

CITY OF BATON ROUGE
PARISH OF EAST BATON ROUGE

November 26, 2024

ADDENDUM NO. 1

TO: ALL BIDDERS

**SUBJECT: MALL OF LOUISIANA BOUELVARD
(RR BRIDGE AND PUMP STATION)**

CITY-PARISH PROJECT No. 12-CS-HC-0043D

BID DATE: TUESDAY, DECEMBER 10, 2024

The following revisions shall be incorporated in and take precedence over any conflicting part of the original contract documents.

PART 2, SPECIAL PROVISIONS AND CONTRACT DOCUMENTS

SPECIAL PROVISIONS/TECHNICAL SPECIFICATIONS

The Special Provisions are amended to add the following items included in ATTACHMENT A.

- PART VII DRAINAGE WORK
 - SECTION 701 CULVERTS AND STORM DRAINS (Attached)
 - SECTION 702 DRAIN MANHOLES, INLETS, JUNCTION BOXES, AND END TREATMENTS (Attached)
 - SECTION 703 PIPE UNDERDRAINS (Attached)
 - SECTION 704 REVETMENTS AND CHANNEL PAVING (Attached)
 - SECTION 705 RIPRAP (Attached)
- PART X MATERIALS
 - SECTION 1015 DRAIN PIPE (Attached)

RESPONSES TO BIDDER QUESTIONS

QUESTION 1:

Could you provide first-generation PDF drawings and/or CAD files? The quality of the scanned drawings makes some details hard to discern.

Response:

CAD files will not be provided.

QUESTION 2:

Could you share the engineer's construction estimate?

Response:

The engineer's construction estimate is not provided by the City-Parish.

QUESTION 3:

What is the funding source for this project? Is there federal funding involved? Will this project require compliance with Buy American or Buy America provisions?

Response:

MOVEBR is funding the project, there is no Buy America provisions required.

QUESTION 4:

Can you provide details on the electrical transmission lines?

RESPONSE:

Electrical transmission lines have been relocated.

QUESTION 5:

Who is the contact for the electrical utility?

RESPONSE:

DEPARTMENT NAME	PHONE NUMBER
AT&T DISTRIBUTION	225-291-1858
BATON ROUGE WATER CO.	225-252-7619
CENTURYLINK	318-388-9775
CITY OF BATON ROUGE SEWER	225-389-5623

DEPARTMENT NAME	PHONE NUMBER
COX COMMUNICATION	225-230-2459
EATEL	225-261-4177
ENTERGY CORPORATION	225-354-3204
ENTERGY LOUISIANA	225-354-3056

DEPARTMENT NAME	PHONE NUMBER
LEVEL (3) COMMUNICATIONS	225-330-7912
VERIZON	225-268-8715
NETWORK USA	337-896-2685
SOUTHERN LIGHT LLC	251-209-4155

QUESTION 6:

Will any outages be permitted during construction?

RESPONSE:

No.

QUESTION 7:

Were there any discussions for temporary overhead power relocations for the construction period?

RESPONSE:

Electrical transmission lines have been relocated.

QUESTION 8:

Will the overhead transmission lines be relocated prior to contractor mobilization?

RESPONSE:

Electrical transmission lines have been relocated.

QUESTION 9:

Would it be possible to get some quantity data tables for this project?

RESPONSE:

There are no data tables provided for this project.

QUESTION 10:

Please provide specifications for the generator required for the pump station. The plans provide the rating, size, and weight but no additional information under the electrical specifications.

RESPONSE:

The generator will be provided by the Owner.

QUESTION 11:

I see on several sheets that there are proposed locations of Entergy power poles. What is the schedule for Entergy to do its work? – Will contractor have to wait for a period after clearing and grubbing while this Entergy work is performed?

RESPONSE:

Electrical transmission lines have been relocated.

QUESTIONS 12:

The bid invitation requires that the contractor be licensed for both Highway, Street, and Bridge Construction and Heavy Construction. Is the contractor required to have both classifications?

RESPONSE:

Yes.

QUESTION 13:

Removal of Concrete Revetment – This is a LS Item. Could you list all of the locations to make sure we include all?

RESPONSE:

See Sheet 1a.

QUESTION 14:

Stone Base 6" – Could you list locations? Is this base below the 12' maintenance drive atop the earthen levee?

RESPONSE:

Shown in plans.

QUESTION 15:

What is the allowable rail outage to allow for tie in and surfacing of the shoofly? Outage allowance for tying in new bridge rail after construction of the overpass?

RESPONSE:

Contractor to coordinate with KCS during construction.

UNIFORM CONSTRUCTION BID FORMS

With reference to Page UCBF 1 of 4, the Bidder shall indicate receipt of this Addendum in the space provided. Failure to indicate receipt of this Addendum may be cause for the bid to be rejected.

For online www.centralbidding.com bidders: An acknowledgment of this addendum will be prompted by the Expedite bidding program prior to formally submitting the bid. Technical addendums may have been created on the Central Bidding website for any changes made due to errors of input of schedule of bid items. The technical addendums might not be numbered the same as paper copy addendums that DPW issues to contractors who have picked up plans directly from them. Contractor should be aware that the technical addendums must be acknowledged when submitting the bid.

APPROVED:


Thomas Stephens, P.E.
Chief Design & Construction Engineer

ATTACHMENT A

PART VII DRAINAGE WORK

Delete the Part in its entirety and replace with the following:

SECTION 701 CULVERTS AND STORM DRAINS

701-1 DESCRIPTION: This work consists of furnishing, installing, and cleaning culverts and storm drains in accordance with these specifications and in conformity with the lines and grades as shown on the plans or as established by the Engineer.

When an item for "Storm Drain Pipe" is included in the contract, the Contractor has the option of furnishing either reinforced concrete pipe or thermoplastic pipe in accordance with Section 1015 unless otherwise specified.

701-2 MATERIALS: Materials shall conform to the following Sections and Subsections:

Bedding Material	1001-6
Backfill Sand	1001-7
Portland Cement Concrete	1005
Reinforcing Steel	1006-1
Joint Systems	1015-1
Reinforced Concrete Pipe	1015-2.1
Reinforced Concrete Pipe Arch	1015-2.2
Thermoplastic Pipe	1015-4
Precast Concrete Box Culvert Units	1017-1
Geotextile Fabric	1022-8

701-2.1 Material Type Abbreviations:

a. Reinforced Concrete Pipe:

1. RCP Reinforced Concrete Pipe
2. RCPA Reinforced Concrete Pipe Arch

b. Corrugated Metal Pipe:

1. CAP Corrugated Aluminum Pipe
2. CAPA Corrugated Aluminum Pipe Arch
3. CMP Corrugated Metal Pipe
4. CMPA Corrugated Metal Pipe Arch
5. CSP Corrugated Steel Pipe
6. CSPA Corrugated Steel Pipe Arch

c. Thermoplastic Pipe:

1. TPP Thermoplastic Pipe
2. PVCP Polyvinyl Chloride Pipe
3. RPVCP Ribbed Polyvinyl Chloride Pipe
4. CPEPSW Corrugated Polyethylene Pipe Single Wall
5. CPEPDW Corrugated Polyethylene Pipe Double Wall

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701-2.2 Joint Type Abbreviations:

- a. T1 Type 1 Joint
- b. T2 Type 2 Joint
- c. T3 Type 3 Joint

701-3 TRENCHING AND BEDDING:

- a. Excavation: Ensure that the sides of the trench excavation are stable, as evidenced by the sides of the trench being able to maintain a vertical cut face. Consider the sides unstable if fissures develop in the face of or adjacent to the open excavation; if the edge of excavation subsides; if material ravel, spalls, or slumps from the face of the excavation; or if the bottom of the excavation bulges or heaves. In all cases of apparent distress or when the trench excavation exceeds five feet in depth, sloping, benching, and shoring will be required in accordance with the OSHA trench safety standards. Unless otherwise permitted, all trench sheeting shall be removed. For pipe installations utilizing trench boxes, do not disturb the installed pipe and its embedment when moving trench boxes. Move the trench box carefully to avoid trench wall displacement or damage. As the trench box is moved, fill any voids left by the trench box and carefully place and compact the backfill material adjacent to and all along the side of the trench box walls.

Control rainfall runoff or excess moisture by dewatering sumps, wells, well points, or other approved procedures during excavation, bedding installation, over-excavated trench backfilling, pipe placement, and pipe backfill.

Trenches shall be excavated to specified width; if not specified, trenches shall be excavated to a width of at least 18" on each side of conduit. Trenches shall be excavated to the depth required accommodate placement of bedding material.

- b. Over-excavation: If unsuitable or unstable bearing material is encountered at trench bottom, unstable material shall be excavated as directed and replaced with limestone encapsulated in geotextile fabric. Payment for additional excavation and stone below specified bedding layer under pipe will be made as extra work in accordance with Subsection 10-4.
- c. Forming Pipe Bed: Bedding material shall be placed and mechanically compacted in accordance with Standard Plan 701-01. Lifts shall not be more than 6" thick (compacted).

When the bottom of the pipe is not laid in a trench but constructed above natural soils, construct a uniform bed as specified for the bottom of a trench.

701-4 LAYING CONDUIT: Laying shall begin at downstream end of line. Conduit shall be in contact with foundation throughout its length. Bell or groove ends of conduit and outside circumferential laps of corrugated steel pipe shall be placed facing upstream. Riveted seam corrugated steel pipe shall be placed with longitudinal laps at sides. Lift holes shall be plugged with concrete plug wrapped with plastic gasket material (Ramnek) and covered with a minimum 18"x18" geotextile fabric suitably secured to the pipe. Corrugated steel pipe with lifting lugs shall be handled only by the lugs, and those without lugs shall be handled only by rope slings.

After laying pipe and before placing backfill, the Project Engineer will inspect the pipe for alignment, grade, integrity of joints, and coating damage.

701-4.1 Relaying Pipe: When existing pipe is to be re-laid, pipe shall be removed by methods that will not damage pipe and suitable sections re-laid as specified for new pipe.

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701-5 JOINTING CONDUIT: For concrete, metal, and plastic pipes, use Types 2 and 3 joints wrapped with geotextile fabric for a minimum of 12 inches on each side of the joint for pipe 36 inches or less in diameter and a minimum of 18 inches on each side of the joint for pipe greater than 36 inches in diameter. Wrap the ends of the fabric around the circumference of the pipe and overlap at least 10 inches. Secure the edges and ends of fabric for the entire circumference of the pipe.

701-5.1 Joint Usage: Type 3 (T3) joints shall be used for all conduits under or adjacent to pavement, including roadway cross drains, side drains, driveway culverts, and storm drain systems.

701-5.2 Concrete Pipe and Precast Box Culverts: Concrete pipe may be either bell and spigot or tongue and groove. Join pipe sections so that ends are fully entered, and inner surfaces are flush and even. Conduit ends shall be cleaned of dirt and other foreign matter and shall be dry. Use an approved mechanical pipe puller for joining pipes over 36 inches in diameter. For pipe 36 inches or less in diameter, use any approved method for joining pipe that does not damage the pipe.

Joints shall comply with Section 1015. Seal with gasket material installed in accordance with the manufacturer's recommendations.

701-5.3 Corrugated Metal Pipe: Pipe sections shall be joined by coupling bands centered over joint. Coupling bands shall be made of the same base metal and coatings as the pipe. Flexible rubber gasket material shall be placed on entire circumference of pipe under band in 2 corrugations on each side of joint.

- a. **Round Pipe:** Coupling bands shall be secured by 2 rods and lugs on each side of joint.
- b. **Arch Pipe:** For pipe sizes less than 36" round equivalent, 1-piece bands, 12-inch minimum width, shall be used; for larger pipe sizes, 2-piece bands, 21-inch minimum width, shall be used. Bands shall be secured by angle or strap connections.

701-5.4 Plastic Pipe: Joints for plastic pipe shall be bell and spigot or split coupling bands.

- a. **Bell and Spigot Joints:** Gaskets shall be rubber O-rings. Just before jointing, O-ring and gasket seat shall be cleaned of dirt and other foreign material and coated with a flax soap lubricant. Join pipe sections so the ends are fully entered and inner surfaces are flush and even. Use any approved method that does not damage the pipe.
- b. **Split Coupling Joints:** Split coupling bands shall comply with all dimensional and material requirements of Subsection 1015-4.3. Center the bands over the joint. Secure the split coupling band to the pipe with a minimum of five stainless steel or other approved corrosion resistant bands.

Place gasket material in the first two corrugation recesses on each side of the pipe connection. Also place gasket material on each band connection to prevent leakage. When using flexible plastic gasket material, it shall be a minimum of 1/2 inch in size. Tighten the bands to create overlap of the band and adequately compress the gasket material.

701-5.4 Joining New Pipes to Existing Pipes and/or Repairing Existing Pipe Joint Separation: Where the joining of pipes of different materials is required or approved, this work shall be done utilizing special adapters and couplers manufactured specifically for this purpose. The adapters and couplers shall be installed and securely attached to both pipe barrels according to the manufacturer's recommendations. If a coupler is not commercially available, the Contractor may use concrete collars as approved by the Engineer to extend the ends of existing pipes that have been damaged or to join different types or sizes of pipes. A 12-inch-wide strip of Class B, C, or D geotextile fabric shall be wrapped around and centered about the joint of the new and existing pipes. A plywood formed concrete collar shall be poured around and centered

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about the joint, a minimum two feet wide at a minimum six-inch thickness from outer diameter of pipe. Concrete collar shall be Class 5B3000 concrete mixture and conform to Section 601.

701-6 CAST-IN-PLACE BOX CULVERTS: Cast-in-place reinforced concrete box culverts shall be constructed in accordance with Section 601.

Concrete base slab or footings shall be placed at least 24 hours before wall forms are placed.

For culverts 4 feet or less in height, walls and top slab may be constructed monolithically. Construction joints shall be vertical.

For culverts more than 4 feet in height, concrete walls shall be allowed to set for at least 7 days before top slab is placed.

Each wingwall shall be constructed monolithically.

701-7 BACKFILL: Backfill shall be placed and mechanically compacted in lifts not more than 6" thick (compacted). Cast-in-place box culverts shall not be backfilled until concrete has attained at least 2500 psi compressive strength.

- a. **Conduits Under or Within 5 Feet of Pavement:** Backfill shall be sand or sand aggregate compacted to at least 95% of maximum density determined by DOTD TR 401; however, the top 12" of backfill for conduits not under pavement shall be usable excavated soils or select material.
- b. **Conduits More Than 5 Feet from Pavement:** Backfill may be sand, sand aggregate, usable excavated soils, or select material; however, the top 12" shall be usable soils or select material. Backfill shall be compacted to at least the density of undisturbed surrounding ground.
- c. **Metal Pipe:** Backfill for steel pipe shall have at least 1500 ohm-cm resistivity and a pH of at least 5.
- d. **Pipes Subject to Construction Traffic:** Construct the embankment or pipe backfill to a minimum height of 24 inches over the pipe before allowing heavy construction equipment to cross the installation. Where practical, do not construct installations with less than 24 inches of cover over the top of the pipe until after completing the heavy hauling over the pipe location. After completion of hauling operations, remove excess cover material. Remove and reinstall or replace, pipe damaged by hauling and backfilling operations at no direct pay.

701-8 JACKED OR BORED PIPE:

- a. **General:** Pipes 30" diameter and greater shall be jacked, and pipes less than 30" shall be bored.

Work shall begin at outfall end of pipe when possible. When grade at jacking or boring end is below ground surface, pits shall be excavated for conducting operations and placing joints of pipe. Sheet piling and bracing shall be provided to prevent earth caving.

For pipe with bell joints, if outside bell diameter exceeds outside barrel diameter by more than 1", pipe shall be cased or pressure grouted its full length. Casing shall be an approved type and size.

- b. **Jacking:** Heavy duty jacks for forcing pipe through embankment shall be provided. Even pressure shall be applied to all jacks and shall be transmitted to pipe end through a jacking head

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designed so that pressure is uniformly applied around ring of pipe. Provide a backstop or jacking frame to adequately resist pressure of the jacks under load.

Pipe shall be set on guides fastened together to support pipe in proper direction at correct grade. Cushioning material, such as plywood, shall be provided between sections of concrete pipe.

Material shall be excavated ahead of pipe and removed through pipe. Excavation shall not extend more than 2 feet beyond forward end of pipe. Distance shall be reduced when necessary to prevent damage to embankment.

A steel cutting edge may be used around forward end of pipe, constructed so that it will transmit pressures uniformly around ring of pipe.

Jacking shall continue without interruption, to prevent pipe from becoming set in embankment.

Pipe shall not vary more than 1/4" in 10 feet from established line and grade. Any variation shall be regular with no abrupt changes in direction. Any pipe damaged or misaligned during the jacking operation shall be removed and replaced by the Contractor at no direct pay.

- c. **Boring:** Boring shall be done mechanically, using a pilot hole approximately 2" in diameter. Pilot hole shall extend through embankment and shall be checked for line and grade before boring begins. Variations from line and grade shall not exceed those specified for jacking. Pilot hole shall serve as centerline of larger diameter hole to be bored.

Use of water and other fluids with boring operations will be permitted only to lubricate cuttings. Jetting will not be permitted.

In unconsolidated soil, a gel-forming colloidal drilling fluid consisting of at least 10% high-grade bentonite may be used to consolidate cuttings of bit, seal walls, provide support of hole, and furnish lubrication for removal of cuttings and installation of pipe.

Overcutting in excess of 1" shall be remedied by pressure grouting entire length of installation.

701-9 CLEANING PIPES

- a. **Existing Pipes:** Clean designated pipes of soil, debris, and other materials to the invert of the pipe by approved methods that will not damage the pipes. Satisfactorily repair all damage caused by the **cleaning** operations at no direct pay. Dispose of removed soil, debris, and other materials in accordance with subsection 203-8 or as otherwise approved in writing.
- b. **Contractor Installed Pipes:** Prior to final acceptance, clean pipes of all debris and soil to the invert of the pipe at no direct pay. Dispose of removed soil, debris, and other materials in accordance with subsection 203-8 or as otherwise approved in writing.

701-10 STUBBING AND PLUGGING PIPES: Construct pipe plugs with Class 5B3000 concrete complying with Section 1005. Thickness of plug and method of construction shall be a minimum of 18 inches or as directed.

When stubbing new pipes are to be stubbed into new or existing pipes or other structures, make the connection with approved mortar complying with ASTM C1329.

701-11 ACCEPTANCE: After completion of embankment and prior to roadway surfacing, the Project Engineer shall inspect pipes for proper alignment and integrity of joints. Contractor shall correct any

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misaligned pipe or defective joints at no direct pay.

Prior to final inspection of project, all new and relaid conduit shall be cleaned of debris and soil in accordance with 701-9. Existing conduit which was extended shall also be cleaned of debris and soil within project limits.

701-11.1 Plastic Pipe: Plastic pipe shall not exceed a vertical deflection of more than 5%. Maximum allowable deflections shall be governed by the mandrel requirements stated herein. Perform deflection tests no sooner than 30 calendar days after installation and compaction of backfill. Clean the pipe and inspect for offsets and obstructions prior to testing.

For pipe 36 inches and less in diameter, pull a mandrel through the pipe by hand to ensure that maximum allowable deflections have not been exceeded. The mandrel must be approved by the engineer prior to use. Use of an unapproved, mandrel or a mandrel altered or modified after approval mandrel will invalidate the test. If the mandrel fails to pass through the pipe, the pipe is over-deflected.

Unless otherwise permitted, uncover over-deflected pipe and, if not damaged, reinstall. Do not reinstall damaged pipe. Remove and replace with new pipe. Any pipe subjected to any method or process other than removal, which attempts, even successfully, to reduce or cure any over-deflection, shall be removed and replaced with new pipe.

Use a rigid, nonadjustable, odd-numbered leg (minimum 9 legs) mandrel having a length not less than its nominal diameter or 24 inches, whichever is less. The minimum diameter at any point shall be 5.0 percent less than the base inside diameter of the pipe being tested. The mandrel shall be fabricated of steel, aluminum, or other approved material fitted with pulling rings at each end. The nominal pipe size and outside diameter of the mandrel shall be stamped or engraved on some segment other than a runner. Furnish a suitable carrying case.

For pipe larger than 36 inches in diameter, determine deflection by a method approved by the engineer. If a mandrel is selected, the minimum diameter, length, and other requirements shall conform to the above requirements.

Conduct mandrel testing in the presence of the engineer. Mandrel testing shall be at no direct pay.

701-11.2 Corrugated Metal Pipe: If the inside diameter of metal pipe or rise dimension of metal pipe arch deflects more than 5.0 percent from original dimensions, remove and reinstall the metal pipes or pipe arches, unless they do not rebound or are damaged. Remove pipes or pipe arches which are damaged or do not rebound; and replace at no direct pay. Measurement of deflection will be made by the engineer away from rerolled ends.

701-12 MEASUREMENT: Quantities of conduit for payment will be the contract quantities, adjusted as required due to plan errors or plan changes.

No measurement for payment will be made for excavation, bedding, geotextile fabric or backfill, except for removal and replacement of unstable foundation material as specified under Subsection 701-3.

Quantities of jacked or bored pipe for payment will be the design lengths as specified on the plans and adjustments thereto. Design quantities will be adjusted if the Project Engineer makes changes to adjust to field conditions, if plan errors are proven, or if design changes are made. Required excavation, sheeting, bracing, falsework, casing, joint materials and grouting will not be measured for payment. Pipe cost is included in the pay item.

Adapter/coupler or concrete collar required to join new pipes to existing pipes shall be measured per each location as identified in the plans.

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Cleaning of existing pipes will be measured by the linear foot of pipe cleaned and accepted.

Plugging and stubbing of pipes will not be measured for payment.

701-13 PAYMENT: Payment for concrete or metal pipe will be made at the contract unit price per linear foot for the specified conduit sizes and types, which includes all labor, materials, equipment, tools, and incidentals necessary to complete the work.

When plastic pipe is shown on the plans or elected to be used by the Contractor, payment will be made at the contract unit price per linear foot of the types and sizes specified in accordance with the payment schedule of Table 701-1.

**Table 701-01
Payment Schedule for Plastic Pipe**

<u>Percent Payment</u>	<u>Stage of Completeness</u>
75	After placement and backfill has been completed
25	After the pipe has met vertical deflection requirements in accordance with 701-11.1

Payment for jacked or bored pipe will be made at the contract unit price per linear foot, which includes all labor, materials, equipment, tools, and incidentals necessary to complete the work.

Payment for adapter/coupler or concrete collar required to join new pipes to existing pipes shall be made per each location as identified in the plans. The cost of the adapter/coupler or concrete collar shall be paid for under the pay item Concrete Collar.

Payment for cleaning existing pipes will be made at the contract unit price per cleaned linear foot.

701-14 PAY ITEMS:

<u>Item No.</u>	<u>Item</u>	<u>Unit</u>
70101--	___ " Storm Drain Pipe	Linear Foot
70102--	___ " Reinforced Concrete Pipe	Linear Foot
70103--	___ " Reinforced Concrete Pipe Arch	Linear Foot
70104--	___ " Reinforced Concrete Box Culvert	Linear Foot
70105--	___ " Corrugated Metal Pipe	Linear Foot
70106--	___ " Corrugated Metal Pipe Arch	Linear Foot
70107--	___ " Polymer Coated Corrugated Steel Pipe	Linear Foot
70108--	___ " Polymer Coated Corrugated Steel Pipe Arch	Linear Foot
70109--	___ " Thermoplastic Pipe	Linear Foot
7011000	Relaid Pipe	Linear Foot
70111--	___ " Jacked or Bored Drain Pipe	Linear Foot
7012000	Concrete Collar	Each

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SECTION 702

DRAIN MANHOLES, INLETS, JUNCTION BOXES AND END TREATMENTS

702-1 DESCRIPTION: This work consists of constructing and adjusting storm drain manholes, inlets, junction boxes, and culvert end treatments, and safety ends in accordance with these specifications and in conformity with lines and grades shown on the plans.

702-2 MATERIALS: Materials shall conform to the following Sections and Subsections:

Bedding Material	1001-6
Backfill Sand	1001-7
Portland Cement Concrete (Class 6A4000)	1005
Reinforcing Steel	1006-1
Brick	1010-1
Frames, Grates and Covers	1011-5
Metalwork Paint	1012-4
Plastic Gasket Material	1015-1
Precast Concrete Drainage Units	1017

The Contractor may furnish structures of either cast-in-place concrete or precast concrete units.

702-3 CONSTRUCTION:

- a. **General:** Excavation shall extend 18" from outside of structure on all sides. Remove all logs, stumps, and other undesirable material. Structures shall be set on a 6" compacted thickness of bedding material if foundation soil is stable; if foundation soil is unstable, unstable soil shall be removed as directed and replaced with bedding material, and payment therefore will be made as extra work in accordance with Subsection 10-4. Bedding material shall be compacted in accordance with Subsection 701-3. At time structure is placed, excavation shall be dry.

Pipes shall be flush with inside walls of structure and project outside sufficiently for proper connection with the next conduit section. Completed new or adjusted structures shall be cleaned of dirt and debris.

- b. **Brick Structures:** Brick structures shall only be allowed when specifically shown on the plans or as directed by the Project Engineer.

Concrete foundations for brick structures shall be constructed in accordance with Section 601 and shall be placed 24 hours before brickwork is begun. Brick shall be clean, wetted immediately before laying, and laid on a full mortar bed. Joints between courses of bricks shall be a uniform thickness of 3/8". If new work is to be joined to existing or unfinished work, contact surfaces shall be cleaned and moistened.

No water shall be permitted to stand or run on brickwork until mortar has set. Inside and outside surfaces of structure shall be plastered with 1/2" thick mortar.

- c. **Concrete Structures:** Cast-in-place concrete structures shall be constructed in accordance with Section 601.

Drainage structures shown on the plans are based on cast-in-place construction. Precast concrete structures may be substituted by the Contractor, however any modifications of precast units or inability to use precast units due to field conditions that otherwise can be

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installed by cast-in-place methods shall be the sole responsibility of the Contractor. No additional compensation shall be given to the Contractor due to modification or elimination of preordered precast units.

Precast concrete structures shall be manufactured in accordance with Section 1017.

Joints between precast concrete units shall be sealed with flexible plastic gasket material.

Prior to installing gasket materials, the gasket seat shall be cleaned of dirt and other foreign matter and shall be dry. At temperatures below 60°F, gasket material shall be heated before installation.

- d. **Pipe Connections:** At pipe connections with structure, a 1/2" diameter bead of hydrophilic elastic sealant shall be placed around pipe at center of structure wall and also along center of wall opening. Space between pipe and wall shall then be grouted up from both sides of wall.

For cast in place drainage structures: Use non-shrink grout for pipe connections to concrete drainage structures, unless otherwise shown on Drawings. Grout pipe penetration in place on both inside and outside of drainage structures.

For precast drainage structures: Provide watertight connections in accordance with ASTM C 923 and ASTM F 2510 as applicable.

- e. **Safety End Treatments:** Furnish and install safety ends on cross drains and roadside culverts in accordance with these specifications, plans and as directed. Cast-in-place concrete structures shall be constructed in accordance with Section 601. Bolt pipe runners in place as shown on the plans. Cast bolts into the plastic concrete or place in approximately one inch diameter holes and epoxy in place using an approved anchor system.
- f. **Adjusting Structures:** If grade adjustment of existing structures is required, frames, covers and gratings shall be removed, and structure walls reconstructed as specified for new work. Frames, covers and grates shall be cleaned and placed in good repair (or replaced, if specified), and reset at required elevation.

Structures may also be adjusted with metal adjusting rings connected to existing ring by either welding at least 30% of circumference or by using an epoxy system designed for metal-to-metal adhesion.

- g. **Frames, Covers and Grates:** Frames shall be set in a full mortar bed. Nongalvanized parts shall be coated with jet black metalwork paint satisfactory to the Project Engineer.
- h. **Backfill:** Backfill shall be placed in accordance with the plan details and in lifts not more than 8" thick (loose). With approval of the Project Engineer, layer thickness may be increased to 12 inches with verification of satisfactory installation and performance.
1. Paved Areas (within 5 feet of roadway): Backfill shall be sand or sand aggregate (bedding material) and compacted to a minimum of 95 percent of the maximum dry density as determined by ASTM D698.
 2. Nonpaved Areas: Backfill can be sand, sand aggregate or usable soils and be compacted to at least the density of undisturbed surrounding ground.

Dispose of excavated material not satisfactory for backfill and surplus material in accordance with Subsection 203-8.

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702-4 MEASUREMENT: New and adjusted inlets, manholes, junction boxes, and safety end treatments will be measured per each. Trench drains will be measured by the linear foot.

702-5 PAYMENT: Payment will be made at the contract unit prices, which includes excavation, bedding and backfill.

702-6 PAY ITEMS:

<u>Item No.</u>	<u>Item</u>	<u>Unit</u>
70201--	Single Curb Inlet (Type)	Each
70202--	Double Curb Inlet (Type)	Each
70203--	Single Grate Inlet (Type)	Each
70204--	Double Grate Inlet (Type)	Each
70205--	Weir Inlet (Type)	Each
7020600	Yard Drain Inlet	Each
70207--	Drain Manhole (Type)	Each
70208--	Junction Box (Type)	Each
70209--	Trench Drain (___" Width)	Linear Foot
7021000	Adjusting Drain Manholes, Inlets and Junction Boxes	Each
7022100	Cross Drain Safety End Treatment	Each
7022200	Culvert Safety End Treatment	Each

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SECTION 703
PIPE UNDERDRAINS

703-1 DESCRIPTION: This work consists of furnishing and constructing pipe underdrain systems.

703-2 MATERIALS: Materials shall conform to the following Subsections:

Bedding Material	1001-6
Plastic Pipe	1015-4
Geotextile Fabric	1022-7

Fittings and materials necessary to make splices of plastic pipe underdrain and to make connections of the perforated plastic pipe to non-perforated plastic pipe shall be from the same pipe manufacturer. Fittings shall be designed to prevent soil or aggregate intrusion into the piping.

703-3 CONSTRUCTION:

- a. **Perforated Pipe:** Trench shall be lined with geotextile fabric and a layer of bedding material at least 3" thick placed in bottom of trench before pipe is laid. Adjoining sheets of geotextile fabric shall be lapped a minimum of 18 inches. Pipe shall be securely jointed and firmly embedded in bedding material. Upgrade ends of pipe shall be capped or plugged and exposed ends shall be covered with galvanized hardware cloth.

Pipe shall be backfilled with bedding material to at least 3" over pipe. Remainder of backfill shall be usable soil placed in layers not more than 12" thick (loose) and compacted as directed.

- b. **Nonperforated Pipe:** Pipe sections shall be securely jointed, joints wrapped with 24" wide geotextile fabric and backfilled with usable soil in layers not more than 12" thick (loose) compacted as directed. Exposed outfall ends of pipe shall be covered with galvanized hardware cloth.

703-4 MEASUREMENT: Quantities of pipe underdrains for payment will be the contract quantities, adjusted as required due to plan errors or plan changes.

703-5 PAYMENT: Payment for pipe underdrains will be made at the contract unit prices per linear foot, which includes excavation, bedding material, pipe, fittings, geotextile fabric, backfill and hardware cloth.

703-6 PAY ITEMS:

<u>Item No.</u>	<u>Item</u>	<u>Unit</u>
70301--	___" Perforated Pipe Underdrain	Linear Foot
70302--	___" Nonperforated Pipe Underdrain	Linear Foot

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SECTION 704

REVETMENTS AND CHANNEL PAVING

704-1 DESCRIPTION: This work consists of furnishing and constructing revetments for protection of embankment slopes, stream channels, culvert end treatments, and other areas. Revetments shall be constructed in accordance with these specifications and in conformity with the details shown on the plans or as directed.

When an item for "Flexible Revetment" is included in the contract, the Contractor has the option of constructing revetments of either riprap, sacked concrete or cabled articulated concrete block mattress. Unless directed otherwise, use the same type of revetment at each location.

704-2 MATERIALS: Materials shall conform to the following Sections and Subsections:

Riprap	1001-8
Portland Cement Concrete (Class 6A4000)	1005
Reinforcing Steel	1006-1
Geotextile Fabric	1022-7
Premolded Expansion Material	1007-1

704-3 CONSTRUCTION:

- a. **General:** Slopes and areas to be re-vetted and channel areas to be paved shall be dry or dewatered. Logs, stumps and other undesirable material shall be removed, and areas brought to required grade and compacted to at least the density of surrounding undisturbed ground.

All revetments, except cast-in-place concrete, shall be placed on geotextile fabric.

- b. **Geotextile Fabric:** Ends of fabric shall be buried as specified. Adjacent fabric strips shall be lapped at least 18" and pinned at maximum 5-foot intervals. Do not damage geotextile fabric during revetment placement. Repair damaged geotextile fabric or replace as directed by the Engineer.
- c. **Cast-in-Place Concrete:** Before concrete is placed, 1/4" premolded expansion material shall be placed around piles, columns, and other structural elements as directed.

Slope paving shall commence at toe and progress upslope. Paving of other areas shall be placed as directed. Concrete shall be placed, consolidated and cured in accordance with Section 502.

- d. **Stone Revetment:** Toe and end walls shall be constructed by placing riprap in trench lined with geotextile fabric. Placement of riprap shall begin at bottom of slope in a layer having the specified average thickness and progress upslope. A tolerance of 2 inches above or below the specified thickness will be allowed. Openings between stones shall not expose fabric. Riprap shall comply with Section 705.
- e. **Cable Articulated Concrete Block Mattress:** Sufficiently excavate the area in which the mattress is to be placed to ensure that the mattress is resting on the bottom of the trench. Excavate the trench to an elevation six inches below the grade line shown on the plans. The mattress placement direction shall be as shown on the plans or as directed by the Engineer. Where requiring more than one width or length of mattress, bind adjacent mattresses together according to plan details or manufacturer's recommendations to the satisfaction of the

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Engineer.

After completion of revetment, topsoil shall be spread over revetment to fill cell openings and/or annular spaces, and area shall be seeded and fertilized in accordance with Section 903.

- f. **Sacked Concrete Revetment:** Concrete for sacked revetment shall be wet-batched. Sacks shall be burlap uniformly filled to approximately 3/4 cubic foot. Open end shall be folded under bag during placement. Sacks of wet-batched concrete shall be placed in one layer in contact with adjacent sacks and tamped into position. Placement of sacked concrete on slopes shall begin at toe and progress upslope. Sacked concrete for other areas shall be placed as directed.

704-4 MEASUREMENT: Quantities for payment will be the contract quantities, adjusted as required due to plan errors or plan changes.

Design quantities are based on surface area of revetment and channel paving. Site preparation, toewalls and sidewalls, geotextile fabric, premolded expansion material and topsoil will not be measured for payment. Excavation, cables, and ties for cabled articulated concrete block mattress will not be measured for payment.

704-5 PAYMENT: Payment for revetments and channel paving will be made at the contract unit price per square yard, which includes furnishing and installing all materials as shown on the plan details and in accordance with this section.

Payment for seed and fertilizer will be made in accordance with Section 903.

704-6 PAY ITEMS:

<u>Item No.</u>	<u>Item</u>	<u>Unit</u>
7040100	Flexible Revetment	Square Yard
7040200	Cable Articulated Concrete Block Mattress	Square Yard
7040300	Stone Revetment	Square Yard
7040400	Sacked Concrete Revetment	Square Yard
70405--	___" Cast-in-Place Concrete Revetment	Square Yard
70406--	___" Concrete Channel Paving	Square Yard

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SECTION 705

RIPRAP

705-1 DESCRIPTION: This work consists of furnishing and placing riprap in accordance with these specifications and in conformity to lines, grades, and thickness shown on the plans or as directed.

705-2 MATERIALS: Materials shall conform to the following Subsections:

Riprap	1001-8
Geotextile Fabric	1022-7

Visually inspect riprap at the source, project site, or both to control gradation. Any difference of opinion between Engineer and Contractor will be resolved by checking the gradation of two random truckloads (or equivalent size samples). Furnish equipment, labor, and a sorting site at no direct pay.

705-3 CONSTRUCTION:

705-3.1 Riprap: Areas on which riprap is to be placed shall be graded to required section and compacted as directed. Geotextile fabric shall be placed on areas prior to placing riprap. Ends of fabric shall be buried for anchorage, and adjacent fabric strips shall be lapped at least 18" and pinned at maximum 5-foot intervals.

Riprap shall be placed by methods that do not damage geotextile fabric. Larger stones shall be placed first and smaller stones used to fill in areas between larger stones so that no geotextile fabric is exposed. Repair damaged geotextile fabric or replace as directed by the Engineer. Surface of completed riprap installation shall be uniform.

When placement in water currents is required, riprap shall be placed by methods that compensate for drift. Furnish necessary facilities, equipment, and personnel for checking riprap depth and distribution.

705-3.2 Filter Stone: When specified, place filter stone on the prepared slope or area before placement of riprap. When filter stone is placed underwater, free dumping will not be permitted. Use controlled methods for underwater placement using bottom dump buckets or wire rope baskets lowered through the water to the point of placement. Contractor shall place riprap promptly after placement of filter stone. Unless shown otherwise on the plans or directed by the Engineer, filter stone shall be Riprap Class 10 lb or less.

705-4 MEASUREMENT: Riprap and filter stone may be measured on a square yard, cubic yard, or weight basis as specified. No measurement will be made for excavation or backfilling.

- a. Square Yard: The quantity of riprap for payment will be that actually placed to the limiting dimensions shown on the plans or as directed by the Engineer.
- b. Cubic Yard: Measurement will be made by the cubic yard, truck measure, at jobsite. Materials delivered by weight will be measured by the ton from certified weight tickets, and divided by 1.5 to determine pay quantity.
- c. Ton: Measurement will be made by the ton from certified weight tickets.

705-5 PAYMENT: Payment for riprap will be made at the contract unit price, which includes geotextile fabric. Filter stone will be paid for as riprap.

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705-6 PAY ITEMS:

<u>Item No.</u>	<u>Item</u>	<u>Unit</u>
70501--	___ " Thick Riprap (Riprap Class)	Square Yard
70502--	___-lb Riprap	Cubic Yard
70503--	___-lb Riprap	Ton

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PART X MATERIALS

SECTION 1015 DRAIN PIPE: Section 1015 of the Standard Specifications is deleted in its entirety and replaced by the following:

SECTION 1015 DRAIN PIPE

1015-1 JOINT SYSTEMS FOR DRAIN PIPE AND PRECAST CONCRETE DRAIN UNITS: All pipe joint systems and materials shall be listed on the LADOTD Approved Materials List (AML).

- a. Type 1 Joints (T1): Type 1 pipe joints shall be soil tight and shall not leak when the pipe joint assembly is filled with water.
- b. Type 2 Joints (T2): Type 2 pipe joints shall not leak when subjected to 5 psi hydrostatic pressure for 10 minutes.
- c. Type 3 Joints (T3): Type 3 Joints shall not leak when subjected to 10 psi hydrostatic pressure for 10 minutes. Also, concrete shall not leak when deflected to create a position ½ inch wider than the assembled position on one side and subjected to hydrostatic pressure for an additional 10 minutes. Flexible pipe shall not leak when then deflected by 5 percent of the original diameter and subjected to 10 psi hydrostatic pressure for an additional 10 minutes.
- d. A Type 2 or 3 joint system may be substituted for a Type 1 joint system; a Type 3 joint system may be substituted for a Type 2 joint system.
- e. Use gaskets from the AML.

1015-2 CONCRETE DRAIN PIPE:

1015-2.1 Reinforced Concrete Pipe (RCP): Pipe shall conform to ASTM C 76, Class III, Wall A, B, or C Pipe. When extra strength pipe is required, use either Class IV or Class V as specified, Wall A, B, or C.

1015-2.2 Reinforced Concrete Pipe Arch (RCPA): Pipe arch shall conform to ASTM C 506, Class III pipe arch.

1015-2.3 Precast Reinforced Concrete Box Culverts (RCB): Precast box culvert shall conform to ASTM C1577 amended as follows:

- a. Use Table 1.
- b. Provide concrete with a Surface Resistivity at 28 days of 22 (kΩ-cm).
- c. When approved, minor surface cavities or irregularities which do not impair the service value of the unit and which can be corrected without marring its appearance shall be pointed with patching material from the Approved Materials List as soon as forms are removed.

1015-2.4 Joints and Gaskets: Joint systems shall comply with subsection 1015-1. Rubber gaskets for pipe joints shall comply with ASTM C443. Flexible sealants for pipe joints shall comply with ASTM C990.

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1015-3 CORRUGATED METAL PIPE:

1015-3.1 Corrugated Steel Pipe and Pipe Arch: Pipe shall conform to AASHTO M 36, Types I and II, amended as follows:

- a. Pipe and pipe arch shall be galvanized in accordance with AASHTO M 218.
- b. Elbows, tees, and other in-line fittings shall be fabricated from sheets of the same thickness and coating material as the pipe or pipe arch to which they are joined.
- c. For helical pipe, no coil splices at pipe manufacturing plants will be allowed for pipe 30 inches in diameter or less. Helical pipe requiring joints shall have annular ends and shall have the ends of seams welded a minimum of 2 inches. Helical pipe ends shall be rerolled a minimum of two full standard corrugations to the same corrugation depth as the pipe when used with the appropriate jointing system.
- d. Pipe larger than 30 inches in diameter or any diameter longer than 30 feet shall have a minimum of two lifting lugs.
- e. All corrugated steel pipe or pipe arches shall be either bituminous coated or polymer coated.
 1. Bituminous coated pipe shall be coated in accordance with AASHTO M 190, Type A, fully bituminous coated.
 2. Polymer coated pipe shall conform to AASHTO M 245, Grade 10/10.
- f. Pipe arch dimensions shall comply with AASHTO M 245 and Table 1015-1.

1015-3.2 Corrugated Aluminum Pipe and Pipe Arch: Pipe shall conform to AASHTO M 196, amended as follows:

- a. Helical pipe shall have annular ends and shall have the ends of seams welded a minimum of 2 inches. Helical pipe ends shall be rerolled a minimum of two full standard corrugations to the same corrugation depth as the pipe when used with the appropriate jointing system.
- b. Pipe larger than 30" inches in diameter or any diameter longer than 30 feet shall have a minimum of two lifting lugs.
- c. Aluminum alloy sheet used in fabricating pipe shall conform to the applicable requirements of AASHTO M 197 for Alclad Alloy 3004-H34 for annular pipe, and Alclad Alloy 3004-H32 for helical pipe.
- d. Pipe arch dimensions shall comply with Table 1015-1.

1015-3.3 Joints and Gaskets: Joint systems shall comply with subsection 1015-1. For Type 1 joints, provide at least one line of approved gasket material under the band on each pipe end.

- a. Gaskets for pipe joint systems shall be from the AML.
 1. Rubber gaskets for pipe joints shall comply with ASTM C443. Gasket cross section shall be the following:

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- i. For pipe 36 inches in diameter or less – 13/16-inch
 - ii. For pipe greater than 36 inches in diameter with ½-inch deep corrugations – 7/8-inch
 - iii. For pipe greater than 36 inches in diameter with 1-inch deep corrugations – 1 3/8-inch
2. Preformed flexible gaskets for pipe joints shall comply with ASTM C990. Gasket material shall be a minimum of 1 inch for ½-inch corrugation depth, and a minimum of 1 ½ inches for 1-inch corrugation depth.
- b. Coupling bands shall be same gage and coating as pipe (with a maximum of 12 gage). Coating shall be the same as used on the conduit. Minimum band width shall be 12 inches.
 - c. Steel banding rods shall comply with AASHTO M 270, Grade 36 (M 270M, Grade 250). Welding of rods will not be permitted. No more than two splices will be allowed.
 - d. Hardware shall be galvanized in accordance with ASTM A153 or B633, Class Fe/ZN 25 or an approved mechanical galvanizing process complying with B695 that provides the same coating thickness.

TABLE 1015-1		
CORRUGATED METAL PIPE ARCH DIMENSIONS (INCHES)		
	Steel & Aluminum	Steel
Round Equivalent, Inches	2 2/3 in. by 1/2 in. Corrugation	3 in. by 1 in. or 5 in. by 1 in. Corrugation
15	17 x 13	--
18	21 x 15	--
21	24 x 18	--
24	28 x 20	--
30	35 x 24	--
36	42 x 29	40 x 31
42	49 x 33	46 x 36
48	57 x 38	53 x 41
54	64 x 43	60 x 46
60	71 x 47	66 x 51
66	77 x 52	73 x 55
72	83 x 57	81 x 59
78	--	87 x 63
84	--	95 X 67
90	--	103 x 71
96	--	112 x 75
102	--	117 x 79
108	--	128 x 83
114	--	137 x 87
120	--	142 x 91

1015-4 THERMOPLASTIC PIPE: Thermoplastic pipe and joint systems may be of any of the following types and shall be products listed on the AML. Thermoplastic pipe for underdrains and yard drains shall be perforated or no-perforated, as specified, and shall be from the AML. Perforations, if

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specified, shall comply with AASHTO M 252. Joints shall be bell and spigot type with rubber gaskets conforming to ASTM F 477. Perforations, if specified, shall conform to AASHTO M 252.

1015-4.1 Polyvinyl Chloride (PVC) Pipe:

- a. Smooth Wall PVC Pipe (PVCP): PVCP and gasket materials shall comply with AASHTO M 278 or ASTM 3034, SDR 35.
- b. Ribbed PVC Pipe (RPVCP): RPVCP may be either open profile or dual wall construction in accordance with the specified ASTM standards. Pipe and gasket materials shall comply with ASTM F 794 or ASTM F 949, Series 46 with UV inhibitors, and the resin shall have a minimum cell classification of 12454-C as defined in ASTM D 1784.

1015-4.2 Polyethylene (PE) Pipe:

- a. Corrugated Polyethylene Pipe Single Wall (CPEPSW): CPEPSW shall be perforated and shall comply with AASHTO M 252, Type C. Perforations shall comply with AASHTO M 252. Do not use CPEPSW as shoulder outlet underdrain pipe.
- b. Corrugated Polyethylene Pipe Double Wall (CPEPDW):
 1. When used for storm drain pipe, cross drains, or culverts, CPEPDW pipe and gasket materials shall comply with AASHTO M 294, Type S, with a minimum resin cell classification of 435400C in accordance with ASTM D3350.
 2. When used for plastic underdrain pipe, the pipe and joint system shall comply with AASHTO M 252.
 3. When used for yard drain pipe, the pipe and joint system shall comply with AASHTO M 252, Type S, with a minimum resin cell classification of 424420C in accordance with ASTM D 3350, or AASHTO M 294, Type S, with a minimum resin cell classification of 435400C in accordance with ASTM D3350.

1015-4.3 Joint Systems for Thermoplastic Pipe: Joint systems shall comply with subsection 1015-1. When using split coupling bands, use one piece that is composed of the same material as the pipe. The bands shall be the same thickness as the base pipe. The width of the band shall be equal to one-half the diameter of the pipe but a minimum of 12 inches wide.