SPECIFICATIONS - BID DOCUMENTS

CITY OF MADISON
NAKOOSA TRAIL FLEET/FIRE/RADIO SHOP FACILITY

4151 Nakoosa Trail
Madison, Wisconsin 53714

Volume 1 of 4: Divisions 00 - 01
Volume 2 of 4: Divisions 02 - 14
Volume 3 of 4: Divisions 21 - 30
Volume 4 of 4: Divisions 31 - 45

Contract No. 7528
Munis No. 10305

Prepared by:

Stantec

1600 Wilson Boulevard, Ste. 360
Arlington, VA 22209
Project No.: 376603

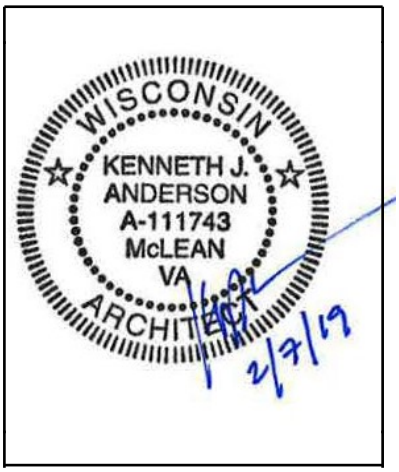
SECTION 00 01 07

SEALS PAGE

DESIGN PROFESSIONALS OF RECORD

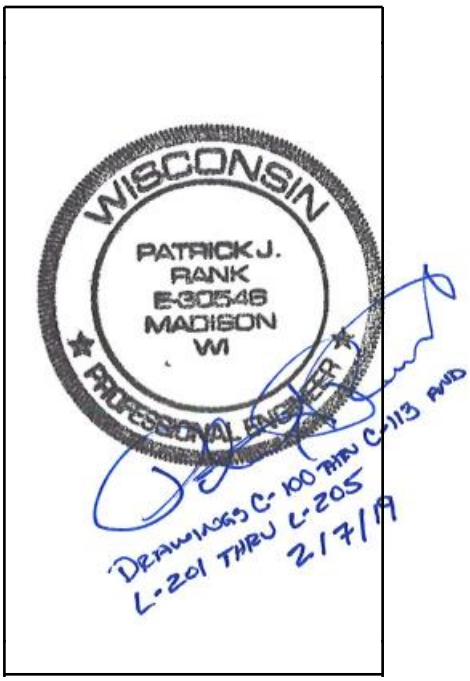
Architect: Stantec Architecture, Inc. [SAI]

Responsible for Divisions 01-49 Sections except where indicated as prepared by other design professionals of record.



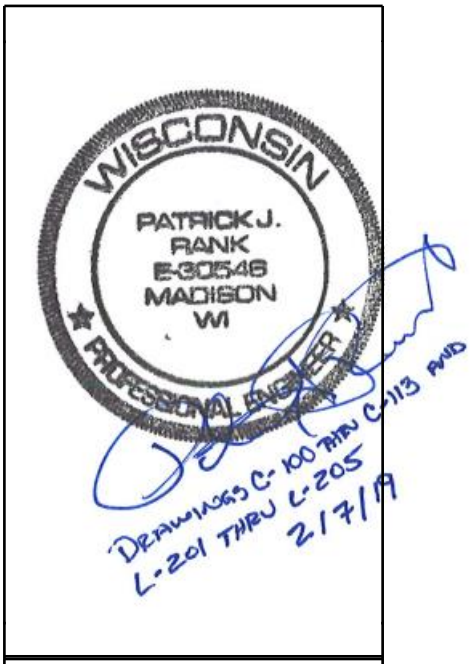
Civil Engineer: Strand Associates [SA]

Responsible for those Sections appended with "[SA]" on Table of Contents.



Landscape Architect: Strand Associates [SA]

Responsible for those Sections appended with "[SA]" on Table of Contents.

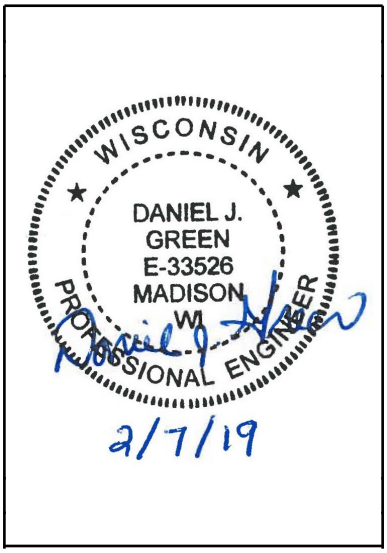


Structural Engineer: Mead & Hunt [M&H]

Responsible for those Sections appended with "[M&H]" on Table of Contents.

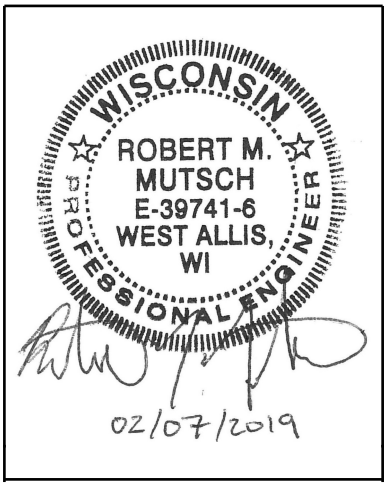
Fire-Protection Engineer: Mead & Hunt [M&H]

Responsible for those Sections appended with "[M&H]" on Table of Contents.



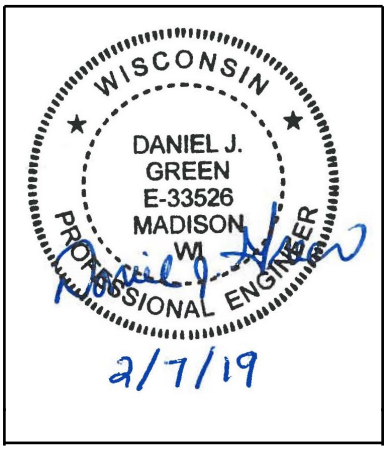
Plumbing Engineer: Mead & Hunt [M&H]

Responsible for those Sections appended with "[M&H]" on Table of Contents.



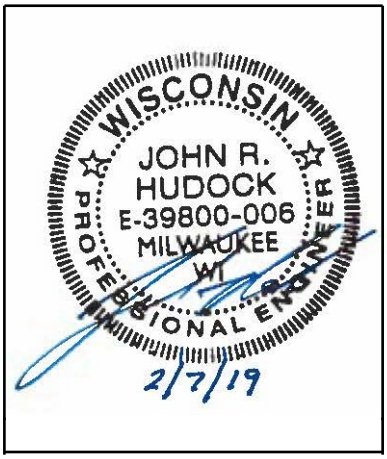
HVAC Engineer: Mead & Hunt [M&H]

Responsible for those Sections appended with "[M&H]" on Table of Contents.



Electrical Engineer: Mead & Hunt [M&H]

Responsible for those Sections appended with "[M&H]" on Table of Contents.



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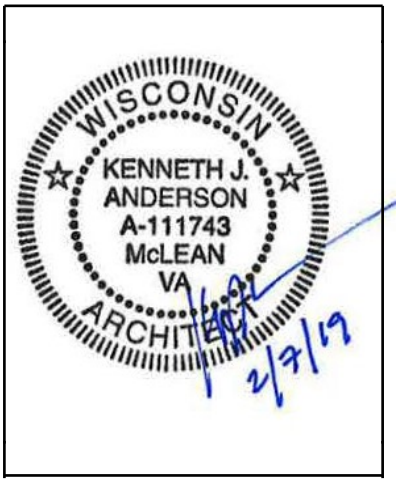

END OF SECTION 00 01 07

SECTION 00 01 09

PROJECT DIRECTORY

1.1 PROJECT TEAM

A. Owner:

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5. Phone: 608-288-4100.

END OF SECTION 00 01 09

SECTION 00 01 10

TABLE OF CONTENTS

Volume 1 of 4 - Divisions 00 - 01

DIVISION 41 – MATERIAL PROCESSING AND HANDLING EQUIPMENT

END OF SECTION 00 01 10

SECTION 00 31 32

GEOTECHNICAL DATA

1.1 GEOTECHNICAL DATA

A. This Document with its referenced attachments is part of the Procurement and Contracting Requirements for Project. They provide Owner's information for Bidders' convenience and are intended to supplement rather than serve in lieu of Bidders' own investigations. They are made available for Bidders' convenience and information, but are not a warranty of existing conditions. This Document and its attachments are not part of the Contract Documents.

B. A geotechnical exploration report for Project, prepared by CGC, Inc., dated August 4, 2016, is available for viewing as appended to this Document.

C. RelatedRequirements:

1. Section 00 31 33 "Geotechnical Data Supplement" for geotechnical memorandum regarding wet detention basin clay liner.

END OF SECTION 00 31 32

(See Geotechnical Exploration report next page.)

CGC, Inc.

Construction • Geotechnical
Consulting Engineering/Testing

August 4, 2016
C16051-5

Mr. Dave Schaller &
Mr. James Whitney
City of Madison
210 Martin Luther King Jr Blvd
Room 115
Madison, WI 53703-3346

Re: Geotechnical Exploration
Nakoosa Trail Fleet Service Facility
Madison, Wisconsin

Dear Dave and Jim:

Construction • Geotechnical Consultants, Inc. (CGC) has completed the first phase subsurface exploration program for the above-referenced project. The purpose of this 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 pavement design/construction. A determination of the site class for seismic design is included. A preliminary evaluation of the potential for infiltrating storm water is also addressed. An electronic copy of this report is provided for your use, and a paper can be provided upon request. We presume that you will forward this report to other parties on the project team as appropriate.

PROJECT DESCRIPTION

We understand that the City of Madison has undertaken a master planning effort to develop five adjoining parcels on Nakoosa Trail for a fleet service facility, with the possible addition of a new bus barn sometime in the future. The currently proposed building will be a single story, slab-on-grade structure with a footprint of about 125,000 sq ft. We presume the facility may possibly include below-grade pits for servicing vehicles. Based on preliminary information provided by Mr. David Cockrum of Mead & Hunt, structural engineer for the project, we understand the exterior walls may be precast concrete with the interior framing being structural steel. Exterior wall loads may be fairly heavy, but interior column loads are expected to be on the order of only 50 kips.

Exterior improvements will include east and west detention basins and underground infiltration galleries if conditions are favorable for their performance. Parking areas, access roadways, storage yards and utilities will also be included in the project. As details on the project are still in a master planning level of development, the recommendations in this report are somewhat preliminary in nature and are expected to be supplemented by a second exploration program as the project proceeds. This is particularly true of storm water/infiltration features, where future exploration may include in-situ infiltration testing.

2921 Perry Street, Madison WI 53713
Telephone: 608/288-4100
FAX: 608/288-7887

SITE CONDITIONS

The site is located south of Nakoosa Trail and is bounded on the west and south by Commercial Avenue. Businesses on Walsh Road border the site on the east. The majority of the site is the location of the former Cub Foods grocery store. The store has been vacant for about five years. A large parking lot occupies most of the site not covered by the building. The building itself is a single story, steel-frame structure with brick veneer which is similar in many respects to the proposed building. A loading dock area exists on the east side of the building.

We understand another building formerly occupied a portion of the site on its south side. The former building was presumably demolished prior to construction of the Cub Food store; its former location is in the parking lot near the Commercial Avenue entrance to the site. Undeveloped grassy to sparsely wooded areas exist north and south of the former grocery store and parking lot. We understand the south parcel was formerly occupied by a gas station, and some of the asphalt/concrete pavement remains. The site is apparently undergoing remediation for soil and/or groundwater contamination. (This site and other potential environmental conditions were evaluated by other consultants for the City of Madison and are not included in the scope of CGC's work.) An operating gas station that is not included in the project is located north of this parcel near the intersection of Commercial Avenue and Nakoosa Trail.

The site has been graded as a result of the previous developments and is relatively flat throughout the majority of the area. Overall site grades generally dip toward the west and typically range between EL 868 and 858. The exception is the steep slope along the south and east sides near Commercial Avenue and the backyards of the properties along Walsh Road to the east where the ground rises from EL 868 up to about EL 912. The topography suggests that this hillside may have been the source for some of the fill used to grade the Cub Foods site.

GLACIAL GEOLOGY

From southeast (near the Commercial Avenue-Walsh Road intersection) to northwest (Nakoosa Trail), glacial deposits are mapped[1] as follows:

- Gravelly, clayey, silty sand ***subglacial till*** with drumlins on the southeast part of the site, grading to
- ***Meltwater stream sediments*** (described as sand and gravel) deposited by braided streams carrying glacial meltwater toward the future Lake Monona, followed by
- ***Off-shore lake sediment*** along Nakoosa Trail including plane-bedded and cross-bedded sand and plane-bedded silt and clay, sometimes found overlain with post-glacial silt and peat deposits.

[1] Lee Clayton and John W. Attig, *Pleistocene Geology of Dane County, Wisconsin*, Wisconsin Geologic and Natural History Survey, Bulletin 95, 1997

SUBSURFACE CONDITIONS

Subsurface conditions on site were explored by drilling 11 Standard Penetration Test (SPT) soil borings to depths of 23.7 to 48.5 ft below existing site grades. Planned depths ranged from 25 to 50 ft, but a number of borings were shortened slightly due to split spoon refusal on very dense soil. Boring 5 was intended to go to 50 ft was terminated at 28.5 ft on probable bedrock. Instead, Boring 10 was extended beyond 25 ft and terminated at split spoon refusal at 48.5 ft. The number and locations were selected by City of Madison personnel with input from CGC and the project design team. The borings were drilled on July 11 to 13, 2016 by Badger State Drilling (under subcontract to CGC) using a truck-mounted CME-55 rotary drill rig equipped with hollow-stem augers and an automatic SPT hammer. The boring locations are shown in plan on the Soil Boring Location Map attached in Appendix B. Ground surface elevations at the boring locations were interpolated from a topographic map provided to us and should be considered approximate (+/- 6 in.). As requested, Borings 1, 2, and 7 were screened in the laboratory with an organic vapor meter (OVM) by Seymour Environmental (as a subconsultant to CGC). OVM results are tabulated for these borings in the far right hand column of the respective logs.

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

- 3 to 5 in. (average of 4.1 in.) of ***asphalt*** over 8 to 9 in. (average of 8.25 in.) of ***base course*** (except where 6 to 8 in. of ***topsoil*** was encountered in Borings 1 and 2 in vegetated areas), followed by
- 3 to 12 ft (including pavement layers) of mostly silty sand ***fill*** with varying gravel, silt and clay contents, scattered cobbles/boulders, and seams or pockets of clay in some locations, underlain by
- Medium to very dense ***sand and gravel strata*** with varying silt contents and scattered to some cobbles, starting at 5.5 to 12 ft and generally extending to the maximum depth explored.

One exception to the above profile includes very stiff to hard lean clay layers found in Borings 1, 2, and 8 between the fill and underlying sand and gravel. As another exception, apparent bedrock was encountered in Borings 5 and 7 at depths of 26.5 to 27.5 ft with refusal shortly below these depths. Also, apparent sandstone bedrock was drilled from about 32 to 48.6 ft in Boring 10.

The existing fill which mantles most of the site appears to be fairly well compacted with SPT blow counts generally in the medium dense to dense range. The majority of the fill appears to be sand, but occasional clay layers can be found throughout. Where encountered, the clay generally appears to be stiff to very stiff. Because of these characteristics, we believe the fill layer would be considered an engineered fill, meaning that it was likely systematically compacted in uniform lifts using a relatively consistent or controlled source of material. Compaction may have been tested when the fill was placed, but it is unlikely that such records would remain.

Groundwater was encountered at about 7 to 15 ft below the ground surface during or shortly after drilling, including several 24-hr readings in borings that remained open overnight. 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 Soil Boring Logs attached in Appendix B.

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 structure can be supported by conventional spread footing foundations. Our recommendations for site preparation, foundation, floor slab, below-grade wall and 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 existing structure be removed in its entirety, including foundations and floor slabs, where the existing building falls within or close to the proposed building footprint or where substructure elements might interfere with new utility lines. Outside the building, foundation walls and footings might be left in place *below new parking areas* provided they are broken off and removed to a depth of at least 2 ft below the bottom of base course. Basement floor slabs, if any, that are left in place below parking areas should be broken up in place to allow drainage through the slab to the underlying soils. Non-degradable building debris such as concrete, brick and masonry that is generally free of reinforcing steel, etc. can be crushed and reused on site as structural fill. Other demolition debris should be hauled off site to a licensed solid waste landfill. Grade should be restored with granular fill compacted with vibratory rollers or plate compactors in uniform, horizontal lifts not exceeding 12 in. in loose thickness.

Following demolition, we recommend that any remaining surficial topsoil and pavement be stripped to at least 5 ft beyond the proposed construction areas, including areas required for cuts and fills beyond the building footprint or new pavement limits. The topsoil can be stockpiled on-site and re-used as fill in landscape areas. The asphalt pavement can be milled in place and salvaged for use as structural fill within the building or below pavements.

Following stripping, the exposed subgrades are expected to consist of mostly sand fill with scattered clay seams. Exposed soils in areas to receive fill should be proof-rolled with a loaded tri-axle truck to check for soft/yielding areas. If loose, soft or yielding areas are detected, they should be undercut/removed. Grade should be re-established using granular backfill compacted to at least 95% compaction based on modified Proctor methods (ASTM D 1557) or stabilized with coarse stone (3-in. clear stone, 3-in. dense graded base, select crushed material or breaker run stone, as described in Appendix D) compacted into the subgrade until no further deflection is evident.

We recommend using granular soils as fill because sand/gravel soils are relatively easy to place and compact. Clay/silt soils are not recommended as structural fill because moisture conditioning will be required to achieve desired compaction levels, which could delay construction progress especially in late fall to early spring. We recommend that fill/backfill be compacted to at least 95% compaction (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.

2. Foundation Design

In our opinion, the proposed structure can be supported on reinforced concrete spread footing foundations bearing on the existing fill or underlying native cohesive and granular soils, and the following parameters should be used for foundation design:

- Maximum allowable bearing pressure: 4,000 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 clays with pocket penetrometer readings ($\mathbf{q_a}$, an estimate of the unconfined compressive strength of cohesive soil) of less than 2.0 ton/sq ft or looser granular soils are observed at or below footing grade. Although the existing fill appears to be relatively uniform and reasonably well-compacted, with no records available to confirm this there is the possibility that localized loose or soft zones may exist at footing grade. For example, the clay layer in the existing fill with a $\mathbf{q_a}$ of 1.25 tsf in Boring 6 from 5.5 to 8 ft would likely require undercutting and replacement. For this reason, *we recommend that a contingency be included in the budget for undercutting and replacement by about 2 ft below about 20% of footings.*

Where undercutting is required, 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. Grade can be restored using granular fill compacted to 95% compaction (ASTM D 1557) or compacted coarse stone (breaker run, select crushed material or 3-in. dense graded base course, as described in Appendix D). CGC should be present during footing excavations to check that adequate soil conditions exist or recommend corrective measures, if necessary.

We recommend using a smooth-edged backhoe bucket for footing excavations. Further, sand footing subgrade soils well above the water table should be recompacted with a large vibratory plate compactor or hoe-pak (backhoe mounted compactor) and clay soils should be recompacted with a jumping jack to densify soils loosened/disturbed 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. Site Class for Seismic Design

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 Slab

We anticipate that the floor slab for the proposed structure will be supported on either native or fill sands or clays and in our opinion may be designed using a subgrade modulus of 100 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. Areas which do not proof-roll satisfactorily should be undercut and replaced with compacted breaker rock or granular fill. To serve as a capillary break, the final 4 in. of soil placed below the slabs should consist of imported well-graded sand or gravel with no more than 5 percent by weight passing a No. 200 U.S. standard sieve. Note that some structural engineers require a 4 to 6 in. layer of dense-graded base course immediately below the floor slab, in lieu of the capillary break, to improve the subgrade modulus. If 6 in. of 1 ¼-in. dense graded base is included below the slab, the subgrade modulus can be increased to 150 pci. To further minimize the potential for moisture migration, a plastic vapor barrier could also be utilized. Fill placed below the floor slabs should be placed as described in the Site Preparation section of this report. The slabs should be structurally separate from the foundations and have construction joints and wire mesh for crack control.

5. Below-Grade Walls

If service pits are included in the plan, we anticipate that the pit walls will be relatively rigid (i.e., laterally restrained from rotation). Therefore, *at-rest* lateral earth pressures should be used during design. To minimize the development of such pressures, granular backfill should be placed within 4 to 6 ft of the walls. Unless the pits are designed as watertight structures with water stops and exterior waterproofing, we recommend that perimeter drainage systems be provided to intercept potential ground water infiltration and that the granular backfill placed behind the walls be continuously connected to this system. The perimeter drainage system should be sloped to drain to a sump pit. To impede the inflow of surface moisture, the final 2 ft of backfill placed along pit walls coinciding with *exterior* foundation walls should consist of a clayey fill cap or other semi-impermeable material such as asphaltic or concrete pavement. The clay cap or pavement should be graded in a manner which promotes positive drainage away from the walls. (The clay cap would not be required if service pits are built on the interior of the building.) Somewhat generic perimeter drain details are attached to this report in Appendix E and can be adapted for this purpose if required. We can provide more specific recommendations if desired.

Compaction of the backfill within 3 to 5 ft of the walls should be performed with lightweight compaction equipment. The granular backfill should be compacted to a minimum of 90% modified Proctor (ASTM D1557) following Appendix D guidelines.

Walls constructed in accordance with the above recommendations may be designed for an equivalent *at-rest* fluid pressure of 55 psf per foot of depth. An equivalent fluid pressure of 200 psf per foot of depth can be used for calculating *passive* resistance. This value includes a factor of safety of 2.0 to reduce lateral deflection. The below-grade wall design should also take into account surcharge effects which could be applied during or after construction. Exterior retaining walls (if any) which are free to rotate

slightly will be subjected to *active* lateral earth pressures and may be designed for an equivalent fluid pressure of 35 psf per foot of depth.

6. Pavement Design

The subgrade soils within the parking and drive areas are generally expected to consist of silty sand fill with scattered layers of lean clay. Pavement subgrades should be proof-rolled/recompacted as described in the Site Preparation section of this report and stabilized as needed with coarse stone or replaced with compacted granular fill. We assume that a visitor/employee vehicle parking lot pavement (if provided) would be subjected to mainly automobile traffic with minimal truck traffic (i.e., less than one design daily equivalent 18-kip single axle load). The main drive and truck parking lot, on the other hand, would likely be subjected to frequent truck traffic. We have assumed truck traffic up to 50 vehicles per day in developing our recommendations for the heavy duty pavement section. Accordingly, the pavement section tabulated below was selected assuming a clay subgrade with a CBR value of approximately 2 to 5 and a design life of 20 years.

TABLE 1
RECOMMENDED PAVEMENT SECTIONS

Material	Layer Thickness (in.)		WDOT Specification[1]
	Light Duty/Car Traffic Only	Heavy Duty/ Truck Drives and Parking	
Bituminous Upper Layer (Surface Course)	1.5	2.0	Section 460, Table 460-1, 9.5 mm
Bituminous Lower Layer (Binder Course)	1.75	3.0	Section 460, Table 460-1, 12.5 mm
Dense Graded Base Course	8.0	12.0	Sections 301 and 305, 75 and 31.5mm
TOTAL THICKNESS	11.25	17.0	

Notes:
1. Wisconsin DOT *Standard Specifications for Highway and Structure Construction*, latest edition, including supplement specifications.

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-0.3 bituminous pavement is recommended; refer to Section 460, Table 460-2 of the *Standard Specifications.*

The pavement design assumes a stable/non-yielding subgrade and a regular program of preventative maintenance. Alternative pavement designs may prove acceptable 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 and should contain mesh reinforcement for crack control. A subgrade modulus of 100 pci should be used for concrete pavement resting on compacted granular fill.

7. Stormwater Management Features

We understand that two types of stormwater features may be provided on this site: 1) wet detention ponds are planned near Borings 1 and 2 on the south side and near Boring 7 on the north side, and 2) infiltration areas may be considered in some locations as the design advances beyond the master planning stage. For this phase of the exploration program, our comments are mainly focused on the wet detention basins near Borings 1, 2, and 7. DSPS forms for soil evaluation-storm are included in Appendix F for these borings.

A significant clay layer was encountered in Borings 1 and 2 ranging in thickness from 2.5 to 7.3 ft. Underlying soils range from silty sand and gravel (designated SM and GM soils on the logs) to 'clean' sand and gravel (SP/GP) with less than 5% fines. Similar SP sands were found in Boring 7 below the surficial sand fill layer. Because of the presence of soil layers with less than 10% fines, a clay liner will be required for the wet detention basins. If salvaged during excavation of the ponds, the surficial clay near Borings 1 and 2 appears suitable to construct the clay liner.

As noted, specific plans to infiltrate stormwater have not been developed and are not addressed in this report. These comments are general in nature and are provided for future consideration. The natural sand soils which predominate this site are generally classified as sand to sandy loam or sandy clay loam according to the United States Department of Agriculture (USDA) classification system. Note that the shallow fill soils contained variable clay content and will therefore likely have lower infiltration potential then the natural sands. The following parameters should be considered for design of infiltration features:

Infiltration Potential: The following infiltration parameters were estimated using Table 2 of the WDNR Conservation Practice Standard 1002, *Site Evaluation for Storm Water Infiltration*. The estimated infiltration rates are as follows:

- Sandy clay loam 0.11 in./hr
- Sandy loam 0.5 in./hr

- Loamy sand 1.63 in./hr
- Sand 3.6 in./hr

Note that the infiltration rates should be considered very approximate. Test pits with in-situ infiltration tests at proposed infiltration areas can be completed to more accurately estimate infiltration potential.

Groundwater: Groundwater was encountered at depths of 9.75 to 14.5 ft in Borings 1, 2, and 7 during or shortly after drilling and was encountered as shallow as 7.1 ft in Boring 6. Seasonal fluctuations in the groundwater level should be expected, depending on infiltration, evaporation, nearby lake levels and other factors. As a result, shallow groundwater is likely to be a limitation to infiltrating significant volumes of storm water.

Bedrock: Bedrock was encountered in three of the eleven borings but may be deep enough to not be considered a limitation to infiltration.

During construction of the proposed building and related site work, appropriate erosion control should be provided to prevent eroded soil from contaminating the infiltration areas. Where appropriate, the basin design should include pretreatment to remove fine-grained soils (silt/clay) from storm water prior to entering the infiltration area. Additionally, a regular maintenance plan should be developed to remove silt/clay soils that may accumulate in the bottom of the infiltration basin over time. Failure to adequately control fine-grained soils from entering the infiltration area or failure to regularly remove fine-grained soils that accumulate at the base of the infiltration basin will likely cause the basin to fail. Refer to WDNR Conservation Practice Standards 1002 and 1004, as well as NR 151 *Runoff Management* for additional information.

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 final site grading activities be completed during dry weather, if possible. Construction traffic should be avoided on prepared subgrades to minimize potential disturbance.
- Contingencies in the project budget for subgrade stabilization with coarse stone in parking and floor slab areas should be increased if the project schedule requires that work proceed during adverse weather conditions.
- 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 excavations is not expected to be a problem. However, water accumulating at the base of excavations as a result of precipitation or seepage should be controlled and quickly removed using pumps operating from filtered sump pits. More extensive dewatering measures may be required if service pits are included within the building.

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.

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

Michael N. Schultz, P.E.
Principal/Consulting Professional

Encl:
Appendix A - Field Exploration
Appendix B - Soil Boring Location Plan
Logs of Test Borings (11)
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 F - DSPS Forms: Soil Evaluation - Storm

APPENDIX A

FIELD EXPLORATION

APPENDIX A

FIELD EXPLORATION

Subsurface conditions on site were explored by drilling 11 Standard Penetration Test (SPT) soil borings to depths of 23.7 to 48.5 ft below existing site grades. Planned depths ranged from 25 to 50 ft, but a number of borings were shortened slightly due to split spoon refusal on very dense soil. Boring 5 was intended to go to 50 ft was terminated at 28.5 ft on probable bedrock. Instead, Boring 10 was extended beyond 25 ft and terminated at split spoon refusal at 48.5 ft. The number and locations were selected by City of Madison personnel with input from CGC and the project design team. The borings were drilled on July 11 to 13, 2016 by Badger State Drilling (under subcontract to CGC) using a truck-mounted CME-55 rotary drill rig equipped with hollow-stem augers and an automatic SPT hammer. The boring locations are shown in plan on the Soil Boring Location Map attached in Appendix B. Ground surface elevations at the boring locations were interpolated from a topographic map provided to us and should be considered approximate (+/- 6 in.).

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)

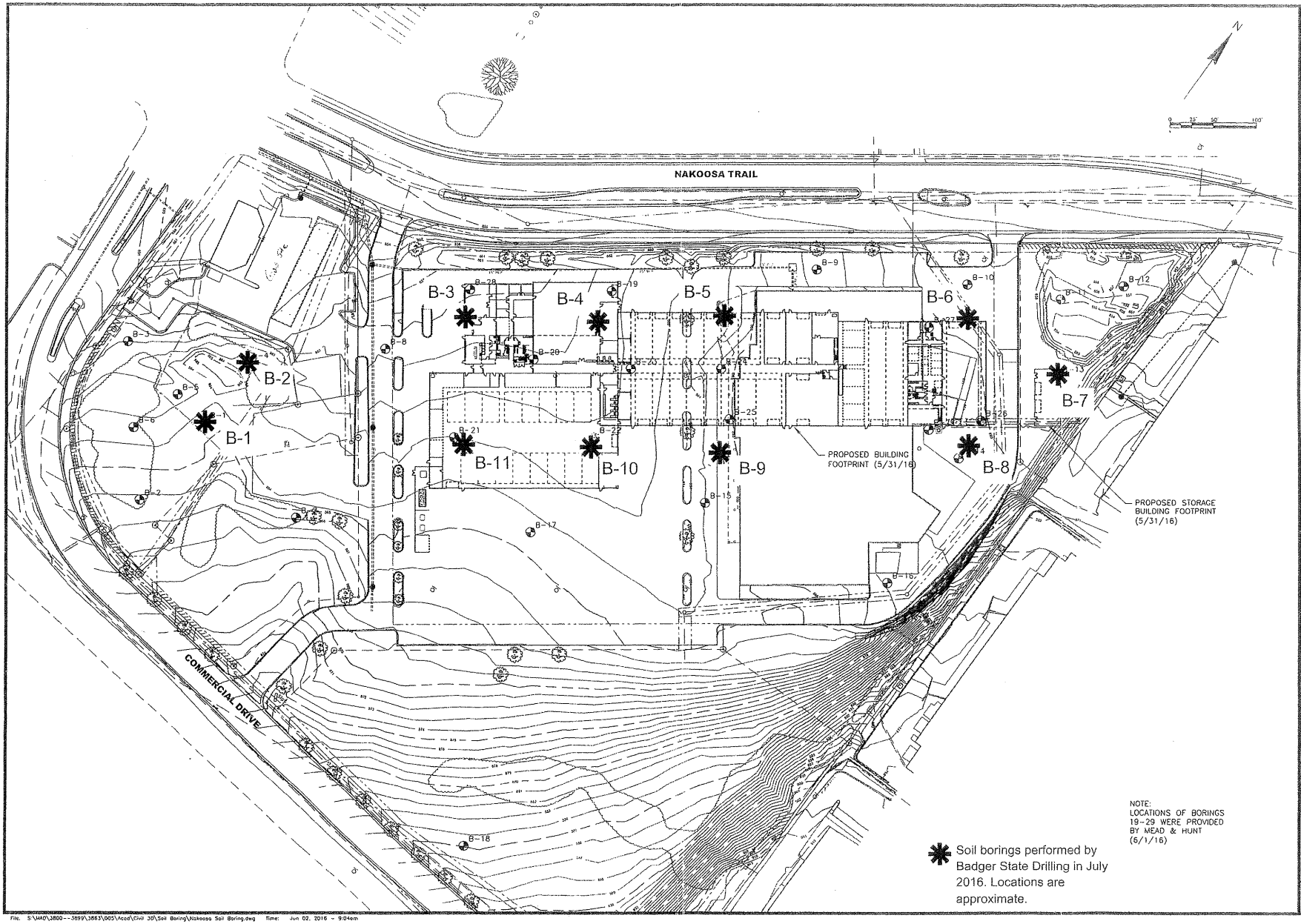
   This method consists of driving a 2-inch outside diameter split-barrel sampler using a 140-pound weight falling freely through a distance of 30 inches. The sampler is first seated 6 inches into the material to be sampled and then driven 12 inches. The number of blows required to drive the sampler the 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. As requested, Borings 1, 2, and 7 were screened in the laboratory with an organic vapor meter (OVM) by Seymour Environmental (as a subconsultant to CGC). OVM results are tabulated for these borings in the far right hand column of the respective logs. CGC's responsibilities relating to evaluating environmental issues for this project are limited to screening samples from the three borings; no interpretations of findings are implied or included in our presentation of this data.

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 EXHIBIT
LOGS OF TEST BORINGS (11)
LOG OF TEST BORING – GENERAL NOTES
UNIFIED SOIL CLASSIFICATION SYSTEM



File: S:\1440\3800--3899\3863\005\Acad\Civil 3D\Soil Boring\Nakoosa Soil Boring.dwg Time: Jun 02, 2016 - 9:04am

NO. | REVISIONS | DATE

SOIL BORING LOCATIONS

NAKOOSA TRAIL FLEET/FIRE RADIO SHOP FACILITY

CITY OF MADISON

DANE COUNTY, WISCONSIN

JOB NO.
3863.005

PROJECT MGR.
PRJ

STRAND ASSOCIATES®

SHEET
1

CGC Inc.

LOG OF TEST BORING

Project: **Nakoosa Trail Facility**

Location: **Madison, WI**

Boring No. **1**
Surface Elevation (ft) **864.4**
Job No. **C16051-5**
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	OVM
						6 in. TOPSOIL					
1	■	18	M	24		FILL: Medium Dense, Brown and Light Brown Sand with Variable Silt and Gravel Contents					0.1
						USDA: 10YR 4/4, 4/2 Gravelly Sandy Loam (Fill)					
2	■	12	M	10		Very Stiff to Hard, Gray Lean CLAY, Little Sand, Trace Gravel (CL)	(4.0)	20.6			0.2
					5	USDA: 10YR 4/4 Silty Clay Laom					
3	■	16	M	17		Medium Dense, Brown Fine SAND, Some Silt, Trace Gravel and Clay, Scattered Clayey Sand Seams (SM)					0.4
						USDA: 10YR 4/4, 3/3 Sandy Loam, Scattered Sandy Clay Loam Seams					
4	■	11	M	27							1.4
					10	Medium Dense, Brown Fine to Coarse SAND and GRAVEL, Some Silt, Scattered Cobbles (SM/GM)					
						USDA: 10YR 4/3 Very Gravelly Sandy Loam					
5	■	9	W	15	▼						1.1
					15	Medium Dense, Brown Fine to Coarse SAND, Some Gravel, Trace Silt (SP)					
						USDA: 10YR 4/3 Gravelly Sand					
6	■	18	W	20							0.2
					20	Occasional Seams and Layers with Sand and Gravel (SP/GP)					
7	■	9	W	16							0
					25	Very Gravelly Near 25 ft					
						End Boring at 25 ft					
						Backfilled with Bentonite Chips					
					30						
					35						

WATER LEVEL OBSERVATIONS

While Drilling ▽	14.5'	Upon Completion of Drilling			14.5'
Time After Drilling					30 min.
Depth to Water					14' ▼
Depth to Cave in					14'

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

GENERAL NOTES

Start **7/13/16** End **7/13/16**
Driller **BSD** Chief **DB** Rig **CME-55**
Logger **FD/DC** Editor **ESF**
Drill Method **2.25" HSA; Automatic Hammer**

CGC Inc.

LOG OF TEST BORING

Project: **Nakoosa Trail Facility**

Location: **Madison, WI**

Boring No. **2**
Surface Elevation (ft) **863.0**
Job No. **C16051-5**
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	OVM
						8 in. Dark Brown TOPSOIL					
1	■	11	M	13		Hard, Brown Lean CLAY (CL) USDA: 10YR 4/3 Silty Clay Loam (Redox Near 3.5 ft C1D 7.5YR 5/6, 10YR 5/2)	(4.5)	18.2			0
2	■	11	M	11	5		(4.25)	19.0			0.1
3	■		M	16		Very Stiff, Brown/Gray Mottled Lean CLAY, Little Sand, Trace Gravel (CL) USDA: 10YR 5/2 Silty Clay Loam (Redox: C2P 7.5YR 4/6)	(2.5)	19.2			
4	■	9	M	55							1.4
					10	Medium Dense to Very Dense, Brown Fine to Coarse SAND and GRAVEL, Trace Silt, Scattered Cobbles (SP/GP) USDA: 10YR 4/4, 3/3 Very Gravelly Sandy Loam					
5	■	10	W	18							0
					15						
6	■	6	W	18		Medium Dense, Brown Fine to Medium SAND, Trace Silt and Gravel (SP) USDA: 10YR 5/3 Sand					
					20						
7	■	9	W	14		Medium Dense, Brown Fine SAND, Little to Some Silt (SP-SM/SM) USDA: 10YR 5/4 Loamy Fine Sand					18.1*
					25	End Boring at 25 ft Backfilled with Bentonite Chips *Odor noted when screening Sample 7 with OVM.					
					30						
					35						

WATER LEVEL OBSERVATIONS

While Drilling ▽	13.5'	Upon Completion of Drilling		15'
Time After Drilling				30 min.
Depth to Water				12.75' ▼
Depth to Cave in				12.75

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

GENERAL NOTES

Start **7/13/16** End **7/13/16**
Driller **BSD** Chief **DB** Rig **CME-55**
Logger **FD/DC** Editor **ESF**
Drill Method **2.25" HSA; Automatic Hammer**

CGC Inc.

LOG OF TEST BORING

Project: Nakoosa Trail Facility

Location: Madison, WI

Boring No. 3
Surface Elevation (ft) 860.2
Job No. C16051-5
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
						4 in. Asphalt/8 in. Base Course					
1		14	M	23		FILL: Medium Dense, Brown and Light Brown Sand with Variable Silt and Gravel Contents to 5.5 ft					
2		11	M	13	5	Very Stiff, Brown to Gray Clay with Sand and Gravel to 7 ft					
3A 3B		11	M	28		Dense, Brown and Light Brown Sand with Variable Silt and Gravel Contents to 8 ft	(3.25)	14.1			
4		9	W	15	10	Stiff, Brown to Gray Clay with Sand and Gravel to 12 ft	(1.5)				
5		15	W	44	15	Dense to Very Dense, Brown Fine to Coarse SAND and GRAVEL, Some Silt, Scattered Cobbles (SM/GM)					
6		15	W	94	20						
7		12	W	91	25	Medium Dense, Brown Fine SAND, Little to Some Silt and Gravel (SP-SM/SM)					
						End Boring at 25 ft Backfilled with Bentonite Chips & Asphalt Patch					
					30						
					35						

WATER LEVEL OBSERVATIONS

While Drilling ▽ 12.0'			Upon Completion of Drilling	10.5'
Time After Drilling				30 min.
Depth to Water				9.5' ▼
Depth to Cave in				9.6'

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

GENERAL NOTES

Start 7/11/16 End 7/11/16
Driller BSD Chief DB Rig CME-55
Logger FD Editor ESF
Drill Method 2.25" HSA; Automatic Hammer

CGC Inc.

LOG OF TEST BORING

Project: **Nakoosa Trail Facility**

Location: **Madison, WI**

Boring No. **4**
Surface Elevation (ft) **861.4**
Job No. **C16051-5**
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
						4 in. Asphalt/8 in. Base Course					
1		12	M	15		FILL: Medium Dense, Brown to Gray Silty Sand with Gravel and Clay					
2		13	M	22	5						
3		13	M	40		Dense, Brown Fine to Coarse SAND, Some Gravel, Trace Silt (SP)					
4		11	M	36							
					10						
5		12	W	17		Medium Dense to Very Dense, Brown Fine to Coarse SAND and GRAVEL, Trace Silt, Scattered Cobbles (SP/GP)					
					15						
6		1	W	50/5"							
					20						
7		14	W	66		Very Dense, Brown Fine to Coarse SAND, Some Gravel, Some Silt, Scattered Cobbles (SM/GM)					
					25	End Boring at 25 ft Backfilled with Bentonite Chips & Asphalt Patch					
					30						
					35						

WATER LEVEL OBSERVATIONS

While Drilling ▽	12.0'	Upon Completion of Drilling		9.5'
Time After Drilling				15 min.
Depth to Water				9.3' ▼
Depth to Cave in				9.3'

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

GENERAL NOTES

Start **7/11/16** End **7/11/16**
Driller **BSD** Chief **DB** Rig **CME-55**
Logger **FD** Editor **ESF**
Drill Method **2.25" HSA; Automatic Hammer**

CGC Inc.

LOG OF TEST BORING

Project: **Nakoosa Trail Facility**

Location: **Madison, WI**

Boring No. **5**
Surface Elevation (ft) **864.0**
Job No. **C16051-5**
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
						4.5 in. Asphalt/8 in. Base Course					
1		14	M	31		FILL: Dense, Brown to Gray Silty Sand with Gravel					
2		6	M	20	5						
3		16	M	25		Brown Fine to Coarse SAND, Some Gravel, Some Silt, Scattered Cobbles (SM/GM)					
4		14	M	59	10						
						Medium Dense to Dense, Brown Fine to Coarse SAND, Some Gravel, Trace Silt (SP)					
5		8	W	20	15						
6		10	W	46	20						
7		14	W	46	25						
						Apparent Weathered to Competent BEDROCK					
8		0	W	50/0"	30	End Boring at 28.5 ft Due to Spoon Refusal on Presumed Competent Bedrock Backfilled with Bentonite Chips & Asphalt Patch					
					35						

WATER LEVEL OBSERVATIONS

While Drilling ▽ **12.5'** 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 **7/12/16** End **7/12/16**
Driller **BSD** Chief **DB** Rig **CME-55**
Logger **FD** Editor **ESF**
Drill Method **4.25" HSA to 15'; 3 7/8" RB w/Mud to 28.5'; Automatic Hammer**

CGC Inc.

LOG OF TEST BORING

Project: **Nakoosa Trail Facility**

Location: **Madison, WI**

Boring No. **6**
Surface Elevation (ft) **859.7**
Job No. **C16051-5**
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
						3 in. Asphalt/8 in. Base Course					
1		15	M	39		FILL: Brown to Gray Silty Sand with Gravel and Clay to 5.5' (No clay noted in Sample 1)					
2		16	M	28	5						
3		10	M	11		Stiff, Brown to Gray CLAY with Sand and Gravel to 8 ft	(1.25)				
4		17	W	27	10	Medium Dense, Brown Fine to Medium SAND, Trace Silt and Gravel (SP)					
5		18	W	17	15						
6		6	W	18	20	Medium Dense, Brown Silty Fine SAND, Some Gravel (SM)					
7		2	W	19	25	Clay Lenses Present in Sample 7					
						End Boring at 25 ft Backfilled with Bentonite Chips & Asphalt Patch					
					30						
					35						

WATER LEVEL OBSERVATIONS

While Drilling ▽	8.0'	Upon Completion of Drilling	7.3'
Time After Drilling			24 hrs
Depth to Water			7.1' ▼
Depth to Cave in			14.3'

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

GENERAL NOTES

Start **7/11/16** End **7/11/16**
Driller **BSD** Chief **DB** Rig **CME-55**
Logger **FD** Editor **ESF**
Drill Method **2.25" HSA; Automatic Hammer**

CGC Inc.

LOG OF TEST BORING

Project: **Nakoosa Trail Facility**

Location: **Madison, WI**

Boring No. **7**
Surface Elevation (ft) **860.5**
Job No. **C16051-5**
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	OVM
						3 in. Dark Brown TOPSOIL					
1	■	14	M	23		FILL: Medium Dense, Brown to Gray Silty Sand with Gravel and Clay					0.1
						USDA: 10YR 4/2, 4/4 Sandy Clay Loam and Silty Clay Loam (Fill)					
2	■	11	M	13	5						0.4
						Dark Gray Silty to Lean Clay Near 5 ft					
3	■	11	M	28		Medium Dense, Brown Fine to Coarse SAND, Some Gravel, Trace Silt (SP)					1.5
4	■	9	W	15	▽	USDA: 10YR 6/4 Gravelly Sand					1.2
					10	Occasional Seams and Layers with Sand and Gravel (SP/GP)					
					▼	Dense to Very Dense, Brown to Gray Fine to Medium SAND, Some Silt and Gravel, Scattered Cobbles/Boulders (SM)					
5	■	15	W	44		USDA: 10YR 5/4, 6/2 Gravelly Sandy Loam					0.6
					15						
6	■	15	W	94							0.2
					20						
7	■	12	W	91							0
					25						
						Possible Weathered to Competent BEDROCK					
8	■	1	W	50/3"		End Boring at 28.8 ft					1.8
					30	Backfilled with Bentonite Chips					
					35						
					40						

WATER LEVEL OBSERVATIONS

While Drilling ▽	9.5'	Upon Completion of Drilling		14'
Time After Drilling				30 min.
Depth to Water				11.6' ▼
Depth to Cave in				

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

GENERAL NOTES

Start **7/13/16** End **7/13/16**
Driller **BSD** Chief **DB** Rig **CME-55**
Logger **FD/DC** Editor **ESF**
Drill Method **2.25" HSA; Automatic Hammer**

CGC Inc.

LOG OF TEST BORING

Project: **Nakoosa Trail Facility**

Location: **Madison, WI**

Boring No. **8**
Surface Elevation (ft) **860.3**
Job No. **C16051-5**
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
						4 in. Asphalt/8 in. Base Course					
1		14	M	23		FILL: Medium Dense, Brown to Gray Silty Sand with Gravel and Clay					
2		12	M	11	5						
3		15	M	10		Very Stiff, Gray Lean Clay, Trace Plant Fibers (CL)	(2.25)	20.1			
4		15	M	59		Very Dense, Brown Fine to Coarse SAND, Some Gravel, Trace Silt (SP)					
					10	▼ ▽					
5		11	W	69		Very Dense, Brown Fine to Coarse SAND and GRAVEL, Some Silt, Scattered Cobbles (SM/GM)					
					15	Rough Drilling Noted from 13 ft to 23.5 ft					
6		9	W	83/8"							
					20						
7		0	W	50/2"		End Boring at 23.8 ft					
					25	Backfilled with Bentonite Chips and Asphalt Patch					
					30						
					35						

WATER LEVEL OBSERVATIONS

While Drilling ▽ **12.0'** Upon Completion of Drilling **11.5'**
Time After Drilling **24 hrs**
Depth to Water **11'** ▼
Depth to Cave in **11'**

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

GENERAL NOTES

Start **7/11/16** End **7/11/16**
Driller **BSD** Chief **DB** Rig **CME-55**
Logger **FD** Editor **ESF**
Drill Method **2.25" HSA; Automatic Hammer**

CGC Inc.

LOG OF TEST BORING

Project: **Nakoosa Trail Facility**

Location: **Madison, WI**

Boring No. **9**
Surface Elevation (ft) **864.4**
Job No. **C16051-5**
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
						5 in. Asphalt/8 in. Base Course					
1	■	16	M	40		FILL: Brown and Light Brown Sand with Variable Silt and Gravel Contents					
2	■	14	M	38	5						
3	■	14	M	13		Medium Dense, Brown Fine SAND, Little to Some Silt and Gravel (SP-SM/SM)					
4	■	13	M	17	10						
5	■	18	M/W	12		Medium Dense, Brown Fine to Medium SAND, Some Silt and Gravel, Scattered Cobbles/Boulders (SM)					
					15 ▽						
6	■	16	W	59		Very Dense, Brown Fine SAND, Trace Silt and Gravel (SP)					
7	■	3	W	50/4"	20						
					25	End Boring at 25 ft Backfilled with Bentonite Chips and Asphalt Patch					
					30						
					35						

WATER LEVEL OBSERVATIONS

While Drilling ▽ **15.0'** 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 **7/11/16** End **7/11/16**
Driller **BSD** Chief **DB** Rig **CME-55**
Logger **FD** Editor **ESF**
Drill Method **2.25" HSA; Automatic Hammer**

CGC Inc.

LOG OF TEST BORING

Project: **Nakoosa Trail Facility**

Location: **Madison, WI**

Boring No. **10**
Surface Elevation (ft) **862.2**
Job No. **C16051-5**
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
						4 in. Asphalt/9 in. Base Course					
1	■	4	M	16		FILL: Medium Dense to Very Dense, Brown and Light Brown Sand with Variable Silt and Gravel Contents, Occastional Clay Pockets and Gravelly Layers with Cobbles					
2	■	12	M	43	5						
3	■	0	M	50/1"							
4	■	13	M	49	10						
						Dense to Very Dense, Brown Fine to Coarse SAND and GRAVEL, Trace Silt, Scattered Cobbles (SP/GP)					
5	■	10	W	39	15	Rough Drilling Noted from 16.5 to 21 ft					
6	■	0	W	50/3"	20						
						Very Dense, Brown Fine to Coarse SAND and GRAVEL, Some Silt, Scattered Cobbles (SM/GM)					
7	■	4	W	50/1"	25						
8	■	3	W	50/4"	30						
						Very Dense, Gray to Brown Fine SAND, Trace Silt and Gravel (SP - Probable Sandstone Bedrock) Smooth Drilling Noted from 32 to 48.6 ft					
9	■	5	W	50/5"	35						
10	■	2	W	50/3"	40						
11	■	0	W	50/1"	45						
12	■	0	W	50/1"	50	End Boring at 48.6 ft					
						Backfilled with Bentonite Slurry/Chips and Asphalt Patch					
					55						

WATER LEVEL OBSERVATIONS

While Drilling ▽ **12.5'** 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 **7/12/16** End **7/12/16**
Driller **BSD** Chief **DB** Rig **CME-55**
Logger **DC** Editor **ESF**
Drill Method **4.25" HSA to 15'; 3 7/8" RB w/Mud to 48.6'; Automatic Hammer**

CGC Inc.

LOG OF TEST BORING

Project: Nakoosa Trail Facility

Location: Madison, WI

Boring No. 11
Surface Elevation (ft) 863.4
Job No. C16051-5
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
						4 in. Asphalt/9 in. Base Course					
1		14	M	46		FILL: Medium Dense to Dense, Brown and Light Brown Sand with Variable Silt and Gravel Contents					
2		11	M	27	5						
3		11	M	32							
4		13	M	44		Dense, Brown Fine to Medium SAND, Some Silt and Gravel, Scattered Cobbles/Boulders (SM - Possible Fill)					
					10						
						Medium Dense, Brown Fine to Medium SAND, Trace Silt and Gravel (SP)					
5		12	W	20							
					15						
						Dense, Brown Fine SAND, Little to Some Silt and Gravel, Scattered Seams and Layers of Fine to Coarse SAND (SP-SM/SM)					
6		14	W	42							
					20						
						Very Dense, Brown Fine to Coarse SAND, Some Gravel, Trace Silt (SP)					
7		3	W	61							
					25	End Boring at 25 ft Backfilled with Bentonite Chips and Asphalt Patch					
					30						
					35						

WATER LEVEL OBSERVATIONS

While Drilling ▽ 13.5' Upon Completion of Drilling 16'
Time After Drilling 30 min.
Depth to Water ▼
Depth to Cave in 13.5'

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

GENERAL NOTES

Start 7/13/16 End 7/13/16
Driller BSD Chief DB Rig CME-55
Logger FD/DC Editor ESF
Drill Method 2.25" HSA; Automatic Hammer

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 or 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

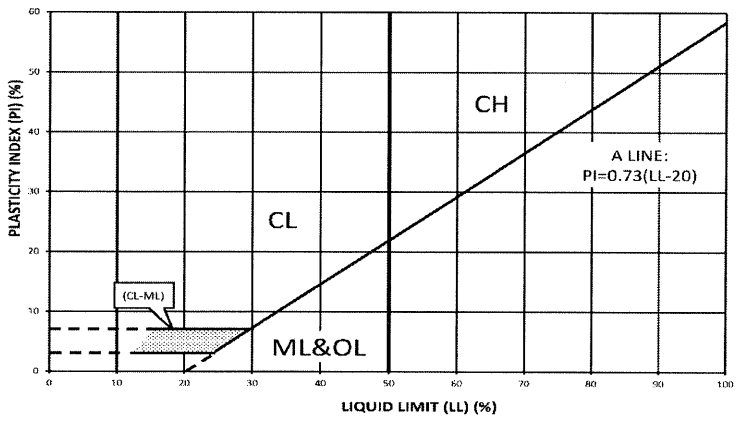
LABORATORY CLASSIFICATION CRITERIA

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 limts 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 limts above "A" line or 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

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes. While you cannot eliminate all such risks, you can manage them. The following information is provided to help.

Geotechnical engineers structure their services to meet the specific needs 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.

READ THE FULL REPORT

Serious problems have occurred because those relying on a geotechnical engineering report did not read it all. Do not rely on an executive summary. Do not read selected elements 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 geotechnical engineer performed the study. *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 subsurface 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 confirmation-dependent recommendations included in your report. *Those confirmation-dependent 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 confirmation-dependent recommendations if we do not perform the geotechnical-construction observation required to confirm the recommendations' applicability.*

A GEOTECHNICAL ENGINEERING REPORT IS SUBJECT TO MISINTERPRETATION

Other design team members' misinterpretation of geotechnical engineering reports has resulted in costly problems. Confront 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. Constructors can also misinterpret a geotechnical engineering report. Confront that risk by having CGC participate in prebid and preconstruction conferences, and by providing geotechnical 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 CONSTRUCTORS A COMPLETE REPORT AND GUIDANCE

Some owners and design professionals mistakenly believe they can make constructors liable for unanticipated subsurface conditions by limiting what they provide for bid preparation. To help prevent costly problems, give constructors the complete geotechnical engineering report, *but* preface it with a clearly written letter of transmittal. In that letter, advise constructors 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 constructors have sufficient time* to perform additional study. Only then might you be in a position to give constructors 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 constructors 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 the risk of such outcomes, 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.

ENVIRONMENTAL CONCERNS ARE NOT COVERED

The equipment, techniques, and personnel used to perform an *environmental* study differ significantly from those used to perform a *geotechnical* study. For that reason, a geotechnical engineering report does not usually relate any environmental 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 environmental 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, many 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 the Geotechnical Business Council (GBC) of Geoprofessional Business Association exposes geotechnical engineers to a wide array of risk confrontation techniques that can be of genuine benefit for everyone involved with a construction project. Confer with CGC, a member of GBC, for more information.

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Geotechnical Business Council
of the Geoprofessional Business Association
8811 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			
No. 40			5-20	8-28	10-35	75 (2)		
No. 100						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.

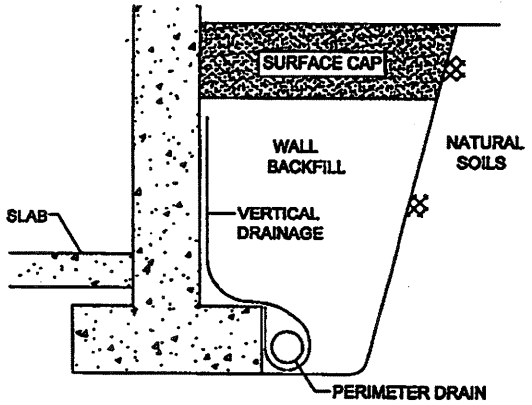
11. Pipe backfill materials should satisfy filter requirements for the slot width or hole diameter of the perforated pipe.

12. Care should be taken during backfilling not to damage the integrity of the system. For compaction requirements, refer to geotechnical report.

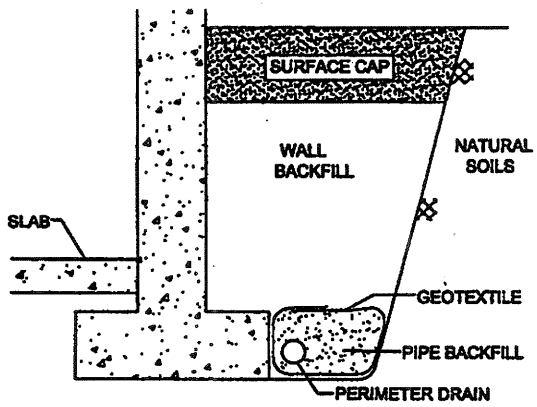
13. Pipe, geotextile, and geocomposite should be installed according to manufacturer specifications.

CGC, Inc.

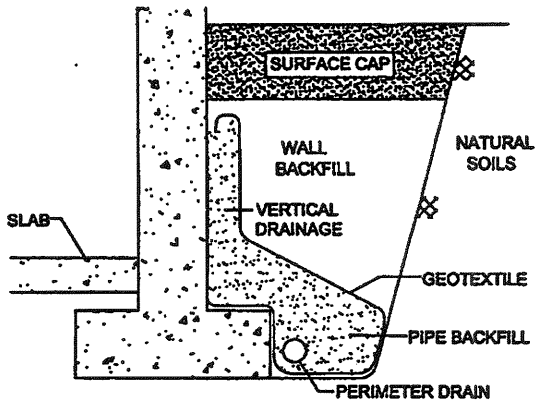
Typical Perimeter Drain Detail
General Notes



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-dimensional drainage geocomposite hydraulically connected to perimeter drain.	Relatively free-draining granular soils with P200 (% fines) ≤12%.	Minimum 6-in. wide zone of free-draining granular 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

APPENDIX F

WISCONSIN DEPARTMENT OF SAFETY & PROFESSIONAL SERVICES
SOIL EVALUATION FORM

Wisconsin Department of Safety & Professional Services
Division of Safety and Buildings

SOIL EVALUATION - STORM

in accordance with Comm 82.365 & 85, Wis. Adm. Code

Attach complete site plan on paper not less than 8 1/2 x 11 inches in size. Plan must include, but not limited to: vertical and horizontal reference point (BM), direction and percent slope, scale or dimensions, north arrow, and BM referenced to nearest road.

Please print all information.

Personal information you provide may be used for secondary purposes (Privacy Law, s.15.04 (1) (m)).

County: Dane

Parcel I.D.: 081033405194

Review by: Date:

Property Owner
City of Madison Motor EQ Motor EQ

Property Location
Govt. Lot: 1/4 1/4 S 08 T 10 N R 33 E

Property Owner's Mailing Address
200 N. First Street

Lot #: 2 Block #: Subd. Name or CSM#: Cub Center

City	State	Zip Code	Phone Number
Madison	WI	53704	

[X] City [ ] Village [ ] Town — Nearest Road: 4118 Commercial Avenue (Madison)

Drainage area_____ [ ] sq. ft. [ ] acres

Optional:

Test Site Suitable for (check all that apply)

[ ] Irrigation [ ] Bioretention trench [ ] Trench(es)
[ ] Rain Garden [ ] Grassed Swale [ ] Reuse
[ ] Infiltration trench [ ] SDS (>15' wide) [ ] Other _____

Hydraulic Application Test Method

[X] Morphological Evaluation
[ ] Double-Ring Infiltrometer
[ ] Other (Specify)_____

Obs. # 1 — [X] Boring [ ] Pit — Ground Surface Elev. 864.4 ft — Depth to limiting factor 168 in.

Horizon	Depth in.	Dominant Color Munsell	Redox Description Qu. Sz. Cont. Color	Texture	Structure Gr. Sz. Sh.	Consistence	Boundary	% Rock Frag.	Hydraulic App. Rate Inches/Hr
1	0 - 6		Topsoil - Sample Not Collected						
2	6 - 36	10 YR 4/4, 4/2	None	GRSL (Fill)	Variable	Variable	gs	15 - 25	0.5
3	36 - 66	10 YR 4/4	None	SiCL	3csbk	mefi	gs	<5	0.04
4	66 - 96	10 YR 4/4, 3/3	None	SL, SCL	1msbk	mvfr	gs	<5	0.11
5	96 - 174	10 YR 4/3	None	VGRSL	1msbk	mvfr	gs	35 - 50	0.5
6	174 - 300	10 YR 4/3	None	GRS	0sg	ml		15 - 25	3.6

Groundwater encountered approximately 14 ft below grade in boring.

Obs. # 2 — [X] Boring [ ] Pit — Ground Surface Elev. 863.0 ft — Depth to limiting factor 42, 153 in.

Horizon	Depth in.	Dominant Color Munsell	Redox Description Qu. Sz. Cont. Color	Texture	Structure Gr. Sz. Sh.	Consistence	Boundary	% Rock Frag.	Hydraulic App. Rate Inches/Hr
1	0 - 8		Topsoil - Sample Not Collected						
2	8 - 66	10 YR 4/3	C1D 7.5YR5/6, 10YR5/2 near 3.5 ft	SiCL	3csbk	mefi	gs	<5	0.04
3	66 - 96	10 YR 5/2	C2P 7.5 YR 4/6	SiCL	2msbk	mfi	gs	<5	0.04
4	96 - 204	10 YR 4/4, 3/3	None	VGRSL	1msbk	mvfr	gs	35 - 50	0.5
5	204 - 264	10 YR 5/3	None	S	0sg	ml	gs	<5	3.6
6	264 - 300	10 YR 5/4	None	LFS	0sg	ml		<5	0.5

Groundwater encountered approximately 12.8 ft below grade in boring.

CST/PSS Name (Please Print)	Signature	CST/PSS Number
DAVID A STAAB	D. Staab	1042602

Address	Date Evaluation Conducted	Telephone Number
641 PIPER DRIVE, MADISON, WI	8/3/2016	608/279-4530

Wisconsin Department of Safety & Professional Services
Division of Safety and Buildings

SOIL EVALUATION - STORM

in accordance with Comm 82.365 & 85, Wis. Adm. Code

Attach complete site plan on paper not less than 8 1/2 x 11 inches in size. Plan must include, but not limited to: vertical and horizontal reference point (BM), direction and percent slope, scale or dimensions, north arrow, and BM referenced to nearest road.

County: Dane

Parcel I.D.: 081033405144

Review by: Date:

Please print all information.

Personal information you provide may be used for secondary purposes (Privacy Law, s.15.04 (1) (m)).

Property Owner
City of Madison Motor EQ Motor EQ

Property Owner's Mailing Address
200 N. First Street

City	State	Zip Code	Phone Number
Madison	WI	53704	

Property Location

Govt. Lot: 1/4 1/4 S 08 T 10 N R 33 E

Lot #	Block #	Subd. Name or CSM#
6		Cub Center

[X] City [ ] Village [ ] Town — Nearest Road: 4201 Nekoosa Trail

Drainage area_____ [ ] sq. ft. [ ] acres

Optional:

Test Site Suitable for (check all that apply)

[ ] Irrigation [ ] Bioretention trench [ ] Trench(es)
[ ] Rain Garden [ ] Grassed Swale [ ] Reuse
[ ] Infiltration trench [ ] SDS (>15' wide) [ ] Other _____

Hydraulic Application Test Method

[X] Morphological Evaluation
[ ] Double-Ring Infiltrometer
[ ] Other (Specify)_____

7 Obs. # [X] Boring [ ] Pit — Ground Surface Elev. 860.5 ft — Depth to limiting factor 114 in.

Horizon	Depth in.	Dominant Color Munsell	Redox Description Qu. Sz. Cont. Color	Texture	Structure Gr. Sz. Sh.	Consistence	Boundary	% Rock Frag.	Hydraulic App. Rate Inches/Hr
1	0 - 3		Topsoil - Sample Not Collected						
2	3 - 66	10 YR 4/4, 4/2	None	SCL & SiCL (Fill)	Variable	Variable	gs	15 - 25	0.04
3	66 - 144	10 YR 6/4	None	GRS	0sg	ml	gs	15 - 25	3.6
4	144 - 330	10 YR 5/4, 6/2	None	GRSL	1msbk	mvfr	gs	<5	0.5
5	330 - 345	-	Possible Weathered Bedrock		-	-	-	-	-

Groundwater encountered approximately 9.5 ft below grade in boring.

Obs. # [ ] Boring [ ] Pit — Ground Surface Elev. _____ ft — Depth to limiting factor _____ in.

Horizon	Depth in.	Dominant Color Munsell	Redox Description Qu. Sz. Cont. Color	Texture	Structure Gr. Sz. Sh.	Consistence	Boundary	% Rock Frag.	Hydraulic App. Rate Inches/Hr

CST/PSS Name (Please Print): DAVID A STAAB

Signature: DJ Staab

CST/PSS Number: 1042602

Address: 641 PIPER DRIVE, MADISON, WI

Date Evaluation Conducted: 8/3/2016

Telephone Number: 608/279-4530

TRC
Results you can rely on

708 Heartland Trail
Suite 3000
Madison, WI 53717

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608.826.3941 FAX

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July 23, 2013

Ms. Brynn Bemis
Hydrogeologist
City of Madison
Engineering Division
210 Martin Luther King Jr. Blvd., Room 115
Madison, WI 53703

Subject: Results for the Phase II Environmental Site Assessments (ESAs)
Five Adjacent Parcels – Nakoosa Trail and Commercial Avenue,
Madison, Wisconsin

Dear Ms. Bemis:

The City of Madison (City) is considering purchasing the five adjacent parcels (tax identification numbers 081033405194, 081033405201, 081033405011, 081033405128 and 081033405144) located at Nakoosa Trail and Commercial Avenue in Madison, Wisconsin ("sites"). The five parcels are associated with the former Cub Foods grocery store that operated on this property from 1987 through 2011. Four of the parcels are currently vacant and the fifth parcel contains the former grocery store building, which is approximately 76,000 square feet. This letter report summarizes the results of a Phase II ESA completed by TRC Environmental Corporation (TRC) on June 26 and 27, 2013.

Background

In May 2013, Midwest Environics completed a Phase I Environmental Site Assessment (ESA) of the five properties listed above. The Phase I ESA identified several recognized environmental conditions (RECs) which warranted further investigation. The RECs included the following:

- The northeast portion of the property for possible impacts to groundwater migrating from the Sycamore landfill.
- The southwest portion of the property for possible impacts to groundwater migrating from the former Lil Bear Gas Station. (Closed BRRTS #03-13-002785).

- The area surrounding the former commercial building at 4025 Commercial Avenue for possible impacts from the former operations, which included a former commercial building for a construction company, a hazardous waste transport facility, and other commercial uses.
- The west portion of the property for possible impacts to groundwater migrating from the existing Road Ranger gas station.
- Asbestos within the former grocery store building.
- Mold within the former grocery store building.

Purpose and Scope

TRC, on behalf of the City, completed a Phase II ESA to determine the nature of impacts associate with each RECs identified in the Phase I ESA. The Phase II ESA included an asbestos inspection and mold survey of the former Cub Foods facility, and a soil and groundwater investigation as summarized in Table 1 and Figure 1. A summary of the Phase II ESA investigation is included in the next section.

Investigation Methods

Asbestos Inspection

On June 27, 2013, TRC conducted an asbestos inspection of the former Cub Foods building in order to determine the extent of potential asbestos containing materials (ACMs) in the building. This was accomplished by identifying, sampling, characterizing, quantifying, and laboratory-analyzing potential ACM. At the request of the City, sampling was conducted from unobtrusive locations or repairs were made to any areas damaged during sampling if it was not possible to collect samples from unobtrusive locations.

Samples of suspect ACM were collected for laboratory analysis in accordance with the United States Environmental Protection Agency's (USEPA's) Asbestos Hazardous Emergency Response Act (AHERA) 40 CFR Part 763, Subpart E, as indicated in WDNR and Occupational Safety and Health Administration (OSHA) regulations. A minimum of three randomly distributed samples of each type of material identified as homogeneous (same type, color, and age of application) were collected by James Gondek, WDHFS Asbestos Inspector #AII-108099. If there was any reason to suspect that the materials might be different, those materials were sampled separately. Samples were collected by hand using hammers, chisels, and utility knives. Sufficient water was applied before and during sample collection to prevent the generation of airborne particulate as a result of

sampling activities. Samples collected were analyzed by TRC Solutions, Inc. in Windsor, Connecticut. Samples were analyzed using polarized light microscopy (PLM) with dispersion staining techniques. Once one sample of a homogeneous material tested positive for asbestos, the remaining samples of that material were not analyzed.

A total of 18 samples were collected during the June 27 sampling event and analyzed for the presence of ACM. Materials sampled included cove base and mastic, floor tile and mastic, roofing material, and ceiling tile.

Mold Survey

On June 27, 2013, Rapid Response Remediation of Middleton, Wisconsin, completed a mold survey within the interior of the facility. Rapid Response Remediation completed a visual inspection within the facility and collected ten laboratory samples from interior surfaces to identify and quantify mold. The approximate locations where samples were collected for mold analysis are shown on the facility drawing included in Attachment 2. The mold samples were sent to SanAir Technologies Laboratory, Inc., in Powhatan, Virginia for analysis.

Soil and Groundwater Investigation

On June 26, 2013, seven soil borings were installed by On-site Environmental Services of Sun Prairie, Wisconsin, under the supervision of TRC (Figure 1). Each boring was advanced to approximately 20 feet below ground surface (bgs); however, GP-4 and GP-5 were stopped at 15 and 19 feet bgs, respectively, due to refusal. The soil was logged and field-screened for visual and olfactory signs of contamination and for volatile organic compounds (VOCs) with a photoionization detector (PID). Because of high moisture conditions in the soil during the investigation, the PID did not produce reliable results; therefore, samples intervals were selected based on visual and/or olfactory screening. Soil boring logs are included in Attachment 1.

The sampling protocol and rationale for sampling at each location are summarized in Table 1. All samples collected from soil and groundwater were submitted to Pace Analytical Services (Pace) for laboratory analysis. A total of nine soil samples were collected from the seven borings for VOC analysis. Three samples were also analyzed for lead (GP-4, GP-6, and GP-7), and one sample (GP-4) was analyzed for polychlorinated biphenyls (PCBs), semivolatile organic compounds (SVOCs), and RCRA metals.

Upon completion of each soil boring, a temporary 1-inch monitoring well was installed and screened across the water table. Groundwater samples were collected from each

temporary well and analyzed for VOCs. In addition, groundwater samples from TW-6 and TW-7 were also analyzed for lead, and the sample from TW-4 was analyzed for RCRA metals.

Following groundwater sampling the temporary wells were abandoned in accordance with NR-141. The abandonment forms are included in Attachment 3. Soil cuttings are currently stored on site on the east side of the former Cub Foods building, and can be thin spread on site. Purge water from the temporary groundwater wells has been arranged for disposal with the Madison Metropolitan Sewage District.

Results

Asbestos Investigation

The results of the asbestos sampling are included in Attachment 2, and photographs are included in Attachment 5. Asbestos was identified in the black mastic sampled from beneath the 12-inch x 12-inch floor tile located under the former pharmacy and liquor store areas of the building. Similar floor tile was also observed in the front cart storage area and several upstairs offices. It is assumed that similar black mastic material is located beneath these additional tiled areas. Due to the City's request to limit damage to building materials during sampling, carpeted areas and large floor tiles located in the main grocery store area were not removed in order to check for the presence of floor tile and/or mastic beneath those materials. The potential exists for the mastic material to also be present beneath those areas.

The mastic is non-friable. Non-friable ACM is any material containing more than 1 percent asbestos that, when dry, cannot be crumbled, pulverized, or reduced to powder by hand pressure. The EPA also defines two categories of non-friable ACM, Category I and Category II non-friable ACM as follows:

- Category I non-friable ACM is any asbestos-containing packing, gasket, resilient floor covering, mastic, or asphalt roofing product that contains more than 1 percent asbestos.
- Category II non-friable ACM is any material, excluding Category I non-friable ACM, containing more than 1 percent asbestos that, when dry, cannot be crumbled, pulverized, or reduced to powder by hand pressure.

Regulated Asbestos-Containing Material (RACM) is (a) friable asbestos material; (b) Category I non-friable ACM that has become friable; (c) Category I non-friable ACM

that will be, or has been, subjected to sanding, grinding, cutting or abrading; or (d) Category II non-friable ACM that has a high probability of becoming, or has become, crumbled, pulverized, or reduced to powder by the forces expected to act on the material in the course of demolition operations.

The non-friable mastic could become friable due to potential abatement methods that could render the material friable (such as removal using hand scrapers), causing it to become RACM, which would need to be removed prior to building demolition.

Mold Investigation

The results from the mold survey are summarized in Attachment 3, and photographs are included in Attachment 5. Mold was found to be present on surfaces within the facility. The most heavily impacted area were associated with Test Sites 2, 4, and 8 as shown on the facility drawing in Attachment 3. The heavily impacted areas are located near the floor of the building, at locations with visible mold contamination, and are less than 5 square feet. Based on discussions with Rapid Response Remediation, with respect to safety for occupancy, their response was as follows:

> "though we are not physicians, we do know that these localized contaminations are less than five contiguous square feet and that people in normal good health will likely be unaffected. This is because the RH (relative humidity) and temp(erature) are optimum—not conducive to a mold bloom. This means that while bad spores are present, it would take high humidity or a water intrusion to allow the replication via spores to accelerate to a concerning level."

Soil and Groundwater Investigation

In general, soils observed at the site were silt and/or clay and underlain by sand and gravel. Groundwater was encountered in all borings at approximately 15 feet below ground surface.

The laboratory analytical results are included in Attachment 4. Soil analytical results are summarized in Table 2 and groundwater results are summarized in Table 3. In addition, the general results are summarized in Table 1 with respect to each boring.

In general significant concentrations of VOCs were not detected in the soil samples. Low level impacts were detected in GP-1, and GP-5, however these samples were collected near or below the water table and are likely indicative of groundwater impacts (discussed

further below) and not associated with a source within the soil. PCBs were not detected in soil collected from GP-4, and metal concentrations in that same sample were all below their respective residual contaminant levels (RCLs) and regional screening levels (RSLs).

Groundwater sampling results indicate there are no impacts to the shallow groundwater associated with the RECs throughout the northern section of the property; however, impacts to groundwater are present on the southwest section of the property based on the sample results from TW-1, TW-2, and TW-5. TW-1 and TW-5 were located near the former Li'l Bear Gas Station and concentrations of petroleum compounds in the groundwater at this location are above the NR 140 Enforcement Standard. The concentrations detected during the Phase II ESA are at similar levels to those found at the time the WDNR issued closure in July 2004, and are likely related to residual contamination to this closed site. Low levels of chlorinated VOCs; TCE (0.69 ug/L), cis-1,2 -DCE (2.2 ug/L), and trichlorofluoromethane (1.2 ug/L) were detected at TW-2. The source of these compounds is not clear, but the concentrations are similar to those detected in 1997 at the former Li'l Bear monitoring well PZ-1 which was located approximately 200 feet from the location of TW-2. The concentrations of chlorinated VOCs detected in TW-2 are below their respective NR 140 ESs.

Conclusions and Recommendations

The following conclusions are made based on the information summarized above:

- Asbestos is present in the black mastic material beneath the 12-inch x 12-inch floor tile in the former pharmacy and liquor store areas, as well as the former shopping cart storage area and several office areas. The floor tile covers an area of approximately 10,000 square feet. The potential exists for this material to also be present beneath areas covered by carpet or the large tile in the main area of the building. This material is not a risk to building usage but will have to be managed as ACM if the material is disturbed. The estimated cost to abate the 10,000 sf black mastic beneath the floor tile is approximately $30,000 or $3/sf.
- Mold is present at several locations within the building, the degree of contamination ranges from none to heavy within stained areas of the drywall. Based on our discussions with the subcontractor, the mold is currently not an issue for occupancy; however, the building could be sanitized to preclude the spreading or worsening of mold conditions. The estimated cost to sanitize the entire building is approximately $30,000; however, based on discussions with the City's sanitarian, the areas with current mold contamination could likely be spot cleaned for a lesser cost.

- Impacts to soil and groundwater are limited to the portion of the site which housed the former Lil Bear Gas Station, which is a closed site listed on the WDNR's registry for residual impacts. (Closed BRRTS #03-13-002785).
  - Low level detections of VOCs in soil were encountered in soil near the water table, but no RCLs were exceeded and a shallow impacts associated with a potential source were not observed.
  - Concentrations of VOCs in groundwater detected at TW-1 and TW-5 exceed the NR 140 ES for one or more petroleum compounds. Concentrations detected during sampling are similar to those detected at closure, and no further action would be required by the WDNR. However, if conditions change (e.g. the soil is excavated, or a building is placed above the impacted soil) additional investigation and or mitigation may be required.
  - Low levels of chlorinated VOCs were detected in TW-2. The concentrations did not exceed their respective NR 140 ESs, however the source of these low-level impacts is unknown.

Please contact Nate Keller at 608-826-3634 or Alyssa Sellwood at (608) 826-3658, if you have questions concerning this report.

Sincerely,

TRC Environmental Corporation

Nathaniel Keller, P.G.
Staff Hydrogeologist

Alyssa Sellwood, P.E.
Project Manager

Attachments: Table 1: Sampling Rationale and Summary of Results – Groundwater and Soil
Table 2: Summary of Soil Analytical Results
Table 3: Summary of Groundwater Analytical Results
Figure 1: Boring Location Figure
Attachment 1: Soil Boring Logs
Attachment 2: Asbestos Analytical Results
Attachment 3: Mold Analytical Results
Attachment 4: Soil and Groundwater Analytical Results
Attachment 5: Photographs

Table 1
Sampling Rationale and Summary of Results – Groundwater and Soil
Phase 2 ESA: Five Parcels – Former Cub Foods on Nakoosa Trail, Madison, Wisconsin
City of Madison

PROPOSED BORING ID	SOIL SAMPLE DEPTH (ft)	SOIL			GROUNDWATER			PURPOSE	RESULTS AND CONCLUSIONS
		VOCs	LEAD	PCBs, SVOCs, RCRA METALS	VOCs	LEAD	RCRA METALS		
GP-1/ TW-1	5-7 18-20	2	0	0	1	0	0	Determine if VOCs are migrating from the former Lil Bear Gas Station. (Closed BRRTS #03-13-002785).	Low level VOCs detected in groundwater and soil. Groundwater ES exceedences for 1,2,4- and 1,3,5-trimethylbenzene, and naphthalene. Similar to conditions at closure.
GP-2/ TW-2	8-10	1	0	0	1	0	0	Determine if there is migration of VOCs from the Road Ranger gas dispensing system.	Low level CVOCs detected in groundwater, concentrations are similar to those detected in former PZ-1. Source unknown.
GP-3/ TW-3	No Sample	0	0	0	1	0	0	Determine if CVOCs are migrating from the Sycamore Landfill in the water table aquifer.	No VOC detections.
GP-4/ TW-3	1.5-4	1	0	1	1	0	1	Determine if VOC impacts are present from former commercial building at 4025 Commercial Ave.	No VOC or PCB detections. Low level detection of metals all below standards.
GP-5/ TW-5	3.5-5 17-19	2	0	0	1	0	0	Determine if VOCs are migrating from the Road Ranger USTs, and what concentrations are present from former Lil Bear Gas Station. (Closed BRRTS #03-13-002785).	Low level VOCs detected in soil and groundwater. No soil exceedences. Groundwater ES exceedences for benzene. Similar to conditions at closure.
GP-6/ TW-6	7.5-10	1	1	0	1	1	0	Determine if VOC impacts are present from former commercial building at 4025 Commercial Ave.	No VOC detections. Low level lead detected, but concentration was significantly below standards.
GP-7/ TW-7	0.5-3 12.5-15	2	2	0	1	1	0	Determine if VOC impacts are present from former commercial building at 4025 Commercial Ave.	No VOC detections. Low level lead detected, but concentration was significantly below standards.

Note:
Total depth of each boring was approximately 20 feet.

Table 2
Summary of Soil Analytical Results
Phase 2 ESA: Five Parcels – Former Cub Foods on Nakoosa Trail, Madison, Wisconsin
City of Madison
July 2013

SAMPLE ID	SAMPLE DEPTH (FT BGS)	PID[1] (ppm)	PETROLEUM ODOR PRESENT	VOCs						
				1,2,4-TMB (µg/kg)	1,3,5-TMB (µg/kg)	ETHYL-BENZENE (µg/kg)	NAPHTHALENE (µg/kg)	n-PROPYL BENZENE (µg/kg)	m&p-XYLENE (µg/kg)	o-XYLENE (µg/kg)
GP-1	5-7'	<10	NO	<25.0	<25.0	<25.0	<25.0	<25.0	<50.0	<25.0
	18-20'	<10	YES	39.2	<12.4	18.1 J	<12.4	<12.4	<24.8	<12.4
GP-2	8-10'	<10	YES	<25.0	<25.0	<25.0	<25.0	<25.0	<50.0	<25.0
GP-4	1.5-5'	<10	NO	<25.0	<25.0	<25.0	<25.0	<25.0	<50.0	<25.0
GP-5	3.5-5'	<10	NO	<25.0	<25.0	<25.0	<25.0	<25.0	<50.0	<25.0
	17-19'	46.3	YES	334	86.4	150	123	31.6 J	511	85.6
GP-6	7.5-10'	23.6	NO	<25.0	<25.0	<25.0	<25.0	<25.0	<50.0	<25.0
GP-7	0.5-3'	<10	YES	<25.0	<25.0	<25.0	<25.0	<25.0	<50.0	<25.0
	12.5-15'	<10	NO	<25.0	<25.0	<25.0	<25.0	<25.0	<50.0	<25.0
NR 720 GENERIC RCLs[2]				--	--	2,900	400[5]	--	4,100[7]	4,100[7]
EPA RSLs FOR SOIL[4]										
DIRECT CONTACT NON-INDUST				89,800	182,000	7,470	5,150	264,000	258,000[7]	258,000[7]
DIRECT CONTACT INDUST				219,000	182,000	37,000	26,000	264,000	258,000[7]	258,000[7]
GW PATH				1,378[6]	1,378[6]	1,570	659	--	3,940[7]	3,940[7]

SAMPLE ID	SAMPLE DEPTH (FT BGS)	PID[1] (ppm)	PETROLEUM ODOR PRESENT	METALS						
				ARSENIC (mg/kg)	BARIUM (mg/kg)	CADMIUM (mg/kg)	CHROMIUM (mg/kg)	LEAD (mg/kg)	SELENIUM (mg/kg)	SILVER (mg/kg)
GP-1	5-7'	<10	NO	--	--	--	--	--	--	--
	18-20'	<10	YES	--	--	--	--	--	--	--
GP-2	8-10'	<10	YES	--	--	--	--	--	--	--
GP-4	1.5-5'	<10	NO	1.4 J	28.2	0.17 J	4.4	1.8	<0.53	<0.19
GP-5	3.5-5'	<10	NO	--	--	--	--	--	--	--
	17-19'	46.3	YES	--	--	--	--	--	--	--
GP-6	7.5-10'	23.6	NO	--	--	--	--	1.5	--	--
GP-7	0.5-3'	<10	YES	--	--	--	--	17.5	--	--
	12.5-15'	<10	NO	--	--	--	--	1.9	--	--
NR 720 GENERIC RCLs[2]				0.039/1.6[3]	--	--	8/510[3]	50/500[3]	--	--
EPA RSLs FOR SOIL[4]										
DIRECT CONTACT NON-INDUST				0.39	15,300	70.2	0.293	400	391	391
DIRECT CONTACT INDUST				1.59	100,000	803	5.57	800	5,110	5,110
GW PATH				0.58	164.8	0.752	--	27	0.52	0.85

Table 2 (continued)
Summary of Soil Analytical Results
Phase 2 ESA: Five Parcels – Former Cub Foods on Nakoosa Trail, Madison, Wisconsin
City of Madison
July 2013

SAMPLE ID	SAMPLE DEPTH (FT BGS)	PID[1] (ppm)	PETROLEUM ODOR PRESENT	PCBs							
				TOTAL PCBs (µg/kg)	AROCLOR 1016 (µg/kg)	AROCLOR 1221 (µg/kg)	AROCLOR 1232 (µg/kg)	AROCLOR 1242 (µg/kg)	AROCLOR 1248 (µg/kg)	AROCLOR 1254 (µg/kg)	AROCLOR 1260 (µg/kg)
GP-1	5-7'	<10	NO	--	--	--	--	--	--	--	--
	18-20'	<10	YES	--	--	--	--	--	--	--	--
GP-2	8-10'	<10	YES	--	--	--	--	--	--	--	--
GP-4	1.5-5'	<10	NO	<26.3	<26.3	<26.3	<26.3	<26.3	<26.3	<26.3	<26.3
GP-5	3.5-5'	<10	NO	--	--	--	--	--	--	--	--
	17-19'	46.3	YES	--	--	--	--	--	--	--	--
GP-6	7.5-10'	23.6	NO	--	--	--	--	--	--	--	--
GP-7	0.5-3'	<10	YES	--	--	--	--	--	--	--	--
	12.5-15'	<10	NO	--	--	--	--	--	--	--	--
NR 720 GENERIC RCLs[2]				--	--	--	--	--	--	--	--
EPA RSLs FOR SOIL[4]											
DIRECT CONTACT NON-INDUST				--	3,930	159	159	222	222	222	222
DIRECT CONTACT INDUST				--	21,200	589	589	744	744	744	744
GW PATH				9.38[8]	--	--	--	--	--	--	--

Notes:

Created By: WJB

Checked By: NRK

J = Estimated value. Analyte detected at a level less than the reporting limit and greater than or equal to the detection limit.

RCLs = Residual Contaminant Levels.

RSLs = Regional Screening Levels

TMB=Trimethylbenzene

PCB =Polychlorinated biphenyl

-- = Parameter wasn't analyzed/Suggested RCL has not been established for this analyte.

Bold = indicates that the sample exceeds the NR 720 RCL groundwater pathway or non-industrial direct contact pathway

Bold = indicates that the sample exceeds the EPA RSL for GW Pathway

Footnotes:

(1) PID measurements are skewed high due to moisture in the air affecting the instrument performance. Sample depths were chosen based on the presence of petroleum odor.

(2) Generic RCL defined by Wisconsin Administrative Code NR 720. Values are the generic RCLs for the groundwater pathway, except where noted.

(3) Values are the generic RCL for exposure by direct contact for non-industrial and industrial, respectively.

(4) Calculated from http://epa-prgs.ornl.gov/cgi-bin/chemicals/csl_search using the default assumption listed in Draft Publication WDNR RR-890 (Dec. 2011).

(5) PAH RCL is used in the absence of an established NR 720 RCL.

(6) RSL GW Path is for combined 1,2,4- and 1,3,5-Trimethylbenzenes.

(7) RCL and RSL is for total Xylenes.

(8) RSL GW Path was only available in total PCB's.

Table 3
Summary of Groundwater Analytical Results
Phase 2 ESA: Five Parcels – Former Cub Foods on Nakoosa Trail, Madison, Wisconsin
City of Madison
July 2013

SAMPLE ID	DTB (FT BGS)	DTW (FT BGS)	VOC's																
			BENZENE (µg/L)	ETHYL-BENZENE (µg/L)	TOLUENE (µg/L)	m&p-XYLENE (µg/L)	o-XYLENE (µg/L)	1,2,4-TMB (µg/L)	1,3,5-TMB (µg/L)	NAPHTH-ALENE (µg/L)	n-BUTYL BENZENE (µg/L)	sec-BUTYL BENZENE (µg/L)	ISOPROPYL-BENZENE (µg/L)	p-ISOPROPYL-BENZENE (µg/L)	n-PROPYL-BENZENE (µg/L)	CHLORO-METHANE (µg/L)	TCE (µg/L)	cis-1,2-DCE (µg/L)	TRICHLORO-FLOURO-METHANE (µg/L)
TW-1	18.5	11.6	<2.5	**499**	15.7	**632**	81.9	**924**	**33.0**	**108**	22.1	7.2 J	36.6	5.0 J	129	<1.9	<2.1	<2.1	<2.4
TW-2	18.7	7.6	<0.50	<0.50	<0.44	<0.82	<0.50	<0.57	<2.5	<2.5	<0.40	<0.60	<0.34	<0.40	<0.50	<0.39	**0.62 J**	2.2	1.2
TW-3	17.8	7.0	<0.50	<0.50	<0.44	<0.82	<0.50	<0.57	<2.5	<2.5	<0.40	<0.60	<0.34	<0.40	<0.50	<0.39	<0.43	<0.42	<0.48
TW-4	14.0	11.5	<0.50	<0.50	<0.44	<0.82	<0.50	<0.57	<2.5	<2.5	<0.40	<0.60	<0.34	<0.40	<0.50	<0.39	<0.43	<0.42	<0.48
TW-5	17.4	12.3	**12.9**	29.7	2.6	167	58.8	**179**	**51.5**	**60.0**	<0.40	1.9 J	4.0	1.1	14.9	0.44 J	<0.43	<0.42	<0.48
TW-6	18.2	13.1	<0.50	<0.50	<0.44	<0.82	<0.50	<0.57	<2.5	<2.5	<0.40	<0.60	<0.34	<0.40	<0.50	<0.39	<0.43	<0.42	<0.48
TW-7	17.9	14.3	<0.50	<0.50	<0.44	<0.82	<0.50	<0.57	<2.5	<2.5	<0.40	<0.60	<0.34	<0.40	<0.50	<0.39	<0.43	<0.42	<0.48
NR 140 STANDARD[1]		**PAL**	0.5	140	160	400	400	96	96	10	--	--	--	--	--	3	0.5	7	--
		ES	**5**	**700**	**800**	**2,000**	**2,000**	**480**	**480**	**100**	**--**	**--**	**--**	**--**	**--**	**30**	**5**	**70**	**--**

SAMPLE ID	DTB (FT BGS)	DTW (FT BGS)	METALS							
			ARSENIC (µg/L)	BARIUM (µg/L)	CADMIUM (µg/L)	CHROMIUM (µg/L)	LEAD (µg/L)	MERCURY (µg/L)	SELENIUM (µg/L)	SILVER (µg/L)
TW-1	18.5	11.6	--	--	--	--	--	--	--	--
TW-2	18.7	7.6	--	--	--	--	--	--	--	--
TW-3	17.8	7.0	--	--	--	--	--	--	--	--
TW-4[4]	14.0	11.5	**9.3[5] J**	210	<0.38	**3.0 J**	**3.2 J**	**1.8[5]**	<6.6	2.2 J
TW-5	17.4	12.3	--	--	--	--	--	--	--	--
TW-6	18.2	13.1	--	--	--	--	<1.2	--	--	--
TW-7	17.9	14.3	--	--	--	--	**1.5 J**	--	--	--
NR 140 STANDARD[1]		**PAL**	1	400	0.5	10	1.5	0.2	10	10
		ES	**10**	**2,000**	**5**	**100**	**15**	**2**	**50**	**50**

Notes:

J = Estimated value. Analyte detected at a level less than the reporting limit and greater than or equal to the detection limit.

ES = Enforcement Standard.

PAL = Preventive Action Limit.

TCE= Trichloroethene

DCE= Dichloroethene

TMB=Trimethylbenzene

PCB =Polychlorinated biphenyl

-- = Parameter wasn't analyzed/Suggested RCL has not been established for this analyte.

Bold = indicates that the sample exceeds the NR 140 PAL

Bold = indicates that the sample exceeds the NR 140 ES

Footnotes:

[1] NR 140 STANDARD = Public Health Groundwater Quality Standards as defined by Wisconsin Administrative Code NR 140.

[2] ES and PAL is for combined 1,2,4- and 1,3,5-Trimethylbenzenes.

[3] ES and PAL is for total Xylenes.

[4] RCRA metals groundwater sample was sent to the lab unfiltered and unpreserved due to slow well recovery after purging.

[5] Sample preservation did not meet EPA or method recommendations.

Created By: WJB
Checked By: NRK

LEGEND

- SOIL BORING/TEMPORARY WELL
- PROPERTY BOUNDARY

NOTES

1. BASE MAP IMAGERY FROM WISCONSIN REGIONAL ORTHOPHOTOGRAPHY CONSORTIUM, SPRING 2010.
2. PROPERTY BOUNDARIES SUPPLIED BY DANE COUNTY.

0 100 200 FEET

1 INCH = 200 FEET

1:2,400

TRC - GIS

TRC

708 Heartland Trail
Suite 3000
Madison, WI 53717
Phone: 608.826.3600

CITY OF MADISON, WISCONSIN
NAKOOSA TRAIL PHASE II ESA

SOIL BORING / TEMPORARY WELL LOCATIONS

DRAWN BY:	PAPEZ J
APPROVED BY:	SELLWOOD A
PROJ. NO.:	204639
FILE NO.:	204639-001.mxd
DATE:	JULY 2013

E:\CityOfMadison\NakoosaPh2\2013_204639\204639-001.mxd
Saved By: JPAPEZ on 7/23/2013, 13:15:20 PM

FIGURE 1

Attachment 1

Soil Boring Logs

TRC Field Soil Boring Log Information

TRC Project No: 204639 Page 1 of 7

Project Name	Start Date	End Date	Boring Number
City of Madison - Cub Foods	6/26/13	6/26/13	GP/TW-1

Boring Drilled By	Drilling Method
Dusty - On-site Env.	Direct Push

Drill Rig	Common Well Name	Initial Water Level	Surface Elevation	Borehole Diameter
Geoprobe-truck Rig	—	—	—	2 Inches

Boring Location: State Plane Easting 2151744 Northing 404491
SW 1/4 of SE 1/4 of Section 33 T 8 N,R 10E
Local Grid Location (If applicable): ☐ N ☐ E Feet ☐ S Feet ☐ W

County	State	DNR County Code	Civil Town/City/ or Village
DANE	WI	13	Madison

Number	Length (In) Recovered	Blow Counts	Depth In Feet	Group Name, Percent & Range of Particle Sizes, Plasticity, Color, Odor, Moisture, Density/Consistency, Additional Comments, Geologic Origin (Stratigraphic Unit)	Sample Type	PID/FID	Standard Penetration	Well Diagram	RQD/ Comments
1	5/5		0-5	Soil, slightly plastic, brown, no odor		>10			0-1
				1' — (CL) Clay, 5-10% gravel (Fn-C), slightly plastic, light-dark brown, no odor, moist, med dense, stiff.		>10			1-5
2	4/5		5-10	5' — same as above to 7', no odor, moist		>10			5-7
				7' — (SW) Sand, VFn-C grained, 5-10% gravel (Fn-C), 20-25% fines, light brown, moist, no odor, loose.		>10			7-10
3	2/5		10-15	10' — same as above, wet @ 12.5', no odor. * took sample from 10-15 due to large amount of gravel and limited recovery.		>10			10-15
4	3/5		15-20	15' — same as above, no odor, wet		>10			15-18
				18' — (SP) Sand, VFn-Med grained, 75% gravel (Fn), 25%-30% Fines, slightly plastic, light brown, Slight Petro odor, wet, med dense. EOB @ 20' BGS 6/26/13		>10			18-20

Logged By: Wesley J Bragg Checked By:

F-204A (R 12-94)

Note: (See GP/TW-6 Log) Sampled: 5-7 @ 1435, 18-20 @ 1445 Well: DTB = 18.45. DTW = 11.59 Sampled @ 1520

TRC Field Soil Boring Log Information

TRC Project No: 204639 Page 2 of 7

Project Name	Start Date	End Date	Boring Number
City of Madison-Cub Foods	6/26/13	6/26/13	GP/TW-2

Boring Drilled By	Drilling Method
Dusty - On-site Env.	Direct Push

Drill Rig	Common Well Name	Initial Water Level	Surface Elevation	Borehole Diameter
Geoprobe-truck Rig	—	—	—	2 Inches

Boring Location: State Plane — Easting 215753 Northing 404655
SW 1/4 of SE 1/4 of Section 33 T 8 N,R 10E
Local Grid Location (If applicable): ☐ N Feet ☐ S ☐ E Feet ☐ W

County	State	DNR County Code	Civil Town/City/ or Village
DANE	WI	13	MADISON

Number	Length (In) Recovered	Blow Counts	Depth In Feet	Group Name, Percent & Range of Particle Sizes, Plasticity, Color, Odor, Moisture, Density/Consistency, Additional Comments, Geologic Origin (Stratigraphic Unit)	Sample Type	PID/FID	Standard Penetration	Well Diagram	RQD/ Comments
1	4/5		0-5	Top soil, 5% gravel (Fn-C), non-plastic, brown, dry, no odor, loose.		>10			0-1.5'
			1.5	Clay (CL), 5-10% gravel (Fn-C), slightly plastic, reddish brown→brown, no odor, dry, stiff.		>10			1.5-5'
			5'						
2	4.5/5		5-10	Same as above, slightly plastic, brown-dark brown, slight petro odor @ 8-10' bgs, moist, med dense.		>10			5-8'
						>10			8-10'
			10'						
3	4/5		10-15	Same as above, no odor, wet.		>10			10-13'
						>10			13-15'
			13'	Sand and gravel, 10-15% fines, light brown, no odor, wet, loose.					
			15'						
4	3/5		15-20	Same as above, no odor, wet		>10			15-17.5'
			20'	EOB @ 20' sampled 8-10 @ 14:25 6/26/13		>10			17.5-20'
				Well: DTB: 18.7 DTW: 7.6 Sampled @ 1900					

Logged By: Wesley J Burger Checked By: TO'Connell

F-204A (R 12-94)

Note: (See GP/TW-6 Log)

TRC Field Soil Boring Log Information

TRC Project No: 204639

Project Name	Start Date	End Date	Boring Number
City of Madison-Cub Foods	6/26/13	6/26/13	GP/TW-3

Boring Drilled By	Drilling Method
Dusty - On-Site Env.	Direct Push

Drill Rig	Common Well Name	Initial Water Level	Surface Elevation	Borehole Diameter
Geoprobe - Truck Rig	–	–	–	2 Inches

Boring Location State Plane Easting 2152266 Northing 405085
SW 1/4 of SE 1/4 of Section 33 T 6 N,R 10E

Local Grid Location (If applicable) ☐ N ☐ E Feet ☐ S Feet ☐ W

County	State	DNR County Code	Civil Town/City/ or Village
DANE	WI	13	MADISON

Number	Length (In) Recovered	Blow Counts	Depth In Feet	Group Name, Percent & Range of Particle Sizes, Plasticity, Color, Odor, Moisture, Density/Consistency, Additional Comments, Geologic Origin (Stratigraphic Unit)	Sample Type	PID/FID	Standard Penetration	Well Diagram	RQD/ Comments
1	3/5		0-5	Soil, 35-40% fines, plastic, brown, no odor, wet, med dense, some sand (Fn-Med), organic material throughout sample		>10			0-3
				3' — Sandy silty Clay (CL-ML), med-C sand, plastic, light Brown → Brown, earthy odor, moist, med dense.		>10			3-5
2	3/5		5-10	5' — Same as above, no odor, moist		11.7			5-6
				6' — Sand with gravel (SP), 15-20% gravel (Fn-C), 10% Fines, non-plastic, light reddish brown, wet, loose.		>10			6-10
3	2.5/5		10-15	10' — same as above, no odor, wet, loose *took one representative sample of 5' interval due to recovery length and amount of gravel.					
				15' — same as above, no odor, wet		>10			15-18.5
4	4/5		15-20	18.5' — silt (ML), 30% sand (~~Fn-Med~~), non-slightly plastic, light reddish brown, no odor, wet, loose.		>10			18.5-20
				EOB @ 20' Bgs @ 6/26/13					

Logged By: Wesley J Burge [signature] Checked By: [signature]

F-204A (R 12-94)

Sampled: none

Well: DTB: 17.8
DTW: 7.0
Sampled @ 1845

Note: (TW/GP-6 Log)

TRC Field Soil Boring Log Information

TRC Project No: 204639 — Page 4 of 7

Project Name	Start Date	End Date	Boring Number
City of Madison - Cub Foods	6/26/13	6/26/13	GP/TW-4

Boring Drilled By	Drilling Method
Dusty - On-Site Env.	Direct Push

Drill Rig	Common Well Name	Initial Water Level	Surface Elevation	Borehole Diameter
Geoprobe - Truck Rig	-	-	-	2 Inches

Boring Location — State Plane: Easting 2152269 Northing 404566
SW 1/4 of SE 1/4 of Section 33 T 8 N, R 10E
Local Grid Location (If applicable): ☐ N ☐ E Feet ☐ S ☐ W Feet

County	State	DNR County Code	Civil Town/City/ or Village
DANE	WI	13	MADISON

Number	Length (In) Recovered	Blow Counts	Depth In Feet	Group Name, Percent & Range of Particle Sizes, Plasticity, Color, Odor, Moisture, Density/Consistency, Additional Comments, Geologic Origin (Stratigraphic Unit)	Sample Type	PID/FID	Standard Penetration	Well Diagram	RQD/ Comments
1	3/5		0-0.5	Asphalt					
			0.5-	Sandy clay (CL), 20-25% sand (Fn-C), non-plastic, brown, no odor, dry, loose.		>10			0.5-1.5
			1.5-	Sand (SW), Fn-C, 10-15% gravel (Fn-C), 5-10% Fns, light yellow brown, no odor, dry, loose.		>10			1.5-5
2	2.5/5		5-10	5'- same as above, 15-20% gravel (Fn-C).		>10			5-9.5
			9.5-	Sandy silt (ML), Fn-Med grained sand, non-plastic, light reddish brown, moist, no odor, med dense.		>10			9.5-10
3	4/4		10-14	10'- same as above, no odor, moist.		>10			10-12.5
			12.5-	layered silt and sand, well laminated, silt rich layers are greenish blue, sand is light brown, no odor, moist going to wet at 15', density increases with depth from Med→Dense,		>10			12.5-14
4	1/1		14-15	15' stiff. Refusal @ 15'		>10			14-15
				EOB @ 15' 6/26/13					

Logged By: Wesley J Bruce — Checked By: Ed O'Connell

F-204A (R 12-94)

Note: (See GP/TW-6 log)

Sampled: 1.5-5 @ 1350

Well: DTB: 14
DTW: 11.5
Sampled VOC's @ 0815 on 6/27/13 RCRA @ 1730 - Sample was unpreserved due to slow producing. and unfiltered.

4/8

TRC Field Soil Boring Log Information

TRC Project No: 204639 Page 5 of 7

Project Name	Start Date	End Date	Boring Number
City of Madison - Cub Foods	6/26/13	6/26/13	GP/TW-5

Boring Drilled By	Drilling Method
Dusty - On-site EW.	Direct Push

Drill Rig	Common Well Name	Initial Water Level	Surface Elevation	Borehole Diameter
Geoprobe - Truck Rig	—	—	—	2 Inches

Boring Location: State Plane — Easting 2157814 Northing 404459
SW 1/4 of SE 1/4 of Section 33 T 8 N,R 10E
Local Grid Location (If applicable): ☐ N Feet ☐ S ☐ E Feet ☐ W

County	State	DNR County Code	Civil Town/City/ or Village
DANE	WI	13	MADISON

Number	Length (In) Recovered	Blow Counts	Depth In Feet	Group Name, Percent & Range of Particle Sizes, Plasticity, Color, Odor, Moisture, Density/Consistency, Additional Comments, Geologic Origin (Stratigraphic Unit)	Sample Type	PID/FID	Standard Penetration	Well Diagram	RQD/ Comments
1	3/5		0-5	Road Gravel (Parking Lot)					
				0.5' — Sand and gravel (SP), Fn-C grained, 10-15% gravel (Fn-C), 5-10% Fines, non-plastic, light brown, no odor, dry, loose		>10			0.5-3.5
						>10			3.5-5
2	2.5/5		5-10	5' — Same as above, moisture increases with depth, no odor.					
				* took one sample due to amount of sample recovery and amount of gravel in sample.		>10			*5-10
				10' —					
3	2.5/5		10-15	Same as above, dry, no odor					
				14.5' — Sand and gravel (SP), 20-25% gravel (Fn-C), 5% cobbles, 10-20% Fines, non-plastic, light reddish brown, no odor, wet		>10			*10-15
4	2.5/5		15-19	15' — Same as above to 15.75		19.9			15-17
				15.75' — Silty sand (SM), 40-45% Fines, Fn-med grained, slightly plastic, light gray brown, slight petro odor, wet, dense. Refusal @ 19.0		46.3			17-19
				EOB @ 19.0 6/26/13					

Logged By: Wesley J Berge Checked By: Rod

F-204A (R 12-94)

Note: (see GP/TW-6 log)

Sampled: 3.5-5' @ 1405
17-19' @ 1415

WELL: DTB: 17.35
DTW: 12.25
Sampled @ 1540

TRC Field Soil Boring Log Information

TRC Project No: 204639 — Page 6 of 7

Project Name	Start Date	End Date	Boring Number
City of Madison - Cub Foods	6/26/13	6/26/13	GP-6 / TW-6

Boring Drilled By	Drilling Method
Dusty - On-Site Env.	Direct Push

Drill Rig	Common Well Name	Initial Water Level	Surface Elevation	Borehole Diameter
Geoprobe - Truck Rig	—	—	—	Inches

Boring Location — State Plane: Easting 2151946 Northing 404491
SW 1/4 of SE 1/4 of Section 33 T 8 N,R 10E
Local Grid Location (If applicable): ☐ N Feet ☐ S ☐ E Feet ☐ W

County	State	DNR County Code	Civil Town/City/ or Village
DANE	WI	13	MADISON

Number	Length (In) Recovered	Blow Counts	Depth In Feet	Group Name, Percent & Range of Particle Sizes, Plasticity, Color, Odor, Moisture, Density/Consistency, Additional Comments, Geologic Origin (Stratigraphic Unit)	Sample Type	PID/FID	Standard Penetration	Well Diagram	RQD/ Comments
1	2/5		0-5	Asphalt		>10			0-5
				0.5' — Sand and gravel (SP), 10-15% gravel (Fn-C), 5% cobbles, Fn-Med grained sand, Non-plastic, light brown, no odor, dry, loose.					
2	3/5		5-10	5' — Same as above, becomes increasingly more fine grained with depth, no odor, dry.		>10			5-7.5
						23.6			7.5-10
3	3.5/5		10-15	10' — Same as above, dry, no odor		34.7			10-14
				14' — Silty, Clayey, Sand (SP-SC), Fn-Med grained, 30-35% Fines, light reddish brown, NO odor, wet, soft, loose.		>10			14-15
4	4.5/5		15-20	15' — Sand (SP), Fn-Med grained, reddish brown, no odor, wet, loose.		>10			15-18.5
				18.5 0.25' layers of clay, reddish brown, dry, no odor intermittent					
				19.0 — Sandy clay (CL), 15-20% sand (Fn-Med), non-plastic, reddish brown, no odor, wet, stiff.		>10			18.5-20
				20' — EOB @ 20' 6/26/13					

Logged By: Wesley J Berger
Checked By: [signature]

F-204A (R 12-94)

Sampled: 7.5-10 @ 1150

Well: DTB: 18.2
DTW: 13.1
Sampled @ 1630

* NOTE: PID was getting inconsistent readings for the early part of the day due to high moisture content in the air and the rain earlier in the day. PID results may be skewed high for some readings.

TRC Field Soil Boring Log Information

TRC Project No: 204639 Page 7 of 7

Project Name	Start Date	End Date	Boring Number
City of Madison - Cub Foods	6/26/13	6/26/13	GP/TW-7

Boring Drilled By	Drilling Method
Dusty - On-Site Env.	Direct Push

Drill Rig	Common Well Name	Initial Water Level	Surface Elevation	Borehole Diameter
Geoprobe - Truck Rig	—	-	—	2 Inches

Boring Location: State Plane — Easting 2152116 Northing 404482
SW 1/4 of SE 1/4 of Section 33 T 8 N,R 10E
Local Grid Location (If applicable): ☐ N Feet ☐ S ☐ E Feet ☐ W

County	State	DNR County Code	Civil Town/City/ or Village
DANE	WI	13	MADISON

Number	Length (In) Recovered	Blow Counts	Depth In Feet	Group Name, Percent & Range of Particle Sizes, Plasticity, Color, Odor, Moisture, Density/Consistency, Additional Comments, Geologic Origin (Stratigraphic Unit)	Sample Type	PID/FID	Standard Penetration	Well Diagram	RQD/ Comments
1	2/5		0-5	Asphalt		>10			0-3
				0.5' - (SW) Sand, Fn-C, 10-15% gravel (Fn-C), 10% silt, light yellowish brown, slight petro odor @2-3, dry, loose.		>10			3-5
				5'					
2	4/5		5-10	Same as above, no odor, moist		>10			5-7.5
						>10			7.5-10
				9.8' - (CL) Clay, non-plastic, reddish brown, no odor, moist, slightly dense.					
3	4/5		10-15	10' Same as above, no odor, moist					
						>10			10-12.5
				10.5' - (SW) Sand, 10-15% gravel (Fn-C), Fn-C, 5-10% Fines, light brown, moist, no odor, loose.		>10			12.5-15
				12.5' - (SP) Sand, 20-25% fines, Fn-Med, slightly plastic, light brown, no odor, wet, loose.					/
4	5/5		15-20	15' Same as above, no odor, wet		>10			15-17
				17' - (CL) Greenish blue clay layer begins in 0.05-0.2' laminations, no odor, moist, med dense, stiff. EOB @ 20' 6/26/13		>10			17-20

Logged By: Wesley J Bruya
Checked By: [signature]

F-204A (R 12-94)

NOTE: (See TW-6)

Sample: 0.5-3 @ 1210
12.5-15 @ 1220

well: DTB: 19.9
DTW: 14.3
Sampled @ 1715

Attachment 2

Asbestos Analytical Results

Industrial Hygiene Laboratory
21 Griffin Road North
Windsor, CT 06095
(860) 298-6308

TRC
Results you can rely on

BULK ASBESTOS ANALYSIS REPORT

CLIENT: City of Madison

Lab Log #: 0042592
Project #: 204639.0000.0000
Date Received: 07/02/2013
Date Analyzed: 07/03/2013

Site: Nakoosa Trail, Madison, WI

POLARIZED LIGHT MICROSCOPY by EPA 600/R-93/116

Sample No.	Color	Homogenous	Multi-Layered	Layer No.	Other Matrix Materials		Asbestos %	Asbestos Type
R1-1	Grey	Yes	No	--		---	ND<1%	None
R1-2	Grey	Yes	No	--		---	ND<1%	None
R1-3	Grey	Yes	No	--		---	ND<1%	None
R2-1	Black	Yes	No	--	90%	synthetic fiber	ND<1%	None
R2-2	Black	Yes	No	--	90%	synthetic fiber	ND<1%	None
R2-3	Black	Yes	No	--	90%	synthetic fiber	ND<1%	None
R3-1	Black	Yes	No	--		---	ND<1%	None
R3-2	Black	Yes	No	--		---	ND<1%	None
R3-3	Black	Yes	No	--		---	ND<1%	None
FT1-1	Black (mastic)	No	Yes	1		---	10%	Chrysotile
FT1-1	White (tile)	No	Yes	2		---	10%	Chrysotile
FT1-2	--	--	--	--		--	NA/PS	--
FT1-2	--	--	--	--		--	NA/PS	--
FT1-3	--	--	--	--		--	NA/PS	--
FT1-3	--	--	--	--		--	NA/PS	--
CT1-1	White/Beige	Yes	No	--	60% 20%	cellulose mineral wool	ND<1%	None
CT1-2	White/Beige	Yes	No	--	60% 20%	cellulose mineral wool	ND<1%	None

Industrial Hygiene Laboratory
21 Griffin Road North
Windsor, CT 06095
(860) 298-6308

TRC
Results you can rely on

POLARIZED LIGHT MICROSCOPY by EPA 600/R-93/116

Sample No.	Color	Homogenous	Multi-Layered	Layer No.	Other Matrix Materials	Asbestos %	Asbestos Type
CT1-3	White/Beige	Yes	No	--	60% cellulose 20% mineral wool	ND<1%	None
CB1-1	Tan (glue)	No	Yes	1	---	ND<1%	None
CB1-1	Dark Brown (cove base)	No	Yes	2	---	ND<1%	None
CB1-2	Tan (glue)	No	Yes	1	---	ND<1%	None
CB1-2	Dark Brown (cove base)	No	Yes	2	---	ND<1%	None
CB1-3	Tan (glue)	No	Yes	1	---	ND<1%	None
CB1-3	Dark Brown (cove base)	No	Yes	2	---	ND<1%	None

Reporting limit- asbestos present at 1%
ND<1% - asbestos was not detected
Trace - asbestos was observed at level of less than 1%
NA/PS - Not Analyzed / Positive Stop

Note: Polarized-light microscopy is not consistently reliable in detecting asbestos in floor coverings and similar non-friable organically bound materials. In those cases, negative results must be confirmed by quantitative transmission electron microscopy.

The Laboratory at TRC follows the EPA's Interim Method for the Determination of Asbestos in Bulk Insulation (1982), and the EPA recommended Method for the Determination of Asbestos in Bulk Building Materials (EPA/600/R-93/116), July 1993, R.L. Perkins and B.W. Harvey which utilizes polarized light microscopy (PLM). Our analysts have completed an accredited course in asbestos identification. TRC's Laboratory is accredited under the National Voluntary Laboratory Accreditation Program (NVLAP), for Bulk Asbestos Fiber Analysis, NVLAP Code 18/A01, effective through June 30, 2014. TRC is an American Industrial Hygiene Association (AIHA) accredited lab for PLM effective through October 1, 2014. Asbestos content is determined by visual estimate unless otherwise indicated. Quality Control is performed in-house on at least 10% of samples and the QC data related to the samples is available upon written request from the client.

Analyzed by: K. Williamson — Kathleen Williamson, Laboratory Manager

Reviewed by: Amanda Parkins — Amanda Parkins, Approved Signatory

Date Issued 07/05/2013

TRC

Edition: October 2009
Supersede Previous Edition

21 GRIFFIN ROAD NORTH
WINDSOR, CONNECTICUT 06095
TELEPHONE (860) 298-9692
FAX (860) 298-6380

ASBESTOS BULK SAMPLING CHAIN OF CUSTODY

City of Madison

LAB ID #. 42592

PROJECT NUMBER	PROJECT NAME	PARAMETERS	TURNAROUND TIME
204639.0000.0000	Nakoosa Trail ~~DOT Bridge Inspection~~		PLM: 8hr 24hr 48hr X 3day TEM: 24hr 48hr 3day 5day

SIGNATURE	INSPECTOR
James D Gudek	James Gudek

FIELD SAMPLE NUMBER	DATE	TIME	TYPE COMP	TYPE GRAB	SAMPLE LOCATION	PLM EPA 600/R93/116 (POSITIVE STOP)	PLM EPA 600/R93/116 (w/ gravimetric reduction) (POSITIVE STOP)	ANALYZE BY LAYER	POINT COUNT (IF >1% & <10%)	TEM NY NOB 198.4 (IF PLM SERIES NEG)	MATERIAL
R1-1	6/27/13	8:30		X	Roof	X					gray caulk
R1-2		8:32									
R1-3		8:33									
R2-1		8:35				X					black felt
R2-2		8:40									
R2-3		8:42									
R3-1		8:50				X					black caulk
R3-2		8:52									
R3-3		8:55									
FT1-1		9:15			Former pharmacy	X					12" white floor tile
FT1-2		9:17									

Relinquished by: (Signature)	Date:	Received by: (Signature)	Relinquished by: (Signature)	Date:	Received by: (Signature)
James D Gudek	6/29/13	7/2/13			
(Printed) James D Gudek	Time: 14:30	(Printed) 1000	(Printed)	Time:	(Printed)

Remarks:

Condition of Samples: OK
Acceptable: Yes ✓ No ____
Comments:

3/4

TRC

Edition: October 2009
Supersede Previous Edition

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WINDSOR, CONNECTICUT 06095
TELEPHONE (860) 298-9692
FAX (860) 298-6380

ASBESTOS BULK SAMPLING CHAIN OF CUSTODY

LAB ID #. 42592

PROJECT NUMBER	PROJECT NAME	PARAMETERS	TURNAROUND TIME
204639.0000.0000	Nakoosa Trail ~~DOT Bridge Inspection~~		PLM: [ ] 8hr [ ] 24hr [ ] 48hr [X] 3day TEM: [ ] 24hr [ ] 48hr [ ] 3day [ ] 5day

SIGNATURE: James Gondek

INSPECTOR: James Gondek

FIELD SAMPLE NUMBER	DATE	TIME	TYPE: COMP	TYPE: GRAB	SAMPLE LOCATION	PLM EPA 600/R93/116 (POSITIVE STOP)	PLM EPA 600/R93/116 (w/ gravimetric reduction) (POSITIVE STOP)	ANALYZE BY LAYER	POINT COUNT (IF >1% & <10%)	TEM NY NOB 198.4 (IF PLM SERIES NEG)	MATERIAL
FT1-3	6/27/13	9:20		X		X					12" White floor tile
CT1-1	"	"		"		X					ceiling tile
CT1-2	"	"		"		"					"
CT1-3	"	"		"		"					"
CB1-1	"	"		"		X					dark brown 4" Cove base
CB1-2	"	"		"		"					"
CB1-3	"	"		"		"					"

Relinquished by: (Signature)	Date:	Received by: (Signature)	Relinquished by: (Signature)	Date:	Received by: (Signature)
James Gondek	6/29/13	7/2/13			
(Printed) James Gondek	Time: 14:30	(Printed) 1000	(Printed)	Time:	(Printed)

Remarks:

Condition of Samples: OK
Acceptable: Yes ___ No ___
Comments:

4/4

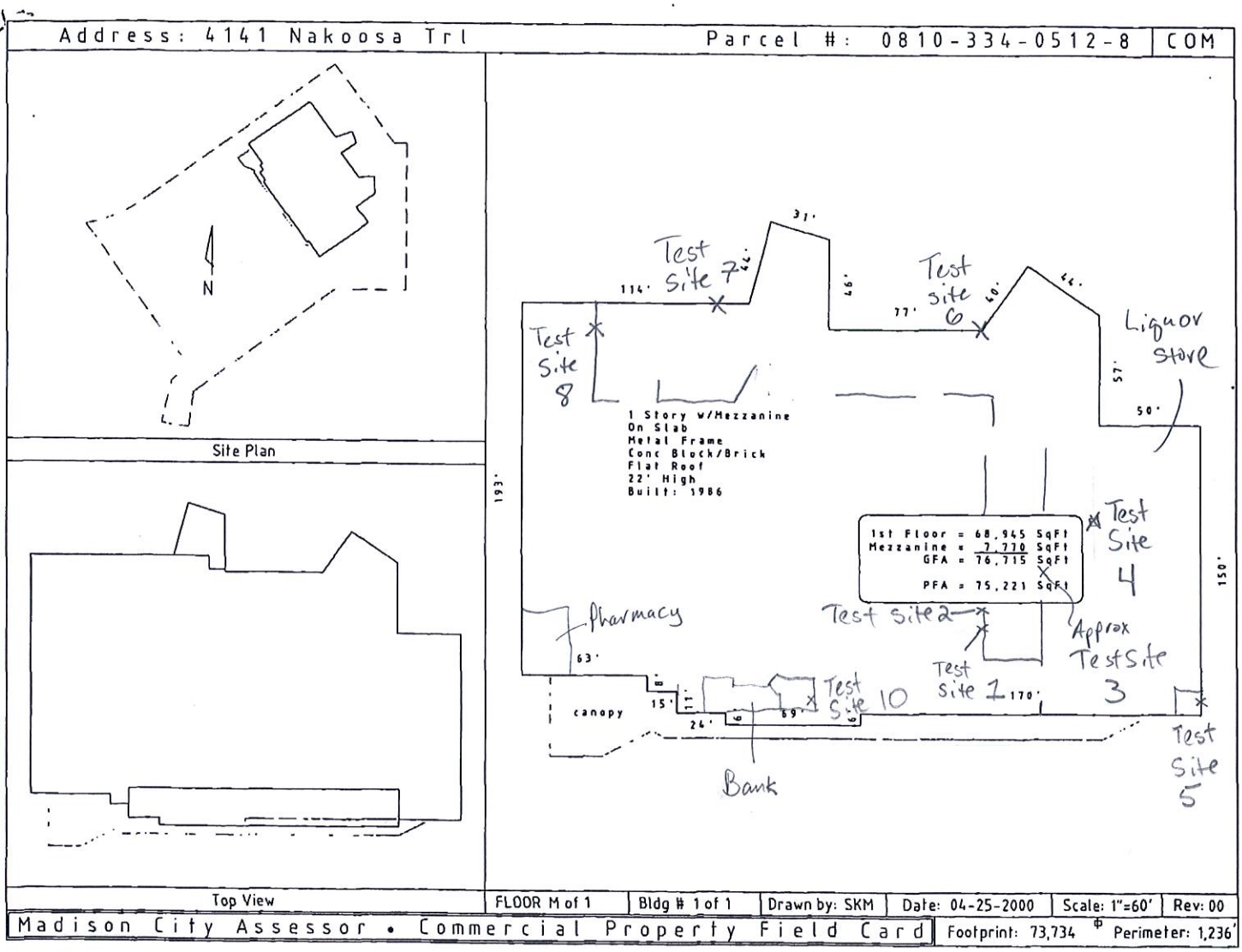
Attachment 3

Mold Analytical Results

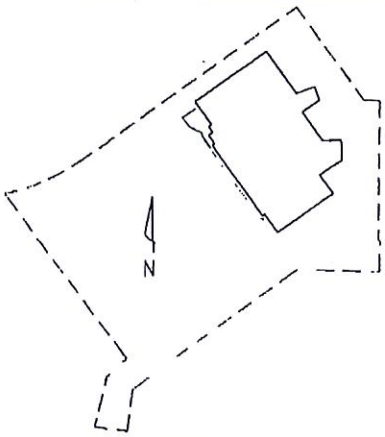
Approximate Locations of Mold Samples

Former Cub Foods

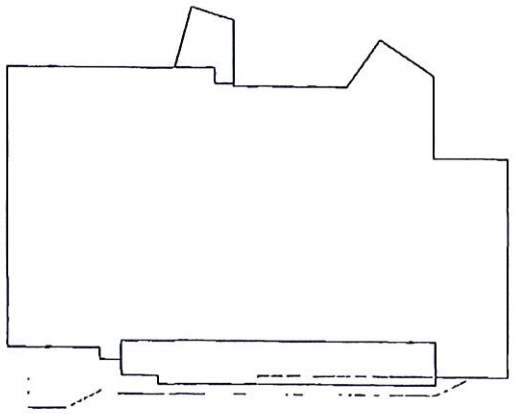
Madison, WI



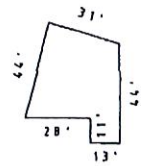
Address: 4141 Nakoosa Trl | Parcel #: 0810-334-0512-8 | COM



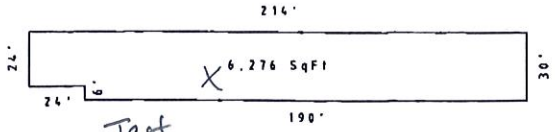
Site Plan



Top View



Mezzanine



Test Site 9

FLOOR M of 1	Bldg # 1 of 1	Drawn by: SKM	Date: 04-25-2000	Scale: 1"=60'	Rev: 00

Madison City Assessor • Commercial Property Field Card | Footprint: 73,734 | Perimeter: 1,236'

SanAir Technologies Laboratory

Analysis Report

prepared for

Rapid Response Remediation

Report Date: 7/1/2013
Project Name: Nakoosa Trail Madison
Project #: 204639
SanAir ID#: 13014032

NVLAP LAB CODE 200870-0

AIHA LAP, LLC ACCREDITED LABORATORY ENVIRONMENTAL MICROBIOLOGY ISO/IEC 17025:2005 www.aihaaccreditedlabs.org LAB #162952

Virginia SBE Certification # 652931

Texas Licensed Mold Analysis Laboratory License # LAB0166

SanAir Technologies Laboratory

804.897.1177 www.sanair.com

SanAir Technologies Laboratory, Inc.

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Web: http://www.sanair.com E-mail: iaq@sanair.com

Rapid Response Remediation
6907 university ave
#122
Middleton, WI 53562

July 1, 2013

SanAir ID # 13014032
Project Name: Nakoosa Trail Madison
Project Number: 204639

Dear Rob Mozgawa,

We at SanAir would like to thank you for the work you recently submitted. The 10 sample(s) were received on Friday, June 28, 2013 via FedEx. The final report(s) is enclosed for the following sample (s): B961727, B961851, B950538, B950357, B948533, B960609, B961926, B957743, B961874, B961894.

These results only pertain to this job and should not be used in the interpretation of any other job. This report is only complete in its entirety. Refer to the listing below of the pages included in a complete final report.

Sincerely,

L. Claire Macdonald
Microbiology Laboratory Manager
SanAir Technologies Laboratory

Final Report Includes:
- Cover Letter
- Analysis Pages
- Disclaimers and Additional Information

sample conditions:
10 sample(s) in Good condition

SanAir Technologies Laboratory, Inc.

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804.897.1177 Toll Free: 888.895.1177 Fax: 804.897.0070
Web: http://www.sanair.com E-mail: iaq@sanair.com

SanAir ID Number

13014032

FINAL REPORT

Name: Rapid Response Remediation
Address: 6907 university ave
#122
Middleton, WI 53562

Project Number: 204639
P.O. Number: 58792
Project Name: Nakoosa Trail Madison

Collected Date: 6/27/2013
Received Date: 6/28/2013 10:20:00 AM
Report Date: 7/1/2013 1:59:44 PM
Analyst: Goodwin, Aaron M.

Direct Identification Analysis

SanAir ID: 13014032-001 Sample #: B961727 ID: Test Site 1

D3-Direct ID Analysis on Tape using STL 112
Quantitative Direct ID

Fungi	Estimated Amount	
Alternaria species	Rare	2 spores / cm sq.
Basidiospores	Rare	2 spores / cm sq.
Smuts/Myxomycetes	Rare	1 spore / cm sq.

Tape was slightly covered with debris which might have occluded fungi.

SanAir ID: 13014032-002 Sample #: B961851 ID: Test Site 2

D3-Direct ID Analysis on Tape using STL 112
Quantitative Direct ID

Fungi	Estimated Amount	
Aspergillus/Penicillium	Rare	120 spores / cm sq.
Chaetomium species	Rare	3 spores / cm sq.
Stachybotrys species	Heavy	350,000 spores / cm sq.
Ulocladium species	Light	100 spores / cm sq.

SanAir ID: 13014032-003 Sample #: B950538 ID: Test Site 3

D3-Direct ID Analysis on Tape using STL 112
Quantitative Direct ID

Fungi	Estimated Amount	
Alternaria species	Rare	2 spores / cm sq.
Aspergillus/Penicillium	Rare	5 spores / cm sq.
Cladosporium species	Rare	25 spores / cm sq.

SanAir ID: 13014032-004 Sample #: B950357 ID: Test Site 4

D3-Direct ID Analysis on Tape using STL 112
Quantitative Direct ID

Fungi	Estimated Amount	
Cladosporium species	Heavy	45,000 spores / cm sq.
Ulocladium species	Heavy	22,500 spores / cm sq.

Certification

Signature: Aaron Goodwin
Date: 7/1/2013

Reviewed: L. Claire Macdonald
Date: 7/1/2013

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SanAir ID Number
13014032
FINAL REPORT

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#122
Middleton, WI 53562

Project Number: 204639
P.O. Number: 58792
Project Name: Nakoosa Trail Madison

Collected Date: 6/27/2013
Received Date: 6/28/2013 10:20:00 AM
Report Date: 7/1/2013 1:59:44 PM
Analyst: Goodwin, Aaron M.

Direct Identification Analysis

SanAir ID: 13014032-005 Sample #: B948533 ID: Test Site 5

D3-Direct ID Analysis on Tape using STL 112
Quantitative Direct ID

Fungi	Estimated Amount	
No Fungi Detected		

SanAir ID: 13014032-006 Sample #: B960609 ID: Test Site 6

D3-Direct ID Analysis on Tape using STL 112
Quantitative Direct ID

Fungi	Estimated Amount	
Cladosporium species	Light	1,392 spores / cm sq.
Smuts/Myxomycetes	Rare	3 spores / cm sq.
Ulocladium species	Rare	1 spore / cm sq.

Tape was slightly covered with debris which might have occluded fungi.

SanAir ID: 13014032-007 Sample #: B961926 ID: Test Site 7

D3-Direct ID Analysis on Tape using STL 112
Quantitative Direct ID

Fungi	Estimated Amount	
No Fungi Detected		

SanAir ID: 13014032-008 Sample #: B957743 ID: Test Site 8

D3-Direct ID Analysis on Tape using STL 112
Quantitative Direct ID

Fungi	Estimated Amount	
Aspergillus/Penicillium	Rare	12 spores / cm sq.
Cladosporium species	Heavy	260,000 spores / cm sq.
Ulocladium species	Rare	1 spore / cm sq.

Certification

Signature: Aaron Goodwin
Date: 7/1/2013

Reviewed: L. Claire Macdonald
Date: 7/1/2013

SanAir Technologies Laboratory, Inc.

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FINAL REPORT

Name: Rapid Response Remediation
Address: 6907 university ave
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Project Number: 204639
P.O. Number: 58792
Project Name: Nakoosa Trail Madison

Collected Date: 6/27/2013
Received Date: 6/28/2013 10:20:00 AM
Report Date: 7/1/2013 1:59:44 PM
Analyst: Goodwin, Aaron M.

Direct Identification Analysis

SanAir ID: 13014032-009 Sample #: B961874 ID: Test Site 9

D3-Direct ID Analysis on Tape using STL 112
Quantitative Direct ID

Fungi	Estimated Amount	
No Fungi Detected		

SanAir ID: 13014032-010 Sample #: B961894 ID: Test Site 10

D3-Direct ID Analysis on Tape using STL 112
Quantitative Direct ID

Fungi	Estimated Amount	
Alternaria species	Rare	2 spores / cm sq.
Aspergillus/Penicillium	Rare	2 spores / cm sq.

Certification

Signature: Date: 7/1/2013

Reviewed: L. Claire Macdonald Date: 7/1/2013

SanAir Technologies Laboratory, Inc.

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SanAir ID Number

13014032

FINAL REPORT

Name: Rapid Response Remediation
Address: 6907 university ave
#122
Middleton, WI 53562

Project Number: 204639
P.O. Number: 58792
Project Name: Nakoosa Trail Madison

Collected Date: 6/27/2013
Received Date: 6/28/2013 10:20:00 AM
Report Date: 7/1/2013 1:59:44 PM

ORGANISM DESCRIPTIONS

The descriptions of the organisms presented are derived from various reference materials. The laboratory report is based on the data derived from the samples submitted and no interpretation of the data, as to potential, or actual, health effects resulting from exposure to the numbers of organisms found, can be made by laboratory personnel. Any interpretation of the potential health effects of the presence of this organism must be made by qualified professional personnel with first hand knowledge of the sample site, and the problems associated with that site.

ALTERNARIA SPECIES - This genus compromises a large number of saprobes and plant pathogens. It is one of the predominate airborne fungal spores indoor and outdoor. Outdoors it may be isolated from samples of soil, seeds, and plants. It is one of the more common fungi found in nature, extremely widespread and ubiquitous. Conidia are easily carried by the wind, with peak concentrations in the summer and early fall. It is commonly found in outdoor samples. It is often found in indoor environments, on drywall, ceiling tiles, in house dust, carpets, textiles, and on horizontal surfaces in building interiors. Often found on window frames. *Health Effects:* In humans, it is recognized to cause type I and III allergic responses. Because of the large size of the spores, it can be deposited in the nose, mouth and upper respiratory tract, causing nasal septum infections. It has been known to cause Baker's asthma, farmer's lung, and hay fever. It has been associated with hypersensitivity pneumoniti, sinusitis, deratomycosis, onychomycosis, subcutaneous phaeohyphomycosis, and invasive infection. Common cause of extrinsic asthma (immediate-type hypersensitivity: type I). Acute symptoms include edema and bronchiospasms, chronic cases may develop pulmonary emphysema.
References: Flannigan, Brian, Robert A. Samson, and J. David Miller, eds. Microorganisms in Home and Indoor Work Environments: Diversity, Health Impacts, Investigation, and Control. London and New York: Taylor & Francis, 2001.

ASPERGILLUS/PENICILLIUM - These spores are easily aerosolized. Only through the visualization of reproductive structures can the genera be distinguished. Also included in this group are the spores of the genera Acremonium, Phialophora, Verticillium, Paecilomyces, etc. Small, round spores of this group lack the necessary distinguishing characteristics when seen on non-viable examination. *Health Effects:* Can cause a variety of symptoms including allergic reactions. Most symptoms occur if the individual is immunocompromised in some way (HIV, cancer, etc). Both Penicillium and Aspergillus spores share similar morphology on non-viable analysis and therefore are lumped together into the same group.

BASIDIOSPORES - From the Subphylum Basidiomycotina which contains the mushrooms, shelf fungi, and a variety of other macrofungi. They are saprophytes, ectomycorrhizal fungi or agents of wood rot, which may destroy the structure wood of buildings. It is extremely difficult to identify a specific genera of mushrooms by using standard culture plate techniques. Some basidiomycete spores can be identified by spore morphology; however, some care should be exercised with regard to specific identification. The release of basidiospores is dependant upon moisture, and they are dispersed by wind. *Health Effects:* Many have the potential to produce a variety of toxins. Members of this group may trigger Type I and III fungal hypersensitivity reactions. Rarely reported as opportunistic pathogens.

CHAETOMIUM SPECIES - It is an ascomycete. It is found on a variety of substrates containing cellulose including paper and plant compost. It can be found on the damp or water damaged paper in sheetrock after a long term water damage. Several species have been reported to play a major role in decomposition of cellulose made materials. These fungi are able to dissolve the cellulose fibers in cotton and paper, and thus cause these materials to disintegrate. The process is especially rapid under moist conditions. *Health Effects:* Chaetomium can produce type I fungal hypersensitivity and has caused onychomycosis (nail infections).
References: Flannigan, Brian, Robert A. Samson, and J. David Miller, eds. Microorganisms in Home and Indoor Work Environments: Diversity, Health Impacts, Investigation, and Control. London and New York: Taylor & Francis, 2001.

CLADOSPORIUM SPECIES - The most commonly identified outdoor fungus. The outdoor numbers are reduced in the winter and are often high in the summer. Often found indoors in numbers less than outdoor numbers. It is commonly found on the surface of fiberglass duct liner in the interior of supply ducts. A wide variety of plants are food sources for this fungus. It is found on dead plants, woody plants, food, straw, soil, paint and textiles. Often found in dirty refrigerators and especially in reservoirs where condensation is collected, on moist window frames it can easily be seen covering the whole painted area with a velvety olive green layer. *Health Effects:* It is a common allergen. It can cause mycosis. Common cause of extrinsic asthma (immediate-type hypersensitivity: type I). Acute symptoms include edema and bronchiospasms, chronic cases may develop pulmonary emphysema. Illnesses caused by this genus can include phaeohyphomycosis, chromoblastomycosis, hay fever and common allergies.
References: Flannigan, Brian, Robert A. Samson, and J. David Miller, eds. Microorganisms in Home and Indoor Work Environments: Diversity, Health Impacts, Investigation, and Control. London and New York: Taylor & Francis, 2001.

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SanAir ID Number

13014032

FINAL REPORT

Name: Rapid Response Remediation
Address: 6907 university ave
#122
Middleton, WI 53562

Project Number: 204639
P.O. Number: 58792
Project Name: Nakoosa Trail Madison

Collected Date: 6/27/2013
Received Date: 6/28/2013 10:20:00 AM
Report Date: 7/1/2013 1:59:44 PM

ORGANISM DESCRIPTIONS

The descriptions of the organisms presented are derived from various reference materials. The laboratory report is based on the data derived from the samples submitted and no interpretation of the data, as to potential, or actual, health effects resulting from exposure to the numbers of organisms found, can be made by laboratory personnel. Any interpretation of the potential health effects of the presence of this organism must be made by qualified professional personnel with first hand knowledge of the sample site, and the problems associated with that site.

SMUTS/MYXOMYCETES - Smuts and Myxomycetes are parasitic plant pathogens. They are typically grouped together due to their association with plants, the outdoors and because they share similar microscopic morphology. *Health Effects:* Can produce type I fungal hypersensitivity reactions.
References: Martin, G.W., C.J. Alexopoulos, and M.L. Farr. The Genera of Myxomycetes. Iowa City, Iowa: University of Iowa Press, 1983.

STACHYBOTRYS SPECIES - This organism is rarely found in outdoor samples. It is usually difficult to find in indoor air samples unless it is physically disturbed because the spores are in a gelatinous mass. Grows well on wet media, preferably containing cellulose. It proliferates in the indoor environment with long term water damage, growing on wallpaper, gypsum board, and textiles. As a general rule, air cultures for Stachybotrys yields unpredictable results, mainly due to the fact that this fungus is usually accompanied by other fungi such as Aspergillus and Penicillium that normally are better aerosolized than Stachybotrys. This is a slow growing fungus on media. It does not compete well with other rapidly growing fungi. The black fungi grow on building material with high cellulose content and low nitrogen content. Appropriate media for the growth of this organism will have high cellulose content and low nitrogen content. *Health Effects:* It has worldwide distribution and has been reported to cause dermatitis, cough, rhinitis, and headache, although no definitive reports of human infections have been verified. It has the ability to cause type I hypersensitivity. It is a documented mycotoxin producer.
References: Flannigan, Brian, Robert A. Samson, and J. David Miller, eds. Microorganisms in Home and Indoor Work Environments: Diversity, Health Impacts, Investigation, and Control. London and New York: Taylor & Francis, 2001.

ULOCLADIUM SPECIES - Isolated from soil, dead plants and cellulose materials. Found on textiles. It can be found on many types of materials, but mostly found on decaying materials. Has a greater water activity need for growth and is therefore considered a water indicator organism. *Health Effects:* Reported to be a major allergen. Rarely causes subcutaneous infections in humans. It has a high water requirement.
References: De Hoog, G.S., J. Guarro, J. Gene, and M.J. Figueras. Atlas of Clinical Fungi, 2nd Edition. The Netherlands: CBS, 2000.

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804-897-1177 / 888-895-1177 / Fax 804-897-0070
www.sanair.com

Microbiology Chain of Custody

SanAir ID Number: 1304032

Company: Rapid Response Remediation	Project Number: 204639	Phone #: 608-203-5788
Address: 6907 university ave	Project Name: Nakoosa Trail Madison	Phone #: 608-225-2216
City, State, Zip: Middleton, WI 53562	Date Collected: 27 June 2013	Fax #: 608-203-8118
Samples Collected By: Rob Mozgawa	P.O. Number: 58792	Email: kmozgawa@r3mail.net

Sample Types		Analysis Types	Turn Around Time
AC	Air Cassette	**A1** - Identification and Enumeration of Fungal spores, plus total dander, fiber, and pollen count	Hours 3/6/24/48-Std
		A2 - Identification and Enumeration of Fungal spores only	Hours 3/6/24/48-Std
T B S*	Tape Bulk Swab*	**D1** - Direct Identification of Fungi	Hours 3/6/24/48-Std
		D2 - Direct Identification of Mites, Insects, Pollen, etc.	Hours 3/6/24/48-Std
AP	Air Plate	**C1** - Culture Identification and Enumeration of Fungi only	5-10 Days
		C2 - Culture Identification and Enumeration of Bacteria only	2-4 Days
B	Bulk	**C3** - Culture Identification and Enumeration of Fungi and Bacteria	5-10 Days
S	Swab	**C4** - Culture Identification and Enumeration of Thermophilic Bacteria with C2 or C3 analysis	2-4 or 5-10 Days
W	Water	**L1** – Culture Identification and Enumeration of *Legionella sp.*	7-10 Days
D	Dust	**M1** – Dust Mite Allergen Test	Hours 3/6/24/48-Std

SanAir Technologies Laboratory offers speciation by PCR. Please call for details and pricing.

Sample #	Sample Identification	Sample Type	Analysis Type(s)	Turn Around Time	Total Volume (L) or Area (in^2)	Time Start – Stop	
B961727	TEST SITE 1	T	D3	48			
B961851	" " 2	T	D3	48			
B950538	" " 3	T	D3	48			
B950357	" " 4	T	D3	48			
B948533	" " 5	T	D3	48			
B960609	" " 6	T	D3	48			
B961926	" " 7	T	D3	48			
B957743	" " 8	T	D3	48			
B961874	" " 9	T	D3	48			
B961894	" " 10	T	D3	48			
	TRC COMPANIES						
	4141 Nakoosa Trail						
	Madison, WI 53714						

Special Instructions	N/A

Relinquished by	Date	Time	Received by	Date	Time
				JUN 28 2013	10:20 AM

Unless scheduled, the turn around time for all samples received after 3 pm Friday will begin at 8 am Monday morning. Weekend or Holiday work must be scheduled ahead of time and is charged 150% of analytical rate.

*Although we allow Direct Identification from a swab sample, best results are received from tape samples.

Additional Information

Direct Identification Analyses

Direct identification analyses can be performed on tape, bulk, dust and swab samples. Direct identification reports indicate the evidence of possible active growth for each genus of fungi present. Whether or not these spores are viable or nonviable cannot be determined using this type of analysis; the sample would have to be cultured in order to determine viability. Keep in mind that this report is valid only for the exact spot in which the sample was taken. Potential mold contamination of other areas can only be extrapolated from the data reported. Light microscopy at a 400 to 1000x magnification is used for direct identification analysis.

For meaningful results, the person sampling the area is encouraged to include a blank tape sample in order to check for contamination during sampling or shipment. Be sure to check the expiration date of any tape. It is recommended not to use expired tapes as the gel on the slide deteriorates thereby losing the tackiness necessary to retain fungi.

The genera *Aspergillus* and *Penicillium* are typically composed of small, round spores that are difficult to distinguish from each other without the presence of intact conidiophores (structures from which spores are formed and released). In this case, they are grouped into the category *Aspergillus* / *Penicillium*. Other fungi that produce spores of similar characteristics to *Aspergillus* and *Penicillium* may also be placed into this combined category in the absence of intact conidiophores (e.g. *Paecilomyces*, *Gliocladium*, *Trichoderma*, etc.).

D3 Analysis: Fungi with Description of Possible Growth, Plus Count Estimates Per Square Inch

This analysis includes spore count estimates for each fungus identified.

Estimated Amount	Indication of Growth	Evidence of Mycelial Fragments / Conidiophores
Rare	Not Likely	None
Light	Possible	Some, 10 to 25% of Tape Covered
Moderate	Probable	Abundant, 25 to 50% of Tape Covered
Heavy	Significant	Throughout, 50 to 100% of Tape Covered

NOTE: Tapes should not be overloaded with debris as that may occlude fungi.

All counts are estimates based on the area of 1 square inch. Any estimate higher than 500,000 spores will be reported as >500,000 spores.

Disclaimer

This report is the sole property of the client named on the SanAir Technologies Laboratory chain-of-custody. Neither results nor reports will be discussed with or released to any third party without our client's written permission. The information provided in this report applies only to the samples submitted and is relevant only for the date, time and exact location of sampling. ***SanAir will not provide any opinion on the safety of a building as visual inspection and knowledge of water damage and past remediation, among other elements, is essential in this decision.*** *SanAir is accredited by AIHA in the EMLAP program for Direct Examination of bulk and surface samples.*

This report does not constitute endorsement by AIHA/NVLAP and/or any other U.S. governmental agencies; and may not be certified by every local, state and federal regulatory agencies.

SanAir Technologies Laboratory, Inc.
IAQ Microbiology Services

1551 Oak Bridge Drive, Suite B
Powhatan, VA 23139
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Phone: 888.895.1177
Phone: 804.897.1177
Fax: 804.897.0070

D3 Analysis Information

Results for direct identification analyses (D3) are quantitative. Estimates of mycelial growth as rare, light, moderate, or heavy are provided in addition to the counts, to provide a better overall picture of the sampled area. These estimates apply only to Quantitative Direct Analysis (D3).

Rare.....No signs of active growth. No mycelial fragments seen.

Light.....Possible active growth. Some mycelial fragments seen.

Moderate…….Probable active growth. Mycelial fragments throughout.

Heavy.....Significant active growth. Mycelial fragments throughout.

Attachment 4

Soil and Groundwater Analytical Results

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

July 15, 2013

ALYSSA SELLWOOD
TRC - Madison
744 HEARTLAND TRAIL
Madison, WI 53717

RE: Project: 204639 CITY OF MADISON-CUB FOO
Pace Project No.: 4080362

Dear ALYSSA SELLWOOD:
Enclosed are the analytical results for sample(s) received by the laboratory on June 28, 2013. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Tod Noltemeyer

Tod Noltemeyer

tod.noltemeyer@pacelabs.com
Project Manager

Enclosures

cc: Wes Braga, TRC

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

CERTIFICATIONS

Project: 204639 CITY OF MADISON-CUB FOO
Pace Project No.: 4080362

Green Bay Certification IDs
1241 Bellevue Street, Green Bay, WI 54302
Florida/NELAP Certification #: E87948
Illinois Certification #: 200050
Kentucky Certification #: 82
Louisiana Certification #: 04168
Minnesota Certification #: 055-999-334
New York Certification #: 11888
North Dakota Certification #: R-150
South Carolina Certification #: 83006001
US Dept of Agriculture #: S-76505
Wisconsin Certification #: 405132750

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

SAMPLE SUMMARY

Project: 204639 CITY OF MADISON-CUB FOO
Pace Project No.: 4080362

Lab ID	Sample ID	Matrix	Date Collected	Date Received
4080362001	GP-1 (5-7')	Solid	06/26/13 14:35	06/28/13 09:45
4080362002	GP-2 (8-10')	Solid	06/26/13 14:25	06/28/13 09:45
4080362003	GP-4 (1.5-5')	Solid	06/26/13 13:50	06/28/13 09:45
4080362004	GP-5 (3.5-5')	Solid	06/26/13 14:05	06/28/13 09:45
4080362005	GP-5 (17-19')	Solid	06/26/13 14:15	06/28/13 09:45
4080362006	GP-6 (7.5-10')	Solid	06/26/13 11:50	06/28/13 09:45
4080362007	GP-7 (0.5-3')	Solid	06/26/13 12:10	06/28/13 09:45
4080362008	TW-1	Water	06/26/13 15:20	06/28/13 09:45
4080362009	TW-2	Water	06/26/13 19:00	06/28/13 09:45
4080362010	TW-3	Water	06/26/13 18:45	06/28/13 09:45
4080362011	TW-5	Water	06/26/13 15:40	06/28/13 09:45
4080362012	TW-6	Water	06/26/13 16:30	06/28/13 09:45
4080362013	TW-7	Water	06/26/13 17:15	06/28/13 09:45
4080362014	GP-7 (12.5-15')	Solid	06/26/13 12:20	06/28/13 09:45
4080362015	TW-4	Water	06/27/13 08:15	06/28/13 09:45
4080362016	GP-1 (18-20')	Solid	06/26/13 14:45	06/28/13 09:45
4080362017	TRIP BLANK	Water	06/26/13 00:00	06/28/13 09:45

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(920)469-2436

SAMPLE ANALYTE COUNT

Project: 204639 CITY OF MADISON-CUB FOO
Pace Project No.: 4080362

Lab ID	Sample ID	Method	Analysts	Analytes Reported
4080362001	**GP-1 (5-7')**	EPA 8260	SMT	64
		ASTM D2974-87	BLF	1
4080362002	**GP-2 (8-10')**	EPA 8260	SMT	64
		ASTM D2974-87	BLF	1
4080362003	**GP-4 (1.5-5')**	EPA 8082	BLM	10
		EPA 6010	DLB	7
		EPA 7471	CMS	1
		EPA 8270	RJN	70
		EPA 8260	SMT	64
		ASTM D2974-87	BLF	1
4080362004	**GP-5 (3.5-5')**	EPA 8260	SMT	64
		ASTM D2974-87	BLF	1
4080362005	**GP-5 (17-19')**	EPA 8260	SMT	64
		ASTM D2974-87	BLF	1
4080362006	**GP-6 (7.5-10')**	EPA 6010	DLB	1
		EPA 8260	SMT	64
		ASTM D2974-87	BLF	1
4080362007	**GP-7 (0.5-3')**	EPA 6010	DLB	1
		EPA 8260	SMT	64
		ASTM D2974-87	BLF	1
4080362008	**TW-1**	EPA 8260	LAP	64
4080362009	**TW-2**	EPA 8260	LAP	64
4080362010	**TW-3**	EPA 8260	LAP	64
4080362011	**TW-5**	EPA 8260	LAP	64
4080362012	**TW-6**	EPA 6010	DLB	1
		EPA 8260	LAP	64
4080362013	**TW-7**	EPA 6010	DLB	1
		EPA 8260	LAP	64
4080362014	**GP-7 (12.5-15')**	EPA 6010	DLB	1
		EPA 8260	SMT	64
		ASTM D2974-87	BLF	1
4080362015	**TW-4**	EPA 6010	MMZ	7
		EPA 7470	CMS	1
		EPA 8260	LAP	64
4080362016	**GP-1 (18-20')**	EPA 8260	SMT	64
		ASTM D2974-87	BLF	1
4080362017	**TRIP BLANK**	EPA 8260	LAP	64

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

HITS ONLY

Project: 204639 CITY OF MADISON-CUB FOO
Pace Project No.: 4080362

Lab Sample ID / Method	Client Sample ID / Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
4080362001	**GP-1 (5-7')**					
ASTM D2974-87	Percent Moisture	16.7	%	0.10	07/01/13 17:05	
4080362002	**GP-2 (8-10')**					
ASTM D2974-87	Percent Moisture	15.5	%	0.10	07/01/13 17:05	
4080362003	**GP-4 (1.5-5')**					
EPA 6010	Arsenic	1.4J	mg/kg	1.8	07/02/13 13:09	
EPA 6010	Barium	28.2	mg/kg	0.45	07/02/13 13:09	
EPA 6010	Cadmium	0.17J	mg/kg	0.45	07/02/13 13:09	
EPA 6010	Chromium	4.4	mg/kg	0.45	07/02/13 13:09	
EPA 6010	Lead	1.8	mg/kg	0.89	07/02/13 13:09	
ASTM D2974-87	Percent Moisture	5.0	%	0.10	07/01/13 17:05	
4080362004	**GP-5 (3.5-5')**					
ASTM D2974-87	Percent Moisture	2.1	%	0.10	07/01/13 17:05	
4080362005	**GP-5 (17-19')**					
EPA 8260	1,2,4-Trimethylbenzene	334	ug/kg	68.6	07/02/13 01:58	
EPA 8260	1,3,5-Trimethylbenzene	86.4	ug/kg	68.6	07/02/13 01:58	
EPA 8260	Ethylbenzene	150	ug/kg	68.6	07/02/13 01:58	
EPA 8260	Naphthalene	123	ug/kg	68.6	07/02/13 01:58	
EPA 8260	m&p-Xylene	511	ug/kg	137	07/02/13 01:58	
EPA 8260	n-Propylbenzene	31.6J	ug/kg	68.6	07/02/13 01:58	
EPA 8260	o-Xylene	85.6	ug/kg	68.6	07/02/13 01:58	
ASTM D2974-87	Percent Moisture	12.5	%	0.10	07/01/13 17:25	
4080362006	**GP-6 (7.5-10')**					
EPA 6010	Lead	1.5	mg/kg	0.95	07/02/13 13:11	
ASTM D2974-87	Percent Moisture	2.9	%	0.10	07/01/13 17:25	
4080362007	**GP-7 (0.5-3')**					
EPA 6010	Lead	17.5	mg/kg	0.99	07/02/13 13:13	
ASTM D2974-87	Percent Moisture	5.7	%	0.10	07/01/13 17:25	
4080362008	**TW-1**					
EPA 8260	n-Butylbenzene	22.1	ug/L	5.0	06/29/13 20:42	
EPA 8260	sec-Butylbenzene	7.2J	ug/L	25.0	06/29/13 20:42	
EPA 8260	Ethylbenzene	499	ug/L	5.0	06/29/13 20:42	
EPA 8260	Isopropylbenzene (Cumene)	36.6	ug/L	5.0	06/29/13 20:42	
EPA 8260	p-Isopropyltoluene	5.0J	ug/L	5.0	06/29/13 20:42	
EPA 8260	Naphthalene	108	ug/L	25.0	06/29/13 20:42	
EPA 8260	n-Propylbenzene	129	ug/L	5.0	06/29/13 20:42	
EPA 8260	Toluene	15.7	ug/L	5.0	06/29/13 20:42	
EPA 8260	1,2,4-Trimethylbenzene	924	ug/L	25.0	06/29/13 20:42	
EPA 8260	1,3,5-Trimethylbenzene	33.0	ug/L	25.0	06/29/13 20:42	
EPA 8260	m&p-Xylene	632	ug/L	10.0	06/29/13 20:42	
EPA 8260	o-Xylene	81.9	ug/L	5.0	06/29/13 20:42	
4080362009	**TW-2**					
EPA 8260	cis-1,2-Dichloroethene	2.2	ug/L	1.0	06/29/13 19:34	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

HITS ONLY

Project: 204639 CITY OF MADISON-CUB FOO
Pace Project No.: 4080362

Lab Sample ID / Method	Client Sample ID / Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
4080362009	**TW-2**					
EPA 8260	Trichloroethene	0.62J	ug/L	1.0	06/29/13 19:34	
EPA 8260	Trichlorofluoromethane	1.2	ug/L	1.0	06/29/13 19:34	
4080362011	**TW-5**					
EPA 8260	Benzene	12.9	ug/L	1.0	06/29/13 20:20	
EPA 8260	sec-Butylbenzene	1.9J	ug/L	5.0	06/29/13 20:20	
EPA 8260	Chloromethane	0.44J	ug/L	1.0	06/29/13 20:20	
EPA 8260	Ethylbenzene	29.7	ug/L	1.0	06/29/13 20:20	
EPA 8260	Isopropylbenzene (Cumene)	4.0	ug/L	1.0	06/29/13 20:20	
EPA 8260	p-Isopropyltoluene	1.1	ug/L	1.0	06/29/13 20:20	
EPA 8260	Naphthalene	60.0	ug/L	5.0	06/29/13 20:20	
EPA 8260	n-Propylbenzene	14.9	ug/L	1.0	06/29/13 20:20	
EPA 8260	Toluene	2.6	ug/L	1.0	06/29/13 20:20	
EPA 8260	1,2,4-Trimethylbenzene	179	ug/L	5.0	06/29/13 20:20	
EPA 8260	1,3,5-Trimethylbenzene	51.5	ug/L	5.0	06/29/13 20:20	
EPA 8260	m&p-Xylene	167	ug/L	2.0	06/29/13 20:20	
EPA 8260	o-Xylene	58.8	ug/L	1.0	06/29/13 20:20	
4080362013	**TW-7**					
EPA 6010	Lead, Dissolved	1.5J	ug/L	7.5	07/02/13 14:29	
4080362014	**GP-7 (12.5-15')**					
EPA 6010	Lead	1.9	mg/kg	1.1	07/02/13 13:15	
ASTM D2974-87	Percent Moisture	11.1	%	0.10	07/01/13 16:28	
4080362015	**TW-4**					
EPA 6010	Arsenic, Dissolved	9.3J	ug/L	20.0	07/11/13 11:51	P4
EPA 6010	Barium, Dissolved	210	ug/L	5.0	07/11/13 11:51	
EPA 6010	Chromium, Dissolved	3.0J	ug/L	5.0	07/11/13 11:51	
EPA 6010	Lead, Dissolved	3.2J	ug/L	7.5	07/11/13 11:51	
EPA 6010	Silver, Dissolved	2.2J	ug/L	10.0	07/11/13 11:51	
EPA 7470	Mercury, Dissolved	1.8	ug/L	0.20	07/15/13 15:25	P4
4080362016	**GP-1 (18-20')**					
EPA 8260	1,2,4-Trimethylbenzene	39.2	ug/kg	33.6	07/02/13 03:29	
EPA 8260	Ethylbenzene	18.1J	ug/kg	33.6	07/02/13 03:29	
ASTM D2974-87	Percent Moisture	11.6	%	0.10	07/01/13 17:25	

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PROJECT NARRATIVE

Project: 204639 CITY OF MADISON-CUB FOO
Pace Project No.: 4080362

Method: **EPA 8082**
Description: 8082 GCS PCB
Client: TRC - MADISON
Date: July 15, 2013

General Information:
1 sample was analyzed for EPA 8082. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 3541 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

Pace Analytical Services, Inc.
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Green Bay, WI 54302
(920)469-2436

PROJECT NARRATIVE

Project: 204639 CITY OF MADISON-CUB FOO
Pace Project No.: 4080362

Method: **EPA 6010**
Description: 6010 MET ICP
Client: TRC - MADISON
Date: July 15, 2013

General Information:
4 samples were analyzed for EPA 6010. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 3050 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

PROJECT NARRATIVE

Project: 204639 CITY OF MADISON-CUB FOO
Pace Project No.: 4080362

Method: **EPA 6010**
Description: 6010 MET ICP, Dissolved
Client: TRC - MADISON
Date: July 15, 2013

General Information:
3 samples were analyzed for EPA 6010. All samples were received in acceptable condition with any exceptions noted below.

P4: Sample field preservation does not meet EPA or method recommendations for this analysis.
- TW-4 (Lab ID: 4080362015)

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

Pace Analytical Services, Inc.
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(920)469-2436

PROJECT NARRATIVE

Project: 204639 CITY OF MADISON-CUB FOO
Pace Project No.: 4080362

Method: **EPA 7470**
Description: 7470 Mercury, Dissolved
Client: TRC - MADISON
Date: July 15, 2013

General Information:
1 sample was analyzed for EPA 7470. All samples were received in acceptable condition with any exceptions noted below.

P4: Sample field preservation does not meet EPA or method recommendations for this analysis.
- TW-4 (Lab ID: 4080362015)

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 7470 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

Analyte Comments:

QC Batch: MERP/3742

2q: Filter Blank for sample 4080362015.
- BLANK (Lab ID: 823143)
  - Mercury, Dissolved

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PROJECT NARRATIVE

Project: 204639 CITY OF MADISON-CUB FOO
Pace Project No.: 4080362

Method: **EPA 7471**
Description: 7471 Mercury
Client: TRC - MADISON
Date: July 15, 2013

General Information:
1 sample was analyzed for EPA 7471. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 7471 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

Pace Analytical Services, Inc.
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Green Bay, WI 54302
(920)469-2436

PROJECT NARRATIVE

Project: 204639 CITY OF MADISON-CUB FOO
Pace Project No.: 4080362

Method: **EPA 8270**
Description: 8270 MSSV FULL LIST MICROWAVE
Client: TRC - MADISON
Date: July 15, 2013

General Information:
1 sample was analyzed for EPA 8270. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 3546 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

QC Batch: OEXT/18842

L0: Analyte recovery in the laboratory control sample (LCS) was outside QC limits.

- LCS (Lab ID: 816804)
  - Dibenz(a,h)anthracene

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

PROJECT NARRATIVE

Project: 204639 CITY OF MADISON-CUB FOO
Pace Project No.: 4080362

Method: **EPA 8260**
Description: 8260 MSV Med Level Normal List
Client: TRC - MADISON
Date: July 15, 2013

General Information:
9 samples were analyzed for EPA 8260. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 5035/5030B with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

Analyte Comments:

QC Batch: MSV/20306

1q: Due to excessive soil weight, sample could not be brought to 1:1 MeOH ratio.
- GP-1 (18-20') (Lab ID: 4080362016)
  - Dibromofluoromethane (S)

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

PROJECT NARRATIVE

Project: 204639 CITY OF MADISON-CUB FOO
Pace Project No.: 4080362

Method: **EPA 8260**
Description: 8260 MSV
Client: TRC - MADISON
Date: July 15, 2013

General Information:
8 samples were analyzed for EPA 8260. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

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ANALYTICAL RESULTS

Project: 204639 CITY OF MADISON-CUB FOO
Pace Project No.: 4080362

Sample: GP-1 (5-7') **Lab ID: 4080362001** Collected: 06/26/13 14:35 Received: 06/28/13 09:45 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Level Normal List	Analytical Method: EPA 8260 Preparation Method: EPA 5035/5030B								
1,1,1,2-Tetrachloroethane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 00:27	630-20-6	W
1,1,1-Trichloroethane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 00:27	71-55-6	W
1,1,2,2-Tetrachloroethane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 00:27	79-34-5	W
1,1,2-Trichloroethane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 00:27	79-00-5	W
1,1-Dichloroethane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 00:27	75-34-3	W
1,1-Dichloroethene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 00:27	75-35-4	W
1,1-Dichloropropene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 00:27	563-58-6	W
1,2,3-Trichlorobenzene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 00:27	87-61-6	W
1,2,3-Trichloropropane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 00:27	96-18-4	W
1,2,4-Trichlorobenzene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 00:27	120-82-1	W
1,2,4-Trimethylbenzene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 00:27	95-63-6	W
1,2-Dibromo-3-chloropropane	**<49.8**	ug/kg	250	49.8	1	07/01/13 14:12	07/02/13 00:27	96-12-8	W
1,2-Dibromoethane (EDB)	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 00:27	106-93-4	W
1,2-Dichlorobenzene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 00:27	95-50-1	W
1,2-Dichloroethane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 00:27	107-06-2	W
1,2-Dichloropropane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 00:27	78-87-5	W
1,3,5-Trimethylbenzene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 00:27	108-67-8	W
1,3-Dichlorobenzene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 00:27	541-73-1	W
1,3-Dichloropropane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 00:27	142-28-9	W
1,4-Dichlorobenzene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 00:27	106-46-7	W
2,2-Dichloropropane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 00:27	594-20-7	W
2-Chlorotoluene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 00:27	95-49-8	W
4-Chlorotoluene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 00:27	106-43-4	W
Benzene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 00:27	71-43-2	W
Bromobenzene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 00:27	108-86-1	W
Bromochloromethane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 00:27	74-97-5	W
Bromodichloromethane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 00:27	75-27-4	W
Bromoform	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 00:27	75-25-2	W
Bromomethane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 00:27	74-83-9	W
Carbon tetrachloride	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 00:27	56-23-5	W
Chlorobenzene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 00:27	108-90-7	W
Chloroethane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 00:27	75-00-3	W
Chloroform	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 00:27	67-66-3	W
Chloromethane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 00:27	74-87-3	W
Dibromochloromethane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 00:27	124-48-1	W
Dibromomethane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 00:27	74-95-3	W
Dichlorodifluoromethane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 00:27	75-71-8	W
Diisopropyl ether	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 00:27	108-20-3	W
Ethylbenzene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 00:27	100-41-4	W
Hexachloro-1,3-butadiene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 00:27	87-68-3	W
Isopropylbenzene (Cumene)	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 00:27	98-82-8	W
Methyl-tert-butyl ether	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 00:27	1634-04-4	W
Methylene Chloride	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 00:27	75-09-2	W
Naphthalene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 00:27	91-20-3	W
Styrene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 00:27	100-42-5	W

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
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(920)469-2436

ANALYTICAL RESULTS

Project: 204639 CITY OF MADISON-CUB FOO
Pace Project No.: 4080362

Sample: GP-1 (5-7') **Lab ID: 4080362001** Collected: 06/26/13 14:35 Received: 06/28/13 09:45 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Level Normal List	Analytical Method: EPA 8260 Preparation Method: EPA 5035/5030B								
Tetrachloroethene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 00:27	127-18-4	W
Toluene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 00:27	108-88-3	W
Trichloroethene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 00:27	79-01-6	W
Trichlorofluoromethane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 00:27	75-69-4	W
Vinyl chloride	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 00:27	75-01-4	W
cis-1,2-Dichloroethene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 00:27	156-59-2	W
cis-1,3-Dichloropropene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 00:27	10061-01-5	W
m&p-Xylene	**<50.0**	ug/kg	120	50.0	1	07/01/13 14:12	07/02/13 00:27	179601-23-1	W
n-Butylbenzene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 00:27	104-51-8	W
n-Propylbenzene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 00:27	103-65-1	W
o-Xylene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 00:27	95-47-6	W
p-Isopropyltoluene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 00:27	99-87-6	W
sec-Butylbenzene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 00:27	135-98-8	W
tert-Butylbenzene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 00:27	98-06-6	W
trans-1,2-Dichloroethene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 00:27	156-60-5	W
trans-1,3-Dichloropropene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 00:27	10061-02-6	W
Surrogates									
Dibromofluoromethane (S)	94	%	57-130		1	07/01/13 14:12	07/02/13 00:27	1868-53-7	
Toluene-d8 (S)	94	%	54-133		1	07/01/13 14:12	07/02/13 00:27	2037-26-5	
4-Bromofluorobenzene (S)	92	%	49-130		1	07/01/13 14:12	07/02/13 00:27	460-00-4	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**16.7**	%	0.10	0.10	1		07/01/13 17:05		

REPORT OF LABORATORY ANALYSIS

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(920)469-2436

ANALYTICAL RESULTS

Project: 204639 CITY OF MADISON-CUB FOO
Pace Project No.: 4080362

Sample: GP-2 (8-10') **Lab ID: 4080362002** Collected: 06/26/13 14:25 Received: 06/28/13 09:45 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Level Normal List	Analytical Method: EPA 8260 Preparation Method: EPA 5035/5030B								
1,1,1,2-Tetrachloroethane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 00:49	630-20-6	W
1,1,1-Trichloroethane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 00:49	71-55-6	W
1,1,2,2-Tetrachloroethane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 00:49	79-34-5	W
1,1,2-Trichloroethane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 00:49	79-00-5	W
1,1-Dichloroethane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 00:49	75-34-3	W
1,1-Dichloroethene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 00:49	75-35-4	W
1,1-Dichloropropene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 00:49	563-58-6	W
1,2,3-Trichlorobenzene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 00:49	87-61-6	W
1,2,3-Trichloropropane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 00:49	96-18-4	W
1,2,4-Trichlorobenzene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 00:49	120-82-1	W
1,2,4-Trimethylbenzene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 00:49	95-63-6	W
1,2-Dibromo-3-chloropropane	**<49.8**	ug/kg	250	49.8	1	07/01/13 14:12	07/02/13 00:49	96-12-8	W
1,2-Dibromoethane (EDB)	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 00:49	106-93-4	W
1,2-Dichlorobenzene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 00:49	95-50-1	W
1,2-Dichloroethane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 00:49	107-06-2	W
1,2-Dichloropropane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 00:49	78-87-5	W
1,3,5-Trimethylbenzene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 00:49	108-67-8	W
1,3-Dichlorobenzene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 00:49	541-73-1	W
1,3-Dichloropropane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 00:49	142-28-9	W
1,4-Dichlorobenzene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 00:49	106-46-7	W
2,2-Dichloropropane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 00:49	594-20-7	W
2-Chlorotoluene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 00:49	95-49-8	W
4-Chlorotoluene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 00:49	106-43-4	W
Benzene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 00:49	71-43-2	W
Bromobenzene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 00:49	108-86-1	W
Bromochloromethane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 00:49	74-97-5	W
Bromodichloromethane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 00:49	75-27-4	W
Bromoform	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 00:49	75-25-2	W
Bromomethane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 00:49	74-83-9	W
Carbon tetrachloride	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 00:49	56-23-5	W
Chlorobenzene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 00:49	108-90-7	W
Chloroethane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 00:49	75-00-3	W
Chloroform	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 00:49	67-66-3	W
Chloromethane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 00:49	74-87-3	W
Dibromochloromethane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 00:49	124-48-1	W
Dibromomethane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 00:49	74-95-3	W
Dichlorodifluoromethane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 00:49	75-71-8	W
Diisopropyl ether	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 00:49	108-20-3	W
Ethylbenzene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 00:49	100-41-4	W
Hexachloro-1,3-butadiene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 00:49	87-68-3	W
Isopropylbenzene (Cumene)	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 00:49	98-82-8	W
Methyl-tert-butyl ether	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 00:49	1634-04-4	W
Methylene Chloride	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 00:49	75-09-2	W
Naphthalene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 00:49	91-20-3	W
Styrene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 00:49	100-42-5	W

REPORT OF LABORATORY ANALYSIS

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Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS

Project: 204639 CITY OF MADISON-CUB FOO
Pace Project No.: 4080362

Sample: GP-2 (8-10') **Lab ID: 4080362002** Collected: 06/26/13 14:25 Received: 06/28/13 09:45 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Level Normal List	Analytical Method: EPA 8260 Preparation Method: EPA 5035/5030B								
Tetrachloroethene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 00:49	127-18-4	W
Toluene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 00:49	108-88-3	W
Trichloroethene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 00:49	79-01-6	W
Trichlorofluoromethane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 00:49	75-69-4	W
Vinyl chloride	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 00:49	75-01-4	W
cis-1,2-Dichloroethene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 00:49	156-59-2	W
cis-1,3-Dichloropropene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 00:49	10061-01-5	W
m&p-Xylene	**<50.0**	ug/kg	120	50.0	1	07/01/13 14:12	07/02/13 00:49	179601-23-1	W
n-Butylbenzene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 00:49	104-51-8	W
n-Propylbenzene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 00:49	103-65-1	W
o-Xylene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 00:49	95-47-6	W
p-Isopropyltoluene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 00:49	99-87-6	W
sec-Butylbenzene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 00:49	135-98-8	W
tert-Butylbenzene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 00:49	98-06-6	W
trans-1,2-Dichloroethene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 00:49	156-60-5	W
trans-1,3-Dichloropropene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 00:49	10061-02-6	W
Surrogates									
Dibromofluoromethane (S)	90	%	57-130		1	07/01/13 14:12	07/02/13 00:49	1868-53-7	
Toluene-d8 (S)	92	%	54-133		1	07/01/13 14:12	07/02/13 00:49	2037-26-5	
4-Bromofluorobenzene (S)	88	%	49-130		1	07/01/13 14:12	07/02/13 00:49	460-00-4	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**15.5**	%	0.10	0.10	1		07/01/13 17:05		

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS

Project: 204639 CITY OF MADISON-CUB FOO
Pace Project No.: 4080362

Sample: GP-4 (1.5-5') **Lab ID: 4080362003** Collected: 06/26/13 13:50 Received: 06/28/13 09:45 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8082 GCS PCB	Analytical Method: EPA 8082 Preparation Method: EPA 3541								
PCB-1016 (Aroclor 1016)	**<26.3**	ug/kg	52.7	26.3	1	07/01/13 12:00	07/01/13 17:33	12674-11-2	
PCB-1221 (Aroclor 1221)	**<26.3**	ug/kg	52.7	26.3	1	07/01/13 12:00	07/01/13 17:33	11104-28-2	
PCB-1232 (Aroclor 1232)	**<26.3**	ug/kg	52.7	26.3	1	07/01/13 12:00	07/01/13 17:33	11141-16-5	
PCB-1242 (Aroclor 1242)	**<26.3**	ug/kg	52.7	26.3	1	07/01/13 12:00	07/01/13 17:33	53469-21-9	
PCB-1248 (Aroclor 1248)	**<26.3**	ug/kg	52.7	26.3	1	07/01/13 12:00	07/01/13 17:33	12672-29-6	
PCB-1254 (Aroclor 1254)	**<26.3**	ug/kg	52.7	26.3	1	07/01/13 12:00	07/01/13 17:33	11097-69-1	
PCB-1260 (Aroclor 1260)	**<26.3**	ug/kg	52.7	26.3	1	07/01/13 12:00	07/01/13 17:33	11096-82-5	
PCB, Total	**<26.3**	ug/kg	52.7	26.3	1	07/01/13 12:00	07/01/13 17:33	1336-36-3	
Surrogates									
Tetrachloro-m-xylene (S)	85	%	40-130		1	07/01/13 12:00	07/01/13 17:33	877-09-8	
Decachlorobiphenyl (S)	86	%	48-130		1	07/01/13 12:00	07/01/13 17:33	2051-24-3	
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**1.4J**	mg/kg	1.8	0.48	1	07/01/13 13:05	07/02/13 13:09	7440-38-2	
Barium	**28.2**	mg/kg	0.45	0.077	1	07/01/13 13:05	07/02/13 13:09	7440-39-3	
Cadmium	**0.17J**	mg/kg	0.45	0.045	1	07/01/13 13:05	07/02/13 13:09	7440-43-9	
Chromium	**4.4**	mg/kg	0.45	0.11	1	07/01/13 13:05	07/02/13 13:09	7440-47-3	
Lead	**1.8**	mg/kg	0.89	0.26	1	07/01/13 13:05	07/02/13 13:09	7439-92-1	
Selenium	**<0.53**	mg/kg	1.8	0.53	1	07/01/13 13:05	07/02/13 13:09	7782-49-2	
Silver	**<0.19**	mg/kg	0.89	0.19	1	07/01/13 13:05	07/02/13 13:09	7440-22-4	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471								
Mercury	**<0.0033**	mg/kg	0.0067	0.0033	1	07/01/13 14:47	07/02/13 12:14	7439-97-6	
8270 MSSV FULL LIST MICROWAVE	Analytical Method: EPA 8270 Preparation Method: EPA 3546								
1,2,4-Trichlorobenzene	**<9.7**	ug/kg	176	9.7	1	07/02/13 08:19	07/02/13 14:51	120-82-1	
1,2-Dichlorobenzene	**<20.1**	ug/kg	176	20.1	1	07/02/13 08:19	07/02/13 14:51	95-50-1	
1,3-Dichlorobenzene	**<20.6**	ug/kg	176	20.6	1	07/02/13 08:19	07/02/13 14:51	541-73-1	
1,4-Dichlorobenzene	**<22.6**	ug/kg	176	22.6	1	07/02/13 08:19	07/02/13 14:51	106-46-7	
2,2'-Oxybis(1-chloropropane)	**<22.5**	ug/kg	176	22.5	1	07/02/13 08:19	07/02/13 14:51	108-60-1	
2,4,5-Trichlorophenol	**<11.6**	ug/kg	176	11.6	1	07/02/13 08:19	07/02/13 14:51	95-95-4	
2,4,6-Trichlorophenol	**<19.4**	ug/kg	176	19.4	1	07/02/13 08:19	07/02/13 14:51	88-06-2	
2,4-Dichlorophenol	**<15.0**	ug/kg	176	15.0	1	07/02/13 08:19	07/02/13 14:51	120-83-2	
2,4-Dimethylphenol	**<87.8**	ug/kg	176	87.8	1	07/02/13 08:19	07/02/13 14:51	105-67-9	
2,4-Dinitrophenol	**<129**	ug/kg	702	129	1	07/02/13 08:19	07/02/13 14:51	51-28-5	
2,4-Dinitrotoluene	**<13.8**	ug/kg	176	13.8	1	07/02/13 08:19	07/02/13 14:51	121-14-2	
2,6-Dinitrotoluene	**<20.3**	ug/kg	176	20.3	1	07/02/13 08:19	07/02/13 14:51	606-20-2	
2-Chloronaphthalene	**<18.3**	ug/kg	176	18.3	1	07/02/13 08:19	07/02/13 14:51	91-58-7	
2-Chlorophenol	**<87.8**	ug/kg	176	87.8	1	07/02/13 08:19	07/02/13 14:51	95-57-8	
2-Methylnaphthalene	**<19.4**	ug/kg	176	19.4	1	07/02/13 08:19	07/02/13 14:51	91-57-6	
2-Methylphenol(o-Cresol)	**<87.8**	ug/kg	176	87.8	1	07/02/13 08:19	07/02/13 14:51	95-48-7	
2-Nitroaniline	**<12.7**	ug/kg	176	12.7	1	07/02/13 08:19	07/02/13 14:51	88-74-4	
2-Nitrophenol	**<21.0**	ug/kg	176	21.0	1	07/02/13 08:19	07/02/13 14:51	88-75-5	
3&4-Methylphenol(m&p Cresol)	**<18.3**	ug/kg	176	18.3	1	07/02/13 08:19	07/02/13 14:51		

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS

Project: 204639 CITY OF MADISON-CUB FOO
Pace Project No.: 4080362

Sample: GP-4 (1.5-5') **Lab ID: 4080362003** Collected: 06/26/13 13:50 Received: 06/28/13 09:45 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8270 MSSV FULL LIST MICROWAVE	Analytical Method: EPA 8270 Preparation Method: EPA 3546								
3,3'-Dichlorobenzidine	**<12.7**	ug/kg	176	12.7	1	07/02/13 08:19	07/02/13 14:51	91-94-1	
3-Nitroaniline	**<13.9**	ug/kg	176	13.9	1	07/02/13 08:19	07/02/13 14:51	99-09-2	
4,6-Dinitro-2-methylphenol	**<87.8**	ug/kg	176	87.8	1	07/02/13 08:19	07/02/13 14:51	534-52-1	
4-Bromophenylphenyl ether	**<18.6**	ug/kg	176	18.6	1	07/02/13 08:19	07/02/13 14:51	101-55-3	
4-Chloro-3-methylphenol	**<17.9**	ug/kg	176	17.9	1	07/02/13 08:19	07/02/13 14:51	59-50-7	
4-Chloroaniline	**<87.8**	ug/kg	351	87.8	1	07/02/13 08:19	07/02/13 14:51	106-47-8	
4-Chlorophenylphenyl ether	**<87.8**	ug/kg	176	87.8	1	07/02/13 08:19	07/02/13 14:51	7005-72-3	
4-Nitroaniline	**<87.8**	ug/kg	176	87.8	1	07/02/13 08:19	07/02/13 14:51	100-01-6	
4-Nitrophenol	**<34.6**	ug/kg	176	34.6	1	07/02/13 08:19	07/02/13 14:51	100-02-7	
Acenaphthene	**<87.8**	ug/kg	176	87.8	1	07/02/13 08:19	07/02/13 14:51	83-32-9	
Acenaphthylene	**<18.8**	ug/kg	176	18.8	1	07/02/13 08:19	07/02/13 14:51	208-96-8	
Anthracene	**<87.8**	ug/kg	176	87.8	1	07/02/13 08:19	07/02/13 14:51	120-12-7	
Benzo(a)anthracene	**<19.8**	ug/kg	176	19.8	1	07/02/13 08:19	07/02/13 14:51	56-55-3	
Benzo(a)pyrene	**<21.3**	ug/kg	176	21.3	1	07/02/13 08:19	07/02/13 14:51	50-32-8	
Benzo(b)fluoranthene	**<20.7**	ug/kg	176	20.7	1	07/02/13 08:19	07/02/13 14:51	205-99-2	
Benzo(g,h,i)perylene	**<87.8**	ug/kg	176	87.8	1	07/02/13 08:19	07/02/13 14:51	191-24-2	
Benzo(k)fluoranthene	**<27.7**	ug/kg	176	27.7	1	07/02/13 08:19	07/02/13 14:51	207-08-9	
Butylbenzylphthalate	**<39.5**	ug/kg	176	39.5	1	07/02/13 08:19	07/02/13 14:51	85-68-7	
Carbazole	**<18.1**	ug/kg	176	18.1	1	07/02/13 08:19	07/02/13 14:51	86-74-8	
Chrysene	**<25.6**	ug/kg	176	25.6	1	07/02/13 08:19	07/02/13 14:51	218-01-9	
Di-n-butylphthalate	**<29.4**	ug/kg	176	29.4	1	07/02/13 08:19	07/02/13 14:51	84-74-2	
Di-n-octylphthalate	**<19.2**	ug/kg	176	19.2	1	07/02/13 08:19	07/02/13 14:51	117-84-0	
Dibenz(a,h)anthracene	**<32.2**	ug/kg	176	32.2	1	07/02/13 08:19	07/02/13 14:51	53-70-3	L2
Dibenzofuran	**<87.8**	ug/kg	176	87.8	1	07/02/13 08:19	07/02/13 14:51	132-64-9	
Diethylphthalate	**<87.8**	ug/kg	176	87.8	1	07/02/13 08:19	07/02/13 14:51	84-66-2	
Dimethylphthalate	**<18.4**	ug/kg	176	18.4	1	07/02/13 08:19	07/02/13 14:51	131-11-3	
Fluoranthene	**<31.1**	ug/kg	176	31.1	1	07/02/13 08:19	07/02/13 14:51	206-44-0	
Fluorene	**<8.8**	ug/kg	176	8.8	1	07/02/13 08:19	07/02/13 14:51	86-73-7	
Hexachloro-1,3-butadiene	**<22.6**	ug/kg	176	22.6	1	07/02/13 08:19	07/02/13 14:51	87-68-3	
Hexachlorobenzene	**<10.3**	ug/kg	176	10.3	1	07/02/13 08:19	07/02/13 14:51	118-74-1	
Hexachlorocyclopentadiene	**<87.8**	ug/kg	176	87.8	1	07/02/13 08:19	07/02/13 14:51	77-47-4	
Hexachloroethane	**<22.2**	ug/kg	176	22.2	1	07/02/13 08:19	07/02/13 14:51	67-72-1	
Indeno(1,2,3-cd)pyrene	**<23.5**	ug/kg	176	23.5	1	07/02/13 08:19	07/02/13 14:51	193-39-5	
Isophorone	**<87.8**	ug/kg	176	87.8	1	07/02/13 08:19	07/02/13 14:51	78-59-1	
N-Nitroso-di-n-propylamine	**<20.8**	ug/kg	176	20.8	1	07/02/13 08:19	07/02/13 14:51	621-64-7	
N-Nitrosodiphenylamine	**<24.1**	ug/kg	176	24.1	1	07/02/13 08:19	07/02/13 14:51	86-30-6	
Naphthalene	**<20.5**	ug/kg	176	20.5	1	07/02/13 08:19	07/02/13 14:51	91-20-3	
Nitrobenzene	**<20.2**	ug/kg	176	20.2	1	07/02/13 08:19	07/02/13 14:51	98-95-3	
Pentachlorophenol	**<87.8**	ug/kg	348	87.8	1	07/02/13 08:19	07/02/13 14:51	87-86-5	
Phenanthrene	**<87.8**	ug/kg	176	87.8	1	07/02/13 08:19	07/02/13 14:51	85-01-8	
Phenol	**<20.9**	ug/kg	176	20.9	1	07/02/13 08:19	07/02/13 14:51	108-95-2	
Pyrene	**<42.7**	ug/kg	176	42.7	1	07/02/13 08:19	07/02/13 14:51	129-00-0	
bis(2-Chloroethoxy)methane	**<21.2**	ug/kg	176	21.2	1	07/02/13 08:19	07/02/13 14:51	111-91-1	
bis(2-Chloroethyl) ether	**<87.8**	ug/kg	176	87.8	1	07/02/13 08:19	07/02/13 14:51	111-44-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
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Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS

Project: 204639 CITY OF MADISON-CUB FOO
Pace Project No.: 4080362

Sample: GP-4 (1.5-5') **Lab ID: 4080362003** Collected: 06/26/13 13:50 Received: 06/28/13 09:45 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8270 MSSV FULL LIST MICROWAVE	Analytical Method: EPA 8270 Preparation Method: EPA 3546								
bis(2-Ethylhexyl)phthalate	**<35.9**	ug/kg	176	35.9	1	07/02/13 08:19	07/02/13 14:51	117-81-7	
Surrogates									
Nitrobenzene-d5 (S)	81	%	40-130		1	07/02/13 08:19	07/02/13 14:51	4165-60-0	
2-Fluorobiphenyl (S)	81	%	53-130		1	07/02/13 08:19	07/02/13 14:51	321-60-8	
Terphenyl-d14 (S)	103	%	36-162		1	07/02/13 08:19	07/02/13 14:51	1718-51-0	
Phenol-d6 (S)	79	%	30-130		1	07/02/13 08:19	07/02/13 14:51	13127-88-3	
2-Fluorophenol (S)	77	%	28-130		1	07/02/13 08:19	07/02/13 14:51	367-12-4	
2,4,6-Tribromophenol (S)	97	%	18-130		1	07/02/13 08:19	07/02/13 14:51	118-79-6	
8260 MSV Med Level Normal List	Analytical Method: EPA 8260 Preparation Method: EPA 5035/5030B								
Benzene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:12	71-43-2	W
Bromobenzene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:12	108-86-1	W
Bromochloromethane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:12	74-97-5	W
Bromodichloromethane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:12	75-27-4	W
Bromoform	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:12	75-25-2	W
Bromomethane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:12	74-83-9	W
n-Butylbenzene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:12	104-51-8	W
sec-Butylbenzene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:12	135-98-8	W
tert-Butylbenzene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:12	98-06-6	W
Carbon tetrachloride	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:12	56-23-5	W
Chlorobenzene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:12	108-90-7	W
Chloroethane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:12	75-00-3	W
Chloroform	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:12	67-66-3	W
Chloromethane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:12	74-87-3	W
2-Chlorotoluene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:12	95-49-8	W
4-Chlorotoluene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:12	106-43-4	W
1,2-Dibromo-3-chloropropane	**<49.8**	ug/kg	250	49.8	1	07/01/13 14:12	07/02/13 01:12	96-12-8	W
Dibromochloromethane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:12	124-48-1	W
1,2-Dibromoethane (EDB)	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:12	106-93-4	W
Dibromomethane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:12	74-95-3	W
1,2-Dichlorobenzene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:12	95-50-1	W
1,3-Dichlorobenzene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:12	541-73-1	W
1,4-Dichlorobenzene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:12	106-46-7	W
Dichlorodifluoromethane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:12	75-71-8	W
1,1-Dichloroethane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:12	75-34-3	W
1,2-Dichloroethane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:12	107-06-2	W
1,1-Dichloroethene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:12	75-35-4	W
cis-1,2-Dichloroethene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:12	156-59-2	W
trans-1,2-Dichloroethene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:12	156-60-5	W
1,2-Dichloropropane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:12	78-87-5	W
1,3-Dichloropropane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:12	142-28-9	W
2,2-Dichloropropane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:12	594-20-7	W
1,1-Dichloropropene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:12	563-58-6	W
cis-1,3-Dichloropropene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:12	10061-01-5	W

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 204639 CITY OF MADISON-CUB FOO
Pace Project No.: 4080362

Sample: GP-4 (1.5-5') **Lab ID: 4080362003** Collected: 06/26/13 13:50 Received: 06/28/13 09:45 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Level Normal List	Analytical Method: EPA 8260 Preparation Method: EPA 5035/5030B								
trans-1,3-Dichloropropene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:12	10061-02-6	W
Diisopropyl ether	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:12	108-20-3	W
Ethylbenzene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:12	100-41-4	W
Hexachloro-1,3-butadiene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:12	87-68-3	W
Isopropylbenzene (Cumene)	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:12	98-82-8	W
p-Isopropyltoluene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:12	99-87-6	W
Methylene Chloride	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:12	75-09-2	W
Methyl-tert-butyl ether	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:12	1634-04-4	W
Naphthalene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:12	91-20-3	W
n-Propylbenzene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:12	103-65-1	W
Styrene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:12	100-42-5	W
1,1,1,2-Tetrachloroethane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:12	630-20-6	W
1,1,2,2-Tetrachloroethane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:12	79-34-5	W
Tetrachloroethene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:12	127-18-4	W
Toluene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:12	108-88-3	W
1,2,3-Trichlorobenzene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:12	87-61-6	W
1,2,4-Trichlorobenzene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:12	120-82-1	W
1,1,1-Trichloroethane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:12	71-55-6	W
1,1,2-Trichloroethane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:12	79-00-5	W
Trichloroethene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:12	79-01-6	W
Trichlorofluoromethane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:12	75-69-4	W
1,2,3-Trichloropropane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:12	96-18-4	W
1,2,4-Trimethylbenzene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:12	95-63-6	W
1,3,5-Trimethylbenzene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:12	108-67-8	W
Vinyl chloride	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:12	75-01-4	W
m&p-Xylene	**<50.0**	ug/kg	120	50.0	1	07/01/13 14:12	07/02/13 01:12	179601-23-1	W
o-Xylene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:12	95-47-6	W
Surrogates									
Dibromofluoromethane (S)	107	%	57-130		1	07/01/13 14:12	07/02/13 01:12	1868-53-7	
Toluene-d8 (S)	108	%	54-133		1	07/01/13 14:12	07/02/13 01:12	2037-26-5	
4-Bromofluorobenzene (S)	105	%	49-130		1	07/01/13 14:12	07/02/13 01:12	460-00-4	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**5.0**	%	0.10	0.10	1		07/01/13 17:05		

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS

Project: 204639 CITY OF MADISON-CUB FOO
Pace Project No.: 4080362

Sample: GP-5 (3.5-5') **Lab ID: 4080362004** Collected: 06/26/13 14:05 Received: 06/28/13 09:45 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Level Normal List	Analytical Method: EPA 8260 Preparation Method: EPA 5035/5030B								
1,1,1,2-Tetrachloroethane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:35	630-20-6	W
1,1,1-Trichloroethane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:35	71-55-6	W
1,1,2,2-Tetrachloroethane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:35	79-34-5	W
1,1,2-Trichloroethane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:35	79-00-5	W
1,1-Dichloroethane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:35	75-34-3	W
1,1-Dichloroethene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:35	75-35-4	W
1,1-Dichloropropene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:35	563-58-6	W
1,2,3-Trichlorobenzene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:35	87-61-6	W
1,2,3-Trichloropropane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:35	96-18-4	W
1,2,4-Trichlorobenzene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:35	120-82-1	W
1,2,4-Trimethylbenzene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:35	95-63-6	W
1,2-Dibromo-3-chloropropane	**<49.8**	ug/kg	250	49.8	1	07/01/13 14:12	07/02/13 01:35	96-12-8	W
1,2-Dibromoethane (EDB)	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:35	106-93-4	W
1,2-Dichlorobenzene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:35	95-50-1	W
1,2-Dichloroethane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:35	107-06-2	W
1,2-Dichloropropane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:35	78-87-5	W
1,3,5-Trimethylbenzene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:35	108-67-8	W
1,3-Dichlorobenzene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:35	541-73-1	W
1,3-Dichloropropane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:35	142-28-9	W
1,4-Dichlorobenzene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:35	106-46-7	W
2,2-Dichloropropane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:35	594-20-7	W
2-Chlorotoluene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:35	95-49-8	W
4-Chlorotoluene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:35	106-43-4	W
Benzene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:35	71-43-2	W
Bromobenzene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:35	108-86-1	W
Bromochloromethane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:35	74-97-5	W
Bromodichloromethane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:35	75-27-4	W
Bromoform	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:35	75-25-2	W
Bromomethane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:35	74-83-9	W
Carbon tetrachloride	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:35	56-23-5	W
Chlorobenzene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:35	108-90-7	W
Chloroethane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:35	75-00-3	W
Chloroform	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:35	67-66-3	W
Chloromethane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:35	74-87-3	W
Dibromochloromethane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:35	124-48-1	W
Dibromomethane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:35	74-95-3	W
Dichlorodifluoromethane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:35	75-71-8	W
Diisopropyl ether	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:35	108-20-3	W
Ethylbenzene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:35	100-41-4	W
Hexachloro-1,3-butadiene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:35	87-68-3	W
Isopropylbenzene (Cumene)	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:35	98-82-8	W
Methyl-tert-butyl ether	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:35	1634-04-4	W
Methylene Chloride	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:35	75-09-2	W
Naphthalene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:35	91-20-3	W
Styrene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:35	100-42-5	W

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS

Project: 204639 CITY OF MADISON-CUB FOO
Pace Project No.: 4080362

Sample: GP-5 (3.5-5') **Lab ID: 4080362004** Collected: 06/26/13 14:05 Received: 06/28/13 09:45 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Level Normal List	Analytical Method: EPA 8260 Preparation Method: EPA 5035/5030B								
Tetrachloroethene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:35	127-18-4	W
Toluene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:35	108-88-3	W
Trichloroethene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:35	79-01-6	W
Trichlorofluoromethane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:35	75-69-4	W
Vinyl chloride	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:35	75-01-4	W
cis-1,2-Dichloroethene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:35	156-59-2	W
cis-1,3-Dichloropropene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:35	10061-01-5	W
m&p-Xylene	**<50.0**	ug/kg	120	50.0	1	07/01/13 14:12	07/02/13 01:35	179601-23-1	W
n-Butylbenzene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:35	104-51-8	W
n-Propylbenzene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:35	103-65-1	W
o-Xylene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:35	95-47-6	W
p-Isopropyltoluene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:35	99-87-6	W
sec-Butylbenzene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:35	135-98-8	W
tert-Butylbenzene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:35	98-06-6	W
trans-1,2-Dichloroethene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:35	156-60-5	W
trans-1,3-Dichloropropene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:35	10061-02-6	W
Surrogates									
Dibromofluoromethane (S)	96	%	57-130		1	07/01/13 14:12	07/02/13 01:35	1868-53-7	
Toluene-d8 (S)	100	%	54-133		1	07/01/13 14:12	07/02/13 01:35	2037-26-5	
4-Bromofluorobenzene (S)	95	%	49-130		1	07/01/13 14:12	07/02/13 01:35	460-00-4	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**2.1**	%	0.10	0.10	1		07/01/13 17:05		

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS

Project: 204639 CITY OF MADISON-CUB FOO
Pace Project No.: 4080362

Sample: GP-5 (17-19') **Lab ID: 4080362005** Collected: 06/26/13 14:15 Received: 06/28/13 09:45 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Level Normal List	Analytical Method: EPA 8260 Preparation Method: EPA 5035/5030B								
1,1,1,2-Tetrachloroethane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:58	630-20-6	W
1,1,1-Trichloroethane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:58	71-55-6	W
1,1,2,2-Tetrachloroethane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:58	79-34-5	W
1,1,2-Trichloroethane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:58	79-00-5	W
1,1-Dichloroethane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:58	75-34-3	W
1,1-Dichloroethene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:58	75-35-4	W
1,1-Dichloropropene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:58	563-58-6	W
1,2,3-Trichlorobenzene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:58	87-61-6	W
1,2,3-Trichloropropane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:58	96-18-4	W
1,2,4-Trichlorobenzene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:58	120-82-1	W
1,2,4-Trimethylbenzene	**334**	ug/kg	68.6	28.6	1	07/01/13 14:12	07/02/13 01:58	95-63-6	
1,2-Dibromo-3-chloropropane	**<49.8**	ug/kg	250	49.8	1	07/01/13 14:12	07/02/13 01:58	96-12-8	W
1,2-Dibromoethane (EDB)	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:58	106-93-4	W
1,2-Dichlorobenzene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:58	95-50-1	W
1,2-Dichloroethane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:58	107-06-2	W
1,2-Dichloropropane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:58	78-87-5	W
1,3,5-Trimethylbenzene	**86.4**	ug/kg	68.6	28.6	1	07/01/13 14:12	07/02/13 01:58	108-67-8	
1,3-Dichlorobenzene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:58	541-73-1	W
1,3-Dichloropropane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:58	142-28-9	W
1,4-Dichlorobenzene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:58	106-46-7	W
2,2-Dichloropropane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:58	594-20-7	W
2-Chlorotoluene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:58	95-49-8	W
4-Chlorotoluene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:58	106-43-4	W
Benzene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:58	71-43-2	W
Bromobenzene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:58	108-86-1	W
Bromochloromethane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:58	74-97-5	W
Bromodichloromethane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:58	75-27-4	W
Bromoform	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:58	75-25-2	W
Bromomethane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:58	74-83-9	W
Carbon tetrachloride	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:58	56-23-5	W
Chlorobenzene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:58	108-90-7	W
Chloroethane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:58	75-00-3	W
Chloroform	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:58	67-66-3	W
Chloromethane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:58	74-87-3	W
Dibromochloromethane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:58	124-48-1	W
Dibromomethane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:58	74-95-3	W
Dichlorodifluoromethane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:58	75-71-8	W
Diisopropyl ether	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:58	108-20-3	W
Ethylbenzene	**150**	ug/kg	68.6	28.6	1	07/01/13 14:12	07/02/13 01:58	100-41-4	
Hexachloro-1,3-butadiene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:58	87-68-3	W
Isopropylbenzene (Cumene)	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:58	98-82-8	W
Methyl-tert-butyl ether	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:58	1634-04-4	W
Methylene Chloride	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:58	75-09-2	W
Naphthalene	**123**	ug/kg	68.6	28.6	1	07/01/13 14:12	07/02/13 01:58	91-20-3	
Styrene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:58	100-42-5	W

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS

Project: 204639 CITY OF MADISON-CUB FOO
Pace Project No.: 4080362

Sample: GP-5 (17-19') **Lab ID: 4080362005** Collected: 06/26/13 14:15 Received: 06/28/13 09:45 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Level Normal List	Analytical Method: EPA 8260 Preparation Method: EPA 5035/5030B								
Tetrachloroethene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:58	127-18-4	W
Toluene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:58	108-88-3	W
Trichloroethene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:58	79-01-6	W
Trichlorofluoromethane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:58	75-69-4	W
Vinyl chloride	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:58	75-01-4	W
cis-1,2-Dichloroethene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:58	156-59-2	W
cis-1,3-Dichloropropene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:58	10061-01-5	W
m&p-Xylene	**511**	ug/kg	137	57.2	1	07/01/13 14:12	07/02/13 01:58	179601-23-1	
n-Butylbenzene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:58	104-51-8	W
n-Propylbenzene	**31.6J**	ug/kg	68.6	28.6	1	07/01/13 14:12	07/02/13 01:58	103-65-1	
o-Xylene	**85.6**	ug/kg	68.6	28.6	1	07/01/13 14:12	07/02/13 01:58	95-47-6	
p-Isopropyltoluene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:58	99-87-6	W
sec-Butylbenzene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:58	135-98-8	W
tert-Butylbenzene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:58	98-06-6	W
trans-1,2-Dichloroethene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:58	156-60-5	W
trans-1,3-Dichloropropene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 01:58	10061-02-6	W
Surrogates									
Dibromofluoromethane (S)	94	%	57-130		1	07/01/13 14:12	07/02/13 01:58	1868-53-7	
Toluene-d8 (S)	96	%	54-133		1	07/01/13 14:12	07/02/13 01:58	2037-26-5	
4-Bromofluorobenzene (S)	92	%	49-130		1	07/01/13 14:12	07/02/13 01:58	460-00-4	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**12.5**	%	0.10	0.10	1		07/01/13 17:25		

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS

Project: 204639 CITY OF MADISON-CUB FOO
Pace Project No.: 4080362

Sample: GP-6 (7.5-10') **Lab ID: 4080362006** Collected: 06/26/13 11:50 Received: 06/28/13 09:45 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Lead	**1.5**	mg/kg	0.95	0.28	1	07/01/13 13:05	07/02/13 13:11	7439-92-1	
8260 MSV Med Level Normal List	Analytical Method: EPA 8260 Preparation Method: EPA 5035/5030B								
1,1,1,2-Tetrachloroethane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 02:20	630-20-6	W
1,1,1-Trichloroethane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 02:20	71-55-6	W
1,1,2,2-Tetrachloroethane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 02:20	79-34-5	W
1,1,2-Trichloroethane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 02:20	79-00-5	W
1,1-Dichloroethane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 02:20	75-34-3	W
1,1-Dichloroethene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 02:20	75-35-4	W
1,1-Dichloropropene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 02:20	563-58-6	W
1,2,3-Trichlorobenzene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 02:20	87-61-6	W
1,2,3-Trichloropropane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 02:20	96-18-4	W
1,2,4-Trichlorobenzene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 02:20	120-82-1	W
1,2,4-Trimethylbenzene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 02:20	95-63-6	W
1,2-Dibromo-3-chloropropane	**<49.8**	ug/kg	250	49.8	1	07/01/13 14:12	07/02/13 02:20	96-12-8	W
1,2-Dibromoethane (EDB)	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 02:20	106-93-4	W
1,2-Dichlorobenzene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 02:20	95-50-1	W
1,2-Dichloroethane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 02:20	107-06-2	W
1,2-Dichloropropane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 02:20	78-87-5	W
1,3,5-Trimethylbenzene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 02:20	108-67-8	W
1,3-Dichlorobenzene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 02:20	541-73-1	W
1,3-Dichloropropane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 02:20	142-28-9	W
1,4-Dichlorobenzene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 02:20	106-46-7	W
2,2-Dichloropropane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 02:20	594-20-7	W
2-Chlorotoluene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 02:20	95-49-8	W
4-Chlorotoluene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 02:20	106-43-4	W
Benzene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 02:20	71-43-2	W
Bromobenzene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 02:20	108-86-1	W
Bromochloromethane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 02:20	74-97-5	W
Bromodichloromethane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 02:20	75-27-4	W
Bromoform	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 02:20	75-25-2	W
Bromomethane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 02:20	74-83-9	W
Carbon tetrachloride	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 02:20	56-23-5	W
Chlorobenzene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 02:20	108-90-7	W
Chloroethane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 02:20	75-00-3	W
Chloroform	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 02:20	67-66-3	W
Chloromethane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 02:20	74-87-3	W
Dibromochloromethane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 02:20	124-48-1	W
Dibromomethane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 02:20	74-95-3	W
Dichlorodifluoromethane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 02:20	75-71-8	W
Diisopropyl ether	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 02:20	108-20-3	W
Ethylbenzene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 02:20	100-41-4	W
Hexachloro-1,3-butadiene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 02:20	87-68-3	W
Isopropylbenzene (Cumene)	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 02:20	98-82-8	W
Methyl-tert-butyl ether	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 02:20	1634-04-4	W

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
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(920)469-2436

ANALYTICAL RESULTS

Project: 204639 CITY OF MADISON-CUB FOO
Pace Project No.: 4080362

Sample: GP-6 (7.5-10') **Lab ID: 4080362006** Collected: 06/26/13 11:50 Received: 06/28/13 09:45 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Level Normal List	Analytical Method: EPA 8260 Preparation Method: EPA 5035/5030B								
Methylene Chloride	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 02:20	75-09-2	W
Naphthalene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 02:20	91-20-3	W
Styrene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 02:20	100-42-5	W
Tetrachloroethene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 02:20	127-18-4	W
Toluene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 02:20	108-88-3	W
Trichloroethene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 02:20	79-01-6	W
Trichlorofluoromethane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 02:20	75-69-4	W
Vinyl chloride	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 02:20	75-01-4	W
cis-1,2-Dichloroethene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 02:20	156-59-2	W
cis-1,3-Dichloropropene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 02:20	10061-01-5	W
m&p-Xylene	**<50.0**	ug/kg	120	50.0	1	07/01/13 14:12	07/02/13 02:20	179601-23-1	W
n-Butylbenzene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 02:20	104-51-8	W
n-Propylbenzene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 02:20	103-65-1	W
o-Xylene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 02:20	95-47-6	W
p-Isopropyltoluene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 02:20	99-87-6	W
sec-Butylbenzene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 02:20	135-98-8	W
tert-Butylbenzene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 02:20	98-06-6	W
trans-1,2-Dichloroethene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 02:20	156-60-5	W
trans-1,3-Dichloropropene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 02:20	10061-02-6	W
Surrogates									
Dibromofluoromethane (S)	94	%	57-130		1	07/01/13 14:12	07/02/13 02:20	1868-53-7	
Toluene-d8 (S)	97	%	54-133		1	07/01/13 14:12	07/02/13 02:20	2037-26-5	
4-Bromofluorobenzene (S)	91	%	49-130		1	07/01/13 14:12	07/02/13 02:20	460-00-4	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**2.9**	%	0.10	0.10	1		07/01/13 17:25		

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS

Project: 204639 CITY OF MADISON-CUB FOO
Pace Project No.: 4080362

Sample: GP-7 (0.5-3') **Lab ID: 4080362007** Collected: 06/26/13 12:10 Received: 06/28/13 09:45 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010		Preparation Method: EPA 3050						
Lead	**17.5**	mg/kg	0.99	0.29	1	07/01/13 13:05	07/02/13 13:13	7439-92-1	
8260 MSV Med Level Normal List	Analytical Method: EPA 8260		Preparation Method: EPA 5035/5030B						
1,1,1,2-Tetrachloroethane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 02:43	630-20-6	W
1,1,1-Trichloroethane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 02:43	71-55-6	W
1,1,2,2-Tetrachloroethane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 02:43	79-34-5	W
1,1,2-Trichloroethane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 02:43	79-00-5	W
1,1-Dichloroethane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 02:43	75-34-3	W
1,1-Dichloroethene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 02:43	75-35-4	W
1,1-Dichloropropene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 02:43	563-58-6	W
1,2,3-Trichlorobenzene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 02:43	87-61-6	W
1,2,3-Trichloropropane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 02:43	96-18-4	W
1,2,4-Trichlorobenzene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 02:43	120-82-1	W
1,2,4-Trimethylbenzene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 02:43	95-63-6	W
1,2-Dibromo-3-chloropropane	**<49.8**	ug/kg	250	49.8	1	07/01/13 14:12	07/02/13 02:43	96-12-8	W
1,2-Dibromoethane (EDB)	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 02:43	106-93-4	W
1,2-Dichlorobenzene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 02:43	95-50-1	W
1,2-Dichloroethane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 02:43	107-06-2	W
1,2-Dichloropropane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 02:43	78-87-5	W
1,3,5-Trimethylbenzene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 02:43	108-67-8	W
1,3-Dichlorobenzene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 02:43	541-73-1	W
1,3-Dichloropropane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 02:43	142-28-9	W
1,4-Dichlorobenzene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 02:43	106-46-7	W
2,2-Dichloropropane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 02:43	594-20-7	W
2-Chlorotoluene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 02:43	95-49-8	W
4-Chlorotoluene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 02:43	106-43-4	W
Benzene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 02:43	71-43-2	W
Bromobenzene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 02:43	108-86-1	W
Bromochloromethane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 02:43	74-97-5	W
Bromodichloromethane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 02:43	75-27-4	W
Bromoform	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 02:43	75-25-2	W
Bromomethane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 02:43	74-83-9	W
Carbon tetrachloride	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 02:43	56-23-5	W
Chlorobenzene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 02:43	108-90-7	W
Chloroethane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 02:43	75-00-3	W
Chloroform	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 02:43	67-66-3	W
Chloromethane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 02:43	74-87-3	W
Dibromochloromethane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 02:43	124-48-1	W
Dibromomethane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 02:43	74-95-3	W
Dichlorodifluoromethane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 02:43	75-71-8	W
Diisopropyl ether	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 02:43	108-20-3	W
Ethylbenzene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 02:43	100-41-4	W
Hexachloro-1,3-butadiene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 02:43	87-68-3	W
Isopropylbenzene (Cumene)	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 02:43	98-82-8	W
Methyl-tert-butyl ether	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 02:43	1634-04-4	W

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS

Project: 204639 CITY OF MADISON-CUB FOO
Pace Project No.: 4080362

Sample: GP-7 (0.5-3') **Lab ID: 4080362007** Collected: 06/26/13 12:10 Received: 06/28/13 09:45 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Level Normal List	Analytical Method: EPA 8260 Preparation Method: EPA 5035/5030B								
Methylene Chloride	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 02:43	75-09-2	W
Naphthalene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 02:43	91-20-3	W
Styrene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 02:43	100-42-5	W
Tetrachloroethene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 02:43	127-18-4	W
Toluene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 02:43	108-88-3	W
Trichloroethene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 02:43	79-01-6	W
Trichlorofluoromethane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 02:43	75-69-4	W
Vinyl chloride	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 02:43	75-01-4	W
cis-1,2-Dichloroethene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 02:43	156-59-2	W
cis-1,3-Dichloropropene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 02:43	10061-01-5	W
m&p-Xylene	**<50.0**	ug/kg	120	50.0	1	07/01/13 14:12	07/02/13 02:43	179601-23-1	W
n-Butylbenzene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 02:43	104-51-8	W
n-Propylbenzene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 02:43	103-65-1	W
o-Xylene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 02:43	95-47-6	W
p-Isopropyltoluene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 02:43	99-87-6	W
sec-Butylbenzene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 02:43	135-98-8	W
tert-Butylbenzene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 02:43	98-06-6	W
trans-1,2-Dichloroethene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 02:43	156-60-5	W
trans-1,3-Dichloropropene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 02:43	10061-02-6	W
Surrogates									
Dibromofluoromethane (S)	93	%	57-130		1	07/01/13 14:12	07/02/13 02:43	1868-53-7	
Toluene-d8 (S)	101	%	54-133		1	07/01/13 14:12	07/02/13 02:43	2037-26-5	
4-Bromofluorobenzene (S)	94	%	49-130		1	07/01/13 14:12	07/02/13 02:43	460-00-4	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**5.7**	%	0.10	0.10	1		07/01/13 17:25		

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS

Project: 204639 CITY OF MADISON-CUB FOO
Pace Project No.: 4080362

Sample: TW-1 **Lab ID: 4080362008** Collected: 06/26/13 15:20 Received: 06/28/13 09:45 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 8260								
Benzene	**<2.5**	ug/L	5.0	2.5	5		06/29/13 20:42	71-43-2	
Bromobenzene	**<2.4**	ug/L	5.0	2.4	5		06/29/13 20:42	108-86-1	
Bromochloromethane	**<2.5**	ug/L	5.0	2.5	5		06/29/13 20:42	74-97-5	
Bromodichloromethane	**<2.3**	ug/L	5.0	2.3	5		06/29/13 20:42	75-27-4	
Bromoform	**<1.2**	ug/L	5.0	1.2	5		06/29/13 20:42	75-25-2	
Bromomethane	**<2.1**	ug/L	25.0	2.1	5		06/29/13 20:42	74-83-9	
n-Butylbenzene	**22.1**	ug/L	5.0	2.0	5		06/29/13 20:42	104-51-8	
sec-Butylbenzene	**7.2J**	ug/L	25.0	3.0	5		06/29/13 20:42	135-98-8	
tert-Butylbenzene	**<2.1**	ug/L	5.0	2.1	5		06/29/13 20:42	98-06-6	
Carbon tetrachloride	**<1.8**	ug/L	5.0	1.8	5		06/29/13 20:42	56-23-5	
Chlorobenzene	**<1.8**	ug/L	5.0	1.8	5		06/29/13 20:42	108-90-7	
Chloroethane	**<2.2**	ug/L	5.0	2.2	5		06/29/13 20:42	75-00-3	
Chloroform	**<3.4**	ug/L	25.0	3.4	5		06/29/13 20:42	67-66-3	
Chloromethane	**<1.9**	ug/L	5.0	1.9	5		06/29/13 20:42	74-87-3	
2-Chlorotoluene	**<2.4**	ug/L	5.0	2.4	5		06/29/13 20:42	95-49-8	
4-Chlorotoluene	**<2.4**	ug/L	5.0	2.4	5		06/29/13 20:42	106-43-4	
1,2-Dibromo-3-chloropropane	**<7.5**	ug/L	25.0	7.5	5		06/29/13 20:42	96-12-8	
Dibromochloromethane	**<9.5**	ug/L	25.0	9.5	5		06/29/13 20:42	124-48-1	
1,2-Dibromoethane (EDB)	**<1.9**	ug/L	5.0	1.9	5		06/29/13 20:42	106-93-4	
Dibromomethane	**<2.4**	ug/L	5.0	2.4	5		06/29/13 20:42	74-95-3	
1,2-Dichlorobenzene	**<2.2**	ug/L	5.0	2.2	5		06/29/13 20:42	95-50-1	
1,3-Dichlorobenzene	**<2.3**	ug/L	5.0	2.3	5		06/29/13 20:42	541-73-1	
1,4-Dichlorobenzene	**<2.2**	ug/L	5.0	2.2	5		06/29/13 20:42	106-46-7	
Dichlorodifluoromethane	**<2.0**	ug/L	5.0	2.0	5		06/29/13 20:42	75-71-8	
1,1-Dichloroethane	**<1.4**	ug/L	5.0	1.4	5		06/29/13 20:42	75-34-3	
1,2-Dichloroethane	**<2.4**	ug/L	5.0	2.4	5		06/29/13 20:42	107-06-2	
1,1-Dichloroethene	**<2.1**	ug/L	5.0	2.1	5		06/29/13 20:42	75-35-4	
cis-1,2-Dichloroethene	**<2.1**	ug/L	5.0	2.1	5		06/29/13 20:42	156-59-2	
trans-1,2-Dichloroethene	**<1.9**	ug/L	5.0	1.9	5		06/29/13 20:42	156-60-5	
1,2-Dichloropropane	**<2.5**	ug/L	5.0	2.5	5		06/29/13 20:42	78-87-5	
1,3-Dichloropropane	**<2.3**	ug/L	5.0	2.3	5		06/29/13 20:42	142-28-9	
2,2-Dichloropropane	**<1.8**	ug/L	5.0	1.8	5		06/29/13 20:42	594-20-7	
1,1-Dichloropropene	**<2.5**	ug/L	5.0	2.5	5		06/29/13 20:42	563-58-6	
cis-1,3-Dichloropropene	**<1.5**	ug/L	5.0	1.5	5		06/29/13 20:42	10061-01-5	
trans-1,3-Dichloropropene	**<1.3**	ug/L	5.0	1.3	5		06/29/13 20:42	10061-02-6	
Diisopropyl ether	**<2.5**	ug/L	5.0	2.5	5		06/29/13 20:42	108-20-3	
Ethylbenzene	**499**	ug/L	5.0	2.5	5		06/29/13 20:42	100-41-4	
Hexachloro-1,3-butadiene	**<6.3**	ug/L	25.0	6.3	5		06/29/13 20:42	87-68-3	
Isopropylbenzene (Cumene)	**36.6**	ug/L	5.0	1.7	5		06/29/13 20:42	98-82-8	
p-Isopropyltoluene	**5.0J**	ug/L	5.0	2.0	5		06/29/13 20:42	99-87-6	
Methylene Chloride	**<1.8**	ug/L	5.0	1.8	5		06/29/13 20:42	75-09-2	
Methyl-tert-butyl ether	**<2.5**	ug/L	5.0	2.5	5		06/29/13 20:42	1634-04-4	
Naphthalene	**108**	ug/L	25.0	12.5	5		06/29/13 20:42	91-20-3	
n-Propylbenzene	**129**	ug/L	5.0	2.5	5		06/29/13 20:42	103-65-1	
Styrene	**<1.7**	ug/L	5.0	1.7	5		06/29/13 20:42	100-42-5	
1,1,1,2-Tetrachloroethane	**<2.3**	ug/L	5.0	2.3	5		06/29/13 20:42	630-20-6	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS

Project: 204639 CITY OF MADISON-CUB FOO
Pace Project No.: 4080362

Sample: TW-1 **Lab ID: 4080362008** Collected: 06/26/13 15:20 Received: 06/28/13 09:45 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 8260								
1,1,2,2-Tetrachloroethane	**<1.9**	ug/L	5.0	1.9	5		06/29/13 20:42	79-34-5	
Tetrachloroethene	**<2.4**	ug/L	5.0	2.4	5		06/29/13 20:42	127-18-4	
Toluene	**15.7**	ug/L	5.0	2.2	5		06/29/13 20:42	108-88-3	
1,2,3-Trichlorobenzene	**<3.8**	ug/L	25.0	3.8	5		06/29/13 20:42	87-61-6	
1,2,4-Trichlorobenzene	**<12.5**	ug/L	25.0	12.5	5		06/29/13 20:42	120-82-1	
1,1,1-Trichloroethane	**<2.2**	ug/L	5.0	2.2	5		06/29/13 20:42	71-55-6	
1,1,2-Trichloroethane	**<1.9**	ug/L	5.0	1.9	5		06/29/13 20:42	79-00-5	
Trichloroethene	**<2.1**	ug/L	5.0	2.1	5		06/29/13 20:42	79-01-6	
Trichlorofluoromethane	**<2.4**	ug/L	5.0	2.4	5		06/29/13 20:42	75-69-4	
1,2,3-Trichloropropane	**<2.3**	ug/L	5.0	2.3	5		06/29/13 20:42	96-18-4	
1,2,4-Trimethylbenzene	**924**	ug/L	25.0	2.9	5		06/29/13 20:42	95-63-6	
1,3,5-Trimethylbenzene	**33.0**	ug/L	25.0	12.5	5		06/29/13 20:42	108-67-8	
Vinyl chloride	**<0.92**	ug/L	5.0	0.92	5		06/29/13 20:42	75-01-4	
m&p-Xylene	**632**	ug/L	10.0	4.1	5		06/29/13 20:42	179601-23-1	
o-Xylene	**81.9**	ug/L	5.0	2.5	5		06/29/13 20:42	95-47-6	
Surrogates									
4-Bromofluorobenzene (S)	103	%	43-137		5		06/29/13 20:42	460-00-4	
Dibromofluoromethane (S)	96	%	70-130		5		06/29/13 20:42	1868-53-7	
Toluene-d8 (S)	100	%	55-137		5		06/29/13 20:42	2037-26-5	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS

Project: 204639 CITY OF MADISON-CUB FOO
Pace Project No.: 4080362

Sample: TW-2 **Lab ID: 4080362009** Collected: 06/26/13 19:00 Received: 06/28/13 09:45 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 8260								
Benzene	**<0.50**	ug/L	1.0	0.50	1		06/29/13 19:34	71-43-2	
Bromobenzene	**<0.48**	ug/L	1.0	0.48	1		06/29/13 19:34	108-86-1	
Bromochloromethane	**<0.49**	ug/L	1.0	0.49	1		06/29/13 19:34	74-97-5	
Bromodichloromethane	**<0.45**	ug/L	1.0	0.45	1		06/29/13 19:34	75-27-4	
Bromoform	**<0.23**	ug/L	1.0	0.23	1		06/29/13 19:34	75-25-2	
Bromomethane	**<0.43**	ug/L	5.0	0.43	1		06/29/13 19:34	74-83-9	
n-Butylbenzene	**<0.40**	ug/L	1.0	0.40	1		06/29/13 19:34	104-51-8	
sec-Butylbenzene	**<0.60**	ug/L	5.0	0.60	1		06/29/13 19:34	135-98-8	
tert-Butylbenzene	**<0.42**	ug/L	1.0	0.42	1		06/29/13 19:34	98-06-6	
Carbon tetrachloride	**<0.37**	ug/L	1.0	0.37	1		06/29/13 19:34	56-23-5	
Chlorobenzene	**<0.36**	ug/L	1.0	0.36	1		06/29/13 19:34	108-90-7	
Chloroethane	**<0.44**	ug/L	1.0	0.44	1		06/29/13 19:34	75-00-3	
Chloroform	**<0.69**	ug/L	5.0	0.69	1		06/29/13 19:34	67-66-3	
Chloromethane	**<0.39**	ug/L	1.0	0.39	1		06/29/13 19:34	74-87-3	
2-Chlorotoluene	**<0.48**	ug/L	1.0	0.48	1		06/29/13 19:34	95-49-8	
4-Chlorotoluene	**<0.48**	ug/L	1.0	0.48	1		06/29/13 19:34	106-43-4	
1,2-Dibromo-3-chloropropane	**<1.5**	ug/L	5.0	1.5	1		06/29/13 19:34	96-12-8	
Dibromochloromethane	**<1.9**	ug/L	5.0	1.9	1		06/29/13 19:34	124-48-1	
1,2-Dibromoethane (EDB)	**<0.38**	ug/L	1.0	0.38	1		06/29/13 19:34	106-93-4	
Dibromomethane	**<0.48**	ug/L	1.0	0.48	1		06/29/13 19:34	74-95-3	
1,2-Dichlorobenzene	**<0.44**	ug/L	1.0	0.44	1		06/29/13 19:34	95-50-1	
1,3-Dichlorobenzene	**<0.45**	ug/L	1.0	0.45	1		06/29/13 19:34	541-73-1	
1,4-Dichlorobenzene	**<0.43**	ug/L	1.0	0.43	1		06/29/13 19:34	106-46-7	
Dichlorodifluoromethane	**<0.40**	ug/L	1.0	0.40	1		06/29/13 19:34	75-71-8	
1,1-Dichloroethane	**<0.28**	ug/L	1.0	0.28	1		06/29/13 19:34	75-34-3	
1,2-Dichloroethane	**<0.48**	ug/L	1.0	0.48	1		06/29/13 19:34	107-06-2	
1,1-Dichloroethene	**<0.43**	ug/L	1.0	0.43	1		06/29/13 19:34	75-35-4	
cis-1,2-Dichloroethene	**2.2**	ug/L	1.0	0.42	1		06/29/13 19:34	156-59-2	
trans-1,2-Dichloroethene	**<0.37**	ug/L	1.0	0.37	1		06/29/13 19:34	156-60-5	
1,2-Dichloropropane	**<0.50**	ug/L	1.0	0.50	1		06/29/13 19:34	78-87-5	
1,3-Dichloropropane	**<0.46**	ug/L	1.0	0.46	1		06/29/13 19:34	142-28-9	
2,2-Dichloropropane	**<0.37**	ug/L	1.0	0.37	1		06/29/13 19:34	594-20-7	
1,1-Dichloropropene	**<0.51**	ug/L	1.0	0.51	1		06/29/13 19:34	563-58-6	
cis-1,3-Dichloropropene	**<0.29**	ug/L	1.0	0.29	1		06/29/13 19:34	10061-01-5	
trans-1,3-Dichloropropene	**<0.26**	ug/L	1.0	0.26	1		06/29/13 19:34	10061-02-6	
Diisopropyl ether	**<0.50**	ug/L	1.0	0.50	1		06/29/13 19:34	108-20-3	
Ethylbenzene	**<0.50**	ug/L	1.0	0.50	1		06/29/13 19:34	100-41-4	
Hexachloro-1,3-butadiene	**<1.3**	ug/L	5.0	1.3	1		06/29/13 19:34	87-68-3	
Isopropylbenzene (Cumene)	**<0.34**	ug/L	1.0	0.34	1		06/29/13 19:34	98-82-8	
p-Isopropyltoluene	**<0.40**	ug/L	1.0	0.40	1		06/29/13 19:34	99-87-6	
Methylene Chloride	**<0.36**	ug/L	1.0	0.36	1		06/29/13 19:34	75-09-2	
Methyl-tert-butyl ether	**<0.49**	ug/L	1.0	0.49	1		06/29/13 19:34	1634-04-4	
Naphthalene	**<2.5**	ug/L	5.0	2.5	1		06/29/13 19:34	91-20-3	
n-Propylbenzene	**<0.50**	ug/L	1.0	0.50	1		06/29/13 19:34	103-65-1	
Styrene	**<0.35**	ug/L	1.0	0.35	1		06/29/13 19:34	100-42-5	
1,1,1,2-Tetrachloroethane	**<0.45**	ug/L	1.0	0.45	1		06/29/13 19:34	630-20-6	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS

Project: 204639 CITY OF MADISON-CUB FOO
Pace Project No.: 4080362

Sample: TW-2 **Lab ID: 4080362009** Collected: 06/26/13 19:00 Received: 06/28/13 09:45 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 8260								
1,1,2,2-Tetrachloroethane	**<0.38**	ug/L	1.0	0.38	1		06/29/13 19:34	79-34-5	
Tetrachloroethene	**<0.47**	ug/L	1.0	0.47	1		06/29/13 19:34	127-18-4	
Toluene	**<0.44**	ug/L	1.0	0.44	1		06/29/13 19:34	108-88-3	
1,2,3-Trichlorobenzene	**<0.77**	ug/L	5.0	0.77	1		06/29/13 19:34	87-61-6	
1,2,4-Trichlorobenzene	**<2.5**	ug/L	5.0	2.5	1		06/29/13 19:34	120-82-1	
1,1,1-Trichloroethane	**<0.44**	ug/L	1.0	0.44	1		06/29/13 19:34	71-55-6	
1,1,2-Trichloroethane	**<0.39**	ug/L	1.0	0.39	1		06/29/13 19:34	79-00-5	
Trichloroethene	**0.62J**	ug/L	1.0	0.43	1		06/29/13 19:34	79-01-6	
Trichlorofluoromethane	**1.2**	ug/L	1.0	0.48	1		06/29/13 19:34	75-69-4	
1,2,3-Trichloropropane	**<0.47**	ug/L	1.0	0.47	1		06/29/13 19:34	96-18-4	
1,2,4-Trimethylbenzene	**<0.57**	ug/L	5.0	0.57	1		06/29/13 19:34	95-63-6	
1,3,5-Trimethylbenzene	**<2.5**	ug/L	5.0	2.5	1		06/29/13 19:34	108-67-8	
Vinyl chloride	**<0.18**	ug/L	1.0	0.18	1		06/29/13 19:34	75-01-4	
m&p-Xylene	**<0.82**	ug/L	2.0	0.82	1		06/29/13 19:34	179601-23-1	
o-Xylene	**<0.50**	ug/L	1.0	0.50	1		06/29/13 19:34	95-47-6	
Surrogates									
4-Bromofluorobenzene (S)	96	%	43-137		1		06/29/13 19:34	460-00-4	
Dibromofluoromethane (S)	103	%	70-130		1		06/29/13 19:34	1868-53-7	
Toluene-d8 (S)	101	%	55-137		1		06/29/13 19:34	2037-26-5	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS

Project: 204639 CITY OF MADISON-CUB FOO
Pace Project No.: 4080362

Sample: TW-3 **Lab ID: 4080362010** Collected: 06/26/13 18:45 Received: 06/28/13 09:45 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 8260								
Benzene	**<0.50**	ug/L	1.0	0.50	1		06/29/13 19:57	71-43-2	
Bromobenzene	**<0.48**	ug/L	1.0	0.48	1		06/29/13 19:57	108-86-1	
Bromochloromethane	**<0.49**	ug/L	1.0	0.49	1		06/29/13 19:57	74-97-5	
Bromodichloromethane	**<0.45**	ug/L	1.0	0.45	1		06/29/13 19:57	75-27-4	
Bromoform	**<0.23**	ug/L	1.0	0.23	1		06/29/13 19:57	75-25-2	
Bromomethane	**<0.43**	ug/L	5.0	0.43	1		06/29/13 19:57	74-83-9	
n-Butylbenzene	**<0.40**	ug/L	1.0	0.40	1		06/29/13 19:57	104-51-8	
sec-Butylbenzene	**<0.60**	ug/L	5.0	0.60	1		06/29/13 19:57	135-98-8	
tert-Butylbenzene	**<0.42**	ug/L	1.0	0.42	1		06/29/13 19:57	98-06-6	
Carbon tetrachloride	**<0.37**	ug/L	1.0	0.37	1		06/29/13 19:57	56-23-5	
Chlorobenzene	**<0.36**	ug/L	1.0	0.36	1		06/29/13 19:57	108-90-7	
Chloroethane	**<0.44**	ug/L	1.0	0.44	1		06/29/13 19:57	75-00-3	
Chloroform	**<0.69**	ug/L	5.0	0.69	1		06/29/13 19:57	67-66-3	
Chloromethane	**<0.39**	ug/L	1.0	0.39	1		06/29/13 19:57	74-87-3	
2-Chlorotoluene	**<0.48**	ug/L	1.0	0.48	1		06/29/13 19:57	95-49-8	
4-Chlorotoluene	**<0.48**	ug/L	1.0	0.48	1		06/29/13 19:57	106-43-4	
1,2-Dibromo-3-chloropropane	**<1.5**	ug/L	5.0	1.5	1		06/29/13 19:57	96-12-8	
Dibromochloromethane	**<1.9**	ug/L	5.0	1.9	1		06/29/13 19:57	124-48-1	
1,2-Dibromoethane (EDB)	**<0.38**	ug/L	1.0	0.38	1		06/29/13 19:57	106-93-4	
Dibromomethane	**<0.48**	ug/L	1.0	0.48	1		06/29/13 19:57	74-95-3	
1,2-Dichlorobenzene	**<0.44**	ug/L	1.0	0.44	1		06/29/13 19:57	95-50-1	
1,3-Dichlorobenzene	**<0.45**	ug/L	1.0	0.45	1		06/29/13 19:57	541-73-1	
1,4-Dichlorobenzene	**<0.43**	ug/L	1.0	0.43	1		06/29/13 19:57	106-46-7	
Dichlorodifluoromethane	**<0.40**	ug/L	1.0	0.40	1		06/29/13 19:57	75-71-8	
1,1-Dichloroethane	**<0.28**	ug/L	1.0	0.28	1		06/29/13 19:57	75-34-3	
1,2-Dichloroethane	**<0.48**	ug/L	1.0	0.48	1		06/29/13 19:57	107-06-2	
1,1-Dichloroethene	**<0.43**	ug/L	1.0	0.43	1		06/29/13 19:57	75-35-4	
cis-1,2-Dichloroethene	**<0.42**	ug/L	1.0	0.42	1		06/29/13 19:57	156-59-2	
trans-1,2-Dichloroethene	**<0.37**	ug/L	1.0	0.37	1		06/29/13 19:57	156-60-5	
1,2-Dichloropropane	**<0.50**	ug/L	1.0	0.50	1		06/29/13 19:57	78-87-5	
1,3-Dichloropropane	**<0.46**	ug/L	1.0	0.46	1		06/29/13 19:57	142-28-9	
2,2-Dichloropropane	**<0.37**	ug/L	1.0	0.37	1		06/29/13 19:57	594-20-7	
1,1-Dichloropropene	**<0.51**	ug/L	1.0	0.51	1		06/29/13 19:57	563-58-6	
cis-1,3-Dichloropropene	**<0.29**	ug/L	1.0	0.29	1		06/29/13 19:57	10061-01-5	
trans-1,3-Dichloropropene	**<0.26**	ug/L	1.0	0.26	1		06/29/13 19:57	10061-02-6	
Diisopropyl ether	**<0.50**	ug/L	1.0	0.50	1		06/29/13 19:57	108-20-3	
Ethylbenzene	**<0.50**	ug/L	1.0	0.50	1		06/29/13 19:57	100-41-4	
Hexachloro-1,3-butadiene	**<1.3**	ug/L	5.0	1.3	1		06/29/13 19:57	87-68-3	
Isopropylbenzene (Cumene)	**<0.34**	ug/L	1.0	0.34	1		06/29/13 19:57	98-82-8	
p-Isopropyltoluene	**<0.40**	ug/L	1.0	0.40	1		06/29/13 19:57	99-87-6	
Methylene Chloride	**<0.36**	ug/L	1.0	0.36	1		06/29/13 19:57	75-09-2	
Methyl-tert-butyl ether	**<0.49**	ug/L	1.0	0.49	1		06/29/13 19:57	1634-04-4	
Naphthalene	**<2.5**	ug/L	5.0	2.5	1		06/29/13 19:57	91-20-3	
n-Propylbenzene	**<0.50**	ug/L	1.0	0.50	1		06/29/13 19:57	103-65-1	
Styrene	**<0.35**	ug/L	1.0	0.35	1		06/29/13 19:57	100-42-5	
1,1,1,2-Tetrachloroethane	**<0.45**	ug/L	1.0	0.45	1		06/29/13 19:57	630-20-6	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS

Project: 204639 CITY OF MADISON-CUB FOO
Pace Project No.: 4080362

Sample: TW-3 **Lab ID: 4080362010** Collected: 06/26/13 18:45 Received: 06/28/13 09:45 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 8260								
1,1,2,2-Tetrachloroethane	**<0.38**	ug/L	1.0	0.38	1		06/29/13 19:57	79-34-5	
Tetrachloroethene	**<0.47**	ug/L	1.0	0.47	1		06/29/13 19:57	127-18-4	
Toluene	**<0.44**	ug/L	1.0	0.44	1		06/29/13 19:57	108-88-3	
1,2,3-Trichlorobenzene	**<0.77**	ug/L	5.0	0.77	1		06/29/13 19:57	87-61-6	
1,2,4-Trichlorobenzene	**<2.5**	ug/L	5.0	2.5	1		06/29/13 19:57	120-82-1	
1,1,1-Trichloroethane	**<0.44**	ug/L	1.0	0.44	1		06/29/13 19:57	71-55-6	
1,1,2-Trichloroethane	**<0.39**	ug/L	1.0	0.39	1		06/29/13 19:57	79-00-5	
Trichloroethene	**<0.43**	ug/L	1.0	0.43	1		06/29/13 19:57	79-01-6	
Trichlorofluoromethane	**<0.48**	ug/L	1.0	0.48	1		06/29/13 19:57	75-69-4	
1,2,3-Trichloropropane	**<0.47**	ug/L	1.0	0.47	1		06/29/13 19:57	96-18-4	
1,2,4-Trimethylbenzene	**<0.57**	ug/L	5.0	0.57	1		06/29/13 19:57	95-63-6	
1,3,5-Trimethylbenzene	**<2.5**	ug/L	5.0	2.5	1		06/29/13 19:57	108-67-8	
Vinyl chloride	**<0.18**	ug/L	1.0	0.18	1		06/29/13 19:57	75-01-4	
m&p-Xylene	**<0.82**	ug/L	2.0	0.82	1		06/29/13 19:57	179601-23-1	
o-Xylene	**<0.50**	ug/L	1.0	0.50	1		06/29/13 19:57	95-47-6	
Surrogates									
4-Bromofluorobenzene (S)	97	%	43-137		1		06/29/13 19:57	460-00-4	
Dibromofluoromethane (S)	102	%	70-130		1		06/29/13 19:57	1868-53-7	
Toluene-d8 (S)	101	%	55-137		1		06/29/13 19:57	2037-26-5	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS

Project: 204639 CITY OF MADISON-CUB FOO
Pace Project No.: 4080362

Sample: TW-5 **Lab ID: 4080362011** Collected: 06/26/13 15:40 Received: 06/28/13 09:45 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 8260								
Benzene	**12.9**	ug/L	1.0	0.50	1		06/29/13 20:20	71-43-2	
Bromobenzene	**<0.48**	ug/L	1.0	0.48	1		06/29/13 20:20	108-86-1	
Bromochloromethane	**<0.49**	ug/L	1.0	0.49	1		06/29/13 20:20	74-97-5	
Bromodichloromethane	**<0.45**	ug/L	1.0	0.45	1		06/29/13 20:20	75-27-4	
Bromoform	**<0.23**	ug/L	1.0	0.23	1		06/29/13 20:20	75-25-2	
Bromomethane	**<0.43**	ug/L	5.0	0.43	1		06/29/13 20:20	74-83-9	
n-Butylbenzene	**<0.40**	ug/L	1.0	0.40	1		06/29/13 20:20	104-51-8	
sec-Butylbenzene	**1.9J**	ug/L	5.0	0.60	1		06/29/13 20:20	135-98-8	
tert-Butylbenzene	**<0.42**	ug/L	1.0	0.42	1		06/29/13 20:20	98-06-6	
Carbon tetrachloride	**<0.37**	ug/L	1.0	0.37	1		06/29/13 20:20	56-23-5	
Chlorobenzene	**<0.36**	ug/L	1.0	0.36	1		06/29/13 20:20	108-90-7	
Chloroethane	**<0.44**	ug/L	1.0	0.44	1		06/29/13 20:20	75-00-3	
Chloroform	**<0.69**	ug/L	5.0	0.69	1		06/29/13 20:20	67-66-3	
Chloromethane	**0.44J**	ug/L	1.0	0.39	1		06/29/13 20:20	74-87-3	
2-Chlorotoluene	**<0.48**	ug/L	1.0	0.48	1		06/29/13 20:20	95-49-8	
4-Chlorotoluene	**<0.48**	ug/L	1.0	0.48	1		06/29/13 20:20	106-43-4	
1,2-Dibromo-3-chloropropane	**<1.5**	ug/L	5.0	1.5	1		06/29/13 20:20	96-12-8	
Dibromochloromethane	**<1.9**	ug/L	5.0	1.9	1		06/29/13 20:20	124-48-1	
1,2-Dibromoethane (EDB)	**<0.38**	ug/L	1.0	0.38	1		06/29/13 20:20	106-93-4	
Dibromomethane	**<0.48**	ug/L	1.0	0.48	1		06/29/13 20:20	74-95-3	
1,2-Dichlorobenzene	**<0.44**	ug/L	1.0	0.44	1		06/29/13 20:20	95-50-1	
1,3-Dichlorobenzene	**<0.45**	ug/L	1.0	0.45	1		06/29/13 20:20	541-73-1	
1,4-Dichlorobenzene	**<0.43**	ug/L	1.0	0.43	1		06/29/13 20:20	106-46-7	
Dichlorodifluoromethane	**<0.40**	ug/L	1.0	0.40	1		06/29/13 20:20	75-71-8	
1,1-Dichloroethane	**<0.28**	ug/L	1.0	0.28	1		06/29/13 20:20	75-34-3	
1,2-Dichloroethane	**<0.48**	ug/L	1.0	0.48	1		06/29/13 20:20	107-06-2	
1,1-Dichloroethene	**<0.43**	ug/L	1.0	0.43	1		06/29/13 20:20	75-35-4	
cis-1,2-Dichloroethene	**<0.42**	ug/L	1.0	0.42	1		06/29/13 20:20	156-59-2	
trans-1,2-Dichloroethene	**<0.37**	ug/L	1.0	0.37	1		06/29/13 20:20	156-60-5	
1,2-Dichloropropane	**<0.50**	ug/L	1.0	0.50	1		06/29/13 20:20	78-87-5	
1,3-Dichloropropane	**<0.46**	ug/L	1.0	0.46	1		06/29/13 20:20	142-28-9	
2,2-Dichloropropane	**<0.37**	ug/L	1.0	0.37	1		06/29/13 20:20	594-20-7	
1,1-Dichloropropene	**<0.51**	ug/L	1.0	0.51	1		06/29/13 20:20	563-58-6	
cis-1,3-Dichloropropene	**<0.29**	ug/L	1.0	0.29	1		06/29/13 20:20	10061-01-5	
trans-1,3-Dichloropropene	**<0.26**	ug/L	1.0	0.26	1		06/29/13 20:20	10061-02-6	
Diisopropyl ether	**<0.50**	ug/L	1.0	0.50	1		06/29/13 20:20	108-20-3	
Ethylbenzene	**29.7**	ug/L	1.0	0.50	1		06/29/13 20:20	100-41-4	
Hexachloro-1,3-butadiene	**<1.3**	ug/L	5.0	1.3	1		06/29/13 20:20	87-68-3	
Isopropylbenzene (Cumene)	**4.0**	ug/L	1.0	0.34	1		06/29/13 20:20	98-82-8	
p-Isopropyltoluene	**1.1**	ug/L	1.0	0.40	1		06/29/13 20:20	99-87-6	
Methylene Chloride	**<0.36**	ug/L	1.0	0.36	1		06/29/13 20:20	75-09-2	
Methyl-tert-butyl ether	**<0.49**	ug/L	1.0	0.49	1		06/29/13 20:20	1634-04-4	
Naphthalene	**60.0**	ug/L	5.0	2.5	1		06/29/13 20:20	91-20-3	
n-Propylbenzene	**14.9**	ug/L	1.0	0.50	1		06/29/13 20:20	103-65-1	
Styrene	**<0.35**	ug/L	1.0	0.35	1		06/29/13 20:20	100-42-5	
1,1,1,2-Tetrachloroethane	**<0.45**	ug/L	1.0	0.45	1		06/29/13 20:20	630-20-6	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
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(920)469-2436

ANALYTICAL RESULTS

Project: 204639 CITY OF MADISON-CUB FOO
Pace Project No.: 4080362

Sample: TW-5 **Lab ID: 4080362011** Collected: 06/26/13 15:40 Received: 06/28/13 09:45 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 8260								
1,1,2,2-Tetrachloroethane	**<0.38**	ug/L	1.0	0.38	1		06/29/13 20:20	79-34-5	
Tetrachloroethene	**<0.47**	ug/L	1.0	0.47	1		06/29/13 20:20	127-18-4	
Toluene	**2.6**	ug/L	1.0	0.44	1		06/29/13 20:20	108-88-3	
1,2,3-Trichlorobenzene	**<0.77**	ug/L	5.0	0.77	1		06/29/13 20:20	87-61-6	
1,2,4-Trichlorobenzene	**<2.5**	ug/L	5.0	2.5	1		06/29/13 20:20	120-82-1	
1,1,1-Trichloroethane	**<0.44**	ug/L	1.0	0.44	1		06/29/13 20:20	71-55-6	
1,1,2-Trichloroethane	**<0.39**	ug/L	1.0	0.39	1		06/29/13 20:20	79-00-5	
Trichloroethene	**<0.43**	ug/L	1.0	0.43	1		06/29/13 20:20	79-01-6	
Trichlorofluoromethane	**<0.48**	ug/L	1.0	0.48	1		06/29/13 20:20	75-69-4	
1,2,3-Trichloropropane	**<0.47**	ug/L	1.0	0.47	1		06/29/13 20:20	96-18-4	
1,2,4-Trimethylbenzene	**179**	ug/L	5.0	0.57	1		06/29/13 20:20	95-63-6	
1,3,5-Trimethylbenzene	**51.5**	ug/L	5.0	2.5	1		06/29/13 20:20	108-67-8	
Vinyl chloride	**<0.18**	ug/L	1.0	0.18	1		06/29/13 20:20	75-01-4	
m&p-Xylene	**167**	ug/L	2.0	0.82	1		06/29/13 20:20	179601-23-1	
o-Xylene	**58.8**	ug/L	1.0	0.50	1		06/29/13 20:20	95-47-6	
Surrogates									
4-Bromofluorobenzene (S)	102	%	43-137		1		06/29/13 20:20	460-00-4	
Dibromofluoromethane (S)	101	%	70-130		1		06/29/13 20:20	1868-53-7	
Toluene-d8 (S)	101	%	55-137		1		06/29/13 20:20	2037-26-5	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
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ANALYTICAL RESULTS

Project: 204639 CITY OF MADISON-CUB FOO
Pace Project No.: 4080362

Sample: TW-6 **Lab ID: 4080362012** Collected: 06/26/13 16:30 Received: 06/28/13 09:45 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP, Dissolved	Analytical Method: EPA 6010								
Lead, Dissolved	**<1.2**	ug/L	7.5	1.2	1		07/02/13 14:22	7439-92-1	
8260 MSV	Analytical Method: EPA 8260								
Benzene	**<0.50**	ug/L	1.0	0.50	1		07/02/13 12:49	71-43-2	
Bromobenzene	**<0.48**	ug/L	1.0	0.48	1		07/02/13 12:49	108-86-1	
Bromochloromethane	**<0.49**	ug/L	1.0	0.49	1		07/02/13 12:49	74-97-5	
Bromodichloromethane	**<0.45**	ug/L	1.0	0.45	1		07/02/13 12:49	75-27-4	
Bromoform	**<0.23**	ug/L	1.0	0.23	1		07/02/13 12:49	75-25-2	
Bromomethane	**<0.43**	ug/L	5.0	0.43	1		07/02/13 12:49	74-83-9	
n-Butylbenzene	**<0.40**	ug/L	1.0	0.40	1		07/02/13 12:49	104-51-8	
sec-Butylbenzene	**<0.60**	ug/L	5.0	0.60	1		07/02/13 12:49	135-98-8	
tert-Butylbenzene	**<0.42**	ug/L	1.0	0.42	1		07/02/13 12:49	98-06-6	
Carbon tetrachloride	**<0.37**	ug/L	1.0	0.37	1		07/02/13 12:49	56-23-5	
Chlorobenzene	**<0.36**	ug/L	1.0	0.36	1		07/02/13 12:49	108-90-7	
Chloroethane	**<0.44**	ug/L	1.0	0.44	1		07/02/13 12:49	75-00-3	
Chloroform	**<0.69**	ug/L	5.0	0.69	1		07/02/13 12:49	67-66-3	
Chloromethane	**<0.39**	ug/L	1.0	0.39	1		07/02/13 12:49	74-87-3	
2-Chlorotoluene	**<0.48**	ug/L	1.0	0.48	1		07/02/13 12:49	95-49-8	
4-Chlorotoluene	**<0.48**	ug/L	1.0	0.48	1		07/02/13 12:49	106-43-4	
1,2-Dibromo-3-chloropropane	**<1.5**	ug/L	5.0	1.5	1		07/02/13 12:49	96-12-8	
Dibromochloromethane	**<1.9**	ug/L	5.0	1.9	1		07/02/13 12:49	124-48-1	
1,2-Dibromoethane (EDB)	**<0.38**	ug/L	1.0	0.38	1		07/02/13 12:49	106-93-4	
Dibromomethane	**<0.48**	ug/L	1.0	0.48	1		07/02/13 12:49	74-95-3	
1,2-Dichlorobenzene	**<0.44**	ug/L	1.0	0.44	1		07/02/13 12:49	95-50-1	
1,3-Dichlorobenzene	**<0.45**	ug/L	1.0	0.45	1		07/02/13 12:49	541-73-1	
1,4-Dichlorobenzene	**<0.43**	ug/L	1.0	0.43	1		07/02/13 12:49	106-46-7	
Dichlorodifluoromethane	**<0.40**	ug/L	1.0	0.40	1		07/02/13 12:49	75-71-8	
1,1-Dichloroethane	**<0.28**	ug/L	1.0	0.28	1		07/02/13 12:49	75-34-3	
1,2-Dichloroethane	**<0.48**	ug/L	1.0	0.48	1		07/02/13 12:49	107-06-2	
1,1-Dichloroethene	**<0.43**	ug/L	1.0	0.43	1		07/02/13 12:49	75-35-4	
cis-1,2-Dichloroethene	**<0.42**	ug/L	1.0	0.42	1		07/02/13 12:49	156-59-2	
trans-1,2-Dichloroethene	**<0.37**	ug/L	1.0	0.37	1		07/02/13 12:49	156-60-5	
1,2-Dichloropropane	**<0.50**	ug/L	1.0	0.50	1		07/02/13 12:49	78-87-5	
1,3-Dichloropropane	**<0.46**	ug/L	1.0	0.46	1		07/02/13 12:49	142-28-9	
2,2-Dichloropropane	**<0.37**	ug/L	1.0	0.37	1		07/02/13 12:49	594-20-7	
1,1-Dichloropropene	**<0.51**	ug/L	1.0	0.51	1		07/02/13 12:49	563-58-6	
cis-1,3-Dichloropropene	**<0.29**	ug/L	1.0	0.29	1		07/02/13 12:49	10061-01-5	
trans-1,3-Dichloropropene	**<0.26**	ug/L	1.0	0.26	1		07/02/13 12:49	10061-02-6	
Diisopropyl ether	**<0.50**	ug/L	1.0	0.50	1		07/02/13 12:49	108-20-3	
Ethylbenzene	**<0.50**	ug/L	1.0	0.50	1		07/02/13 12:49	100-41-4	
Hexachloro-1,3-butadiene	**<1.3**	ug/L	5.0	1.3	1		07/02/13 12:49	87-68-3	
Isopropylbenzene (Cumene)	**<0.34**	ug/L	1.0	0.34	1		07/02/13 12:49	98-82-8	
p-Isopropyltoluene	**<0.40**	ug/L	1.0	0.40	1		07/02/13 12:49	99-87-6	
Methylene Chloride	**<0.36**	ug/L	1.0	0.36	1		07/02/13 12:49	75-09-2	
Methyl-tert-butyl ether	**<0.49**	ug/L	1.0	0.49	1		07/02/13 12:49	1634-04-4	
Naphthalene	**<2.5**	ug/L	5.0	2.5	1		07/02/13 12:49	91-20-3	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS

Project: 204639 CITY OF MADISON-CUB FOO
Pace Project No.: 4080362

Sample: TW-6 **Lab ID: 4080362012** Collected: 06/26/13 16:30 Received: 06/28/13 09:45 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 8260								
n-Propylbenzene	**<0.50**	ug/L	1.0	0.50	1		07/02/13 12:49	103-65-1	
Styrene	**<0.35**	ug/L	1.0	0.35	1		07/02/13 12:49	100-42-5	
1,1,1,2-Tetrachloroethane	**<0.45**	ug/L	1.0	0.45	1		07/02/13 12:49	630-20-6	
1,1,2,2-Tetrachloroethane	**<0.38**	ug/L	1.0	0.38	1		07/02/13 12:49	79-34-5	
Tetrachloroethene	**<0.47**	ug/L	1.0	0.47	1		07/02/13 12:49	127-18-4	
Toluene	**<0.44**	ug/L	1.0	0.44	1		07/02/13 12:49	108-88-3	
1,2,3-Trichlorobenzene	**<0.77**	ug/L	5.0	0.77	1		07/02/13 12:49	87-61-6	
1,2,4-Trichlorobenzene	**<2.5**	ug/L	5.0	2.5	1		07/02/13 12:49	120-82-1	
1,1,1-Trichloroethane	**<0.44**	ug/L	1.0	0.44	1		07/02/13 12:49	71-55-6	
1,1,2-Trichloroethane	**<0.39**	ug/L	1.0	0.39	1		07/02/13 12:49	79-00-5	
Trichloroethene	**<0.43**	ug/L	1.0	0.43	1		07/02/13 12:49	79-01-6	
Trichlorofluoromethane	**<0.48**	ug/L	1.0	0.48	1		07/02/13 12:49	75-69-4	
1,2,3-Trichloropropane	**<0.47**	ug/L	1.0	0.47	1		07/02/13 12:49	96-18-4	
1,2,4-Trimethylbenzene	**<0.57**	ug/L	5.0	0.57	1		07/02/13 12:49	95-63-6	
1,3,5-Trimethylbenzene	**<2.5**	ug/L	5.0	2.5	1		07/02/13 12:49	108-67-8	
Vinyl chloride	**<0.18**	ug/L	1.0	0.18	1		07/02/13 12:49	75-01-4	
m&p-Xylene	**<0.82**	ug/L	2.0	0.82	1		07/02/13 12:49	179601-23-1	
o-Xylene	**<0.50**	ug/L	1.0	0.50	1		07/02/13 12:49	95-47-6	
Surrogates									
4-Bromofluorobenzene (S)	94	%	43-137		1		07/02/13 12:49	460-00-4	
Dibromofluoromethane (S)	102	%	70-130		1		07/02/13 12:49	1868-53-7	
Toluene-d8 (S)	100	%	55-137		1		07/02/13 12:49	2037-26-5	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS

Project: 204639 CITY OF MADISON-CUB FOO
Pace Project No.: 4080362

Sample: TW-7 **Lab ID: 4080362013** Collected: 06/26/13 17:15 Received: 06/28/13 09:45 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP, Dissolved	Analytical Method: EPA 6010								
Lead, Dissolved	**1.5J**	ug/L	7.5	1.2	1		07/02/13 14:29	7439-92-1	
8260 MSV	Analytical Method: EPA 8260								
Benzene	**<0.50**	ug/L	1.0	0.50	1		07/02/13 13:12	71-43-2	
Bromobenzene	**<0.48**	ug/L	1.0	0.48	1		07/02/13 13:12	108-86-1	
Bromochloromethane	**<0.49**	ug/L	1.0	0.49	1		07/02/13 13:12	74-97-5	
Bromodichloromethane	**<0.45**	ug/L	1.0	0.45	1		07/02/13 13:12	75-27-4	
Bromoform	**<0.23**	ug/L	1.0	0.23	1		07/02/13 13:12	75-25-2	
Bromomethane	**<0.43**	ug/L	5.0	0.43	1		07/02/13 13:12	74-83-9	
n-Butylbenzene	**<0.40**	ug/L	1.0	0.40	1		07/02/13 13:12	104-51-8	
sec-Butylbenzene	**<0.60**	ug/L	5.0	0.60	1		07/02/13 13:12	135-98-8	
tert-Butylbenzene	**<0.42**	ug/L	1.0	0.42	1		07/02/13 13:12	98-06-6	
Carbon tetrachloride	**<0.37**	ug/L	1.0	0.37	1		07/02/13 13:12	56-23-5	
Chlorobenzene	**<0.36**	ug/L	1.0	0.36	1		07/02/13 13:12	108-90-7	
Chloroethane	**<0.44**	ug/L	1.0	0.44	1		07/02/13 13:12	75-00-3	
Chloroform	**<0.69**	ug/L	5.0	0.69	1		07/02/13 13:12	67-66-3	
Chloromethane	**<0.39**	ug/L	1.0	0.39	1		07/02/13 13:12	74-87-3	
2-Chlorotoluene	**<0.48**	ug/L	1.0	0.48	1		07/02/13 13:12	95-49-8	
4-Chlorotoluene	**<0.48**	ug/L	1.0	0.48	1		07/02/13 13:12	106-43-4	
1,2-Dibromo-3-chloropropane	**<1.5**	ug/L	5.0	1.5	1		07/02/13 13:12	96-12-8	
Dibromochloromethane	**<1.9**	ug/L	5.0	1.9	1		07/02/13 13:12	124-48-1	
1,2-Dibromoethane (EDB)	**<0.38**	ug/L	1.0	0.38	1		07/02/13 13:12	106-93-4	
Dibromomethane	**<0.48**	ug/L	1.0	0.48	1		07/02/13 13:12	74-95-3	
1,2-Dichlorobenzene	**<0.44**	ug/L	1.0	0.44	1		07/02/13 13:12	95-50-1	
1,3-Dichlorobenzene	**<0.45**	ug/L	1.0	0.45	1		07/02/13 13:12	541-73-1	
1,4-Dichlorobenzene	**<0.43**	ug/L	1.0	0.43	1		07/02/13 13:12	106-46-7	
Dichlorodifluoromethane	**<0.40**	ug/L	1.0	0.40	1		07/02/13 13:12	75-71-8	
1,1-Dichloroethane	**<0.28**	ug/L	1.0	0.28	1		07/02/13 13:12	75-34-3	
1,2-Dichloroethane	**<0.48**	ug/L	1.0	0.48	1		07/02/13 13:12	107-06-2	
1,1-Dichloroethene	**<0.43**	ug/L	1.0	0.43	1		07/02/13 13:12	75-35-4	
cis-1,2-Dichloroethene	**<0.42**	ug/L	1.0	0.42	1		07/02/13 13:12	156-59-2	
trans-1,2-Dichloroethene	**<0.37**	ug/L	1.0	0.37	1		07/02/13 13:12	156-60-5	
1,2-Dichloropropane	**<0.50**	ug/L	1.0	0.50	1		07/02/13 13:12	78-87-5	
1,3-Dichloropropane	**<0.46**	ug/L	1.0	0.46	1		07/02/13 13:12	142-28-9	
2,2-Dichloropropane	**<0.37**	ug/L	1.0	0.37	1		07/02/13 13:12	594-20-7	
1,1-Dichloropropene	**<0.51**	ug/L	1.0	0.51	1		07/02/13 13:12	563-58-6	
cis-1,3-Dichloropropene	**<0.29**	ug/L	1.0	0.29	1		07/02/13 13:12	10061-01-5	
trans-1,3-Dichloropropene	**<0.26**	ug/L	1.0	0.26	1		07/02/13 13:12	10061-02-6	
Diisopropyl ether	**<0.50**	ug/L	1.0	0.50	1		07/02/13 13:12	108-20-3	
Ethylbenzene	**<0.50**	ug/L	1.0	0.50	1		07/02/13 13:12	100-41-4	
Hexachloro-1,3-butadiene	**<1.3**	ug/L	5.0	1.3	1		07/02/13 13:12	87-68-3	
Isopropylbenzene (Cumene)	**<0.34**	ug/L	1.0	0.34	1		07/02/13 13:12	98-82-8	
p-Isopropyltoluene	**<0.40**	ug/L	1.0	0.40	1		07/02/13 13:12	99-87-6	
Methylene Chloride	**<0.36**	ug/L	1.0	0.36	1		07/02/13 13:12	75-09-2	
Methyl-tert-butyl ether	**<0.49**	ug/L	1.0	0.49	1		07/02/13 13:12	1634-04-4	
Naphthalene	**<2.5**	ug/L	5.0	2.5	1		07/02/13 13:12	91-20-3	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS

Project: 204639 CITY OF MADISON-CUB FOO
Pace Project No.: 4080362

Sample: TW-7 **Lab ID: 4080362013** Collected: 06/26/13 17:15 Received: 06/28/13 09:45 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 8260								
n-Propylbenzene	**<0.50**	ug/L	1.0	0.50	1		07/02/13 13:12	103-65-1	
Styrene	**<0.35**	ug/L	1.0	0.35	1		07/02/13 13:12	100-42-5	
1,1,1,2-Tetrachloroethane	**<0.45**	ug/L	1.0	0.45	1		07/02/13 13:12	630-20-6	
1,1,2,2-Tetrachloroethane	**<0.38**	ug/L	1.0	0.38	1		07/02/13 13:12	79-34-5	
Tetrachloroethene	**<0.47**	ug/L	1.0	0.47	1		07/02/13 13:12	127-18-4	
Toluene	**<0.44**	ug/L	1.0	0.44	1		07/02/13 13:12	108-88-3	
1,2,3-Trichlorobenzene	**<0.77**	ug/L	5.0	0.77	1		07/02/13 13:12	87-61-6	
1,2,4-Trichlorobenzene	**<2.5**	ug/L	5.0	2.5	1		07/02/13 13:12	120-82-1	
1,1,1-Trichloroethane	**<0.44**	ug/L	1.0	0.44	1		07/02/13 13:12	71-55-6	
1,1,2-Trichloroethane	**<0.39**	ug/L	1.0	0.39	1		07/02/13 13:12	79-00-5	
Trichloroethene	**<0.43**	ug/L	1.0	0.43	1		07/02/13 13:12	79-01-6	
Trichlorofluoromethane	**<0.48**	ug/L	1.0	0.48	1		07/02/13 13:12	75-69-4	
1,2,3-Trichloropropane	**<0.47**	ug/L	1.0	0.47	1		07/02/13 13:12	96-18-4	
1,2,4-Trimethylbenzene	**<0.57**	ug/L	5.0	0.57	1		07/02/13 13:12	95-63-6	
1,3,5-Trimethylbenzene	**<2.5**	ug/L	5.0	2.5	1		07/02/13 13:12	108-67-8	
Vinyl chloride	**<0.18**	ug/L	1.0	0.18	1		07/02/13 13:12	75-01-4	
m&p-Xylene	**<0.82**	ug/L	2.0	0.82	1		07/02/13 13:12	179601-23-1	
o-Xylene	**<0.50**	ug/L	1.0	0.50	1		07/02/13 13:12	95-47-6	
Surrogates									
4-Bromofluorobenzene (S)	93	%	43-137		1		07/02/13 13:12	460-00-4	
Dibromofluoromethane (S)	104	%	70-130		1		07/02/13 13:12	1868-53-7	
Toluene-d8 (S)	99	%	55-137		1		07/02/13 13:12	2037-26-5	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS

Project: 204639 CITY OF MADISON-CUB FOO
Pace Project No.: 4080362

Sample: GP-7 (12.5-15') **Lab ID: 4080362014** Collected: 06/26/13 12:20 Received: 06/28/13 09:45 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Lead	**1.9**	mg/kg	1.1	0.32	1	07/01/13 13:05	07/02/13 13:15	7439-92-1	
8260 MSV Med Level Normal List	Analytical Method: EPA 8260 Preparation Method: EPA 5035/5030B								
1,1,1,2-Tetrachloroethane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 03:06	630-20-6	W
1,1,1-Trichloroethane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 03:06	71-55-6	W
1,1,2,2-Tetrachloroethane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 03:06	79-34-5	W
1,1,2-Trichloroethane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 03:06	79-00-5	W
1,1-Dichloroethane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 03:06	75-34-3	W
1,1-Dichloroethene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 03:06	75-35-4	W
1,1-Dichloropropene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 03:06	563-58-6	W
1,2,3-Trichlorobenzene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 03:06	87-61-6	W
1,2,3-Trichloropropane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 03:06	96-18-4	W
1,2,4-Trichlorobenzene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 03:06	120-82-1	W
1,2,4-Trimethylbenzene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 03:06	95-63-6	W
1,2-Dibromo-3-chloropropane	**<49.8**	ug/kg	250	49.8	1	07/01/13 14:12	07/02/13 03:06	96-12-8	W
1,2-Dibromoethane (EDB)	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 03:06	106-93-4	W
1,2-Dichlorobenzene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 03:06	95-50-1	W
1,2-Dichloroethane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 03:06	107-06-2	W
1,2-Dichloropropane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 03:06	78-87-5	W
1,3,5-Trimethylbenzene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 03:06	108-67-8	W
1,3-Dichlorobenzene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 03:06	541-73-1	W
1,3-Dichloropropane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 03:06	142-28-9	W
1,4-Dichlorobenzene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 03:06	106-46-7	W
2,2-Dichloropropane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 03:06	594-20-7	W
2-Chlorotoluene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 03:06	95-49-8	W
4-Chlorotoluene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 03:06	106-43-4	W
Benzene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 03:06	71-43-2	W
Bromobenzene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 03:06	108-86-1	W
Bromochloromethane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 03:06	74-97-5	W
Bromodichloromethane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 03:06	75-27-4	W
Bromoform	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 03:06	75-25-2	W
Bromomethane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 03:06	74-83-9	W
Carbon tetrachloride	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 03:06	56-23-5	W
Chlorobenzene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 03:06	108-90-7	W
Chloroethane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 03:06	75-00-3	W
Chloroform	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 03:06	67-66-3	W
Chloromethane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 03:06	74-87-3	W
Dibromochloromethane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 03:06	124-48-1	W
Dibromomethane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 03:06	74-95-3	W
Dichlorodifluoromethane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 03:06	75-71-8	W
Diisopropyl ether	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 03:06	108-20-3	W
Ethylbenzene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 03:06	100-41-4	W
Hexachloro-1,3-butadiene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 03:06	87-68-3	W
Isopropylbenzene (Cumene)	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 03:06	98-82-8	W
Methyl-tert-butyl ether	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 03:06	1634-04-4	W

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS

Project: 204639 CITY OF MADISON-CUB FOO
Pace Project No.: 4080362

Sample: GP-7 (12.5-15') **Lab ID: 4080362014** Collected: 06/26/13 12:20 Received: 06/28/13 09:45 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Level Normal List	Analytical Method: EPA 8260 Preparation Method: EPA 5035/5030B								
Methylene Chloride	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 03:06	75-09-2	W
Naphthalene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 03:06	91-20-3	W
Styrene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 03:06	100-42-5	W
Tetrachloroethene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 03:06	127-18-4	W
Toluene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 03:06	108-88-3	W
Trichloroethene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 03:06	79-01-6	W
Trichlorofluoromethane	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 03:06	75-69-4	W
Vinyl chloride	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 03:06	75-01-4	W
cis-1,2-Dichloroethene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 03:06	156-59-2	W
cis-1,3-Dichloropropene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 03:06	10061-01-5	W
m&p-Xylene	**<50.0**	ug/kg	120	50.0	1	07/01/13 14:12	07/02/13 03:06	179601-23-1	W
n-Butylbenzene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 03:06	104-51-8	W
n-Propylbenzene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 03:06	103-65-1	W
o-Xylene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 03:06	95-47-6	W
p-Isopropyltoluene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 03:06	99-87-6	W
sec-Butylbenzene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 03:06	135-98-8	W
tert-Butylbenzene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 03:06	98-06-6	W
trans-1,2-Dichloroethene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 03:06	156-60-5	W
trans-1,3-Dichloropropene	**<25.0**	ug/kg	60.0	25.0	1	07/01/13 14:12	07/02/13 03:06	10061-02-6	W
Surrogates									
Dibromofluoromethane (S)	95	%	57-130		1	07/01/13 14:12	07/02/13 03:06	1868-53-7	
Toluene-d8 (S)	101	%	54-133		1	07/01/13 14:12	07/02/13 03:06	2037-26-5	
4-Bromofluorobenzene (S)	98	%	49-130		1	07/01/13 14:12	07/02/13 03:06	460-00-4	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**11.1**	%	0.10	0.10	1		07/01/13 16:28		

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS

Project: 204639 CITY OF MADISON-CUB FOO
Pace Project No.: 4080362

Sample: TW-4 **Lab ID: 4080362015** Collected: 06/27/13 08:15 Received: 06/28/13 09:45 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP, Dissolved	Analytical Method: EPA 6010								
Arsenic, Dissolved	**9.3J**	ug/L	20.0	4.4	1		07/11/13 11:51	7440-38-2	P4
Barium, Dissolved	**210**	ug/L	5.0	1.1	1		07/11/13 11:51	7440-39-3	
Cadmium, Dissolved	**<0.38**	ug/L	5.0	0.38	1		07/11/13 11:51	7440-43-9	
Chromium, Dissolved	**3.0J**	ug/L	5.0	1.2	1		07/11/13 11:51	7440-47-3	
Lead, Dissolved	**3.2J**	ug/L	7.5	1.2	1		07/11/13 11:51	7439-92-1	
Selenium, Dissolved	**<6.6**	ug/L	20.0	6.6	1		07/11/13 11:51	7782-49-2	
Silver, Dissolved	**2.2J**	ug/L	10.0	1.4	1		07/11/13 11:51	7440-22-4	
7470 Mercury, Dissolved	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury, Dissolved	**1.8**	ug/L	0.20	0.10	1	07/15/13 10:35	07/15/13 15:25	7439-97-6	P4
8260 MSV	Analytical Method: EPA 8260								
Benzene	**<0.50**	ug/L	1.0	0.50	1		07/02/13 14:00	71-43-2	
Bromobenzene	**<0.48**	ug/L	1.0	0.48	1		07/02/13 14:00	108-86-1	
Bromochloromethane	**<0.49**	ug/L	1.0	0.49	1		07/02/13 14:00	74-97-5	
Bromodichloromethane	**<0.45**	ug/L	1.0	0.45	1		07/02/13 14:00	75-27-4	
Bromoform	**<0.23**	ug/L	1.0	0.23	1		07/02/13 14:00	75-25-2	
Bromomethane	**<0.43**	ug/L	5.0	0.43	1		07/02/13 14:00	74-83-9	
n-Butylbenzene	**<0.40**	ug/L	1.0	0.40	1		07/02/13 14:00	104-51-8	
sec-Butylbenzene	**<0.60**	ug/L	5.0	0.60	1		07/02/13 14:00	135-98-8	
tert-Butylbenzene	**<0.42**	ug/L	1.0	0.42	1		07/02/13 14:00	98-06-6	
Carbon tetrachloride	**<0.37**	ug/L	1.0	0.37	1		07/02/13 14:00	56-23-5	
Chlorobenzene	**<0.36**	ug/L	1.0	0.36	1		07/02/13 14:00	108-90-7	
Chloroethane	**<0.44**	ug/L	1.0	0.44	1		07/02/13 14:00	75-00-3	
Chloroform	**<0.69**	ug/L	5.0	0.69	1		07/02/13 14:00	67-66-3	
Chloromethane	**<0.39**	ug/L	1.0	0.39	1		07/02/13 14:00	74-87-3	
2-Chlorotoluene	**<0.48**	ug/L	1.0	0.48	1		07/02/13 14:00	95-49-8	
4-Chlorotoluene	**<0.48**	ug/L	1.0	0.48	1		07/02/13 14:00	106-43-4	
1,2-Dibromo-3-chloropropane	**<1.5**	ug/L	5.0	1.5	1		07/02/13 14:00	96-12-8	
Dibromochloromethane	**<1.9**	ug/L	5.0	1.9	1		07/02/13 14:00	124-48-1	
1,2-Dibromoethane (EDB)	**<0.38**	ug/L	1.0	0.38	1		07/02/13 14:00	106-93-4	
Dibromomethane	**<0.48**	ug/L	1.0	0.48	1		07/02/13 14:00	74-95-3	
1,2-Dichlorobenzene	**<0.44**	ug/L	1.0	0.44	1		07/02/13 14:00	95-50-1	
1,3-Dichlorobenzene	**<0.45**	ug/L	1.0	0.45	1		07/02/13 14:00	541-73-1	
1,4-Dichlorobenzene	**<0.43**	ug/L	1.0	0.43	1		07/02/13 14:00	106-46-7	
Dichlorodifluoromethane	**<0.40**	ug/L	1.0	0.40	1		07/02/13 14:00	75-71-8	
1,1-Dichloroethane	**<0.28**	ug/L	1.0	0.28	1		07/02/13 14:00	75-34-3	
1,2-Dichloroethane	**<0.48**	ug/L	1.0	0.48	1		07/02/13 14:00	107-06-2	
1,1-Dichloroethene	**<0.43**	ug/L	1.0	0.43	1		07/02/13 14:00	75-35-4	
cis-1,2-Dichloroethene	**<0.42**	ug/L	1.0	0.42	1		07/02/13 14:00	156-59-2	
trans-1,2-Dichloroethene	**<0.37**	ug/L	1.0	0.37	1		07/02/13 14:00	156-60-5	
1,2-Dichloropropane	**<0.50**	ug/L	1.0	0.50	1		07/02/13 14:00	78-87-5	
1,3-Dichloropropane	**<0.46**	ug/L	1.0	0.46	1		07/02/13 14:00	142-28-9	
2,2-Dichloropropane	**<0.37**	ug/L	1.0	0.37	1		07/02/13 14:00	594-20-7	
1,1-Dichloropropene	**<0.51**	ug/L	1.0	0.51	1		07/02/13 14:00	563-58-6	
cis-1,3-Dichloropropene	**<0.29**	ug/L	1.0	0.29	1		07/02/13 14:00	10061-01-5	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS

Project: 204639 CITY OF MADISON-CUB FOO
Pace Project No.: 4080362

Sample: TW-4 **Lab ID: 4080362015** Collected: 06/27/13 08:15 Received: 06/28/13 09:45 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 8260								
trans-1,3-Dichloropropene	**<0.26**	ug/L	1.0	0.26	1		07/02/13 14:00	10061-02-6	
Diisopropyl ether	**<0.50**	ug/L	1.0	0.50	1		07/02/13 14:00	108-20-3	
Ethylbenzene	**<0.50**	ug/L	1.0	0.50	1		07/02/13 14:00	100-41-4	
Hexachloro-1,3-butadiene	**<1.3**	ug/L	5.0	1.3	1		07/02/13 14:00	87-68-3	
Isopropylbenzene (Cumene)	**<0.34**	ug/L	1.0	0.34	1		07/02/13 14:00	98-82-8	
p-Isopropyltoluene	**<0.40**	ug/L	1.0	0.40	1		07/02/13 14:00	99-87-6	
Methylene Chloride	**<0.36**	ug/L	1.0	0.36	1		07/02/13 14:00	75-09-2	
Methyl-tert-butyl ether	**<0.49**	ug/L	1.0	0.49	1		07/02/13 14:00	1634-04-4	
Naphthalene	**<2.5**	ug/L	5.0	2.5	1		07/02/13 14:00	91-20-3	
n-Propylbenzene	**<0.50**	ug/L	1.0	0.50	1		07/02/13 14:00	103-65-1	
Styrene	**<0.35**	ug/L	1.0	0.35	1		07/02/13 14:00	100-42-5	
1,1,1,2-Tetrachloroethane	**<0.45**	ug/L	1.0	0.45	1		07/02/13 14:00	630-20-6	
1,1,2,2-Tetrachloroethane	**<0.38**	ug/L	1.0	0.38	1		07/02/13 14:00	79-34-5	
Tetrachloroethene	**<0.47**	ug/L	1.0	0.47	1		07/02/13 14:00	127-18-4	
Toluene	**<0.44**	ug/L	1.0	0.44	1		07/02/13 14:00	108-88-3	
1,2,3-Trichlorobenzene	**<0.77**	ug/L	5.0	0.77	1		07/02/13 14:00	87-61-6	
1,2,4-Trichlorobenzene	**<2.5**	ug/L	5.0	2.5	1		07/02/13 14:00	120-82-1	
1,1,1-Trichloroethane	**<0.44**	ug/L	1.0	0.44	1		07/02/13 14:00	71-55-6	
1,1,2-Trichloroethane	**<0.39**	ug/L	1.0	0.39	1		07/02/13 14:00	79-00-5	
Trichloroethene	**<0.43**	ug/L	1.0	0.43	1		07/02/13 14:00	79-01-6	
Trichlorofluoromethane	**<0.48**	ug/L	1.0	0.48	1		07/02/13 14:00	75-69-4	
1,2,3-Trichloropropane	**<0.47**	ug/L	1.0	0.47	1		07/02/13 14:00	96-18-4	
1,2,4-Trimethylbenzene	**<0.57**	ug/L	5.0	0.57	1		07/02/13 14:00	95-63-6	
1,3,5-Trimethylbenzene	**<2.5**	ug/L	5.0	2.5	1		07/02/13 14:00	108-67-8	
Vinyl chloride	**<0.18**	ug/L	1.0	0.18	1		07/02/13 14:00	75-01-4	
m&p-Xylene	**<0.82**	ug/L	2.0	0.82	1		07/02/13 14:00	179601-23-1	
o-Xylene	**<0.50**	ug/L	1.0	0.50	1		07/02/13 14:00	95-47-6	
Surrogates									
4-Bromofluorobenzene (S)	98	%	43-137		1		07/02/13 14:00	460-00-4	
Dibromofluoromethane (S)	111	%	70-130		1		07/02/13 14:00	1868-53-7	
Toluene-d8 (S)	93	%	55-137		1		07/02/13 14:00	2037-26-5	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS

Project: 204639 CITY OF MADISON-CUB FOO
Pace Project No.: 4080362

Sample: GP-1 (18-20') **Lab ID: 4080362016** Collected: 06/26/13 14:45 Received: 06/28/13 09:45 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Level Normal List	Analytical Method: EPA 8260 Preparation Method: EPA 5035/5030B								
1,1,1,2-Tetrachloroethane	**<12.4**	ug/kg	29.7	12.4	1	07/01/13 14:12	07/02/13 03:29	630-20-6	W
1,1,1-Trichloroethane	**<12.4**	ug/kg	29.7	12.4	1	07/01/13 14:12	07/02/13 03:29	71-55-6	W
1,1,2,2-Tetrachloroethane	**<12.4**	ug/kg	29.7	12.4	1	07/01/13 14:12	07/02/13 03:29	79-34-5	W
1,1,2-Trichloroethane	**<12.4**	ug/kg	29.7	12.4	1	07/01/13 14:12	07/02/13 03:29	79-00-5	W
1,1-Dichloroethane	**<12.4**	ug/kg	29.7	12.4	1	07/01/13 14:12	07/02/13 03:29	75-34-3	W
1,1-Dichloroethene	**<12.4**	ug/kg	29.7	12.4	1	07/01/13 14:12	07/02/13 03:29	75-35-4	W
1,1-Dichloropropene	**<12.4**	ug/kg	29.7	12.4	1	07/01/13 14:12	07/02/13 03:29	563-58-6	W
1,2,3-Trichlorobenzene	**<12.4**	ug/kg	29.7	12.4	1	07/01/13 14:12	07/02/13 03:29	87-61-6	W
1,2,3-Trichloropropane	**<12.4**	ug/kg	29.7	12.4	1	07/01/13 14:12	07/02/13 03:29	96-18-4	W
1,2,4-Trichlorobenzene	**<12.4**	ug/kg	29.7	12.4	1	07/01/13 14:12	07/02/13 03:29	120-82-1	W
1,2,4-Trimethylbenzene	**39.2**	ug/kg	33.6	14.0	1	07/01/13 14:12	07/02/13 03:29	95-63-6	
1,2-Dibromo-3-chloropropane	**<24.7**	ug/kg	124	24.7	1	07/01/13 14:12	07/02/13 03:29	96-12-8	W
1,2-Dibromoethane (EDB)	**<12.4**	ug/kg	29.7	12.4	1	07/01/13 14:12	07/02/13 03:29	106-93-4	W
1,2-Dichlorobenzene	**<12.4**	ug/kg	29.7	12.4	1	07/01/13 14:12	07/02/13 03:29	95-50-1	W
1,2-Dichloroethane	**<12.4**	ug/kg	29.7	12.4	1	07/01/13 14:12	07/02/13 03:29	107-06-2	W
1,2-Dichloropropane	**<12.4**	ug/kg	29.7	12.4	1	07/01/13 14:12	07/02/13 03:29	78-87-5	W
1,3,5-Trimethylbenzene	**<12.4**	ug/kg	29.7	12.4	1	07/01/13 14:12	07/02/13 03:29	108-67-8	W
1,3-Dichlorobenzene	**<12.4**	ug/kg	29.7	12.4	1	07/01/13 14:12	07/02/13 03:29	541-73-1	W
1,3-Dichloropropane	**<12.4**	ug/kg	29.7	12.4	1	07/01/13 14:12	07/02/13 03:29	142-28-9	W
1,4-Dichlorobenzene	**<12.4**	ug/kg	29.7	12.4	1	07/01/13 14:12	07/02/13 03:29	106-46-7	W
2,2-Dichloropropane	**<12.4**	ug/kg	29.7	12.4	1	07/01/13 14:12	07/02/13 03:29	594-20-7	W
2-Chlorotoluene	**<12.4**	ug/kg	29.7	12.4	1	07/01/13 14:12	07/02/13 03:29	95-49-8	W
4-Chlorotoluene	**<12.4**	ug/kg	29.7	12.4	1	07/01/13 14:12	07/02/13 03:29	106-43-4	W
Benzene	**<12.4**	ug/kg	29.7	12.4	1	07/01/13 14:12	07/02/13 03:29	71-43-2	W
Bromobenzene	**<12.4**	ug/kg	29.7	12.4	1	07/01/13 14:12	07/02/13 03:29	108-86-1	W
Bromochloromethane	**<12.4**	ug/kg	29.7	12.4	1	07/01/13 14:12	07/02/13 03:29	74-97-5	W
Bromodichloromethane	**<12.4**	ug/kg	29.7	12.4	1	07/01/13 14:12	07/02/13 03:29	75-27-4	W
Bromoform	**<12.4**	ug/kg	29.7	12.4	1	07/01/13 14:12	07/02/13 03:29	75-25-2	W
Bromomethane	**<12.4**	ug/kg	29.7	12.4	1	07/01/13 14:12	07/02/13 03:29	74-83-9	W
Carbon tetrachloride	**<12.4**	ug/kg	29.7	12.4	1	07/01/13 14:12	07/02/13 03:29	56-23-5	W
Chlorobenzene	**<12.4**	ug/kg	29.7	12.4	1	07/01/13 14:12	07/02/13 03:29	108-90-7	W
Chloroethane	**<12.4**	ug/kg	29.7	12.4	1	07/01/13 14:12	07/02/13 03:29	75-00-3	W
Chloroform	**<12.4**	ug/kg	29.7	12.4	1	07/01/13 14:12	07/02/13 03:29	67-66-3	W
Chloromethane	**<12.4**	ug/kg	29.7	12.4	1	07/01/13 14:12	07/02/13 03:29	74-87-3	W
Dibromochloromethane	**<12.4**	ug/kg	29.7	12.4	1	07/01/13 14:12	07/02/13 03:29	124-48-1	W
Dibromomethane	**<12.4**	ug/kg	29.7	12.4	1	07/01/13 14:12	07/02/13 03:29	74-95-3	W
Dichlorodifluoromethane	**<12.4**	ug/kg	29.7	12.4	1	07/01/13 14:12	07/02/13 03:29	75-71-8	W
Diisopropyl ether	**<12.4**	ug/kg	29.7	12.4	1	07/01/13 14:12	07/02/13 03:29	108-20-3	W
Ethylbenzene	**18.1J**	ug/kg	33.6	14.0	1	07/01/13 14:12	07/02/13 03:29	100-41-4	
Hexachloro-1,3-butadiene	**<12.4**	ug/kg	29.7	12.4	1	07/01/13 14:12	07/02/13 03:29	87-68-3	W
Isopropylbenzene (Cumene)	**<12.4**	ug/kg	29.7	12.4	1	07/01/13 14:12	07/02/13 03:29	98-82-8	W
Methyl-tert-butyl ether	**<12.4**	ug/kg	29.7	12.4	1	07/01/13 14:12	07/02/13 03:29	1634-04-4	W
Methylene Chloride	**<12.4**	ug/kg	29.7	12.4	1	07/01/13 14:12	07/02/13 03:29	75-09-2	W
Naphthalene	**<12.4**	ug/kg	29.7	12.4	1	07/01/13 14:12	07/02/13 03:29	91-20-3	W
Styrene	**<12.4**	ug/kg	29.7	12.4	1	07/01/13 14:12	07/02/13 03:29	100-42-5	W

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS

Project: 204639 CITY OF MADISON-CUB FOO
Pace Project No.: 4080362

Sample: GP-1 (18-20') **Lab ID: 4080362016** Collected: 06/26/13 14:45 Received: 06/28/13 09:45 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Med Level Normal List	Analytical Method: EPA 8260 Preparation Method: EPA 5035/5030B								
Tetrachloroethene	**<12.4**	ug/kg	29.7	12.4	1	07/01/13 14:12	07/02/13 03:29	127-18-4	W
Toluene	**<12.4**	ug/kg	29.7	12.4	1	07/01/13 14:12	07/02/13 03:29	108-88-3	W
Trichloroethene	**<12.4**	ug/kg	29.7	12.4	1	07/01/13 14:12	07/02/13 03:29	79-01-6	W
Trichlorofluoromethane	**<12.4**	ug/kg	29.7	12.4	1	07/01/13 14:12	07/02/13 03:29	75-69-4	W
Vinyl chloride	**<12.4**	ug/kg	29.7	12.4	1	07/01/13 14:12	07/02/13 03:29	75-01-4	W
cis-1,2-Dichloroethene	**<12.4**	ug/kg	29.7	12.4	1	07/01/13 14:12	07/02/13 03:29	156-59-2	W
cis-1,3-Dichloropropene	**<12.4**	ug/kg	29.7	12.4	1	07/01/13 14:12	07/02/13 03:29	10061-01-5	W
m&p-Xylene	**<24.8**	ug/kg	59.4	24.8	1	07/01/13 14:12	07/02/13 03:29	179601-23-1	W
n-Butylbenzene	**<12.4**	ug/kg	29.7	12.4	1	07/01/13 14:12	07/02/13 03:29	104-51-8	W
n-Propylbenzene	**<12.4**	ug/kg	29.7	12.4	1	07/01/13 14:12	07/02/13 03:29	103-65-1	W
o-Xylene	**<12.4**	ug/kg	29.7	12.4	1	07/01/13 14:12	07/02/13 03:29	95-47-6	W
p-Isopropyltoluene	**<12.4**	ug/kg	29.7	12.4	1	07/01/13 14:12	07/02/13 03:29	99-87-6	W
sec-Butylbenzene	**<12.4**	ug/kg	29.7	12.4	1	07/01/13 14:12	07/02/13 03:29	135-98-8	W
tert-Butylbenzene	**<12.4**	ug/kg	29.7	12.4	1	07/01/13 14:12	07/02/13 03:29	98-06-6	W
trans-1,2-Dichloroethene	**<12.4**	ug/kg	29.7	12.4	1	07/01/13 14:12	07/02/13 03:29	156-60-5	W
trans-1,3-Dichloropropene	**<12.4**	ug/kg	29.7	12.4	1	07/01/13 14:12	07/02/13 03:29	10061-02-6	W
Surrogates									
Dibromofluoromethane (S)	110	%	57-130		1	07/01/13 14:12	07/02/13 03:29	1868-53-7	1q
Toluene-d8 (S)	110	%	54-133		1	07/01/13 14:12	07/02/13 03:29	2037-26-5	
4-Bromofluorobenzene (S)	106	%	49-130		1	07/01/13 14:12	07/02/13 03:29	460-00-4	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**11.6**	%	0.10	0.10	1		07/01/13 17:25		

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS

Project: 204639 CITY OF MADISON-CUB FOO
Pace Project No.: 4080362

Sample: TRIP BLANK **Lab ID: 4080362017** Collected: 06/26/13 00:00 Received: 06/28/13 09:45 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 8260								
Benzene	**<0.50**	ug/L	1.0	0.50	1		06/29/13 17:17	71-43-2	
Bromobenzene	**<0.48**	ug/L	1.0	0.48	1		06/29/13 17:17	108-86-1	
Bromochloromethane	**<0.49**	ug/L	1.0	0.49	1		06/29/13 17:17	74-97-5	
Bromodichloromethane	**<0.45**	ug/L	1.0	0.45	1		06/29/13 17:17	75-27-4	
Bromoform	**<0.23**	ug/L	1.0	0.23	1		06/29/13 17:17	75-25-2	
Bromomethane	**<0.43**	ug/L	5.0	0.43	1		06/29/13 17:17	74-83-9	
n-Butylbenzene	**<0.40**	ug/L	1.0	0.40	1		06/29/13 17:17	104-51-8	
sec-Butylbenzene	**<0.60**	ug/L	5.0	0.60	1		06/29/13 17:17	135-98-8	
tert-Butylbenzene	**<0.42**	ug/L	1.0	0.42	1		06/29/13 17:17	98-06-6	
Carbon tetrachloride	**<0.37**	ug/L	1.0	0.37	1		06/29/13 17:17	56-23-5	
Chlorobenzene	**<0.36**	ug/L	1.0	0.36	1		06/29/13 17:17	108-90-7	
Chloroethane	**<0.44**	ug/L	1.0	0.44	1		06/29/13 17:17	75-00-3	
Chloroform	**<0.69**	ug/L	5.0	0.69	1		06/29/13 17:17	67-66-3	
Chloromethane	**<0.39**	ug/L	1.0	0.39	1		06/29/13 17:17	74-87-3	
2-Chlorotoluene	**<0.48**	ug/L	1.0	0.48	1		06/29/13 17:17	95-49-8	
4-Chlorotoluene	**<0.48**	ug/L	1.0	0.48	1		06/29/13 17:17	106-43-4	
1,2-Dibromo-3-chloropropane	**<1.5**	ug/L	5.0	1.5	1		06/29/13 17:17	96-12-8	
Dibromochloromethane	**<1.9**	ug/L	5.0	1.9	1		06/29/13 17:17	124-48-1	
1,2-Dibromoethane (EDB)	**<0.38**	ug/L	1.0	0.38	1		06/29/13 17:17	106-93-4	
Dibromomethane	**<0.48**	ug/L	1.0	0.48	1		06/29/13 17:17	74-95-3	
1,2-Dichlorobenzene	**<0.44**	ug/L	1.0	0.44	1		06/29/13 17:17	95-50-1	
1,3-Dichlorobenzene	**<0.45**	ug/L	1.0	0.45	1		06/29/13 17:17	541-73-1	
1,4-Dichlorobenzene	**<0.43**	ug/L	1.0	0.43	1		06/29/13 17:17	106-46-7	
Dichlorodifluoromethane	**<0.40**	ug/L	1.0	0.40	1		06/29/13 17:17	75-71-8	
1,1-Dichloroethane	**<0.28**	ug/L	1.0	0.28	1		06/29/13 17:17	75-34-3	
1,2-Dichloroethane	**<0.48**	ug/L	1.0	0.48	1		06/29/13 17:17	107-06-2	
1,1-Dichloroethene	**<0.43**	ug/L	1.0	0.43	1		06/29/13 17:17	75-35-4	
cis-1,2-Dichloroethene	**<0.42**	ug/L	1.0	0.42	1		06/29/13 17:17	156-59-2	
trans-1,2-Dichloroethene	**<0.37**	ug/L	1.0	0.37	1		06/29/13 17:17	156-60-5	
1,2-Dichloropropane	**<0.50**	ug/L	1.0	0.50	1		06/29/13 17:17	78-87-5	
1,3-Dichloropropane	**<0.46**	ug/L	1.0	0.46	1		06/29/13 17:17	142-28-9	
2,2-Dichloropropane	**<0.37**	ug/L	1.0	0.37	1		06/29/13 17:17	594-20-7	
1,1-Dichloropropene	**<0.51**	ug/L	1.0	0.51	1		06/29/13 17:17	563-58-6	
cis-1,3-Dichloropropene	**<0.29**	ug/L	1.0	0.29	1		06/29/13 17:17	10061-01-5	
trans-1,3-Dichloropropene	**<0.26**	ug/L	1.0	0.26	1		06/29/13 17:17	10061-02-6	
Diisopropyl ether	**<0.50**	ug/L	1.0	0.50	1		06/29/13 17:17	108-20-3	
Ethylbenzene	**<0.50**	ug/L	1.0	0.50	1		06/29/13 17:17	100-41-4	
Hexachloro-1,3-butadiene	**<1.3**	ug/L	5.0	1.3	1		06/29/13 17:17	87-68-3	
Isopropylbenzene (Cumene)	**<0.34**	ug/L	1.0	0.34	1		06/29/13 17:17	98-82-8	
p-Isopropyltoluene	**<0.40**	ug/L	1.0	0.40	1		06/29/13 17:17	99-87-6	
Methylene Chloride	**<0.36**	ug/L	1.0	0.36	1		06/29/13 17:17	75-09-2	
Methyl-tert-butyl ether	**<0.49**	ug/L	1.0	0.49	1		06/29/13 17:17	1634-04-4	
Naphthalene	**<2.5**	ug/L	5.0	2.5	1		06/29/13 17:17	91-20-3	
n-Propylbenzene	**<0.50**	ug/L	1.0	0.50	1		06/29/13 17:17	103-65-1	
Styrene	**<0.35**	ug/L	1.0	0.35	1		06/29/13 17:17	100-42-5	
1,1,1,2-Tetrachloroethane	**<0.45**	ug/L	1.0	0.45	1		06/29/13 17:17	630-20-6	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS

Project: 204639 CITY OF MADISON-CUB FOO
Pace Project No.: 4080362

Sample: TRIP BLANK **Lab ID: 4080362017** Collected: 06/26/13 00:00 Received: 06/28/13 09:45 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 8260								
1,1,2,2-Tetrachloroethane	**<0.38**	ug/L	1.0	0.38	1		06/29/13 17:17	79-34-5	
Tetrachloroethene	**<0.47**	ug/L	1.0	0.47	1		06/29/13 17:17	127-18-4	
Toluene	**<0.44**	ug/L	1.0	0.44	1		06/29/13 17:17	108-88-3	
1,2,3-Trichlorobenzene	**<0.77**	ug/L	5.0	0.77	1		06/29/13 17:17	87-61-6	
1,2,4-Trichlorobenzene	**<2.5**	ug/L	5.0	2.5	1		06/29/13 17:17	120-82-1	
1,1,1-Trichloroethane	**<0.44**	ug/L	1.0	0.44	1		06/29/13 17:17	71-55-6	
1,1,2-Trichloroethane	**<0.39**	ug/L	1.0	0.39	1		06/29/13 17:17	79-00-5	
Trichloroethene	**<0.43**	ug/L	1.0	0.43	1		06/29/13 17:17	79-01-6	
Trichlorofluoromethane	**<0.48**	ug/L	1.0	0.48	1		06/29/13 17:17	75-69-4	
1,2,3-Trichloropropane	**<0.47**	ug/L	1.0	0.47	1		06/29/13 17:17	96-18-4	
1,2,4-Trimethylbenzene	**<0.57**	ug/L	5.0	0.57	1		06/29/13 17:17	95-63-6	
1,3,5-Trimethylbenzene	**<2.5**	ug/L	5.0	2.5	1		06/29/13 17:17	108-67-8	
Vinyl chloride	**<0.18**	ug/L	1.0	0.18	1		06/29/13 17:17	75-01-4	
m&p-Xylene	**<0.82**	ug/L	2.0	0.82	1		06/29/13 17:17	179601-23-1	
o-Xylene	**<0.50**	ug/L	1.0	0.50	1		06/29/13 17:17	95-47-6	
Surrogates									
4-Bromofluorobenzene (S)	94	%	43-137		1		06/29/13 17:17	460-00-4	
Dibromofluoromethane (S)	97	%	70-130		1		06/29/13 17:17	1868-53-7	
Toluene-d8 (S)	99	%	55-137		1		06/29/13 17:17	2037-26-5	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

QUALITY CONTROL DATA

Project: 204639 CITY OF MADISON-CUB FOO
Pace Project No.: 4080362

QC Batch: ICP/7745 Analysis Method: EPA 6010
QC Batch Method: EPA 6010 Analysis Description: ICP Metals, Trace, Dissolved
Associated Lab Samples: 4080362012, 4080362013

METHOD BLANK: 816989 Matrix: Water
Associated Lab Samples: 4080362012, 4080362013

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Lead, Dissolved	ug/L	<1.2	7.5	07/02/13 13:40	

LABORATORY CONTROL SAMPLE: 816990

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Lead, Dissolved	ug/L	500	446	89	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 816991 816992

Parameter	Units	4080419004 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Lead, Dissolved	ug/L	2.5J	500	500	493	498	98	99	75-125	1	20	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

QUALITY CONTROL DATA

Project: 204639 CITY OF MADISON-CUB FOO
Pace Project No.: 4080362

QC Batch: ICP/7773
QC Batch Method: EPA 6010
Analysis Method: EPA 6010
Analysis Description: ICP Metals, Trace, Dissolved
Associated Lab Samples: 4080362015

METHOD BLANK: 820817 Matrix: Water
Associated Lab Samples: 4080362015

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Arsenic, Dissolved	ug/L	<4.4	20.0	07/11/13 11:47	
Barium, Dissolved	ug/L	<1.1	5.0	07/11/13 11:47	
Cadmium, Dissolved	ug/L	<0.38	5.0	07/11/13 11:47	
Chromium, Dissolved	ug/L	<1.2	5.0	07/11/13 11:47	
Lead, Dissolved	ug/L	<1.2	7.5	07/11/13 11:47	
Selenium, Dissolved	ug/L	<6.6	20.0	07/11/13 11:47	
Silver, Dissolved	ug/L	<1.4	10.0	07/11/13 11:47	

LABORATORY CONTROL SAMPLE: 820818

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Arsenic, Dissolved	ug/L	500	523	105	80-120	
Barium, Dissolved	ug/L	500	523	105	80-120	
Cadmium, Dissolved	ug/L	500	524	105	80-120	
Chromium, Dissolved	ug/L	500	519	104	80-120	
Lead, Dissolved	ug/L	500	528	106	80-120	
Selenium, Dissolved	ug/L	500	461	92	80-120	
Silver, Dissolved	ug/L	250	222	89	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 820819 820820

Parameter	Units	4080362015 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Arsenic, Dissolved	ug/L	9.3J	500	500	556	567	109	112	75-125	2	20	
Barium, Dissolved	ug/L	210	500	500	720	732	102	104	75-125	2	20	
Cadmium, Dissolved	ug/L	<0.38	500	500	552	564	110	113	75-125	2	20	
Chromium, Dissolved	ug/L	3.0J	500	500	520	531	103	106	75-125	2	20	
Lead, Dissolved	ug/L	3.2J	500	500	497	509	99	101	75-125	2	20	
Selenium, Dissolved	ug/L	<6.6	500	500	486	507	97	101	75-125	4	20	
Silver, Dissolved	ug/L	2.2J	250	250	247	253	98	100	75-125	3	20	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

QUALITY CONTROL DATA

Project: 204639 CITY OF MADISON-CUB FOO
Pace Project No.: 4080362

QC Batch: MERP/3742
QC Batch Method: EPA 7470
Analysis Method: EPA 7470
Analysis Description: 7470 Mercury Dissolved
Associated Lab Samples: 4080362015

METHOD BLANK: 823141 Matrix: Water
Associated Lab Samples: 4080362015

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury, Dissolved	ug/L	<0.10	0.20	07/15/13 14:08	

METHOD BLANK: 823143 Matrix: Water
Associated Lab Samples: 4080362015

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury, Dissolved	ug/L	<0.10	0.20	07/15/13 14:27	2q

LABORATORY CONTROL SAMPLE: 823142

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury, Dissolved	ug/L	5	4.6	91	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 823144 823145

Parameter	Units	4081036001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury, Dissolved	ug/L	<0.10	5	5	4.9	4.9	97	97	85-115	0	20	

Pace Analytical Services, Inc.
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QUALITY CONTROL DATA

Project: 204639 CITY OF MADISON-CUB FOO
Pace Project No.: 4080362

QC Batch: MERP/3727
QC Batch Method: EPA 7471
Analysis Method: EPA 7471
Analysis Description: 7471 Mercury
Associated Lab Samples: 4080362003

METHOD BLANK: 816563 Matrix: Solid
Associated Lab Samples: 4080362003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	mg/kg	<0.0033	0.0067	07/02/13 11:33	

LABORATORY CONTROL SAMPLE: 816564

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	.17	0.18	106	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 816565 816566

Parameter	Units	4080411003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	mg/kg	0.012	.19	.2	0.21	0.21	102	102	85-115	0	20	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

QUALITY CONTROL DATA

Project: 204639 CITY OF MADISON-CUB FOO
Pace Project No.: 4080362

QC Batch: MPRP/8728 Analysis Method: EPA 6010
QC Batch Method: EPA 3050 Analysis Description: 6010 MET
Associated Lab Samples: 4080362003, 4080362006, 4080362007, 4080362014

METHOD BLANK: 816504 Matrix: Solid
Associated Lab Samples: 4080362003, 4080362006, 4080362007, 4080362014

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Arsenic	mg/kg	<0.54	2.0	07/02/13 12:37	
Barium	mg/kg	<0.087	0.50	07/02/13 12:37	
Cadmium	mg/kg	<0.051	0.50	07/02/13 12:37	
Chromium	mg/kg	<0.13	0.50	07/02/13 12:37	
Lead	mg/kg	<0.29	1.0	07/02/13 12:37	
Selenium	mg/kg	<0.59	2.0	07/02/13 12:37	
Silver	mg/kg	<0.21	1.0	07/02/13 12:37	

LABORATORY CONTROL SAMPLE: 816505

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Arsenic	mg/kg	50	45.1	90	80-120	
Barium	mg/kg	50	46.9	94	80-120	
Cadmium	mg/kg	50	45.4	91	80-120	
Chromium	mg/kg	50	46.9	94	80-120	
Lead	mg/kg	50	46.5	93	80-120	
Selenium	mg/kg	50	46.3	93	80-120	
Silver	mg/kg	25	23.0	92	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 816506 816507

Parameter	Units	4080411003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Arsenic	mg/kg	0.71J	58.2	58.2	50.8	50.1	86	85	75-125	1	20	
Barium	mg/kg	23.5	58.2	58.2	74.8	73.1	88	85	75-125	2	20	
Cadmium	mg/kg	0.089J	58.2	58.2	50.2	49.8	86	85	75-125	1	20	
Chromium	mg/kg	11.2	58.2	58.2	62.3	60.4	88	85	75-125	3	20	
Lead	mg/kg	2.9	58.2	58.2	53.5	53.5	87	87	75-125	0	20	
Selenium	mg/kg	<0.69	58.2	58.2	49.5	50.0	84	85	75-125	1	20	
Silver	mg/kg	<0.25	29.1	29.1	25.2	25.0	87	86	75-125	1	20	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
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(920)469-2436

QUALITY CONTROL DATA

Project: 204639 CITY OF MADISON-CUB FOO
Pace Project No.: 4080362

QC Batch: MSV/20306 Analysis Method: EPA 8260
QC Batch Method: EPA 5035/5030B Analysis Description: 8260 MSV Med Level Normal List
Associated Lab Samples: 4080362001, 4080362002, 4080362003, 4080362004, 4080362005, 4080362006, 4080362007, 4080362014, 4080362016

METHOD BLANK: 816619 Matrix: Solid
Associated Lab Samples: 4080362001, 4080362002, 4080362003, 4080362004, 4080362005, 4080362006, 4080362007, 4080362014, 4080362016

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/kg	<25.0	60.0	07/01/13 17:59	
1,1,1-Trichloroethane	ug/kg	<25.0	60.0	07/01/13 17:59	
1,1,2,2-Tetrachloroethane	ug/kg	<25.0	60.0	07/01/13 17:59	
1,1,2-Trichloroethane	ug/kg	<25.0	60.0	07/01/13 17:59	
1,1-Dichloroethane	ug/kg	<25.0	60.0	07/01/13 17:59	
1,1-Dichloroethene	ug/kg	<25.0	60.0	07/01/13 17:59	
1,1-Dichloropropene	ug/kg	<25.0	60.0	07/01/13 17:59	
1,2,3-Trichlorobenzene	ug/kg	<25.0	60.0	07/01/13 17:59	
1,2,3-Trichloropropane	ug/kg	<25.0	60.0	07/01/13 17:59	
1,2,4-Trichlorobenzene	ug/kg	<25.0	60.0	07/01/13 17:59	
1,2,4-Trimethylbenzene	ug/kg	<25.0	60.0	07/01/13 17:59	
1,2-Dibromo-3-chloropropane	ug/kg	<49.8	250	07/01/13 17:59	
1,2-Dibromoethane (EDB)	ug/kg	<25.0	60.0	07/01/13 17:59	
1,2-Dichlorobenzene	ug/kg	<25.0	60.0	07/01/13 17:59	
1,2-Dichloroethane	ug/kg	<25.0	60.0	07/01/13 17:59	
1,2-Dichloropropane	ug/kg	<25.0	60.0	07/01/13 17:59	
1,3,5-Trimethylbenzene	ug/kg	<25.0	60.0	07/01/13 17:59	
1,3-Dichlorobenzene	ug/kg	<25.0	60.0	07/01/13 17:59	
1,3-Dichloropropane	ug/kg	<25.0	60.0	07/01/13 17:59	
1,4-Dichlorobenzene	ug/kg	<25.0	60.0	07/01/13 17:59	
2,2-Dichloropropane	ug/kg	<25.0	60.0	07/01/13 17:59	
2-Chlorotoluene	ug/kg	<25.0	60.0	07/01/13 17:59	
4-Chlorotoluene	ug/kg	<25.0	60.0	07/01/13 17:59	
Benzene	ug/kg	<25.0	60.0	07/01/13 17:59	
Bromobenzene	ug/kg	<25.0	60.0	07/01/13 17:59	
Bromochloromethane	ug/kg	<25.0	60.0	07/01/13 17:59	
Bromodichloromethane	ug/kg	<25.0	60.0	07/01/13 17:59	
Bromoform	ug/kg	<25.0	60.0	07/01/13 17:59	
Bromomethane	ug/kg	<25.0	60.0	07/01/13 17:59	
Carbon tetrachloride	ug/kg	<25.0	60.0	07/01/13 17:59	
Chlorobenzene	ug/kg	<25.0	60.0	07/01/13 17:59	
Chloroethane	ug/kg	<25.0	60.0	07/01/13 17:59	
Chloroform	ug/kg	<25.0	60.0	07/01/13 17:59	
Chloromethane	ug/kg	<25.0	60.0	07/01/13 17:59	
cis-1,2-Dichloroethene	ug/kg	<25.0	60.0	07/01/13 17:59	
cis-1,3-Dichloropropene	ug/kg	<25.0	60.0	07/01/13 17:59	
Dibromochloromethane	ug/kg	<25.0	60.0	07/01/13 17:59	
Dibromomethane	ug/kg	<25.0	60.0	07/01/13 17:59	
Dichlorodifluoromethane	ug/kg	<25.0	60.0	07/01/13 17:59	
Diisopropyl ether	ug/kg	<25.0	60.0	07/01/13 17:59	
Ethylbenzene	ug/kg	<25.0	60.0	07/01/13 17:59	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
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QUALITY CONTROL DATA

Project: 204639 CITY OF MADISON-CUB FOO
Pace Project No.: 4080362

METHOD BLANK: 816619 Matrix: Solid

Associated Lab Samples: 4080362001, 4080362002, 4080362003, 4080362004, 4080362005, 4080362006, 4080362007, 4080362014, 4080362016

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Hexachloro-1,3-butadiene	ug/kg	<25.0	60.0	07/01/13 17:59	
Isopropylbenzene (Cumene)	ug/kg	<25.0	60.0	07/01/13 17:59	
m&p-Xylene	ug/kg	<50.0	120	07/01/13 17:59	
Methyl-tert-butyl ether	ug/kg	<25.0	60.0	07/01/13 17:59	
Methylene Chloride	ug/kg	<25.0	60.0	07/01/13 17:59	
n-Butylbenzene	ug/kg	<25.0	60.0	07/01/13 17:59	
n-Propylbenzene	ug/kg	<25.0	60.0	07/01/13 17:59	
Naphthalene	ug/kg	<25.0	60.0	07/01/13 17:59	
o-Xylene	ug/kg	<25.0	60.0	07/01/13 17:59	
p-Isopropyltoluene	ug/kg	<25.0	60.0	07/01/13 17:59	
sec-Butylbenzene	ug/kg	<25.0	60.0	07/01/13 17:59	
Styrene	ug/kg	<25.0	60.0	07/01/13 17:59	
tert-Butylbenzene	ug/kg	<25.0	60.0	07/01/13 17:59	
Tetrachloroethene	ug/kg	<25.0	60.0	07/01/13 17:59	
Toluene	ug/kg	<25.0	60.0	07/01/13 17:59	
trans-1,2-Dichloroethene	ug/kg	<25.0	60.0	07/01/13 17:59	
trans-1,3-Dichloropropene	ug/kg	<25.0	60.0	07/01/13 17:59	
Trichloroethene	ug/kg	<25.0	60.0	07/01/13 17:59	
Trichlorofluoromethane	ug/kg	<25.0	60.0	07/01/13 17:59	
Vinyl chloride	ug/kg	<25.0	60.0	07/01/13 17:59	
4-Bromofluorobenzene (S)	%	100	49-130	07/01/13 17:59	
Dibromofluoromethane (S)	%	101	57-130	07/01/13 17:59	
Toluene-d8 (S)	%	103	54-133	07/01/13 17:59	

LABORATORY CONTROL SAMPLE & LCSD: 816620 816621

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
1,1,1-Trichloroethane	ug/kg	2500	2300	2380	92	95	70-130	3	20	
1,1,2,2-Tetrachloroethane	ug/kg	2500	2550	2490	102	100	70-130	2	20	
1,1,2-Trichloroethane	ug/kg	2500	2220	2230	89	89	70-130	1	20	
1,1-Dichloroethane	ug/kg	2500	2380	2470	95	99	70-130	4	20	
1,1-Dichloroethene	ug/kg	2500	2420	2480	97	99	64-130	2	20	
1,2,4-Trichlorobenzene	ug/kg	2500	2440	2350	98	94	68-130	4	20	
1,2-Dibromo-3-chloropropane	ug/kg	2500	2150	2180	86	87	50-150	1	20	
1,2-Dibromoethane (EDB)	ug/kg	2500	2330	2310	93	92	70-130	1	20	
1,2-Dichlorobenzene	ug/kg	2500	2540	2480	102	99	70-130	2	20	
1,2-Dichloroethane	ug/kg	2500	2410	2370	97	95	70-130	2	20	
1,2-Dichloropropane	ug/kg	2500	2360	2400	94	96	70-130	2	20	
1,3-Dichlorobenzene	ug/kg	2500	2420	2380	97	95	70-130	2	20	
1,4-Dichlorobenzene	ug/kg	2500	2390	2330	95	93	70-130	2	20	
Benzene	ug/kg	2500	2310	2380	92	95	70-130	3	20	
Bromodichloromethane	ug/kg	2500	2370	2360	95	94	70-130	0	20	
Bromoform	ug/kg	2500	2180	2210	87	88	63-130	1	20	
Bromomethane	ug/kg	2500	2420	2410	97	96	41-142	1	20	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

QUALITY CONTROL DATA

Project: 204639 CITY OF MADISON-CUB FOO
Pace Project No.: 4080362

LABORATORY CONTROL SAMPLE & LCSD: 816620 816621

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Carbon tetrachloride	ug/kg	2500	2370	2350	95	94	70-130	1	20	
Chlorobenzene	ug/kg	2500	2310	2370	92	95	70-130	3	20	
Chloroethane	ug/kg	2500	2310	2430	92	97	57-130	5	20	
Chloroform	ug/kg	2500	2310	2350	93	94	70-130	2	20	
Chloromethane	ug/kg	2500	2170	2160	87	86	57-130	0	20	
cis-1,2-Dichloroethene	ug/kg	2500	2300	2370	92	95	70-130	3	20	
cis-1,3-Dichloropropene	ug/kg	2500	2200	2200	88	88	70-130	0	20	
Dibromochloromethane	ug/kg	2500	2320	2340	93	94	70-130	1	20	
Dichlorodifluoromethane	ug/kg	2500	1790	1830	72	73	31-150	3	20	
Ethylbenzene	ug/kg	2500	2370	2390	95	96	65-137	1	20	
Isopropylbenzene (Cumene)	ug/kg	2500	2350	2350	94	94	70-130	0	20	
m&p-Xylene	ug/kg	5000	4810	4870	96	97	64-139	1	20	
Methyl-tert-butyl ether	ug/kg	2500	2410	2480	96	99	69-130	3	20	
Methylene Chloride	ug/kg	2500	2400	2500	96	100	70-130	4	20	
o-Xylene	ug/kg	2500	2350	2350	94	94	63-135	0	20	
Styrene	ug/kg	2500	2310	2360	92	94	69-130	2	20	
Tetrachloroethene	ug/kg	2500	2330	2390	93	96	70-130	2	20	
Toluene	ug/kg	2500	2400	2440	96	98	70-130	2	20	
trans-1,2-Dichloroethene	ug/kg	2500	2430	2490	97	99	70-130	2	20	
trans-1,3-Dichloropropene	ug/kg	2500	2310	2320	92	93	70-130	1	20	
Trichloroethene	ug/kg	2500	2400	2510	96	100	70-130	4	20	
Trichlorofluoromethane	ug/kg	2500	2530	2600	101	104	50-150	3	20	
Vinyl chloride	ug/kg	2500	2320	2380	93	95	57-130	3	20	
4-Bromofluorobenzene (S)	%				104	106	49-130			
Dibromofluoromethane (S)	%				104	105	57-130			
Toluene-d8 (S)	%				106	105	54-133			

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 816622 816623

Parameter	Units	4080411003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
1,1,1-Trichloroethane	ug/kg	<25.0	2930	2930	2800	2780	96	95	63-139	1	20	
1,1,2,2-Tetrachloroethane	ug/kg	<25.0	2930	2930	2990	2920	102	100	52-149	2	26	
1,1,2-Trichloroethane	ug/kg	<25.0	2930	2930	2740	2670	93	91	65-134	3	20	
1,1-Dichloroethane	ug/kg	<25.0	2930	2930	2920	2910	100	99	55-138	0	20	
1,1-Dichloroethene	ug/kg	<25.0	2930	2930	2890	2940	99	100	50-133	2	20	
1,2,4-Trichlorobenzene	ug/kg	<25.0	2930	2930	3020	2860	103	98	68-130	5	24	
1,2-Dibromo-3-chloropropane	ug/kg	<49.8	2930	2930	2710	2700	93	92	50-150	1	20	
1,2-Dibromoethane (EDB)	ug/kg	<25.0	2930	2930	2870	2730	98	93	67-130	5	20	
1,2-Dichlorobenzene	ug/kg	<25.0	2930	2930	3020	2930	103	100	70-130	3	20	
1,2-Dichloroethane	ug/kg	<25.0	2930	2930	2900	2840	99	97	58-142	2	21	
1,2-Dichloropropane	ug/kg	<25.0	2930	2930	2860	2630	98	90	59-135	9	20	
1,3-Dichlorobenzene	ug/kg	<25.0	2930	2930	2830	2800	97	95	70-130	1	20	
1,4-Dichlorobenzene	ug/kg	<25.0	2930	2930	2800	2720	96	93	68-130	3	20	
Benzene	ug/kg	<25.0	2930	2930	2830	2740	96	94	41-130	3	20	
Bromodichloromethane	ug/kg	<25.0	2930	2930	2930	2780	100	95	58-136	5	20	
Bromoform	ug/kg	<25.0	2930	2930	2660	2640	91	90	33-162	1	20	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
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(920)469-2436

QUALITY CONTROL DATA

Project: 204639 CITY OF MADISON-CUB FOO
Pace Project No.: 4080362

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 816622 816623

Parameter	Units	4080411003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Bromomethane	ug/kg	<25.0	2930	2930	3170	2930	108	100	31-156	8	27	
Carbon tetrachloride	ug/kg	<25.0	2930	2930	2730	2760	93	94	56-146	1	22	
Chlorobenzene	ug/kg	<25.0	2930	2930	2890	2780	99	95	67-130	4	20	
Chloroethane	ug/kg	<25.0	2930	2930	3350	3480	114	119	18-187	4	29	
Chloroform	ug/kg	<25.0	2930	2930	2780	2770	95	94	63-135	0	20	
Chloromethane	ug/kg	<25.0	2930	2930	2680	2690	91	92	36-130	0	30	
cis-1,2-Dichloroethene	ug/kg	<25.0	2930	2930	2820	2830	96	96	59-130	0	20	
cis-1,3-Dichloropropene	ug/kg	<25.0	2930	2930	2690	2610	92	89	61-130	3	20	
Dibromochloromethane	ug/kg	<25.0	2930	2930	2850	2820	97	96	51-145	1	20	
Dichlorodifluoromethane	ug/kg	<25.0	2930	2930	2270	2120	77	72	15-150	7	50	
Ethylbenzene	ug/kg	<25.0	2930	2930	2910	2850	99	97	25-150	2	20	
Isopropylbenzene (Cumene)	ug/kg	<25.0	2930	2930	2840	2820	97	96	70-130	1	20	
m&p-Xylene	ug/kg	<50.0	5870	5870	5890	5740	100	98	26-146	3	20	
Methyl-tert-butyl ether	ug/kg	<25.0	2930	2930	2930	2910	100	99	54-130	1	20	
Methylene Chloride	ug/kg	<25.0	2930	2930	3000	2880	102	98	52-137	4	20	
o-Xylene	ug/kg	<25.0	2930	2930	2920	2780	99	95	20-149	5	20	
Styrene	ug/kg	<25.0	2930	2930	2860	2720	97	93	60-135	5	20	
Tetrachloroethene	ug/kg	<25.0	2930	2930	2830	2850	96	97	62-133	1	20	
Toluene	ug/kg	<25.0	2930	2930	2920	2830	99	96	34-136	3	20	
trans-1,2-Dichloroethene	ug/kg	<25.0	2930	2930	2930	2930	100	100	60-130	0	20	
trans-1,3-Dichloropropene	ug/kg	<25.0	2930	2930	2830	2750	97	94	53-136	3	20	
Trichloroethene	ug/kg	<25.0	2930	2930	2950	2830	100	96	66-131	4	20	
Trichlorofluoromethane	ug/kg	<25.0	2930	2930	2880	2930	98	100	50-150	2	31	
Vinyl chloride	ug/kg	<25.0	2930	2930	2860	2870	97	98	36-130	1	28	
4-Bromofluorobenzene (S)	%						104	103	49-130			
Dibromofluoromethane (S)	%						107	102	57-130			
Toluene-d8 (S)	%						105	105	54-133			

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
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(920)469-2436

QUALITY CONTROL DATA

Project: 204639 CITY OF MADISON-CUB FOO
Pace Project No.: 4080362

QC Batch: MSV/20284 Analysis Method: EPA 8260
QC Batch Method: EPA 8260 Analysis Description: 8260 MSV
Associated Lab Samples: 4080362008, 4080362009, 4080362010, 4080362011, 4080362017

METHOD BLANK: 816096 Matrix: Water
Associated Lab Samples: 4080362008, 4080362009, 4080362010, 4080362011, 4080362017

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	<0.45	1.0	06/29/13 10:49	
1,1,1-Trichloroethane	ug/L	<0.44	1.0	06/29/13 10:49	
1,1,2,2-Tetrachloroethane	ug/L	<0.38	1.0	06/29/13 10:49	
1,1,2-Trichloroethane	ug/L	<0.39	1.0	06/29/13 10:49	
1,1-Dichloroethane	ug/L	<0.28	1.0	06/29/13 10:49	
1,1-Dichloroethene	ug/L	<0.43	1.0	06/29/13 10:49	
1,1-Dichloropropene	ug/L	<0.51	1.0	06/29/13 10:49	
1,2,3-Trichlorobenzene	ug/L	<0.77	5.0	06/29/13 10:49	
1,2,3-Trichloropropane	ug/L	<0.47	1.0	06/29/13 10:49	
1,2,4-Trichlorobenzene	ug/L	<2.5	5.0	06/29/13 10:49	
1,2,4-Trimethylbenzene	ug/L	<0.57	5.0	06/29/13 10:49	
1,2-Dibromo-3-chloropropane	ug/L	<1.5	5.0	06/29/13 10:49	
1,2-Dibromoethane (EDB)	ug/L	<0.38	1.0	06/29/13 10:49	
1,2-Dichlorobenzene	ug/L	<0.44	1.0	06/29/13 10:49	
1,2-Dichloroethane	ug/L	<0.48	1.0	06/29/13 10:49	
1,2-Dichloropropane	ug/L	<0.50	1.0	06/29/13 10:49	
1,3,5-Trimethylbenzene	ug/L	<2.5	5.0	06/29/13 10:49	
1,3-Dichlorobenzene	ug/L	<0.45	1.0	06/29/13 10:49	
1,3-Dichloropropane	ug/L	<0.46	1.0	06/29/13 10:49	
1,4-Dichlorobenzene	ug/L	<0.43	1.0	06/29/13 10:49	
2,2-Dichloropropane	ug/L	<0.37	1.0	06/29/13 10:49	
2-Chlorotoluene	ug/L	<0.48	1.0	06/29/13 10:49	
4-Chlorotoluene	ug/L	<0.48	1.0	06/29/13 10:49	
Benzene	ug/L	<0.50	1.0	06/29/13 10:49	
Bromobenzene	ug/L	<0.48	1.0	06/29/13 10:49	
Bromochloromethane	ug/L	<0.49	1.0	06/29/13 10:49	
Bromodichloromethane	ug/L	<0.45	1.0	06/29/13 10:49	
Bromoform	ug/L	<0.23	1.0	06/29/13 10:49	
Bromomethane	ug/L	<0.43	5.0	06/29/13 10:49	
Carbon tetrachloride	ug/L	<0.37	1.0	06/29/13 10:49	
Chlorobenzene	ug/L	<0.36	1.0	06/29/13 10:49	
Chloroethane	ug/L	<0.44	1.0	06/29/13 10:49	
Chloroform	ug/L	<0.69	5.0	06/29/13 10:49	
Chloromethane	ug/L	<0.39	1.0	06/29/13 10:49	
cis-1,2-Dichloroethene	ug/L	<0.42	1.0	06/29/13 10:49	
cis-1,3-Dichloropropene	ug/L	<0.29	1.0	06/29/13 10:49	
Dibromochloromethane	ug/L	<1.9	5.0	06/29/13 10:49	
Dibromomethane	ug/L	<0.48	1.0	06/29/13 10:49	
Dichlorodifluoromethane	ug/L	<0.40	1.0	06/29/13 10:49	
Diisopropyl ether	ug/L	<0.50	1.0	06/29/13 10:49	
Ethylbenzene	ug/L	<0.50	1.0	06/29/13 10:49	
Hexachloro-1,3-butadiene	ug/L	<1.3	5.0	06/29/13 10:49	
Isopropylbenzene (Cumene)	ug/L	<0.34	1.0	06/29/13 10:49	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

QUALITY CONTROL DATA

Project: 204639 CITY OF MADISON-CUB FOO
Pace Project No.: 4080362

METHOD BLANK: 816096 Matrix: Water

Associated Lab Samples: 4080362008, 4080362009, 4080362010, 4080362011, 4080362017

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
m&p-Xylene	ug/L	<0.82	2.0	06/29/13 10:49	
Methyl-tert-butyl ether	ug/L	<0.49	1.0	06/29/13 10:49	
Methylene Chloride	ug/L	<0.36	1.0	06/29/13 10:49	
n-Butylbenzene	ug/L	<0.40	1.0	06/29/13 10:49	
n-Propylbenzene	ug/L	<0.50	1.0	06/29/13 10:49	
Naphthalene	ug/L	<2.5	5.0	06/29/13 10:49	
o-Xylene	ug/L	<0.50	1.0	06/29/13 10:49	
p-Isopropyltoluene	ug/L	<0.40	1.0	06/29/13 10:49	
sec-Butylbenzene	ug/L	<0.60	5.0	06/29/13 10:49	
Styrene	ug/L	<0.35	1.0	06/29/13 10:49	
tert-Butylbenzene	ug/L	<0.42	1.0	06/29/13 10:49	
Tetrachloroethene	ug/L	<0.47	1.0	06/29/13 10:49	
Toluene	ug/L	<0.44	1.0	06/29/13 10:49	
trans-1,2-Dichloroethene	ug/L	<0.37	1.0	06/29/13 10:49	
trans-1,3-Dichloropropene	ug/L	<0.26	1.0	06/29/13 10:49	
Trichloroethene	ug/L	<0.43	1.0	06/29/13 10:49	
Trichlorofluoromethane	ug/L	<0.48	1.0	06/29/13 10:49	
Vinyl chloride	ug/L	<0.18	1.0	06/29/13 10:49	
4-Bromofluorobenzene (S)	%	96	43-137	06/29/13 10:49	
Dibromofluoromethane (S)	%	97	70-130	06/29/13 10:49	
Toluene-d8 (S)	%	101	55-137	06/29/13 10:49	

LABORATORY CONTROL SAMPLE & LCSD: 816097 816098

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
1,1,1-Trichloroethane	ug/L	50	47.6	49.2	95	98	70-136	3	20	
1,1,2,2-Tetrachloroethane	ug/L	50	54.7	56.8	109	114	70-130	4	20	
1,1,2-Trichloroethane	ug/L	50	52.6	54.1	105	108	70-130	3	20	
1,1-Dichloroethane	ug/L	50	62.7	64.2	125	128	70-146	2	20	
1,1-Dichloroethene	ug/L	50	55.1	56.2	110	112	70-130	2	20	
1,2,4-Trichlorobenzene	ug/L	50	49.2	51.8	98	104	70-130	5	20	
1,2-Dibromo-3-chloropropane	ug/L	50	43.3	46.8	87	94	46-150	8	20	
1,2-Dibromoethane (EDB)	ug/L	50	49.4	52.0	99	104	70-130	5	20	
1,2-Dichlorobenzene	ug/L	50	51.3	52.7	103	105	70-130	3	20	
1,2-Dichloroethane	ug/L	50	54.4	56.1	109	112	70-144	3	20	
1,2-Dichloropropane	ug/L	50	54.4	55.3	109	111	70-136	2	20	
1,3-Dichlorobenzene	ug/L	50	52.3	52.9	105	106	70-130	1	20	
1,4-Dichlorobenzene	ug/L	50	50.8	52.7	102	105	70-130	4	20	
Benzene	ug/L	50	54.6	56.2	109	112	70-137	3	20	
Bromodichloromethane	ug/L	50	46.7	47.8	93	96	70-133	2	20	
Bromoform	ug/L	50	41.1	42.6	82	85	59-130	4	20	
Bromomethane	ug/L	50	46.8	49.7	94	99	41-148	6	20	
Carbon tetrachloride	ug/L	50	46.3	48.1	93	96	70-154	4	20	
Chlorobenzene	ug/L	50	50.2	51.6	100	103	70-130	3	20	
Chloroethane	ug/L	50	54.9	56.1	110	112	70-139	2	20	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

QUALITY CONTROL DATA

Project: 204639 CITY OF MADISON-CUB FOO
Pace Project No.: 4080362

LABORATORY CONTROL SAMPLE & LCSD: 816097 816098

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Chloroform	ug/L	50	51.8	52.8	104	106	70-130	2	20	
Chloromethane	ug/L	50	49.3	50.2	99	100	45-154	2	20	
cis-1,2-Dichloroethene	ug/L	50	50.7	52.8	101	106	70-130	4	20	
cis-1,3-Dichloropropene	ug/L	50	44.9	46.1	90	92	70-136	3	20	
Dibromochloromethane	ug/L	50	44.7	45.9	89	92	70-130	3	20	
Dichlorodifluoromethane	ug/L	50	43.0	44.4	86	89	20-157	3	20	
Ethylbenzene	ug/L	50	53.5	54.7	107	109	70-130	2	20	
Isopropylbenzene (Cumene)	ug/L	50	53.9	55.2	108	110	70-130	2	20	
m&p-Xylene	ug/L	100	105	108	105	108	70-130	2	20	
Methyl-tert-butyl ether	ug/L	50	49.8	52.1	100	104	59-141	5	20	
Methylene Chloride	ug/L	50	54.7	56.1	109	112	70-130	3	20	
o-Xylene	ug/L	50	50.6	52.0	101	104	70-130	3	20	
Styrene	ug/L	50	53.0	53.6	106	107	70-130	1	20	
Tetrachloroethene	ug/L	50	47.8	49.5	96	99	70-130	4	20	
Toluene	ug/L	50	51.6	52.7	103	105	70-130	2	20	
trans-1,2-Dichloroethene	ug/L	50	54.9	56.4	110	113	70-130	3	20	
trans-1,3-Dichloropropene	ug/L	50	43.7	45.3	87	91	55-135	4	20	
Trichloroethene	ug/L	50	52.4	53.9	105	108	70-130	3	20	
Trichlorofluoromethane	ug/L	50	54.9	56.2	110	112	50-150	2	20	
Vinyl chloride	ug/L	50	53.1	54.4	106	109	61-143	2	20	
4-Bromofluorobenzene (S)	%				102	102	43-137			
Dibromofluoromethane (S)	%				102	103	70-130			
Toluene-d8 (S)	%				102	101	55-137			

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 816240 816241

Parameter	Units	4080331001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
1,1,1-Trichloroethane	ug/L	<0.44	50	50	47.4	46.4	95	93	70-136	2	20	
1,1,2,2-Tetrachloroethane	ug/L	<0.38	50	50	54.0	52.5	108	105	70-130	3	20	
1,1,2-Trichloroethane	ug/L	<0.39	50	50	51.0	50.1	102	100	70-130	2	20	
1,1-Dichloroethane	ug/L	<0.28	50	50	62.3	59.7	125	119	70-146	4	20	
1,1-Dichloroethene	ug/L	<0.43	50	50	52.7	50.6	105	101	70-130	4	20	
1,2,4-Trichlorobenzene	ug/L	<2.5	50	50	48.1	46.5	96	93	70-130	3	20	
1,2-Dibromo-3-chloropropane	ug/L	<1.5	50	50	44.0	41.9	88	84	46-150	5	20	
1,2-Dibromoethane (EDB)	ug/L	<0.38	50	50	48.5	47.6	97	95	70-130	2	20	
1,2-Dichlorobenzene	ug/L	<0.44	50	50	50.0	48.8	100	98	70-130	2	20	
1,2-Dichloroethane	ug/L	<0.48	50	50	53.8	52.6	108	105	70-146	2	20	
1,2-Dichloropropane	ug/L	<0.50	50	50	53.0	52.1	106	104	70-136	2	20	
1,3-Dichlorobenzene	ug/L	<0.45	50	50	50.1	49.0	100	98	70-130	2	20	
1,4-Dichlorobenzene	ug/L	<0.43	50	50	49.5	48.1	99	96	70-130	3	20	
Benzene	ug/L	<0.50	50	50	54.0	52.5	108	105	70-137	3	20	
Bromodichloromethane	ug/L	<0.45	50	50	45.5	44.3	91	89	70-133	3	20	
Bromoform	ug/L	<0.23	50	50	40.3	38.0	81	76	57-130	6	20	
Bromomethane	ug/L	<0.43	50	50	46.8	46.2	94	92	41-148	1	20	
Carbon tetrachloride	ug/L	<0.37	50	50	46.8	45.3	94	91	70-154	3	20	
Chlorobenzene	ug/L	<0.36	50	50	48.5	48.0	97	96	70-130	1	20	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

QUALITY CONTROL DATA

Project: 204639 CITY OF MADISON-CUB FOO
Pace Project No.: 4080362

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 816240 816241

Parameter	Units	4080331001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloroethane	ug/L	<0.44	50	50	53.6	51.5	107	103	70-140	4	20	
Chloroform	ug/L	<0.69	50	50	51.0	49.2	102	98	70-130	4	20	
Chloromethane	ug/L	<0.39	50	50	45.6	45.0	91	90	45-154	1	20	
cis-1,2-Dichloroethene	ug/L	<0.42	50	50	50.4	48.6	101	97	70-130	4	20	
cis-1,3-Dichloropropene	ug/L	<0.29	50	50	44.1	41.4	88	83	70-136	6	20	
Dibromochloromethane	ug/L	<1.9	50	50	43.5	41.8	87	84	70-130	4	20	
Dichlorodifluoromethane	ug/L	<0.40	50	50	37.6	36.6	75	73	10-157	3	20	
Ethylbenzene	ug/L	<0.50	50	50	51.0	49.9	102	100	70-130	2	20	
Isopropylbenzene (Cumene)	ug/L	<0.34	50	50	52.0	50.5	104	101	70-130	3	20	
m&p-Xylene	ug/L	<0.82	100	100	99.0	96.8	99	97	70-130	2	20	
Methyl-tert-butyl ether	ug/L	<0.49	50	50	51.0	49.0	102	98	59-141	4	20	
Methylene Chloride	ug/L	<0.36	50	50	54.0	51.7	108	103	70-130	4	20	
o-Xylene	ug/L	<0.50	50	50	47.9	47.4	96	95	70-130	1	20	
Styrene	ug/L	<0.35	50	50	44.8	44.6	90	89	35-164	1	20	
Tetrachloroethene	ug/L	<0.47	50	50	45.4	44.8	91	90	70-130	1	20	
Toluene	ug/L	<0.44	50	50	49.1	48.5	98	97	70-130	1	20	
trans-1,2-Dichloroethene	ug/L	<0.37	50	50	54.2	52.0	108	104	70-130	4	20	
trans-1,3-Dichloropropene	ug/L	<0.26	50	50	42.3	39.9	85	80	55-137	6	20	
Trichloroethene	ug/L	<0.43	50	50	51.3	50.2	103	100	70-130	2	20	
Trichlorofluoromethane	ug/L	<0.48	50	50	53.6	52.1	107	104	50-150	3	20	
Vinyl chloride	ug/L	<0.18	50	50	50.8	49.4	102	99	59-144	3	20	
4-Bromofluorobenzene (S)	%						102	102	43-137			
Dibromofluoromethane (S)	%						106	104	70-130			
Toluene-d8 (S)	%						100	100	55-137			

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
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QUALITY CONTROL DATA

Project: 204639 CITY OF MADISON-CUB FOO
Pace Project No.: 4080362

QC Batch: MSV/20290 Analysis Method: EPA 8260
QC Batch Method: EPA 8260 Analysis Description: 8260 MSV
Associated Lab Samples: 4080362012, 4080362013, 4080362015

METHOD BLANK: 816412 Matrix: Water
Associated Lab Samples: 4080362012, 4080362013, 4080362015

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	<0.45	1.0	07/02/13 07:09	
1,1,1-Trichloroethane	ug/L	<0.44	1.0	07/02/13 07:09	
1,1,2,2-Tetrachloroethane	ug/L	<0.38	1.0	07/02/13 07:09	
1,1,2-Trichloroethane	ug/L	<0.39	1.0	07/02/13 07:09	
1,1-Dichloroethane	ug/L	<0.28	1.0	07/02/13 07:09	
1,1-Dichloroethene	ug/L	<0.43	1.0	07/02/13 07:09	
1,1-Dichloropropene	ug/L	<0.51	1.0	07/02/13 07:09	
1,2,3-Trichlorobenzene	ug/L	<0.77	5.0	07/02/13 07:09	
1,2,3-Trichloropropane	ug/L	<0.47	1.0	07/02/13 07:09	
1,2,4-Trichlorobenzene	ug/L	<2.5	5.0	07/02/13 07:09	
1,2,4-Trimethylbenzene	ug/L	<0.57	5.0	07/02/13 07:09	
1,2-Dibromo-3-chloropropane	ug/L	<1.5	5.0	07/02/13 07:09	
1,2-Dibromoethane (EDB)	ug/L	<0.38	1.0	07/02/13 07:09	
1,2-Dichlorobenzene	ug/L	<0.44	1.0	07/02/13 07:09	
1,2-Dichloroethane	ug/L	<0.48	1.0	07/02/13 07:09	
1,2-Dichloropropane	ug/L	<0.50	1.0	07/02/13 07:09	
1,3,5-Trimethylbenzene	ug/L	<2.5	5.0	07/02/13 07:09	
1,3-Dichlorobenzene	ug/L	<0.45	1.0	07/02/13 07:09	
1,3-Dichloropropane	ug/L	<0.46	1.0	07/02/13 07:09	
1,4-Dichlorobenzene	ug/L	<0.43	1.0	07/02/13 07:09	
2,2-Dichloropropane	ug/L	<0.37	1.0	07/02/13 07:09	
2-Chlorotoluene	ug/L	<0.48	1.0	07/02/13 07:09	
4-Chlorotoluene	ug/L	<0.48	1.0	07/02/13 07:09	
Benzene	ug/L	<0.50	1.0	07/02/13 07:09	
Bromobenzene	ug/L	<0.48	1.0	07/02/13 07:09	
Bromochloromethane	ug/L	<0.49	1.0	07/02/13 07:09	
Bromodichloromethane	ug/L	<0.45	1.0	07/02/13 07:09	
Bromoform	ug/L	<0.23	1.0	07/02/13 07:09	
Bromomethane	ug/L	<0.43	5.0	07/02/13 07:09	
Carbon tetrachloride	ug/L	<0.37	1.0	07/02/13 07:09	
Chlorobenzene	ug/L	<0.36	1.0	07/02/13 07:09	
Chloroethane	ug/L	<0.44	1.0	07/02/13 07:09	
Chloroform	ug/L	<0.69	5.0	07/02/13 07:09	
Chloromethane	ug/L	<0.39	1.0	07/02/13 07:09	
cis-1,2-Dichloroethene	ug/L	<0.42	1.0	07/02/13 07:09	
cis-1,3-Dichloropropene	ug/L	<0.29	1.0	07/02/13 07:09	
Dibromochloromethane	ug/L	<1.9	5.0	07/02/13 07:09	
Dibromomethane	ug/L	<0.48	1.0	07/02/13 07:09	
Dichlorodifluoromethane	ug/L	<0.40	1.0	07/02/13 07:09	
Diisopropyl ether	ug/L	<0.50	1.0	07/02/13 07:09	
Ethylbenzene	ug/L	<0.50	1.0	07/02/13 07:09	
Hexachloro-1,3-butadiene	ug/L	<1.3	5.0	07/02/13 07:09	
Isopropylbenzene (Cumene)	ug/L	<0.34	1.0	07/02/13 07:09	

REPORT OF LABORATORY ANALYSIS

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1241 Bellevue Street - Suite 9
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(920)469-2436

QUALITY CONTROL DATA

Project: 204639 CITY OF MADISON-CUB FOO
Pace Project No.: 4080362

METHOD BLANK: 816412 Matrix: Water

Associated Lab Samples: 4080362012, 4080362013, 4080362015

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
m&p-Xylene	ug/L	<0.82	2.0	07/02/13 07:09	
Methyl-tert-butyl ether	ug/L	<0.49	1.0	07/02/13 07:09	
Methylene Chloride	ug/L	<0.36	1.0	07/02/13 07:09	
n-Butylbenzene	ug/L	<0.40	1.0	07/02/13 07:09	
n-Propylbenzene	ug/L	<0.50	1.0	07/02/13 07:09	
Naphthalene	ug/L	<2.5	5.0	07/02/13 07:09	
o-Xylene	ug/L	<0.50	1.0	07/02/13 07:09	
p-Isopropyltoluene	ug/L	<0.40	1.0	07/02/13 07:09	
sec-Butylbenzene	ug/L	<0.60	5.0	07/02/13 07:09	
Styrene	ug/L	<0.35	1.0	07/02/13 07:09	
tert-Butylbenzene	ug/L	<0.42	1.0	07/02/13 07:09	
Tetrachloroethene	ug/L	<0.47	1.0	07/02/13 07:09	
Toluene	ug/L	<0.44	1.0	07/02/13 07:09	
trans-1,2-Dichloroethene	ug/L	<0.37	1.0	07/02/13 07:09	
trans-1,3-Dichloropropene	ug/L	<0.26	1.0	07/02/13 07:09	
Trichloroethene	ug/L	<0.43	1.0	07/02/13 07:09	
Trichlorofluoromethane	ug/L	<0.48	1.0	07/02/13 07:09	
Vinyl chloride	ug/L	<0.18	1.0	07/02/13 07:09	
4-Bromofluorobenzene (S)	%	96	43-137	07/02/13 07:09	
Dibromofluoromethane (S)	%	103	70-130	07/02/13 07:09	
Toluene-d8 (S)	%	98	55-137	07/02/13 07:09	

LABORATORY CONTROL SAMPLE & LCSD: 816413 816414

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
1,1,1-Trichloroethane	ug/L	50	58.2	58.4	116	117	70-136	0	20	
1,1,2,2-Tetrachloroethane	ug/L	50	50.2	52.5	100	105	70-130	5	20	
1,1,2-Trichloroethane	ug/L	50	53.1	53.6	106	107	70-130	1	20	
1,1-Dichloroethane	ug/L	50	57.3	57.3	115	115	70-146	0	20	
1,1-Dichloroethene	ug/L	50	58.5	59.4	117	119	70-130	2	20	
1,2,4-Trichlorobenzene	ug/L	50	50.1	52.5	100	105	70-130	5	20	
1,2-Dibromo-3-chloropropane	ug/L	50	53.1	55.4	106	111	46-150	4	20	
1,2-Dibromoethane (EDB)	ug/L	50	55.9	55.7	112	111	70-130	0	20	
1,2-Dichlorobenzene	ug/L	50	52.7	52.1	105	104	70-130	1	20	
1,2-Dichloroethane	ug/L	50	57.8	57.1	116	114	70-144	1	20	
1,2-Dichloropropane	ug/L	50	53.6	55.5	107	111	70-136	3	20	
1,3-Dichlorobenzene	ug/L	50	52.6	52.8	105	106	70-130	0	20	
1,4-Dichlorobenzene	ug/L	50	51.7	53.5	103	107	70-130	3	20	
Benzene	ug/L	50	56.8	56.8	114	114	70-137	0	20	
Bromodichloromethane	ug/L	50	55.3	55.8	111	112	70-133	1	20	
Bromoform	ug/L	50	58.5	59.4	117	119	59-130	2	20	
Bromomethane	ug/L	50	24.3	27.1	49	54	41-148	11	20	
Carbon tetrachloride	ug/L	50	54.6	56.7	109	113	70-154	4	20	
Chlorobenzene	ug/L	50	54.5	53.7	109	107	70-130	1	20	
Chloroethane	ug/L	50	51.5	54.5	103	109	70-139	6	20	

REPORT OF LABORATORY ANALYSIS

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(920)469-2436

QUALITY CONTROL DATA

Project: 204639 CITY OF MADISON-CUB FOO
Pace Project No.: 4080362

LABORATORY CONTROL SAMPLE & LCSD: 816413 816414

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Chloroform	ug/L	50	57.0	57.1	114	114	70-130	0	20	
Chloromethane	ug/L	50	45.4	47.5	91	95	45-154	4	20	
cis-1,2-Dichloroethene	ug/L	50	54.6	55.1	109	110	70-130	1	20	
cis-1,3-Dichloropropene	ug/L	50	54.2	55.8	108	112	70-136	3	20	
Dibromochloromethane	ug/L	50	57.3	56.8	115	114	70-130	1	20	
Dichlorodifluoromethane	ug/L	50	52.7	52.0	105	104	20-157	1	20	
Ethylbenzene	ug/L	50	55.0	54.4	110	109	70-130	1	20	
Isopropylbenzene (Cumene)	ug/L	50	55.6	54.9	111	110	70-130	1	20	
m&p-Xylene	ug/L	100	115	111	115	111	70-130	3	20	
Methyl-tert-butyl ether	ug/L	50	54.2	56.5	108	113	59-141	4	20	
Methylene Chloride	ug/L	50	55.4	57.4	111	115	70-130	3	20	
o-Xylene	ug/L	50	55.7	53.8	111	108	70-130	3	20	
Styrene	ug/L	50	55.9	54.6	112	109	70-130	2	20	
Tetrachloroethene	ug/L	50	55.2	54.7	110	109	70-130	1	20	
Toluene	ug/L	50	54.1	53.2	108	106	70-130	2	20	
trans-1,2-Dichloroethene	ug/L	50	56.6	58.0	113	116	70-130	2	20	
trans-1,3-Dichloropropene	ug/L	50	55.9	55.6	112	111	55-135	1	20	
Trichloroethene	ug/L	50	55.7	56.4	111	113	70-130	1	20	
Trichlorofluoromethane	ug/L	50	59.7	60.8	119	122	50-150	2	20	
Vinyl chloride	ug/L	50	54.3	55.2	109	110	61-143	2	20	
4-Bromofluorobenzene (S)	%				106	105	43-137			
Dibromofluoromethane (S)	%				102	101	70-130			
Toluene-d8 (S)	%				98	97	55-137			

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 816720 816721

Parameter	Units	4080399006 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
1,1,1-Trichloroethane	ug/L	<0.44	50	50	58.9	59.2	118	118	70-136	1	20	
1,1,2,2-Tetrachloroethane	ug/L	<0.38	50	50	47.6	48.7	95	97	70-130	2	20	
1,1,2-Trichloroethane	ug/L	<0.39	50	50	54.4	52.7	109	105	70-130	3	20	
1,1-Dichloroethane	ug/L	<0.28	50	50	56.9	57.0	114	114	70-146	0	20	
1,1-Dichloroethene	ug/L	<0.43	50	50	60.6	60.1	121	120	70-130	1	20	
1,2,4-Trichlorobenzene	ug/L	<2.5	50	50	47.6	47.7	95	95	70-130	0	20	
1,2-Dibromo-3-chloropropane	ug/L	<1.5	50	50	48.3	50.6	97	101	46-150	5	20	
1,2-Dibromoethane (EDB)	ug/L	<0.38	50	50	54.3	53.5	109	107	70-130	1	20	
1,2-Dichlorobenzene	ug/L	<0.44	50	50	50.9	50.1	102	100	70-130	2	20	
1,2-Dichloroethane	ug/L	<0.48	50	50	56.5	58.0	113	116	70-146	3	20	
1,2-Dichloropropane	ug/L	<0.50	50	50	56.9	55.4	114	111	70-136	3	20	
1,3-Dichlorobenzene	ug/L	<0.45	50	50	50.6	51.2	101	102	70-130	1	20	
1,4-Dichlorobenzene	ug/L	<0.43	50	50	50.6	49.3	101	99	70-130	3	20	
Benzene	ug/L	<0.50	50	50	55.7	56.4	111	113	70-137	1	20	
Bromodichloromethane	ug/L	<0.45	50	50	56.8	55.6	114	111	70-133	2	20	
Bromoform	ug/L	<0.23	50	50	58.7	55.6	117	111	57-130	6	20	
Bromomethane	ug/L	<0.43	50	50	28.9	25.5	58	51	41-148	12	20	
Carbon tetrachloride	ug/L	<0.37	50	50	61.3	61.1	123	122	70-154	0	20	
Chlorobenzene	ug/L	<0.36	50	50	55.7	53.9	111	108	70-130	3	20	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

QUALITY CONTROL DATA

Project: 204639 CITY OF MADISON-CUB FOO
Pace Project No.: 4080362

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 816720 816721

Parameter	Units	4080399006 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloroethane	ug/L	<0.44	50	50	53.1	54.5	106	109	70-140	3	20	
Chloroform	ug/L	<0.69	50	50	57.4	57.1	115	114	70-130	1	20	
Chloromethane	ug/L	<0.39	50	50	46.3	47.8	93	96	45-154	3	20	
cis-1,2-Dichloroethene	ug/L	<0.42	50	50	54.8	55.1	110	110	70-130	1	20	
cis-1,3-Dichloropropene	ug/L	<0.29	50	50	54.9	52.6	110	105	70-136	4	20	
Dibromochloromethane	ug/L	<1.9	50	50	57.7	55.1	115	110	70-130	5	20	
Dichlorodifluoromethane	ug/L	<0.40	50	50	49.7	53.9	99	108	10-157	8	20	
Ethylbenzene	ug/L	<0.50	50	50	56.0	53.8	112	108	70-130	4	20	
Isopropylbenzene (Cumene)	ug/L	<0.34	50	50	55.3	53.2	111	106	70-130	4	20	
m&p-Xylene	ug/L	<0.82	100	100	114	108	114	108	70-130	5	20	
Methyl-tert-butyl ether	ug/L	<0.49	50	50	53.9	52.8	108	106	59-141	2	20	
Methylene Chloride	ug/L	<0.36	50	50	57.3	56.2	115	112	70-130	2	20	
o-Xylene	ug/L	<0.50	50	50	55.1	53.4	110	107	70-130	3	20	
Styrene	ug/L	<0.35	50	50	54.2	54.8	108	110	35-164	1	20	
Tetrachloroethene	ug/L	<0.47	50	50	55.8	53.3	112	107	70-130	5	20	
Toluene	ug/L	<0.44	50	50	54.9	52.6	110	105	70-130	4	20	
trans-1,2-Dichloroethene	ug/L	<0.37	50	50	57.6	58.6	115	117	70-130	2	20	
trans-1,3-Dichloropropene	ug/L	<0.26	50	50	55.4	52.8	111	106	55-137	5	20	
Trichloroethene	ug/L	<0.43	50	50	55.8	56.3	112	113	70-130	1	20	
Trichlorofluoromethane	ug/L	<0.48	50	50	59.6	59.4	119	119	50-150	0	20	
Vinyl chloride	ug/L	<0.18	50	50	54.9	55.8	110	112	59-144	2	20	
4-Bromofluorobenzene (S)	%						106	102	43-137			
Dibromofluoromethane (S)	%						103	104	70-130			
Toluene-d8 (S)	%						98	94	55-137			

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 204639 CITY OF MADISON-CUB FOO
Pace Project No.: 4080362

QC Batch: OEXT/18833
QC Batch Method: EPA 3541
Analysis Method: EPA 8082
Analysis Description: 8082 GCS PCB
Associated Lab Samples: 4080362003

METHOD BLANK: 816408 Matrix: Solid
Associated Lab Samples: 4080362003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
PCB-1016 (Aroclor 1016)	ug/kg	<25.0	50.0	07/01/13 14:54	
PCB-1221 (Aroclor 1221)	ug/kg	<25.0	50.0	07/01/13 14:54	
PCB-1232 (Aroclor 1232)	ug/kg	<25.0	50.0	07/01/13 14:54	
PCB-1242 (Aroclor 1242)	ug/kg	<25.0	50.0	07/01/13 14:54	
PCB-1248 (Aroclor 1248)	ug/kg	<25.0	50.0	07/01/13 14:54	
PCB-1254 (Aroclor 1254)	ug/kg	<25.0	50.0	07/01/13 14:54	
PCB-1260 (Aroclor 1260)	ug/kg	<25.0	50.0	07/01/13 14:54	
Decachlorobiphenyl (S)	%	101	48-130	07/01/13 14:54	
Tetrachloro-m-xylene (S)	%	87	40-130	07/01/13 14:54	

LABORATORY CONTROL SAMPLE: 816409

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
PCB-1016 (Aroclor 1016)	ug/kg		<25.0			
PCB-1221 (Aroclor 1221)	ug/kg		<25.0			
PCB-1232 (Aroclor 1232)	ug/kg		<25.0			
PCB-1242 (Aroclor 1242)	ug/kg		<25.0			
PCB-1248 (Aroclor 1248)	ug/kg		<25.0			
PCB-1254 (Aroclor 1254)	ug/kg		<25.0			
PCB-1260 (Aroclor 1260)	ug/kg	500	492	98	70-130	
Decachlorobiphenyl (S)	%			103	48-130	
Tetrachloro-m-xylene (S)	%			90	40-130	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 816410 816411

Parameter	Units	4080387001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
PCB-1016 (Aroclor 1016)	ug/kg	<208			<208	<208					31	
PCB-1221 (Aroclor 1221)	ug/kg	<208			<208	<208					31	
PCB-1232 (Aroclor 1232)	ug/kg	<208			<208	<208					31	
PCB-1242 (Aroclor 1242)	ug/kg	4120			4700	4950				5	31	
PCB-1248 (Aroclor 1248)	ug/kg	<208			<208	<208					31	
PCB-1254 (Aroclor 1254)	ug/kg	<208			<208	<208					31	
PCB-1260 (Aroclor 1260)	ug/kg	<208	831	831	835	771	101	93	40-149	8	31	
Decachlorobiphenyl (S)	%						75	70	48-130			
Tetrachloro-m-xylene (S)	%						92	88	40-130			

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 204639 CITY OF MADISON-CUB FOO
Pace Project No.: 4080362

QC Batch: OEXT/18842
QC Batch Method: EPA 3546
Analysis Method: EPA 8270
Analysis Description: 8270 Solid MSSV Microwave
Associated Lab Samples: 4080362003

METHOD BLANK: 816803
Matrix: Solid
Associated Lab Samples: 4080362003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,2,4-Trichlorobenzene	ug/kg	<9.2	167	07/02/13 08:58	
1,2-Dichlorobenzene	ug/kg	<19.1	167	07/02/13 08:58	
1,3-Dichlorobenzene	ug/kg	<19.6	167	07/02/13 08:58	
1,4-Dichlorobenzene	ug/kg	<21.5	167	07/02/13 08:58	
2,2'-Oxybis(1-chloropropane)	ug/kg	<21.3	167	07/02/13 08:58	
2,4,5-Trichlorophenol	ug/kg	<11.0	167	07/02/13 08:58	
2,4,6-Trichlorophenol	ug/kg	<18.4	167	07/02/13 08:58	
2,4-Dichlorophenol	ug/kg	<14.2	167	07/02/13 08:58	
2,4-Dimethylphenol	ug/kg	<83.3	167	07/02/13 08:58	
2,4-Dinitrophenol	ug/kg	<122	667	07/02/13 08:58	
2,4-Dinitrotoluene	ug/kg	<13.1	167	07/02/13 08:58	
2,6-Dinitrotoluene	ug/kg	<19.3	167	07/02/13 08:58	
2-Chloronaphthalene	ug/kg	<17.4	167	07/02/13 08:58	
2-Chlorophenol	ug/kg	<83.3	167	07/02/13 08:58	
2-Methylnaphthalene	ug/kg	<18.4	167	07/02/13 08:58	
2-Methylphenol(o-Cresol)	ug/kg	<83.3	167	07/02/13 08:58	
2-Nitroaniline	ug/kg	<12.1	167	07/02/13 08:58	
2-Nitrophenol	ug/kg	<19.9	167	07/02/13 08:58	
3&4-Methylphenol(m&p Cresol)	ug/kg	<17.4	167	07/02/13 08:58	
3,3'-Dichlorobenzidine	ug/kg	<12.1	167	07/02/13 08:58	
3-Nitroaniline	ug/kg	<13.2	167	07/02/13 08:58	
4,6-Dinitro-2-methylphenol	ug/kg	<83.3	167	07/02/13 08:58	
4-Bromophenylphenyl ether	ug/kg	<17.7	167	07/02/13 08:58	
4-Chloro-3-methylphenol	ug/kg	<17.0	167	07/02/13 08:58	
4-Chloroaniline	ug/kg	<83.3	333	07/02/13 08:58	
4-Chlorophenylphenyl ether	ug/kg	<83.3	167	07/02/13 08:58	
4-Nitroaniline	ug/kg	<83.3	167	07/02/13 08:58	
4-Nitrophenol	ug/kg	<32.9	167	07/02/13 08:58	
Acenaphthene	ug/kg	<83.3	167	07/02/13 08:58	
Acenaphthylene	ug/kg	<17.9	167	07/02/13 08:58	
Anthracene	ug/kg	<83.3	167	07/02/13 08:58	
Benzo(a)anthracene	ug/kg	<18.8	167	07/02/13 08:58	
Benzo(a)pyrene	ug/kg	<20.2	167	07/02/13 08:58	
Benzo(b)fluoranthene	ug/kg	<19.7	167	07/02/13 08:58	
Benzo(g,h,i)perylene	ug/kg	<83.3	167	07/02/13 08:58	
Benzo(k)fluoranthene	ug/kg	<26.3	167	07/02/13 08:58	
bis(2-Chloroethoxy)methane	ug/kg	<20.1	167	07/02/13 08:58	
bis(2-Chloroethyl) ether	ug/kg	<83.3	167	07/02/13 08:58	
bis(2-Ethylhexyl)phthalate	ug/kg	<34.1	167	07/02/13 08:58	
Butylbenzylphthalate	ug/kg	<37.5	167	07/02/13 08:58	
Carbazole	ug/kg	<17.2	167	07/02/13 08:58	
Chrysene	ug/kg	<24.3	167	07/02/13 08:58	
Di-n-butylphthalate	ug/kg	<27.9	167	07/02/13 08:58	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
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(920)469-2436

QUALITY CONTROL DATA

Project: 204639 CITY OF MADISON-CUB FOO
Pace Project No.: 4080362

METHOD BLANK: 816803 Matrix: Solid

Associated Lab Samples: 4080362003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Di-n-octylphthalate	ug/kg	<18.2	167	07/02/13 08:58	
Dibenz(a,h)anthracene	ug/kg	<30.5	167	07/02/13 08:58	
Dibenzofuran	ug/kg	<83.3	167	07/02/13 08:58	
Diethylphthalate	ug/kg	<83.3	167	07/02/13 08:58	
Dimethylphthalate	ug/kg	<17.5	167	07/02/13 08:58	
Fluoranthene	ug/kg	<29.5	167	07/02/13 08:58	
Fluorene	ug/kg	<8.4	167	07/02/13 08:58	
Hexachloro-1,3-butadiene	ug/kg	<21.5	167	07/02/13 08:58	
Hexachlorobenzene	ug/kg	<9.8	167	07/02/13 08:58	
Hexachlorocyclopentadiene	ug/kg	<83.3	167	07/02/13 08:58	
Hexachloroethane	ug/kg	<21.1	167	07/02/13 08:58	
Indeno(1,2,3-cd)pyrene	ug/kg	<22.4	167	07/02/13 08:58	
Isophorone	ug/kg	<83.3	167	07/02/13 08:58	
N-Nitroso-di-n-propylamine	ug/kg	<19.8	167	07/02/13 08:58	
N-Nitrosodiphenylamine	ug/kg	<22.9	167	07/02/13 08:58	
Naphthalene	ug/kg	<19.5	167	07/02/13 08:58	
Nitrobenzene	ug/kg	<19.1	167	07/02/13 08:58	
Pentachlorophenol	ug/kg	<83.3	330	07/02/13 08:58	
Phenanthrene	ug/kg	<83.3	167	07/02/13 08:58	
Phenol	ug/kg	<19.8	167	07/02/13 08:58	
Pyrene	ug/kg	<40.6	167	07/02/13 08:58	
2,4,6-Tribromophenol (S)	%	98	18-130	07/02/13 08:58	
2-Fluorobiphenyl (S)	%	80	53-130	07/02/13 08:58	
2-Fluorophenol (S)	%	78	28-130	07/02/13 08:58	
Nitrobenzene-d5 (S)	%	88	40-130	07/02/13 08:58	
Phenol-d6 (S)	%	81	30-130	07/02/13 08:58	
Terphenyl-d14 (S)	%	107	36-162	07/02/13 08:58	

LABORATORY CONTROL SAMPLE: 816804

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2,4-Trichlorobenzene	ug/kg	1670	1430	86	56-130	
1,2-Dichlorobenzene	ug/kg	1670	1430	86	54-130	
1,3-Dichlorobenzene	ug/kg	1670	1430	86	50-130	
1,4-Dichlorobenzene	ug/kg	1670	1450	87	51-130	
2,2'-Oxybis(1-chloropropane)	ug/kg	1670	1440	86	56-130	
2,4,5-Trichlorophenol	ug/kg	1670	1480	89	66-130	
2,4,6-Trichlorophenol	ug/kg	1670	1500	90	68-130	
2,4-Dichlorophenol	ug/kg	1670	1580	95	66-130	
2,4-Dimethylphenol	ug/kg	1670	1850	111	66-130	
2,4-Dinitrophenol	ug/kg	1670	2100	126	11-130	
2,4-Dinitrotoluene	ug/kg	1670	2010	121	56-130	
2,6-Dinitrotoluene	ug/kg	1670	1860	111	63-130	
2-Chloronaphthalene	ug/kg	1670	1440	86	64-130	
2-Chlorophenol	ug/kg	1670	1440	87	58-130	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
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(920)469-2436

QUALITY CONTROL DATA

Project: 204639 CITY OF MADISON-CUB FOO
Pace Project No.: 4080362

LABORATORY CONTROL SAMPLE: 816804

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
2-Methylnaphthalene	ug/kg	1670	1540	92	63-130	
2-Methylphenol(o-Cresol)	ug/kg	1670	1570	94	65-130	
2-Nitroaniline	ug/kg	1670	1570	94	71-130	
2-Nitrophenol	ug/kg	1670	1490	90	63-130	
3&4-Methylphenol(m&p Cresol)	ug/kg	1670	1500	90	63-130	
3,3'-Dichlorobenzidine	ug/kg	1670	1420	85	56-139	
3-Nitroaniline	ug/kg	1670	1650	99	64-130	
4,6-Dinitro-2-methylphenol	ug/kg	1670	1970	118	33-130	
4-Bromophenylphenyl ether	ug/kg	1670	1750	105	66-130	
4-Chloro-3-methylphenol	ug/kg	1670	1780	107	66-130	
4-Chloroaniline	ug/kg	1670	1590	95	69-130	
4-Chlorophenylphenyl ether	ug/kg	1670	1620	97	68-130	
4-Nitroaniline	ug/kg	1670	1870	112	48-148	
4-Nitrophenol	ug/kg	1670	1860	112	51-133	
Acenaphthene	ug/kg	1670	1530	92	69-130	
Acenaphthylene	ug/kg	1670	1510	91	70-130	
Anthracene	ug/kg	1670	1640	98	70-130	
Benzo(a)anthracene	ug/kg	1670	1500	90	70-130	
Benzo(a)pyrene	ug/kg	1670	1610	97	62-130	
Benzo(b)fluoranthene	ug/kg	1670	1520	91	59-130	
Benzo(g,h,i)perylene	ug/kg	1670	1290	77	56-130	
Benzo(k)fluoranthene	ug/kg	1670	1950	117	64-130	
bis(2-Chloroethoxy)methane	ug/kg	1670	1500	90	66-130	
bis(2-Chloroethyl) ether	ug/kg	1670	1580	95	58-130	
bis(2-Ethylhexyl)phthalate	ug/kg	1670	1440	87	51-130	
Butylbenzylphthalate	ug/kg	1670	1500	90	57-130	
Carbazole	ug/kg	1670	1830	110	68-130	
Chrysene	ug/kg	1670	1380	83	70-130	
Di-n-butylphthalate	ug/kg	1670	1570	94	55-130	
Di-n-octylphthalate	ug/kg	1670	1260	76	47-130	
Dibenz(a,h)anthracene	ug/kg	1670	480	29	54-130	L0
Dibenzofuran	ug/kg	1670	1580	95	67-130	
Diethylphthalate	ug/kg	1670	1570	94	60-130	
Dimethylphthalate	ug/kg	1670	1510	91	60-130	
Fluoranthene	ug/kg	1670	1610	96	60-130	
Fluorene	ug/kg	1670	1610	96	70-130	
Hexachloro-1,3-butadiene	ug/kg	1670	1490	90	53-130	
Hexachlorobenzene	ug/kg	1670	1690	102	62-130	
Hexachlorocyclopentadiene	ug/kg	1670	1110	67	34-130	
Hexachloroethane	ug/kg	1670	1460	88	50-130	
Indeno(1,2,3-cd)pyrene	ug/kg	1670	1470	88	44-130	
Isophorone	ug/kg	1670	1640	98	57-130	
N-Nitroso-di-n-propylamine	ug/kg	1670	1650	99	61-130	
N-Nitrosodiphenylamine	ug/kg	1670	1710	103	70-135	
Naphthalene	ug/kg	1670	1440	87	63-130	
Nitrobenzene	ug/kg	1670	1560	93	59-130	
Pentachlorophenol	ug/kg	1670	1770	106	43-130	
Phenanthrene	ug/kg	1670	1650	99	70-130	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 204639 CITY OF MADISON-CUB FOO
Pace Project No.: 4080362

LABORATORY CONTROL SAMPLE: 816804

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Phenol	ug/kg	1670	1500	90	62-130	
Pyrene	ug/kg	1670	1740	104	63-130	
2,4,6-Tribromophenol (S)	%			104	18-130	
2-Fluorobiphenyl (S)	%			82	53-130	
2-Fluorophenol (S)	%			78	28-130	
Nitrobenzene-d5 (S)	%			85	40-130	
Phenol-d6 (S)	%			82	30-130	
Terphenyl-d14 (S)	%			110	36-162	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 816805 816806

Parameter	Units	4080362003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
1,2,4-Trichlorobenzene	ug/kg	<9.7	1760	1760	1470	1480	84	84	47-130	0	26	
1,2-Dichlorobenzene	ug/kg	<20.1	1760	1760	1540	1500	87	86	49-130	2	33	
1,3-Dichlorobenzene	ug/kg	<20.6	1760	1760	1530	1510	87	86	46-130	1	34	
1,4-Dichlorobenzene	ug/kg	<22.6	1760	1760	1550	1530	88	87	48-130	1	34	
2,2'-Oxybis(1-chloropropane)	ug/kg	<22.5	1760	1760	1570	1550	89	89	43-130	1	26	
2,4,5-Trichlorophenol	ug/kg	<11.6	1760	1760	1680	1550	95	89	16-130	8	21	
2,4,6-Trichlorophenol	ug/kg	<19.4	1760	1760	1520	1470	87	84	11-132	4	33	
2,4-Dichlorophenol	ug/kg	<15.0	1760	1760	1580	1560	90	89	32-130	1	31	
2,4-Dimethylphenol	ug/kg	<87.8	1760	1760	1900	1860	108	106	17-139	3	29	
2,4-Dinitrophenol	ug/kg	<129	1760	1760	435J	414J	25	24	10-130		40	
2,4-Dinitrotoluene	ug/kg	<13.8	1760	1760	2040	1890	116	108	22-146	8	42	
2,6-Dinitrotoluene	ug/kg	<20.3	1760	1760	1880	1840	107	105	30-136	2	38	
2-Chloronaphthalene	ug/kg	<18.3	1760	1760	1540	1480	87	84	39-130	4	25	
2-Chlorophenol	ug/kg	<87.8	1760	1760	1580	1570	90	89	39-130	1	31	
2-Methylnaphthalene	ug/kg	<19.4	1760	1760	1620	1590	93	91	37-130	2	29	
2-Methylphenol(o-Cresol)	ug/kg	<87.8	1760	1760	1740	1690	99	96	33-130	3	29	
2-Nitroaniline	ug/kg	<12.7	1760	1760	1640	1540	93	88	33-135	6	33	
2-Nitrophenol	ug/kg	<21.0	1760	1760	1630	1600	93	91	22-130	2	41	
3&4-Methylphenol(m&p Cresol)	ug/kg	<18.3	1760	1760	1680	1670	96	95	28-130	1	29	
3,3'-Dichlorobenzidine	ug/kg	<12.7	1760	1760	1740	1650	99	94	10-173	5	50	
3-Nitroaniline	ug/kg	<13.9	1760	1760	1800	1640	103	94	10-166	9	40	
4,6-Dinitro-2-methylphenol	ug/kg	<87.8	1760	1760	1450	1310	83	75	10-130	10	50	
4-Bromophenylphenyl ether	ug/kg	<18.6	1760	1760	1830	1830	104	104	27-130	0	31	
4-Chloro-3-methylphenol	ug/kg	<17.9	1760	1760	1790	1740	102	99	29-130	3	31	
4-Chloroaniline	ug/kg	<87.8	1760	1760	1600	1570	91	90	20-132	2	36	
4-Chlorophenylphenyl ether	ug/kg	<87.8	1760	1760	1690	1670	96	95	35-130	1	34	
4-Nitroaniline	ug/kg	<87.8	1760	1760	2000	1720	114	98	10-178	15	37	
4-Nitrophenol	ug/kg	<34.6	1760	1760	1420	1160	81	66	10-142	20	47	
Acenaphthene	ug/kg	<87.8	1760	1760	1580	1570	90	90	57-130	0	34	
Acenaphthylene	ug/kg	<18.8	1760	1760	1620	1580	93	90	38-130	3	34	
Anthracene	ug/kg	<87.8	1760	1760	1760	1690	100	96	29-130	4	38	
Benzo(a)anthracene	ug/kg	<19.8	1760	1760	1600	1520	91	86	19-132	6	42	
Benzo(a)pyrene	ug/kg	<21.3	1760	1760	1740	1670	99	95	11-131	4	38	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

QUALITY CONTROL DATA

Project: 204639 CITY OF MADISON-CUB FOO
Pace Project No.: 4080362

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 816805 816806

Parameter	Units	4080362003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Benzo(b)fluoranthene	ug/kg	<20.7	1760	1760	1750	1680	100	96	10-133	4	40	
Benzo(g,h,i)perylene	ug/kg	<87.8	1760	1760	1470	1350	84	77	14-130	9	47	
Benzo(k)fluoranthene	ug/kg	<27.7	1760	1760	1770	1820	101	104	18-136	3	42	
bis(2-Chloroethoxy)methane	ug/kg	<21.2	1760	1760	1570	1560	89	89	55-130	1	22	
bis(2-Chloroethyl) ether	ug/kg	<87.8	1760	1760	1750	1690	99	96	47-130	4	24	
bis(2-Ethylhexyl)phthalate	ug/kg	<35.9	1760	1760	1490	1470	85	84	10-163	1	34	
Butylbenzylphthalate	ug/kg	<39.5	1760	1760	1570	1580	89	90	10-163	1	39	
Carbazole	ug/kg	<18.1	1760	1760	2000	1850	114	105	16-144	8	32	
Chrysene	ug/kg	<25.6	1760	1760	1560	1500	89	85	25-130	4	41	
Di-n-butylphthalate	ug/kg	<29.4	1760	1760	1690	1650	96	94	19-142	3	33	
Di-n-octylphthalate	ug/kg	<19.2	1760	1760	1430	1290	81	73	10-160	11	42	
Dibenz(a,h)anthracene	ug/kg	<32.2	1760	1760	544	509	31	29	11-130	7	38	
Dibenzofuran	ug/kg	<87.8	1760	1760	1630	1550	93	89	32-130	5	35	
Diethylphthalate	ug/kg	<87.8	1760	1760	1630	1600	93	91	27-134	2	36	
Dimethylphthalate	ug/kg	<18.4	1760	1760	1620	1550	92	88	30-131	4	37	
Fluoranthene	ug/kg	<31.1	1760	1760	1770	1600	101	91	20-143	10	40	
Fluorene	ug/kg	<8.8	1760	1760	1680	1610	96	92	36-130	5	32	
Hexachloro-1,3-butadiene	ug/kg	<22.6	1760	1760	1580	1550	90	88	40-130	2	21	
Hexachlorobenzene	ug/kg	<10.3	1760	1760	1790	1790	102	102	28-130	0	34	
Hexachlorocyclopentadiene	ug/kg	<87.8	1760	1760	1090	1080	62	62	10-130	1	45	
Hexachloroethane	ug/kg	<22.2	1760	1760	1550	1540	88	88	32-130	0	37	
Indeno(1,2,3-cd)pyrene	ug/kg	<23.5	1760	1760	1490	1340	85	76	10-130	10	48	
Isophorone	ug/kg	<87.8	1760	1760	1750	1710	100	98	49-130	2	20	
N-Nitroso-di-n-propylamine	ug/kg	<20.8	1760	1760	1780	1840	101	105	55-130	3	31	
N-Nitrosodiphenylamine	ug/kg	<24.1	1760	1760	1960	2010	112	114	37-147	2	29	
Naphthalene	ug/kg	<20.5	1760	1760	1540	1510	88	86	46-130	2	27	
Nitrobenzene	ug/kg	<20.2	1760	1760	1700	1690	97	96	47-130	1	26	
Pentachlorophenol	ug/kg	<87.8	1760	1760	1500	1480	85	84	10-130	1	50	
Phenanthrene	ug/kg	<87.8	1760	1760	1760	1740	100	99	26-131	1	35	
Phenol	ug/kg	<20.9	1760	1760	1730	1650	99	94	39-130	5	30	
Pyrene	ug/kg	<42.7	1760	1760	1690	1840	96	105	10-155	9	44	
2,4,6-Tribromophenol (S)	%						100	98	18-130			
2-Fluorobiphenyl (S)	%						85	85	53-130			
2-Fluorophenol (S)	%						79	77	28-130			
Nitrobenzene-d5 (S)	%						87	89	40-130			
Phenol-d6 (S)	%						83	84	30-130			
Terphenyl-d14 (S)	%						103	112	36-162			

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

QUALITY CONTROL DATA

Project: 204639 CITY OF MADISON-CUB FOO
Pace Project No.: 4080362

QC Batch: PMST/8627
QC Batch Method: ASTM D2974-87
Analysis Method: ASTM D2974-87
Analysis Description: Dry Weight/Percent Moisture
Associated Lab Samples: 4080362014

SAMPLE DUPLICATE: 816732

Parameter	Units	4080362014 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	11.1	11.4	2	10	

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
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QUALITY CONTROL DATA

Project: 204639 CITY OF MADISON-CUB FOO
Pace Project No.: 4080362

QC Batch: PMST/8628
QC Batch Method: ASTM D2974-87
Analysis Method: ASTM D2974-87
Analysis Description: Dry Weight/Percent Moisture
Associated Lab Samples: 4080362001, 4080362002, 4080362003, 4080362004

SAMPLE DUPLICATE: 816753

Parameter	Units	4080259001 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	12.3	12.4	0	10	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

QUALITY CONTROL DATA

Project: 204639 CITY OF MADISON-CUB FOO
Pace Project No.: 4080362

QC Batch: PMST/8629 Analysis Method: ASTM D2974-87
QC Batch Method: ASTM D2974-87 Analysis Description: Dry Weight/Percent Moisture
Associated Lab Samples: 4080362005, 4080362006, 4080362007, 4080362016

SAMPLE DUPLICATE: 816766

Parameter	Units	4080379005 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	2.6	2.6	0	10	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
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Green Bay, WI 54302
(920)469-2436

QUALIFIERS

Project: 204639 CITY OF MADISON-CUB FOO
Pace Project No.: 4080362

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PRL - Pace Reporting Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

ANALYTE QUALIFIERS

1q	Due to excessive soil weight, sample could not be brought to 1:1 MeOH ratio.
2q	Filter Blank for sample 4080362015.
L0	Analyte recovery in the laboratory control sample (LCS) was outside QC limits.
L2	Analyte recovery in the laboratory control sample (LCS) was below QC limits. Results may be biased low.
P4	Sample field preservation does not meet EPA or method recommendations for this analysis.
W	Non-detect results are reported on a wet weight basis.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 204639 CITY OF MADISON-CUB FOO
Pace Project No.: 4080362

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
4080362003	**GP-4 (1.5-5')**	EPA 3541	OEXT/18833	EPA 8082	GCSV/9793
4080362003	**GP-4 (1.5-5')**	EPA 3050	MPRP/8728	EPA 6010	ICP/7743
4080362006	**GP-6 (7.5-10')**	EPA 3050	MPRP/8728	EPA 6010	ICP/7743
4080362007	**GP-7 (0.5-3')**	EPA 3050	MPRP/8728	EPA 6010	ICP/7743
4080362014	**GP-7 (12.5-15')**	EPA 3050	MPRP/8728	EPA 6010	ICP/7743
4080362012	**TW-6**	EPA 6010	ICP/7745		
4080362013	**TW-7**	EPA 6010	ICP/7745		
4080362015	**TW-4**	EPA 6010	ICP/7773		
4080362015	**TW-4**	EPA 7470	MERP/3742	EPA 7470	MERC/4691
4080362003	**GP-4 (1.5-5')**	EPA 7471	MERP/3727	EPA 7471	MERC/4665
4080362003	**GP-4 (1.5-5')**	EPA 3546	OEXT/18842	EPA 8270	MSSV/5791
4080362001	**GP-1 (5-7')**	EPA 5035/5030B	MSV/20306	EPA 8260	MSV/20307
4080362002	**GP-2 (8-10')**	EPA 5035/5030B	MSV/20306	EPA 8260	MSV/20307
4080362003	**GP-4 (1.5-5')**	EPA 5035/5030B	MSV/20306	EPA 8260	MSV/20307
4080362004	**GP-5 (3.5-5')**	EPA 5035/5030B	MSV/20306	EPA 8260	MSV/20307
4080362005	**GP-5 (17-19')**	EPA 5035/5030B	MSV/20306	EPA 8260	MSV/20307
4080362006	**GP-6 (7.5-10')**	EPA 5035/5030B	MSV/20306	EPA 8260	MSV/20307
4080362007	**GP-7 (0.5-3')**	EPA 5035/5030B	MSV/20306	EPA 8260	MSV/20307
4080362014	**GP-7 (12.5-15')**	EPA 5035/5030B	MSV/20306	EPA 8260	MSV/20307
4080362016	**GP-1 (18-20')**	EPA 5035/5030B	MSV/20306	EPA 8260	MSV/20307
4080362008	**TW-1**	EPA 8260	MSV/20284		
4080362009	**TW-2**	EPA 8260	MSV/20284		
4080362010	**TW-3**	EPA 8260	MSV/20284		
4080362011	**TW-5**	EPA 8260	MSV/20284		
4080362012	**TW-6**	EPA 8260	MSV/20290		
4080362013	**TW-7**	EPA 8260	MSV/20290		
4080362015	**TW-4**	EPA 8260	MSV/20290		
4080362017	**TRIP BLANK**	EPA 8260	MSV/20284		
4080362001	**GP-1 (5-7')**	ASTM D2974-87	PMST/8628		
4080362002	**GP-2 (8-10')**	ASTM D2974-87	PMST/8628		
4080362003	**GP-4 (1.5-5')**	ASTM D2974-87	PMST/8628		
4080362004	**GP-5 (3.5-5')**	ASTM D2974-87	PMST/8628		
4080362005	**GP-5 (17-19')**	ASTM D2974-87	PMST/8629		
4080362006	**GP-6 (7.5-10')**	ASTM D2974-87	PMST/8629		
4080362007	**GP-7 (0.5-3')**	ASTM D2974-87	PMST/8629		
4080362014	**GP-7 (12.5-15')**	ASTM D2974-87	PMST/8627		
4080362016	**GP-1 (18-20')**	ASTM D2974-87	PMST/8629		

REPORT OF LABORATORY ANALYSIS

SW

Pace Analytical®
www.pacelabs.com

UPPER MIDWEST REGION
MN: 612-607-1700 WI: 920-469-2436

4080362

CHAIN OF CUSTODY

(Please Print Clearly)	
Company Name:	TRC Env. Corp
Branch/Location:	Madison
Project Contact:	Alyssa Sellwood
Phone:	608-826-3658
Project Number:	204639
Project Name:	City of Madison-Cob Feeds
Project State:	Wisconsin
Sampled By (Print):	Wesley Braga
Sampled By (Sign):	Wesley J Braga
PO #:	Regulatory Program:

*Preservation Codes
A=None B=HCL C=H2SO4 D=HNO3 E=DI Water F=Methanol G=NaOH
H=Sodium Bisulfate Solution I=Sodium Thiosulfate J=Other

Quote #:	
Mail To Contact:	
Mail To Company:	
Mail To Address:	
Invoice To Contact:	
Invoice To Company:	
Invoice To Address:	
Invoice To Phone:	

Data Package Options (billable)
☐ EPA Level III
☐ EPA Level IV

MS/MSD
☐ On your sample (billable)
☐ NOT needed on your sample

Matrix Codes
A = Air, B = Biota, C = Charcoal, O = Oil, S = Soil, SI = Sludge, W = Water, DW = Drinking Water, GW = Ground Water, SW = Surface Water, WW = Waste Water, WP = Wipe

PACE LAB #	CLIENT FIELD ID	COLLECTION DATE	COLLECTION TIME	MATRIX	FILTERED? (YES/NO) Y/N	PRESERVATION (CODE)* Pick Letter	Analyses Requested: VOC (Soil)	LEAD (Soil)	PCB, SVOC, RCRA	VOC (GW)	LEAD (GW)	CLIENT COMMENTS	LAB COMMENTS (Lab Use Only)	Profile #
					Y/N						Y			
					Pick Letter		F	A	A	B	D			
001	GP-1 5-7'	6/26/13	1435	S			X						1-4ozP^A, 1-40mL^F	
002	GP-2 8-10'	6/26/13	1425	S										
003	~~GP-3~~ GP-4 1.5-5'	6/26/13	1350	S					X				, 1-4ozag^A	
004	~~GP-4~~ GP-5 3.5-5'	6/26/13	1405	S										
005	GP-5 17-19'	6/26/13	1415	S										
006	GP-6 7.5-10'	6/26/13	1150	S				X					, 1-4ozag^A	
007	GP-7 0.5-3'	6/26/13	1210	S				X		/				
008	TW-1	6/26/13	1520	GW						X			3-40mL^B	
009	TW-2	6/26/13	1900	GW										
010	TW-3	6/26/13	1845	GW										
011	TW-5	6/26/13	1540	GW										
012	TW-6	6/26/13	1630	GW							X		1-250mL^P	
013	TW-7	6/26/13	1715	GW							X			

Rush Turnaround Time Requested - Prelims
(Rush TAT subject to approval/surcharge)
Date Needed:

Transmit Prelim Rush Results by (complete what you want):

Email #1:	
Email #2:	
Telephone:	
Fax:	

Samples on HOLD are subject to special pricing and release of liability

Relinquished By:	Date/Time:	Received By:	Date/Time:
Wesley J Braga	6/27/13 1820		
Fed Ex	6/28/13 0945		

PACE Project No.: 4080362

Receipt Temp = R01 °C

Sample Receipt pH: OK / Adjusted

Cooler Custody Seal: Present / Not Present; Intact / Not Intact

Version 6.0 06/14/06

C019a(27Jun2006)

ORIGINAL

UPPER MIDWEST REGION
MN: 612-607-1700 WI: 920-469-2436

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CHAIN OF CUSTODY

4080362

(Please Print Clearly)	
Company Name:	TRC Env. Corp.
Branch/Location:	Madison
Project Contact:	Alyssa Sellwood
Phone:	608-826-3658
Project Number:	204639
Project Name:	City of Madison-Cub Foods
Project State:	Wisconsin
Sampled By (Print):	Wesley Braga
Sampled By (Sign):	Wesley J Braga
PO #:	58714
Regulatory Program:	

*Preservation Codes
A=None B=HCL C=H2SO4 D=HNO3 E=DI Water F=Methanol G=NaOH
H=Sodium Bisulfate Solution I=Sodium Thiosulfate J=Other

Quote #:	
Mail To Contact:	
Mail To Company:	
Mail To Address:	
Invoice To Contact:	
Invoice To Company:	
Invoice To Address:	
Invoice To Phone:	

Data Package Options (billable)
☐ EPA Level III
☐ EPA Level IV

MS/MSD
☐ On your sample (billable)
☐ NOT needed on your sample

Matrix Codes
A = Air, W = Water, B = Biota, DW = Drinking Water, C = Charcoal, GW = Ground Water, O = Oil, SW = Surface Water, S = Soil, WW = Waste Water, Sl = Sludge, WP = Wipe

PACE LAB #	CLIENT FIELD ID	COLLECTION DATE	COLLECTION TIME	MATRIX	Analyses Requested: VOC (soil)	LEAD (soil)	VOC (GW)	RCRA Metals (GW)	CLIENT COMMENTS	LAB COMMENTS (Lab Use Only)	Profile #
	FILTERED? (YES/NO)				Y/N			N	N				
	PRESERVATION (CODE)*				Pick Letter	F	A	B	A				
014	GP-7 12.5-15'	6/26/13	1220	S		X	X				1-4ozag A, 1-4oz p A, 1-40mL F	
015	TW-4	6/27/13	0815	GW				X	X	← No Filter or preserve on RCRA SAMPLE. Sampled RCRA at ~~different~~ time then VOC. in TW-4 @1730 6/27/13	1-250mL p A, 3-40mL B	
016	GP-1 18-20'	6/26/13	1445	S		X					1-4oz p A, 1-40mL F	
017	Trip Blank *										2-40mL B	

Rush Turnaround Time Requested - Prelims
(Rush TAT subject to approval/surcharge)
Date Needed:

Transmit Prelim Rush Results by (complete what you want):

Email #1:	
Email #2:	
Telephone:	
Fax:	

Samples on HOLD are subject to special pricing and release of liability

Relinquished By:	Date/Time:	Received By:	Date/Time:
Wesley J Braga	6/27/13 1820		
Fed Ex	6/28/13 0945	[signature]	6/28/13 0945

PACE Project No.: 4080362
Receipt Temp = R01 °C
Sample Receipt pH: OK / Adjusted
Cooler Custody Seal: Present / Not Present
Intact / Not Intact

Version 6.0 06/14/06

C019a(27Jun2006) *Received + added to COC by lab. 6/28/13 BK

ORIGINAL

Pace Analytical Services, Inc.
1241 Bellevue Street, Suite 9
Green Bay, WI 54302

Pace Analytical™

Sample Condition Upon Receipt

Client Name: TRC Project # 4080362

Courier: ☑ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace Other _____

Tracking #: 8009 7817 9125

Custody Seal on Cooler/Box Present: ☐ yes ☐ no Seals intact: ☑ yes ☐ no

Custody Seal on Samples Present: ☐ yes ☑ no Seals intact: ☐ yes ☐ no

Packing Material: ☑ Bubble Wrap ☑ Bubble Bags ☐ None ☐ Other _____

Thermometer Used NA **Type of Ice:** Wet Blue Dry None ☑ Samples on ice, cooling process has begun

Cooler Temperature Uncorr: 12.0 /Corr: **Biological Tissue is Frozen:** ☐ yes ☐ no

Temp Blank Present: ☑ yes ☐ no

Person examining contents:
Date: 6/28/13
Initials: BF

Temp should be above freezing to 6°C for all sample except Biota.
Frozen Biota Samples should be received ≤ 0°C.

		Comments:
Chain of Custody Present:	☑Yes ☐No ☐N/A	1.
Chain of Custody Filled Out:	☑Yes ☐No ☐N/A	2.
Chain of Custody Relinquished:	☑Yes ☐No ☐N/A	3.
Sampler Name & Signature on COC:	☑Yes ☐No ☐N/A	4.
Samples Arrived within Hold Time:	☑Yes ☐No ☐N/A	5.
- VOA Samples frozen upon receipt	☐Yes ☐No	Date/Time:
Short Hold Time Analysis (<72hr):	☐Yes ☑No ☐N/A	6.
Rush Turn Around Time Requested:	☐Yes ☑No ☐N/A	7.
Sufficient Volume:	☑Yes ☐No ☐N/A	8.
Correct Containers Used:	☑Yes ☐No ☐N/A	9.
-Pace Containers Used:	☑Yes ☐No ☐N/A	
-Pace IR Containers Used:	☐Yes ☐No ☑N/A	
Containers Intact:	☑Yes ☐No ☐N/A	10.
Filtered volume received for Dissolved tests	☐Yes ☑No ☐N/A	11. received filtered volume for 012 + 013, need to lab filter 015, 6/28/13 BF
Sample Labels match COC:	☐Yes ☑No ☐N/A	12. added 1-250mL 004 (1-4oz p) labeled GP-5 1.5-5. 6/28/13 BF
-Includes date/time/ID/Analysis Matrix: S + W		
All containers needing preservation have been checked. (Non-Compliance noted in 13.)	☑Yes ☐No ☐N/A	13. ☑ HNO3 ☐ H2SO4 ☐ NaOH ☐ NaOH +ZnAct
All containers needing preservation are found to be in compliance with EPA recommendation. (HNO3, H2SO4 ≤2; NaOH+ZnAct ≥9, NaOH ≥12)	☑Yes ☐No ☐N/A	
exceptions: VOA, coliform, TOC, TOX, TOH, O&G, WIDROW, Phenolics, OTHER:	☑Yes ☐No	Initial when completed: BF; Lab Std #ID of preservative: ; Date/Time:
Headspace in VOA Vials (>6mm):	☑Yes ☐No ☐N/A	14.
Trip Blank Present:	☑Yes ☐No ☐N/A	15. Trip Blank received + added to COC by lab, 6/28/13 BF
Trip Blank Custody Seals Present	☑Yes ☐No ☐N/A	
Pace Trip Blank Lot # (if purchased): 307		

Client Notification/ Resolution: If checked, see attached form for additional comments ☐

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: CH EC TW **Date:** 6/28/13

Attachment 5

Photographs

Photographic Log

Client Name:	Site Location:	Project No.:
City of Madison Asbestos Photos	Former Cub Foods Nakoosa Trail, Madison, WI	204639.0000.0000

Photo No.	Date
1	6/27/13

Description
The main area of the former grocery store building.

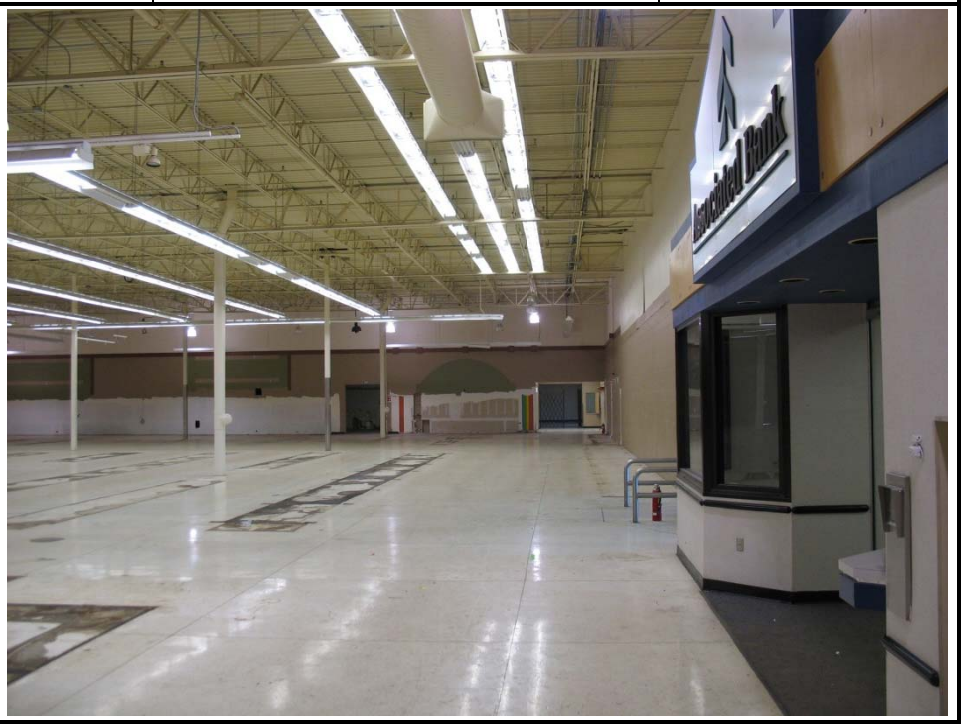


Photo No.	Date
2	6/27/13

Description
Electrical room located in the upper level office area. No suspect ACM identified.

Photographic Log

Client Name:	Site Location:	Project No.:
City of Madison Asbestos Photos	Former Cub Foods Nakoosa Trail, Madison, WI	204639.0000.0000

Photo No.	Date
3	6/27/13

Description
Black felt material located on the roof of the building, between aggregate and rubber membrane layers. No asbestos detected.

Photo No.	Date
4	6/27/13

Description
Gray caulk located on the roof of the building. No asbestos detected.

Photographic Log

Client Name:	Site Location:	Project No.:
City of Madison Asbestos Photos	Former Cub Foods Nakoosa Trail, Madison, WI	204639.0000.0000

Photo No.	Date
5	6/27/13

Description
Black caulk located on the roof of the building. No asbestos detected.

Photo No.	Date
6	6/27/13

Description
Electrical room located in the rear of the building. No suspect ACM identified.

Photographic Log

Client Name:	Site Location:	Project No.:
City of Madison Asbestos Photos	Former Cub Foods Nakoosa Trail, Madison, WI	204639.0000.0000

Photo No.	Date
7	6/27/13

Description
12″ x 12″ floor tile and black mastic located in the former pharmacy area. This material was similar to the floor tile found in the former liquor store area and other sections of the building.

Photo No.	Date
8	6/27/13

Description
Restroom located near the main entrance. No suspect ACM identified.

Photographic Log

Client Name:	Site Location:	Project No.:
City of Madison Asbestos Photos	Former Cub Foods Nakoosa Trail, Madison, WI	204639.0000.0000

Photo No.	Date
9	6/27/13

Description
12" x 12" floor tile and black mastic located in the former liquor store area of the building. No asbestos was detected in the tile, but the mastic contains 10% asbestos.

Photo No.	Date
10	6/27/13

Description
Cove base and mastic located inside the main grocery store area. No asbestos detected.

Photographic Log

Client Name:	Site Location:	Project No.:
City of Madison Mold Samples	Former Cub Foods Nakoosa Trail, Madison, WI	204639.0000.0000

Photo No.	Date
1	7/22/13

Description
Test Site 1

Alternaria species Rare
2 spores / cm sq.

Basidiospores Rare
2 spores / cm sq.

Smuts/Myxomycetes Rare
1 spore / cm sq.

Photo No.	Date
2	7/22/13

Description
Test Site 2

Aspergillus/Penicillium Rare
120 spores / cm sq.

Chaetomium species Rare
3 spores / cm sq.

Stachybotrys species Heavy
350,000 spores / cm sq.

Ulocladium species Light
100 spores / cm sq.

Photographic Log

Client Name:	Site Location:	Project No.:
City of Madison Mold Samples	Former Cub Foods Nakoosa Trail, Madison, WI	204639.0000.0000

Photo No.	Date
4	7/22/13

Description
Test Site 4

Cladosporium species Heavy
45,000 spores / cm sq.

Ulocladium species Heavy
22,500 spores / cm sq.

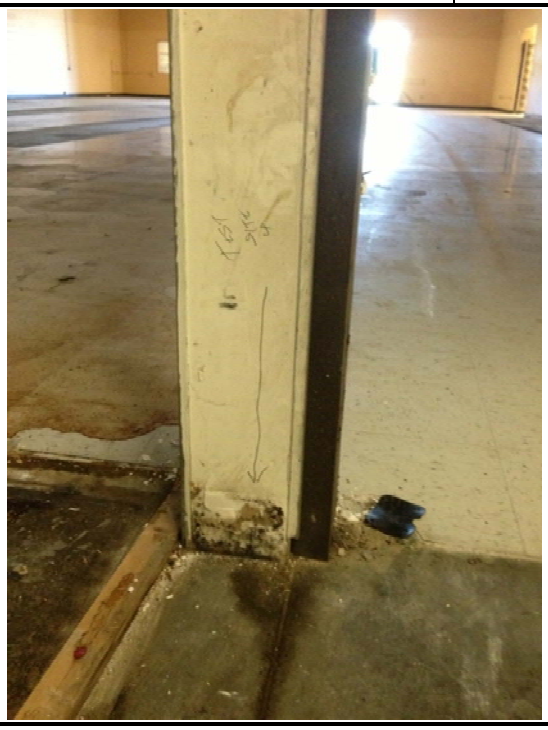


Photo No.	Date
5	7/22/13

Description
Test Site 5

No Fungi Detected

Photographic Log

Client Name:	Site Location:	Project No.:
City of Madison Mold Samples	Former Cub Foods Nakoosa Trail, Madison, WI	204639.0000.0000

Photo No.	Date
6	7/22/13

Description
Test Site 6

Cladosporium species Light
1,392 spores / cm sq.

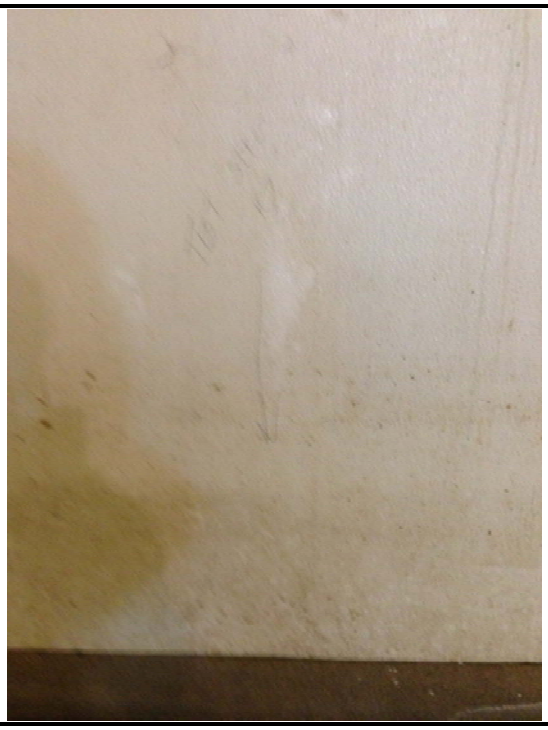
Smuts/Myxomycetes Rare
3 spores / cm sq.

Ulocladium species Rare
1 spore/cm sq.

Photo No.	Date
7	7/22/13

Description
Test Site 7

No Fungi Detected



Photographic Log

Client Name:	Site Location:	Project No.:
City of Madison Mold Samples	Former Cub Foods Nakoosa Trail, Madison, WI	204639.0000.0000

Photo No.	Date
8	7/22/13

Description
Test Site 8

Aspergillus/Penicillium Rare
12 spores / cm sq.

Cladosporium species Heavy
260,000 spores / cm sq.

Ulocladium species Rare
1 spore / cm sq.

Photo No.	Date
9	7/22/13

Description
Test Site 9

No Fungi Detected

Photographic Log

Client Name:	Site Location:	Project No.:
City of Madison Mold Samples	Former Cub Foods Nakoosa Trail, Madison, WI	204639.0000.0000

Photo No.	Date
10	7/22/13

Description
Test Site 10

Alternaria species Rare
2 spores / cm sq.

Aspergillus/Penicillium Rare
2 spores / cm sq.

SECTION 00 31 33

GEOTECHNICAL DATA SUPPLEMENT

1.1 GEOTECHNICAL DATA

A. This Document with its referenced attachments is part of the Procurement and Contracting Requirements for Project. They provide Owner's information for Bidders' convenience and are intended to supplement rather than serve in lieu of Bidders' own investigations. They are made available for Bidders' convenience and information, but are not a warranty of existing conditions. This Document and its attachments are not part of the Contract Documents.

B. A geotechnical memorandum report for Project, prepared by CGC, Inc., titled "Wet Detention Basin Clay Liner" and dated February 9, 2017, is available for viewing as appended to this Document.

C. Related Requirements:

1. Section 00 31 32 "Geotechnical Data" for geotechnical report.

END OF SECTION 00 31 33

(See Geotechnical Memorandum report next page.)

CGC, Inc.

Construction • Geotechnical
Consulting Engineering/Testing

February 9, 2017
C16051-5

Mr. Dave Schaller and
Mr. James Whitney
City of Madison
210 Martin Luther King Jr Blvd
Room 115
Madison, WI 53703-3346

Re: Geotechnical Memorandum
Wet Detention Basin Clay Liner
Nakoosa Trail Fleet Service Facility
Madison, Wisconsin

Dear Dave and Jim:

As requested, Construction • Geotechnical Consultants, Inc. (CGC) has completed a geotechnical memorandum as a follow-up to the geotechnical report CGC prepared for the Nakoosa Trail Fleet Service Facility to provide additional geotechnical recommendations regarding design and construction of the proposed wet detention basins at the facility. The recommendations included in our original report are still current. An electronic copy of this memorandum is provide for your use, and an additional copy is being sent to Mr. Jon Lindert of Strand Associates.

1. General

It is our understanding that wet detention basins are planned to the east (Boring 7) and west (Borings 1 and 2) of the proposed facility. The wet detention basins will be constructed in accordance with the Type A Liner described in WDNR Technical Standard 1001 (*Wet Detention Pond*), which references NRCS *Wisconsin Construction Specifications 300 (Clay Liner) and 204 (Earthfill for Waste Storage Facilities),* in addition to any applicable municipal or county requirements. The clay liner thickness will be 2 ft, which is the minimum thickness of a Type A Liner.

2. Laboratory Testing

Based on laboratory tests completed on representative clay samples from Borings 1 and 2 as summarized in Table 1 below, the on-site native clay generally satisfies the requirements outlined for Type A Liners in the WDNR *Technical Standard 1001*. However, the representative soil from Sample 3 in Boring 2 (collected from 6 to 7.5 ft and interpreted to represent soils from about 5.5 to 8 ft below grade) contained less than 50% passing the No. 200 Sieve and also did not satisfy the remainder of the criteria outlined for Type A Clay liners. Based on the laboratory test results, it is our opinion that the thin clay layer encountered below the surficial fill in Boring 1, and about 5 ft of clay below the topsoil in Boring 2, appear to generally be suitable for use as clay liner material.

However, these soils must be selectively stockpiled and separated from surficial fill and underlying sandy soils during basin excavation.

Table 1 - Laboratory Test Results

Sample No.	Percent Fines (Passing No. 200)		Liquid Limit (%)		Plasticity Index (%)	
	Test Result	Satisfied (Y/N)	Test Result	Satisfied (Y/N)	Test Result	Satisfied (Y/N)
B-1/S-2	63.3	Y	38	Y	19	Y
B-2/S-1	80.9	Y	50	Y	28	Y
B-2/S-3	45.2	N	17	N	6	N

3. Construction Considerations

Based on Borings 1, 2, and 7, and proposed bottom of basin (top of clay liner) elevations of 847 ft and 849 ft in the west and east basins, respectively, the bottom of each basin will extend through the native clay layer and into underlying natural sand soils. In addition, the bottom of the proposed clay liner in the east basin will be about 2 ft below the groundwater level observed in Boring 7, and about 5 ft below the groundwater level in Borings 1 and 2 within the west basin.

We envision that the basins will likely be constructed by excavating the interior side slopes through the natural clay, existing fill, and natural sand soils to reach the bottom of basin elevations. Although the natural clays encountered in Borings 1 and 2 generally extended to less than half of the planned depth of the basin, they generally satisfied the requirements for Type A liners (as described above) and may potentially remain in place around the perimeter of the west basin provided they are satisfactorily recompacted. As previously discussed, on-site clay soils potentially excavated during basin construction are generally suitable for use during liner construction provided they are selectively stockpiled and separated from overlying fill and underlying soils with higher sand content. Close attention will be required when separating soils near Boring 2, as the bellows below about 5.5 ft do not satisfy clay liner criteria.

Where clay liner filling is required, the clay should be placed in maximum 6-in. (loose) lifts and compacted to a minimum of 95% based on standard Proctor methods (ASTM D698) (or 90% modified Proctor) based on specifications outlined in NRCS Construction Specification 300. Based on laboratory tests, the on-site clay soil may require moisture conditioning to achieve adequate compaction levels but is expected to meet clay quality specifications as noted above. Note that the clay should be placed wet of the optimum moisture content.

Note that since each basin will be excavated below the groundwater levels encountered in the soil borings, dewatering will be required to facilitate construction and to prevent uplift of the compacted clay layer at the bottom of the basins during construction. We recommend that groundwater be temporarily lowered a minimum of 2 ft below the proposed bottom of basin elevations in advance of final excavation. Based on groundwater drawdowns of between about 2 and 5 ft required at the east and west basins, respectively, well points of deeps wells will likely be required. We recommend that dewatering continue through construction until the basins have been filled with stormwater. Dewatering means and methods are the responsibility of the contractor.

4. Specified Field and Laboratory Testing

We recommend that samples of the clay liner material be tested during construction to check that the specifications are satisfied. The frequency of field and laboratory testing specified in the NRCS Wisconsin Construction Specifications noted above, for a Type A Liner, as determined in Appendix D of WDNR *Technical Standard 1001,* include the following:

- Standard (ASTM D698) or Modified (ASTM D1557) proctor test – 1 per 5,000 cubic yards of clay liner placed.
- Field density tests – 1 test per 100-ft grid per 1 foot installed thickness.
- Atterberg Limit test (ASTM D4318) – 1 test per 1,500 cubic yards of clay liner.
- Grain size distribution (ASTM D422) – 1 test per 1,500 cubic yards of clay liner.
- Permeability (ASTM D5084) – 1 test per 5,000 cubic yards of clay liner (minimum of 2).

* * * * *

CGC, Inc.

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

Sincerely,

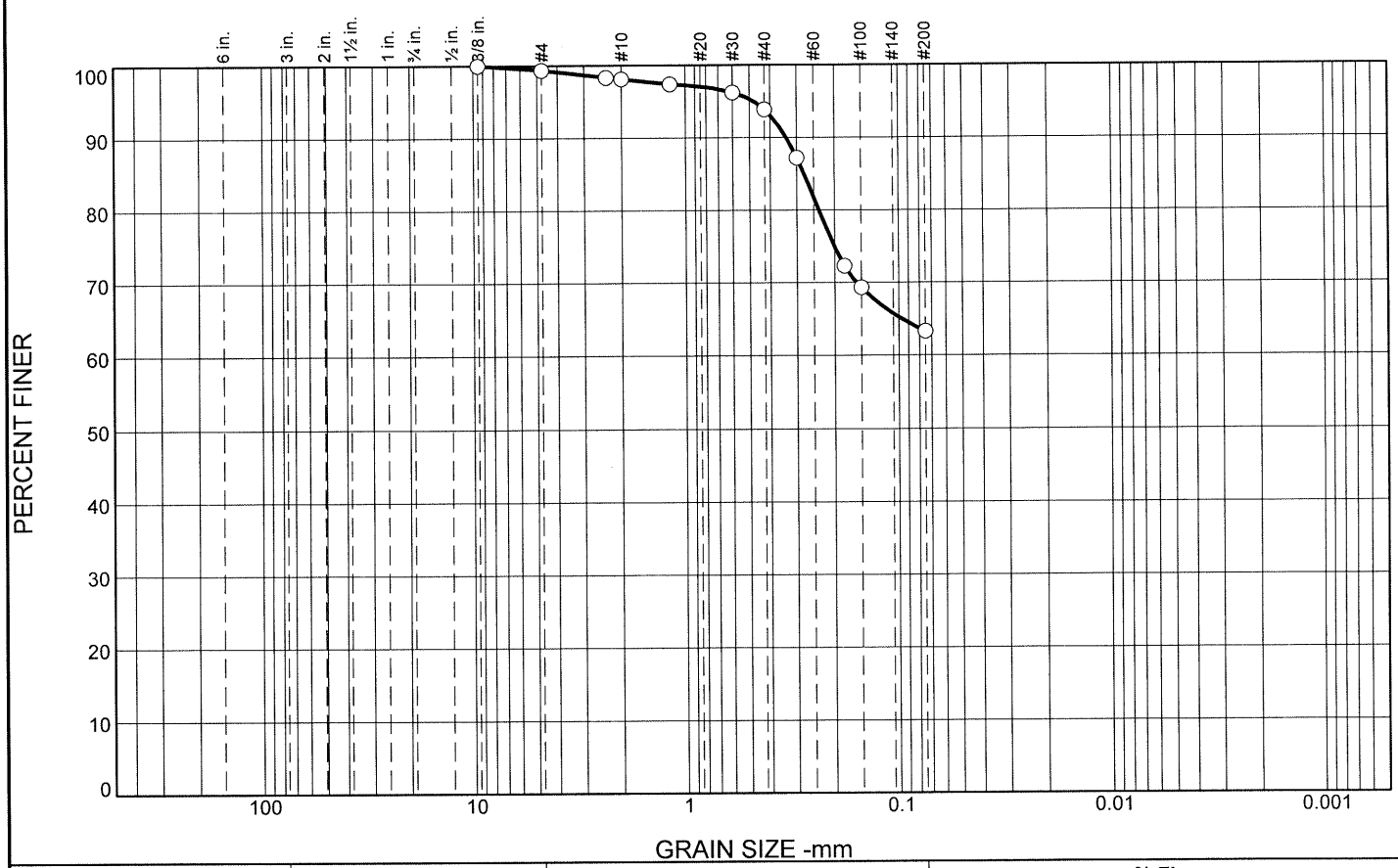
CGC, Inc.

Alex J. Bina, P.E.
Staff Engineer

David A. Staab, P.E., LEED AP
Consulting Professional

Encl: Appendix A - Particle Size Distribution Reports (3)

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.6	1.3	4.2	30.6	63.3	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/8	100.0		
#4	99.4		
#8	98.4		
#10	98.1		
#16	97.4		
#30	96.2		
#40	93.9		
#50	87.2		
#80	72.3		
#100	69.3		
#200	63.3		

* (no specification provided)

Material Description

Brown Sandy Lean Clay

Atterberg Limits

PL= 19 LL= 38 PI= 19

Coefficients

D_{90}= 0.3364 D_{85}= 0.2777 D_{60}=
D_{50}= D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CL AASHTO= A-6(10)

Remarks

Sample Number: B1-S2

Date: 2/7/17

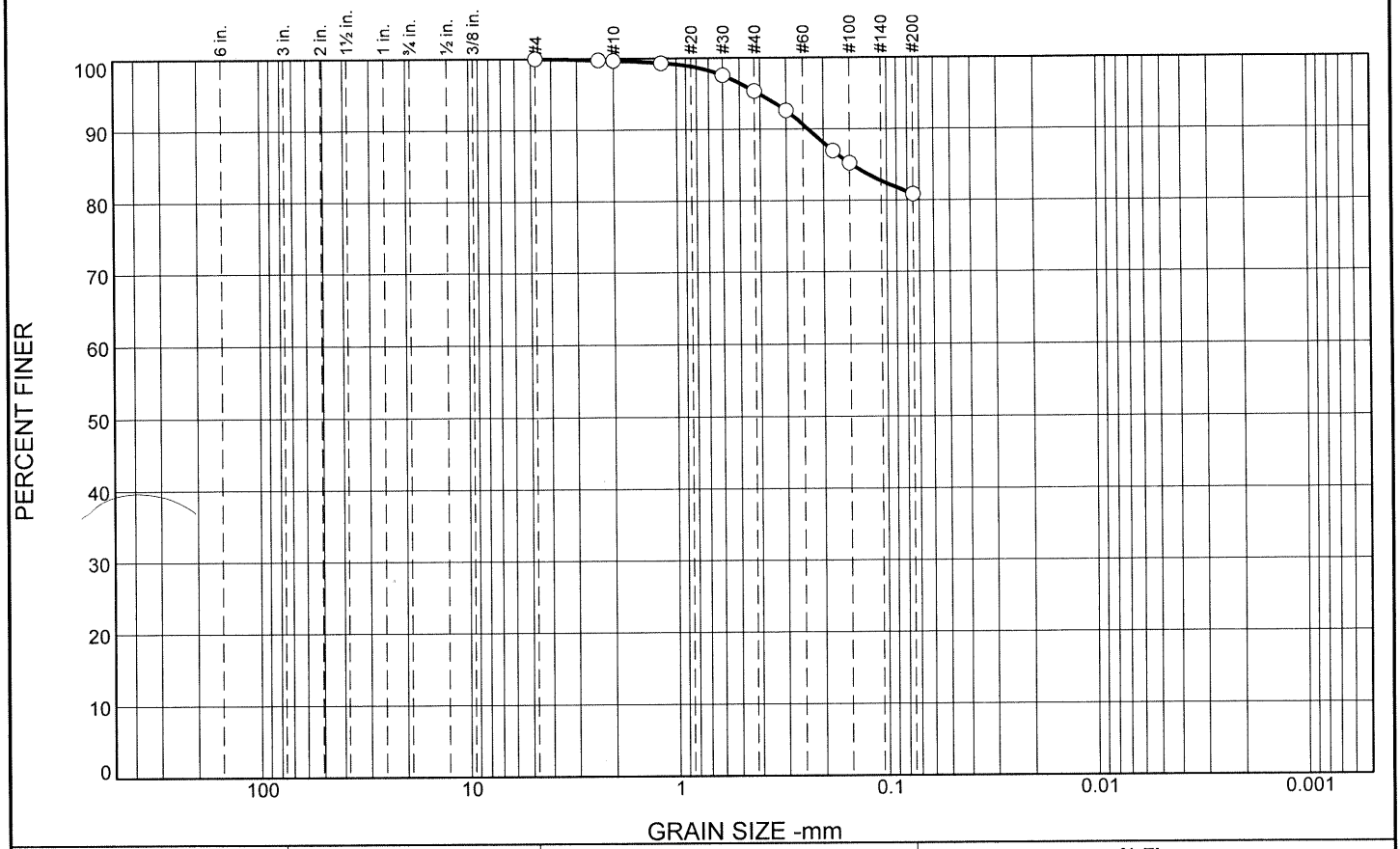
CGC, Inc.

Client: City of Madison
Project: Nakoosa Facility

Project No: C16051-5 **Figure**

Tested By: KJS **Checked By:** AJB

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.3	4.3	14.5	80.9	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#4	100.0		
#8	99.8		
#10	99.7		
#16	99.3		
#30	97.6		
#40	95.4		
#50	92.6		
#80	87.0		
#100	85.2		
#200	80.9		

* (no specification provided)

Material Description

Brown Lean to Fat Clay, Some Sand

Atterberg Limits

PL= 22 LL= 50 PI= 28

Coefficients

D_{90}= 0.2356 D_{85}= 0.1462 D_{60}=
D_{50}= D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CL/CH AASHTO= A-7-6(23)

Remarks

Sample Number: B2-S1

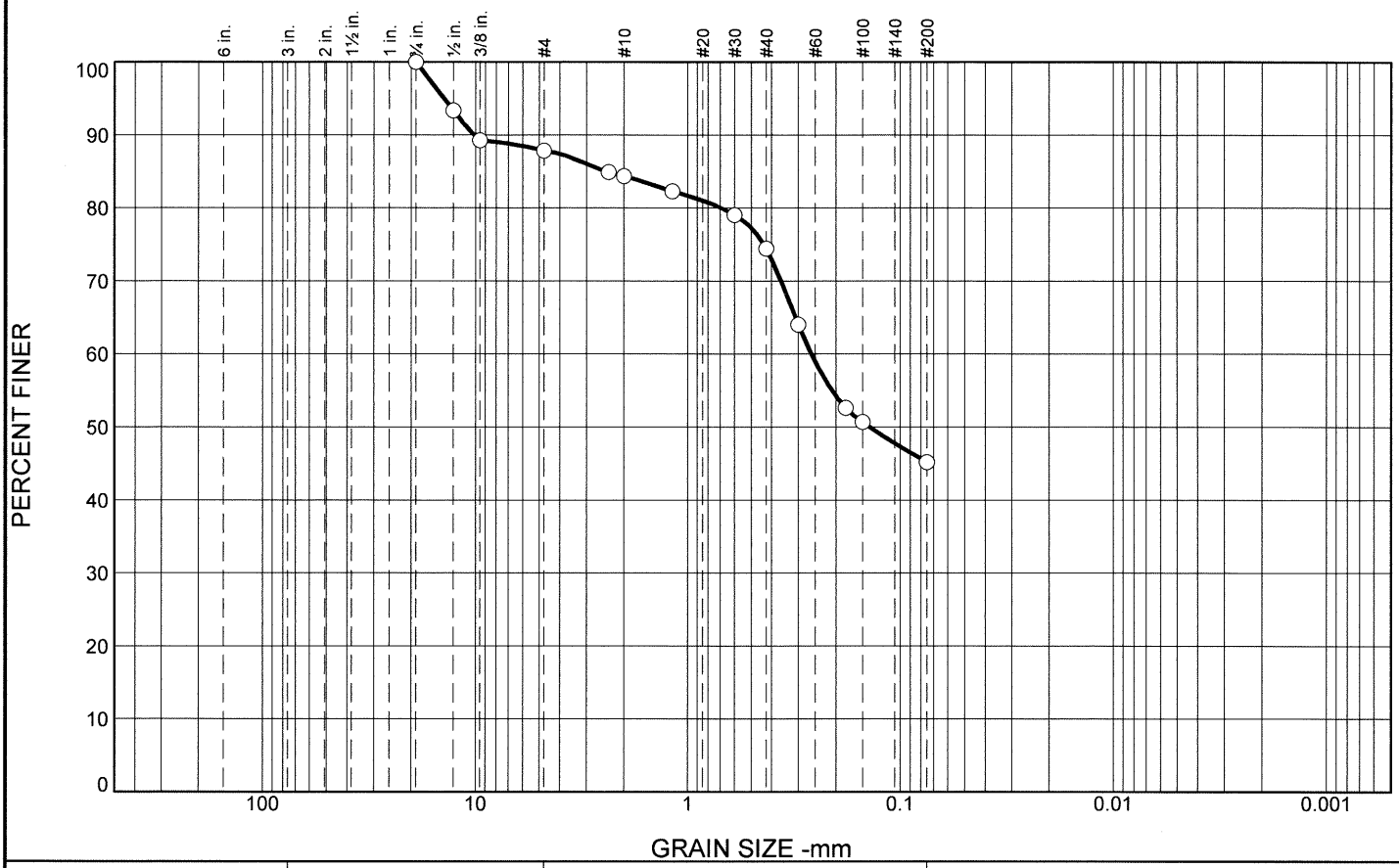
Date: 2/7/17

CGC, Inc.

Client: City of Madison
Project: Nakoosa Facility
Project No: C16051-5 **Figure**

Tested By: KJS **Checked By:** AJB

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	12.1	3.5	10.0	29.2	45.2	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/4	100.0		
1/2	93.3		
3/8	89.3		
#4	87.9		
#8	84.9		
#10	84.4		
#16	82.3		
#30	79.0		
#40	74.4		
#50	64.0		
#80	52.6		
#100	50.7		
#200	45.2		

* (no specification provided)

Material Description

Brown Clayey to Silty Fine to Medium Sand, Some Gravel

Atterberg Limits

PL= 17 LL= 23 PI= 6

Coefficients

D_{90}= 10.1779 D_{85}= 2.4141 D_{60}= 0.2607
D_{50}= 0.1392 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= SC/SM AASHTO= A-4(0)

Remarks

Sample Number: B2-S3

Date: 2/7/17

CGC, Inc.

Client: City of Madison
Project: Nakoosa Facility
Project No: C16051-5 **Figure**

Tested By: KJS **Checked By:** AJB

SECTION 00 31 46
PERMITS

PART 1 – GENERAL

1.1. SUMMARY

A. Each project has varying requirements for permits, inspections, and fees based on the scope, size, and location of the project.

B. The City of Madison (Owner) is subject to all permits, inspections and associated fees for construction, demolition, utility connection, storm water management, and other similar requirements that may be required to complete the scope of work associated with these contract documents.

C. The General Contractor (GC) shall be responsible for obtaining all permits, inspections and paying for all associated fees unless specifically identified within this specification.

1.2. REFERENCES

A. The following references are not intended to be all inclusive. It shall be the GC's responsibility to determine all requirements based on the scope of work in the contract documents.

B. City of Madison Ordinances: Review all ordinances that may require a permit or fee that may be connected with a required permit. Contact the following City Agencies to determine the exact requirements during bidding

1. Building Inspection
2. Zoning
3. Engineering
4. Water Utility
5. Traffic Engineering
6. Others as may be specified by the contract documents.

B. State Statutes

C. Other Regulatory Regulations

D. Other Agencies or companies that may have related requirements

1. Madison Metropolitan Sewerage District
2. Local gas and electric utility companies
3. Other utility companies

1.3. GENERAL CONTRACTORS REQUIREMENTS

A. The GC shall be responsible for all of the following:

1. Execute application for all required permits as may be required by the scope of work described within the contract documents.
2. Paying all fees associated with the application of any required permits.
3. Scheduling all required inspections that may be conditions of any required permits.

B. The GC shall provide high quality scanned images of all required permits and inspections and upload them to the Contract Documents-Regulatory Documents Library on the Project Management Web Site.

PART 2 – PRODUCTS – THIS SECTION NOT USED

PART 3 – EXECUTION – THIS SECTION NOT USED

END OF SECTION

DOCUMENT 003147 PERMIT APPLICATION SUPPLEMENT

PART 1 - HIDDEN DUMMY LINE - DO NOT REMOVE

1.1 PERMIT APPLICATION INFORMATION

A. This Document with its referenced attachments is part of the Procurement and Contracting Requirements for Project. They provide Owner's information for Bidders' convenience and are intended to supplement rather than serve in lieu of the Bidders' own investigations. This Document and its attachments are not part of the Contract Documents.

B. Permit Application:

1. The Erosion Control Permit from the City of Madison Engineering Division has been applied for by Owner. A copy of the permit has been attached to this Document and is available for viewing on Project Web site.
2. The Stormwater Management Permit from the City of Madison Engineering Division has been applied for by Owner. A copy of the permit has been attached to this Document and is available for viewing on Project Web Site.

END OF DOCUMENT 003147

City of Madison Engineering Division

EROSION CONTROL PERMIT

Permit Number: ENG100-2019-00174
City Engineering: (608) 266-4751

Location of Work: 4141 Nakoosa TRL **Parcel: 081033405128**

Permittee: Jim Whitney **Telephone:** (608) 266-4563 **Email:** jwhitney@cityofmadison.com

Owner: CITY OF MADISON MOTOR EQ **Telephone:**

FEE SCHEDULE	
Full Plan Base Fee	200.00
Total Disturbed Area Fee	2,403.24
Total Fee Amount	2,603.24
Total Invoiced Amount	2,603.24
Paid	2,603.24
Balance Due	0.00

APPROVALS	
Plan Review:	DAO
Issuance:	DAO

DIGGERS HOTLINE

Call 811 or (800) 242-8511
(262) 432-7910
(877) 500-9592 (emergency only)

PROPOSED WORK: Nakoosa Trail Fleet/Fire/Radio Shop Facility

Project Description:

Permit Type: Full Plan

Construction Start Date: 5/15/2019 **Permit Expiration Date:** 6/14/2020 **Seed Sod Restore Date:** 4/14/2020

USLE Rate: 4.6 **Total Disturbed Area:** 480,647

☐ **EC Checklist Attached** ☒ **EC Plan Attached** ☐ **Pumping Plan Attached**

FOR CITY OF MADISON USE ONLY: APPROVED

Daniel Olivares 01/15/2019

- Erosion Control Permit Reviewer Date Full Plan

See page two of this permit for Permit Conditions and Requirements.

City of Madison Engineering Division

EROSION CONTROL PERMIT

Permit Number: ENG100-2019-00174
City Engineering: (608) 266-4751

Location of Work: 4141 Nakoosa TRL **Parcel: 081033405128**

Permittee: Jim Whitney **Telephone:** (608) 266-4563 **Email:** jwhitney@cityofmadison.com

Owner: CITY OF MADISON MOTOR EQ **Telephone:**

Permit Conditions and Requirements:

Failure to abide by any of the following permit conditions will be considered a violation of the City's Erosion Control Ordinance (MGO Ch. 37) and can result in the issuance to the permittee and/or the property owner of Official Notices, citations, and/or referral to the City Attorney for resolution of non-compliance.

Erosion & Sediment Control Measures are to be installed prior to any land disturbance activities.

Within ten (10) days of the completion of the project or site stabilization the applicant shall submit an Erosion Control Notice of Termination (ECNOT). The ECNOT should be sent to the administrative authority that initially approved your permit.

The Erosion Control Permit applicant shall conduct a pre-construction meeting attended by a Professional Engineer responsible for initial implementation certification of the erosion control plan. The Professional Engineer shall document and submit minutes of this meeting to City Engineering.

A Professional Engineer currently licensed in the State of Wisconsin shall certify the initial installation and implementation of the measures shown on the approved erosion control plan. Documentation on the City's Installation Certification form shall be submitted to the administrative authority within one (1) week of the installation. The certification form can be found on the City's webpage at http://www.cityofmadison.com/engineering/Permits.cfm.

As part of the Erosion Control Permit requirements this construction project requires erosion control inspections and reporting by the permittee (or by their authorized inspector). Inspections shall be conducted a minimum of once per week and also after every 24-hour rain event of 0.5" or more precipitation. The results of these inspections shall be entered on the City's permit and inspection tracking system.

Dust Control, if applicable shall be provided, per WDNR Conservation Practice Standard 1068.

Trench Dewatering, if applicable shall be provided, per WDNR Conservation Practice Standard 1061.

All BMP's installed for erosion control shall be in accordance with the applicable WDNR Conservation Practice Standards found at: http://dnr.wi.gov/topic/stormwater/standards/const_standards.html

City of Madison Engineering Division

STORMWATER MANAGEMENT PERMIT

Permit Number: ENGT20-2019-00175
City Engineering: (608) 266-4751

Location of Work: 4141 Nakoosa TRL **Parcel: 081033405128**

Permittee: Jim Whitney **Telephone:** (608) 266-4563 **Email:** jwhitney@cityofmadison.com

Owner: CITY OF MADISON MOTOR EQ **Telephone:**

FEE SCHEDULE	
Base Fee	400.00
New Impervious Area Fee	429.50
Redeveloped Area Fee	1,423.98
Total Fee Amount	2,253.48
Total Invoiced Amount	2,253.48
Paid	2,253.48
Balance Due	0.00

APPROVALS	
Plan Review:	DAO
Issuance:	DAO

DIGGERS HOTLINE

CALL 811 or (800) 242-8511
(262) 432-7910
(877) 500-9592 (emergency only)

PROPOSED WORK Nakoosa Trail Fleet/Fire/Radio Shop Facility

Construction Start Date: 5/15/2019 **Estimated Completion Date:** 4/14/2020

Existing Impervious Area (before project): 327423 Sq. Ft.
New Impervious Area (Outside footprint of existing impervious Area): 42950 Sq. Ft.
Redeveloped Impervious Area (inside original impervious footprint): 284795 Sq. Ft.
Removed Impervious Area (from inside original impervious footprint): 42602 Sq. Ft.
Net Impervious Area (total after project): 327771 Sq. Ft.
Total Site Area: 6668820 Sq. Ft.

Storm Water Management Requirements

- ☐ 40% TSS Reduction
- ☐ 80% TSS Reduction (New Development)
- ☑ 80% TSS Reduction (TMDL Redevelopment)
- ☑ Oil & Grease Removal
- ☐ Infiltration
- ☐ Groundwater Recharge
- ☐ Thermal Control
- ☐ Runoff Control - Detention

Maintenance Agreement Executed:

FOR CITY OF MADISON USE ONLY: APPROVED

Daniel Olivares 01/15/2019

- Stormwater Management Permit Reviewer **Date**

See page two of this permit for Permit Conditions and Requirements.

City of Madison Engineering Division

STORMWATER MANAGEMENT PERMIT

Permit Number: ENGT20-2019-00175
City Engineering: (608) 266-4751

Location of Work: 4141 Nakoosa TRL **Parcel: 081033405128**

Permittee: Jim Whitney **Telephone:** (608) 266-4563 **Email:** jwhitney@cityofmadison.com

Owner: CITY OF MADISON MOTOR EQ **Telephone:**

Permit Conditions and Requirements:

Failure to abide by any of the following permit conditions will be considered a violation of the City's Storm Water Management Ordinance (MGO Ch. 37) and can result in the issuance of Official Notices, citations, and/or referral to the City Attorney for resolution of non-compliance.

A Professional Engineer currently licensed in the State of Wisconsin shall certify the initial installation and implementation of the Best Management Practices (BMPs) shown on the approved stormwater management plan. Documentation shall be submitted to the administrative authority using the standard forms available from City Engineering and found on the City's website at http://www.cityofmadison.com/engineering/Permits.cfm.

Any property owner required to have a Storm Water BMP or maintenance agreement on the property as part of a stormwater management plan shall submit to the administrative authority an annual report reviewing the condition of the practice(s) and the maintenance performed during the past calendar year. This report shall be submitted and sealed by a Professional Engineer currently licensed in the State of Wisconsin per MGO Chapter 37.

SECTION 00 43 25
SUBSTITUTION REQUEST FORM (DURING BIDDING)

PART 1 – GENERAL

1.1. SUMMARY

A. The City of Madison uses a specific list of preferred products for various specification items to establish standards of quality, utility, and appearance required.

B. The City of Madison will not allow substitutions for specified Products except as follows:

1. The Product is no longer produced or the product manufacturer is no longer in business.
2. The manufacturer has significantly changed performance data, product dimensions, or other such design criteria for the specified Product(s).
3. Products specified by naming one or more Products or manufacturer's and "or approved equal" or "approved equivalent."

C. The procedures in this specification shall apply to all proposals by Contractors, Suppliers, Vendors, and Manufacturers when the conditions in item 1.1.B. above have been met during the bidding phase.

1.2. RELATED SPECIFICATIONS

A. 01 25 13 Product Substitution Procedures

PART 2 – PRODUCTS – THIS SECTION NOT USED

PART 3 - EXECUTION

3.1. REQUESTING A SUBSTITUTION DURING BIDDING

A. In the event that a substitution is requested during the bidding phase the Contractor, Supplier, Vendor, or Manufacturer shall do all of the following:

1. Submit a Substitution Request Form for each different product. Use a printed/scanned copy of the form at the end of this specification as a cover sheet.
2. Support your request with complete data, drawings, specifications, performance data and samples as appropriate. A complete submission shall include the following:
   a. Substitution Request Form as a cover sheet
   b Comparison of qualities of the proposed substitutions with that specified.
   c. Changes required in other elements of the Work because of the substitution.
   d. Effect on the construction schedule.
   e. Cost data comparing the proposed substitution with the Product specified.
   f. Any required license fees or royalties.
   g. Availability of maintenance service and source of replacement materials.
3. Submit the Substitution Request Form and all required supporting documentation to the City Project Manager and Project Architect.
   a. Submissions to be done as complete PDF files for each product, appropriately titled
   b. Email submissions to the Project Architect and City Project Manager at the email addresses provided on the last page of Section D of the contract documents.
      i. The subject line shall include the contract number and "Request for Substitution". Example: Contract 1234 – Request for Substitution
4. Submissions must be received by the substitution request deadline specified in Section A of the Contract Documents.

3.2. SUBMISSION REVIEW

A. The Project Architect, City Project Manager, members of the design team, and the Owners staff shall review all submissions for substitutions during the bidding phase.

3.3. SUBSTITUTION APPROVAL

A. All requests for substitutions that have been approved shall be published by Addenda to the bid documents.

NOTE SEE NEXT PAGE FOR SAMPLE SUBSTITUTION REQUEST FORM.

3.4. SUBSTITUTION REQUEST FORM

For Pre-bid Substitution Requests all text boxes on this form are required information for a complete request.

Substitution Request

Today's Date:

Project Title:

Project Number: *Contract Number:*

By completing and submitting this form for review the General Contractor affirms that all of the following statements are correct:

1. The General Contractor affirms that this request is in compliance with the requirements described in ***Specification 01 25 13 Product Substitution Procedures.***
2. The function, appearance, and quality of the proposed substitution are equal or superior to the specified item.
3. The proposed substitution does not affect dimensions shown on the drawings.
4. The proposed substitution will have no adverse affects on other trades, the construction schedule, or any specified warranty requirements.
5. Maintenance and service parts will be locally available for the proposed substitution. (GC shall provide supporting documentation in the attachments section below.)
6. The General Contractor shall be responsible for any and all costs associated with this substitution request if approved. This includes but is not to limited to fees for building design, engineering design fees, detailing fees, plan review fees, construction costs, and inspection fees.

GC Substitution Request:

General Title:

Related Specification:

Reason for Substitution:

Proposed Substitution:
(include Name, Model, etc.)

Submitted By: *Phone:*

Company: *Email:*

END OF SECTION

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SECTION 00 43 43
WAGE RATES FORM

PART 1 – GENERAL

1.1. SUMMARY

A. The Reimbursable Hourly Worksheet is a contractor provided document that indicates the basic rate of pay, fringe benefits, and each companies cost of required insurance for all Trades and Classifications that will be performing productive labor during the execution of this contract.
   1. Rates shall be similar to recognized rates published by the Bureau of Labor Statistics, Associated General Contractors (AGC), Associated Builders and Contractors (ABC), appropriate union contracts, and other similar organizations or documents.

B. The Reimbursable Labor Rate Worksheet shall provide the basis for labor rates being used on Change Order Request forms.

1.2. RELATED SPECIFICATIONS

A. Section 01 26 57 Change Order Request
B. Section 01 29 76 Progress Payment Procedures
C. Section 01 31 23 Project Management Web Site (SharePoint)
D. Section 01 32 19 Submittals Schedule

PART 2 – PRODUCTS – NOT USED

PART 3 - EXECUTION

3.1. GENERAL REQUIREMENTS

A. Prior to the Pre-Construction Meeting the City Project Manager (CPM) or the City Construction Manager (CCM) shall provide the GC a copy of the *Reimbursable Labor Rate Worksheet.xls*.
   1. See the last page of this specification for an example of the worksheet.

B. The GC shall provide all subcontractors that will be performing productive labor during the execution of this contract with additional copies of the worksheet as needed.

C. All contractors shall be required to fill out and submit completed worksheets for all Trades and Classifications of labor that will be performing productive labor during the execution of this contract.

3.2. GENERAL CONTRACTORS RESPONSIBILITIES

A. The GC shall consolidate all Trades and Classifications into one master Excel Workbook of all trades.

B. The GC shall provide the combined workbook as required by Section 1.6 of Specification 01 32 19 Submittals Schedule for review and approval by the Owners Representatives.
   1. Submittal shall be an Exported PDF of the completed Excel Workbook.
      a. As an Exported PDF the individual worksheets will be bookmarked and the document will be word searchable for easy reference.

C. The GC shall only use the rates posted in the approved submittal throughout the execution of this contract.

Reimbursable Hourly Rate Worksheet

(see bottm of page for instructions)

Project Name:

Project Location:

Project Number:

Contractor:

Rates are based on the following documentaton:

Enter TRADE Here:

Carpenter

Classification:		Foreman	Journeyman	Laborer	Apprt 1	Other	Other	Other
Base Rate (BR)		$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Vacation		$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Health Insurance		$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Pension		$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Apprenticeship		$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Sub-total		$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
BR Sub-total		$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Work. Comp	% of BR	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Gen Liability	% of BR	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
WI Unemploy	% of BR	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Fed Unemploy	% of BR	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
FICA	% of BR	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Sub-total		$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
TOTAL COST		$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00

Enter **YOUR** percentage of base rate in the column below.

% of BR	
0	- Work. Comp
0	- Gen Liability
0	- WI Unemploy
0.6	- Fed Unemploy
7.65	- FICA

Form Instructions:

1. Provide a work sheet for ALL Trade Classifications that will be performing on site productive labor during the execution of this project.

2. Responsible contractor to complete only boxes that are shaded, all non-shaded boxes are formula driven.

3. Contractor shall provide the name of the source used for these rates. (union contract, Bureau of Labor and Statistices, AGC, ABC, etc.) and be prepared to provide copies if so requested.

END OF SECTION

SECTION 00 62 76.13
SALES TAX FORM

PART 1 – GENERAL

1.1. SUMMARY

A. The City of Madison is a qualifying tax exempt entity in the State of Wisconsin.

B. The Contractor shall refer to *Section 102.9 – Bidders Understanding* of the *City of Madison Standard Specifications for Public Works Construction* for more information on Tax Exempt Status.

C. This project constructs or remodels facilities owned by the City of Madison in Madison, Wisconsin.

1.2. RELATED SPECIFICATION SECTIONS

A. Parts of this specification will reference articles within "The City of Madison Standard Specifications for Public Works Construction".

1. Use the following link to access the Standard Specifications web page:
   http://www.cityofmadison.com/business/pw/specs.cfm
   a. Click on the "Part" chapter identified in the specification text. For example if the specification says "Refer to City of Madison Standard Specification **2**10.2" click the link for Part II, the Part II PDF will open.
   b. Scroll through the index of Part II for specification 210.2 and click the text link which will take you to the referenced text.

1.3. TAX EXEMPT FORM

A. The Contractor can access Wisconsin Sales and Use Tax Exemption Certificates (form S-211, Wisconsin Department of Revenue) from the City of Madison Finance website.

1. City of Madison tax exempt information and signature by Purchasing Supervisor is already completed.
2. Website: http://www.cityofmadison.com/employeenet/finance/purchasing
   a. Under the title *Purchasing Forms*, scroll down to the form link titled *Sales Tax Exempt Form S-211*.

PART 2 – PRODUCTS – THIS SECTION NOT USED

PART 3 – EXECUTION – THIS SECTION NOT USED

END OF SECTION

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SECTION 01 25 13
PRODUCT SUBSTITUTION PROCEDURES

PART 1 – GENERAL

1.1. SUMMARY

A. The City of Madison uses a specific list of preferred products for various specification items to establish standards of quality, utility, and appearance required.

B. The City of Madison will not allow substitutions for specified Products except as follows:

1. The Product is no longer produced or the product manufacturer is no longer in business.
2. The manufacturer has significantly changed performance data, product dimensions, or other such design criteria for the specified Product(s).
3. Products specified by naming one or more Products or manufacturer's and "or approved equal" or "approved equivalent."

C. The City of Madison will not allow substitutions for specified Products as follows:

1. For Products specified by naming only one Product and manufacturer, no substitute product will be considered.
2. For Products specified by naming several Products or manufacturers select any one of the products or manufacturers named, which complies with the specifications. No substitute product will be considered.

D. Request for substitutions from any party other than the General Contractor (GC) will not be accepted.

1.2. RELATED SPECIFICATIONS

A. Section 01 26 13 Request for Information (RFI)
B. Section 01 31 23 Project Management Web Site
C. Section 01 33 23 Submittals

PART 2 – PRODUCTS

2.1. SUBSTITUTION REQUEST FORM

A. During bidding all contractors (General and Sub-contractors) and suppliers of materials or products shall provide hard copy of the Substitution Request form and all required attachments directly to the Project Architect.

1. Contractors and suppliers shall use the screen shot of the form located at the end of this specification to print a hard copy for all pre-bid substitution requests.

B. After bidding only the GC shall submit a request and shall use the form located on the Project Management Web Site.

PART 3 - EXECUTION

3.1. REQUESTING A SUBSTITUTION DURING BIDDING

A. In the event that a substitution is requested during the bidding phase the Contractor or Supplier shall meet the substitution request deadline listed in the bidding documents. No substitution request will be considered during the bidding period after the stated substitution request deadline. In general this procedure shall be as follows:

1. Submit a Substitution Request Form for each different product
2. Support your request with complete data, drawings, specifications, performance data and samples as appropriate. A complete submission shall include the following:
   i. Substitution Request Form as a cover sheet
   ii Comparison of qualities of the proposed substitutions with that specified.
   iii. Changes required in other elements of the Work because of the substitution.

iv. Effect on the construction schedule.
v. Cost data comparing the proposed substitution with the Product specified.
vi. Any required license fees or royalties.
vii. Availability of maintenance service and source of replacement materials.

3. Submit the Substitution Request Form and all required supporting documentation to the City Project Manager and Project Architect.
   i. Submissions to be done as complete PDF files for each product, appropriately titled
   ii. Email submissions to the Project Architect and City Project Manager at the email addresses provided on the last page of Section D of the contract documents.
   iii. Submissions must be received by the substitution request deadline specified in Section A of the Contract Documents.

B. Substitutions submitted and approved during the bidding phase shall be announced by the City of Madison by addenda prior to the bid due date.

C. The Owner and Architect may reject any substitution request without providing specific reasons.

3.2. REQUESTING A SUBSTITUTION AFTER AWARD OF CONTRACT

A. A substitution request will only be considered after award of contract if it meets the qualifying provisions as described in 1.1.B.1 and .2 above.

B. The GC shall submit a substitution request using the digital form on the Project Management Web Site located in the Construction Administration-Substitution Request library.
   1. Click on *Add document* to open a new digital form, fill out form, provide required attachments, then click the Submit button.
   2. Consulting Staff, Owner and Owners Representatives will review the request and provide the appropriate approvals and feed back to the GC.

3.3. UNAUTHORIZED SUBSTITUTIONS

A. Any Contractor who substitutes products without proper authorization by the Owner and Architect will be required to immediately remove and replace the product and all costs required to conform to the Contract Documents shall be borne by the General Prime Contractor.

NOTE SEE NEXT PAGE FOR SAMPLE SUBSTITUTION REQUEST FORM.

1

For Pre-bid Substitution Requests all text boxes on this form are required information for a complete request.

Substitution Request

Today's Date:

Project Title:

Project Number: *Contract Number:*

By completing and submitting this form for review the General Contractor affirms that all of the following statements are correct:

1. The General Contractor affirms that this request is in compliance with the requirements described in ***Specification 01 25 13 Product Substitution Procedures***.
2. The function, appearance, and quality of the proposed substitution are equal or superior to the specified item.
3. The proposed substitution does not affect dimensions shown on the drawings.
4. The proposed substitution will have no adverse affects on other trades, the construction schedule, or any specified warranty requirements.
5. Maintenance and service parts will be locally available for the proposed substitution. (GC shall provide supporting documentation in the attachments section below.)
6. The General Contractor shall be responsible for any and all costs associated with this substitution request if approved. This includes but is not to limited to fees for building design, engineering design fees, detailing fees, plan review fees, construction costs, and inspection fees.

GC Substitution Request:

General Title:

Related Specification:

Reason for Substitution:

Proposed Substitution:
(include Name, Model, etc.)

Submitted By: *Phone:*

Company: *Email:*

2
3
4
5
6
7

END OF SECTION

SECTION 01 26 13
REQUEST FOR INFORMATION (RFI)

PART 1 – GENERAL

1.1. SUMMARY

A. Contractors shall use the RFI form/process to request additional information or clarification regarding the construction documents.

B. All RFI documentation will be processed through the through the Construction Administration-Request for Information Library on the Project Management Web Site (PMWS).

1.2. RELATED SPECIFICATIONS

A.	Section 01 26 46	Construction Bulletin (CB)
B.	Section 01 26 57	Change Order Request (COR)
C.	Section 01 26 63	Change Order (CO)
D.	Section 01 31 23	Project Management Web Site (PMWS)
E.	Section 01 91 00	Commissioning

1.3. PERFORMANCE REQUIREMENTS

A. RFI issues initiated by any contractor shall be done through the General Contractor (GC).
   1. RFIs submitted by any Sub-contractor under the GCs control shall be returned with no response.

B. Submit a new RFI for each issue. Only multiple questions that are of a similar nature may be combined into one RFI shall be allowed and responded to.

1.4. QUALITY ASSURANCE

A. The GC shall be responsible for all of the following:
   1. Ensure that any request for additional information is valid and the information being requested is not addressed in the construction documents.
   2. Ensure that all requests are clearly stated and the RFI form is completely filled out.
   3. Ensure that all Work associated an RFI response is carried out as intended.

B. The PA shall be responsible for the following:
   1. Ensure that all responses to contractor initiated RFIs are properly responded to in a timely fashion.
      a. The CPM, Owner, consulting staff, and other City staff shall be responsible for the initial review of the RFI. The PA shall be responsible for codifying all consultant and Owner/City staff comments into a unified RFI response.

PART 2 – PRODUCTS

2.1. REQUEST FOR INFORMATION FORM

A. The RFI form is located on the Project Management Web Site. The GC, PA, or CPM as appropriate shall click the link in the left margin of the project web site opening a new form. Project information is pre-loaded, provide additional information as indicated below in the execution to complete the form.

PART 3 - EXECUTION

3.1. CONTRACTOR INITIATED RFI

A. Immediately on discovery of the need for additional information or interpretation of the Contract Documents any contractor may initiate an RFI for additional information or clarification through the GC.

B. The GC shall select the "Submit an RFI" link on the Project Management Web Site and completely fill out the form as follows:

1. Contract related information will be automatically populated on the form.
2. Thoroughly explain the issue at hand, provide backup information (photographs, sketches, drawings, data, etc) as necessary, and clearly state the question or problem that requires a resolution. Combine like or related issues but do not include multiple issues on one form.
    a. Example. If a duct interferes with other critical piping and electrical work include all issues into one RFI.
    b. Example. If you have a question regarding the chiller and another regarding toilet partitions create separate RFIs.
3. Check all relevant boxes for trades affected. This will assist the design team in determining who should be reviewing the RFI.

C. Upon completing the RFI click the "Submit" button. The PMWS software will automatically route the RFI to the appropriate reviewers.

3.3. RFI RESPONSES

A. Responses to simple RFI issues shall use the response section of the RFI form and shall be completed within five (5) working days of the RFI form being submitted.

B. Responses to more complex issues may require additional time or may require a Construction Bulletin to be published. The initial RFI shall be responded to within five (5) working days stating that the RFI is being reviewed and provide an estimated date for the response.

C. The following GC generated RFIs will be returned without action:

1. Requests for approval of submittals
2. Requests for approval of substitutions
3. Requests for approval of Contractor's means and methods.
4. Requests for coordination information already indicated in the Contract Documents.
5. Requests for adjustments in the Contract Time or the Contract Sum.
6. Requests for interpretation of A/E's actions on submittals.
7. Incomplete RFI or inaccurately prepared RFI.

3.4. COMMENCEMENT OF WORK RELATED TO AN RFI

A. The GC shall only proceed with the Work of an RFI when additional information is not required.

B. The GC shall not proceed with any Work associated with an RFI while it is under review.

C. The GC shall not proceed with any Work associated with an RFI that clearly states a CB will be issued in response to the RFI.

D. The GC will be required to immediately remove and replace unauthorized Work and all costs required to conform to the Contract Documents shall be borne by the GC.

END OF SECTION

SECTION 01 26 46
CONSTRUCTION BULLETIN (CB)

PART 1 – GENERAL

1.1. SUMMARY

A. Construction Bulletins (CB) are formal published construction documents that modify the original contract bid documents after construction has commenced. CBs may be published for many reasons, including but not limited to the following:
   1. Clarification of existing construction documents including specifications, plans, and details
   2. Change in product or equipment
   3. A response to a Request for Information
   4. Change in scope of the contract as either an add or a deduct of work

B. CBs provide a higher degree of detail in response to a Request for Information (RFI) through directives, revised plans/details, and specifications as necessary.

C. The CB may change the original contract documents through additions or deletions to the Work.

D. Where the directives of a CB are significant enough to warrant a Change Order Request (COR) the GC shall use all information provided in the CB to assemble all required back-up documentation for additions and deletions of materials, labor and other related contract costs for the COR.

E. All CB documentation will be processed through the Construction Administration-Construction Bulletin Library on the Project Management Web Site (PMWS).

1.2. RELATED SPECIFICATIONS

A.	Section 01 26 13	Request for Information (RFI)
B.	Section 01 26 57	Change Order Request (COR)
C.	Section 01 26 63	Change Order (CO)
D.	Section 01 31 23	Project Management Web Site
E.	Section 01 91 00	Commissioning

1.3. PERFORMANCE REQUIREMENTS

A. Project Architect (PA): The PA shall be the only person authorized to publish a CB as needed for any reason indicated in section 1.1.A above. The PA shall consult as necessary with any of the following while drafting the CB and shall confirm final direction with the CPM prior to issuing a CB:
   1. City Project manager (CPM)
   2. Owner
   3. Members of the consulting staff
   4. Members of city staff
   5. The General Contractor
   6. Sub-contractors
   7. Commissioning Agent (CxA)

B. General Contractor: The GC shall be responsible for the following as needed:
   1. Executing the directives of the CB when he/she believes that no changes in labor, materials, equipment, or contract duration will be required for additions or deletions.
   2. Submit a COR when he/she believes that a change in labor, materials, equipment or contract duration will be required for additions or deletions.

1.4. QUALITY ASSURANCE

A. The PA shall be responsible for ensuring the final CB sufficiently provides direction, details, specifications and other information as necessary for the GC to perform the intended Work.

B. The PA shall be responsible for ensuring the final CB is published as expeditiously as practical based on the complexity of the CB being written. CBs that may affect the GC critical path shall be given priority.

PART 2 – PRODUCTS

2.1. CONSTRUCTION BULLETIN FORM

A. The CB form is located on the Project Management Web Site. The PA shall click the link in the left margin of the project web site opening a new form. Project information is pre-loaded, the PA only needs to enter information and make attachments as needed to complete the form.

PART 3 - EXECUTION

3.1. WRITING THE CONSTRUCTION BULLETIN

A. The PA shall draft a CB as needed using the Construction Bulletin form on the Project Management Web Site.

1. The PA and/or consulting staff as necessary shall provide specifications, model numbers and performance data, details and other such information necessary to clearly state the intentions of the CB.
2. The consulting staff, CPM, Owner, CxA and other City Staff shall review the draft and recommend changes as needed.
3. The PA shall amend the draft as necessary into a final CB for review

B. Once the final CB has been approved the PA shall “Submit” the CB through the Project Management Web Site to the GC.

3.2. EXECUTING THE CONSTRUCTION BULLETIN

A. The GC shall acknowledge receipt of the CB on the Project Management Web Site as instructed in the Tutorial Manual provided to the awarded contractor.

B. The GC shall notify all Sub-contractors of the CB and publish the CB to all field sets of drawings and specifications as appropriate.

C. The GC shall execute the directives of the CB or submit COR documentation as necessary during the execution and implementation of the CB.

1. See Specification 01 26 57 Change Order Request (COR)

END OF SECTION

SECTION 01 26 57
CHANGE ORDER REQUESTS (COR)

PART 1 – GENERAL

1.1. SUMMARY

A. Except in cases of emergency, no changes in the Work required by the Contract Documents may be made by the General Contractor (GC) without having prior approval of the City Engineer or his representative.

B. The City may at any time, without invalidating the Contract and without Notice to Sureties, order changes in the Work by written Change Order (CO). Such changes may include additions and/or deletions.

C. Where the City desires to make changes in the Work through use of written Change Order Request (COR), the following procedures apply:

1. If requested by the City, the GC shall prepare and submit a detailed proposal, including all cost and time adjustments to which the GC believes it will be entitled if the change proposed is incorporated into the Contract. The City shall be under no legal obligation to issue a Change Order for such proposal.
2. The parties shall attempt in good faith to reach agreement on the adjustments needed to the Contract to properly incorporate the proposed change(s) into the Work. In the event that the parties agree on such adjustments, the City may issue a Change Order and incorporate such changes and agreed to adjustments, if any.
3. In some instances, it may be necessary for the City to authorize Work or direct changes in Work for which no final and binding agreement has been reached and for which unit prices are not applicable. In such cases the following shall apply.
    a. Upon written request by the City, the GC shall perform proposed Work
    b. The cost of such change may be determined in accordance with this specification.
    c. In the event agreement cannot be accomplished as contemplated herein, the City may authorize the Work to be performed by City forces or to hire others to complete the Work. Such action on the part of the City shall not be the basis of a claim by the GC for failure to allow it to perform the changed Work.

D. Where changes in the Work are made by the City through use of a force account basis, the GC shall as soon as practicable, and in no case later than ten (10) working days from the receipt of such order, unless another time period has been agreed to by both parties, give the City written Notice, stating:

1. The date, circumstances and source of the extra work; and,
2. The cost of performing extra work described by such Order, if any; and,
3. Effect of the order on the required completion date of the Project, if any.

E. The giving of each Notice by the GC as prescribed by this specification, shall be a requirement to liability of the City for payment of any additional costs incurred by the GC in implementing changes in the Work. Under this specification, no order or statement of the City shall be treated as a Change Order, or shall entitle the GC to an equitable adjustment of the terms of this Contract or damages for costs incurred by the GC on any activity for which the Notice was not given.

F. In the event Work is required due to an emergency as described in this specification the GC must request an equitable adjustment as soon as practicable, and in no case later than ten (10) working days of the commencement of such emergency.

G. All GC requests for equitable adjustment shall be submitted to the CPM per the specifications below. Such requests shall set forth with specificity the amount of and reason(s) for the proposed adjustment and shall be accompanied by supporting information and documents.

H. No adjustment of any kind shall be made to this Contract, if asserted by the GC for the first time, after the date of final payment.

I. This specification shall be used by the GC when preparing documentation for any COR to ensure each has been properly and completely filled out as required by the City of Madison.

J. All COR documentation will be processed through the Construction Administration-Change Order Request Library on the Project Management Web Site (PMWS).

1.2. RELATED SPECIFICATION SECTIONS

A. Section 01 26 13 Request for Information (RFI)
B. Section 01 26 46 Construction Bulletins (CB)
C. Section 01 26 63 Change Order (CO)
D. Section 01 31 23 Project Management Web Site
E. Section 01 91 00 Commissioning

F. Parts of this specification will reference articles within "The City of Madison Standard Specifications for Public Works Construction".

1. Use the following link to access the Standard Specifications web page:
   http://www.cityofmadison.com/business/pw/specs.cfm
   a. Click on the "Part" chapter identified in the specification text. For example if the specification says "Refer to City of Madison Standard Specification **2**10.2" click the link for Part II, the Part II PDF will open.
   b. Scroll through the index of Part II for specification 210.2 and click the text link which will take you to the referenced text.

1.3. DEFINITIONS AND STANDARDS

A. LABOR: The amount of time and cost associated with the performance of human effort for a defined scope of Work. Labor is further defined as follows:
   1. Labor rate is the total hourly rate which includes the basic rate of pay, fringe benefits plus each company's cost of required insurance, also referred to as a reimbursable labor rate.
   2. Unit labor is the labor hours anticipated to install the corresponding unit of material.
   3. Labor cost is the labor hours multiplied by the hourly labor rates.

B. MATERIAL: Actual material cost is the amount paid, or to be paid, by the GC for materials, supplies and equipment entering permanently into the Work, including cost of transportation and applicable taxes. The cost shall not exceed the usual and customary cost for such items available in the geographical area of the project

C. LARGE TOOLS AND MAJOR EQUIPMENT: Large tools and major equipment are those with an initial cost greater than $1,500, whether from the GC or other sources.
   1. Tool and equipment use and time allowed is only for extra work associated with change orders.
      a. Rental Rate is the machine cost associated with operating a piece of equipment for a defined length of time (hour, day, week, or month) and shall not exceed the usual and customary amount for such items available in the geographical area of the project.
      b. Rental cost is the rental rate multiplied by the anticipated duration the equipment shall be required.
   2. The GC shall provide a breakdown of all rental rates to indicate what items and costs are associated with the rate. Examples of items to include in the breakdown would be fuel consumption, lubrication, maintenance and other similar expenses but not including profit and overhead.
   3. When large tools and equipment needed for Change Order work are not already at the job site, the actual cost to get the item there is also reimbursable.

D. BOND COST: The cost shall be calculated at 1% of the total proposed change order.

E. SUB-CONTRACTOR COSTS: Sub-contractor costs are for those labor, material, and equipment costs required by subcontracted specialties to complete the Change Order work.

F. OVERHEAD AND PROFIT Markup: The allowable markup percentage to a COR by the GC and Sub-contractors for overhead and profit. All of the following are expenses associated with overhead and profit and shall not be reimbursable as individual items on any COR:
   1. CHANGE ORDER PREPARATION: All costs associated with the preparing and processing of the change order.

2. DESIGN, ESTIMATING, AND SUPERVISION: All such efforts, unless specifically requested by Owner as additional Work to be documented as a COR or portion thereof.
3. INSTALLATION LAYOUT: The layout required for the installation of material and equipment, and the installation design, is the responsibility of the GC.
4. SMALL TOOLS AND SUPPLIES: The cost of small hand tools with an initial cost of $1,500 or less, along with consumable supplies and expendable items such as drill bits, saw blades, gasoline, lubricating or cutting oil, and similar items.
5. GENERAL EXPENSE: The general expense, which is those items that are a specific job cost not associated with direct labor and material such as job trailers, foreman truck, and similar items.
6. RECORD DRAWINGS: The preparation of record or as-built drawings.
7. OTHER COSTS: Any miscellaneous cost not directly assessable to the execution of the Change Order including but not limited to the following:
    a. All association dues, assessments, and similar items.
    b. All education, training, and similar items.
    c. All drafting and/or engineering, unless specifically requested by Owner as additional Work to be documented as a Change Order proposal or portion thereof.
    d. All other items including but not limited to review, coordination, estimating and expediting, field and office supervision, administrative work, etc.

G. Contract Extension: The necessary amount of time to be added to the contract deadlines for the completion of a change order.

1.4. CONTRACT EXTENSION

A. The GC shall not assume that every COR will require a Contract Extension. If the GC feels a contract extension is warranted he/she shall provide sufficient scheduling information that shows how the COR being requested impacts the critical path of the project.
B. The City of Madison strongly encourages the GC to explore alternative methods and practices prior to submitting a COR with a request for contract extension.

1.5. OVERHEAD AND PROFIT MARKUP

A. Pursuant to the City of Madison Standard Specifications for Public Works Construction, Section 104.7, Extra Work, the following maximum allowable markups shall be strictly enforced on all change orders associated with the execution of this contract.
    1. The total maximum overhead and profit shall not exceed fifteen percent (15%) of the total costs.
    2. The total maximum overhead and profit shall be distributed as follows:
        a. For work performed and materials provided solely by the General Contractor, fifteen percent (15%) of the total costs.
        b. For work performed and materials provided solely by Sub-contractors and supervised by the General Contractor:
            i. Supervision of the GC, five percent (5%) of the total Sub-contractor cost.
            ii. Sub-contractors work and materials ten percent (10%) of the total Sub-contractor cost.

1.6. PERFORMANCE REQUIREMENTS

A. The GC shall become thoroughly familiar with this specification as it will identify procedures and expenses that are or are not allowed under the Change Order and Change Order Request process.
B. The GC shall be responsible for all of the following:
    1. Carefully reviewing the CB that is associated with the COR.
    2. Collecting required supporting documentation from all contractors that quantify the need for a COR.
        a. Labor hours and wage rates
        b. Material costs
        c. Equipment costs
C. The following shall apply to establishing prices for labor, materials, and equipment costs:
    1. Where Work to be completed has previously been established by individual bid items in the contract bid proposal the GC shall use the unit bid prices previously established.
    2. Where Work to be completed was bid as a Lump Sum without individual bid items the GC shall provide a breakdown of all labor, materials, equipment including unit rates and quantities required.
D. The completion date is determined by Owner. The schedule, however, is the responsibility of the GC. Time extensions for extra Work will be considered when a schedule analysis of the critical path shows that the Change Order Request places the Work beyond the completion date stated in the Contract.

1.7. QUALITY ASSURANCE

A. The GC shall be responsible for ensuring that all COR supporting documentation meets the following requirements prior to completing the COR form on the Project Management Web Site:
   1. Sufficiently indicates labor, material, and other expenses related to completing the intent of the CB.
   2. No costs exceed the usual and customary amount for such items available in the geographical area of the project, and no costs exceed those established under the contract.

B. The Project Architect (PA), Commissioning Agent (CxA), City Project Manager (CPM), other members of the consulting staff, and city staff shall review all COR requests to ensure that the intent of the CB will be met under the proposal of the COR or request additional information as necessary.

PART 2 – PRODUCTS

2.1. CHANGE ORDER REQUEST FORM

A. The COR form is located on the Project Management Web Site. The GC shall click the link in the left margin of the project web site opening a new form. Follow additional instructions below in the execution section for filling out the form.

PART 3 - EXECUTION

3.1. ESTABLISHING A CHANGE ORDER REQUEST

A. Upon receipt of a Construction Bulletin (CB) where the GC believes a significant change in contract scope warrants the submittal of a COR the GC shall do all of the following within ten (10) working days after receipt of the CB:
   1. Review the CB with all necessary trades and sub-contractors required by the change in scope.
      a. Additions or deletions to the contract scope shall be as directed within the CB.
      b. Additions or deletions of labor and materials shall be determined by the GC based on the directives of the CB.
   2. Assemble all required back-up documentation for additions and deletions of materials, labor and other related contract costs as previously outlined in this specification.
   3. Submit a COR request form on the Project Management Web Site.

B. Submitting a COR does not obligate the GC to complete the work associated with the COR nor does it obligate the Owner to approve the COR as a change to the contract.

3.2. SUBMIT A CHANGE ORDER REQUEST FORM

A. This specification shall provide a subject overview only. In depth instructions shall be provided to the awarded Contractor in a PDF Instructional Manual.

B. The GC shall select the “Submit a COR” link on the Project Management Web Site.

C. The software will open a new COR form and the GC shall provide all of the following information:
   1. DO NOT perform any calculations on this worksheet, only provide the raw data as requested below. All calculations, totals, and markups shall be computed as described within this specification.
   2. Provide a summary description of the COR request, and justification for any requested time extension to the contract, indicate the number of calendar days being requested for the extension and add any attachments to the form as needed.
   3. Provide all GC self performance data including all of the following:
      a. Materials description, quantities, and unit costs.
      b. Labor hours and rates for all Foremen, Journeymen, and Apprentices by trade.
      c. Equipment descriptions, quantities, unit costs and rates.
   4. Provide all Sub-contractor data including all of the following:
      a. Materials description, quantities, and unit costs.
      b. Labor hours and rates for all Foremen, Journeymen, and Apprentices by trade.
      c. Equipment descriptions, quantities, unit costs and rates.
   5. Ensure all calculations performed by the form have been completed correctly. Contact the CPM directly if you suspect an error before hitting the save button.

C. At any time after creating a COR you must at a minimum click “Save as Draft” to save your work.

D. When all data has been entered and verified click on the “Submit COR” button. This will kick off the COR Review and Approval process.

3.3. CHANGE ORDER REQUEST REVIEW, APPROVAL, AND PROCESSING

A. The PA and CPM shall review all CORs submitted by the GC.
   1. Additional consulting staff and city staff having knowledge of the components of the COR shall review and advise the PA and CPM as to the accuracy of the items, quantities, and associated costs of the COR as directed by the CB.
   2. The CPM shall review the COR with the Owner.

B. If required the PA and CPM, shall in good faith, further negotiate the COR with the GC as necessary. All amendments to any COR shall be documented within the Project Management Web Site software.

C. After final review of the COR the CPM and Owner may accept the COR.

D. The CPM shall prepare the COR in the form of an official Board of Public Works Change Order for final review and approval as outlined in Section 01 26 63 Change Order (CO).

E. The GC shall not act upon any accepted COR until it has received final approval through the Public Works process as an official CO to the Work unless instructed to do so by the CPM. Proceeding without the final approval of a fully authorized Change Order is at the GC's own risk.

3.4. EMERGENCY CHANGE ORDER REQUEST

A. In the event Work is required due to an emergency as described in the Contract Documents, the GC must request an equitable adjustment as soon as practicable, and in no case later than ten (10) working days of the commencement of such emergency.

B. The GC shall provide full documentation of all labor, materials and equipment used during the period of emergency as part of the COR submittal.

END OF SECTION

SECTION 01 26 63
CHANGE ORDER (CO)

PART 1 – GENERAL

1.1. SUMMARY

A. Except in cases of emergency, no changes in the Work required by the Contract Documents may be made by the General Contractor (GC) without having prior approval of the City Project Manager (CPM).

B. The City may at any time, without invalidating the Contract and without Notice to Sureties, order changes in the Work by written Change Order. Such changes may include additions and/or deletions.

C. The Change Order (CO) is a Board of Public Works (BPW) form that is reviewed and approved by a specific process.

D. The CO form is typically made up of multiple Change Order Requests (CORs) and/or Bid Items as appropriate depending on the type of project and how the contract was bid.

E. All CO documentation shall be processed through the Construction Administration-Change Order Library and digital workflow on the Project Management Web Site (PMWS).

1.2. RELATED SPECIFICATION SECTIONS

A. Section 01 26 13 Request for Information (RFI)
B. Section 01 26 46 Construction Bulletin (CB)
C. Section 01 26 63 Change Order Request (COR)
D. Section 01 31 23 Project Management Web Site
E. Section 01 91 00 Commissioning

1.3. BOARD OF PUBLIC WORKS PROCEDURE

A. The Board of Public Works has a very explicit procedure for the review and approval of all change orders associated with any Public Works Contract as follows:

1. The Supervisory Chain of the CPM shall review and approve any CO under $10,000 provided it does not include either of the following:
   a. The CO does not request a time extension to the contract.
   b. The CO does not cause the contract contingency sum to be exceeded.
2. The Board of Public Works shall review and approve any CO that requires any of the following:
   a. Any CO over $10,000.
   b. Any CO requesting a time extension to the contract regardless of the monetary value of the CO.
   c. Any CO that that causes the contract contingency sum to be exceeded.

B. The Board of Public Works generally meets every other week and only once in August and December. The GC is cautioned that, under normal scheduling, a CO requiring a BPW review will take a minimum of two (2) weeks to achieve final approval.

1. The City shall not be responsible for additional delays to the Work caused by the scheduling constraints of the Board of Public Works.

C. *SPECIAL NOTE:* The GC is cautioned to never proceed unless told to do so by the CPM. Only in rare instances may the CPM give a written notice to proceed on a COR without an approved CO. Proceeding without the written notice of the CPM or an approved CO is at the GC's own risk.

PART 2 – PRODUCTS

2.1. CHANGE ORDER FORM

A. The CO form is located on the Project Management Web Site. The CPM shall click the link in the left margin of the project web site opening a new form. Project information is pre-loaded, the CPM only needs to enter information and make attachments as needed to complete the form.

PART 3 - EXECUTION

3.1. PREPARATION OF THE CHANGE ORDER

A. The CPM shall prepare the required CO forms in the Construction Administration-Change Order Library on the Project Management Web Site as follows:
   1. Provide information for all contract information.
   2. Provide a general description of the items described within the change order.
   3. Provide detailed information for each Item on the CO form. At the option of the CPM he/she may include multiple Change Order Requests each as their own item.
   4. Provide required pricing and accounting information as needed for the item.
   5. Insert attachments of contractor/architect provided information that clarifies and quantifies the CO. Attachments may include but not be limited to material lists, estimated labor, revised details or specifications, and other documents that may be related to the requested change.
   6. Save the final version of the completed CO.

3.2. EXECUTION OF THE CHANGE ORDER

A. Upon saving the CO as described in section 3.1 above the software associated with the Project Management Web Site shall notify the GC that the CO has been drafted and is ready for review. The GC shall do the following:
   1. Open the appropriate CO form in the Construction Administration-Change Order Library and review all items on the form.
   2. The GC shall notify the CPM immediately of any errors or discrepancies on the form and shall not sign or save it.
      a. The CPM shall make any corrections as needed, re-save the form, and notify the GC.
   3. If/when the GC concurs with the CO form as drafted the GC shall digitally sign the form and click SAVE.

B. After the GC digitally signs/saves the CO it shall be routed through the Project Management Web Site for additional review and/or approvals. The CPM shall do the following:
   1. Monitor the review process to ensure the software is working properly at each review step.
   2. Ensure that proper BPW procedures are executed as needed by the CO approval process.
      a. Schedule the CO on the next available BPW agenda if required.
         i. Attend the BPW meeting to speak on the CO to board members and answer questions.
         ii. The GC and/or PA may be required to attend the BPW meeting to address specific information as it relates to the Work and/or materials associated with the CO.
   3. Monitor final approval and distribution of the CO.
   4. Notify the GC that the CO has been completed.
   5. Ensure that the CO is posted to the next Public Works payment schedule.
   6. Verify that the GC's next Progress Payment-Schedule of Values show the CO as part of the contract sum.

C. Upon final approval of the CO the GC may proceed with executing the Work associated with the CO.

END OF SECTION

SECTION 01 29 73
SCHEDULE OF VALUES

PART 1 – GENERAL

1.1. SUMMARY

A. The Schedule of Values (SOV) is a Contractor provided statement that allocates portions of the total contract sum to various portions of the contracted work and shall be the basis for reviewing the Contractors Progress Payment Requests.

B. AIA Document G702 – Application and Certificate for Payment and AIA Document G703 Continuation Sheet shall be filled out in sufficient detail to be used as a guideline in determining work completed and materials stored on site when verifying Progress Payment Requests.

C. The General Contractor shall be responsible for filling out, updating, and providing these work sheets with each Progress Payment Request.

1.2. RELATED SPECIFICATIONS

A. Section 01 26 63 Change Order (CO)
B. Section 01 29 76 Progress Payment Procedures
C. Section 01 31 23 Project Management Web Site
D. Section 01 32 26 Construction Progress Reporting
E. Section 01 33 23 Submittals

F. Parts of this specification will reference articles within “The City of Madison Standard Specifications for Public Works Construction”.

1. Use the following link to access the Standard Specifications web page:
   http://www.cityofmadison.com/business/pw/specs.cfm
   a. Click on the “Part” chapter identified in the specification text. For example if the specification says “Refer to City of Madison Standard Specification **2**10.2” click the link for Part II, the Part II PDF will open.
   b. Scroll through the index of Part II for specification 210.2 and click the text link which will take you to the referenced text.

1.3. RELATED DOCUMENTS

A. The following documents shall be used as the basis for initiating and maintaining the SOV worksheets throughout the execution of this contract.

1. Drawing documents and specifications (including general provisions) as provided with the bid set documents and any published addendums.
2. Documents associated with revisions or clarifications to number 1 above after awarding of the contract, including but not limited to:
   a. Construction Bulletins
   b. Request for Information
   c. Approved Change Orders
3. The latest daily/weekly Construction Progress Report
4. Other specifications as identified in Section 1.2 above

1.4. BASIS OF VALUES

A. The Contractor shall provide a breakdown of the Contract Sum in sufficient detail to assist the Architect and City Project Manager in evaluating Progress Payment Requests. The breakdown detail may require a labor and material breakdown for each division of work or trade or as directed by the CPM.

B. The total sum of all items shall equal the Contract Sum.

PART 2 – PRODUCTS – THIS SECTION NOT USED

PART 3 - EXECUTION

3.1. AIA DOCUMENT G702 – APPLICATION AND CERTIFICATE FOR PAYMENT

A. The Contractor shall use AIA Document G-702 Application and Certificate for Payment with each Progress Payment Request.

B. Completely fill out the Project Information section as follows:
   1. TO OWNER; provide all owner related information as provided in the contract documents.
   2. PROJECT; provide all contract information including contract number, title and address.
   3. FROM CONTRACTOR; provide all contractor related information.
   4. VIA ARCHITECT; provide all the architect's related information including the architect's project reference number if different from the owners.
   5. Indicate the current APPLICATION NO., PERIOD TO date, and CONTRACT DATE.

C. Completely fill out the Contractors Application for Payment section.
   1. Fill out lines 1 through 9 to reflect the current status of the contract through the payment date being requested.
   2. The City of Madison calculates retainage on Public Works Contracts as follows:
      a. In general, across the duration of the contract, 2.5% of the total contract sum, including change orders, is withheld for retainage as referenced from the City of Madison Standard Specification 110.2:
         i. Beginning with Progress Payment 1, 5% retainage will be withheld until such time that 50% of the total contract sum has been paid out.
         ii. No additional retainage will be withheld after 50% of the total contract sum has been paid, unless additional change orders have been approved after the 50% milestone has been reached. Per City of Madison Standard Specification 110.2, additional retainage up to 10%, may be held in the event there are holds placed by Affirmative Action or liquidated damages by BPW.
         iii. Retainage for additional change orders after the 50% milestone will be withheld at the rate of 2.5% of the total cost of the change order.
         iv. Retainage is based on the change orders posted to the City's contract worksheet at the time the progress payment is processed.

D. Completely fill out the Change Order Summary section. Only change orders that have been finalized and posted to the City of Madison's Application for Partial Payment worksheet may be itemized into the SOV documents.

E. The Contractor shall sign and date the application and it shall be properly notarized.

F. The Contractor shall not fill in any information in the Architects Certificate for Payment section.

3.2. AIA DOCUMENT G703 – CONTINUATION SHEET

A. The Contractor shall use AIA Document G-703 Continuation Sheet to itemize his/her SOV for this contract. Provide additional sheets as necessary.

B. Provide information in Column A (Item No.), Column B (Description of Work), and Column C (Scheduled Value) by any method that allocates portions of the total contract sum to various portions of the contracted work. Possible methods include combinations of the following:
   1. By division of work
   2. By contractor, sub-contractor, sub sub-contractor
   3. By specialty item or group
   4. Other methods of breakdown as may be requested by the City Project Manager or City Construction Manager at the pre-construction meeting.

C. Provide total cost of the item/description of work including proportionate shares of profit and overhead related to the item.

3.3. INITIAL SCHEDULE OF VALUES SUBMITTAL

A. The Contractor shall upload his/her initial SOV to the Project Management Web Site, Submittals Library, no later than five (5) working days after the Pre-construction Meeting.
   1. The initial SOV shall provide information in Column A (Item No.), Column B (Description of Work), and Column C (Scheduled Value) only.
   2. The level of detail shall be as described in section 3.2 above.

B. The Project Architect (PA) and the City Project Manager (CPM) shall review the SOV as any other submittal and may require modifications to reflect additional detail as necessary.

C. The Contractor shall resubmit the SOV as necessary until such time as the PPA and CPM have sufficient detail for assessing and approving future Progress Payment Applications.

D. Progress Payment Application 1 will not be processed until such time as the Contractor has met this requirement regardless of the amount of work completed per the application.

3.4. SOV FOR PROGRESS PAYMENT REQUESTS

A. The Contractor shall update the initial SOV with each Progress Payment Application as follows:
   1. Initial items and values as part of Section 3.3 above will not be adjusted once the original Schedule of Values submittal has been approved.
   2. Change orders shall be added as additional items and values at the bottom of the SOV as they become approved and posted to the City's contract worksheet. The value for each change order shall be the value indicated on the SOV and shall stand alone. Values shall not be split out or combined with other existing items with similar work descriptions on the original SOV.
   3. Fill out Columns D, E, F and G to properly reflect the work completed and materials received since the last Progress Payment Application.
   4. Only materials delivered and stored on the project site may be reflected on SOV progress updates.

B. Provide updated G702 and G703 sheets with each Progress Payment application.

C. See Specification 01 29 76 Progress Payment Procedures for additional information on submitting Progress Payment Applications.

END OF SECTION

SECTION 01 29 76
PROGRESS PAYMENT PROCEDURES

PART 1 – GENERAL

1.1. SUMMARY

A. The General Contractor (GC) shall review this and all related specifications prior to submitting progress payment requests.

B. Progress payment requests (Partial Payment-PP) for this contract shall be uploaded digitally by the GC to the Project Management Web Site

C. The Project Architect (PA) and City Project Manager (CPM) shall review and amend or approve the PP on the Project Management Web Site.

D. After approval of the PP by the CPM, he/she shall forward the PP to the appropriate agencies for BPW contractual review and payment processing.

1.2. RELATED SPECIFICATIONS

A.	Section 01 26 63	Change Order (CO)
B.	Section 01 29 73	Schedule of Values
C.	Section 01 31 19	Progress Meetings
D.	Section 01 31 23	Project Management Web Site
E.	Section 01 32 16	Construction Progress Schedules
F.	Section 01 32 26	Construction Progress Reporting
G.	Section 01 33 23	Submittals
H.	Section 01 45 16	Field Quality Control Procedures
I.	Section 01 77 00	Closeout Procedures
J.	Section 01 78 13	Completion and Correction List
K	Section 01 78 23	Operation and Maintenance Data
L.	Section 01 78 36	Warranties
M.	Section 01 78 39	As-Built Drawings
N.	Section 01 78 43	Spare Parts and Extra Materials
O.	Section 01 79 00	Demonstration and Training

1.3. RELATED DOCUMENTS

A. The following documents shall be used when evaluating PP requests.

1. Daily and weekly construction progress reports filed since the last payment request.
2. Contractors Schedule of Values as updated from the last payment request. See Specification 01 29 73.
3. Any document that may be required to be submitted for review and approval, as noted by the specifications listed in Section 1.2 above, or the Progress Payment Milestone Schedule in Section 1.4 below, to achieve a required bench mark of contract progression or contract requirement.

1.4. PROGRESS PAYMENT MILESTONES

A. City Engineering-Facility Management has developed the Project Payment Milestone Schedule (Section 1.4 below) to assist the GC in providing required construction specific documentation and general contractual documentation in a timely manner.

B. The Progress Payment Milestone Schedule is not an all inclusive list. Multiple agencies review progress payment requests and contract closeout requests. Missing, incomplete, or incorrect documentation for any agency may

be a cause for not processing progress payments. It shall be the sole responsibility of the Contractor for providing documentation as required or requested to the appropriate agencies.

C. The milestone schedule is based on the contract total sum and shall be valid for most contracts. Milestone submittals will be required with whatever progress payment hits the percentage of contract total indicated in the schedule.

D. The CPM shall review the milestone schedule with each progress payment request and at his/her option may elect to hold processing the progress payment until such time as the contractor has met the requirements for providing construction specific documentation.

E. It shall be the General Contractors responsibility to comply with all BPW Contract Administration requirements and related deadlines as outlined in the Award Letter, Award Checklist, and Start Work Letter.

Progress Payment (PP) Milestone Schedule		
Milestone Description	***Due Before***	***Remarks***
BPW Contract Administration Documentation • Workforce profiles • Best Value Contracting Documentation • Sub-contractors prequalification approval & Affirmative Action plans • Other as may be required	PP-1, or start work as applicable	• For GC and Sub-contractors before PP-1 regardless of scheduling • Sub-contractors (if applicable), due 10 days before they may start work • Sub-contractors (if applicable), due 10 days before they may start work
Required Construction Submittals/Administrative Documents • Contractors Project Directory • Schedule of Values • Submittals Schedule • Waste Management Plan • Closeout Requirement Checklist • Warranty Checklist	PP-1	References • Specification 01 31 23 • Specification 01 29 73 • Specification 01 32 19 • Specification 01 74 19 • Specification 01 77 00 • Specification 01 78 36 • Various specifications.
Construction Progress Milestones • Early submittals, per submittal schedule • Detailed Contract Schedules	PP-1	See specifications for specific requirements • Specification 01 32 19, Examples: concrete mix, structural steel, products with long lead times • See Specification 01 32 16
General Construction Progress Requirements are all up to date • Progress Schedules • Submittals/Re-submittals (ongoing) • Schedule of Values • Progress Reporting • LEED Documentation • Waste Management documentation • QMOs are being addressed and closed • Progress Cleaning • As-Built Drawings	Each future PP	Verified with each Progress Payment Request • Specification 01 32 16 • Specification 01 33 23 • Specification 01 29 73 • Specification 01 32 26 • All specifications with LEED documentation requirements • Specification 01 74 19 • Specification 01 45 16 • Specification 01 74 13 • Specification 01 78 39
*** All of the above are being updated on the Project Management Web Site as required**		
BPW Contract Administration Documentation • Weekly payroll reports • Best Value Contracting Reports	25% CT or PP 2	See 1.4.E above. *This progress payment will be with held by BPW for any missing contractual documentation.*

Progress Payment (PP) Milestone Schedule		
Milestone Description	***Due Before***	***Remarks***
• SBE Reports		
Construction Progress Milestones • Construction/Contract Closeout Meeting #1 • Submittals/Re-submittals complete	50% CT	• Specification 01 31 19 • Specification 01 33 23
Operation and Maintenance (O & M) drafts	60% CT	• Specification 01 78 23
Construction/Contract Closeout Meeting #2 • Construction closeout checklist	70% CT	• Specification 01 31 19 • Specification 01 77 00
BPW Contract Administration Documentation • Request Finalization Review from BPW	80% CT	This is a recommendation to the GC and is not a requirement of this PP. • Specification 01 77 00
Construction Progress Milestones • Operation and Maintenance (O & M) finals, accepted • All major QMO issues resolved • As-Built Drawings, Division Trades ready for GC review	80% CT	• Specification 01 78 23 • Specification 01 45 16; Items that could prevent occupancy • Specification 01 78 39
All of the following shall be completed for this PP: • Regulatory Inspections completed • All QMO reports closed • Demonstration and Training completed • Attic Stock completed • Final Cleaning	90% CT	Contractor to determine the proper order of completion: • Governing ordinances and statutes • Specification 01 45 16 • Specification 01 79 00 • Specification 01 78 43 • Specification 01 74 13
Construction Closeout Procedures: • Letter of Substantial Compliance sent to BI and DHS as needed • Certificate of Occupancy issued • As-Built Drawings, finals, accepted • City Letter of Substantial Completion • Warranty letters dated and issued	100% CT	• Specification 01 77 00 • Generated/Signed by the Architect • Building Inspection • Specification 01 78 39 • Signed by the City Engineer • Specification 01 78 36
*** Completion of this begins the one year warranty.**		
BPW Contract Administration Documentation Contract Closeout Procedures • Construction Closeout has been completed • Contractor requests final payment of retainage upon receiving City Letter of Substantial Completion • All BPW contractual requirements are verified	Final	• Specification 01 77 00 • Contractor must provide any missing BPW Contractual Documentation

Progress Payment (PP) Milestone Schedule		
Milestone Description	***Due Before***	***Remarks***
*** Completion of this closes the contract but not the warranty period/bond.**		
NOTE: **CT = Contract Total less held retainage**		

1.5. PROGRESS PAYMENT SUBMITTAL

A. Each progress payment submittal shall be:
   1. Digital in PDF format
   2. PDF shall be in color
   3. Uploaded to the appropriate Project Management library and properly named per the tutorial instructions provided to the awarded contractor.

B. Submit all required construction progress documentation to the appropriate Project Management Web Site library.

C. In general the following shall apply to all PP requests:
   1. Materials or products:
      a. On order, being shipped, etc. may not be invoiced.
      b. Received and stored on the project site may be invoiced.
      c. Being manufactured off site at any location may not be invoiced (example: cabinetry, ductwork, etc.)
      d. Completed products stored off site locally waiting for delivery to the project site may be invoiced with prior approval by the CPM. All of the following conditions must be met to be allowed:
         i. Items must be visually inspected by CPM to verify product is complete.
         ii. Item must be stored inside a compatible structure and the structure and contents must be insured.
         iii. Contractor is responsible for condition until installation is completed.
   2. All labor and equipment, including rental time for the current progress period may be invoiced.
   3. Only completed installations may be invoiced to 100% based on the Schedule of Values.

D. DO NOT submit BPW Contract Administration Documentation for review with Progress Payment Requests, submit them directly to the correct agency and in the correct format as instructed from information in your BPW Contract Award Packet instructions.

PART 2 - PRODUCTS - THIS SECTION NOT USED

PART 3 - EXECUTION

3.1. GENERAL CONTRACTOR PROCEDURE

A. The GC shall provide an updated version of his/her schedule of values (AIA documents G702 & G 703) with each PP request.
   1. The AIA - Application and Certificate for Payment (G702) shall be properly filled out and prepared for the Architects review. See specification 01 29 73, Schedule of Values for more information.
   2. The AIA - Continuation sheets (G703) shall be properly filled out and indicate the dollar value of the completed work to date for each item on the form. See specification 01 29 73, Schedule of Values for more information.
      a. The GC shall subtotal the work completed to date for all of the original Schedule of Value items.
      b. Divide the sub total of work completed by the Original Contract Total to obtain a percentage complete of the original Lump Sum Bid. This percentage may be taken out to five (5) decimal places (round fifth place up or down as needed).
         i. Example: $5,192.55 of completed work divided by $10,000 original Contract Total = 0.519255, round this to 0.51926
      c. Write the percentage in Column 10 on the City Tabular Sheet for the original lump sum bid item in RED ink.
   3. Ensure that any newly posted change orders from the City of Madison provided tabulation sheet have been entered on the G703 continuation sheets. Repeat steps a thru c above for each change order on the schedule of values and the City Tabular Sheet.

B. The GC shall fill out the City of Madison Application and Certificate of Payment cover sheet as follows:

1. The GC shall not change any pre-printed information and shall not write in the box that indicates previous progress payments.
2. The GC shall sign and date the form where indicated.
3. The GC shall provide the dates from and to for the PP being requested.
4. The GC shall provide the list of all contractors/sub-contractors that were actively working during the dates indicated above.
    a. All contractors/sub-contractors named must be in compliance with all City requirements (Pre-qualified, Affirmative Action Plan on file, etc). The PP will be held and not processed by the City of Madison until all contractors/sub-contractors are in compliance.
    b. Do not list the names of suppliers or manufacturers, doing so will slow down processing and require a re-submittal of the paperwork.

C. The General Contractor (GC) shall scan all of the documents listed below in the order shown, save the scan as a single PDF file for each PP request.
1. City cover sheet – Application and Certificate for Payment
2. City tabulation sheet(s)
3. AIA G702 - Application and Certificate for Payment
4. AIA G703 - Continuation Sheet(s)
5. Any miscellaneous documents that may be requested as backup documentation for the pay request.
    a. Lien waivers are not required and shall not be submitted.
    b. Do not provide contractual administrative documents such as pay reports with pay requests.
    c. Do not supply progress deliverables with pay requests.

F. Upload the pay request PDF to the Contract Documents-GC Partial Pay Apps library on the Project Management Web Site.

3.2. PROJECT ARCHITECT PROCEDURE

A. The PA shall review the AIA-continuation sheets provided by the GC to determine if the Schedule of Values accurately reflects the work completed for the inclusive dates indicated.
B. The PA shall advise the CPM of any discrepancies in the schedule of values.
C. The PA shall work with the GC and the CPM to resolve any issues prior to signing the AIA - Application and Certificate for Payment.
D. When verified, the PA shall digitally sign the original PDF version of the AIA - Application and Certificate for Payment on the Project Management Web Site.

3.3. CITY PROJECT MANAGER PROCEDURE

A. The CPM shall review all documents submitted by the GC and work with the PA to ensure the schedule of values accurately reflects the work completed to date.
B. The CPM may elect to hold processing of any progress payment pending submittal of required progress payment milestones.
C. When verified, the CPM shall digitally sign the City Cover Sheet and forward the required documentation to the appropriate City agencies for further processing of the payment request.
D. The CPM shall add a scanned copy of any documents indicating the PP request processing was completed to the PMWS.

END OF SECTION

SECTION 01 31 13
PROJECT COORDINATION

PART 1 – GENERAL

1.1. SUMMARY

A. Project Coordination covers many areas within the execution of the Contract Documents and the requirements of proper coordination are the applicable to all contractors executing the Work of this contract.

B. This specification provides general information regarding project coordination for the General Contractor and all Sub-contractors. All contractors shall be familiar with project coordination requirements and responsibilities that may be defined in other specification within these Contract Documents.

C. The General Contractor shall at all times be responsible for the project, project site, and execution of the Contract Documents.

1.2. RELATED SPECIFICATIONS

A.	Section 01 29 76	Progress Payment Procedures
B.	Section 01 31 19	Progress Meetings
C.	Section 01 31 23	Project Management Web Site
D.	Section 01 32 16	Construction Progress Schedules
E.	Section 01 32 19	Submittals Schedule
F.	Section 01 33 23	Submittals
G.	Section 01 43 39	Mockups
H.	Section 01 45 16	Field Quality Control Procedures
I.	Section 01 60 00	Product Requirements
J.	Section 01 77 00	Closeout Procedures, including all specifications referenced therein
K.	Section 01 91 00	Commissioning

1.3. GENERAL REQUIREMENTS

A. The following general requirements shall applicable to all contractors:
   1. Cooperate with the Owner, all authorized Owner Representatives, Project Architect and all consultants of the Owner.
   2. Materials, products, and equipment shall be new, as specified and to industry standards except where otherwise noted.
   3. Labor and workmanship shall be of a high quality and to industry standards.

B. Existing conditions:
   1. Verify all existing conditions noted in the contract documents with actual filed locations. Verify dimensions, sizes and locations, of structural, equipment, mechanical and utility components.
   2. Report any inconsistencies, errors, omissions, or code violations in writing to the General Contractor (GC) immediately.
   3. Annotate any inconsistencies, errors, omissions on the GC As-Built record drawings immediately for future reference.

C. Contract Documents:
   1. The Contract Documents are intended to include everything necessary to perform the work. Every item required may not be specifically mentioned, shown, or detailed.
      a. Except where specifically stated all systems and equipment shall be complete, installed, and fully operable.
      b. If a conflict exists within the contract documents the contractor shall furnish the item, system, or workmanship of the highest quality, largest, largest quantity, or most closely fits the intent of the contract documents.

c. Manufacturers recommended installation details shall be verified and used prior to installation of products and equipment so as to not void warranties.

D. Errors and Omissions
1. No Contractor shall take any advantage of any apparent error or omission in the construction documents.
2. The City of Madison shall be permitted to make such corrections and interpretations as may be deemed necessary for the fulfillment of the intent of the construction documents.

E. Owners Representatives
1. All contractors shall be familiar with various Owner Representatives having Quality Management responsibilities for the duration of this project including but not limited to the following:
a. Project Architect, responsible for all decisions affecting the code compliance and design intent of the construction documents.
b. Consulting Architects and Engineers, responsible for providing consulting services to the Project Architect, Owner, and City Project Manager, also responsible for Quality Management of the construction documents.
c. Owner, the designated representative of the City Agency that will occupy the project upon completion.
d. City Project Manager, responsible for all day to day decisions regarding the execution and performance of this Public Works Contract.
e. Consulting City Staff, responsible for providing consulting services to the Project Architect, Owner, and City Project Manager, also responsible for Quality Management of the construction documents.
f. Commissioning Agent (CxA), responsible for ensuring that the project is meeting the Owner's Project Requirements and related quality assurance procedures.
2. Owner Representatives shall be attending progress meetings, pre-installation meetings, performing or being present for final testing and acceptance and quality management reporting during the execution of the contract documents as outlined in other specifications.

1.4. GENERAL CONTRACTOR PERFORMANCE REQUIREMENTS

A. Assume the responsibility for all Work specified in the Contract Documents except where specifically identified to be performed by the Owner or other contractor separately hired by the Owner.
1. Coordinate all work by Owner, equipment provided Owner, or contractor hired by the Owner into the project schedule.

B. Provide all construction management responsibilities as specified in other Division 1 specifications including but not limited to:
1. Scheduling of work
2. Coordination of work between other Trades and Sub-contractors
3. Construction administration and management
4. Site layout, cleanliness, and protection of completed work/stored materials
5. Waste Management
6. Quality Assurance and Quality Control

C. Use Diggers Hotline and private utility locating companies to accurately locate all public and private utilities on the property as needed. The GC is responsible for any repair or replacement to any public or private utility damaged during the execution of the Work

D. Report any inconsistencies, errors, omissions, or code violations in writing to the Project Architect immediately. Failure to report inconsistencies prior to beginning work shall indicate that the GC accepted all existing conditions.

E. The GC shall be responsible for assigning work and related responsibilities where the Contract Documents may not clearly state who is responsible for providing the work, material, or product.

F. Provide construction management oversight of all items described in Section 1.5 below.

G. Coordinate and assist CxA as outlined within 01 91 00 and as directed by Owner.

1.5. SUB-CONTRACTOR PERFORMANCE REQUIREMENTS

A. Be familiar with all of the contract documents as they pertain to your Work, adjacent work and the overall progress of the project.
1. All Sub-contractors shall be familiar with all Division 1 specifications as they may apply to progress, progress payments, quality control construction management, and closeout of the contract.

B. Coordinate your Work with all adjacent work and existing conditions.

1. Perform your work in proper sequence according to the GC's project schedule and in relation to the work of other trades.
2. Notify other sub-contractors and trades whose work may be connected to, combined with, or influenced by your work and allow them reasonable time and access to complete their work.
3. Join your work to the work of others in accordance with the intent of the Contract Documents.
4. Order materials and schedule deliveries to facilitate the general progress of the Work.

C. Cooperate with all other trades to facilitate the general progress of the work. This shall include providing every reasonable opportunity for the installation of work by others and the storage of their materials and equipment.
1. In no case shall any contractor exclude from the premises or work any Sub-contractor or their employees.
2. In no case shall any contractor interfere with the execution or installation of Work by any other Sub-contractor or their employees.

D. Arrange your work, equipment, and materials and dispose of your construction waste so as to not interfere with the work or storage of materials of others.

E. Coordinate all work as indicated during pre-installation meetings with Owner Representatives, the GC and other trades. Any work improperly coordinated shall be relocated as designated by the Owner Representative at no additional cost to the City.

F. Coordinate and assist CxA as outlined within 01 91 00 and as directed by Owner.

PART 2 – PRODUCTS – THIS SECTION NOT USED

PART 3 – EXECUTION – THIS SECTION NOT USED

END OF SECTION

SECTION 01 31 19
PROJECT MEETINGS

PART 1 – GENERAL

1.1. SUMMARY

A. The purpose of this specification is to identify various project related meetings and the responsible parties for scheduling, agendas, minutes, and required attendance.

B. This specification is not intended to be inclusive of all meeting types or a complete list of required meetings.

C. This specification is not intended to cover planning and execution meetings between the General Contractor (GC) and his/her sub-contractors.

1.2. RELATED SPECIFICATIONS

A. 01 31 23 Project Management Web Site

B. 01 32 16 Construction Progress Schedules

C. 01 43 39 Mockups

D. 01 91 00 Commissioning

1.3. PROJECT MEETING TYPES

A. The following project meeting types may be used but not limited to the following

1. Preconstruction Meeting
2. Project Management Web Site – Tutorial Meeting
3. Construction Progress Meetings
4. Pre-installation Meetings (including mock-up review meetings)
5. Weekly Trade Meetings
6. Special Meetings
7. Commissioning Meetings

1.4. GENERAL REQUIREMENTS

A. Representatives of Contractors, Subcontractors, and suppliers attending meetings shall be qualified and authorized to act on behalf of the entity each represents.

PART 2 – PRODUCTS – NOT USED IN THIS SECTION

PART 3 - EXECUTION

3.1. PRECONSTRUCTION MEETING

A. After execution of the Contract the City Project Manager (CPM) shall schedule and conduct the Preconstruction Meeting at the Owner's facilities. The CPM shall coordinate the meeting agenda with the Project Architect and the GC Project Manager.

B. The CPM shall be responsible for the final agenda.

C. The CPM and Project Architect shall take notes on the meeting and post completed meeting minutes.

D. Attendance shall be required by all of the following:

1. Owner Representative(s)

2. Architect and applicable sub consultant(s)
3. General Contractor and applicable subcontractors and suppliers
4. City Quality Management Staff
5. Commissioning Agent
6. Others, as may be invited for particular agenda items.

E. Topics of the Preconstruction Meeting shall include but not be limited to the following:
1. Staff and contractor introductions
2. Completion Date
3. BPW Administrative requirements and due outs
   a. Small Business Enterprise (SBE) (if applicable)
   b. Certified payroll forms
   c. Workforce profiles
   d. Best Value Contracting (BVC)
4. General Facility Management Division 1 Specifications, including:
   a. Section 01 29 76 Progress Payment Procedures
   b. Section 01 31 23 Project Management Web Site (overview)
   c. Section 01 45 16 Field Quality Control Procedures
   d. Section 01 77 00 Closeout Procedures
   e. Section 01 91 00 Commissioning
5. Project Meeting scheduling
   a. Section 01 31 19 Project Meetings
6. Construction Schedule
7. Commissioning Process

3.2. PROJECT MANAGEMENT WEB SITE – TUTORIAL MEETING

A. The CPM shall schedule and conduct a tutorial presentation of the PMWS prior to the beginning of construction.
B. The CPM shall be responsible for the final agenda, there will be no minutes.
C. The required attendance list in 3.1.D. above shall apply except for City Staff in items 1 and 4 who are already familiar with the PMWS system.
D. It is recommended that all contractors bring their lap top, tablet or other internet capable device with them including a fully charged battery and internet connection devices as necessary.

3.3. CONSTRUCTION PROGRESS MEETINGS

A. In general all of the following shall apply:
1. Representatives of Contractors, Subcontractors, and suppliers attending meetings shall be qualified and authorized to act on behalf of the entity each represents.
2. The attendance shall be from the required attendance list in 3.1.D. above.

B. The General Contractor Project Manager (GCPM) shall:
1. Schedule and conduct all construction progress meetings biweekly or more frequently as required.
2. Prepare agenda for meetings including, but not limited to the following:
   a. Safety
   b. Current Schedule, including review of the critical path and 6-week look ahead schedule
   c. Status of project related documentation (Submittals, RFIs, CBs, etc.)
   d. Quality Observation Log and status of correction of deficient items
   e. Project questions and issues from meeting attendees
   f. BPW Administration Check
   g. Other as needed
   h. Status of CORs and COs to be reviewed outside the standard progress meeting time.
3. Make physical arrangements for meetings.
4. GCPM to post meeting agendas to the appropriate libraries on the Project Management Web Site (PMWS) no less than two (2) working days prior to the scheduled meeting. Notify all required attendees, applicable parties to the contract, and others affected of the posted meeting agenda.
5. Preside at meetings.
6. Route a meeting attendance roster for attendees to sign-in on.
7. GCPM to record the minutes of the meeting; include significant proceedings and decisions. Post meeting minutes to the PMWS no more than two (2) working days after the completed meeting. Meeting minutes shall include a scanned copy of the attendance sign-in sheet. Notify all required meeting attendees, applicable parties to the contract, and others affected by decisions made at the meetings.

8. The above requirements do not apply to GC/sub-contractor meetings.

3.4. PRE-INSTALLATION MEETINGS

A. The GCPM shall schedule and conduct all pre-installation meetings, including mockup reviews, before each construction activity that requires coordination with other trades.
B. The GCPM shall be responsible for the final agenda and meeting minutes.
C. The GCPM will work with all concerned parties to resolve issues as needed and submit RFI's if necessary.
D. Required attendance shall be from the list in 3.1.D. above and shall be personnel having a stake in the outcome of the installation or knowledge of the system being installed.
E. In the event the Contractor installs equipment or materials without a pre-installation meeting the Contractor shall be solely responsible for removing, replacing, repositioning materials and equipment as instructed by the Project Architect or City Project Manager at no additional cost to the City.

3.6 PRE-CONTRACT CLOSEOUT MEETINGS

A. Two (2) Pre-contract Closeout Meetings shall be held to review the closeout procedures, requirements, and contract deliverables.
   1. Pre-contract Closeout Meeting #1 shall be scheduled prior to the 50% Progress Payment Request is being requested. This meeting shall discuss items such as closing out QMO reports, providing O&M drafts and finals, payroll and Affirmative Action documentation, and other contract deliverables.
   2. Pre-contract Closeout Meeting #2 shall be scheduled prior to the 80% Progress Payment Request is being requested. This meeting shall discuss, but not be limited to, the status of scheduling final regulatory inspections, cleaning up outstanding QMO's, demonstration and training, attic stock; and finalization review of payroll and other related documents.
B. The GCPM shall schedule, coordinate, and make physical arrangements for both meetings.
C. All of the following shall be required to attend both meetings:
   1. The GCPM and the GC Field superintendent
   2. All Subcontractor Project Managers regardless of the current status of their work.
      a. The GCPM may excuse a Subcontractor PM if he is confident that all contractual requirements for closeout by the subcontractor have been completed and/or delivered to the GCPM. The list of attendees shall be reviewed and agreed upon with CPM ahead of the meeting.
      b. At the option of these project managers the field supervisors may also attend.
   3. The Project Architect and at least one design consultant from each discipline represented by the plans and specifications to address open QMOs, final tests, reports, etc.
   4. The Owner
   5. The CPM
   6. Quality Management staff as needed to address open QMOs, final tests, reports, etc.
   7. The Commissioning Agent
D. The CPM shall publish an agenda and chair the meeting.

3.7 OTHER SPECIAL MEETINGS

A. The Contractor shall schedule special meetings per the requirements of the LEED Specification, the Project Quality Management Plan, the Commissioning Plan and as indicated by other specifications.
B. Special meetings include but are not limited to the following:
   1. Waste Management Conference
   2. Equipment start up meetings
   3. Testing and balancing meetings
   4. Commissioning meetings
   5. Other meetings as necessitated by the contract documents

END OF SECTION

SECTION 01 31 23
PROJECT MANAGEMENT WEB SITE

PART 1 – GENERAL

1.1. GENERAL DESCRIPTION

A. The City of Madison (CoM) has established a web based Project Management Tool (PMT) using a Microsoft product called SharePoint (SP).

B. The software is used throughout the design, construction and warranty process of major remodels and new construction projects executed as a City of Madison, Board of Public Works project.

C. Initially deployed in mid-2013, the PMT software has been successfully deployed on several projects, and we continue to modify/update/enhance the PMT on a regular basis.

1.2. SHAREPOINT PROCEDURE OVERVIEW

A. The CoM PMT is a system of consolidated Document & Form Libraries and Data Lists that assist in performing day to day functions of design/construction management while reducing the use of surface mail, email and email attachments.

1. Document libraries store a wide variety of documents in many different formats including but not limited to Word, Excel, PDF, photographs (all popular formats), etc.
2. Data Lists contain consolidated data information that can be generated and stored for further use. Punch Lists and Warranty issues will be examples of Data Lists.
3. Form Libraries are primarily used when a specific work flow process is needed. The form acts as the cover letter. An example of this would be the Submittal Review Process.
4. Libraries are controlled by Permission Groups and Permission Levels.

B. The following libraries and sub-libraries on the PMWS are provided for specific workflows and contract documentation. Related specification numbers are in "( )" if applicable.

Contract Documents	Construction Administration	Construction Progress	LEED Documentation	Quality Control	Construction Closeout
GC Partial Pay Apps (01 29 76)	*Change Order Requests (COR Form) (01 26 57)*	*Schedules (01 32 16)*	*LEED Documents*	*Regulatory Inspections*	*Misc Closeout Documents*
Construction Documents	*Change Orders (CO Form) (01 26 63)*	*Progress Meetings (01 31 19)*	*Waste Management (01 74 19)*	*Commissioning Checklists*	*O & M Manuals (01 78 23)*
Regulatory Documents	*Construction Bulletins (CB Form) (01 26 46)*	*Daily Journal (DJ Form) (01 32 26)*		*System Performance Tests*	*Product Warranties /Guarantees (01 78 36)*
Testing Contract	*Request for Information (RFI Form) (01 26 13)*			*Quality Management Observation (QMO Form) (01 45 16)*	*As-Builts (01 78 39)*
	Submittals (SUB Form) (01 33 23)			*Safety and Incident Reports*	*Attic Stock (01 78 23)*
	Substitution Request (SR Form) (01 25 13)			*Material Testing & Field Reports*	*Demonstration and Training (01 79 00)*

Contract Documents	Construction Administration	Construction Progress	LEED Documentation	Quality Control	Construction Closeout
					Warranty Issues (WI Form) (01 78 23)

C. A tutorial document on the web based PMT will be provided to the General Contractor (GC) who is awarded the contract. Additional training will be provided as needed for the GC and Sub-Contractors (SC) by the CoM.

D. The PMT has predefined work flows that channel automated alerts as documents are uploaded, reviewed, and completed. These workflows are designed for inbound information from the contractor as well as outbound information from the Architectural/Engineer consultant and the Owner.

E. The GC will be required to receive email notifications, access the internet to review related documentation and be able to upload/download documentation to the various project libraries.

F. The SC's will be required (at a minimum) to receive email notifications and access the internet to review related documentation. Prior to setting up the final PMT the GC and CPM shall meet to review all SP workflows, the GC will determine to what level over the minimum requirements the SC's will be involved.

1.3. RELATED SPECIFICATIONS

A. The following specification sections are directly related to the CoM PMT system.

1. 01 25 13 Product Substitution Procedures
2. 01 26 13 Request for Information (RFI)
3. 01 26 46 Construction Bulletins (CB)
4. 01 26 57 Change Order Request (COR)
5. 01 26 63 Change Order (CO)
6. 01 29 76 Progress Payment Procedures
7. 01 31 19 Project Meetings
8. 01 32 16 Construction Progress Schedules
9. 01 32 26 Construction Progress Reporting
10. 01 32 33 Photographic Documentation
11. 01 33 23 Submittals
12. 01 45 16 Field Quality Control Procedures (Owner)

PART 2 - PRODUCTS

2.1. SHAREPOINT SYSTEM RELATED PRODUCTS

A. SharePoint is a Microsoft Windows based software that requires no additional software installation, hardware or other special requirements/applications for the users. There are no costs associated with the use of this system.

B. Currently the CoM is using SharePoint 2010.

1. SharePoint works best if the user's computer is running Windows versions 7 through 8.1.
2. SharePoint works best when used with Internet Explorer versions 9 - 11 (32 bit).

a. At this time SharePoint is not compatible with other internet browsers such as Fire Fox, Google Chrome, and Safari.

PART 3 - EXECUTION

3.1. POST BID-OPENING

A. After bids have been opened, a successful bidder has been determined, and bid acceptance procedures have been initiated the City Project Manager (CPM) will contact the GC to provide the following information.

1. Project Management Software Tutorial. This tutorial is in a PDF printable format with screen shots and associated instructions on how to access and use the PMT.

a. Tutorial instructions will include but not be limited to the following:

i. Descriptions of various libraries, documents, and forms that will be used throughout the construction project.

ii. Uploading procedures for various types of documents including standardized naming conventions.

2. A blank Project Directory in an Excel spread sheet format. The contractor shall provide the following information for GC and SC staffs as indicated on the spreadsheet. This will generally be the Project Manager for the GC as well as the Sub-contractors and the GC Site Supervisor.
    a. Last Name, First Name
    b. Company Name
    c. Email address (valid, work related)
    d. Work Phone Number (required, include area code)
    e. Cell Phone Number (not required, include area code)
3. The GC shall provide the above information for all SC's where the GC is not self-performing the work.
4. The GC may provide project foreperson information for work being self-performed if he/she so desires.

3.2. POST PRE-CONSTRUCTION MEETING

A. The GCPM will return the completed Project Directory spread sheet to the CPM no later than the Pre-construction meeting.

B. The CPM is responsible for uploading all project directory data into SharePoint and coordinating with CoM Information Technology (CoM-IT) for creating the logins and passwords of non-city staff (GC/SC staffs).

C. All GC/SC staff will be notified through an automated email from CoM IT that logins and passwords are available. It is the responsibility of each GC/SC to call the CoM-IT number provided in the email to receive his/her login/password over the phone. Logins and passwords will not be released via email.

D. Once the GCPM has received his/her login/password uploading of contract related documents can begin. This would include but not be limited to project schedules, submittals, RFI's, and other documents as needed.

E. All workflows, review of documentation, and general archiving of construction related documentation will be conducted on the PMWS. These documents will generally not be emailed.

F. The following documents related to the execution of the contract will not be part of the PMWS:
1. All documentation related to executing the contract, such as:
    a. Sub Contractors list
    b. Affirmative Action documentation
    c. Bonding documentation
    d. Documentation associated with payroll verification
    e. Final documentation associated with closing out the contract
2. Any documentation required/generated by ordinance, code or statute, such as;
    a. Erosion Control inspections
    b. Building Inspection Department inspections

END OF SECTION

SECTION 01 32 16
CONSTRUCTION PROGRESS SCHEDULES

PART 1 – GENERAL

1.1. SCOPE

A. This specification is to identify various project related schedules associated with indicating construction progress and outlook. The following schedules are the responsibility of the General Contractor (GC).
   1. Overall Project Schedule
   2. 6 Week Look-out Schedule

B. This specification is not intended to include internal schedules generated by the contractors during their planning and execution of the contract.

1.2. RELATED SPECIFICATIONS

A. Section 01 29 76 Progress Payment Procedures
B. Section 01 31 23 Project Management Web Site
C. Section 01 31 19 Progress Meetings
D. Section 01 74 13 Progress Cleaning
E. Section 01 77 00 Closeout Procedures
F. Section 01 78 23 Operation and Maintenance Data
G. Section 01 78 36 Warranties
H. Section 01 78 39 As-Built Drawings
I. Section 01 78 43 Spare Parts and Extra Materials
J. Section 01 79 00 Demonstration and Training
K. Section 01 91 00 Commissioning
L. Other specification within the construction documents that may indicate the need for scheduling any event with Owner, Project Architect, Owner Representatives, including any owner provided equipment.

PART 2 – PRODUCTS – THIS SECTION NOT USED

PART 3 - EXECUTION

3.1. OVERALL PROJECT SCHEDULE (OPS)

A. The GC shall prepare an OPS that covers the duration of the contract from the pre-construction meeting through the end of construction to final contract closeout.
   1. The GC shall review Specification 01 77 00 Closeout Procedures to become familiar with definitions, differences, and requirements for closing out the construction and contract including the association with progress payments.

B. The GC shall provide copies and lead a discussion on the OPS during the pre-construction meeting.
C. The OPS shall indicate start and end dates of each task associated with the project.
D. The OPS shall clearly indicate the critical path of the project.
E. The GC shall update the OPS as often as necessary during the duration of the project. Updates will be briefed as needed during bi-weekly progress meetings.

3.2. 6 WEEK LOOK-OUT SCHEDULES (LOS)

A. The GC shall prepare the initial LOS to include detail of daily tasks for the first six (6) weeks of construction in depth for the Pre-construction meeting. The LOS shall be compatible and complimentary to the OPS.
B. The GC shall provide copies and lead a discussion on the LOS during the pre-construction meeting.

C. The LOS shall indicate start and end dates of each major task, associated related sub-tasks, and required parallel or pre-requisite tasks required to complete the major task on time.

D. The LOS shall also include identifying and scheduling such events as:
   1. Pre-installation meetings and mock-up review meetings.
   2. Quality management reviews of installations before they are covered.
   3. Owner provided equipment as designated by the contract documents.
   4. Work by others as designated by the contract documents.
   5. Critical submittal dates.

E. The GC shall update the LOS prior to each bi-weekly progress meeting to indicate the next 6 weeks of scheduled work. Updates will be briefed during each bi-weekly progress meeting.

3.3. PROJECT MANAGEMENT WEB SITE (PMWS)

A. The GC shall upload all project schedules and updates to the PMWS in an original PDF version of the scheduling document. Scans will not be permitted.

END OF SECTION

SECTION 01 32 19
SUBMITTALS SCHEDULE

PART 1 – GENERAL

1.1. SUMMARY

A. The General Contractor shall submit a complete and comprehensive list of all submittals anticipated during the execution of this contract.

B. The GC shall include the Administrative submittals identified in item 1.5 below and shall be required to up load them to the Project Management Web Site.

C. The initial Submittals Schedule shall be based on the original contract documents used at the time of bidding and any posted addenda through awarding of the contract.

D. The Submittal Schedule may be appended during the execution of the contract based on amendments to the contract in the form of Change Orders, Construction Bulletins, and other related documents that add, or change the scope of the work.

1.2. RELATED SPECIFICATIONS

A. Section 01 29 76 Progress Payment Procedures
B. Section 01 31 23 Project Management Web Site
C. Section 01 33 23 Submittals
D. Section 01 91 00 Commissioning

1.3. RELATED DOCUMENTS

A. The following documents shall be used as the basis for initiating the original Submittals Schedule.
   1. Drawing documents and specifications (including general provisions) as provided with the bid set documents and any published addenda.

B. The following documents shall be used to amend the submittals schedule as needed during the execution of this contract.
   1. Documents associated with revisions or clarifications to number A.1 above after awarding of the contract, including but not limited to:
      a. Construction Bulletins
      b. Approved Change Orders

1.4. SUBMITTAL DEFINITIONS

A. Administrative Submittal: Any submittal that may be required by a Division 1 Specification and as noted in Section 1.5 below.

B. Critical Path Submittal: Any early submittal that needs a priority review due to early construction use or long lead times where a delay could affect the critical path of the construction schedule

C. Submittal: Any material, product, equipment, or general requirement as outlined in this and other specifications that require a favorable review or acceptance prior to proceeding with procuring the item or proceeding with the Work.

1.5. SUBMITTAL REQUIREMENTS

A. The GC and all Sub-contractors shall review the construction documents including the specifications of their individual Division or Trade to compile a complete list of all materials, products, or equipment that will require a positively reviewed submittal to be completed prior to procurement and installation.
   1. Submittals shall include but not be limited to any of the following that may apply:
      a. Shop Drawings
      b. Product Data
      c. Assembly Drawings
      d. Engineered Drawings
      e. Product Samples

B. The following items will require an approved submittal, verify with specifications for specific needs and requirements:
   1. Contractor certifications for specialized work such as asbestos removal, well drilling, controls, AV, etc.

1.6. ADMINISTRATIVE SUBMITTALS

A. The GC shall upload the following submittals within 15 working days of receipt of the City of Madison Start Work Letter. All Administrative Submittals shall be approved prior to requesting Progress Payment Number 1.
   1. Contractors Project Directory, see specification 01 31 23, discuss requirements with CPM
   2. Schedule of Values, see Specification 01 29 73
   3. Submittals Schedule, see Specification 01 32 19
   4. Waste Management Plan, see Specification 01 74 19
   5. Closeout Requirement Checklist, see Specification 01 77 00
   6. Warranty Checklist, see Specification 01 78 36

PART 2 – PRODUCTS – THIS SECTION NOT USED

PART 3 - EXECUTION

3.1. OVERALL RESPONSIBILITIES OF ALL CONTRACTORS

A. All contractors shall be responsible for reviewing the drawings and specifications within their Divisions of Work to provide a complete and comprehensive list of submittals to the General Contractor.

B. Each list shall indicate the title of the submittal, the associated specification of the submittal, whether the submittal can be considered an early/middle/late submittal, the anticipated date the submittal will be provided and the anticipated date the submittal needs to be approved.

C. Contractors shall be aware that the goals for submittal review by the Architect staff and City staff will be as follows:
   1. For items on the Critical Path as identified by the GC, five (5) working days
   2. For most other submittals ten (10) working days
   3. Additional time may be needed for complex submittals or if re-submittals are required.

D. The general format of the Submittal Schedule shall be tabular as per this example:

Title	Specification	Critical Path (Y or N)	Date provided	Date required	Remarks
Concrete Mix Design	03 30 00	Y	Oct 1, 2014	Oct 15, 2014	
Paint Draw Downs	09 90 00	N	Jan 2, 2015	Jan 20, 2015	

3.2. GENERAL CONTRACTORS RESPONSIBILITIES

A. The General Contractor shall be responsible for all of the following:
   1. Consolidating all submittal lists from individual contractors into one master list.
   2. Reviewing all submitted lists for completeness, timing with the overall contract, etc. The GC shall meet with individual contractors to make changes as necessary.
   3. Upload the completed Submittals Schedule to the Submittal Library on the Project Management Web Site for review as SD 003.0. See Specification 01 33 23 Submittals for more information on this procedure.
   4. Resubmit the schedule as needed after initial reviews have been completed.

B. The GC shall work with other contractors to amend the Submittals Schedule throughout the execution of the project based on changes and modifications as needed.

C. The GC and Project Architect shall be responsible for reviewing and briefing the submittal schedule and submittals status at each bi-weekly construction meeting.

3.3. STAFF REVIEW RESPONSIBILITIES

A. The Project Architect, consulting staff, Commissioning Agent (CxA), Owner, and city staff will review the Submittal Schedule for completeness per the plans and specifications within their divisions of work. The reviewing staff may provide comments as needed. Some examples might include the following:
   1. Submittal not required
   2. Provide photos of samples with digital submittal
   3. Insure one submittal for complete system
   4. Append the schedule to include…
   5. See Specification <xyz> for additional requirements

B. The Project Architect and City Project Manager will finalize review comments regarding the Submittal Schedule. Re-submittal of the submittal schedule may be required.

END OF SECTION

SECTION 01 32 23
SURVEY AND LAYOUT DATA

PART 1 – GENERAL

1.1. SUMMARY

A. The purpose of this specification is to set forth the minimal required guide lines to be followed by the General Contractor (GC) and the Land Surveyor (Surveyor) including but not limited to the following:
   1. Surveyor Professional Requirements
   2. Horizontal and Vertical Datum Control
   3. Local Control (if any)
   4. Electronic File and Data Requirements
   5. As-Built Documentation Requirements

B. When working on any City of Madison project, OSHA standards must be complied with. The Surveyor shall provide appropriate traffic control in accordance to the Manual on Uniform Traffic Control Devices (MUTCD).

C. The Surveyor shall be responsible for notifying Diggers Hotline in advance of beginning the field work for this contract.

1.2. RELATED SPECIFICATIONS

A. Section 01 29 76 Progress Payment Procedures
B. Section 01 31 23 Project Management Web Site (SharePoint)
C. Section 01 33 23 Submittals
D. Section 01 78 39 As-Built Drawings
E. Section 105.9, Survey Points and Instructions, of the City of Madison Standard Specifications for Public Works

1.3. SURVEYOR QUALIFICATIONS

A. The General Contractors, Land Surveyor Sub-Contractor shall meet or exceed the following:
   1. The Principal Land Surveyor (PLS) shall be licensed to practice in the State of Wisconsin.
      a. The PLS's license shall be current at the beginning of the contract and the PLS shall maintain an active license throughout the execution of this contract.
   2. The PLS shall have a minimum of minimum of ten (10) years of field experience on similar projects of scope and size.
      a. Land Surveyors working under the direction of the PLS shall have a minimum of five (5) years of field experience on similar projects of scope and size.

B. The PLS shall be responsible for checking and verifying all work being performed under the PLS's direction during the execution of this contract. This shall include but not be limited to periodic field checks of equipment and survey data for accuracy and compliance with the contract documents.

1.4. QUALITY ASSURANCE

A. The PLS shall do all surveying in City of Madison Datum's as follows:
   1. All Horizontal Control shall be in the Dane County Coordinates (WISCRS), NAD 83(1997) datum, US Survey foot).
   2. All Vertical Control shall be in NAVD88(1991).

3. Information on PLSS Section Corner Monuments and Tie Sheets can be found on the City Engineering Mapping website http://gis.cityofmadison.com/Madison_PLSS/PLSS_TieSheets.html.

1.5. SUBMITTALS

A. After initial project setup the PLS shall provide the following information as a Survey Data Submittal for review by the CPM/CCM, and Owner. See Specification 01 33 23 – Submittals for more information.
   1. Copy of the PLS (and any supporting staff) current State of Wisconsin registration certificate/licenses.
   2. Digital Survey Submittal on a thumb drive delivered to the CPM/CCM. Submittal Survey shall be on a thumb drive or CD in Auto CAD 2017, MicroStation V8i, or DXF format. Digital Submittal shall be of the project site setup showing all of the following:
      a. Key features not scheduled for demolition, including but not limited to building corners, roof overhangs, and door locations.
      b. Location of construction limits fencing.
      c. Locations of PLSS and/or project control points provided by the Owner.
      d. Locations of project based control points.
   3. Printed Survey Submittal shall be the same as item 1 above in PDF format. PDF file shall be formatted to print to scale on 24"x36" sheets as required to show all features with text neatly organized for each item identified. When multiple sheets are used a match line and sheet references shall be required.
   4. PDF file of the complete level/layer scheme. Scheme shall be in tabular form formatted to 8.5 by 11 paper and shall include all of the following:
      a. Level/layer designation (abbreviation).
      b. Level/layer designation (full title).
      c. Feature attribute characteristics (line weight, line style, font, etc.).
      d. Cell attribute information
      e. Samples of line styles and cells.

1.6. EXAMINATION

A. The PLS shall be responsible for verifying all site data including the owner provided local control points (see Section 3.1 below) prior to starting the Work.

B. Notify the Project Architect and CPM/CCM immediately if any discrepancies are discovered.

PART 2 – PRODUCTS – NOT USED

PART 3 - EXECUTION

3.1. PRE-CONSTRUCTION OWNER SUPPORT

A. The CPM/CCM shall provide the GC/PLS with a digital CAD seed file on or before the Pre-construction meeting.
   1. Seed file shall be a MicroStation 3D seed file using the datum indicated above. Seed file shall be delivered as a MicroStation V8i or DXF format as requested by the PLS.
      a. Seed file shall be used as the PLS's initial base file for all future work on this contract.

3.2. UTILITY LOCATING

A. The GC and/or PLS shall be responsible for notifying Diggers Hotline for all utility locate requests.

3.3. SURVEY CONTROL AND LAYOUT DATA

A. The GC and PLS are responsible for all other survey control and layout data required to perform the work in this contract.

3.4. TOPOGRAPHIC SURVEYING

A. The Surveyor may perform the topographic survey with properly calibrated equipment as follows:
   1. Total station, achieving minimum accuracy for well-defined features of +/- 0.1 feet horizontal and +/-0.04 feet vertical at 95% confidence relative to control. "Well defined features" shall include but not be limited to property irons, pavements, trees, landscaping features, buildings, utility locations, and other permanent features.
   2. RTK GPS shall be permitted in large open areas, along tree lines, and in brushy areas.

3.5. SITE SURVEY AS-BUILT

A. See Specification 01 78 39 As-Built Drawings, Section 3.2 for more information on required record site information to be provided prior to contract closeout.

B. The GC shall be responsible for scheduling the PLS to capture locations and depths of all buried utilities prior to any contractor back filing trenches. The Owner may require missing information to be located and surveyed at the GC's expense.

END OF SECTION

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SECTION 01 32 26
CONSTRUCTION PROGRESS REPORTING

PART 1 – GENERAL

1.1. SUMMARY

A. Daily records of project activities, resources used, weather conditions, and other information related to the ongoing progress of the project are extremely important at all levels of Construction Management.

B. Daily records provide the base for weekly progress reports and updating progress schedules.

1.2. RELATED SPECIFICATION SECTIONS

A. Section 01 31 19 Project Meetings

B. Section 01 31 23 Project Management Web Site

C. Section 01 32 23 Photographic Documentation

1.3. PERFORMANCE AND QUALITY ASSURANCE REQUIREMENTS

A. The General Contractor (GC) shall be responsible for all Construction Progress Reporting as outlined in this and other specifications as noted.

B. The GC shall maintain daily progress journals in a format of his/her choosing provided it is legible and contains the information as outlined in Section3.1 below.

C. The journal shall be located in the job trailer and shall be reviewable by the Project Architect or City Project Manager if so requested.

PART 2 – PRODUCTS - THIS SECTION NOT USED

PART 3 - EXECUTION

3.1. CONTRACTOR JOURNAL

A. The GC shall maintain a journal of daily progress on which Work is performed by any employee or entity for which the GC is responsible. Such reports shall include all relevant data concerning the progress of Work activities the GC and Subcontractors are responsible for and the effect of that activity on the time of performance of the Contract.

1. Some projects may not require weekly journals be kept instead of daily journals. This is at the sole discretion of the City Project Manager. A daily journal will generally be required when the contract has a significant amount of site work. A weekly journal will generally be used when a contract is interior work only.

B. Journal entries shall be made on the Contractor Daily/Weekly Report Form located in the Construction Progress-Daily Journal Library on the Project Management Web Site. The form consists of the following areas:

1. Weather; include temperature, humidity, precipitation, wind and other related information such as significant storm events, times, and details.
2. Work completed by trade
3. Delays encountered
4. Deliveries received or delayed
5. Hot issues that need to be addressed
6. Safety issues
7. Photograph progress and upload to the Photo Library on the Project Management Web Site.
8. Other including inspections, testing, etc.
9. Space for attaching documents

C. Contractor Daily/Weekly Report Forms shall be completed and signed by the GC's Job Superintendent or other on-site representative authorized by the GC confirming each such report is current, accurate and complete.

D. If applicable the GC shall include schedules of quantities and costs, progress schedules, wage rates, reports, estimates, invoices, records and other data as requested by the CPM concerning Work performed or to be performed under this Contract if the CPM determines such information is needed to substantiate Change Order proposals, claims, or to resolve disputes.

3.2. CONSTRUCTION PROGRESS MEETINGS

A. The GC shall provide a verbal summary of the previous two (2) weeks progress reports at each bi-weekly construction progress meeting.

END OF SECTION

SECTION 01 32 33
PHOTOGRAPHIC DOCUMENTATION

PART 1 – GENERAL

1.1. SCOPE

A. The General Contractor (GC) shall be required to take weekly digital photographs of interior and exterior construction progress and upload the photos directly to the Project Management Web Site (SharePoint).

B. The GC shall be required to provide digital time-lapse photo service of the project exterior construction progress.

1.2. RELATED SPECIFICATION SECTIONS

A. Section 01 29 76 Progress Payment Procedures
B. Section 01 31 23 Project Management Web Site (SharePoint)
C. Section 01 32 19 Submittals Schedule
D. Section 01 32 33 Submittals
E. Section 01 77 00 Closeout Procedures

1.3. SUBMITTALS

A. The GC shall provide general information on the type of camera being used for interior and exterior digital photographs.
   1. Information may be written on Contractor's transmittal sheet.
      a. Include camera name/type, aspect ratio setting, and average file size
      b. Provide sample project pictures as part of PDF submittal.

B. The GC shall provide sufficient information on the type of time lapse system being used that meets the requirements identified in section 2.2 below.

PART 2 – PRODUCTS

2.1. DIGITAL CAMERA

A. All digital photographs shall be taken with a good quality digital camera, cell phone, tablet, and other such digital device.

B. Digital photographs shall be formatted to achieve a good, clear, and detailed image where the final file size is between 600 KB and 3.0 MB (3000KB).

2.1. TIME LAPSE CONSTRUCTION CAMERA (TLCC)

A. The TLCC shall be a high quality weather proof camera owned and operated, or leased, by the GC for the duration of this contract with the following minimum capabilities:
   1. Pan-Tilt-Zoom (PTZ) capable.
   2. Wireless internet or built in cellular technology capable.
      a. The use of memory cards will not be permitted.
   3. Widescreen, high resolution (5-30 MP rating).
   4. Powered by 120V AC.
      a. The use of battery packs will not be permitted.
   5. Web/cloud hosted access to archived photos and video.
   6. Provides complete time lapse video capability.
   7. 24/7 service and support for equipment, software, and hosting services.

B. Approved equipment/services include but are not limited to the following:
   1. OxBlue Corporation, www.oxblue.com
   2. EarthCam, www.earthcam.net
   3. TrueLook, www.truelook.com

PART 3 – EXECUTION

3.1. REQUIREMENTS FOR DIGITAL PHOTOGRAPHS

A. The GC shall take a minimum of two (2) exterior photographs each week. Exterior photographs will not be required on projects that do not include any exterior work.
   1. Exterior photos shall be taken from approximately the same location each week for the duration of the project.
   2. When applicable this requirement shall begin prior to commencing any site work.
   3. This requirement shall only be applicable when there is exterior work actively being conducted with the project. Periods of inactivity due to weather (winter conditions) do not require a photograph.
   4. This requirement shall end when the exterior work has been substantially completed.
   5. This requirement may be suspended due to weather conditions or substantial delays in exterior progress.

B. The GC shall take interior photographs each week that document interior construction progress.
   1. This requirement will begin when exterior wall framing begins.
      a. When an interior remodeling project includes demolition work interior photos shall be taken during the demolition process.
   2. Pictures do not need to be taken from the same location each week.
   3. This requirement shall end when the interior work has been substantially completed.

C. Digital photographs shall be properly zoomed in/out, and flash used as needed, to capture a level of detail required to properly show the progress being captured by the photograph.
   1. Blurry and dark pictures will not be accepted.

D. The camera default naming convention is acceptable. The GC does not need to rename or specifically identify pictures with a title.

E. All digital photographs shall be saved in a JPEG (.jpg) format and uploaded directly to the SharePoint Project Images Library.
   1. The GC shall upload the photos to the folder that designates the appropriate construction week and date (beginning Monday date). If no folder exists, contact the CPM/CCM prior to uploading photos.

3.2. REQUIREMENTS FOR TIME LAPSE PHOTOGRAPHS

A. The GC shall be responsible for all of the following:
   1. Verify with the CPM/CCM a suitable place for mounting the camera and related equipment prior to installation.
   2. The complete installation, setup, maintenance, and removal of the camera and related equipment.
   3. The hosting and access of all photographs and videos taken by the camera during the project.
   4. Production of a final time lapse video (minimum of 3 minutes in length) of the project provided in a viewable format to the Owner on a thumb drive or CD.

B. Time lapse photos shall be taken from the same fixed position at approximately ten (10) minute intervals.
   1. Time lapse shall start before normal daily activities begin and end after normal daily activities have been completed.
      a. The GC shall adjust the camera time lapse schedule as needed to accommodate any periods of overtime or weekend work.
      b. Time lapse shall not be taken during major periods of no activity including night hours, holidays, weather related (winter) inactivity, etc.

C. All photos taken during the execution of this contract shall be accessible from a web based service. Archived photos shall be organized by date and time so that they can be easily retrieved and viewed as needed.
   1. If necessary the GC shall coordinate usernames and passwords for access to the photos. The City of Madison would prefer that the access be generic to accommodate a wide audience.

3.3. PROJECT MANAGEMENT WEB SITE (SHAREPOINT)

A. The CPM/CCM shall provide weekly progress folders in the Project Images Library on SharePoint.
   1. Progress folders are labeled with the Construction Week Number and the date for Monday of that week.
   2. The GC shall notify the CPM/CCM if additional weekly progress folders need to be created.

B. The GC shall upload the weekly digital photographs to the appropriate progress folder in the Project Images Library.

C. Copies of Time Lapse video shall be uploaded to a separate project folder in the Project Images Library prior to Construction Closeout.

END OF SECTION

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SECTION 01 33 23
SUBMITTALS

PART 1 – GENERAL

1.1. SUMMARY

A. The General Contractor (GC) shall be responsible for providing submittals for review of all contractors and sub-contractors as designated in the construction documents. Submittals shall include but not be limited to all of the following:
   1. Equipment specified and pre-approved in the specification; to ensure quality, construction, and performance specifications have not changed since final design.
   2. Equipment specified by performance in the specification; to ensure that the intended quality, construction, and performance specified is met by the selected material or product.
   3. Shop, piece, erection, and other such drawings as indicated in the specifications to ensure all structural, dimensional, and assembly requirements are being met.
   4. Submittals indicating installation sequencing
   5. Submittals indicating control sequencing
   6. Contractor licensing, certification, and other such regulatory documentation when required by a specification.
   7. Other submittals as may be required by individual specifications.

B. The submittal process shall not be used to determine alternates to specified products or equipment. All considerations shall be reviewed during the bidding process and acceptable alternates shall be acknowledged by addendum prior to the closing of bidding. See bidding instructions for the information on submitting alternates for consideration.

D. In the event that a manufacturer has significantly changed a product (discontinued a model, changed dimension or performance data changed available colors, etc.) since bid opening the GC shall submit a Request for Information (RFI) to the Project Architect requesting other approved alternates prior to uploading a digital submittal.

E. Contractors and sub-contractors shall be responsible for knowing the submittal requirements of ALL sections within their scope of work under the contract. The Owner reserves the right to request documentation on any materials, equipment, or product being installed where a submittal is not on file. If the material, equipment, or product installed is determined not to meet the intent of the specification the contractor/sub-contractor shall be required to remove and replace the items involved. The GC shall be solely responsible for all costs associated with the removal and replacement.

1.2. RELATED REFERENCES

A. Section 01 29 76 Progress Payment Procedures
B. Section 01 31 23 Project Management Web Site
C. Section 01 32 19 Submittals Schedule
D. Section 01 32 26 Construction Progress Reporting
E. Section 01 91 00 Commissioning
F. All Technical Specifications, contract documents, construction drawings, and any published addendums during the bidding process.
G. All contract documents generated during the execution of the contract including but not limited to Requests for Information (RFI) and Construction Bulletins (CB).

1.3. SUBMITTAL REQUIREMENTS

A. A completed submittal shall meet the following requirements:

1. Digital submittal shall be original PDF of manufacturer's data sheets or high quality color scan of the same.
    a. Submittals shall not include sales fliers or other similar documents that typically do not provide complete manufacturers data.
2. Documents within the PDF submittal shall be printable to a sized sheet no less than 8-1/2 by 11 inches and no larger than 24 by 36 inches.
3. At the beginning of each submittal the contractor shall identify the plan reference (WC-1, EF-3, etc.) in RED block letters that the submittal is for.
4. Where multiple model numbers appear in a table the contractor shall identify the specific model being submitted by using a RED square, box, or other designation to distinguish the correct model from others on the page.

B. A complete submittal will include all information associated with the product or equipment as presented in plans, equipment tables, and specifications. Information shall include but not be limited to the following:
1. Dimensional data
2. Performance data
3. Resource requirements, power, water, waste, etc
4. Clearance and maintenance requirements
5. Finish information, colors, textures, etc.
6. Warranty information

C. Where a submittal includes material samples (carpet, tile, paint draw downs, etc.) the contractor shall do the following:
1. The Contractor shall submit the sample(s) as indicated in the specification.
2. The Contractor shall include a quality photograph(s) of the product with the digital submittal. Photographs shall meet the following requirements:
    a. Formatted to be between 500Kb and 1.0 Mb in file size
    b. Have no glare or flash reflection on the sample
    c. Sample fills the frame of the photo and shows detail as needed. Include multiple photos from other angles as needed.
    d. Scanned copies of products or photos are not acceptable.

D. Uploaded submittals should be relative and related to a specific written specification.
1. Do not upload submittals under a broad category or division (I.E. HVAC 23 00 00). Always upload by the specific specification that identifies a required product or performance to be met.
2. Group related items together if the specification is written that way. (I.E. all of the plumbing fixtures and trim relative to one specific specification should be submitted together).
3. Submittals shall be grouped and adhere to the divisions in the submittal schedule. Submittals that do not conform to the submittal schedule and/or specification divisions will be rejected for re-submittal.

PART 2 – PRODUCTS – THIS SECTION NOT USED

PART 3 - EXECUTION

3.1. GENERAL CONTRACTORS PROCEDURES

A. All required submittals will be uploaded to the Construction Administration-Submittal Drawings Library on the Project Management Web Site (PMWS) by the GC.
1. The GC shall open a new Submittal Form in the Submittals Drawings Library for each required submittal from the Submittals schedule.
2. Fill in required information on the form that will be used for routing the review and comments.
3. Attach all documentation as described in Section 1.3 above.
    a. Submit samples under separate cover to the Project Architect when necessary.

B. Uploading the submittal indicates that the GC has reviewed and approved the submittal against the contract document requirements.

C. The GC shall discuss submittal status at all progress meetings and shall monitor submittal review/approval/re-submittal so as to not incur delays in the project schedule.

D. A completed upload of the submittal to the PMWS initiates the review process workflow.

E. The GC and sub-contractors shall provide re-submittals as required.

3.2. SUBMITTAL REVIEW

A. Upon completion of the submittal upload by the GC the PMWS automatically notifies the appropriate Architect/Engineer and Owner Representative, including CxA, by Division/Specification number that there is a submittal for review.

B. The submittal shall be reviewed internally by the required Architect/Engineer and Owner Representative and CxA in a timely fashion and provide commentary on missing items, incorrect information, or incomplete shop drawings, etc as needed.

C. When the internal review is completed the PMWS will notify the Project Architect the submittal is ready for final review.

3.3. PROJECT ARCHITECTS REVIEW

A. Upon completion of the internal review the Project Architect shall review all internal review comments, confer with the CPM and CxA as needed and determine the appropriate disposition status for the submittal (approved or resubmit).

C. The Project Architect shall summarize final internal review comments onto the submittal cover sheet, provide a final disposition of the submittal and update the review status of the submittal to “Complete…” (with or w/o comments) or “Rejected”.

D. A completed Final Review status initiates the PMWS to notify the GC and appropriate sub-contractor(s) that the review of the submittal has been completed.

END OF SECTION

SECTION 01 43 50
AIR BARRIER SYSTEMS

PART 1 – HEADING 1

1.1. RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, Division 07 Specification Sections, apply to this Section.

1.2. SUMMARY

A. Contractor will engage a qualified consultant(s) to perform tests and inspections prior to the installation of air barrier components.

B. This section includes administrative and procedural requirements for accomplishing an airtight building enclosure that controls infiltration or exfiltration of air.

C. Related Sections:

1. Section 07 25 00: Weather Barriers.
2. Requirements of this section relate to the coordination between subcontractors required to provide an airtight building enclosure, customized fabrication and installation procedures, not production of standard products.

1.3. DEFINITIONS

A. Air Barrier System: The airtight components of the building enclosure and the joints, junctures and transitions between materials, products, and assemblies forming the air-tightness of the building enclosure.

B. Services: Include coordination between the trades, the proper scheduling and sequencing of the work, pre-construction meetings, inspections, tests, and related actions, including reports performed by Contractor, by independent agencies, and by governing authorities. They do not include contract enforcement activities performed by Architect.

1.4. PERFORMANCE REQUIREMENTS

A. General Performance: The Contractor shall ensure that the intent of constructing the building enclosure with a continuous air barrier system to control air leakage into, or out of the conditioned space is achieved. The air barrier system shall have the following characteristics:

1. It shall be continuous, with all joints sealed.
2. It shall be structurally supported to withstand positive and negative air pressures applied to the building enclosure.
3. Continuity of the air barrier materials and products with joints to provide complete assemblies.
4. Continuity of all the enclosure assemblies with joints and transition materials to provide a whole building air barrier system.

B. Connection shall be made between:

1. Foundation and walls.
2. Walls and windows or doors.
3. Different wall systems.
4. Wall and roof.
5. Wall and roof over unconditioned space.
6. Walls, floor and roof across construction, control and expansion joints.

7. Walls, floors and roof to utility, pipe and duct penetrations.

C. Air Barrier Penetrations: All penetrations of the air barrier and paths of air infiltration / exfiltration shall be made air-tight.

D. Compliance Requirements:

1. Assemblies: an air permeance not to exceed 0.03 cfm/ft2p under a pressure differential of 0.3 in. water (1.57psf) (0.15 L/s.m2 @ 75 Pa) when tested in accordance with ASTM E 1677.
2. Materials: Materials used for the air barrier system in the opaque envelope shall have an air permeance not to exceed 0.004 cfm/ft2 under a pressure differential of 0.3 in. water (1.57psf) (0.02 L/s.m2 @ 75 Pa) when tested in accordance with ASTM E 2178. Or,
3. Entire Building: The air leakage of the entire building shall not exceed 0.15 cfm/sf under a pressure differential of 0.3 in. water (1.57psf) (0.75 L/s.m2 @ 75 Pa) when tested according to ASTM E 779.

1.5. SUBMITTALS

A. Field quality-control reports.

B. Testing agency shall submit a certified written report, in duplicate, of each inspection, test, or similar service to the Architect. If the Contractor is responsible for the service, submit a certified written report, in duplicate, of each inspection, test, or similar service through the Contractor.

1. Submit additional copies of each written report directly to the governing authority, when the authority so directs.

C. Report Data: Written reports of each inspection, test, or similar service include, but are not limited to, the following:

1. Date of issue.
2. Project title and number.
3. Name, address, and telephone number of testing agency.
4. Dates and locations of samples and tests or inspections.
5. Names of individuals making the inspection or test.
6. Designation of the Work and test method.
7. Identification of product and Specification Section.
8. Complete inspection or test data.
9. Test results and an interpretation of test results.
10. Ambient conditions at the time of sample taking and testing.
11. Comments or professional opinion on whether inspected or tested Work complies with Contract Document requirements.
12. Name and signature of laboratory inspector.
13. Recommendations on retesting.

1.6. QUALITY ASSURANCE

A. General Performance: The Contractor shall ensure that the intent of constructing the building enclosure with a continuous air barrier system to control air leakage into, or out of the conditioned space is achieved. The air barrier system shall have the following characteristics:

B. Inspection and testing services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with Contract Document requirements.

1. Qualifications for Air Barrier Testing and Inspection Agencies: Engage Air Barrier inspection and testing service agencies, including independent testing laboratories, that are prequalified and that specialize in the types of air barrier system inspections and tests to be performed.

C. Specific quality-control requirements for individual construction activities are specified in the sections of the specifications. Requirements in those sections may also cover production of standard products. It is the Contractor’s responsibility to ensure that each subcontractor is adequately and satisfactorily performing the quality assurance documentation, tests and procedures required by each section.

D Specified inspections, tests, and related actions do not limit Contractor's quality-control procedures that facilitate compliance with Contract Document requirements.

1.7. PROJECT CONDITIONS

A. Contractor Responsibilities: Unless otherwise indicated as the responsibility of another identified entity, Contractor shall provide coordination of the trades, and the sequence of construction to ensure continuity of the air barrier system joints, junctures and transitions between materials and assemblies of materials and products, from substructure to walls to roof. Provide quality assurance procedures, testing and verification as specified herein. Facilitate inspections, tests, and other quality-control services specified elsewhere in the Contract

Documents and required by authorities having jurisdiction or by the Owner. Costs for these services are included in the Contract Sum.

B. Organize preconstruction meetings between the trades involved in the whole building's air barrier system to discuss where each trade begins and ends and the responsibility and sequence of installation of all the air-tight joints, junctures, and transitions between materials, products and assemblies of products specified in the different sections, to be installed by the different trades.

C. Build a mock-up before proceeding with the work, satisfactory to the Architect, of each airtight joint type, juncture, and transition between products, materials and assemblies.

D. Associated Services: Cooperate with agencies performing required inspections, tests, and similar services, and provide reasonable auxiliary services as requested. Notify the agency sufficiently in advance of operations to permit assignment of personnel. Auxiliary services required include, but are not limited to, the following:
   1. Provide access to the Work.
   2. Furnish incidental labor and facilities necessary to facilitate inspections and tests.
   3. Take adequate quantities of representative samples of materials that require testing or assist the agency in taking samples.
   4. Deliver samples to testing laboratories.
   5. Provide security and protection of samples and test equipment at the Project Site.

E. Duties of the Testing and Inspection Agency: The independent agency engaged to perform inspections, sampling, and testing of air barrier materials, components and assemblies specified in individual Sections shall cooperate with the Architect and the Contractor in performance of the agency's duties. The testing agency shall provide qualified personnel to perform required inspections and tests.
   1. The agency shall notify the Architect and the Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
   2. The agency is not authorized to release, revoke, alter, or enlarge requirements of the Contract Documents or approve or accept any portion of the Work.
   3. The agency shall not perform any duties of the Contractor.

F. Coordination: Coordinate the sequence of activities to accommodate required services with a minimum of delay. Coordinate activities to avoid the necessity of removing and replacing construction to accommodate inspections and tests.
   1. The Contractor is responsible for scheduling times for inspections, tests, taking samples, and similar activities.

PART 2 – PRODUCTS – NOT USED

PART 3 - EXECUTION

3.1. FIELD QUALITY CONTROL

A. Testing Agency: Contractor will engage a qualified testing agency to perform tests and inspections.

B. Tests and Inspections:
   1. Qualitative Testing and Inspection:
      a. Daily reports of observations, with copies to the Owner, Contractor and Architect.
      b. Continuity of the air barrier system throughout the building enclosure with no gaps, holes.
      c. Structural support of the air barrier system to withstand design air pressures.
      d. Masonry and concrete surfaces are smooth, clean and free of cavities, protrusions and mortar droppings, with mortar joints struck flush, or as required by the manufacturer of the air barrier material.
      e. Site conditions for application temperature and dryness of substrates.
      f. Maximum length of exposure time of materials to ultra-violet deterioration.
      g. Surfaces are properly primed.
      h. Laps in material are 2" minimum, shingled in the correct direction (or mastic applied on exposed edges), with no fishmouths.
      i. Mastic applied on cut edges.
      j. Roller has been used to enhance adhesion.
      k. Measure application thickness of liquid-applied materials to manufacturer's specifications for the specific substrate.
      l. Materials used for compatibility.
      m. Transitions at changes in direction, and structural support at gaps.

n. Connections between assemblies (membrane and sealants) for cleaning, preparation and priming of surfaces, structural support, integrity and continuity of seal.
o. All penetrations sealed.

2. ASTM E 1186/98 “Standard Practices for Air Leakage Site Detection in Building Envelopes and Air Retarder Systems.”
   a. Infrared scanning with pressurization/depressurization.
   b. Smoke pencil with pressurization/depressurization.
   c. Pressurization/depressurization with use of anemometer.
   d. Generated sound with sound detection.
   e. Tracer gas measurement of decay rate.
   f. Chamber pressurization/depressurization in conjunction with smoke tracers.
   g. Chamber depressurization using detection liquids.

3. Quantitative Tests: Provide written test reports of all tests performed, with copies to the Owner, Contractor and Architect.
   a. Material compliance for maximum air permeance, ASTM E 2178.
   b. ASTM E 283, Determining rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors under Specified Pressure Differences Across the Specimen.
   c. Assemblies, ASTM E 1677, test pressure and allowable air leakage rate to be determined by design professional for interior design conditions and location of project.
   d. CAN/CGSB 1986 Standard 149.10, Determination of the Airtightness of Building Envelopes by the Fan Depressurization Method.
   e. CAN/CGSB 1996 Standard 149.15 Determination of the Overall Envelope Airtightness of Office Buildings by the Fan Depressurization Method Using the Building’s Air Handling System.
   f. Canadian National Master Specification Sections 07272 Air Barrier Systems for Exterior Walls of Low-Rise Buildings.
   g. Canadian National Master Specification 07272.1 : Durability Assessment of Bead-Applied Urethane-Based Sealant Foam for Air Barriers.
   h. Whole building, floors, or suites, ASTM E779, Determining Airtightness of Buildings Air Leakage Rate by Single Zone Air Pressurization.
   i. Windows and connections to adjacent opaque assemblies, ASTM E783.
   j. Tracer gas testing, ASTM E741.
   k. Pressure test, ASTM E330.
   l. Bond to substrate, ASTM D4541-95.
   m. Minimum dry or wet film thickness for liquid-applied materials are per the manufacturer’s requirements.

3.2. REPAIR AND PROTECTION

A. Upon completion of inspection, testing, sample taking and similar services, repair damaged construction and restore substrates and finishes. Comply with Contract Document requirements for Division 1 Section "Cutting and Patching."
B. Protect construction exposed by or for quality-control service activities, and protect repaired construction.
C. Repair and protection is Contractor's responsibility, regardless of the assignment of responsibility for inspection, testing, or similar services.

END OF SECTION

SECTION 01 45 16
FIELD QUALITY CONTROL PROCEDURES

PART 1 – GENERAL

1.1. SUMMARY

A. The City of Madison has developed a multi-faceted Quality Management Program that begins with contract signing and runs through contract closeout to ensure the best quality materials, workmanship, and product are delivered for the contracted Work.
   1. The Progress Management Web Site is a Construction Management tool that provides contractors and staff a single on-line location for the daily operations and progression of the Work.
   2. The Quality Management Observation (QMO) is an ongoing observation of the construction process as it progresses. The City of Madison does not use a “Punch List” or “Corrections List” as it is typically known throughout the construction industry. The QMO process acts as an “in progress punch list”.
      a. By using the QMO process the City of Madison’s goal is to have a zero item punch list prior to the 90% progress payment and owner occupancy.

B. All contractors shall be required to review the specifications identified in Section 1.2 below, and other related specifications identified therein to become familiar with the terminology and expectations of this City of Madison Public Works contract.

C. It is the intent of this specification to outline the requirements, expectations, and responsibilities of the General Contractor (GC), Project Architect, and other representatives of the Owner for items of Quality Assurance and Quality Control.
   1. This specification is not intended to conflict with Specification 01 40 00 Quality Requirements or other specifications requiring testing and inspecting services.
   2. This specification does not relieve the GC from any requirements associated with regulatory inspections performed by the City of Madison Building Inspection Unit, or inspectors from other agencies as required by code.
   3. Any testing performed by an Owner’s Representative does not relieve the GC from performing any testing that may required by the construction documents.

1.2. RELATED SPECIFICATION SECTIONS

A. Section 01 26 13 Request for Information (RFI)
B. Section 01 29 76 Progress Payment Procedures
C. Section 01 31 13 Project Coordination
D. Section 01 31 23 Project Management Web Site
E. Section 01 40 00 Quality Requirements
F. Section 01 77 00 Closeout Procedures
G. Section 01 78 13 Completion and Correction List
H. Section 01 91 00 Commissioning

1.3. PERFORMANCE REQUIREMENTS

A. All contractors shall be responsible for a proper quality assurance/quality control (QA/QC) program throughout the execution of the Work defined within the construction documents, including all recognized construction industry standards and all applicable regulatory codes.

B. The GC shall be responsible for all of the following:
   1. Monitor the quality of all workmanship, supplies, materials, and products being installed by all contractors and installers to ensure they meet or exceed the minimum requirements set forth by the construction documents.
   2. Submit a Request for Information (RFI) whenever manufacturers' instructions or referenced standards conflict with the construction documents before proceeding with the Work.
   3. Ensure that Work requiring special certifications or licensing is being performed by is being performed and supervised by personnel that meet the appropriate requirements.
      a. Ensure that all certificates and licenses are current throughout the execution of the project.

C. The CoM and its representatives shall perform quality assurance and quality control activities throughout the execution of this project. This in no way relieves the GC of maintaining an acceptable QA/QC program. =

1.4. QUALITY ASSURANCE

A. The GC shall be responsible for the following:
   1. All materials, equipment, and products shall be new, clean, undamaged, and meet the performance specifications defined within the construction documents including favorably reviewed submittals.
      a. Any material, equipment, or product that does not meet the requirements of the construction documents shall be removed and replaced, including any adjacent and related work, at the GCs expense.
   2. All Work shall be performed by persons properly trained and/or qualified to produce workmanship of the quality specified in the construction documents.
   3. Providing access to updated as-builts, addenda, submittals, bulletins and other related construction documents at the project site.

B. The CoM and its representatives may be responsible for any of the following:
   1. Attend pre-installation meetings
   2. Attend construction progress meetings
   3. Review all submittals
   4. Conduct field visits for QA/QC purposes, provide feedback to the GC and sub-contractors using Quality Management Observation (QMO) reports.
   5. Review delivered equipment
   6. Witness equipment installations, startups, testing as specified in other specifications

1.5. QUALITY MANAGEMENT OBSERVATION REPORT

A. The Quality Management Observation report or QMO is used as a QA/QC tool by those entities responsible for QA/QC activities, including but not limited to, the GC, CoM, PA, CX agent, etc.

B. QMOs are designed to be an early observation of non-conforming construction work before it becomes buried by follow on work. As such it is most often used as an "in progress punch list".

C. QMO forms are part of the Quality Control Library on the Project Management Web Site.

PART 2 – PRODUCTS - THIS SECTION NOT USED

PART 3 - EXECUTION

3.1. QUALITY MANAGEMENT RESPONSIBILITIES

A. While making routine progress visits to the construction project the GC, CPM, CxA and A/E, and applicable others shall observe the details of the construction and installations to ensure that the intent of the construction documents is being followed.

B. If during the progress visit there is a determination of contract non-conformance a QMO report shall be initiated to begin the documentation process.
   1. The GC field superintendent shall be informed immediately of any issue that may cause harm, damage to finished work, or be buried prior to properly filing a QMO report.

C. The following information when filing a QMO report:
   1. Open a QMO report in the Quality Control Library on the Project Management Web Site
   2. Enter the date and time of the field visit
   2. Provide references to construction documents if any (examples; specification, drawing page, details, approved submittals, RFI, CB, etc)
   3. Provide a short title for the observation being made
   4. Provide a detailed description of the observation being made

5. Select all categories (Sitework, Structure, Enclosure, Interior, etc) from the given list that may apply to the observation being reported.
    a. For each category selected additional boxes shall open with contractor names associated with each category.
6. Select all contractors from the lists provided that may need to be aware of the observation.
7. Provide any attachments that may help provide reference to the observation.
8. Click the SAVE button before closing the form.

D. The software for the Project Management Website will email notifications that a QMO report has been initiated. The software will automatically select and notify the following:
1. The GC, PA, and CPM for all observation reports being filed.
2. Others depending on the observation categories selected.
3. Contractors based on the selections made in the sub-contractors lists.

3.2. RESPONDING TO A QMO

A. All contractors receiving email notification of a QMO Observation shall review the details of the observation.
B. The GC shall be responsible for determining the course of action required to remedy the non-conforming issue and shall coordinate and direct the contractor(s) responsible for any work related to the observation.
C. All contractors assigned to remedy the observation by the GC shall provide follow-up responses on the QMO report as follows:
1. Open the QMO report in the Quality Control Library on the Project Management Web Site.
2. In the "Follow-Up Response" area enter a description of your follow-up response in the box provided.
    a. Click "Insert Item" if additional boxes are required.
3. Add attachments (pictures) if needed to show the work has been completed.
4. Click the SAVE button before closing the form.

3.3. GENERAL CONTRACTORS FOLLOW-UP

A. The GC shall inspect the work to ensure that all assigned contractors have remedied the observation to the intent of the construction documents.
B. The GC shall respond with any additional comments in his/her response box.
1. If no comments are to be made the GC at a minimum must date the response box to trigger the next work flow.
C. Click the SAVE button before closing the form.
D. The software will email a notification to the CPM and the person who initiated the QMO that the issue has been remedied.

3.4. QMO CLOSEOUT PROCEDURE

A. The person who initiated the QMO shall review the remedied work and if properly corrected shall close and date the QMO form.
1. Click SAVE and the software will email a notification to the CPM that final review of the Observation is required.
2. In the event there are still issues the Quality Manager can add additional comments in the response area, click SAVE and re-issue the QMO for additional review as needed.
B. Once the person who initiated the QMO has closed the item the CPM shall review and verify with the PA that the Observation has been properly remedied and provide final closure on the QMO.

3.5. CONSTRUCTION CLOSEOUT

A. The GC shall note that successful close out QMOs are required for construction closeout as follows:
1. Certain progress payments as identified in Specification 01 29 76 are contingent QMO reports being properly closed out.
2. Specification 01 77 00 defines all construction closeout requirements.

END OF SECTION

SECTION 01 45 29
TESTING LABORATORY SERVICES

PART 1 – GENERAL

1.1. REQUIREMENTS INCLUDED

A. The Contractor shall employ and pay for the services of an independent testing laboratory to perform specified services and testing.

B. Testing Laboratory inspection, sampling and testing is required for:

1. Section 03 30 00: Cast-In-Place Concrete
2. Section 05 12 00: Structural Steel Framing
3. Section 05 40 00: Cold-Formed Steel Framing
4. Section 31 20 00: Earthwork

1.2. RELATED REQUIREMENTS

A. Conditions of the Contract: Inspections and testing required by laws, ordinances, rules, regulations, orders or approvals of public authorities.

B. Related Requirements Specified in Other Sections:

1. Division 22 and 23: Testing of Mechanical Systems
2. Division 26: Testing of Electrical Systems

1.3. QUALIFICATION OF LABORATORY

A. Meet "Recommended Requirements of Independent Laboratory Qualification" published by American Council of Independent Laboratories.

B. Meet basic requirements of ASTM E 329, "Standards of Recommended Practice for Inspection and Testing Agencies for Concrete and Steel as Used in Construction."

C. Authorized to operate in State in which the Project is located.

1.4. LABORATORY DUTIES

A. Cooperate with Owner, A/E and Contractor; provide qualified personnel after due notice.

B. Perform specified inspections, sampling and testing of materials and methods of construction:

1. Comply with specified standards.
2. Ascertain compliance of materials with requirements of Contract Documents.

C. Promptly notify the Owner, A/E and Contractor of observed irregularities or deficiencies of work or products.

D. Promptly submit written report of each test and inspection; one copy each to A/E, Consulting Engineer, Owner and Contractor. Each report shall include:

1. Date issued.
2. Project Title and number.
3. Testing laboratory name, address and telephone number.
4. Name and signature of laboratory inspector.
5. Date and time of sampling or inspection.
6. Record of temperature and weather conditions.
7. Date of test.
8. Identification of product and specification section.
9. Location of sample or test in the Project.
10. Type of inspection or test.
11. Results of tests and compliance with Contract Documents.

12. Interpretation of test results, when requested by A/E or the Contractor.

E. Perform additional tests as required by Owner, A/E or the Contractor.

1.5. LIMITATIONS OF AUTHORITY OF TESTING LABORATORY

A. Laboratory is not authorized to:
1. Release, revoke, alter, or enlarge on requirements of Contract Documents.
2. Approve or accept any portions of the Work other than those portions of the Work scheduled for testing.
3. Perform any duties of the Contractor.

1.6. CONTRACTOR'S RESPONSIBILITIES

A. Cooperate with laboratory personnel, provide access to Work and to manufacturer's operations.

B. Secure and deliver to the laboratory, adequate quantities of representative samples of materials proposed to be used and which require testing. Submit concrete mix designs to A/E for approval prior to pouring concrete.

C. Provide to the laboratory the preliminary design mix proposed to be used for concrete, and other material mixes that require control by the testing laboratory.

D. Furnish copies of Product test reports as required.

E. Furnish incidental labor and facilities:
1. To provide access to Work to be tested.
2. To obtain and handle samples at the Project site or at the source of the product to be tested.
3. To facilitate inspections and tests.
4. For storage and curing of test samples.

F. Notify laboratory sufficiently in advance of operations to allow for laboratory assignment of personnel and scheduling of tests.

G. Make arrangements with laboratory and pay for additional samples and tests required for Contractor's convenience.

H. Employ and pay for the services of a separate, equally qualified independent testing laboratory to perform additional inspections, sampling and testing required when initial tests indicate work does not comply with Contract Documents.

I. Temporarily halt the progress of the Work when tested materials do not comply with Contract Documents and promptly notify the Owner or his designated representative and A/E.

J. Remove and replace at no cost to the Owner, all defective materials discovered upon testing not to comply with Contract Documents, including cost for retesting and re-inspecting replaced Work that failed to comply with the Contract Documents.

1.7. SPECIFIC TEST, INSPECTIONS, AND METHODS REQUIRED

A. **Section 03 30 00: Cast-In-Place Concrete**
1. Secure sample of aggregates Contractor proposes to use and test for compliance with Specifications.
2. Certify compliance with Specifications of cement proposed for use by the Contractor.
3. Review and approve the Contractor's proposed concrete mix proportions for the required concrete strengths using materials Contractor proposed to use on the project. Incorporate specified admixtures and not less than amounts of cement specified.
4. Perform appropriate laboratory tests, including compression tests of cylinders and slump test to substantiate mix designs.
5. Inspect and test materials during concrete work to substantiate compliance with Specifications and mix requirements.
a. Testing:
i. Sample and test concrete in accordance with ASTM C 31, ASTM C 143, ASTM C 172, and ASTM C 231.
ii. Perform slump tests in accord with ASTM C 143 from same concrete batch used for test cylinders and record results and comments on compression test reports.
iii. Perform compression tests in accordance with ASTM C39.
iv. When air-entrained concrete is used, a minimum of one (1) air content test shall be performed in accordance with ASTM C 231 for each set of test cylinders taken.
v. Identify all test cylinders with symbols to indicate location on the job where concrete test was made. Record on project record drawings.
vi. Strength tests shall be made for: each day's pour; each class of concrete; each change of supplies or sources; and for each 100 cubic yards of concrete or fraction thereof.

vii. One slump test shall be made for each set of test cylinders taken following the procedure in ASTM C 143.

b. Test Cylinders for all Concrete

i. Each test shall consist of a minimum of four cylinders.

ii. Make test cylinders in conformity with ASTM C 31.

iii. After 24 hours three cylinders to be carefully transported to the testing laboratory for moisture curing and one cylinder to be field cured.

iv. One field cured cylinder to be tested at 7 days and two laboratory cured cylinders to be tested at 28 days. Reserve one cylinder for further testing.

v. The average of all strength tests representing each class of concrete, as well as the average of any three consecutive strength tests for each class of concrete, shall be equal to or greater than the specified strength.

vi. If the A/E has reason to believe that cylinder strength tests are not representative of the strength of concrete in place, A/E shall require drilled cores to be cut and tested at the Contractor's expense. Coring and testing shall be in accordance with ASTM C 42 Standard Method of Obtaining and Testing Drilled Cores and Sawed Beams of Concrete.

B. **Section 05 12 00: Structural Steel Framing**

1. Welding:

a. Provide inspection of shop and field welding in accordance with Section 6 of AWS D1.1.

b. Visually inspect all welds, perform appropriate non-destructive tests on apparent defective welds. Verify conformance with Specifications.

c. Non-destructive testing shall be performed on 20 percent of the total length of all full penetration welds. If a sufficient number of welds are deficient, additional testing may be performed at the discretion of the testing lab, at no cost to Owner.

2. Bolting:

a. Visually inspect all connections for proper number, size and type of bolt.

b. Review all bolted connections for compliance with "snug tight" requirements of AISC.

c. No Slip-critical (SC) connections/bolts are required for this project.

d. Shear Connectors, Headed/Deformed Bar Concrete Anchors:

i. Verify pre-production test records for installation of shear connectors, concrete anchors and threaded studs.

ii. Shear connectors shall be struck with a hammer. Those not producing a "clean" pinging sound indicative of a fully attached shear connector shall be bent 15 degrees off vertical towards the nearest support by striking with a hammer. If shear connector does not become loose and weld is not broken, it shall be considered acceptable, and shall be left in the bent position. Replace failing shear connectors and test as before.

iii. A visual inspection shall be made of shear connectors and headed/deformed bar concrete anchors after installation. If visual inspection reveals that a sound weld and a 360 degree flash has not been obtained, the connector/anchor shall also be tested by bending a minimum of 15 degrees off vertical opposite to the missing weld/flash, irrespective of the results of the "ping" test required for shear connectors. If the connector/anchor does not become loose it shall be considered acceptable and shall be left in this position. Replace failing connector/anchors and inspect as before.

C. **Section 05 40 00: Cold Formed Steel Framing**

1. As directed by A/E, Contractor's testing agency may inspect the maintenance of a quality control program including spot checking weldments and welding procedures in accordance with AWS standards.

D. **Section 31 20 00: Soil Compaction Control and Trenching and Backfilling**

1. Soils Engineer to be onsite during excavation operation.

2. Visually inspect, test, and certify that exposed undisturbed underlying soil is suitable for required footing bearing capacity and placement of fills.

3. Maximum and minimum density of fill soil for compaction percentage of relative density and moisture density shall be determined in accordance with ASTM Designation D 1557. Testing agency will test compaction of soils in place according to ASTM D 1556, ASTM D 2167, ASTM D 2922, and ASTM D 2937, as applicable.

4. Number of tests as follows:

a. Subgrade, Undisturbed and Demolition Surfaces: Visual inspection and probe; test if required.

b. Interior Fills: One test per 2,500 sq. ft for each two foot or less lift.

c. Exterior Fills: One test per 2,500 sq. ft for each two foot or less lift.

d. Utility Trenches: One test per 50 lineal feet for each two foot or less lift.

PART 2 – PRODUCTS – THIS SECTION NOT USED

PART 3 – EXECUTION – THIS SECTION NOT USED

END OF SECTION

SECTION 01 50 00
TEMPORARY FACILITIES AND CONTROLS

PART 1 – GENERAL

1.1. SUMMARY

A. This Section includes general procedural requirements for temporary facilities and controls including, but not limited to the following:
   1. Temporary Utilities
   2. Telecommunications Services
   3. Temporary Sanitary Facilities
   4. Barriers
   5. Fencing
   6. Exterior Enclosures
   7. Security
   8. Vehicular Access and Parking
   6. Waste Removal
   7. Project Identification
   8. Field Offices

1.2. RELATED SPECIFICATION SECTIONS

A. Section 01 31 19 Progress Meetings
B. Section 01 31 23 Project Management Web Site
C. Section 01 74 19 Construction Waste Management and Disposal

1.3. QUALITY ASSURANCE

A. Regulations: Comply with industry standards and applicable laws and regulations if authorities having jurisdiction, including but not limited to:
   1. Building Code requirements
   2. Health and safety regulations
   3. Utility company regulations
   4. Police, Fire Department and Rescue Squad rules
   5. Environmental protection regulations
   6. Joint Commission - Hospital Accreditation Standards

B. Standards: Comply with NFPA 241 "Standard for Safeguarding Construction, Alterations, and Demolition Operations," ANSI A10 Series standards for "Safety Requirements for Construction and Demolition," and NECA Electrical Design Library "Temporary Electrical Facilities".

C. Electrical Service: Comply with NEMA, NECA, and UL standards and regulations for temporary electric service. Install service in compliance with NFPA 70 "National Electric Code".

1.4. TEMPORARY UTILITIES

A. Contractor will provide and pay for (both installation cost and consumption costs) the following:
   1. Electrical power and metering.
   2. Water supply.

B. General:
   1. No existing facilities on the property.
   2. New permanent facilities may be used.

C. Water Service: Hydrant with backflow preventer and temporary heat (if needed) to be provided by contractor.
   1. Use trigger-operated nozzles for water hoses, to avoid waste of water.

D. Temporary Electric Power Service: Electrical Contractor to provide.

E. Temporary Lighting: Electrical Contractor shall provide temporary lighting with local switching
   1. Install and operate temporary lighting, minimum of 30 fc, to fulfill security and protection requirements, without operating the entire system, and will provide adequate illumination for all areas of work, including construction operations and traffic conditions.

F. Temporary Heat: General Contractor shall provide temporary heat required by construction activities, for curing or drying of completed installations or protection of installed construction from adverse effects of low temperatures or high humidity. Select safe equipment that will not have a harmful effect on completed installations or elements being installed. Coordinate ventilation requirements to produce the ambient condition required and minimize consumption of energy.
   1. Heating Facilities: Except where use of the permanent system is authorized, provide vented self-contained LP gas or fuel oil heaters with individual space thermostatic control.
      a. Use of gasoline-burning space heaters, open flame, or salamander type heating units is prohibited.

1.5. TELECOMMUNICATIONS SERVICES AND WI-FI

A. Provide, maintain, and pay for telecommunications services to field office at time of project mobilization through construction closeout.

B. Telecommunications services shall include:
   1. Windows-based personal computer dedicated to project telecommunications.
   2. Shared access to the internet via WIFI or similar wireless connection.
      a. Access must be capable to support minimum of 10 wireless devices.
   3. Email Account/address dedicated for GC Project Manager of GC Supervisor on site.

1.6. TEMPORARY SANITARY FACILITIES

A. Provide and maintain required facilities and enclosures. Provide at time of project mobilization.

B. Temporary toilets: Comply with regulations and health codes for the type, number, location, operation, and maintenance of fixtures and facilities. Install where facilities will best serve the Project's needs.
   1. Provide toilet tissue, paper towels, paper cups, and similar disposable materials foreach facility. Provide covered waste containers for used material.
   2. Toilets: Install self-contained toilet units. Shield toilets to ensure privacy.

C. Maintain daily in clean and sanitary condition

D. Water: Provide potable water approved by local health authorities

1.7. 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.

1.8. FENCING

A. Construction: Refer to Plan Documents and Specification Section 01 76 00: Fencing Materials and Barricades

1.9. EXTERIOR ENCLOSURES

A. Provide temporary weather tight closure of exterior openings 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.

1.10. SECURITY

A. Provide security and facilities to protect Work, existing facilities, and Owner's operations from unauthorized entry, vandalism, or theft.

1.11. 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.

1.12. WASTE REMOVAL

A. See Section 01 74 19 - Waste Management, 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 periodically.
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.

1.13. PROJECT IDENTIFICATION

A. Provide project identification sign of design and construction indicated in Section 01 58 13.
B. Erect on site at location determined by Owner .
C. No other signs are allowed without Owner permission except those required by law.

1.14. FIELD OFFICES

A. Office: Weather tight, with lighting, electrical outlets, heating, cooling equipment, and equipped with sturdy furniture, drawing rack and drawing display table.
B. Field Office shall be located project site.
C. Provide space for Project Meetings with table and chairs to accommodate a minimum of fifteen (15) persons.
D. Provide a minimum of a 40” LCD monitor or other digital projection device to be connected to the computer identified in Section 1.4 Telecommunications Services (above), for use during progress meetings in connection with reviewing construction progress information posted to the Project Management Web Site (Specification 01 31 23) hosted by the Owner.

PART 2 - PRODUCTS

2.1. TEMPORARY PARTITIONS

A. Provide dustproof partitions to limit dust and dirt migration and to separate occupied areas from fumes and noise.
    1. Non-fire rated partitions, standard
        a. Wood stud framing, 6-mil polyethylene

2.2. EQUIPMENT

A. Temporary Lifts and Hoists: Contractors requiring temporary lifts and hoists shall provide facilities for hoisting materials and employees.
B. Electrical Outlets: Electrical Contractor shall provide properly configured NEMA polarized outlets to prevent insertion of 110-120 volt plugs into higher voltage outlets. Provide receptacle outlets equipped with ground-fault circuit interrupters, reset button and pilot light, for connection of power tools and equipment.
C. Electrical Power Cords: Contractors requiring power cords shall provide grounded extension cords; use "hard-service" cords where exposed to abrasion and traffic. Provide waterproof connectors to connect separate lengths of electric cords, if single lengths will not reach areas where construction activities are in progress. Do not exceed safe length-voltage ratio.

D. Lamps and Light Fixtures: Electrical Contractor shall provide general service incandescent lamps of wattage required for adequate illumination. Provide guard cages or tempered glass enclosures, where exposed to breakage. Provide exterior fixtures where exposed to moisture.
E. Heating Units: General Contractor shall provide temporary heating units that have been tested and labeled by UL, FM or another recognized trade association related to the type of fuel being consumed.
F. First Aid Supplies: General Contractor shall provide first aid supplies complying with governing regulations.
G. Fire Extinguishers: General Contractor shall provide hand-carried, portable UL-rated, fire extinguishers of NFPA recommended classes for the exposures, extinguishing agent and size required by location and class of fire exposure.

PART 3 - EXECUTION

3.1. TEMPORARY FIRE PROTECTION

A. Until fire protection needs are supplied by permanent facilities, General Contractor shall install and maintain temporary fire protection facilities of the types needed to protect against reasonably predictable and controllable fire losses.
B. Comply with NFPA 10 "Standard for Portable Fire Extinguishers," and NFPA 241 "Standard for Safeguarding Construction, Alterations and Demolition Operations".
C. Locate fire extinguishers where convenient and effective for their intended purpose.
D. Store combustible materials in containers in fire-safe locations.
E. Maintain unobstructed access to fire extinguishers, fire hydrants, temporary fire protection facilities, stairways and other access routes for fighting fires.
F. Prohibit smoking on the premises.
G. Supervise welding operations, combustion-type temporary heating units, and similar sources of fire ignition according to requirements of authorities having jurisdiction.
H. Develop and supervise an overall fire-prevention and -protection program for personnel at Project site
I. Review needs with local fire department and establish procedures to be followed. Instruct personnel in methods and procedures. Post warnings and information.

3.2. COLLECTION AND DISPOSAL OF WASTE

A. Collect waste from construction areas and elsewhere daily
B. Comply with requirements of NFPA 241 for removal of combustible waste material and debris. Enforce requirements strictly.
C. Do not hold materials more than 7 days during normal weather or 3 days when the temperature is expected to rise above 80 deg F.
D. Handle hazardous, dangerous, or unsanitary waste materials separately from other waste by containerizing properly. Dispose of material in a lawful manner.

3.3. ENVIRONMENTAL PROTECTION

A. Provide protection, operate temporary facilities and conduct construction in ways and by methods that comply with environmental regulations, and minimize the possibility that air, waterways and subsoil might be contaminated or polluted, or that other undesirable effects might result.
B. Avoid use of tools and equipment which produce harmful noise.
C. Restrict use of noise making tools and equipment to hours that will minimize complaints from persons or firms near the site.

3.4. REMOVAL OF TEMPORARY UTILITIES, FACILITIES, AND CONTROLS

A. Remove temporary utilities, equipment, facilities, and materials prior to Substantial Completion inspection.
B. Remove underground installations to a minimum depth of 2 feet (600 mm). Grade site as indicated.
C. Clean and repair damage caused by installation or use of temporary work.
D. Restore existing facilities used during construction to original condition.
E. Restore new permanent facilities used during construction to specified condition.

END OF SECTION

SECTION 01 58 13
TEMPORARY PROJECT SIGNAGE

PART 1 – GENERAL

1.1. SECTION INCLUDES

A. Project identification sign.

1.2. QUALITY ASSURANCE

A. Design sign and structure to withstand 50 miles/hr wind velocity.
B. Sign Painter: Experienced as a professional sign painter for minimum three years.
C. Finishes, Painting: Adequate to withstand weathering, fading, and chipping for duration of construction.

1.3. SUBMITTALS

A. See Section 01 30 00 – Administrative Requirements for submittal procedures.
B. Shop Drawing: Show content, layout, lettering, color, structure, sizes.

PART 2 - PRODUCTS

2.1. SIGN MATERIALS

A. Structure and Framing: New, wood, structurally adequate.
B. Sign Surfaces: Exterior grade plywood with medium density overlay, minimum ¾" thick, standard large sizes to minimize joints.
C. Rough Hardware: Galvanized

2.2. PROJECT IDENTIFICATION SIGN

A. One painted sign, 32 sq ft area, bottom 6 feet above ground.
B. Content:
   1. Project title, City of Madison, Fleet Services logo and name of Owner as indicated on Contract Documents.
   2. Names and title of Architect.
   3. Name of Prime Contractor.
   4. Full color project rendering from high resolution image as furnished by Architect.

PART 3 - EXECUTION

3.1. INSTALLATION

A. Install project identification sign within 30 days after date fixed by Notice to Proceed.
B. Erect at designated location.
C. Install sign surface plumb and level, with butt joints. Anchor securely.

3.2. REMOVAL

A. Remove sign, framing supports, and foundations at completion of Project and restore the area.

END OF SECTION

SECTION 01 60 00
PRODUCT REQUIREMENTS

PART 1 – GENERAL

1.1. SUMMARY

A. The purpose of this specification is to provide general guidelines and responsibilities related to the receiving, handling, and storage of all materials and products from arrival on the job site through installation.
   1. Immediate inspection of delivered goods means a timely replacement if damaged.
   2. Proper storage helps prevent damage and loss by weather, vandalism, theft, and job site accidents.
   3. Proper storage helps with job site performance and safety.
   2. Proper handling helps prevent damage and job site accidents.

B. Each Contractor shall be directly responsible for the receiving, handling, and storage of all materials and products associated with the Work of their Division or Trade.

C. Each Contractor responsible for Work associated with Owner provided materials or products shall be responsible for the receiving, handling and storage of the material/product as outlined in Section 3.8 below..

1.2. RELATED SPECIFICATIONS

A. Parts of this specification will reference articles within "The City of Madison Standard Specifications for Public Works Construction".
   1. Use the following link to access the Standard Specifications web page:
      http://www.cityofmadison.com/business/pw/specs.cfm
      a. Click on the "Part" chapter identified in the specification text. For example if the specification says "Refer to City of Madison Standard Specification **2**10.2" click the link for Part II, the Part II PDF will open.
      b. Scroll through the index of Part II for specification 210.2 and click the text link which will take you to the referenced text.
      c. City Standard Detail Drawings (SDD) may be located from the index in Part VIII.

B. Section 01 57 21 Indoor Air Quality

C. Section 01 74 13 Progress Cleaning

D. Section 01 76 00 Protecting Installed Construction

E. Other Divisions and Specifications that may address more specifically the requirements for the storage and handling of materials and products associated Work of other Divisions or Trades.

1.3. QUALITY ASSURANCE

A. The GC shall be responsible for ensuring that these minimum storage and handling requirements are met by all contractors on the project site including but not limited to the following:
   1. Receiving deliveries of materials, products, and equipment.
      a. Inspect all deliveries upon arrival for damage, completeness, and compliance with the construction documents.
         i. Deliveries shall remain in original packaging or crates, shipping manifest shall be kept with the delivery and the packaging shall have visible identification of the items within the packaging.

b. Immediately report any damaged products or equipment to the GC, begin arrangements for immediate replacement.
c. Materials or equipment that have been damaged, are incomplete, or do not comply with the construction documents shall not be permitted to be installed.

2. All materials and products shall be stored within the designated limits of the project site. Only store the amount of material necessary for upcoming operations so as not to interfere with other construction activities and access to Work by the Owner and Architect. Any offsite storage shall be at the expense of the contractor storing the material or product. All offsite storage requirements shall comply with this specification. All offsite storage of materials is subject to Owner Representative Quality Management review at any time.
3. Large storage containers may be used but shall be weather tight, securable, placed on concrete blocks, timbers, or jack stands and shall be level.
4. When lifting equipment is required the equipment rating shall be greater than the loading requirements of the item being lifted. In addition all of the following shall apply as necessary:
   a. Only designated and/or designed lift points shall be used.
   b. Large items shall have tag lines and handlers at all times during lifting operations.
   c. Lift at multiple points as needed to prevent bending.
5. Materials and products stored inside of the structure shall comply with all of the following:
   a. Storage shall not be allowed to impede the flow of work in progress.
   b. Storage shall not be allowed to hide completed work from review and inspections.
   c. Storage shall not exceed the design loads of the structural components it is being stored upon.
6. All materials and products shall be stored according the manufacturers minimum recommended requirements. All of the following shall be considered before storing any product or material:
   a. Dust and dirt
   b. Moisture and humidity, including rain and snow
   c. Excessive temperatures, direct sun, etc
   d. Product or material weight and size
   e. Potential for breakage
   f. Product incompatibility with other products such as corrosiveness, chemical reactions, flammability, etc.
   g. Product or material value and replacement cost
7. The Contractor shall be responsible for providing fully functional tarps or plastic wrap, to protect materials and products from the weather. All coverings shall be free of large holes and tears, and shall be tied, strapped, or weighted down to resist blowing.
8. The Contractor shall be responsible for any temporary heating, cooling, or other utility requirement that may be associated with the storage of a material or product.
9. The Contractor shall be responsible for securing materials and products of value such as copper, A/V equipment, etc. Such items shall be stored in securable shipping containers, job trailers or other such storage devices. Container shall be kept secured when not in use.

B. The GC shall inspect the job site daily to ensure that all products and materials stay weather tight and are secured against vandalism or theft as required by this specification.
C. The Owners Representative may at any time request improvements regarding storage of any material or product being provided under these construction documents.

PART 2 – PRODUCTS – THIS SECTION NOT USED

PART 3 - EXECUTION

3.1. GENERAL CONTRACTOR REQUIREMENTS

A. Designate material storage and handling areas as needed including all of the following:
   1. Designate specific areas of the site for delivery and storage of materials to be used during the execution of the Work.
   2. Designated areas shall not be located so as to interfere with the installation of any Work including Work by others such as the installation of utilities or the maintenance of existing utilities. This shall include not storing items in active utility easements as designated by the site plan.
B. Arrange for openings in the building as needed to allow delivery and installation of large items. Openings shall be appropriately sized to include the use of booms, slings, and other such lifting devices that may be larger than the item being installed.

1. When openings are required in completed Work (new or existing) the GC shall be responsible for providing an appropriate opening and for restoring the opening to the original or better condition upon completion. Restoration shall be weather tight and complete.

C. Repeated moving and handling of items being stored shall not be allowed. The GC shall be responsible for any damage and replacement because of mishandling or excessive handling.

3.2. BULK MATERIAL

A. Bulk material such as sand, gravel, top soil and other types of fill shall be stored away from the construction area and shall be stock piled as follows:
1. All bulk material shall be piled safely and efficiently in as small an area as practical. Only store the amount of material necessary for upcoming operations so as not to interfere with other construction activities and access to Work by the Owner and Architect.
2. All stock piles shall have silt fence/sock properly installed around the perimeter to prevent erosion and loss of material. Refer to City of Madison Standard Specification Section 210.1(f) and other related specification or details.
3. Fine grained material shall be protected with tarps to prevent blowing. Tarps shall be weighted or staked to stay in place.

B. Bulk material such as brick, concrete block, stone, and other palletized materials shall be stored on original shipping pallets until ready for use.

3.3. DRY PACKAGED MATERIAL

A. Dry packaged material such as cement, mortar, etc shall be stored on pallets, on slightly elevated ground or clear stone pad to keep water away from the base of the material being stored. Protect from moisture.

3.4. STRUCTURAL AND FRAMING MATERIAL

A. All structural and framing material shall be stored in an organized manner arranged by type, size and dimension. Materials shall be stored on pallets or timbers as necessary and shall not be allowed to lie directly on the ground.

B. Long and heavy items shall be supported at several points to prevent bending and warping.

3.5. EQUIPMENT

A. Equipment delivered to the site shall be stored away from all construction activities until the item can either be moved inside or properly installed.

B. Equipment shall be stored on slightly elevated ground or clear stone pad to keep water away from the base of the equipment.

3.6. FINISH PRODUCTS

A. Finish products such as flooring, tile, counters, lockers, toilets, partitions, lighting, and other similar items should not be delivered and stored until the structure has been enclosed, is weather tight, temperature controlled and the contractor is ready for such items to be installed.
1. Storage of finished products outside for any length of time shall not be allowed.

B. Products that cannot be stored inside the structure shall be stored in secured containers or job trailers until such time as they are ready to be installed.

C. Products with a high potential for breakage such as glass, mirrors, tiles, toilet fixtures, etc. shall be stored with additional protection as necessary such as but not limited to the following:
1. Store in original shipping containers until ready for installation.
2. Do not store in high traffic areas.
3. Shield with other materials such as cardboard, plywood, or similar products.

3.7. DUCTWORK, PIPING, AND CONDUIT

A. All piping and conduit shall be stored horizontally unless otherwise specified by the manufacturer or Division and Trade Specifications.
1. Do not store directly on grade.
2. Cover metal pipes and tubes to prevent rust and corrosion, allow ventilation to prevent condensation.
3. Whenever possible use pipe stands for storing pipe and conduit to prevent tripping and rolling hazards.

B. All ductwork shall be stored horizontally or vertically as necessary unless otherwise specified by the manufacturer or Division and Trade Specifications.
1. During storage, both ends of each duct shall be protected with plastic sheathing to prevent dust and dirt from getting inside the duct. Sheathing shall be sufficiently taped to the duct.

2. After installation, free/open ends shall remain protected with taped plastic sheathing and or temporary filters as specified by division or Trade specifications.

3.8. OWNER PROVIDED, CONTRACTOR INSTALLED EQUIPMENT

A. Section 3.8.A. shall apply to all equipment being provided to any contractor directly from the Owner for installation under the contract.
   1. The Owner or Owners Representative shall do the following:
      a. Inspect all deliveries upon receipt and notify manufacturer of any issues directly.
      b. Review the received shipment with the contractor.
         i. Only provide products or materials to the contractor that were not damaged through shipping or handling.
         ii. Confirm missing products or materials and anticipated delivery schedule if known.
   2. The Contractor responsible for the installation of Work associated with Owner provided materials or products shall "take ownership" and provide safe and secure storage and handling as previously described within this specification.
      i. The Contractor shall be liable for the repair or replacement of any material or product damaged after taking ownership of the product from receipt through final acceptance.

B. Section 3.8.B. shall apply to all equipment being provided by the Owner but shipped directly to any sub-contractor or the project site for installation under the contract.
   1. The GC and/or Contractor responsible for the Work associated with the Owner provided materials or products shall do the following:
      a. Inspect all deliveries upon receipt and notify the Owner or Owners Representative of any issues directly.
         i. Owner or Owners Representative shall notify manufacturer of any issues directly.
      b. Review the received shipment with the Owner or Owners Representative
         i. Confirm missing products or materials and anticipated delivery schedule if known.
   2. The Contractor shall "take ownership" and provide safe and secure storage and handling as previously described within this specification.
      i. The Contractor shall be liable for the repair or replacement of any material or product damaged after taking ownership of the product from receipt through final acceptance.

END OF SECTION

SECTION 01 71 23
FIELD ENGINEERING

PART 1 – GENERAL

1.1. REQUIREMENTS INCLUDED

A. The Contractor shall provide and pay for field engineering services required for the Project:
   1. Land surveying services required to execute the Work, to include building addition location and layout, and location and layout of pavements and all proposed site improvements.
   2. Verification of existing building dimensions, elevations, and relationship to proposed additions.
   3. Professional Engineering services to execute Contractor's construction methods.
   4. Registered Professional Engineer in the State of Wisconsin to determine the load capacity of the existing structure for use of Contractors temporary facilities, equipment, lifts, machinery, material storage, etc.

1.2. RELATED REQUIREMENTS

A. Conditions of the Contract

1.3. PROCEDURES

A. A property survey has been prepared for the Owner and has been bound with Contract Drawings. Surveys shall describe physical characteristics, legal limitations and utility locations for the site of the Project, and a legal description of the site. If information is incomplete, notify Owner to furnish additional information. Verify easement locations, front, side, and rear yard restrictions, if any; and property line locations. Verify control points, and establish bench marks. Locate and layout roads, walks, parking areas and all civil structures and all proposed site improvements.

B. Verify locations of underground services, utilities, structures, etc. which may be encountered or affected by the Work.

1.4. PROJECT SURVEY REQUIREMENTS

A. Using datum, the lot lines and present levels have been established as indicated on the Drawings. Other grades, lines, levels and benchmarks, shall be established and maintained by the Contractor, who shall be responsible for them. As work progresses, the Contractor shall layout on forms and floor, the locations of all partitions, walls and fix column centerlines as a guide to all trades. The Contractor shall make provision to preserve property line stakes, benchmarks, or datum point. If any are lost, displaced or disturbed through neglect of any Contractor, Contractor's agents or employee, the Contractor responsible shall pay the cost of restoration.

B. Establish lines and levels, locate and layout, by instrumentation and similar appropriate means, additions, column locations, floor levels, stakes for walks, etc.

C. Provide data to all Subcontractors for their use as applicable.

D. From time to time, verify layouts by same methods.

1.5. RECORDS

A. Maintain a complete, accurate log of all control and survey work as it progresses.

PART 2 – PRODUCTS – THIS SECTION NOT USED

PART 3 – EXECUTION – THIS SECTION NOT USED

END OF SECTION

SECTION 01 73 29
CUTTING AND PATCHING

PART 1 – GENERAL

1.1. SUMMARY

A. This Section includes general procedural requirements for cutting and patching including, but not limited to the following:
   1. Examination
   2. Preparation
   3. Performance
   4. Cleanup and Restoration

1.2. RELATED SPECIFICATION SECTIONS

A. Divisions 02 through 32 Sections for specific requirements and limitations applicable to cutting and patching individual parts of the Work.
B. Division 07 Section "Penetration Fire Stopping" for patching fire-rated construction.

1.3. DEFINITIONS

A. Cutting: Removal of in-place construction necessary to permit installation or performance of other Work.
B. Patching: Fitting and repair work required to restore surfaces to original conditions after installation of other Work.
C. Level Alpha

1.4. QUALITY ASSURANCE

A. Structural Elements: Do not cut and patch structural elements in a manner that could change their load-carrying capacity or load-deflection ratio.
B. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that may result in increased maintenance or decreased operational life or safety.
C. Miscellaneous Elements: Do not cut and patch miscellaneous elements or related components in a manner that could change their load-carrying capacity that results in reducing their capacity to perform as intended, or that may result in increased maintenance or decreased operational life or safety. Some miscellaneous elements include the following:
   1. Water, moisture, or vapor barriers
   2. Membranes and flashings
   3. Exterior curtain-wall construction
   4. Equipment supports
   5. Piping, ductwork, vessels, and equipment
   6. Noise and vibration control elements and systems
D. Visual Requirements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch construction exposed on the exterior or in occupied spaces in a manner that would, in Architect's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.

1.5. WARRANTY

A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during cutting and patching operations, by methods and with materials so as not to void existing warranties.

B. All cutting and patching work performed under this contract shall be warranted like new work as defined by the Specification governing the work.

PART 2 - MATERIALS

2.1. GENERAL

A. Comply with requirements specified within other sections of the Specifications.

B. In-Place Materials: Use materials identical to existing in-place materials. For exposed surfaces use materials that visually match in-place adjacent surfaces to the fullest extent possible.

1. If identical materials are unavailable or cannot be used, use materials that, when installed, will match the visual and functional performance of in-place materials.

PART 3 - EXECUTION

3.1. EXAMINATION

A. Examine surfaces to be cut and patched and conditions under which cutting and patching are to be performed.

1. Compatibility: Before patching, verify compatibility with and suitability of substrates, including compatibility with in-place finishes or primers.
2. Proceed with installation only after unsafe or unsatisfactory conditions have been corrected.

3.2. PREPARATION

A. Temporary Support: Provide temporary support of Work to be cut.

B. Protection: Protect in-place construction and existing conditions during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations. If the failure to protect, or the lack of protection, of in-place construction and/or existing conditions results in damage, the contractor shall be responsible for repair to previous condition.

C. Adjoining Areas: Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.

D. Existing Utility Services and Mechanical/Electrical Systems: Where existing services/systems are required to be removed, relocated, or abandoned, bypass such services/systems before cutting to eliminate interruption to occupied areas.

3.3. PERFORMANCE

A. General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.

1. Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.

B. Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.

1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots as small as possible, neatly to size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
2. Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
3. Concrete or Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
4. Excavating and Backfilling: Comply with requirements in applicable Division 3l Sections where required by cutting and patching operations.
5. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
6. Proceed with patching after construction operations requiring cutting are complete.

C. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other Work. Patch with durable seams that are as invisible as possible. Provide materials and comply with installation requirements specified in other Sections.

D. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate integrity of installation.

3.4. CLEANUP AND RESTORATION

A. Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.

1. Clean piping, conduit, and similar features before applying paint or other finishing materials.
2. Restore damaged pipe covering to its original condition.
3. Floors and Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove in-place floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.
4. Where patching occurs in a painted surface, apply primer and intermediate paint coats over the patch and apply final paint coat over entire unbroken surface containing the patch. Provide additional coats until patch blends with adjacent surfaces.
5. Ceilings: Patch, repair, or re-hang in-place ceilings as necessary to provide an even-plane surface of uniform appearance.
6. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weather tight condition.
7. Cleaning: Clean areas and spaces where cutting and patching are performed. Completely remove paint, mortar, oils, putty, and similar materials.
8. Any smoke and fire caulking that has been disturbed must be replaced by the Contractor as required by code.

END OF SECTION

SECTION 01 74 13
PROGRESS CLEANING

PART 1 – GENERAL

1.1. SUMMARY

A. Throughout the execution of this contract all contractors shall be responsible for maintaining the project site in a standard of cleanliness as described in this specification.

B. All contractors shall also comply with the requirements for cleaning as described in other specifications.

C. Work included in this specification shall include but not be limited to:

1. Safety Cleaning
2. Project Site Cleaning
3. Progress Cleaning
4. Final Cleaning

1.2. RELATED SPECIFICAITONS

A. Section 01 35 00 Special Procedures
B. Section 01 60 00 Product Requirements
C. Section 01 74 19 Construction Waste Management and Disposal
D. Section 01 76 00 Protecting Installed Construction

1.3. QUALITY ASSURANCE

A. The General Contractor (GC) shall conduct daily inspections, more often if necessary, of the entire project site to ensure the requirements of cleanliness are being met as described within these specifications.

B. All contractors shall comply with other regulatory requirements as they apply to waste recycling, reuse, hauling, and disposal requirements of any governmental authority having jurisdiction.

C. The Owner reserves the right to have work done by others in the event any contractor fails to perform cleaning as described within these specifications. The cost of any Owner provided cleaning shall be charged to the contractor through a deduct change order.

PART 2 - PRODUCTS

2.1. CLEANING MATERIALS AND EQUIPMENT

A. The Contractor shall provide all required personnel, equipment, and materials necessary to maintain the required level of cleanliness as described in this specification.

B. Use only cleaning materials and equipment that are compatible with the surface being cleaned, as recommended by the manufacturer, or as approved by the A/E.

C. Use only cleaning materials, equipment, and methods as recommended in the manufacturers care and use guide of the material, finish or equipment being cleaned.

PART 3 - EXECUTION

3.1. SAFETY CLEANING

A. All Contractors shall be responsible for safety cleaning as required by OSHA and other regulatory requirements as applicable.

B. Safety Cleaning shall include but not be limited to the following:
   1. All work areas, passageways, ramps, and stairs shall be kept free of debris, scrap materials, pallets, and other large items that would obstruct exiting routes. Small items such as tools, electrical cords, etc are picked up when not in use.
   2. Form and scrap lumber shall have nails/screws removed or bent over. Lumber shall be neatly stacked in an area designated by the GC.
   3. Spills of oil, grease, and other such liquids shall be cleaned immediately or sprinkled with sand/oil-dry first, then cleaned.
   4. Oily, flammable, or hazardous items shall be stored in appropriate covered containers and storage devices unless actively being used.
   5. Oily, or flammable rags, and other such waste shall only be disposed of in authorized covered containers.
   6. Disposal by burning shall not be allowed at any time.

3.2. PROJECT SITE CLEANING

A. This section applies to the general cleanliness of the project site as a whole for the duration of the execution of this contract.

B. Exterior Project Site Areas
   1. The GC and other Contractors as appropriate shall ensure the following levels of cleanliness are applied to the exterior project site areas.
      a. The overall appearance of the project site is neat and orderly. Defined areas for material storage, material waste, job trailers, and the project area are clean and well maintained.
      b. The construction fence is maintained, erect with no gaps, and properly posted per all regulatory requirements.
      c. All erosion control measures are properly maintained, cleaned, and repaired as necessary.
      d. All loose materials (construction or waste) are properly tied or weighted down to resist blowing.
      e. All construction materials are properly covered with fully functional tarps or plastic wrap, protected from the weather, coverings are tied, strapped, or weighted down to resist blowing.
      f. Dust control is applied as necessary or as required by any regulatory requirement.

C. Interior Project Site Areas
   1. All Contractors shall ensure the following levels of cleanliness are applied to the interior project site areas.
      a. The overall appearance of the project site is neat and orderly. Defined areas for material storage, material waste, and project area are clean and well maintained.
      b. Stored materials are kept in original shipping containers whenever possible. Stored materials not in shipping containers are properly stored and protected according to other applicable specifications.
      c. All scraps and debris shall be properly disposed of as often as necessary to keep work areas, passageways, stairs, and ramps free of debris and clear for emergency exiting.
      d. Boxes, pallets, and other such shipping containers, are broken down, stored in a consolidated area or, disposed of as often as is necessary.
      e. Hand tools, supplies, materials, electrical cords not being used are picked up and sptored in gang boxes, not left as walking hazards in work areas, passageways, etc.

D. Job Trailer
   1. The interior of the job trailer shall be kept clean and available as a work space at all times. The GC shall ensure that the following is provided for within the job trailer:
      a. Meeting space including tables and chairs.
      b. Sufficient space for all contractors to access the official construction documents, provide updates, etc.

3.3. PROGRESS CLEANING

A. This sub-section shall apply to all Progress Cleaning prior to the installation of finishes, fixtures, and trim (IE rough-in).
   1. For the purposes of this section “clean” shall be defined as a level of cleanliness free of dust and other material capable of being removed by use of reasonable effort using a good quality janitor broom and shop-vac.
   2. Daily cleanings shall be conducted by all contractors at the end of the work day as follows:
      a. Debris in excavated areas shall be removed prior to backfill and compaction.
      b. Debris in wall cavities, chase spaces, etc shall be removed prior to enclosing the spaces.

c. Large items shall be properly stored, returned to designated areas, or disposed of as necessary.
d. Loose materials shall be properly secured.
e. Flammable or hazardous materials are properly stored or disposed of.

3. Weekly cleaning shall be conducted by all contractors as designated by the GC. Weekly cleanings shall include all the above for a daily cleaning and other necessary cleaning as designated by the GC.

B. This sub-section shall apply to Progress Cleaning in preparation for the installation of finishes, fixtures, and trim.
a. Surfaces receiving finishes shall be thoroughly cleaned prior to contractors applying finish materials. The GC shall be responsible for inspecting the area and surfaces being cleaned for finish prior to the sub-contractor applying the finish. This shall include but not be limited to the following:
i. Wall surfaces shall be wiped clean of dirt and oily residues, vacuumed free of dust, and shall be free of surface imperfections prior to painting or installing wall coverings.
ii. Metal surfaces shall be wiped clean of dirt and oily residues, and be free of surface imperfections prior to painting.
iii. Flooring shall be broom swept of large and loose items then vacuumed clean of dust and small particles, and damp mopped clean and dried prior to installing any flooring finish. Additional cleaning may be required depending on the preparation requirements recommended by the flooring material manufacturer.

C. This sub-section shall apply to Progress Cleaning after the installation of finishes, fixtures, and trim.
1. For the purposes of this section "clean" shall be defined as a level of cleanliness free of dust and other material capable of damaging or visually disfiguring finished work, finishes, fixtures, and trim.
2. Progress Cleaning at this point in the contract shall be conducted immediately as follows:
a. Dust, dirt, etc shall be swept and vacuumed off of finish flooring and trim.
b. Liquid spills shall be cleaned up according to the spill type. This shall include drips and spills caused by paint, stain, sealants, and other such items.
3. The Contractor(s) at no additional cost to the Owner shall be responsible for replacing any finished work, finishes, fixtures, and trim damaged or disfigured because of inadequate or improper cleaning.

3.4. FINAL CLEANING

A. As noted in Specification 01 29 76 Progress Payment Procedures, Progress Payment Milestone Schedule, Final Cleaning shall not be conducted prior to requesting the 90% contract total progress payment and all of the following shall be complete:
1. All final regulatory inspections including but not limited to Building Inspection Department and Madison Fire Department inspections have been successfully completed.
2. All Quality Management Observation (QMO) reports have been closed out.
3. All Demonstration and Training has been completed.
4. All Attic Stock has been consolidated and located to its designated area
5. All protection for installed construction shall be removed prior to final cleaning by the contractor responsible for providing the protections. This shall include the removal of any adhesive residues left behind from tapes. Contractors shall only use manufacturer authorized cleaning materials for removing adhesives, etc.

B. For the purposes of this section "clean" shall be defined as a level of cleanliness generally provided by skilled cleaners using commercial quality building maintenance equipment and materials.

C. The GC shall be responsible for ensuring that all requirements under this section are being met.

D. General Requirements
1. Employ experienced personnel or professional cleaners for final cleaning as necessary for the areas or equipment being cleaned.
2. Cleaning equipment used shall be commercial grade equipment commonly used by professional cleaners.
3. Cleaning equipment and materials shall be cleaned, rinsed, or replaced to ensure a uniform level of cleanliness is being maintained during the final cleaning. This shall include but not be limited to the following:
a. Vacuum cleaner bags and/or filters are changed and/or cleaned as often as necessary.
b. Dust & wipe down rags are washed, rinsed, or replaced before starting each room.
c. Mopping equipment
i. Mop water for washing shall have cleaning solution added to the amount and temperature per manufacturer's recommendations. Mop washing water shall be replaced often to maintain the levels of the cleaning solution and temperature required.
ii. Mop water for rinsing shall remain clean, clear, and be replaced as often as necessary.

iii. Mop heads shall be rinsed often and replaced as necessary.
iv. Mop heads and buckets shall be thoroughly rinsed with each change of water.
v. Only new mop heads shall be used for rinsing.

E. Refer to all other specifications in this contract for specific requirements regarding final cleaning of finishes, fixtures, equipment, etc.

F. Exterior Cleaning shall include but not be limited to the following:
1. All exterior glazing surfaces have been professionally cleaned and are free of dust and streaking.
2. Metal roofs, siding, and other surfaces shall be clean of dirt and free of splashed or excess materials such as sealants, mortar, paint, etc.
3. All exterior furnishings shall be clean, waste receptacles shall be empty.
4. Paved areas shall be clean, free of dirt, oily stains and other such blemishes
5. Exterior lights and diffusers are clean and free of dust.

G. Interior Cleaning shall include but not be limited to the following:
1. Remove all labels, stickers, tags, and other such items which are not required by code as permanent labels.
2. All interior glazing surfaces, including mirrors, have been professionally cleaned and are free of dust and streaking.
3. All interior surfaces have been cleaned of excess materials such as paint, sealants, etc and have been wiped free of dust.
4. Interior metals, fixtures, and trim have been cleaned free of dust and oily residues
5. Carpet flooring has been thoroughly cleaned; vacuumed free of dust, excess glues and other stains removed per manufacturers use and care instructions.
6. Resilient flooring has been thoroughly cleaned; vacuumed free of dust, excess glues and other stains removed, mopped and buffed per manufacturers use and care instructions.
7. Interior non-occupied concrete floors shall be broom cleaned, vacuumed free of dust, excess glues and other stains removed per manufacturers use and care instructions.
8. Light fixtures, lamps, diffusers and other such items have been dusted and cleaned as necessary.

3.5. CALL BACK WORK

A. The GC shall be responsible for ensuring that any contractor returning to the project site for completion or correction work has re-cleaned and restored the area to the levels described in section 3.4 above upon completion of the work. This shall include but not be limited to the following:
1. The immediate area(s) where work was completed.
2. Adjacent areas where dust or debris may have traveled.
3. Other areas occupied during the completion of the call back work.
4. Path of entrance/exit, to/from the area(s) of work.

END OF SECTION

SECTION 01 74 19
CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART 1 – GENERAL

1.1. SUMMARY

A. This specification includes administrative and procedural requirements for the recycling, re-use, salvaging, and disposal of non-hazardous construction and demolition waste.

B. The General Contractor (GC) shall be fully responsible for complying with all applicable ordinances and other such regulatory requirements during the execution of this contract.

1.2. RELATED SPECIFICAITONS

A. 01 29 76 Progress Payment Procedures
B. 01 31 23 Project Management Web site
C. 01 32 19 Submittals Schedule
D. 01 33 23 Submittals
E. 01 77 00 Closeout Procedures
F. Other Divisions and Specifications that may address the proper disposal of construction or demolition waste as it pertains to work being conducted under that particular specification.

1.3. CITY ORDINANCES

A. There are two (2) Madison General Ordinances (MGO) that the City of Madison has regarding construction and demolition waste.
   1. MGO 10.185, Recycling and Reuse of Construction and Demolition Debris, describes the requirements associated with this ordinance including definitions, documentation requirements, and penalties.
   2. MGO 28.185, Approval of Demolition (Razing, Wrecking) and Removal, describes the requirements associated with applying for and receiving a demolition permit.

B. All City of Madison, Board of Public Works, contracts being conducted by City Engineering, Facility Management, for construction, remodeling, or demolition shall comply with the above ordinances regardless of project type or size.

1.4. DEFINITIONS

A. Clean: Untreated and unpainted material, free of contamination caused by oils, solvents, caulks, and other chemicals.

B. Construction and Demolition Debris: Materials resulting from the construction, remodeling, repair, and demolition of utilities, structures, buildings, and roads.

C. Disposal: Off-site removal of construction and demolition debris and the subsequent sale, recycling, reuse, or deposit in authorized landfill or incinerator.

D. Hazardous: Exhibiting the characteristics of hazardous substance, i.e. ignitability, corrosiveness, toxicity, or reactivity and including but not limited to asbestos containing materials, lead, mercury and PCBs.

E. Non-hazardous: Exhibiting none of the characteristics of a hazardous substance.

F. Nontoxic: Not immediately poisonous to humans or poisonous after a long period of exposure.
G. Recyclable: The ability of a product or material to be recovered at the end of its life cycle and remanufactured into a new product.
H. Recycle: Any process by which construction or demolition debris is diverted from final disposal as solid waste at a permitted landfill and instead is collected, separated, and/or processed into raw materials for new, reused, or reconstituted products; or for the recovery of materials for energy production processes.
I. Recycler: Any recycling facility, transfer station, or other waste handling facility which accepts construction and demolition debris for recycling, or for other transferring to a recycling facility.
J. Recycling: The process of sorting, cleaning, treating, or reconstituting solid waste and other discarded materials for the purpose of preparing the material to be recyclable. Recycling does not include burning, incinerating or thermally destroying waste.
K. Return: To give back reusable items or unused products to vendors for credit.
L. Reuse: Shall mean any of the following:
    1. The on-site use of reprocessed construction and demolitions debris.
    2. The off-site redistribution of a material, for use in the same manner or similar manner at another location.
    3. The use of non-toxic, clean wood as an alternative fuel source.
M. Salvage: To remove a waste material from the project site for resale or reuse by the Owner or others.
N. Toxic: Poisonous to humans either immediately or after a long period of exposure.
O. Trash: Any product or material unable to be re-used, returned, recycled, or salvaged.
P. Waste: Extra materials or products that have reached the end of its useful life or its intended use. Waste includes salvageable, returnable, recyclable and re-useable construction and demolition materials, and trash.

1.5. PERFORMANCE REQUIREMENTS

A. The GC shall develop a Waste Management Plan that results in end-of-project rates for salvage/recycling/reuse of 95 percent (minimum) by weight of the total waste generated by the Work. Percentages may be adjusted on a project by project basis depending on selected LEED goals associated with the project.
B. The GC shall salvage or recycle 100 percent of all uncontaminated packaging materials including but not limited to the following:
    1. Paper
    2. Cardboard
    3. Beverage containers
    4. Boxes
    5. Plastic Sheet and film
    6. Polystyrene packaging
    7. Wood crates and pallets
    8. Plastic pails and buckets
C. Promote a resourceful use of supplies and materials through proper planning and handling. Generate the least amount of waste possible by minimizing errors, poor planning, breakage, mishandling, contamination or other similar factors.
D. Use all reasonable means to divert construction waste from landfills and incinerators through recycling, reuse, or salvage as appropriate.

1.6. SUBMITTALS AND DELIVERABLES

A. The GC shall provide his/her completed Waste Management Plan to the Project Management Web Site as a submittal for review by the Project Architect and City Project Manager.
    1. See item 1.8 below for Waste Management Plan submittal requirements.
    2. The Waste Management Plan shall be completed, submitted, and approved as a pre-requisite for Progress Payment number 1.
    3. Copies of all documentation required by this specification shall be submitted to the appropriate Project Management Web Site Library. Documentation shall be reviewed by the City Project Manager during all Progress Payment reviews for compliance and accuracy.
B. The Waste Management Coordinator shall provide copies of items 1 through 5 below to the appropriate Project Management Web Site Library and shall update the Waste Management Summary Log to reflect the records being submitted.
    1. Records of Donations: Indicate receipt and acceptance of itemized salvageable waste donated to individuals or organizations. Indicate if the organization is tax exempt.

2. Records of Sales: Indicate receipt and acceptance of itemized salvageable waste sold to individuals or organizations. Indicate if the organization is tax exempt.
3. Recycling and Processing Facility Records: Indicate receipt and acceptance of recyclable waste by recycling and processing facilities licensed to accept them. Include manifests, weight tickets, receipts and invoices.
4. Landfill and Incinerator Disposal Records: Indicate receipt and acceptance of waste by landfills and incinerator facilities licensed to accept them. Include manifests, weight tickets, receipts and invoices.
5. Statement of Refrigerant Recovery: The Refrigerant Recovery Technician responsible for recovering refrigerant shall provide the GC with a statement indicating all of the following:
    a. All recovery was performed according to EPA Regulations.
    b. All refrigerant present was recovered; indicate the total quantity recovered by unit.
    c. Date of Recovery.
    d. Name, address, company name, and phone number of technician performing the recovery.
    e. Technician shall sign and date the statement.

C. LEED Submittal: The GC shall provide the following information using the appropriate LEED letter template upon project completion: indicating that the requirements of the credit have been met. *NOTE: This requirement shall only apply to projects having a LEED certification goal.*
1. Total waste material generated.
2. Total waste material diverted by diversion method; recycling, salvage, re-use, etc.
3. Statement that the credit requirements have been met.
4. GC shall sign the letter.

1.7. QUALITY ASSURANCE

A. Waste Management Coordinator: The GC shall be responsible for designating a Waste Management Coordinator. Coordinator may be the GC Supervisor, GC Project Manager or other member of the GC staff having knowledge of proper waste management procedures and all applicable regulations.
B. Regulatory Requirements: comply with all hauling and disposal regulations of authorities having jurisdiction.
C. The Waste Management Coordinator shall comply with Specification 01 31 19 Project Meetings, Section 3.7.B.1 and conduct a Waste Management Conference at the job site. This conference shall be repeated as necessary as additional trades are added to the Work. The conference shall include but not be limited to the following:
1. Identify the Waste Management Coordinator; provide trade contractors with name, phone, and email information.
2. Review and discuss the Waste Management Plan and the roles of the Coordinator.
3. Review the requirements for documenting and reporting procedures of each type of waste and its disposition.
4. Review procedures for material separation; indicate availability and locations of containers and bins.
5. Review procedures for periodic waste collection and transportation to recycling and disposal facilities.
6. Review waste management procedures specific to each trade.

D. Refrigerant Recovery Technician Qualifications: Certified by EPA-approved certification program.

1.8. WASTE MANAGEMENT PLAN

A. Develop a plan consisting of waste identification, a waste reduction work plan, and cost/revenue analysis. Indicate quantities by weight or volume. Use the same units of measure throughout the waste management plan.
1. Waste Identification: Indicate anticipated types and quantities of site clearing, demolition waste, and construction waste that will be generated during the execution of this contract. Include assumptions for the estimates.
2. Waste Reduction Work Plan: The work plan shall consist of but not be limited to all of the following:
    a. Identify methods for reducing construction waste. Re-using, framing and forming materials, re-planning material cuts to minimize waste, etc.
    b. Identify what types of materials will be recycled. Provide lists of local companies that receive and/or process the materials. Include names, addresses, and phone numbers.
    c. Identify what types of materials will be disposed of and whether it will be disposed of in a landfill facility or by incineration facility. Provide lists of local companies that receive and/or process the materials. Include names, addresses, and phone numbers.
    d. Identify methods to be used on site for separating waste including all of the following:
        i. Sizes of containers to be used.
        ii. Labels to be used on the containers to identify the type of waste allowed in the container.

iii. Designated locations on the project site for waste material containers.

B. If project requires demolition incorporate the ordinance required (MGO 28.185) Recycling and Reuse Plan into the Waste Management Plan.

C. Provide all of the following for the Waste Management Coordinator:
1. Name, employer, employer address, phone number, and email address of the designated coordinator.
a. The GC shall also provide this information with the required Project Directory Submittal at the beginning of the project.

D. If at the option of the GC, he/she chooses to contract with a Waste Management Disposal Company that allows comingled and unsorted waste materials, the GC shall include with his/her Waste Management Plan the following:
1. Name, address, phone number, state permitting information, and other pertinent information about the disposal company.
2. Documentation from the disposal company indicating company policies and procedures regarding comingled and unsorted waste materials to include:
a. GC responsibilities on the project site.
b. Disposal company procedures for receiving, sorting, recycling, and disposing of comingled and unsorted waste material.

PART 2 – PRODUCTS – THIS SECTION NOT USED

PART 3 - EXECUTION

3.1. PLAN IMPLEMENTATION

A. Implement the approved waste management plan. Provide adequate containers, storage space, signage, transportation and other items required to implement the plan during the execution of this contract.

B. The GC and Waste Management Coordinator shall be responsible for monitoring and reporting the status of the Waste Management Plan and shall monitor the waste management practices on site as frequently as needed.

C. Train all workers, sub-contractors, and suppliers on proper waste management procedures as appropriate for the work being conducted on the project site.
1. Distribute the waste management plan to everyone concerned within seven (7) days of submittal approval.
2. Distribute the waste management plan to new workers, sub-contractors, and suppliers when they first appear on the project site.
3. Conduct additional training as needed during the execution of the contract to keep a positive focus on the waste management plan.

D. Conduct waste management operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent and used facilities.
1. Designate and label specific areas on the project site necessary for separating materials to be salvaged, recycled, reused, donated, and sold.
2. Comply with any specification or regulatory requirements pertaining to dust, dirt, environmental protection, and noise control.

3.2. HAZARDOUS AND TOXIC WASTE

A. The Owner shall be responsible under separate contract for the removal of any asbestos related materials. All other materials shall be removed by the GC.

B. All hazardous and toxic waste shall be separated, stored, and disposed of according to all applicable regulations.

C. All hazardous and toxic materials on site shall have a Material Safety and Data Sheet (MSDS) available that indicates storage requirements, emergency information, and disposal requirements as necessary.

3.3. GENERAL GUIDELINES FOR ALL WASTES

A. Recycle all paper and beverage containers used by workers, sub-contractors, suppliers and visitors to the project site.

B. All revenues, savings, rebates, tax credits, and other such incentives received from recycling, reusing, or salvaging waste materials shall accrue to the GC unless specified otherwise in the contract documents.

C. Separate recyclable, reusable, and salvageable waste from other waste materials, trash, and debris except where Waste Management Disposal Company allows comingled waste materials, see section 1.8.D above.
1. Separate by type in appropriate containers or designated areas according to the approved waste management plan away from the construction area. Do not store within the drip lines of existing trees.

2. Inspect containers and bins frequently for contamination and inappropriately sorted materials. Remove contaminated materials and resort as necessary.
3. Stockpile bulk materials such as sand, topsoil, stone, etc., on site away from the construction area and without intermixing with other materials. Place, grade, and shape stockpiles to drain surface water, and cover to prevent windblown dust. Do not store within the drip lines of existing trees.
4. Whenever possible store items off the ground and/or protect them from the weather.

3.4. GUIDELINES FOR RECYCLABLE, RE-USABLE, AND SALVAGEABLE WASTE

A. The following guidelines is not a complete or all inclusive list and shall be adjusted as needed by the methods and procedures identified in the Waste Management Plan.
B. Asphalt Paving: Break-up into transportable pieces or grind, transport to an authorized recycling facility.
C. Carpet and Pad: Separate carpet and pad scraps, containerize and transport to an authorized recycling facility.
D. Ceiling System Components: Suspended ceiling system components shall be sorted by material type as follows:
   1. Broken, cut, or damaged tiles shall be containerized, transport to an authorized recycling facility.
   2. Damaged, or cut tracks, trim and other metal grid system components shall be sorted with other metals of similar types, palletize, transport to an authorized recycling facility.
E. Clean Fill: When allowed by Division 31 Specifications; concrete, masonry, stone, asphalt pavement, sand and other such materials may be used as clean fill on this project site. The GC shall verify with the Project Architect, Structural Engineer, or Civil Engineer as necessary prior to using any materials as clean fill. Materials shall be processed, placed, and compacted as specified. If not being re-used on site, transport to an authorized recycling facility.
F. Clean Wood Materials: Including but not limited framing cutoffs, wood sheathing or paneling materials, structural or engineered wood products, and pallets or crates. Clean Wood shall be free of paints, stains, oils, preservatives and other such contaminates.
   1. Useable pieces shall be sorted by type and dimension, bundled and transported off site by the GC or returned to the supplier.
   2. Non-useable pieces shall be palletized or containerized, transport to an authorized recycling facility.
   3. Clean, uncontaminated sawdust and wood shavings shall be bagged, transport to an authorized recycling facility.
G. Concrete: Break-up into transportable pieces, remove all reinforcing and other metals, transport to an authorized recycling facility.
H. Glass Products: Shall be sorted by types, do not include light fixture lamps and bulbs. Products broken in shipment shall be returned to the supplier. Broken or cracked items still in frames shall be taped to prevent further breakage and injury to workers. Transport to an authorized recycling facility.
I. Gypsum Board: Stack large clean pieces on wooden pallets or container, store in a dry location, transport to an authorized recycling facility.
J. Light Fixture Lamps and Bulbs: Fluorescent tubes shall be containerized, transport to an authorized recycling facility.
K. Masonry and CMU: Remove all metal reinforcing, anchors, and ties, clean undamaged pieces and neatly stack on pallets, transport damaged pieces to an authorized recycling facility.
L. Metals: Sort metals by type as follows, this does not include piping:
   1. Architectural metals including but not limited to siding, soffit, and roofing panels shall be sorted by material, palletize or bundle as needed and transport to an authorized recycling facility.
   2. Structural steel, sort by size and type; palletize and transport to an authorized recycling facility.
   3. Miscellaneous metals such as aluminum, brass, bronze, etc shall be sorted by type, containerized or palletized as necessary, transport to an authorized recycling facility.
M. Packaging and shipping materials
   1. Cardboard boxes and containers: Breakdown all cardboard boxes and containers into flat sheets. Bundle and store in a dry location until transported for recycling.
   2. Pallets:
      a. Whenever possible require deliveries using pallets to remove them from the project site.
      b. Neatly stack pallets in preparation for reusing them or providing them to other companies for salvage or re-use.
      c. Break down pallets into component wood pieces that comply with the requirements for recycling clean wood materials. Neatly stack or palletize pieces in preparation for transportation.
   3. Crates: Break down crates into component wood pieces that comply with the requirements for recycling clean wood materials. Neatly stack or palletize pieces in preparation for transportation.
   4. Polystyrene Packaging: Separate and bag materials.

N. Piping and conduit: Reduce all piping and conduit to straight lengths, sort and store by size, material and type. Remove supports, hangers, valves, boxes, sprinkler heads, and other such components, sort and store by size, material and type. Transport to authorized recycling facilities according to material types.

O. Roofing: Roofing materials shall be sorted and containerized by type, transport to authorized recycling facilities according to material types.

P. Site-Clearing Waste: Sort all site waste by type.

1. Only stockpile soils types and quantities required for re-use on the project site. All remaining quantities shall be transported off site to an authorized facility that receives such materials.
2. Brush, branches, and trees with no marketable re-use shall be transported to facilities for chipping into mulch.
3. Trees with a marketable re-use shall be salvaged and transported to facilities that specialize in processing trees for future use as wood products.

3.5. GUIDELINES FOR DISPOSAL OF WASTES

A. The following guidelines shall be adjusted as needed by the methods and procedures identified in the Waste Management Plan.

B. Any waste that is contaminated, organic, or cannot be recycled, re-used, or salvaged shall be legally disposed of in an authorized landfill or incinerator. Disposal methods shall follow all applicable regulatory requirements.

C. No waste material of any kind, except those types designated as clean fill in section 3.4 above, shall be allowed to be buried on the project site at any time.

D. No burning of any kind of waste material shall be permitted on this project site at any time.

E. Paint and Stain: Paints, stains, and their containers shall be disposed of as follows:

1. Whenever possible containers should be thoroughly cleaned immediately after emptying and sorted with as appropriate (metal or plastic) for recycling
2. Empty containers, regardless of type or base material, may be disposed of with lids off with general garbage.
3. Latex paint may be placed with general garbage if properly solidified as follows:
   a. Small amounts (an inch or less in can): Remove lids and allow paint to dry out in the can and harden. Protect cans from rain and freezing.
   b. Large amounts (more than one inch): Mix paint with equal amounts of cat litter, stir and allow to completely dry. Alternate method: mix with commercial paint hardener.
4. Oil-based or combustible paints and stains, regardless of liquid or solid, shall be transported to an approved facility that takes such items such as Dane County Clean Sweep Sites.

F. Treated Wood Materials: Treated wood materials including but not limited to wood that has been painted, stained, or chemically treated shall not be recycled or incinerated.

END OF SECTION

SECTION 01 76 00
PROTECTING INSTALLED CONSTRUCTION

PART 1 – GENERAL

1.1. SUMMARY

A. The purpose of this specification is to provide clear responsibilities, guide lines, and requirements related to providing protection to already installed construction.

B. Already installed construction shall include but not be limited to the following:

1. Any existing site feature such as pavement, curbs, drainage features, utilities, landscaping features (trees, shrubbery, plantings, flagpoles, etc) and other such exterior items not associated with the building whether on or adjacent to the project site.
2. Any existing structure on or adjacent to the project site.
3. Any existing interior work that may be adjacent to the new work including all paths of ingress/egress to areas associated with accessing the Work.
4. Any existing feature of any kind within the public right-of-way that may be on the project site property, adjacent to the project site or across the street from the project site.

C. All contractors shall be familiar with the specifications of their Division of Work for specific requirements on protection of the Work.

D. The requirements noted within this specification do not relieve any contractor of the responsibility for compliance with any code, statute, ordinance, or other such regulatory requirement having jurisdictional authority over these contract documents.

1.2. QUALITY ASSURANCE

A. It shall be the responsibility of every contractor and worker assigned to the project to be diligent in protecting all existing work, and newly installed construction.

B. It shall be the General Contractors' (GC) responsibility under the contract to provide all reasonable protection methods, materials, or precautionary measures required to protect new or existing construction as described in within this specification to the project as a whole.

1. The GC shall be responsible to ensure any damaged new or existing construction is repaired or replaced at no additional cost to the Contract.
2. The GC at his/her discretion may direct other contractors to provide and maintain protection of completed work associated with their Division of Work. I.E.: The carpet installer may be required by the GC to provide carpet protection along traveled paths, ingress/egress, etc after installation.

C. It shall be the responsibility of the GC to ensure that all materials being used to protect installed construction are compatible with, and/or adjacent to, the materials being protected. This shall include but not be limited to the material used as covering, tapes used to fasten protective materials, etc.

1.3. RELATED SPECIFICATIONS

A. Parts of this specification will reference articles within "The City of Madison Standard Specifications for Public Works Construction".
   1. Use the following link to access the Standard Specifications web page:
      http://www.cityofmadison.com/business/pw/specs.cfm
      a. Click on the "Part" chapter identified in the specification text. For example if the specification says "Refer to City of Madison Standard Specification **2**10.2" click the link for Part II, the Part II PDF will open.
      b. Scroll through the index of Part II for specification 210.2 and click the text link which will take you to the referenced text.
      c. City Standard Detail Drawings (SDD) may be located from the index in Part VIII.

B. Section 01 60 00 Product Requirements

C. Section 01 74 13 Progress Cleaning

PART 2 - PRODUCTS

2.1. FENCING MATERIALS AND BARRICADES

A. Except where noted in other areas of the construction documents, the responsible contractor shall provide fencing around the construction site as shown on the Civil Drawings of an appropriate construction as identified below. For temporary barricade situations, the responsible contractor may provide one of the following that sufficiently provide a sturdy physical barrier and/or visual barrier as necessary for the intended application.
   1. Standard orange construction barrels each with a standard rubber base ring and reflective tape
      a. Provide flashing amber lights as needed to increase night time visibility
   2. Steel "T" style fence posts
   3. 4'0" high standard orange construction fence
   4. Traffic barricades
   5. Jersey barriers
   6. Other types of fencing or barricades typically used in the construction industry

B. The contractor responsible for providing the fencing materials and barricades shall also be responsible for maintaining them. This shall include but not limited to fixing damaged fencing, standing up barrels that have been knocked over, realigning barrels, and ensuring flashing lights are fully operational at all times.

C. The following fencing and barricade designations, and their use descriptions shall be used throughout this specification to provide uniformity in describing protection requirements.
   1. Type A, Jersey Barriers, to be used as permanent blocking devices to deny access to alternate project site entrances or exits.
   2. Type B, Traffic Barricades, to be used as temporary blocking devices to deny access to alternate project site entrances or exits.
   3. Type C, Construction Barrels without construction fencing shall be used for lane closures, temporary blocking devices to deny access and the protection of single locations (I.E. identify the location of an access structure) that do not require fencing.
   4. Type D, Construction Barrels with construction fencing where it becomes necessary to surround an object with a complete visual barricade and it is impractical or unacceptable to install fence posts. The surround shall be constructed in such a manner as to provide a buffer zone around and access to the item being protected.
   5. Type E, Steel "T" Fence Posts shall be used at the project lines, as indicated on the Civil Drawings, with six foot galvanized chain link fencing to surround an object with a complete visual barricade and it is practical to install fence posts. The surround shall be constructed in such a manner as to provide a buffer zone around and access to the item being protected. All posts shall be driven installed. Surface mounted posts to only be used for temporary barricades.
   6. Type X, Other fencing or barricade types that may be designated and detailed within the construction documents shall use additional alpha numeric designations.

2.2. EROSION CONTROL PROTECTION

A. Refer to City of Madison Standard Specification 210.2 for authorized materials associated with erosion control materials.

2.3. INTERIOR FINISH PROTECTION MATERIALS

A. Except where noted in other areas of the construction documents or this specification the responsible contractor:
   1. Shall not provide the cheapest or least effective method as an effort to meet any protection requirement.
   2. Shall provide materials of sufficient quality, and durability to provide adequate protection based on the seasonal conditions and the anticipated duration at the time the protection will be needed.
   3. Shall provide sufficient quantity of protection material to protect the construction as needed.

B. Prior to installing protective measures the responsible contractor shall propose to the GC, Project Architect (PA) and City Project Manager (CPM) the proposed plan for protection, materials to be used and samples as necessary.
   1. The PA and CPM reserve the right to disapprove any proposed method and/or material and/or make alternate proposals.

PART 3 - EXECUTION

3.1. GENERAL EXECUTION REQUIREMENTS

A. The GC shall be responsible for ensuring all of the following procedures and requirements are implemented as needed for the duration of the Work performed under this contract.

B. The GC shall also be responsible for the following:
   1. Reporting any incident of damage to existing property, right-of-way, or utility to the CPM immediately upon rendering the incident safe, and notifying emergency response teams, and emergency utility crews as needed.
   2. Conduct a site walk through prior to leaving at the end of each day to assess:
      a. Protection measures are properly in place, provide correction actions as necessary.
      b. Note damage to existing completed work and schedule repair/replacement as needed.
   3. Ensure all contractors and workers are being diligent in protecting existing work, and newly installed construction.

3.2. PROTECT ADJACENT PROPERTIES

A. Whenever possible through the design process the City of Madison shall have previously provided notice to adjacent property owners that work will be occurring on or near their property. The City of Madison shall also have obtained any permanent or temporary easements that may be necessary to complete any Work on adjacent properties.

B. It shall be the responsibility of the GC to do the following for all Work under this contract being performed on or adjacent to the property line:
   1. Contact the adjacent property owner and provide him/her with information on the work to be done, equipment to be used, and estimated duration of the work. Information to be updated and communicated to property owner(s) as construction progresses and site conditions change.
      a. If any adjacent property is a rented or leased space the GC shall also make contact and provide the same information to the tenants.
      b. Determine from the owner and/or tenants if there are any concerns for children, pets, special plantings, or other concerns.
   2. Discuss the following with all contractors performing work on or near the property line.
      a. Work to be completed and timeline.
      b. Concerns of adjacent property owners/tenants from item 1 above.
      c. Which protective measures will be necessary to protect adjacent properties and address the concerns of adjacent property owners/tenants.
   3. Ensure all protective measures are placed and maintained during the execution of Work on or adjacent to the property line. Interact with the adjacent property owners/tenants as needed.

C. Any contractor doing work on or adjacent to the property line shall install and maintain any protective measure identified in the contract documents, this specification, or as directed by the GC.

D. The GC shall be responsible for restoring any damage to structure and property located on or adjacent to the property line.
   1. Restoration shall include but not be limited to repair or replacement using like materials and finishes to its original condition or better.
   2. Restoration of landscaping materials shall include watering of any seed, sod, or other planting of any kind for a reasonable period of time to encourage germination and root development.

E. The GC shall keep the CPM informed directly to any issues pertaining to adjacent property owners and tenants.

3.3. PROTECT LANDSCAPING FEATURES

A. Except where specifically stated in other areas of the construction documents the following minimal protection requirements shall apply under this section.

1. Whenever possible do not install new landscape features until exterior building construction has been completed, equipment such as scaffolding and lifts are no longer needed and have been removed, and heavy equipment operation is no longer required.
2. Whenever possible remove and temporarily store all existing landscape features such as benches, waste receptacles, signage, and other such features that will be within the area of Work that can be removed.
3. Landscape features that cannot be removed such as flag poles, light poles, light bollards, etc. shall be protected with Type D fencing for areas on pavement or Type E fencing for areas on soil.
4. Planting beds shall be protected using Type E fencing around the exposed perimeter of the planting bed as needed.
5. The City of Madison Standard Specification 107.13 shall apply to all tree protection in and around the project site at all times.

3.4. PROTECT UTILITIES

A. The contractor shall be responsible for notifying all utilities to determine emergency response procedures and protection requirements prior to installing any construction protection.

1. This includes requesting utility marking through Diggers Hotline.
   a. Call 811 or 1-800-242-8511 to request a public utility locate
   b. For emergency locate call (262) 432-7910 or (877) 500-9592
2. Contact the Owner and CPM for any available private utility information on the property that may be available prior to calling a private utility locating company.

B. Except where specifically stated in other areas of the construction documents the following minimal protection requirements shall apply under this section.

1. Hydrants, lamp posts, electrical transformers, and other utility pedestals shall be protected with Type D fencing for areas on pavement or Type E fencing for areas on soil. Fence posts shall be located so as to not be directly over the utility main.
2. Storm sewer structures in pavement shall have proper inlet protection according to City of Madison Standard Specification 210.1(g) and Type C Construction Barrels when necessary.
3. Storm sewer structures in turf and other landscaped areas shall have proper inlet protection according to City of Madison Standard Specification 210.1(g) and Type E fencing for areas on soil.
4. Stormwater management features such as greenways, retention/detention ponds, bio-filtration ponds and other such features shall be properly protected according to the appropriate erosion control measure specified on the Erosion Control Plan. See multiple sections of City of Madison Standard Specification 210.1
   a. For the protection of hard to see items such as structures, castings, inlets, etc. in grassy areas provide Type E fencing for areas on soil.
   c. For the protection of storm water management features having special soils and plants such as bio-filtration ponds provide Type E fencing for areas on soil.
5. Other structures and covers including but not limited to cleanouts, wiring hand holes, valve boxes, access structures, grease trap structures, etc shall be protected as follows:
   a. Provide Type E fencing for areas on soil.
   b. When paving operations are complete provide a construction barrel or cone near structures as necessary depending on required heavy construction traffic.

3.5. PROTECT PUBLIC RIGHT OF WAY

A. Except where specifically stated in other areas of the construction documents the following minimal protection requirements shall apply under this section.

1. All public right-of-way (area from behind the sidewalk to the centerline of the street) shall remain open and accessible except during periods of active work. At such times the public right of way shall be properly closed and signed as referenced in City of Madison Standard Specification 107.9.
2. Bus stops and bus stop structures shall remain accessible at all times.
3. Traffic signage and traffic signals, traffic control boxes shall be protected with Type D fencing for areas on pavement or Type E fencing for areas on soil.
   a. Protection at traffic signage/signals shall not obstruct the viewing of the sign/signal for its intended purpose at any time.

B. When additional protection for traffic control is required, the use of barricades, guardrails, lane closures and other such procedures will be detailed within the construction documents.

C. When additional protection for overhead sidewalk cover is required the contract documents shall indicate the specific location and structural requirements of the protective structure.

3.6. PROTECT STORED MATERIALS

A. All contractors shall refer to Specification 01 60 00 Product Requirements for all storage and protection requirements of building materials and products delivered to the site.

3.7. PROTECT WORK - EXTERIOR

A. Provide all temporary services that may be required to protect the installed material from heat, cold, humidity, etc, while materials such as concrete, mortar, sealants, paints, etc, are drying and/or curing.

B. Open trenches, pits, and other such excavations shall be properly covered, lined, or shored as needed during periods of inclement weather to prevent the caving of soils onto existing work in progress. Refer to the appropriate specifications and/or regulatory requirements governing this type of work as necessary.

C. Provide adequate protection at all openings with heavy duty tarps, plastic sheathing, or wood framing and sheathing as needed to protect interior work in progress from inclement weather as needed.

D. Protect exterior finishes of all kinds with heavy duty tarps or plastic sheathing as needed while landscaping is being installed through full germination of seeded areas or installation of filter fabric and mulches to keep dust, dirt, and mud off of finished exterior surfaces.

E. Designate specific curb mounting points and provide wood blocking where small vehicles, skid loaders and other such equipment may need access to areas being landscaped.

F. Provide plywood turning pads for skid loaders to turn on to prevent tire marking on new pavement.

G. Do not permit the parking of vehicles with any kind of fluid leaks to park on new pavement.

H. The contractor shall be responsible for cleaning, repairing, or replacing any completed work or work in progress under this specification as deemed necessary by the CPM without additional cost to the contract.

3.8. PROTECT WORK - INTERIOR

A. The GC shall do all of the following:

1. Provide all temporary services that may be required to protect the installed material from heat, cold, humidity, etc, while materials such as concrete, mortar, sealants, paints, etc, are drying and/or curing.
2. Provide adequate visual and/or physical protection as needed to protect newly completed interior work such as paint, flooring material, sealants, grouts, etc that may be drying and/or curing.
3. Provide adequate space and materials for cleaning boots, tool boxes, supplies, and other items coming into the project site once finish work has begun.
4. Clean dirtied areas and repair/replace damaged areas immediately.

B. The contractors responsible for interior work shall be responsible for protecting their work and finishes from dirt, mud, snow, spills, splatters, and physical damage after installation as follows:

1. Protect vinyl composite, rubber composite, painted/stained concrete, and tiled flooring as follows:
   a. Define foot traffic areas and protect with Ramboard Temporary Floor Protection products as a minimum basis of design or other protection product(s) compatible with installed flooring product if Ramboard is not compatible. Products to be used shall be new.
      i. Tape all edges, seams, etc with a good quality tape that does not leave sticky residue. Do not allow any debris or other material between the installed flooring and the protection material.
      ii. Repair tears immediately, replace worn areas with like material as necessary.
2. Protect carpeted areas as follows:
   a. Define foot traffic areas and protect with a minimum of 6mil, clear, polyethylene sheeting 3 feet wide. Products to be used shall be new.
      i. Tape all edges, seams, etc with a good quality tape that does not leave sticky residue. Do not allow any debris or other material between the installed flooring and the protection material.
      ii. Repair tears immediately, replace worn areas with like materials as necessary.
3. Protect all finished walls in high traffic areas with Ramboard Temporary Wall protection products or approved equal.
      i. Tape all edges, seams, etc with a good quality tape that does not leave sticky residue. Do not allow any debris or other material between the installed flooring and the protection material.

ii. Repair tears immediately, replace worn areas with like materials as necessary.

3. Protect counter tops, cabinets, and other finished surfaces with large sheets of thick cardboard or Ramboard products. Do not allow toolboxes, finish materials, parts and other such items to be placed on finished materials.

C. All protection shall stay in place until the CPM, PA, and GC mutually deem the project is ready for Final Cleaning. The contractors responsible for protecting the work shall be responsible for removing the protection and removing any adhesive residue at that time. Contractors shall only use manufacturer authorized cleaning materials for removing adhesives, etc.

D. Contractors doing work in un-protected areas of finished work shall be required to provide drop cloths and other protection as noted within this specification for the duration of their work.

1. Finished areas shall be sufficiently covered to accommodate all equipment, and materials being used to complete the work being done.
2. Finished areas shall be sufficiently covered to prevent splatters, over spray, etc when doing touch-up work.
3. Contractors who do not provide sufficient protection under this sub-section shall be responsible for any costs associated with cleaning, repairing or replacing already finished construction at no additional cost to the contract.

END OF SECTION

SECTION 01 77 00
CLOSEOUT PROCEDURES

PART 1 – GENERAL

1.1. SUMMARY

A. The purpose of this specification is to clearly define and quantify the requirements associated with closing a City of Madison Public Works Contract for facility related work.

B. All contracts have two distinct but related paths. Each path needs to be properly closed independently in order to close the contract as a whole.

1. Construction closeout is related to closing out all of the Work associated with the construction documents.
   a. It shall be the responsibility of all contractors to be fully aware of the required Work and closeout requirements involved in their individual trades.
2. Contract closeout is related to closing out all of the administrative aspects of the contract in general.
   a. It shall be the responsibility of all contractors to be fully aware of the administrative requirements required by the contract and to provide the supporting documentation required.
3. Construction Closeout must be completed before Contract Closeout can begin.

C. This specification will provide general knowledge associated with the following areas:

1. Construction Closeout Requirements
2. Construction Closeout Procedure
3. Contract Closeout Requirements
4. Contract Closeout Procedure
5. Final Payment and Certificate of Completion

1.2. RELATED SPECIFICATIONS

A. Contractors shall review all references to other specifications including specifications relating to the execution of the Work associated with their Division or Trade.

B.	Section 01 29 76	Progress Payment Procedures
C.	Section 01 31 23	Project Management Web Site
D.	Section 01 32 26	Construction Progress Reporting
E.	Section 01 45 16	Field Quality Control Procedures
F.	Section 01 74 13	Progress Cleaning
G.	Section 01 45 16	Construction Waste Management and Disposal
H.	Section 01 76 00	Protecting Installed Construction
I.	Section 01 78 13	Completion and Correction List
J	Section 01 78 23	Operation and Maintenance Data
K.	Section 01 78 36	Warranties
L.	Section 01 78 39	As-Built Drawings
M.	Section 01 78 43	Spare Parts and Extra Materials
N.	Section 01 79 00	Demonstration and Training
O	Section 01 91 00	Commissioning

P. Other requirements as noted in the contract documents signed by the General Contractor

1.3. DEFINITIONS

A. ***Substantial Compliance***: A letter provided to the City of Madison Building Inspection and signed by the Project Architect indicating that all Work has been completed to a level that would allow Owner Occupancy and that all construction is in compliance with the construction documents. A copy of this letter is also provided to the State of Wisconsin Department of Health and Safety as necessary to clear plan review requirements. This letter does not represent construction closeout.

B. ***Certificate of Occupancy***: The Regulatory letter from the City of Madison Building Inspection Department indicating that all regulatory requirements and inspections have been completed and the building may now be occupied for its intended use. This letter does not represent construction closeout.

C. ***Certificate of Substantial Completion***: A letter provided by the Department of Public Works, signed by the City Engineer indicating that Construction activities are substantially complete. This letter does represent construction closeout and the date of this letter begins the date of the Warranty Period.

D. ***Construction Closeout***: The point in the contract where all contractual requirements associated the execution of the Work as described in the plans, specifications, and other documents have been successfully met and the items described in 1.3.A, .B, and .C above have been completed.

E. ***Final Progress Payment***: The progress payment associated with achieving Construction closeout as described in 1.3.D above. At this point the contractor may request all monies associated with the contract be paid with the exception of held retainage.

F. ***Contract Closeout***: The point in the contract where all contractual requirements associated with the City of Madison, Board of Public Works contract has been successfully met.

G. ***Final Payment***: The final contract payment submittal that may be approved by the City of Madison after all contractual requirements of the Public Works Contract have been met and any remaining monies (retainage) due to the contractor may be released for the Final Payment.

1.4. QUALITY ASSURANCE – CONSTRUCTION CLOSEOUT

A. All contractors shall be responsible for properly executing the construction closeout requirements associated with their Work as described in the specifications governing their Work.

B. The GC shall be responsible for all of the following:

1. Ensuring that all contractors have met the construction closeout requirements associated with their Work.
2. Coordinate the collection of all construction closeout deliverables from all contractors, provide the deliverables to the Project Architect and City Project Manager for review as necessary, and ensure all contractors correct deficiencies of deliverables and resubmit as needed for final acceptance.
3. Ensure all closeout requirements identified in the Construction Closeout Checklist below have been completed as intended by the construction documents.

1.5. QUALITY ASSURANCE – CONTRACT CLOSEOUT

A. The City of Madison, Department of Civil Rights (DCR) monitors contract compliance for construction and procurement contracts to ensure that local, state and federal regulations are followed by contractors working on City of Madison Public Works (PW) projects. DCR will monitor all PW projects from contract award through the final payment at the close of the project. Contractors will be required to submit reporting paperwork throughout the PW project process.

1. Contractors are encouraged to visit the web site identified below for additional information, checklists, forms, and other information provided by DCR as it relates to Contract Compliance.
   http://www.cityofmadison.com/Business/PW/contractCompliance.cfm
2. Questions regarding the process should be directed to parties and offices as identified on the various forms, documents, and instructions or contact:
   City of Madison, Department of Civil Rights
   210 Martin Luther King Jr. Blvd., Room 523
   Madison, WI 53703
   (608) 266-4910

B. All Sub-Contractors have submitted the applicable required documents described in item 1.5.D below to the General Contractor (GC) for Contract Closeout.

C. The GC has submitted the required applicable documents described in item 1.5.D below for all contractors to the appropriate City of Madison Agency per instructions associated with each submittal.

D. The documents required for submittal to the City of Madison for Contract Closeout may include any/all of the items listed below depending on contract type. It is the sole responsibility of all contractors to know and submit the required and complete documentation in a timely fashion.

1. Weekly Payroll Reports
2. Employee Utilization Reports
3. Agent or Subcontractor Affidavit of Compliance with Prevailing Wage Rate Determination
4. Prime Contractor Affidavit of Compliance with Prevailing Wage Rate Determination
5. Documentation required for Small Business Enterprise (SBE) goals
6. Other documents as maybe required or requested through the Finalization Review Process

PART 2 – PRODUCTS – THIS SECTION NOT USED

PART 3 - EXECUTION

3.1. CONSTRUCTION CLOSEOUT CHECKLIST

A. All contractors shall be responsible for reviewing the drawings and specifications within their Divisions of Work to provide a complete and comprehensive list of all Construction Closeout Requirements to the GC.
   1. The checklist shall include all items identified within the construction documents that require any of the following (and examples) prior to moving into Contract Closeout Procedures:
      a. Documents indicating a specified level of performance has been achieved, such as:
         i. Test reports of all types
         ii. Startup reports
      b. Required documentation, such as:
         i. As-builts and record drawings
         ii. Operation and maintenance data
      c. Physical items to be turned over to the owner, such as:
         i. Attic stock
         ii. Keys
      d. Required maintenance completed, such as:
         i. Ducts cleaned
         ii. Filters replaced
      e. Commissioning and LEED related items and submittals
      f. Owner and Maintenance Training

B. Each list shall indicate the title of the closeout requirement, the associated specification of the requirement, the required result or deliverable, the responsible contractor(s), and a column to verify the item has been turned in and completed.

C. The GC shall be responsible for all of the following:
   1. Consolidating all the closeout lists into one master Construction Closeout Checklist.
      a. The checklist shall be in a tabular data format similar to the sample below
   2. Upload the completed checklist to the Contract Closeout-Miscellaneous Documents Library on the Project Management Web Site for review.
   3. Resubmit the checklist as needed after initial reviews have been completed.

D. The GC shall work with all contractors to amend the Construction Closeout Checklist throughout the execution of the project based on changes and modifications as necessary.

Title	Specification	Description	Responsibility	Completed
Quality Management Observation Reports	01 45 16	All QMO reports have been properly responded to, reviewed and closed by the CPM.	All, GC	
As-Built Drawings	01 78 39	As-Built drawings have been reviewed and accepted per the specification	All, GC	
Testing and Balancing of HVAC	23 09 23	Provide final TnB reports indicating design performance has been achieved	HVAC	

3.2. CONSTRUCTION CLOSEOUT REQUIREMENTS

A. The timely submittal or completion of closeout requirements shall go hand in hand with the Progress Payment Milestone Schedule that can be found in Specification 01 29 76 Progress Payments. No payments shall be made until all requirements for that payment have been met.
   1. The GC and all major Subcontractors, PA, and CPM, shall review all requirements for Construction/Contract Closeout during two (2) special meetings.

a. The first meeting shall be held at the 50% Contract Total Payment milestone. This meeting shall discuss the requirements associated with various construction/contract closeout documentation and events when they are due with respect to progress payments.
b. The second meeting shall be held at the 70% Contract Total Payment milestone. This meeting shall review the contractors progress regarding the closeout checklist, begin making plans for upcoming deadlines such as scheduling training, where to put attic stock, and when they are due with respect to progress payments.

2. The GC, PA, and CPM, shall utilize the Construction Closeout checklist to ensure that all construction closeout requirements have been met.

3.3. CONSTRUCTION CLOSEOUT PROCEDURE

A. Upon successful completion and final acceptance of all Construction Closeout Requirements the GC may submit to the CPM and PA the request for Final Progress Payment (100% contract total, less retainage).

B. The PA will confirm with the design consultants, CPM, and other City of Madison staff that all requirements of the Work have been completed and will do the following:
1. Approve the final progress payment application
2. Provide the required signed payment documents to the CPM
3. Provide the required Letter of Substantial Compliance to the following as required:
a. State Safety and Building Division
b. Local Building Inspection office
c. GC
d. CPM

C. The CPM shall draft the City Letter of Substantial Completion for signature by the City Engineer. This letter shall state any of the following that may still be tied to the contract and/or warranty:
1. Indicate that the date of the letter shall also be the beginning of the Warranty period.
2. Indicate any allowed due outs, reasons for them, and anticipated dates of finalization.
a. QMO issues such as off season testing of equipment
b. Off season training of equipment

D. The GC and all subcontractors shall finalize all warranty letters associated with their Work using the date noted on the City Letter of Substantial Completion, and provide the CPM with all warranties as described in Specification 01 78 36 Warranties. Upon receipt and final approval of the Warranties the CPM may initiate final processing of the Final Progress Payment (100% contract total, less retainage).

3.4. CONTRACT CLOSEOUT REQUIREMENTS

A. The GC and all sub-contractors shall follow all requirements associated with documenting contract compliance and provide documentation as required or requested by DCR or PW staff. All contractors are encouraged to stay current with submissions of the following documentation:
1. Weekly Payroll Reports no later than the Progress Payment equal to 50% of the contract total.
2. Employee Utilization Reports
3. Agent or Subcontractor Affidavit of Compliance with Prevailing Wage Rate Determination
4. Prime Contractor Affidavit of Compliance with Prevailing Wage Rate Determination
5. Documentation required for Small Business Enterprise (SBE) goals
6. Other documents as maybe required or requested through the Finalization Review Process

B. Near the Progress Payment equal to 80% of the contract total the GC shall request in writing a Finalization Review. At that time DCR or PW staff shall prepare a report of all contract documentation submitted to date. A list of missing items or outstanding issues will be emailed to the GC. <u>No additional follow-up will be generated by DCR or PW Staff</u>.

3.5. CONTRACT CLOSEOUT PROCEDURE

A. The Contract Closeout Procedure will not begin until the Construction Closeout Procedure has been completed.

B. When the GC feels he/she has successfully met all of the Contract Closeout Requirements associated with Section 3.3 above the GC may submit to the request for Final Payment to the CPM.

C. The CPM shall sign and submit the Final Payment request for processing.

D. DCR and PW staff shall do a complete review of all documentation associated with item 3.3.A above.

E. The GC shall be notified directly by DCR or PW Staff of any documentation that may still be missing, have incomplete information, or other outstanding issues. It shall be the responsibility of the GC to continue follow-up with DCR and PW staff until all documentation has been successfully submitted and accepted.

F. When all required documentation associated with Contract Closeout has been successfully submitted and accepted by DCR and PW Staff the City of Madison shall process the Final Payment of any remaining monies including retainage.

END OF SECTION

SECTION 01 78 13
COMPLETION AND CORRECTION LIST

PART 1 – GENERAL

1.1. SUMMARY

A. The City of Madison has developed a multi-faceted Quality Management Program that begins with contract signing and runs through contract closeout to ensure the best quality materials, workmanship, and product are delivered for the contracted Work.

1. The Progress Management Web Site is a Construction Management tool that provides contractors, consultants, and staff a single on-line location for the daily operations and progression of the Work.
2. The Quality Management Observation (QMO) is an ongoing observation of the construction process as it progresses. The City of Madison does not use a "Punch List" or "Corrections List" as it is typically known throughout the construction industry. The QMO process acts as an "in progress punch list". Work identified as not in compliance with the contract documents by the Owner, Owner Representatives, Owner Consultants, etc. shall be resolved immediately at the Contractor's expense. Unresolved issues will be subject to withholding of progress payment(s) until completed.
3. Very stringent expectations are tied to Construction Closeout and Contract Closeout procedures. Specific milestones throughout the project need to be met and the milestones are tied to the Progress Payment Schedule.

B. All contractors shall be required to review the specifications identified in Section 1.2 below, and other related specifications identified therein to become familiar with the terminology and expectations of this City of Madison Public Works contract.

1.2. RELATED SPECIFICATIONS

A. Section 01 29 76 Progress Payment Procedures
B. Section 01 31 23 Project Management Web Site
C. Section 01 45 16 Field Quality Control Procedures
D. Section 01 77 00 Closeout Procedures

PART 2 – PRODUCTS – THIS SECTION NOT USED

PART 3 – EXECUTION – THIS SECTION NOT USED

END OF SECTION

SECTION 01 78 23
OPERATION AND MAINTENANCE DATA

PART 1 – GENERAL

1.1. SUMMARY

A. The purpose of this specification is to provide clear responsibilities and guide lines related to providing well documented and complete Operation and Maintenance (O&M) Data related to general facility use, equipment, systems, finishes, and materials to City of Madison Staff (Owner, Owner Representatives, Maintenance, and Custodial Personnel) as needed.

B. Operation and Maintenance Data shall apply to both of the following categories except where specific requirements are noted under their separate titles as follows:

1. Operation and Maintenance Data: Generally shall mean the owner manual that provides information on start-up, shut-down, operation, troubleshooting, maintenance, parts, and other such documentation as it pertains to all equipment and systems installed under the Work.
2. Use and Care instructions: Where applicable use and care instructions shall also be considered O&M for such things as flooring, tile, partitions, and other such finishes and trim related items, installed under the Work.

1.2. RELATED SPECIFICATIONS

A. Section 01 29 76 Progress Payment Procedures
B. Section 01 31 23 Project Management Web Site
C. Section 01 77 00 Closeout Procedures
D. Section 01 78 13 Completion and Correction List
E. Section 01 78 19 Maintenance Contracts
F. Section 01 78 36 Warranties
G. Section 01 79 00 Demonstration and Training
H. Section 01 91 00 Commissioning
I. Other Divisions and Specifications that may address more specifically the requirements for O&M Data.

1.3. QUALITY ASSURANCE

A. All O&M Data shall meet the requirements identified in Section 1.4 below.

B. All contractors shall provide O&M Data for each piece of equipment, system, or finish installed during the installation of the Work. O&M Data shall be provided to the General Contractor (GC) for verification and submittal.

C. The GC shall be responsible for receiving all required O&M Data files from all contractors for verifying that all files submitted meet the requirements in Section 1.4 below.

1.4. O&M DATA REQUIREMENTS

A. O&M Data shall be provided in digital PDF format as follows:

1. PDF files shall be complete first generation consumer useable editions of PDF documents as provided by any of the following:
   a. Product manufacturer
   b. Supplier of product
   c. Product manufacturer internet site

2. Acceptable PDF files shall have the following functionality:
    a. Word searchable
    b. Key areas are bookmarked
    c. Table of Contents and/or Index linked to content is preferred whenever possible.
3. Scanned printed material, with word searchable capabilities, saved as a PDF, is not acceptable and will be rejected without further review.

B. O&M Data shall include but not be limited to the following manufacturers' published information as appropriate for the equipment, system, material, or finish:
1. Installation instructions
2. Parts lists, assembly diagrams, explosion diagrams
3. Wiring diagrams
4. Start-up, shut-down, troubleshooting and other related operation procedures
5. Lubrication, testing, parts replacement, and other such maintenance procedures
6. General use, care, and cleaning instructions
7. Special precautions and safety requirements
8. A list of certified equipment vendors, service companies, parts suppliers including company name, address, and phone number
9. A list of the recommended spare parts to have on hand at all times
10. A list by type of all recommended lubes, oils, packing material, and other maintenance supplies
11. Copies of final test reports, balance reports, and other related documentation
12. Warranty information for equipment and systems

1.5. O&M DATA SUBMITTALS

A. O&M Data shall be prepared as identified in this specification and shall be submitted for review as per the schedule identified in Specification Section 01 29 76, Progress Payment Procedures.

B. O&M Data Draft submittals will be reviewed for content, procedure, and compliance only. A general critique with recommendations for improvement will be made but re-submittals will not be required.

C. O&M Data Final submittals will be reviewed for content, procedure, and compliance. Re-submittals will be required until such time as each submittal is accepted.

NOTE: Acceptance of O&M Data Final submittals is required to be complete prior to scheduling and conducting owner related training and construction closeout.

PART 2 – PRODUCTS – THIS SECTION NOT USED

PART 3 - EXECUTION

3.1. O&M DATA PREPARATION - GENERAL

A. All contractors shall prepare O&M Data for draft and final submission as follows:
1. Obtain digital PDF files for each piece of equipment, system, material or finish as described in Sections 1.4.A.1 and 1.4.A.2 above.
2. Verify that all information as described in Section 1.4.B above is included with the PDF file. Obtain missing information as necessary for a complete submittal.

B. Rename each individual PDF file as follows.
1. Do not use special characters such as #, %, &, /, etc. These characters are reserved by the Project Management Web Site software the City of Madison uses; however the under-score (or under-bar) '_' is an allowed character.
2. Use the following format and examples for renaming your file:
    a. Format: ***Equipment name_What_NAKOOSA TRAIL FLEET/FIRE/RADIO SHOP FACILITY_Contract number_Year***
        i. *Equipment Name* represents the name of any equipment, system, material or finish as designated in the Contract Documents.
        ii. *What* represents what the file is about
        iii. *NAKOOSA TRAIL FLEET/FIRE/RADIO SHOP FACILITY* represents the title of the project or contract. A shortened version of the title may be identified by the City Project Manager to be used by all contractors.
        iv. *Contract number* is the specific identification number the Work was bid under and appears on the plan set title sheet and in each sheet title block

v. *Year* represents the year the contract will be closed out

b. Examples of file names

i. AHU 2_Operation Manual_Fire Admin_1234_2015

ii. CPT 2_Use and Care_MPD West_9876_2011

C. All contractors shall submit the completed digital PDF files to the GC in sufficient time for the GC to meet the O&M Data submission deadlines as described in Specification Section 01 29 76, Progress Payment Procedures.

D. O&M Data shall be submitted and reviewed as described in sections 3.2 and 3.3 below.

3.2. O&M DATA DRAFT SUBMITTAL

A. All contractors shall prepare and submit the following for an O&M Data Draft review submittal:

1. Prepare three (3) complete O&M Data file samples as described in section 3.1 above.
2. Review all specifications within his/her Division of Work and prepare a complete O&M Data checklist listing all equipment, systems, materials, or finishes. Checklist shall be in tabular form similar to the example below and shall indicate the title (and plan identifier when applicable) of the O&M Data, the associated specification, and a column to verify the item has been turned in and completed.

B. The GC shall be required to review all contractors' samples and checklists for compliance with this specification and shall return any to the originating contractor that are insufficient for re-submittal.

1. When acceptable to the GC, he/she shall upload each O&M Data draft submittal file to the O&M Draft library on the Project Management Web Site.

C. The Project Architect, City Project Manager, CxA, Consulting Staffs and Owner Representatives shall review the O&M Data draft submittals and checklist within fifteen 15 working days as follows:

1. Provide general critique comments by Division on O&M Data samples submitted. Critique is intended to provide all contractors with information on strengths and weaknesses of their submittals.
   a. Re-submittal of the O&M Data samples will not be required.
2. Review in detail the O&M Data Checklist for completeness. Provide comments as needed.
   a. Re-submittal of the O&M Checklist will be required until accepted.

Title	Specification	Completed
Overhead Door Operator	08 36 00	
Air Handling Unit (AHU-3)	23 00 00	
Water Heater (WH-1)	22 30 00	

3.3. O&M DATA FINAL SUBMITTAL

A. All contractors shall prepare and submit the following for an O&M Data Final review submittal:

1. Prepare complete O&M Data files as described in Section 3.1 above according to their approved checklist as described in Section 3.2 above.
2. Submit completed checklist and all final O&M Data files to the GC for final submittal review.

B. The GC shall be required to spot check all contractors' submittals for completeness against their checklists and for compliance with this specification and shall return any to the originating contractor that are insufficient for re-submittal.

1. When acceptable to the GC, he/she shall upload each O&M Data final submittal file to the O&M Final library on the Project Management Web Site.

C. The Project Architect, City Project Manager, CxA, Consulting Staffs and Owner Representatives shall review the O&M Data final submittals and checklist within fifteen (15) working days as follows:

1. Review the files submitted against the checklist and request any missing files through the GC.
2. Review in detail all of the O&M Data files for completeness.
   a. Submittals shall be accepted or rejected as individual PDF files.
   b. Contractors shall re-submit entire O&M submittal if any portion is rejected or incomplete.

3.4. CONSTRUCTION CLOSEOUT

A. All contractors shall review Specification 01 77 00, Closeout Procedures and Specification 01 79 00 Demonstration and Training.

1. Acceptance of all final O&M Data submittals is required prior to scheduling Demonstration and Training Sessions.
2. Completion of all Demonstration and Training Sessions is required to receive the Substantial Compliance for Occupancy Certificate, and to begin Construction Closeout procedures.

END OF SECTION

SECTION 01 78 36
WARRANTIES

PART 1 – GENERAL

1.1. SUMMARY

A. The purpose of this specification is to provide clear responsibilities and guide lines related to providing all Warranties and Guarantees related to the Work, workmanship, materials, equipment, and other such items required by the Construction Documents.

B. Manufacturers' disclaimers and limitations on product warranties do not relieve any contractor of the warranty on the Work that includes the product.

C. Manufacturers' disclaimers and limitations on product warranties do not relieve suppliers, manufacturers and any contractor required to provide special warranties under the contract documents.

1.2. RELATED SPECIFICATIONS

A. Section 01 29 76 Progress Payment Procedures
B. Section 01 31 23 Project Management Web Site
C. Section 01 77 00 Closeout Procedures
D. Section 01 78 23 Operation and Maintenance Data
E. Section 01 91 00 Commissioning
F. Other Divisions and Specifications that may address more specifically the requirements for Warranties related to the installation of all items and equipment installed under the execution of the Work.

1.3. DEFINITIONS

A. See specification 01 77 00 for the definitions of the following terms that may also be used in this specification:
1. Substantial Compliance
2. Certificate of Occupancy
3. Certificate of Substantial Completion
4. Construction Closeout
5. Contract Closeout

B. Emergency Repair: The Owner or Owner Representative reserves the right to make emergency repairs as required to keep equipment or materials in operation or to prevent damage to property and injury to persons without voiding the contractors warranty or bond or relieving the contractor of his/her responsibilities during the warranty period.

C. Installer: The company or contractor hired to install a finished product that was manufactured and supplied specifically for the Work within this contract. The Installer may or may not be the same company that supplied the product. See the definition for supplier.

D. Supplier: Any company that makes a specific finished product for the Work from information within the Contract Documents. Examples of suppliers would include custom cabinets, steel stairs and railings, etc. A supplier would not be a company that distributes items manufactured by others such as an electrical or plumbing supplier.

E. Warranty: A written guarantee from the manufacturer to the owner on the integrity of a product and its installation, and the manufacturers' responsibility to repair or replace the defective product or components within a specified time from the date of ownership. Warranty may also be used interchangeably with Guarantee. The following warranty types may be part of any specification within the Work associated with the Construction Documents:

1. Expressed Warranty: A warranty that provides specific repair or replacement for covered components of a product over a specified length of time.
2. Implied Warranty: A warranty that is not stated explicitly by a seller or manufacturer that the product is merchantable and fit for the intended purpose.
3. Standard Product Warranty: Preprinted written warranties published by individual manufacturers for particular products and are specifically endorsed by the manufacturer to the Owner. Standard warranties may be for any amount of time but shall not be for anything less than one (1) year from the warranty date.
4. Special Warranty: A written warranty required by the Contract Documents either to extend the time limit provided under a standard warranty or to provide greater rights to the Owner.

F. Warranty Date: The effective date that begins all warranty periods required for products, installations, and work-manship associated with the execution of the Work for this contract. The Warranty Date shall be set by the CPM.

G. Related Damages and Losses: When correcting failed or damaged Warranted Work, remove and reinstall (or replace if necessary) the construction that has been damaged as a result of the failure or the construction that must be removed and replaced to obtain access for the correction of Warranted Work.

H. Reinstatement of Warranty: When Work covered by a warranty has failed and been corrected reinstate the warranty by a new written endorsement. The reinstated warranty shall be equal to the original warranty with an equitable adjustment for depreciation unless specifically noted otherwise in a specification.

I. Replacement Cost: All costs that may be associated with Work being replaced under warranty including but not limited to the following:
1. Related damages and losses
2. Labor, material and equipment
3. Permits and inspection fees
4. This shall be regardless of any benefit the Owner may have had from the Work through any portion of its anticipated useful service life.

J. Replacement Work: All materials, products, required labor, and equipment necessary to replace failed or damaged warranted to an acceptable condition that complies with the requirements of the original Construction Documents.

K. Owners Recourse: Expressed warranties made to the Owner are in addition to implied warranties and shall not limit the duties, obligations, rights, and remedies otherwise available under the law. Expressed warranty periods shall not be interpreted as limitations on the time in which the Owner can enforce such other duties, obligations, rights, and remedies.
1. Rejection of Warranties: The Owner reserves the right to reject any warranty and to limit the selection of products with warranties not in conflict with the requirements of the contract documents.
2. Where the Contract Documents require a Special Warranty or similar commitment on the Work or product, the Owner reserves the right to refuse acceptance of the Work until the Contractor presents evidence the entities required to countersign such required commitments have done so.

1.4. GENERAL CONTRACTORS RESPONSIBILITIES

A. The General Contractor (GC) shall be responsible to remedy, at his/her expense, any defect in the Work and any damage to City owned or controlled real or personal property when the damage is a result of:
1. The GC's failure to conform to Contract Document requirements.
   a. Any substitutions not properly approved and authorized may be considered defective.
2. Any defect in workmanship, materials, equipment, or design furnished by the GC or Sub-contractors.

B. All warranties as described in this specification and these Contract Documents shall take effect on the date established by the CPM, as noted in Section 1.3F above.
1. All warranties shall remain in effect for one (1) year thereafter unless specifically stated otherwise in the Contract Documents or where standard manufacturer warranties are greater.

C. The GC's warranty with respect to Work repaired or replaced, including restored or replaced Work due to damage, will run for one (1) year from the date of Owner Acceptance of said repair or replacement.
1. This shall be regardless of any benefit the Owner may have had from the Work through any portion of its anticipated useful service life.

D. Warranty Response
1. See Section 3.5 of this specification.

PART 2 – PRODUCTS - THIS SECTION NOT USED

PART 3 - EXECUTION

3.1. WARRANTY CHECKLIST

A. All contractors shall be responsible for reviewing the drawings and specifications within their Divisions of Work to provide a complete and comprehensive list of all Warranty Requirements to the GC.

B. Each list shall indicate the title (and plan identifier when applicable) of the warranted item, the associated specification of the warranted item, the terms of the warranty (years), and a column to verify the item has been turned in and completed.

C. The GC shall be responsible for all of the following:

1. Consolidating all the warranty lists into one master Warranty Checklist.
    a. The checklist shall be in a tabular data format similar to the sample below.
2. Upload the completed checklist to the Submittal Library on the Project Management Web Site for review. See Specification 01 33 23 Submittals for more information on this procedure.
3. Resubmit the schedule as needed after initial reviews have been completed.

D. The GC shall work with all contractors to amend the Warranty Checklist throughout the execution of the project based on changes and modifications as necessary.

Title	Specification	Terms	Completed
Overhead Door Operator	08 36 00	MFR 2yr	
Exterior Bench and Trash Receptacles	12 93 00	MFR 3 year warranty on finish	
Kitchen Sink (SK-1)	22 42 00	MFR 5 year	
Disposal (D-1)	22 42 00	MFR 7 year parts and in-home service	
Toilet (WC-1)	22 42 00	MFR 1 year limited	

3.2. LETTERS OF WARRANTY

A. All letters of warranty shall be in a typed letter format and provide the following information:

1. The letter shall be on official company stationary including company name, address, and phone number.
2. Indicate NAKOOSA TRAIL FLEET/FIRE/RADIO SHOP FACILITY, contract number, and contract address the warranty is for on the reference line.
3. Provide a description of the warranty(ies) being provided.
    a. Include Division, Trade, or Specification information as necessary.
    b. Only combine warranties of related Divisional Work together. Create new letters for additional Divisions as necessary.
4. Indicate the effective Warranty Date. As noted in Section1.3.F above, the Warranty Date shall be the date the Certificate of Substantial Completion was signed by the City Engineer.
5. Contractor Letters of Warranty shall only be signed by a principal officer of the company.
6. After signing the letter provide the GC with a high quality color scanned image in PDF format and the original signed letter.

B. The GC shall be responsible for the Final Warranty submittal as identified in Section 3.4 below.

C. The GC shall obtain letters of warranty from all of the following:

1. The General Contractor shall provide warranty letters for all Work that was self performed under the contract documents, identify all trades or Divisions of Work.
2. All Sub-contractors shall provide warranty letters for Work performed under the contract documents; identify all trades or Divisions of Work.
3. Suppliers, as required by other specifications within the Construction Documents where the manufacture of a specific product unique to the Work of this contract was required.
    a. The terms and conditions of the Supplier Letter of Warranty shall be as defined by the specifications associated with the Work but shall not be less than the industry standard of repair, or replace defective materials and workmanship within one (1) year of the warranty date.
    b. When the supplier is also the installer a single written letter may be submitted identifying both the warranty for the manufacture of the product and the warranty for the installation of the product.
4. Installers as required by other specifications within the Construction Documents where the installation of a specific product unique to the Work of this contract was required.

1. The terms and conditions of the Installer Letter of Warranty shall be as defined by the specifications associated with the Work but shall not be less than the industry standard of repair, or replace defective materials and workmanship associated with the installation of the product within one (1) year of the warranty date.

5. Special Letters of Warranty shall be required from any contractor, supplier, installer or manufacturer who agrees to provide warranty services required by any Division Specification in excess of their Standard Product Warranty.

3.3. STANDARD PRODUCT WARRANTY

A. All contractors shall be responsible for collecting and providing copies of all standard product warranties for commercially available products purchased and installed under this contract.

B. Only one copy of the manufacturers' standard warranty needs to be submitted as representative for all quantities of the same model number used throughout the Work.

C. Provide the manufacturers certificate, letter, or other standard documentation for each Standard Product Warranty submitted as follows:

1. Whenever possible a PDF version of the document shall be used.
   a. If a PDF version is used all additional information shall be completed using simple PDF editing tools such as text boxes, highlight, etc.
   b. If a PDF version is not available and an original document is furnished the additional information shall be neatly hand written and highlighted on the document in such a fashion so that it does not obscure any part of the written warranty.
2. Provide the following additional information on each warranty document:
   a. Contract warranty date.
   b. Provide the manufacturer name and model number of the product if not specified within the warranty.
      i. Where the manufacturer name and model number is specified within the warranty it shall be highlighted for visibility.
   c. Provide the plan identifier (LAV-1, WC-2, etc) when applicable.

D. Each completed warranty shall be saved as a digital PDF. The file shall be named using the specification number and item description. I.E. 22 42 00 Toilet (WC-1).pdf
   a. Where an original certificate was furnished provide a high quality colored scan of the completed document with the additional information. Save the scanned image in PDF format and use the same naming convention as indicated above.

E. Provide all PDF files and any original documents to the GC for final consolidation to be provided to the Owner.

3.4. FINAL WARRANTY SUBMITTAL

A. The GC shall receive all required warranties (digital PDF and any original documents) from all contractors, suppliers, installers and manufacturers.

B. The GC shall inventory all received warranties with the Warranty Submittal List to ensure all required warranties have been received and all warranty periods are correct according to the specifications.

C. Provide with each Operation and Maintenance Manual a complete copy of any associated warranty.

D. Scan all warranties into a single organized electronic PDF file as follows:
1. Organize the PDF file into an orderly sequence based on the table of contents of the Specifications.
2. Provide a typed Table of Contents for the entire file at the front of the document.
3. Provide bookmarks and links to each individual PDF to enable quick navigation through the PDF document.

E. Upload the warranty submittal to the appropriate document library on the Project Management Web Site for review by the PA and CPM.

F. Correct any deficiencies or omissions and resubmit as necessary.

3.5. WARRANTY NOTIFICATION, RESPONSE, EXECUTION AND FOLLOW-UP

A. Warranty Notification:
1. The City of Madison, Project Management Web Site, uses an email notification system for all warranty related issues. The GC will be required to provide, and keep current during the warranty period, a minimum of two (2) email addresses and phone numbers of current employees to receive email notifications and provide response regarding Work associated with these construction documents.
   a. In the event a Warranty Issue is deemed by the City of Madison to be an emergency, the GC shall first receive a phone call with a follow-up email from the Project Management Web Site.

b. The Contract Closeout-Warranty Issue Library on the Project Management Web Site uses a form for each warranty issue that is logged into the system.
   i. The GC shall open each warranty issue form, review the issue description and any attached documentation or photos.
   ii. The GC shall also notify any other sub-contractor, supplier, or installer that may be required to review the warranty issue.

B. Warranty Response:
1. The GC shall upon notification by the City of Madison provide warranty response as follows:
   a. Critical Systems or equipment: Where damage to equipment and other building components, or injury to personnel is probable provide immediate emergency shut-down information and an on-site response team as soon as possible but in no case shall on-site response exceed 24 hours.
   b. For non-critical responses where damage or injury is unlikely provide on-site response no later than the next business day.
   c. Where Technical Assistance support is part of the written warranty provide all assistance necessary via phone, text, or internet systems as indicated by the warranty. If issues cannot be resolved provide on-site response no later than the next business day.
   d. If the request cannot be supported in sufficient time as outlined above the Owner (or Owner Representative) reserves the right to contact other contractors or service companies having similar capability to expedite the repair or replacement and shall invoice all associated costs to the Owner back to the GC.

C. Warranty Execution:
1. The GC shall provide all repairs or replacements as necessary to restore broken or damaged Work to the original level of acceptance as intended by the Contract Documents.
   a. Provide all materials, equipment, products, and labor necessary to complete the repair or replacement associated with the Warranty Issue.
   b. Provide all cleaning services as may be required before, during, and after the repair or replacement as per Specification 01 74 13 Progress Cleaning.
   c. Provide any protection necessary for existing construction as per Specification 01 76 00 Protecting Installed Construction
   d. Provide new letters of warranty when required.

D. Warranty Follow-up:
1. Logged Warranty Issues:
   a. The GC shall provide complete documented responses of all logged Warranty Issues. Responses shall provide a description of work completed, by who, inclusive dates, and photos of completed or repaired work.
      i. Provide call back response if work is not acceptable.
   b. The City Project Manager shall review the submitted response documentation and do a field inspection if necessary.
      i. If work is not acceptable, contact GC to review details and expectations of the repair as needed.
      ii. If work is acceptable close the Warranty Issue.
2. Quarterly Warranty Reviews:
   a. The GC shall be responsible for scheduling quarterly on-site review with all of the following:
      i. City Project Manager, and other City staff as needed
      ii. Owner and Owner Tenant Representative
      iii. Commissioning Agent (CxA)
      iv. Plumbing, Heating, Electrical Sub-contractors
      v. Other Sub-contractors that may be responsible for open Warranty issues
   b. Quarterly reviews shall be scheduled at 3 months, 6 months, and 11 months after the effective date of the warranty. The review meetings shall:
      i. Review the status of all open Warranty Issues, determine course of action and estimated date of completion.
      ii. In the appropriate quarter, provide shut-down, start-up, testing, and training of off-season equipment as required by the contract documents.
      iii. The 11th month review shall review all open Warranty Issues, final plan for resolution, and all Warranty Issues where a new letter of warranty may have been issued.

END OF SECTION

SECTION 01 78 39
AS-BUILT DRAWINGS

PART 1 – GENERAL

1.1. SUMMARY

A. This specification is intended to provide clear guidelines and identify the responsibilities of all contractors as they pertain to City of Madison contract procedures regarding the accurate recording of the Work associated with the execution of this contract. This shall include but not be limited to work that will be hidden, concealed, or buried.

B. Each contractor shall be responsible for maintaining an accurate record of all installations, locations, and changes to the contract documents during the execution of this contract as it may relate to their specific division or trade.

C. The General Contractor (GC) shall be responsible for ensuring all contractors provide as-built record information to the Master As-Built Document Set as described in this specification.

1.2. RELATED SPECIFICAITONS

A. 00 31 21 Survey Information
B. 01 26 13 Request for Information
C. 01 31 23 Construction Bulletin
D. 01 32 33 Photographic Documentation
E. 01 26 63 Change Orders
F. 01 29 76 Progress Payment Procedures
G. 01 31 23 Project Management Web Site
H. 01 33 23 Submittals
I. 01 77 00 Closeout Procedures
J 01 91 00 Commissioning
K. Other Divisions and Specifications that may address more specifically the requirements for field recording the installation of all items associated with the execution of this contract by Division or Trade.

1.3. RELATED DOCUMENTS

A. Other related documents shall include but not be limited to the following:
1. Bidding documents including drawings, specifications, and addenda.
2. Required regulatory documents of conditional approval.
3. Field orders, verbal or written by inspectors having regulatory jurisdiction.
4. Shop drawings and installation drawings.

1.4. PERFORMANCE REQUIREMENTS

A. The GC shall be responsible for maintaining the “Master As-Built Document Set” in the job trailer at all times during the execution of this contract. This document set shall include all of the following:
1. Master As-Built Plan Set
2. Master As-Built Specification Set
3. Other Document Sets

B. The GC shall designate one person of the GC staff to be responsible for maintaining the Master As-Built Document Set at the job trailer. This shall include, posting updates, revisions, deletions and the monitoring of all contractors posting as-built information as described in this specification.

C. All contractors shall use this specification as a general guideline regarding the requirements for documenting their completed Work. Contractors shall explicitly follow additional specification requirements within their own Division of Trade as it may apply to this specification.

1.5. QUALITY ASSURANCE

A. The GC shall be responsible for all of the following:
   a. Spot checking all sub-contractors field documents to insure daily information is being recorded as work progresses.
   b. Discuss as-built recording to the plan set at weekly job meetings with all sub-contractors on site.
   c. Schedule time with sub-contractors in the job trailer for recording as-built information to the plan set.
   d. Insure that all sub-contractors are providing clear and accurate information to the plan set in a neat and organized manner.
   e. Insure sub-contractors who have completed work have finalized recording all as-built information to the plan set before releasing them from the project site.

B. The Project Architect, the City Project Manager, Commissioning Agent and other design team staff will perform random checks of the Master As-Built Document Set during the execution of this contract to ensure as-built information is being recorded in a timely fashion as the Work progresses. An updated and current Master As-Built Document Set is a stipulation for approval of the progress payment.

PART 2 – PRODUCTS

2.1. OFFICE SUPPLIES

A. The GC shall provide a sufficient supply of office products in the job trailer at all times for all contractors to use in recording as-built information into the plan set. This shall include but not be limited to the following:
   a. Red ink pens, medium point. Pens that bleed through paper, markers, and felt tips will not be accepted.
   b. The use of highlighters is acceptable. Assign colors to various trades for consistency in recording information.
   c. Straight edges of various lengths for drawing dimension, extension and other lines.
   d. Civil and Architectural scales
   e. Clear transparent, non-yellowing, single sided tape.
   f. Correction tape or correction fluid for correcting small errors.

PART 3 - EXECUTION

3.1. FIELD DOCUMENT AS-BUILTS

A. The GC and all Sub-contractors shall be responsible for keeping their own field set of as-built documents including plans, specifications and published changes.

B. Field sets shall be kept dry and in good condition at all times.

C. No Work shall be buried, covered, or hidden, by any additional Work, regardless of Contractor or Trade, until locations of all materials and equipment has been properly documented as described below.

D. All contractors shall be required to record the following as-built information:
   a. Notes on the daily installation of materials and equipment.
   b. Sketches, corrections, and markups indicating final location, positioning, and arrangement of materials and equipment such as pipes, conduits, valves, cleanouts, pull boxes and other such items. Note all final locations on plan sheets, indicate dimension off identifiable building features. Riser diagrams need only be corrected for significant changes in locations, routing or configuration.
      i. The use of photographs in lieu of hand drawn sketches is acceptable.
      ii. Photos shall be taken according to Specification 01 32 33 Photographic Documentation
      iii. Print photo and markup with dimensions or notes as necessary.
   c. Identify by the use of existing plan symbology and notes the size, type, quantity, and use as applicable of materials such as pipes, valves, conduits, etc.

d. Note whether horizontal runs are below slab or above ceiling, include dimensions above or below finished floor elevation.

E. All contractors shall be responsible for transferring the information from their field set of documents to the Master As-Built Plan Set kept in the GC job trailer. See Section 3.3.D. below for the proper procedure.

F. All contractors shall update the GC Master Plan Set as often as necessary, but not less than once per work week.

3.2. SITE SURVEY AS-BUILT

A. The Land Surveyor Sub-Contractor shall provide digital as-built information including but not be limited to the following:

a. For underground buried utility laterals and services of all types locate all of the following that may apply:

i. Connection points at all mains
ii. Storm discharge points to open air
iii. All corners and bends regardless of angle, large radius sweeps shall have multiple point locations sufficient to define the sweep.
iv. All vertical drops
v. All wells
vi. Private buried utilities such as buried electrical cables, irrigation systems, etc.
v. Other information that may need to be located in the future by the owner prior to digging

b. Record all surface features including but not limited to the following:

i. Building corners, pavement edges, and other permanent structural features.
ii. All surface covers for inlets, catch basins, cleanouts, access structures, curb stops and other such devices.
iii. Other permanent surface features such as hydrants, lamp posts, and other permanent site amenities.

c. The following data shall be recorded while locating items in sub-sections 3.2.a and 3.2.b above:

i. Flow lines at both ends of pipes
ii. Pipe sizes and material types
iii. Rim elevations for all covers
iv. Sump elevations and invert elevations of all structures
v. Spot elevations for all pads, driveways, walks, stoops, and floors

B. The Surveyor shall provide the final digital as-built on a media and in a format specified in Specification 00 31 21 Survey Information to the GC for turn in to the Project Architect and the Civil Engineer.

C. The Surveyor shall provide two printed as-built site plans to the GC for inclusion in the Master As-Built Plan Set as follows:

1. One sheet to show all features (but not contour information) with text neatly organized for each item identified.
2. One sheet showing contours, contour labels, and features from item 1 above, but with no additional text.

3.3. MASTER AS-BUILT DOCUMENT SET

A. The GC shall be responsible for maintaining the Master As-Built Document Set in the job trailer at all times.

1. The Master As-Built Plan Set (Plan Set) shall begin with one complete bid set of drawings and any additional sheets that were supplied by published addenda during the bidding process. The cover sheet shall be titled as the “Master As-Built Plan Set” in large bold red letters approximately 2” in height and shall not be used for any other purpose.

a. The Plan Set shall be kept dry, legible, and in good condition at all times.

b. The Plan Set shall be kept up to date with new revisions within two (2) working days of supplemental drawings being issued. Revisions shall be posted as follows:

i. Insert new, revised sheets into the plan set. Void old sheets but do not remove them from the plan set. Indicate date received and what document (RFI, CB, CO, etc) caused the change.
ii. Insert new, revised individual details into the plan set. Void old details, tape new details over the old details with a “tape hinge” to allow them to be viewed. Indicate date received and what document (RFI, CB, CO, etc) caused the change.
iii. Add new details in appropriate white space on relevant sheets. If no space is available use the back side of the previous sheet or insert a new sheet. Indicate date received and what document (RFI, CB, CO, etc) caused the change.

c. The Plan Set shall be available at anytime for easy reference during progress meetings and for emergency location information of new work already completed.

2. The Master As-Built Specification Set (Spec Set) shall begin with one complete bid set of specifications and any additional specifications that were supplied by published addenda during the bidding process. The Spec Set shall be provided in three "D" ring type binders of sufficient thickness to accommodate the specification set. Multiple binders are allowed as necessary. Label the front cover and binding edge with "Master As-Built Specifications" in bold red letters. Provide other information as necessary to distinguish the contents of multi-volume sets.
   a. The Spec Set shall be kept dry, legible, and in good condition at all times.
   b. The Spec Set shall be kept up to date with new revisions within two (2) working days of supplemental drawings being issued.
   c. The Spec Set shall be available at anytime for easy reference during progress meetings.
3. Other Document Sets may be kept at the GCs option in three "D" ring type binders of sufficient thickness to accommodate the documentation. Other documentation sets may include but not be limited to RFIs, CBs, COs, etc.

C. The Land Surveyor Sub-Contractor shall be required to use digital surveying for all exterior site surveying, and provide deliverable digital as-builts as specified in Specification 00 31 21 Survey Information. As soon as practical the surveyor shall provide the GC with a preliminary copy of installed buried utilities for inclusion with the plan set in the job trailer. The surveyor shall provide final digital as builts as per section 3.2 above.

D. All contractors shall be responsible for updating the Plan Set from their field sets at least once per work week. Updates shall include but not be limited to the following procedures:
   a. All updates shall be done only in red ink. Place a "cloud" around small areas of correction to call attention to the change.
   b. Whenever possible place general work notes, field sketches, supplemental details, photos, and other such information on the reverse side of the preceding sheet. Installation notes including dates shall be kept neatly organized in chronological order as necessary.
   c. Accurately locate items on the plan set as follows:
      i. For items that are located as dimensioned provide a check mark or circle indicating the dimension was verified.
      ii. For items that are within 5 feet of the location indicated on the plans leave as shown and:
         - Provide correct dimensions to existing dimension strings or,
         - Accurately locate with new dimension strings
      iii. For items that are more than 5 feet from the location indicated on the plans
         - Accurately draw the items in the new location as installed and,
         - Accurately locate with new dimension strings and,
         - Note that the existing location is void.
   d. Include dimensioned locations for items that will be buried, concealed, or hidden in the ground, under floors, in walls or above ceilings.
      i. Dimensions shall be pulled from identifiable building features, not from centers of columns or other buried features.
      ii. When necessary pull more dimensions as needed from opposing directions to properly locate single items.

3.4. AS-BUILT REVIEW AND ACCEPTANCE

A. The GC shall provide the Master As-Built Plan Set to the Project Architect (PA), the City Project Manager (CPM), the Commissioning Agent (CxA) and other design team staff for content review prior to the Progress Payment Milestone indicated in Specification 01 29 76 Progress Payment Procedures. The submitted plan set shall include the digital survey information produced under Section 3.2 above.
   1. If the plan set is not approved:
      a. The PA and CPM shall only be required to generalize deficiencies by trade there shall be no requirement or expectation to generate a "punch list" of required corrections.
      b. The GC and Sub-contractors as necessary shall be responsible for inspecting the installation and correcting the drawings as needed.
      c. The GC shall re-submit the plan set for review.
   2. If the plan set is approved the PA shall take possession of the plan set to be used in providing the owner with digital CAD record drawings. Upon completion of transferring the information to CAD the PA shall provide the Owner with CAD record drawings, record PDFs, and the Master As-Built Plan Set.

3.5. CHANGES AFTER ACCEPTANCE

A. No Contractor shall be responsible for making changes to the As-Built record documents after acceptance by the PA and CPM except when necessitated by changes resulting from any Work made by the Contractor as part of his/her guarantee.

END OF SECTION

SECTION 01 78 43
SPARE PARTS AND EXTRA MATERIALS

PART 1 – GENERAL

1.1. SUMMARY

A. This specification is intended to provide clear guidelines and identify the responsibilities of all contractors as they pertain to City of Madison contract procedures regarding spare parts, special tools, special materials, and extra materials.

B. Each contractor shall be responsible for knowing the specific requirements of their Division Specifications as they may relate to the general information provided in this specification.

C. The General Contractor (GC) shall be responsible for ensuring all contractors provide spare parts and extra materials as described in this specification.

1.2. RELATED SPECIFICAITONS

A. 01 29 76 Progress Payment Procedures

B. 01 31 23 Project Management Web Site

C. 01 77 00 Closeout Procedures

D. Other Divisions and Specifications that may address more specifically how to proceed with spare parts, special tools, special materials, and extra materials.

1.3. DEFINITIONS

A. Spare Parts: Any component of a product or assembly that comes pre-packaged or was specially ordered for the explicit use of the product or assembly. This shall include but not be limited to fastening devices, mounting brackets, replacement parts, wheels, pulleys, wiring, alternate assembly pieces, etc.

B. Special Tools: Any tool of any kind that was pre-packaged or specially ordered, and is required to be used for the installation or maintenance of an installed product or assembly as part of this contract.

C. Special Materials: Any oil, lubricant, glue, touch-up paint, or other such material that comes pre-packaged or was specially ordered and is required to be used for the installation or maintenance of an installed product or assembly as part of this contract.

D. Extra Materials (Attic Stock): Any surplus materials in new and useable condition that was installed a part of this contract. Attic Stock shall include but not be limited to the following: ceiling tiles, paint, stain, floor coverings, ceramic tiles, light bulbs/lamps, filters, strainers, etc. Attic Stock shall include partially opened bulk items and additional unopened quantities as directed by other specifications.

1.4. PERFORMANCE REQUIREMENTS

A. All contractors shall be responsible for consolidating spare parts, special tools, special materials, and attic stock as it pertains to the specific Work within their Division or Trade.

B. All contractors shall use this specification as a general guideline regarding the requirements for turning spare parts, special tools, special materials, and attic stock over to the owner. Contractors shall explicitly follow specification requirements within their own Division of Trade.

1.5. QUALITY ASSURANCE

A. The General Contractor (GC) shall be responsible for all of the following:

1. Coordinate the location for and the delivery of all spare parts, special tools, special materials, and attic stock being provided by all contractors under this contract to one centralized location as designated by the Owner.
2. Verify that all items being delivered are:
   a. Clean, new, and in a usable condition.
   b. Properly sealed, protected, and labeled
   c. Properly documented

PART 2 – PRODUCTS – THIS SECTION NOT USED

PART 3 - EXECUTION

3.1. PACKAGING

A. Whenever possible all surplus items should remain in their original packaging such as parts envelopes.
B. Package small parts in re-sealable plastic bags (Ziploc) or envelopes with clasp fasteners. Do not use envelopes that seal with glue or tape envelopes closed. Do not leave packaging unsealed.
C. Package like parts together for products or assemblies. I.E. keep all spare parts for flushometers together.
D. Many small packages may be grouped together into a larger container by trade.
E. Do not use unrelated boxes or containers for packaging spare items. I.E. do not use a light fixture box for spare breakers, or flushometers parts.

3.2. LABELING

A. Whenever possible the original labeling indicating part numbers and other pertinent information shall remain on the original packaging.
B. If original labeling is not available the contractor shall label all parts and packages using tape or labels and permanent black markers. Tape or labels being used shall absorb the permanent marker without bleeding or allowing ink to be smeared or rubbed off.
C. Labels shall include the name of the product or equipment the item belongs to, part number and/or name, and any other information that would assist maintenance personnel in identifying the piece and related product.
D. Labels shall include plan or specification designations (WC-1, LAV-3, DF-2, CPT-1, etc) that identify the particular product or finish material it represents.
E. Labels for parts stored in clear re-sealable plastic bags may be placed inside the bag. Label shall face out and be able to be read from one side. Multiple bags shall be numbered individually for identification.
F. Label the outside of large containers with the trade name (Plumbing, Electrical, etc).

3.3. INVENTORY

A. All contractors shall provide the GC with complete inventories of all spare parts, special tools, special materials, and attic stock that they are providing at the end of the contract. The inventories shall be organized as follows:
   1. The cover sheet shall indicate the Contractors name, address, phone number, identify that the document is the “Spare Parts and Extra Materials Inventory”, and identify the Division or Trade the inventory is for.
   2. Provide an inventory in a tabular format of all items being provided under this and other specifications. The minimum information to be provided for each item on the inventory shall be as follows:
      a. Bag or container number, all items of one bag or container shall be grouped together on the inventory
      b. Item description
      c. Item size (if applicable)
      d. Total quantity provided
      e. Identify if item is a spare part, tool, special material, or attic stock
B. The GC shall consolidate inventories from all sub-contractors into one tabular data sheet organized by Division or Trade of Work.
   1. Upon completing the consolidated list the GC shall upload the completed inventory to the Contract Closeout-Attic Stock Library on the Project Management Web Site.
   2. The GC shall notify the Project Architect and City Project Manager that the scans have been uploaded.
   3. Consulting Staff and Owner Staff shall review the inventories prior to Final Review to verify that minimum required quantities have been met. Deficiencies shall be noted and returned back to the GC for corrective action.

3.4. STORAGE

A. Prior to the 80% Progress Payment milestone the GC shall coordinate with the City Project Manager and Maintenance Personnel where spare parts, special tools, special materials, and attic stock shall be stored.

B. The GC shall instruct all contractors as to the location and proper storage procedures.

C. The GC shall be responsible for ensuring the storage area is kept neat and orderly as follows:

1. Like items are stored together by material, product, or trade as necessary.
2. Liquids are stored in sealable containers and the lids have been properly installed to prevent drying out, spillage, etc.
3. All labels are clearly visible and provide the required information.

D. Large items shall be stored so as not to damage other items. Do not stack heavy items or items with distinct shapes/outlines on softer items that may get crushed or imprinted.

3.5. CLOSEOUT PROCEDURE

A. Prior to the 90% Progress Payment milestone the GC shall review all attic stock already stored by the contractors to ensure the following:

1. Materials are stored in the proper location(s).
2. All boxes, containers and items are properly labeled according to the submitted/approved inventory.
3. Quantities are correct according to the submitted/approved inventory.

B. The GC shall ensure that all deficiencies are corrected prior to conducting Demonstration and Training Sessions.

C. The GC shall review with Maintenance Staff all inventories and labeling during the scheduled Demonstration and Training Sessions.

D. Any discrepancies associated with Attic Stock shall be resolved and verified prior to the CPM releasing the 90% CT progress payment.

END OF SECTION

SECTION 01 79 00
DEMONSTRATION AND TRAINING

PART 1 – GENERAL

1.1. SUMMARY

A. The purpose of this specification is to provide clear responsibilities and guidelines related to providing Demonstration and Training (D&T) Sessions related to general facility use, equipment, systems, finishes, and materials to City of Madison Staff (Owner, Owner Representatives, Maintenance, and Custodial Personnel) as needed.

B. All D&T shall be coordinated through the General Contractor (GC), Project Architect (PA) and City Project Manager (CPM), and will be based on or customized to the needs of City of Madison Staff being trained. New equipment and systems may have complete D&T sessions as described in this specification while equipment or systems staff is familiar with may have sessions more focused on maintenance only.

1.2. RELATED SPECIFICATIONS

A. Section 01 29 76 Progress Payment Procedures
B. Section 01 78 13 Completion and Correction List
C. Section 01 78 19 Maintenance Contracts
D. Section 01 78 23 Operation and Maintenance Data
E. Section 01 78 36 Warranties
F. Section 01 78 39 As-Built Drawings
G. Section 01 78 43 Spare Parts and Extra Materials
H Section 01 91 00 Commissioning
I. Other Divisions and Specifications that may address more specifically the requirements for D&T sessions related to the installation of all items and equipment installed under the execution of the Work.

1.3. QUALITY ASSURANCE

A. All contractors shall have the responsibility of preparing for and conducting D&T sessions as determined by this and other Division or Trade related specifications, Owner Operation and Maintenance Manuals, and other such documentation related to the Work.

B. The GC shall have responsibility for:

1. Ensuring that all contractors required to conduct a D&T session have successfully completed all of the following:
    a. Turned in all required documentation for review and documentation has been approved/accepted prior to scheduling D&T sessions.
    b. Other required documentation as needed is available and ready for use during the D&T session.
    c. All systems have been started, tested, and running as per appropriate specification and/or manufacturers recommendations prior to scheduling D&T sessions.
    d. All contractors are sufficiently prepared for their D&T session
    e. Documents the D&T session including date, time, contractor and company name, attendees and other information regarding the session
2. Organizing the coordination and scheduling of all D&T sessions between all contractors and the appropriate representatives of the Owner. These representatives may include any of the following depending on the Work of the Contract:

a. Owner – end users
b. Facility Maintenance personnel
   i. Facility general operation procedures including custodial services
   ii. Electrical
   iii. Mechanical
   iv. Plumbing
   v. Site
c. Information Technology (IT) Department
d. Traffic Engineering – Radio Shop
e. Architects, Engineers and Facility Management staff as project completion overview

PART 2 – PRODUCTS – THIS SECTION NOT USED

PART 3 - EXECUTION

3.1. GENERAL REQUIREMENTS

A. The GC shall develop a specific D&T plan to be scheduled and conducted as described below but no sooner than the meeting discussed in 3.2.A.2 below.

C. The GC shall not schedule D&T sessions to preclude required personnel from attending multiple sessions.

3.2. COORDINATING AND SCHEDULING THE TRAINING

A. The GC, PA, CxA and CPM, shall review all Training and Demonstration requirements during two (2) special meetings.
   1. The first meeting shall be held at the 50% Contract Total Payment. During this meeting the following shall be discussed:
      a. Preliminary schedule of training dates to be completed prior to beginning construction closeout.
      b. List of documentation and items that need to be completed and available before and during the training session.
      c. Who (Owner, Maintenance, etc) will be attending what training session(s).
   2. The second meeting shall be held at the 80% Contract Total Payment. This meeting shall review due outs that have not yet been completed for the 90% Contract Total Payment and the requirements necessary for Construction Closeout. All Demonstration and Training sessions shall be completed prior to receiving the 90% progress payment and beginning Construction Closeout Procedures (see Specification 01 77 00).
      a. This does not include any requirement associated with off season equipment preparation and/or demonstration and Training Sessions.

B. All of the Construction Work shall be operationally ready prior to conducting training as follows:
   1. All contractors shall have their As-Built Drawing Records available for reviewing locations of system components during training.
   2. All final and approved Operations and Maintenance Data shall be completed no less than two (2) full weeks prior to the scheduled training.
   3. All systems shall have been started, functionally tested, balanced, and fully operational, and all piping and equipment labeling complete at least two (2) days prior to the scheduled training.
      a. Seasonal equipment shall not be trained out of season. Contractors having seasonal equipment shall work with the GC and CPM for coordinating additional training sessions as appropriate for seasonal equipment.

C. Correction list items that prevent a piece of equipment or system from being fully operational for training shall be corrected prior to conducting the training.

3.3. TRAINING OBJECTIVES

A. For each piece of equipment or system installed train on the following objectives/topics as applicable:
   1. System design, concept, and capabilities
   2. Review of related contractor as-built drawings
   3. Facility walkthrough to identify key components of the system
   4. System operation and programming including weekly, monthly, annual test procedures
   5. System maintenance requirements
   6. System troubleshooting procedures
   7. Testing, inspection, and reporting requirements associated with any regulatory requirements
   8. Identification of any correction list items still outstanding

9. Review of system documentation including the following:
    a. Operation and maintenance data
    b. Warranties
    c. Valve charts, tags, and pipe identification markers

B. For each piece of specialty equipment train on the following objectives/topics as applicable:
1. Manufacturers operations instructions
2. Manufacturers use and care instructions
3. Manufacturers maintenance and troubleshooting instructions
4. System operation and programming including weekly, monthly, annual test procedures
5. Identification of any correction list items still outstanding
6. Review of system documentation including the following:
    a. Operation and maintenance data
    b. Warranties

C. End User Orientation
1. Facility walkthrough
2. Security and emergency features
3. General facility operation procedures

D. Facility General Use and Custodial Services – if requested
1. Facility walkthrough
2. Security and emergency features
3. General facility operation procedures
4. Care and maintenance of specialty items, finishes, etc as requested
5. Attic stock inventory and material designations

3.4. DEMONSTRATION AND TRAINING PROGRAM PREPARATION

A. Each contractor having a responsibility for providing D&T sessions shall meet with the GC, CPM, and other City Staff as needed to review the extent of the Training Objectives in section 3.3 above needed for each piece of equipment, system, finish, etc. This meeting shall occur no less than four (4) weeks prior to the anticipated training session.

B. The contractor shall use the information from item 3.4.A above to prepare a formal training program for each piece of equipment or system based on the Training Objectives in 3.3 above.
1. The formal training program shall include the following information:
    a. Session title
    b. List of systems, equipment, use, care, etc to be covered during the session
    c. Provide the following for each systems, equipment, use, care, etc to be covered during the session
        i. Name and affiliation of each instructor to be used. As needed and discretion of the Owner the GC to require attendance by the installing technician, installing Contractor and the appropriate trade or manufacturer's representative.
        ii. Qualifications of each instructor to be used. Practical building operation expertise as well as in-depth knowledge of all modes of operation of the specific piece of equipment as installed in this project is required by the training personnel. If Owner determines training was not adequate, the training shall be repeated until acceptable to Owner.
        iii. A checklist of all documentation and system/equipment requirements necessary to complete a successful training session and the current status of each
        iv. Any additional documents, training aids, video or other items to be used to complete the training
        v. Any special requirements or needs associated with item iv above to complete the training
    d. The intended audience for the training
    e. The approximate duration of each objective or topic to be covered
2. Submit the completed training program to the GC for review and approval by the PA and CPM.

C. The PA and CPM shall work with staff as necessary to ensure all points of anticipated training needs have been met. The PA and CPM will approve the program as submitted or recommend changes for re-submittal as necessary.

3.5. CONDUCTING A DEMONSTRATION AND TRAINING SESSION

A. All contractors shall conduct their required D&T Sessions as follows:
1. Begin with a classroom session
    a. Provide a sign in sheet indicating all training to be conducted, instructors, etc.

b. Provide an overview of the training to be conducted including the approximate schedule.

2. Conduct a general walk-through of the site.
   a. Point out locations of various equipment, valves, charts, and other related items.
   b. Use the Division or Trade As-Built record drawings to indicate locations of hidden or buried items.
3. Provide a demonstration of general equipment/system operation including using the O&M manual.
   a. Startup and shutdown procedures.
   b. Normal operational levels as depicted by any gauges, software, etc.
   c. Indicate warning devices, signs etc. and demonstrate emergency shut-down procedures.
4. Provide a demonstration of all owner level maintenance using the O&M manual.
   a. Indicate frequency of maintenance.
   b. Provide and review all spare parts, special tools, and special materials.
5. Provide and review all spare parts, special tools, special materials, or attic stock as applicable.
6. While conducting D&T sessions:
   a. Allow hands on training whenever practical.
   b. Answer questions promptly
   c. Repeat demonstrations and procedures as necessary.

B. Within two (2) working days of completing the D&T session the contractor responsible for the session shall turn-in any documentation generated including the sign in roster to the GC.

C. The GC shall turn over all training documentation to the PA and CPM upon completion of D&T sessions.

D. Re-schedule any training that has been determined to be inadequate or inappropriate for any reason including but not limited to any of the following;
   1. Unqualified instructor
   2. System installation incomplete or untested to the specifications
   3. Equipment failure during demonstration
   4. Un-expected cancellation

3.6. CLOSEOUT PROCEDURE

A. Prior to receiving the 90% Progress payment the GC shall:
   1. Verify with the PA and CPM that each Demonstration and Training Session was conducted properly and according to the submitted plan.
   2. Any required “Off Season” equipment testing, balancing, and Demonstration and Training Sessions have been tentatively scheduled with the GC, necessary sub-contractors, instructors and Owner/Owner Representatives as necessary.

END OF SECTION

SECTION 01 81 13
SUSTAINABLE DESIGN REQUIREMENTS – LEED FOR NEW CONSTRUCTION V3

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

B. Comply with Wisconsin Commercial Building Codes/International Building Code (IBC).

C. Comply with Americans with Disabilities Architectural Guidelines, and ICC/ANSI A117.1-Latest Edition.

D. Comply with USGBC LEED prerequisites and credits needed for Project to obtain "LEED Gold certification based on USGBC's LEED 2009 for New Construction and Major Renovations".

1.2 SUMMARY

A. Section includes general requirements and procedures for compliance with certain USGBC LEED prerequisites and credits needed for Project to obtain "LEED Gold certification based on USGBC's LEED-NC (New Construction and Major Renovations)" Version 3.0.

1. Other LEED prerequisites and credits needed to obtain LEED certification depend on product selections and may not be specifically identified as LEED requirements. Compliance with requirements needed to obtain LEED prerequisites and credits may be used as one criterion to evaluate substitution requests and comparable product requests.
2. Additional LEED prerequisites and credits needed to obtain the indicated LEED certification depend on Architect's design and other aspects of Project that are not part of the Work of the Contract.
3. A copy of the LEED Project checklist is attached at the end of this Section for information only.
4. Specific requirements for LEED are included in greater detail in other Sections.

B. Related Sections: Divisions 01 through 32 Sections for LEED requirements specific to the work of each of these Sections. Requirements may or may not include reference to LEED.

1.3 DEFINITIONS

A. Albedo (a.k.a. solar reflectance): The ratio of the reflected electromagnetic energy to the incoming electromagnetic energy.

B. Chain-of-Custody Certificates: Certificates signed by manufacturers certifying that wood used to make products was obtained from forests certified by an FSC-accredited certification body to comply with FSC STD-01-001, "FSC Principles and Criteria for Forest Stewardship." Certificates shall include evidence that manufacturer is certified for chain of custody by an FSC-accredited certification body.

C. Emissivity (a.k.a. infrared emittance): A parameter between 0 and 1 that indicates the ability of a material to shed infrared radiation.

D. LEED: Leadership in Energy and Environmental Design. Green Building Rating System representing the US Green Building Council's effort to provide a national standard for what constitutes a "green building". The standard requires quantitative and technical documentation to demonstrate compliance with goals described in the US Green Building Council's Green Building Rating System, Version 3.0.

E. Hydrofluorocarbons (HFCs): Refrigerants used in building equipment that do not deplete the stratospheric ozone layer.

F. Locally-Manufactured (for LEED™ Materials Credit 5): Refers to the final assembly of components into the building product that is furnished and installed by the trades people. For example, if the hardware comes from Seoul, South Korea, the lumber from Vancouver, British Columbia, and the joist is assembled in Kent Washington, then the location of the final assembly is Kent, Washington.

G. Post-Consumer Recycled Content: The percentage of waste material by weight available from consumer use incorporated into a building material.

H. Pre-consumer (aka Post-Industrial Recycled) Content: The percentage of waste material by weight available from industrial use incorporated into a building material. Post-industrial recyclable materials are different from industrial scrap, a by-product of industrial processes that can easily be reused as a feedstock.

I. Potable Water: Water that is suitable for drinking and is supplied from wells or municipal water systems.

J. Recycling: The collection, reprocessing, marketing and use of materials that were recovered or diverted from the solid waste stream. Note that LEED uses the term "pre-consumer" rather than "post-industrial." Also note that when manufacturers and trade associations use the term "post- industrial" it often includes spills, scraps, and damaged and surplus materials that are fed back into the same manufacturing process and that these materials are not considered recycled content by the LEED rating systems.

K. Recycled Content: The recycled content value of a material assembly shall be determined by weight. The recycled fraction of the assembly is then multiplied by the cost of assembly to determine the recycled content value.

L. "Post-consumer" material is defined as waste material generated by households or by commercial, industrial, and institutional facilities in their role as end users of the product, which can no longer be used for its intended purpose.

M. "Pre-consumer" material is defined as material diverted from the waste stream during the manufacturing process. Excluded is reutilization of materials such as rework, regrind, or scrap generated in a process and capable of being reclaimed within the same process that generated it.

N. Regional Materials: Materials that have been extracted, harvested, or recovered, as well as manufactured, within 500 miles of Project site. If only a fraction of a product or material is extracted/harvested/recovered and manufactured locally, then only that percentage (by weight) shall contribute to the regional value.

O. Regionally Manufactured Materials: Materials that are manufactured within a radius of 500 miles from Project site. Manufacturing refers to the final assembly of components into the building product that is installed at Project site.

P. Regionally Extracted and Manufactured Materials: Regionally manufactured materials made from raw materials that are extracted, harvested, or recovered within a radius of 500 miles from Project site.

Q. Solar Reflectance: See "Albedo."

R. Sustainable Forestry: The practice of managing forest resources to meet the long-term product needs of humans while maintaining the biodiversity of forested landscapes. The primary goal is to restore, enhance, and sustain a full range of forest values, both economic and ecological.

S. Type A Finishes: Material and finishes with potential for short-term levels of off gassing from chemicals inherent in their manufacturing process, or which are applied in form requiring vehicles or carriers for spreading which release high level of particulate matter in process of installation and/or curing. Including, but not limited to:

1. Composite wood products, specifically including particleboard from which millwork, wood paneling, doors, or furniture may be fabricated.
2. Adhesives, sealants, and glazing compounds, specifically those with petrochemical vehicles or carriers.
3. Wood preservatives, finishes, and paint.

4. Control and/or expansion joint-fillers.
5. Hard finishes requiring adhesive installation.
6. Gypsum board and associated finish processes.

T. Type B Finishes: Fuzzy material and finishes which are woven, fibrous, or porous in nature and tend to adsorb chemicals off-gassed by Type A finishes or may be adversely affected by particulates. These materials become "sink" for deleterious substances which may be released much later, or collectors of contaminants that may promote subsequent bacterial growth. Including, but not limited to:
1. Carpeting and padding.
2. Fabric wallcovering.
3. Insulation exposed to air stream.
4. Acoustic ceiling materials.
5. Fabric covered acoustic wall panels.
6. Upholstered furnishings.
7. Materials that can be categorized as both Type A and Type B.

U. Ventilation: The process of supplying and removing air to and from interior spaces by natural or mechanical means.

V. Volatile organic compounds (VOCs): Chemical compounds based on carbon and hydrogen structures that are vaporized at room temperatures. VOCs are one type of indoor air contaminant.

W. Waste Materials: Large and small pieces of materials indicated which are excess to contract requirements and generally include materials salvaged from existing construction and items of trimmings, cuttings, and damaged goods resulting from new installations which cannot be effectively used in Work.

X. LEED Project Administrator: LEED Certified Professional hired by the project owner to review LEED submittals.

1.4 ADMINISTRATIVE REQUIREMENTS

A. Respond to questions and requests from Architect and the USGBC regarding LEED credits that are the responsibility of the Contractor, that depend on product selection or product qualities, or that depend on Contractor's procedures until the USGBC has made its determination on the project's LEED certification application. Document responses as informational submittals.

1.5 ACTION SUBMITTALS

A. General: Submit additional LEED submittals required by other Specification Sections.

B. LEED submittals are in addition to other submittals. If submitted item is identical to that submitted to comply with other requirements, submit duplicate copies as a separate submittal to verify compliance with indicated LEED requirements.

C. LEED Submittals: Submit LEED related information under a separate Tab within each product submittal. The LEED submittal shall include:
1. Summary Sheet: A summary, on General Contractors letterhead, of all LEED information requested in specifications shall include:
   a. Project name.
   b. LEED Submittal List: A list of all materials being submitted. For products com- posed of multiple materials the submittal shall include a list of all materials composing the product.
   c. For Products in Divisions 2 - 10, include the following information:
      i. Material costs, for each material on the LEED submittal list, excluding labor costs, delivery cost, cost of installation, as well as profit and overhead.
      ii. The preconsumer and post-consumer recycled content of each material on the LEED submittal list.
      iii. List of all material manufacturing locations.
      iv. Provide distance between manufacturing and construction site.
   d. All other LEED information required in specification.
2. Manufacturer's literature with information highlighted that confirm the figures used in the summary report.
   a. If a range is used in the manufacturer's literature, the summary report shall use the lowest number in the range.
   b. For VOC Submissions: Submit MSDS sheets or manufacturer's literature with VOC figure highlighted.

D. Project Material Costs Data: Provide a statement, on Contractor's letterhead, documenting the total material for the project. Include a spreadsheet tallying the material cost for all materials specified in Divisions 2 - 32. The

total in the material cost data will be used in the LEED Online template to be completed by the Contractor as the actual material cost of the project.

E. LEED Action Plan: Provide preliminary submittal within 30 days of Notice to Proceed that contains:
   1. Example spreadsheets for each construction credit identified in this section.
   2. Contact information for Contractor's LEED coordinators.
   3. Brief description of how the following requirements will be met.
      a. Credit SS Prerequisite 1: Construction Activities Pollution Prevention complying with Section 31 25 00, Erosion Control.
      b. Credit MR c2: Construction Waste Management complying with Section 01 74 19 Construction Waste Management and Disposal. Include a sample spreadsheet showing how the tipping information is going to be recorded to comply with LEED requirements.
      c. Credit MR c4: Recycled content information including methods of collection and recording.
      d. Credit MR c5: Manufacturing location information including methods of collection and recording.
      e. Credit MR c6: Rapidly renewable materials information including methods of collection recording.
      f. Credit MR c7: Certified wood product incorporated into the construction of the facility and a description of how certified wood information, including the chain-of-custody letters are going to be collected and recorded.
      g. EQ c4.1 – 4.4: VOC information including methods of collection and recording required LEED information.
   4. After CPM approval of the Preliminary Action Plan the Contractor shall update the plan monthly with LEED information collected to date and be submitted as part of a monthly progress report.

F. LEED Progress Reports: Concurrent with each Application for Payment, submit reports comparing the actual construction and purchasing activities with LEED requirements for the following:
   1. Credit SS Prerequisite 1: Construction Activities Pollution Prevention.
   2. Credit MR c2: Construction Waste Management.
   3. Credit MR c4: Recycled content for materials specified in Divisions 2 - 32.
   4. Credit MR c5 Regional Materials: Distance to manufacturing for materials specified in Divisions 2 - 32.
   5. Credit MR c6: Rapidly Renewable Materials: Content and cost for materials specified in Divisions 2- 32.
   6. Credit MR c7: Certified wood products including the chain-of-custody letters identifying the forest of origin.
   7. IEQ c4.1 – 4.4: VOC information.

G. LEED Documentation Online Submittals: The Contractor shall be responsible for completing the following LEED submissions using the LEED online tool for credit submission to USGBC. The LEED Project Administrator will determine if the information prepared by the Contractor is satisfactory for USGBC submission.
   1. Credit EA 5: Product data and wiring diagrams for sensors and data collection system used to provide continuous metering of building energy-consumption performance over a period of time of not less than one year of post-construction occupancy.
   2. Credit MR 2: Comply with Division 1 Section "Construction Waste Management and Disposal."
   3. Credit MR 4: Product data and certification letter from product manufacturers indicating percentages by weight of post-consumer and pre-consumer recycled content for products having recycled content. Include statement indicating material costs for each product having recycled content.
   4. Credit MR 5: Product data for regional materials indicating location and distance from Project of material manufacturer and point of extraction, harvest, or recovery for each raw material. Include statement indicating cost for each regional material and the fraction by weight that is considered regional.
   5. Credit MR 7: Product data and chain-of-custody certificates for products containing certified wood. Include statement indicating cost for each certified wood product.
   6. Credit IEQ 3.1:
      1. Construction indoor-air-quality management plan.
      2. Product data for temporary filtration media.
      3. Product data for filtration media used during occupancy.
      4. Construction Documentation: Six photographs at three different times during the construction period, along with a brief description of the SMACNA approach employed, documenting implementation of the indoor-air-quality management measures, such as protection of ducts and on-site stored or installed absorptive materials.
   7. Credit IEQ 3.2: Construction IAQ Plan: Before Occupancy.
      1. Signed statement describing the building air flush-out procedures including the dates when flush-out was begun and completed and statement that filtration media was replaced after flush-out.

2. Report from testing and inspecting agency indicating results of indoor-air- quality testing and documentation showing compliance with indoor-air-quality testing procedures and requirements.

8. Credit IEQ 4.1: Product data for adhesives and sealants used inside the weatherproofing system indicating VOC content of each product used. Indicate VOC content in g/L calculated according to 40 CFR 59, Subject D (EPA Method 24).
9. Credit IEQ 4.2: Product data for paints and coatings used inside the weatherproofing system indicating VOC content of each product used. Indicate VOC content in g/L calculated according to 40 CFR 59, Subject D (EPA Method 24).
10. Credit IEQ 4.4: Product data for products containing composite wood or agrifiber products or wood glues indicating that they do not contain urea-formaldehyde resin.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For LEED coordinator.

B. Project Materials Cost Data: Provide statement indicating total cost for materials used for Project. Costs exclude labor, overhead, and profit. Include breakout of costs for the following categories of items:
1. Furniture.
2. Plumbing.
3. Mechanical.
4. Electrical.
5. Specialty items such as elevators and equipment.
6. Wood-based construction materials.

C. LEED Action Plans: Provide preliminary submittals within 30 days of date established for the Notice of Award indicating how the following requirements will be met:
1. Credit MR 2: Waste management plan complying with Section 01 74 19 "Construction Waste Management and Disposal."
2. Credit MR 4: List of proposed materials with recycled content. Indicate cost, post- consumer recycled content, and pre-consumer recycled content for each product having recycled content.
3. Credit MR 5: List of proposed regional materials. Identify each regional material, including its source, cost, and the fraction by weight that is considered regional.
4. Credit MR 7: List of proposed certified wood products. Indicate each product containing certified wood, including its source and cost of certified wood products.
5. Credit IEQ 3.1: Construction indoor-air-quality management plan.

D. LEED Progress Reports: Concurrent with each Application for Payment, submit reports comparing actual construction and purchasing activities with LEED action plans for the following:
1. Credit MR 2: Waste reduction progress reports complying with Section 01 74 19 "Construction Waste Management and Disposal."
2. Credit MR 4: Recycled content.
3. Credit MR 5: Regional materials.
4. Credit MR 7: Certified wood products.

1.7 QUALITY ASSURANCE

A. LEED Coordinator: Engage an experienced LEED-Accredited Professional to coordinate LEED requirements. LEED coordinator may also serve as waste management coordinator.

1.8 CONTRACTOR RESPONSIBILITIES

A. This project has been registered with USGBC. The Contractor shall provide all necessary documentation for LEED v3.0 certification in accordance with the specifications. Format and content of all construction documentation must be in accordance with the LEED Reference Guide requirements for supporting data required in event of USGBC audit of the particular credit. Con- tractor is required to coordinate all requirements to assure assembled data is acceptable to USGBC and respond to USGBC requests for additional construction data in the course of preparing the project for certification.

PART 2 – PRODUCTS

2.1 MATERIALS, GENERAL

A. Provide products and procedures necessary to obtain LEED credits required in this Section. Although other Sections may specify some requirements that contribute to LEED credits, the Contractor shall determine additional materials and procedures necessary to obtain LEED credits indicated.

2.2 RECYCLED CONTENT OF MATERIALS

A. Credit MR 4.1: Building materials shall have recycled content such that post-consumer recycled content plus one-half of pre-consumer recycled content constitutes a minimum of [10] percent of cost of materials used for Project.

1. Cost of post-consumer recycled content plus one-half of pre-consumer recycled content of an item shall be determined by dividing weight of post-comsumer recycled comtent plus one-half of pre-consumer recycled content in the item by total weight of the item and multiplying by cost of the item.
2. Cost of post-consumer recycled content plus one-half of pre-consumer recycled content of an item shall be determined by dividing weight of post-consumer recycled content plus one-half of pre-consumer recycled content in the item by total weight of the item and multiplying by cost of the item.
3. Do not include plumbing, mechanical and electrical components, and specialty items such as elevators and equipment in the calculation.

2.3 REGIONAL MATERIALS

A. Credit MR 5: Provide a minimum of 10 percent of building materials (by cost) that are regional materials.

2.4 RAPIDLY RENEWABLE MATERIALS

A. Credit MR 6: Provide a minimum of 2.5 percent of the building materials (by cost) that are rapidly renewable materials.

2.5 CERTIFIED WOOD

A. Credit MR 7: Not less than 50 percent (by cost) of wood-based materials that are produced from wood obtained from forests certified by an FSC-accredited certification body to comply with FSC STD-01-001, "FSC Principles and Criteria for Forest Stewardship."

1. Wood-based materials include, but are not limited to, the following materials when made from wood, engineered wood products, or wood-based panel products:
   a. Rough carpentry.
   b. Miscellaneous carpentry.
   c. Finish carpentry.
   d. Architectural woodwork.

2.6 LOW-EMITTING MATERIALS

A. Credit IEQ 4.1: For field applications that are inside the weatherproofing system, use adhesives and sealants shall comply with the following limits for VOC content limits when calculated according to 40 CFR 59, Subpart D (EPA Method 24):

1. Wood Glues: 30 g/L.
2. Metal to Metal Adhesives: 30 g/L.
3. Adhesives for Porous Materials (Except Wood): 50 g/L.
4. Plastic Foam Adhesives: 50 g/L.
5. Carpet Adhesives: 50 g/L.
6. Carpet Pad Adhesives: 50 g/L.
7. VCT and Asphalt Tile Adhesives: 50 g/L.
8. Cove Base Adhesives: 50 g/L.
9. Gypsum Board and Panel Adhesives: 50 g/L.
10. Rubber Floor Adhesives: 60 g/L.
11. Ceramic Tile Adhesives: 65 g/L.
12. Multipurpose Construction Adhesives: 70 g/L.
13. Contact Adhesive: 80 g/L.
14. Structural Wood Member Adhesive: 140 g/L.
15. Special Purpose Contact Adhesive (contact adhesive that is used to bond melamine covered board, metal, unsupported vinyl, rubber or wood veneer 1/16 inch or less in thickness to any surface): 250 g/L.
16. Top and Trim Adhesive: 250 g/L.
17. ABS Welding Compounds: 325 g/L.
18. CPVC Welding Compounds: 490 g/L.
19. PVC Welding Compounds: 510 g/L.

20. Adhesive Primer for Plastic: 550 g/L.
21. Plastic Cement Welding Compounds: 350 g/L.
22. ABS Welding Compounds: 400 g/L.
23. CPVC Welding Compounds: 490 g/L.
24. PVC Welding Compounds: 510 g/L.
25. Adhesive Primer for Plastic: 650 g/L.
26. Sheet Applied Rubber Lining Adhesive: 850 g/L.
27. Aerosol Adhesive, General Purpose Mist Spray: 65 percent by weight.
28. Aerosol Adhesive, General Purpose Web Spray: 55 percent by weight.
29. Special Purpose Aerosol Adhesive (All Types): 70 percent by weight.
30. Other Adhesives: 250 g/L.
31. Architectural Sealants: 250 g/L.
32. Non-membrane Roof Sealants: 300 g/L.
33. Single-Ply Roof Membrane Sealants: 450 g/L.
34. Other Sealants: 420 g/L.
35. Sealant Primers for Nonporous Substrates: 250 g/L.
36. Sealant Primers for Porous Substrates: 775 g/L.
37. Modified Bituminous Sealant Primers: 500 g/L.
38. Other Sealant Primers: 750 g/L.

B. Credit IEQ 4.2: For field applications that are inside the weatherproofing system, paints and coatings shall comply with the following VOC content limits when calculated according to 40 CFR 59 (EPA method 24):

1. Flat Paints and Coatings: VOC not more than 50 g/L.
2. Nonflat Paints and Coatings: VOC not more than 150 g/L.
3. Dry-Fog Coatings: VOC not more than 400 g/L.
4. Primers, Sealers, and Undercoaters: VOC not more than 200 g/L.
5. Anticorrosive and Antirust Paints Applied to Ferrous Metals: VOC not more than 250 g/L.
6. Zinc-Rich Industrial Maintenance Primers: VOC not more than 340 g/L.
7. Pretreatment Wash Primers: VOC not more than 420 g/L.
8. Clear Wood Finishes, Varnishes: VOC not more than 350 g/L.
9. Clear Wood Finishes, Lacquers: VOC not more than 550 g/L.
10. Floor Coatings: VOC not more than 100 g/L.
11. Shellacs, Clear: VOC not more than 730 g/L.
12. Shellacs, Pigmented: VOC not more than 550 g/L.
13. Stains: VOC not more than 250 g/L.

C. Credit IEQc4.3: All flooring must comply with the following as applicable to the project scope:

1. All carpet and carpet cushion must meet the requirements of the Carpet and Rug Institute Green Label Program.
2. All carpet adhesive must have VOC limit of 50 g/L.
3. All hard surface flooring must meet the requirements of the FloorScore Standard.
4. Concrete, wood, bamboo and cork floor finishes and tile setting adhesives must meet the requirements of South Coast Air Quality Management District (SCAQMD) Rules 1113 and 1168.

D. Credit IEQc4.4: Do not use composite wood, agrifiber products or adhesives that contain urea- formaldehyde resin. FF & E are not included. Products include:

1. Panel substrates
2. Door cores
3. Strawboard
4. Wheatboard
5. Plywood
6. Medium density fiberboard (MDF)
7. Particleboard

PART 3 – EXECUTION

3.1 CONSTRUCTION ACTIVITIES POLLUTION PREVENTION

A. SS Prerequisite 1 Construction Activities Pollution Prevention:
   1. Follow LEED instructions in LEED NCv3.0 Reference Guide and complying with Section 31 25 00, Erosion Control.
   2. Contractor is responsible for completing the LEED online credit template and attaching the following information to the template:
      a. Provide record of compliance with Erosion and Sediment Control Plan:
         i. Monthly photographs of barriers and containment.
         ii. Monthly photographs of dust control measures
         iii. Records of inspections by agency in charge of overseeing compliance.
   3. The LEED Project Administrator will determine if the information prepared by the Contractor is satisfactory for USGBC submission.

3.2 CONSTRUCTION WASTE MANAGEMENT

A. Credit MRc2: Comply with Division 1 Section "Construction Waste Management and Disposal".
   1. Contractor is responsible for completing the LEED online credit template. Attached documentation in support of the credit shall include:
      a. Monthly photographs of waste recycling sorting area including:
         i. Debris control fencing.
         ii. Signage clearly identifying the containers content.
      b. Spreadsheet containing the following information:
         i. Diverted materials description.
         ii. Diverted materials/waste hauler name.
         iii. Date of each haul.
         iv. Quantity of material in each haul.
      c. Copies of recycling vender and waste hauler tipping receipts.
   2. The LEED Project Administrator will determine if the information prepared by the Contractor is satisfactory for USGBC submission.

3.3 RECYCLED CONTENT OF BUILDING MATERIALS

A. Credit MRc4: Recycled Content:
   1. Follow LEED instructions in LEED NCv3.0 Reference Guide.
   2. Provide record showing the preconsumer and post-consumer recycled content of all materials specified in Divisions 2 - 32.
   3. Contractor is responsible for completing the LEED online credit template and attaching the following information to the template:
      a. Spreadsheet containing the following information:
         i. The description of each materials in each product specified in Divisions 2 - 32.
         ii. Material manufacturer's name.
         iii. Material cost.
         iv. Percent preconsumer recycled content of each material.
         v. Percent post-consumer recycled content of each material.
         vi. Recycled content information source.
      b. Copies of vendors literatures or a statement from vendors on vendor's letterhead confirming the figures used in the spreadsheet.
   4. The LEED Project Administrator will determine if the information prepared by the Contractor is satisfactory for USGBC submission.

3.4 REGIONAL MATERIALS

A. Credit MRc5: Regional Materials:
   1. Follow LEED instructions in LEED NCv3.0 Reference Guide.
   2. Provide record showing the manufacturing location for all materials specified in Divisions 2 - 32.
   3. Contractor is responsible for completing the LEED online credit application and attaching the following information to the application:
      a. Copies of vendors literatures or a statement from vendors on vendor's letterhead confirming the figures used in the spreadsheet.
   4. The LEED Project Administrator will determine if the information prepared by the Contractor is satisfactory for USGBC submission.

3.5 RAPIDLY RENEWABLE MATERIALS

A. Credit MRc6: Rapidly Renewable Materials:
   1. Follow LEED instructions in LEED NCv3.0 Reference Guide.
   2. Provide record showing the cost for all rapidly renewable materials specified in Divisions 2 - 32.
   3. Contractor is responsible for completing the LEED online credit application and attaching the following information to the application:
      a. Spreadsheet containing the following information:
         i. The description of each materials in each product specified in Divisions 2 - 32.
         ii. Material manufacturer's name.
         iii. Material cost.
         iv. Percent rapidly renewable.
      b. Copies of vendors literatures or a statement from vendors on vendor's letterhead confirming the figures used in the spreadsheet.
   4. The LEED Project Administrator will determine if the information prepared by the Contractor is satisfactory for USGBC submission.

3.6 CERTIFIED WOOD

A. Credit MRc7 Certified Wood:
   1. Follow LEED instructions in LEED NCv3.0 Reference Guide to comply with Credit MRc7 requirements for certified wood installed in construction.
   2. Contractor is responsible for completing the LEED online credit template and attaching the following information to the template:
      a. Copies of vendors literatures or a statement from vendors on vendor's letterhead confirming the figures used in the LEED Online Certified Wood Materials Calculator spreadsheet.
      b. Copies of the chain-of-custody documentation received from vendors on vendors.
   3. The LEED Project Administrator will determine if the information prepared by the Contractor is satisfactory for USGBC submission.

3.7 CONSTRUCTION INDOOR-AIR-QUALITY MANAGEMENT

A. Credit IEQc3.1: Comply with SMACNA's "SMACNA IAQ Guideline for Occupied Buildings under Construction."
   1. If Owner authorizes use of permanent heating, cooling, and ventilating systems during construction period as specified in Division 1 Section "Temporary Facilities and Controls", install filter media having a MERV 8 according to ASHRAE 52.2 at each return-air inlet for the air-handling system used during construction.
   2. Replace all air filters immediately prior to occupancy.
   3. Provide record of compliance with Indoor Air Quality Management Plan:
      a. Monthly photographs of equipment and ductwork protection.
      b. Monthly photographs of filters used to protect air distribution and equipment.
      c. Contractor's report documenting that MERV 8 filters were used to protect equipment during construction and MERV 13 filters were installed prior to occupancy.

B. Credit IEQc3.2: Indoor Air Quality management Plan – Before Occupancy:
   1. After construction ends, prior to occupancy and with all interior finishes installed, perform a building flush-out by supplying a total volume of 14000 cu. ft. of outdoor air per sq. ft. of floor area while maintaining an internal temperature of at least 60 deg F and a relative humidity no higher than 60 percent.
   2. If occupancy is desired prior to flush-out completion, the space may be occupied following delivery of a minimum of 3500 cu. ft. of outdoor air per sq. ft. of floor area to the space. Once a space is occupied, it shall be ventilated at a minimum rate of 0.30 cfm per sq. ft. of outside air or the design minimum outside air rate determined in IEQ Prerequisite 1, whichever is greater. During each day of the flush-out period, ventilation shall begin a minimum of three (3) hours prior to occupancy and continue during occupancy. These conditions shall be maintained until a total of 14000 cu. ft./sq. ft. of outside air has been delivered to the space.
   3. Air-Quality Testing: If the Contractor chooses to test for compliance with LEED Credit IEQc3.2 the following is required:
      a. Conduct baseline indoor-air-quality testing, after construction ends and prior to occupancy, using testing protocols consistent with the EPA's "Compendium of Methods for the Determination of Air

Pollutants in Indoor Air," and as additionally detailed in the USGBC's "Green Building Design and Construction Reference Guide".

b. Demonstrate that the contaminant maximum concentrations listed below are not exceeded:
   i. Formaldehyde: 27 ppb.
   ii. Particulates (PM10): 50 micrograms/cu. m.
   iii. Total Volatile Organic Compounds (TVOC): 500 micrograms/cu. m.
   iv. 4-Phenylcyclohexene (4-PH): 6.5 micrograms/cu. m.
   v. Carbon Monoxide: 9 ppm and no greater than 2 ppm above outdoor levels.

c. For each sampling point where the maximum concentration limits are exceeded, conduct additional flush-out with outside air and retest the specific parameter(s) exceeded to indicate the requirements are achieved. Repeat procedure until all requirements have been met. When retesting non-complying building areas, samples are to be taken from the same locations as the first test.

d. Air-sample testing shall be conducted as follows:
   i. All measurements shall be conducted prior to occupancy but during normal occupied hours and with building ventilation system starting at the normal daily start time and operated at the minimum outside air flow rate for the occupied mode throughout the duration of the air testing.
   ii. Building shall have all interior finishes installed including, but not limited to, millwork, doors, paint, carpet, and acoustic tiles. Non-fixed furnishings such as workstations and partitions are encouraged, but not required to be in place for the testing.
   iii. Number of sampling locations will vary depending on the size of building and number of ventilation systems. For each portion of building served by a separate ventilation system, the number of sampling points shall not be less than one per 25,000 sq. ft. or for each contiguous floor area, whichever is larger, and shall include areas with the least ventilation and greatest presumed source strength.
   iv. Air samples shall be collected between 3 and 6 feet from the floor to represent the breathing zone of occupants, and over a minimum four- hour period.

4. The LEED Project Administrator will determine if the information prepared by the Contractor is satisfactory for USGBC submission.

3.8 LOW EMITTING MATERIALS

A. Credit IEQc4.1 through Credit MRc4.4: Low Emitting Materials:
   1. Follow LEED instructions in LEED NCv3.0 Reference Guide.
   2. Contractor is responsible for completing the LEED online credit template and attaching the following information to the template:
      a. Copies of vendor's literature or MSDS sheets confirming the figures used in the spreadsheet.
   3. The LEED Project Administrator will determine if the information prepared by the Contractor is satisfactory for USGBC submission.

3.9 INDOOR CHEMICAL AND POLLUTANT SOURCE CONTROL

A. Credit IEQc5: Indoor Chemical and Pollutant Source Control:
   1. Install new air filtration media, with a MERV 13 Rating, in regularly occupied areas prior to occupancy.

3.10 SUPPLEMENT

A. The supplement listed below, following "End of Section," is a part of this Specification:
   1. LEED for New Construction v3.0 Registered Project Checklist.

1

LEED v3 for New Construction and Major Renovations
Project Checklist 12-12-14

13	**0**	**0**	**13**		**Sustainable Sites**		Possible	**26**
Y	?Y	?N	N	d/C				
Y				C	Prereq 1	Construction Activity Pollution Prevention		
1				d	Credit 1	Site Selection		1
			5	d	Credit 2	Development Density and Community Connectivity		5
			1	d	Credit 3	Brownfield Redevelopment		1
			6	d	Credit 4.1	Alternative Transportation—Public Transportation Access		6
1				d	Credit 4.2	Alt Transportation—Bike Storage and Changing Rooms		1
3				d	Credit 4.3	Alternative Transportation—L.E. and Efficient Vehicles		3
2				d	Credit 4.4	Alternative Transportation—Parking Capacity		2
1				C	Credit 5.1	Site Development—Protect or Restore Habitat		1
1				d	Credit 5.2	Site Development—Maximize Open Space		1
1				d	Credit 6.1	Stormwater Design—Quantity Control		1
1				d	Credit 6.2	Stormwater Design—Quality Control		1
			1	C	Credit 7.1	Heat Island Effect—Non-roof		1
1				d	Credit 7.2	Heat Island Effect—Roof		1
1				d	Credit 8	Light Pollution Reduction		1
8	**0**	**0**	**2**		**Water Efficiency**		Possible Points:	**10**
Y	?Y	?N	N	d/C				
Y				d	Prereq 1	Water Use Reduction—20% Reduction		
4				d	Credit 1	Water Efficient Landscaping		2 to 4
						Reduce by 50%		2
						4 No Potable Water Use for Irrigation		4
2				d	Credit 2	Innovative Wastewater Technologies		2
2			**2**	d	Credit 3	Water Use Reduction		2 to 4
						2 Reduce by 30%		2
						Reduce by 35%		3
						Reduce by 40%		4
28	**0**	**5**	**2**		**Energy and Atmosphere**		Possible Points:	**35**
Y	?Y	?N	N	d/C				
Y				C	Prereq 1	Fundamental Commissioning of Building Energy Systems		
Y				d	Prereq 2	Minimum Energy Performance		
Y				d	Prereq 3	Fundamental Refrigerant Management		
19				d	Credit 1	Optimize Energy Performance		1 to 19
						Improve by 12% for New Buildings		1

							Improve by 14% for New Buildings	2
							Improve by 16% for New Buildings	3
							Improve by 18% for New Buildings	4
							Improve by 20% for New Buildings	5
							Improve by 22% for New Buildings	6
							Improve by 24% for New Buildings	7
							Improve by 26% for New Buildings	8
							Improve by 28% for New Buildings	9
							Improve by 30% for New Buildings	10
							Improve by 32% for New Buildings	11
							Improve by 34% for New Buildings	12
							Improve by 36% for New Buildings	13
							Improve by 38% for New Buildings	14
							Improve by 40% for New Buildings	15
							Improve by 42% for New Buildings	16
							Improve by 44% for New Buildings	17
							Improve by 46% for New Buildings	18
						19	Improve by 48%+ for New Buildings	19
2		**5**		d	Credit 2	On-Site Renewable Energy		1 to 7
							1% Renewable Energy	1
						2	3% Renewable Energy	2
							5% Renewable Energy	3
							7% Renewable Energy	4
							9% Renewable Energy	5
							11% Renewable Energy	6
						5	13% Renewable Energy	7
2				C	Credit 3	Enhanced Commissioning		2
2				d	Credit 4	Enhanced Refrigerant Management		2
3				C	Credit 5	Measurement and Verification		3
			2	C	Credit 6	Green Power		2
4	**4**	**0**	**6**	d/C	**Materials and Resources**		Possible Points:	**14**
Y	?Y	?N	N					
Y				d	Prereq 1	Storage and Collection of Recyclables		
			3	C	Credit 1.1	Building Reuse—Maintain Existing Walls, Floors, and Roof		1 to 3
							Reuse 55%	1
							Reuse 75%	2
							Reuse 95%	3
			1	C	Credit 1.2	Building Reuse—Maintain 50% of Interior Non-Structural		1
2				C	Credit 2	Construction Waste Management		1 to 2
							50% Recycled or Salvaged	1

						2	75% Recycled or Salvaged	2
			2	C	Credit 3	Materials Reuse		1 to 2
						1	Reuse 5%	1
						1	Reuse 10%	2
1	**1**			C	Credit 4	Recycled Content		1 to 2
						1	10% of Content	1
						1	20% of Content	2
1	**1**			C	Credit 5	Regional Materials		1 to 2
						1	10% of Materials	1
						1	20% of Materials	2
	1			C	Credit 6	Rapidly Renewable Materials		1
	1			C	Credit 7	Certified Wood		1
12	**0**	**0**	**3**		**Indoor Environmental Quality**		Possible Points:	**15**
Y	?Y	?N	N	d/C				
Y				d	Prereq 1	Minimum Indoor Air Quality Performance		
Y				d	Prereq 2	Environmental Tobacco Smoke (ETS) Control		
			1	d	Credit 1	Outdoor Air Delivery Monitoring		1
1				d	Credit 2	Increased Ventilation		1
1				C	Credit 3.1	Construction IAQ Management Plan—During Construction		1
1				C	Credit 3.2	Construction IAQ Management Plan—Before Occupancy		1
1				C	Credit 4.1	Low-Emitting Materials—Adhesives and Sealants		1
1				C	Credit 4.2	Low-Emitting Materials—Paints and Coatings		1
1				C	Credit 4.3	Low-Emitting Materials—Flooring Systems		1
1				C	Credit 4.4	Low-Emitting Materials—Composite Wood and Agrifiber		1
1				d	Credit 5	Indoor Chemical and Pollutant Source Control		1
1				d	Credit 6.1	Controllability of Systems—Lighting		1
			1	d	Credit 6.2	Controllability of Systems—Thermal Comfort		1
1				d	Credit 7.1	Thermal Comfort—Design		1
1				d	Credit 7.2	Thermal Comfort—Verification		1
1				d	Credit 8.1	Daylight and Views—Daylight		1
			1	d	Credit 8.2	Daylight and Views—Views		1
4	**2**	**0**	**0**		**Innovation and Design Process**		Possible Points:	**6**
Y	?Y	?N	N					
1				d	Credit 1.1	Innovation in Design: WEc2: Treat 100% onsite		1
	1			C	Credit 1.2	Innovation in Design: MRc4: 30% Recycled Content		1
	1			C	Credit 1.3	Innovation in Design: MRc5: 30% Regional Materials		1
1				d	Credit 1.4	Innovation in Design: Building Education Program		1
1				d	Credit 1.5	Innovation in Design: Green Cleaning		1
1				d	Credit 2	LEED Accredited Professional		1

4	**0**	**0**	**0**		**Regional Priority Credits**		Possible Points:	**4**
Y	?Y	?N	N	d/C				
1				d	Credit 1.1	Regional Priority: SS4.2		1
1				d	Credit 1.2	Regional Priority: SSc4.4		1
1				d	Credit 1.3	Regional Priority: WEc3 (30%)		1
1				d	Credit 1.4	Regional Priority: EAc2 (1%)		1
73	6	5	26		**Total**		Possible Points:	**110**
Y	?Y	?N	N					

END OF SECTION

SECTION 01 91 00
COMMISSIONING

PART 1 – GENERAL

1.1. SUMMARY

A. Purpose: Define the responsibilities of the parties involved and the procedures related to the commissioning process

1.2. RELATED SPECIFICATIONS

A.	Section 01 31 13	Project Coordination
B.	Section 01 31 19	Project Meetings
C.	Section 01 31 23	Project Management Website
D.	Section 01 32 26	Construction Progress Reporting
E.	Section 01 33 23	Submittals
F.	Section 01 45 16	Field Quality Control Procedures
G.	Section 01 77 00	Closeout Procedures
H.	Section 01 78 23	Operation and Maintenance Data
I.	Section 01 78 39	As-Built Drawings
J.	Section 01 79 00	Demonstration and Training
K.	Section 01 81 13	Sustainable Design Requirements – LEEDv3
L.	Section 01 95 00	Measurement & Verification
M.	Section 23 05 93	Testing, Adjusting, and Balancing for HVAC
N.	Section 23 09 00	Instrumentation and Control for HVAC
O.	Section 23 09 24	Direct Digital Control (DDC) System for HVAC

1.3 REFERENCES

A. ASHRAE Guideline 1.1-2007, “HVAC&R Technical Requirements for The Commissioning Process”.
B. ASHRAE Guideline 0-2005, “The Commissioning Process”.
C. NEBB – Procedural Standards for Building Systems Commissioning.

1.4 DEFINITIONS

A. Acceptance Phase. Phase of construction after startup and initial checkout when functional performance tests are performed.
B. Commissioning Authority (CxA). An independent entity, not otherwise associated with the A/E team members or the Contractor and reports directly to the Owner. The CxA directs and coordinates the commissioning activities.

C. Commissioning Plan (Cx Plan). An overall plan, developed before or after bidding, that provides the structure, schedule and coordination planning for the commissioning process. The Cx Plan is included in the bid documents and is to be reviewed by all contractors before submitting their bid.

D. Contract Documents. The documents binding on parties involved in the construction of this project (drawings, specifications, change orders, amendments, contracts, Cx Plan, etc.).

E. Construction Checklist (CC). a list of items to inspect and test equipment and components to verify proper installation of equipment. The CCs are provided by the CxA to the Sub.

F. Datalogging. - Monitoring flows, currents, status, pressures, etc. of equipment using stand-alone dataloggers separate from the control system.

G. Deferred System Performance Tests. SPT's that are performed later, after substantial completion, due to partial occupancy, equipment, seasonal requirements, design or other site conditions that prevent the tests from being performed earlier.

H. Deficiency. A condition in the installation or function of a component, piece of equipment or system that is not in compliance with the Contract Documents (that is, does not perform properly or is not complying with the Owner's Project Requirements).

I. Factory Testing. Testing of equipment on-site or at the factory by factory personnel with an Owner's representative present.

J. Indirect Indicators. Indicators of a response or condition, such as a reading from a control system screen reporting a damper to be 100% closed.

K. Manual Test. Using hand-held instruments, immediate control system readouts or direct observation to verify performance (contrasted to analyzing monitored data taken over time to make the "observation").

L. Monitoring. Recording parameters (flow, current, status, pressure, etc.) of equipment operation using dataloggers or the trending capabilities of control systems.

M. Over-written Value. Writing over a sensor value in the control system to see the response of a system (e.g., changing the outside air temperature value from 75F to 50F to verify economizer operation). See also "Simulated Signal."

N. Owner's Project Requirements (OPR). A document that describes what the Owner and stakeholders want to achieve with this project and what expectations they have of the completed project.

O. Sampling. Reviewing or testing only a fraction of the total number of identical or near identical pieces of equipment.

P. Seasonal Performance Tests. SPT's that are deferred until the system(s) will experience conditions closer to their design conditions.

Q. Simulated Condition. Condition that is created for the purpose of testing the response of a system (e.g., applying a hair blower to a space sensor to see the response in a VAV box).

R. Simulated Signal. Disconnecting a sensor and using a signal generator to send an amperage, resistance or pressure to the transducer and DDC system to simulate a sensor value.

S. System Performance Test (SPT). Dynamic testing of entire systems (rather than just components of the system) under full operation.

T. Trending. Monitoring of control points using the building automation system.

1.5 DESCRIPTION

A. General: Commissioning (Cx) is a systematic process of verifying that all building systems perform interactively to meet the Owner's Project Requirements (OPR). This is achieved by beginning in the planning phase with documenting the OPR and continuing through design, construction, acceptance, and the warranty period with verification of performance. The Cx process shall encompass and coordinate the traditionally separate functions of system documentation, equipment startup, control system calibration, testing and balancing, performance testing and training. Cx during the construction phase is intended to achieve the following specific objectives according to the Contract Documents:

1. Verify that applicable equipment and systems are installed according to the manufacturer's recommendations and to industry accepted minimum standards and that they receive adequate operational checkout by installing contractors.
2. Verify and document proper performance of equipment and systems.
3. Verify that O&M documentation is complete.
4. Verify that the Owner's operating personnel are adequately trained.

B. The Cx process does not take away from or reduce the responsibility of the system designers or installing contractors to provide a finished and fully functioning product.

C. The commissioning authority (CxA) has no authority to change, modify or direct any work. The CxA can only provide comments and suggestions.

D. Commissioning Plan. The Cx Plan provides guidance in the execution of the Cx process. The CxA will update the Cx Plan regularly as the project progresses. The Drawings and Specifications will take precedence over the Cx Plan.

1.6 RESPONSIBILITIES

A. General Contractor (GC) and Subcontractors (Subs)

1. Construction and Acceptance Phase
   a. Provide assistance to the Construction Manager CM in the coordination of the Cx work by the CxA, and with the CM and CxA ensure that Cx activities are being scheduled into the master schedule.
   b. Provide an updated construction schedule to the CxA any time the schedule changes.
   c. Include the Cx activities in the contract.
   d. Furnish a copy of all submittals and shop drawings pertaining to the commissioned systems for review concurrently with the Architect and Engineers.
   e. Furnish a copy of all construction meeting agendas and minutes to the CxA.
   f. In each purchase order or subcontract written, include requirements for submittal data, O&M data, Cx tasks and training.
   g. GC will ensure that all Subs execute their Cx responsibilities according to the Contract Documents and schedule.
   h. A representative from the GC and each sub associated with the Cx process shall attend the Cx pre- construction meeting and the regular Cx meetings scheduled by the CxA to facilitate the Cx process.
   i. Coordinate and execute the training of Owner personnel.
   j. Prepare O&M manuals, according to the Contract Documents, including clarifying and updating the original sequences of operation to as-built conditions.
   k. Prepare and submit draft forms, including but not limited to start-up procedures, Testing and Balancing (TAB) forms, calibration forms, etc. for review by the CxA before execution.
   l. Submit test reports to the CxA of all tests performed on components and equipment to be commissioned that are not included as part of the Construction Checklist and SPT procedures.
   m. Complete all construction checklist and functional performance test forms as required by the Cx process.
   n. Support the CxA with verification of the completion of construction checklist and functional performance tests as outlined in PART 3.
   o. Complete and inspect all installations. Certify that all components and systems are operating as intended per Contract Documents.
   p. Remedy all deficiencies immediately as they are identified throughout construction.
   q. Demonstrate functionality of all systems and equipment.
   r. Maintain an updated set of record drawings (on a daily basis) on the construction site.
   s. Provide support and instrumentation to verify TAB reports, start-up reports, calibration reports, and any other report pertinent to the commissioned equipment and systems.
   t. Notify the CxA no less than 21 days before all testing, start-up, and training.
   u. Update the CxA on a weekly basis on the progress of the Cx activities.
   v. Submit trend data in electronic format or allow access to trending data by internet connection as requested by the CxA.
   w. Install access points by every sensor such that the sensor can be calibrated without removal (P/T plugs, plugged holes in ducts etc.).
2. Warranty Period
   a. Execute seasonal or deferred functional performance testing, witnessed by the CxA, according to the specifications.
   b. Correct deficiencies and make necessary adjustments to O&M manuals and record drawings for applicable issues identified in any seasonal testing.

B. Equipment Suppliers

1. Provide all requested submittal data, including detailed start-up procedures and specific responsibilities of the Owner to keep warranties in force.
2. Assist in equipment testing per agreements with Subs.
3. Include all special tools and instruments (only available from vendor, specific to a piece of equipment) required for testing equipment according to these Contract Documents in the base

bid price to the Contractor, except for stand-alone data logging equipment that may be used by the CxA.

4. Provide information requested by CxA regarding equipment sequence of operation and testing procedures.
5. Review test procedures for equipment installed by factory representatives.

1.7 SYSTEMS TO BE COMMISSIONED

A. Heating, Ventilation and Air Conditioning (HVAC) systems.
B. Building Automation System (BAS) for the HVAC systems.
C. Plumbing systems including domestic hot water, cold water, waste, vent piping, and fixtures.
D. Electrical systems including lighting fixtures, lighting controls, electrical panels, transformers, motor control centers, and electrical motors.
E. Renewable energy systems including solar hot water heating and photovoltaic systems.
F. Building envelope and roofing system as it pertains to HVAC.

PART 2 – PRODUCTS

2.1 TEST INFORMATION

A. All instruments needed to verify sensor readings, component performance, and system performance will be provided by GC and Subs and be available to the CxA. These instruments will not be beyond what the contractors need to complete the work specified in these construction documents. Any data logging equipment required in addition to the BAS will be provided by the CxA.
B. All instruments shall be of sufficient quality and accuracy to test and/or measure system performance with the tolerances specified in the Contract Documents. Refer to specification section 23 05 93- Testing, Adjusting, and Balancing for required instrument tolerances.

PART 3 - EXECUTION

3.1 COMMISSIONING TEAM

A. The members of the commissioning team consist of the Commissioning Authority (CxA), the Owner's Project Manager (PM), the designated representative of the Owner's Construction Management team (CM), the General Contractor (GC or Contractor), the architect and design engineers, the Mechanical Contractor, the Electrical Contractor, the TAB Contractor, the Controls Contractor, any other installing subcontractors or suppliers of equipment.
B. Each Cx Team member shall designate one person who is responsible for coordinating the commissioning efforts with the CxA.

3.2 SCHEDULING AND MEETINGS

A. Scheduling. The CxA will work with the other members of the Cx Team according to established protocols to schedule the Cx activities. The CxA will provide sufficient notice to the Cx Team for scheduling Cx activities. The GC will integrate all Cx activities into the master schedule. All parties will address scheduling problems and make necessary notifications in a timely manner in order to expedite the Cx process.
B. The CxA will provide the initial schedule of primary Cx events at the Cx pre-construction meeting. The Cx Plan provides a format for this schedule. As construction progresses more detailed schedules are developed by the CxA. The Cx Plan also provides a format for detailed schedules.
C. Pre-Construction Meeting. Within 60 days of selection of the GC, the CxA will schedule, plan, and conduct a Cx pre-construction meeting with the entire Cx team in attendance. Meeting minutes will be distributed to all parties by the CxA. Information gathered from this meeting will allow the CxA to revise the Cx Plan which will also be distributed to all parties.
D. Meetings. The Cx meetings will be scheduled approximately once a month during construction. These meetings will be scheduled directly before or after the regular construction meetings if practical. These meetings will cover coordination, deficiency resolution and planning issues with particular Subs. The CxA will plan these meetings and will minimize unnecessary time being spent by Subs

3.3 REPORTING

A. The CxA will provide regular reports to the Owner as construction and Cx progresses. Standard forms are provided and referenced in the Cx Plan.

B. The CxA will regularly communicate with all members of the Cx team, keeping them apprised of Cx progress and scheduling changes through memos, progress reports, etc.

C. Testing or review approvals and non-conformance and deficiency reports are made regularly with the review and testing as described in later sections.

3.4 RECORD DRAWINGS

A. The CxA will verify that the record drawings are updated throughout the construction. If a discrepancy is found between the record drawings and the installations, the CxA will notify the GC immediately. It is the GC and subcontractors responsibility to then inspect the installations and immediately and completely update the record drawings such that they accurately reflect the installation.

3.5 CONSTRUCTION COMMISSIONING PROCEDURES

A. The following procedures apply to all equipment to be commissioned.

B. General. Construction checklists are important to ensure that the equipment and systems are hooked up and operational. It ensures that system performance testing (in-depth system checkout) may proceed without unnecessary delays. Each piece of equipment receives full checkout. No sampling strategies are used. All construction checklists for a given system must be successfully completed prior to formal system performance testing of equipment or subsystems of the given system.

C. Construction Checklists.

1. The primary purpose of the construction checklists is to provide the individual workers with the key criteria for a successful installation. The secondary purpose is to track the progress of the delivery and installation.
2. The CxA will develop construction checklists for all commissioned equipment and distribute these to the responsible contractor. The GC and Subs will review the construction checklists for each equipment type and provide comments to the CxA. The CxA will then print and distribute the construction checklist for each individual component.
3. The GC and Subs are responsible for all requirements in the specification, not only the requirements listed on the checklists.
4. The checklists answer format will be to circle yes /no or provide a brief answer such as providing the model or serial numbers.
5. These checklists are provided by the CxA to the GC. The GC determines which trade is responsible for executing and documenting each of the line item tasks and notes that trade on the form. Each form may have more than one trade responsible for its execution. A sample checklist for a VAV box is provided at the end of this specification section.
6. The construction checklists shall be completed as delivery is completed and the installation progresses.
7. Only individuals who have direct knowledge and witnessed that a line item task on the construction checklist was actually performed shall initial or check that item off. It is not acceptable for supervisors without direct knowledge or who have not witnessed the line item task on the construction checklist to fill out these forms.
8. Any negative response shall immediately be brought to the attention of the CxA. All negative replies shall be explained in detail on the construction checklist.
9. The GC and Subs are responsible for recording the completion of the checklists. Checklists shall be submitted electronically to SharePoint in .pdf format in separate files by Division. Each file shall be bookmarked by checklist tag.
10. Non-itemized installations such as wiring, ductwork, piping etc. will not have checklists to be completed, but the GC and Subs will be provided the key criteria for successful installation.
11. The CxA will verify the construction checklist completion by a sampling of the delivered and installed equipment. The sampling process will be described in the Cx Plan.

D. Sensor Calibration. Calibration of all sensors shall be included as part of the construction checklists performed by the Contractors. Calibration information is provided in specification Section 23 09 23 - Direct Digital Control System for HVAC

E. Deficiencies, Non-Conformance and Approval in Checklists and Startup.

1. The Subs shall clearly list any outstanding items of the construction checklist that were not completed successfully, at the bottom of the procedures form or on an attached sheet. The procedures form and any outstanding deficiencies are provided to the CxA within two days of task completion.

2. The CxA reviews the report and submits either a non-compliance report or an approval form to the Sub or CM. The CxA shall work with the Subs and vendors to correct deficiencies or uncompleted items. The CxA will involve the CM and others as necessary. The installing Subs or vendors shall correct all areas that are deficient or incomplete in the checklists and tests in a timely manner, and shall notify the CxA as soon as outstanding items have been corrected and include a Statement of Correction on the original non- compliance report. When satisfactorily completed, the CxA recommends approval of the completion of the checklists to the CM using a standard form.
3. Items left incomplete, which later cause deficiencies or delays during functional testing may result in back charges to the responsible party.

F. System Performance Tests (SPT). SPTs shall be performed to demonstrate that each system is operating according to the documented OPR and Contract Documents. System testing differs to the tests required in the Construction Checklist in that they facilitate bringing all the individual components together to verify that they operate collectively on a system level to provide the required design conditions.
1. Development of Test Procedures. The CxA shall prepare the SPT forms and procedures in accordance with the criteria defined in the Cx Plan. The GC and Subs shall assist the CxA in the preparation of these procedures by answering queries and forwarding site-specific information. A sample System Performance Test form is provided at the end of this specification section.
2. Participation: The GC and the Subs are responsible for testing all systems to be commissioned such that they function as described in the contract documents. The CxA will verify the performance of the systems. The CxA will direct, witness and document the SPT verification and GC and Subs will execute the verification tests.

G. Problem Solving. The CxA will recommend solutions to problems found, however the burden of responsibility to solve, correct and retest problems is with the GC, Subs and A/E.

H. Seasonal Testing. During the warranty period, seasonal testing (tests delayed until weather conditions are closer to the system's design) shall be completed as part of this contract. The CxA shall coordinate this activity. Tests will be executed, documented and deficiencies corrected by the appropriate Subs, with facilities staff and the CxA witnessing. Any final adjustments to the O&M manuals and record documents due to the testing will be made.

I. Unforeseen Deferred Tests. If any check or test cannot be completed due to the building structure, required occupancy condition or other deficiency, execution of checklists and functional testing may be delayed upon approval of the PM. These tests will be conducted in the same manner as the seasonal tests.

3.6 SENSOR AND ACTUATOR CALIBRATION

A. Calibrate all field-installed temperature, relative humidity, carbon monoxide, carbon dioxide, and pressure sensors and gages, and all actuators (dampers and valves) on this piece of equipment shall be calibrated. Sensors installed in the unit at the factory with calibration certification provided need not be field calibrated.

B. Calibrate using the methods described below; alternate methods may be used, if approved by Owner beforehand. See PART 2 for test instrument requirements. Record methods used on the relevant Construction Checklist or other suitable forms, documenting initial, intermediate and final results.

C. All Sensors:
1. Verify that sensor location is appropriate and away from potential causes of erratic operation.
2. Verify that sensors with shielded cable are grounded only at one end.
3. For sensor pairs that are used to determine a temperature or pressure difference, for temperature make sure they are reading within 0.2 degree F (0.1 degree C) of each other, and for pressure, within tolerance equal to 2 percent of the reading, of each other.
4. Tolerances for critical applications may be tighter.

D. Sensors without Transmitters - Standard Application:
1. Make a reading with a calibrated test instrument within 6 inches (150 mm) of the site sensor.
2. Verify that the sensor reading, via the permanent thermostat, gage or building automation system, is within the tolerances in the table below of the instrument-measured value.
3. If not, install offset, calibrate or replace sensor.

E. Sensors with Transmitters - Standard Application.
1. Disconnect sensor.
2. Connect a signal generator in place of sensor.
3. Connect ammeter in series between transmitter and building automation system control panel.
4. Using manufacturer's resistance-temperature data, simulate minimum desired temperature.
5. Adjust transmitter potentiometer zero until 4 mA is read by the ammeter.

6. Repeat for the maximum temperature matching 20 mA to the potentiometer span or maximum and verify at the building automation system.
7. Record all values and recalibrate controller as necessary to conform with specified control ramps, reset schedules, proportional relationship, reset relationship and P/I reaction.
8. Reconnect sensor.
9. Make a reading with a calibrated test instrument within 6 inches (150 mm) of the site sensor.
10. Verify that the sensor reading, via the permanent thermostat, gage or building automation system, is within the tolerances in the table below of the instrument-measured value.
11. If not, replace sensor and repeat.
12. For pressure sensors, perform a similar process with a suitable signal generator.

F. Sensor Tolerances for Standard Applications: Plus/minus the following maximums:
1. Watthour, Voltage, Amperage: 1 percent of design.
2. Pressure, Air, Water, Gas: 3 percent of design.
3. Air Temperatures (Outside Air, Space Air, Duct Air): 0.4 degrees F (0.2 degree C).
4. Relative Humidity: 4 percent of design.
5. Barometric Pressure: 0.1 inch of Hg (340 Pa).
6. Flow Rate, Air: 10 percent of design.
7. Flow Rate, Water: 4 percent of design.
8. Flow Rate, Steam: 3 percent of design.
9. AHU Wet Bulb and Dew Point: 2.0 degrees F (1.1 degrees C).
10. Hot Water Coil and Boiler Water Temperature: 1.5 degrees F (0.8 degrees C).
11. Cooling Coil, Chilled and Condenser Water Temperatures: 0.4 degrees F (0.2 degree C).
12. Combustion Flue Temperature: 5.0 degrees F (2.8 degrees C).
13. Oxygen and CO2 Monitors: 0.1 percentage points.
14. CO Monitor: 0.01 percentage points.
15. Natural Gas and Oil Flow Rate: 1 percent of design.

G. Critical Applications: For some applications more rigorous calibration techniques may be required for selected sensors. Describe any such methods used on an attached sheet.

H. Valve/Damper Stroke Setup and Check:
1. For all valve/damper actuator positions checked, verify the actual position against the control system readout.
2. Set pump/fan to normal operating mode.
3. Command valve/damper closed; visually verify that valve/damper is closed and adjust output zero signal as required.
4. Command valve/damper to open; verify position is full open and adjust output signal as required.
5. Command valve/damper to a few intermediate positions.
6. If actual valve/damper position does not reasonably correspond, replace actuator

I. Isolation Valve or System Valve Leak Check: For valves not associated with coils.
1. With full pressure in the system, command valve closed.
2. Use an ultra-sonic flow meter to detect flow or leakage.

3.7 NON-CONFORMANCE

A. All deficiencies or non-conformance issues shall be noted and reported by the GC to the CM on a standard non-compliance form.

B. Corrections of minor deficiencies identified may be made during the tests at the discretion of the CxA. In such cases the deficiency and resolution will be documented on the procedure form.

C. Every effort will be made to expedite the testing process and minimize unnecessary delays, while not compromising the integrity of the procedures. However, the CxA will not be pressured into overlooking deficient work or loosening acceptance criteria to satisfy scheduling or cost issues, unless there is an overriding reason to do so at the request of the CM and the Owner.

D. As tests progress and a deficiency is identified, the CxA discusses the issue with the executing contractor.
1. When there is no dispute on the deficiency and the Sub accepts responsibility to correct it:
a. The CxA documents the deficiency and the Sub's response and intentions and they go on to another test or sequence. After the day's work, the CxA submits the non-compliance reports to the CM for signature, if required. A copy is provided to the Sub and CxA. The Sub corrects the deficiency, signs the statement of correction at the bottom of the non-compliance form certifying that the equipment is ready to be retested and sends it back to the CxA.

b. The CxA reschedules the test and the test is repeated.

2. If there is a dispute about a deficiency, regarding whether it is a deficiency or who is responsible:
   a. The deficiency shall be documented on the non-compliance form with the Sub's response and a copy given to the CM and to the Sub representative assumed to be responsible.
   b. Resolutions are made at the lowest management level possible. Other parties are brought into the discussions as needed. Final interpretive authority is with the A/E. Final acceptance authority is with the Project Manager.
   c. The CxA documents the resolution process.
   d. Once the interpretation and resolution have been decided, the appropriate party corrects the deficiency, signs the statement of correction on the non-compliance form and provides it to the CxA. The CxA reschedules the test and the test is repeated until satisfactory performance is achieved.

3. Cost of Retesting.
   a. The cost incurred by the Subs to retest a construction checklist item or functional test, if they are responsible for the deficiency, shall be theirs. If they are not responsible, any cost recovery for retesting costs shall be negotiated with the GC.
   b. For a deficiency identified, not related to any construction checklist or start-up fault, the following shall apply: The CxA and CM will direct the retesting of the equipment once at no "charge" to the GC for their time. However, the CxA's and CM's time for a second retest will be charged to the GC, who may choose to recover costs from the responsible Sub.
   c. The time for the CxA and CM to direct any retesting required because a specific construction checklist or start-up test item, reported to have been successfully completed, but determined during functional testing to be faulty, will be backcharged to the GC, who may choose to recover costs from the party responsible for executing the faulty installation or test.
   d. The Contractor shall respond in writing to the CxA and CM at least as often as Cx meetings are being scheduled concerning the status of each apparent outstanding discrepancy identified during Cx. Discussion shall cover explanations of any disagreements and proposals for their resolution.
   e. The CxA retains the original non-conformance forms until the end of the project.
   f. Failure Due to Manufacturer Defect. If 10%, or three, whichever is greater, of identical pieces (size alone does not constitute a difference) of equipment fail to perform to the Contract Documents (mechanically or substantively) due to manufacturing defect, not allowing it to meet its submitted performance spec, all identical units may be considered unacceptable by the CM or PM. In such case, the Contractor shall provide the Owner with the following:
   g. Within one week of notification from the CM or PM, the Contractor or manufacturer's representative shall examine all other identical units making a record of the findings. The findings shall be provided to the CM or PM within two weeks of the original notice.
   h. Within two weeks of the original notification, the Contractor or manufacturer shall provide a signed and dated, written explanation of the problem, cause of failures, etc. and all proposed solutions which shall include full equipment submittals. The proposed solutions shall not significantly exceed the specification requirements of the original installation. The CM or PM will determine whether a replacement of all identical units or a repair is acceptable.
   i. Two examples of the proposed solution will be installed by the Contractor and the CM will be allowed to test the installations for up to one week, upon which the CM or PM will decide whether to accept the solution.
   j. Upon acceptance, the Contractor and/or manufacturer shall replace or repair all identical items, at their expense and extend the warranty accordingly, if the original equipment warranty had begun. The replacement/repair work shall proceed with reasonable speed beginning within one week from when parts can be obtained.

E. Approval. The CxA notes each satisfactorily demonstrated function on the test form. Formal approval of the functional test is made later after review by the CxA and by the CM, if necessary. The CxA recommends acceptance of each test to the CM using a standard form. The CM gives final approval on each test using the same form, providing a signed copy to the CxA and the Contractor.

3.8 SAMPLE DOCUMENTS

A. The two documents after this section (Sample Construction Checklist and Sample System Performance Test) are included to demonstrate the level of effort and quality expected of the contractors. These documents will be revised as necessary as the project progresses.

END OF SECTION

Sample Variable Air Volume Box Construction Checklist

TAG ID:	VAV 1-1

Instructions:

1. *Lead contractor to assure that subcontractors are aware of the checklists while installing the equipment and systems.*
2. *Subcontractors are to be given these checklists to complete.*
   a. *Check Yes or No for each checklist item.*
   b. *Explain all discrepancies or negative responses.*
   c. *Sign and date the completed checklists.*

Checklist items are to be completed as part of startup & initial checkout, prior to performing functional testing.

- The checklist items have been checked off only by parties having direct knowledge of the event, as marked below, respective to each responsible contractor.
- This checklist does not take the place of the manufacturer's recommended checkout and startup procedures or report.
- Contractors who are assigned responsibility for sections of the checklist shall be responsible to see that checklist items by their subcontractors are completed and checked off.

DELIVERY CHECK

Performed by: *Mechanical Contractor*

*Fill in the "*DELIVERED*" product information. Provide information on any discrepancies in "Comments" section.*

	SUBMITTAL	DELIVERED	COMMENTS
Manufacturer			
Model #			
Min. / Max. Airflow (CFM)	/	/	
Total static pressure (in. W.C.) (including reheat coil)			
Inlet size (inches)			
Re-heat Coil Rating (MBH/GPM)	/	/	
Re-heat Coil # rows			

DELIVERY CHECK **Performed by:** Mechanical Contractor	Date
Print Name: Signature:	

PHYSICAL CHECK

Performed by: *Mechanical Contractor*

Check the following items prior to installing the unit. Check YES or NO for each item. Each NO response ***MUST*** *be explained in the "Comments" section below.*

Check "YES" if Acceptable; Provide comment if unacceptable	YES	NO	Comments
All unit and location identifiers are correct	☐	☐	
Unit nameplate clearly visible and easy to read	☐	☐	
No physical damage to the unit	☐	☐	
No signs of water damage	☐	☐	
Duct openings are tightly sealed and not breached	☐	☐	
Pipe connections are sealed and not breached	☐	☐	
Airflow station is secure and ends of sampling tubes are properly covered	☐	☐	
Re-heat coil is secure and fins are not damaged	☐	☐	
Electrical control panel labeling is clear and appropriate for rated voltage	☐	☐	
The DDC control enclosure is secure and accessible	☐	☐	
Installation and startup instructions included with unit	☐	☐	

PHYSICAL CHECK **Performed by:** Mechanical Contractor	Date
Print Name: Signature:	

INSTALLATION CHECK

Performed by: *Mechanical Contractor*

Check the following items after mounting the unit in place and ***before*** *pipe and electrical connections are made. Check YES or NO for each item. Each NO response* ***MUST*** *be explained in the "Comments" section below.*

Check "YES" if Acceptable; Provide comment if unacceptable	YES	NO	Comments
Unit identifier is correct and clearly visible from below	☐	☐	
Unit nameplate is clearly visible and easy to read	☐	☐	
Unit is properly mounted and supported according to the specifications and Detail X	☐	☐	
Service and maintenance clearances are according to the specifications and Detail X	☐	☐	
Covering over duct and pipe openings are secure and not breached	☐	☐	

INSTALLATION CHECK **Performed by:** Mechanical Contractor	Date
Print Name: Signature:	

HOT WATER PIPING CHECK

Performed by: *Mechanical Piping Contractor*

Check the following items after piping has been connected to the unit but before TAB tests are performed. Check YES or NO for each item. Each NO response ***MUST*** *be explained in the "Comments" section below.*

Check "YES" if Acceptable; Provide comment if unacceptable	YES	NO	Comments
Hot water return piped to top and hot water supply piped to bottom of coil	☐	☐	
Piping installation allows for easy reheat coil removal.	☐	☐	

Control valve, balancing valve, isolating valve, strainers and all other piping components are installed per Detail X	☐	☐	
Piping does not obstruct access and maintenance clearances	☐	☐	
Manual air vent provided at top of coil per Detail X	☐	☐	
Valves are tagged	☐	☐	
Piping is insulated per contract documents	☐	☐	

HOT WATER PIPING CHECK **Performed by:** Mechanical Contractor	Date
Print Name: Signature:	

DUCTWORK CHECK

Performed by: *Mechanical Contractor*

Check the following items after ducts have been connected to the unit but before TAB tests are performed. Check YES or NO for each item. Each NO response ***MUST*** *be explained in the "Comments" section below.*

Check "YES" if Acceptable; Provide comment if unacceptable	YES	NO	Comments
Straight duct length at inlet to VAV box minimum 1.5-duct diameters	☐	☐	
Minimum of 48" straight duct is provided from the discharge of the unit prior to any take-offs or transitions	☐	☐	
Duct does not obstruct access and maintenance clearances	☐	☐	
Access panel to reheat coil is provided per submittals	☐	☐	

DUCTWORK CHECK **Performed by:** Mechanical Contractor	Date
Print Name: Signature:	

ELECTRICAL CHECK

Performed by: *Electrical Contractor*

Check the following items after ducts and piping have been connected and electrical wiring is completed. Check YES or NO for each item. Each NO response ***MUST*** *be explained in the "Comments" section below.*

Check "YES" if Acceptable; Provide comment if unacceptable	YES	NO	Comments
Electrical and control wiring is properly installed	☐	☐	
All wire sizes are correct per the Specifications	☐	☐	
All electrical connections are properly grounded	☐	☐	
Control transformer is properly installed and wired	☐	☐	

ELECTRICAL CHECK **Performed by:** Electrical Contractor	Date
Print Name: Signature:	

CONTROLS CHECK

Performed by: *Controls Contractor*

Check the following items after ducts and piping have been connected and control and electrical wiring is completed. Check YES or NO for each item. Each NO response ***MUST*** *be explained in the "Comments" section.*

Check "YES" if Acceptable; Provide comment if unacceptable	YES	NO	Comments
VAV box points are successfully linked to Building Automation System (BAS)	☐	☐	
Graphical display representative of system configuration	☐	☐	
Space temperature sensor calibrated and interfaced with the BAS	☐	☐	
Airflow sensor calibrated and interfaced with the BAS	☐	☐	
Confirm at both operator workstation and physically at unit that heating control valve operates through its full range of motion – fully open to fully closed	☐	☐	
Confirm at both operator workstation and physically at unit that air valve operates through its full range of motion – fully open to fully closed	☐	☐	

CONTROLS CHECK **Performed by:** Controls Contractor	Date
Print Name: Signature:	

MECHANICAL STARTUP CHECK

Performed by: *Controls Contractor*

Check the following items before TAB tests are performed. Check YES or NO for each item. Each NO response ***MUST*** *be explained in the "Comments" section below.*

Check "YES" if Acceptable; Provide comment if unacceptable	YES	NO	Comments
Coils are clean and undamaged	☐	☐	
VAV box airflow (CFM) as per submittal	☐	☐	
Heating coil water flow (GPM) as per submittal	☐	☐	
Heating coil entering and leaving water temperatures (°F) as per submittal	☐	☐	
Heating coil entering and leaving air temperatures (°F) as per submittal	☐	☐	
Heating coil air and water pressure drops as per submittal	☐	☐	

MECHANICAL STARTUP CHECK **Performed by:** Controls Contractor	Date
Print Name: Signature:	

SAMPLE SYSTEM PERFORMANCE TEST **CITY OF MADISON**

Air Distribution Served by AHU-1

DATE_____

COMMISSIONING PARTICIPANTS:

	Test Duty	Name	Company
Commissioning Authority	Direct	_____	HGA
Control Contractor	Perform	_____	X
Mechanical Contractor	Standby	_____	X
Plumbing Contractor	Standby	_____	X
Electrical Contractor	Standby	_____	X
TAB Contractor	Standby	_____	X

Direct means that the Commissioning Authority will witness the tests and show the controls contractor which tests to execute.
Perform means that the contractor will be the one actually executing the test under the CxA directions
Standby means that the contractor is available to assist with operating equipment during the test if required.

The following system performance tests relate to air distribution system served by air handling units at the City of Madison project. The equipment to be tested includes the air handling units, exhaust fans, the building fire alarm system, and all related dampers, valves, and assemblies.

The contractors need to complete these tests on all equipment prior to verification by the CxA to ensure that the systems are functioning as required, and to ensure that the contractor is able to demonstrate the functionality of the systems as described in this document under the direction of the CxA without excessive time spent on determining how to perform the test procedures. The CxA will verify the performance on selected system(s) and modes. If the systems are not able to perform as required, retest will be required on the contractors' expense. **Verification of performance should not be considered a "troubleshooting" session, only a few minor corrections (implementation less than 15 mins each occurrence, 1 hr accumulated) will be allowed during testing.**

1. SYSTEM PERFORMANCE TEST RESULTS:

After performing all the system performance tests included in this document the test results are rated as:

- ☐ Successful, No Comments
- ☐ Successful, Comments as Noted
- ☐ Deferred Seasonal Test Recommended
- ☐ Complete Retest Recommended
- ☐ Retest Recommended only on Noted Sections

2. COMPLETED CONSTRUCTION CHECKLISTS

Confirm that the following construction checklists have been submitted and reviewed and that the equipment has been approved for system performance testing by checking the appropriate box.

Equipment	Tag ID	Delivery Check	Physical Check	Installation Check	Ductwork Check	Piping & Valve Check	Gas Piping Check	Electrical Check	Mech. Start-up Check	Controls Check
Air Handling Unit	AHU-1	☐	☐	☐	☐	☐		☐	☐	☐
VAV Boxes	VAV 1-X	☐	☐	☐	☐	☐		☐	☐	☐
Exhaust Fan	EF-X	☐	☐	☐	☐			☐	☐	☐

Notes:

3. INSTRUMENT LIST

The following is a list of required instrumentation to perform measurements and verification during this system performance test. **It is the contractor's responsibility to provide this instrumentation**. Included are measurement units and degree of accuracy; e.g. GPM, Amps, °F, "H_2O, etc, and the acceptable calibration date range.

REF	INSTRUMENT	RANGE	ACCURACY	DATE OF CALIBRATION
A	Thermometer	0-150 °F	±0.5 °F	
B	Humidity meter	10-90% RH	± 2.5%	
C	CO meter	0-1000 ppm	±3% or ± 30 ppm	
D	Air Pressure meter	0-5 inches H_2O	± 0.05 inches H_2O	
E	Air flow meter	50-500 cfm	± 5%	
F	Air flow sensor	30-1000 fpm	± 5%	
G	Noise meter, 125-8000 Hz bands	25-120 dB	± 2 dB	

4. VISUAL INSPECTION OF SYSTEM

Before starting the system performance test, perform a visual inspection of the building and major equipment related to the air distribution system. Note any items that may be of importance when reviewing the test data.

Notes:

5. CURRENT CONDITIONS

Record the following set-point and scheduling information as provided by the BAS for the air handling unit. All of these values will be returned to their pre-test value unless noted otherwise.

ITEM	PRE-TEST VALUE	END TEST VALUE	NOTES
Space temperature setpoint (heating, occupied)			
Space temperature setpoint (cooling, occupied)			
Space temperature setpoint (heating, unoccupied)			
Space temperature setpoint (cooling unoccupied)			
Minimum outside air damper setpoint. Ensure this value was obtained by the TAB Contractor			
Economizer enable setpoint			
CO level alarm setpoint			

Schedule:

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Occupied							
Unoccupied							

Holidays: _____

Notes:

_____

_____

6. DEVICE CALIBRATION CHECK

Check calibration of devices such as valves, dampers, actuators, etc. Verify that the reading at the BAS matches actual physical condition.

Device or Actuator & Location	Procedure / State	BAS Value	Control Reading	Site Observation	Pass Y/N
Outside air damper	Command damper to fully open position and observe	100%			
	Command damper to fully closed position and observe	0%			
Return air damper	Command damper to fully open position and observe	100%			
	Command damper to fully closed position and observe	0%			
Relief air damper	Command damper to fully open position and observe	100%			
	Command damper to fully closed position and observe	0%			
Heating Coil Control Valve	Command valve to fully open position and observe	100%			
	Command valve to fully closed position and observe	0%			
Supply air temperature sensor	Compare measured value to reading				
Return air temperature sensor	Compare measured value to reading				
Mixed air temperature sensor	Compare measured value to reading				
Zone CO Sensor Serving AHU-1	Compare measured value to reading				
Zone temperature sensor serving AHU-1	Compare measured value to reading				

7. BAS DATA TRENDING

Prior to starting the system performance tests begin the collection of data as shown below using trend logs on the BAS. The purpose of collecting this data is to record the results of the tests and to verify the BAS performance, i.e. speed of response to step changes, no oscillations, etc. To do this we need a short sampling interval on all points that can change rapidly. A longer interval is acceptable for points that will not change quickly. For simplicity it may be easier to select the same sampling interval for all points (i.e. 1 min.). **Controls contractor must set up these trends before test and provide the data electronically no later than 1 week after test.** The trends should be set up for the following points:

Start Date: _____ Start Time: _____

BAS TRENDING			
POINT ID	**DESCRIPTION**	**MINIMUM SAMPLING INTERVAL**	**Y/N**
	Outside air temperature	10 min	
	Supply Fan Status	COV	
	Relief air damper position	1 min	
	Heating coil control valve position	1 min	
	HW Circulating Pump Status	COV	
	Return air damper position	1 min	
	Outside air damper position	1 min	
	Filter status	30 min	
	Supply air temperature	1 min	
	Return air temperature	1 min	
	Mixed air temperature	1 min	
	Zone temperature	1 min	
	Zone CO level	1 min	
	Exhaust fan status	COV	

Notes:

8. GENERAL CONDITIONS OF TEST

The testing of the air distribution system served by the air handling unit shall verify that the system operates as per the control sequences detailed in the design documents. The tests shall demonstrate that the following functions are working correctly:

- Emergency conditions (smoke alarm, power failure)
- Failure and alarm conditions (freezestat control alarm, CO concentration alarm)
- Off / On modes
- Unoccupied mode
- Occupied mode (heating)
- Economizer mode
- Optimum start with morning warm-up or cool-down mode
- Room conditions

Make sure that the fire department is notified and/or that the no false alarms will be sent to the fire department when doing any of the failure and alarm tests.

9. ALARM AND FAILURE TESTING PROCEDURES AND RECORD

9a. SMOKE ALARM

Make sure that the fire department is notified and/or that the no false alarms will be sent to the fire department when performing the smoke alarm test.

STEP	ACTION	VERIFICATION	SUCCESS		COMMENT
			Yes	No	
1.	Verify that the AHU is on. Then initiate a smoke alarm	AHU supply fan turns off			
		EF-34 turns off (interlocked with AHU-1)			
		Alarm is present at BAS			
		Outside air damper closes			
		Relief air damper closes (RH-1)			
		Return air damper opens			
		Heating control valve is open			
	Reset alarm	Systems return to normal operation			
2.	Clear alarm at BAS	Verify alarm clears at fire alarm panel and BAS			

9b. POWER FAILURE					
STEP	**ACTION**	**VERIFICATION**	**SUCCESS**		**COMMENT**
			Yes	**No**	
1.	Cut power to AHU and control panel	AHU outside air damper closes			
		AHU return air damper opens			
		AHU relief air damper closes (RH-1)			
		Supply fan is off			
		EF-34 is off (interlocked with AHU-1)			
		Heating coil control valve opens			
2.	Return power to AHU and control panel	AHU starts up and returns to correct mode.			

9c. ZONE CO CONCENTRATION ALARM					
STEP	**ACTION**	**VERIFICATION**	**SUCCESS**		**COMMENT**
			Yes	**No**	
1.	Record current zone CO level	The CO level recorded by the BAS matches the measured CO level in the zone			
2.	Use the BAS to change the CO setpoint to 2 ppm less than the current reading **OR** Use the BAS to change the CO level to 11 ppm	Alarm is present at BAS			
		EF-2 damper opens			
		EF-2 energizes and runs for a minimum of 5 minutes or until the CO level is 5 ppm or less			
		Zone temperatures remain unchanged			
3.	Reset the CO setpoint to specified value.	Alarm clears at BAS			

9d. FREEZE CONTROL ALARM					
STEP	**ACTION**	**VERIFICATION**	**SUCCESS**		**COMMENT**
			Yes	**No**	
1.	Put the AHU into occupied mode. Trip the freezestat physically at the unit OR Use ice to freeze a 1 foot section of the low-temperature limit sensor located downstream of the heating coil	AHU supply fan turns off			
		EF-34 turns off (interlocked with AHU-1)			
		AHU outside air damper closes			
		AHU return air damper opens			
		AHU relief air damper closes (RH-1)			
		AHU heating valve opens			
		HW coil pump is energized			
		Alarm is present at BAS			
2.	If necessary, reset low limit discharge air temperature setpoint to specified value. Manually reset freezestat	Alarm clears at BAS			
		System starts up and returns to correct mode			Manual reset device

9e. FILTER ALARM					
STEP	**ACTION**	**VERIFICATION**	**SUCCESS**		**COMMENT**
			Yes	**No**	
1.	Initiate a dirty filter alarm by changing the setpoints or manually tripping the differential pressure sensor.	Dirty filter alarm message is generated by BAS			
2.	Return settings to original values.	Alarm clears and system returns to normal operation.			

10. SYSTEM TESTING PROCEDURES AND RECORD

10a. SYSTEM OFF / ON MODES					
STEP	**ACTION**	**VERIFICATION**	**SUCCESS**		**COMMENT**
			Yes	**No**	
1.	Verify that AHU is in occupied mode. Use the BAS to send an OFF command to AHU.	Supply fan is off.			
		Outside air damper is closed.			
		Return air damper is open.			
		Relief air damper is closed (RH-1).			
		Heating coil control valve is open.			
		EF-34 is off (interlocked with AHU-1).			
2.	Use the BAS to send an ON command to AHU.	Supply fan is on.			
		Outside air damper opens to its minimum position if unit is not in economizer mode.			
		Return air damper closes proportionally as the outside air damper opens.			
		Relief air damper opens proportionally as the outside air damper opens.			
		EF-34 is on (interlocked with AHU-1).			
		Unit maintains discharge air temperature setpoint.			

10b. UNOCCUPIED MODE					
STEP	**ACTION**	**VERIFICATION**	**SUCCESS**		**COMMENT**
			Yes	**No**	
1.	Use the BAS to put the unit into Unoccupied Mode.	Outside air and relief air dampers remain closed.			
		AHU supply fan is off (unless space temperatures are outside the unoccupied temperature setpoint).			
		EF-34 is off during AHU-1 unoccupied mode.			
		If the outside air temperature is below the low temperature protection setpoint (20°F) the coil pump is energized. Otherwise the coil pump is off.			
2.	Use the BAS to change the unoccupied heating space temperature setpoint 3-5 °F higher than the lowest space sensor reading.	Outside air and relief air dampers remain closed if unit is not in economizer mode.			
		AHU supply fan energizes when the lowest space temperature drops below the unoccupied heating space temperature setpoint.			
		EF-34 remains off.			
		AHU control valve modulates as necessary to maintain the unoccupied supply air temperature setpoint (95°F).			
		AHU supply fan turns off when the space temperature is above the unoccupied setpoint plus differential. Differential = _____			
3.	Reset the unoccupied setback temperature to initial value and if necessary, put system back into occupied mode.	System returns to normal operation.			

10c. OCCUPIED MODE - HEATING

This test procedure is written for ambient conditions being such that heating mode can be achieved. This test may need to be completed at a later date when the ambient conditions are fit for the heating mode.
This test requires that the outside air temperature is about 40°F or lower to make sure the economizer cycle is disabled.

STEP	ACTION	VERIFICATION	SUCCESS		COMMENT
			Yes	No	
1.	Verify that the system is in occupied mode. Set room setpoint temp associated with this AHU to 3-5°F above current space temperature.	AHU supply fan is on			
		EF-34 is on (interlocked with AHU-1)			
		Return air damper modulates			
		AHU outside air damper opens to minimum position.			
		Relief air damper opens to minimum position (RH-1)			
		AHU supply air temperature reaches setpoint			
		Coil pump is off in occupied mode regardless of OA temperature			
2.	Reset room temperatures back to original values	System returns to normal operation			

10d. OCCUPIED MODE - ECONOMIZER

This test procedure is written for ambient conditions being such that economizer mode can be achieved which require the Outside Air Temp 40-75F. This test may need to be completed at a later date when the ambient conditions are fit for the economizer mode.

STEP	ACTION	VERIFICATION	SUCCESS		COMMENT
			Yes	No	
1.	Verify that there is a call for cooling and the OA temperature is less than the return air temperature	Return air temperature is greater than outside air temperature			
		AHU fan is on			
		EF-34 is on (interlocked with AHU-1)			
		AHU outside air damper modulates			
		Relief air damper modulates (RH-1)			
		Return air damper modulates			
		Zone temperature setpoint is maintained without mechanical cooling.			
		Unit heaters located in the same area are off when this AHU is in economizer mode.			

10e. COOLING / HEATING OPTIMUM START WITH WARM-UP & COOL-DOWN MODES

This test may need to be completed at a later date when the air handling unit has been in operation long enough to have sufficient startup trend data available for both the warm-up and cool-down modes.

STEP	ACTION	VERIFICATION	SUCCESS		COMMENT
			Yes	No	
1.	Access AHU startup trends and outside air damper position trends	Trends show the AHU achieves occupied zone temperature setpoint within ±1°F no more than 30 minutes prior to scheduled start of occupied period.			
		Trends show that outside air damper remains closed during warm-up and cool-down modes.			

10f. VERIFICATION OF ROOM CONDITIONS

This test procedure should be done at different ambient conditions when the system is in different modes, i.e. heating (winter), economizer (spring/fall), cooling (summer) Up to three sample spaces will be evaluated:
Space 1:_____ Space 2: _____ Space 3: _____

STEP	ACTION	VERIFICATION	SUCCESS		COMMENT
			Yes	No	
1.	Current conditions.	The room temperature at the thermostat is within ± 1.0 °F of the setpoint temperature in less than 0.5 hr without oscillations or offsets outside 1.0°F of the setpoint.			
		So as to avoid "too hot" or "too cold" spots the temperature distribution within the occupied zone does not exceed -3 and +2 °F from the setpoint temperature.			
2.	Set the room temperature setpoint to 5 °F higher than the initial setpoint temperature.	The room temperature at the thermostat is within ± 1.0 °F of the setpoint temperature in less than 0.5 hr without oscillations or offsets outside 1.0°F of the setpoint.			
		So as to avoid "too hot" or "too cold" spots the temperature distribution within the occupied zone does not exceed -3 and +2 °F from the setpoint temperature.			
3.	Set the room temperature back to the initial setpoint temperature.	There is no noticeable drafts in the occupied zone while the system is cooling to reach the setpoint temperature.			
		The noise level in the room is within the requirement for that particular space during cooling.			
		The room temperature at the thermostat is within ± 1.0 °F of the setpoint temperature in less than 0.5 hr without oscillations or offsets outside 1.0°F of the setpoint.			
		So as to avoid "too hot" or "too cold" spots the temperature distribution within the occupied zone does not exceed -3 and +2 °F from the setpoint temperature.			

Return all changed control parameters and conditions to their pre-test values
Record permanently changed parameter values and submit changes to Owner.

- END OF TESTING -

SECTION 01 95 00
MEASUREMENT AND VERIFICATION

PART 1 – GENERAL

1.1 SUMMARY

A. Purpose: This section includes general requirements that apply to implementation of measurement and verification.

B. RELATED WORK AND REQUIREMENTS

1. Section 01 31 13 Project Coordination
2. Section 01 31 19 Project Meetings
3. Section 01 31 23 Project Management Website
4. Section 01 91 00 Commissioning
5. Section 23 09 00 Instrumentation and Control for HVAC
6. Section 23 09 24 Direct Digital Control (DDC) System for HVAC
7. Section 26 24 13 Switchboards
8. Section 26 24 16 Panelboards

1.2 DEFINITIONS

A. BAS - Building Automation System
B. DHW - Domestic Hot Water
C. M&V - Measurement and Verification
D. kW - Electric power read from utility meter
E. KWh - Electric energy consumption read from utility meter
F. Plug Loads – Electric power and consumption from wall receptacles

1.3 MECHANICAL CONTRACTOR RESPONSIBILITIES

A. Contractor shall assign representatives with expertise and authority to act on its behalf and shall schedule them to participate in and perform M&V activities including, but not limited to, the following:

1. Follow activities identified in the M&V Plan.
2. Coordinate connection of gas and DHW monitoring equipment with BAS.
3. Cooperate with the M&V Provider and Controls Contractor for resolution of issues related to data collection.
4. Attend team meetings during construction and post-construction M&V period (1 year).

1.4 ELECTRICAL CONTRACTOR RESPONSIBILITIES

A. Contractor shall assign representatives with expertise and authority to act on its behalf and shall schedule them to participate in and perform M&V activities including, but not limited to, the following:

1. Follow activities identified in the M&V Plan.
2. Coordinate connection of electrical monitoring equipment with BAS
3. Cooperate with the M&V Provider and Controls Contractor for resolution of issues related to data collection.

4. Attend team meetings during construction and post-construction M&V period (1 year).

1.5 CONTROLS CONTRACTOR RESPONSIBILITIES

A. Contractor shall assign representatives with expertise and authority to act on its behalf and shall schedule them to participate in and perform M&V activities including, but not limited to, the following:
   1. Follow activities identified in the M&V Plan.
   2. Coordinate connection of electrical, gas, and DHW monitoring equipment with BAS
   3. Cooperate with the M&V Provider Mechanical Contractor and Electrical Contractor for resolution of issues related to establishing connection between BAS and monitoring meters and equipment.
   4. Attend team meetings during construction and post-construction M&V period (1 year).

1.6 M&V PROVIDERS RESPONSIBILITIES

A. Providers responsibilities include:
   1. Organize and lead the M&V team.
   2. Provide M&V plan.
   3. Convene M&V meetings as needed.
   4. Cooperate with the Mechanical Contractor, Electrical Contractor, and Controls Contractor for resolution of issues related to establishing connection between BAS and monitoring meters and equipment.
   5. Provide an M&V report at 1 year post construction.

PART 2 – PRODUCTS – THIS SECTION NOT USED

2.1 METERS

A. Monitoring meters, both gas and electric, to have the ability to connect to the BAS and provide data to BAS at a minimum of 15 minute intervals. It is acceptable to use the utility for this purpose if allowable by utility company.

PART 3 - EXECUTION

3.1 METER

A. Provide real-time monitoring of the whole building electricity kW and kWh use by using a signal from the building utility meter serving the HVAC, lighting, and plug loads and provide the data input to the Building Automation System (BAS). The BAS must be capable of trending this kW and kWh data. Data is to be collected in 15 minute intervals. Storage of at least 3 months of 15 minute data is required on the BAS. Data older than 3 months is to be automatically saved and archived on the BAS computer without being overwritten. Data older than 5 years can be overwritten. It is the responsibility of the electrical contractor to coordinate this work.

3.2 NATURAL GAS

A. Provide real-time monitoring of whole building natural gas consumption by using a signal from the building utility meter to provide the data input to the BAS. The BAS must be capable of trending gas consumption. Data is to be collected in 15 minute intervals. Storage of at least 3 months of 15 minute data is required on the BAS. Data older than 3 months is to be automatically saved and archived on the BAS computer without being overwritten. Data older than 5 years can be overwritten. It is the responsibility of the mechanical contractor to coordinate this work.

3.3 DOMESTIC HOT WATER

A. Provide real-time monitoring of the domestic hot water (DHW) system by measuring water flow to DHW heater and DHW supply and return temperatures and providing data input to the BAS. The BAS must be capable of trending gas consumption. Data is to be collected in 15 minute intervals. Storage of at least 3 months of 15 minute data is required on the BAS. Data older than 3 months is to be automatically saved and archived on the BAS computer without being overwritten. Data older than 5 years can be overwritten. It is the responsibility of the mechanical contractor to coordinate this work.

3.4 TEMPORARY MONITORING

A. Provide easy access to allow for the temporary installation of split-core current sensors and voltage sensors for the electrical measurement and datalogging on the following systems:
   1. Lighting

2. Plug loads
3. HVAC equipment including chillers, fans, circulation pumps, and air handling units
4. DHW equipment

3.5 DDC TRENDS

A. The Controls Contractor is to provide provision for remote access to BAS to view status of building and the ability to download trendable points.

END OF SECTION