BROWNSVILLE
PUBLIC UTILITIES BOARD

Date: August 9, 2022
To: All Vendors
Subject: Addendum #1

REFERENCE: B060-22 Boca Chica Waterline Improvements (International Blvd. to Owens Road)

This Addendum forms part of the contract and clarifies, corrects or modifies original bid document.

See contract document revisions attached.

NEW SUBMISSION DATE & TIME: AUGUST 18, 2022 by 2:00 PM
NEW OPENING DATE & TIME: AUGUST 18, 2022 at 2:15 PM

The signature of the company agent, for the acknowledgement of this addendum, shall be required.
Complete information below and return via e-mail to: dsolitaire@brownsville-pub.com.

I hereby acknowledge receipt of this addendum.

Company: _____

Agent Name: _____

Agent Signature: _____

Address: _____

City: _____ **State:** _____ **Zip:**_____

Phone #:_____**E-mail address:**_____

If you have any further questions about the Bid, call 956-983-6366.

Diane Solitaire
BY: Diane Solitaire
Purchasing

HALFF
1075 Paredes Line Road
Brownsville, TX 78521
Phone (956) 303-7100
TBPELS Firm No. 312

Project Addendum No.1

Project:	**Brownsville PUB – Boca Chica Waterline Upgrade (International Blvd. to Owens Road)** **BPUB Bid No. B060-22**	Addendum Date:	**August 9, 2022**
From:	**John W. Clint, PE**	Project No.:	**43503.001**

ADDENDUM No. 1

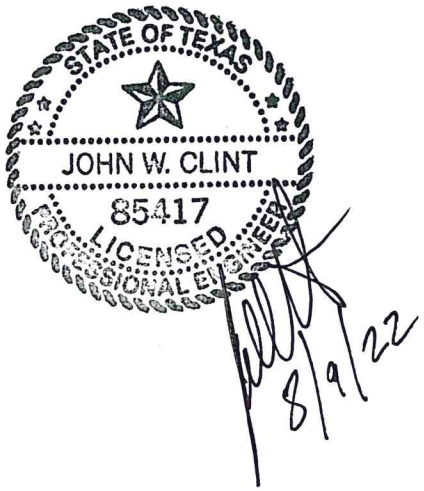
CONTRACT DOCUMENT REVISIONS

1. The Bid Submittal Date and Time has been postponed to August 18, 2022 at 2.00PM. Bid Opening shall follow on the same day at 2:15pm.

2. Bid Item No. 35 – Trench Dewatering refers to well point dewatering methods "ONLY". Bailing and shallow groundwater dewatering methods, mentioned in the note below the bid schedule, references sump pump and other methods of dewatering the trench (excluding well point systems), and are considered subsidiary to other items in the bid schedule.

DESIGN REVISIONS

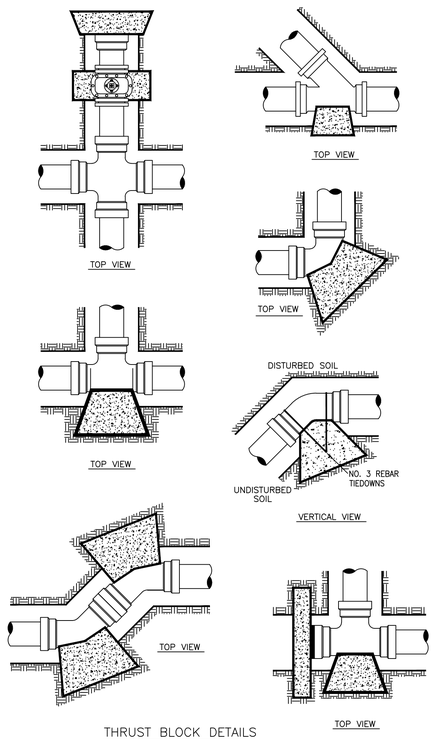
3. Bid Items 6 – 17 – Waterline, valves, casing and fittings installed within Boca Chica (SH 4) ROW shall be backfilled with flowable fill as per the Boca Chica Blvd. Pavement Repair Detail shown on the attached revised Sheet No. 10. Specification 31 23 23.33 - Flowable Fill is attached to this addendum.



BOCA CHICA WATERLINE UPGRADE (INTERNATIONAL BLVD. TO OWENS ROAD)

BROWNSVILLE, TEXAS

HALFF
1970 PARKSIDE DRIVE, SUITE B
BROWNSVILLE, TEXAS 78520
TEL (956) 303-7100
TBPELS ENGINEERING FIRM #312



THRUST BLOCK DETAILS

NOT TO SCALE

ALL MJ FITTINGS WILL REQUIRE RESTRAINERS (MEGA LUGS) WITH THRUST BLOCKS

NOTES ON THRUST BLOCKING:

1. ALL BLOCKING SHALL BE AGAINST UNDISTURBED HAND DUG SOIL AND SHALL BE CONCRETE HAVING A MINIMUM 28 DAY STRENGTH OF 2000 LBS. PER SQUARE INCH.
2. THRUST CALCULATIONS TO BE BASED ON THRUST DUE TO WATER PRESSURE AT 100% OF TEST PRESSURE. THRUST = 2 AP SIN 1/2 ø WHERE A = AREA OF PIPE, P = WATER PRESSURE, ø = DEFLECTION ANGLE.
3. VERTICAL UPLIFT BLOCKS SHALL BE DESIGNED ON THE BASIS OF 150 LBS. PER CU. FT. FOR CONCRETE AND SOIL AT 120 LBS. PER FT. OVER THE AREAOF BLOCK.
4. VERTICAL DOWN THRUST BLOCKS SHALL BE DESIGNED ON THE BASIS OF 2000 LBS. PER SQ. FT. ALLOWABLE SOIL BEARING PRESSURE. DIMENSION MAY BE DECREASED WITH APPROVAL OF THE ENGINEER IF MEASURED SOIL CONDITIONS PERMIT. IN POOR SOIL CONDITIONS, BLOCK DIMEMSIONS SHALL BE INCREASED IN PROPORTION TO ALLOWABLE BEARING VALUE.
5. THRUST BLOCKS ON HORIZONTAL BENDS, TEES, CROSSES, AND REDUCERS SHALL BE SIZED BASED ON 24000 LBS. PER SQ. FT. OF BLOCKING SURFACE AREA IN CONTACT WITH UNDISTURBED SOIL, BLOCK DIMENSIONS MAY BE DECREASED WITH APPROVAL OF THE ENGINEER IF MEASURED SOIL CONDITIONS PERMIT. IN POOR SOIL CONDITIONS, BLOCK DIMENSIONS SHALL BE INCREASED IN PROPORTION TO THE ALLOWABLE BEARING VALUE.
6. ALL BLOCKING SHALL HAVE A MINUMUM SOIL COVER OF 1 FT.
7. ADDITIONAL REINFORCING MAY BE REQUIRED FOR HORIZONTAL BLOCKING TO HANDLE UNUSUAL SHEAR LOADING CONDITIONS.

GENERAL DATA FOR BLOCKING STANDARD FITTING

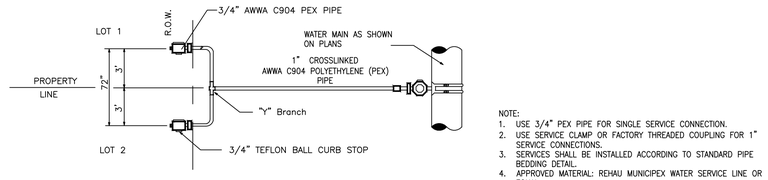
PIPE SIZE	THRUST IN TONS EXERTED AT PLUGS, TEES AND BENDS FOR EACH 100 LBS. PER SQ. IN. OF TEST PRESSURE.					
	PLUG	TEE	90° BEND	45° BEND	22-1/2° BEND	11-1/4° BEND
4"	0.63	0.63	0.89	0.48	0.25	0.12
6"	1.40	1.40	2.00	1.08	0.55	0.28
8"	2.50	2.50	3.55	1.92	0.98	0.49
10"	3.93	3.93	5.55	3.00	1.53	0.77
12"	5.65	5.65	8.00	4.33	2.21	1.11
14"	7.70	7.70	10.88	5.89	3.00	1.51
16"	10.05	10.05	14.21	7.69	3.85	1.97
18"	12.70	12.70	17.99	9.74	4.96	2.49
20"	15.71	15.71	22.22	12.02	6.13	3.08
24"	22.67	22.67	32.00	17.31	8.83	4.43
27"	28.63	28.63	40.48	21.91	11.17	5.61
30"	35.35	35.35	50.00	27.08	13.79	6.93
36"	50.90	50.90	72.98	38.95	19.89	9.98
42"	69.27	69.27	97.97	53.02	27.03	13.58
48"	90.48	90.48	127.96	69.25	35.30	17.74
54"	114.51	114.51	161.94	87.64	44.68	22.45

WATER MAIN – SANITARY SEWER CROSSINGS

PRIMARY CONDITION	PROPOSED WATER EXISTING SANITARY SEWER				PROPOSED WATER PROPOSED SANITARY SEWER OR EXISTING WATER PROPOSED SANITARY SEWER			
SECONDARY CONDITION	WATER OVER SANITARY SEWER		WATER UNDER SANITARY SEWER		WATER OVER SANITARY SEWER		WATER UNDER SANITARY SEWER	
IF THE CLEARANCE IS	LESS THAN 2'	GREATER THAN 2' BUT LESS THAN 9'	LESS THAN 2'	GREATER THAN 2' BUT LESS THAN 9'	LESS THAN 2'	GREATER THAN 2' BUT LESS THAN 9'	LESS THAN 2'	GREATER THAN 2' BUT LESS THAN 9'
*PROTECTION REQUIREMENT	1	2	3	4	5 6(B)	6	3	6

*PROTECTION REQUIREMENTS FOR SANITARY SEWER CROSSINGS (UNLESS VARIANCE IS GRANTED BY THE TCEQ)

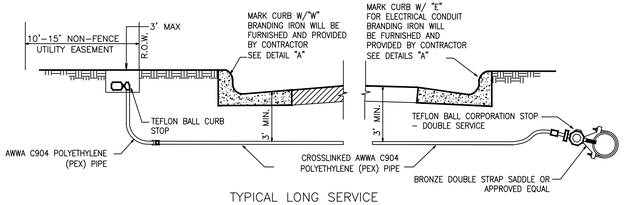
1. CENTER ONE (1) 20-FOOT JOINT OF C-900 PVC DR18, CLASS 150, WATERLINE PIPE OVER SANITARY SEWER; 6-INCH ABSOLUTE MINIMUM CLEARANCE.
2. IF NO EVIDENCE OF SANITARY SEWER LEAKAGE, CENTER ONE JOINT OF WATER LINE OVER SANITARY SEWER: 24-INCH ABSOLUTE MINIMUM CLEARANCE. IF THE SEWER LINE IS LEAKING, THE SEWER LINE SHALL BE REPLACED FOR AT LEAST NINE FEET IN BOTH DIRECTIONS (18 FEET TOTAL) WITH AT LEAST 150 psi PRESSURE- RATED PIPE EMBEDDED IN CEMENT STABILIZED SAN FOR THE TOTAL LENGTH OF ONE PIPE SEGMENT PLUS 12 INCHES BEYOND THE JOINT ON EACH END.
3. SEWER LINE SHALL BE ENCASED. THE CASING PIPE SHALL BE CONSTRUCTED OF AT LEAST 150 psi PRESSURE PIPE CLASS PIPE, AT LEAST 18 FEET LONG, SEALED IN BOTH ENDS WITH CEMENT GROUT OR A MANUFACTURED SEAL. AT LEAST 2 NOMINAL SIZES LARGER THAN THE WASTEWATER COLLECTION PIPE, AN ABSOLUTE MINIMUM SEPARATION OF ONE FOOT BETWEEN WATER LINE AND ENCASEMENT PIPE, OR WATER LINE SHALL BE CONSTRUCTED OF DUCTILE IRON OR STEEL PIPE WITH MECHANICAL OR WELDED JOINTS AS APPROPRIATE. AN ABSOLUTE MINIMUM SEPARATION DISTANCE OF ONE FOOT BETWEEN THE WATER LINE AND WASTEWATER MAIN OR LATERAL SHALL BE PROVIDED.
4. AUGER 9-FEET MINIMUM EACH SIDE OF SANITARY SEWER. PLACE ONE 20-FOOT JOINT OF C900 PVC, 150 PSI, CENTERED UNDER SANITARY SEWER. FILL BORED HOLE WITH BENTONITE/CLAY MIXTURE: 2-FOOT ABSOLUTE MINIMUM CLEARANCE OR REPLACE THE EXISTING SANITARY SEWER WITH 150 PSI LINED DUCTILE IRON OR PVC PIPE WITH APPROPRIATE ADAPTERS ON ALL PORTIONS OF THE SANITARY WITHIN 9-FEET OF THE WATER MAIN.
5. WHERE A NEW POTABLE WATER LINE CROSSES A NEW. PRESSURE RATED WASTEWATER MAIN OR LATERAL, ONE SEGMENT OF THE WATER LINE PIPE SHALL BE CENTERED OVER AND SHALL BE PERPENDICULAR TO THE WASTE WATER LINE SUCH THAT THE JOINTS OF THE WATERLINE PIPE ARE EQUIDISTANT AND AT LEAST NINE FEET HORIZONTALLY FROM THE CENTER LINE OF THE WASTEWATER MAIN OR LATERAL. THE POTABLE WATER LINE SHALL BE AT LEAST SIX INCHES ABOVE THE WASTEWATER MAIN OR LATERAL. WHENEVER POSSIBLE. THE CROSSING SHALL BE CENTERED BETWEEN JOINTS OF THE WASTEWATER MAIN OR LATERAL. THE WASTEWATER PIPE SHALL HAVE A MINIMUM PRESSURE RATING OF AT LEAST 150 psi, THE WASTEWATER MAIN OR LATERAL SHALL EMBEDDED IN CEMENT STABILIZED SAND FOR THE TOTAL LENGTH OF ONE PIPE SEGMENT PLUS 12 INCHES BEYOND THE JOINT ON EACH END.
6. IF CLEARANCE IS BETWEEN 2 TO 9-FEET
   A.) CENTER A MINIMUM 18-FOOT JOINT OF 150 PSI LINED DUCTILE IRON OR PVC PIPE AT WATER LINE.
   B.) CEMENT STABILIZED SAND SHALL HAVE A MINIMUM OF 10% CEMENT PER CUBIC YARD OF CEMENT STABILIZED SAND MIXTURE, BASED ON LOOSE DRY WEIGHT VOLUME SAT LEAST 2.5 BAGS OF CEMENT PER CUBIC YARD OF MIXTURE). THE CEMENT STABILIZED SAND BEDDING SHALL BE A MINIMUM OF SIX INCHES ABOVE AND FOUR INCHES BELOW THE WASTEWATER MAIN OR LATERAL. THE USE OF BROWN COLORING IN CEMENT STABILIZED SAND FOR WASTEWATER MAIN OR LATERAL BEDDING IS RECOMMENDED FOR THE IDENTIFICATION OF PRESSURE RATED WASTEWATER MAINS DURING FUTURE CONSTRUCTION.



TYPICAL DOUBLE SERVICE CONNECTION

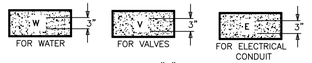
NOT TO SCALE

NOTE:
1. USE 3/4" PEX PIPE FOR SINGLE SERVICE CONNECTION.
2. USE SERVICE CLAMP OR FACTORY THREADED COUPLING FOR 1" SERVICE CONNECTIONS.
3. SERVICES SHALL BE INSTALLED ACCORDING TO STANDARD PIPE BEDDING DETAIL.
4. APPROVED MATERIAL: REHAU MUNICIPEX WATER SERVICE LINE OR EQUAL.



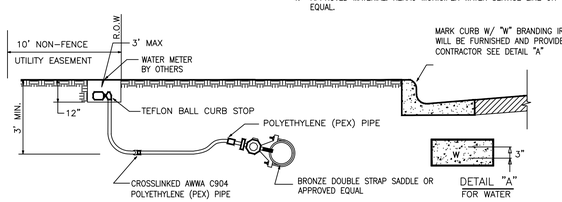
TYPICAL LONG SERVICE

NOT TO SCALE



DETAIL "A"

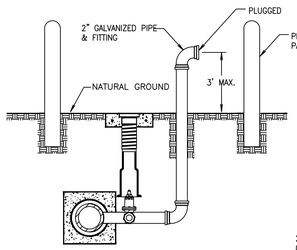
NOTE:
1. USE 3/4" PEX PIPE FOR SINGLE SERVICE CONNECTION.
2. USE SERVICE CLAMP OR FACTORY THREADED COUPLING FOR 1" SERVICE CONNECTIONS.
3. SERVICES SHALL BE INSTALLED ACCORDING TO STANDARD PIPE BEDDING DETAIL.
4. APPROVED MATERIAL: REHAU MUNICIPEX WATER SERVICE LINE OR EQUAL.



TYPICAL SHORT SERVICE

NOT TO SCALE

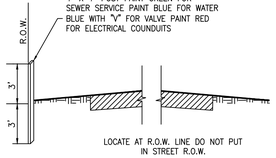
NOTE:
1. USE 3/4" PEX PIPE FOR SINGLE SERVICE CONNECTION.
2. USE SERVICE CLAMP OR FACTORY THREADED COUPLING FOR 1" SERVICE CONNECTIONS.
3. SERVICES SHALL BE INSTALLED ACCORDING TO STANDARD PIPE BEDDING DETAIL.
4. APPROVED MATERIAL: REHAU MUNICIPEX WATER SERVICE LINE MEETING AWWA C904 SDR9 OR EQUAL.



TEMP: DEAD END BLOWOFF

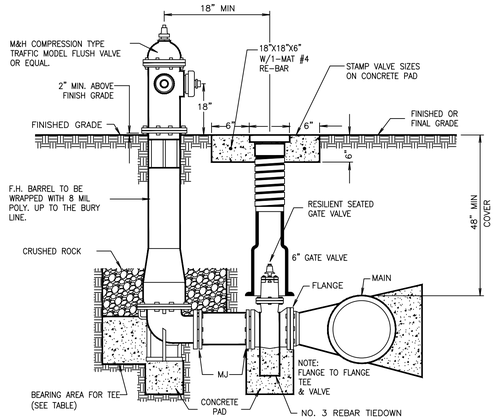
NOT TO SCALE

NOTE
1. A BLOWOFF TAP, AS SHOWN ON THE DETAIL HEREON SHALL BE PROVIDED AT ALL DEAD ENDS FOR RELEASING TRAPPED AIR TO AID IN FLUSHING, AND FOR SAMPLING FOR TESTING.
2. CONCRETE THRUST BLOCKS SHALL BE REQUIRED AT PLUGS, AS WELL AS AT ALL OTHER LOCATIONS AS NOTED HEREON.



SERVICE MARKING FOR NO CURB

NOT TO SCALE

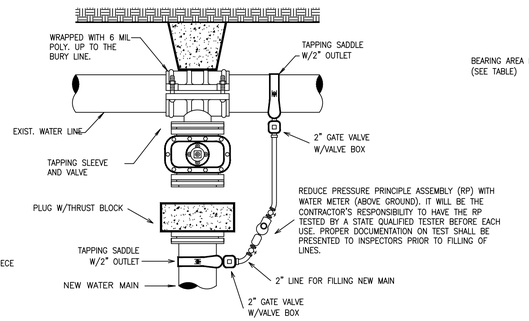


FIRE HYDRANT

NOT TO SCALE

VALVE & BOX

NOT TO SCALE



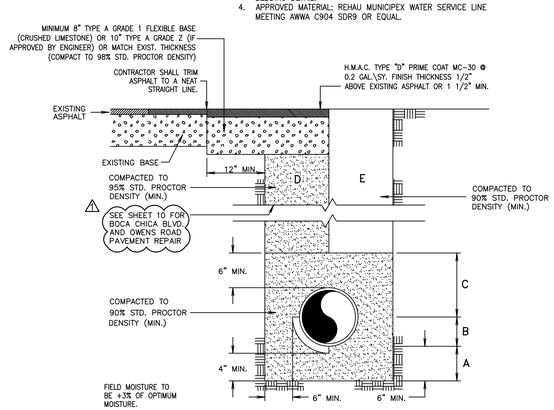
METHOD FOR FILLING AND FLUSHING NEW WATER LINES

NOT TO SCALE

NOTE:

WATER USAGE FOR ALL INITIAL TESTING WILL NOT BE BILLED TO THE CONTRACTOR. ANY RE-TESTING NEEDED WILL BE THE RESPONSIBILITY OF THE CONTRACTOR INCLUDING PAYMENT OF ADDITIONAL WATER NEEDED. CONTRACTOR WILL BE ALLOWED TO FLUSH THE WATERLINE INITIALLY FOR A MAXIMUM OF 12-24 HRS. OR AS DETERMINED BY THE ENGINEER. IF FLUSHING IS DETERMINED TO BE LONGER, THE ENGINEER WILL BE REQUIRED TO SUPPLY THE PROPER DOCUMENTATION AND CALCULATIONS TO SUPPORT SUCH FINDINGS.

AMOUNT OF FLOW TO BE USED FOR FLUSHING WILL BE MONITORED AND REGULATED BY THE BPUB INSPECTORS. CONTRACTOR WILL NOT BE ALLOWED TO TIE-IN TO EXISTING WATER LINE UNTIL ALL TEST ON NEW LINES HAVE BEEN COMPLETED AND APPROVED.



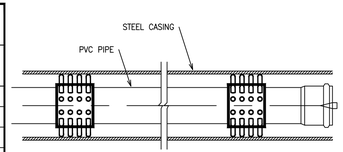
TYPICAL PIPE BEDDING AND TRENCH BACKFILL DETAIL

NOT TO SCALE

STEEL CASING WALL THICKNESS CHART	
MINIMUM THICKNESS	DIAMETER OF CASING PIPE
1/4"	12" OR LESS
5/16"	OVER 12"-18"
3/8"	OVER 18"-22"
7/16"	OVER 22"-28"
1/2"	OVER 28"-34"
9/16"	OVER 34"-42"
5/8"	OVER 42"-48"

OVER 48" MUST BE APPROVED BY B.P.U.B.

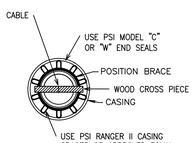
NOTE: THIS CHART IS ONLY FOR SMOOTH STEEL CASING PIPES WITH MINIMUM YIELD STRENGTH OF 35,000 PSI

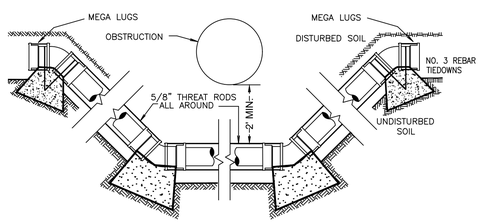


PVC PIPE CASING & SKIDS

NOT TO SCALE

NOMINAL PIPE SIZE	CASING SIZE	NO. OF SKIDS
6"	12"	4
8"	16"	4
12"	20"	4
16"	24"	5





ADJUSTMENTS

NOT TO SCALE

SPECIAL CONDITION LINE ADJUSTMENTS 5/8" GALV. ALL THREAT RODS WITH EYELET BOLTS FOR ASSEMBLY WITH THRUST BLOCKS.

A BANK RUN SAND BEDDING PLACED BEFORE PIPE IS LAID UP TO FLOW LINE OF PIPE (MIN. THICKNESS = 6").

B BANK RUN SAND BACKFILL PLACED AFTER PIPE IS LAID FROM BOTTOM OF PIPE TO SPRING LINE OF PIPE (4" LIFTS, HAND TAMPED).

C BANK RUN SAND BACKFILL PLACED FROM SPRING LINE OF PIPE TO 6" ABOVE TOP OF PIPE (6" LIFTS, HAND TAMPED).

D BANK RUN SAND BACKFILL, CLASS "A" (6" LIFTS, MECHANICAL COMPACTION).

E EARTH BACKFILL, CLASS "B" (12" LIFTS, MECHANICAL COMPACTION).

FOUNDATION PREPARATION (WELLPOINTS, GRAVEL OR CEMENT STABILIZATION, OR APPROVED SUBSTITUTE) SHALL BE REQUIRED WHEN TRENCH BOTTOM IS UNSTABLE.)

BACKFILLING AT STRUCTURES SHALL BE PLACED IN UNIFORM LAYERS, MOISTENED AS REQUIRED TO APPROXIMATE OPTIMUM MOISTURE CONTENT, AND COMPACTED TO 95% STD. PROCTOR DENSITY. THE THICKNESS OF EACH LOOSE LAYER SHALL NOT EXCEED 6". STRUCTURE BACKFILL MATERIAL SHALL BE BANK RUN SAND, APPROVED SITE SOIL, OR OTHER APPROVED SUBSTITUTE.

Revision No.	Date	Description
1	8/8/2022	ADDENDUM 1- ADDED NOTE

STATE OF TEXAS
JOHN W. CLINT
85117
LICENSED PROFESSIONAL ENGINEER
8/8/22

Project No.:	43503.001
Issued:	5/16/2022
Drawn By:	RJA
Checked By:	JWC
Scale:	AS NOTED

Sheet Title

WATER DETAILS

9

Sheet Number

STANDARD DETAILS REVISED: APRIL 2020

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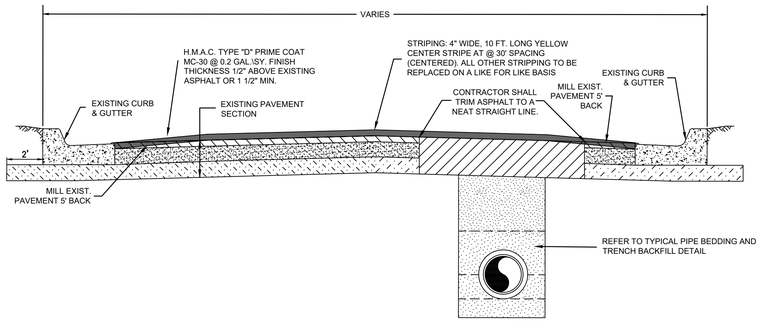


NOTES 1

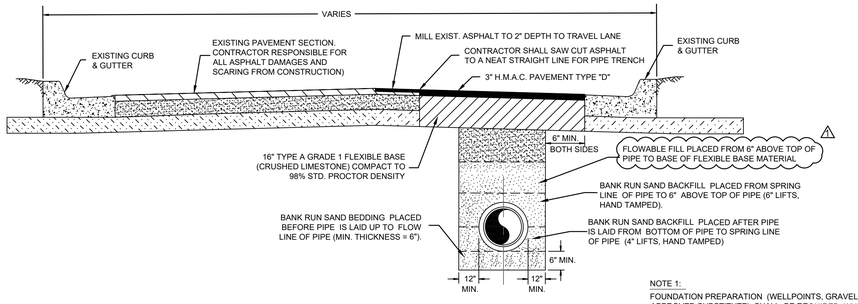
FOUNDATION PREPARATION (WELLPOINTS, GRAVEL OR CEMENT STABILIZATION, OR APPROVED SUBSTITUTE) SHALL BE REQUIRED WHEN TRENCH BOTTOM IS UNSTABLE AS DETERMINED BY THE ENGINEER OR OWNER'S REPRESENTATIVE.

NOTES 2

ALL EXISTING STRIPING TO BE REPLACED ON A LIKE FOR LIKE BASIS FOLLOWING TXDOT SPECIFICATIONS

OWENS ROAD PAVEMENT REPAIR

NOT TO SCALE



BOCA CHICA BLVD PAVEMENT REPAIR

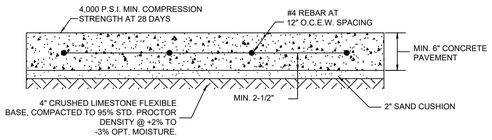
NOT TO SCALE

NOTE 1:

FOUNDATION PREPARATION (WELLPOINTS, GRAVEL OR CEMENT STABILIZATION, OR APPROVED SUBSTITUTE) SHALL BE REQUIRED WHEN TRENCH BOTTOM IS UNSTABLE AS DETERMINED BY THE ENGINEER OR OWNER'S REPRESENTATIVE.

NOTE 2:

ALL EXISTING STRIPING TO BE REPLACED ON A LIKE FOR LIKE BASIS FOLLOWING TXDOT SPECIFICATIONS



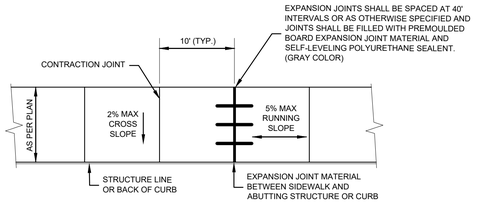
NOTES:

1. CONTRACTION JOINTS SHALL BE CONSTRUCTED EVERY 10' EACH DIRECTION WITH ISOLATION (EXPANSION) JOINTS EVERY 40', EXCEPT WHERE NOTED ON ENTRANCE DETAILS.

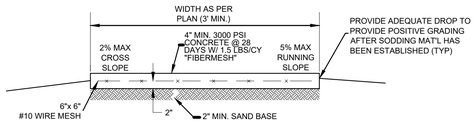
2. THE ABOVE CONCRETE PAVEMENT SECTION IS CONSIDERED THE MINIMUM STANDARD FOR CONCRETE PAVEMENT SECTIONS WITHIN NEW RESIDENTIAL AND COLLECTOR STREET CONSTRUCTION. THIS PAVEMENT SECTION IS NOT CONSIDERED FOR BUS PADS. THE DEVELOPER SHALL PROVIDE A DESIGNED CONCRETE PAVEMENT SECTION, PREPARED BY A CITY APPROVED GEOTECHNICAL ENGINEER LICENSED IN THE STATE OF TEXAS, FOR THE CITY OF BROWNSVILLE'S REVIEW.

CONCRETE DRIVEWAY/ VALLEY GUTTER SECTION

N.T.S.



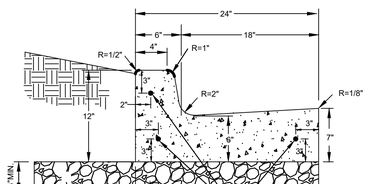
PLAN VIEW



CROSS SECTION

CONCRETE SIDEWALK DETAIL

N.T.S.



NOTES:

1. CONCRETE SHALL BE CLASS "A" WITH A 3,000 PSI MINIMUM COMPRESSIVE STRENGTH AT 28 DAYS WITH 1.5 LBS/CY "FIBERMESH".

2. CURBS SHALL BE BACKFILLED IMMEDIATELY AFTER REMOVAL OF FORMS TO PREVENT TILTING.

3. 1" DEEP CONTRACTION JOINTS @ 10 O.C. MAX.

4. EXPANSION JOINTS WILL BE PLACED AT CURB RETURNS, INLETS, AND END OF EACH POUR WITH INTERVALS NOT TO EXCEED 40 LF.

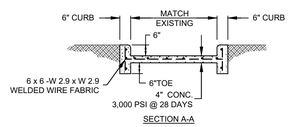
5. JOINTS WILL CONSIST OF BOARD EXPANSION JOINT MATERIAL AND SELF LEVELING POLYURETHANE SEALANT (GRAY COLOR) WITH 3-36" #5 SMOOTH DOWELS, ONE END GREASED AND WRAPPED.

6. CARE MUST BE TAKEN THAT THE DOWELS ARE STRAIGHT AND LAID PARALLEL WITH CURB AND NO CONCRETE "PLUGS" OR OTHER MATERIAL BE ALLOWED THROUGH THE DOWEL HOLES OR EXPANSION MATERIAL THAT WOULD PREVENT JOINT FROM OPERATING AS AN EXPANSION JOINT

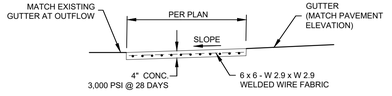
7. PROOF ROLL EXIST. SUBGRADE. ANY UNSTABLE SUBGRADE SHALL BE REMOVED AND REPLACED WITH FLEXIBLE BASE OR APPROVED SALVAGE MATERIAL.

TYPICAL CURB AND GUTTER SECTION

N.T.S.



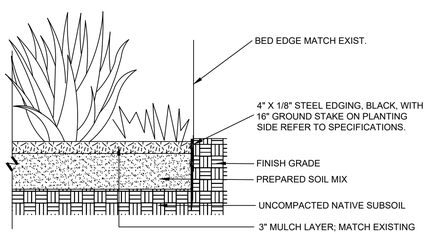
SECTION A-A



SECTION B-B

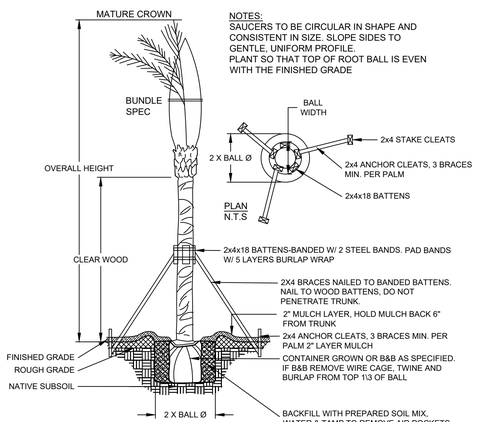
CONCRETE FLUME & SIDEWALK FLUME DETAIL

NTS



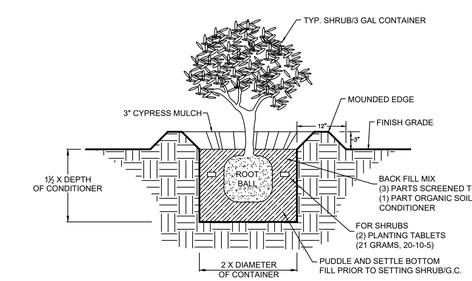
TYPICAL STEEL EDGING

N.T.S



PALM TREE PLANTING WITH BRACES

N.T.S.



SHRUB/G.C. PLANTING DETAIL

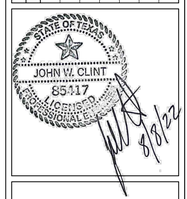
NOT TO SCALE

BOCA CHICA WATERLINE UPGRADE (INTERNATIONAL BLVD. TO OWENS ROAD)

BROWNSVILLE, TEXAS

HALFF
1170 PARKSTONE LOOP, SUITE B
BROWNSVILLE, TEXAS 78526
TEL (956) 303-7100
TBPELS ENGINEERING FIRM #312

Revision No.	Date	Description
1	8/8/2022	ADDENDUM 1- BACKFILL CHANGE



Project No.:	43503.001
Issued:	5/16/2022
Drawn By:	RJA
Checked By:	JWC
Scale:	AS NOTED

Sheet Title

PAVING AND LANDSCAPING DETAILS

10

Sheet Number

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August 8, 2022, 10:00 AM

Section 31 23 23.33 – FLOWABLE FILL

PART 1 – GENERAL

1.1 SUMMARY

A. Section includes requirements for furnishing, mixing, transporting and placing flowable fill.

1.2 MEASUREMENT AND PAYMENT

A. Measurement and payment is as noted on the Unit Price Schedule.

B. Refer to Section 01270 – Measurement and Payment for unit price procedures.

1.3 REFERENCES

A. ASTM C 31 – Making and Curing Concrete Test Specimens in the Field.

B. ASTM C 39 – Compressive Strength of Cylindrical Concrete Specimens.

C. ASTM C 40 – Organic Impurities in Fine Aggregates for Concrete.

D. ASTM C 94 – Ready-Mixed Concrete.

E. ASTM C 150 – Portland Cement.

F. ASTM C 192 – Making and Curing Concrete Test Specimens in the Laboratory.

G. ASTM C 260 – Air-Entraining Admixtures for Concrete.

H. ASTM C 494 – Chemical Admixtures for Concrete.

I. ASTM C 618 – Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Concrete.

J. ASTM D 4318 – Liquid Limit, Plastic Limit and Plasticity Index of Soils.

1.4 SUBMITTALS

A. Refer to Section 01330 – Submittal Procedures.

B. Submit proposed mix design.

C. Submit a copy of delivery tickets accompanied by batch tickets, providing the information required by ASTM C 94 to Engineer in the field at time of delivery.

D. Submit underwater placement plan, if required.

PART 2 – PRODUCTS

2.1 MATERIALS

A. Provide material conforming to:

1. Cement – ASTM C 150, Type I.

2. Fly Ash – ASTM C 618, Class C, with a minimum CaO content of 20 percent.

3. Water – ASTM C 94.

4. Fine Aggregate – Natural or manufactured fine aggregate, or a combination thereof, free from deleterious amounts of salt, alkali, vegetable matter or other objectionable material. The plasticity index shall be 4 or less when tested in accordance with ASTM D 4318. Organic impurities, when tested in accordance with ASTM C 40, shall not show a color darker than the standard color. It is intended that the fine aggregate be fine enough to stay in suspension in the mortar to the extent required for proper flow. The fine aggregate shall conform to the following gradation:

Sieve Size	Percent Passing
3/8 inch	100
No. 200	0-10

If flowable mixture cannot be produced, the fine aggregate may not be approved.

5. Admixtures – ASTM C 260 and/or C 494.

2.2 MIX DESIGN

A. Mix designs shall state the following information:

1. Mix design number or code designation to order the concrete from the Supplier.

2. Design strength at 7 days (unless otherwise noted on the plans).

3. Cement type and brand.

4. Fly ash type and brand.

5. Admixtures type and brand.

6. Proportions of each material used.

B. Minimum strength requirement is 100 psi in 7 days unless otherwise

noted on the Plans.

PART 3 – EXECUTION

3.1 BATCHING, MIXING AND TRANSPORTATION

A. Batch, mix and transport flowable fill in accordance with ASTM C 94, except when directed otherwise by the Engineer.

B. Mix flowable fill in quantities required for immediate use. Do not use portions which have developed initial set or which are not in place within 90 minutes after the initial water has been added.

C. Do not mix flowable fill while the air temperature is at or below 35 degrees F. without prior approval of the Engineer.

3.2 PLACEMENT

A. Seal off the area to be repaired.

B. Monitor and control the fluid pressure during placement of flowable fill prior to set. Take appropriate measures to avoid excessive pressures that may damage or displace structures or cause flotation. Cease operations if flowable fill is observed leaking from the repair area. Repair or replace damaged or displaced structures at no cost to the District.

C. Do not place flowable fill under water without authorization from the Engineer.

3.3 TESTING AND INSPECTION

A. Refer to Section 01457 – Construction Tests and Inspection.

3.4 CLEAN UP

A. Clean up excess flowable fill discharged from the work area and remove excess flowable fill from pipes at no cost to the District.

B. Refer to Section 02120 – Material Disposal.

END OF SECTION