Concord
NORTH CAROLINA
High Performance Living
635 Alfred Brown Jr. Court SW, P.O. Box 308, Concord, NC 28026 – www.concordnc.gov

COUNTRY CLUB DR. CULVERT REPLACEMENT

PROJECT NO. 2021-043
BID NO. 2561

ADDENDUM 3

November 15, 2022

To all bidders:

1. BASE INDEX FOR ASPHALT BINDER:

   - The Contractor shall use $673.16/TN as the Base Index for Asphalt Binder for Plant Mix, per Section 620 of the NCDOT Standard Specifications.

2. ROAD CLOSURE:

   - The goal of the city is to complete this project in the least amount of time possible to minimize traffic disruption. The contract allows for 270 calendar days to complete the project after Notice to Proceed (NTP) has been issued. NTP will be issued after the city has evidence that the fabrication of the pre-cast culvert has been completed or is at least 90 % complete. The road closure can start after NTP is issued and can remain in place as necessary.

3. GRAVITY BLOCK WALL:

   - Stone Strong, Redi-Rock or equivalent precast gravity block walls will be acceptable for the culverts wingwalls. Wall systems relying on geogrid or any other means of soil reinforcement to provide stability will not be acceptable.

4. OVERHEAD UTILITIES:

   - The slack on the existing Windstream cable across the upstream side of the creek will be removed before construction begins. Existing poles and overhead lines within the construction area will remain in place and will need to be protected during construction.

5. PROJECT SPECIAL PROVISIONS:

   - Replace Special Provision *SP-07 Precast Reinforced Concrete Culvert* in Addendum 2 and Exhibit C of the project bid documents with the following SP. This SP-07 supersedes any previous version. This updates the bedding description in the Installation section to match Figure 2.1.

SP-07, PRECAST REINFORCED CONCRETE CULVERT

Description

Work covered by this special provision consists of installation of a precast reinforced concrete culvert or arch culvert (culvert), in accordance with the plans and specifications at locations shown on the plans. The work shall also include the construction of such joints and connections to other culverts, pipes, drainage structures, and steps as may be necessary to complete the work shown on the plans.

Materials and Construction Methods

Installation of the culvert shall conform to Section 414 of the NCDOT Standard Specifications as well as any requirements of this provision. Backfill shall be as specified in the *Earthwork, Excavation, Unsuitable Materials, and Backfill Materials* Special Provision.

Design and Manufacture

Culvert sections shall conform to ASTM C-1577 or the latest edition of the AASHTO LRFD Bridge Design Specifications. Provide a precast culvert that meets the requirements of Section 1077 and any other applicable parts of the Standard Specifications.

The concrete mixture shall meet the requirements for Single Cell Box Sections shown in Table 1077-1 in Section 1077 of the NCDOT Standard Specifications. Movement of the precast sections should be minimized during the initial curing period. Any damage caused by moving or handling during the initial curing phase will be grounds for rejection of that precast section. Air entrain the concrete in accordance with Section 1077 - 5(A) of the NCDOT Standard Specifications. For dry cast manufacturing, air entrainment is not required.

Handling devices or holes are permitted in each culvert section for the purpose of handling and laying. Submit details of handling devices or holes for approval and do not cast any concrete until approval is granted. Remove all handling devices flush with concrete surfaces as directed. Fill holes in a neat and workmanlike manner with an approved non-metallic non-shrink grout, concrete, or hole plug.

Each culvert section shall be checked at the plant for fitment and numbered which shall correspond to the laying schedule.

Concrete sills to hold invert fill material shall be furnished with the culvert end units.

All openings shown on the plans in the culvert shall be formed during the manufacturing process.

Culvert minimum waterway area shown on the plans shall be verified with the manufacturer for the culvert sizes due to manufacturing differences.

Joints

Produce the precast reinforced concrete culvert section with tongue and groove ends. Design and form these ends of the culvert section so, when the sections are laid together, they make a continuous line of culvert sections with a smooth interior free of appreciable irregularities in the flowline. The internal joint formed at the tongue and groove ends of the precast units shall be sealed with either bitumen/butyl sealant or closed-cell neoprene material conforming to ASTM C990 or C1677. The internal joint material shall be installed in accordance with the manufacturer's recommendations. The material shall be shown on the shop drawings when they are submitted for review.

Seal the external joint with an outside sealer wrap conforming to ASTM C877 that is at least 12 inches wide and covers the joint on both the sides and the top of the box section. Use ConWrap CS-212 from Concrete Sealants, Inc., EZ-Wrap from Press-Seal Gasket Corporation, Seal Wrap from Mar-Mac Manufacturing Co., Inc., Cadilloc External Pipe Joint from Cadilloc, or an approved equal for the outside sealer wrap. If the outside sealer wrap is not applied in a continuous strip along the entire joint, a 12 inch minimum lap of the outside sealer wrap is permitted. Before placing the outside sealer wrap, clean and prime the area receiving the outside sealer wrap in accordance with the sealer wrap manufacturer recommendations. The joint wrap manufacturer installation recommendations shall be included with shop drawings submitted for review.

Cover the external joint sealer with a 3 foot strip of filter fabric conforming to Type 4 requirements in Section 1056 of the Standard Specifications.

Installation

Ensure that equipment of the correct lifting capacity is available to install precast concrete units. Site conditions must be checked well in advance of shipping to ensure proper equipment location and to avoid any lifting restrictions. The lift anchors or holes provided in each section are only means to lift the elements unless otherwise approved by manufacturer.

In no case shall equipment operating in excess of the design load be permitted over the culvert units unless otherwise approved by manufacturer.

No construction equipment shall cross the bare precast concrete unit. The contractor shall refer to the Manufacturers specifications for additional restrictions.

No backfill shall be placed against any structural elements until they have been approved by the Engineer. Complete backfill in accordance with Sections 410-8 and 414-7 of the NCDOT Standard Specifications, Manufacturer's Specifications, and as specified in the *Earthwork, Excavation, Unsuitable Materials, and Backfill Materials* Special Provision. Sections 410-10 and 414-9 of the NCDOT Standard Specifications do not apply.

Bedding for precast culvert shall meet the requirements of Section 410 and 414 of the NCDOT Standard Specifications. Excavate **24 inches** below the bottom of barrel and footings and backfill with Class VI select material in accordance with Section 1016 of the NCDOT Standard Specifications or as shown on the plans. Bedding shall extend **12 inches** outside of the culvert or footings. In addition, bedding material shall be placed on filter fabric conforming to Type 4 requirements in Section 1056 of the NCDOT Standard Specifications. The filter fabric shall be placed perpendicular to the culvert barrel a with the geotextile wrapped up and around the conditioning material to fully encapsulated it. Perpendicular sections of fabric shall be continuous. A minimum lap of 2 feet shall be provided between sections of fabric.

a) Culvert sections shall be placed at the beginning of the outlet end of the culvert with the groove end being laid upgrade. Tongue sections shall be laid into the groove sections. Positive means shall be provided to pull each section firmly into the previously placed section so that the joints are tightly homed. Use a "come-along", box pullers or other approved methods to create a positive means of joining box sections. Construction equipment shall not have direct contact with the culvert section. The load of the culvert sections shall be suspended by a lifting device during joining procedure.

b) Place multiple, parallel lines of a culvert such that the separation between the lines of culvert has a minimum width of 3 inches. Fill the separation between multiple lines of culvert with non-excavatable flowable fill. Use flowable fill that meets the requirements listed in Section 1000 of the NCDOT Standard Specifications except that Field Compressive Strength Specimens are not required. Other fill materials may be used if approved by the Engineer.

<u>Invert Fill Material (as needed)</u>

a) The culvert shall be filled with native soil as shown on the plans and details. Native material consists of material that is excavated from the stream bed or floodplain at the project site during culvert construction. Only material that is excavated from the stream bed may be used to line the low flow channel or culvert barrel. Rip rap may be used to supplement the native material. If rip

rap is used, native material shall be placed on top to fill voids and provide a flat surface for animal passage. Native material is subject to approval by the Engineer and may be subject to permit conditions. If native material is not available, the Engineer shall approve an alternate source of material.

b) The material shall be compacted as little as possible but firm enough to walk on without leaving footprints.

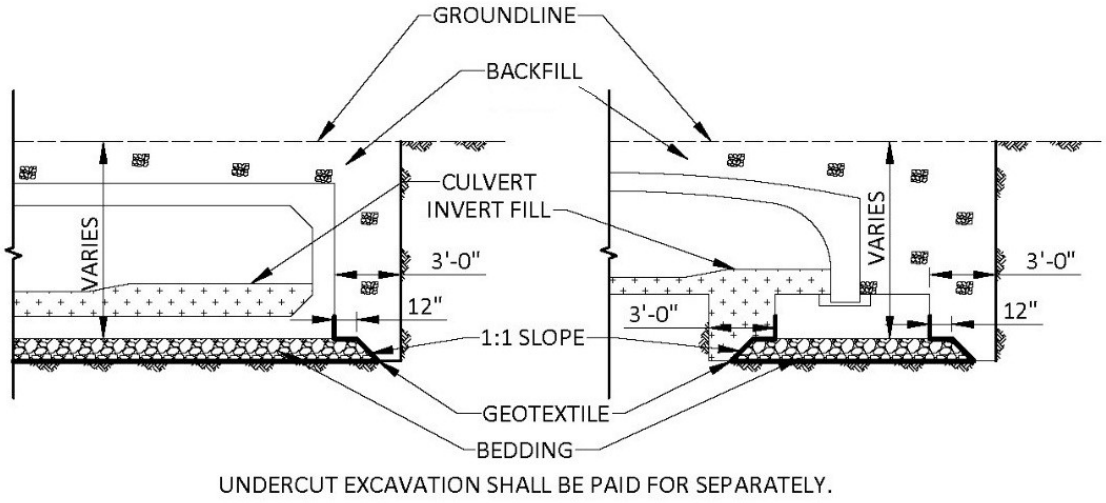


Figure 2.1 – Precast Reinforced Concrete Culvert Typical Section

Submittals

The designs of the precast culverts are the responsibility of the Contractor and are subject to review, comments, and approval. Submit two sets of detailed plans for review. Include all details in the plans, including the size and spacing of the required reinforcement necessary to build the precast culverts and the laying schedule. A North Carolina Registered Professional Engineer shall seal the plans and design calculations. **The shop drawings must show the proposed openings (top and sides) and reinforcing for pipe connections, structure openings, and precast holes for steps.**

The Contractor shall submit the manufacturer's certification for the culvert sections and those products to be used in the installation.

All submittals shall be made a minimum of two weeks prior to construction or placing an order for materials for review by the Engineer.

Measurement

The quantity of precast reinforced concrete culvert to be paid for will be the actual number of linear feet of culvert which has been installed and accepted. Measurement will be made horizontally along the centerline of the installed culvert. Measurement will not be made across precast bends or other drainage structures.

Payment

Payment for all work covered by this special provision will be made at the contract unit price per linear foot for "Precast Reinforced Concrete Culvert". Such payment will be full compensation for all work covered by this special provision including, but not limited to, furnishing all labor, materials, filter fabric, equipment, excavating, bedding, invert fill material, concrete sill, grout, installing culvert, constructing joints and connections, furnishing project submittals and other incidentals necessary to complete this work. There shall be no separate payment for Culvert Excavation, filter fabric, bedding, or any other items required by Section 410 (Articles 1-6 and 9) or 414 (Articles 1-5 and 8) of the NCDOT Standard Specifications. Backfill shall be as specified in the Earthwork, Excavation, Unsuitable Materials, and Backfill Materials special provision. Sections 410-10 and 414-9 of the NCDOT Standard Specifications do not apply.

Payment will be made under:

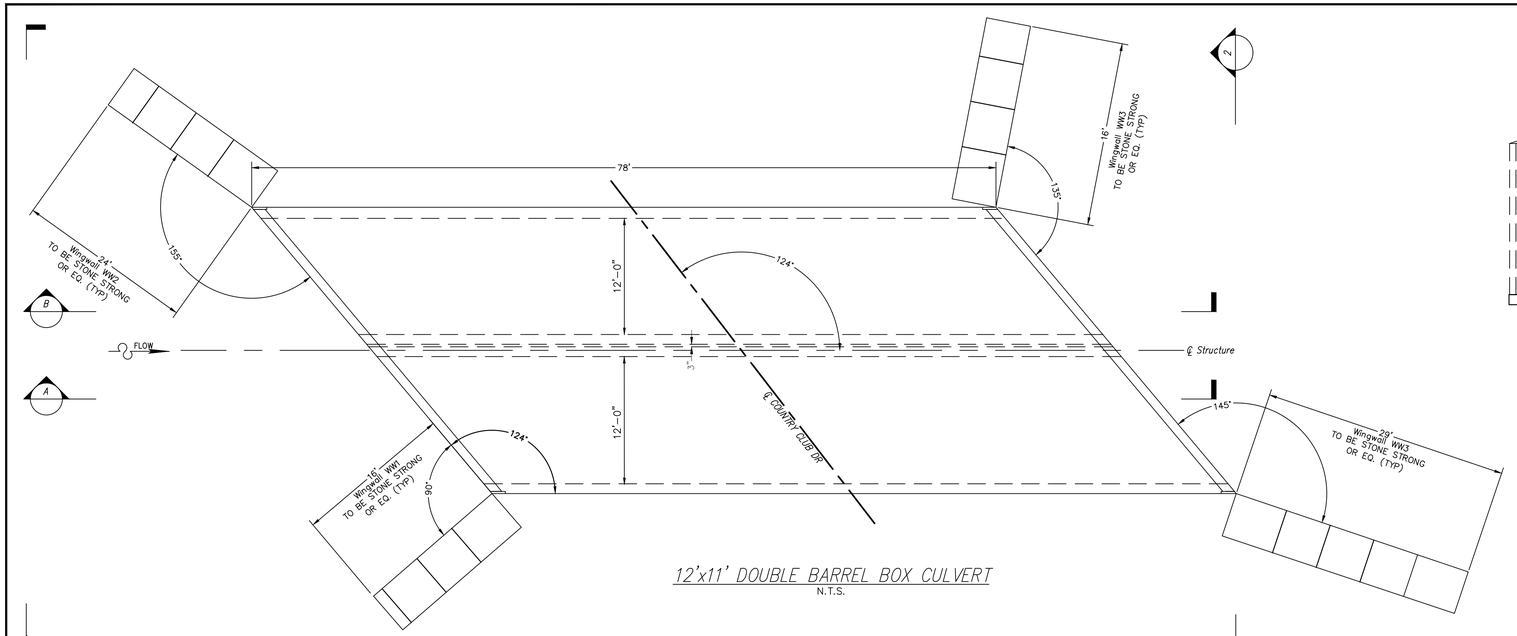
12' x 11' PRECAST R. C. CULVERT ..... LF

6. DRAWINGS:

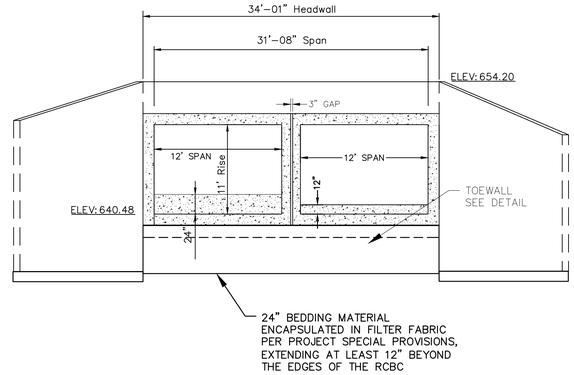
- Replace sheet 21 of the plans with the following sheet, which updates the culvert bedding to match *SP-07 Precast Reinforced Concrete Culvert,* and updates the wingwalls description.

7. Acknowledge Addendum 3 on the bid form of the documents.

End of Addendum 3

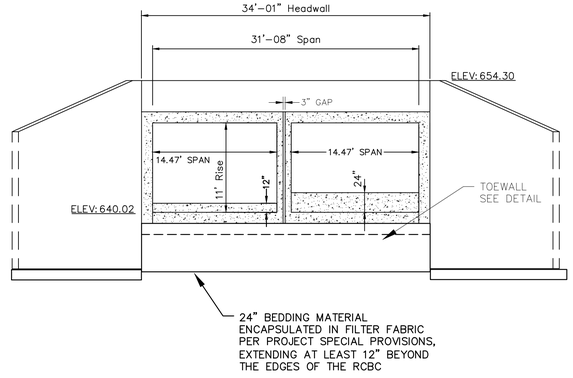


12'x11' DOUBLE BARREL BOX CULVERT
N.T.S.



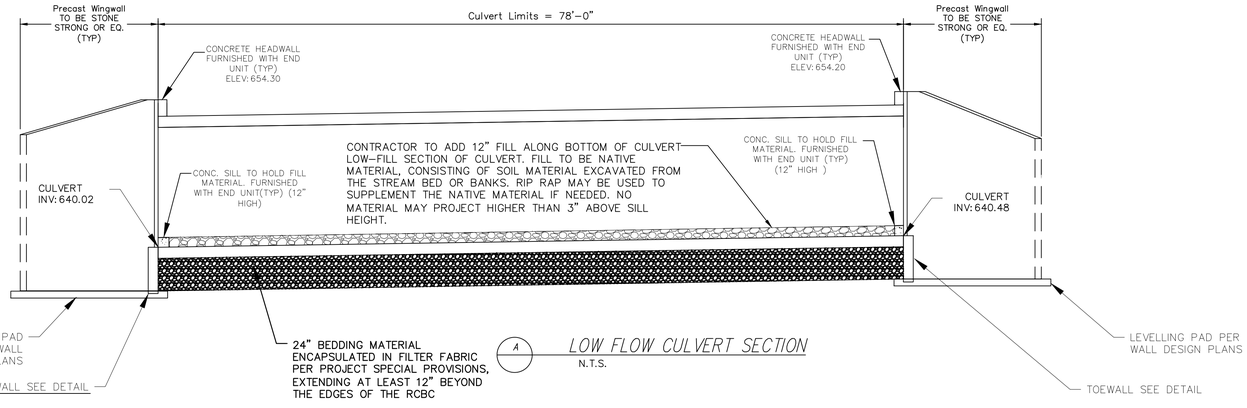
UPSTREAM END ELEVATION (1)
N.T.S.

Note:
U.S. – denotes Upstream
D.S. – denotes Downstream

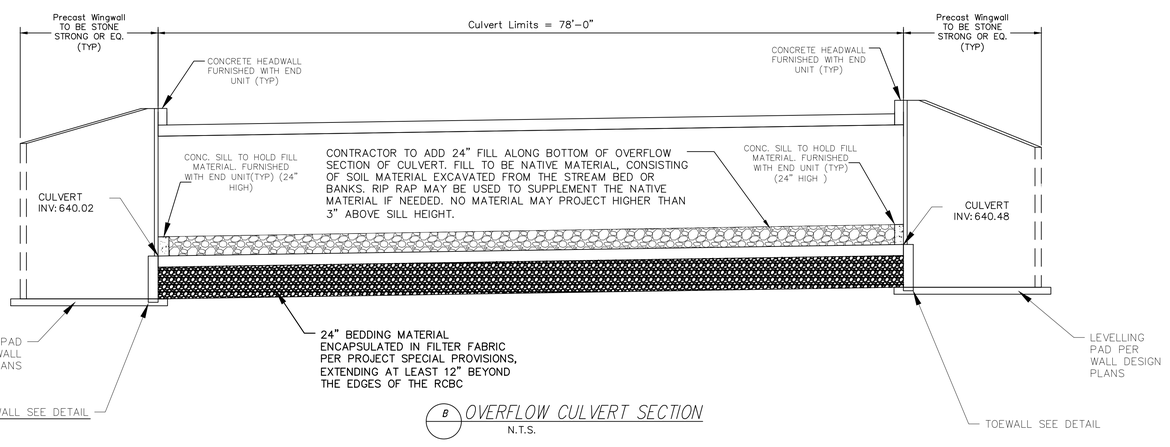


Note:
U.S. – denotes Upstream
D.S. – denotes Downstream

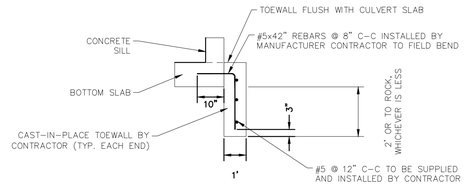
DOWNSTREAM END ELEVATION (2)
N.T.S.



A LOW FLOW CULVERT SECTION
N.T.S.



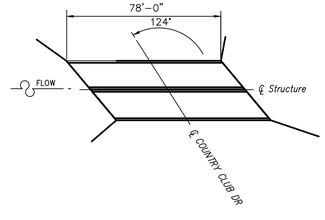
B OVERFLOW CULVERT SECTION
N.T.S.



TOEWALL DETAIL (D1)
N.T.S.

NOTE:

1. CULVERT SLAB AND WALL DIMENSIONS ARE PRELIMINARY. FINAL DIMENSIONS TO BE DETERMINED BY CULVERT STRUCTURAL DESIGNER.



LOCATION PLAN
N.T.S.

Concord NORTH CAROLINA High Performance Living

PREPARED BY
ENGINEERING DEPARTMENT
CITY OF CONCORD
P.O. BOX 308
CONCORD N.C. 28026
(704) 920-5425

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 044150 ENGINEER CAROLINA GARCIA ZARINCEDA VILLA
Carolina García-Zarinceda Villa 11/15/22

Engineer's Seal

Surveyor's Seal

COUNTRY CLUB DR.
CULVERT REPLACEMENT
CULVERT DESIGN DETAILS
PROJECT # : 2021-043

REV. #	DATE	DESCRIPTION	BY
0	09/22/22	FINAL FOR CONSTRUCTION	BCC
1	10/07/22	ADDRESSING COMMENTS	BCC
2	10/27/22	FINAL FOR BIDDING PURPOSES	BCC
3	10/31/22	REVISED PER EROSION CONTROL PERMIT	BCC

DESIGNED BY: CGZ
DRAWN BY: BCC
CHECKED BY: EAB
SCALE: AS SHOWN
DATE: 07/01/22
PROJECT NUMBER: 2021-043
SHEET: 21 OF: 27

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