SECTION 33 08 00
COMMISSIONING OF UTILITIES
BASED ON DFD MASTER SPECIFICATION DATED 02/27/15

P A R T 1 - G E N E R A L

SCOPE
This section includes commissioning forms for construction verification and functional performance testing. Included are the following topics:

PART 1 - GENERAL
- Scope
- Related Work
- Reference
- Submittals

PART 2 - PRODUCTS
- (Not Used)

PART 3 – EXECUTION
- Commissioning Forms
- CV-33 40 00 Storm Drainage Utilities

RELATED WORK
Section 01 91 01 or 01 91 02 – Commissioning Process

REFERENCE
Applicable provisions of Division 1 shall govern work under this section.

SUBMITTALS
Reference the General Conditions of the Contract for submittal requirements.

Reference Section 01 91 01 or 01 91 02 Commissioning Process for Construction Verification Checklist and Functional Performance Test submittal requirements.

P A R T 2 – P RO D U C T S
(Not Used)

P A R T 3 – E X E C U T I O N
COMMISSIONING FORMS
Commissioning forms are to be filled in as work progresses by the individuals responsible for installation and shall be completed for each installation phase.

Provide a description of the work completed since the last entry, the percentage of the total work completed for the system for that area and the step of installation or finalization.

Circle Yes or No for each commissioning form item. If the information requested for an item does not apply to the given stage of installation for the system, list it as "N/A". Explain all discrepancies, negative responses or N/A responses in the negative responses section.

Once the work is 100% complete and the responses to each item are complete and resolved for a given commissioning forms group, mark as complete, initial and date in the spaces provided.

Provide copies of the commissioning forms to the commissioning agent 2 days prior to construction progress meetings.

CV-33 40 00 – Storm Drainage Utilities

Equipment Identification/Tag: _______
Location:__________________________

A) PRE-INSTALLATION CHECKS

Date	Description of Work Performed	% Complete	Initials	Questions (See details below) 1)	2)	3)
				YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO
❑ CHECKLIST GROUP COMPLETE				INITIALS:	_______________	DATE: _______________

Question Details

1) All piping, etc. is clean and free of damage prior to installation.
2) Temporary protective coating is provided on cast iron during storage.
3) Temporary end caps are provided on piping and fittings until installation.

B) UNDERGROUND PIPING INSTALLATION CHECKS

Date	Description of Work Performed	% Complete	Initials	Questions (See details below) 1)	2)	3)	4)	5)	6)	7)	8)	9)	10)
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
❑ CHECKLIST GROUP COMPLETE				INITIALS:	_______________					DATE:	_______________		

Question Details

1) Horizontal and vertical spacing as required by the specifications between water piping and sanitary sewer and storm drainage piping is maintained.
2) 4” of crushed stone bedding material provided.
3) Piping grade and horizontal alignment is within 0.05’ and 0.10’ respective to section as shown in contract documents.
4) Changes in pipe sizes are made with the proper size reducing fittings, reducing elbow or reducing tees, and no bushings are utilized.
5) Pipe joint deflections meet or are less than manufacturer recommendations.
6) Bonding straps and lugs connected (ductile iron pipe ONLY).
7) Deflector tape provided 2’ above all pipe noted in contract documents
8) Insulation is provided at top of 6” and 1’ initial cover levels per specification requirements. For all piping above 6’ below finish grade or as shown in contract documents.
9) Initial cover and backfill materials and methods meet specification requirements.
10) Open pipe ends capped at completion of work day.

Negative Responses

Group/ Item	Date Found	Found By	Location	Reason for Negative Response	Resolved	Date Resolved	Resolution
					YES / NO		
					YES / NO		
					YES / NO		
					YES / NO		
					YES / NO		

C) FACILITY PIPING INSTALLATION CHECKS

Date	Description of Work Performed	% Complete	Initials	Questions (See details below) 1)	2)	3)	4)	5)	6)	7)	8)	9)	10)
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
❑ CHECKLIST GROUP COMPLETE				INITIALS:	_______________					DATE:	_______________		

Question Details

1) Piping is free to expand and contract without noise or damage to hangers, joints, or the building.
2) Piping is installed in a manner to ensure that insulation will not contact adjacent surfaces.
3) Piping is installed with sufficient pitch and arranged in a manner to ensure drainage of entire system.
4) Changes in pipe sizes are made with the proper size reducing fittings, reducing elbow or reducing tees, and no bushings are utilized.
5) Connections between dissimilar pipe materials are made with dielectric fittings.
6) Pipe hanger spacing complies with specification requirements.
7) All equipment requiring maintenance is accessible.
8) Piping allows access to equipment that is part of this system or another system.
9) Minimum clearance of 18” provided for all cleanouts.
10) Open pipe ends capped at completion of work day.

Negative Responses

Group/ Item	Date Found	Found By	Location	Reason for Negative Response	Resolved	Date Resolved	Resolution
					YES / NO		
					YES / NO		
					YES / NO		
					YES / NO		
					YES / NO		

D) STRUCTURE & APRON WALL INSTALLATION CHECKS

Date	Description of Work Performed	% Complete	Initials	Questions (See details below) 1)	2)	3)	4)	5)	6)
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
❑ CHECKLIST GROUP COMPLETE				INITIALS:	_______________		DATE:	_______________	

Question Details

1) Excavation for structure limited to space necessary to sufficiently prepare the subgrade, set the base, set the manhole or structure, and lay pipe, but no less than 1’ between structure and trench wall.
2) 8” of crushed stone provided for structure base.
3) Structure base set level and plumb.
4) Watertight gaskets provided between all structure sections (if applicable).
5) Sealant material as noted in specifications provided between all adjusting rings and ring exteriors coated with mortar.
6) Riprap provided downstream of apron endwalls at all storm sewer outfalls and as indicated on contract documents.

Negative Responses

Group/ Item	Date Found	Found By	Location	Reason for Negative Response	Resolved	Date Resolved	Resolution
					YES / NO		
					YES / NO		
					YES / NO		
					YES / NO		
					YES / NO		

E) TESTING & FINALIZATION CHECKS

Date	Description of Work Performed	% Complete	Initials	Questions (See details below) 1)	2)	3)	4)	5)	6)	7)	8)	9)
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
				YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
❑ CHECKLIST GROUP COMPLETE				INITIALS:	_______________				DATE:	_______________		

Question Details

1) All underground PVC piping deflection tested in accordance with specification requirements and results are acceptable.
2) All underground pipes televised and results are acceptable.
3) Underground piping visually inspected for excessive water infiltration and soil leakage and results are acceptable.
4) Piping and direction of flow is provided per specification requirements.
5) Facility piping tested utilizing air or water at specified pressure and duration as per specification for given piping system type.
6) All leaks identified during facility piping testing have been repaired and test re-done until satisfactory conditions are accomplished.
7) Test conducted with all facility piping of tested system or section visible during testing.
8) All penetrations through fire rated wall assemblies have been sealed per specification requirements.
9) All penetrations through non-rated wall assemblies have been sealed per specification requirements for given space type.

Negative Responses

Group/ Item	Date Found	Found By	Location	Reason for Negative Response	Resolved	Date Resolved	Resolution
					YES / NO		
					YES / NO		
					YES / NO		
					YES / NO		
					YES / NO		

SECTION 33 40 00
STORM DRAINAGE UTILITIES
BASED ON DFD MASTER SPECIFICATION DATED 11/23/2021

PART 1 - GENERAL

SCOPE

The work under this section shall consist of providing all work, materials, labor, equipment, and supervision necessary to provide for the storm drainage work required in these specifications and on the drawings. The limits of the work, including the responsible party for testing purposes, shall be clearly defined on the Drawings. Included are the following topics:

PART 1 - GENERAL
- Scope
- Related Work
- Reference Documents
- Reference Standards
- Submittals
- Provisions for Future Work
- As-Built Drawings

PART 2 - MATERIALS
- Inlets
- Castings
- Board Insulation
- Locator Tape

PART 3 - EXECUTION
- General
- Laying Pipe
- Bedding/Utility Cover
- Structures
- Casting Installation
- Drainage Laterals
- Pipe Insulation
- Locator Tape
- Leakage Testing

RELATED WORK

Applicable provisions of Division 1 govern work under this section.

Related work specified elsewhere:
Section 02 32 00 – Geo Technical Investigation
Section 30 05 00 – Common Work Results for All Exterior Work
Section 31 2 00 – Earthmoving
Section 31 25 00 – Erosion Control
Section 32 91 13.50 – Stormwater Bioinfiltration

REFERENCE DOCUMENTS

Wherever WisDOT or SSHSC appears in this specification it shall be construed to mean the pertinent sections of the Wisconsin Department of Transportation, Standard Specifications for Highway and Structure Construction (SSHSC), current edition, and all supplemental and interim supplemental specifications, as they may pertain, except this contract shall be a lump sum contract and measurement and basis of payment methods shall not apply.

Where these specifications do not cover portions of the work to be undertaken, the Standard Specifications for Sewer and Water Construction in Wisconsin, current edition, shall govern the work.

REFERENCE STANDARDS

American Society for Testing and Materials (ASTM):

C76	Standard Specification for Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe
C443	Standard Specification for Joints for Concrete Pipe and Manholes, Using Rubber Gaskets
C877	Standard Specification for External Sealing Bands for Concrete Pipe, Manholes, and Precast Box Sections

SUBMITTALS

Provide manufacturer's product information (cut sheets), shop drawings and O&M information for storm drainage materials including:

- Pipe
- Fittings
- Pre-Cast and Cast-in-Place Structures
- Outfalls
- Castings

Provide reports documenting all required testing and televising.

AS-BUILT DRAWINGS

Show the actual locations of storm drainage facilities and service lines and structures on drawings. Show changes to proposed storm drainage facilities, alignment, or grades. Show the actual locations, sizes and types of underground utilities and other features encountered during construction.

PART 2 - MATERIALS

INLETS

General

Submit manufacturer's preproduction (shop) drawings for approval prior to the start of manufacturing.

Contractor shall verify pipe locations, sizes, orientation and elevation prior to ordering new inlets.

LOCATOR TAPE

Detectable metallic locator tape, specifically manufactured for marking utilities.

Tape shall be a minimum of 6" wide and shall be marked "STORM".

PART 3 - EXECUTION

GENERAL

Complete exploratory excavations at utility crossings as shown on the drawings and as necessary to complete the work.

Maintain clearances between existing or proposed storm drainage lines and watermains as follows:
- 8' horizontal separation (measured center to center) between existing or proposed sanitary or storm drainage lines and watermains.
- 12" vertical separation (measured from outsides of pipes) where watermains cross over sanitary or storm drainage lines.
- 18" vertical separation (measured from outsides of pipes) where watermains cross under sanitary or storm drainage lines.

Notify the A/E and DFD Project Representative of utility conflicts as soon as they are encountered.

Store and handle pipe in accordance with manufacturers' recommendations. Keep pipes clean of soil, debris and animals.

LAYING PIPE

Install pipe in accordance with the SSSWC and ASTM specifications that pertain to the specified type of pipe material and the installation situation.

Do not use any pipe or fittings cracked in cutting or handling or otherwise not free from defects.

Clean all pipe of any dirt and/or debris both inside and outside prior to placing in the trench.

Make joints in accordance with manufacturer's directions with due care to avoid damaging pipe and/or disturbing previously laid pipe.

Cut pipe only according to manufacturer's directions.

Lay all drainage pipes to horizontal alignment and grade shown on the drawings with bell ends up hill. Establish and maintain horizontal alignment using total station, transit or theodolite. Discrepancies from the required horizontal alignment or grade at any location shall not be greater than 0.10' or 0.05', respectively.

BEDDING/UTILITY COVER

Provide bedding and utility cover in accordance with the applicable requirements of Section 31 23 16.13 – Trenching.

Where excavation extends below the bottom of the structure's base or the trench, bring the excavation to the required elevation by the use of compacted Crushed Stone Bedding.

A minimum of 12" of compacted Crushed Stone Bedding shall be placed below the structure base.

A minimum of 8" of compacted Crushed Stone Bedding shall be placed below the bottom of the apron endwall.

A minimum of 6" of compacted Crushed Stone Bedding shall be placed below the storm drainage pipe and 12" of cover material shall be placed over the storm drainage pipe (both measured at the bell of the pipe).

STRUCTURES

Structures having improper location and/or orientation of the pipe connections will be rejected. Field repairs or adjustments of connection points are not permitted.

Do not connect abandoned pipes to new structures.

Limit the excavation for structures so as to provide only the necessary amount of space to sufficiently prepare the subgrade, set the base, set the structure, and lay pipe. Provide adequate clearance for compaction equipment and operator between structure and trench soil retention for adequate backfilling and compaction.

Set structure base in accordance with elevation and location as indicated on the drawings. Install base plumb and level. Install subsequent pre-cast sections in accordance with shop drawing layout. Provide watertight gaskets between each section.

LOCATOR TAPE

Install locator tape directly above new non-metallic storm sewer pipe approximately 15 inches below finished grade. Bring tape to surface and terminate in a drainage structure.

LEAKAGE TESTING

Storm sewers shall be visually inspected for excessive water infiltration and soil leakage into sewers or structures. Contractor shall repair/correct any infiltration or soil leakage that is considered excessive by the DFD Project Representative.

END OF SECTION