

Madison, Wisconsin

# CITY OF MADISON

## CITY ENGINEERING DIVISION

### DEPARTMENT OF PUBLIC WORKS

#### PLAN OF PROPOSED IMPROVEMENT

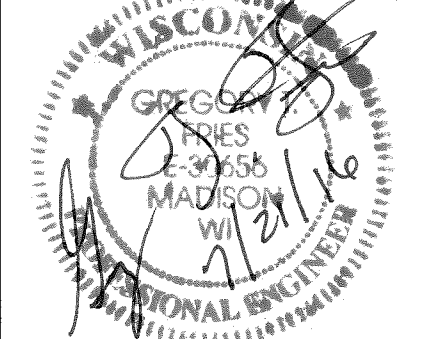
PUBLIC IMPROVEMENT PROJECT APPROVED

BY THE COMMON COUNCIL OF MADISON, WISCONSIN

PUBLIC IMPROVEMENT DESIGN APPROVED BY:

*[Signature]* 7/26/16  
City Engineer Date

PROJECT DESIGNED BY:



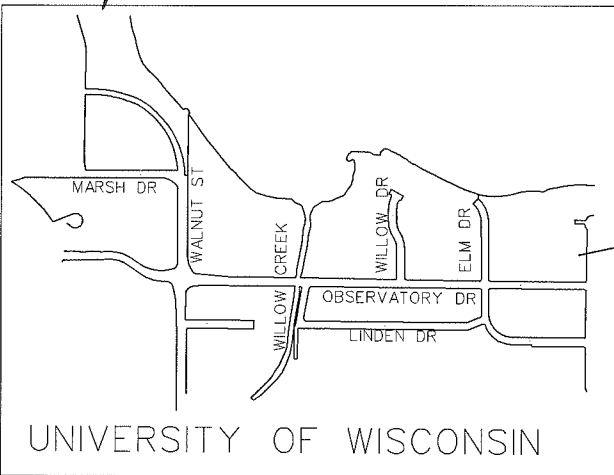
# WILLOW CREEK STORMWATER TREATMENT

CITY PROJECT NO. 53W1734  
CONTRACT NO. 7330

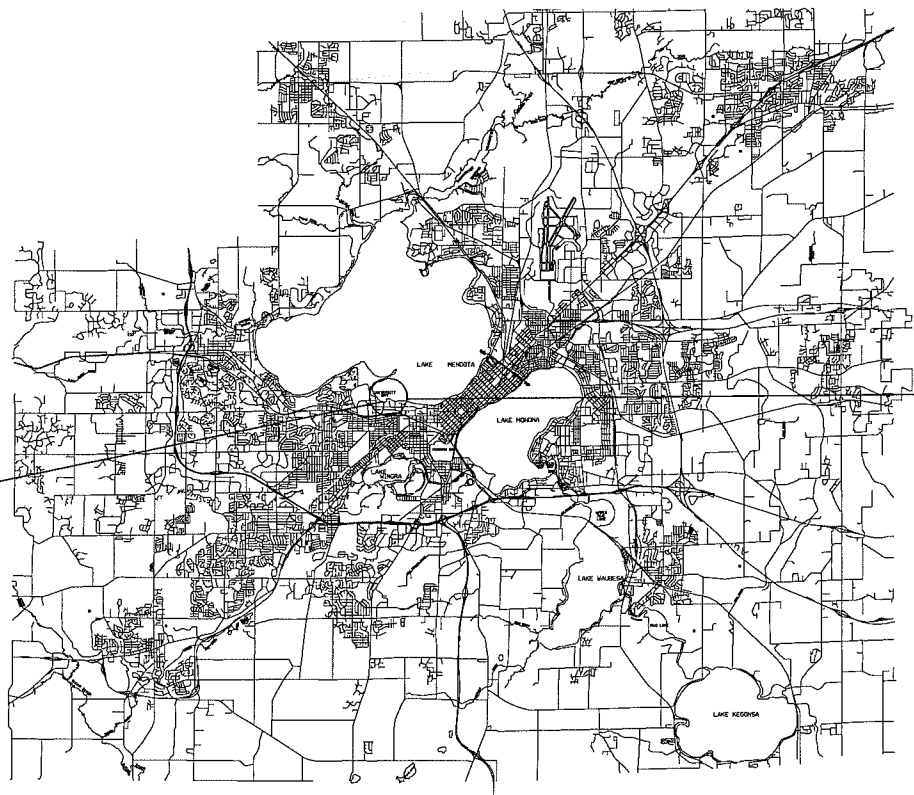
INDEX OF SHEETS

SHEET NO. S1	EXISTING CONDITIONS
SHEET NO. S2	SITE DEMOLITION PLAN
SHEET NO. S3	CHANNEL LAYOUT PLAN
SHEET NO. S4	CHANNEL UNDERDRAIN PLAN
SHEET NO. S5	SOUTH END ENLARGED PLAN
SHEET NO. S6	TYPICAL CHANNEL SECTIONS -1
SHEET NO. S7	TYPICAL CHANNEL SECTIONS -2
SHEET NO. S8	WIER WALL DETAILS
SHEET NO. S9	CHANNEL DETAILS -1
SHEET NO. S10	CHANNEL DETAILS -2
SHEET NO. S11	CHANNEL DETAILS -3
SHEET NO. 1	ENVIROLOK TITLE
SHEET NO. 2	ENVIROLOK PLAN
SHEET NO. 3	ENVIROLOK WALL 1
SHEET NO. 4	ENVIROLOK WALL 2&3
SHEET NO. 5	ENVIROLOK SECTIONS
SHEET NO. 6	ENVIROLOK DETAILS
SHEET NO. 7	ENVIROLOK SPECIFICATIONS
SHEET NO. L1	LANDSCAPING GENERAL LAYOUT

SHEET NO. U-2	EXISTING COND. PLAN
SHEET NO. U-3	GRADING PLAN-PROFILE
SHEET NO. U-4	DREDGING
SHEET NO. U-5	CHANNEL DETAIL
SHEET NO. U-6	RAMP + WEIR
SHEET NO. U-7	DETAILS



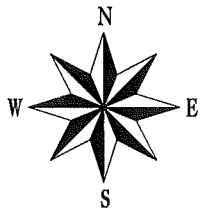
SHEET NO. U-10	EROSION CONTROL
SHEET NO. U-11	STORM SCHEDULE
SHEET NO. U-12	PLANSING PLAN
SHEET NO. U13+U14	EXISTING BOX PLANS



PROJECT LOCATION

CONVENTIONAL SIGNS  
FIELD VERIFY ALL UTILITY LOCATIONS

GAS	— G —
STORM SEWER	— ST —
SANITARY SEWER	— SAN —
WATER	— W —
OVERHEAD ELECTRIC	— OH —
POWER POLE	⊥
HANDICAP RAMP	♿
COMBUSTIBLE FLUIDS	☠



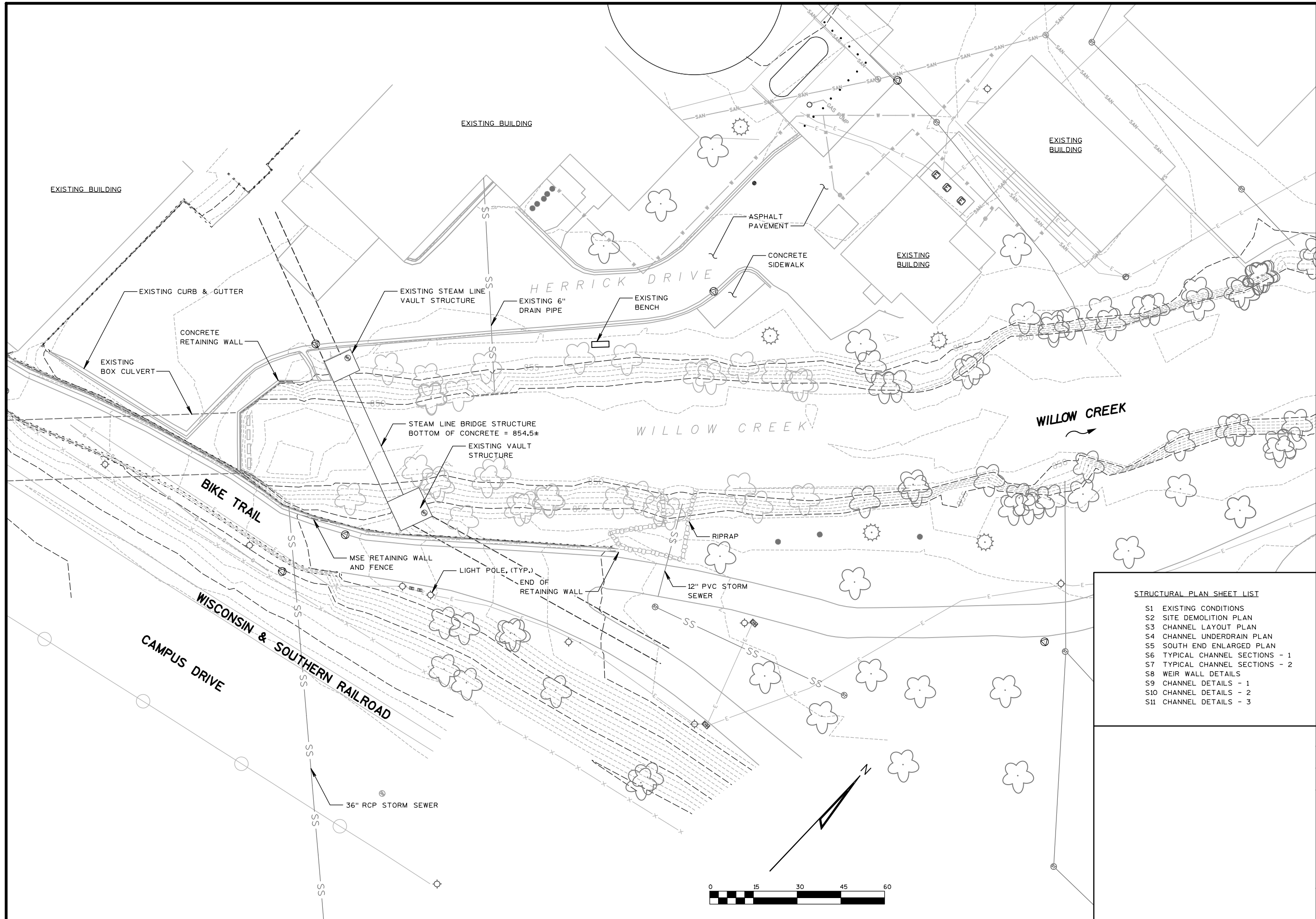
PLANNED EARTHWORK QUANTITIES  
EXCAVATION CUT (MEASURED PLAN QUANTITY).....700 CY

PLOT SCALE:

PLOT NAME:

REV. DATE:

ORIGINATOR: CITY OF MADISON, STREETS DIVISION



**STRUCTURAL PLAN SHEET LIST**

- S1 EXISTING CONDITIONS
- S2 SITE DEMOLITION PLAN
- S3 CHANNEL LAYOUT PLAN
- S4 CHANNEL UNDERDRAIN PLAN
- S5 SOUTH END ENLARGED PLAN
- S6 TYPICAL CHANNEL SECTIONS - 1
- S7 TYPICAL CHANNEL SECTIONS - 2
- S8 WEIR WALL DETAILS
- S9 CHANNEL DETAILS - 1
- S10 CHANNEL DETAILS - 2
- S11 CHANNEL DETAILS - 3

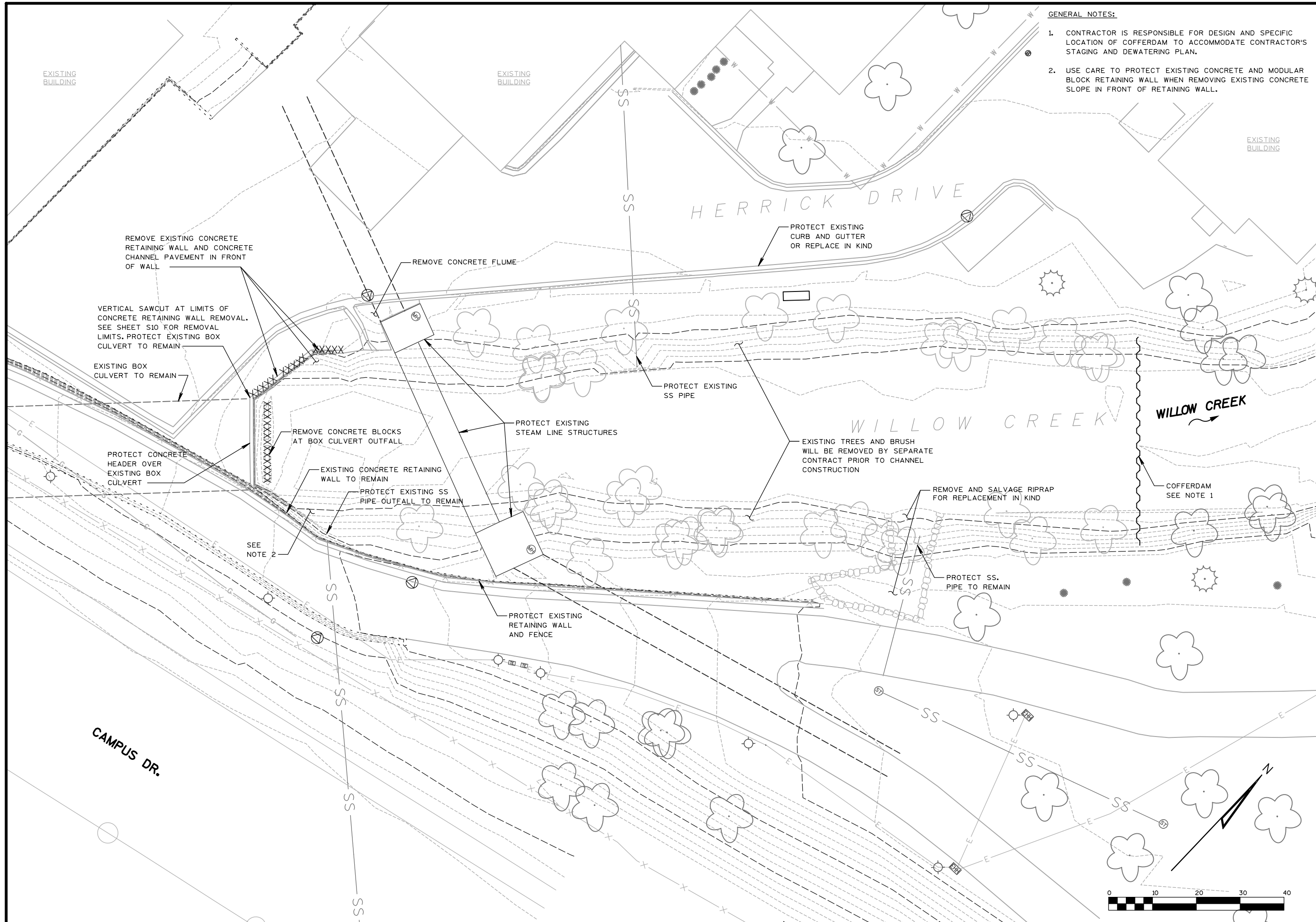
NO.	REVISIONS	DATE
1	ISSUED FOR BID	5/6/2016

**EXISTING CONDITIONS**  
 WILLOW CREEK TREATMENT BASIN  
 CITY OF MADISON  
 DANE COUNTY, WISCONSIN

JOB NO.  
1020.093  
 PROJECT MGR.  
BMO



SHEET  
**S1**



**GENERAL NOTES:**

1. CONTRACTOR IS RESPONSIBLE FOR DESIGN AND SPECIFIC LOCATION OF COFFERDAM TO ACCOMMODATE CONTRACTOR'S STAGING AND DEWATERING PLAN.
2. USE CARE TO PROTECT EXISTING CONCRETE AND MODULAR BLOCK RETAINING WALL WHEN REMOVING EXISTING CONCRETE SLOPE IN FRONT OF RETAINING WALL.

NO.	REVISIONS	DATE
1	ISSUED FOR BID	5/6/2016

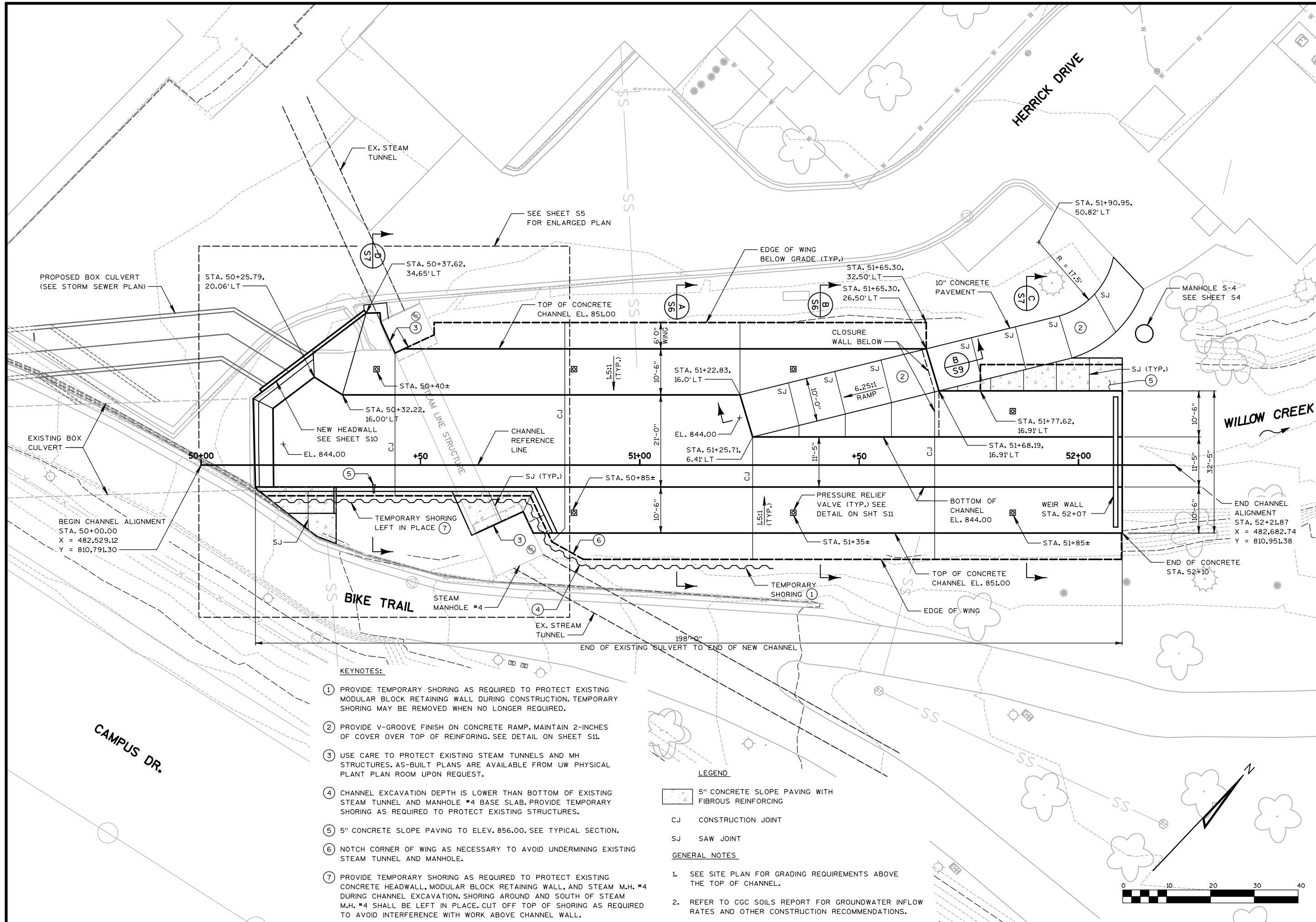
**SITE DEMOLITION PLAN**

WILLOW CREEK TREATMENT BASIN  
CITY OF MADISON  
DANE COUNTY, WISCONSIN

JOB NO.  
1020.093  
PROJECT MGR.  
BMO



SHEET  
S2



**KEYNOTES:**

- ① PROVIDE TEMPORARY SHORING AS REQUIRED TO PROTECT EXISTING MODULAR BLOCK RETAINING WALL DURING CONSTRUCTION. TEMPORARY SHORING MAY BE REMOVED WHEN NO LONGER REQUIRED.
- ② PROVIDE V-GROOVE FINISH ON CONCRETE RAMP. MAINTAIN 2-INCHES OF COVER OVER TOP OF REINFORCING. SEE DETAIL ON SHEET S11.
- ③ USE CARE TO PROTECT EXISTING STEAM TUNNELS AND MH STRUCTURES. AS-BUILT PLANS ARE AVAILABLE FROM UW PHYSICAL PLAN ROOM UPON REQUEST.
- ④ CHANNEL EXCAVATION DEPTH IS LOWER THAN BOTTOM OF EXISTING STEAM TUNNEL AND MANHOLE #4 BASE SLAB. PROVIDE TEMPORARY SHORING AS REQUIRED TO PROTECT EXISTING STRUCTURES.
- ⑤ 5" CONCRETE SLOPE PAVING TO ELEV. 856.00. SEE TYPICAL SECTION.
- ⑥ NOTCH CORNER OF WING AS NECESSARY TO AVOID UNDERMINING EXISTING STEAM TUNNEL AND MANHOLE.
- ⑦ PROVIDE TEMPORARY SHORING AS REQUIRED TO PROTECT EXISTING CONCRETE HEADWALL, MODULAR BLOCK RETAINING WALL, AND STEAM M.H. #4 DURING CHANNEL EXCAVATION. SHORING AROUND AND SOUTH OF STEAM M.H. #4 SHALL BE LEFT IN PLACE. CUT OFF TOP OF SHORING AS REQUIRED TO AVOID INTERFERENCE WITH WORK ABOVE CHANNEL WALL.

**LEGEND**

- 5" CONCRETE SLOPE PAVING WITH FIBROUS REINFORCING
- CJ CONSTRUCTION JOINT
- SJ SAW JOINT

**GENERAL NOTES**

1. SEE SITE PLAN FOR GRADING REQUIREMENTS ABOVE THE TOP OF CHANNEL.
2. REFER TO CGC SOILS REPORT FOR GROUNDWATER INFLOW RATES AND OTHER CONSTRUCTION RECOMMENDATIONS.

DATE:	5/6/2016
REVISIONS	ISSUED FOR BID
NO.	1

**CHANNEL LAYOUT PLAN**  
 WILLOW CREEK TREATMENT BASIN  
 CITY OF MADISON  
 DANE COUNTY, WISCONSIN

JOB NO.  
 1020.093  
 PROJECT MGR.  
 BMO

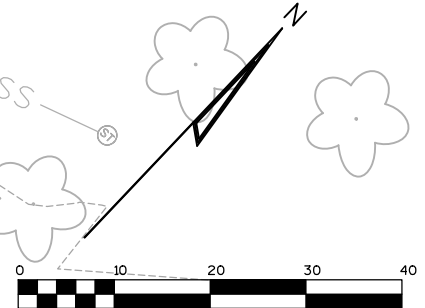


SHEET  
 S3

CAMPUS DR.

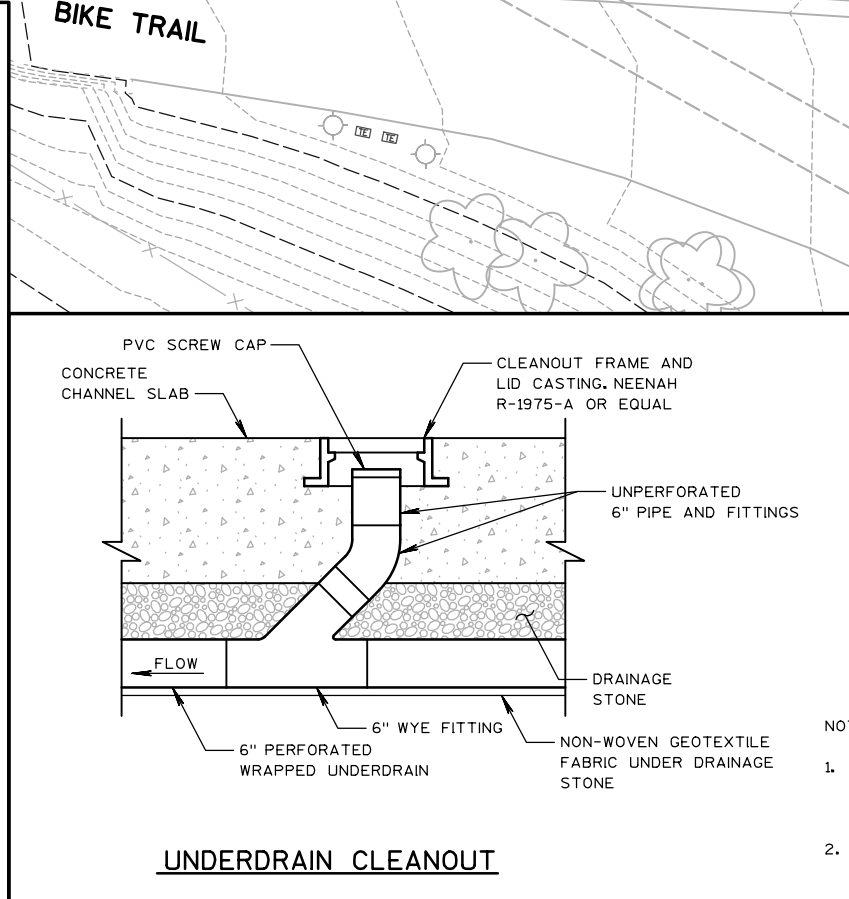
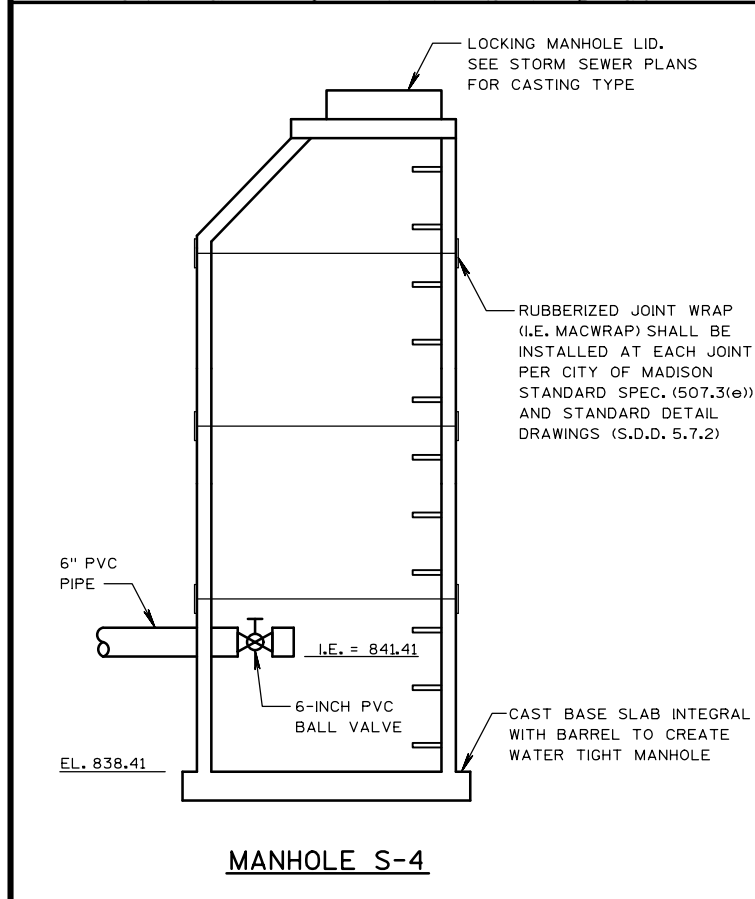
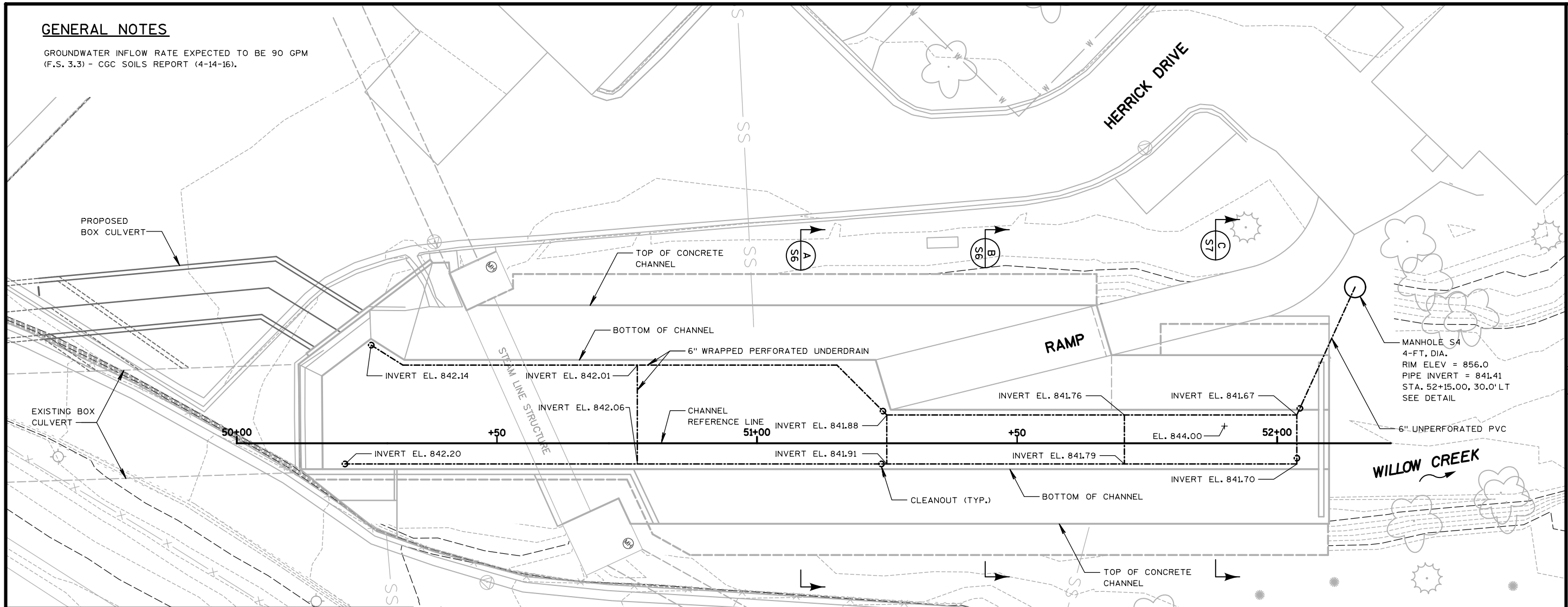
HERRICK DRIVE

WILLOW CREEK

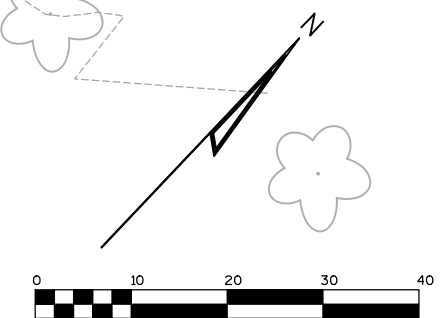


**GENERAL NOTES**

GROUNDWATER INFLOW RATE EXPECTED TO BE 90 GPM  
(F.S. 3.3) - CGC SOILS REPORT (4-14-16).



- NOTES:
1. IN-LINE CLEANOUT SHOWN, END CLEANOUT IS SIMILAR WITH END CAP UPSTREAM OF WYE FITTING.
  2. ALL CONNECTIONS, FITTINGS, AND CASTING ARE INCIDENTAL TO UNDERDRAIN BID ITEM.



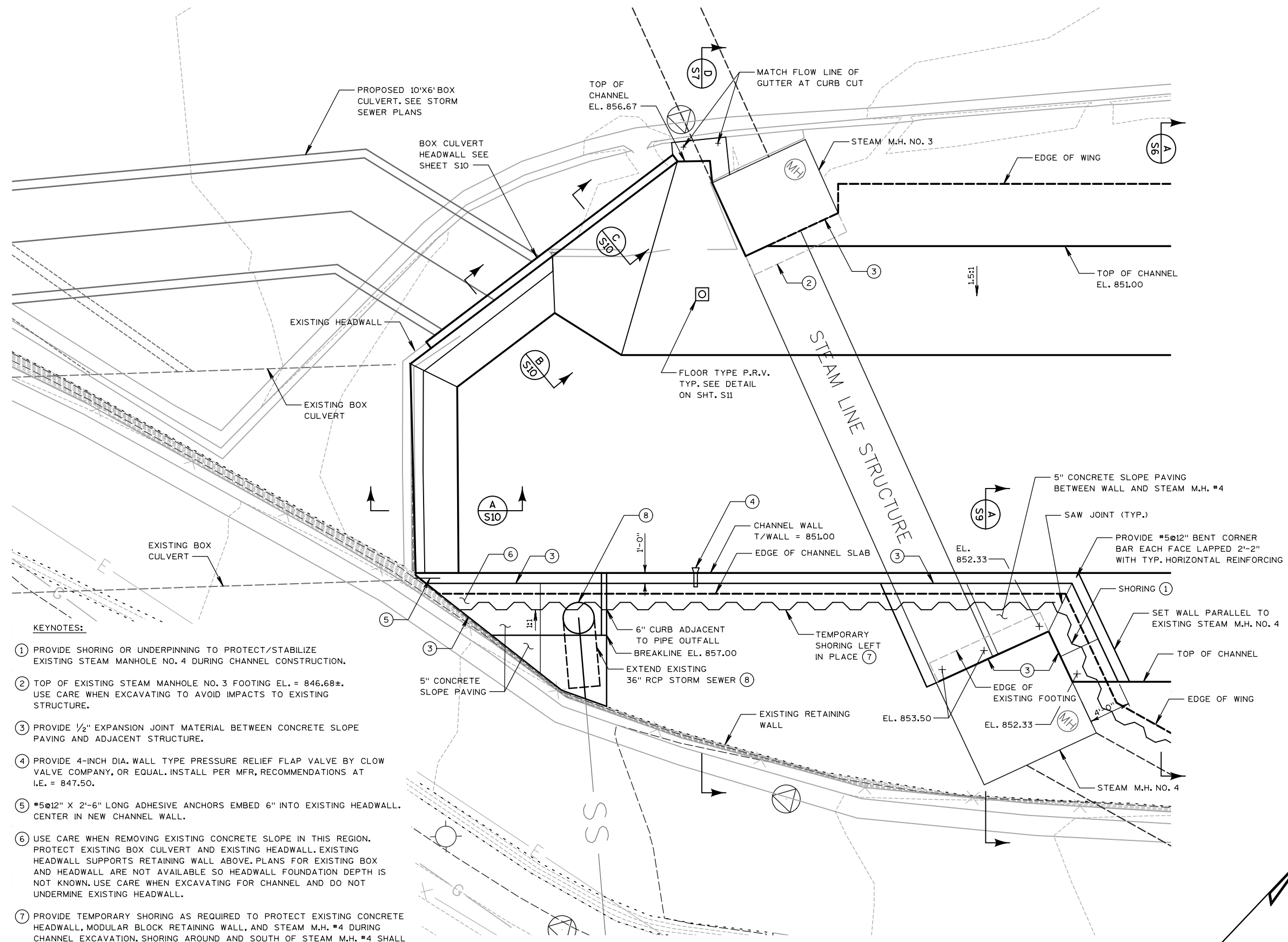
NO.	REVISIONS	DATE
1	ISSUED FOR BID	5/6/2016

**CHANNEL UNDERDRAIN PLAN**  
WILLOW CREEK TREATMENT BASIN  
CITY OF MADISON  
DANE COUNTY, WISCONSIN

JOB NO.  
**1020.093**  
PROJECT MGR.  
**BMO**



SHEET  
**S4**



**KEYNOTES:**

- ① PROVIDE SHORING OR UNDERPINNING TO PROTECT/STABILIZE EXISTING STEAM MANHOLE NO. 4 DURING CHANNEL CONSTRUCTION.
- ② TOP OF EXISTING STEAM MANHOLE NO. 3 FOOTING EL. = 846.68±. USE CARE WHEN EXCAVATING TO AVOID IMPACTS TO EXISTING STRUCTURE.
- ③ PROVIDE 1/2" EXPANSION JOINT MATERIAL BETWEEN CONCRETE SLOPE PAVING AND ADJACENT STRUCTURE.
- ④ PROVIDE 4-INCH DIA. WALL TYPE PRESSURE RELIEF FLAP VALVE BY CLOW VALVE COMPANY, OR EQUAL. INSTALL PER MFR, RECOMMENDATIONS AT I.E. = 847.50.
- ⑤ #5@12" X 2'-6" LONG ADHESIVE ANCHORS EMBED 6" INTO EXISTING HEADWALL. CENTER IN NEW CHANNEL WALL.
- ⑥ USE CARE WHEN REMOVING EXISTING CONCRETE SLOPE IN THIS REGION. PROTECT EXISTING BOX CULVERT AND EXISTING HEADWALL. EXISTING HEADWALL SUPPORTS RETAINING WALL ABOVE. PLANS FOR EXISTING BOX AND HEADWALL ARE NOT AVAILABLE SO HEADWALL FOUNDATION DEPTH IS NOT KNOWN. USE CARE WHEN EXCAVATING FOR CHANNEL AND DO NOT UNDERMINE EXISTING HEADWALL.
- ⑦ PROVIDE TEMPORARY SHORING AS REQUIRED TO PROTECT EXISTING CONCRETE HEADWALL, MODULAR BLOCK RETAINING WALL, AND STEAM M.H. #4 DURING CHANNEL EXCAVATION. SHORING AROUND AND SOUTH OF STEAM M.H. #4 SHALL BE LEFT IN PLACE. CUT OFF TOP OF SHORING AS REQUIRED TO AVOID INTERFERENCE WITH WORK ABOVE CHANNEL WALL.
- ⑧ PROVIDE 36" RCP TO EXTEND EXISTING STORM SEWER. MATCH EXISTING PIPE SLOPE AND EXTEND TO POINT WHERE PIPE INTERSECTS WITH SLOPE PAVING ABOVE CHANNEL, CUT END OF PIPE TO MATCH FINISHED GRADE ABOVE.

NO.	REVISIONS	DATE
1	ISSUED FOR BID	5/6/2016

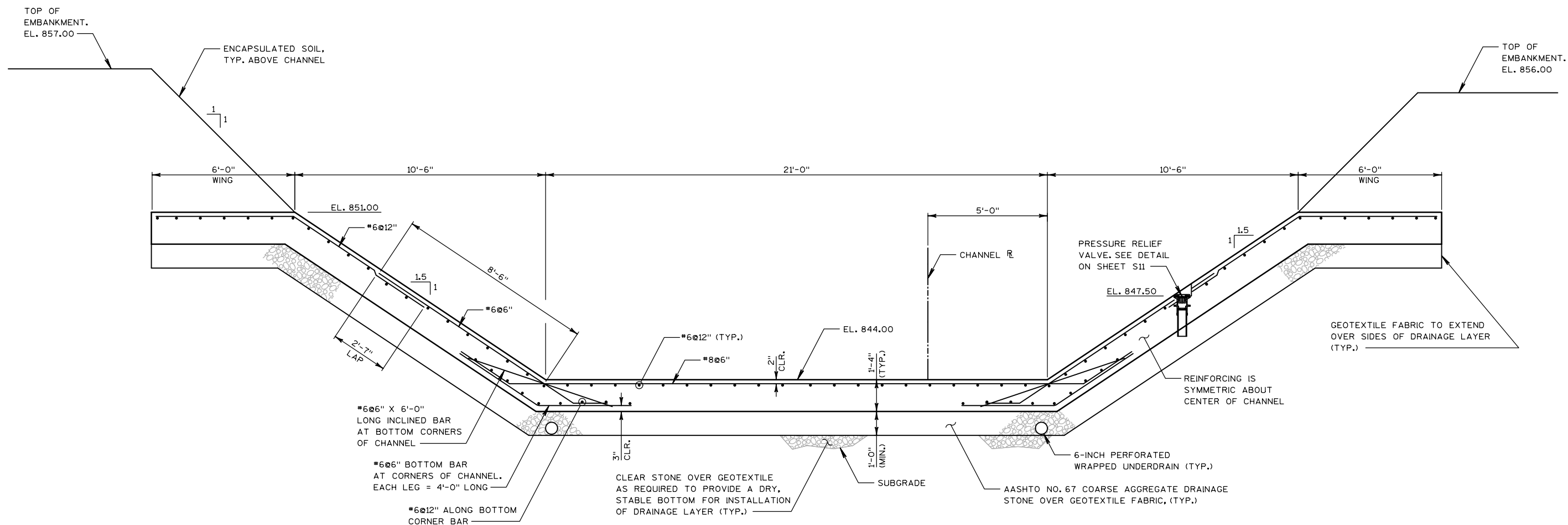
**SOUTH END ENLARGED PLAN**  
 WILLOW CREEK TREATMENT BASIN  
 CITY OF MADISON  
 DANE COUNTY, WISCONSIN

JOB NO.  
**1020.093**  
 PROJECT MGR.  
**BMO**

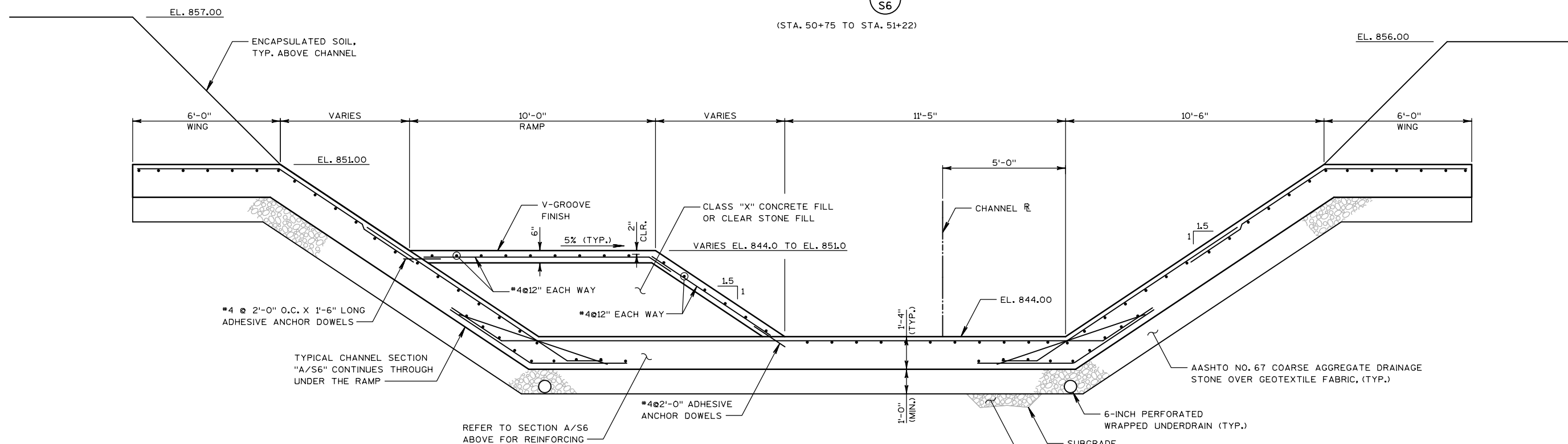


SHEET  
**S5**





**SECTION A**  
S6  
(STA. 50+75 TO STA. 51+22)



**SECTION B**  
S6  
(STA. 51+22 TO STA. 51+68)

NO.	REVISIONS	DATE
1	ISSUED FOR BID	5/6/2016

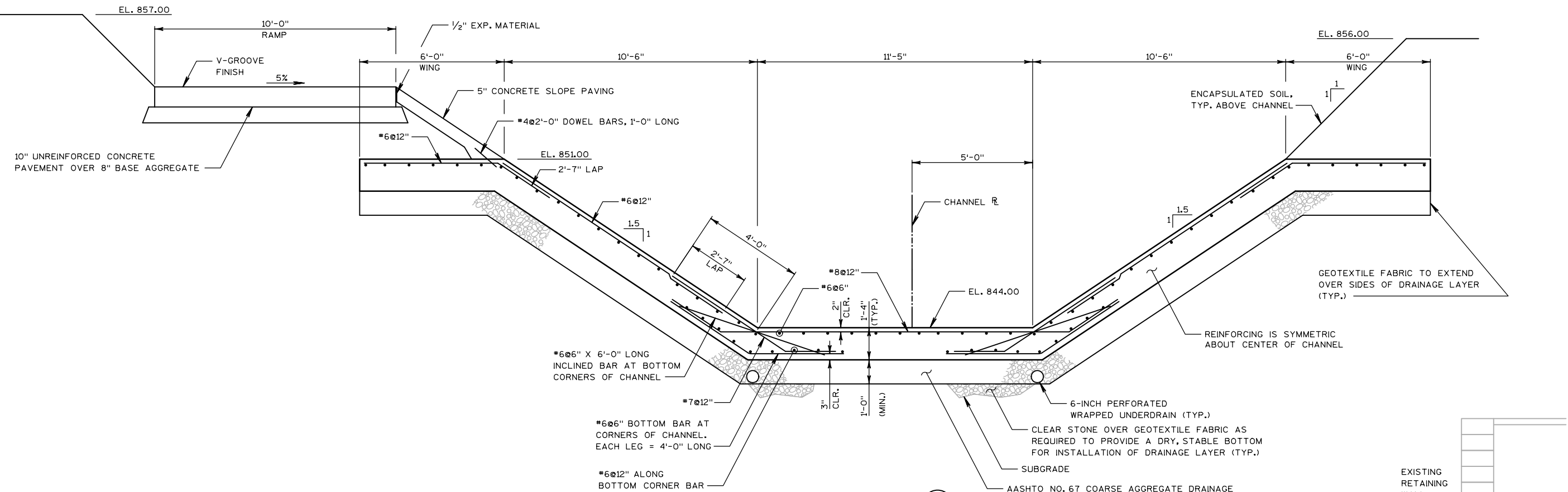
**TYPICAL CHANNEL SECTIONS - 1**

WILLOW CREEK TREATMENT BASIN  
CITY OF MADISON  
DANE COUNTY, WISCONSIN

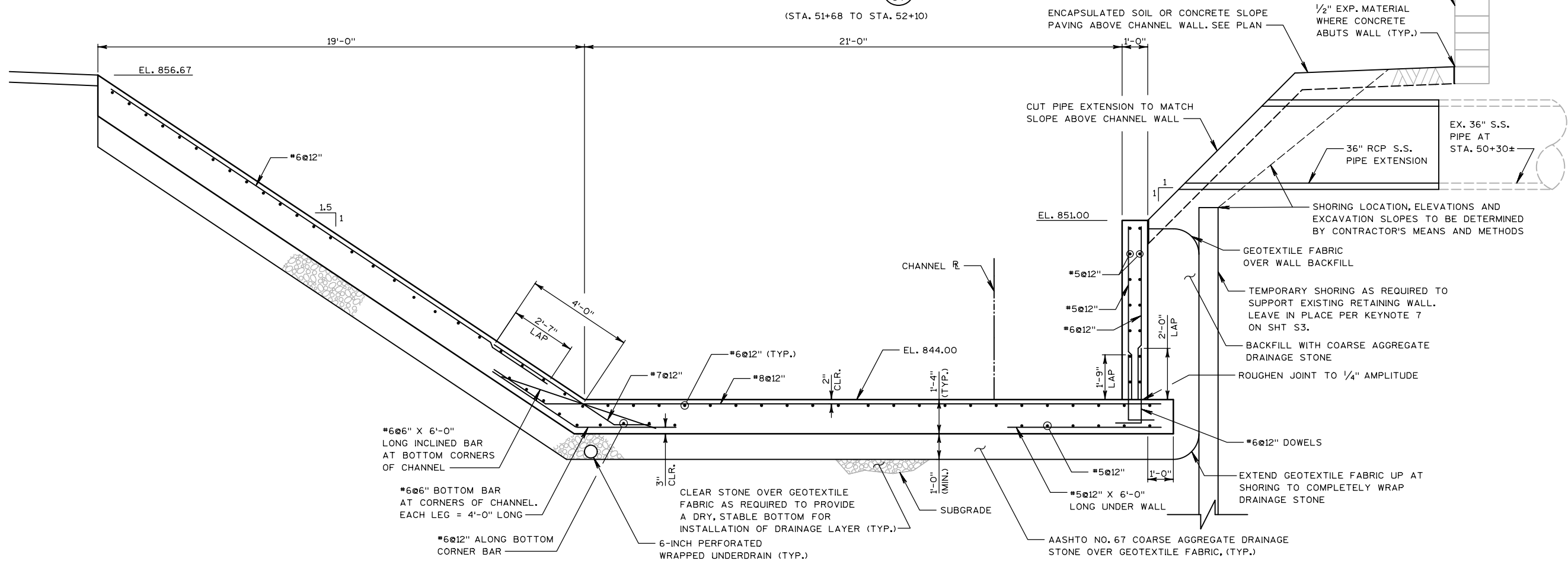
JOB NO.  
1020.093  
PROJECT MGR.  
BMO



SHEET  
S6



**SECTION C**  
S7  
(STA. 51+68 TO STA. 52+10)



**SECTION D**  
S7  
(STA. 51+16 TO STA. 50+75)

NO.	REVISIONS	DATE
1	ISSUED FOR BID	5/6/2016

**TYPICAL CHANNEL SECTIONS - 2**

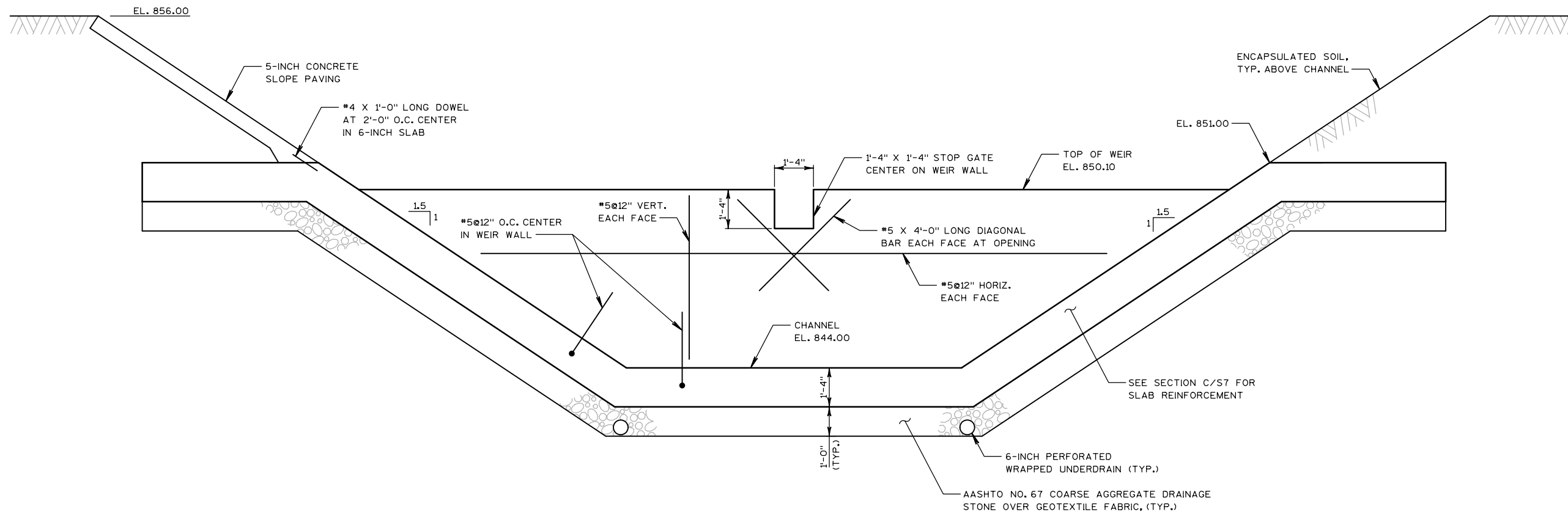
WILLOW CREEK TREATMENT BASIN  
CITY OF MADISON  
DANE COUNTY, WISCONSIN

JOB NO.  
1020.093  
PROJECT MGR.  
BMO

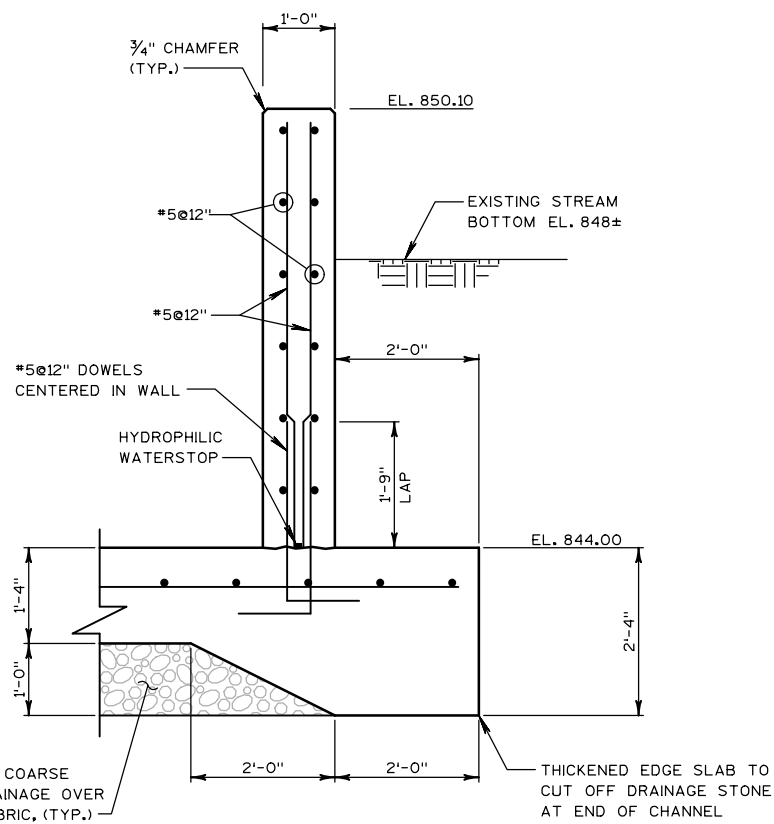


SHEET  
S7

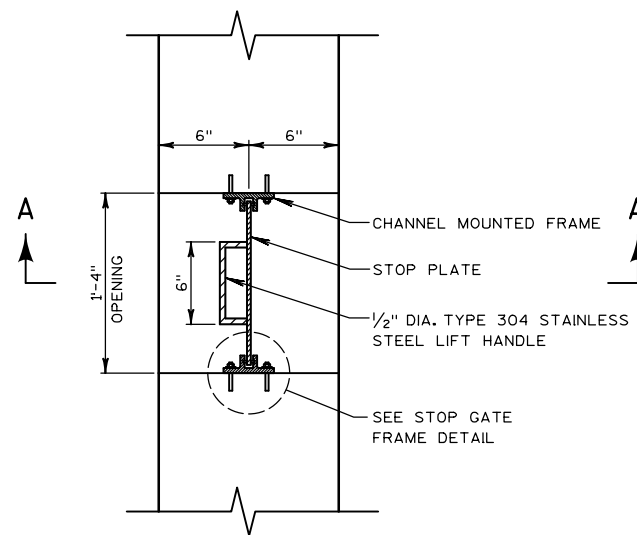




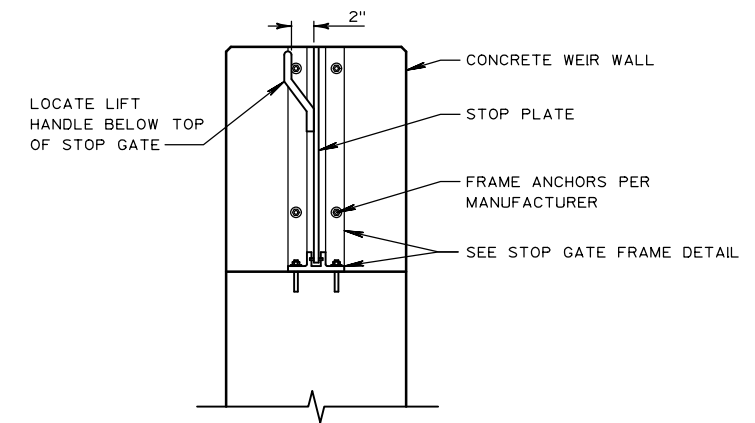
**WEIR WALL ELEVATION**  
LOOKING NORTH



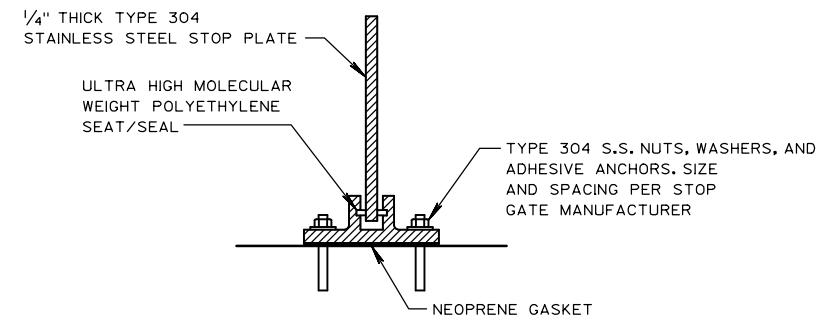
**WEIR WALL SECTION**  
NOT TO SCALE



**STOP GATE**  
NOT TO SCALE



**SECTION A-A AT STOP GATE**  
NOT TO SCALE



**STOP GATE FRAME DETAIL**  
TYP. ON SIDES AND BOTTOM

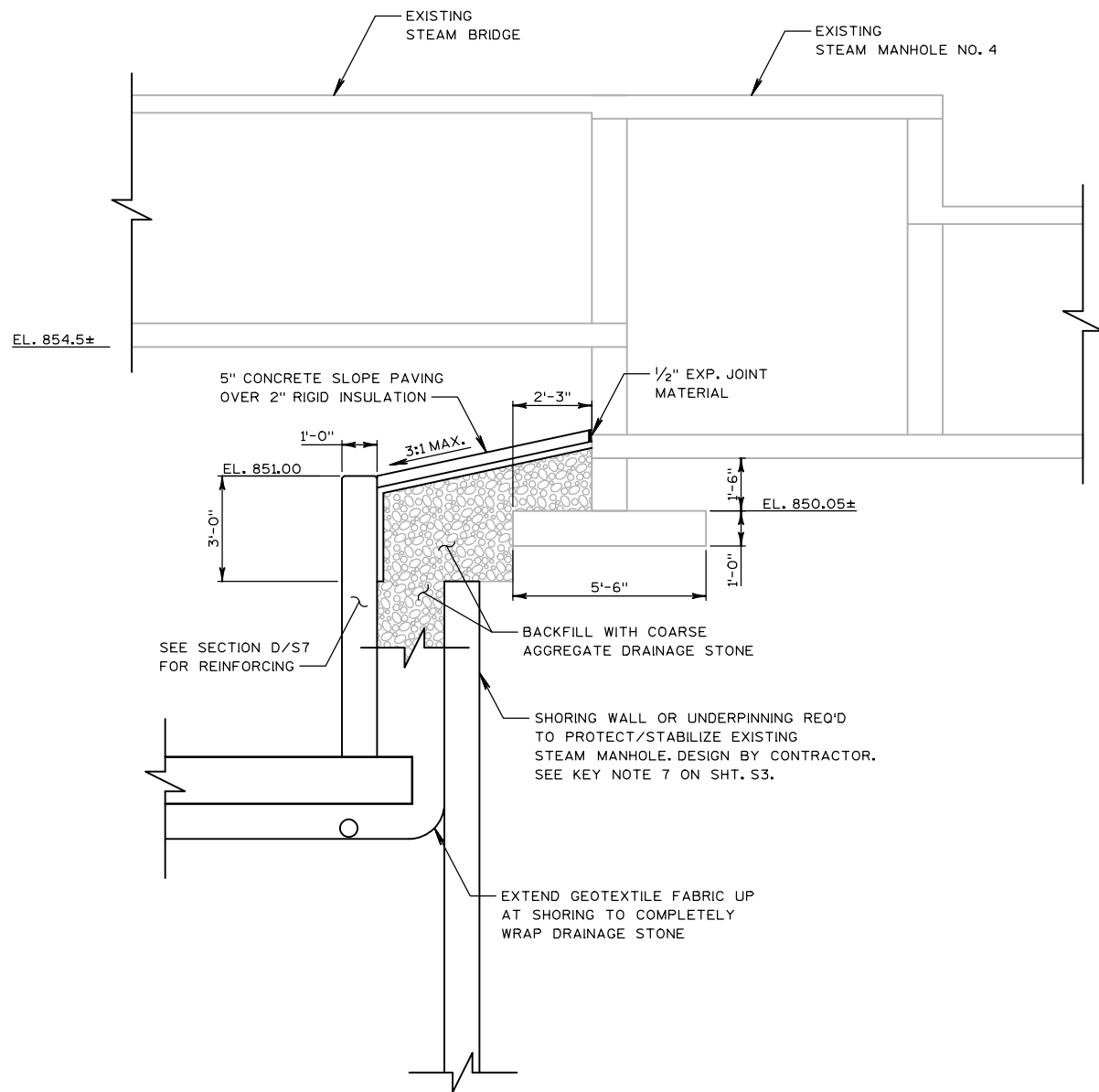
NO.	REVISIONS	DATE
1	ISSUED FOR BID	5/6/2016

**WEIR WALL DETAILS**  
WILLOW CREEK TREATMENT BASIN  
CITY OF MADISON  
DANE COUNTY, WISCONSIN

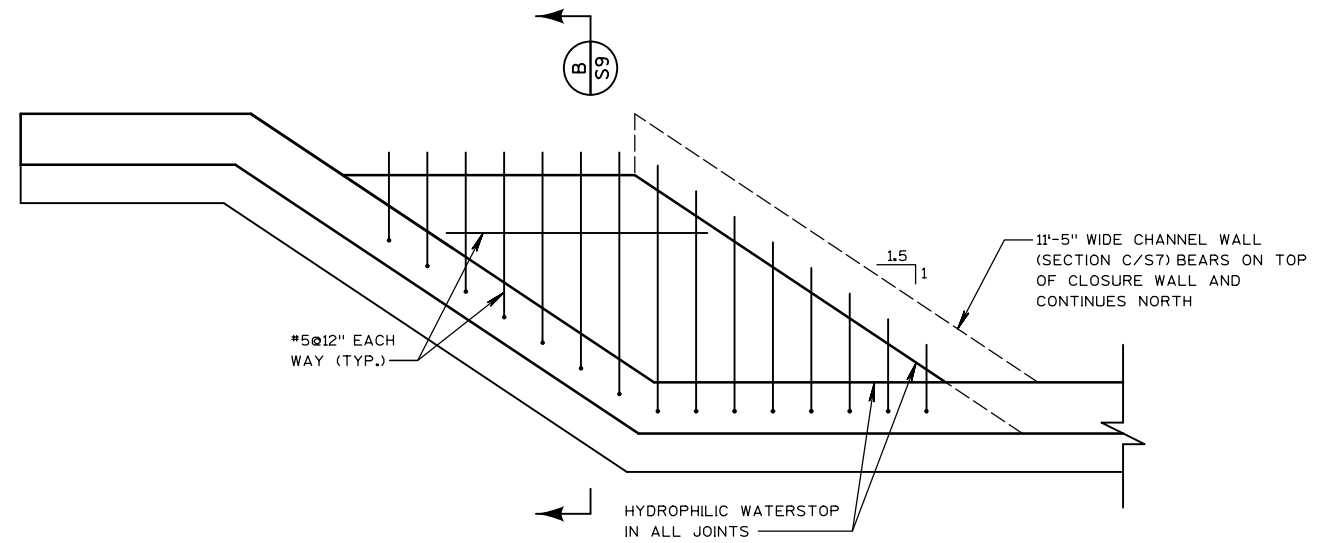
JOB NO.  
1020.093  
PROJECT MGR.  
BMO



SHEET  
S8

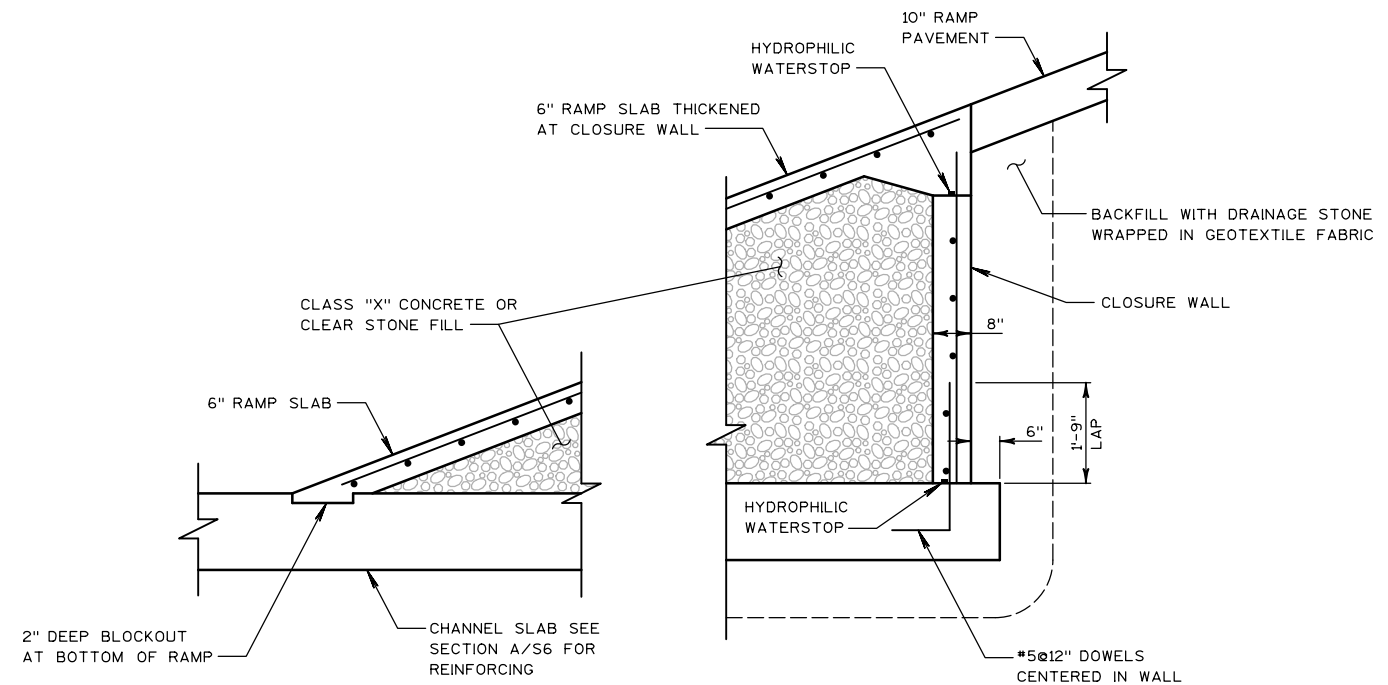


SECTION **A**  
S9



RAMP CLOSURE WALL ELEVATION

NOTE:  
THE CLOSURE WALL IS LOCATED AT THE NORTH END OF THE 21'-0" WIDE CHANNEL SECTION (SECTION A/S6). SLOPE THE TOP OF THE CLOSURE WALL TO MATCH THE BOTTOM OF THE 11'-5" WIDE CHANNEL SECTION (SECTION C/S7). THE SIDEWALL OF THE 11'-5" WIDE CHANNEL BEARS ON THE TOP OF THE CLOSURE WALL.



SECTION **B**  
S9

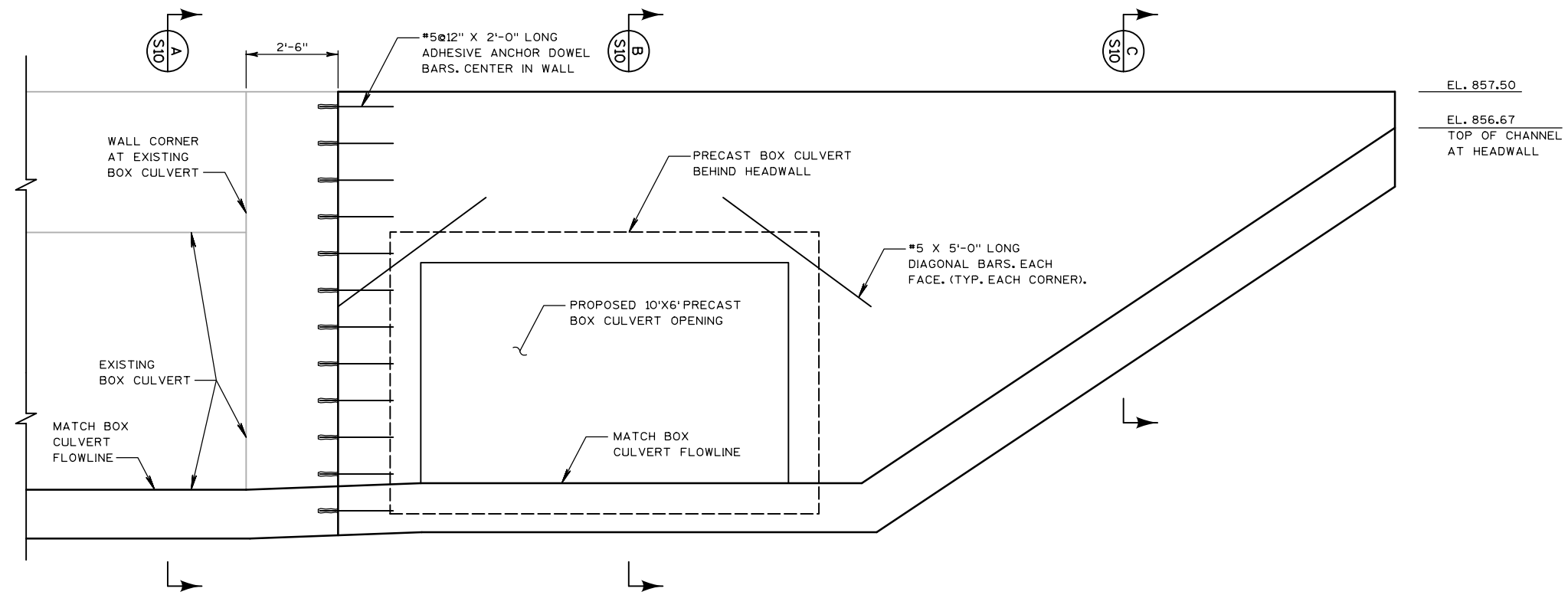
NO.	REVISIONS	DATE
1	ISSUED FOR BID	5/6/2016

**CHANNEL DETAILS - 1**  
WILLOW CREEK TREATMENT BASIN  
CITY OF MADISON  
DANE COUNTY, WISCONSIN

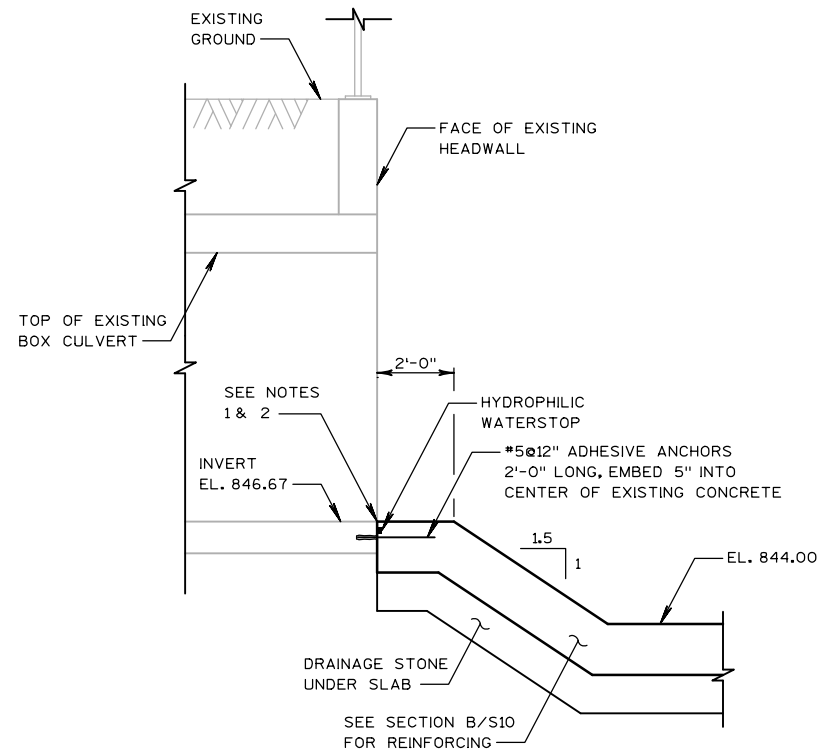
JOB NO.  
1020.093  
PROJECT MGR.  
BMO



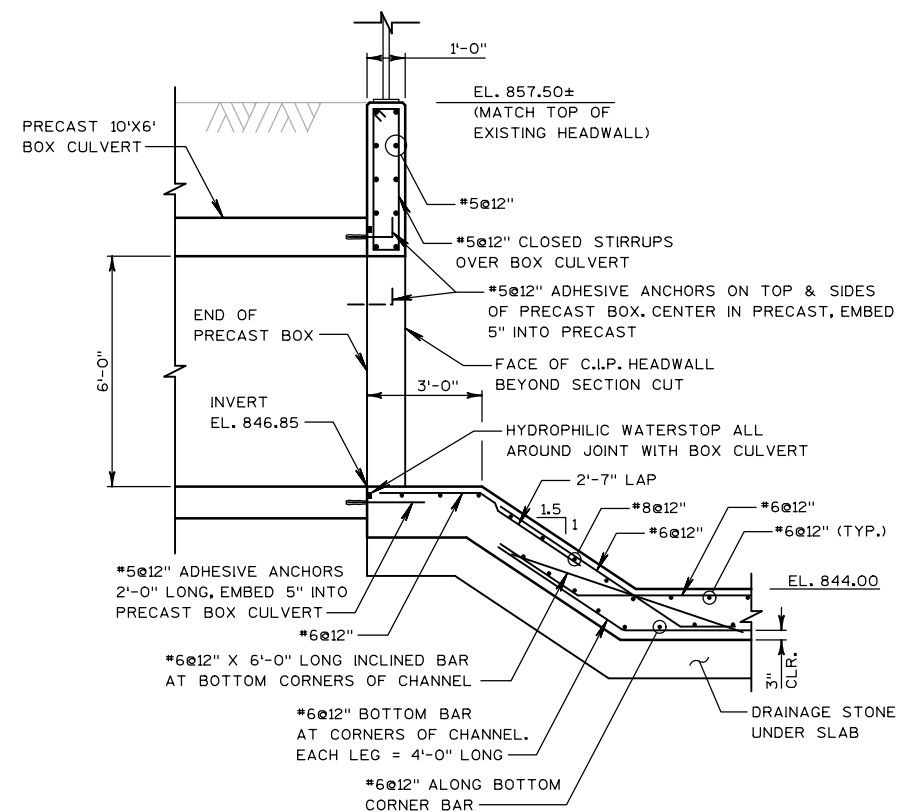
SHEET  
S9



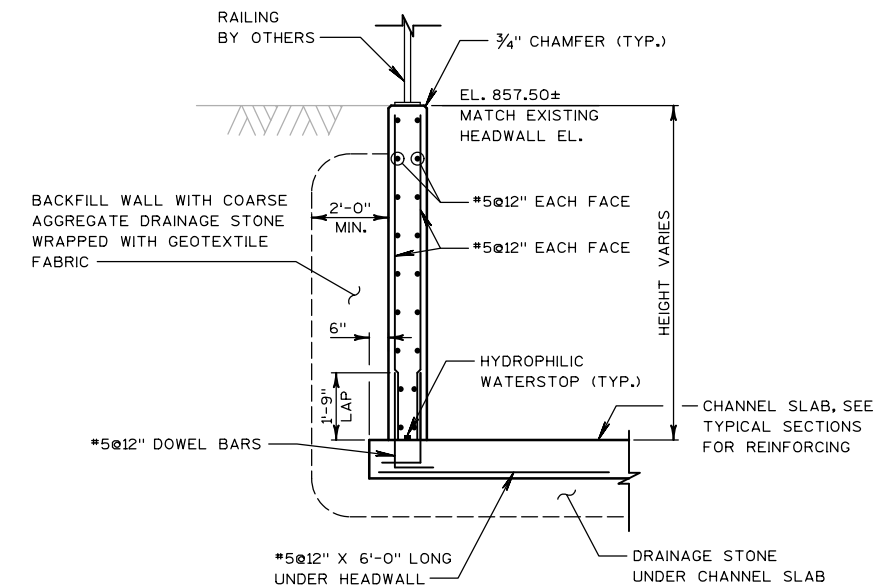
**BOX CULVERT HEADWALL ELEVATION**



**A SECTION AT EXISTING BOX CULVERT**  
NOT TO SCALE



**B SECTION AT NEW 10'X6' BOX CULVERT**  
NOT TO SCALE



**C SECTION AT HEADWALL**  
NOT TO SCALE

**NOTES:**

1. INVERT ELEVATION AND DETAILS AT END OF EXISTING BOX CULVERT ARE ESTIMATES ONLY SINCE THE OUTFALL IS CURRENTLY BURIED UNDER SEDIMENT.
2. REMOVE OUTFALL APRON AND EXISTING CONCRETE BLOCKS AT OUTFALL, PROVIDE SAW CUT AT END OF BOX CULVERT IF NO COLD JOINT EXISTS. NOTIFY ENGINEER IF ACTUAL SITE CONDITIONS VARY FROM THOSE DEPICTED BY THIS DETAIL.

NO.	REVISIONS	DATE
1	ISSUED FOR BID	5/6/2016

**CHANNEL DETAILS - 2**

WILLOW CREEK TREATMENT BASIN  
CITY OF MADISON  
DANE COUNTY, WISCONSIN

JOB NO.  
1020.093  
PROJECT MGR.  
BMO



SHEET  
S10



# WILLOW CREEK MADISON, WI

## GENERAL NOTES:

### DESIGN PROVISIONS:

- THE FOLLOWING EFFECTIVE STRENGTH PARAMETERS WERE ASSUMED IN THE PREPARATION OF THE STRUCTURAL CALCULATIONS FOR THE RETAINING WALL SYSTEM:

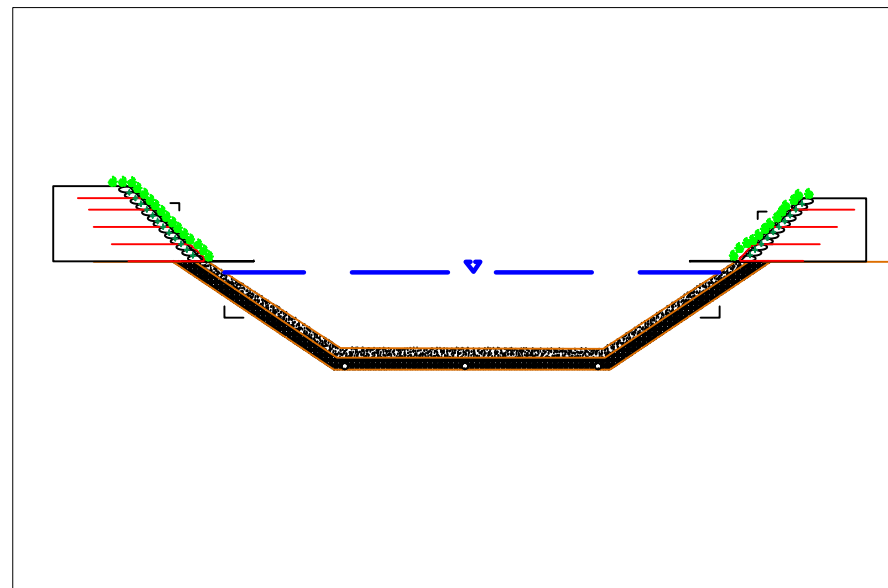
	$\phi$	c	$\gamma$	SOIL TYPE
REINFORCED SOIL	30°	0 PSF	120 PCF	SILTY SAND
RETAINED SOIL	30°	0 PSF	120 PCF	SILTY SAND
FOUNDATION SOIL	30°	0 PSF	120 PCF	SILTY SAND

SOIL TYPES AND DESIGN PROPERTIES SHALL BE CONFIRMED BY THE SITE GEOTECHNICAL ENGINEER PRIOR TO WALL CONSTRUCTION.

- THE WALL(S) ARE DESIGNED TO SUPPORT THE FOLLOWING MAXIMUM SURCHARGE LOADINGS:

BEARING LOAD: 1000 PSF  
 DEAD LOAD: NONE  
 BACK SLOPE: NONE  
 SEISMIC: NOT APPLICABLE  
 HYDROSTATIC: NOT APPLICABLE

- THE FOUNDATION SOILS AT WALL LOCATIONS SHALL BE CAPABLE OF SAFELY SUPPORTING THE MAXIMUM APPLIED BEARING PRESSURE, AS SHOWN ON THE WALL PROFILES, WITHOUT FAILURE OR EXCESSIVE SETTLEMENT. LOCAL BEARING CAPACITY SHALL BE CONFIRMED BY THE SITE GEOTECHNICAL ENGINEER AFTER FOUNDATION EXCAVATION AND PRIOR TO WALL CONSTRUCTION.



## SHEET INDEX

SHEET	DESCRIPTION
1	TITLE SHEET
2	PLAN
3	SLOPE 1
4	SLOPE 2
5	SECTIONS
6	ENVIROLOK UNITS
7	SPECIFICATION

## GENERAL NOTES:

### SUGGESTED QUALITY ASSURANCE PROVISIONS:

- WALL CONSTRUCTION SHALL BE SUPERVISED BY A QUALIFIED ENGINEER OR TECHNICIAN TO VERIFY FIELD AND SITE SOIL CONDITIONS. IF THIS WORK IS NOT PERFORMED BY THE SITE GEOTECHNICAL ENGINEER, A QUALIFIED GEOTECHNICAL ENGINEER/TECHNICIAN SHALL BE CONSULTED IN THOSE MATTERS PERTAINING TO THE SOIL CONDITIONS AND WALL PERFORMANCE.
- THE FOUNDATION SOILS AT THE BASE OF THE WALL(S) SHALL BE INSPECTED BY THE GEOTECHNICAL ENGINEER. ANY UNSUITABLE SOILS OR IMPROPERLY COMPACTED EMBANKMENT MATERIAL SHALL BE REMOVED AND REPLACED AS DIRECTED BY THE ENGINEER PRIOR TO WALL CONSTRUCTION TO PROVIDE ADEQUATE BEARING CAPACITY AND MINIMIZE SETTLEMENT.
- ALL WALL EXCAVATION AND RETAINED SOILS SHALL BE INSPECTED FOR GROUNDWATER CONDITIONS. ANY ADDITIONAL DRAINAGE PROVISIONS REQUIRED IN THE FIELD SHALL BE INCORPORATED INTO THE WALL CONSTRUCTION AS DIRECTED BY THE GEOTECHNICAL ENGINEER.
- WALL BACKFILL MATERIAL SHALL BE TESTED AND APPROVED BY THE ENGINEER, MEETING THE MINIMUM REQUIREMENTS OF THE APPROVED DESIGN PLANS OR SPECIFICATIONS.
- ALL SOIL BACKFILL SHALL BE TESTED BY THE GEOTECHNICAL ENGINEER FOR MOISTURE, DENSITY, AND COMPACTION PERIODICALLY (EVERY 2' VERTICALLY, 100'-200' C/C) MEETING THE MINIMUM REQUIREMENTS OF THE APPROVED DESIGN PLANS OR SPECIFICATIONS.
- THE CONTRACTOR SHALL ESTABLISH AND MAINTAIN QUALITY CONTROL FOR THE CONSTRUCTION OF THE WALL TO ASSURE COMPLIANCE WITH CONTRACT REQUIREMENTS AND MAINTAIN RECORDS OF ITS QUALITY CONTROL.
- ALL WALL ELEVATIONS, GRADES, AND BACK SLOPE CONDITIONS SHALL BE VERIFIED BY THE ENGINEER IN THE FIELD FOR CONFORMANCE WITH APPROVED DESIGN PLANS. ANY REVISIONS TO THE STRUCTURE GEOMETRY OR DESIGN CRITERIA SHALL REQUIRE DESIGN MODIFICATIONS PRIOR TO PROCEEDING WITH CONSTRUCTION.



10101 N. Casey Road  
 Evansville, WI 53536  
 T: 608.223.3571  
 e: ecosolutions@agrecol.com

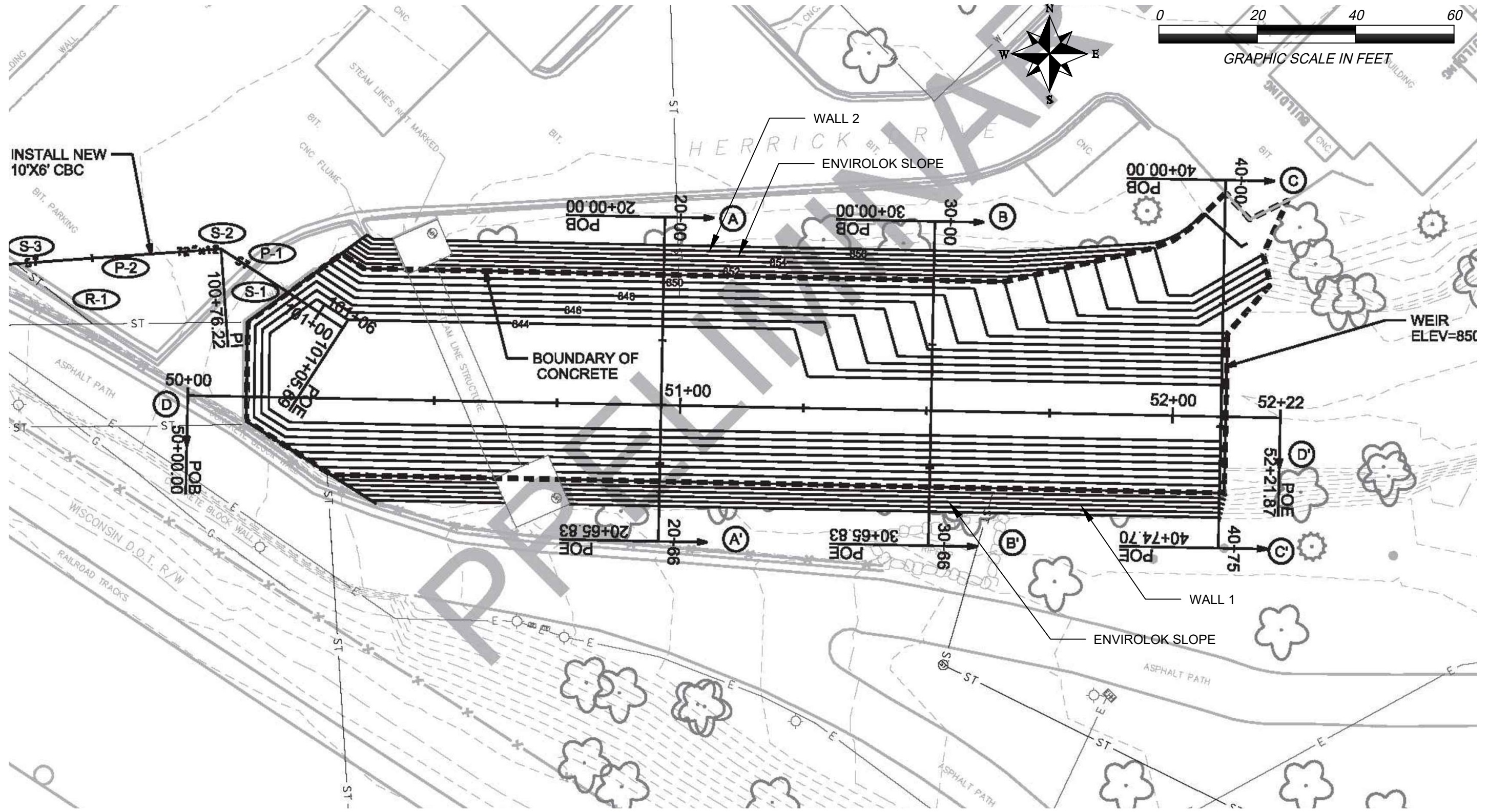
No.	Date	Revision	By
1			

Designed By:  
RJR  
 Scale:  
As Noted  
 Date:  
2/1/16

Project:  
**WILLOW CREEK, WI**  
 Title:  
TITLE

Project No:  
16-003-03  
 Sheet No.  
1





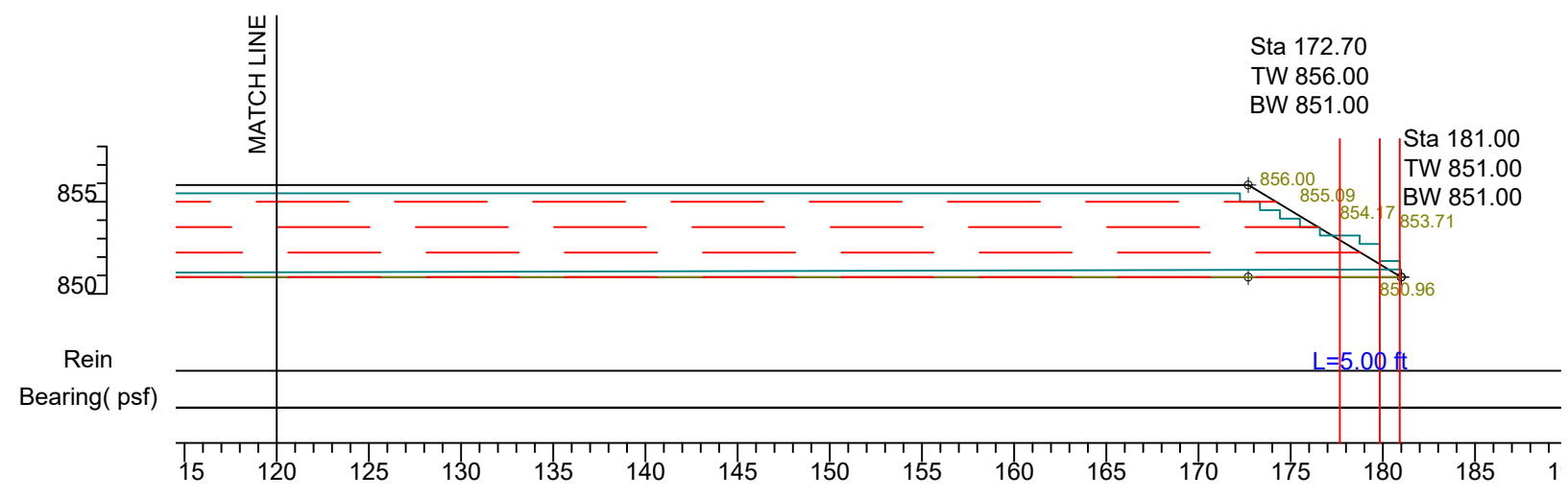
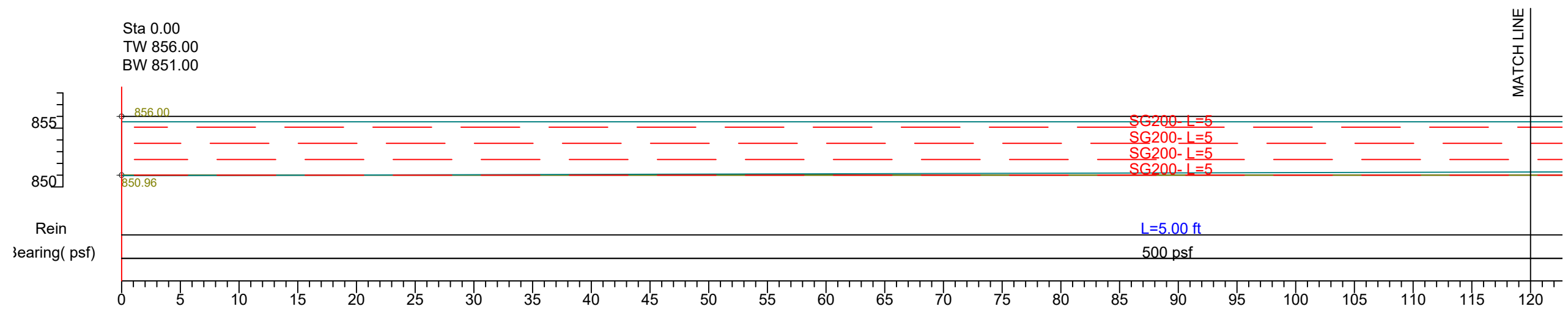
10101 N. Casey Road  
 Evansville, WI 53536  
 T: 608.223.3571  
 e: ecosolutions@agrecol.com

No.	Date	Revision	By
1			

Designed By:  
 RJR  
 Scale:  
 As Noted  
 Date:  
 2/1/16

Project:  
**WILLOW CREEK, WI**  
 Title:  
 PLAN

Project No:  
 16-003-03  
 Sheet No.  
 2



**Envirolok**<sup>TM</sup>  
 Vegetated Environmental Solutions  
 10101 N. Casey Road  
 Evansville, WI 53536  
 T: 608.223.3571  
 e: ecosolutions@agrecol.com

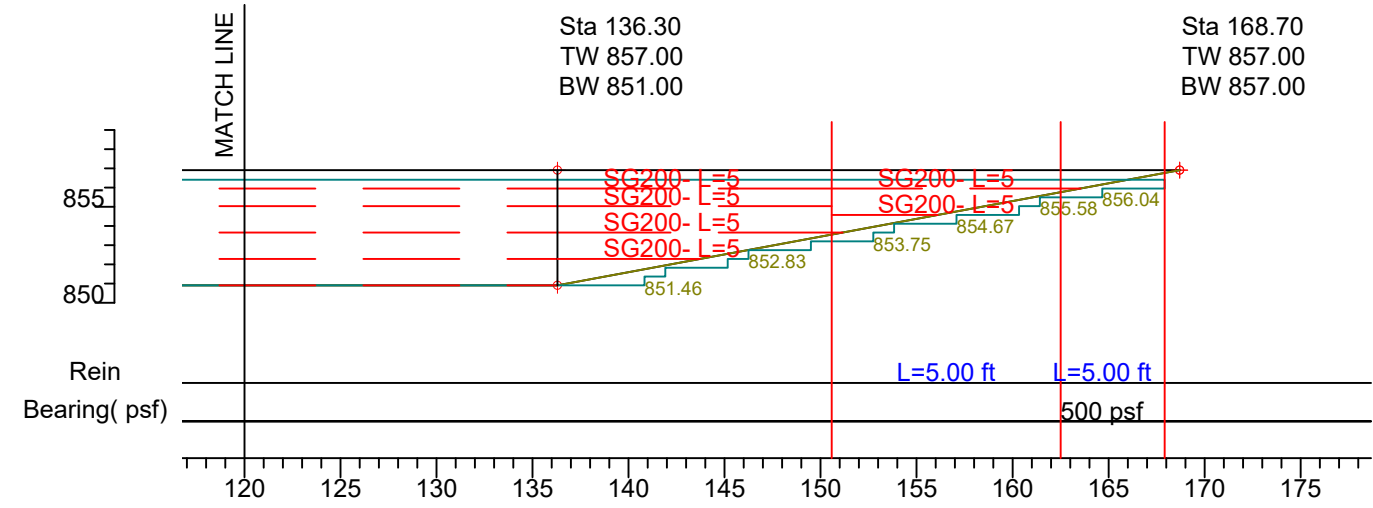
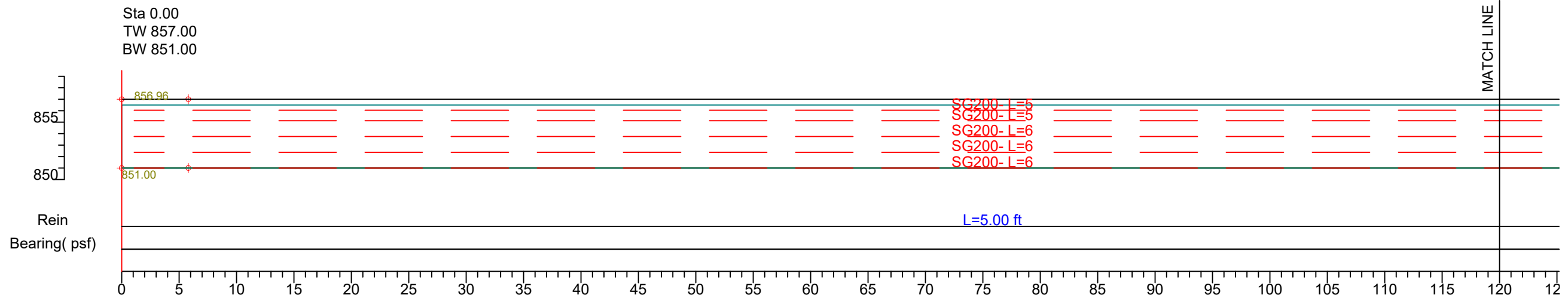
No.	Date	Revision	By
1			

Designed By:  
RJR  
 Scale:  
As Noted  
 Date:  
2/1/16

Project:  
**WILLOW CREEK, WI**  
 Title:  
WALL 1

Project No:  
16-003-03  
 Sheet No.  
3





WALL 2



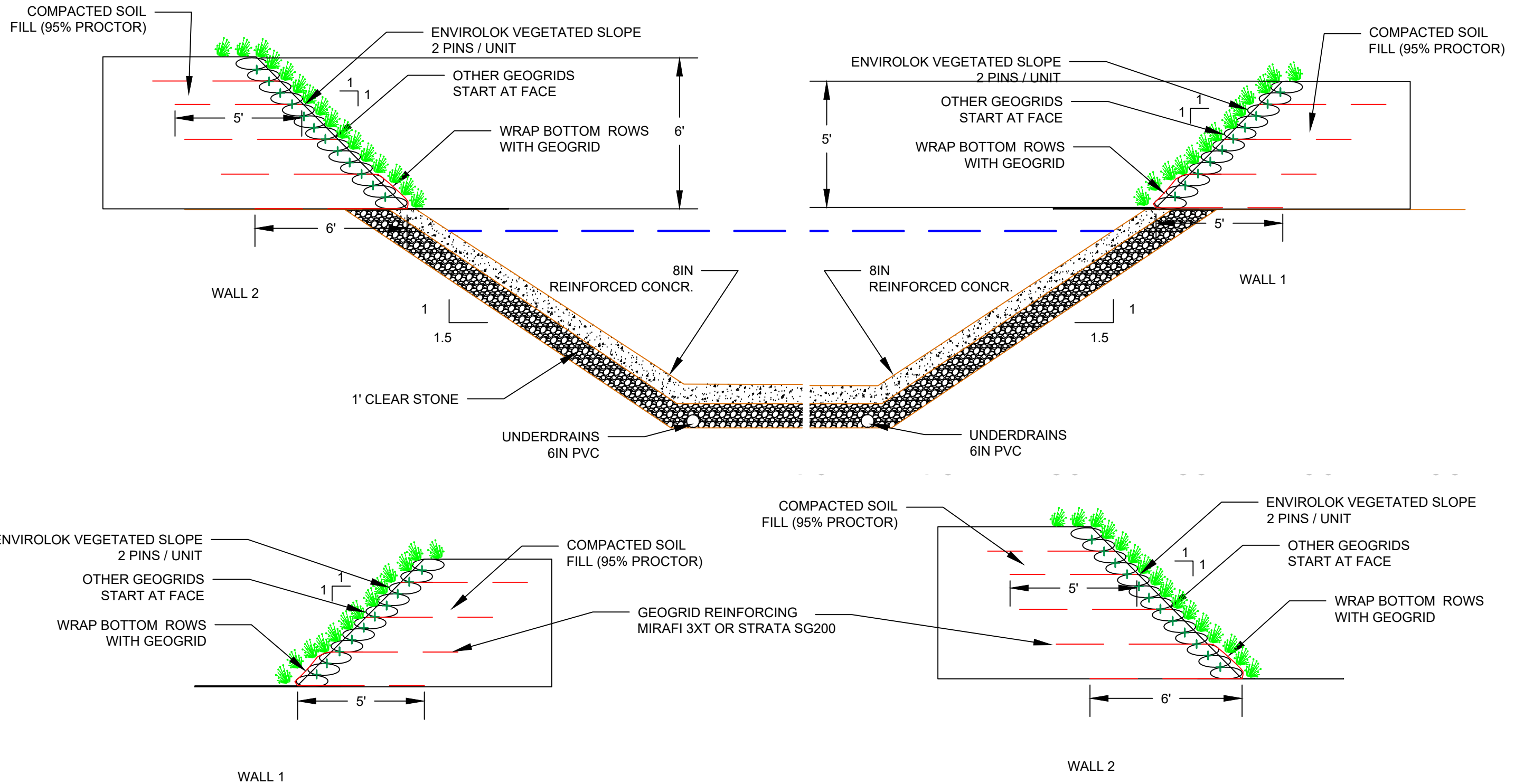
10101 N. Casey Road  
Evansville, WI 53536  
T: 608.223.3571  
e: ecosolutions@agrecol.com

No.	Date	Revision	By
1			

Designed By:  
RJR  
Scale:  
As Noted  
Date:  
2/1/16

Project:  
**WILLOW CREEK, WI**  
Title:  
WALL 2

Project No:  
16-003-03  
Sheet No.  
4



10101 N. Casey Road  
 Evansville, WI 53536  
 T: 608.223.3571  
 e: ecosolutions@agrecol.com

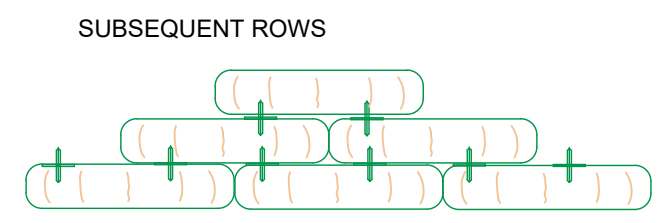
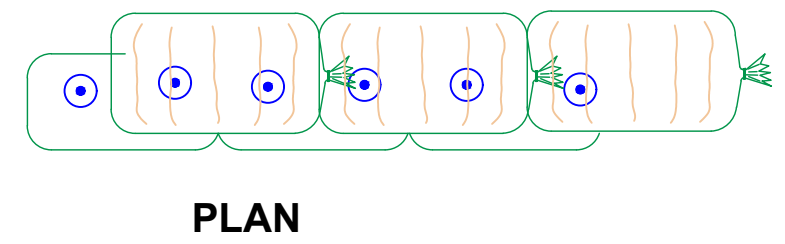
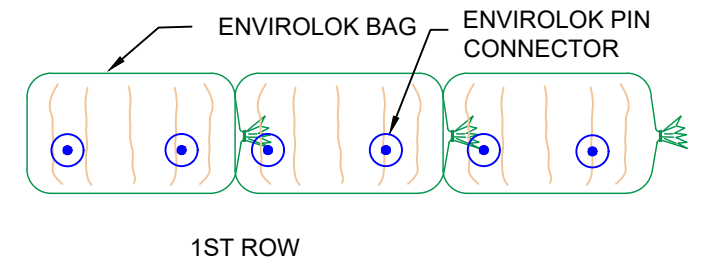
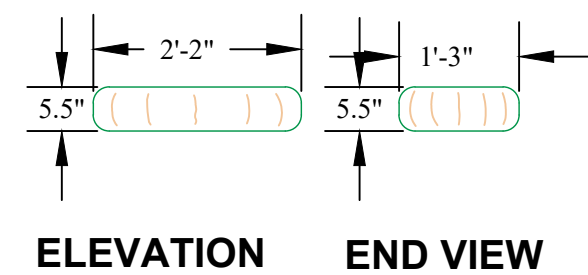
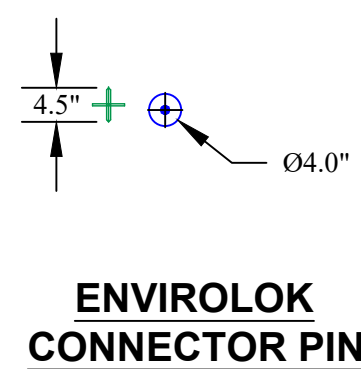
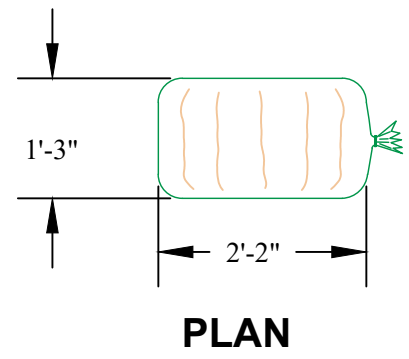
No.	Date	Revision	By
1			

Designed By:  
 RJR  
 Scale:  
 As Noted  
 Date:  
 2/1/16

Project:  
**WILLOW CREEK, WI**  
 Title:  
 SECTIONS

Project No:  
 16-003-03  
 Sheet No.  
 5

# Envirolok Standard Unit



Unit dimensions are approximate, they may vary with the amount of filling. The dimensions shown produce an 80 to 90 lb filled bag.

No.	Date	Revision	By
1			

Designed By: RJR	Project: <b>WILLOW CREEK, WI</b>
Scale: As Noted	
Date: 2/1/16	Title: ENVIROLOK DETAILS

Project No: 16-003-03
Sheet No. 6

**PART 1: GENERAL**

- 1.1 Description:
  - A. Provide all labor, materials, equipment and supervision to install a vegetated wall/slope system in accordance with these specifications and in reasonable close conformity with the dimensions shown on the plans or as specified by the Owner or Owner's Engineer.
  - B. Work shall consist of furnishing and installing appurtenant materials required for the construction of the vegetated system shown on the construction plans.
- 1.2 Reference Standards
  - A. Engineering design
    - 1) AASHTO, "AASHTO LRFD Bridge Design Specifications", 17th edition, 2012.
  - B. Soils
    - 1) ASTM D 698 Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12 400 ft-lb/ft<sup>3</sup> (600 kN-m/m<sup>3</sup>))
    - 2) ASTM D 6938 Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)
    - 3) ASTM D 4318 Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils
- 1.5 Definitions
  - A. Retained Soil
    - 1) Compacted, imported or in-situ soil behind reinforced zone of the retaining wall.
  - B. Reinforced Soil
    - 1) Compacted fill placed in the area behind that face units with internal geogrid reinforcing.

**PART 2: Products**

- 2.1 Vegetated Wall / Slope units
  - A. The Vegetated unit is composed of 100% polypropylene must be weather resistant to minus 30 degrees Celsius and is 100% recyclable. Two connection pins shall be supplied per Envirolok unit, interconnecting the units vertically and horizontally.
  - B. The Envirolok Unit is for use in all Envirolok System applications including applications using P.E.T. (polyester) geogrids or HDPE (high density polyethylene) for geogrid reinforced wall and slope applications.
  - C. Envirolok Bags are made from a specifically designed Non-Woven geotextile that will not rot or mildew, is non-biodegradable and is resistant to damage from insects and rodents. The Envirolok bags provide a filtering functionality, are water permeable and root friendly. Envirolok Bags have met all applicable ASTM standards for geotextile testing.
  - D. Envirolok units shall be manufactured from polypropylene resins. Facing panel polymers shall be greater than 70% U.V. stabilized.
  - E. Vegetated units are manufactured using an ultra violet resistant (UVR) bonded anti-wick polyester threat.
- 2.2 Unit Interlock
  - A. Unit interlock devices shall be polymeric and shall penetrate the units a minimum of 2 inches to form a positive connection.
  - B. Unit interlocks shall penetrate the geogrid reinforcing connecting the reinforcing to the vegetated facing system.
  - C. Connecting pins shall have a 35% open geometry to allow root penetration through the locking plate.
- 2.3 Infill Soil/ Reinforced Backfill
  - A. The reinforced backfill shall be free of debris, and consist of one of the following inorganic USCS soil types: SW, SP, SM, SC, meeting the following gradation as determined in accordance with ASTM D 422.
 


Sieve Size	Percent Passing
1 in.	100
No. 4	100 - 20
No. 40	0 - 60
No. 200	0 - 35
  - B. Cohesionless, coarse-grained soils, are preferred; finer soils with low-plasticity (i.e., PI of the finer fraction is less than 10) may be used provided they are approved by the Owner.
  - C. The maximum size should be limited to 1in. for geosynthetic reinforced soil unless tests have been performed to evaluate potential strength reduction in the geosynthetic due to installation damage.
- 2.4 Soil Reinforcement
  - A. Geosynthetic reinforcement formed by a regular network of integrally connected tensile elements with apertures of sufficient size to allow interlocking with surrounding soil, rock or earth and function as reinforcement. Soil reinforcement shall be specifically manufactured for use in reinforcing soil materials.
- 2.5 Envirolok Bag Fill Material
  - A. Bag fill material should be selected with the desired vegetation and specific application in mind. Criteria for bag fill soils should be specified by the Designer, suggestions include:
  - B. Walls, slopes and above High Waterline Applications
    - 1) Freely draining native soils and granular materials cleaned of all debris, roots, branches, stones in excess of 2" (50 mm) diameter and other deleterious materials. Remove soil contaminated with calcium chloride, toxic materials and petroleum products.
    - 2) Properties should include (by volume)
      - a) Approximate Organic Content: 7% -12% (for an engineered structure)
      - b) Granular Content: smaller than 50 mm larger than 2 mm 60 - 70%
      - c) Granular Content larger than 0.05 mm smaller than 2mm 10 -15%
      - d) Clay and Silts 0 - 5%
      - e) Percolations shall be such that no standing water is visible 60 minutes after at least 10 minutes of moderate to heavy rain or irrigation.

- f) Organic additive materials should be a locally available commercial compost product.
- g) Mix all organic materials evenly throughout the bag fill material
- h) Other criteria may be required in Project Specific Engineered Drawings. Refer to Contract Documents.
- C. Below Waterline Applications
  - 1) Clean Granular material; 3/4 in (20mm) gravel minimum particle size 2mm. Pre-seeding bags is suggested for structures built below normal water levels if vegetation is desired.
  - 2) Clay soils shall not be used for bag fill.
- 2.8 Vegetated Materials
  - A. Vegetation shall be applied through hydro-seeding, hand application and/or planting methods.
  - B. Live Vegetation / Vegetation Mix shall [can] be applied during the construction of the structure.
    - 1) Hydro-seeding can be applied after completion of the structure.
    - 2) It is possible to complete after construction as approved by the Owner.
  - C. Hydro-seeding can be applied after completion of the structure or in phases as approved by the Owner.
  - D. Vegetation should be selected with consideration of the environment - weather, climate, exposure, etc. A vegetation specialist may assist in the selection of plant materials.
  - E. Depending on the location and climate, an irrigation system may need to be incorporated within the Envirolok System.
    - 1) A low pressure drip irrigation system may be located between selected rows should be used (if required)
  - F. Vegetation methods Include, but are not limited to:
    - 1) Hand Seeding -
    - 2) Hydro-seeding & Pre-Vegeted the Envirolok Bag
    - 3) Live Planting
    - 4) Live Staking
    - 5) Brush Layering
- 2.9 Materials NOT Allowed for Vegetated Wall / Slope Solutions
  - A. Systems or components that would provide entrapment to mammals.
  - B. System or components that will oxidize.
  - C. Systems with exposed surfaces or pieces that could cause injury to people or animals climbing or traversing the vegetated wall / slope system.
  - D. Systems that do not allow for 100% percent vegetation on exposed surfaces.

**PART 3: Execution**

- 3.1 General
  - A. Construction and construction tolerances shall be in accordance with the plans or specifications. Grades shall be within 3 inches of the grades shown on the plans.
  - B. Before beginning installation, verify site conditions are as indicated on the drawings. Notify the Owner if site conditions are not acceptable. Do not begin preparation or installation until unacceptable conditions have been corrected.
- 3.2 Preparation of Envirolok Units
  - A. Ensure the bag fill material is suitably mixed with any required additives prior to beginning the filling process. Fill materials are shown in section 2.
  - B. Fill the bags completely, to a consistent weight, density, and size, allowing adequate geotextile material for secure closure of the bag.
    - 1) Placed and compacted units should have approximately one square of face area.
  - C. Bag closure methods include but are not limited to methods such as zip-ties, stapling or sewing.
  - D. Envirolok units shall be stored in a covered area and shall be kept dry.
- 3.3 Excavation
  - A. Contractor shall excavate to the lines and grades shown on the project grading plans and SRW plan and profile drawing. Contractor shall take precautions to minimize over-excavation. Over-excavation shall be filled with compacted infill material, or as directed by the Owner/Engineer, at the Contractor's expense.
- 3.4 Foundation Preparation
  - A. Following excavation for the leveling pad and the reinforced soil zone, foundation soil shall be examined by the Owner's Engineer to assure the actual foundation soil strength meets or exceeds the assumed design bearing strength. Soils not meeting the required strength shall be removed and replaced with soil meeting the design criteria, as directed by the Owner's Engineer.
- 3.5 Installation
  - A. Install the base course of filled Envirolok bags as per design drawings. Compact the units to ensure the connection pin penetrate the bags. Place bags so that the seam is horizontal and faces inwards towards backfill material. Start installation at the lowest point.
  - B. Place and compact backfill every course of units.
  - C. Place Envirolok units to straddle each juncture of soil bags as shown in the engineered drawings. Compact every row to ensure the connection pins on the unit interlock penetrate the bags.
    - 1) Envirolok connection pins interlock three units to form a totally connected slope/wall structure.
  - F. Maintain the specified batter or slope as rows of Envirolok units are placed.
- 3.6 Backfill
  - A. Backfill shall be placed in maximum 8 inch (200mm) uncompacted lift thickness and compacted to 95 percent Standard Proctor density as determined in accordance with ASTM D 698. The in-place moisture content shall not exceed the optimum moisture content as determined in accordance with ASTM D 698 and shall be no

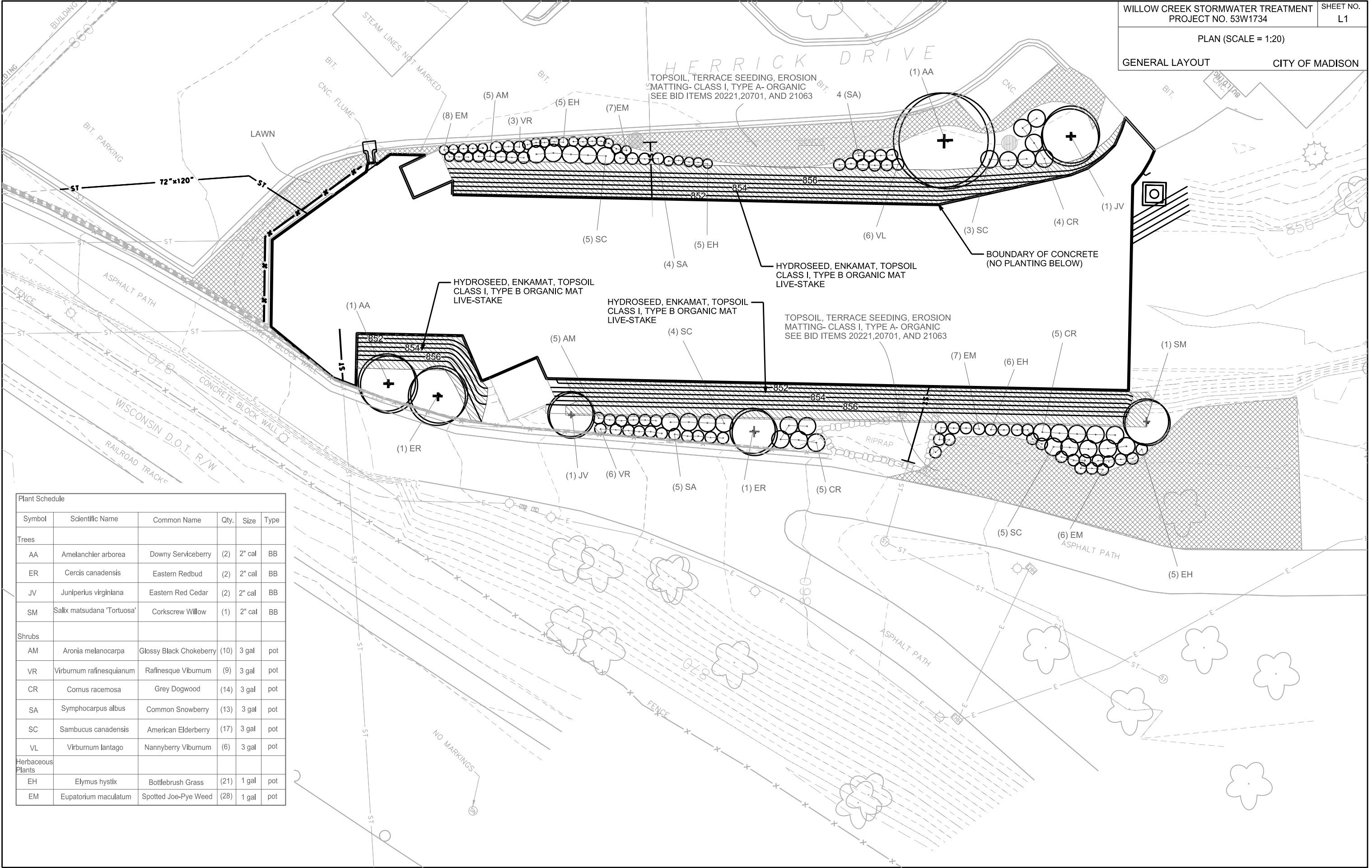
- lower than 3 percentage points below optimum moisture content.
- B. Backfill shall be placed, spread, and compacted in such a manner that minimizes the development of slack or loss of tension in the geogrid reinforcement layer. Preferred placement is from the units back toward the tail of reinforcement to increase tension.
- C. Only hand operated compaction equipment shall be operated within 3 feet (1m) of the back of the Envirolok units.
- D. Tracked equipment shall not be operated directly on the reinforcing. A minimum thickness of 6 inches (150mm) of fill is required prior to operating tracked equipment over the reinforcing.
- E. Rubber tired equipment may be operated on the geogrid reinforcing if care is taken, avoiding sudden braking and sharp turns.
- F. At the end of each day's operation the Contractor shall grade the backfill away from the wall area and direct runoff away from the wall area. The Contractor shall not allow surface runoff from adjacent areas to enter the wall construction area.
- 3.10 Geogrid Installation
  - A. Geogrid reinforcing shall be cut and laid at the proper elevations as shown on the construction drawings or as directed by the Engineer.
  - B. Geogrid reinforcing shall be attached to the Envirolok system by placing the geogrid to the front face of the Envirolok unit above the installed course. Install the connecting pins through geogrid and into the Envirolok units. The next course of units shall be placed, and compacted locking the reinforcement in place.
  - C. Geogrid shall be pulled taut removing any slack in the layer while fill is placed over the reinforcing. Care shall be taken to not operate equipment directly on the reinforcing to minimize potential for damage.
- 3.11 Vegetating
  - A. Finish in accordance with the supplier recommendations.
  - B. Vegetation can be applied through seeding or planting methods. Vegetation/ vegetation mix to be applied to the structure within two weeks of Envirolok System placement.
  - C. Seeding:
    - 1) Hydro-seeding is the preferred method of seeding. Apply hydro seeded material to the wall or slope face of the Envirolok structure to achieve complete coverage of the exposed bag face.
    - 2) Use a seed mixture which responds to the specific site environmental conditions such as shoreline, roadside, interior grasslands. The mixture should contain a variety of easily germinated, hardy, drought resistant vegetation proven for the area and exposure.
  - D. Pre-Vegetated Envirolok bags can be used.
  - E. Live Planting:
    - 1) Planting with locally available native plants, ornamental or plants proven to be sustainable in the area may also be used to re-vegetate the structure.
    - 2) The root ball can be positioned snugly under the Envirolok bags. Depending on the chosen plants and site location, a 10gm slow release fertilizer tablet sitting on top of the root ball may be required. Refer to construction documents for plant list, spacing and placement instructions.
  - F. Live Staking:
    - 1) Live-staking with locally available native materials such as willows may be used to re-vegetate the structure. Live staking is achieved by placing between units to be in contact with soil behind the units. Timing of construction must be coordinated to ensure the survivability of live stakes for successful vegetation.
  - G. Brush Layering:
    - 1) Brush layering is achieved by placing the plant between the bags with the root ball behind the Envirolok System. This method is may be recommended with applications in water.
- 3.12 Field Review
  - A. Field Review at regular intervals to ensure satisfactory germination and/or coverage of the Envirolok bags.
  - B. At six months, if adequate coverage of the Envirolok system has not occurred it is recommended that reseeded or remedial planting be performed.
- 3.13 Field Quality Control
  - A. Field Quality Assurance - The Owner shall engage inspection and testing services, including independent laboratories, to provide quality assurance and testing services during construction. As a minimum, quality assurance testing should include foundation soil inspection, inspection for the need for any additional drainage, soil and backfill testing, verification of design parameters, and observation of construction for general compliance with design drawings and specifications. This does not relieve the Contractor from securing the necessary construction quality control testing during construction.
  - B. Field Quality Control - The Contractor's quality control testing and construction inspection services shall only be performed by independent, qualified and experienced technicians and engineers. The Contractor's quality control testing, as a minimum, shall include:
    - 1) Field density testing
    - 2) Sub grade: one test for every 2500 square feet (230 sm) of sub grade.
  - C. Reinforced Backfill: one test for every 2500 square feet (230 sm) per lift with a minimum of one test for every other lift.
  - D. Retained and Foundation Soil: per Section 02200 (Site Preparation).
  - E. Laboratory Moisture Density - minimum one test per soil type.



10101 N. Casey Road  
 Evansville, WI 53536  
 T: 608.223.3571  
 e: ecosolutions@agrecol.com

No.	Date	Revision	By	Designed By:	Project:
				RJR	<b>WILLOW CREEK, WI</b>
				Scale: As Noted	
				Date: 2/1/16	
1					TITLE: <b>SPECIFICATIONS</b>

Project No: 16-003-03
Sheet No. 7



Plant Schedule

Symbol	Scientific Name	Common Name	Qty.	Size	Type
<b>Trees</b>					
AA	Amelanchier arborea	Downy Serviceberry	(2)	2" cal	BB
ER	Cercis canadensis	Eastern Redbud	(2)	2" cal	BB
JV	Juniperus virginiana	Eastern Red Cedar	(2)	2" cal	BB
SM	Salix matsudana 'Tortuosa'	Corkscrew Willow	(1)	2" cal	BB
<b>Shrubs</b>					
AM	Aronia melanocarpa	Glossy Black Chokeberry	(10)	3 gal	pot
VR	Virburnum rafinesquianum	Rafinesque Viburnum	(9)	3 gal	pot
CR	Cornus racemosa	Grey Dogwood	(14)	3 gal	pot
SA	Symphocarpus albus	Common Snowberry	(13)	3 gal	pot
SC	Sambucus canadensis	American Elderberry	(17)	3 gal	pot
VL	Virburnum lantago	Nannyberry Viburnum	(6)	3 gal	pot
<b>Herbaceous Plants</b>					
EH	Elymus hystix	Bottlebrush Grass	(21)	1 gal	pot
EM	Eupatorium maculatum	Spotted Joe-Pye Weed	(28)	1 gal	pot

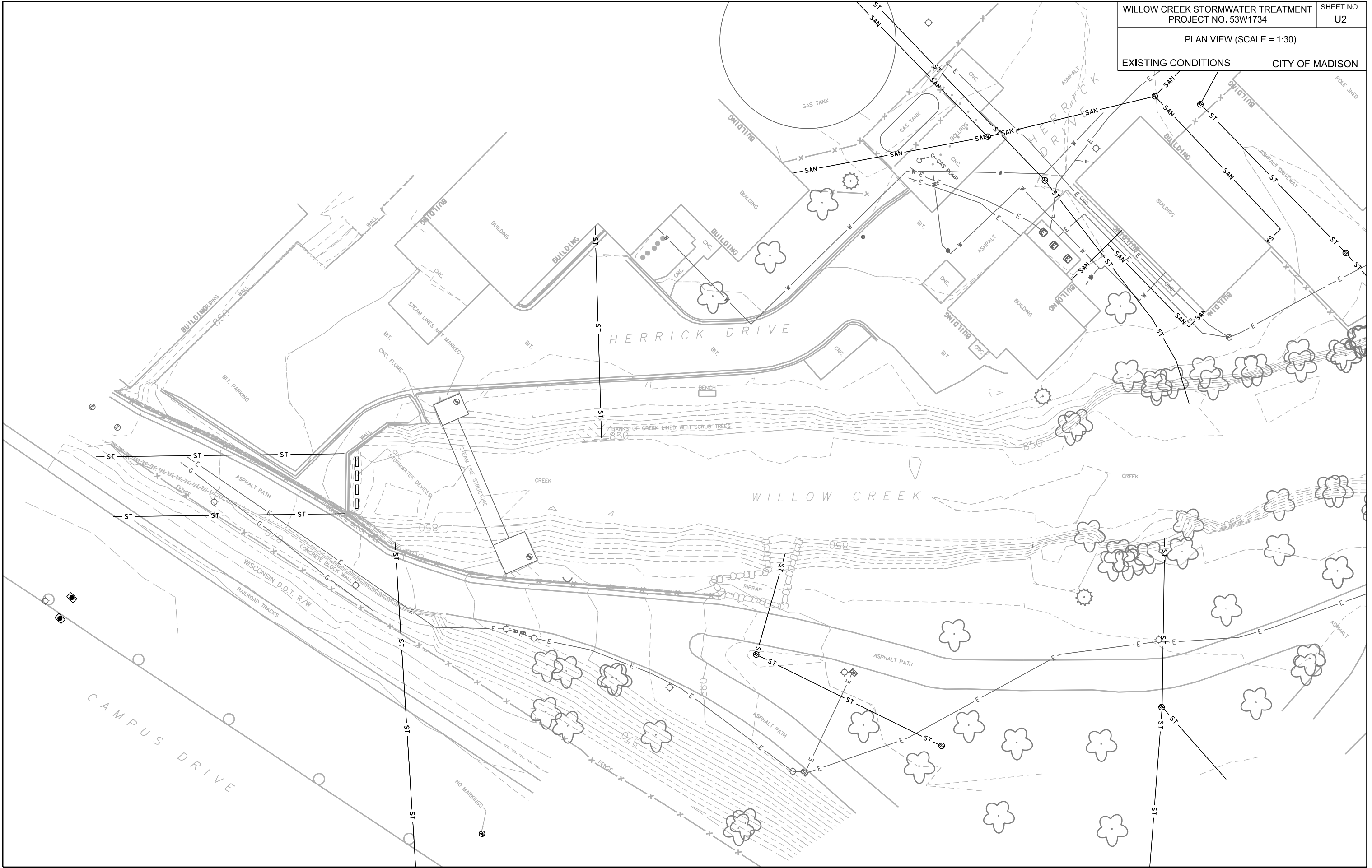
PLOT SCALE: \_\_\_\_\_

PLOT NAME: \_\_\_\_\_

REV. DATE: \_\_\_\_\_

ORIGINATOR: CITY OF MADISON, STREETS DIVISION



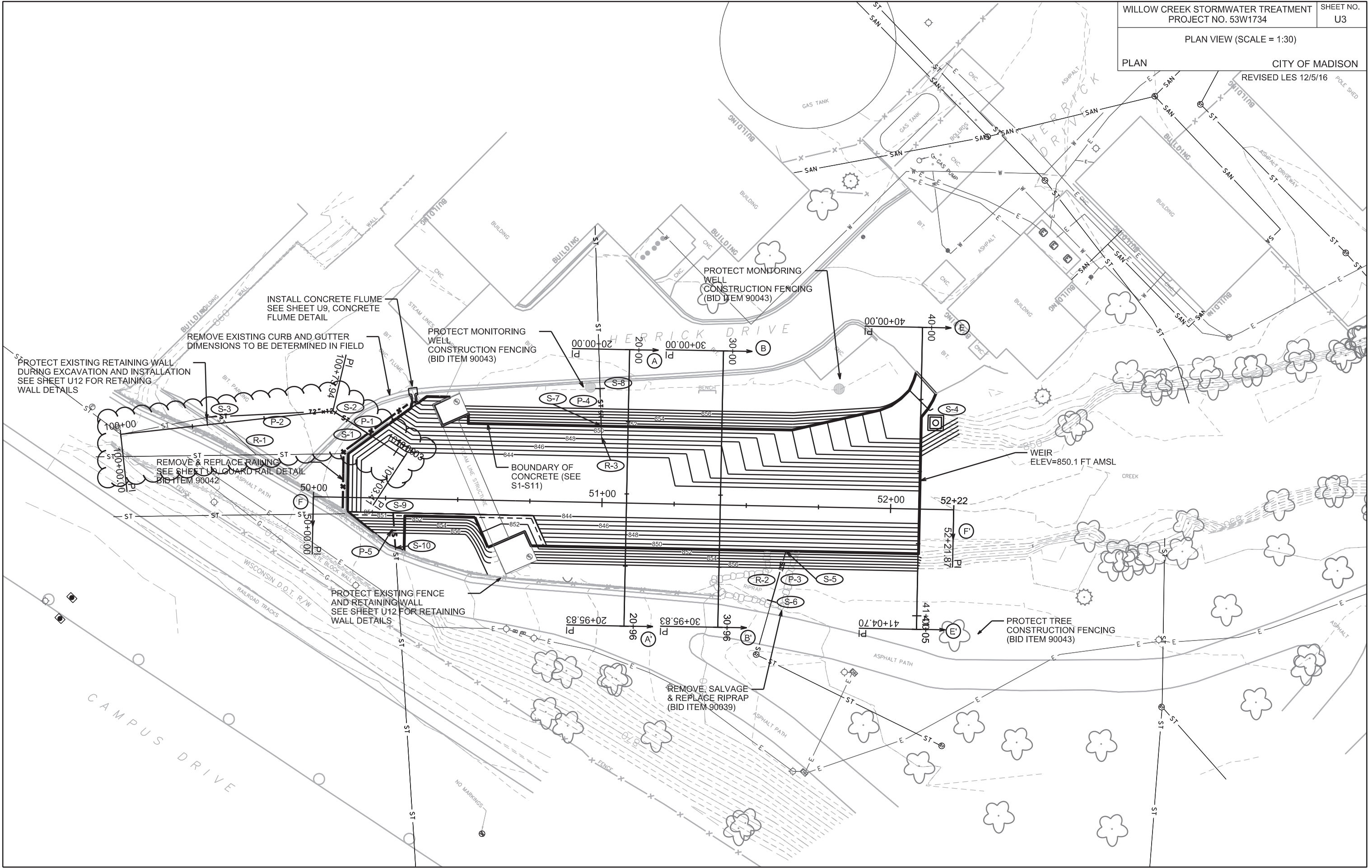


PLOT SCALE: \_\_\_\_\_

PLOT NAME: \_\_\_\_\_

REV. DATE: \_\_\_\_\_

ORIGINATOR: CITY OF MADISON, STREETS DIVISION



PLOT SCALE:

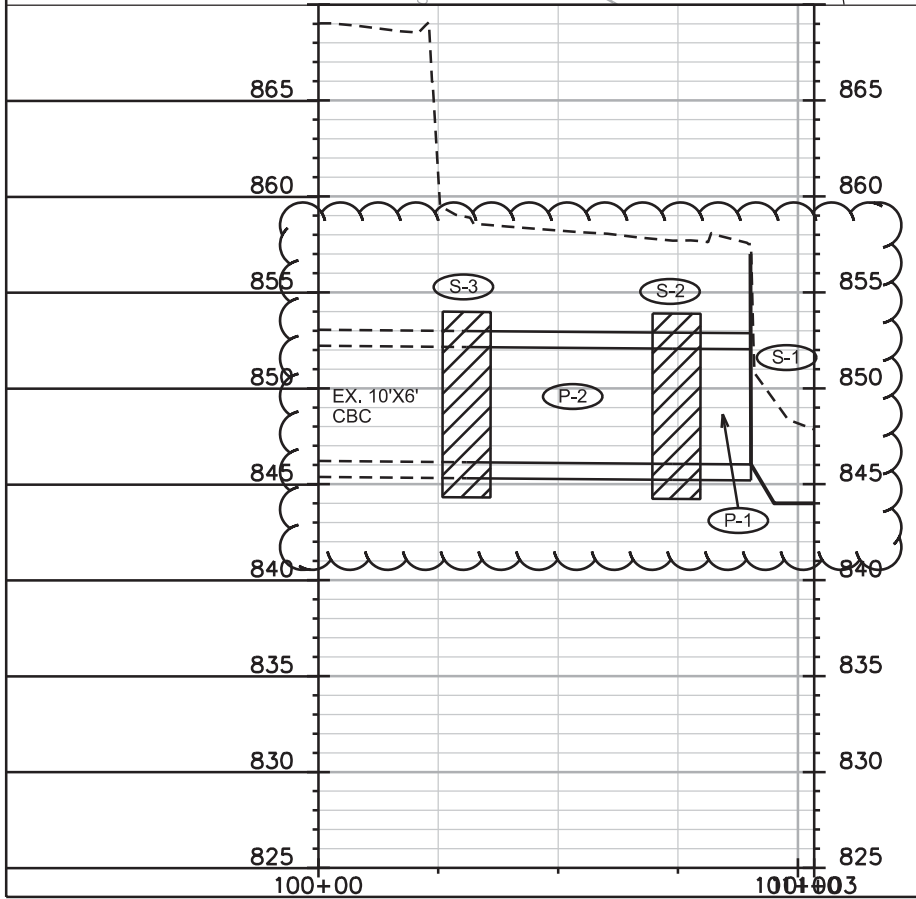
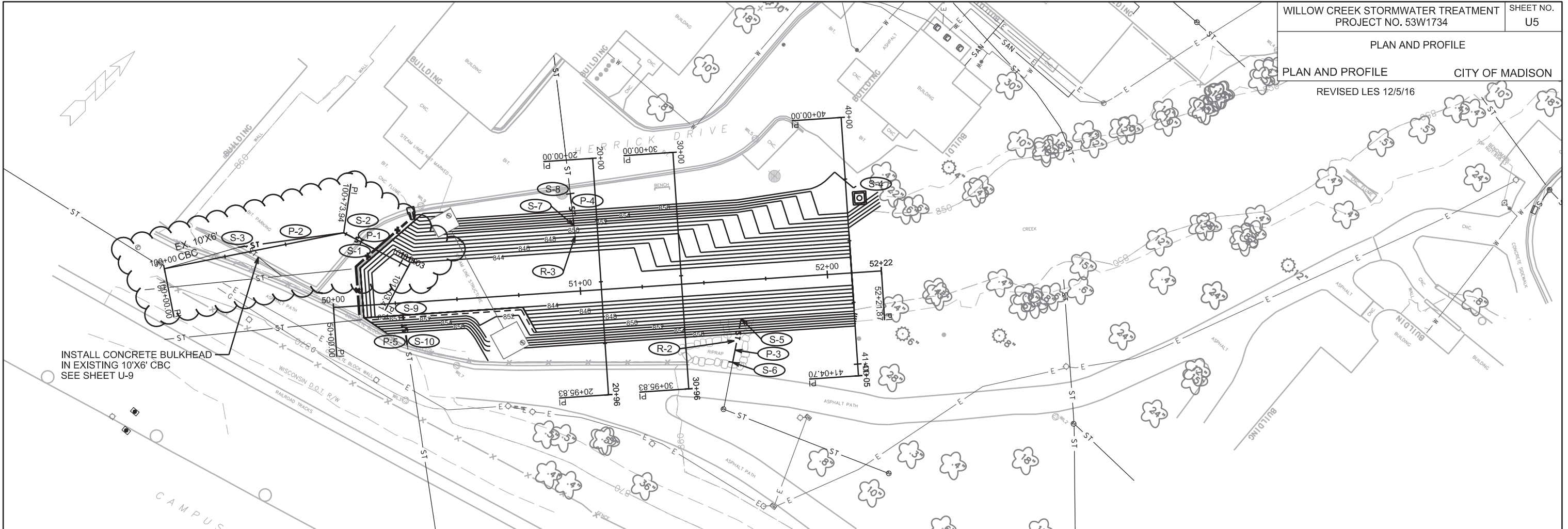
PLOT NAME:

REV. DATE:

ORIGINATOR: CITY OF MADISON, STREETS DIVISION







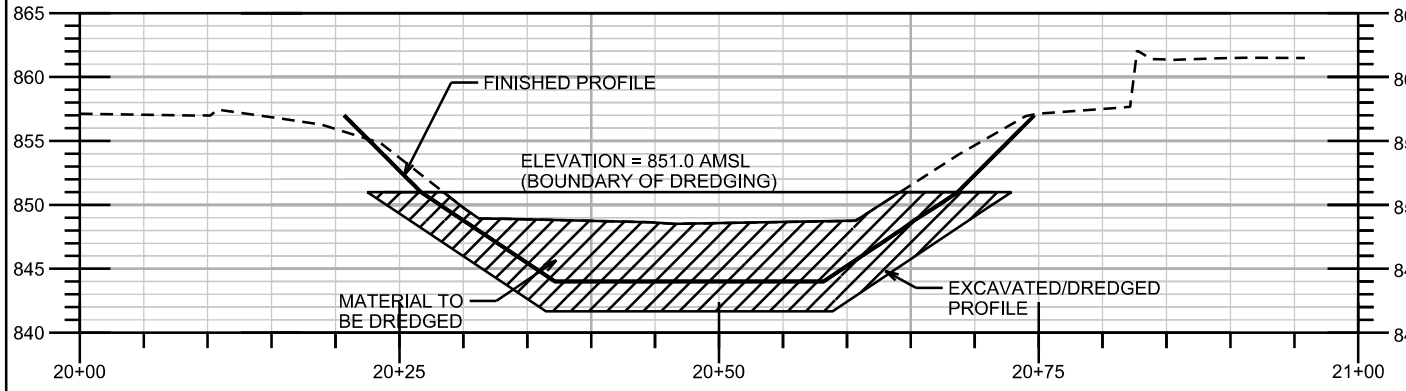
PLOT SCALE: \_\_\_\_\_

PLOT NAME: \_\_\_\_\_

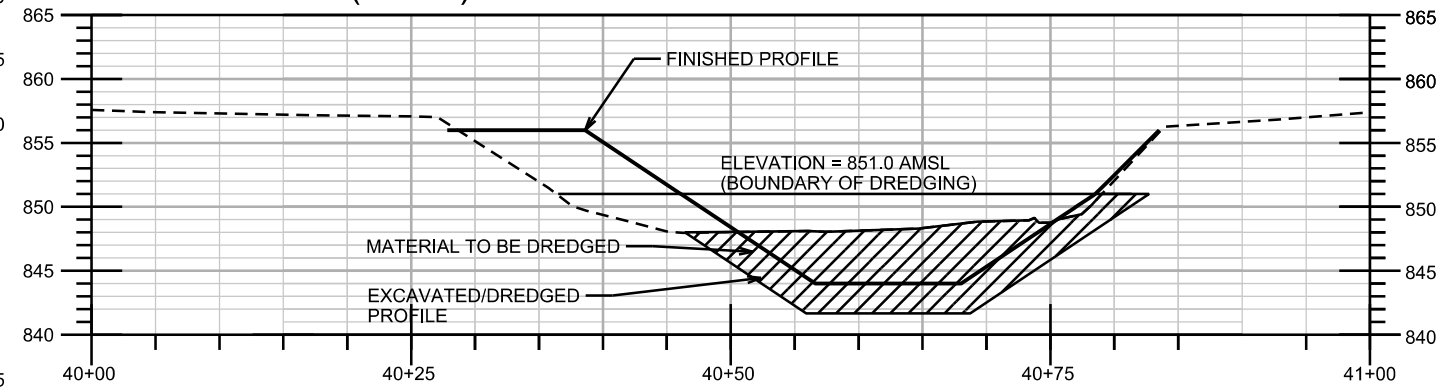
REV. DATE: \_\_\_\_\_

ORIGINATOR: CITY OF MADISON, STREETS DIVISION

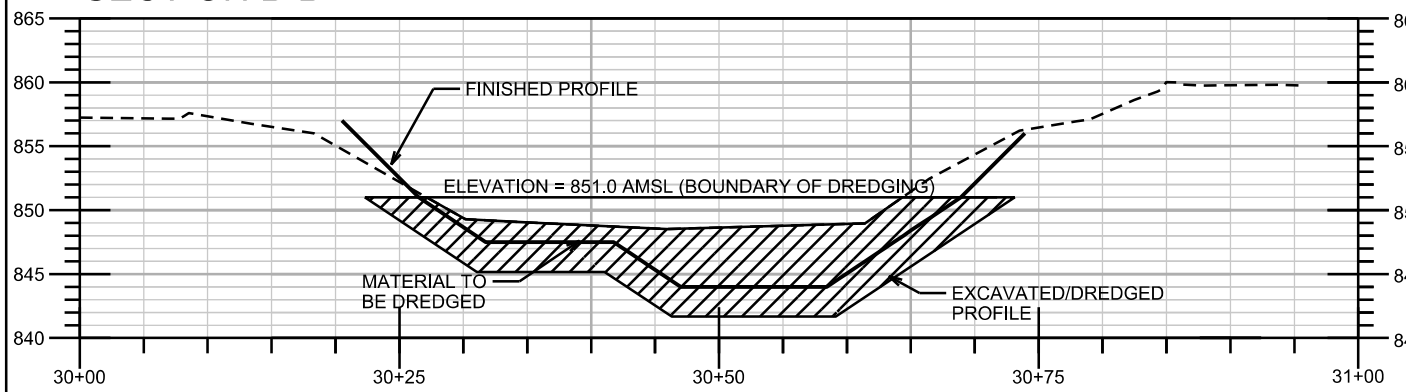
SECTION A-A'



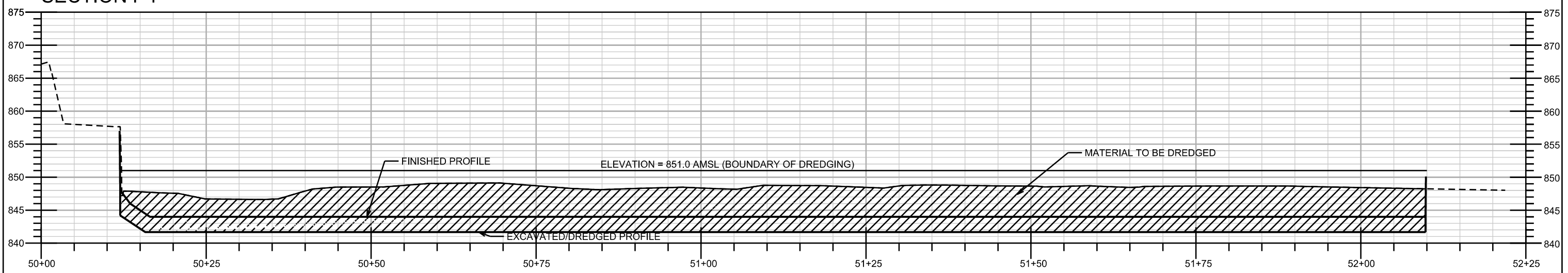
SECTION E-E' (WEIR)



SECTION B-B'



SECTION F-F'



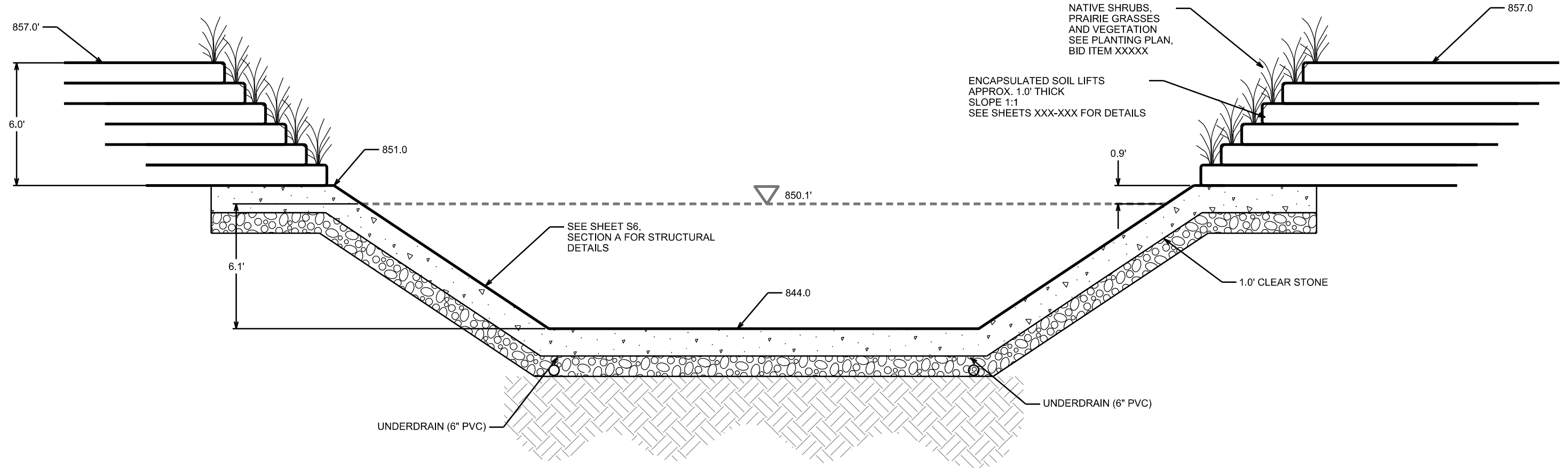
PLOT SCALE: \_\_\_\_\_

PLOT NAME: \_\_\_\_\_

REV. DATE: \_\_\_\_\_

ORIGINATOR: CITY OF MADISON, STREETS DIVISION

SECTION A-A'



NATIVE SHRUBS,  
PRAIRIE GRASSES  
AND VEGETATION  
SEE PLANTING PLAN,  
BID ITEM XXXXX

ENCAPSULATED SOIL LIFTS  
APPROX. 1.0' THICK  
SLOPE 1:1  
SEE SHEETS XXX-XXX FOR DETAILS

SEE SHEET S6,  
SECTION A FOR STRUCTURAL  
DETAILS

UNDERDRAIN (6" PVC)

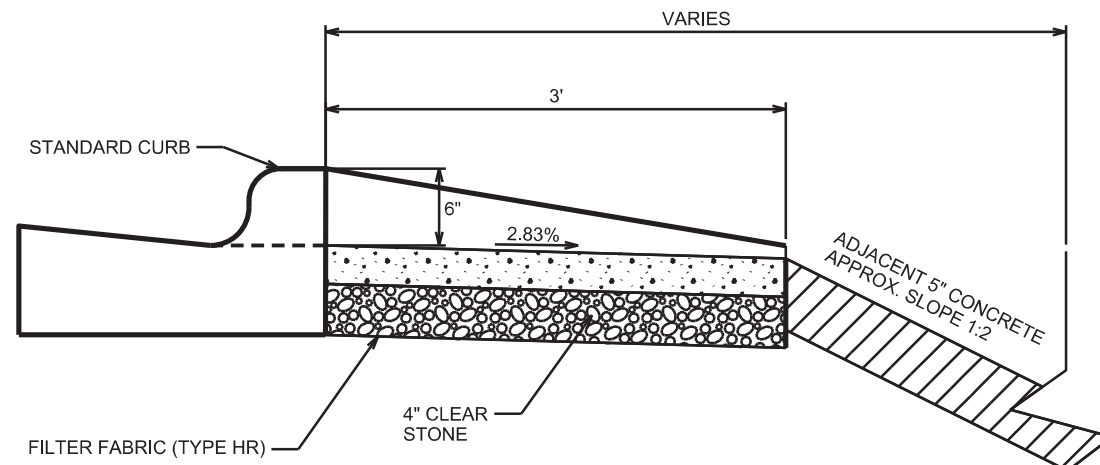
UNDERDRAIN (6" PVC)

1.0' CLEAR STONE

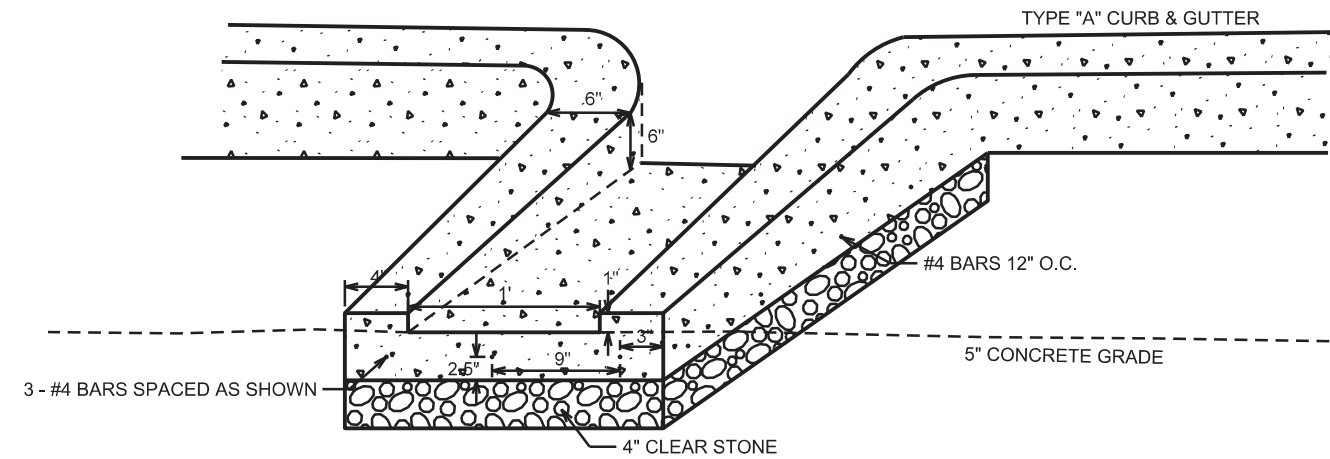
PLOT SCALE: \_\_\_\_\_  
PLOT NAME: \_\_\_\_\_  
REV. DATE: \_\_\_\_\_  
ORIGINATOR: CITY OF MADISON, STREETS DIVISION

REVISED LES 12/5/16

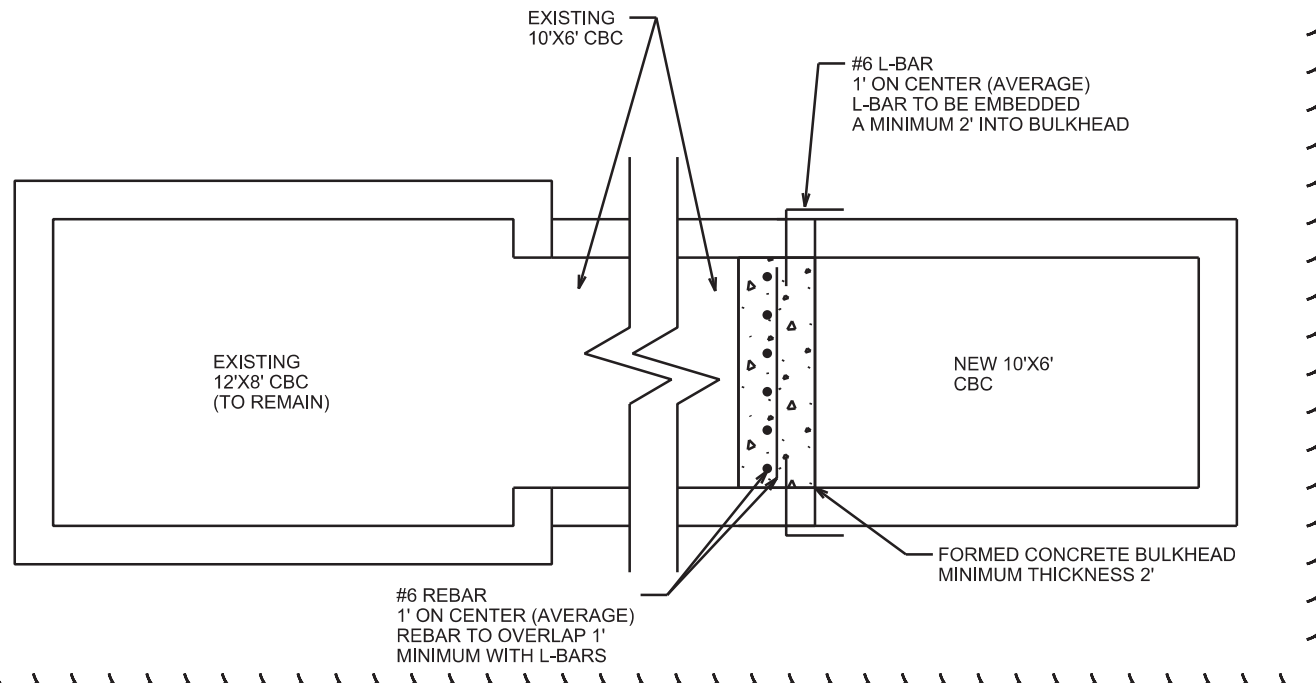
**CONCRETE FLUME OPENING DETAIL (NOT TO SCALE)**



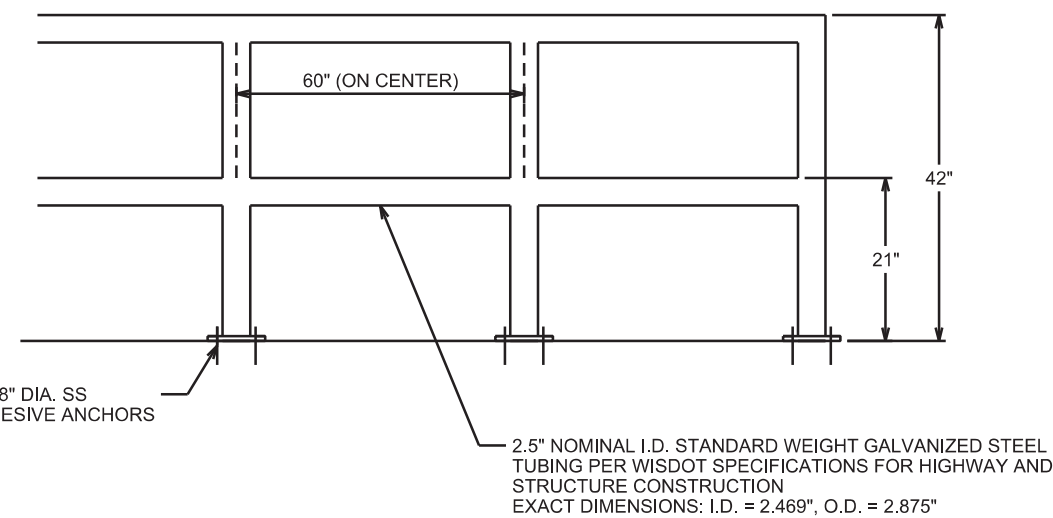
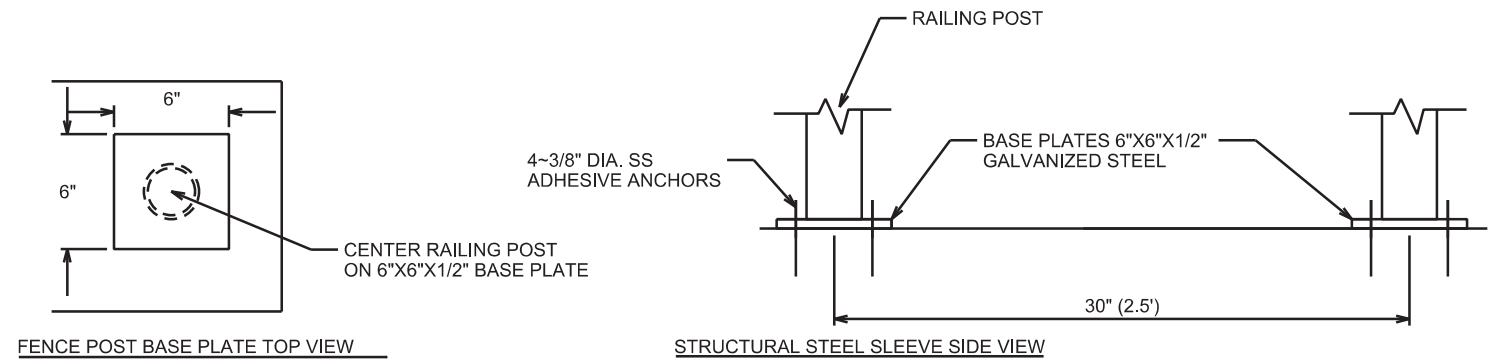
**CONCRETE FLUME DETAIL (NOT TO SCALE)**



**BULKHEAD DETAIL (NOT TO SCALE)**



**GUARD RAIL DETAILS (NOT TO SCALE)**

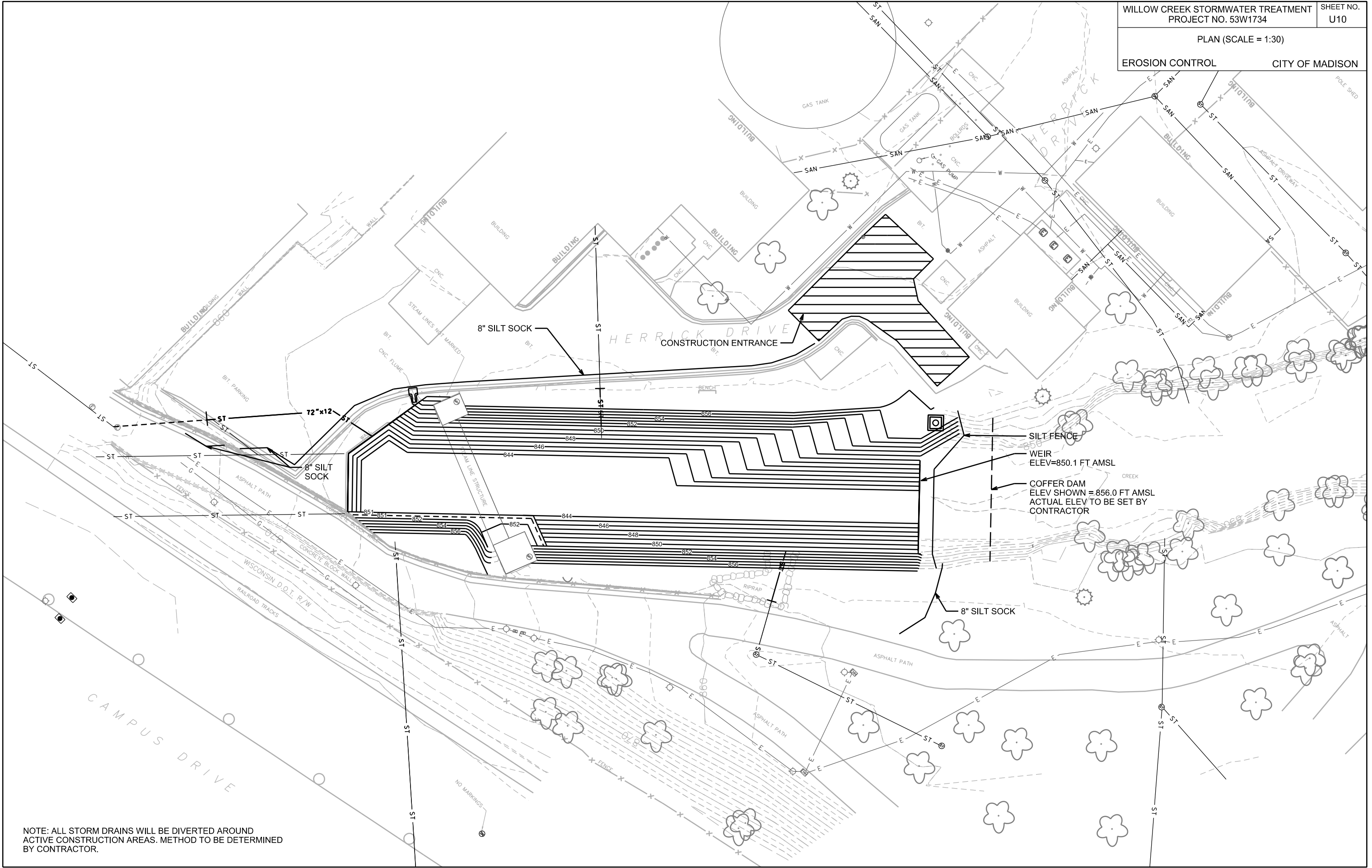


**GENERAL RAILING NOTES:**  
 ALL TUBING SHALL BE GALVANIZED STEEL PER WISDOT SPECIFICATIONS FOR HIGHWAY AND STRUCTURE CONSTRUCTION.  
 RAILING SHALL BE CENTERED ON TOP OF WALL.

STRUCTURAL STEEL TUBING SIDE VIEW

PLOT SCALE: CITY OF MADISON - STREETS DIVISION





NOTE: ALL STORM DRAINS WILL BE DIVERTED AROUND ACTIVE CONSTRUCTION AREAS. METHOD TO BE DETERMINED BY CONTRACTOR.

PLOT SCALE: \_\_\_\_\_

PLOT NAME: \_\_\_\_\_

REV. DATE: \_\_\_\_\_

ORIGINATOR: CITY OF MADISON, STREETS DIVISION

# STORM SEWER SCHEDULE

REVISED LES 12/5/16

## PROPOSED STORM STRUCTURES

STRUC NO.	STATION	LOCATION (OFFSET)	TYPE	TOP OF CASTING	E.I.	DEPTH	NOTES
* S-1	100+90.22	RT-0.00	SQUARE-CUT HEADWALL	857.52	846.03	11.49	
* S-2	100+73.94	RT-0.00	CONCRETE COLLAR	857.70	846.06	11.64	PER S.D.D. 5.4.5; SEE SPEC. NOTE 1
* S-3	100+30.92	LT-2.60	CONCRETE COLLAR	858.64	846.15	12.49	PER S.D.D. 5.4.5; SEE SPEC. NOTE 1 AND SPEC. NOTE 3
S-4	52+15.00	LT-30.00	4X4 SAS	856.00	841.41	17.59	W/ LOCKING FRAME & COVER PER S.D.D. 5.7.16A; SEE SPEC. NOTE 2
S-5	51+64.04	RT-15.50	SQUARE-CUT HEADWALL	-	851.00	-	
S-6	51+59.46	RT-32.91	2° PVC BEND	-	853.21	-	SEE SPEC. NOTE 1
S-7	50+99.17	LT-26.50	SQUARE-CUT HEADWALL	-	851.00	-	
S-8	50+98.51	LT-39.48	COUPLING	-	853.12	-	SEE BID ITEM 50437; SEE SPEC. NOTE 1
S-9	50+27.73	RT-5.00	SQUARE-CUT HEADWALL	-	851.00	-	
S-10	50+28.75	RT-17.13	CONCRETE COLLAR	-	853.27	-	PER S.D.D. 5.4.5; SEE SPEC. NOTE 1

## PROPOSED STORM PIPES

PIPE NO.	FROM SAS (DWNSTRM)	TO SAS (UPSTREAM)	EI # (DWNSTRM)	EI # (UPSTRM)	PIPE LENGTH (FT)	PLAN LENGTH (FT)	SLOPE (%)	SIZE (DIA)	TYPE	NOTES
* P-1	S-1	S-2	846.03	846.06	16	16	0.18%	10'X6'	CONCRETE BOX CULVERT	
* P-2	S-2	S-3	846.06	846.15	43	43	0.21%	10'X6'	CONCRETE BOX CULVERT	
P-3	S-5	S-6	851.00	853.21	18	18	12.28%	12"	TYPE III STORM SEWER PIPE	
P-4	S-7	S-8	851.00	853.12	13	13	16.31%	6"	TYPE III STORM SEWER PIPE	
P-5	S-9	S-10	851.00	853.27	12	12	18.92%	36"	RCP	

## STORM PIPE REMOVAL

PIPE REMOVAL NO.	REMOVE FROM	REMOVE TO	LENGTH (FT)	PAID (Y/N)	SIZE	TYPE	NOTES
R-1	S-3	STA 100+49.19 RT-13.32	22	N	10'X6'	CONCRETE BOX CULVERT	
R-2	STA 51+63.86 RT-16.18	S-6	17	N	12"	PVC	
R-3	STA 50+99.38 LT-22.32	S-8	17	N	6"	CAST IRON	

**NOTE:** PLAN LENGTH (PAY LENGTH) IS FROM CENTER OF STRUCTURE TO CENTER OF STRUCTURE. PIPE LENGTH IS ACTUAL LENGTH OF PIPE FROM STRUCTURE WALL TO STRUCTURE WALL. SLOPE CALCULATED USING PIPE LENGTH.

## SPECIAL NOTES:

- 1) PLACE SEWER ELECTRONIC MARKER ABOVE STORM SEWER TAP AND BEND LOCATIONS
- 2) DEPTH INCLUDES 3' SUMP
- \* 3) COLLAR TO BE INSTALLED TOGETHER WITH BULKHEAD IN EXISTING 10'X6' CBC AT TIE-IN OF P-2

## STANDARD NOTES:

- ABBREVIATIONS: AE = APRON ENDWALL; RCP = REINFORCED CONCRETE PIPE; HERCP = HORIZONTAL ELLIPTICAL REINFORCED CONCRETE PIPE; DNA = DOES NOT APPLY; SAS = SEWER ACCESS STRUCTURE; LP = LOW POINT INLET STRUCTURE; FP = FIELD POURED STRUCTURE; TR = TOP OF CONCRETE ROOF; NCM = NO CROWN MATCH FOR PIPES; UD = UNDERDRAIN
- APPROXIMATE DISCHARGE E.I. GIVEN, ADJUST E.I. AND PIPE SLOPE IN THE FIELD.
- TOP OF CASTING GRADE GIVEN IS THE TOP OF CURB FOR INLET STRUCTURES AND THE FLOWLINE OF THE CLOSED CASTING FOR SAS's.
- TOP OF CONCRETE ROOF (TR) IS 1.25' BELOW TOP OF CASTING UNLESS OTHERWISE NOTED.
- ALL REINFORCED CONCRETE PIPES TO BE CLASS III UNLESS OTHERWISE NOTED.
- SURVEYOR TO CONFIRM THAT ALL INLET STATION / OFFSETS LINE UP WITH PROPOSED CURB AND GUTTER.
- ALL STRUCTURES CALLED OUT AS FIELD POURED SHALL BE FIELD POURED. ALL OTHER STRUCTURES (NOT INDICATED AS FIELD POURED) SHALL BE SUBMITTED TO CITY ENGINEERING FOR APPROVAL IF PRECAST STRUCTURES ARE PREFERRED. CONTACT LAUREN STRIEGL OF CITY ENGINEERING AT (608) 266-4094, LSTRIEGL@CITYOFMADISON.COM, FOR PRECAST APPROVALS, OR FAX SHOP DRAWINGS TO (608) 264-9275.



INSTALL CONCRETE COLLAR ON NORTHWEST  
SIDE OF 10'X6' CBC  
SEE CITY OF MADISON S.D.D. 5.4.5

REMOVE 14' OF EXISTING 10'X6' CBC  
PIPE WALL

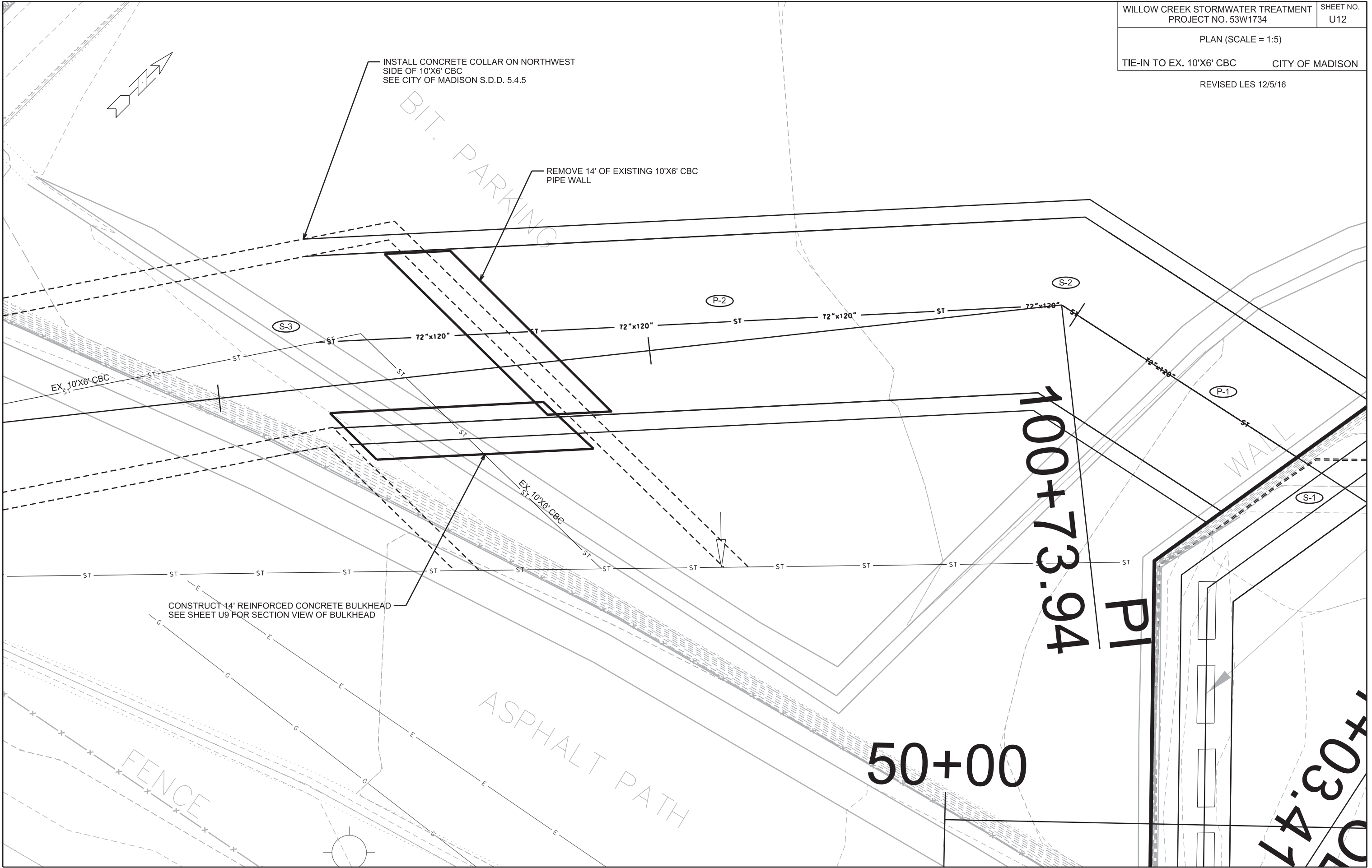
CONSTRUCT 14' REINFORCED CONCRETE BULKHEAD  
SEE SHEET U9 FOR SECTION VIEW OF BULKHEAD

PLOT SCALE: \_\_\_\_\_

PLOT NAME: \_\_\_\_\_

REV. DATE: \_\_\_\_\_

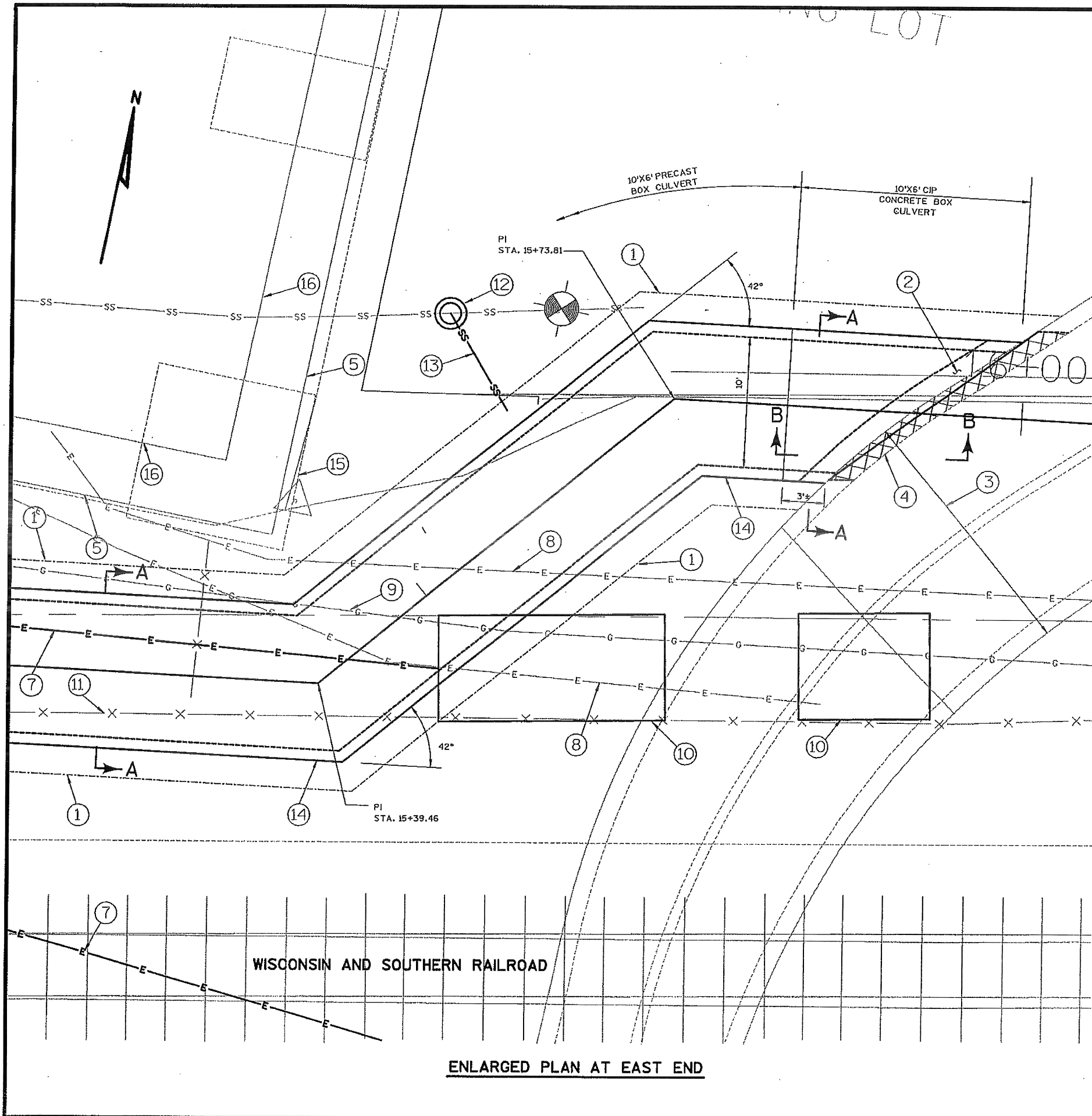
ORIGINATOR: CITY OF MADISON, STREETS DIVISION





KEY NOTES

1. PROVIDE TEMPORARY AND PERMANENT SHORING SYSTEM AS REQUIRED TO SUPPORT TRENCH EXCAVATION. SEE SPECIAL PROVISIONS FOR DESIGN AND CONSTRUCTION REQUIREMENTS. SHORING SYSTEM ON SOUTH TRENCH WALL OR WITHIN 15' OF STRUCTURES SHALL BE PERMANENT.
2. CONSTRUCT CIP CONCRETE HEADER BEAM INTEGRAL WITH TOP SLAB OF NEW BOX CULVERT.
3. EXISTING CIP CONCRETE CULVERT STRUCTURE TO REMAIN.
4. CUT OPENING IN EXISTING CULVERT WALL. SEE SECTION B-B. HEADER MUST BE CONSTRUCTED, DOWELED INTO EXISTING CULVERT STRUCTURE, AND HAVE REACHED 4000 PSI COMPRESSIVE STRENGTH PRIOR TO CREATING NEW OPENING.
5. EXISTING BUILDING OVERHANG MAY BE REMOVED BY CONTRACTOR IF IT INTERFERES WITH CONSTRUCTION. CONTRACTOR MAY SALVAGE STEEL FRAMING FROM OVERHANG FOR USE IN TEMPORARY SHORING SYSTEM.
6. OUTSIDE FACE OF PHYSICAL PLANT BUILDING FOUNDATION WALL. PROTECT DURING CONSTRUCTION.
7. PROPOSED 134 KV BURIED ELECTRIC LINE TO BE INSTALLED BY AMERICAN TOWER CORPORATION (ATC) AFTER COMPLETION OF THIS CONTRACT. THE ELECTRIC LINE WILL BE INSTALLED ABOVE THE NEW RELIEF CULVERT.
8. EXISTING AMERICAN TOWER CORPORATION (ATC) BURIED 13 KV ELECTRIC LINE IN CONCRETE ENCASED CONDUIT TO REMAIN. SEE CROSS SECTIONS FOR APPROXIMATE LOCATION. PROTECT AND TEMPORARILY SUPPORT LINE DURING CONSTRUCTION BY METHODS APPROVED BY THE UTILITY COMPANY.
9. EXISTING NG&E BURIED 175 PSI HIGH PRESSURE GAS MAIN TO REMAIN. SEE CROSS SECTIONS FOR APPROXIMATE LOCATION. PROTECT AND TEMPORARILY SUPPORT LINE DURING CONSTRUCTION BY METHODS APPROVED BY THE UTILITY COMPANY.
10. PROPOSED PRECAST CONCRETE UTILITY VAULT TO BE INSTALLED BY AMERICAN TOWER CORPORATION (ATC) AFTER COMPLETION OF THIS CONTRACT.
11. REMOVE AND SALVAGE EXISTING FENCE. ERECT FENCE IN SAME LOCATION AFTER CULVERT IS INSTALLED AND BACKFILLED.
12. CONSTRUCT NEW 5'X5' SEWER ACCESS STRUCTURE
13. CONSTRUCT NEW 36" PRECAST CONCRETE SS PIPE BETWEEN MANHOLE AND RELIEF CULVERT.
14. PRECAST BEND. BEND MAY BE PROVIDED USING SINGLE OR MULTIPLE PRECAST CONCRETE BOX CULVERT SECTIONS JOINED USING CONCRETE COLLARS. ALTERNATIVELY, CAST-IN-PLACE CONCRETE BEND SECTION MAY BE CONSTRUCTED.
15. EXISTING 10'-0" X 10'-0" CONCRETE FOOTING APPROXIMATELY 4 FEET BELOW GRADE. PROTECT DURING CONSTRUCTION
16. EXISTING BUILDING WALL TO REMAIN. PROTECT BUILDING STRUCTURE DURING CONSTRUCTION. CONTRACTOR IS CAUTIONED THAT WALL COVERING MATERIAL CONTAINS TRANSITE ASBESTOS.



U14

REVISION	NO.	DATE	BY	DATE	CONTRACTOR	CONSTRUCTED	NOTE

DATE: AUGUST 2003  
 DES BY: DRW  
 DWN BY: MAW  
 CHK BY:  
 APP BY:  
 PRINTED:

**CITY OF MADISON DEPT. OF PUBLIC WORKS  
 CITY ENGINEERING DIVISION  
 WILLOW CREEK RELIEF CULVERT OUTFALL  
 STRUCTURAL DETAILS**

**STRAND ASSOCIATES, INC.  
 ENGINEERS**

DRAWING NO.  
**020-750-007**