



**GARLAND**

TEXAS MADE HERE

# WATER DEPARTMENT ISSUED FOR BIDDING PLANS FOR

## WYNN JOYCE ROAD 24" WATER LINE

WYNN JOYCE RD. (BETWEEN INTERSECTIONS WITH S. COUNTRY CLUB ROAD)

PROJECT No. WA26-2021

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CITY OF GARLAND STANDARD CONSTRUCTION DETAILS AND SPECIFICATIONS SHALL GOVERN THIS PROJECT.

THE STANDARD DETAIL SHEETS SPECIFICALLY IDENTIFIED ABOVE HAVE BEEN SELECTED BY ME OR UNDER MY DIRECT RESPONSIBLE SUPERVISION AS BEING APPLICABLE TO THIS PROJECT.

DAVID HAWKINS, P.E., 10.08.2021.  
DATE

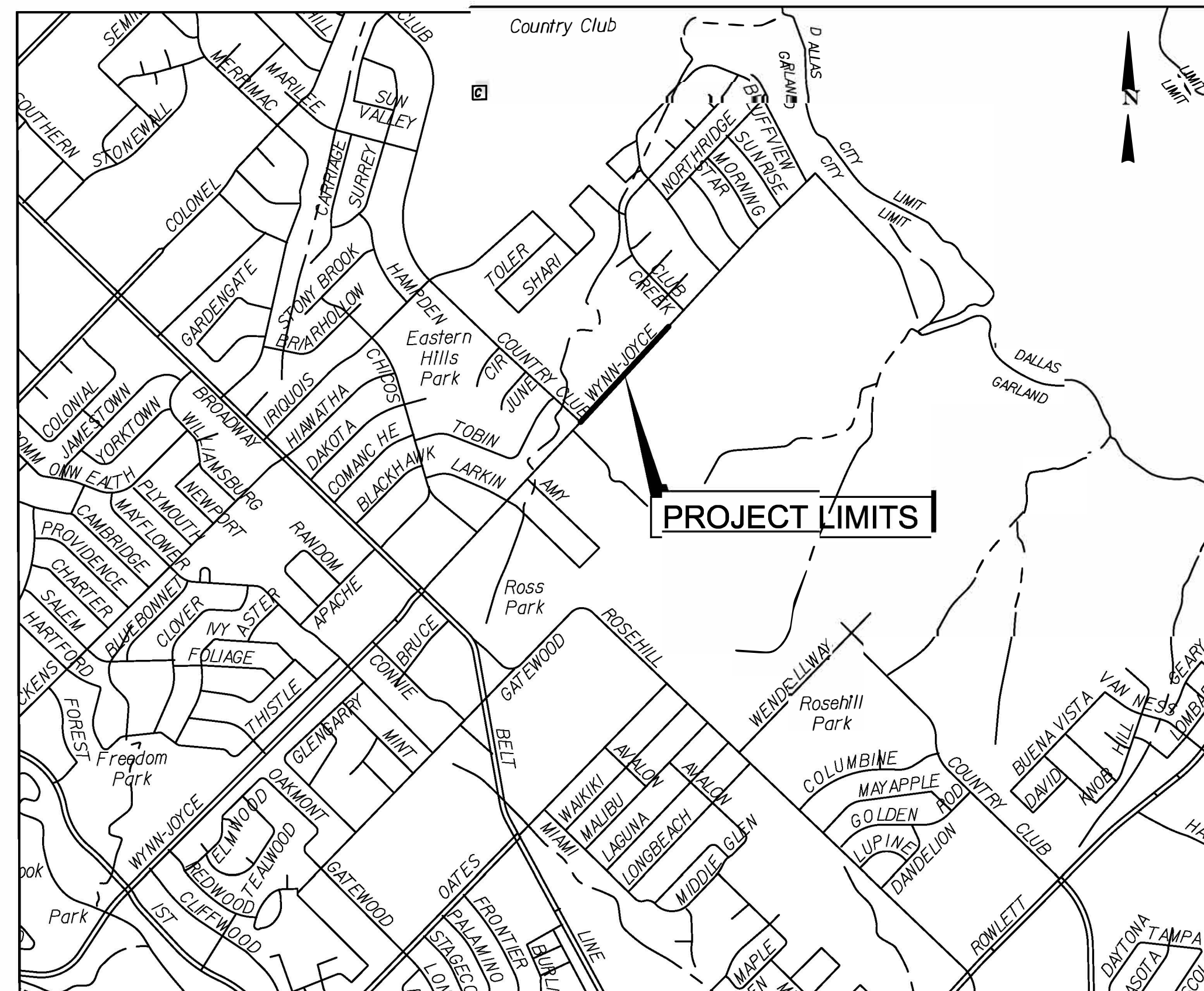


10.12.2021

PREPARED BY:

# CRiado

4100 SPRING VALLEY RD., SUITE 1001  
DALLAS, TX 75244  
Tel 972.392.9092  
Firm No. F-4373



WYNN JOYCE ROAD  
LOCATION MAP  
N.T.S.

OCTOBER 2021

RELEASED FOR CONSTRUCTION  
CITY OF GARLAND  
WATER / WASTEWATER  
DEPARTMENT  
MAMUN YUSUF, P.E.  
10/12/21

OWNER:

CITY OF GARLAND  
WATER DEPARTMENT  
2343 FOREST LN.  
GARLAND, TEXAS 75042

WYNN JOYCE ROAD 24" WATER LINE-WA26-2021

GENERAL NOTES - ALL DEVELOPMENT

CONTRACTOR IS RESPONSIBLE FOR NOTIFYING THE ENGINEERING DEPARTMENT FOR FINAL INSPECTION PRIOR TO FINAL ACCEPTANCE. COPIES OF CONTRACTS ON APPROVED FORMS AND BONDS MUST BE SUBMITTED TO THE ENGINEERING DEPARTMENT.

- 1. All construction shall be done in accordance with the adopted Standard Specifications for Public Works Construction in North Central Texas (Third Edition, unless otherwise specified) 'Specifications' by North Central Texas Council of Governments, P.O. Tower CCG, Arlington, Texas, 76009-3988, (817) 461-3300, as amended by the City of Garland. A copy of this book may be obtained from the North Central Texas Council of Governments at the address or phone number above, or is on file in the office of the Purchasing Agent of the City of Garland, located at City Hall, Garland, Texas. A copy of City Amendments is available in the Engineering Department, located at 800 Main Street, third floor, Garland, Texas.
2. The Engineering Department is to be NOTIFIED 24 HOURS PRIOR TO ANY CONSTRUCTION.
3. WORK WILL NOT BE ACCEPTED WITHOUT A PERMIT AND CITY INSPECTION OF WORK. Contact Engineering Department (972-205-3622) for right-of-way permit and for work in city right-of-way or easement. Contact Building Inspection (972-205-2300) for sidewalk and driveway permits.
4. Four-foot (4') wide sidewalks are required in single family residential zoning districts unless waived by Planning Commission. All other zoning districts require six-foot (6') sidewalks. All existing sidewalk, driveway approach and curb and gutter abutting a new development or re-development must be in compliance with current City of Garland Engineering Department Standard Details. Existing paving not in compliance shall be repaired or replaced. Connecting to an existing sidewalk to make a wider sidewalk is prohibited; longitudinal butt joints are unacceptable in sidewalk paving.
5. Sidewalk and driveway geometrics shall conform to state and federal accessibility standards.
6. Sidewalk shall be free draining; low spots that pond water are unacceptable.
7. Sidewalks shall drain towards the street curb line. The parkway must be elevated a minimum of one fourth (1/4) of an inch per foot above the top of curb. Consult the most current City of Garland Engineering Department Standard Details for additional information.

GENERAL NOTES

PAGE 1

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Table with project details: Revision Date: 04/19, Scale: N/A, Date: 06/01/05, Design: JMK, Drawn: JMK, Dwg. File: GEN\_001.DWG, Project No.: STANDARD-DETAILS



STANDARD DETAILS

GENERAL NOTES - (CONT.)

- 19. Any undesirable materials within the City Right-of-Way (ROW) and easements shall be excavated, materials removed, and filled with compacted select fill. Undesirable materials to be removed include, but are not limited to, organic material, unstable material, or undocumented fill. All materials removed shall be disposed of according to the Health Dept. and TCEQ regulations. See note 26 for further details regarding select fill.
20. Backfill of Excavations shall be select native material compacted in maximum 8 inch lifts to a minimum of 95 percent of standard proctor density as determined by laboratory testing. This applies to:
a. Utility excavations above the Utility Embedment Material
b. Structural excavations and other Non-Utility excavations
c. In areas of new construction
d. Areas of Utility replacement and/or repair under existing streets and alleys
21. The use of cement stabilized sand or flowable fill for final backfill is restricted primarily to localized or spot repairs of utilities under paving where restoration of paving and traffic is time critical as approved by the Engineering Department.
22. All bores under existing streets or alleys shall be lined with smooth steel carrier pipes unless open cutting of the street/alley is permitted by Engineering. Ends of steel carrier pipe to be sealed with grout.
23. The City will not accept utilities until all pavement over or near same has been constructed.
24. The contractor shall adjust the tops of all manholes, valves, meter boxes, fire hydrants and other utility appurtenances to fit the finished paving and shoulders. There will be no separate pay item for this work and the cost shall be included in the price bid for other items.
25. Barrier free ramps that comply with ADA requirements will be provided at all incoming streets, alleys, and non-residential driveways. No extra pay item.
26. Any fill material within proposed or future R.O.W. or Street Easements shall be Select fill provided, placed, and compacted in accordance with TxDOT current edition of Standard Specifications for Construction and Maintenance of Highways, Streets, and Bridges Item 132. Select fill shall be capable of forming a stable embankment from the required excavation and shall be granular material that is free from vegetation or other objectionable material and shall meet the requirements of TxDOT Item 132.2 Type A. The existing subgrade shall provide a stable working platform when the soil is compacted to a density of 95% of standard proctor of optimum moisture content according to ASTM D698. The cost shall be included in the price bid for excavation.
27. Traffic routing, signal removal and placement, and all other traffic matters shall be coordinated with the Transportation Department (972-205-2430) with 48 hours notice. Contractor is responsible for all temporary traffic signal, traffic control and school signal work during construction.
28. All traffic signal and street light base locations to be field approved prior to installation.
29. The contractor shall be required to provide and maintain all necessary warning and safety devices to protect the public safety and health until all work has been completed and accepted.
30. The location of existing utilities shown on these plans are approximate unless specifically noted. It is the responsibility of the contractor to locate and verify on-site any utilities that may conflict with the construction. At least 48 hours prior to beginning construction in the vicinity of existing underground utilities, the contractor shall notify the following as applicable:
• CALL TEXAS811
Contractor to mark area to be located with WHITE MARKER PAINT.
Contractor shall not begin work until all utilities have been located with marks on the ground.
31. Stabilization of disturbed areas prior to final acceptance:
a. Public right-of-way, easements, and common areas must be stabilized with perennial vegetation cover, fully established with 100% coverage, or other approved stabilization method. (See typical paving section - Detail Sheet No. 1)
b. Detention/Retention Facilities, Channels, Drainage Ways and Outfalls shall have established perennial vegetation with 100% coverage.

GENERAL NOTES

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STANDARD DETAILS

GENERAL NOTES - (CONT.)

- 32. Contractor is responsible for maintaining pedestrian access and signage as directed by the City.
33. The contractor shall be responsible for furnishing all laboratory tests necessary for testing new pavement. The testing laboratory used shall be under the management of a professional engineer licensed to practice in the State of Texas.
34. Roadways and alleys (CIP and Development) shall have a geotechnical investigation and subgrade design performed per the Technical Standards Manual (TSM) Section 9. If after the geotechnical investigation, the soil parameters and standard subgrade result in a modulus of subgrade reaction of 300 pci and all other parameters are applicable, the City's standard subgrade and pavement shown on the standard details can be specified. If not, a custom pavement design to achieve a 40-year design life will be required per the TSM.
9. All sewer mains shall be installed with polyethylene plastic tape for identification and protection purpose. Tape for sewer mains shall be green and lettered with 'caution sewer line buried below'. Tape shall be 4.0 mil thick and 6' wide and furnished in 1000 foot rolls. Marking tape shall be placed along the center line of pipe trench on top of normal pipe embedment, and in no case less than 6" above top of pipe. All tape shall be Terra Tape as manufactured by Reef Industries or equal.
GENERAL NOTES - LIGHT POLE BASES
Contractor shall have Engineering Inspector notify Garland Power and Light 48 hours prior to start of construction so that power to circuit may be killed out and light pole removed from base.
Existing street light bases shall be removed and new street light base, 1 1/2" PVC conduit, and new wiring installed to new base prior to removing existing curb and gutter for left turn lane.
New wire installed shall consist of 2 # 6 Cu. insulated conductors and 1 # 6 bare Cu. conductor with minimum of three feet of conductor extending out of top of new street light base or pull box. All existing/new conductor wires which are to be covered by concrete paving shall be placed in conduit in such a manner that the conduit extends a minimum of two feet beyond the edge of proposed concrete or median paving. Splicing of the conductor wires will not be permitted in the conduit, but shall be re-spliced so as to be continuous from street light base to street light base or junction box.
Anchor bolts and ground rods will be furnished by the City and will be picked up by the Engineering Inspector at the City Warehouse at the contractor request.
After installation of wire, Contractor shall notify Garland Power and Light Distribution Department (972-205-3449) to have street light pole re-installed. Garland Power and Light will re-energize circuit.
GENERAL NOTES - WASTEWATER
1. All sewer lines shall be placed in the center of streets, alleys, or easements, unless otherwise noted.
2. All sewer pipe shall be PVC SDR-26. Minimum pipe size shall be 8 inch unless specifically approved.
3. All 4 inch sewer service laterals shall be SDR-26.
4. Install sewer services 10 feet downstream from water service.
5. TV inspection (with pan/tilt cameras) will be the responsibility of the Developer/Contractor, and must be performed by an independent testing company that is regularly employed for such services. A digital copy of the TV inspection shall be made and turned over for review and approval by the Engineering Department and/or Water Utilities Department.
6. All sanitary sewer mains are to be "SDR-26 pressure pipe" at least 5 feet on either side of water mains where crossings occur within a 9 radius.
7. Contractor may use standard precast concrete manholes or cast-in-place manholes.
8. Blocking of sewer lines, deep sewer cut connections, and embedment shall conform to City of Garland standards.

GENERAL NOTES: WASTEWATER LIGHT POLE BASES

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STANDARD DETAILS

GENERAL NOTES - STORM SEWER

- 1. Reinforced concrete pipe only. (min. 21")
2. Storm sewer connections for new intercepting mains and laterals into new trunk mains shall be factory wyes for 48" and smaller pipe.
3. Joint materials permitted are as follows:
Ram-Neck Con-Seal Cement Grout
4. All headwalls shall be poured-in-place.
5. If reinforced box culvert is required, contractor shall provide shop drawings for city approval.
6. Meter boxes to be furnished and installed by developer and/or contractor shall be:
For 5/8" & 3/4" Meters:
• The box shall be 18" diameter & 18" tall, with slots 3" wide & 4" tall.
• The lid shall be 12-5/8" dia., with a lid opening of 11-3/4" dia.
For 1" Meters:
• The box shall be 24" diameter & 18" tall, with slots 3" wide & 4" tall.
• The lid shall be 20" dia., with a lid opening of 18-3/4" dia.
For 1-1/2" & 2" Meters:
• The box shall be 28" diameter & 18" tall, with slots 3" wide & 4" tall.
• The lid shall be 20" dia., with a lid opening of 18-3/4" dia.
Base
• The box shall be constructed from black polyethylene material with crush resistant ribbing.
• Only one slot shall be cut out on opposite end of the box's sides.
• A cast iron ring shall be molded to the top and secured with four (4) coated self-tapping bolts.
• The box shall have a (2") base footing to help eliminate sinking or floating.
• The box shall be constructed to withstand twelve hundred pound (1200 lb) of compression on a vertical crush test.
• Meter box shall be "F" series by DFW Plastics Inc. or approved equal.
Lid
• The lid shall be constructed from a black polyethylene material.
• The lid shall have "Water Meter" molded into the lid.
• The lid shall be textured with a diamond pattern for skid resistance.
• The lid shall sit securely and evenly inside the cast iron ring.
• The lid shall have a spring-loaded brass locking mechanism that uses a standard brass meter box key.
GENERAL NOTES - WATER
1. All water lines to have a minimum cover as follows or as required to clear other utilities:
Up through 8" - 4'
10" - 12" - 5'
Over 12" - 6'
Type K Copper - Services Min. Depth 2'
2. All water lines to be placed 6' from property line, unless otherwise noted.
3. All lines 12" or less in diameter shall be C-900 PVC DR-18.
4. Install services at center of lot or as shown on plans.
5. Services on PVC pipe shall be Mueller Ford, McDonald or Jones bronze double strap tapping saddles with outlet tapped with A.W.W.A. tapered threads. No PVC coated saddles will be allowed.
6. Service must be continuous, one piece copper, from corporation stop to meter without any splices or couplings.
7. "Squeeze Stopping" or "Crimp Stopping" is absolutely prohibited. This practice damages the copper too much and just contributes to future problems. If this practice is employed for some emergency reason, then the copper service must be replaced from corporation stop to meter.

GENERAL NOTES: STORM SEWER WATER

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STANDARD DETAILS

GENERAL NOTES - WATER (CONT.)

- 9. On all valves, use three piece adjustable screw type cast iron valve box covers with PVC C-900 extensions as required. The bell end of the C-900 shall be installed over the valve operating nut. Spigot end will not be allowed over the operating nut. Cast iron valve boxes and covers shall be made in the U.S.A. and conform to A.W.W.A. Permanent scoring of curbs or pavement for valve location, is required prior to final inspection. The arrow scoring is approximately 1/2" deep with a 6" high, three-sided arrow pointing directly at the valve box. The scored arrow marks are then neatly sprayed with Blue paint.
10. Fire hydrant brands acceptable to the City are Mueller Centurian A-423, Waterloo Pacer W857, Kennedy Guardian, Clow Medallion, or Firefo-Model F-06.
11. Bonnet of fire hydrants to be painted as follows:
Size of Main Color
8 inch Flynt Aluminum Paint
8 inch Flynt Tropic Blue Enamel
10 inch or above Flynt Safety Yellow Enamel
12. Fire hydrants must be located no less than 2'-6" nor more than 8'-0" (4'-0" in residential streets) from the back of curb/drive to center of barrel or not in sidewalk location.
13. The center of the fire hydrant pumper nozzle must be no less than 15' nor more than 21' above the top of curb or finished grade.
14. Heavily Chlorinated water (3.5 mg/l or greater free Chlorine) resulting from water line sterilization shall be directed under permit to the sanitary sewer unless otherwise noted. The Contractor shall apply to the Engineering Department for a sanitary sewer discharge permit after the mandatory Chlorine retention time (usually 24 hours). The heavily Chlorinated water may be discharged to the sanitary sewer, beginning two working days after permit application.
15. Upon receipt of an acceptable bacteriological report on new water mains, the contractor shall remove all copper bleeder lines from water mains.
16. All bolts, studs and nuts used in water main fittings, valves and appurtenances shall be stainless steel on flange joints, Corten on MJ joints.
17. All fittings and valves shall be polywrapped with a minimum of 8 ms and shall be made in the U.S.A. and shall conform to A.W.W.A.

GENERAL NOTES: WATER

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STANDARD DETAILS

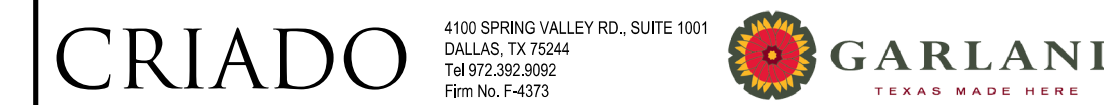
NOTES:

- 1. ON PRIVATE PROPERTY - CROSS-LINKED POLYETHYLENE PLASTIC TUBING (PEX) AS SPECIFIED BY ASTM F876, ASTM F877 & CSA B137.5.
2. TYPICAL CONNECTION TO NEW WATER SERVICE IS 2 FEET FROM EDGE OF STRUCTURE AT EXISTING CONNECTION.
3. BRASS COMPRESSION FITTINGS WITH INTEGRAL METAL GRIP RINGS (GATORBITE OR SHARKBITE FITTINGS) ARE REQUIRED TO BE USED WITH PEX TUBING.
4. PACK JOINT FITTINGS MUST BE SPECIFICALLY FOR COPPER TUBING SIZE (CTS) POLY TUBING AND MUST INCLUDE STAINLESS STEEL INSERT STIFFENERS FOR POLYPIPE OR TUBING.
5. ALL NEW CONNECTIONS SHALL BE INSTALLED SO THAT THERE IS NO ADDED ADDITIONAL STRESS AT THE CONNECTION TO THE EXISTING SERVICES.
6. MUELLER BRONZE SERVICES SADDLES WITH "CC" THREAD ONLY. IRONPIPE (IP) OR NATIONAL PIPE THREAT (NTP) ARE NOT ACCEPTABLE.
7. ALL WORK ON PRIVATE PROPERTY REQUIRES A LICENSED PLUMBER. PERMITS ARE REQUIRED THROUGH BUILDING INSPECTION DEPT. FOR WORK ON THE PRIVATE SITE.
8. ALL NEW WATER SERVICES SHALL HAVE A MINIMUM OF 24" OF COVER ABOVE IT.
9. CLASS 1 EMBEDMENT IS REQUIRED FOR ALL PUBLIC UTILITIES.
10. ACCEPTABLE MECHANICAL COMPACTORS FOR DITCH LINES (VEHICULAR OR NON-VEHICULAR AREAS) MUST BE SUBMITTED TO ENGINEERING DEPARTMENT FOR REVIEW AND ACCEPTANCE. MECHANICAL COMPACTORS INCLUDE VIBRATOR SHEEP FOOT ROLLER, VIBRATOR DRUM ROLLER, ETC.



10.12.2021

Table with columns: REV. NO., DATE, DESCRIPTION, BY. Contains revision entries with symbols.



GENERAL NOTES

WYNN JOYCE ROAD 24" WATER LINE

CITY OF GARLAND, TEXAS

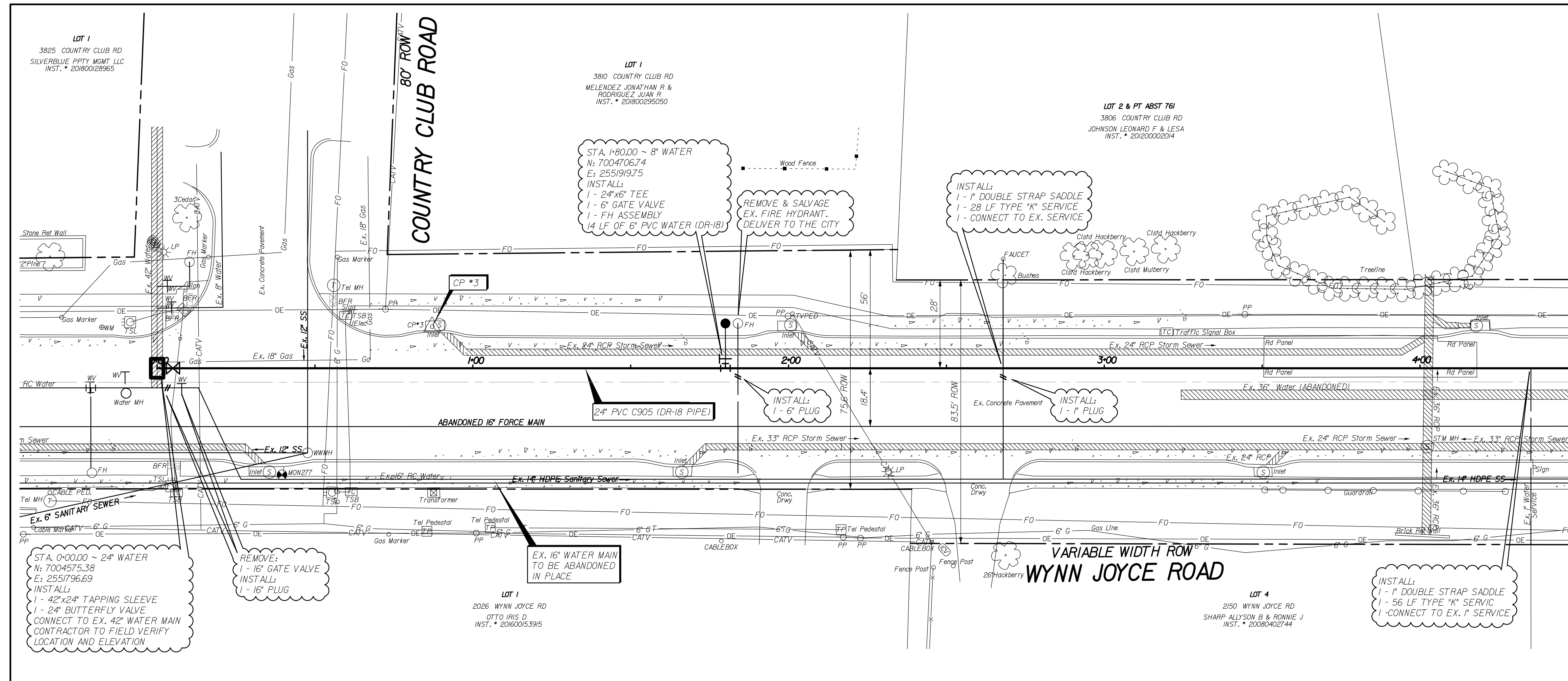
Table with columns: DESIGN, DRAWN, DATE, SCALE, COG PROJECT, SHEET. Values: CRIADO, CRIADO, October 2021, N/A, WA26-2021, 2

Item	Description	Units	General	Wynn Joyce 24-in WTR	Bid Quantity
130.0000	CONC PAVING SAW REMOVE & DISPOSE	SY		2,685	2,685
140.0000	FIRE HYDRANT REMOVE & SALVAGE & TRANSPORT TO CITY	EA		6	6
145.0001	VALVE REMOVE & DISPOSE	EA		4	4
145.0002	GATE VALVE REMOVE & SALVAGE & TRANSPORT TO THE CITY	EA		14	14
201.0000	HYDRATED LIME	TN		25	25
202.3000	SUBGRADE CEMENT TREATED	TN		50	50
205.0800	8" THICK LIME AND CEMENT STABILIZED SUBGRADE	SY		2,685	2,685
265.0400	TOP SOIL 4"	SY		19	19
271.0000	SODDING	SY		19	19
311.0406	SIDEWALK 4" CLASS C	SY		95	95
339.1000	STREET PAVING 10" 4000 PSI	SY		2,685	2,685
380.0000	ACCESS RAMP CURB	EA		1	1
400.0600	WATER 6" DR-18 PVC	LF		118	118
400.2410	WATER 24" AWWA C905 DR-18 PVC	LF		1,374	1,374
405.0000	DUCTILE IRON FITTINGS	TN		1	1
410.0600	GATE VALVE 6"	EA		6	6
414.1600	BUTTERFLY VALVE 16" VERTICAL	EA		1	1
415.2400	BUTTERFLY VALVE 24" HORIZONTAL	EA		3	3
420.1010	WATER SERVICE 1" TYPE "K" REMOVE AND REPLACE	LF		84	84
420.2010	WATER SERVICE 2" TYPE "K" REMOVE AND REPLACE	LF		28	28
450.0000	FIRE HYDRANT STANDARD	EA		6	6
493.0000	CONC BLOCKING 2000 PSI	CY		50	50
496.0000	TRENCH SAFETY	LF		1,492	1,492
702.0010	SPRINKLER SYSTEM REMOVE, REPLACE & REPAIR	HD		10	10
763.2000	PORTABLE ARROW BOARD TEMPORARY	MOS	2		2
797.0000	CAPITAL IMPROVEMENTS SIGN	EA	1		1
798.0000	EROSION CONTROL	LS	1		1
1601.0000	THERMOPLASTIC 8" (CROSSWALK)	LF		40	40
1602.0000	TRAFFIC STOP BAR 24"	LF		12	12
1650.0000	TRAFFIC BUTTONS NRW 4" ROUND	EA		540	540
1656.0000	TRAFFIC BUTTONS NRY 4" ROUND	EA		540	540
1900.0000	SIGN & BARRICADE	LS	1		1
2100.0000	MOBILIZATION	LS	1		1

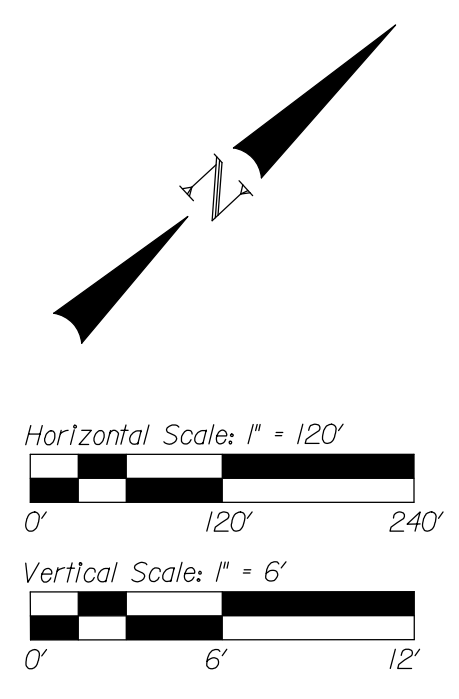


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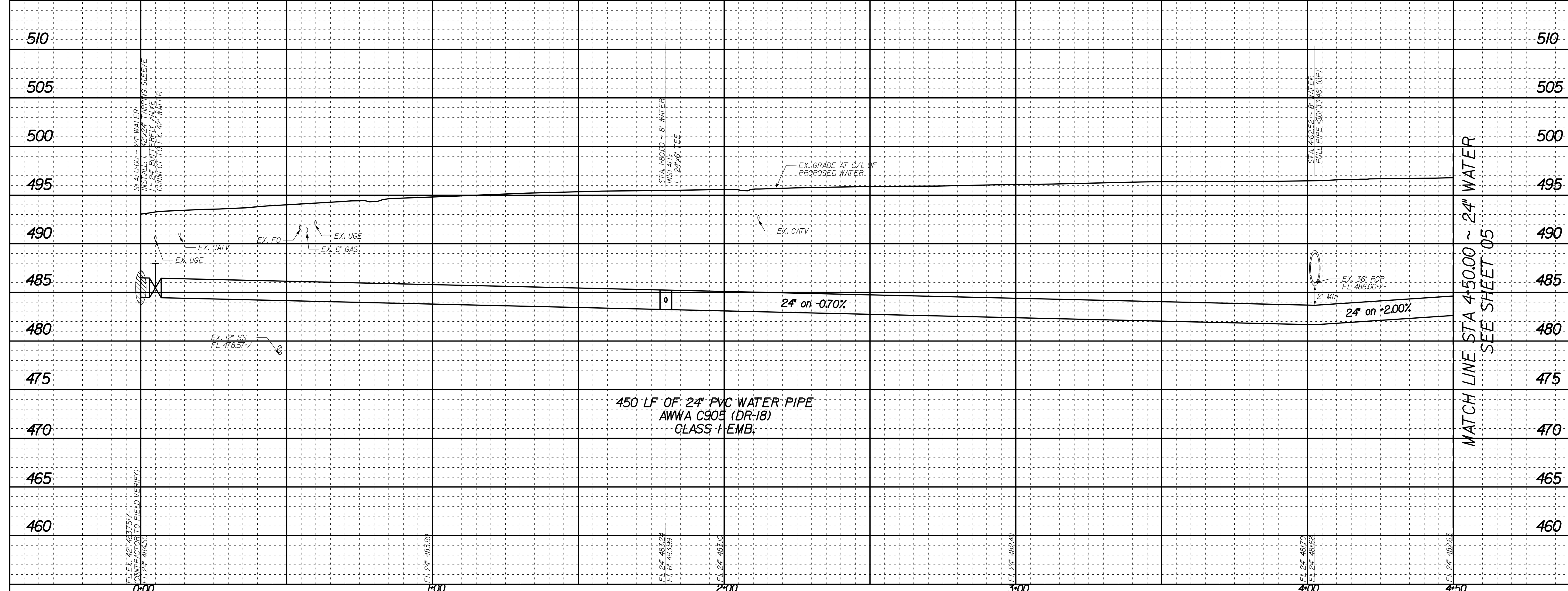
<b>CRIADO</b>		4100 SPRING VALLEY RD., SUITE 1001 DALLAS, TX 75244 TEL: 972.302.9025 FAX: 972.302.9025			
<b>QUANTITY SUMMARY</b>					
WYNN JOYCE ROAD 24" WATER LINE					
CITY OF GARLAND, TEXAS					
DESIGN	DRAWN	DATE	SCALE	COG PROJECT	SHEET
CRIADO	CRIADO	October 2021	N/A	WA26-2021	<b>3</b>



MATCH LINE STA 4+50.00 ~ 24\"/>



THE INFORMATION SHOWN ON THIS PLAN IS FROM RECORD DRAWINGS. THE ENGINEER IS NOT RESPONSIBLE FOR THE ACCURACY OF THE INFORMATION SHOWN ON THIS DRAWING. CONTRACTOR SHALL FIELD VERIFY ALL UTILITIES ON PRIVATE PROPERTY AND IN THE CITY RIGHT-OF-WAY. CONTRACTOR SHALL CONTACT ALL UTILITY COMPANIES 48 HOURS PRIOR TO ANY EXCAVATION. CALL 1-800-DIG TESS/ TEXAS 811



**BENCHMARKS & CONTROL POINTS**

BENCHMARK COG: 277  
2" BRASS CAP FOUND ON CONCRETE INLET @ WYNN JOYCE DR & COUNTRY CLUB RD  
ELEV - 494.274

BENCHMARK COG  
BRASS CAP FOUND ON CONCRETE INLET @ WYNN JOYCE DR & EAST EAST OATS RD  
ELEV - 443.46

Point	Northing	Easting	Elev.	Description
CP-3	7004647.977	2551846.622	464.916	"X" CUT
CP-4	7004969.031	2552212.004	497.904	"X" CUT
CP-5	7005275.344	2552434.925	505.584	"X" CUT
CP-6	7005533.96	2552747.426	513.490	"X" CUT

**REVISIONS**

REV NO.	DATE	DESCRIPTION	BY
1			
2			
3			

**CRIADO** 4100 SPRING VALLEY RD., SUITE 1001 DALLAS, TX 75244 TEL: 972.389.9692 FAX: 972.389.9692

**GARLAND** TEXAS MADE HERE

**24" WATER LINE**  
STA 0+00 TO STA 4+50  
WYNN JOYCE ROAD 24" WATER LINE

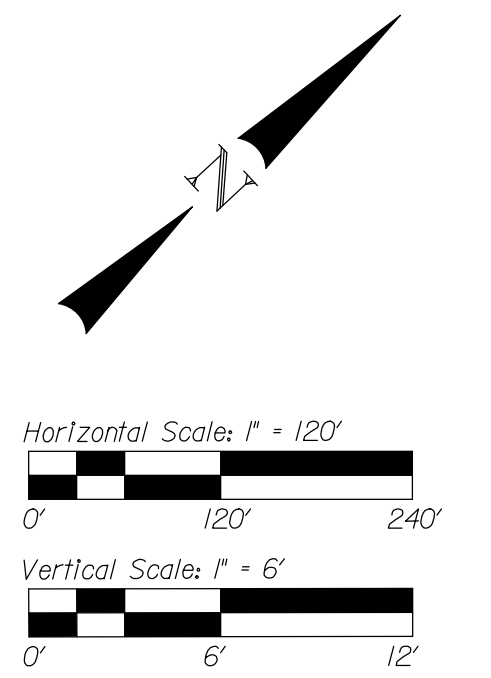
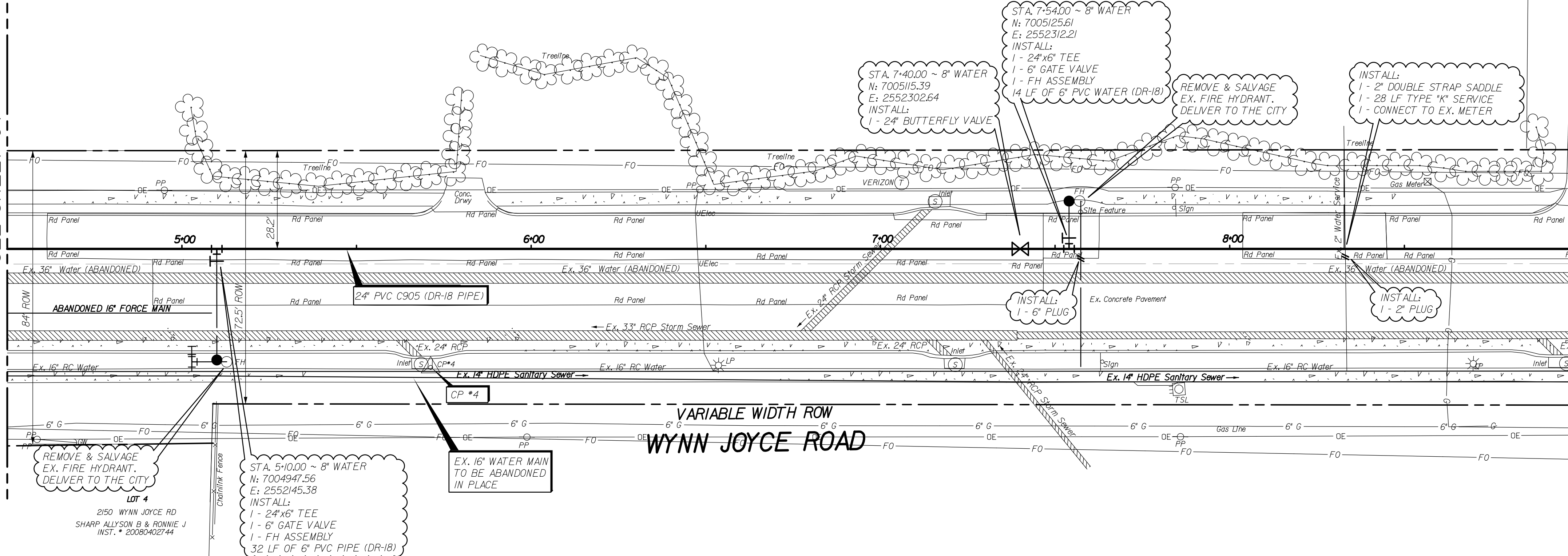
CITY OF GARLAND, TEXAS

DESIGN	DRAWN	DATE	SCALE	COG PROJECT	SHEET
CRIADO	CRIADO	October 2021	1"=20' H 1"=6' V	WA26-2021	04

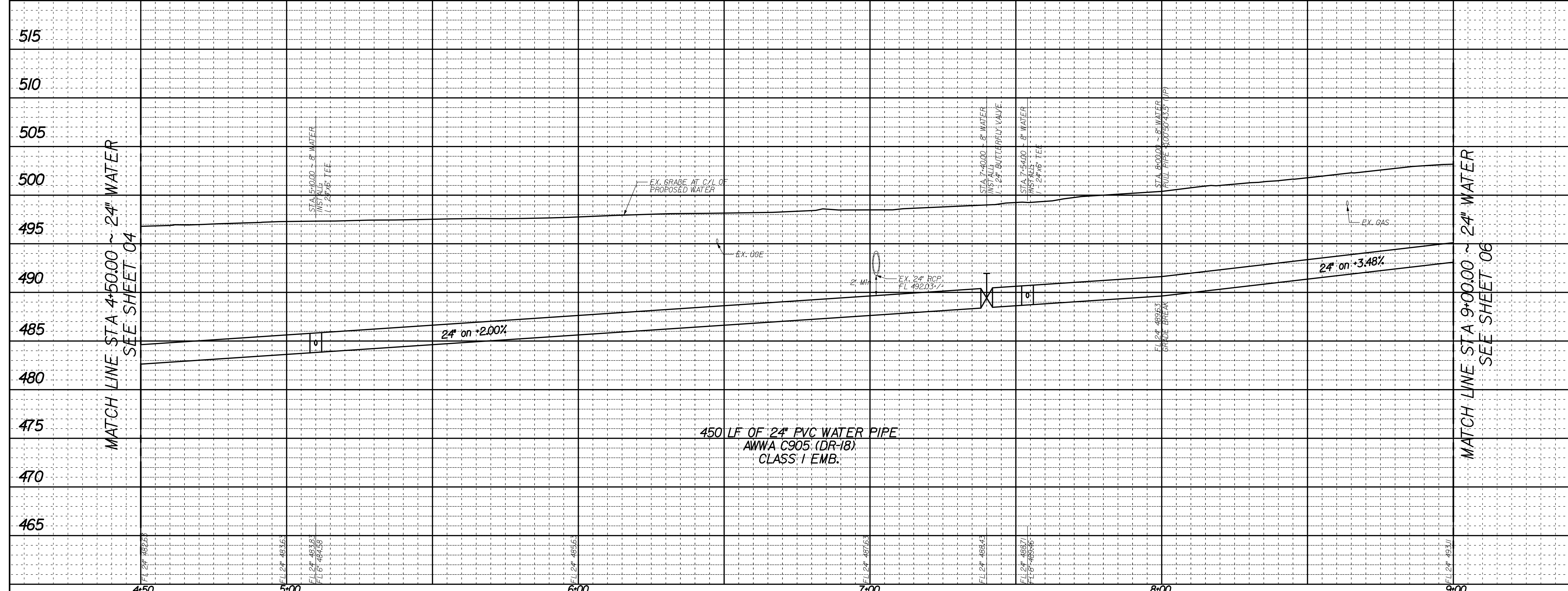
MATCH LINE STA 4+50.00 ~ 24" WATER  
SEE SHEET 04

MATCH LINE STA 4+50.00 ~ 24" WATER  
SEE SHEET 04

MATCH LINE STA 4+50.00 ~ 24" WATER  
SEE SHEET 04



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**BENCHMARKS & CONTROL POINTS**

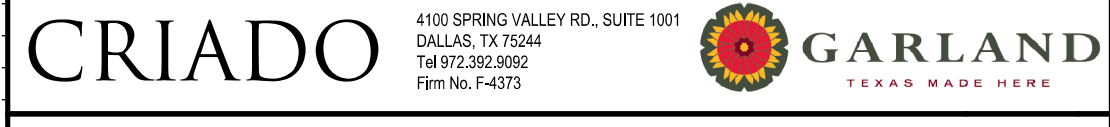
BENCHMARK COG: 277  
2" BRASS CAP FOUND ON CONCRETE INLET @ WYNN JOYCE DR & COUNTRY CLUB RD  
ELEV - 494.274

BENCHMARK COG  
BRASS CAP FOUND ON CONCRETE INLET @ WYNN JOYCE DR & EAST EAST OATS RD  
ELEV - 443.46

Point	Northing	Eastng	Elev.	Description
CP-3	7004647.977	2551846.622	464.916	"X" CUT
CP-4	7004969.031	2552212.004	497.904	"X" CUT
CP-5	7005275.344	2552434.925	505.584	"X" CUT
CP-6	7005533.96	2552747.426	513.490	"X" CUT

**REVISIONS**

REV NO.	DATE	DESCRIPTION	BY
1			
2			
3			



**CRIADO** 4100 SPRING VALLEY RD., SUITE 1001 DALLAS, TX 75244 TEL: 972.382.9062 FAX: 972.382.9063

**GARLAND** TEXAS MADE HERE

**24" WATER LINE**

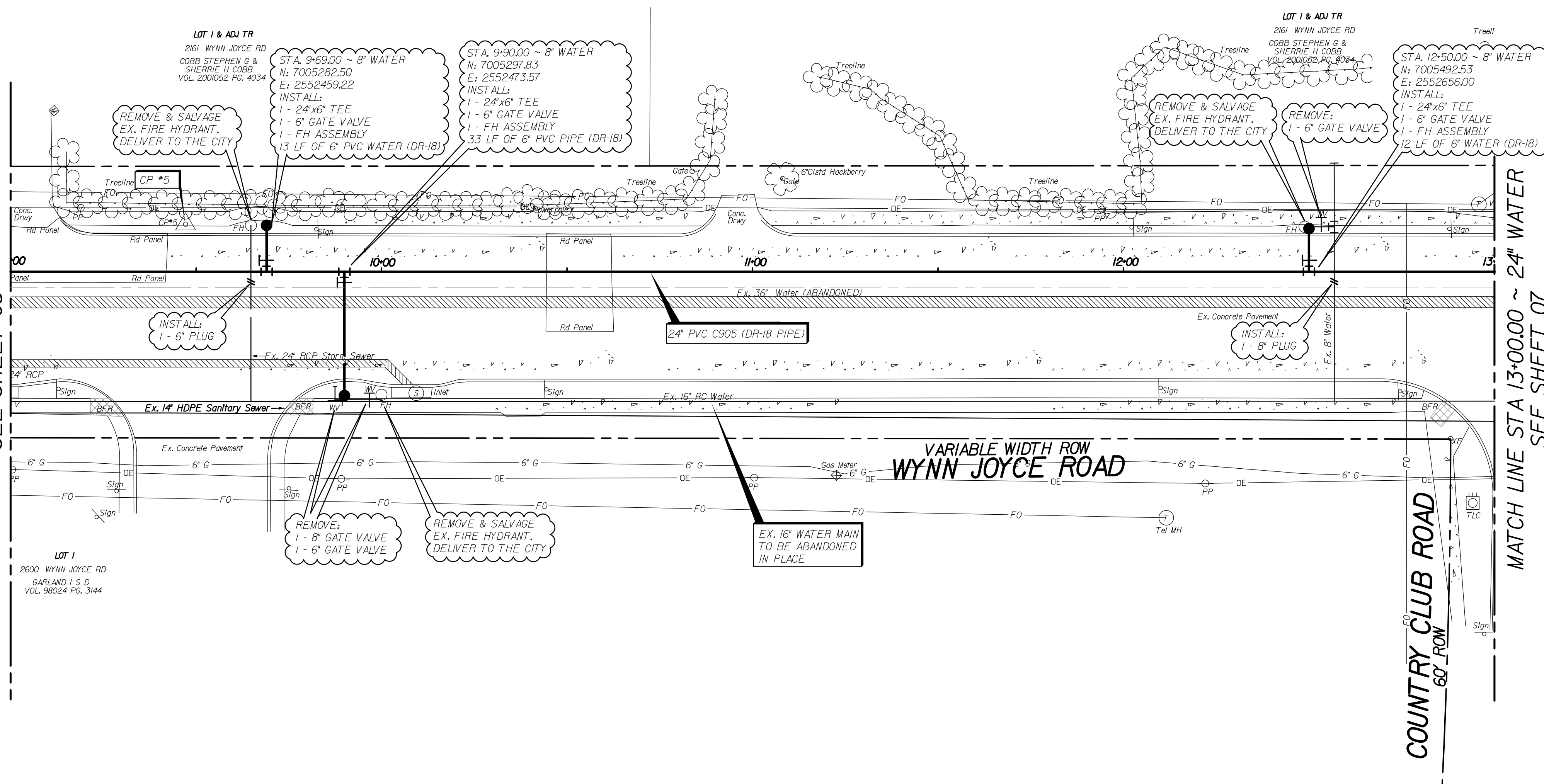
**STA 4+50 TO STA 9+00**

**WYNN JOYCE ROAD 24" WATER LINE**

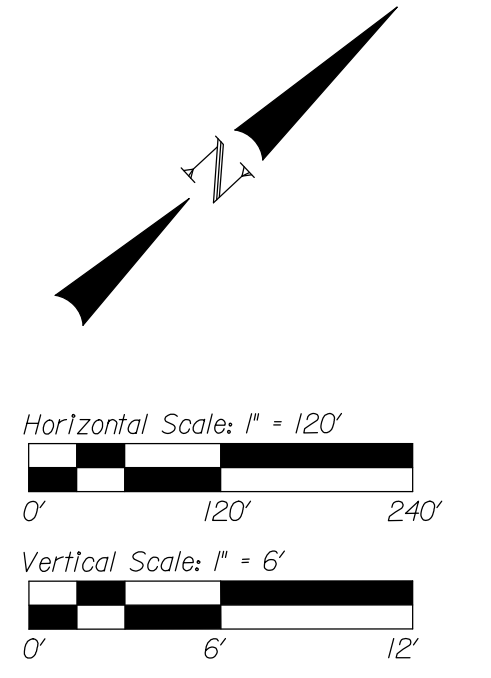
**CITY OF GARLAND, TEXAS**

DESIGN	DRAWN	DATE	SCALE	COG PROJECT	SHEET
CRIADO	CRIADO	October 2021	1"=20' H 1"=8' V	WA26-2021	05

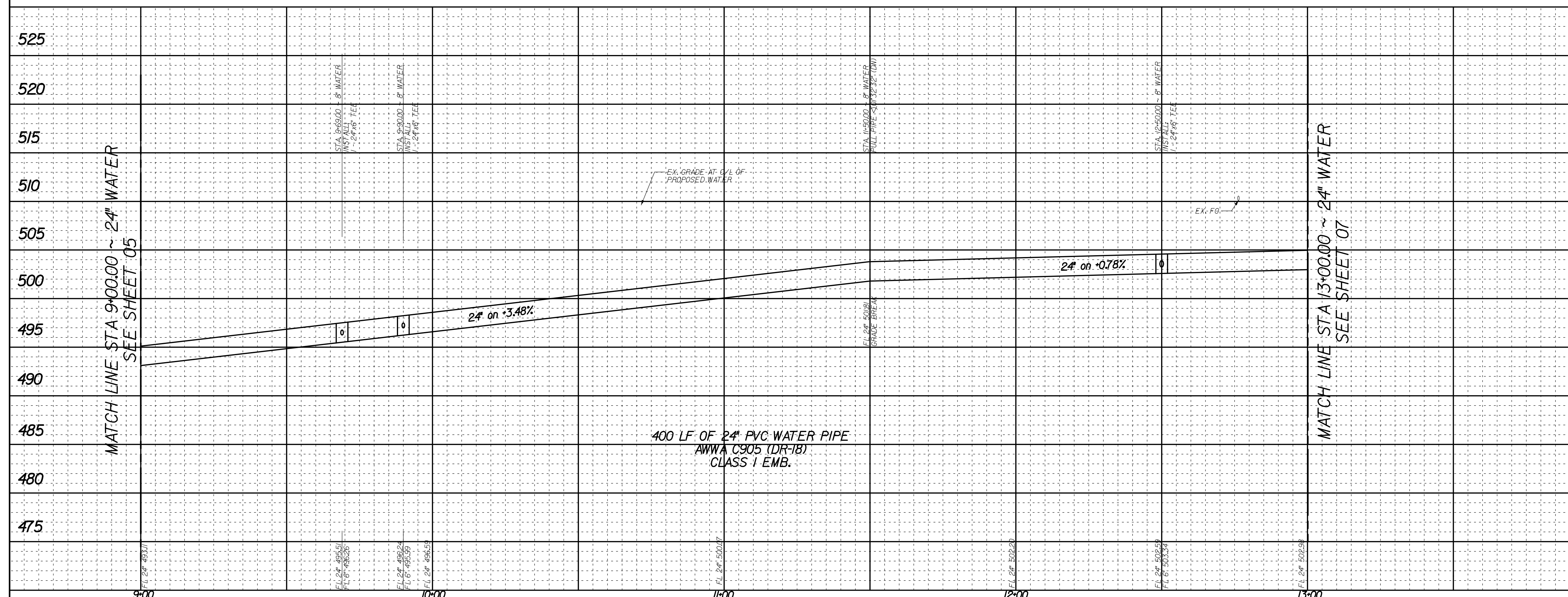
MATCH LINE STA 9+00.00 ~ 24" WATER  
SEE SHEET 05



MATCH LINE STA 13+00.00 ~ 24" WATER  
SEE SHEET 07



THE INFORMATION SHOWN ON THIS PLAN IS FROM RECORD DRAWINGS. THE ENGINEER IS NOT RESPONSIBLE FOR THE ACCURACY OF THE INFORMATION SHOWN ON THIS DRAWING. CONTRACTOR SHALL FIELD VERIFY ALL UTILITIES ON PRIVATE PROPERTY AND IN THE CITY RIGHT-OF-WAY. CONTRACTOR SHALL CONTACT ALL UTILITY COMPANIES 48 HOURS PRIOR TO ANY EXCAVATION. CALL 1-800-DIG TESS/ TEXAS 811



**BENCHMARKS & CONTROL POINTS**

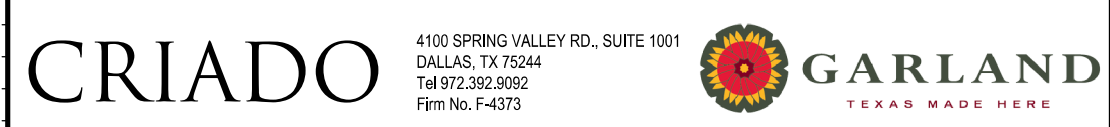
BENCHMARK COG: 277  
2" BRASS CAP FOUND ON CONCRETE INLET @ WYNN JOYCE DR & COUNTRY CLUB RD  
ELEV - 494.274

BENCHMARK COG  
BRASS CAP FOUND ON CONCRETE INLET @ WYNN JOYCE DR & EAST EAST OATS RD  
ELEV - 443.46

Point	Northing	Easting	Elev.	Description
CP-3	7004647.977	2551846.622	464.916	"X" CUT
CP-4	7004969.031	2552212.004	497.904	"X" CUT
CP-5	7005275.344	2552434.925	505.584	"X" CUT
CP-6	7005533.96	2552747.426	513.490	"X" CUT

**REVISIONS**

REV NO.	DATE	DESCRIPTION	BY
1			
2			
3			

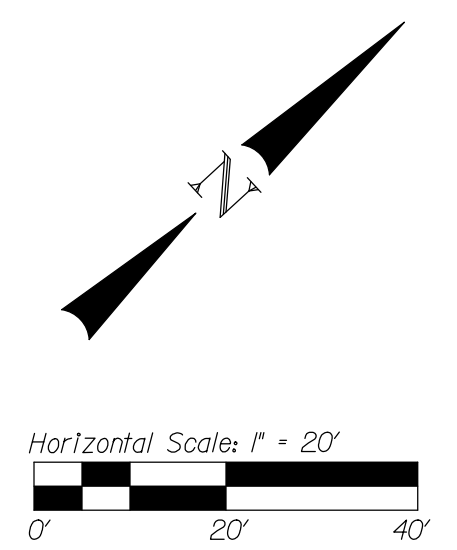
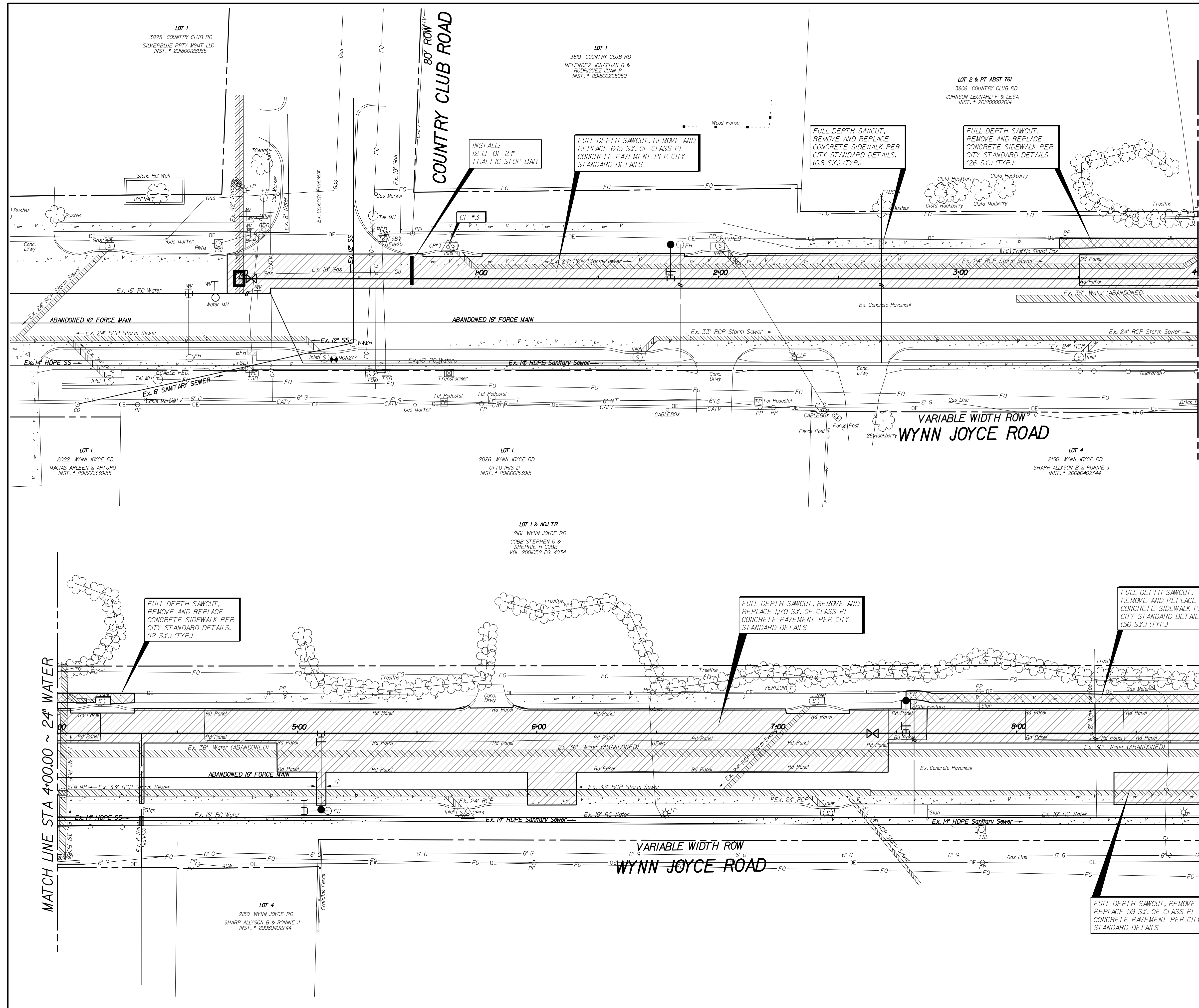


**24" WATER LINE**  
**STA 9+00 TO 13+00**  
**WYNN JOYCE ROAD 24" WATER LINE**

CITY OF GARLAND, TEXAS

DESIGN	DRAWN	DATE	SCALE	COG PROJECT	SHEET
CRIADO	CRIADO	October 2021	1"=20' H 1"=8' V	WA26-2021	06



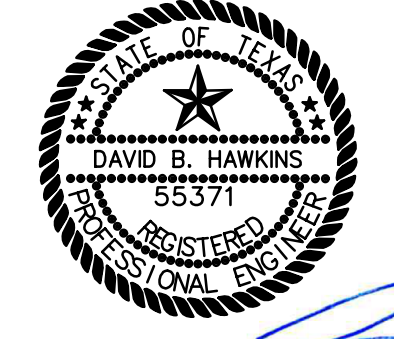


- LEGEND:**
- LIMITS OF 10' CLASS PI CONCRETE PAVEMENT REPLACEMENT
  - LIMITS OF CONCRETE SIDEWALK REPLACEMENT
  - 24" TRAFFIC STOP BAR

**NOTE:**

1. REFER TO THE CITY OF GARLAND STANDARD CONSTRUCTION DETAILS FOR TRAFFIC BUTTON INSTALLATION DESIGN.

THE INFORMATION SHOWN ON THIS PLAN IS FROM RECORD DRAWINGS. THE ENGINEER IS NOT RESPONSIBLE FOR THE ACCURACY OF THE INFORMATION SHOWN ON THIS DRAWING. CONTRACTOR SHALL FIELD VERIFY ALL UTILITIES ON PRIVATE PROPERTY AND IN THE CITY RIGHT-OF-WAY. CONTRACTOR SHALL CONTACT ALL UTILITY COMPANIES 48 HOURS PRIOR TO ANY EXCAVATION. CALL 1-800-DIG TESS/ TEXAS 811



10.12.2021

**BENCHMARKS & CONTROL POINTS**

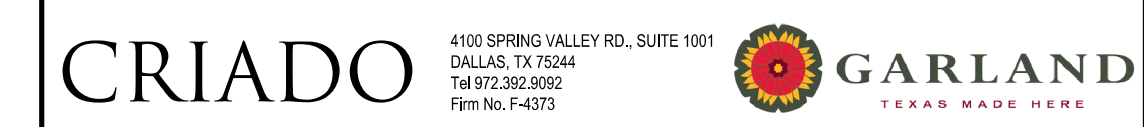
**BENCHMARK COG: 277**  
2" BRASS CAP FOUND ON CONCRETE INLET @ WYNN JOYCE DR & COUNTRY CLUB RD  
**ELEV - 494.274**

**BENCHMARK COG**  
BRASS CAP FOUND ON CONCRETE INLET @ WYNN JOYCE DR & EAST EAST OATS RD  
**ELEV - 443.46**

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CP-3	7004647.977	2551846.622	464.916	"X" CUT
CP-4	7004969.031	2552212.004	497.904	"X" CUT
CP-5	7005275.344	2552434.925	505.584	"X" CUT
CP-6	7005533.96	2552747.426	513.490	"X" CUT

**REVISIONS**

REV NO.	DATE	DESCRIPTION	BY



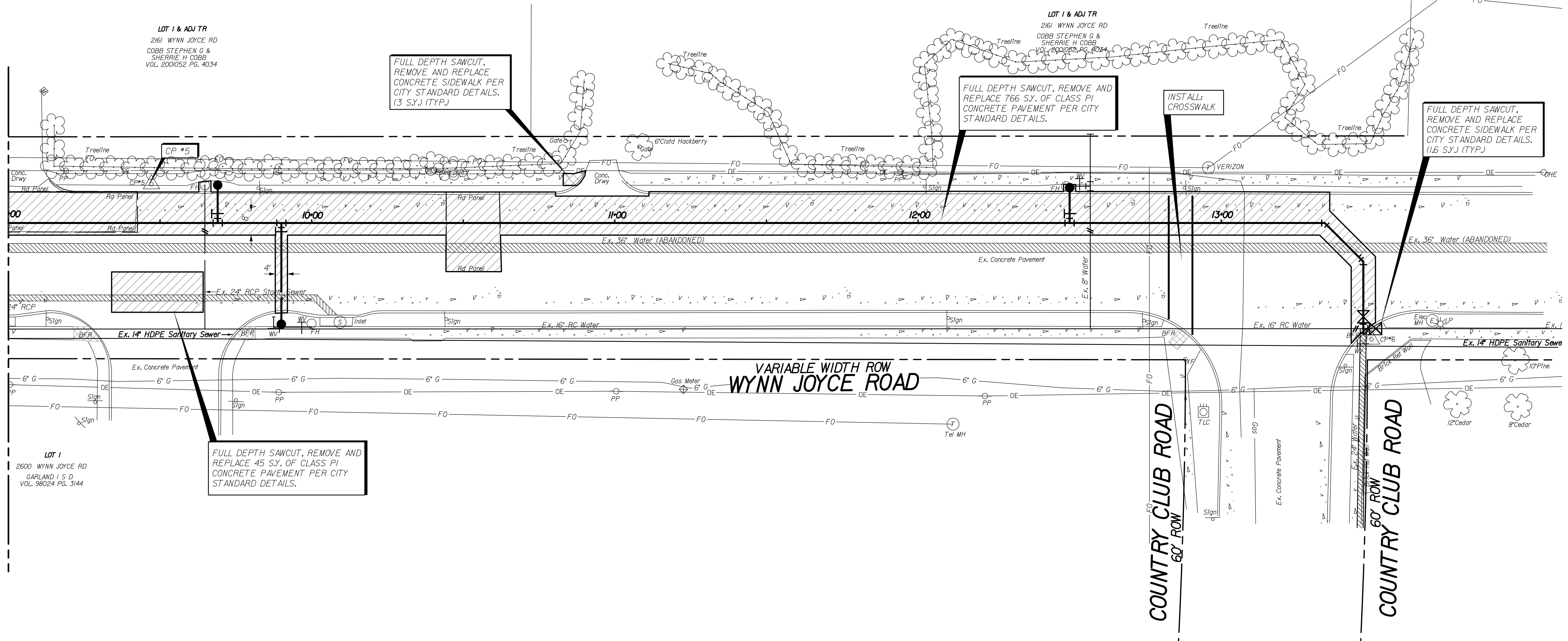
**PAVING PLAN**  
**STA 0+00 TO STA 9+00**  
**WYNN JOYCE ROAD 24" WATER LINE**

**CITY OF GARLAND, TEXAS**

DESIGN	DRAWN	DATE	SCALE	COG PROJECT	SHEET
CRIADO	CRIADO	October 2021	1"=20' H	WA26-2021	<b>08</b>



MATCH LINE STA 9+00.00 ~ 24" WATER  
SEE SHEET 08



LOT 1 & ADJ TR  
2161 WYNN JOYCE RD  
COBB STEPHEN G &  
SHERRIE H COBB  
VOL. 2001052 PG. 4034

LOT 1 & ADJ TR  
2161 WYNN JOYCE RD  
COBB STEPHEN G &  
SHERRIE H COBB  
VOL. 2001052 PG. 4034

LOT 1  
2600 WYNN JOYCE RD  
GARLAND, T.S.D.  
VOL. 98024 PG. 3144

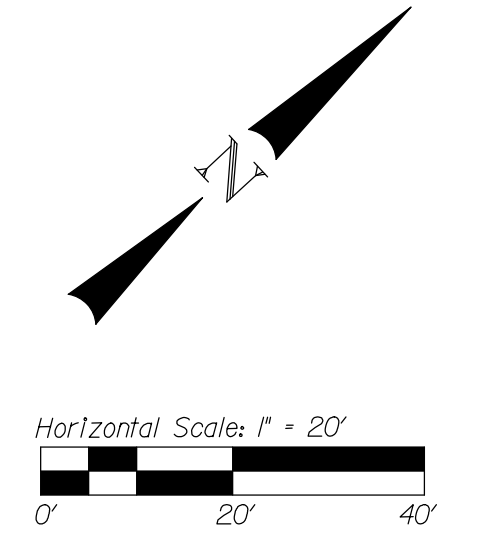
FULL DEPTH SAWCUT,  
REMOVE AND REPLACE  
CONCRETE SIDEWALK PER  
CITY STANDARD DETAILS.  
(3 S.Y.) (TYP.)

FULL DEPTH SAWCUT, REMOVE AND  
REPLACE 766 SY. OF CLASS PI  
CONCRETE PAVEMENT PER CITY  
STANDARD DETAILS.

INSTALL  
CROSSWALK

FULL DEPTH SAWCUT,  
REMOVE AND REPLACE  
CONCRETE SIDEWALK PER  
CITY STANDARD DETAILS.  
(1.6 S.Y.) (TYP.)

FULL DEPTH SAWCUT, REMOVE AND  
REPLACE 45 SY. OF CLASS PI  
CONCRETE PAVEMENT PER CITY  
STANDARD DETAILS.



LEGEND:

- LIMITS OF 10" CLASS PI CONCRETE PAVEMENT REPLACEMENT
- LIMITS OF CONCRETE SIDEWALK REPLACEMENT

NOTE:

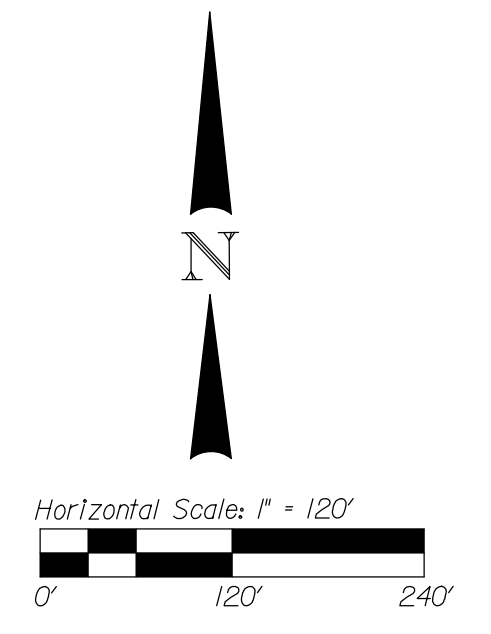
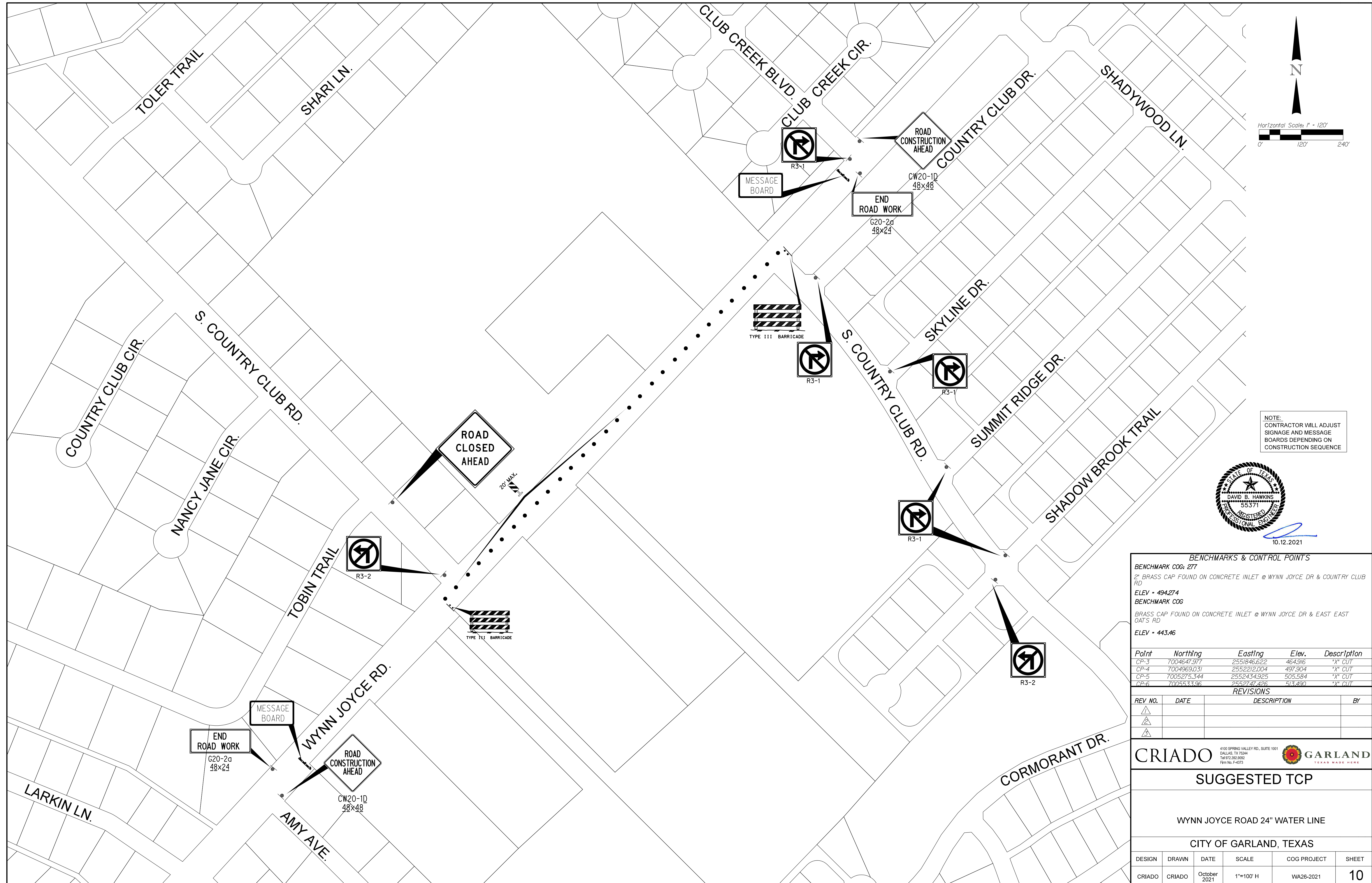
1. REFER TO THE CITY OF GARLAND STANDARD CONSTRUCTION DETAILS FOR TRAFFIC BUTTON INSTALLATION DESIGN.

THE INFORMATION SHOWN ON THIS PLAN IS FROM RECORD DRAWINGS. THE ENGINEER IS NOT RESPONSIBLE FOR THE ACCURACY OF THE INFORMATION SHOWN ON THIS DRAWING. CONTRACTOR SHALL FIELD VERIFY ALL UTILITIES ON PRIVATE PROPERTY AND IN THE CITY RIGHT-OF-WAY. CONTRACTOR SHALL CONTACT ALL UTILITY COMPANIES 48 HOURS PRIOR TO ANY EXCAVATION. CALL 1-800-DIG TESS/ TEXAS 811



10.12.2021

BENCHMARKS & CONTROL POINTS					
BENCHMARK COG: 277					
2" BRASS CAP FOUND ON CONCRETE INLET @ WYNN JOYCE DR & COUNTRY CLUB RD					
ELEV - 494.274					
BENCHMARK COG					
BRASS CAP FOUND ON CONCRETE INLET @ WYNN JOYCE DR & EAST EAST OATS RD					
ELEV - 443.46					
Point	Northing	Easting	Elev.	Description	
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CP-4	7004969.031	2552212.004	497.904	"X" CUT	
CP-5	7005275.344	2552434.925	505.584	"X" CUT	
CP-6	7005533.96	2552747.426	513.490	"X" CUT	
REVISIONS					
REV NO.	DATE	DESCRIPTION	BY		
△					
△					
△					
<b>PAVING PLAN</b> <b>STA 9+00 TO END</b> <b>WYNN JOYCE ROAD 24" WATER LINE</b>					
CITY OF GARLAND, TEXAS					
DESIGN	DRAWN	DATE	SCALE	COG PROJECT	SHEET
CRIADO	CRIADO	October 2021	1"=20' H	WA26-2021	09



NOTE:  
CONTRACTOR WILL ADJUST  
SIGNAGE AND MESSAGE  
BOARDS DEPENDING ON  
CONSTRUCTION SEQUENCE



10.12.2021

**BENCHMARKS & CONTROL POINTS**

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2" BRASS CAP FOUND ON CONCRETE INLET @ WYNN JOYCE DR & COUNTRY CLUB RD  
ELEV - 494.274  
BENCHMARK COG  
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CP-5	7005275.344	2552434.925	505.584	"X" CUT
CP-6	7005533.96	2552747.426	513.490	"X" CUT

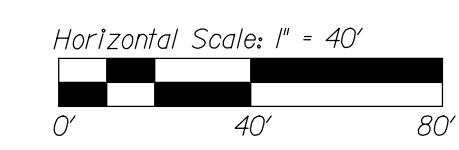
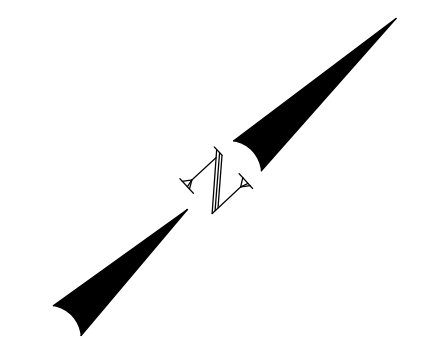
REV NO.	DATE	DESCRIPTION	BY
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**CRIADO** 4100 SPRING VALLEY RD., SUITE 1001 DALLAS, TX 75244 TEL: 972.382.9025 FAX: 972.382.9025  
**GARLAND** TEXAS MADE HERE

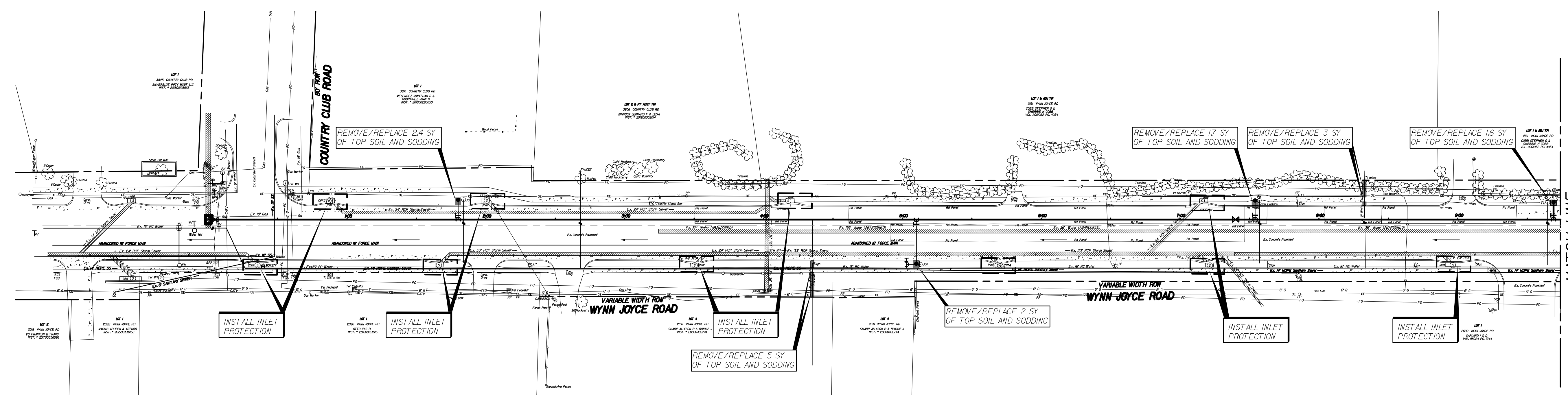
**SUGGESTED TCP**

WYNN JOYCE ROAD 24" WATER LINE  
CITY OF GARLAND, TEXAS

DESIGN	DRAWN	DATE	SCALE	COG PROJECT	SHEET
CRIADO	CRIADO	October 2021	1"=100' H	WA26-2021	10

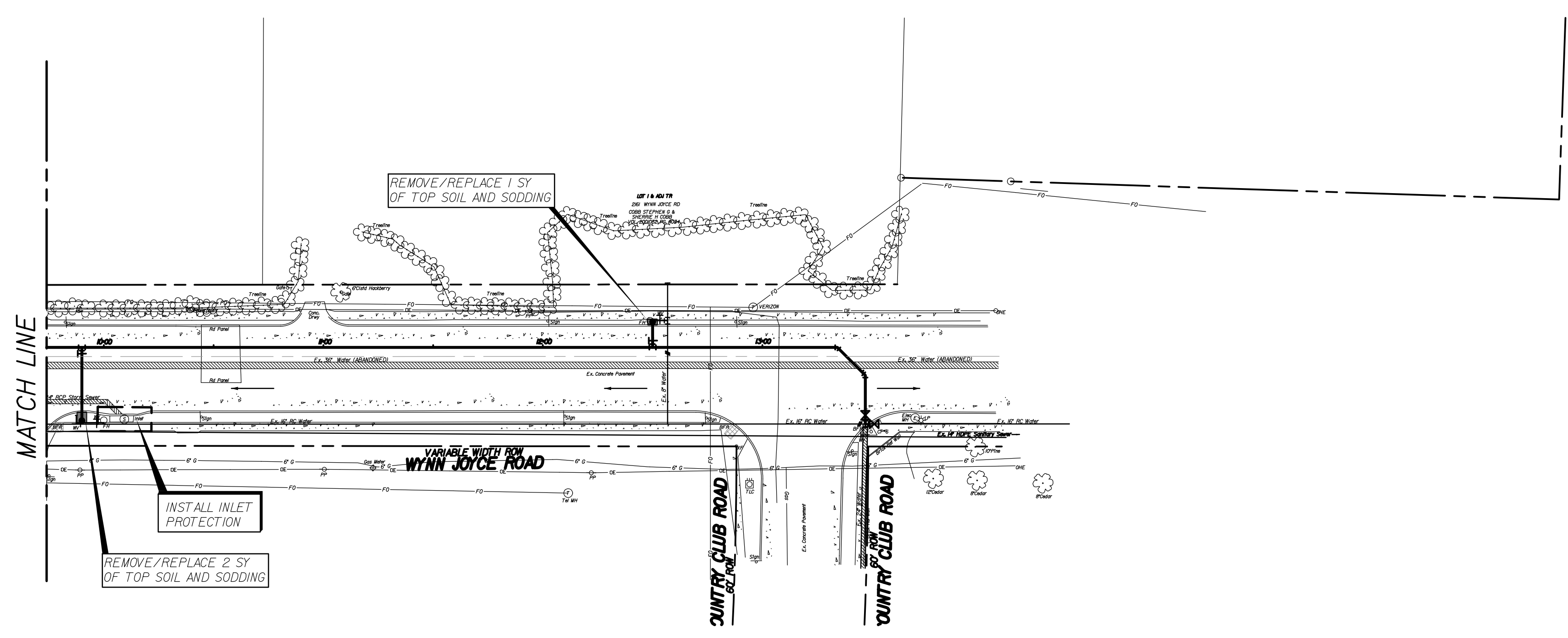


- INLET PROTECTION
- DIRECTION OF FLOW
- TOP SOIL AND SODDING REMOVE/REPLACE



MATCH LINE

**NOTE:**  
CONTRACTOR SHALL PROVIDE CONSTRUCTION SITE NOTICE TO THE CITY PRIOR TO START OF CONSTRUCTION



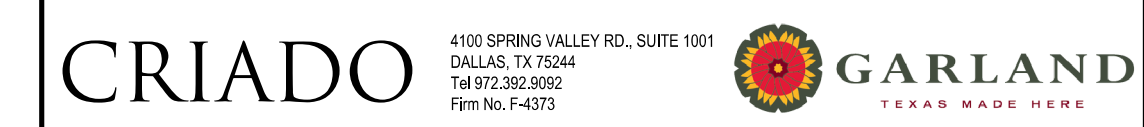
MATCH LINE

**BENCHMARKS & CONTROL POINTS**  
 BENCHMARK COG: 277  
 2" BRASS CAP FOUND ON CONCRETE INLET @ WYNN JOYCE DR & COUNTRY CLUB RD  
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**REVISIONS**

REV NO.	DATE	DESCRIPTION	BY
1			
2			
3			



**EROSION CONTROL PLAN**

WYNN JOYCE ROAD 24" WATER LINE

CITY OF GARLAND, TEXAS

DESIGN	DRAWN	DATE	SCALE	COG PROJECT	SHEET
CRIADO	CRIADO	October 2021	1"=40' H	WA26-2021	11

### DEBRIS AND TRASH MANAGEMENT

**DESCRIPTION**  
Large volumes of debris and trash are often generated at construction sites including: packaging, pallets, wood waste, concrete waste, soil, electrical wiring, cuttings, and a variety of other materials. There are several techniques and procedures to minimize the potential of storm water contamination from solid waste through appropriate storage and disposal practices. Recycling of construction debris also reduces the volume of material to be disposed of and associated costs.

**PRIMARY USE**  
Debris and trash management should be a part of all construction practices. By limiting the trash and debris on site, storm water quality is improved along with reduced clean up requirements at the completion of the project.

**APPLICATIONS**  
Solid waste management for construction sites is based on proper storage and disposal practices by construction workers and supervisors. Key elements of the program are education and modification of improper disposal habits. Cooperation and vigilance is required on the part of supervisors and workers to ensure that the recommendations and procedures are followed. Following are lists describing the targeted materials and recommended procedures:

- Construction (and Demolition) Debris
  - Dimensional lumber
  - Miscellaneous wood (pallets, plywood, etc)
  - Copper (pipe and electrical wiring)
  - Miscellaneous metal (studs, pipe, conduit, sheathing, nails, etc)
  - Insulation
  - Concrete, brick, and mortar
  - Shingles
  - Roofing materials
  - Gypsum board
- Trash
  - Paper and cardboard (packaging, containers, wrappers)
  - Plastic (packaging, bottles, containers)
  - Styrofoam (cups, packing, and forms)
  - Food and beverage containers
  - Food waste

**Storage Procedures**

- Wherever possible, minimize production of debris and trash.
- Designate a foreman or supervisor to oversee and enforce proper debris and trash procedures.
- Instruct construction workers in proper debris and trash storage and handling procedures.
- Segregate potentially hazardous waste from non-hazardous construction site debris.
- Segregate recyclable construction debris from other non-recyclable materials.

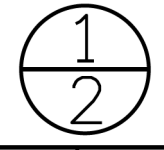
**Applications**  
Perimeter Control  
Slope Protection  
Sediment Trapping  
Channel Protection  
Temporary Stabilization  
Permanent Stabilization  
Waste Management  
Housekeeping Practices




**Targeted Constituents**  
○ Sediment  
● Nutrients Toxic Materials  
○ Oil & Grease  
● Floatable Materials  
● Other Construction Wastes

**Implementation Requirements**  
● Capital Costs  
● Maintenance  
● Training  
○ Suitability for Slopes > 5%

**Legend**  
● Significant Impact  
● Medium Impact  
○ Low Impact  
? Unknown or Questionable Impact

**M-1**



Scale : N/A	Date : 02/21/05		<b>DEBRIS AND TRASH MANAGEMENT</b>	PAGE
Design : COG	Drawn : COG		<b>DEBRIS AND TRASH MANAGEMENT</b>	<b>1</b>
Dwg. File : ERO_009.DWG	Project No. : STANDARD-DETAILS		<b>STANDARD DETAILS</b>	

### DEBRIS AND TRASH MANAGEMENT

- Keep debris and trash under cover in either a closed dumpster or other enclosed trash container that limits contact with rain and runoff and prevents light materials from blowing out.
- Store waste materials away from drainage ditches, swales and catch basins.
- Do not allow trash containers to overflow.
- Do not allow waste materials to accumulate on the ground.
- Prohibit littering by workers and visitors.
- Police site daily for litter and debris.
- Enforce solid waste handling and storage procedures.

**Storage Procedures**

- If feasible, recycle construction and demolition debris such as wood, metal, and concrete.
- General construction debris may be hauled to a licensed construction debris landfill (typically less expensive than a sanitary landfill).
- Use waste and recycling haulers/facilities approved by the local jurisdiction.

**Education**

- Educate all workers on solid waste storage and disposal procedures.
- Instruct workers in identification of solid waste and hazardous waste.
- Have regular meetings to discuss and reinforce disposal procedures (incorporate in regular safety seminars).
- Clearly mark on all debris and trash containers which materials are acceptable.

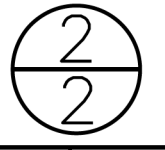
**Quality Control**




- Foreman and/or construction supervisor shall monitor on-site solid waste storage and disposal procedures.
- Discipline workers who repeatedly violate procedures.

**Requirements**

- Job-site waste handling and disposal education and awareness program.
- Compliance by workers.
- Sufficient and appropriate waste storage containers.
- Timely removal of stored solid waste materials.
- Training workers and monitoring compliance.

**LIMITATIONS**  
Only addresses non-hazardous solid waste.  
One part of a comprehensive construction site management program.



Scale : N/A	Date : 02/21/05		<b>DEBRIS AND TRASH MANAGEMENT</b>	PAGE
Design : COG	Drawn : COG		<b>DEBRIS AND TRASH MANAGEMENT</b>	<b>2</b>
Dwg. File : ERO_009.DWG	Project No. : STANDARD-DETAILS		<b>STANDARD DETAILS</b>	

### CONCRETE WASTE MANAGEMENT

**DESCRIPTION**  
Concrete waste at construction sites comes in two forms: 1) excess fresh concrete mix including truck and equipment washing, and 2) concrete dust and concrete debris resulting from demolition. Both forms have the potential to impact water quality through storm water runoff contact with the waste.

**PRIMARY USE**  
Concrete waste is present at most construction sites. This BMP should be utilized at sites in which concrete waste is present.

**APPLICATIONS**  
A number of water quality parameters can be affected by introduction of concrete - especially fresh concrete. Concrete affects the pH of runoff, causing significant chemical changes in water bodies and harming aquatic life. Suspended solids in the form of both cement and aggregate dust are also generated from both fresh and demolished concrete waste.

**Unacceptable Waste Concrete Disposal Practices**

- Dumping in vacant areas on the job-site.
- Illicit dumping off-jobsite.
- Dumping into ditches or drainage facilities.

**Recommended Disposal Practices**

- Avoid unacceptable disposal practices listed above.
- Develop pre-determined, safe concrete disposal areas.
- Provide a washout area with a minimum of 6 cubic feet of containment area volume for every 10 cubic yards of concrete poured.
- Never dump waste concrete illicitly or without property owner's knowledge and consent.
- Overflow of washdown water shall be discharged in an area protected by one or more sediment removal BMPs and shall be done in a manner that does not result in a violation of groundwater or surface water quality standards.

**Education**

- Drivers and equipment operators should be instructed on proper disposal and equipment washing practices (see above).
- Supervisors must be made aware of the potential environmental consequences of improperly handled concrete waste.

**Enforcement**

- The construction site manager or foreman must ensure that employees and pre-mix companies follow proper procedures for concrete disposal and equipment washing.
- Employees violating disposal or equipment cleaning directives must be re-educated or disciplined if necessary.

**Demolition Practices**

- Monitor weather and wind direction to ensure concrete dust is not entering drainage structures and surface waters.
- Where appropriate, construct sediment traps or other types of sediment detention devices downstream of demolition activities.

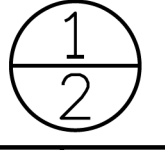
**Applications**  
Perimeter Control  
Slope Protection  
Sediment Trapping  
Channel Protection  
Temporary Stabilization  
Permanent Stabilization  
Waste Management  
Housekeeping Practices




**Targeted Constituents**  
○ Sediment  
○ Nutrients Toxic Materials  
○ Oil & Grease  
○ Floatable Materials  
● Other Construction Wastes

**Implementation Requirements**  
● Capital Costs  
● Maintenance  
● Training  
○ Suitability for Slopes > 5%

**Legend**  
● Significant Impact  
● Medium Impact  
○ Low Impact  
? Unknown or Questionable Impact

**M-3**



Scale : N/A	Date : 02/21/05		<b>CONCRETE WASTE MANAGEMENT</b>	PAGE
Design : COG	Drawn : COG		<b>CONCRETE WASTE MANAGEMENT</b>	<b>5</b>
Dwg. File : ERO_011.DWG	Project No. : STANDARD-DETAILS		<b>STANDARD DETAILS</b>	

### CONCRETE WASTE MANAGEMENT

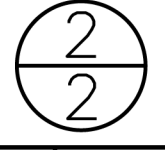
**Requirements**




- Use pre-determined disposal sites for waste concrete.
- Prohibit dumping waste concrete anywhere but pre-determined areas.
- Assign pre-determined truck and equipment washing areas.
- Educate drivers and operators on proper disposal and equipment cleaning procedures.

**Costs**

- Minimal cost impact for training and monitoring.
- Concrete disposal cost depends on availability and distance to suitable disposal areas
- Additional costs involved in equipment washing could be significant.

**LIMITATIONS**  
Concrete waste management is one part of a comprehensive construction site waste management program.



Scale : N/A	Date : 02/21/05		<b>CONCRETE WASTE MANAGEMENT</b>	PAGE
Design : COG	Drawn : COG		<b>CONCRETE WASTE MANAGEMENT</b>	<b>6</b>
Dwg. File : ERO_011.DWG	Project No. : STANDARD-DETAILS		<b>STANDARD DETAILS</b>	

### CHEMICAL MANAGEMENT

**DESCRIPTION**  
Chemical management addresses the problem of storm water polluted with chemical pollutants through spills or other forms of contact. The objective of the chemical management is to minimize the potential of storm water contamination from construction chemicals through appropriate recognition, handling, storage, and disposal practices.

It is not the intent of chemical management to supersede or replace normal site assessment and remediation procedures. Significant spills and/or contamination warrant immediate response by trained professionals. Suspected job-site contamination should be immediately reported to regulatory authorities and protective actions taken. Significant spills should be reported to the National Response Center (NRC) at (800) 424-8802.

**PRIMARY USE**  
These management practices along with applicable OSHA and EPA guidelines should be incorporated at all construction sites that use or generate hazardous wastes. Many chemicals such as fuel, oil, grease, fertilizer, and pesticide are present at most construction sites.

**INSTALLATION, APPLICATION AND DISPOSAL CRITERIA**  
The chemical management techniques presented here are based on proper recognition, handling, and disposal practices by construction workers and supervisors. Key elements are education, proper disposal practices, as well as provisions for safe storage and disposal. Following are lists describing the targeted materials and recommended procedures:

- Targeted Chemical Materials
  - Paints
  - Solvents
  - Stains
  - Wood preservatives
  - Cutting oils
  - Greases
  - Roofing tar
  - Pesticides, herbicides, & fertilizer
  - Fuels & lube oils
  - Antifreeze

**Storage Procedures**

- Wherever possible, minimize use of hazardous materials.
- Minimize generation of hazardous wastes on the job-site.
- Segregate potentially hazardous waste from non-hazardous construction site debris.
- Designate a foreman or supervisor to oversee hazardous materials handling procedures.
- Keep chemicals in appropriate containers (closed drums or similar) and under cover.
- Store chemicals away from drainage ditches, swales and catch basins.
- Use containment berms in fueling and maintenance areas and where the potential for spills is high.

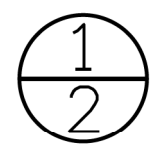
**Applications**  
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Slope Protection  
Sediment Trapping  
Channel Protection  
Temporary Stabilization  
Permanent Stabilization  
Waste Management  
Housekeeping Practices




**Targeted Constituents**  
○ Sediment  
● Nutrients Toxic Materials  
● Oil & Grease  
○ Floatable Materials  
● Other Construction Wastes

**Implementation Requirements**  
● Capital Costs  
● Maintenance  
● Training  
○ Suitability for Slopes > 5%

**Legend**  
● Significant Impact  
● Medium Impact  
○ Low Impact  
? Unknown or Questionable Impact

**M-2**



Scale : N/A	Date : 02/21/05		<b>CHEMICAL MANAGEMENT</b>	PAGE
Design : COG	Drawn : COG		<b>CHEMICAL MANAGEMENT</b>	<b>3</b>
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### CHEMICAL MANAGEMENT

**Waste Handling**

- Ensure that adequate hazardous waste storage volume is available.
- Ensure that hazardous waste collection containers are conveniently located.
- Do not allow potentially hazardous waste materials to accumulate.
- Enforce hazardous waste handling and disposal procedures.
- Clearly mark on all hazardous waste containers which materials are acceptable for the container.

**Disposal Procedures**

- Ensure that adequate cleanup and containment materials are available onsite.
- Regularly schedule hazardous waste removal to minimize on-site storage.
- Use only licensed hazardous waste haulers.

**Education**

- Instruct workers on safety procedures for construction site chemical storage.
- Instruct workers in identification of chemical pollutants.
- Ensure that workers are trained in procedures for spill prevention and response.
- Educate workers of potential dangers to humans and the environment from chemical pollutants.
- Educate all workers on chemical storage and disposal procedures.
- Have regular meetings to discuss and reinforce identification, handling, and disposal procedures (incorporate in regular safety seminars).
- Establish a continuing education program to indoctrinate new employees.

**Quality Assurance**

- Foreman and/or construction supervisor shall monitor on-site chemical storage and disposal procedures.
- Educate and if necessary, discipline workers who violate procedures.
- Ensure that the hazardous waste disposal contractor is reputable and licensed.

**Requirements**

- Job-site chemical and hazardous waste handling and disposal education and awareness program.
- Commitment by management to implement chemical storage and hazardous waste management practices.
- Compliance by workers.
- Sufficient and appropriate chemical and hazardous waste storage containers.
- Timely removal of stored hazardous waste materials.

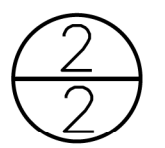
**Cost**




- Possible modest cost impact for additional chemical storage containers.
- Small cost impact for training and monitoring.
- Potential cost impact for hazardous waste collection and disposal by licensed hauler - actual cost depends on type of material and volume.

**LIMITATIONS**  
This practice is not intended to address site-assessments and pre-existing contamination. Major contamination, large spills and other serious hazardous waste incidents require immediate response from specialists.

Demolition activities and potential pre-existing materials, such as lead and asbestos, are not addressed by this program. Site-specific information on plans is necessary.

Contaminated soils are not addressed.



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Dwg. File : ERO_010.DWG	Project No. : STANDARD-DETAILS		<b>STANDARD DETAILS</b>	

### CONCRETE SAWCUTTING WASTE MANAGEMENT

**DESCRIPTION**  
Sawcutting of concrete pavement is a routine practice, necessary to control shrinkage cracking immediately following placement of plastic concrete. It is also used to remove curb sections and pavement sections for pavement repairs, utility trenches, and driveways. Sawcutting for joints involves sawing a narrow, shallow groove in the concrete, while sawcutting for removals is usually done full depth through the slab. Water is used to control saw blade temperature and to flush the debris from the sawed groove. The resulting slurry of process water and fine particles and high pH must be properly managed.

A number of water quality parameters can be affected by introduction of concrete fines. Concrete affects the pH of runoff, causing significant chemical changes in water bodies and harming aquatic life. Suspended solids in the form of saw fines are also generated from sawcutting operations.

**DESIGN CRITERIA**

**Slurry Collection**

- During saw cutting operations, the slurry and cuttings shall be continuously vacuumed to control the flow of water from the operations site.
- The slurry and cuttings shall not be allowed to drain to the storm drain system, swale, stream or other water body.
- The slurry and cuttings shall not be allowed to remain on the pavement to dry out.

**Slurry Disposal**

- Develop pre-determined, safe slurry disposal areas.
- Collected slurry and cuttings shall be discharged in an area protected by one or more sediment removal BMPs and shall be done in a manner that does not result in a violation of groundwater or surface water quality standards.
- Never dump waste illicitly or without property owner's knowledge and consent.
- Slurry may be disposed of in facilities designated for washdown of concrete trucks (see M-3, Concrete Waste Management).

**MAINTENANCE**  
Project personnel should inspect the operations to assure that operators are diligent in controlling the water produced by the saw cutting activities. Following operations the pavement should be inspected to ensure that waste removal has been adequately performed.

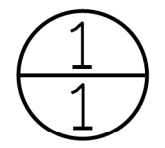
**Applications**  
Perimeter Control  
Slope Protection  
Sediment Trapping  
Channel Protection  
Temporary Stabilization  
Permanent Stabilization  
Waste Management  
Housekeeping Practices




**Targeted Constituents**  
○ Sediment  
○ Nutrients/Toxic Materials  
○ Oil & Grease  
○ Floatable Materials  
● Other Construction Wastes

**Implementation Requirements**  
○ Capital Costs  
● Maintenance  
● Training  
○ Suitability for Slopes > 5%

**Legend**  
○ Significant Impact  
● Medium Impact  
○ Low Impact  
? Unknown or Questionable Impact

**M-4**



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Dwg. File : ERO_012.DWG	Project No. : STANDARD-DETAILS		<b>STANDARD DETAILS</b>	

### SANITARY FACILITIES

**DESCRIPTION**  
Facilities for collection and disposal of sanitary waste must be provided and properly managed to minimize the potential contamination of surface water with septic wastes. Location of portable facilities away from storm drain systems and surface waters or containment is necessary in case of spills.

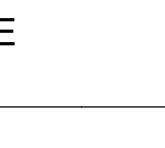
**PROCEDURES**



- Sanitary facilities must be provided on the site in close proximity to areas where people are working.
- Portable toilets must be provided if no permanent facilities are available.
- Locate portable toilets a minimum of 20 feet away from storm drain inlets, conveyance channels, or surface waters
- If unable to meet 20-foot distance requirement, provide containment for portable toilets.
- Portable toilets should be regularly serviced.

**Applications**  
Perimeter Control  
Slope Protection  
Sediment Trapping  
Channel Protection  
Temporary Stabilization  
Permanent Stabilization  
Waste Management  
Housekeeping Practices

**Targeted Constituents**  
○ Sediment  
● Nutrients Toxic Materials  
○ Oil & Grease  
○ Floatable Materials  
● Other Construction Wastes

**Implementation Requirements**  
○ Capital Costs  
● Maintenance  
● Training



<b>REVISIONS</b>					
REV. NO.	DATE	DESCRIPTION	BY		
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<b>EROSION CONTROL NOTES</b>					
WYNN JOYCE ROAD 24" WATER LINE					
CITY OF GARLAND, TEXAS					
DESIGN	DRAWN	DATE	SCALE	COG PROJECT	SHEET
CRIADO	CRIADO	October 2021	N/A	WA26-2021	<b>12</b>

### INLET PROTECTION

**1. STANDARD INSTALLATION**

**ELEVATION OF STAKE AND FABRIC ORIENTATION**

**DETAIL A**

**PERSPECTIVE VIEW**

**DROP INLET WITH GRATE**

**SPECIFIC APPLICATION**  
THIS METHOD OF INLET PROTECTION IS APPLICABLE WHERE THE INLET DRAINS A RELATIVELY FLAT AREA (SLOPE NO GREATER THAN 5%) WHERE THE INLET SHEET OR OVER-LAND FLOWS (NOT TO EXCEED 1 c.f.s.) ARE TYPICAL. THE METHOD SHALL NOT APPLY TO INLETS RECEIVING CONCENTRATED FLOWS SUCH AS IN STREETS OR HIGHWAY MEDIANS.

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**INLET PROTECTION**

STANDARD DETAILS

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### INLET PROTECTION

**CROSS SECTION**

**PLAN VIEW**

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**INLET PROTECTION**

STANDARD DETAILS

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### SILT FENCE & STONE OVERFLOW STRUCTURE

**SILT FENCE**

**STONE OVERFLOW STRUCTURE**

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**SILT FENCE & STONE OVERFLOW STRUCTURE**

STANDARD DETAILS

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### SILT FENCE

**DESCRIPTION**  
A silt fence consists of geotextile fabric supported by wire mesh netting or other backing stretched between metal posts with the lower edge of the fabric securely embedded six-inches in the soil. The fence is typically located downstream of disturbed areas to intercept runoff in the form of sheet flow. A silt fence provides both filtration and time for sediment settling by reducing the velocity of the runoff.

**PRIMARY USE**  
Silt fence is normally used as perimeter control located downstream of disturbed areas. It is only feasible for non-concentrated, sheet flow conditions. If it becomes necessary to place a silt fence where concentrated flows may be experienced (e.g. where two silt fences join at an angle, or across minor channels or gullies), it will be necessary to reinforce the silt fence at that area by a rock berm or sand bag berm, or other structural measures that will support the silt fence.

**APPLICATIONS**  
Silt fence is an economical means to treat overland, non-concentrated flows for all types of projects. Silt fences are used as perimeter control devices for both site developers and linear (roadway) type projects. They are most effective with coarse to silty soil types. Due to the potential of clogging and limited effectiveness, silt fences should be used with caution in areas that have predominantly clay soil types. In this latter instance a soils engineer or soil scientist should confirm the suitability of silt fence for that application.

**DESIGN CRITERIA**

- Fences are to be constructed along a line of constant elevation (along a contour line) where possible.
- Maximum drainage area shall be 0.25 acre per 100 linear feet of silt fence.
- Maximum flow to any 20 foot section of silt fence shall be 1 CFS.
- Maximum distance of flow to silt fence shall be 200 feet or less. If the slope exceeds 10 percent the flow distance shall be less than 50 feet.
- Maximum slope adjacent to the fence shall be 2:1.
- If 50% or less soil, by weight, passes the U.S. Standard sieve No. 200; select the apparent opening size (A.O.S.) to retain 85% of the soil.
- If 85% or more of soil by weight, passes the U.S. Standard sieve No. 200, silt fences shall not be used unless the soil mass is evaluated and deemed suitable by a soil scientist or geotechnical engineer concerning the erodibility of the soil mass, dispersive characteristics, and the potential grain-size characteristics of the material that is likely to be eroded.

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**SILT FENCE**

STANDARD DETAILS

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**APPLICATIONS**  
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**SILT FENCE**

STANDARD DETAILS

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### INLET PROTECTION

**CROSS SECTION**

**DESCRIPTION**  
Inlet protection consists of a variety of methods of intercepting sediment at low point inlets through the use of stone, filter fabric, inlet inserts, and other materials. This is normally located at the inlet, providing either detention or filtration to reduce sediment and floatable materials in storm water.

**PRIMARY USE**  
Inlet protection should be considered a secondary defense in site erosion control due to the limited effectiveness and applicability of the technique. It is normally used in new developments that include new inlets or roads with new curb inlets or during major repairs to existing roadways.

**APPLICATIONS**  
Inlet protection has limited use in developed areas due to the potential for flooding, traffic safety, pedestrian safety, and maintenance problems. Inlet protection can reduce sediment in storm sewer systems by serving as a back up system to onsite controls or by reducing sediment loads from controls with limited effectiveness.

**APPLICATIONS**  
Different inlet protection variations are used for different conditions as follows:

- Filter barrier protection (similar to a silt fence barrier around the inlet) is appropriate when the drainage area is less than one acre and the basin slope is less than five (5) percent. This type of protection is not applicable in paved areas.
- Block and gravel (crushed stone, recycled concrete is also appropriate) protection is used when flows exceed 0.5 c.f.s. and it is necessary to allow for overtopping to prevent flooding.
- Excavated impoundment protection around a drop inlet may be used for protection against sediment entering a storm drain system. With this method, it is necessary to install weep holes to allow the impoundment to drain completely. The impoundment shall be sized such that the volume of excavation shall be equal to 1800 to 3600 cubic feet per acre of disturbed area entering the inlet for full effectiveness.

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**INLET PROTECTION**

STANDARD DETAILS

1  
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### INLET PROTECTION

**DESIGN CRITERIA**

- Special caution must be exercised when installing inlet protection on publicly traveled streets or in developed areas. Ensure that inlet protection is properly designed, installed and maintained to avoid flooding of the roadway or adjacent properties and structures.
- Filter fabric protection shall be designed and maintained in a manner similar to silt fence.
- Where applicable, filter fabric, posts, and wire backing shall meet the material requirements specified in BMP Fact Sheet S-1, Silt Fence.
- Filter gravel shall be ¾ inch (Block and Gravel Protection) or 1-1/2 to 2 inch (Excavated Impoundment Protection) washed stone containing no fines. Angular shaped stone is preferable to rounded shapes.
- Concrete blocks shall be standard 8" x 8" x 16" concrete masonry units.
- Maximum depth of flow shall be eight (8) inches or less.
- Positive drainage is critical in the design of inlet protection. If overflow is not provided for at the inlet, excess flows shall be routed through established swales, streets, or other watercourses to minimize damage due to flooding.
- Filter Barrier Protection  
Silt Fence shall consist of nylon geotextile supported by wire mesh, W1.4 X W1.4, and galvanized steel posts set a minimum of 1 foot depth and spaced not more than 6 feet on center. A 6 inch wide trench is to be cut 6 inches deep at the toe of the fence to allow the fabric to be laid below the surface and backfilled with compacted earth or gravel. This entrenchment prevents any bypass of runoff under the fence.
- Block and Gravel Protection (Curb and Drop Inlets)  
Concrete blocks are to be placed on their sides in a single row around the perimeter of the inlet, with ends abutting. Openings in the blocks should face outward, not upward. ½" x ½" wire mesh shall then be placed over the outside face of the blocks covering the holes. Filter stone shall then be piled against the wire mesh to the top of the blocks with the base of the stone being a minimum of 18 inches from the blocks. Alternatively, where loose stone is a concern (streets, etc.), the filter stone may be placed in appropriately sized geotextile fabric bags. Periodically, when the stone filter becomes clogged, the stone must be removed and cleaned in a proper manner or replaced with new stone and piled back against the wire mesh.
- Excavated Impoundment Protection  
An excavated impoundment shall be sized to provide a storage volume of between 1800 and 3600 cubic feet per acre of disturbed area. The trap shall have a minimum depth of one foot and a maximum depth of 2 feet as measured from the top of the inlet and shall have sideslopes of 2:1 or flatter. Weep holes are to be installed in the inlet walls to allow for the complete dewatering of the trap. When the storage capacity of the impoundment has been reduced by one-half, the silt shall be removed and disposed in a proper manner.
- Inlet inserts are commercially available to remove sediment, constituents (pollutants) adsorbed to sediment, and oil and grease. Maintenance is required to remove sediment and debris that could clog the filters. Inlet inserts must have a bypass function to prevent flooding from clogging or high flows.

**LIMITATIONS**  
Special caution must be exercised when installing inlet protection on publicly traveled streets or in developed areas. Ensure that inlet protection is properly designed, installed and maintained to avoid flooding of the roadway or adjacent properties and structures.

Inlet protection is only viable at low point inlets. Inlets that are on a slope cannot be effectively protected because storm water will bypass the inlet and continue downstream, causing an overload condition at inlets downstream.

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**INLET PROTECTION**

STANDARD DETAILS

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7

### INLET PROTECTION

**MAINTENANCE REQUIREMENTS**  
Inlet protection should be inspected regularly (at least as often as required by the TPDES Construction General Permit). When silt fence is used and the fabric becomes clogged, it should be cleaned or, if necessary, replaced. Also, sediment should be removed when it reaches approximately one-half the height of the inlet protection device. If a sump is used, sediment should be removed when the volume of the basin is reduced by 50%.

**SPECIFICATION**  
Specifications for construction of this item may be found in the Standard Specifications for Public Works Construction - North Central Texas Council of Governments, Section 201.15 Inlet Protection.

For systems using filter stone, when the filter stone becomes clogged with sediment, the stones must be pulled away from the inlet and cleaned or replaced. Since cleaning of stone at a construction site may be difficult, an alternative approach would be to use the clogged stone as fill material and put new stone around the inlet.

REVISIONS			
REV. NO.	DATE	DESCRIPTION	BY

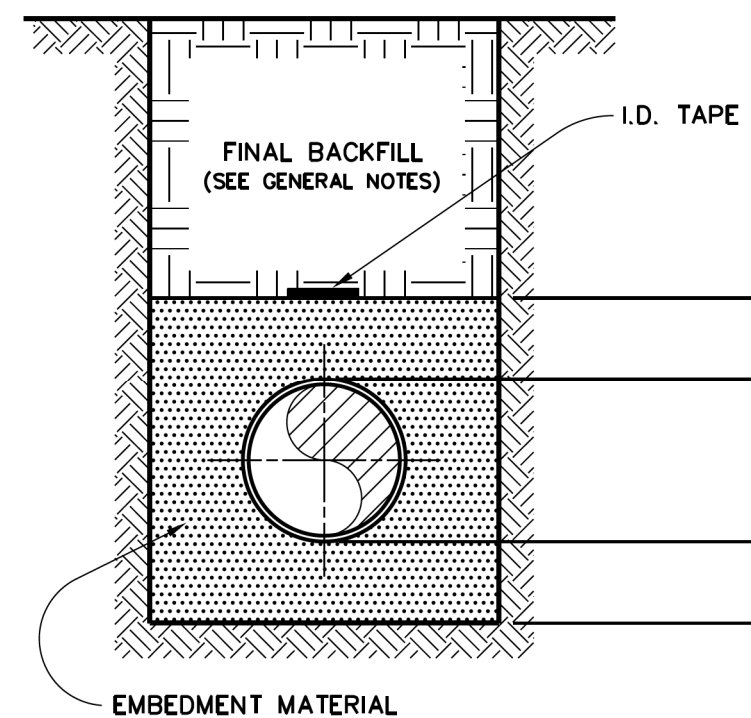
## EROSION CONTROL DETAILS

WYNN JOYCE ROAD 24" WATER LINE

CITY OF GARLAND, TEXAS

DESIGN	DRAWN	DATE	SCALE	COG PROJECT	SHEET
CRiado	CRiado	October 2021	N/A	WA26-2021	13

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**CLASS I EMBEDMENT MATERIAL:** SAND - MUST BE CLEAN, FREE DRAINING AND FREE FLOWING. CONTAINS NO LUMPS, CLAY, OR ORGANICS.

**GENERAL NOTES:**

- FOR THE DEFINITION OF THE BACKFILL MATERIAL TERMS SEE N.C.T.C.O.G. SPECIFICATIONS.
- FINAL BACKFILL SHALL BE SELECT NATIVE MATERIAL COMPACTED TO THE TOP OF THE SUBGRADE IN 6 INCH LIFTS TO AT LEAST 95 PERCENT OF MAXIMUM DENSITY AS DETERMINED BY ASTM D 698.
- THE USE OF CEMENT STABILIZED SAND OR FLOWABLE FILL FOR FINAL BACKFILL IS RESTRICTED PRIMARILY TO LOCALIZED OR SPOT REPAIRS OF UTILITIES UNDER PAVING WHERE RESTORATION OF PAVING AND TRAFFIC IS TIME CRITICAL AS APPROVED BY THE ENGINEERING DEPARTMENT.
- FOR USE IN EARTH OR ROCK UP TO A MAXIMUM OF 30'-0" EXCAVATION.
- I.D. TAPE MUST BE 6" WIDE BY 4.0 MIL THICK POLYETHYLENE PLASTIC.

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Revision Date: 03/14

Scale: N/A Date: 06/01/05

Design: JMK

Drawn: JMK

Dwg. File: EMB\_001.DWG

Project No.: STANDARD-DETAILS

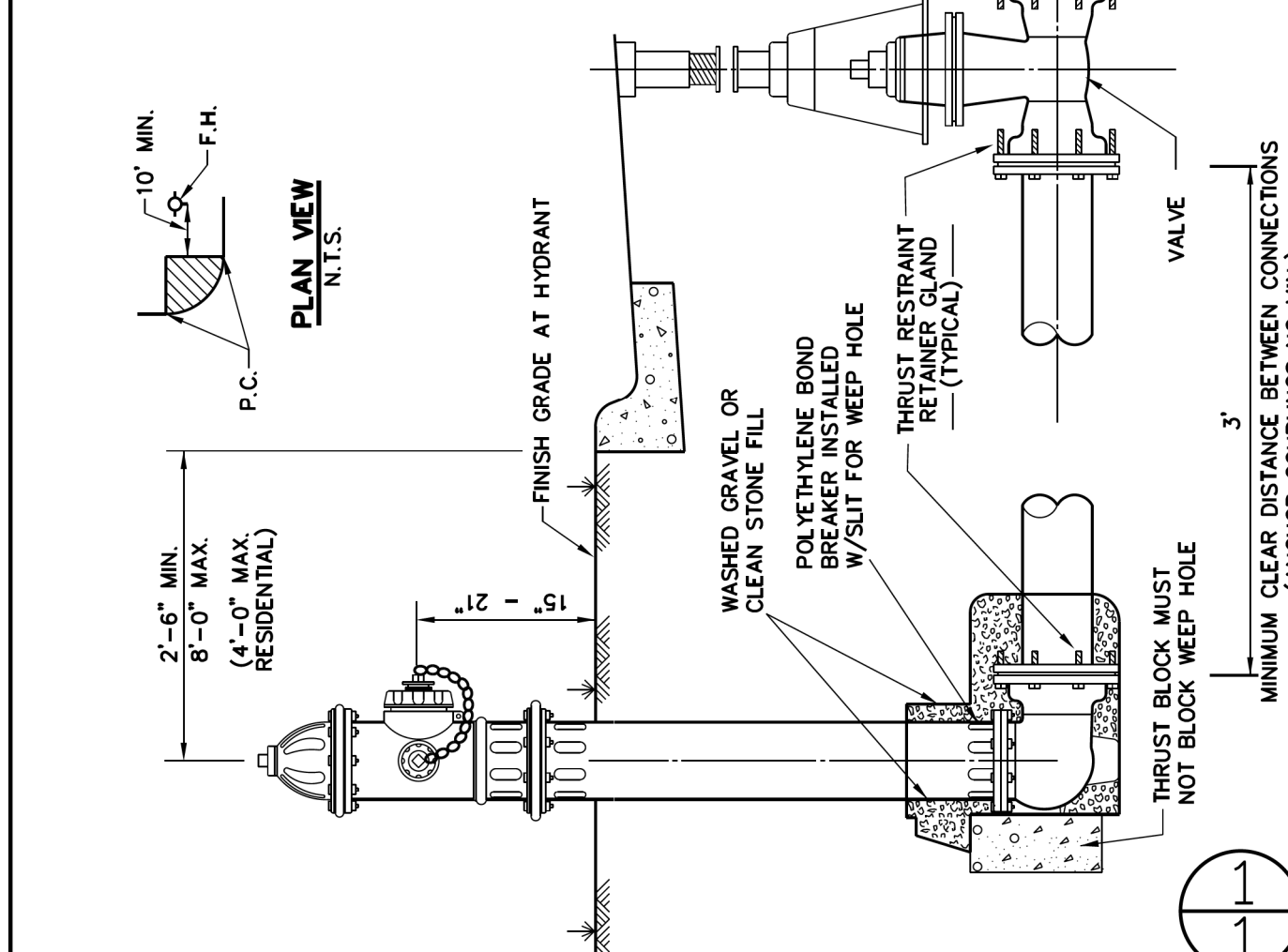
**GARLAND ENGINEERING**

**STANDARD DETAILS**

**CLASS I - WATER EMBEDMENT DETAIL**

PAGE 1

- NOTES:**
- ALL FIRE HYDRANTS SHALL CONFORM TO AWWA STANDARD SPECIFICATIONS FOR FIRE HYDRANTS FOR ORDINARY WATER WORKS SERVICE, C-502. FIRE HYDRANTS SHALL HAVE A 5/16" MIN. VALVE AND 1/2" MIN. HOSE CONNECTION. ALL HYDRANTS SHALL BE EQUIPPED WITH A BREAKAWAY FLANGE.
  - ALL JOINTS SHALL BE MECHANICAL JOINTS WITH THRUST RESTRAINER GLANDS. ALL FITTINGS AND VALVES SHALL BE LOCATED WITH NO LESS THAN 8 MILS AND SHALL HAVE A SUT FOR A WEEP HOLE.
  - TYPICAL VALVE, ACTUAL VALVE LOCATION WILL DEPEND ON LOCATION OF WATER MAIN.
  - F.H. NO CLOSER THAN 18" TO EXISTING OR PROPOSED SIDEWALKS (USUAL).
  - SET FIRE HYDRANT ON THE LOT LINE EXTENDED WHEN POSSIBLE.
  - F.H. SHALL BE LOCATED MINIMUM 10 FT. OUTSIDE OF THE AREA BETWEEN THE P.C.'S OF THE CORNER TURNING RADI AT INTERSECTIONS. (SEE PLAN VIEW) IN TRAFFIC LANE ADJACENT TO FIRE HYDRANT.
  - A BLUE ASPHYC 2-WAY REFLECTOR TO BE PLACED IN TRAFFIC LANE ADJACENT TO FIRE HYDRANT.
  - ACCEPTABLE FIRE HYDRANTS ARE: SERRAVALLO, KENNEDY GUARDIAN, CLOW-MEDALLION, OR FIFREFO MODEL F-06.
  - NEW FIRE HYDRANTS MUST BE WITHIN 12 MONTHS FROM DATE OF MANUFACTURE AT THE TIME OF PROJECT ACCEPTANCE. HYDRANTS OLDER THAN 12 MONTHS MUST BE APPROVED BY THE WATER DEPARTMENT.



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Revision Date: 12/12

Scale: N/A Date: 06/01/05

Design: GAV

Drawn: GAV

Dwg. File: FIR\_001.DWG

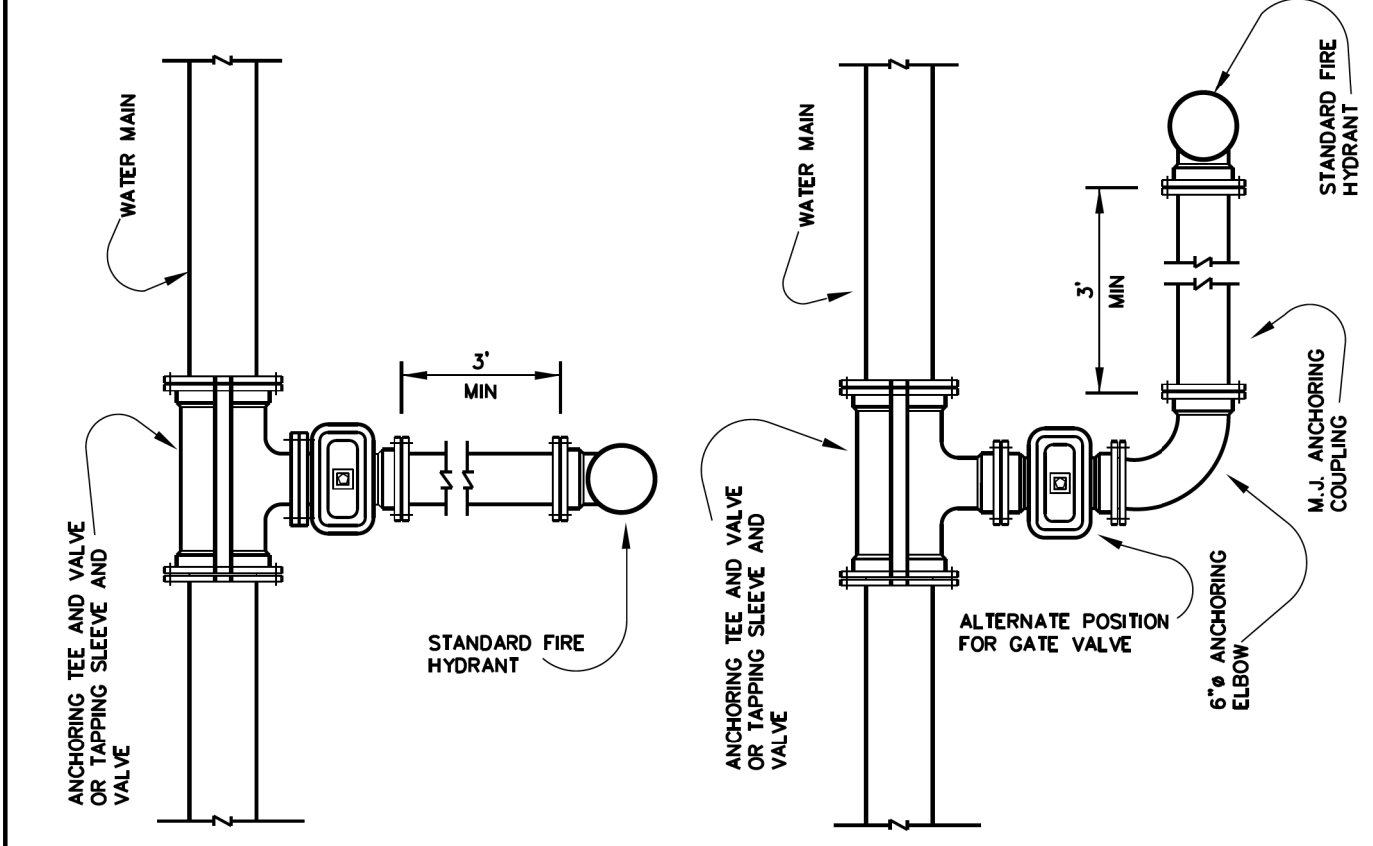
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**GARLAND ENGINEERING**

**STANDARD DETAILS**

**FIRE HYDRANT INSTALLATION**

PAGE 1



**STANDARD INSTALLATION ALTERNATE INSTALLATION**

1  
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Revision Date: 07/21/06

Scale: N/A Date: 06/01/05

Design: JMK

Drawn: JMK

Dwg. File: FIR\_002.DWG

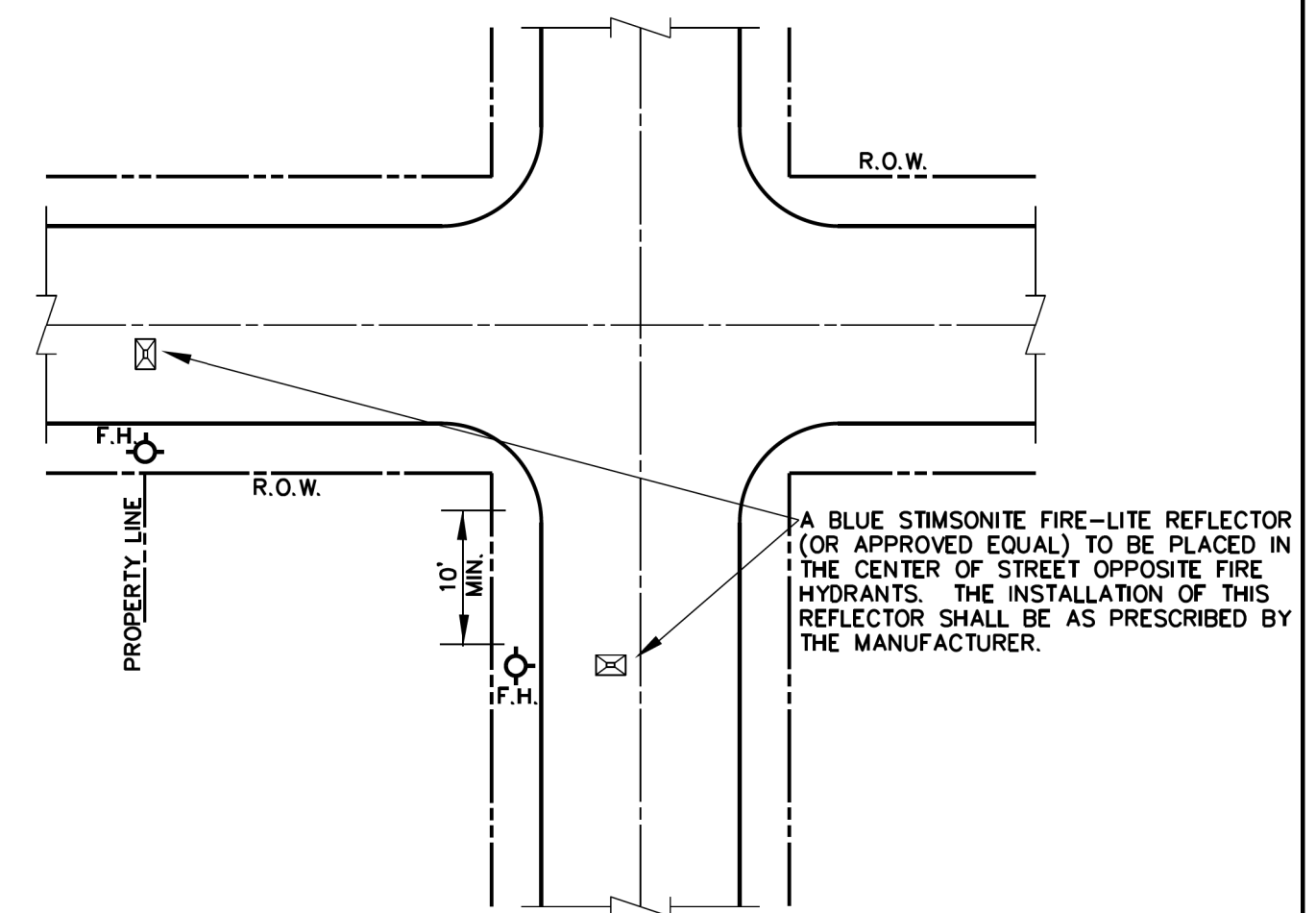
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**GARLAND ENGINEERING**

**STANDARD DETAILS**

**TYPICAL FIRE HYDRANT INSTALLATION**

PAGE 2



- NOTES:**
- DO NOT PLACE FIRE HYDRANT WITHIN CURB RADIUS RETURN.
  - WHERE FIRE HYDRANT IS TO BE LOCATED BETWEEN STREET INTERSECTIONS FIRE HYDRANTS SHALL BE PLACED AT A PROPERTY INTERSECTION (EXTENDED).

**TYPICAL FIRE HYDRANT REFLECTOR INSTALLATION**

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4

Revision Date:

Scale: N/A Date: 06/01/05

Design: JMK

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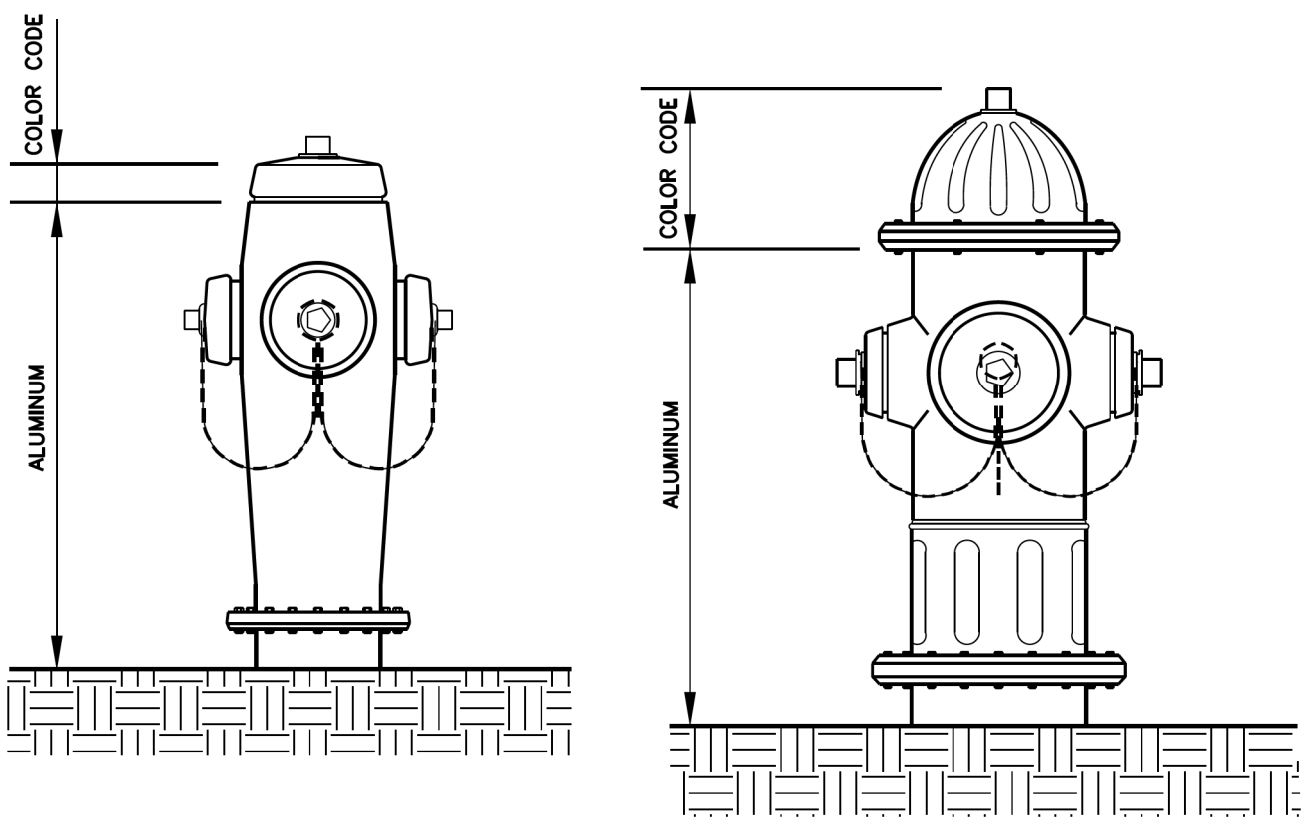
Project No.: STANDARD-DETAILS

**GARLAND ENGINEERING**

**STANDARD DETAILS**

**FIRE HYDRANT REFLECTOR INSTALLATION**

PAGE 4



**COLOR CODE**

6" MAINS	FLYNT ALUMINUM PAINT
8" WATER MAINS	FLYNT TROPIC BLUE ENAMEL 2543
10" MAIN OR LARGER	FLYNT SAFETY YELLOW ENAMEL FE95102

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4

Revision Date: 03/28/19

Scale: N/A Date: 06/01/05

Design: JMK

Drawn: JMK

Dwg. File: FIR\_005.DWG

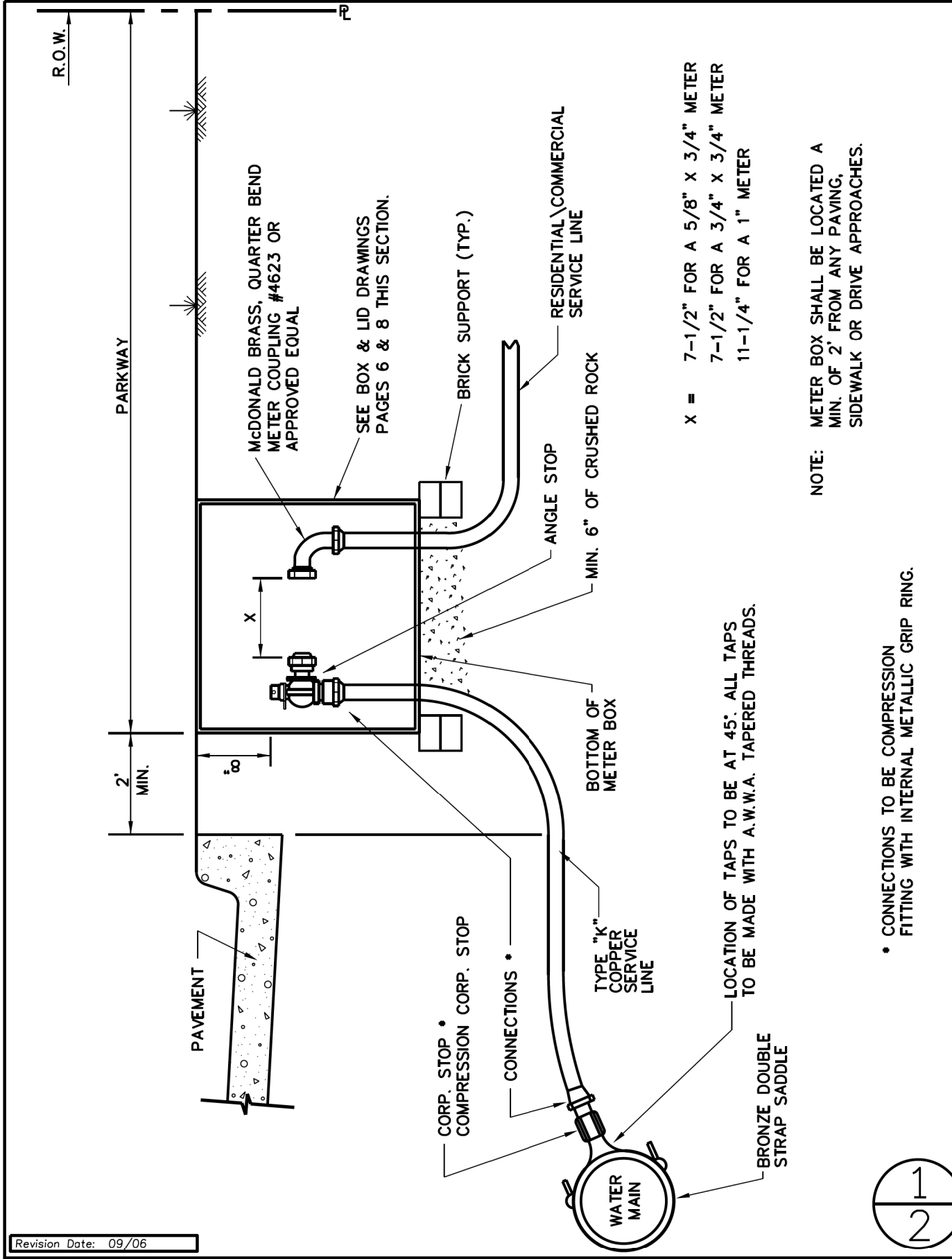
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**GARLAND ENGINEERING**

**STANDARD DETAILS**

**FIRE HYDRANT PAINTING DETAILS**

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Revision Date: 09/06

Scale: N/A Date: 06/01/05

Design: GAV

Drawn: GAV

Dwg. File: SER\_001.DWG

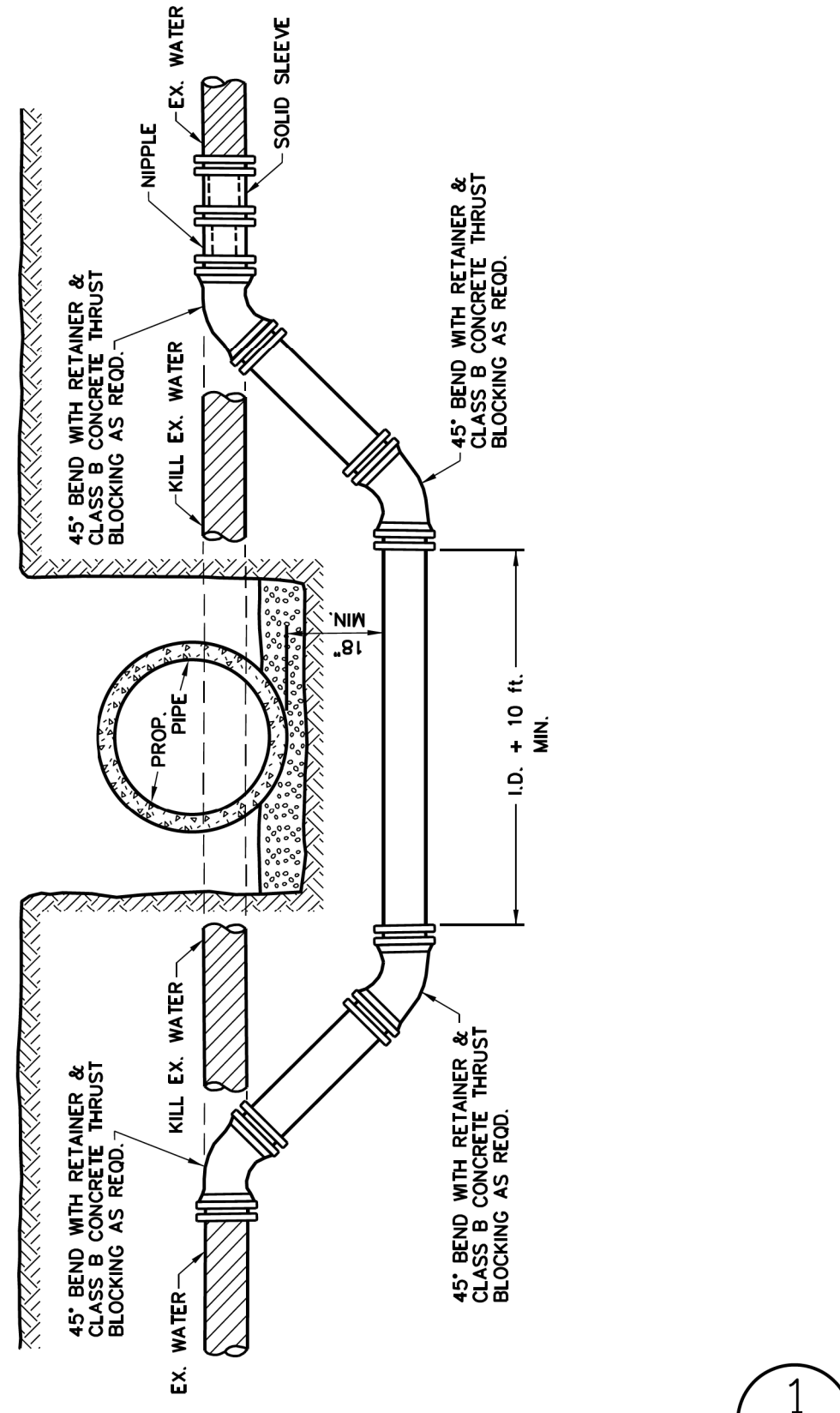
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**GARLAND ENGINEERING**

**STANDARD DETAILS**

**WATER SERVICE INSTALLATION 3/4" OR 1" LINE**

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Revision Date: 12/09

Scale: N/A Date: 02/24/06

Design: GAV

Drawn: GAV

Dwg. File: WATLOW\_001.DWG

Project No.: STANDARD-DETAILS

**GARLAND ENGINEERING**

**STANDARD DETAILS**

**STANDARD WATER MAIN LOWERING**

PAGE 18

**REVISIONS**

REV. NO.	DATE	DESCRIPTION	BY

**CRIADO** 4100 SPRING VALLEY RD., SUITE 1001 DALLAS, TX 75244 TEL 972-382-8925 FAX 972-382-8925

**GARLAND ENGINEERING** TEXAS MADE HERE

**STANDARD DETAILS**

**WATER**

WYNN JOYCE ROAD 24" WATER LINE

CITY OF GARLAND, TEXAS

DESIGN	DRAWN	DATE	SCALE	COG PROJECT	SHEET
CRIADO	CRIADO	October 2021	N/A	WA26-2021	14

**TOP VIEW** **BOTTOM VIEW**

DFW18AMR-1BA%T 100-LID

CRUSH RESISTANT RIBBING  
3x4" PIPE SLOT ON MOST MODELS  
CAST IRON RING

METER BOX SHALL BE "F" SERIES BY DFW PLASTICS INC. OR APPROVED EQUAL. ALL SPECS ARE SUBJECT TO CHANGE WITHOUT NOTICE.

Part No.	Series	Size	Height	ID	OD
DFW-1818F	F	18x18"	18"	14"	18"
DFW-1818-PLCIR	F	18x18"	18"	14"	18"
DFW-18RING	F	18"	1 1/2"	11 3/4"	17 3/4"
DFW18AMR-1BA%T 100-LID	F	12"	1 1/2"		

\* SEE SHEET 4 FOR LID AND BODY DETAILS

Revision Date: 04/19  
Scale: N/A Date: 06/01/05  
Design: DCN  
Drawn: DCN  
Dwg. File: SER\_002.DWG  
Project No.: STANDARD-DETAILS

**GARLAND ENGINEERING**  
STANDARD DETAILS

**BOX AND LID FOR 5/8" & 3/4" METERS**

PAGE 5

**NOTES**

METER BOX SHALL BE BLACK AND CONSTRUCTED OUT OF MODIFIED POLYETHYLENE MATERIAL FOR MAXIMUM DURABILITY AND CORROSION RESISTANCE.

THE BLACK MATERIAL IS FOR MAXIMUM UV PROTECTION. THE BLACK MATERIAL SHALL BE UNIFORM THROUGHOUT THE METER BOX FOR MAXIMUM LONGEVITY AND NOT HAVE A FOAMING AGENT THAT CREATES AIR POCKETS WITHIN THE PLASTIC WALL.

**PLASTIC LID**

- THE LID SHALL HAVE "WATER METER" MOLDED INTO THE LID WITH A DIAMOND PATTERN FOR SKID RESISTANCE.
- THE LID SHALL SEAT SECURELY AND EVENLY INSIDE THE CAST IRON RING.
- THE LID SHALL HAVE A SPRING LOADED PLASTIC LOCKING MECHANISM THAT USES A STANDARD BRASS KEY (MFG BY MIDLAND MFG. CO. #1414)

**PLASTIC BODY**

- THE BODY SHALL HAVE CRUSH RESISTANT RIBBING ALONG THE OUTSIDE OF THE BOX WITH 2" BASE FOOTING LOCATED AT THE BOTTOM OF THE METER PIT TO HELP ELIMINATE SINKING OR FLOATING ONCE INSTALLED.
- THE BODY SHALL HAVE A PATENTED UNIVERSAL RING LOCATOR MOLDED INTO THE TOP OF THE METER PIT TO HELP SECURE CAST IRON RING (MFG BY SIGMA) ONTO TOP OF METER PIT WITH 4 COATED SELF TAPPING BOLTS.
- THE BODY SHALL HAVE ONE PIPE SLOT ON EACH END OF THE BODY THAT MEASURE 3"x4"

Revision Date: 05/05  
Scale: N/A Date: 06/01/05  
Design: DCN  
Drawn: DCN  
Dwg. File: SER\_005.DWG  
Project No.: STANDARD-DETAILS

**GARLAND ENGINEERING**  
STANDARD DETAILS

**GENERAL NOTES & LID AND BODY DETAILS**

PAGE 8

**INSTALLATION ONE** **INSTALLATION TWO**

ANCHORING TEE AND VALVE OR TAPPING SLEEVE AND VALVE  
ANCHORING BEND  
M.J. ANCHORING COUPLING  
ALTERNATE POSITION FOR GATE VALVE

Revision Date: 11/09  
Scale: N/A Date: 06/01/05  
Design: JMK  
Drawn: JMK  
Dwg. File: FIR\_002.DWG  
Project No.: STANDARD-DETAILS

**GARLAND ENGINEERING**  
STANDARD DETAILS

**VALVE AND TEE INSTALLATION**

PAGE 17

THERE WILL BE A MINIMUM OF 3' CLEAR DISTANCE BETWEEN ANY TAP, BEND OR FITTING ON ANY CITY WATER MAIN.

Revision Date: 09/06  
Scale: N/A Date: 07/21/06  
Design: JMK  
Drawn: JMK  
Dwg. File: SER\_009.DWG  
Project No.: STANDARD-DETAILS

**GARLAND ENGINEERING**  
STANDARD DETAILS

**TYPICAL SPACING FOR TAPS/FITTINGS**

PAGE 14

**TYPICAL VALVE SETTING AND BOX**

COVER  
FINISH GRADE  
VALVE BOX WITH NECESSARY EXTENSIONS  
WATER LINE EMBEDMENT TYPICAL  
WATER MAIN

NOTE:

- RESILIENT SEAT VALVES 4" THRU 12" IN SIZE SHALL BE IN ACCORDANCE WITH AWWA STANDARD C-509.
- C-900 PVC PIPE BELL SECTION SHALL BE USED FOR VALVE STACKS WITH ADJUSTABLE VALVE BOXES.
- CUT A "V" SHAPED SYMBOL ON THE NEAREST CURB FACE WITH THE POINT OF THE "V" SYMBOL POINTING TOWARDS THE VALVE LOCATION.

Revision Date: 10/14  
Scale: N/A Date: 06/01/05  
Design: JMK  
Drawn: JMK  
Dwg. File: VAL\_005.DWG  
Project No.: STANDARD-DETAILS

**GARLAND ENGINEERING**  
STANDARD DETAILS

**TYPICAL GATE VALVE INSTALLATION**

PAGE 6

**TYPICAL RESIDENTIAL WATER & SAN. SEWER CONNECTION DETAIL**

LOT LINE  
50' R.O.W.  
27' B-B  
3/4" Wtr. Svc. Typ. w/Meter Box  
4" San. Sew. Svc. Typ.  
C.L.  
7'-6"  
6"  
1'-0"  
4" SIDEWALK TYP.  
BACK OF CURB  
STORM SEWER  
SAN SEWER MAIN  
C.L. STREET TYP.  
WATER MAIN (Typ. North or East of Street Lt.)  
4" SIDEWALK TYP.  
1'-0"  
C.L.  
7'-6"  
6"  
10" TYP.  
3/4" Wtr. Svc. Typ. w/Meter Box  
4" San. Sew. Svc. Typ.  
Single Stack Double-Sweep Clean Out  
6" TYP.  
3/4" Wtr. Svc. Typ. w/Meter Box  
7'-6"  
6"  
10" TYP.  
4" San. Sew. Svc. Typ.  
Single Stack Double-Sweep Clean Out  
1'-0"  
BLUE TWO-WAY REFLECTOR 1'-0" OFF C  
FIRE HYDRANTS ARE NOT ALLOWED IN DRIVEWAY OR STREET INTER-SECTION RADIUS  
4'-0" MAX.

NOTE: METERS AND FIRE HYDRANTS ARE NOT ALLOWED IN CONCRETE PAVEMENT.

Revision Date: 10/14  
Scale: N/A Date: 02/24/06  
Design: JMK  
Drawn: JMK  
Dwg. File: SER\_001.DWG  
Project No.: STANDARD-DETAILS

**GARLAND ENGINEERING**  
STANDARD DETAILS

PAGE 1

REVISIONS			
REV. NO.	DATE	DESCRIPTION	BY

**CRIADO** 4100 SPRING VALLEY RD., SUITE 1001 DALLAS, TX 75244 TEL: 972.302.8025 FAX: 972.302.8025

**GARLAND ENGINEERING** TEXAS MADE HERE

**STANDARD DETAILS**

**WATER**

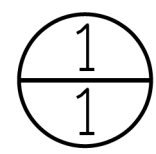
WYNN JOYCE ROAD 24" WATER LINE

CITY OF GARLAND, TEXAS

DESIGN	DRAWN	DATE	SCALE	COG PROJECT	SHEET
CRIADO	CRIADO	October 2021	N/A	WA26-2021	15

**GENERAL NOTES FOR ALL THRUST BLOCKS**  
IN CONJUNCTION WITH THRUST RETAINER GLANDS

- CONCRETE FOR BLOCKING SHALL BE CLASS "B".
- ALL CALCULATIONS ARE BASED ON INTERNAL PRESSURE OF 200 PSI FOR DUCTILE IRON, P.V.C., AND 150 PSI FOR CONCRETE PIPE.
- VOLUMES OF THRUST BLOCKS ARE NET VOLUMES OF CONCRETE TO BE FURNISHED. THE CORRESPONDING WEIGHT OF THE CONCRETE (CLASS "B") IS EQUAL TO OR GREATER THAN THE VERTICAL COMPONENT OF THE THRUST ON THE VERTICAL BEND.
- WALL THICKNESS (T) ASSUMED HERE FOR ESTIMATING PURPOSES ONLY.
- POUR CONCRETE FOR BLOCK AGAINST UNDISTURBED EARTH.
- DIMENSIONS MAY BE VARIED AS REQUIRED BY FIELD CONDITIONS WHERE AND AS DIRECTED BY THE ENGINEER. THE VOLUME OF CONCRETE BLOCKING SHALL NOT BE LESS THAN SHOWN HERE.
- THE SOIL BEARING PRESSURES ARE BASED ON 1000 LBS./S.F. IN SOIL AND 2000 LBS./S.F. IN ROCK.
- USE POLYETHYLENE BOND BREAKER OR EQUAL BETWEEN CONCRETE AND BEND, TEE, OR PLUG.
- CONCRETE SHALL NOT EXTEND BEYOND JOINTS.

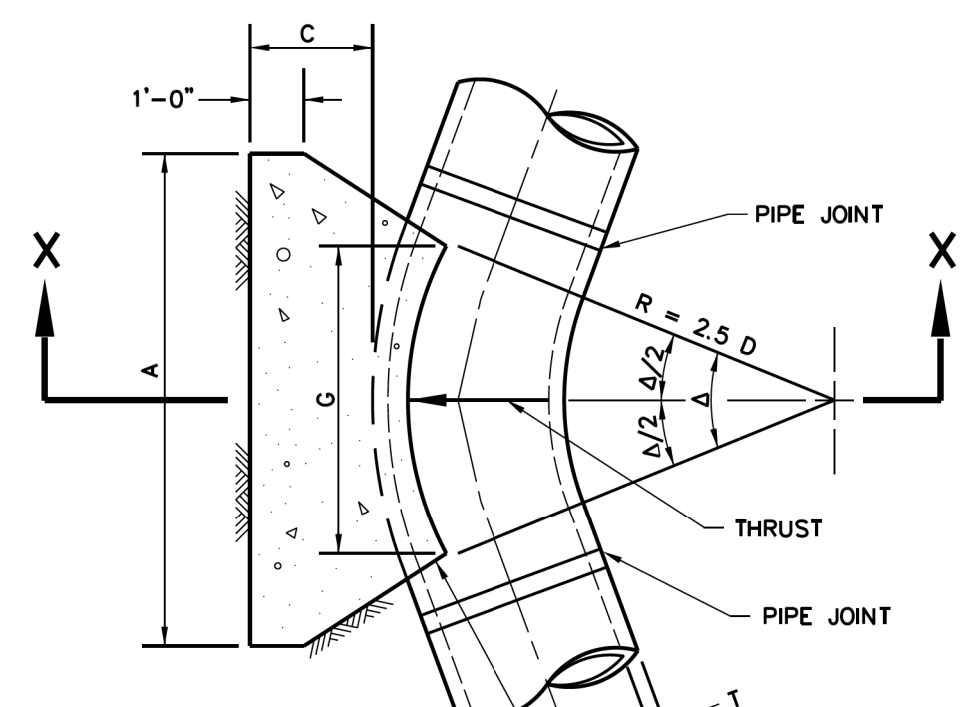


Revision Date: \_\_\_\_\_  
Scale: N/A Date: 06/01/05  
Design: GAV  
Drawn: GAV  
Dwg. File: THR\_005.DWG  
Project No.: STANDARD-DETAILS

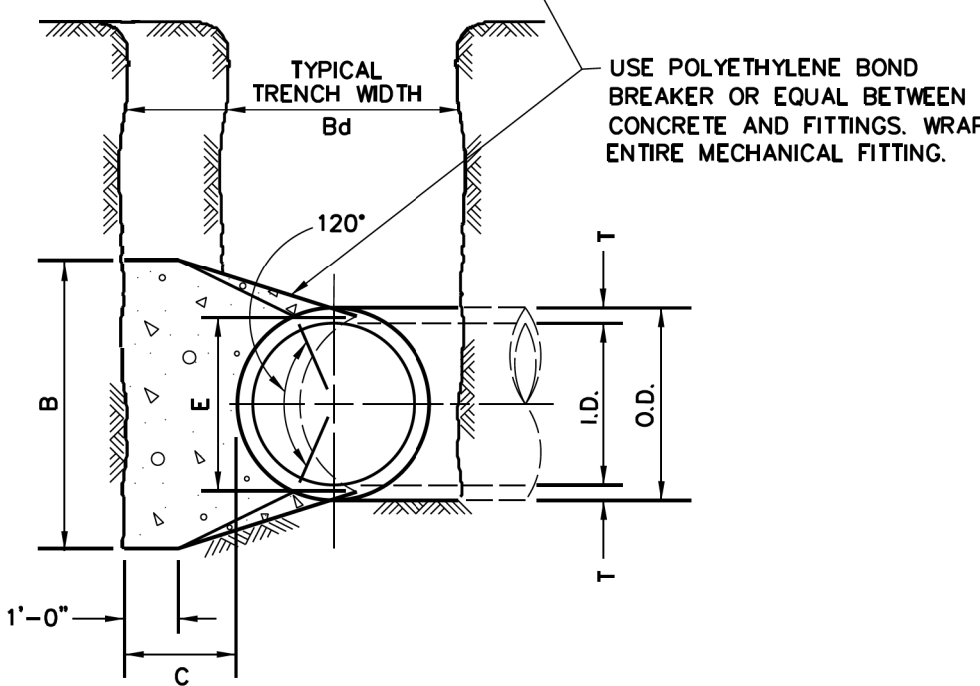
**THRUST BLOCK GENERAL NOTES**

PAGE **6**

**GARLAND**  
ENGINEERING  
STANDARD DETAILS



**PLAN**  
N.T.S.



**SECTION X-X**  
N.T.S.

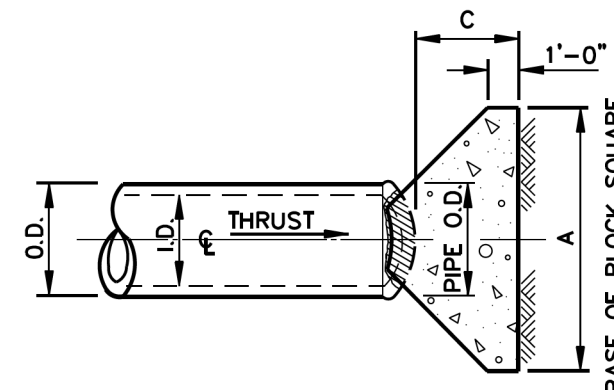
NOTE: REFER TO STANDARD DRAWINGS THR\_004 AND THR\_005 PAGES 4 AND 5 FOR DIMENSION TABLE AND QUANTITIES

Revision Date: 12/11  
Scale: N/A Date: 06/01/05  
Design: GAV  
Drawn: GAV  
Dwg. File: THR\_003.DWG  
Project No.: STANDARD-DETAILS

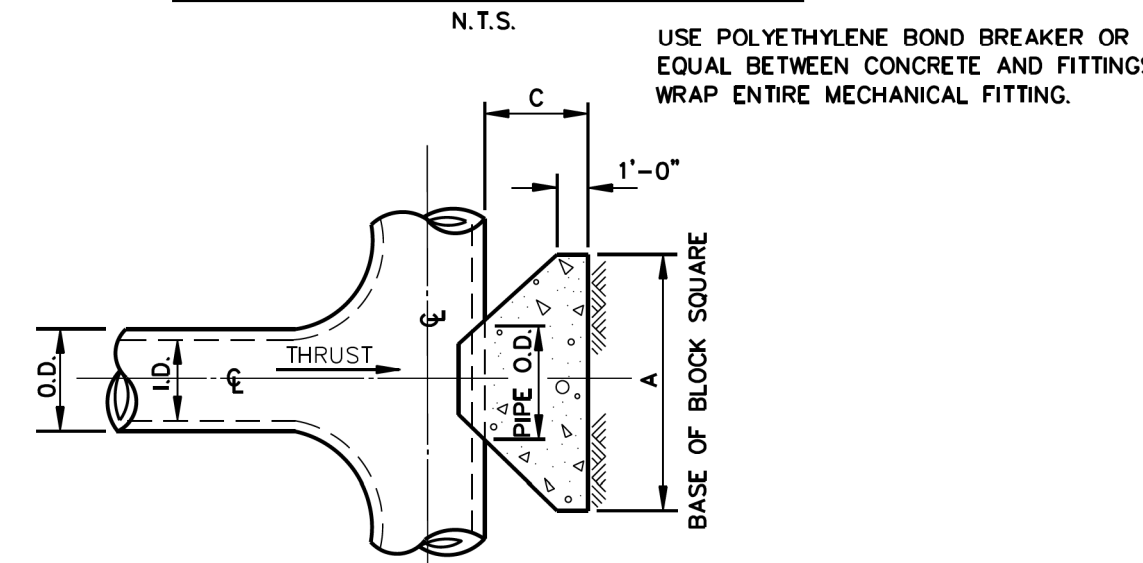
**HORIZONTAL THRUST BLOCK AT PIPE BEND**

PAGE **3**

**GARLAND**  
ENGINEERING  
STANDARD DETAILS



**PLAN OF PLUG THRUST BLOCK**  
N.T.S.



**PLAN OF TEE THRUST BLOCK**  
N.T.S.

I.D. (IN.)	THRUST (TONS)	EARTH			ROCK		
		A (FT.)	B (FT.)	VOL. (C.Y.)	A (FT.)	B (FT.)	VOL. (C.Y.)
4.6,8	5.1	1.5	2.5	0.3	2.0	0.2	
10,12	11.3	1.5	3.5	0.6	2.5	0.3	
16,18	25.5	2.0	5.5	1.6	4.0	0.9	
20	31.5	2.0	6.0	1.9	4.0	0.9	
24	45.2	2.5	7.0	3.1	5.0	1.7	
30	53.0	3.0	7.5	4.1	5.5	2.4	
36	76.3	4.0	9.0	7.3	6.5	4.2	
42	104.0	4.5	10.5	11.0	7.5	6.2	
48	136.0	5.0	12.0	15.6	8.5	8.7	
54	172.0	5.5	13.5	21.4	9.5	11.9	
60	212.0	6.0	15.0	28.4	10.5	15.7	
66	257.0	6.5	16.5	36.8	11.5	20.5	
72	305.0	7.5	17.5	47.2	12.5	27.2	
78	358.0	8.0	19.0	59.9	13.5	33.7	
84	416.0	8.5	20.5	72.3	14.5	41.2	
90	477.0	9.0	22.0	87.7	15.5	49.7	
96	543.0	9.5	23.5	104.8	16.5	61.0	

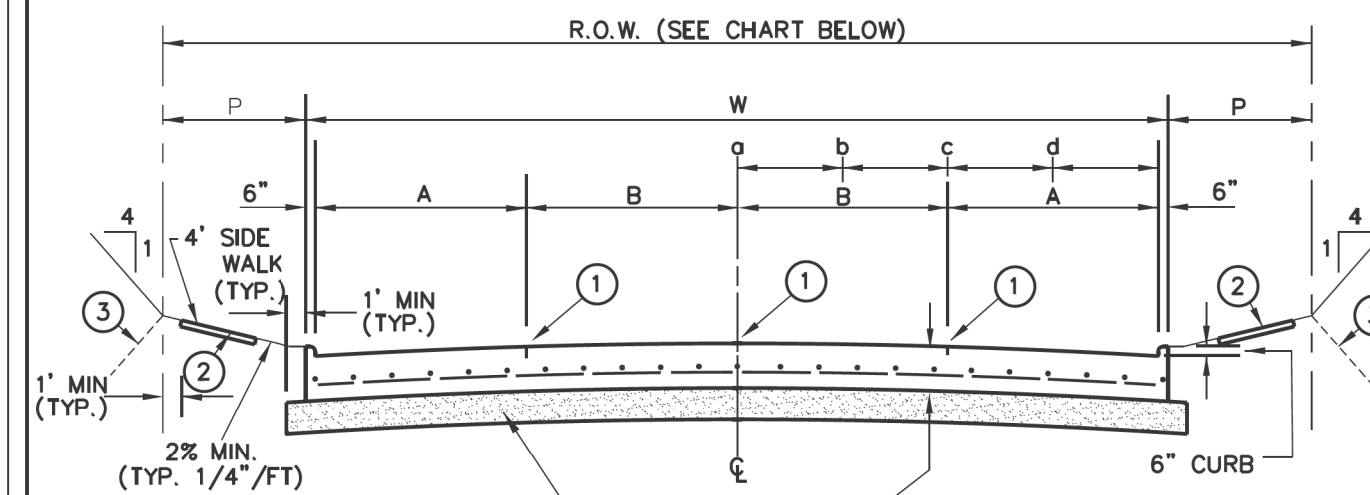
NOTE: SEE THRUST BLOCK GENERAL NOTES PAGE 6

Revision Date: 12/11  
Scale: N/A Date: 06/01/05  
Design: GAV  
Drawn: GAV  
Dwg. File: THR\_001.DWG  
Project No.: STANDARD-DETAILS

**HORIZONTAL THRUST BLOCK AT TEES AND PLUGS**

PAGE **1**

**GARLAND**  
ENGINEERING  
STANDARD DETAILS



CLASS "P1" REINFORCED CONCRETE, #4 BARS ON 18" CENTERS BOTH WAYS

USE THE FOLLOWING RATIO:  
LIME 18# PER SQ. YD.  
CEMENT 36# PER SQ. YD.

- INDICATES SAWED & SEALED LONGITUDINAL CONTRACTION OR CONSTRUCTION JOINT.
- SIDEWALK CROSS SLOPE 1% MAX.
- SLOPE EXCEEDING 4:1 ONLY ALLOWED WITH STABILITY ANALYSIS.

TYPE (*)	STREET WIDTH (W)	A	B	R.O.W. WIDTH	P	PARABOLIC CROWN HEIGHT	MIN. PAVING THICKNESS
G	27' B-B	0'	13'	50'	11.5'	5"	6"
F	37' B-B (RES)	8'	10'	60'	11.5'	6"	7"
F	37' B-B (COM)	8'	10'	60'	11.5'	7"	8"
E	45' B-B	11'	11'	80'	17.5'	8"	10"
D2	61' B-B	10'	10'	80'	9.5'	8"	9"
D1	62' B-B	10.5'	10'	82'	10'	8"	10"

(\*) PER C.O.G. MAJOR THOURGFARE PLAN

Total Crown	1/4" MID CUTTER			3/4" CUTTER
	(a)	(b)	(c)	
5"	4-11/16"	3-3/4"	2-3/16"	
6"	5-5/8"	4-1/2"	2-5/8"	
7"	6-9/16"	5-1/4"	3-1/16"	
8"	7-1/2"	6"	3-1/2"	

- NOTES:
- ALL REINFORCEMENT SHALL BE #4 BARS ON 18" CENTERS BOTH WAYS, EXCEPT WHERE NOTED.
  - PAVEMENT SHALL BE CLASS "P1" CONCRETE.

**STABILIZATION OF DISTURBED AREAS PRIOR TO FINAL ACCEPTANCE:**  
PUBLIC RIGHT-OF-WAY, EASEMENT, AND COMMON AREAS MUST BE STABILIZED WITH PERENNIAL VEGETATION COVER, FULLY ESTABLISHED WITH 100% COVERAGE, OR OTHER APPROVED STABILIZATION METHOD.

Revision Date: 04/19  
Scale: N/A Date: 06/01/05  
Design: GAV  
Drawn: GAV  
Dwg. File: PAV\_003.DWG  
Project No.: STANDARD-DETAILS

**TYPICAL PAVING SECTION**

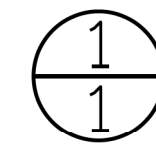
PAGE **5**

**GARLAND**  
ENGINEERING  
STANDARD DETAILS

I.D. (IN.)	T (IN.)	$\Delta = 11.25'$		$\Delta = 22.50'$		E (FT.)
		A (FT.)	B (FT.)	A (FT.)	B (FT.)	
4.6,8	0.4	1.5	1.5	1.5	0.9	
10,12	0.5	1.5	1.5	1.5	1.2	
16,18	0.6	1.5	1.5	1.5	1.6	
20	0.7	1.5	1.5	1.5	1.8	
24	0.9	1.5	1.5	1.5	2.1	
30	2.9	1.5	1.9	2.6		
36	4.5	1.5	2.3	3.3		
42	5.0	1.8	2.6	3.8		
48	5.5	2.0	3.0	4.3		
54	6.0	2.3	3.4	4.8		
60	6.5	2.5	3.8	5.3		
66	6.8	2.8	4.1	5.7		
72	7.5	3.0	4.5	6.3		
78	7.5	3.3	4.9	6.7		
84	8.0	3.5	5.3	7.2		
90	8.5	3.8	5.6	7.7		
96	9.0	4.0	6.0	8.2		

I.D. (IN.)	G (FT.)	THRUST (TONS)	$\Delta = 11.25'$			$\Delta = 22.50'$			I.D. (IN.)	G (FT.)	THRUST (TONS)	$\Delta = 11.25'$			$\Delta = 22.50'$								
			A (FT.)	B (FT.)	VOL. (C.Y.)	A (FT.)	B (FT.)	VOL. (C.Y.)				A (FT.)	B (FT.)	VOL. (C.Y.)	A (FT.)	B (FT.)	VOL. (C.Y.)						
4.6,8	1.0	1.0	1.0	1.0	0.1	4.6,8	0.8	2.0	1.5	0.1	4.6,8	2.7	7.1	5.0	1.5	0.4	2.0	0.2					
10,12	0.6	2.2	1.5	1.5	0.1	10,12	1.1	4.4	2.0	2.5	0.3	1.5	1.5	0.1	10,12	4.0	16.0	6.5	2.5	1.0	3.5	2.5	0.5
16,18	0.8	5.0	2.0	2.5	0.3	1.5	2.0	0.2	16,18	1.6	9.9	3.0	3.5	0.6	2.0	2.5	0.3						
20	0.9	6.2	2.0	3.5	0.4	1.5	3.0	0.3	20	1.8	12.3	3.5	3.5	0.7	2.0	3.0	0.4						
24	1.1	8.9	3.0	3.5	0.5	1.5	3.0	0.3	24	2.2	17.7	4.0	4.5	1.0	3.0	3.5	0.5						
30	1.4	10.4	3.0	3.5	0.6	2.0	3.5	0.4	30	2.7	20.7	5.0	4.5	1.5	3.0	4.0	0.8						
36	1.7	15.0	3.5	4.5	0.9	2.0	4.0	0.5	36	3.3	29.8	5.5	5.5	2.3	4.0	4.0	1.3						
42	1.9	20.4	4.5	5.0	1.5	2.5	5.0	0.8	42	3.8	40.5	7.0	6.0	3.9	4.5	5.0	2.1						
48	2.2	26.6	4.5	6.0	2.0	2.5	6.0	1.1	48	4.4	52.9	8.0	7.0	5.7	4.5	6.0	2.8						
54	2.5	33.7	6.0	6.0	3.0	3.0	6.0	1.4	54	4.9	67.0	9.0	8.0	8.0	6.0	6.0	4.1						
60	2.7	41.6	6.0	7.0	3.8	3.0	7.0	1.8	60	5.5	82.7	9.5	9.0	10.6	6.0	7.0	5.3						
66	3.0	50.3	6.5	8.0	5.1	3.5	8.0	2.7	66	6.0	100.1	10.5	10.0	14.1	6.5	8.0	7.2						
72	3.3	59.9	7.5	8.0	6.3	4.0	8.0	3.3	72	6.6	119.1	11.0	11.0	17.6	7.5	8.0	9.1						
78	3.6	70.2	8.0	9.0	8.1	4.0	9.0	3.9	78	7.1	139.8	12.0	12.0	22.5	8.0	9.0	11.7						
84	3.8	81.5	8.5	10.0	10.3	4.5	10.0	5.3	84	7.6	162.1	13.0	12.5	27.2	8.5	10.0	14.8						
90	4.1	93.5	9.5	10.0	12.2	5.0	10.0	6.3	90	8.2	186.1	14.0	13.5	33.7	9.5	10.0	17.7						
96	4.4	106.4	10.0	11.0	15.0	5.0	11.0	7.4	96	8.7	211.7	15.0	14.5	41.2	10.0	11.0	21.8						

**TABLES OF DIMENSIONS AND QUANTITIES**



Revision Date: \_\_\_\_\_  
Scale: N/A Date: 06/01/05  
Design: GAV  
Drawn: GAV  
Dwg. File: THR\_004.DWG  
Project No.: STANDARD-DETAILS

**HORIZONTAL THRUST BLOCK AT PIPE BEND**

PAGE **4**

**GARLAND**  
ENGINEERING  
STANDARD DETAILS

I.D. (IN.)	G (FT.)	THRUST (TONS)	$\Delta = 30'$			$\Delta = 45'$			I.D. (IN.)	G (FT.)	THRUST (TONS)	$\Delta = 30'$			$\Delta = 45'$		
			A (FT.)	B (FT.)	VOL. (C.Y.)	A (FT.)	B (FT.)	VOL. (C.Y.)				A (FT.)	B (FT.)	VOL. (C.Y.)	A (FT.)	B (FT.)	VOL. (C.Y.)
4.6,8	1.0	2.6	2.0	1.5	0.2	1.0	1.5	0.1	4.6,8	1.5	3.9	2.0	2.0	0.2	1.5	1.5	0.1
10,12	1.5	5.9	2.5	2.5	0.3	2.0	1.5	0.2	10,12	2.2	8.7	3.5	2.5	0.5	2.0	2.5	0.3
16,18	2.2	13.2	3.5	4.0	0.8	2.5	3.0	0.4	16,18	3.2	19.5	4.5	4.5	1.2	3.0	3.5	0.6
20	2.4	16.3	4.5	4.0	1.0	3.0	3.0	0.5	20	3.6	24.1	5.5	4.5	1.5	3.5	3.5	0.7
24	2.9	23.4	6.0	4.0	1.4	3.5	3.5	0.7	24	4.3	34.6	8.0	4.5	2.3	4.5	4.0	1.1
30	3.6	27.5	6.5	5.0	1.9	3.5	4.0	0.9	30	5.4	40.6	8.5	5.0	3.2	5.5	4.0	1.6
36	4.4	39.5	7.0	6.0	3.4	4.5	4.5	1.6	36	6.5	58.5	10.0	6.0	5.3	6.5	4.5	2.6
42	5.1	53.8	8.0	7.0	5.1	5.5	5.0	2.5	42	7.5	79.6	11.5	7.0	8.1	8.0	5.0	4.2
48	5.8	70.3	9.0	8.0	7.4	6.0	6.0	3.7	48	8.6	104.0	13.0	8.0	11.9	9.0	6.0	6.3
54	6.5	89.0	10.0	9.0	10.3	7.0	6.5	5.3	54	9.7	131.5	15.0	9.0	17.1	10.5	6.5	8.9
60	7.3	110.0	11.0	10.0	13.9	7.5	7.5	7.3	60	10.7	162.4	16.5	10.0	23.1	11.0	7.5	12.0
66	8.0	132.9	12.5	11.0	18.9	8.5	8.0	9.6	66	11.8	196.5	18.0	11.0	30.1	12.0	8.5	16.2
72	8.7	158.2	13.5	12.0	24.0	9.0	9.0	12.3	72	12.9	233.9	19.5	12.0	38.6	14.0	8.5	20.7
78	9.4	185.6	14.5	13.0	30.0	10.0	9.5	15.6	78	13.9	274.5	21.5	13.0	49.8	14.5	9.5	25.9
84	10.1	215.3	15.5	14.0	37.1	10.5	10.5	19.5	84	15.0	318.4	23.0	14.0	61.2	15.5	10.5	32.6
90	10.9	247.1	16.5	15.0	45.0	11.5	11.0	23.9	90	16.1	365.5	24.5	15.0	74.5	17.5	10.5	39.6
96	11.6	281.2	18.0	16.0	55.5	12.5	11.5										