

## **CHANGE ORDER**

| Project Number:IFB#24-111 Contractor: B&B Underground Construction Inc.    |
|--|
| Project Name: Parrot Cove Stormwater Improvements Project                  |
| Change Order Number: 02  |
| Change Order Effective Date: March 24, 2025 Contractor Phone: 561 249 0341 |
| Change Order Type: _Lump Sum Existing Purchase Order Number:               |
|  |

## **Description of Change:**

The project consist of stormwater improvements at four locations on the Lake Worth Beach golf course.

Site 4. (4<sup>th</sup> Avenue North, Sheet C-06) The contract drawings depict the existing pipe and Headwall to be approximately 26 feet from the actual edge of water into the intercoastal waterway. Pursuant to the permit conditions, the Contractor is not permitted to do work beyond the water line. This section of pipe is in very bad condition which facilitates significant infiltration. The dewatering of this pipe in order to complete the necessary repairs is not possible due to this amont of infiltration.

This Change Order is to compensate the Contractor in the construction of a new headwall within the limits set by the permit conditions and remove the existing Headwall and pipe which currently poses a navigational hazard. The pipe will then be cleaned and the remaining of the construction work can continue.

The contractor will be compensated to make this additional work effort possible in the amount of \$82,434.61. This Change Order is to increase the contract by \$82,434.61. Additionally, the contract time will be increased by Twenty (20) working days. The goal is still to meet the project grant deadline of August 30, 2025.

| 1           | 2  | 3   | 4    | 5           | 6                          |
|-------------|--|-----|------|-------------|----------------------------|
| Item<br>No. | Description  | Qty | Unit | Unit Price  | Increase In Contract Price |
| 1           | See Attached Change Order No. 2 Backup documentation | 1   | Ea   | \$82,434.61 | \$82,434.61                |
|             |  |     |      | ii.         |                            |
|             |  |     |      |             |                            |
|             |  |     |      |             |                            |
|             | Total Amount:  |     |      |             | \$ 82,434.61               |

| rice of Original Contract: \$ 1,222,715.00 (authorized by Commission on 9/24/2024 genda Item (# E )  |
|--|
| urrent Price of Contract (including Change Orders): \$1,229,416.14   |
| rice of Current Change Order: \$82,434.61  |
| ew Contract Price: \$1,311,850.75  |
| asis of Price Change: Unit Price Time & Material X_ Lump Sum   |
| ontract Time Change  |
| No Change Extended Decreased by <u>20</u> work days  |
| the CONTRACTOR and the OWNER agree that this CHANGE ORDER represents the complete greement of the parties with respect to these matters as of the date of this CHANGE ORDER. By opposing this Change Order, the CONTRACTOR releases any and all claims that it may have gainst the OWNER under the subject contract including, but not limited to claims for equitable djustments, which occurred or accrued prior to the effective date of this CHANGE ORDER.  OMPLIANCE WITH SECTION 787.06 By Signing this change order before a notary public and king an oath under the penalty of perjury, the CONTRACTOR attests and warrants that the ONTRACTOR does not use coercion for labor or services as defined in section 787.06, Florida tatues (2024). |
| his Change Order may be executed in counterparts and is not effective until approved by ther the City Manager or City Commission (as designated on the last page of this Change rder).   |
| Approved by:   7. Bakev (Department Director) (Date)   |

| IN WITNESS WHEREOF, the C to the  | DWNER/CITY has approved this Change Order No. Project on, 20_25  |
|---|--|
|   | CITY OF LAKE WORTH BEACH, FLORIDA  |
| ATTEST:   | By:<br>Betty Resch, Mayor  |
| By:<br>Melissa Ann Coyne, City Clerk  |  |
| APPROVED AS TO FORM AND LEGAL SUFFICIENCY:  | APPROVED FOR FINANCIAL SUFFICIENCY:  |
| By: Glen J. Torcivia, City Attorney  CON  [Corporate Seal]  | By: Yannick Ngendahayo, Financial Services Director  TRACTOR: B&B Underground Construction Inc.  By:  Print Name: Stephen Decker   |
| STATE OFFLORIDA (COUNTY OFPalm Beach)  The Foregoing Affidavit of Bidder acknowledged before me by means of physes March 2025, byStephen Decker of B&B Underground Construction Inc which is authorized to do business in the Staproduced as in perjury that the facts stated with regard to see the or she is duly authorized to execute the fore Inc to the same. | regarding Non-Collusion and Public Entity Crime was sical presence or online notarization on this _24_ day of r, as thePresident [title], ACorporation, ate of Florida, who is personally known to me or who has dentification, and who did take an oath under penalty of tion 787.06, Florida Statutes, are true and correct, and that going instrument and bindB&B Underground Construction, |
| Notary Public Signature   | r Public - State of Florida<br>nmission # HH 120510<br>nm. Expires May 19, 2025<br>pugh National Notary Assn.  |

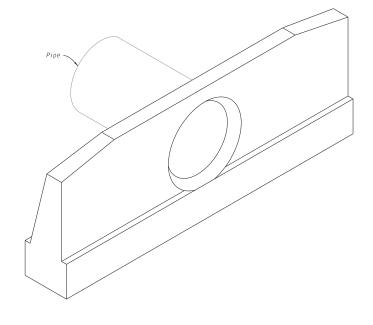
DESCRIPTION Parrot Cove The contract drawings depict the existing pipe and Headwall to be approximately 26 feet from the actual edge of water City of Lake Worth Beach Pursuant to the Permit Conditions, the Contractor is not permitted to do work beyond the water line. Site 4 The section of existing pipe is in very bad condition which facilitates significant infiltration. This amount of infiltration makes dewatering the impossible. Price Proposal to remove and replace New Headwall in location as shown and remove the existing Navigational Hazard Extra Work Item No. 04 Regular Hr Labor Rate\* Amount Labor Requirements Qty Overtime Hr 2,475.60 3,200.00 20.00 0.00 \$123.78 1.00 Superintendent 1.00 40.00 0.00 \$80.00 Foreman 5,544.00 2.00 40.00 0.00 \$69.30 Operator 2,178.00 40.00 40.00 0.00 \$54.45 Pipelayer 1.00 6,138.00 0.00 \$51.15 Laborer 3.00 1.00 24.00 0.00 \$62.10 1,490.40 Truck Driver Rate Includes Burden 21,026.00 Sub Total: Duration Amount **Equipment Requirements** Qty Rate/hr Fuel/Maintenance 40.00 6,583.68 \$27.43 Cat 325C Excavator 1.00 \$137.16 40.00 Komatsu PC300 Excavator 1.00 \$137.16 \$27.43 \$11.52 40.00 2,765.76 1.00 \$57.62 544 J Loader 40.00 0.00 \$48.16 \$9.63 Kubota 75-3 468.00 2" Pump & Hoses \$9.75 \$48.29 1.00 \$1.95 40.00 1,390.75 1.00 \$9.66 24.00 Dump Truck \$62.34 \$6.44 \$12.47 40.00 2,992.32 8" Dewatering Pump w/Header 1.00 \$1.29 40.00 309.12 1.00 Misc. Tools & small equipment Foreman's Transportation F-250 Pick-Up Truck 1.00 \$11.12 40.00 533.76 Superintendent's Transportation 2500 HD 1.00 \$11.12 \$2.22 20.00 266.88 0.00 \$62.33 \$12.47 40.00 Grading Tractor \$4.69 40.00 0.00 \$23.45 Ford Sweeper 1,096.32 40.00 \$11.42 \$2.28 Plate Compactors 2.00 \$ 22,990.27 Rates are based on Blue Book Monthly rates divided by 176 for hourly rate Rate Amount Material Requirements Qty Unit Tax 1.00 CY 223.19 15.62 238.81 Concrete 684.80 1.00 Cub 640.00 44.80 9,343.44 60 inch Elliptical Headwall 611.25 1.00 Ea 8.732.19 889.71 57 Stone 1.00 Load 831.50 58.21 11,156,76 \$ Sub Total Unit Amount Qtv Rate Subcontractor Requirements 8,750.00 4,329.18 1.0 Day \$8,750.00 Crane Speedy Concrete Cutting \$4,329.18 1.00 LS 13,079.18 Sub Total : Qty Unit Rate **Duration (hrs)** Amount Misc. Requirements LS \$1,750.00 1,750.00 1.00 Disposal Fee 1,750.00 70,002.21 \$ Sub Total : 1,680.05 2 40% Increased Bond& Insurance \$ Profit 15% \$ 10,752.34 82,434.61 TOTAL DIRECT COST 10 days Contract Time Extension Remarks

# C.O. #2 4th Ave. N Location 48"x76" elliptical rcp equivalent 60" round

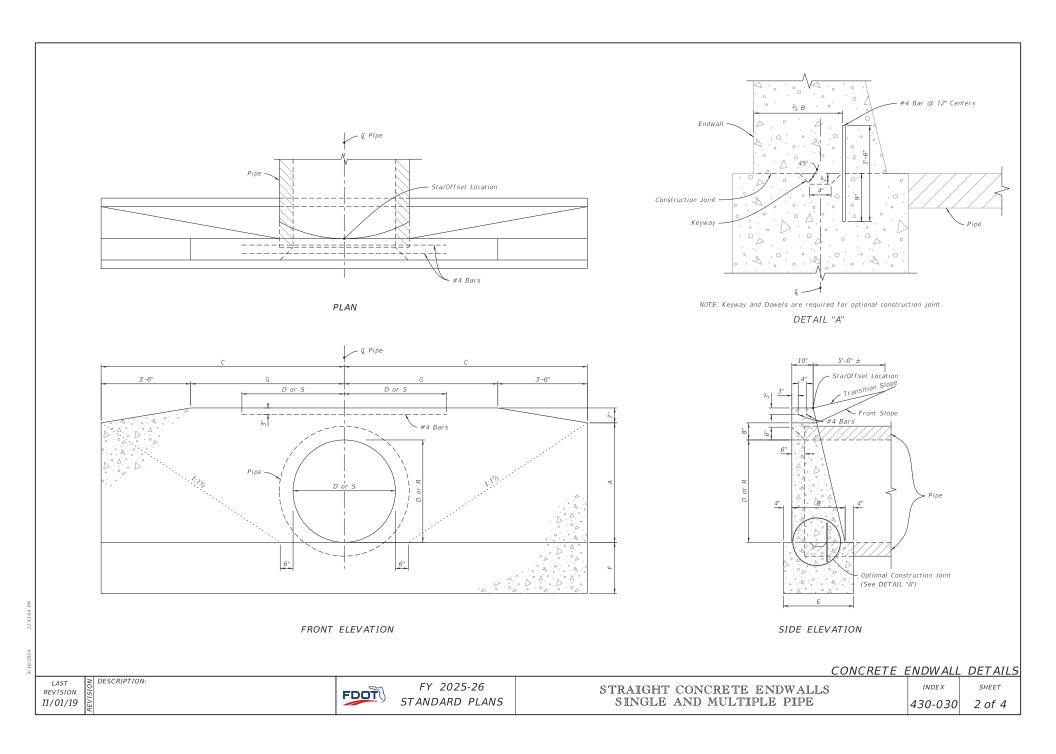
#### GENERAL NOTES:

- 1. Use Class II concrete.
- 2. Reinforcing steel is either Grade 40 or 60.
- Endwalls may be cast in place or precast concrete. (Additional reinforcement necessary for handling precast units will be determined by the Contractor or the supplier).
- 4. Chamfer all exposed edges and corners to 3/4".
- Endwall dimensions, locations and positions are for round and elliptical concrete pipe and for round and pipe-arch corrugated metal pipe. Round concrete pipe shown.
- 6. On outfall ditches with side slopes flatter than 1:1.5 provide 20' transitions from the endwall to the flatter side slopes, right of way permitting.
- 7. Construct front slope and ditch transitions in accordance with Index 430-001.
- 8. Quantities shown are for estimating purposes only.

|       | TABLE OF CONTENTS:             |
|-------|--------------------------------|
| Sheet | Description                    |
| 1     | General Notes and Contents     |
| 2     | Concrete Endwall Details       |
| 3     | Concrete and Metal Pipe Tables |
| 4     | Spacing For Multiple Pipes     |



STRAIGHT CONCRETE ENDWALL



|      |      |       |          |          |       |        |        |        |        |       | ROU     | ND C   | ONCR   | ETE A  | AND C  | ORRU    | GATED  | MET   | AL PI | PΕ    |          |          |       |       |         |       |       |               |          |      |
|------|------|-------|----------|----------|-------|--------|--------|--------|--------|-------|---------|--------|--------|--------|--------|---------|--------|-------|-------|-------|----------|----------|-------|-------|---------|-------|-------|---------------|----------|------|
|      |      | 0     | pening . | Area (SE | = )   |        |        |        |        | D     | imensio | ne     |        |        |        |         |        |       |       |       |          | lass II  |       |       |         |       |       |               |          |      |
| be.  | Dia. |       |          |          |       |        |        |        |        |       |         | 113    |        |        |        |         |        |       |       |       | per Of I | Pipe And |       |       | Of Pipe | (a)   |       |               |          | Dia. |
| 0    | D    | ^     | lumber   | Of Pipe. | S     | Δ      | R      |        | F      | F     | G       | l y    |        |        | X      |         | Single |       | Dou   |       |          |          |       | ple   |         |       |       | ruple         |          | D    |
|      |      | 1     | 2        | 3        | 4     |        |        | ·      | -      | ,     | _       | '      | 0°     | 15°    | 30°    | 45°     | 0°     | 0°    | 15°   | 30°   | 45°      | 0°       | 15°   | 30°   | 45°     | 0°    | 15°   | 30°           | 45°      |      |
|      | 15"  | 1.23  | 2.46     | 3.69     | 4.92  | 1'-11" | 1'-2"  | 4'-0"  | 1'-10" | 1'-2" | 0'-6"   | 2'-7"  | 2'-7"  | 2'-8"  | 3'-0"  | 3'-8"   | 1.23   | 1.59  | 1.60  | 1.65  | 1.74     | 1.94     | 1.96  | 2.05  | 2.23    | 2.30  | 2.34  | 2.47          | 2.74     | 15"  |
|      | 18"  | 1.77  | 3.54     | 5.31     | 7.08  | 2'-2"  | 1'-3"  | 4'-6"  | 1'-11" | 1'-3" | 1'-0"   | 2'-10" | 2'-10" | 2'-11" | 3'-3"  | 4'-0"   | 1.56   | 1.99  | 2.01  | 2.06  | 2.17     | 2.43     | 2.46  | 2.56  | 2.79    | 2.86  | 2.91  | 3.06          | 3.40     | 18"  |
| ١.   | 21"  | 2.41  | 4.82     | 7.23     | 9.64  | 2'-5"  | 1'-4"  | 5'-0"  | 2'-0"  | 1'-4" | 1'-6"   | 3'-2"  | 3'-2"  | 3'-3"  | 3'-8"  | 4'-6"   | 1.97   |       |       |       |          |          |       |       |         |       |       | لــــــــا    | <u> </u> | 21"  |
| it e | 24"  | 3.14  | 6.28     | 9.42     | 12.56 | 2'-8"  | 1'-4"  | 5'-6"  | 2'-0"  | 1'-4" | 2'-0"   | 3'-5"  | 3'-5"  | 3'-6"  | 3'-11" | 4'-10"  | 2.24   | 2.82  | 2.84  | 2.91  | 3.06     | 3.39     | 3.43  | 3.57  | 3.87    | 3.97  | 4.03  | 4.24          | 4.69     | 24"  |
| 18   | 27"  | 3.98  | 7.96     | 11.94    | 15.92 | 2'-11" | 1'-5"  | 6'-0"  | 2'-1"  | 1'-5" | 2'-6"   | 3'-10" | 3'-10" | 4'-0"  | 4'-5"  | 5'-5"   | 2.73   |       |       |       |          |          |       |       |         |       |       | $\overline{}$ |          | 27"  |
| l š  | 30"  | 4.91  | 9.82     | 14.73    | 19.64 | 3'-2"  | 1'-6"  | 6'-6"  | 2'-2"  | 1'-6" | 3'-0"   | 4'-3"  | 4'-3"  | 4'-5"  | 4'-11" | 6'-0"   | 3.26   | 4.13  | 4.16  | 4.26  | 4.49     | 4.98     | 5.04  | 5.25  | 5.69    | 5.84  | 5.93  | 6.24          | 6.91     | 30"  |
| ŭ    | 36"  | 7.07  | 14.14    | 21.21    | 28.28 | 3'-8"  | 1'-8"  | 7'-6"  | 2'-4"  | 1'-8" | 4'-0"   | 5'-1"  | 5'-1"  | 5'-3"  | 5'-10" | 7'-2"   | 4.53   | 5.73  | 5.77  | 5.92  | 6.23     | 6.92     | 7.00  | 7.29  | 7.91    | 8.13  | 8.26  | 8.69          | 9.62     | 36"  |
|      | 42"  | 9.62  | 19.24    | 28.86    | 38.48 | 4'-2"  | 1'-10" | 8'-6"  | 2'-6"  | 2'-0" | 5'-0"   | 6'-0"  | 6'-0"  | 6'-3"  | 6'-11" | 8'-6"   | 6.33   | 8.11  | 8.17  | 8.39  | 8.85     | 9.90     | 10.02 | 10.45 | 11.38   | 11.68 | 11.87 | 12.51         | 13.89    | 42"  |
|      | 48"  | 12.57 | 25.14    | 37.71    | 50.28 | 4'-8"  | 2'-1"  | 9'-6"  | 2'-9"  | 2'-0" | 6'-0"   | 6'-9"  | 6'-9"  | 7'-0"  | 7'-10" | 9'-7"   | 8.15   | 10.40 | 10.48 | 10.75 | 11.33    | 12.64    | 12.80 | 13.34 | 14.50   | 14.89 | 15.13 | 15.93         | 17.68    | 48"  |
|      | 54"  | 15.90 | 31.80    | 47.70    | 63.60 | 5'-2"  | 2'-6"  | 10'-6" | 3'-2"  | 2'-3" | 7'-0"   | 7'-8"  | 7'-8"  | 7'-11" | 8'-10" | 10'-10" | 11.71  | 15.23 | 15.35 | 15.78 | 16.69    | 18.77    | 19.02 | 19.86 | 21.69   | 22.29 | 22.66 | 23.93         | 26.67    | 54"  |
|      | 15"  | 1.23  | 2.46     | 3.69     | 4.92  | 1'-11" | 1'-2"  | 4'-0"  | 1'-10" | 1'-2" | 0'-6"   | 2'-7"  | 2'-7"  | 2'-8"  | 3'-0"  | 3'-8"   | 1.24   | 1.62  | 1.63  | 1.68  | 1.78     | 1.99     | 2.02  | 2.11  | 2.30    | 2.37  | 2.41  | 2.75          | 2.84     | 15"  |
| a a  | 18"  | 1.77  | 3.54     | 5.31     | 7.08  | 2'-2"  | 1'-3"  | 4'-6"  | 1'-11" | 1'-3" | 1'-0"   | 2'-10" | 2'-10" | 2'-11" | 3'-3"  | 4'-0"   | 1.59   | 2.04  | 2.06  | 2.11  | 2.23     | 2.51     | 2.54  | 2.65  | 2.89    | 2.96  | 3.01  | 3.17          | 3.53     | 18"  |
| Jet  | 21"  | 2.41  | 4.82     | 7.23     | 9.64  | 2'-5"  | 1'-4"  | 5'-0"  | 2'-0"  | 1'-4" | 1'-6"   | 3'-2"  | 3'-2"  | 3'-3"  | 3'-8"  | 4'-6"   |        |       |       |       |          |          |       |       |         |       |       |               |          | 21"  |
| 4    | 24"  | 3.14  | 6.28     | 9.42     | 12.56 | 2'-8"  | 1'-4"  | 5'-6"  | 2'-0"  | 1'-4" | 2'-0"   | 3'-5"  | 3'-5"  | 3'-6"  | 3'-11" | 4'-10"  | 2.29   | 2.91  | 2.93  | 3.01  | 3.17     | 3.52     | 3.56  | 3.71  | 4.03    | 4.14  | 4.20  | 4.43          | 4.91     | 24"  |
| 9    | 27"  | 3.98  | 7.96     | 11.94    | 15.92 | 2'-11" | 1'-5"  | 6'-0"  | 2'-1"  | 1'-5" | 2'-6"   | 3'-10" | 3'-10" | 4'-0"  | 4'-5"  | 5'-5"   |        |       |       |       |          |          |       |       |         |       |       |               |          | 27"  |
| at   | 30"  | 4.91  | 9.82     | 14.73    | 19.64 | 3'-2"  | 1'-6"  | 6'-6"  | 2'-2"  | 1'-6" | 3'-0"   | 4'-3"  | 4'-3"  | 4'-5"  | 4'-11" | 6'-0"   | 3.34   | 4.28  | 4.31  | 4.43  | 4.67     | 5.20     | 5.27  | 5.49  | 5.97    | 6.13  | 6.23  | 6.56          | 7.29     | 30"  |
| 15   | 36"  | 7.07  | 14.14    | 21.21    | 28.28 | 3'-8"  | 1'-8"  | 7'-6"  | 2'-4"  | 1'-8" | 4'-0"   | 5'-1"  | 5'-1"  | 5'-3"  | 5'-10" | 7'-2"   | 4.64   | 5.95  | 6.00  | 6.15  | 6.49     | 7.25     | 7.34  | 7.65  | 8.33    | 8.57  | 8.71  | 9.18          | 10.20    | 36"  |
| 15   | 42"  | 9.62  | 19.24    | 28.86    | 38.48 | 4'-2"  | 1'-10" | 8'-6"  | 2'-6"  | 2'-0" | 5'-0"   | 6'-0"  | 6'-0"  | 6'-3"  | 6'-11" | 8'-6"   | 6.49   | 8.43  | 8.50  | 8.73  | 9.23     | 10.38    | 10.52 | 10.98 | 11.99   | 12.32 | 12.52 | 13.22         | 14.73    | 42"  |
| ŭ    | 48"  | 12.57 | 25.14    | 37.71    | 50.28 | 4'-8"  | 2'-1"  | 9'-6"  | 2'-9"  | 2'-0" | 6'-0"   | 6'-9"  | 6'-9"  | 7'-0"  | 7'-10" | 9'-7"   | 8.38   | 10.85 | 10.94 | 11.23 | 11.87    | 13.34    | 13.51 | 14.11 | 15.39   | 15.82 | 16.08 | 16.97         | 18.90    | 48"  |
|      | 54"  | 15.90 | 31.80    | 47.70    | 63.60 | 5'-2"  | 2'-6"  | 10'-6" | 3'-2"  | 2'-3" | 7'-0"   | 7'-8"  | 7'-8"  | 7'-11" | 8'-10" | 10'-10" | 11.77  | 15.35 | 15.48 | 15.90 | 16.83    | 18.93    | 19.18 | 20.04 | 21.89   | 22.51 | 22.89 | 24.17         | 26.96    | 54"  |

|               |       |            |      |              |            |       |        |            |           |         | ELLI   | PTICA    | AL CO   | NCRE   | TE AI   | VD CC  | DRRUG  | SATED .        | META           | L PIP   | E ARC          | ЭН             |       |              |              |                |                |                |                |                |                 |            |            |
|---------------|-------|------------|------|--------------|------------|-------|--------|------------|-----------|---------|--------|----------|---------|--------|---------|--------|--------|----------------|----------------|---|----------------|----------------|-------|--------------|--------------|----------------|----------------|----------------|----------------|----------------|-----------------|------------|------------|
| 26            | Rise  | Span       | 0    | pening /     | Area (Si   | F)    |        | Dimensions |           |         |        |          |         |        |         |        |        |                |                | Class II Concrete (CY)<br>Number Of Pipe And Skew Angle Of Pipe (α) |                |                |       |              |              |                |                |                |                | Rise           | Span            | Approx.    |            |
| P             | R     | 5          | ٨    | umber        | Of Pipe    | 5     | Δ      | B          |           | F       | F      | G        | Y       | X      |         |        | Single | ingle Double   |                |   | Triple         |                |       |              | Quadruple    |                |                |                | R              | 5              | Equiv.<br>Round |            |            |
| $\vdash$      | 1 211 | 1.00       | 1    | 2            | 3          | 4     | 1/ 0// | 11 211     | 21.0//    | 1/ 10// | 1/ 2// | 0'-3"    | 21.10// | 0°     | 15°     | 30°    | 45°    | 0°             | 0°             | 15°   | 30°            | 45°            | 0°    | 15°          | 30°          | 45°            | 0°             | 15°            | 30°            | 45°            | 120             | 1.00       | 15"        |
|               | 14"   | 18"<br>23" | 1.8  | 2.6<br>3.6   | 3.9<br>5.4 | 7.2   | 1'-8"  | 1'-2"      | 1 21/2"   | 1' 11"  | 1' 3"  | 91/4"    | 3'-5"   | 3'-5"  | 3'-6"   | 3' -5" | 4'-0"  | 1.09<br>1.36   | 1.45           | 1.46  | 1.51           | 1.60           | 2.29  | 1.82<br>2.32 | 1.91<br>2.43 | 2.09           | 2.16           | 2.20           | 2.33           | 2.60<br>3.33   | 14"             | 18"<br>23" | 18"        |
|               | 19"   | 30"        | 3.3  | 6.6          | 9.9        | 13.2  | 2'-3"  | 1'-4"      | 5'-11/3"  | 2'-0"   | 1'-4"  | 1'-71/3" | 4'-2"   | 4'-2"  | 4'-4"   | 4'-10" | 5'-11" | 1.89           | 2.55           | 2.57  | 2.65           | 2.82           | 3.22  | 3.27         | 3.43         | 3.77           | 3.88           | 3.95           | 4.19           | 4.70           | 19"             | 30"        | 24"        |
|               | 24"   | 38"        | 5.1  | 10.2         | 15.3       | 20.4  | 2'-8"  | 1'-5"      | 6'-3"     | 2'-1"   | 1'-5"  | 2'-9"    | 5'-2"   | 5'-2"  | 5'-4"   | 6'-0"  | 7'-4"  | 2.64           | 3.55           | 3.58  | 3.69           | 3.93           | 4.48  | 4.54         | 4.77         | 5.24           | 5.39           | 5.49           | 5.82           | 6.53           | 24"             | 38"        | 30"        |
| l #           | 29"   | 45"        | 7.4  | 14.8         | 22.2       | 29.6  | 3'-1"  | 1'-6"      | 7'-0"     | 2'-2"   | 1'-6"  | 3'-6"    | 6'-0"   | 6'-0"  | 6'-3"   | 6'-11" | 8'-6"  | 3.32           | 4.48           | 4.52  | 4.66           | 4.96           | 5.64  | 5.72         | 6.00         | 6.60           | 6.80           | 6.92           | 7.34           | 8.24           | 29"             | 45"        | 36"        |
| -   5         | 34"   | 53"        | 10.2 | 20.4         | 30.6       | 40.8  | 3'-6"  | 1'-7"      | 7'-111/2" | 2'-3"   | 1'-7"  | 4'-51/2" | 7'-1"   | 7'-1"  | 7'-4"   | 8'-2"  | 10'-0" | 4.24           | 5.76           | 5.81  | 6.00           | 6.39           | 7.29  | 7.40         | 7.76         | 8.55           | 8.81           | 8.97           | 9.52           | 10.70          | 34"             | 53"        | 42"        |
| . [5          | 38"   | 60"        | 12.9 | 25.8         | 38.7       | 51.6  | 3'-10" | 1'-8"      | 8'-9"     | 2'-4"   | 1'-8"  | 5'-3"    | 7'-11"  | 7'-11" | 8'-2"   | 9'-2"  | 11'-2" | 5.22           | 7.16           | 7.23  | 7.46           | 7.96           | 9.10  | 9.24         | 9.70         | 10.71          | 11.05          | 11.25          | 11.95          | 13.46          | 38"             | 60"        | 48"        |
|               | 43"   | 68"        | 16.6 | 33.2         | 49.8       | 66.4  | 4'-3"  | 1'-10"     | 9'-81/2"  | 2'-6"   | 1'-10" | 6'-21/2" | 8'-10"  | 8'-10" | 9'-2"   | 10'-2" | 12'-6" | 6.63           | 9.01           | 9.09  | 9.38           | 10.00          | 11.39 | 11.56        | 12.13        | 13.36          | 13.77          | 14.02          | 14.88          | 16.73          | 43"             | 68"        | 54"        |
| $\rightarrow$ | 48"   | 76"        | 20.5 | 41.0         | 61.5       | 82.0  | 4'-8"  | 2'-1"      | 10'-8"    | 2'-9"   | 2'-0"  | 7'-2"    | 9'-9"   | 9'-9"  | 10'-1"  | 11'-3" | 13'-9" | 8.66           | 11.74          | 11.85   | 12.22          | 13.02          | 14.82 | 15.04        | 15.77        | 17.37          | 17.91          | 18.23          | 19.34          | 21.74          | 48"             | 76"        | 60"        |
|               | 53"   | 91"        | 24.8 | 49.6<br>59.0 | 88.5       | 99.2  | 5'-1"  | 2'-6"      | 11'-/"    | 3'-2"   | 2'-6"  | 8'-1"    | 10'-/"  | 10'-/" | 10'-11" | 12'-5" | 15'-0" | 12.50<br>16.46 | 16.98<br>22.26 | 16.98   | 17.67<br>23.16 | 18.83<br>24.66 | 28.05 | 28.46        | 22.86        | 25.18<br>32.85 | 25.97<br>33.85 | 26.44<br>34.46 | 28.06<br>36.55 | 31.55<br>41.05 | 53"<br>58"      | 91"        | 66"<br>72" |
| -             | 13"   | 17"        | 29.5 | 2.2          | 2 2        | 118.0 | 2 -0   | 2-10       | 2' 10"    | 1' 10"  | 2-10   | 0' 4"    | 2'-6"   | 2'-6"  | 21 7"   | 2' 11" | 3'-6"  | 1.16           | 1 47           | 1.48  | 1.52           | 1.60           | 1.78  | 1.80         | 1.88         | 2 04           | 2.09           | 2.12           | 2.23           | 2.48           | 12"             | 91         | 15"        |
| ā             | 15"   | 21"        | 1.6  | 3.2          | 4.8        | 6.4   | 1'-11" | 1'-2"      | J-10      | 1'-10"  | 1'-2"  | 0'-9"    | 2'-10"  | 2'-10" | 2'-11"  | 3'-3"  | 4'-0"  | 1.33           | 1.69           | 1.70  | 1.75           | 1.84           | 2.04  | 2.06         | 2.15         | 2.33           | 2.40           | 2.44           | 2.57           | 2.84           | 15"             | 21"        | 18"        |
| 1et           | 20"   | 28"        | 2.8  | 5.6          | 8.4        | 11.2  | 2'-4"  | 1'-3"      | 5'-2"     | 1'-11"  | 1'-3"  | 1'-8"    | 3'-5"   | 3'-5"  | 3'-6"   | 3'-11" | 4'-10" | 1.78           | 2.31           | 2.33  | 2.39           | 2.53           | 2.83  | 2.87         | 2.99         | 3.26           | 3.36           | 3.42           | 3.60           | 4.01           | 20"             | 28"        | 24"        |
| 2             | 24"   | 35"        | 4.3  | 8.6          | 12.9       | 17.2  | 2'-8"  | 1'-4"      | 5'-111/5" | 2'-0"   | 1'-4"  | 2'-51/2" | 4'-0"   | 4'-0"  | 4'-2"   | 4'-7"  | 5'-8"  | 2.34           | 3.03           | 3.05  | 3.14           | 3.32           | 3.72  | 3.77         | 3.93         | 4.29           | 4.40           | 4.47           | 4.72           | 5.25           | 24"             | 35"        | 30"        |
| i ė           | 29"   | 42"        | 5.9  | 11.8         | 17.7       | 23.6  | 3'-1"  | 1'-5"      | 6'-101/2" | 2'-1"   | 1'-5"  | 3'-41/2" | 4'-9"   | 4'-9"  | 4'-11"  | 5'-6"  | 6'-9"  | 3.13           | 4.06           | 4.09  | 4.20           | 4.45           | 4.99  | 5.06         | 5.28         | 5.76           | 5.93           | 6.03           | 6.36           | 7.09           | 29"             | 42"        | 36"        |
| 199           | 33"   | 49"        | 8.4  | 16.8         | 25.2       | 33.6  | 3'-5"  | 1'-6"      | 7'-8"     | 2'-2"   | 1'-6"  | 4'-2"    | 5'-6"   | 5'-6"  | 5'-8"   | 6'-4"  | 7'-9"  | 3.83           | 5.00           | 5.04  | 5.18           | 5.48           | 6.16  | 6.24         | 6.52         | 7.12           | 7.32           | 7.44           | 7.86           | 8.76           | 33"             | 49"        | 42"        |
| - 15          | 38"   | 57"        | 10.6 | 21.2         | 31.8       | 42.4  | 3'-10" | 1'-7"      | 8'-71/2"  | 2'-3"   | 1'-7"  | 5'-11/2" | 6'-4"   | 6'-4"  | 6'-7"   | 7'-4"  | 8'-11" | 4.87           | 6.31           | 6.36  | 6.53           | 6.91           | 7.74  | 7.84         | 8.18         | 8.93           | 9.18           | 9.33           | 9.85           | 10.96          | 38"             | 57"        | 48"        |
| 00            | 43"   | 64"        | 13.2 | 26.4         | 39.6       | 52.8  | 4'-3"  | 1'-8"      | 9'-61/2"  | 2'-4"   | 1'-8"  | 6'-01/2" | 7'-1"   | 7'-1"  | 7'-4"   | 8'-2"  | 10'-0" | 5.88           | 7.64           | 7.70  | 7.91           | 8.37           | 9.40  | 9.52         | 9.94         | 10.86          | 11.15          | 11.33          | 11.97          | 13.33          | 43"             | 64"        | 54"        |
|               | 47"   | 71"        | 16.9 | 33.8         | 50.7       | 67.6  | 4'-7"  | 1'-10"     | 10'-4"    | 2'-6"   | 2'-0"  | 6'-10"   | 7'-10"  | 7'-10" | 8'-1"   | 9'-1"  | 11'-1" | 7.80           | 10.15          | 10.23   | 10.51          | 11.12          | 12.49 | 12.65        | 13.22        | 14.43          | 14.85          | 15.10          | 15.94          | 17.77          | 47"             | 71"        | 60"        |

### NOTES:

1. Dimension X is calculated as:  $X = Y*SEC \alpha$ .

2. Select tabular quantities using skew values as follows:

End Skew to Pipe Use Tabulated Value

0° to 5° 6° to 15° 16° to 30° 31° or Over 0° 15° 30° 45°

### CONCRETE AND METAL PIPE TABLES

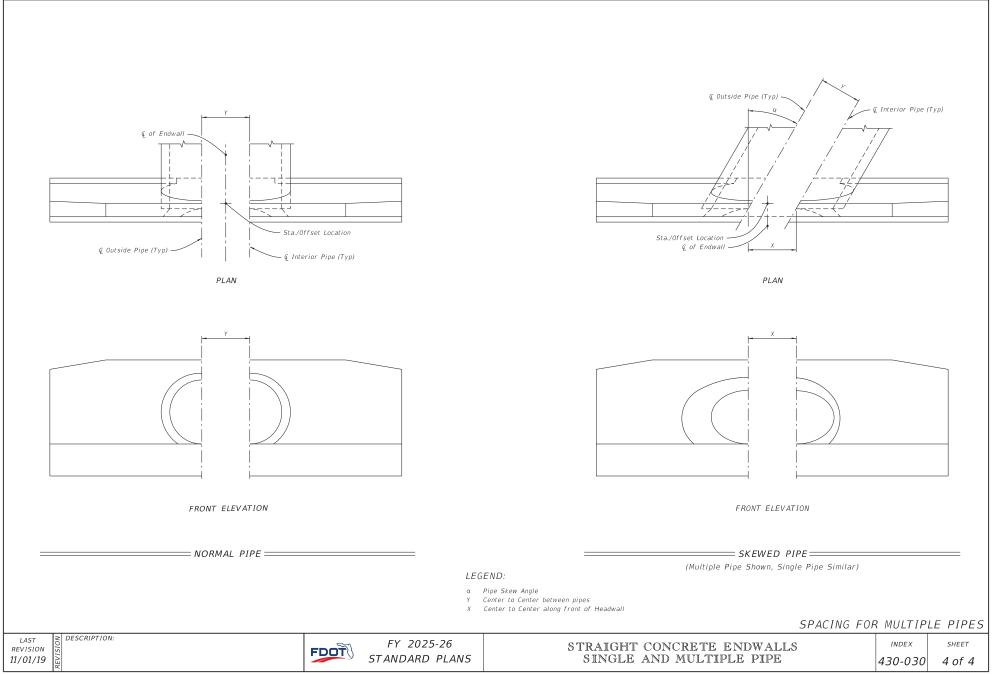
REVISION 11/01/21 ≥ DESCRIPTION:



FY 2025-26 STANDARD PLANS STRAIGHT CONCRETE ENDWALLS SINGLE AND MULTIPLE PIPE

INDEX 430-030

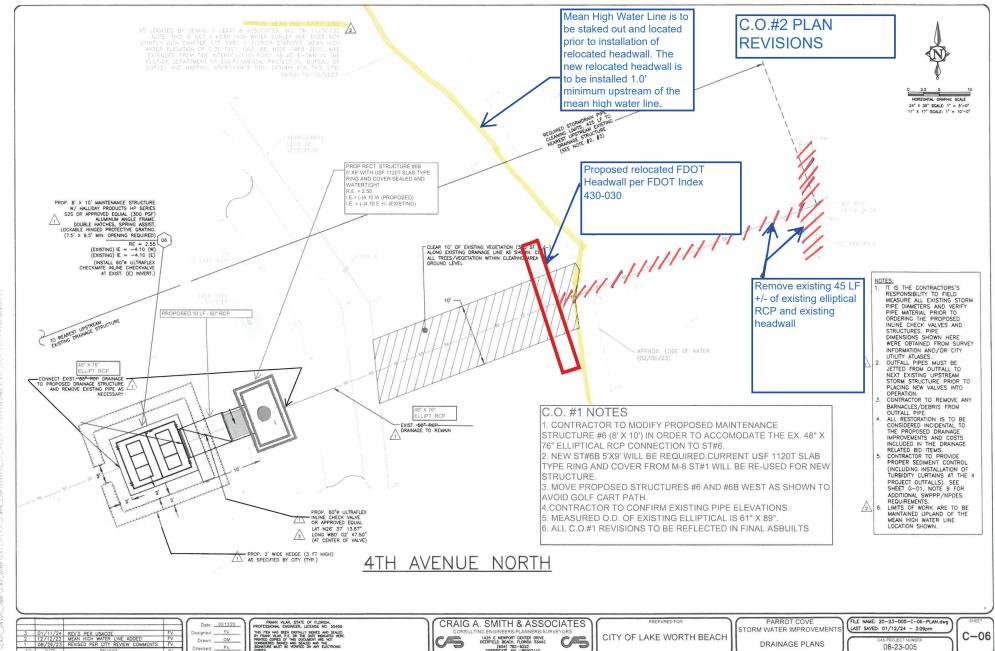
SHEET 3 of 4



12:43:17

\* 10110110

9/10/2024



DRAINAGE PLANS

08-23-005

Drawn OM