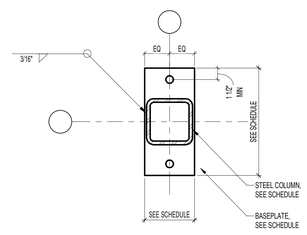
LINTEL SCHEDULE NOTES:
1. PROVIDE 8" MINIMUM BEARING FOR ALL LINTELS, UNO.
2. PROVIDE MINIMUM OF 3 COURSES SOLID GROUTED CMU BELOW LINTEL BEARING (UNLESS OTHERWISE NOTED). SEE MASONRY WALL SCHEDULE.
3. CENTER BEAMS WITHIN WIDTH OF BLOCK UNLESS NOTED OTHERWISE.
4. PROVIDE ADJUSTABLE MASONRY ANCHORS ON WEBS / FLANGES AT 32"OC. AND ON UNDERSIDE OF BOTTOM PLATE FOR LINTELS IN FUTURE OPENINGS.
5. PROVIDE HORIZONTAL REINFORCING IN THE JOINT ABOVE THE LINTEL, AND EXTEND 24" BEYOND EDGE OF OPENING.
6. REFER TO ARCHITECTURAL DRAWINGS FOR OPENING LOCATIONS, ELEVATIONS, & SIZES.
7. EXTEND BOTTOM PLATES FULL LENGTH.
8. SHORE ALL CMU LINTELS UNTIL GROUT HAS CURED.
9. BOTTOM PLATE TO BE 1" NARROWER THAN NOMINAL TOTAL WALL THICKNESS, UNLESS NOTED WHERE LINTEL BRG COINCIDES w/ IN-WALL PIER. WRAP ENDS OF STEEL LINTEL w/ BUILDING PAPER AND GROUT SOLID.
10. LOOSE BRICK LINTELS:
    OPENINGS 6'-0" AND SMALLER PROVIDE L3 1/2x3 1/2x5/16"
    OPENINGS LARGER THAN 6'-0" & LESS THAN 7'-6" PROVIDE L5x3 1/2x3/8" (LLV)
    OPENINGS LARGER THAN 7'-6" & LESS THAN 9'-0" PROVIDE L8x4x3/8" (LLV)
11. VERIFY LOOSE BRICK LINTEL HORIZONTAL LEG DIMENSION w/ ARCHITECTURAL DETAILS.



2 S-0.1 **ANCHOR BOLT DETAIL**



TYPE 1



TYPE 2

1 S-0.1 **BASE PLATE DETAIL**

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KEY PLAN

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PE PROJECT 15213

ISSUED

Issued for Bid	September 25, 2015
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3 Revision To Prevously Approved Plan	January 12, 2018
4 Revisions	May 11, 2018

WISCONSIN RICHARD C. PIERCE E-22511 WAUKESHA WI PROFESSIONAL ENGINEER 1/12/18

PROJECT TITLE
ROYSTER CROSSINGS LOT 2

521-523 GRAND OAK TRL, MADISON, WI

SHEET TITLE
STRUCTURAL SCHEDULES

SHEET NUMBER
S-0.1

PROJECT NUMBER 1421

CONCRETE PIER SCHEDULE

PIER MARK	SIZE	VERTICAL REINFORCEMENT	PIER TIES	DETAIL	DOWELS	REMARKS
P1	6"x18"	(4) #5	#3 AT 12" o/c	13/S3.2	(4) #5	
P2	16"x16"	(4) #5	#3 AT 12" o/c		(4) #5	
P3	18"x18"	(4) #7	#3 AT 12" o/c	9/S3.2	(4) #7	
P4	18"x22"	(4) #7	#3 AT 12" o/c	2/S3.2	(4) #7	
P5	18"x23"	(4) #7	#3 AT 12" o/c	13/S3.2	(4) #7	
P6	22"x24"	(4) #7	#3 AT 12" o/c	5/S3.2	(4) #7	
P7	22"x36"	(8) #7	#3 AT 12" o/c	8/S3.2	(8) #7	
P8	23"x23"	(4) #7	#3 AT 12" o/c	3/S3.2	(4) #7	
P9	23"x24"	(4) #7	#3 AT 12" o/c	3/S3.2	(4) #7	
P10	23"x37"	(8) #7	#3 AT 12" o/c	8/S3.2	(8) #7	
P11	23"x47"	(8) #7	#3 AT 12" o/c	6/S3.2	(8) #7	
P12	23"x49"	(8) #7	#3 AT 12" o/c	6/S3.2	(8) #7	
P13	23"x61"	(8) #7	#3 AT 12" o/c	10/S3.2	(8) #7	
P14	24"x24"	(4) #7	#3 AT 12" o/c	4/S3.2 & 9/S3.2	(4) #7	
P15	24"x48"	(8) #7	#3 AT 12" o/c	7/S3.2 & 8/S3.2	(8) #7	
P16	24"x49.5"	(8) #7	#3 AT 12" o/c	12/S3.2	(8) #7	
P17	25"x25"	(4) #7	#3 AT 12" o/c	3/S3.2	(4) #7	
P18	26"x49.5"	(8) #7	#3 AT 12" o/c	12/S3.2	(8) #7	
P19	26"x59.5"	(8) #7	#3 AT 12" o/c	12/S3.2	(8) #7	
P20	31"x49.5"	(8) #7	#3 AT 12" o/c	12/S3.2	(8) #7	
P21	26"x24"	(4) #7	#3 AT 12" o/c	9/S3.2	(4) #7	
P22	12"x16"	(4) #7	#3 AT 12" o/c	21/S3.2	(4) #7	

CONCRETE PIER SCHEDULE NOTES:
1. REFER TO PLAN FOR TOP OF CONCRETE PIER ELEVATION.
2. AT TOP OF CONCRETE PIER, PROVIDE (3) #3 TIES AT 3" o/c.
3. WHERE NO DOWELS ARE SHOWN FROM THE CONCRETE PIER TO THE CONCRETE FOOTING, EMBED VERTICAL PIER REINFORCEMENT TO BOTTOM OF FOOTING w/ 3" CONCRETE COVERAGE AND PROVIDE A STANDARD 90 DEGREE HOOK.
4. CENTER CONCRETE PIER BELOW COLUMN ABOVE UNLESS DETAILED OTHERWISE. LAP VERTICAL REINFORCEMENT 30 BAR DIAMETERS OR 24", WHICH EVER IS GREATER.

FOUNDATION PLAN KEYED NOTES

MARK	DESCRIPTION
A	PROVIDE CONCRETE WALL OPENING FOR DOOR. SEE ARCH FOR SIZE & LOCATION. REINFORCE DOOR HEAD PER 13/S-3.0. PROVIDE 2 - #5 x 4'-0" CORNER BARS AT CORNERS OF WALL OPENING.
B	PROVIDE CONCRETE WALL OPENING FOR DOOR. SEE ARCH FOR SIZE & LOCATION. REINFORCE DOOR HEAD PER 20/S-3.0. PROVIDE 2 - #5 x 4'-0" CORNER BARS AT CORNERS OF WALL OPENING.
C	8'x24" WITH 2 - #8 TOP AND BOTTOM AND #3 TIES AT 6"OC.
D	PROVIDE CONCRETE WALL OPENING. SEE ARCH FOR SIZE & LOCATION. REINFORCE HEADER PER 6/S-4.2.

STRIP FOOTING SCHEDULE

MARK	WIDTH	THICKNESS	REINFORCING	REMARKS
W1	1'-4"	1'-0"	NONE	
W2	2'-0"	1'-0"	NONE	
W3	3'-0"	1'-0"	NONE	
WALL A	3'-0"	1'-0"	NONE	
WALL B	4'-4"	1'-0"	NONE	
WALL C	5'-6"	1'-0"	NONE	

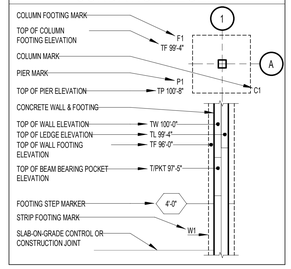
SPREAD FOOTING SCHEDULE

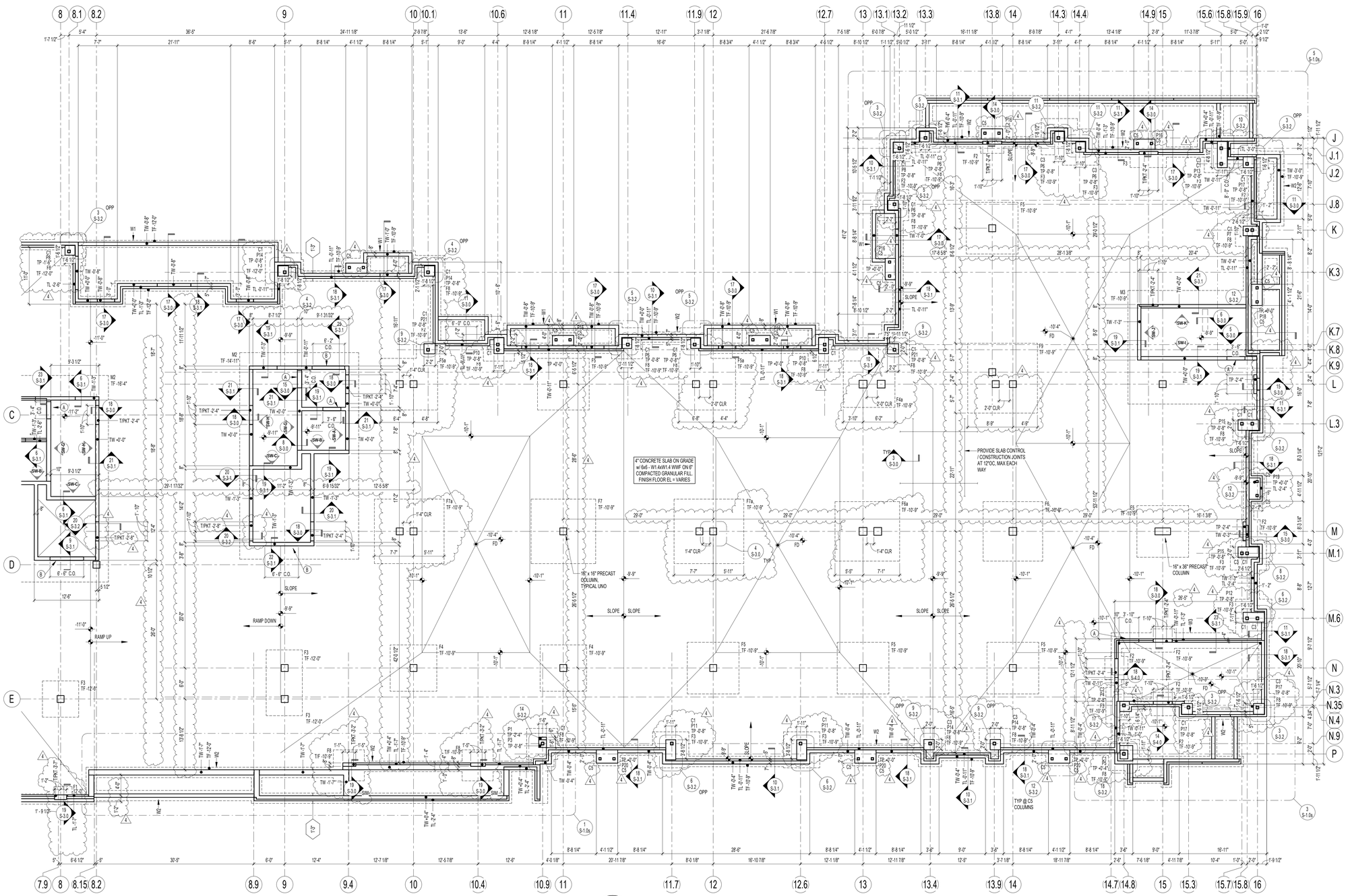
MARK	WIDTH	LENGTH	THICKNESS	REINFORCING	REMARKS
F1	3'-6"	3'-6"	1'-0"	5 - #4	
F2	4'-6"	4'-6"	1'-3"	4 - #5 EW	
F3	7'-0"	7'-0"	1'-6"	7 - #6 EW	
F4	9'-0"	9'-0"	1'-9 1/2"	8 - #7 EW	
F4a	10'-0"	9'-0"	1'-11"	8 - #7 EW	
F5	10'-0"	10'-0"	2'-2"	8 - #8 EW	
F5a	11'-0"	10'-0"	2'-2"	8 - #8 EW	
F6	11'-6"	11'-6"	2'-5"	10 - #8 EW	
F6a	12'-6"	11'-6"	2'-5"	10 - #8 EW	
F7	12'-6"	12'-6"	2'-8"	12 - #8 EW	
F7a	13'-6"	12'-6"	2'-8"	12 - #8 EW	
F8	6'-0"	6'-0"	1'-5"	5 - #6 EW	
F9	13'-6"	13'-6"	2'-8"	13 - #8 EW TOP & BOTTOM	
F14070	14'-0"	7'-0"	1'-6"	10 - #7 EW	
M1	29'-0"	18'-0"	1'-6"	#6 @ 12"OC EACH WAY TOP & BOTTOM	
M2	40'-0"	23'-0"	1'-6"	#6 @ 12"OC EACH WAY TOP & BOTTOM	
M3	30'-0"	22'-0"	1'-6"	#6 @ 12"OC EACH WAY TOP & BOTTOM	

FOUNDATION PLAN GENERAL NOTES

1. REFER TO SHEET S-0.1 FOR STRUCTURAL NOTES.
2. REFER TO SHEET S-0.2 FOR STRUCTURAL SCHEDULES.
3. REFER TO SHEET S-2.0 FOR SHEARWALL ELEVATIONS.
4. REFER TO S-3.0 FOR TYPICAL DETAILS THAT APPLY TO PLAN THAT ARE NOT NECESSARILY CUT AT ALL LOCATIONS.
5. REFERENCE FOUNDATION 0'-0" = SITE ELEVATION 867.5'. VERIFY w/ CIVIL DRAWINGS.

FOUNDATION LEGEND





1 S-1.0e FOUNDATION PLAN - EAST
SCALE: 1/8" = 1'-0"

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KEY PLAN

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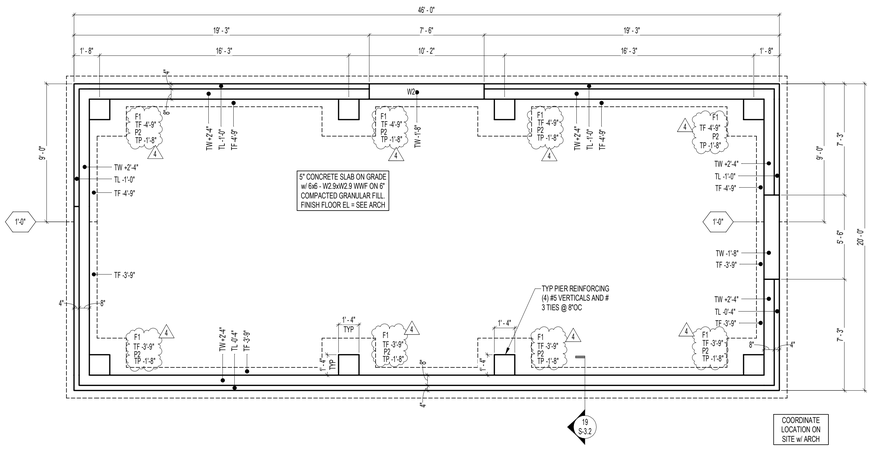
PROJECT TITLE
ROYSTER CROSSINGS LOT 2

521-523 GRAND OAK TRL, MADISON, WI

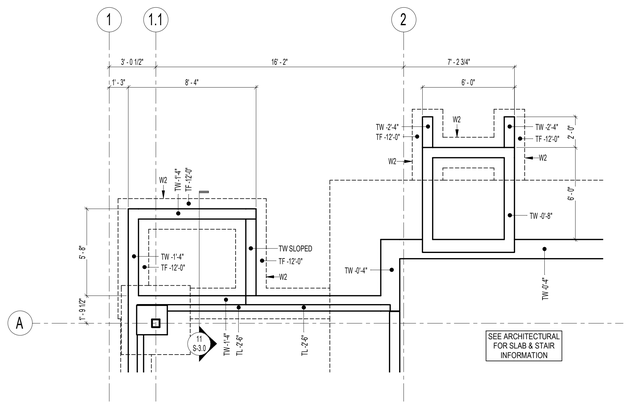
SHEET TITLE
FOUNDATION PLAN - EAST

SHEET NUMBER
S-1.0e

PROJECT NUMBER 1421

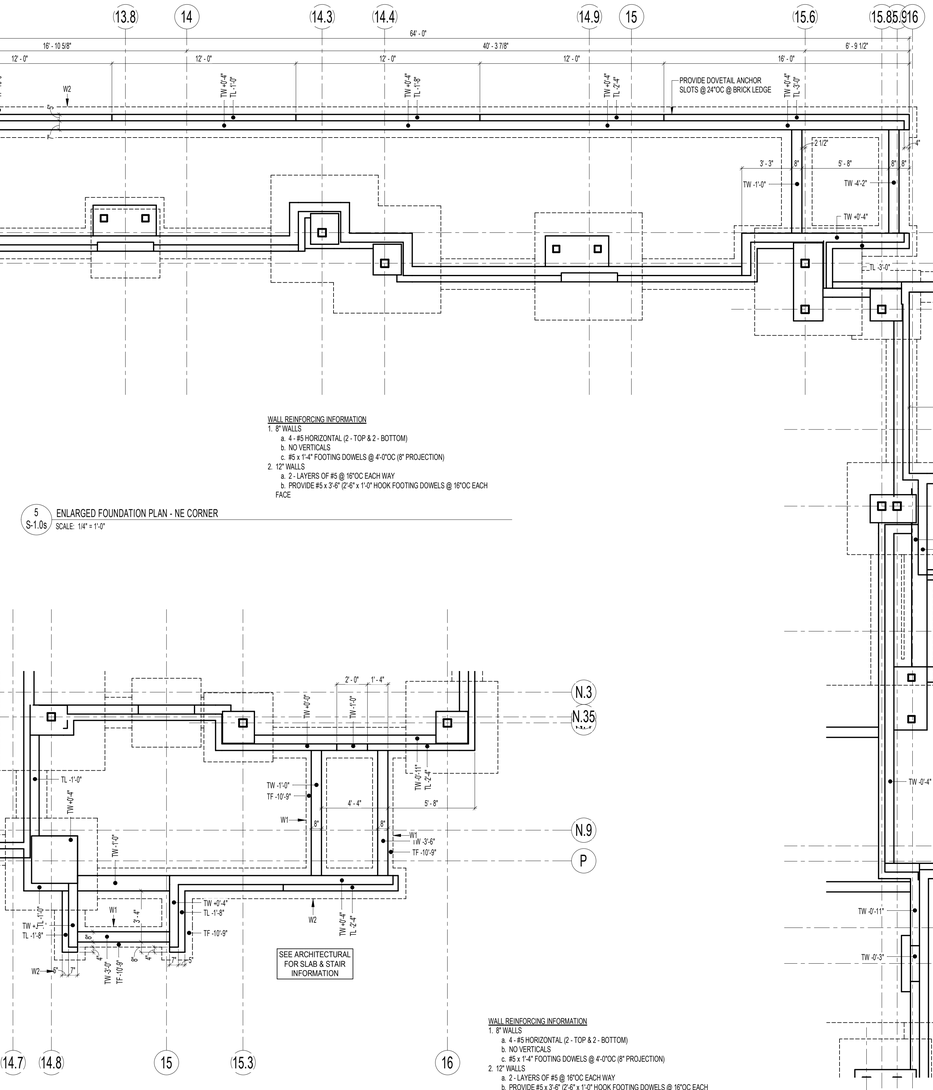


6 S-1.0s ENLARGED FOUNDATION PLAN - BIKE ENCLOSURE
SCALE: 1/4" = 1'-0"



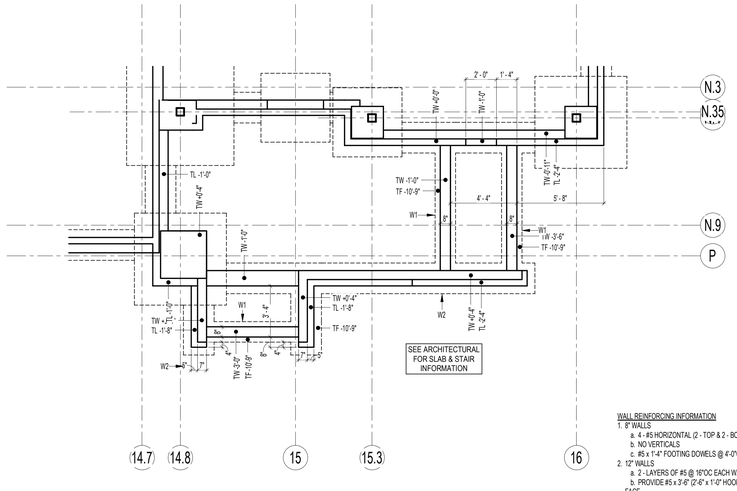
WALL REINFORCING INFORMATION
1. 2 - LAYERS OF #4 @ 16"OC EACH WAY
2. PROVIDE #4 x 3'-6" (2'-6" x 1'-0" HOOK) DOWELS @ 16"OC EACH FACE OF WALL.

4 S-1.0s ENLARGED FOUNDATION PLAN - NW CORNER
SCALE: 1/4" = 1'-0"



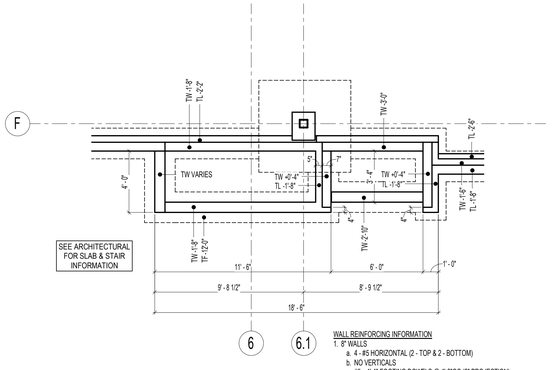
WALL REINFORCING INFORMATION
1. 8" WALLS
   a. 4 - #5 HORIZONTAL (2 - TOP & 2 - BOTTOM)
   b. NO VERTICALS
   c. #5 x 1'-4" FOOTING DOWELS @ 4'-0"OC (8" PROJECTION)
2. 12" WALLS
   a. 2 - LAYERS OF #5 @ 16"OC EACH WAY
   b. PROVIDE #5 x 3'-6" (2'-6" x 1'-0" HOOK FOOTING DOWELS @ 16"OC EACH FACE

5 S-1.0s ENLARGED FOUNDATION PLAN - NE CORNER
SCALE: 1/4" = 1'-0"



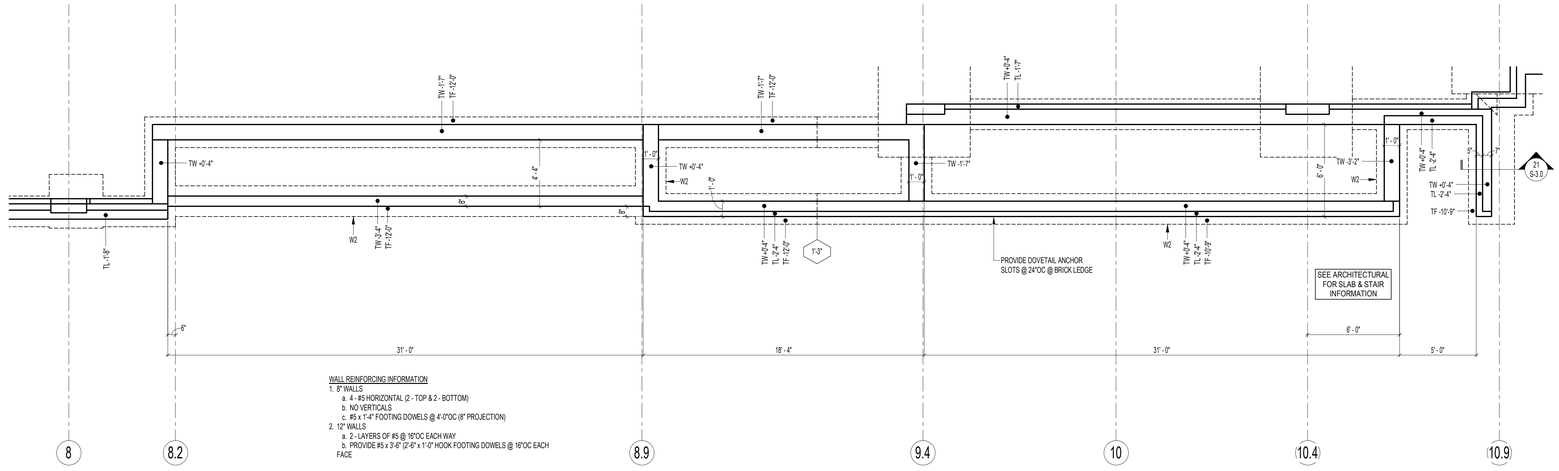
WALL REINFORCING INFORMATION
1. 8" WALLS
   a. 4 - #5 HORIZONTAL (2 - TOP & 2 - BOTTOM)
   b. NO VERTICALS
   c. #5 x 1'-4" FOOTING DOWELS @ 4'-0"OC (8" PROJECTION)
2. 12" WALLS
   a. 2 - LAYERS OF #5 @ 16"OC EACH WAY
   b. PROVIDE #5 x 3'-6" (2'-6" x 1'-0" HOOK FOOTING DOWELS @ 16"OC EACH FACE

3 S-1.0s ENLARGED FOUNDATION PLAN - SE CORNER
SCALE: 1/4" = 1'-0"



WALL REINFORCING INFORMATION
1. 8" WALLS
   a. 4 - #5 HORIZONTAL (2 - TOP & 2 - BOTTOM)
   b. NO VERTICALS
   c. #5 x 1'-4" FOOTING DOWELS @ 4'-0"OC (8" PROJECTION)
2. 12" WALLS
   a. 2 - LAYERS OF #5 @ 16"OC EACH WAY
   b. PROVIDE #5 x 3'-6" (2'-6" x 1'-0" HOOK FOOTING DOWELS @ 16"OC EACH FACE

2 S-1.0s ENLARGED PLAZA FOUNDATION PLAN
SCALE: 1/4" = 1'-0"



WALL REINFORCING INFORMATION
1. 8" WALLS
   a. 4 - #5 HORIZONTAL (2 - TOP & 2 - BOTTOM)
   b. NO VERTICALS
   c. #5 x 1'-4" FOOTING DOWELS @ 4'-0"OC (8" PROJECTION)
2. 12" WALLS
   a. 2 - LAYERS OF #5 @ 16"OC EACH WAY
   b. PROVIDE #5 x 3'-6" (2'-6" x 1'-0" HOOK FOOTING DOWELS @ 16"OC EACH FACE

1 S-1.0s ENLARGED PLAZA FOUNDATION PLAN
SCALE: 1/4" = 1'-0"

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KEY PLAN

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Phone: 608.256.7304 | Fax: 608.256.7306
PE PROJECT 15213

ISSUED

Issued for Bid	September 25, 2015
Revised Bid Set	January 19, 2016
Issued for Plan Review	February 8, 2016
4 Revised-Revisions	February 29, 2016 May 11, 2018

WISCONSIN RICHARD C. PIERCE E-22511 WAUKESHA WI PROFESSIONAL ENGINEER 11/9/18

PROJECT TITLE
ROYSTER CROSSINGS LOT 2

521-523 GRAND OAK TRL, MADISON, WI

SHEET TITLE
ENLARGED FOUNDATION PLANS

SHEET NUMBER
S-1.0s

PROJECT NUMBER 1421

CONCRETE PIER SCHEDULE

PIER MARK	SIZE	VERTICAL REINFORCEMENT	PIER TIES	DETAIL	DOWELS	REMARKS
P1	6"x18"	(4) #5	#3 AT 12" o/c	13/S3.2	(4) #5	
P2	16"x16"	(4) #5	#3 AT 12" o/c		(4) #5	
P3	18"x18"	(4) #7	#3 AT 12" o/c	9/S3.2	(4) #7	
P4	18"x22"	(4) #7	#3 AT 12" o/c	2/S3.2	(4) #7	
P5	18"x23"	(4) #7	#3 AT 12" o/c	13/S3.2	(4) #7	
P6	22"x24"	(4) #7	#3 AT 12" o/c	5/S3.2	(4) #7	
P7	22"x36"	(8) #7	#3 AT 12" o/c	8/S3.2	(8) #7	
P8	23"x23"	(4) #7	#3 AT 12" o/c	3/S3.2	(4) #7	
P9	23"x24"	(4) #7	#3 AT 12" o/c	3/S3.2	(4) #7	
P10	23"x37"	(8) #7	#3 AT 12" o/c	8/S3.2	(8) #7	
P11	23"x47"	(8) #7	#3 AT 12" o/c	6/S3.2	(8) #7	
P12	23"x49"	(8) #7	#3 AT 12" o/c	6/S3.2	(8) #7	
P13	23"x61"	(8) #7	#3 AT 12" o/c	10/S3.2	(8) #7	
P14	24"x24"	(4) #7	#3 AT 12" o/c	4/S3.2 & 9/S3.2	(4) #7	
P15	24"x48"	(8) #7	#3 AT 12" o/c	7/S3.2 & 8/S3.2	(8) #7	
P16	24"x49.5"	(8) #7	#3 AT 12" o/c	12/S3.2	(8) #7	
P17	25"x25"	(4) #7	#3 AT 12" o/c	3/S3.2	(4) #7	
P18	26"x49.5"	(8) #7	#3 AT 12" o/c	12/S3.2	(8) #7	
P19	26"x59.5"	(8) #7	#3 AT 12" o/c	12/S3.2	(8) #7	
P20	31"x49.5"	(8) #7	#3 AT 12" o/c	12/S3.2	(8) #7	
P21	26"x24"	(4) #7	#3 AT 12" o/c	9/S3.2	(4) #7	
P22	12"x16"	(4) #7	#3 AT 12" o/c	21/S3.2	(4) #7	

CONCRETE PIER SCHEDULE NOTES:
1. REFER TO PLAN FOR TOP OF CONCRETE PIER ELEVATION.
2. AT TOP OF CONCRETE PIER, PROVIDE (3) #3 TIES AT 3" o/c.
3. WHERE NO DOWELS ARE SHOWN FROM THE CONCRETE PIER TO THE CONCRETE FOOTING, EMBED VERTICAL PIER REINFORCEMENT TO BOTTOM OF FOOTING w/ 3" CONCRETE COVERAGE AND PROVIDE A STANDARD 90 DEGREE
4. HOOK.
5. CENTER CONCRETE PIER BELOW COLUMN ABOVE UNLESS DETAILED OTHERWISE. LAP VERTICAL REINFORCEMENT 30 BAR DIAMETERS OR 24", WHICH EVER IS GREATER.

4

FOUNDATION PLAN KEYED NOTES

MARK	DESCRIPTION
A	PROVIDE CONCRETE WALL OPENING FOR DOOR. SEE ARCH FOR SIZE & LOCATION. REINFORCE DOOR HEAD PER 13/S-3.0. PROVIDE 2 - #5 x 4'-0" CORNER BARS AT CORNERS OF WALL OPENING.
B	PROVIDE CONCRETE WALL OPENING FOR DOOR. SEE ARCH FOR SIZE & LOCATION. REINFORCE DOOR HEAD PER 20/S-3.0. PROVIDE 2 - #5 x 4'-0" CORNER BARS AT CORNERS OF WALL OPENING.
C	8"x24" WITH 2 - #8 TOP AND BOTTOM AND #3 TIES AT 6"OC.
D	PROVIDE CONCRETE WALL OPENING. SEE ARCH FOR SIZE & LOCATION. REINFORCE HEADER PER 6/S-4.2.

STRIP FOOTING SCHEDULE

MARK	WIDTH	THICKNESS	REINFORCING	REMARKS
W1	1'-4"	1'-0"	NONE	
W2	2'-0"	1'-0"	NONE	
W3	3'-0"	1'-0"	NONE	
WALL A	3'-0"	1'-0"	NONE	
WALL B	4'-4"	1'-0"	NONE	
WALL C	5'-6"	1'-0"	NONE	

SPREAD FOOTING SCHEDULE

MARK	WIDTH	LENGTH	THICKNESS	REINFORCING	REMARKS
F1	3'-6"	3'-6"	1'-0"	5 - #4	
F2	4'-6"	4'-6"	1'-3"	4 - #5 EW	
F3	7'-0"	7'-0"	1'-6"	7 - #6 EW	
F4	9'-0"	9'-0"	1'-11"	8 - #7 EW	
F4a	10'-0"	9'-0"	1'-11"	8 - #7 EW	
F5	10'-0"	10'-0"	2'-2"	8 - #8 EW	
F5a	11'-0"	10'-0"	2'-2"	8 - #8 EW	
F6	11'-6"	11'-6"	2'-5"	10 - #8 EW	
F6a	12'-6"	11'-6"	2'-5"	10 - #8 EW	
F7	12'-6"	12'-6"	2'-8"	12 - #8 EW	
F7a	13'-6"	12'-6"	2'-8"	12 - #8 EW	
F8	6'-0"	6'-0"	1'-5"	5 - #6 EW	
F9	13'-6"	13'-6"	2'-8"	13 - #8 EW TOP & BOTTOM	
F14070	14'-0"	7'-0"	1'-6"	10 - #7 EW	
M1	29'-0"	18'-0"	1'-6"	#6 @ 12"OC EACH WAY TOP & BOTTOM	
M2	40'-0"	23'-0"	1'-6"	#6 @ 12"OC EACH WAY TOP & BOTTOM	
M3	30'-0"	22'-0"	1'-6"	#6 @ 12"OC EACH WAY TOP & BOTTOM	

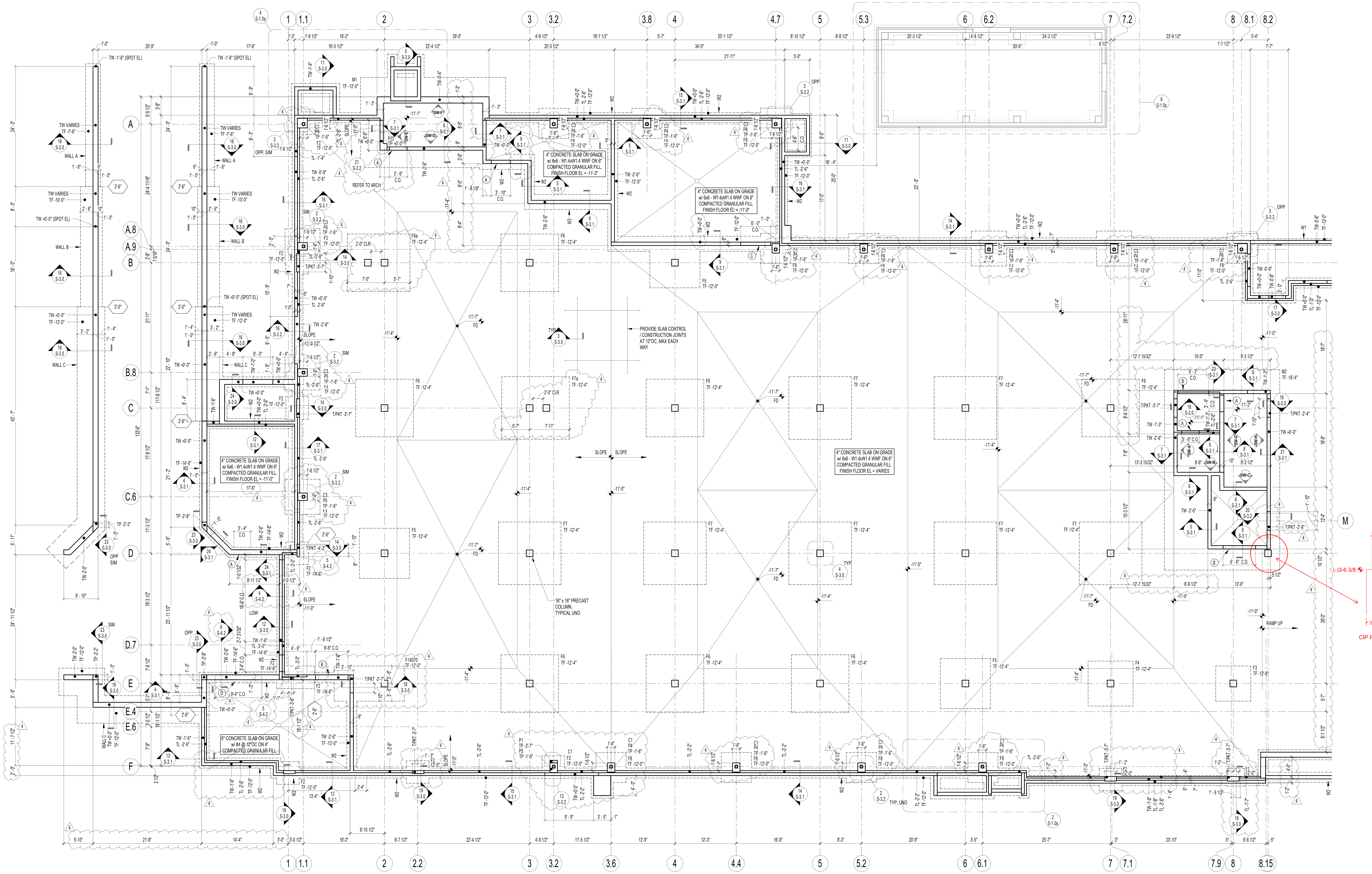
4

FOUNDATION PLAN GENERAL NOTES

1. REFER TO SHEET S-0.1 FOR STRUCTURAL NOTES.
2. REFER TO SHEET S-0.2 FOR STRUCTURAL SCHEDULES.
3. REFER TO SHEET S-2.0 FOR SHEARWALL ELEVATIONS.
4. REFER TO S-3.0 FOR TYPICAL DETAILS THAT APPLY TO PLAN THAT ARE NOT NECESSARILY CUT AT ALL LOCATIONS.
5. REFERENCE FOUNDATION 0'-0" = SITE ELEVATION 867.5'. VERIFY w/ CIVIL DRAWINGS.

FOUNDATION LEGEND

COLUMN FOOTING MARK — F1
TOP OF COLUMN FOOTING ELEVATION — TF 99'-4"
COLUMN MARK — C1
PIER MARK — P1
TOP OF PIER ELEVATION — TP 100'-8"
CONCRETE WALL & FOOTING
TOP OF WALL ELEVATION — TW 100'-0"
TOP OF LEDGE ELEVATION — TL 99'-4"
TOP OF WALL FOOTING ELEVATION — TF 96'-0"
TOP OF BEAM BEARING POCKET ELEVATION — T/PKT 97'-5"
FOOTING STEP MARKER — 4'-0"
STRIP FOOTING MARK — W1
SLAB-ON-GRADE CONTROL OR CONSTRUCTION JOINT



1 S-1.0w FOUNDATION PLAN - WEST
SCALE: 1/8" = 1'-0"

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PE PROJECT 15213

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	Issued for Plan Review	February 8, 2016
	Revised-	February 29, 2016
1	Implemented City's LOI Clarifications	August 7, 2017
2	CB #1	December 7, 2017
4	Revisions	May 11, 2018

WISCONSIN RICHARD C. PIERCE E-22511 WAUKESHA, WI PROFESSIONAL ENGINEER 7/12/18

PROJECT TITLE
ROYSTER CROSSINGS LOT 2

521-523 GRAND OAK TRL, MADISON, WI

SHEET TITLE
FOUNDATION PLAN - WEST

SHEET NUMBER
S-1.0w

PROJECT NUMBER 1421

FRAMING PLAN KEYED NOTES

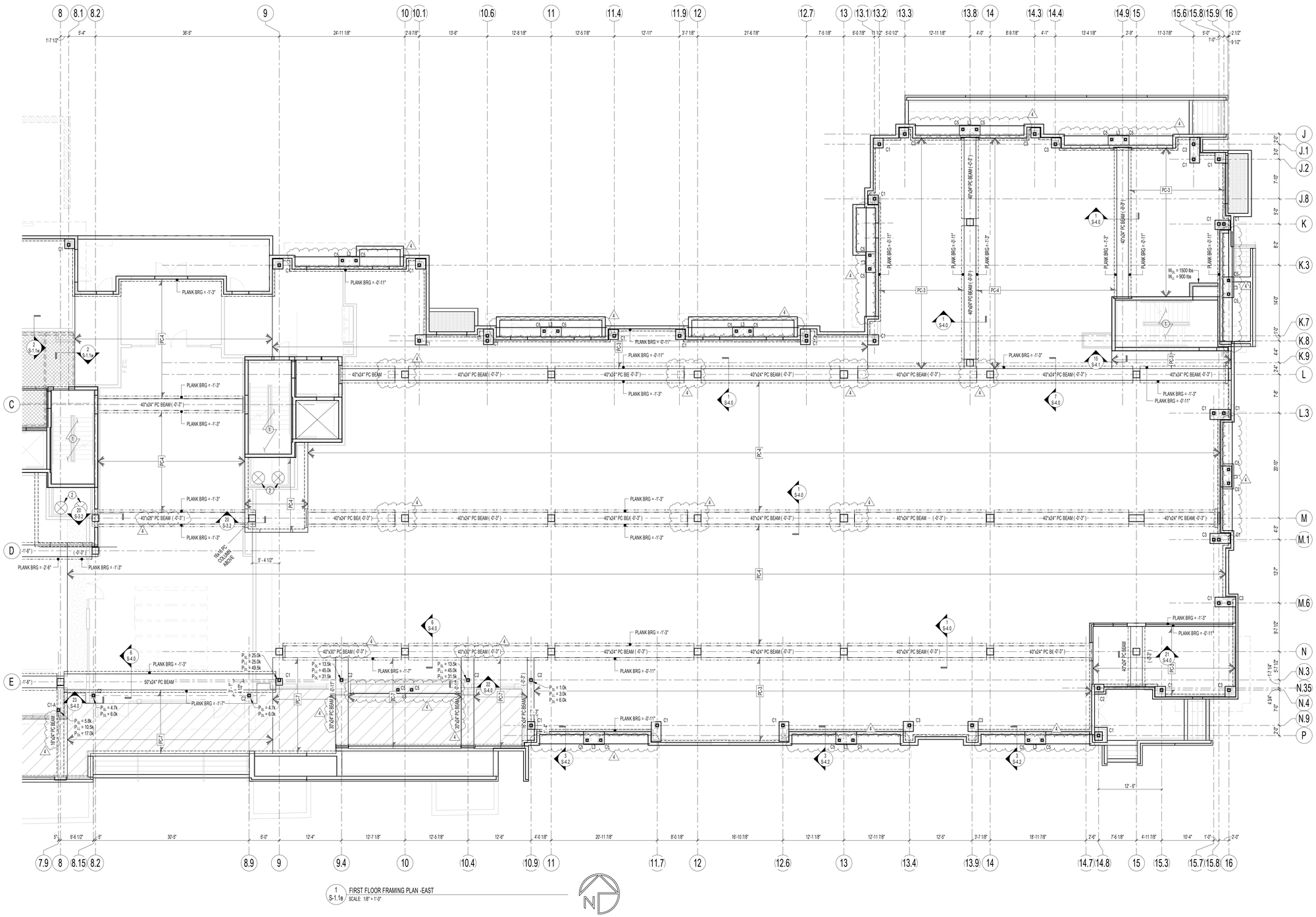
MARK	DESCRIPTION
1	STEEL-FRAMED STAIR w/ CONCRETE FILLED PANS DESIGNED AND SUPPLIED BY FABRICATOR FOR 100 psf IMPOSED LOAD. PROVIDE SOLID OR SOLID-GROUTED CMU AT STAIR CONNECTION POINTS. PROVIDE PIPE OR HSS SUPPORTS AT LANDINGS AT FABRICATOR'S OPTION.
2	OPENING FOR TRASH CHUTE, SEE ARCH FOR SIZE & LOCATION.
3	FLOOR OPENING FOR HVAC, COORDINATE SIZE & LOCATION w/ HVAC CONTRACTOR.
4	STEEL SADDLE @ OPENING BY PRECASTER, SEE 3/S-4.0.
5	3 1/2" CONCRETE TOPPING (2" ABOVE THE METAL DECK) w/ 6x6 - W1.4xW1.4 WWF ON 1 1/2x18GA GALVANIZED COMPOSITE FLOOR DECK.
6	DASHED WALLS INDICATE 362S162-43 AT 24"OC STUB WALLS FOR SUPPORT OF CONCRETE TOPPING ON METAL DECK FLOOR.
7	DASHED LINE INDICATED STRUCTURAL STEEL SUPPORT FRAMING TO SUPPORT EXTERIOR BRICK. REFER TO DETAILS FOR SIZES AND SPACING.
8	NOTCH IN BOTTOM OF PC BEAM WHERE PC BEARS ON STEEL BEAM. REFER TO PC AND STEEL BEAM ELEVATIONS TO DETERMINE DEPTH OF NOTCH. PC SUPPLIER/ENGINEER TO ACCOUNT FOR NOTCH IN BEAM DESIGN. SITE CAST MILDLY REINFORCED BEAM MAY BE USED IN PLACE OF PC AT GC'S OPTION.

PRECAST PLANK SCHEDULE

MARK	PLANK DEPTH	TOPPING	DEAD LOAD	LIVE LOAD	FIRE RATING	REMARKS
PC-1	8"	NONE	SELF WT + 20 psf	150 psf	2 HR	
PC-2	12"	NONE	SELF WT + 20 psf	150 psf	2 HR	
PC-3	8"	3"	SELF WT + 15 psf	100 psf	2 HR	
PC-4	12"	3"	SELF WT + 15 psf	100 psf	2 HR	
PC-5	8"	NONE	SELF WT + 20 psf	NOTE 5	3 HR	
PC-6	12"	NONE	SELF WT + 20 psf	NOTE 5	3 HR	
PC-7	8"	NONE	SELF WT + 60 psf	NOTE 5	3 HR	NOTE 8
PC-8	12"	NONE	SELF WT + 60 psf	NOTE 5	3 HR	
PC-9	12"	NONE	SELF WT + 35 psf	30 psf	3 HR	
PC-11	12"	NONE	SELF WT + 30 psf	100 psf	3 HR	
PC-12	12"	NONE	SELF WT + 30 psf	NOTE 7	3 HR	
PC-13	12"	NONE	SELF WT + 100 psf	250 psf	2 HR	
PC-14	12"	NONE	SELF WT + 100 psf	NOTE 6	2 HR	

PRECAST PLANK SCHEDULE NOTES:

1. VERIFY FIRE RATING w/ ARCHITECTURAL.
2. ALL TOPPING (BONDED OR NON-BONDED) TO BE REINFORCED w/ 6x6 - W1.4xW1.4 WWF.
3. AT BONDED TOPPING AREAS THE SELF WT NOTED AS DEAD LOAD IS THE WEIGHT OF THE PLANK PLUS THE BONDED TOPPING.
4. IN ADDITION TO THE LOADS NOTED IN THE SCHEDULE, THE PLANK IS TO BE DESIGNED FOR LINE LOADS AND POINT LOADS FROM WOOD BEARING WALLS, POINT LOADS AND EXTERIOR CLADDING MATERIALS.
5. LIVE LOAD = 40 psf @ UNIT AREAS AND 80 psf AT CORRIDOR. 100 psf @ ELEVATOR LOBBY AREAS. 70 psf @ BALCONIES. 55 psf @ ROOF AREAS AND 100 psf @ EXTERIOR. SEE ARCHITECTURAL FOR LOCATIONS.
6. LIVE LOAD = 150 psf @ FLOOR AREA
   LIVE LOAD = 250 psf @ EXTERIOR AREA
7. LIVE LOAD = 100 psf @ FLOOR AREA
   LIVE LOAD = 75 psf @ ROOF AREA
8. 2 HOUR AT FIRST FLOOR. 3 HOUR AT SECOND FLOOR.



1 S-1.1e FIRST FLOOR FRAMING PLAN - EAST
SCALE: 1/8" = 1'-0"

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KEY PLAN

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PE PROJECT 15213

ISSUED

Issued for Bid	September 25, 2015
Revised Bid Set	January 19, 2016
Issued for Plan Review	February 8, 2016
Revised-	February 29, 2016
2 CB #1	December 7, 2017
3 Revision To Prevously Approved Plan	January 12, 2018
4 Revisions	May 11, 2018

WISCONSIN RICHARD C. PIERCE E-22511 WAUKESHA, WI PROFESSIONAL ENGINEER 1/2/18

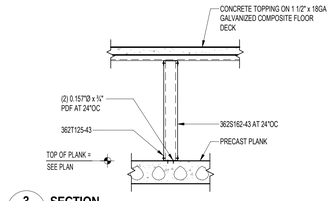
PROJECT TITLE
ROYSTER CROSSINGS LOT 2

521-523 GRAND OAK TRL, MADISON, WI

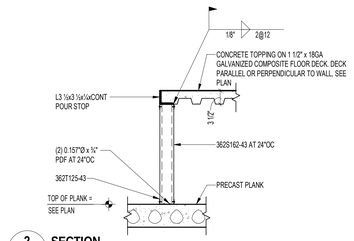
SHEET TITLE
FIRST FLOOR FRAMING PLAN - EAST

SHEET NUMBER
S-1.1e

PROJECT NUMBER 1421



3 SECTION S-1.1w



2 SECTION S-1.1w

FRAMING PLAN KEYED NOTES

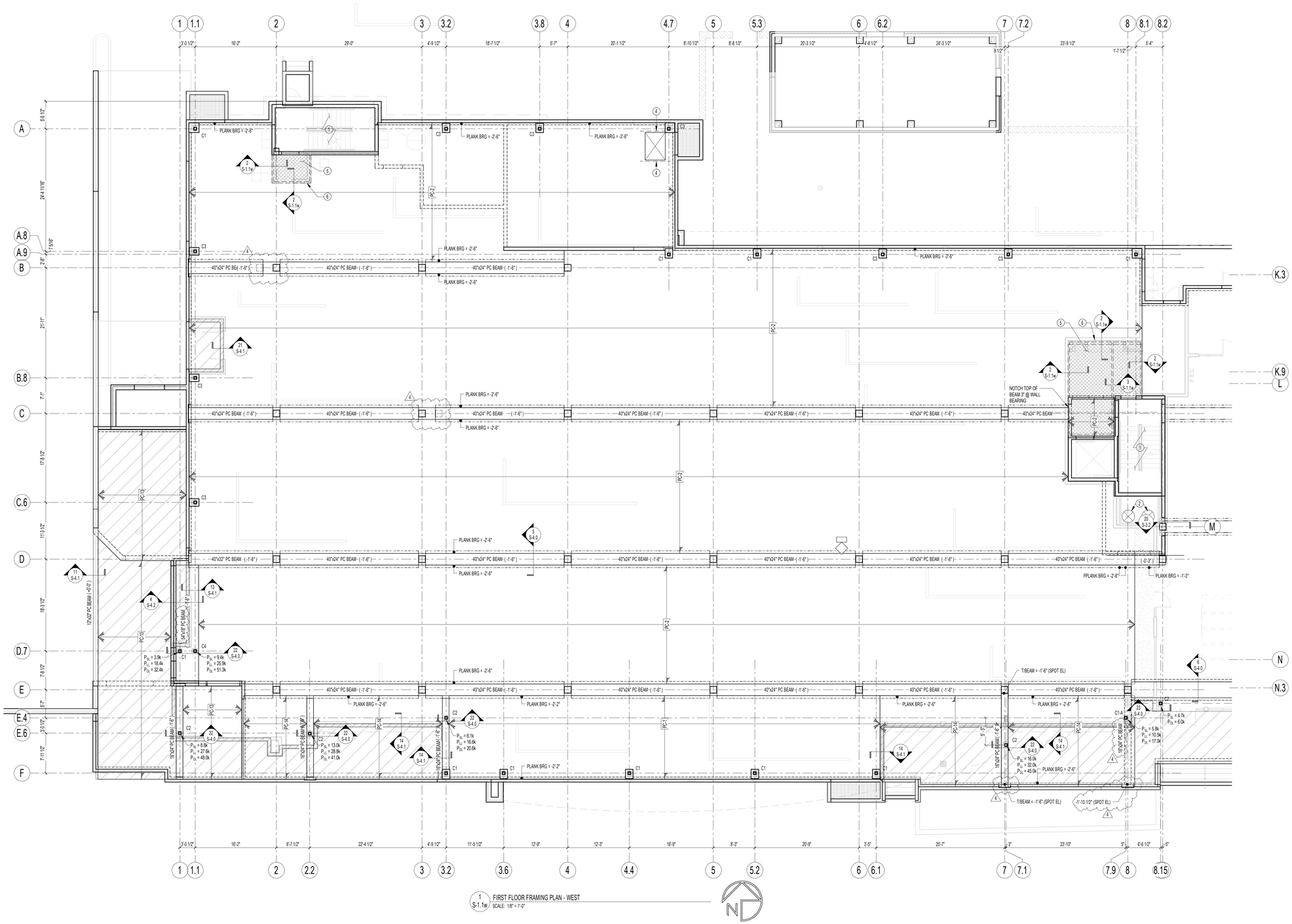
MARK	DESCRIPTION
1	STEEL-FRAMED STAIR w/ CONCRETE FILLED PANS DESIGNED AND SUPPLIED BY FABRICATOR FOR 100 psf IMPOSED LOAD. PROVIDE SOLID OR SOLID-GROUTED CMU AT STAIR CONNECTION POINTS. PROVIDE PIPE OR HSS SUPPORTS AT LANDINGS AT FABRICATOR'S OPTION.
2	OPENING FOR TRASH CHUTE, SEE ARCH FOR SIZE & LOCATION.
3	FLOOR OPENING FOR HVAC, COORDINATE SIZE & LOCATION w/ HVAC CONTRACTOR.
4	STEEL SADDLE @ OPENING BY PRECASTER, SEE 3/S-4.0.
5	3 1/2" CONCRETE TOPPING (2" ABOVE THE METAL DECK) w/ 6x6 - W1.4xW1.4 WWF ON 1 1/2x18GA GALVANIZED COMPOSITE FLOOR DECK.
6	DASHED WALLS INDICATE 362S162-43 AT 24"OC STUB WALLS FOR SUPPORT OF CONCRETE TOPPING ON METAL DECK FLOOR.
7	DASHED LINE INDICATED STRUCTURAL STEEL SUPPORT FRAMING TO SUPPORT EXTERIOR BRICK. REFER TO DETAILS FOR SIZES AND SPACING.
8	NOTCH IN BOTTOM OF PC BEAM WHERE PC BEARS ON STEEL BEAM. REFER TO PC AND STEEL BEAM ELEVATIONS TO DETERMINE DEPTH OF NOTCH. PC SUPPLIER/ENGINEER TO ACCOUNT FOR NOTCH IN BEAM DESIGN. SITE CAST MILDLY REINFORCED BEAM MAY BE USED IN PLACE OF PC AT GC'S OPTION.

PRECAST PLANK SCHEDULE

MARK	PLANK DEPTH	TOPPING	DEAD LOAD	LIVE LOAD	FIRE RATING	REMARKS
PC-1	8"	NONE	SELF WT + 20 psf	150 psf	2 HR	
PC-2	12"	NONE	SELF WT + 20 psf	150 psf	2 HR	
PC-3	8"	3"	SELF WT + 15 psf	100 psf	2 HR	
PC-4	12"	3"	SELF WT + 15 psf	100 psf	2 HR	
PC-5	8"	NONE	SELF WT + 20 psf	NOTE 5	3 HR	
PC-6	12"	NONE	SELF WT + 20 psf	NOTE 5	3 HR	
PC-7	8"	NONE	SELF WT + 60 psf	NOTE 5	3 HR	NOTE 8
PC-8	12"	NONE	SELF WT + 60 psf	NOTE 5	3 HR	
PC-9	12"	NONE	SELF WT + 35 psf	30 psf	3 HR	
PC-11	12"	NONE	SELF WT + 30 psf	100 psf	3 HR	
PC-12	12"	NONE	SELF WT + 30 psf	NOTE 7	3 HR	
PC-13	12"	NONE	SELF WT + 100 psf	250 psf	2 HR	
PC-14	12"	NONE	SELF WT + 100 psf	NOTE 6	2 HR	

PRECAST PLANK SCHEDULE NOTES:

1. VERIFY FIRE RATING w/ ARCHITECTURAL.
2. ALL TOPPING (BONDED OR NON-BONDED) TO BE REINFORCED w/ 6x6 - W1.4xW1.4 WWF.
3. AT BONDED TOPPING AREAS THE SELF WT NOTED AS DEAD LOAD IS THE WEIGHT OF THE PLANK PLUS THE BONDED TOPPING.
4. IN ADDITION TO THE LOADS NOTED IN THE SCHEDULE, THE PLANK IS TO BE DESIGNED FOR LINE LOADS AND POINT LOADS FROM WOOD BEARING WALLS, POINT LOADS AND EXTERIOR CLADDING MATERIALS.
5. LIVE LOAD = 40 psf @ UNIT AREAS AND 80 psf AT CORRIDOR, 100 psf @ ELEVATOR LOBBY AREAS, 70 psf @ BALCONIES, 55 psf @ ROOF AREAS AND 100 psf @ EXTERIOR. SEE ARCHITECTURAL FOR LOCATIONS.
6. LIVE LOAD = 150 psf @ FLOOR AREA
   LIVE LOAD = 250 psf @ EXTERIOR AREA
7. LIVE LOAD = 100 psf @ FLOOR AREA
   LIVE LOAD = 75 psf @ ROOF AREA
8. 2 HOUR AT FIRST FLOOR. 3 HOUR AT SECOND FLOOR.



1 S-1.1w FIRST FLOOR FRAMING PLAN - WEST
SCALE: 1/8" = 1'-0"

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4 Revisions	May 11, 2018

WISCONSIN RICHARD C. PIERCE E-22511 WAUKESHA, WI PROFESSIONAL ENGINEER 11/2/18

PROJECT TITLE
ROYSTER CROSSINGS LOT 2

521-523 GRAND OAK TRL, MADISON, WI

SHEET TITLE
FIRST FLOOR FRAMING PLAN - WEST

SHEET NUMBER
S-1.1w

PROJECT NUMBER 1421

FRAMING PLAN KEYED NOTES

MARK	DESCRIPTION
1	STEEL-FRAMED STAIR w/ CONCRETE FILLED PANS DESIGNED AND SUPPLIED BY FABRICATOR FOR 100 psf IMPOSED LOAD. PROVIDE SOLID OR SOLID-GROUTED CMU AT STAIR CONNECTION POINTS. PROVIDE PIPE OR HSS SUPPORTS AT LANDINGS AT FABRICATOR'S OPTION.
2	OPENING FOR TRASH CHUTE, SEE ARCH FOR SIZE & LOCATION.
3	FLOOR OPENING FOR HVAC, COORDINATE SIZE & LOCATION w/ HVAC CONTRACTOR.
4	STEEL SADDLE @ OPENING BY PRECASTER, SEE 3/S-4.0.
5	3 1/2" CONCRETE TOPPING (2" ABOVE THE METAL DECK) w/ 6x6 - W1.4xW1.4 WWF ON 1 1/2x18GA GALVANIZED COMPOSITE FLOOR DECK.
6	DASHED WALLS INDICATE 3625160-43 AT 24"OC STUB WALLS FOR SUPPORT OF CONCRETE TOPPING ON METAL DECK FLOOR.
7	DASHED LINE INDICATED STRUCTURAL STEEL SUPPORT FRAMING TO SUPPORT EXTERIOR BRICK. REFER TO DETAILS FOR SIZES AND SPACING.
8	NOTCH IN BOTTOM OF PC BEAM WHERE PC BEARS ON STEEL BEAM. REFER TO PC AND STEEL BEAM ELEVATIONS TO DETERMINE DEPTH OF NOTCH. PC SUPPLIER/ENGINEER TO ACCOUNT FOR NOTCH IN BEAM DESIGN. SITE CAST MILDLY REINFORCED BEAM MAY BE USED IN PLACE OF PC AT GC'S OPTION.

SECOND FLOOR FRAMING PLAN GENERAL NOTES

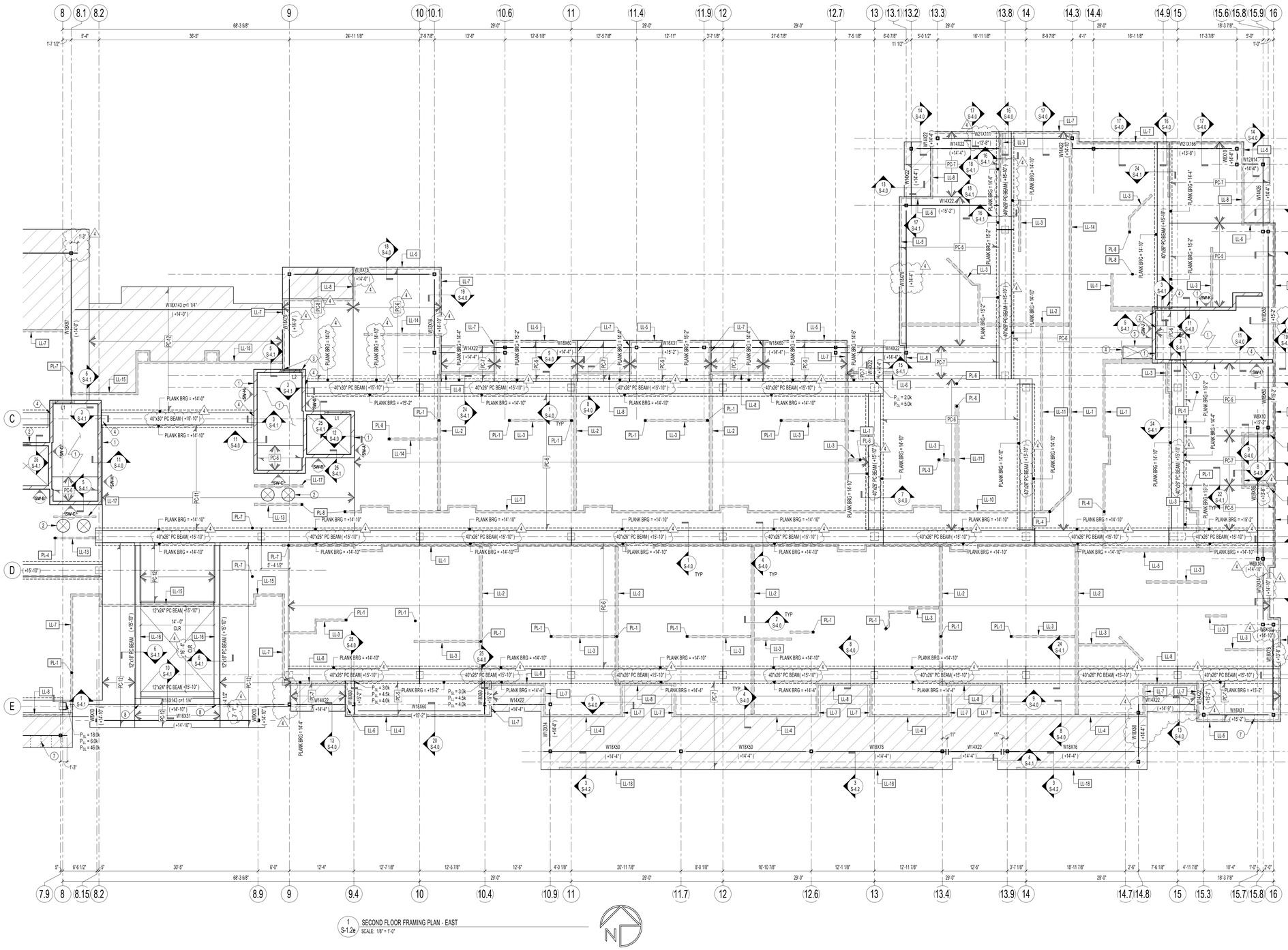
1. REFER TO SHEET S-0.1 FOR STRUCTURAL NOTES.
2. REFER TO SHEET S-0.2 FOR STRUCTURAL SCHEDULES.
3. TOP OF SECOND FLOOR = +16'-0".
4. TOP OF STEEL BEAM = TOS = x'-x" OR (x'-x")
5. REFER TO S-2.0 FOR CMU SHEAR WALL ELEVATIONS.

PRECAST PLANK SCHEDULE

MARK	PLANK DEPTH	TOPPING	DEAD LOAD	LIVE LOAD	FIRE RATING	REMARKS
PC-1	8"	NONE	SELF WT + 20 psf	150 psf	2 HR	
PC-2	12"	NONE	SELF WT + 20 psf	150 psf	2 HR	
PC-3	8"	3"	SELF WT + 15 psf	100 psf	2 HR	
PC-4	12"	3"	SELF WT + 15 psf	100 psf	2 HR	
PC-5	8"	NONE	SELF WT + 20 psf	NOTE 5	3 HR	
PC-6	12"	NONE	SELF WT + 20 psf	NOTE 5	3 HR	
PC-7	8"	NONE	SELF WT + 60 psf	NOTE 5	3 HR	NOTE 8
PC-8	12"	NONE	SELF WT + 60 psf	NOTE 5	3 HR	
PC-9	12"	NONE	SELF WT + 35 psf	30 psf	3 HR	
PC-11	12"	NONE	SELF WT + 30 psf	100 psf	3 HR	
PC-12	12"	NONE	SELF WT + 30 psf	NOTE 7	3 HR	
PC-13	12"	NONE	SELF WT + 100 psf	250 psf	2 HR	
PC-14	12"	NONE	SELF WT + 100 psf	NOTE 6	2 HR	

PRECAST PLANK SCHEDULE NOTES:

1. VERIFY FIRE RATING w/ ARCHITECTURAL.
2. ALL TOPPING (BONDED OR NON-BONDED) TO BE REINFORCED w/ 6x6 - W1.4xW1.4 WWF.
3. AT BONDED TOPPING AREAS THE SELF WT NOTED AS DEAD LOAD IS THE WEIGHT OF THE PLANK PLUS THE BONDED TOPPING.
4. IN ADDITION TO THE LOADS NOTED IN THE SCHEDULE, THE PLANK IS TO BE DESIGNED FOR LINE LOADS AND POINT LOADS FROM WOOD BEARING WALLS, POINT LOADS AND EXTERIOR CLADDING MATERIALS.
5. LIVE LOAD = 40 psf @ UNIT AREAS AND 80 psf AT CORRIDOR. 100 psf @ ELEVATOR LOBBY AREAS. 70 psf @ BALCONIES. 55 psf @ ROOF AREAS AND 100 psf @ EXTERIOR. SEE ARCHITECTURAL FOR LOCATIONS.
6. LIVE LOAD = 150 psf @ FLOOR AREA
   LIVE LOAD = 250 psf @ EXTERIOR AREA
7. LIVE LOAD = 100 psf @ FLOOR AREA
   LIVE LOAD = 75 psf @ ROOF AREA
8. 2 HOUR AT FIRST FLOOR. 3 HOUR AT SECOND FLOOR.



1 S-1.2e SECOND FLOOR FRAMING PLAN - EAST
SCALE: 1/8" = 1'-0"

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KEY PLAN

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PE PROJECT 15213

ISSUED

Issued for Bid	September 25, 2015
Revised Bid Set	January 19, 2016
Issued for Plan Review	February 8, 2016

	Revised-	February 29, 2016
2	CB #1	December 7, 2017
3	Revision To Prevously Approved Plan	January 12, 2018
4	Revisions	May 11, 2018

WISCONSIN RICHARD C. PIERCE E-22511 WAUKESHA, WI PROFESSIONAL ENGINEER 7/2/18

PROJECT TITLE
ROYSTER CROSSINGS LOT 2

521-523 GRAND OAK TRL, MADISON, WI

SHEET TITLE
SECOND FLOOR FRAMING PLAN - EAST

SHEET NUMBER
S-1.2e

PROJECT NUMBER 1421

FRAMING PLAN KEYED NOTES

MARK	DESCRIPTION
1	STEEL-FRAMED STAIR w/ CONCRETE FILLED PANS DESIGNED AND SUPPLIED BY FABRICATOR FOR 100 psf IMPOSED LOAD. PROVIDE SOLID OR SOLID-GROUTED CMU AT STAIR CONNECTION POINTS. PROVIDE PIPE OR HSS SUPPORTS AT LANDINGS AT FABRICATOR'S OPTION.
2	OPENING FOR TRASH CHUTE, SEE ARCH FOR SIZE & LOCATION.
3	FLOOR OPENING FOR HVAC, COORDINATE SIZE & LOCATION w/ HVAC CONTRACTOR.
4	STEEL SADDLE @ OPENING BY PRECASTER, SEE 3/S-4.0.
5	3 1/2" CONCRETE TOPPING (2" ABOVE THE METAL DECK) w/ 6x6 - W1.4xW1.4 WWF ON 1 1/2x18GA GALVANIZED COMPOSITE FLOOR DECK.
6	DASHED WALLS INDICATE 3025162-43 AT 24"OC STUB WALLS FOR SUPPORT OF CONCRETE TOPPING ON METAL DECK FLOOR.
7	DASHED LINE INDICATED STRUCTURAL STEEL SUPPORT FRAMING TO SUPPORT EXTERIOR BRICK. REFER TO DETAILS FOR SIZES AND SPACING.
8	NOTCH IN BOTTOM OF PC BEAM WHERE PC BEARS ON STEEL BEAM. REFER TO PC AND STEEL BEAM ELEVATIONS TO DETERMINE DEPTH OF NOTCH. PC SUPPLIER/ENGINEER TO ACCOUNT FOR NOTCH IN BEAM DESIGN. SITE CAST MILDLY REINFORCED BEAM MAY BE USED IN PLACE OF PC AT GC'S OPTION.

SECOND FLOOR FRAMING PLAN GENERAL NOTES

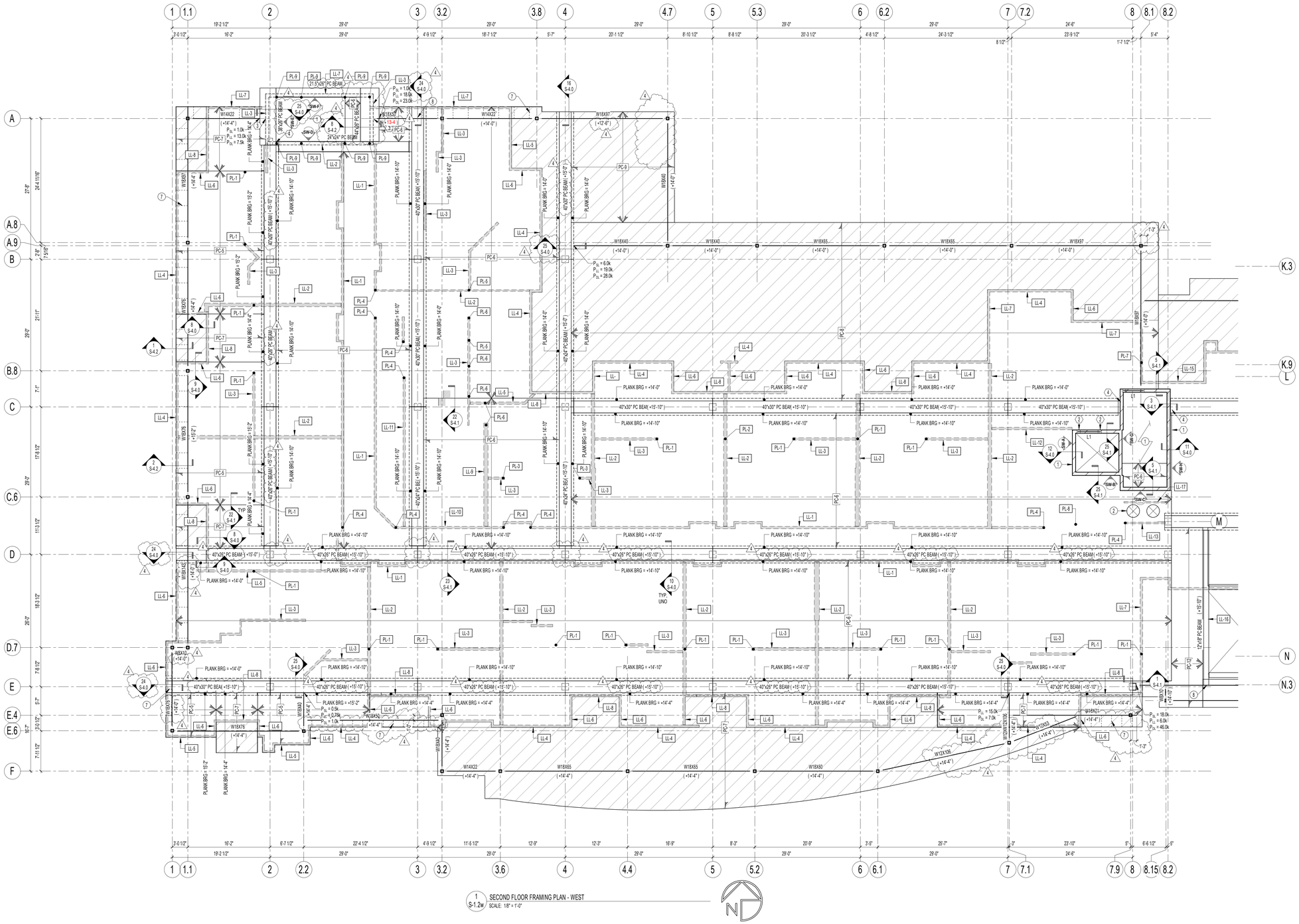
1. REFER TO SHEET S-0.1 FOR STRUCTURAL NOTES.
2. REFER TO SHEET S-0.2 FOR STRUCTURAL SCHEDULES.
3. TOP OF SECOND FLOOR = +16'-0".
4. TOP OF STEEL BEAM = TOS = x'-x" OR (x'-x")
5. REFER TO S-2.0 FOR CMU SHEAR WALL ELEVATIONS.

PRECAST PLANK SCHEDULE

MARK	PLANK DEPTH	TOPPING	DEAD LOAD	LIVE LOAD	FIRE RATING	REMARKS
PC-1	8"	NONE	SELF WT + 20 psf	150 psf	2 HR	
PC-2	12"	NONE	SELF WT + 20 psf	150 psf	2 HR	
PC-3	8"	3"	SELF WT + 15 psf	100 psf	2 HR	
PC-4	12"	3"	SELF WT + 15 psf	100 psf	2 HR	
PC-5	8"	NONE	SELF WT + 20 psf	NOTE 5	3 HR	
PC-6	12"	NONE	SELF WT + 20 psf	NOTE 5	3 HR	
PC-7	8"	NONE	SELF WT + 60 psf	NOTE 5	3 HR	NOTE 8
PC-8	12"	NONE	SELF WT + 60 psf	NOTE 5	3 HR	
PC-9	12"	NONE	SELF WT + 35 psf	30 psf	3 HR	
PC-11	12"	NONE	SELF WT + 30 psf	100 psf	3 HR	
PC-12	12"	NONE	SELF WT + 30 psf	NOTE 7	3 HR	
PC-13	12"	NONE	SELF WT + 100 psf	250 psf	2 HR	
PC-14	12"	NONE	SELF WT + 100 psf	NOTE 6	2 HR	

PRECAST PLANK SCHEDULE NOTES:

1. VERIFY FIRE RATING w/ ARCHITECTURAL.
2. ALL TOPPING (BONDED OR NON-BONDED) TO BE REINFORCED w/ 6x6 - W1.4xW1.4 WWF.
3. AT BONDED TOPPING AREAS THE SELF WT NOTED AS DEAD LOAD IS THE WEIGHT OF THE PLANK PLUS THE BONDED TOPPING.
4. IN ADDITION TO THE LOADS NOTED IN THE SCHEDULE, THE PLANK IS TO BE DESIGNED FOR LINE LOADS AND POINT LOADS FROM WOOD BEARING WALLS, POINT LOADS AND EXTERIOR CLADDING MATERIALS.
5. LIVE LOAD = 40 psf @ UNIT AREAS AND 80 psf AT CORRIDOR, 100 psf @ ELEVATOR LOBBY AREAS, 70 psf @ BALCONIES, 55 psf @ ROOF AREAS AND 100 psf @ EXTERIOR. SEE ARCHITECTURAL FOR LOCATIONS.
6. LIVE LOAD = 150 psf @ FLOOR AREA
   LIVE LOAD = 250 psf @ EXTERIOR AREA
7. LIVE LOAD = 100 psf @ FLOOR AREA
   LIVE LOAD = 75 psf @ ROOF AREA
8. 2 HOUR AT FIRST FLOOR. 1 HOUR AT SECOND FLOOR.



1 S-1.2w SECOND FLOOR FRAMING PLAN - WEST
SCALE: 1/8" = 1'-0"

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4	Revisions	May 11, 2018

WISCONSIN RICHARD C. PIERCE E-22511 WAUKESHA, WI PROFESSIONAL ENGINEER 11/3/18

PROJECT TITLE
ROYSTER CROSSINGS LOT 2

521-523 GRAND OAK TRL, MADISON, WI

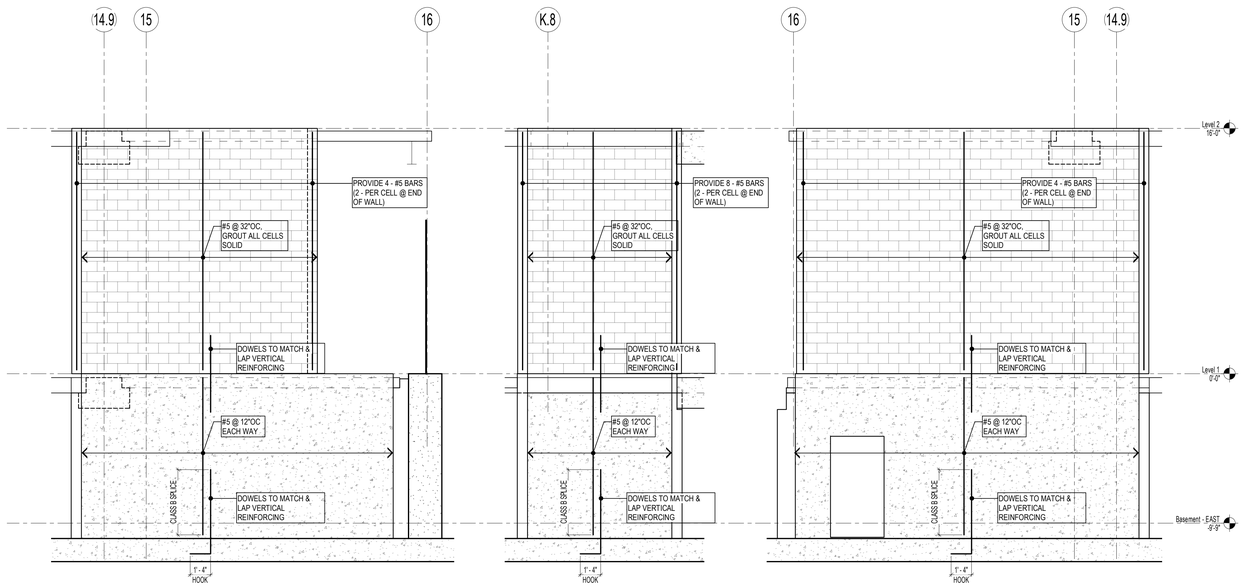
SHEET TITLE
SECOND FLOOR FRAMING PLAN - WEST

SHEET NUMBER
S-1.2w

PROJECT NUMBER 1421

SHEARWALL ELEVATION GENERAL NOTES

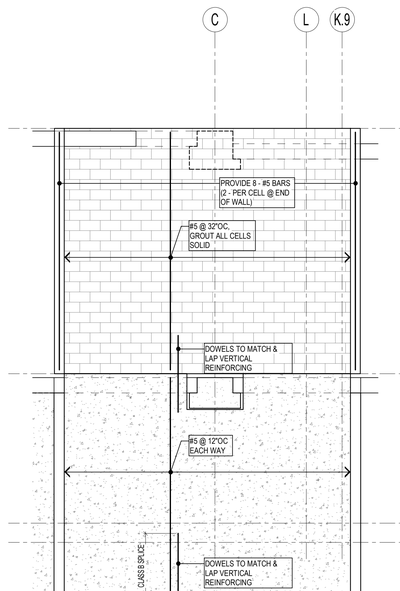
1. ALL HORIZONTAL AND VERTICAL REINFORCING SHALL BE LAP SPLICED.
2. ALL MASONRY WALLS TO BE FULL GROUTED. SEE ELEVATIONS FOR VERTICAL REINFORCING.
3. #5 BARS TO BE LAP SPLICED 30".
4. MASONRY f'm = 1500 psi. MASONRY FILL PEA GRAVEL = 3000 psi.
5. AT WALL STEPS ADJUST VERTICAL BARS TO LAP INTO REDUCED WALL THICKNESS. DO NOT PLACE CONTROL JOINTS IN SHEARWALLS.



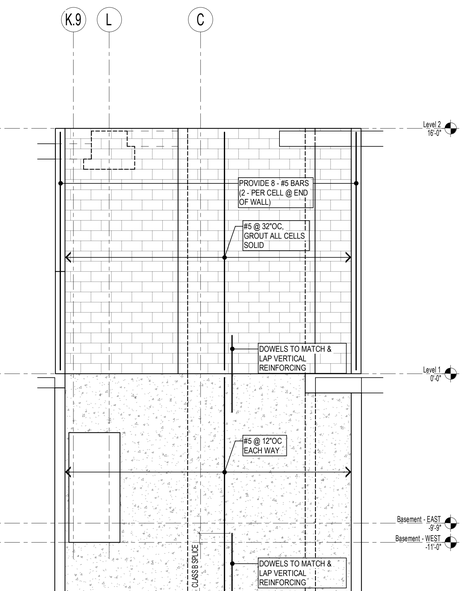
11 S-2.0 SW-K
SCALE: 1/4" = 1'-0"

10 S-2.0 SW-J
SCALE: 1/4" = 1'-0"

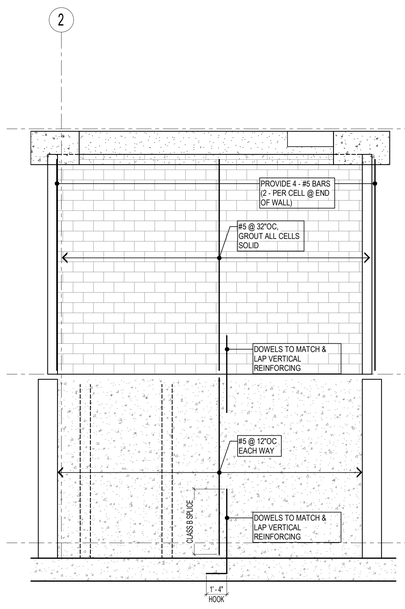
9 S-2.0 SW-I
SCALE: 1/4" = 1'-0"



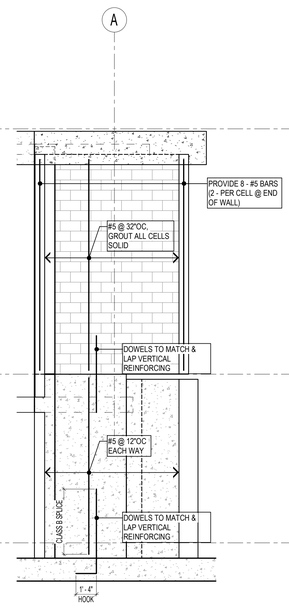
5 S-2.0 SW-H
SCALE: 1/4" = 1'-0"



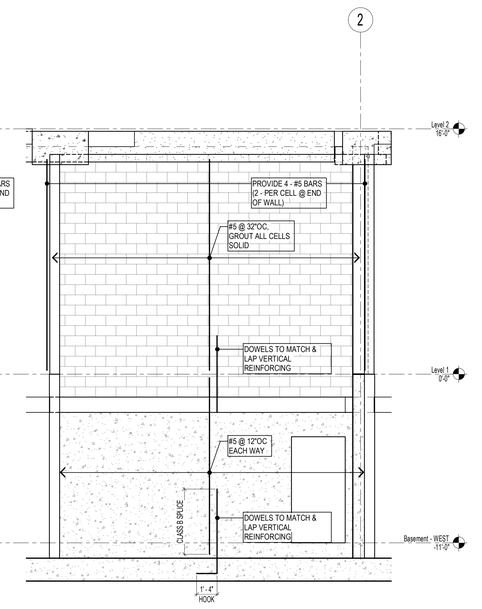
4 S-2.0 SW-G
SCALE: 1/4" = 1'-0"



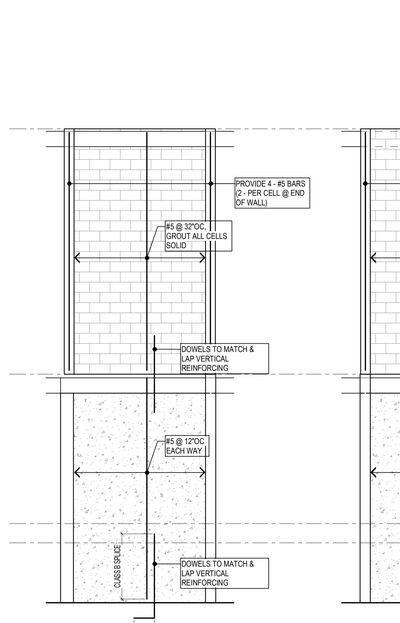
8 S-2.0 SW-F
SCALE: 1/4" = 1'-0"



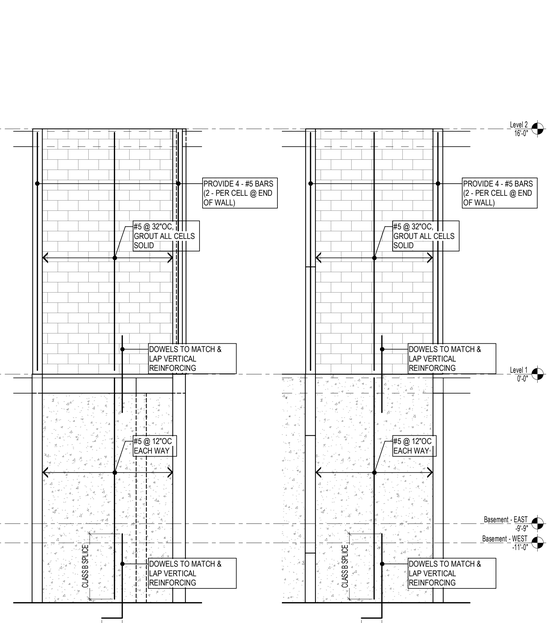
7 S-2.0 SW-E
SCALE: 1/4" = 1'-0"



6 S-2.0 SW-D
SCALE: 1/4" = 1'-0"



3 S-2.0 SW-C
SCALE: 1/4" = 1'-0"



2 S-2.0 SW-B
SCALE: 1/4" = 1'-0"

1 S-2.0 SW-A
SCALE: 1/4" = 1'-0"

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2 CB #1 December 7, 2017

WISCONSIN RICHARD C. PIERCE E-22511 WAUKESHA WI PROFESSIONAL ENGINEER 11/13/18

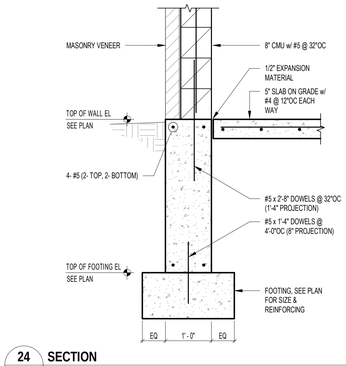
PROJECT TITLE
ROYSTER CROSSINGS LOT 2

521-523 GRAND OAK TRL, MADISON, WI

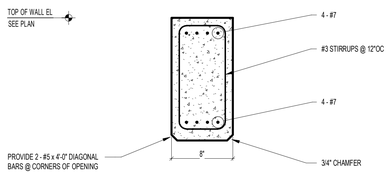
SHEET TITLE
SHEARWALL ELEVATIONS

SHEET NUMBER
S-2.0

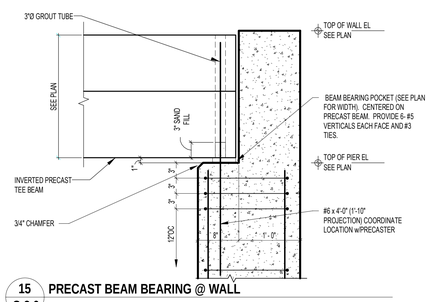
PROJECT NUMBER 1421



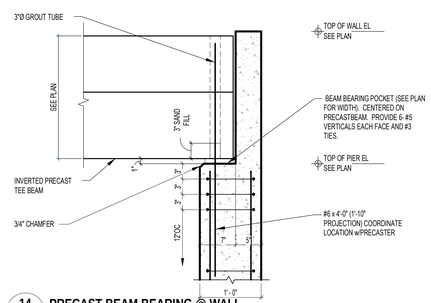
24 SECTION
S-3.0



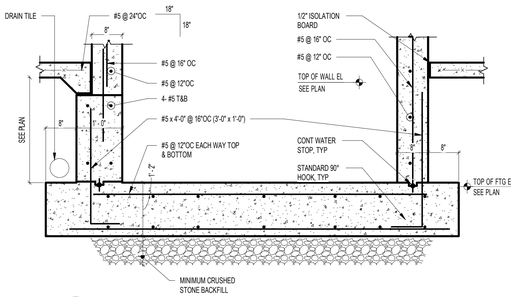
20 CONCRETE WALL OPENING
S-3.0



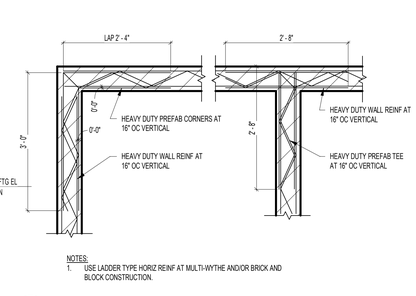
15 PRECAST BEAM BEARING @ WALL
S-3.0



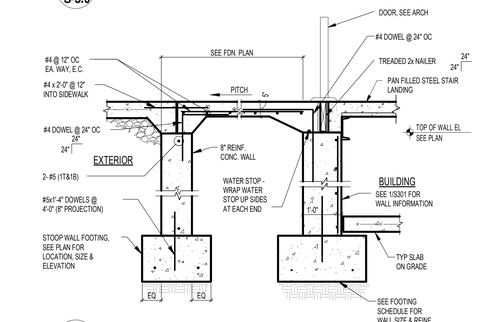
14 PRECAST BEAM BEARING @ WALL
S-3.0



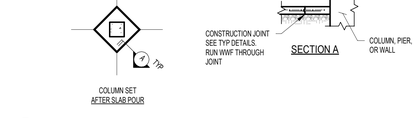
10 ELEVATOR PIT FOOTING SECTION
S-3.0



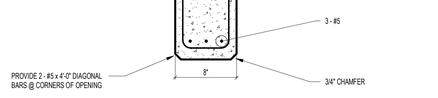
9 HORIZ. MASONRY WALL REINF.
S-3.0



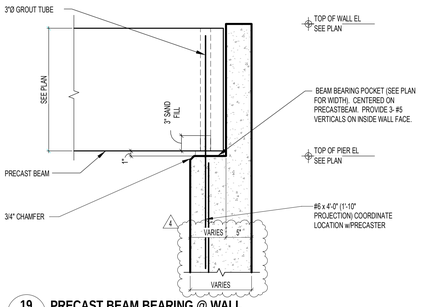
5 STOOP SECTION
S-3.0



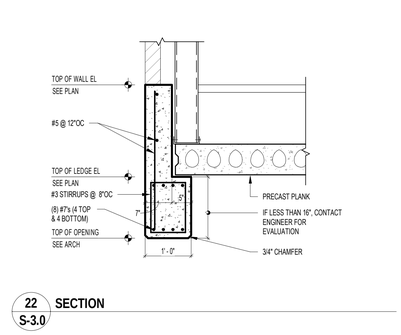
4 TYPICAL SLAB ON GRADE @ COLUMN
S-3.0



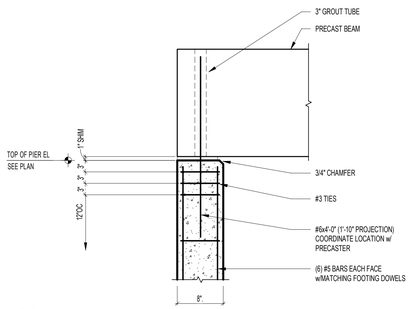
23 SECTION
S-3.0



19 PRECAST BEAM BEARING @ WALL
S-3.0

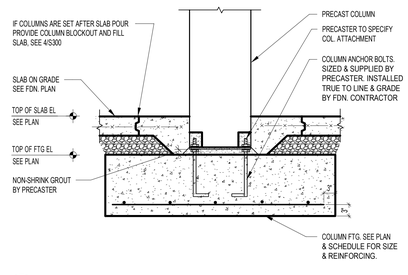


22 SECTION
S-3.0

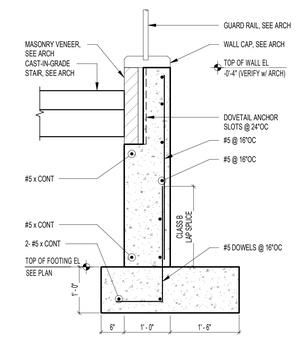


18 SECTION
S-3.0

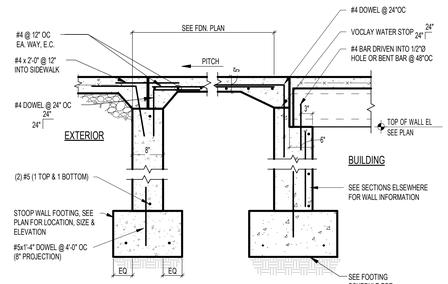
13 CONCRETE WALL OPENING
S-3.0



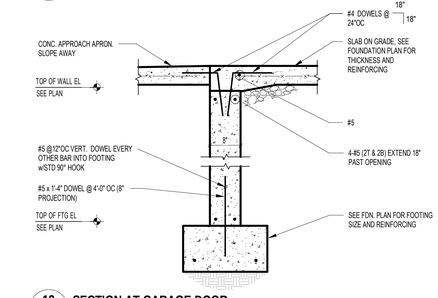
8 COLUMN ANCHORAGE DETAIL
S-3.0



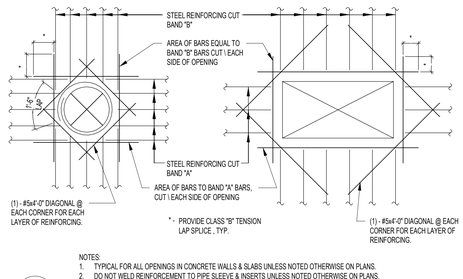
21 SECTION
S-3.0



17 STOOP SECTION w/ PRECAST BEARING
S-3.0



12 SECTION AT GARAGE DOOR
S-3.0

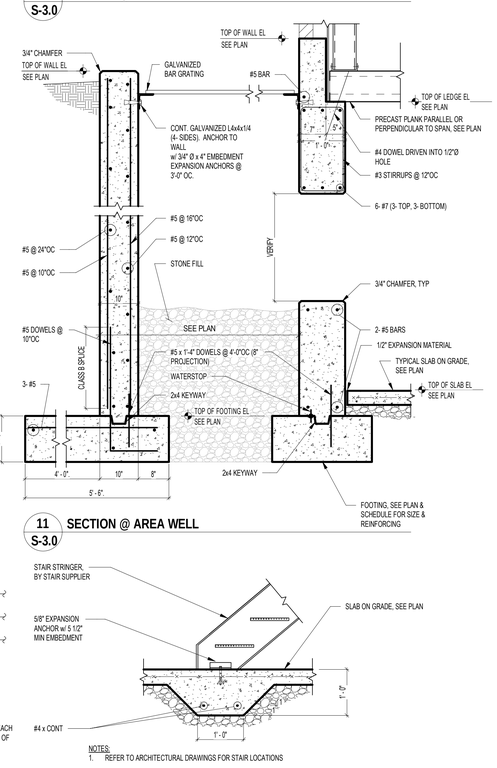


NOTES:
1. TYPICAL FOR ALL OPENINGS IN CONCRETE WALLS & SLABS UNLESS NOTED OTHERWISE ON PLANS.
2. DO NOT WELD REINFORCEMENT TO PIPE SLEEVE & INSERTS UNLESS NOTED OTHERWISE ON PLANS.

7 REINFORCING @ CONCRETE OPENINGS
S-3.0

NOTES:
1. REFER TO ARCHITECTURAL DRAWINGS FOR STAIR LOCATIONS

6 STEEL STAIR FOOTING / FOUNDATION
S-3.0

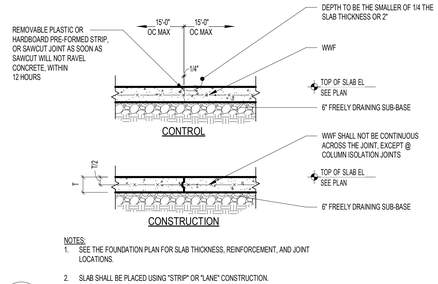


11 SECTION @ AREA WELL
S-3.0

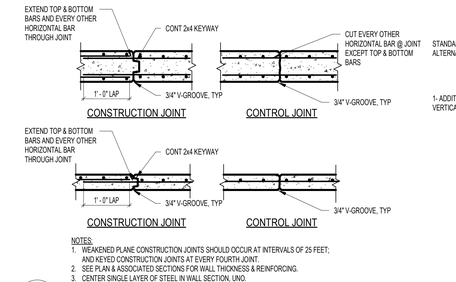
16 SECTION @ RETAINING WALL
S-3.0

5 STOOP SECTION
S-3.0

4 TYPICAL SLAB ON GRADE @ COLUMN
S-3.0

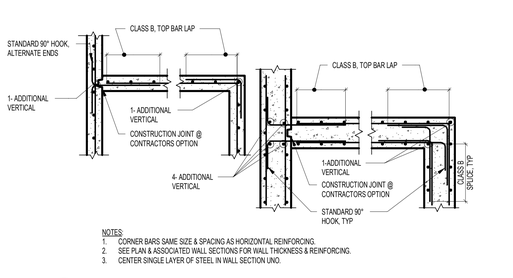


3 SLAB ON GRADE
S-3.0



NOTES:
1. WEAKENED PLANE CONSTRUCTION JOINTS SHOULD OCCUR AT INTERVALS OF 25 FEET; AND KEYED CONSTRUCTION JOINTS AT EVERY FOURTH JOINT.
2. SEE PLAN & ASSOCIATED SECTIONS FOR WALL THICKNESS & REINFORCING.
3. CENTER SINGLE LAYER OF STEEL IN WALL SECTION, UNO.

2 TYPICAL VERTICAL WALL JOINTS
S-3.0



NOTES:
1. CORNER BARS SAME SIZE & SPACING AS HORIZONTAL REINFORCING.
2. SEE PLAN & ASSOCIATED WALL SECTIONS FOR WALL THICKNESS & REINFORCING.
3. CENTER SINGLE LAYER OF STEEL IN WALL SECTION UNO.

1 REINFORCING @ WALL CORNERS
S-3.0

WALL INFO SCHEDULE

MARK	A	B	C	D	E	F	G
WALL A	3'-0"	1'-6"	6"	NONE	2 - #5	#5 @ 16"OC	#5 @ 16"OC
WALL B	4'-4"	2'-6"	10"	#5 @ 24"OC	3 - #5	#5 @ 16"OC	#5 @ 16"OC
WALL C	5'-6"	3'-2"	1'-4"	#5 @ 16"OC	4 - #5	#5 @ 16"OC	#5 @ 16"OC

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knothebruce.com 608.836.3690
7601 University Ave. • Suite 201 • Middleton, WI 53562

KEY PLAN

PIERCE ENGINEERS INC
CONSULTING STRUCTURAL ENGINEERS
10 West Mifflin St, Suite 205 | Madison, WI 53703
Phone: 608.256.7304 | Fax: 608.256.7306
PE PROJECT 15213

ISSUED

Issued for Bid	September 25, 2015
Revised Bid Set	January 19, 2016
Issued for Plan Review	February 8, 2016

4	Revisions	May 11, 2018

WISCONSIN RICHARD C. PIERCE E-22511 WAUKESHA, WI PROFESSIONAL ENGINEER 5/11/18

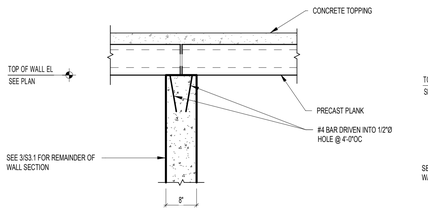
PROJECT TITLE
ROYSTER CROSSINGS LOT 2

521-523 GRAND OAK TRL, MADISON, WI

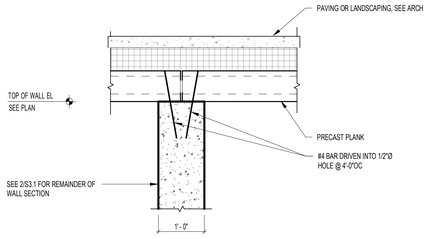
SHEET TITLE
FOUNDATION DETAILS

SHEET NUMBER
S-3.0

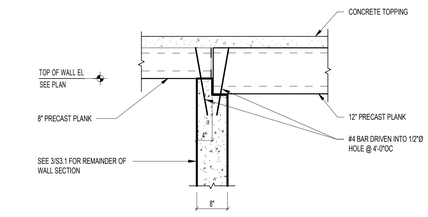
PROJECT NUMBER 1421



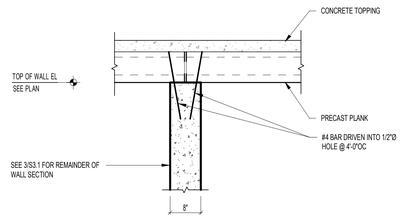
25 TOP OF WALL DETAIL
S-3.1



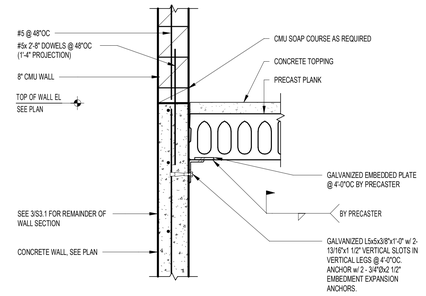
24 TOP OF WALL DETAIL
S-3.1



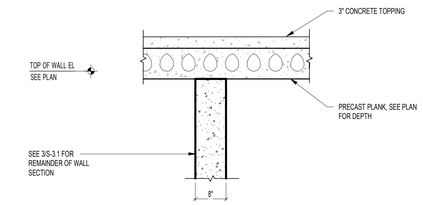
23 TOP OF WALL DETAIL
S-3.1



22 TOP OF WALL DETAIL
S-3.1



21 TOP OF WALL DETAIL
S-3.1



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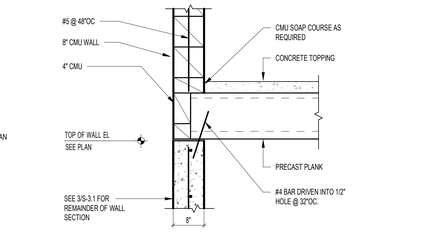
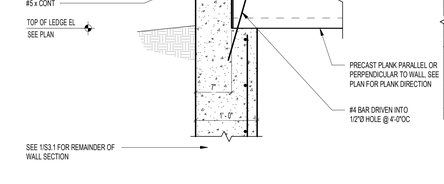
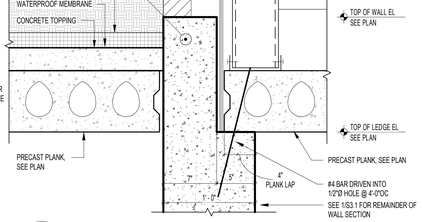
S-3.1



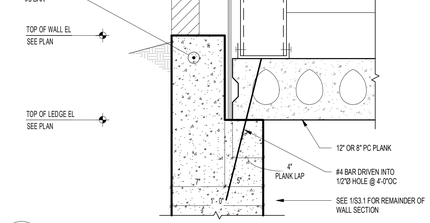
19 TOP OF WALL DETAIL
S-3.1



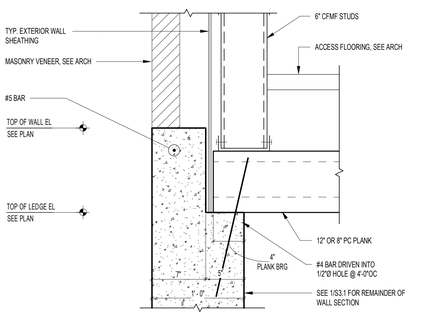
18 SECTION
S-3.1



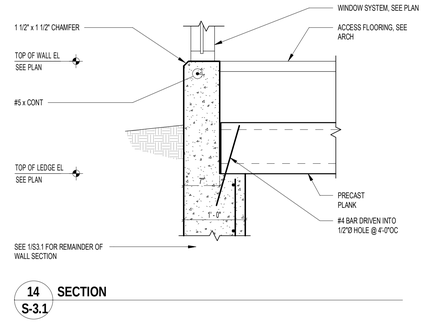
17 DETAIL @ TOP OF WALL
S-3.1



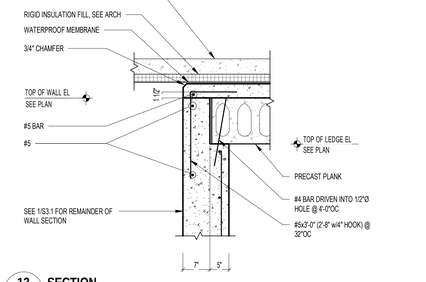
16 DETAIL @ TOP OF WALL
S-3.1



15 DETAIL @ TOP OF WALL
S-3.1



14 SECTION
S-3.1



13 SECTION
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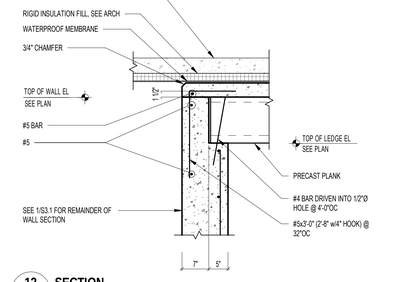
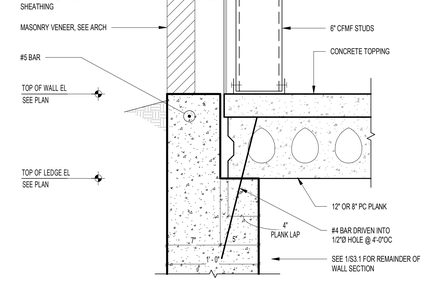
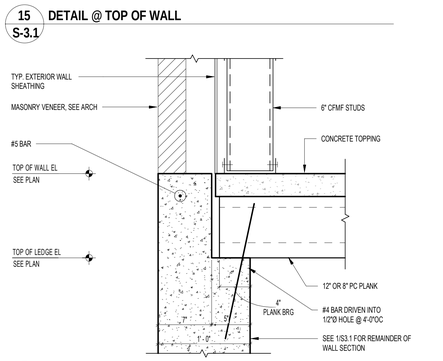


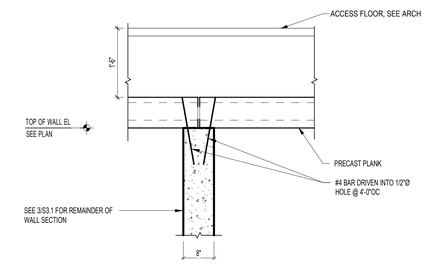
12 SECTION
S-3.1



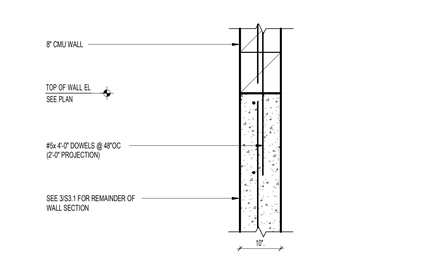
11 DETAIL @ TOP OF WALL
S-3.1



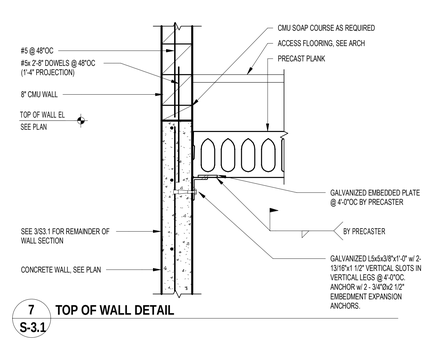
10 DETAIL @ TOP OF WALL
S-3.1



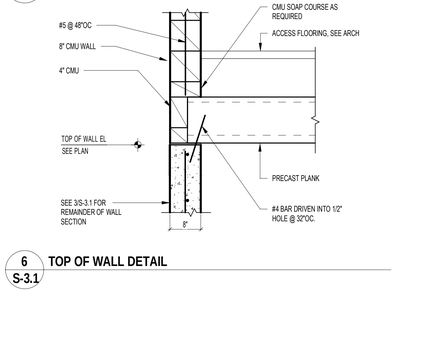
9 TOP OF WALL DETAIL
S-3.1



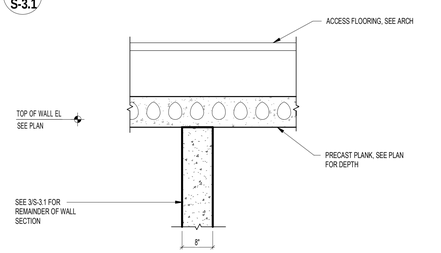
8 TOP OF WALL DETAIL
S-3.1



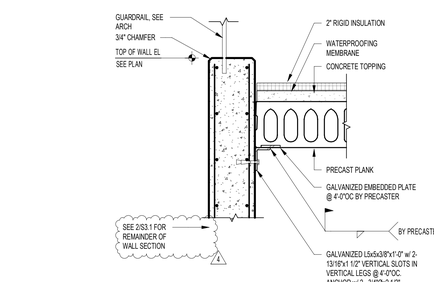
7 TOP OF WALL DETAIL
S-3.1



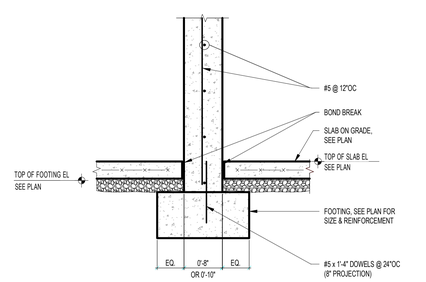
6 TOP OF WALL DETAIL
S-3.1



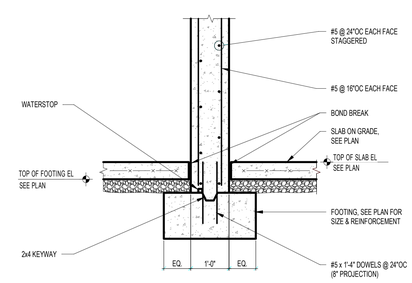
5 TOP OF WALL DETAIL
S-3.1



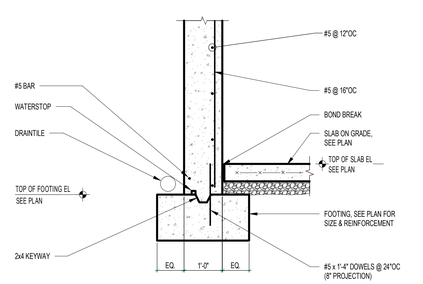
4 TOP OF WALL DETAIL
S-3.1



3 8" OR 10" FOUNDATION WALL SECTION
S-3.1



2 12" FOUNDATION WALL SECTION
S-3.1



1 12" FOUNDATION WALL SECTION
S-3.1

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4. Revisions May 11, 2018

WISCONSIN
RICHARD C. PIERCE
E-22511
WAUKESHA, WI
PROFESSIONAL ENGINEER
5/11/18

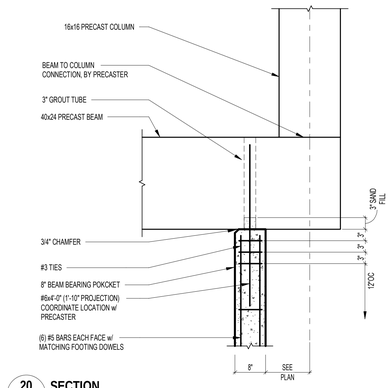
PROJECT TITLE
ROYSTER CROSSINGS LOT 2

521-523 GRAND OAK TRL, MADISON, WI

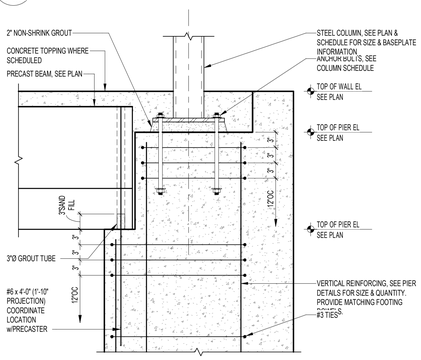
SHEET TITLE
FOUNDATION DETAILS

SHEET NUMBER
S-3.1

PROJECT NUMBER 1421

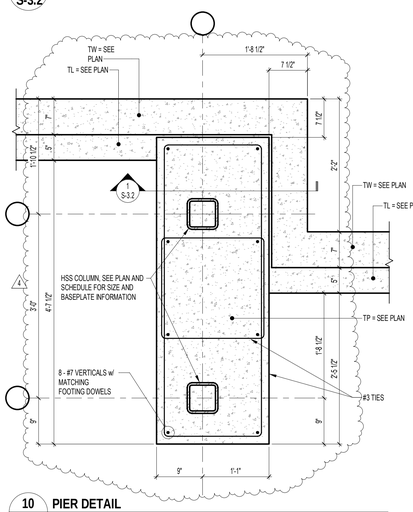


20 SECTION
S-3.2

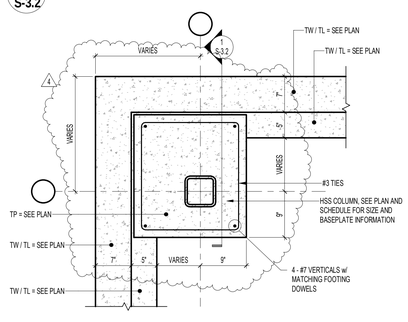


NOTE: STEEL ERECTOR TO COORDINATE w/ PRECASTER TO SET AND GROUT BASEPLATES w/ PRECAST PLANK ERECTION AS REQUIRED OR STEEL FABRICATOR TO STEEL SETTING PLATES PRIOR TO PRECAST PLANK ERECTION.

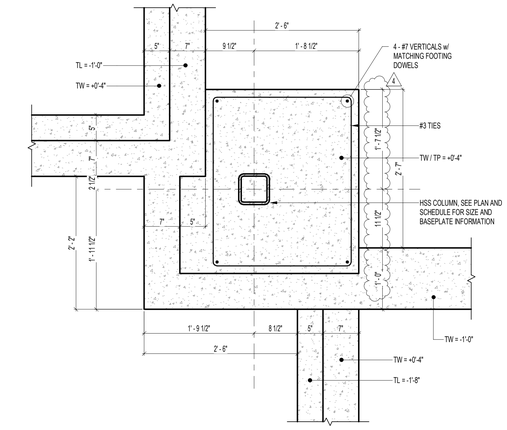
15 COLUMN PIER DETAIL
S-3.2



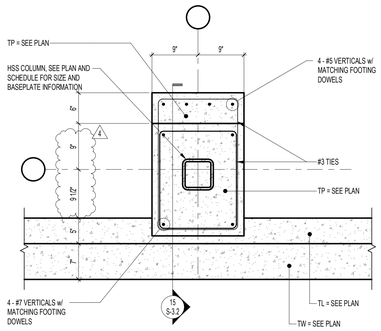
10 PIER DETAIL
S-3.2



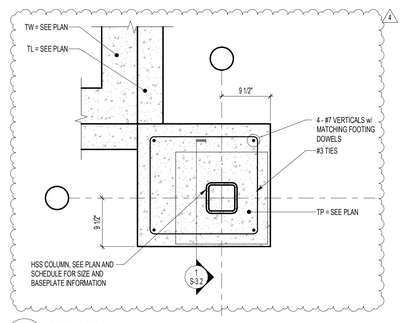
5 PIER DETAIL
S-3.2



19 SECTION
S-3.2



14 PIER DETAIL
S-3.2



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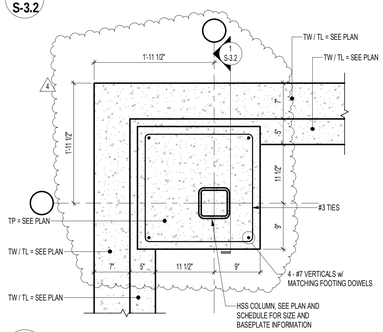
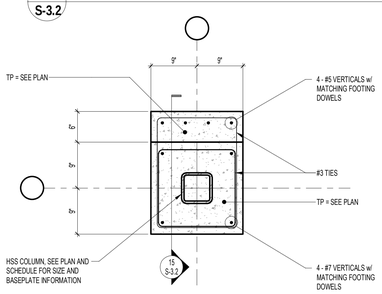
S-3.2

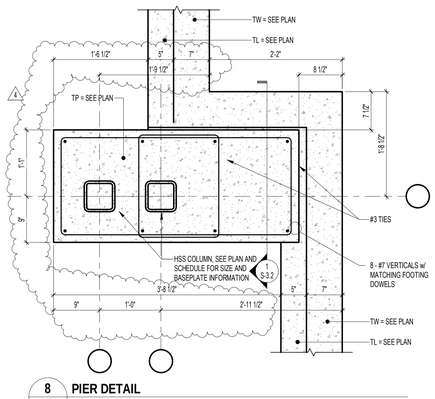


4 PIER DETAIL
S-3.2

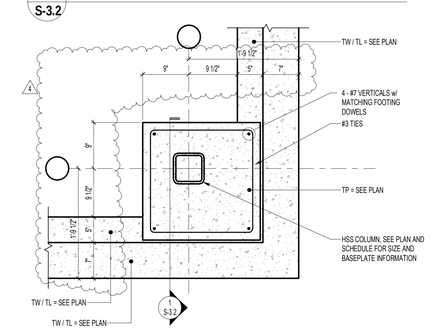
18 PIER DETAIL
S-3.2



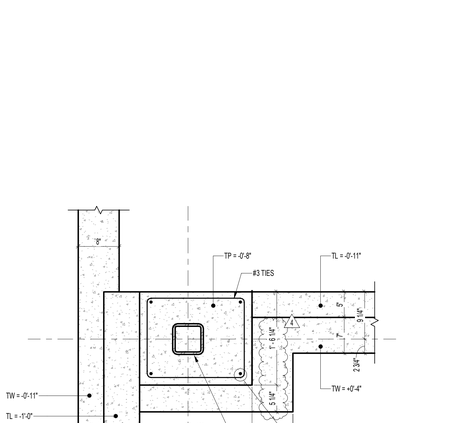
13 PIER DETAIL
S-3.2



8 PIER DETAIL
S-3.2

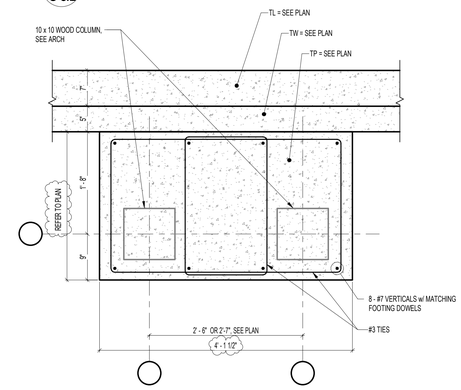


3 PIER DETAIL
S-3.2



21 PIER DETAIL
S-3.2

17 PIER DETAIL
S-3.2



12 PIER DETAIL
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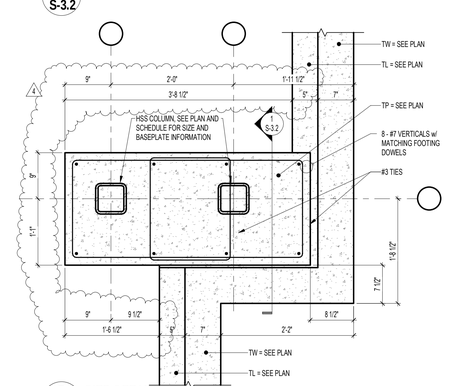
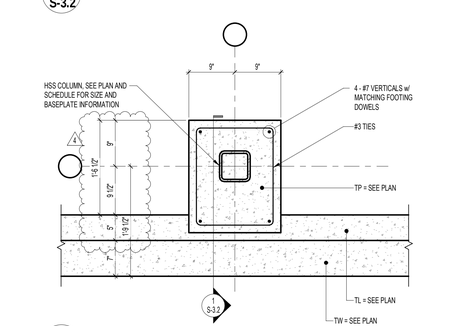
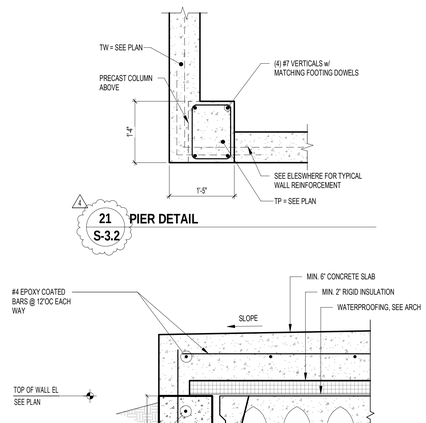


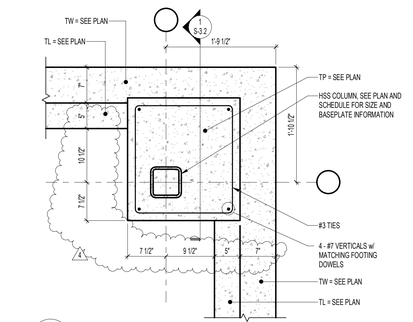
7 PIER DETAIL
S-3.2



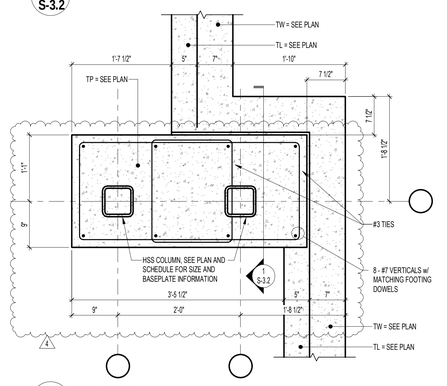
2 PIER DETAIL
S-3.2



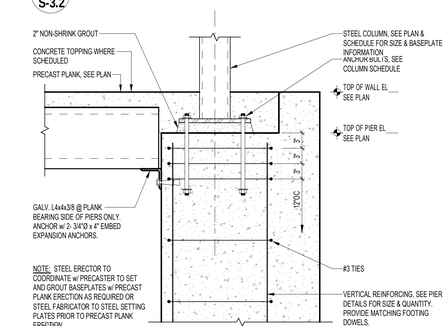
16 DETAIL @ TOP OF WALL
S-3.2



11 PIER DETAIL
S-3.2



6 PIER DETAIL
S-3.2



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1 COLUMN PIER DETAIL
S-3.2

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PE PROJECT 15213

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4 Revised-Revisions	February 29, 2016 May 11, 2018

WISCONSIN RICHARD C. PIERCE E-22511 WAUKESHA, WI PROFESSIONAL ENGINEER 5/11/18

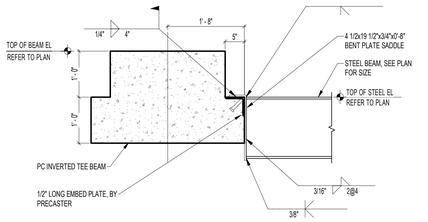
PROJECT TITLE
ROYSTER CROSSINGS LOT 2

521-523 GRAND OAK TRL, MADISON, WI

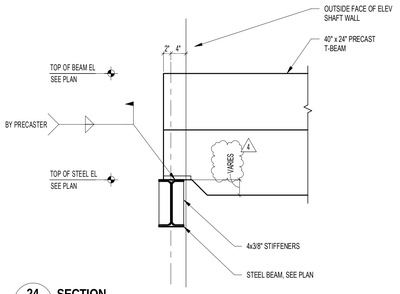
SHEET TITLE
FOUNDATION DETAILS

SHEET NUMBER
S-3.2

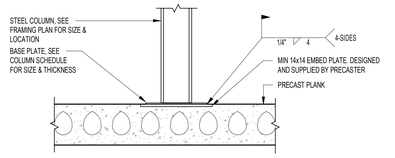
PROJECT NUMBER 1421



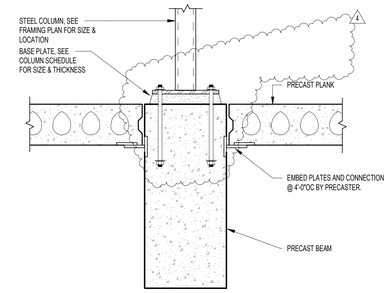
25 S-4.0 SECTION
SCALE: 3/4" = 1'-0"



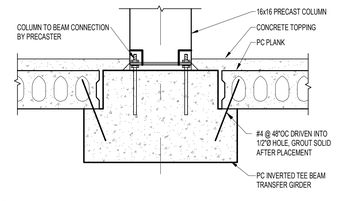
24 S-4.0 SECTION



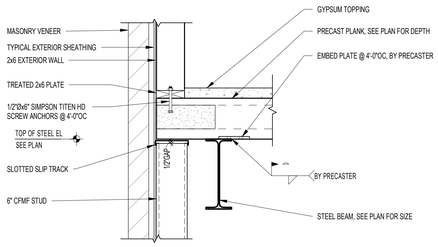
23 S-4.0 STEEL COLUMN @ PLANK
SCALE: 1" = 1'-0"



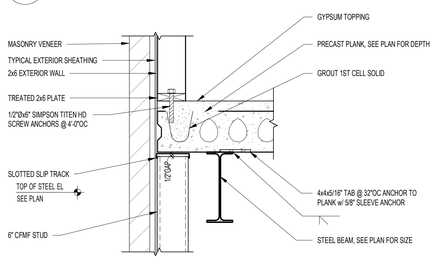
22 S-4.0 STEEL COLUMN @ PLANK



21 S-4.0 SECTION



20 S-4.0 PRECAST BEAM BEARING @ CMU WALL



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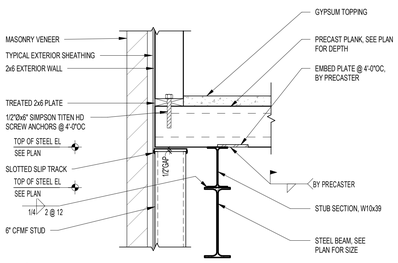
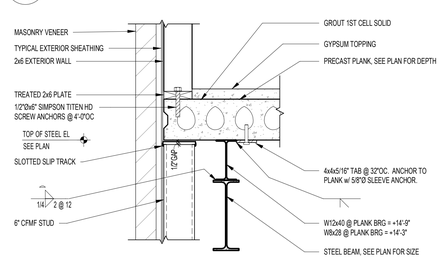


18 S-4.0 SECTION



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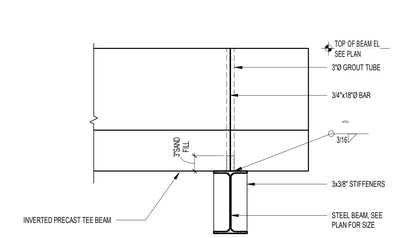

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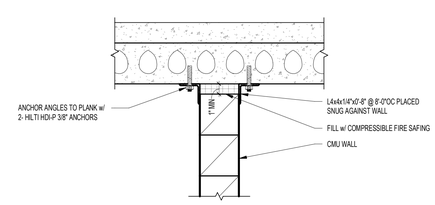
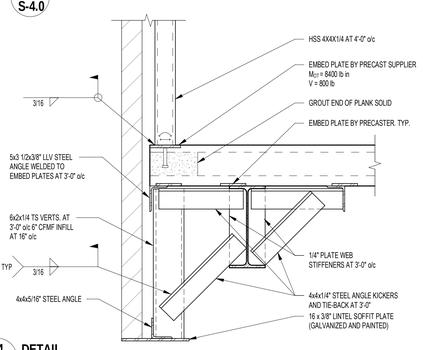
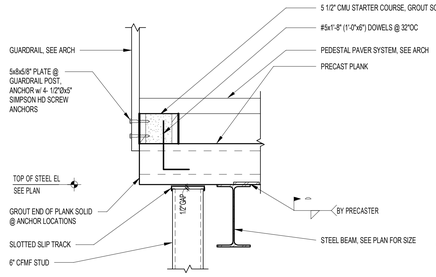


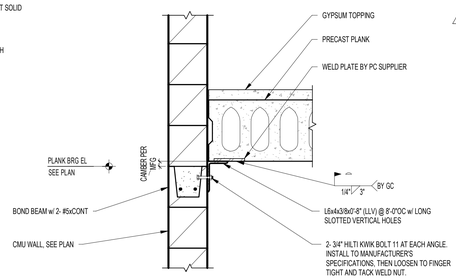
15 S-4.0 LATERAL SUPPORT OF MASONRY PARTITION



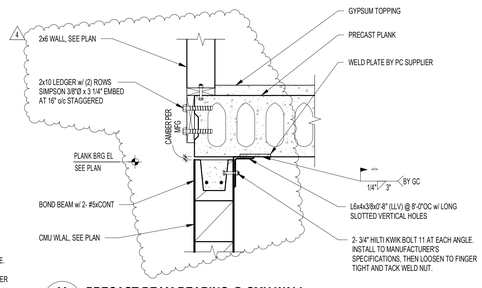
14 S-4.0 DETAIL



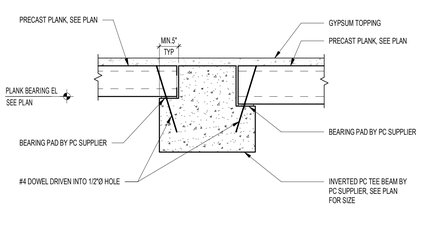
13 S-4.0 DETAIL



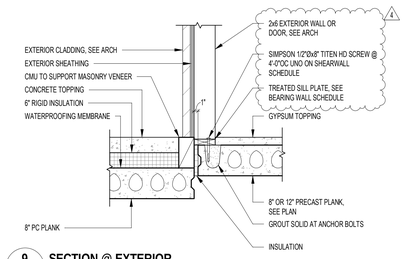
12 S-4.0 PRECAST BEAM BEARING @ CMU WALL



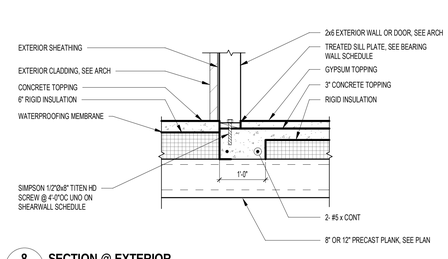
11 S-4.0 PRECAST BEAM BEARING @ CMU WALL



10 S-4.0 SECTION



9 S-4.0 SECTION @ EXTERIOR



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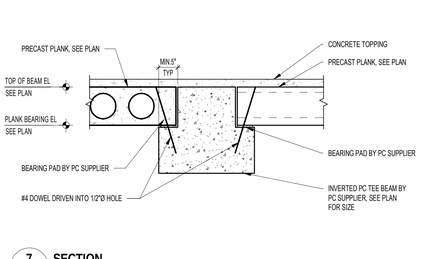
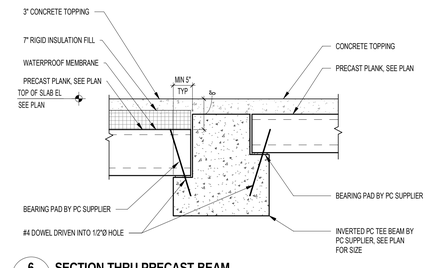
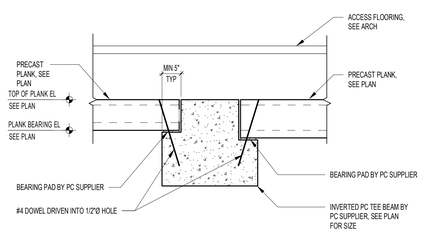


7 S-4.0 SECTION



6 S-4.0 SECTION THRU PRECAST BEAM



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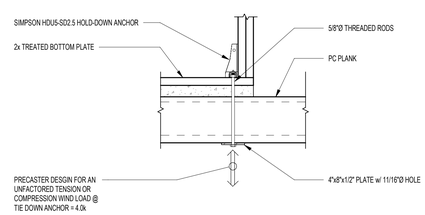
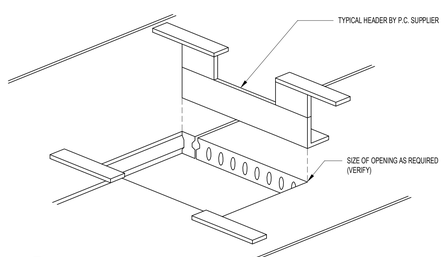
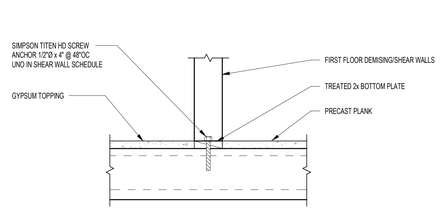


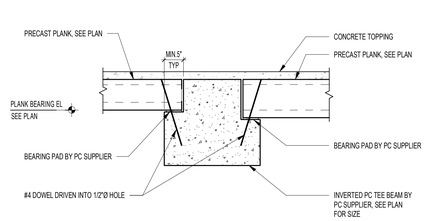
4 S-4.0 HOLD DOWN ANCHOR @ PC PLANK



3 S-4.0 PRECAST PLANK HEADER



2 S-4.0 SECTION



1 S-4.0 SECTION

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KEY PLAN

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10 West Mifflin St, Suite 205 | Madison, WI 53703
Phone: 608.256.7304 | Fax: 608.256.7306
PE PROJECT 15213

ISSUED

Issued for Bid	September 25, 2015
Revised Bid Set	January 19, 2016
Issued for Plan Review	February 8, 2016
2 CB #1	December 7, 2017
4 Revisions	May 11, 2018

WISCONSIN
RICHARD C. PIERCE
E-22511
WAUKESHA, WI
PROFESSIONAL ENGINEER
5/11/18

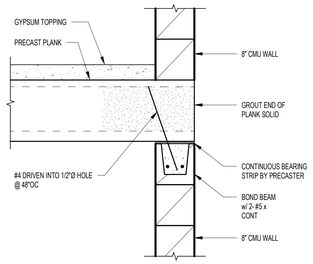
PROJECT TITLE
ROYSTER CROSSINGS LOT 2

521-523 GRAND OAK TRL, MADISON, WI

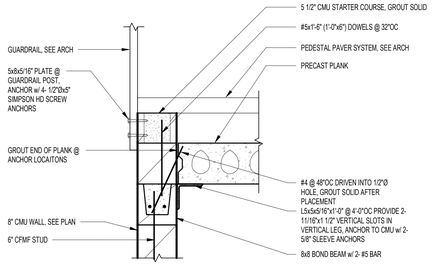
SHEET TITLE
FRAMING DETAILS

SHEET NUMBER
S-4.0

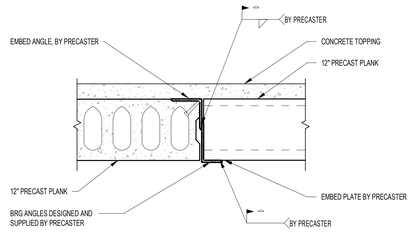
PROJECT NUMBER 1421



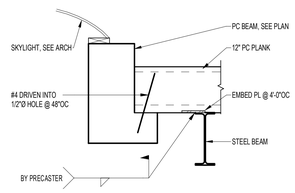
25 SECTION
S-4.1



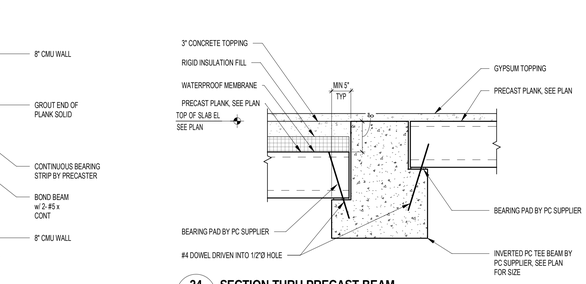
20 DETAIL
S-4.1



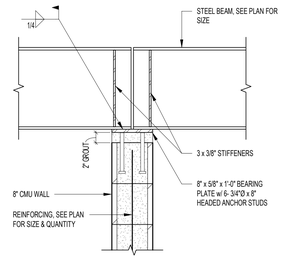
15 PRECAST BEAM BEARING @ CMU WALL
S-4.1



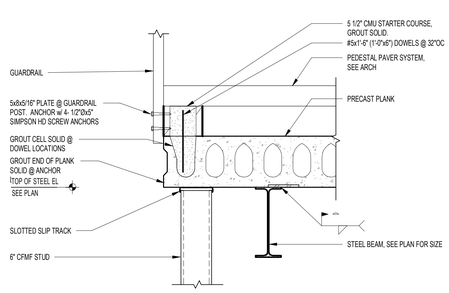
10 SECTION
S-4.1



24 SECTION THRU PRECAST BEAM
S-4.1



9 DETAIL
S-4.1



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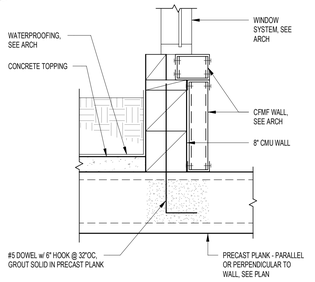
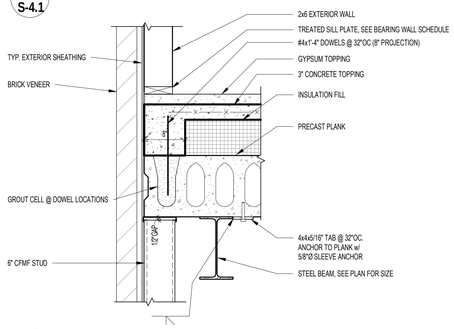
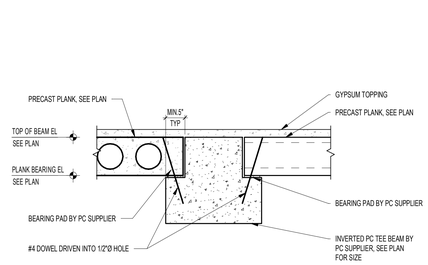
S-4.1



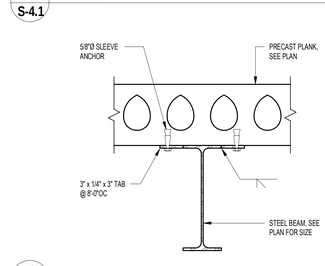
14 SECTION
S-4.1



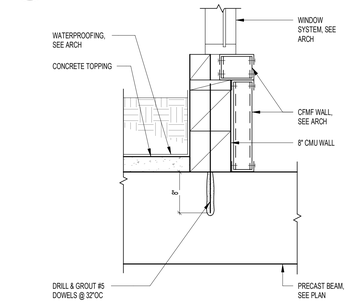
8 DETAIL
S-4.1



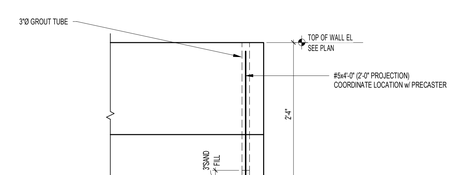
23 SECTION
S-4.1



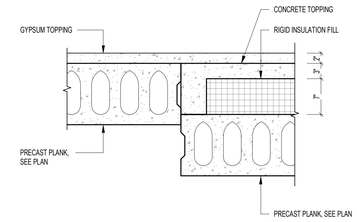
18 SECTION
S-4.1



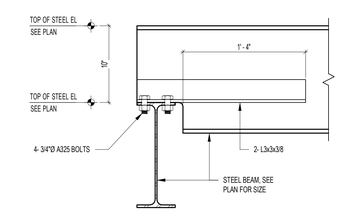
13 SECTION
S-4.1



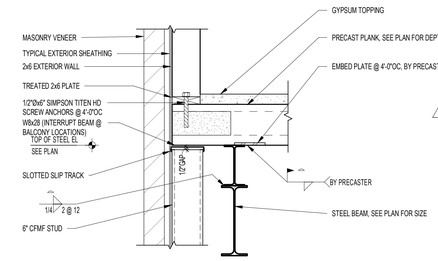
3 PRECAST BEAM BEARING @ CMU WALL
S-4.1



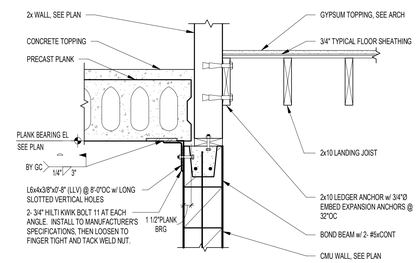
22 SECTION @ PLANK DROP
S-4.1



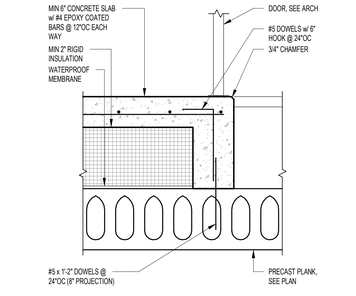
17 SECTION
S-4.1



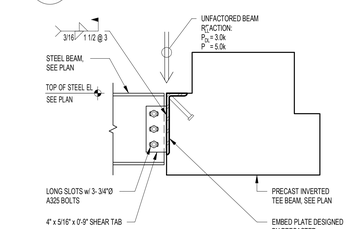
12 PRECAST BEAM BEARING @ CMU WALL
S-4.1



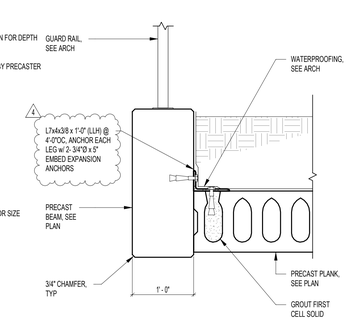
7 PRECAST BEAM BEARING @ CMU WALL
S-4.1



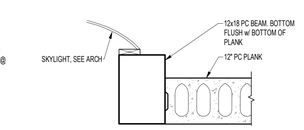
21 SECTION
S-4.1



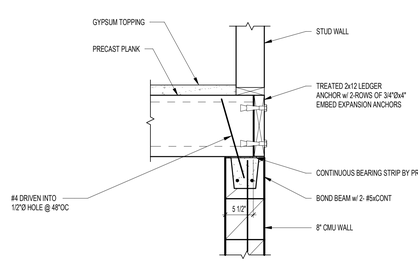
16 SECTION
S-4.1



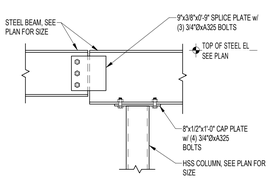
11 SECTION
S-4.1



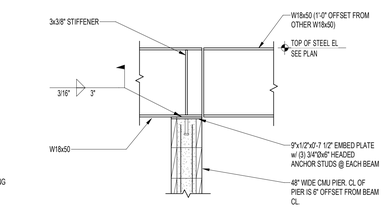
6 SECTION
S-4.1



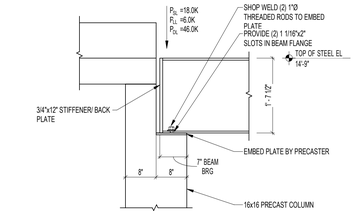
5 PRECAST BEAM BEARING @ CMU WALL
S-4.1



4 SECTION
S-4.1



2 SECTION
S-4.1



1 SECTION
S-4.1

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KEY PLAN

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10 West Mifflin St, Suite 205 | Madison, WI 53703
Phone: 608.256.7304 | Fax: 608.256.7306
PE PROJECT 15213

ISSUED

Issued for Bid	September 25, 2015
Revised Bid Set	January 19, 2016
Issued for Plan Review	February 8, 2016
1. Implemented City's LOI Clarifications	August 7, 2017
2. CB #1	December 7, 2017
4. Revisions	May 11, 2018

WISCONSIN RICHARD C. PIERCE E-22511 WAUKESHA, WI PROFESSIONAL ENGINEER 11/2/18

PROJECT TITLE
ROYSTER CROSSINGS LOT 2

521-523 GRAND OAK TRL, MADISON, WI

SHEET TITLE
FRAMING DETAILS

SHEET NUMBER
S-4.1

PROJECT NUMBER 1421

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ARCHITECTS
knothebruce.com 608.836.3690
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KEY PLAN

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CONSULTING STRUCTURAL ENGINEERS
10 West Mifflin St, Suite 205 | Madison, WI 53703
Phone: 608.256.7304 | Fax: 608.256.7306
PE PROJECT 15213

ISSUED

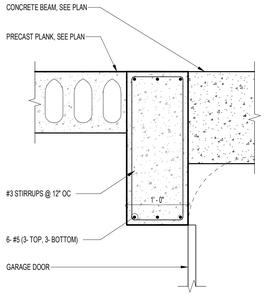
2	CB #1	December 7, 2017
3	Revision To Prevously Approved Plan	January 12, 2018
4	Revisions	May 11, 2018

4 8 SECTION S-4.2

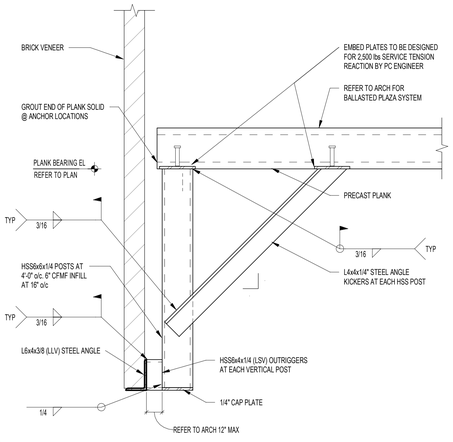
4 7 PRECAST BEARING @ STAIR S-4.2

4 6 CONCRETE WALL OPENING D S-4.2

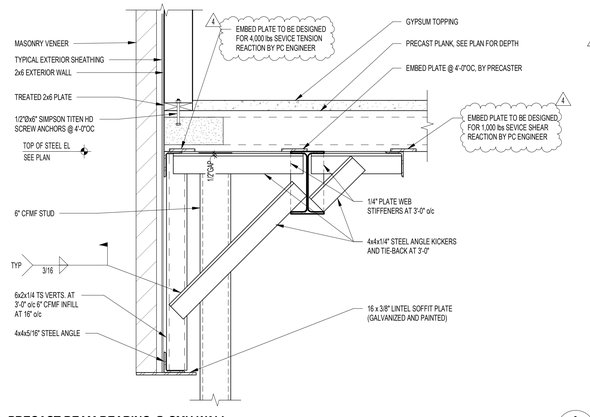
4 5 PIER DETAIL S-4.2



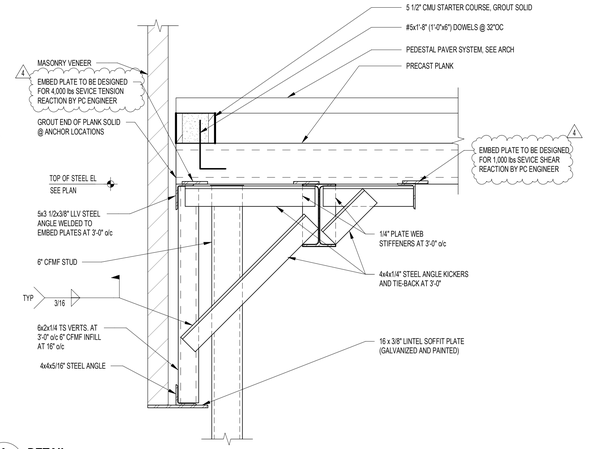
4 4 GARAGE HEADER S-4.2



4 3 SECOND FLOOR BRICK SUPPORT S-4.2



4 2 PRECAST BEAM BEARING @ CMU WALL S-4.2



4 1 DETAIL S-4.2

PROJECT TITLE
ROYSTER CROSSINGS LOT 2

521-523 GRAND OAK TRL, MADISON, WI

SHEET TITLE
FRAMING DETAILS

SHEET NUMBER
S-4.2

PROJECT NUMBER 1421

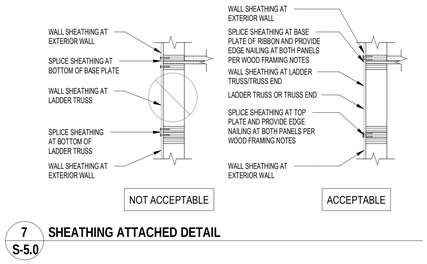
knothe bruce
ARCHITECTS
knothebruce.com 608.836.3690
7601 University Ave. • Suite 201 • Middleton, WI 53562

KEY PLAN

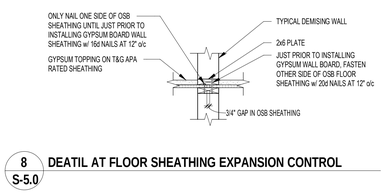
PIERCE ENGINEERS INC
CONSULTING STRUCTURAL ENGINEERS
10 West Mifflin St, Suite 205 | Madison, WI 53703
Phone: 608.256.7304 | Fax: 608.256.7306
PE PROJECT 15213

ISSUED

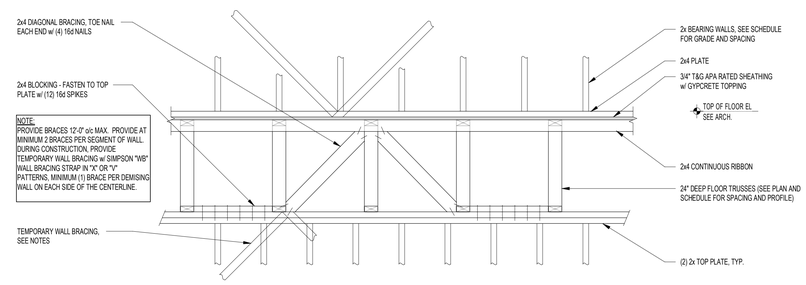
2	CB #1	December 7, 2017



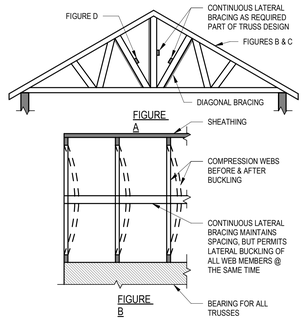
7 S-5.0 **SHEATHING ATTACHED DETAIL**



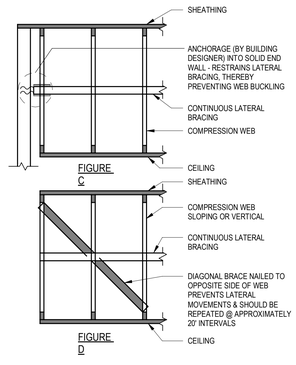
8 S-5.0 **DEATIL AT FLOOR SHEATHING EXPANSION CONTROL**

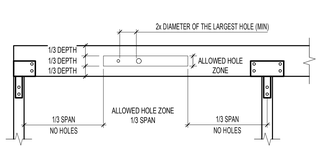


6 S-5.0 **BRACING AT CORRIDOR AND EXTERIOR WALLS**



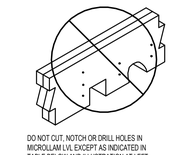
5 S-5.0 **BRACING DETAILS**





NOTES:
1. THE ALLOWED HOLE ZONE IS SUITABLE ONLY FOR UNIFORMLY LOADED BEAMS USING MAXIMUM LOADS FOR ANY TABLES LISTED IN THIS BROCHURE. FOR OTHER LOAD CONDITIONS OR HOLE CONFIGURATIONS, PLEASE CONTACT YOUR TRUSS JOIST MACMILLAN REPRESENTATIVE.
2. RECTANGULAR HOLES ARE NOT ALLOWED.
3. HOLES IN CANTILEVERS REQUIRE ADDITIONAL ANALYSIS.
4. IF LARGER HOLES ARE REQUIRED CONTACT STRUCTURAL ENGINEER FOR EVALUATION.

4 S-5.0 **ALLOWABLE HOLES IN LVL & PARALLAM BEAMS**



DO NOT CUT, NOTCH OR DRILL HOLES IN MICROLLAM LVL EXCEPT AS INDICATED IN TABLE BELOW AND ILLUSTRATION AT LEFT.

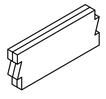
BEAM DEPTH	MAXIMUM ROUND HOLE SIZE
5 1/2"	1 3/4"
7 1/4" TO 18"	2"

1 3/4" WIDTH PIECES:
1. MINIMUM OF 2 ROWS 12d (3 1/4") COMMON NAILS AT 12" o/c.
2. MINIMUM OF 3 ROWS 12d (3 1/4") COMMON NAILS AT 12" o/c FOR 14", 16", 18", AND 20" BEAMS.
3. NAILED CONNECTIONS REQUIRE AN ADDITIONAL ROW OF NAILS WHEN NAIL SIZE IS SMALLER THAN SPECIFIED ABOVE (MINIMUM 0.125"x3").
4. LOAD MUST BE APPLIED EVENLY ACROSS ENTIRE BEAM WIDTH. OTHERWISE, USE CONNECTIONS FOR SIDE-LOADED BEAMS.

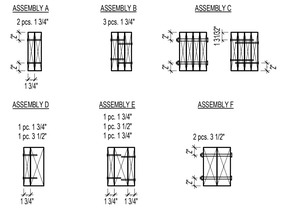
3 1/2" WIDTH PIECES:
1. MINIMUM OF (2) ROWS "I" BOLTS AT 24" o/c, STAGGERED.

   FOR ALL OTHER TWO PIECE, CONTINUOUS HEADERS, PROVIDE 16d COMMON NAILS AT 16" o/c ALONG EACH EDGE, UNLESS NOTED OTHERWISE.

NOTE:
1. MULTIPLE PIECES OF MICROLLAM LVL OR TIMBERSTRAND LSL CAN BE NAILED OR BOLTED TOGETHER TO FORM A HEADER OR BEAM OF THE REQUIRED SIZE, UP TO A MAXIMUM WIDTH OF 7".



3 S-5.0 **MULTIPLE-MEMBER CONN. FOR TOP-LOADED BEAMS**



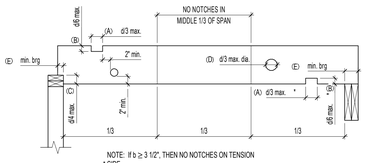
NOTE:
1. 7" WIDE BEAMS SHOULD ONLY BE SIDE-LOADED WHEN LOADS ARE APPLIED TO BOTH SIDES OF THE MEMBERS (TO MINIMIZE ROTATION)

2 S-5.0 **MULTIPLE-MEMBER CONNECTIONS FOR SIDE-LOADED BEAMS**

MAXIMUM UNIFORM LOAD APPLIED TO EITHER OUTSIDE MEMBER (PLF)

MULTIPLE ASSEMBLY	NAILED CONNECTION (1), (2)		THROUGH-BOLTED CONNECTION (3)		STRUCTURAL WOOD SCREW CONNECTION (4)	
	2 ROWS 12d (0.148"x3.25") COMMON WIRE AT 12" o/c	3 ROWS 12d (0.148"x3.25") COMMON WIRE AT 12" o/c	2 ROWS 1/2" BOLTS AT 24" o/c	2 ROWS 1/2" BOLTS AT 12" o/c	2 ROWS 1/4" x 3 1/2" SCREW AT 24" o/c	2 ROWS 1/4" x 3 1/2" SCREW AT 12" o/c
A	470	705	505	1015	500	995
B	355	530	380	760	375	745
C			340	680	330 (5)	665 (5)
D	355	530	520	1045	375	745
E	315	470	465	930	330	665
F			860	1720		

NOTES:
1. NAILED CONNECTION VALUES MAY BE DOUBLED FOR 6" ON-CENTER OR TRIPLED FOR 4" o/c NAIL SPACING.
2. NAILED CONNECTION VALUES REQUIRE AN ADDITIONAL ROW OF NAILS WHEN NAIL SIZE IS SMALLER THAN SPECIFIED ABOVE (MINIMUM 0.128"x3").
3. A307 BOLTS WITH WASHERS REQUIRED. BOLT HOLES TO BE 9/16" MAXIMUM.
4. SCREWS MUST HAVE SELF-DRILLING TIP AND MINIMUM BENDING YIELD STRENGTH OF 217,000 psi. LEAD HOLES MAY BE REQUIRED BY LOCAL BUILDING OFFICIAL.



NOTE: If b ≥ 3 1/2", THEN NO NOTCHES ON TENSION
* SIDE EXCEPT AT ENDS. b = MEMBER THICKNESS.

1 S-5.0 **JOIST HOLES & NOTCHES**

JOIST SIZE	(A) MAXIMUM NOTCH LENGTH	(B) MAXIMUM NOTCH DEPTH	(C) MAXIMUM END NOTCH DEPTH	(D) MAXIMUM HOLE DEPTH	(E) MINIMUM BEARING LENGTH (1)	
2x6	1-13/16"	7/8"	1-3/8"	1-13/16"	1-1/2"	3"
2x8	2-3/8"	1-3/16"	1-13/16"	2-3/8"	1-1/2"	3"
2x10	3-1/16"	1-1/2"	2-5/16"	3-1/16"	1-1/2"	3"
2x12	3-3/4"	1-7/8"	2-13/16"	3-3/4"	1-1/2"	3"

NOTE:
1. MINIMUM BEARING: 1-1/2" ON WOOD OR STEEL; 3" BEARING ON MASONRY.

PROJECT TITLE
ROYSTER CROSSINGS LOT 2

521-523 GRAND OAK TRL, MADISON, WI

SHEET TITLE
FRAMING DETAILS

SHEET NUMBER
S-5.0

PROJECT NUMBER 1421

CONSTRUCTION BULLETIN

CONSTRUCTION BULLETIN #1

DATE ISSUED: 10/23/2018

PROJECT: Royster / Library

PROJECT # 1421

OWNER: Ruedebusch Development

CONTRACTOR: Connery Construction

DISTRIBUTION

☒Owner
☒Architect
☒Contractor

The work shall be carried out in accordance with the following supplemental instructions issued in accordance with the Contract Documents without change in Contract Sum or Contract Time. Prior to proceeding in accordance with these instructions, indicate your acceptance of these instructions for minor change to the Work as consistent with the Contract Documents and return a copy to the Architect, or submit an itemized quotation for changes in the contract sum and/or time incidental to proposed modifications to the Contract Documents described herein. **This is not a Change Order and does not modify the terms of the Agreement between the Owner and Contractor.**

Description:

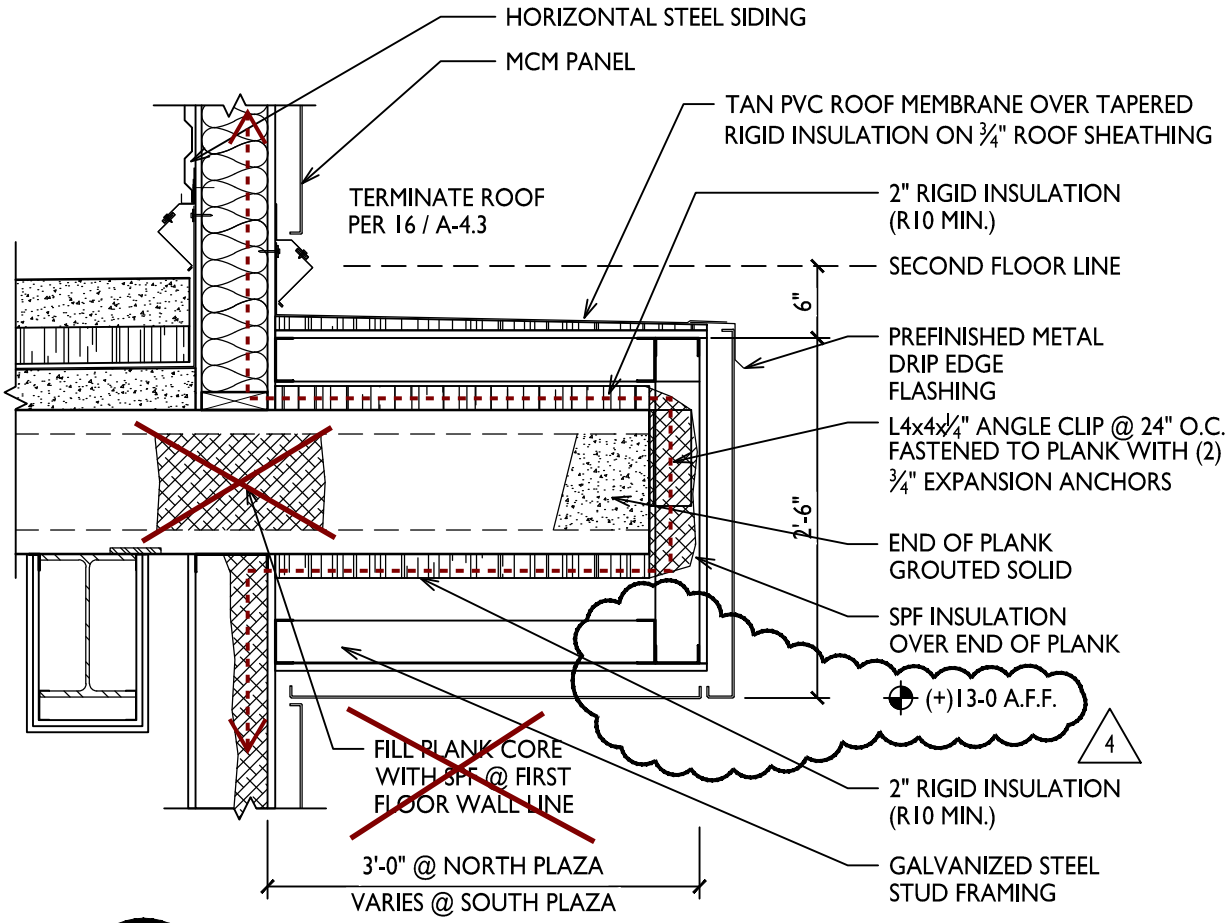
1. Spray foam insulation within the precast plank cores at the exterior wall line may be eliminated.

Attachments:

1. Marked up detail 23/A-4.4

ARCHITECT		CONTRACTOR	
ISSUED BY:	Greg Held	ACCEPTED BY:	_____
DATE:	10/23/2018	DATE:	_____

Ph 608.836.3690
Fx 608.836.6934
knothebruce.com
7601 University Ave., Suite 201
Middleton, WI 53562



23 / A-4.4 CANOPY DETAIL

3/4" = 1'-0"

CB 10/23/2018

The spray foam shown in the precast plank cores at the exterior wall may be omitted for the following reasons:

1. It is thermally inefficient because of thermal bridging by the concrete webs and steel tendons.
2. It is redundant to the insulation on the exterior of the plank.
3. The plank ends were grouted at the plant, making access difficult.