16C

Fort Bend County
Engineering Department
301 Jackson Suite 401
Richmond, Texas 77469
281.633.7500
Permits@fortbendcountytx.gov

REVIEW BY FORT BEND COUNTY COMMISSIONERS COURT

☐ **Right of Way Permit**

☒ **Commercial Driveway Permit**

Permit No: 2017-17119

Applicant: Jaho, Inc.

Job Location Site: 6440 Oilfield Road, Sugar Land, TX 77479

Bond No. [redacted] **Date of Bond:** 11/29/2017 **Amount:** $5,000.00

The above applicant came to make use of certain Fort Bend County property subject to, "The Order Regulating the Laying, Construction, Maintenance, and Repair of Buried Cables, Conduits, and Pole Lines, In, Under, Across or Along Roads, Streets, Highways, and Drainage Ditches in Fort Bend County, Texas, Under the Jurisdiction of the Commissioners Court of Fort Bend County, Texas," as passed by the Commissioners Court of Fort Bend County, Texas, of the Minutes of the Commissioners Court of Fort Bend County, Texas, to the extent that such order is not inconsistant with Chapter 181, Vernon's Texas Statutes and Codes Annoted.

Notes:

1. Evidence of review by the Commissioners Court must be kept on the job site and failure to do so constitutes grounds for job shutdown.
2. Written notices are required:
   a. 48 hours in advance of construction start up, and
   b. When construction is completed and ready for final inspection, submit notification to Permit Administrator thru MyGovernmentOnline.org portal.
3. This permit expires one (1) year from date of permit if construction has not commenced.

On this 12th day of December, 2017, Upon Motion of Commissioner Meyers, seconded by Commissioner Patterson, duly put and carried, it is ORDERED, ADJUDGED AND DECREED that said notice of said above purpose is hereby acknowledged by the Commissioners Court of Fort Bend County, Texas, and that said notice be placed on record according to the regulation order thereof.

Signature

By: Charles O. Dean
for County Engineer

N/A
By: _____
Drainage District Engineer/Manager

Presented to Commissioners Court and approved.

Date Recorded 12-18-2017 Comm. Court No. 16C

Clerk of Commissioners Court
By: Linda Willis
Deputy

12-18-2017 Original sent to Charles Dean, Engineering dept.

Fort Bend County
Engineering Department
301 Jackson Suite 401
Richmond, Texas 77469
281.633.7500
Permits@fortbendcountytx.gov

PERMIT APPLICATION REVIEW FORM FOR CABLE, CONDUIT, AND POLE LINE ACTIVITY IN FORT BEND COUNTY

[ ] **Right of Way Permit**

[X] **Commercial Driveway Permit**

Permit No: 2017-17119

The following "Notice of Proposed Cable, Conduit, and/or Pole Line activity in Fort Bend County" and accompanying attachments have been reviewed and the notice conforms to appropriate regulations set by Commissioner's Court of Fort Bend County, Texas.

(1) COMPLETE APPLICATION FORM:

- [X] a. Name of road, street, and/or drainage ditch affected.
- [X] b. Vicinity map showing course of directions
- [X] c. Plans and specifications

(2) BOND:

- [ ] County Attorney, approval when applicable.
- [ ] Perpetual bond currently posted. Bond No: _____ Amount: _____
- [X] Performance bond submitted. Bond No: [redacted] Amount: $5,000.00
- [ ] Cashier's Check Check No: _____ Amount: _____

(3) DRAINAGE DISTRICT APPROVAL (WHEN APPLICABLE):

_____ _____
Drainage District Approval Date

We have reviewed this project and agree it meets minimum requirements.

Charles O. Ay

Permit Administrator

12/1/2017
Date

4 pgs 2017137332

PERFORMANCE BOND COVERING ALL CABLE, CONDUIT AND/OR POLE LINE ACTIVITY IN, UNDER, ACROSS OR ALONG FORT BEND COUNTY ROAD AUTHORIZED

BOND NO [redacted]

THE STATE OF TEXAS §

KNOW ALL MEN BY THESE PRESENTS:

COUNTY OF FORT BEND §

THAT WE, Jaho, Inc. **whose address is** 2003 Wilson Rd., Humble, TX 77396 **Texas, hereinafter called the Principal, And** Fidelity and Deposit Company of Maryland **, a Corporation existing under and by virtue of the laws of the state of** Maryland **and authorized to do an indemnifying business in the state of Texas, and whose principal office is located at** 1299 Zurich Way, 5th Floor, Schaumburg, IL 60196 **, whose officer residing in the State of Texas, authorized to accept service in all suits and actions brought whining said state is** Tracey Haley **and Whose address is** 12222 Merit Drive, 8th Floor, Dallas, TX 75251 **, hereinafter called the Surety, and held and firmly bound unto , Robert e. Hebert, County Judge of Fort Bend County, Texas, or his successors in office, in the full sum of** Five Thousand and 00/100 Cents **Dollars ($** 5,000.00 **) current, lawful money of the United Stated of America, to be paid to said Robert E. Hebert, County Judge of Fort Bend County, Texas, or his successors in office, to which payment well and truly to be made and done, we, the undersigned, bind ourselves and each of us, our heirs, executors, administrators, successors, assigns, and legal representatives, jointly and severally, by these presents.**

THE CONDITION OF THIS BOND IS SUCH THAT, WHEREAS, the above bounden principal contemplates laying, constructing, maintaining and/or repairing one or more cables, conduits, and/or pole lines in, under, across and/or along roads, streets and highways, commercial driveway and median openings or modifications in the County of Fort Bend, and the State of Texas, under the jurisdiction of the Commissioners' Court of Fort Bend County, Texas, pursuant to the Commissioners' Court order adopted on the 1st day of December, A.D. 1980, recorded in Volume 13, of the Commissioners' Court Minutes of Fort Bend County, Texas, regulating same, which Commissioners' Court order is hereby referred to and made a part hereof for all purposes as though fully set out herein;

AND WHEREAS, the principal desires to provide Fort Bend County with a performance bond covering all such cable, conduit and/or pole line activity, commercial driveway and median openings or modifications;

NOW, THEREFORE, if the above bounden principal shall faithfully perform all its cable, conduit and/or pole line activity (including, but not limited to the laying, construction, maintenance and/or repair of cables, conduits and/or pole lines) in, under, across and/or along roads, streets and highways, commercial driveway and median openings or modifications in the County of Fort Bend and State of Texas, under the jurisdiction of the Commissioners Court of Fort Bend County, Texas, pursuant to and in accordance with minimum requirements and conditions of the above mentioned Commissioners' Court order set forth and specified to be by said principal done and performed, at the time and in the manner therein specified, and shall pay over and make good and reimburse Fort Bend County, all loss and damages which Fort Bend County may sustain by reason of any failure or default on the part of said principal, then this obligation shall be null and void, otherwise to remain in full force and effect.

This bond is payable at the County Courthouse in the County of Fort Bend and State of Texas.

It is understood that at any time Fort Bend County deems itself insecure under this bond, it may require further and/or additional bonds of the principal.

EXECUTED this 29th **day of** November **, 20** 17 **.**

Jaho, Inc.
PRINCIPAL

BY GREG POLLARD - VP

Fidelity and Deposit Company of Maryland
SURETY

BY Jessica Richmond, Attorney-in-Fact

SEAL

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CCM 12-12-2017 # 16 C
Fort Bend County Clerk
Return Admin Serv Coord RAC
Permit #20171119

ZURICH AMERICAN INSURANCE COMPANY
COLONIAL AMERICAN CASUALTY AND SURETY COMPANY
FIDELITY AND DEPOSIT COMPANY OF MARYLAND
POWER OF ATTORNEY

KNOW ALL MEN BY THESE PRESENTS: That the ZURICH AMERICAN INSURANCE COMPANY, a corporation of the State of New York, the COLONIAL AMERICAN CASUALTY AND SURETY COMPANY, a corporation of the State of Maryland, and the FIDELITY AND DEPOSIT COMPANY OF MARYLAND a corporation of the State of Maryland (herein collectively called the "Companies"), by **MICHAEL BOND, Vice President,** in pursuance of authority granted by Article V, Section 8, of the By-Laws of said Companies, which are set forth on the reverse side hereof and are hereby certified to be in full force and effect on the date hereof, do hereby nominate, constitute, and appoint **Philip N. BAIR, Eric S. FEIGHL and Jessica RICHMOND, all of Houston, Texas, EACH** its true and lawful agent and Attorney-in-Fact, to make, execute, seal and deliver, for, and on its behalf as surety, and as its act and deed: **any and all bonds and undertakings, EXCEPT bonds on behalf of Independent Executors, Community Survivors and Community Guardians.** and the execution of such bonds or undertakings in pursuance of these presents, shall be as binding upon said Companies, as fully and amply, to all intents and purposes, as if they had been duly executed and acknowledged by the regularly elected officers of the ZURICH AMERICAN INSURANCE COMPANY at its office in New York, New York., the regularly elected officers of the COLONIAL AMERICAN CASUALTY AND SURETY COMPANY at its office in Owings Mills, Maryland., and the regularly elected officers of the FIDELITY AND DEPOSIT COMPANY OF MARYLAND at its office in Owings Mills, Maryland., in their own proper persons.

The said Vice President does hereby certify that the extract set forth on the reverse side hereof is a true copy of Article V, Section 8, of the By-Laws of said Companies, and is now in force.

IN WITNESS WHEREOF, the said Vice-President has hereunto subscribed his/her names and affixed the Corporate Seals of the said **ZURICH AMERICAN INSURANCE COMPANY, COLONIAL AMERICAN CASUALTY AND SURETY COMPANY, and FIDELITY AND DEPOSIT COMPANY OF MARYLAND**, this 8th day of June, A.D. 2017.

ATTEST:

ZURICH AMERICAN INSURANCE COMPANY
COLONIAL AMERICAN CASUALTY AND SURETY COMPANY
FIDELITY AND DEPOSIT COMPANY OF MARYLAND

By: _____
Secretary
Michael McKibben

_____
Vice President
Michael Bond

State of Maryland
County of Baltimore

On this 8th day of June, A.D. 2017, before the subscriber, a Notary Public of the State of Maryland, duly commissioned and qualified, **MICHAEL BOND, Vice President, and MICHAEL MCKIBBEN, Secretary,** of the Companies, to me personally known to be the individuals and officers described in and who executed the preceding instrument, and acknowledged the execution of same, and being by me duly sworn, deposeth and saith, that he/she is the said officer of the Company aforesaid, and that the seals affixed to the preceding instrument are the Corporate Seals of said Companies, and that the said Corporate Seals and the signature as such officer were duly affixed and subscribed to the said instrument by the authority and direction of the said Corporations.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed my Official Seal the day and year first above written.

_____
Constance A. Dunn, Notary Public
My Commission Expires: July 9, 2019

EXTRACT FROM BY-LAWS OF THE COMPANIES

"Article V, Section 8, Attorneys-in-Fact. The Chief Executive Officer, the President, or any Executive Vice President or Vice President may, by written instrument under the attested corporate seal, appoint attorneys-in-fact with authority to execute bonds, policies, recognizances, stipulations, undertakings, or other like instruments on behalf of the Company, and may authorize any officer or any such attorney-in-fact to affix the corporate seal thereto; and may with or without cause modify of revoke any such appointment or authority at any time."

CERTIFICATE

I, the undersigned, Vice President of the ZURICH AMERICAN INSURANCE COMPANY, the COLONIAL AMERICAN CASUALTY AND SURETY COMPANY, and the FIDELITY AND DEPOSIT COMPANY OF MARYLAND, do hereby certify that the foregoing Power of Attorney is still in full force and effect on the date of this certificate; and I do further certify that Article V, Section 8, of the By-Laws of the Companies is still in force.

This Power of Attorney and Certificate may be signed by facsimile under and by authority of the following resolution of the Board of Directors of the ZURICH AMERICAN INSURANCE COMPANY at a meeting duly called and held on the 15th day of December 1998.

RESOLVED: "That the signature of the President or a Vice President and the attesting signature of a Secretary or an Assistant Secretary and the Seal of the Company may be affixed by facsimile on any Power of Attorney...Any such Power or any certificate thereof bearing such facsimile signature and seal shall be valid and binding on the Company."

This Power of Attorney and Certificate may be signed by facsimile under and by authority of the following resolution of the Board of Directors of the COLONIAL AMERICAN CASUALTY AND SURETY COMPANY at a meeting duly called and held on the 5th day of May, 1994, and the following resolution of the Board of Directors of the FIDELITY AND DEPOSIT COMPANY OF MARYLAND at a meeting duly called and held on the 10th day of May, 1990.

RESOLVED: "That the facsimile or mechanically reproduced seal of the company and facsimile or mechanically reproduced signature of any Vice-President, Secretary, or Assistant Secretary of the Company, whether made heretofore or hereafter, wherever appearing upon a certified copy of any power of attorney issued by the Company, shall be valid and binding upon the Company with the same force and effect as though manually affixed.

IN TESTIMONY WHEREOF, I have hereunto subscribed my name and affixed the corporate seals of the said Companies, this 29th day of November, 20 17.

David McVicker, Vice President

TO REPORT A CLAIM WITH REGARD TO A SURETY BOND, PLEASE SUBMIT ALL REQUIRED INFORMATION TO:

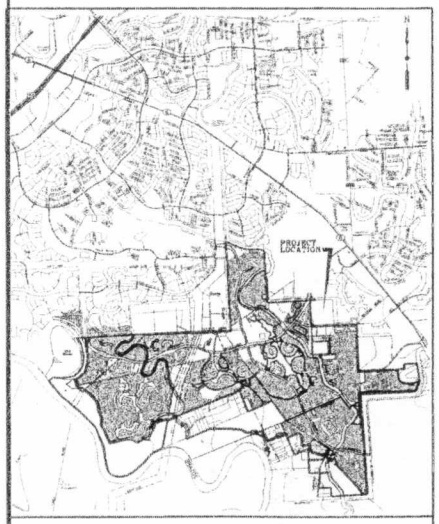
Zurich American Insurance Co.
Attn: Surety Claims
1299 Zurich Way
Schaumburg, IL 60196-1056

FILED AND RECORDED
OFFICIAL PUBLIC RECORDS

Laura Richard

Laura Richard, County Clerk
Fort Bend County Texas
December 15, 2017 02:57:03 PM
FEE: $0.00 SB **2017137332**

CONSTRUCTION PLANS
FOR
WATER, SEWER, DRAINAGE & PAVING IMPROVEMENTS
FOR
THE GROVE AT RIVERSTONE SECTION ONE
FORT BEND COUNTY M.U.D. No. 129
FORT BEND COUNTY, TEXAS



VICINITY MAP
N.T.S.

missouri CITY
TEXAS

RON J. DECHERT
92644
LICENSED PROFESSIONAL ENGINEER
3-22-17

CITY OF MISSOURI CITY
DIRECTOR OF PUBLIC WORKS/ CITY ENGINEER: Sundhi Kuvara, P.E.
DATE: 3/23/17
APPROVAL VOID IF NO PROGRESS HAS BEEN MADE TOWARDS COMPLETION OF THE PROJECT WITHIN TWO YEARS OF DATE OF SIGNATURE.

FORT BEND COUNTY ENGINEER
ENGINEER: Allen J. Stein, III, PE for RICHARD W. STOLLER, P.E.
DATE: 3/30/17
THESE SIGNATURES ARE VOID IF CONSTRUCTION HAS NOT COMMENCED WITHIN ONE (1) YEAR FROM THE DATE OF APPROVAL.
APPROVED: Mary Ingle
DEVELOPMENT COORDINATOR
DATE: 3/30/17

811
Know what's below.
Call before you dig.

Costello
Engineering and Surveying
9990 Richmond Avenue, Suite 450 N
Houston, Texas 77042
(713) 783-7788 (713) 783-3580, Fax
TBPE FIRM REG. No. 280
TBPLS FIRM REG. No. 100486

JOB NO. 2016-159-001/101

DATE: NOVEMBER 2016

CONTACT NUMBERS

CITY OF MISSOURI CITY - PUBLIC WORKS DEPT	281-403-8578
FORT BEND COUNTY M.U.D. No.129 - OPERATOR - SI ENVIRONMENTAL	832-490-1500
FORT BEND COUNTY M.U.D. No.129 - ENGINEER - COSTELLO, Inc.	713-783-7788
FORT BEND COUNTY DRAINAGE DISTRICT	281-342-2863

INDEX OF DRAWINGS

DESCRIPTION

STRUCTURAL DRAWINGS

MISSOURI CITY DETAILS

GENERAL NOTES

1. CONTRACTOR SHALL CONTACT THE CITY OF MISSOURI CITY ENGINEERING DEPT. (281-261-4280), FORT BEND COUNTY ENGINEERING (281-633-7500), AND MR. ROY DOCKERY (713-783-7788) 48 HOURS PRIOR TO THE START OF ANY CONSTRUCTION.
2. CONTRACTOR SHALL GIVE COSTELLO, INC. (713-783-7788), THREE (3) WORKING DAYS NOTICE FOR CONSTRUCTION CONTROL STAKING, AND 48 HOURS NOTICE IN ADVANCE OF BEGINNING CONSTRUCTION.
3. CONTRACTOR SHALL CONTACT UTILITY FOLLOWING 72 HOURS PRIOR TO ANY WORK ON EXISTING WATER LINES- SEWNVIRONMENTAL (832-490-1500).
4. ALL UNSATISFACTORY AND/OR WASTE MATERIALS INCLUDING STRIPPINGS, VEGETATION ROOTS, CONCRETE, DEBRIS AND EXCESS EXCAVATION SHALL BE HAULED OFF SITE BY THE CONTRACTOR. INCLUDE COST OF THIS WORK INCLUDING HAUL IN OTHER ITEMS OF THIS PROJECT. ALL TREES ARE NOT INDICATED ON THE CONSTRUCTION PLANS. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VISIT THE SITE AND DETERMINE THE EXTENT OF TREE REMOVAL REQUIRED.
5. CONTRACTOR SHALL MAINTAIN ADEQUATE DRAINAGE AT ALL TIMES DURING CONSTRUCTION OF PROPOSED IMPROVEMENTS.
6. EXISTING UTILITIES ARE INDICATED IN AN APPROXIMATE MANNER ONLY. ALL EXISTING UTILITIES MAY NOT BE SHOWN. CONTRACTOR SHALL VERIFY LOCATION AND ELEVATION OF EXISTING IMPROVEMENTS PRIOR TO CONSTRUCTION OF PROPOSED IMPROVEMENTS. CONTRACTOR SHALL NOTIFY UTILITIES 48 HOURS PRIOR TO COMMENCEMENT OF CONSTRUCTION. CONTACT TEXAS ONE CALL (811).
7. ALL EXISTING LANDSCAPING, IRRIGATION, SIDEWALKS, FENCES, UTILITIES AND OTHER EXISTING IMPROVEMENTS DAMAGED DURING CONSTRUCTION WILL BE REPLACED OR REPAIRED TO THEIR ORIGINAL CONDITION BY THE CONTRACTOR AT HIS EXPENSE.
8. ALL WORK SHALL BE COMPLETED TO THE SATISFACTION OF THE CITY OF MISSOURI CITY, FORT BEND COUNTY, THE ENGINEER AND THE OWNER.
9. MANHOLE RIM ELEVATIONS SHOWN ON THE PLANS ARE APPROXIMATE. ALL FINAL MANHOLE RIM ELEVATIONS ARE TO BE SET AT 4-INCHES ABOVE FINISHED GRADE IN STREET R.O.W. AND 6" ABOVE NATURAL GROUND WITHIN EASEMENTS. ALL EXISTING MANHOLES WITHIN OR ADJACENT TO THE PROJECT ARE TO BE ADJUSTED TO 4-INCHES ABOVE FINISHED GRADE AFTER FINAL GRADING IS COMPLETE. THIS NOTE SHALL GOVERN SHOULD A CONFLICT ARISE WITH THE ELEVATIONS ON THE PLAN AND PROFILE SHEETS.
10. MAINTAIN A MINIMUM OF 6-INCHES OF CLEARANCE BETWEEN ALL UTILITIES EXCEPT WATER AND SANITARY. WATER AND SANITARY CLEARANCE SHALL BE A MINIMUM OF 12-INCHES.
11. INCLUDE PRICE OF ALL BEDDING AND BACKFILL REQUIRED FOR WATER LINES, SANITARY SEWERS AND STORM SEWERS IN THE PRICE BID PER LINEAR FOOT OF PIPE.
12. UPON PROJECT COMPLETION AND PRIOR TO FINAL RELEASE OF RETAINAGE, CONTRACTOR SHALL COMPLY WITH ALL REQUIREMENTS OF SECTION 01770 "PROJECT RECORD DOCUMENTS" OF THE CONTRACT.
13. DELIVERY TICKETS FOR ALL MATERIALS (I.E. CONCRETE, CEMENT STABILIZED SAND, ETC.) SHALL BE MAINTAINED BY THE CONTRACTOR AND UPON WRITTEN REQUEST BE MADE AVAILABLE TO THE ENGINEER.
14. PRIOR TO FINAL RELEASE OF RETAINAGE, THE CONTRACTOR SHALL PROVIDED A NOTARIZED CERTIFICATION THAT ALL MATERIALS INSTALLED IN THE PROJECT WERE INSTALLED IN PLACE IN ACCORDANCE WITH APPROVED PLANS AND SPECIFICATIONS.
15. ALL WATER, SANITARY AND STORM SEWER STUBS ARE TO BE MARKED IN ACCORDANCE WITH THE CITY OF MISSOURI CITY STANDARD. (SEE DETAIL SHEET).
16. THE CONTRACTOR SHALL CONFINE HIS WORK EFFORTS WITHIN THE EASEMENTS SHOWN ON THE PLANS UNLESS SPECIFICALLY AUTHORIZED BY OWNER. EXTREME CARE SHOULD BE EXERCISED NEAR ADJACENT PROPERTY TO PROTECT ANY EXISTING TREES AND PROPERTY. ONLY THOSE TREES DIRECTLY IN THE PATH OF PAVING OR UTILITIES SHALL BE CONSIDERED FOR REMOVAL. ONCE CONSTRUCTION STAKING IS COMPLETE, COORDINATE WITH THE OWNER AND THE INSPECTOR TO DETERMINE TREES, IF ANY, ARE TO BE SAVED. REFERENCE THE TECHNICAL SPECIFICATIONS FOR DAMAGES.
17. ANY CONSTRUCTION WHICH HINDERS TRAFFIC OR REQUIRES TRAFFIC DIVERSION SHALL BE DONE ACCORDING TO TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES. TEXAS DEPARTMENT OF TRANSPORTATION IS REQUIRED TO CONTROL TRAFFIC FOR MATERIAL AND OR EQUIPMENT DELIVERIES. THE CONTRACTOR IS RESPONSIBLE FOR PREPARING AND OBTAINING CITY OF MISSOURI CITY APPROVAL FOR ALL TRAFFIC CONTROL PRIOR TO IMPLEMENTING SAME.
18. THE CONTRACTOR SHALL NOTIFY THE CITY OF MISSOURI CITY ENGINEERING DEPARTMENT AND THE ENGINEER IMMEDIATELY IF UNSTABLE SOILS ARE ENCOUNTERED.
19. PRIOR TO EXCAVATION, THE CONTRACTOR SHALL STRIP THE VEGETATION IN ALL AREAS WHERE EMBANKMENT IS TO BE CONSTRUCTED. EXCAVATED MATERIALS IS TO BE PLACED OR IN ANY LOCATION WHERE CONSTRUCTION WILL BE PERFORMED. THE LIMITS OF THE STRIPPING OPERATION IS DEFINED AS THE REMOVAL OF ALL GRASS AND THE ORGANIC ZONE.
20. ALL EXCESS EXCAVATION SHALL BE EVENLY SPREAD AND COMPACTED ON THE PROJECT SITE AS DIRECTED BY THE ENGINEER OR THE CONTRACTOR. ALL SUCH EXCESS EXCAVATED MATERIAL SHALL BE REMOVED, PROPERLY HAULED AND DISPOSED OF FOR THE WORK INVOLVED IN CLEARING AND GRUBBING BID ITEM, UNDER COMPLETION OF UTILITIES. ALL SPOILS SHALL BE SPREAD AND SHAPED TO A SMOOTH, UNIFORM APPEARANCE AS DIRECTED BY THE ENGINEER (NO SEPARATE PAY).
21. THE CONTRACTOR SHALL CONTACT THE DISTRICT OPERATOR TO ARRANGE FOR THE OPERATION OF ALL VALVES ON THE EXISTING WATER SYSTEM THAT ARE AFFECTED BY THE CONSTRUCTION. THIS SHALL RESULT IN A DAILY FEE IN ACCORDANCE WITH THE DISTRICT RATE ORDER.
22. THERE WILL BE NO SEPARATE PAYMENT FOR WORK SHOWN ON THESE DRAWINGS UNLESS SPECIFICALLY ESTABLISHED IN THE CONTRACT BID DOCUMENTS.
23. THE CONTRACTOR SHALL OBTAIN ALL REQUIRED PERMITS FROM THE CITY OF MISSOURI CITY AND FORT BEND COUNTY.
24. THE UTILITY CONTRACTOR AND PAVING CONTRACTOR SHALL EXECUTE THE REQUIRED POLLUTION PREVENTION PLAN (PPP) AND NOTICE OF INTENT FORM (NOI) FOR THIS PROJECT AND BE RESPONSIBLE FOR CONSTRUCTING AND MAINTAINING ITEMS IDENTIFIED IN THE PPP, AS THE FIRST ITEM OF WORK, THE CONTRACTOR SHALL ERECT ALL PERIMETER SILT FENCE AS SHOWN IN THE PPP. THE CONTRACTOR SHALL CONSTRUCT INLET PROTECTION BARRIERS AROUND ALL INLETS AS PER PPP AND AS DIRECTED BY ENGINEER.
25. REFERENCE IS MADE IN SUBSEQUENT NOTES AND DETAILS REGARDING THE PLACEMENT OF CEMENT STABILIZED SAND UNDER OR WITHIN 3 FEET OF EXISTING PAVEMENT. BY DEFINITION, THIS MEANS ALL AREAS BENEATH OR WITHIN 3 FEET OF PAVEMENT IN ADDITION TO A LINE STARTING AT 3 FEET FROM PAVEMENT AND EXTENDING DOWN AT 45° FROM THE PAVEMENT ON A DOWNWARD SLOPE OF ONE FOOT HORIZONTAL TO ONE FOOT VERTICAL.
26. THESE PLANS, PREPARED BY COSTELLO, INC., DO NOT EXTEND TO OR INCLUDE DESIGNS OR SYSTEMS PERTAINING TO THE SAFETY OF THE CONTRACTOR OR ITS EMPLOYEES, AGENTS OR REPRESENTATIVES IN THE PERFORMANCE OF THE WORK. THE SEAL OF THE REGISTERED PROFESSIONAL ENGINEER(S) HEREON DOES NOT EXTEND TO ANY SUCH SYSTEMS THAT MAY NOW OR HEREAFTER BE INCORPORATED IN THESE PLANS. THE CONTRACTOR SHALL PREPARE OR OBTAIN THE APPROPRIATE SAFETY SYSTEMS, INCLUDING THE PLANS AND SPECIFICATIONS REQUIRED BY THE HOUSE BILLS 852 AND 885 ENACTED BY THE TEXAS LEGISLATURE IN THE 70TH LEGISLATURE REGULAR SESSION AND CURRENT OSHA STANDARDS FOR TRENCH SAFETY. DESIGN OF TRENCH SAFETY SYSTEMS, SEALED BY A LICENSED PROFESSIONAL ENGINEER, SHALL BE ACQUIRED BY THE CONTRACTOR PRIOR TO EXECUTION OF THIS WORK.

Continuation of General notes

27. THE CONTRACTOR SHALL COORDINATE WITH THE SOILS LABORATORY AND DIG TEST HOLES TO OBTAIN PROCTOR PRIOR TO COMMENCING WORK ON SECTIONS OF STREET.
28. CONTRACTOR SHALL UNCOVER EXISTING UTILITIES AT ALL POINTS OF CONNECTION/CROSSING PRIOR TO THE START OF CONSTRUCTION. IF CONFLICTS EXIST, CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER AND OWNER IN WRITING.
29. ALL CONTRACTOR VEHICLES, INCLUDING EMPLOYEE'S VEHICLES, SHALL PARK WITHIN THE PROJECT SITE AND NOT ON ADJACENT PUBLIC STREETS. A SIGN SHALL BE INSTALLED AT THE WORK SITE ENTRANCE. CONTRACTOR WILL BE RESPONSIBLE FOR ANY DAMAGE TO PUBLIC STREETS. ANY PUBLIC STREETS OR ANY AREAS DISTURBED OR DESTROYED BY VEHICULAR PARKING WILL BE RESTORED TO ITS ORIGINAL CONDITION AT THE EXPENSE OF THE PROJECT. NO SEPARATE PAYMENT SHALL BE MADE FOR THIS ITEM.
30. IF SOIL CONDITIONS ARE ENCOUNTERED THAT REQUIRE MAINTAIN A VEHICLE WASHDOWN AREA OF SUFFICIENT SIZE AND IN A LOCATION TO FACILITATE CONSTRUCTION TRAFFIC WITHOUT THE VEHICLE PRIOR TO LEAVING THE WORK SITE. CONTRACTOR SHALL PROVIDE THE NECESSARY EQUIPMENT FOR WATER AND DRAINAGE TO MAINTAIN THE WASHDOWN AREA. VEHICLE WASHDOWN AREA WILL BE PROVIDED DURING WET OR MUDDY CONDITIONS AT THE DIRECTION OF THE ENGINEER OR OWNER. ALL CONSTRUCTION WATER USED SHALL BE OBTAINED FROM A CITY APPROVED SEWER SYSTEM WITHOUT SUCH ENTRANCE LOCATION BEING PROTECTED BY AN APPROPRIATE BACK FLOW PROTECTION DEVICE. CONTRACTOR SHALL BE ON A DAILY BASIS, CLEAN ALL STREETS IN THE VICINITY OF THE WORK SITE ENTRANCE TO PREVENT THE TRACKING OF MUD THAT PROJECT ACCUMULATES IN THE EXISTING STREETS. NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK. A PENALTY WILL BE ASSESSED IN ACCORDANCE WITH THE CONTRACT FOR EACH DAY STREETS ARE NOT CLEANED AFTER NOTIFICATION BY THE ENGINEER.
31. THE CONTRACTOR SHALL NOT OPERATE EXISTING WATER LINE VALVES UNLESS SPECIFICALLY DIRECTED BY THE EXISTING WATER LINE OPERATOR. ALL SUCH OPERATIONS SHALL BE DONE BY DISTRICT OPERATOR.
32. BORE PITS SHALL BE LOCATED NO CLOSER THAN 5-FEET FROM AN EXISTING BACK OF CURB UNLESS NO OTHER CIRCUMSTANCE.
33. ALL MATERIALS INSTALLED ON THIS PROJECT MUST COMPLY WITH THE CITY OF MISSOURI CITY APPROVED PRODUCT LIST.
34. ALL EXISTING DITCHES PROPOSED FOR FILL (OR THOSE FILLED DURING THE COURSE OF THE PROJECT) SHALL BE COMPLETELY STRIPPED (A MINIMUM OF 6-INCHES) AND MUCKED OUT IN THE PRESENCE OF THE SOILS LABORATORY. REMOVED MATERIAL (STRIPPINGS AND MUCKING) SHALL BE TEMPORARILY STOCKPILED AND GRADED TO DRAIN. ALL SOIL TO FILL EXISTING DITCHES SHALL BE FREE OF ORGANICS AND DEBRIS. ALL FILL SHALL BE PLACED IN MAXIMUM 8-INCH LOOSE LIFTS AND COMPACTED TO A MINIMUM OF 95% STANDARD PROCTOR MAXIMUM DRY DENSITY AT +/- 2 PERCENTAGE POINTS OF OPTIMUM MOISTURE CONTENT AS DETERMINED BY ASTM D698. PAYMENT FOR ALL REQUIREMENTS FOR THE REMOVAL AND FILLING OF EXISTING DITCHES SHALL BE CONSIDERED INCIDENTAL TO THE VARIOUS BID ITEMS.
35. IN AREAS WHERE THE TOP OF THE COVER BETWEEN THE TOP OF WATER LINE, SANITARY OR STORM SEWER IS LESS THAN THREE (3) FEET, THE UTILITY CONTRACTOR SHALL PLACE CEMENT STABILIZED SAND OVER THE PIPE AS REQUIRED TO PROVIDE A MINIMUM COVER OF THREE (3) FEET.
36. THE UTILITY CONTRACTOR AND PAVING CONTRACTOR SHALL PERFORM A SITE INSPECTION AT THE END OF THE DAY'S WORK OF UTILITY CONSTRUCTION AND PRIOR TO PAVING OPERATIONS. THE UTILITY CONTRACTOR SHALL CLEAN ALL MUD AND DEBRIS PRIOR TO BALE-THRU WITH PAVING CONTRACTOR. THE UTILITY CONTRACTOR SHALL CORRECT ANY DEFICIENCIES FOUND DURING THE BALE-THRU AND ALL PIPES SHALL BE THOROUGHLY CLEAN. SUCH CORRECTIONS AND CLEANLINESS MUST BE SATISFIED BY THE ENGINEER'S PROJECT REPRESENTATIVE. ANY ITEMS NOT CORRECTED BY UTILITY CONTRACTOR (AND NOT VERIFIED BY ENGINEER'S REPRESENTATIVE) PRIOR TO PAVEMENT CONSTRUCTION SHALL BE RESPONSIBILITY OF THE UTILITY CONTRACTOR TO REPAIR AT THE END OF THE UTILITY CONTRACTOR'S WORK. PAVING CONTRACTOR HAS NO OBJECTION TO UTILITY CONTRACTOR DEFICIENCIES OR CLEANLINESS IN WRITING TO UTILITY CONTRACTOR AND ENGINEER PRIOR TO PAVING. SUCH DOCUMENTATION, ANY DEFICIENCIES LATER IDENTIFIED SHALL BE THE RESPONSIBILITY OF THE UTILITY CONTRACTOR.
37. THE RESPECTIVE CONTRACTOR (UTILITY OR PAVING) SHALL PROVIDE A WATERTIGHT JOB BOARD AT THE SITE ENTRANCE FOR POSTING NOI INFORMATION AND THE POLLUTION PREVENTION PLAN. THE RESPECTIVE CONTRACTOR SHALL ALSO PROVIDE THE REQUIRED SANITATION FACILITIES. ALL SUCH AFOREMENTIONED ITEMS MUST BE PROVIDED PRIOR TO BEGINNING WORK. FAILURE TO PROVIDE THE AFOREMENTIONED ITEMS WILL RESULT IN THE WITHHOLDING OF PAY REQUESTS. ALL SUCH ITEMS MUST BE REMOVED UPON PROJECT COMPLETION. (NO SEPARATE PAY).
38. IT IS THE CONTRACTOR'S RESPONSIBILITY (BOTH UTILITY & PAVING) TO CONTACT THE TESTING LABORATORY TO HAVE THE LAB PRESENT DURING ALL BACKFILL PLACEMENT OF ANY FILL OR ANY OTHER REQUIRED LAB TESTING.

WATER MAIN CONSTRUCTION NOTES

1. ALL WATER LINES 4-INCH TO 12-INCH SHALL HAVE A MINIMUM OF 4 FEET OF COVER FROM TOP OF CURB TO TOP OF PIPE OR FROM NATURAL GROUND TO TOP OF PIPE WHERE NO CURB IS PRESENT ALONG THE LINE. WATER LINES NOT LOCATED WITHIN STREET RIGHT-OF-WAY SHALL HAVE 5 FEET OF COVER, UNLESS OTHERWISE SHOWN ON THE PLANS.
2. WATER MAINS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE CITY OF MISSOURI CITY DESIGN STANDARDS AS CURRENTLY AMENDED UNLESS A VARIANCE IS SPECIFICALLY NOTED. ALL VALVES SHALL OPEN COUNTER CLOCKWISE.
4. ALL WATER LINES 4-INCH TO 12-INCH (EXCEPT STEEL WATER LINES) SHALL BE POLYVINYL CHLORIDE OF V.C.) CONFORMING TO A.W.W.A SPECIFICATION C-900 AS CURRENTLY REVISED. ALL HYDROSTATIC WATER TESTS SHALL CONFORM TO SAME A.W.W.A C-900 AS CURRENTLY REVISED.
   8"-12" LINES - CLASS 150 DR-18
   4"-6" LINES - CLASS 200 DR-14
   CONTRACTOR SHALL NOTIFY THE CITY OF MISSOURI CITY ENGINEERING DEPARTMENT (281-261-4280), AND THE ENGINEER 24 HOURS PRIOR TO HYDROSTATIC TESTS ON WATER LINES.
5. MAINTAIN A MINIMUM OF 9 FEET OF HORIZONTAL SEPARATION BETWEEN ALL SANITARY SEWER AND WATER LINES.
6. ALL WATER LINES SHALL BE ENCASED WITH BANK SAND AS PER CITY OF MISSOURI CITY DETAIL SHEET. WATERLINES WITHIN SOIL LOT EASEMENTS SHALL BE ENCASED WITH CEMENT STABILIZED SAND PER ITEM NO. 275 BEDDING AND BACKFILL SHALL FOR ALL WATER LINES SHALL BE CONSIDERED INCIDENTAL TO THE VARIOUS BID ITEMS.
7. WATER LINES LOCATED UNDER PROPOSED OR FUTURE PAVEMENT OR WITHIN 3 FEET OF THE PROPOSED OR FUTURE BACK OF CURB SHALL BE BACKFILLED WITH CEMENT STABILIZED SAND TO THE LINES OF CEMENT PER TON? TO PAVEMENT SUBGRADE, (NO SEPARATE PAY).
8. FLUSH VALVES SHALL HAVE THREE-WAY NOZZLE ARRANGEMENT, FIVE AND ONE-QUARTER INCH (5-1/4") DIAMETER MAIN VALVE, CONFORMING TO AWWA JOINT BOOT, AND CONFORM TO THE REQUIREMENTS OF AWWA C502. THE PUMPER NOZZLE SHALL BE THE MISSOURI CITY STANDARD OR FOUR AND ONE-EIGHTH INCH (4-1/8") INSIDE DIAMETER AND NO LESS THAN SIX AND ONE-HALF-INCH (2-1/2") THREADS. THE CENTERLINE OF FLUSHING VALVES SHALL BE LOCATED TWO (2'-0" FROM THE BACKSIDE OF CURB WITH THE TOP OF FLANGE AT THE ELEVATION INDICATED ON THE DETAIL SHEET.
9. ALL FLUSHING VALVES ARE SHOWN WITH MINIMUM 4 FEET OF BURY REQUIREMENTS TO BE INSTALLED. VALVES SHALL BE AT THE CONTRACTOR'S RESPONSIBILITY TO ADJUST WATER MAINS AND FURNISH FLUSHING VALVES AS REQUIRED TO OBTAIN PROPER VERTICAL LOCATION OF THE FLUSHING VALVES IN RELATION TO THE TOP OF CURB (SEE DETAIL SHEET). ANY ADJUSTMENT WILL BE CONSIDERED INCIDENTAL TO THE VARIOUS OTHER ITEMS OF WORK. FLUSHING VALVES SHALL BE COLOR CODED ON THE FLUSHING VALVE BONNET IN ACCORDANCE WITH CITY OF MISSOURI CITY DESIGN STANDARDS.
   ALL FLUSH VALVES SHALL BE PAINTED TO WHITE METAL PRIMED WITH 2 MILS DFT INORGANIC ZINC (CARBO-ZINC 11 OR APPROVED EQUAL) AND FINISHED WITH TWO COATS OF EPOXY PER SPECIFICATIONS.
10. CONTRACTOR SHALL MAINTAIN A MINIMUM OF 6 INCHES OF CLEARANCE BETWEEN PROPOSED WATER LINES AND EXISTING UTILITIES EXCEPT EXISTING SANITARY. SEE TCEQ NOTES FOR THE MINIMUM CLEARANCE BETWEEN WATER AND SANITARY.

Continuation of Water Main notes

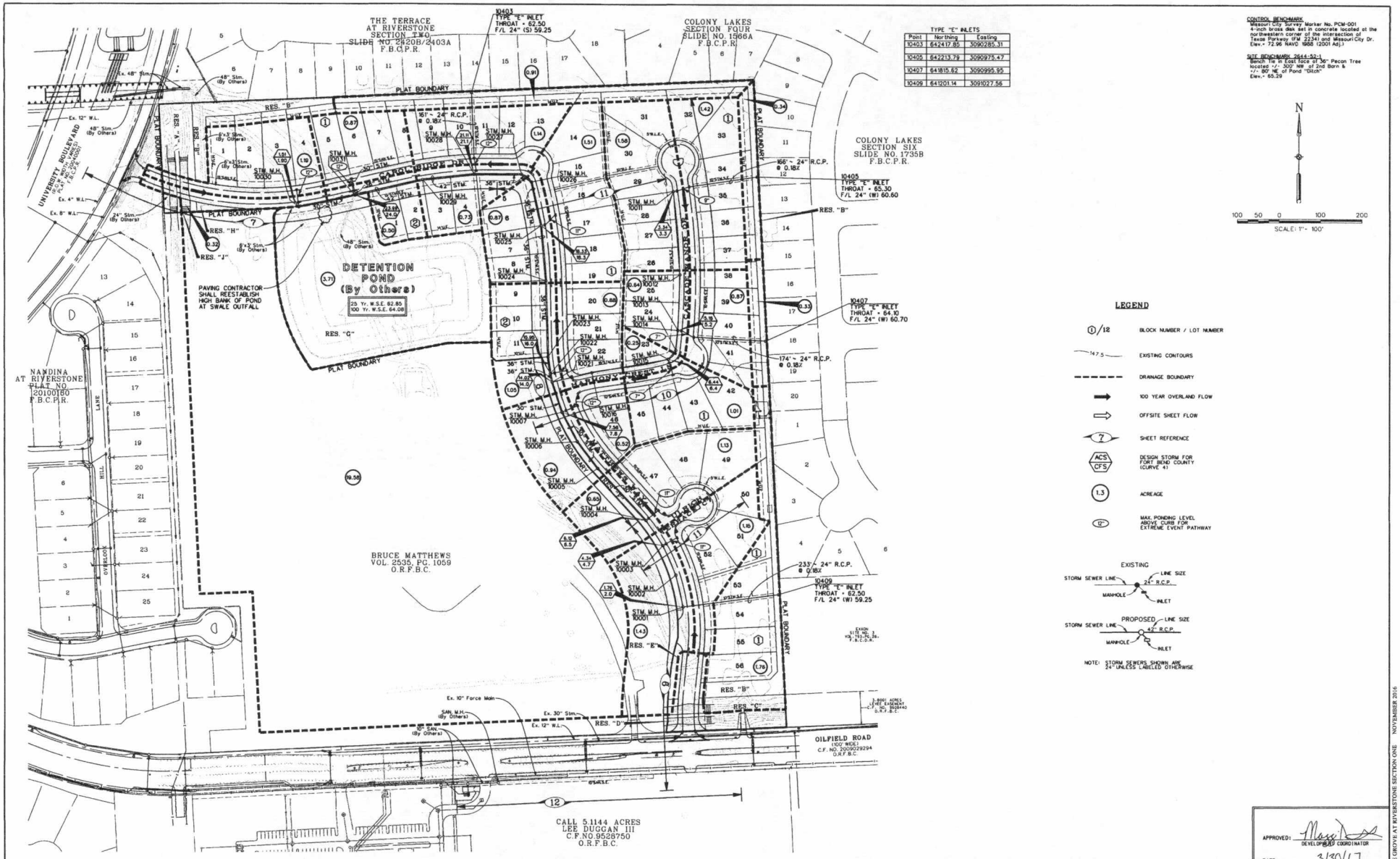
11. ALL GATE VALVES ARE TO BE RESILIENT-SEATED GATE VALVES AS PER A.W.W.A C-509. VALVES SHALL HAVE A COMPLETE COATING ON ALL IRON PARTS IN THE VALVE INTERIOR AS SPECIFIED BY THE MANUFACTURER.
12. WHEREVER POSSIBLE, ALL MAIN LINE GATE VALVES ARE TO BE LOCATED OPPOSITE PAVING CURB RETURNS AS INDICATED ON THE CONSTRUCTION PLANS. GATE VALVES LOCATED ON A MAIN LINE ADJACENT TO A FLUSHING VALVE ARE TO BE 5 FEET FROM THE FLUSHING VALVE.
13. 4-INCH THROUGH 12-INCH WATER LINE FITTINGS SHALL BE DUCTILE IRON CONFORMING TO A.W.W.A C-153. ALL FITTINGS SHALL BE POLYETHYLENE WRAPPED AND FURNISHED WITH CEMENT MORTAR LINING AS PER A.W.W.A C-104 STANDARDS. ALL FITTINGS SHALL HAVE RESTRAINED JOINTS (MEGALUG OR EQUAL).
14. ALL WATER MAIN GATE VALVES AND BLOW OFF VALVES ARE TO BE LOCATED ALONG THE PROJECTION OF THE LOT LINE INDICATED AT A DISTANCE OF 1-FOOT BEHIND THE BACK OF THE CURB AT A MINIMUM OF 5 FEET FROM THE EDGE OF ANY DRIVE APPROACH. ALL VALVES SHALL BE LOCATED OUTSIDE OF THE LIMITS OF ANY DRIVE APPROACH. CHILDREN WITH DISABILITIES (TAS 206.44 (E) SHALL BE MET AT ALL VALVE LOCATIONS.
15. WATER MAIN FITTINGS SHALL BE SUPPORTED WITH CONCRETE THRUST BLOCKING. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE ADEQUACY OF THE BLOCKING SO AS TO PREVENT LATERAL MOVEMENT OF SUCH FITTINGS WHEN THE WATER LINE IS PRESSURE TESTED AND PUT INTO OPERATION.
16. STEEL WATER PIPE 6-INCH AND LARGER SHALL CONFORM TO AWWA C200. STEEL WATER PIPE SHALL HAVE COAL TAR EXTERIOR COATING IN ACCORDANCE WITH AWWA C203. ALL INTERIOR COATING IS IN ACCORDANCE WITH AWWA C210. ALL MATERIAL USED FOR INTERNAL COATING OF STEEL CURRENT PIPE MUST BE NOT SOLUBLE AND SUITABLE FOR CONTACT WITH POTABLE WATER AS REQUIRED BY CHAPTER 290, RULES AND REGULATIONS FOR PUBLIC SYSTEMS, TCEQ LATEST REVISIONS.
17. THE OPENING AND CLOSING OF ALL VALVES ON EXISTING WATER LINES LINES MUST BE PERFORMED BY THE DISTRICT OPERATOR. THE CONTRACTOR SHALL NOT OPERATE GATE VALVES ON EXISTING LINES EXCEPT DURING AN EMERGENCY.
18. WHENEVER A WATER LINE CROSSES A SANITARY SEWER, ONE JOINT OF WATER LINE SHALL BE CENTERED OVER THE SEWER SUCH THAT THE JOINTS OF THE WATER LINE ARE EQUIDISTANT AND AT LEAST NINE (9) FEET HORIZONTALLY FROM THE CENTERLINE OF THE SEWER. WHENEVER A SANITARY SEWER CROSSES A WATER LINE, ONE JOINT OF THE SEWER SHALL BE CENTERED UNDER THE WATER LINE SUCH THAT THE JOINTS OF THE SEWER ARE EQUIDISTANT AND AT LEAST NINE (9) FEET HORIZONTALLY FROM THE CENTERLINE OF THE WATER LINE. THE SEWER SHALL BE BACKFILLED WITH CEMENT STABILIZED SAND CONTAINING 2 SACKS OF CEMENT PER TON FOR THE FULL LENGTH OF ONE JOINT OF SEWER PLUS TWELVE (12) INCHES BEYOND THE JOINT ON EACH END.
19. THE GRAVITY SANITARY SEWER PIPE SHALL BE SDR 26 PVC (IPS ISO) OR DR18 AS INDICATED ON THE PLANS) CONFORMING TO ASTM D-2241. PIPE JOINTS SHALL BE CELL CLASS 12454-B PER ASTM D-3139. JOINTS SHALL BE BELL AND SPIGOT TYPE WITH RUBBER GASKETS CONFORMING TO ASTM F-477. CHEMICALLY WELDED P.V.C. PIPE JOINTS ARE NOT ACCEPTABLE. ALL SANITARY SEWER PIPE SHALL BE TESTED FOR LEAKS ARE TO BE REPAIRED.
20. THE CONTRACTOR SHALL NOTIFY THE CITY OF MISSOURI CITY AND THE ENGINEER 24 HOURS PRIOR TO ALL AIR TESTS, HYDROSTATIC TESTS AND DEFLECTION TESTS OF SANITARY SEWER LINES AND MANHOLES, AS REQUIRED.
21. ALL SANITARY SEWER MANHOLES SHALL BE COATED AS PER THE SANITARY SEWER MANHOLE DETAIL. THE CONTRACTOR SHALL NOTIFY THE CITY OF MISSOURI CITY ENGINEERING DEPARTMENT (281-275-2450), AND THE ENGINEER 24-HOURS PRIOR TO ANY MANHOLE SEALING.
22. NO BRICK WILL BE ALLOWED ON SANITARY SEWER MANHOLES. ALL ADJUSTMENTS FOR MANHOLE TOPS MUST BE MADE USING CONCRETE RINGS. PRECAST SANITARY SEWER MANHOLES SHALL HAVE RAM-NECK GASKET JOINTS. THE MAXIMUM CHIMNEY HEIGHT IS TWO FEET. TIE-INS TO EXISTING MANHOLES TO BE AT CONTRACTOR'S ONLY AND SOLE CONVENIENCE.
23. ALL SERVICE STUBS AND STACKS ARE TO BE MARKED IN ACCORDANCE WITH THE DETAIL SHEET. IT WILL BEGIN AT THE FLOW LINE OF THE STUB. THE TOP OF THE SERVICE FINISHED GRADE SHALL BE CLEARLY LABELED WITH A PERMANENT MARKER. GRINDING AND SAW CUTTING ARE NOT ACCEPTABLE AND SHALL BE REPAIRED.
24. ALL SANITARY SEWER MANHOLES ARE REQUIRED TO HAVE ECCENTRIC (OFFSET) CONES AS PER THE DETAIL SHEETS. THE CENTERLINE FOR THE SANITARY SEWER MANHOLES IS AT THE CENTERLINE OF THE MANHOLE BASE.
25. ALL SANITARY MANHOLES SHALL BE TESTED FOR LEAKAGE BY PERFORMING A LOW PRESSURE AIR TEST CONFORMING TO T.C.E.Q. RULES.

SANITARY SEWER CONSTRUCTION NOTES

1. ALL SANITARY SEWERS SHALL BE CONSTRUCTED IN ACCORDANCE WITH CITY OF MISSOURI CITY DESIGN STANDARDS AS CURRENTLY AMENDED, REVISIONS, AMENDMENTS, AND SPECIAL PROVISIONS THERETO, UNLESS SPECIFICALLY OTHERWISE ON PLANS OR TECHNICAL SPECIFICATIONS. A 30-DAY MANDREL TEST WILL BE REQUIRED. THE PAVING CONTRACTOR MAY BEGIN PAVING OPERATIONS PRIOR TO THE 30-DAY MANDREL TEST. THE UTILITY CONTRACTOR MAY PULL A MANDREL PRIOR TO THE 30-DAY TEST FOR HIS OWN CONFIDENCE. BUT WILL STILL BE REQUIRED TO PERFORM THE 30-DAY MANDREL TEST. ADDITIONAL TESTS MAY BE REQUIRED AS PRESCRIBED AT THE INITIAL INSPECTION. WATER WILL BE ADDED AT THE UPSTREAM MANHOLE AND RELEASED AT THE DOWNSTREAM MANHOLE. ALL COSTS INCLUDED. INCLUDE THE COST FOR THESE TESTS WITH THE OTHER ITEMS OF THE BID.
2. ALL BEDDING AND BACKFILL SHALL BE CONSTRUCTED IN ACCORDANCE WITH DESIGN STANDARDS, BEDDING AND BACKFILL SHALL BE CONSIDERED SUBSIDIARY TO PAY ITEM FOR PIPE AND SHALL NOT BE PAID FOR DIRECTLY.
3. ALL SANITARY SEWERS UNDER OR WITHIN 3 FEET OF PROPOSED OR FUTURE PAVEMENT SHALL BE BACKFILLED WITH 2 SACKS OF CEMENT STABILIZED SAND PER TON TO PAVEMENT SUBGRADE.
4. SANITARY MANHOLE COVERS SHALL BE NOMINAL 32-INCH CITY OF MISSOURI CITY CAST IRON, TRAFFIC BEARING TYPE RING AND COVER WITH THE WORDS " SANITARY SEWER " AND "CITY OF MISSOURI CITY" CAST INTO THE COVER.
5. WHENEVER A WATER LINE CROSSES A SANITARY SEWER, ONE JOINT OF WATER LINE SHALL BE CENTERED OVER THE SEWER SUCH THAT THE JOINTS OF THE WATER LINE ARE EQUIDISTANT AND AT LEAST NINE (9) FEET HORIZONTALLY FROM THE CENTERLINE OF THE SEWER. WHENEVER A SANITARY SEWER CROSSES A WATER LINE, ONE JOINT OF THE SEWER SHALL BE CENTERED UNDER THE WATER LINE SUCH THAT THE JOINTS OF THE SEWER ARE EQUIDISTANT AND AT LEAST NINE (9) FEET HORIZONTALLY FROM THE CENTERLINE OF THE WATER. THE SEWER SHALL BE BACKFILLED WITH CEMENT STABILIZED SAND CONTAINING 2 SACKS OF CEMENT PER TON FOR THE FULL LENGTH OF ONE JOINT OF SEWER PLUS TWELVE (12) INCHES BEYOND THE JOINT ON EACH END.
6. THE GRAVITY SANITARY SEWER PIPE SHALL BE SDR 26 PVC (IPS ISO) OR DR18 AS INDICATED ON THE PLANS) CONFORMING TO ASTM D-2241. PIPE JOINTS SHALL BE CELL CLASS 12454-B PER ASTM D-3139. JOINTS SHALL BE BELL AND SPIGOT TYPE WITH RUBBER GASKETS CONFORMING TO ASTM F-477. CHEMICALLY WELDED P.V.C. PIPE JOINTS ARE NOT ACCEPTABLE. ALL SANITARY SEWER PIPE SHALL BE TESTED FOR LEAKS ARE TO BE REPAIRED.
7. THE CONTRACTOR SHALL NOTIFY THE CITY OF MISSOURI CITY AND THE ENGINEER 24 HOURS PRIOR TO ALL AIR TESTS, HYDROSTATIC TESTS AND DEFLECTION TESTS OF SANITARY SEWER LINES AND MANHOLES, AS REQUIRED.
8. ALL SANITARY SEWER MANHOLES SHALL BE COATED AS PER THE SANITARY SEWER MANHOLE DETAIL. THE CONTRACTOR SHALL NOTIFY THE CITY OF MISSOURI CITY ENGINEERING DEPARTMENT (281-275-2450), AND THE ENGINEER 24-HOURS PRIOR TO ANY MANHOLE SEALING.
9. NO BRICK WILL BE ALLOWED ON SANITARY SEWER MANHOLES. ALL ADJUSTMENTS FOR MANHOLE TOPS MUST BE MADE USING CONCRETE RINGS. PRECAST SANITARY SEWER MANHOLES SHALL HAVE RAM-NECK GASKET JOINTS. THE MAXIMUM CHIMNEY HEIGHT IS TWO FEET. TIE-INS TO EXISTING MANHOLES TO BE AT CONTRACTOR'S ONLY AND SOLE CONVENIENCE.
10. ALL SERVICE STUBS AND STACKS ARE TO BE MARKED IN ACCORDANCE WITH THE DETAIL SHEET. IT WILL BEGIN AT THE FLOW LINE OF THE STUB. THE TOP OF THE SERVICE FINISHED GRADE SHALL BE CLEARLY LABELED WITH A PERMANENT MARKER. GRINDING AND SAW CUTTING IN GOOD CONDITION THROUGHOUT THE REMAINDER OF THE PROJECT.
11. ALL SANITARY SEWER MANHOLES ARE REQUIRED TO HAVE ECCENTRIC (OFFSET) CONES AS PER THE DETAIL SHEETS. THE CENTERLINE FOR THE SANITARY SEWER MANHOLES IS AT THE CENTERLINE OF THE MANHOLE BASE.
12. ALL SANITARY MANHOLES SHALL BE TESTED FOR LEAKAGE BY PERFORMING A LOW PRESSURE AIR TEST CONFORMING TO T.C.E.Q. RULES.

Continuation of Sanitary Sewer notes

13. ALL EXISTING AND PROPOSED SANITARY SEWER MANHOLES WITHIN THE PROJECT SITE ARE TO BE PROVIDED WITH INFLOW PROTECTORS. THE IN FLOW PROTECTOR SHALL BE "NO FLOW INFLOW DISK" AS SUPPLIED BY CONTRACTOR SPECIALTIES & SUPPLY CO., SAN ANTONIO, TEXAS 1(210) 497-8407 OR APPROVED EQUAL.
14. AT THE OPTION OF THE ENGINEER, ALL SANITARY SEWERS ARE SUBJECT TO BEING LAMPED. ANY SANITARY SEWER WHICH DOES NOT EXHIBIT A "FULL MOON" FROM LAMPING OPERATIONS IS SUBJECT TO REMOVAL AND REPLACEMENT AT THE CONTRACTOR'S EXPENSE.
15. WHEN MAKING A CONNECTION TO AN EXISTING SANITARY SEWER MANHOLE OR BUILDING A MANHOLE ON AN EXISTING LINE, THE UTILITY CONTRACTOR SHALL PLUG THE DOWNSTREAM END OF THE PROPOSED SANITARY SEWER LINE. THIS PLUG SHALL REMAIN IN PLACE UNTIL FINAL ACCEPTANCE. INCLUDE COST FOR THIS WORK IN OTHER ITEMS OF THE BID.
16. ALL TIES TO EXISTING MANHOLES SHALL BE MADE BY CORE. MECHANICAL SEALS (LEAK-SEAL OR EQUAL) SHALL



TYPE "E" INLETS		
Point	Northing	Easting
10403	642417.85	3090285.31
10405	642213.79	3090975.47
10407	641815.62	3090995.95
10409	641201.14	3091027.58

CONTROL BENCHMARK:
Missouri City Survey Marker No. PCM-001
4-inch brass disk set in concrete located at the northwestern corner of the intersection of Texas Parkway (FM 2234) and Missouri City Dr.
Elev.= 72.96 NAVD 1988 (2001 Adj.)

SITE BENCHMARK 2644-52-1
Bench Tie in East face of 36" Pecan Tree located +/- 300' NW of 2nd Barn & +/- 80' NE of Pond "Glitch"
Elev.= 65.29

N

100 50 0 100 200
SCALE: 1"= 100'

LEGEND

①/12	BLOCK NUMBER / LOT NUMBER
147.5	EXISTING CONTOURS
	DRAINAGE BOUNDARY
	100 YEAR OVERLAND FLOW
	OFFSITE SHEET FLOW
7	SHEET REFERENCE
ACS / CFS	DESIGN STORM FOR FORT BEND COUNTY (CURVE 4)
1.3	ACREAGE
12"	MAX. PONDING LEVEL ABOVE CURB FOR EXTREME EVENT PATHWAY

EXISTING
STORM SEWER LINE — LINE SIZE 24" R.C.P. — MANHOLE — INLET

PROPOSED
STORM SEWER LINE — LINE SIZE 42" R.C.P. — MANHOLE — INLET

NOTE: STORM SEWERS SHOWN ARE 24" UNLESS LABELED OTHERWISE

APPROVED: _____ DEVELOPER'S COORDINATOR
DATE: 3/30/17

NO.	REVISION	DATE	BY

DESIGNED BY: FJ
DESIGN CHECKED BY: BD
DRAWN BY: CB
COGO CHECKED BY:
SURVEY CHECKED BY:
QA/QC BY: RCS DATE: 4-4-17
QA/QC REVISIONS BY:

Costello
Engineering and Surveying
9990 Richmond Avenue, Suite 450 N
Houston, Texas 77042
(713) 783-7788 (713) 783-3580, Fax
TBPE FIRM REG. No. 280
TBPLS FIRM REG. No. 100486

THE GROVE AT RIVERSTONE SECTION ONE

PAVING AND DRAINAGE LAYOUT

1-23-17
STATE OF TEXAS
RON J. DECHERT
96544
LICENSED PROFESSIONAL ENGINEER

SHEET 3
OF 16 SHEETS
JOB NO. 2016-159-001/101

JOB NO. 2016-159-001/101 THE GROVE AT RIVERSTONE SECTION ONE NOVEMBER 2016

THE GROVE AT RIVERSTONE
DESIGN STORM FOR FORT BEND COUNTY
2016-159-02
22-Sep-16
BAP

US MH	DS MH	CRV NO.	AREA (ac)	TOTAL (ac)	t	Ci	Q (cfs)	REACH (ft)	CULV SIZE	n	PIPE SLOPE %	AREA PIPE	R	ACT. V (fps)	HYDRAULIC SLOPE (ft/ft)	DELTA H	U/S WSEL	D/S WSEL	U/S TOP OF CURB	U/S FL	D/S FL
E Inlet	MH 1	4	1.76	1.76	5.00	1.28	2.3	233	24	0.013	0.18	3.14	0.50	0.7	0.0099%	0.023	63.60	63.58		59.25	58.83
MH 1	MH 3	4	0.00	1.76	10.42	1.15	2.0	158	24	0.013	0.18	3.14	0.50	0.6	0.0080%	0.013	63.58	63.56		58.83	58.55
I-3a	I-3b	4	1.15	1.15	5.00	1.28	1.5	28	24	0.013	0.18	3.14	0.50	0.5	0.0042%	0.001	63.57	63.57	64.19	59.39	59.19
I-3b	MH 3	4	1.43	2.58	6.00	1.25	3.2	13	24	0.013	0.18	3.14	0.50	1.0	0.0023%	0.003	63.57	63.56	64.19	58.19	58.09
MH 3	MH 4	4	0.00	4.34	14.50	1.08	4.7	74	24	0.013	0.18	3.14	0.50	1.5	0.0429%	0.032	63.56	63.53		58.09	57.96
I-4a	I-4b	4	1.13	1.13	5.00	1.28	1.4	28	24	0.013	0.18	3.14	0.50	0.5	0.0041%	0.001	63.53	63.53	64.19	59.39	59.19
I-4b	MH 4	4	0.65	1.78	6.01	1.25	2.2	13	24	0.013	0.18	3.14	0.50	0.7	0.0097%	0.001	63.53	63.53	64.19	58.06	57.96
MH 4	MH 7	4	0.00	6.12	15.33	1.07	6.5	334	30	0.013	0.13	4.91	0.63	1.3	0.0255%	0.085	63.53	63.45		57.46	57.02
I-7a	I-7b	4	0.52	0.52	5.00	1.28	0.7	28	24	0.013	0.18	3.14	0.50	0.2	0.0009%	0.000	63.45	63.45	64.13	59.33	59.13
I-7b	MH 7	4	0.94	1.46	7.20	1.21	1.8	13	24	0.013	0.18	3.14	0.50	0.6	0.0061%	0.001	63.45	63.45	64.13	57.60	57.50
MH 7	MH 21	4	0.00	7.58	19.50	1.03	7.8	77	30	0.013	0.13	4.91	0.63	1.6	0.0362%	0.028	63.45	63.42		57.02	56.92
E Inlet	I-11a	4	0.34	0.34	5.00	1.28	0.4	166	24	0.013	0.18	3.14	0.50	0.1	0.0004%	0.001	63.77	63.77		60.59	60.30
I-11a	I-11b	4	1.42	1.76	24.97	1.00	1.8	28	24	0.013	0.18	3.14	0.50	0.6	0.0061%	0.002	63.77	63.77	64.37	59.57	59.37
I-11b	MH 11	4	1.58	3.34	25.80	1.00	3.3	13	24	0.013	0.18	3.14	0.50	1.1	0.0218%	0.003	63.77	63.77	64.37	58.37	58.27
MH 11	MH 13	4	0.00	3.34	28.01	1.00	3.3	339	24	0.013	0.18	3.14	0.50	1.1	0.0218%	0.074	63.77	63.69		58.27	57.66
E Inlet	I-13a	4	0.33	0.33	5.00	1.28	0.4	174	24	0.013	0.18	3.14	0.50	0.1	0.0003%	0.001	63.69	63.69		60.71	60.40
I-13a	I-13b	4	0.87	1.20	26.57	1.00	1.2	28	24	0.013	0.18	3.14	0.50	0.4	0.0028%	0.001	63.69	63.69	64.54	59.74	59.54
I-13b	MH 13	4	0.64	1.84	27.79	1.00	1.8	13	24	0.013	0.18	3.14	0.50	0.6	0.0066%	0.001	63.69	63.69	64.54	57.79	57.66
MH 13	MH 15	4	0.00	5.18	31.32	1.00	5.2	78	24	0.013	0.18	3.14	0.50	1.6	0.0524%	0.041	63.69	63.65		57.66	57.52
I-15a	I-15b	4	1.01	1.01	5.00	1.28	1.3	28	24	0.013	0.18	3.14	0.50	0.4	0.0033%	0.001	63.65	63.65	64.57	59.77	59.57
I-15b	MH 15	4	0.25	1.26	6.13	1.25	1.6	13	24	0.013	0.18	3.14	0.50	0.5	0.0048%	0.001	63.65	63.65	64.57	57.90	57.80
MH 15	MH 21	4	0.00	6.44	32.11	1.00	6.4	287	24	0.013	0.18	3.14	0.50	2.0	0.0810%	0.233	63.65	63.42		57.52	57.00
MH 21	MH 22	4	0.00	14.02	34.44	1.00	14.0	21	36	0.013	0.10	7.07	0.75	2.0	0.0442%	0.009	63.42	63.41		56.99	56.97
I-22a	I-22b	4	0.88	0.88	5.00	1.28	1.1	28	24	0.013	0.18	3.14	0.50	0.4	0.0025%	0.001	63.41	63.41	64.13	59.33	59.13
I-22b	MH 22	4	1.05	1.93	6.30	1.24	2.4	13	24	0.013	0.18	3.14	0.50	0.8	0.0112%	0.001	63.41	63.41	64.13	57.60	57.50
MH 22	MH 25	4	0.00	15.95	34.62	1.00	16.0	363	36	0.013	0.10	7.07	0.75	2.3	0.0572%	0.208	63.41	63.20		56.97	56.60
I-25a	I-25b	4	1.51	1.51	5.00	1.28	1.9	28	24	0.013	0.18	3.14	0.50	0.6	0.0073%	0.002	63.21	63.20	64.22	59.42	59.22
I-25b	MH 25	4	0.87	2.38	5.76	1.26	3.0	13	24	0.013	0.18	3.14	0.50	1.0	0.0176%	0.002	63.20	63.20	64.22	58.02	57.92
MH 25	MH 28	4	0.00	18.33	37.30	1.00	18.3	255	36	0.013	0.10	7.07	0.75	2.6	0.0755%	0.193	63.20	63.01		55.60	55.34
E Inlet	I-28a	4	0.91	0.91	5.00	1.28	1.2	161	24	0.013	0.18	3.14	0.50	0.4	0.0027%	0.004	63.02	63.01		59.24	58.96
I-28a	I-28b	4	1.14	2.05	12.24	1.12	2.3	28	24	0.013	0.18	3.14	0.50	0.7	0.0103%	0.003	63.01	63.01	64.17	58.96	58.76
I-28b	MH 28	4	0.73	2.78	12.86	1.11	3.1	13	24	0.013	0.18	3.14	0.50	1.0	0.0186%	0.002	63.01	63.01	64.17	57.10	57.00
MH 28	MH 31	4	0.00	21.11	38.94	1.00	21.1	294	42	0.013	0.08	9.62	0.88	2.2	0.0440%	0.129	63.01	62.88		54.84	54.61
I-30a	I-30b	4	1.19	1.19	5.00	1.28	1.5	28	24	0.013	0.18	3.14	0.50	0.5	0.0045%	0.001	62.89	62.88	64.10	59.30	59.10
I-30b	MH 30	4	0.32	1.51	5.96	1.25	1.9	13	24	0.013	0.18	3.14	0.50	0.6	0.0070%	0.001	62.88	62.88	64.10	59.10	59.00
MH 30	MH 31	4	0.00	1.51	6.32	1.24	1.9	139	30	0.013	0.13	4.91	0.63	0.4	0.0021%	0.003	62.88	62.88		58.50	58.32
I-31a	I-31b	4	0.87	0.87	5.00	1.28	1.1	28	30	0.013	0.13	4.91	0.63	0.2	0.0007%	0.000	62.88	62.88	64.10	58.80	58.60
I-31b	MH 31	4	0.50	1.37	7.06	1.22	1.7	13	36	0.013	0.10	7.07	0.75	0.2	0.0006%	0.000	62.88	62.88	64.10	57.10	57.00
MH 31	Outfall	4	0.00	23.99	41.17	1.00	24.0	108	48	0.013	0.07	12.57	1.00	1.9	0.0279%	0.030	62.88	62.85		47.08	47.00

The Grove at Riverstone
EXTREME EVENT CALCULATIONS
12/08/16 (BAP)

25 YR @ OUTFALL	62.85
LOWEST T/C	64.1
MAX PONDING	63.1

Qp=CiCfA

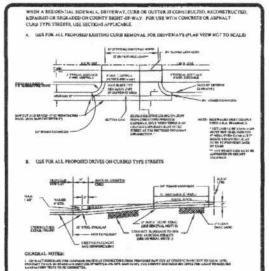
Ci =	0.6
Cf =	1.25
LONGEST RUN	1630ft
L=	22.6 mi
I =	7 in/hr
A =	23.99 acres

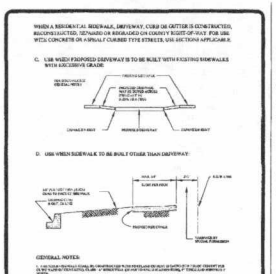
Qpe = 104.98 cfs
Qpe- Qp = 82.56 cfs

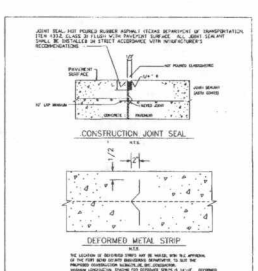
U/S MH	D/S MH	Qpe	PIPE DIA	LENGTH	AREA OF PIPE	VELOCITY (FPS)	HGL U/S	HGL D/S	TOP CURB	U/S F/L	D/S F/L
I-30a	I-30b	6	24	37	3.14	1.9	64.81	64.58	64.10	59.30	59.10
I-30b	MH 10030	22	24	12	3.14	7.0	64.58	64.47	64.10	59.10	59.00
MH 10030	MH 10031	22	30	139	4.91	4.5	64.47	64.07		58.50	58.32
I-31a	I-31b	15	30	37	4.91	3.1	64.22	64.17	64.10	58.80	58.60
I-31b	MH 10031	60.56	36	12	7.07	8.6	64.17	64.07	64.10	57.10	57.00
MH 10031	Outfall	82.56	48	106	12.57	6.6	64.07	62.86		47.08	47.00

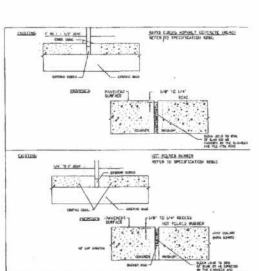
INLET CAPACITY
q=C*A*(64.4*(head))

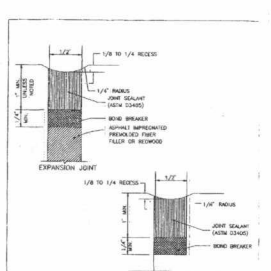
INLET	TYPE	OPEN AREA	C	CONTROL	HEAD	q (cfs)		CAPACITY REQUIRED
I-30a	H-2	2.5	0.8	Gutter	0.49	11.23	>	6.00
I-30b	C-1	3.67	0.8	Gutter	0.52	18.99	>	16.00
						28.22		
I-31a	H-2	2.5	0.8	Gutter	0.88	15.06	>	15.00
I-31b	C-2 MOD	8.33	0.8	Gutter	0.93	51.57	>	40.56
						66.63		
					Total Inlet Capacity =	94.85	>	82.56
						THEREFORE SYSTEM WORKS		











APPROVED: DEVELOPMENT COORDINATOR
DATE: 3/30/17

NO.	REVISION	DATE	BY

DESIGNED BY: RJ
DESIGN CHECKED BY: RJ
DRAWN BY: CB
COGO CHECKED BY:
SURVEY CHECKED BY:
QA/QC BY: RS DATE: 4-4-17
QA/QC REVISIONS BY:

Costello

Engineering and Surveying
9990 Richmond Avenue, Suite 450 N
Houston, Texas 77042
(713) 783-7788 (713) 783-3580, Fax

TBPE FIRM REG. No. 280
TBPLS FIRM REG. No. 100486

THE GROVE AT RIVERSTONE SECTION ONE

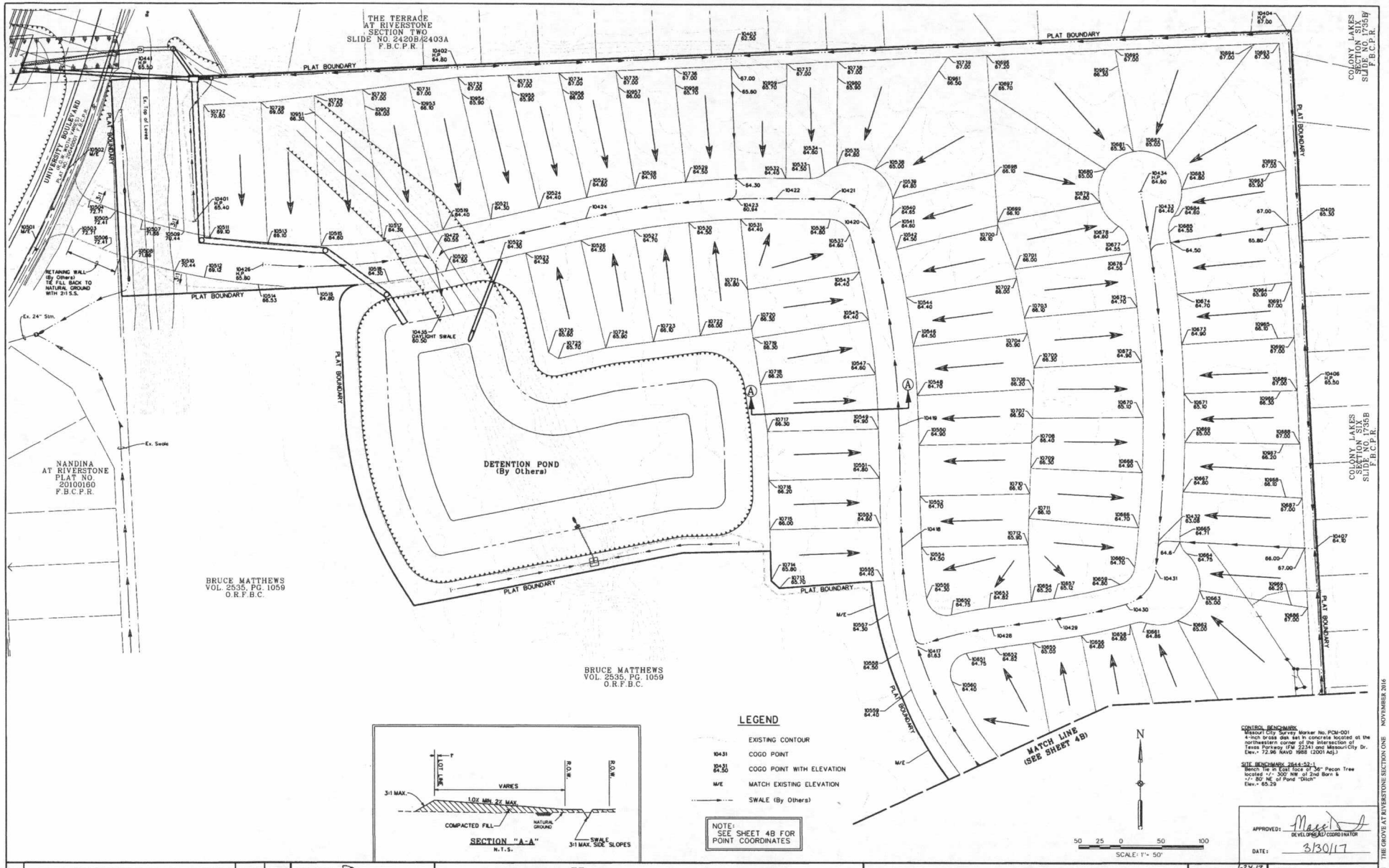
DRAINAGE CALCULATIONS

STATE OF TEXAS — RON J. DECHERT — 96544 — LICENSED PROFESSIONAL ENGINEER — 1-25-17

SHEET 4 OF 16 SHEETS

JOB NO. 2016-159-001/101

JOB NO. 2016-159-001/101 THE GROVE AT RIVERSTONE SECTION ONE NOVEMBER 2016



APPROVED: _____ DEVELOPMENT COORDINATOR

DATE: 3/30/17

NO.	REVISION	DATE	BY

DESIGNED BY: RJ
DESIGN CHECKED BY: RJ
DRAWN BY: JB
COGO CHECKED BY:
SURVEY CHECKED BY:
QA/QC BY: RS DATE: 4-4-17
QA/QC REVISIONS BY:

Costello
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9990 Richmond Avenue, Suite 450 N
Houston, Texas 77042
(713) 783-7788 (713) 783-3580, Fax
TBPE FIRM REG. No. 280
TBPLS FIRM REG. No. 100486

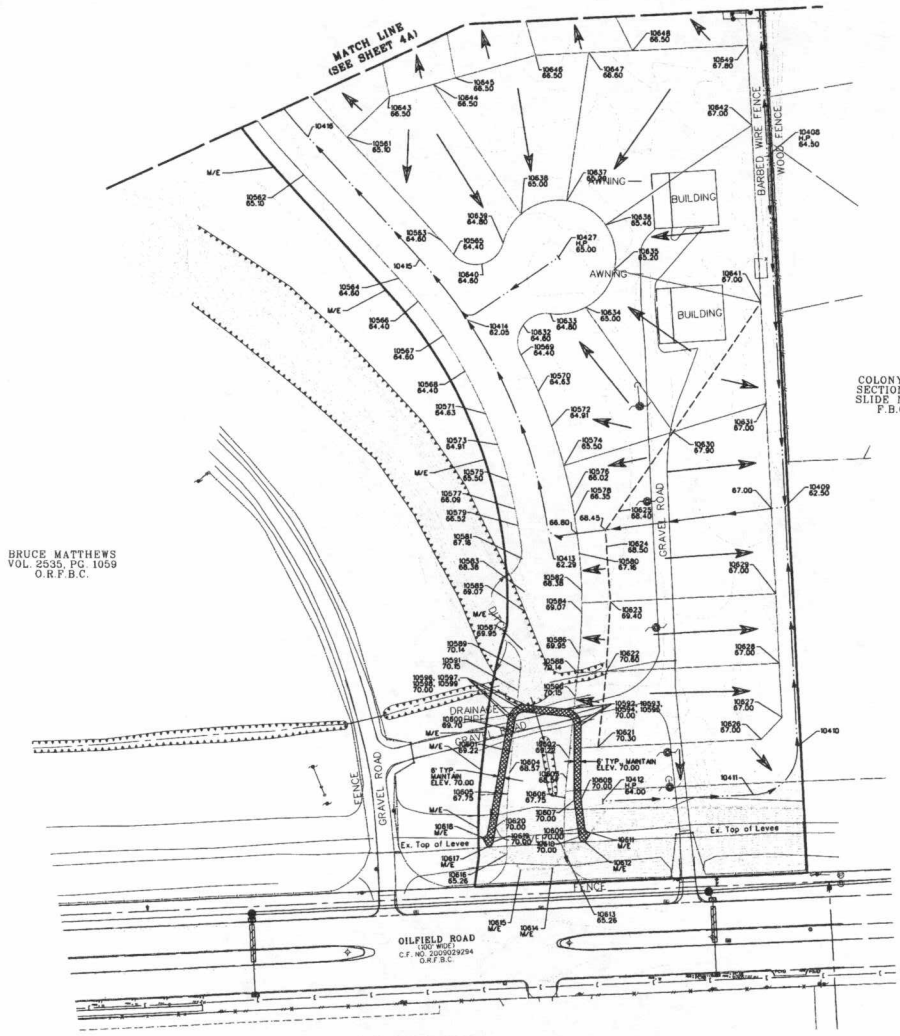
THE GROVE AT RIVERSTONE SECTION ONE

LOT GRADING PLAN (SHEET 1 of 2)

STATE OF TEXAS
RON J. DECHERT
96544
LICENSED PROFESSIONAL ENGINEER
4-24-17

SHEET 4A
OF 16 SHEETS
JOB NO. 2016-159-001/101

JOB NO. 2016-159-001/101 THE GROVE AT RIVERSTONE SECTION ONE NOVEMBER 2016



STM. SWR. STRUCTURES		
PT*	Northing	Easting
10309	6423891.83	3089659.24
10351	6417127.75	3090198.18
10352	6418151.96	3090092.58
10361	6423254.32	3089541.19
10362	6421077.77	3089545.87
10363	6420792.75	3089445.53

SWALES		
PT*	Northing	Easting
10353	6417631.31	3089971.07
10354	6418201.61	3090134.66
10401	6423114.20	3089631.88
10402	6423403.10	3089631.92
10403	6423177.85	3090038.31
10404	6423447.86	3090081.43
10405	6423376.72	3090076.47
10406	6423016.91	3090185.71
10407	6418153.62	3090095.95
10408	6419018.58	3090111.75
10409	6419201.14	3090127.56
10410	6420990.93	3090136.37
10411	6420948.82	3090130.74
10412	6420842.89	3090188.19
10413	6421173.70	3090280.90
10414	6421364.05	3090743.28
10415	6421417.27	3090707.70
10416	6419214.61	3090810.07
10417	6418915.12	3090511.85
10418	6418918.59	3090514.08
10419	6419184.34	3090489.54
10420	6423206.04	3090544.15
10421	6423279.19	3090459.33
10422	6423243.31	3090339.78
10423	6423242.55	3090239.85
10424	6423218.05	3090108.33
10425	6421013.27	3089901.84
10426	6421161.45	3089715.17
10427	6421919.12	3090180.16
10428	6417818.36	3090061.83
10429	6417729.60	3090681.80
10430	6417477.77	3090783.76
10431	6417790.02	3090801.38
10432	6418115.11	3090807.01
10433	6421896.36	3090726.46
10434	6423092.85	3090784.88
10435	6423078.37	3089910.87
10436	6423417.09	3089626.00
10441	6423350.81	3089541.46
10442	6423074.84	3089436.85

GRADING POINTS		
PT*	Northing	Easting
10501	6421981.44	3089938.03
10502	6422377.82	3089978.58
10503	6421794.09	3089983.43
10504	6422329.98	3089901.34
10505	6422128.96	3089901.53
10506	6421980.13	3089918.00
10507	6421816.83	3089918.14
10508	6421637.96	3089951.24
10509	6421501.76	3089918.79
10510	6421451.15	3089970.18
10511	6421295.22	3089850.24
10512	6421413.80	3089843.67
10513	6421186.09	3089720.71
10514	6421138.85	3089720.35
10515	6421284.26	3089785.86
10516	6421314.49	3089785.84
10517	6421280.10	3089881.74
10518	6421413.55	3089868.44
10519	6421201.73	3089918.42
10520	6421251.17	3089931.27
10521	6422127.16	3090002.55
10522	6421988.38	3090001.58
10523	6421778.52	3090014.76
10524	6422210.53	3090015.01
10525	6421971.94	3090014.50
10526	6421981.01	3089930.30
10527	6422004.32	3089787.07
10528	6422585.24	3089788.42
10529	6422613.97	3089925.94
10530	6422614.43	3090114.08
10531	6422519.72	3090096.97
10532	6422517.23	3090441.53
10533	6422521.66	3090441.53
10534	6422274.38	3090439.33
10535	6422283.62	3090414.21
10536	6422417.78	3090408.13
10537	6422799.42	3090410.04
10538	6422779.05	3090480.08
10539	6422743.78	3090480.14
10540	6422214.53	3090480.19
10541	6422107.08	3090479.78
10542	6421981.97	3090486.43
10543	6421513.25	3090441.53
10544	6421521.78	3090198.85
10545	6422091.28	3090452.79
10546	6422081.07	3090507.78
10547	6422037.45	3090481.07
10548	6422001.66	3090453.12
10549	6421990.68	3090484.72
10550	6421949.83	3090505.20
10551	6421900.70	3090466.12
10552	6421878.84	3090518.64
10553	6421843.79	3090467.52
10554	6421818.57	3090468.10
10555	6421778.75	3090470.78
10556	6421753.07	3090470.34
10557	6421739.22	3090478.99
10558	6421687.55	3090483.02
10559	6421642.42	3090500.45
10560	6421615.32	3090501.70
10561	6421524.34	3090644.12
10562	6421491.22	3090606.85
10563	6421454.10	3090728.20
10564	6421400.45	3090689.21
10565	6421421.56	3090737.37
10566	6421380.28	3090706.44
10567	6421350.28	3090728.40
10568	6421318.99	3090743.37
10569	6421301.98	3090796.38
10570	6421281.98	3090811.90
10571	6421281.71	3090765.53
10572	6421270.97	3090821.30
10573	6421254.50	3090976.09
10574	6421241.10	3090933.98
10575	6421241.74	3090765.53
10576	6421208.08	3090840.50
10577	6421195.23	3090781.18
10578	6421192.04	3090843.44
10579	6421183.27	3090794.11
10580	6421159.69	3090847.66
10581	6421154.33	3090797.89
10582	6421127.13	3090843.65
10583	6421125.80	3090796.66
10584	6421108.13	3090849.77
10585	6421081.80	3090796.78
10586	6421070.20	3090847.75
10587	6421074.86	3090797.96
10588	6421055.00	3090846.18
10589	6421057.21	3090796.15
10590	6421034.13	3090844.02
10591	6421039.31	3090742.29
10592	6421008.91	3090843.17
10593	6421008.91	3090841.23
10594	6421039.84	3090838.63
10595	6421018.87	3090836.00
10596	6421010.56	3090800.79
10597	6421010.60	3090800.17
10598	6421015.16	3090785.57
10599	6421014.07	3090781.47
10600	6421013.50	3090795.56
10601	6420989.80	3090788.70
10602	6420980.72	3090838.43
10603	6420965.52	3090836.57
10604	6420967.69	3090786.84
10605	6420948.80	3090785.22
10606	6420945.54	3090835.12
10607	6420943.73	3090841.23
10608	6420944.11	3090849.23
10609	6420919.77	3090845.42
10610	6420911.58	3090847.33
10611	6420976.41	3090857.56
10612	6420907.32	3090781.47
10613	6420898.11	3090834.82
10614	6420884.18	3090782.29
10615	6420883.97	3090796.32
10616	6420882.52	3090784.34
10617	6420907.01	3090761.34
10618	6420911.17	3090784.50
10619	6420907.01	3090771.88

GRADING POINTS		
PT*	Northing	Easting
10620	6420915.27	3090767.39
10621	6420898.84	3090864.25
10622	6421052.29	3090871.18
10623	6421117.55	3090874.78
10624	6421165.73	3090871.46
10625	6421196.85	3090881.72
10626	6420997.18	3091006.80
10627	6421018.52	3091025.04
10628	6421054.08	3091032.56
10629	6421125.00	3091019.46
10630	6421256.11	3090929.88
10631	6421317.41	3090910.90
10632	6421359.34	3090798.17
10633	6421368.53	3090837.10
10634	6421375.09	3090855.84
10635	6421408.19	3090939.89
10636	6421447.51	3090870.32
10637	6421468.59	3090836.45
10638	6421456.90	3090798.41
10639	6421431.39	3090780.89
10640	6421411.18	3090782.09
10641	6421380.09	3091008.34
10642	6421316.81	3090998.53
10643	6421561.15	3090681.03
10644	6421618.16	3090670.52
10645	6421678.78	3090678.97
10646	6421696.85	3090809.04
10647	6421595.20	3090835.70
10648	6421501.72	3090894.11
10649	6421606.40	3090994.70
10650	6421734.11	3090954.93
10651	6421686.25	3090806.86
10652	6421743.90	3090808.41
10653	6421743.09	3090950.67
10654	6421750.48	3090951.00
10655	6421700.21	3090954.81
10656	6421709.27	3090716.18
10657	6421754.35	3090680.27
10658	6421721.42	3090678.57
10659	6421731.76	3090760.73
10660	6421792.89	3090778.54
10661	6421741.81	3090792.64
10662	6421728.11	3090829.67
10663	6421743.84	3090954.41
10664	6421801.69	3090945.67
10665	6421836.34	3090937.58
10666	6421840.81	3090783.29
10667	6421884.90	3090836.34
10668	6421908.23	3090787.41
10669	6421945.13	3090838.20
10670	6421975.76	3090788.24
10671	6422005.13	3090837.70
10672	6422025.76	3090786.07
10673	6422047.07	3090945.83
10674	6422127.29	3090870.34
10675	6422110.59	3090780.82
10676	6422177.61	3090772.49
10677	6421982.96	3090770.15
10678	6421926.32	3090758.60
10679	6421836.44	3090742.71
10680	6422281.10	3090742.96
10681	6423309.10	3090776.24
10682	6423274.74	3090819.02
10683	6422935.67	3090834.80
10684	6422622.91	3090824.24
10685	6422027.85	3090819.23
10686	6421977.99	3090987.62
10687	6421977.56	3090990.75
10688	6421813.57	3090977.35
10689	6422028.96	3090973.92
10690	6422074.24	3090970.63
10691	6423147.29	3090967.13
10692	6423279.83	3090950.05
10693	6423215.35	3090952.05
10694	6423431.01	3090921.75
10695	6423428.80	3090734.40
10696	6423418.88	3090596.10
10697	6423721.25	3090601.22
10698	6423723.44	3090607.89
10699	6423215.08	3090611.55
10700	6423211.17	3090611.89
10701	6423421.98	3090734.67
10702	6423418.12	3090734.76
10703	6423415.81	3090744.42
10704	6423078.58	3090647.98
10705	6423038.12	3090656.27
10706	6423010.90	3090655.40
10707	6423074.53	3090654.71
10708	6423944.08	3090653.20
10709	6423913.18	3090653.17
10710	6423911.98	3090651.13
10711	6423851.81	3090650.12
10712	6423819.91	3090649.05
10713	6423766.22	3090644.21
10714	6423775.48	3090644.42
10715	6423537.56	3090632.56
10716	6423527.53	3090631.96
10717	6423527.53	3090631.76
10718	6423014.98	3090620.96
10719	6423011.81	3090610.25
10720	6423011.13	3090610.53
10721	6423111.54	3090605.05
10722	6423074.81	3090248.05
10723	6423057.17	3090180.59
10724	6423057.43	3090132.48
10725	6423048.17	3090074.67
10726	6423049.69	3090062.69
10727	6423157.39	3089843.06
10728	6423160.49.77	3089672.99
10729	6423458.75	3089777.89
10730	6423376.31	3089838.80
10731	6423363.47	3089892.81
10732	6423911.11	3089952.83
10733	6423911.81	3090115.57
10734	6423915.55	3090075.58
10735	6423915.83	3090145.07
10736	6423402.77	3090218.00
10737	6423408.84	3090353.20
10738	6423411.99	3090414.42
10739	6423417.56	3090500.53
10740	6423488.77	3089778.58
10741	6423506.49	3089839.46
10742	6423485.98	3089892.81
10743	6423311.82	3089957.10
10744	6423324.34	3090038.94
10745	6423417.03	3090079.92
10746	6423429.89	3090148.26
10747	6423387.87	3090417.99
10748	6423388.84	3090353.04
10749	6423391.59	3090416.06
10750	6423400.83	3090539.59
10751	6423406.90	3090737.86
10752	6423421.04	3090940.42
10753	6423412.12	3090947.25
10754	6423072.90	3090950.68
10755	6423008.40	3090954.00
10756	6423431.79	3090957.35
10757	6421876.58	3090960.77
10758	6421747.13	3090967.87

CONTROL BENCHMARK
Missouri City Survey Marker No. PCM-001
4-inch brass disk set in concrete located at the northeastern corner of the intersection of Texas Parkway (FM 2234) and Missouri City Dr.
Elev.= 72.96 NAVD 1988 (2001 Adj.)

SITE BENCHMARK 2644-52-1
Bench Tie in East face of 36" Pecan Tree located +/- 300' NW of 2nd Barn & +/- 80' NE of Pond "Ditch"
Elev.= 65.29

N

50 25 0 50 100
SCALE: 1" = 50'

LEGEND

- EXISTING CONTOUR
- 10431 COGO POINT
- 10431 64.50 COGO POINT WITH ELEVATION
- M/E MATCH EXISTING ELEVATION
- SWALE (By Others)
- RELOCATED TOP OF LEVEE

APPROVED: _____ DEVELOPMENT COORDINATOR

DATE: 3/30/17

NO.	REVISION	DATE	BY

DESIGNED BY: RD
DESIGN CHECKED BY: RD
DRAWN BY: B
COGO CHECKED BY: _____
SURVEY CHECKED BY: _____
QA/QC BY: RS DATE: 4-4-17
QA/QC REVISIONS BY: _____

Costello

Engineering and Surveying
9990 Richmond Avenue, Suite 450 N
Houston, Texas 77042
(713) 783-7788 (713) 783-3580, Fax

TBPE FIRM REG. No. 280
TBPLS FIRM REG. No. 100486

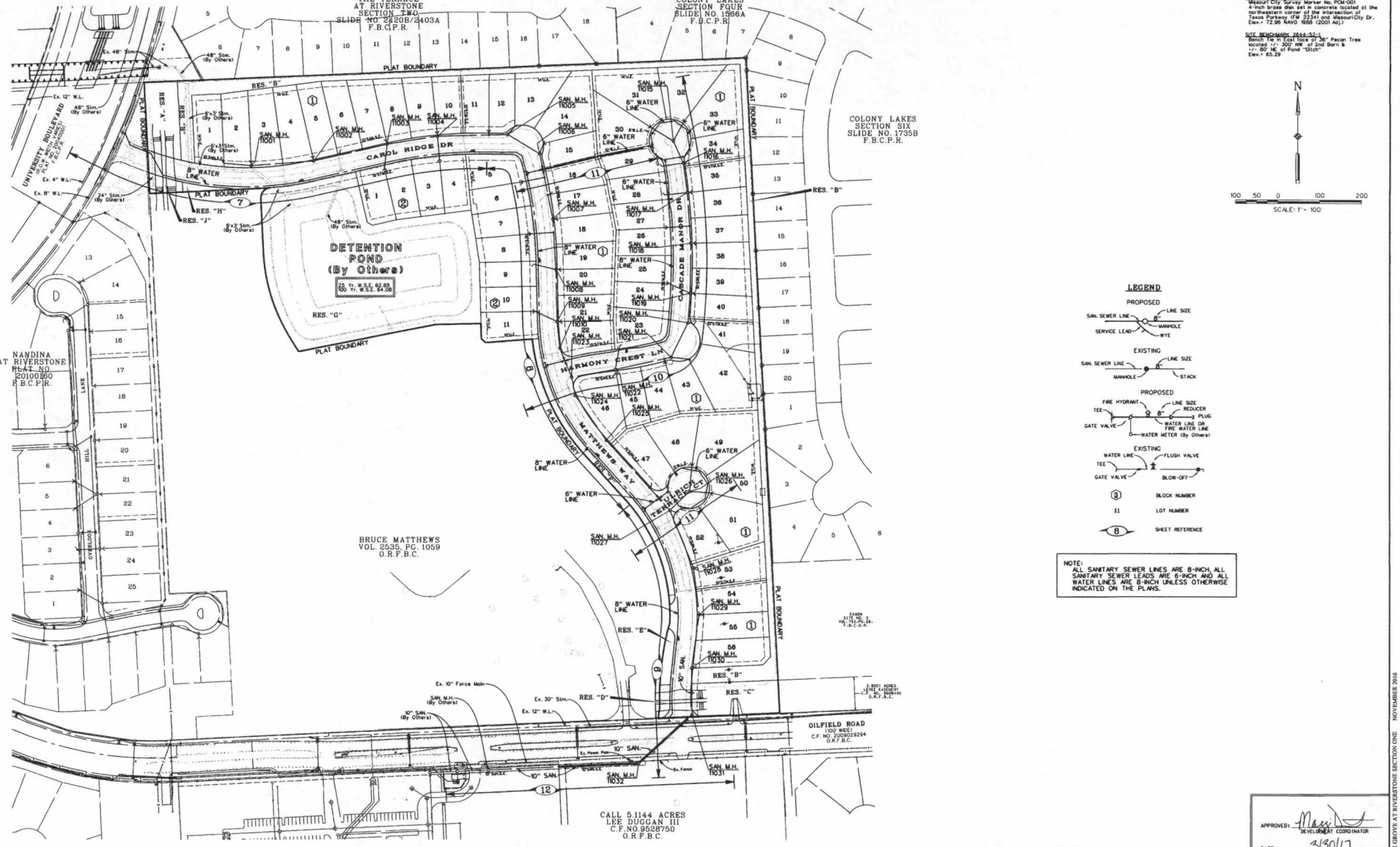
THE GROVE AT RIVERSTONE SECTION ONE

LOT GRADING PLAN
(SHEET 2 of 2)

STATE OF TEXAS
RON J. DECHERT
98544
LICENSED
PROFESSIONAL ENGINEER
3-23-17

SHEET 4B
OF 16 SHEETS
JOB NO. 2016-159-001/101

JOB NO. 2016-159-001/101 THE GROVE AT RIVERSTONE SECTION ONE NOVEMBER 2016



CONTROL BENCHMARK
Missouri City Survey Marker No. PCM-001
4-inch brass disk set in concrete located at the northeastern corner of the intersection of Texas Parkway (FM 2234) and Missouri City Dr.
Elev.= 72.96 NAVD 1988 (2001 Adj.)

SITE BENCHMARK 2644-52-1
Bench Tie in East face of 36" Pecan Tree located +/- 300' NW of 2nd Barn & +/- 80' NE of Pond "Ditch"
Elev.= 65.29

N

100 50 0 100 200
SCALE: 1" = 100'

LEGEND

PROPOSED
SAN. SEWER LINE — LINE SIZE — 8" — MANHOLE
SERVICE LEAD — WYE

EXISTING
SAN. SEWER LINE — LINE SIZE — 8" — MANHOLE — STACK

PROPOSED
FIRE HYDRANT — TEE — LINE SIZE — 8" — REDUCER — PLUG — GATE VALVE — WATER LINE OR FIRE WATER LINE — WATER METER (By Others)

EXISTING
WATER LINE — FLUSH VALVE — TEE — GATE VALVE — BLOW-OFF

3 BLOCK NUMBER
11 LOT NUMBER
8 SHEET REFERENCE

NOTE:
ALL SANITARY SEWER LINES ARE 8-INCH, ALL SANITARY SEWER LEADS ARE 6-INCH AND ALL WATER LINES ARE 8-INCH UNLESS OTHERWISE INDICATED ON THE PLANS.

APPROVED: _____ DEVELOPMENT COORDINATOR
DATE: 3/30/17

NO.	REVISION	DATE	BY

DESIGNED BY: RD
DESIGN CHECKED BY: RD
DRAWN BY: B
COGO CHECKED BY:
SURVEY CHECKED BY:
QA/QC BY: RS DATE: 4-4-17
QA/QC REVISIONS BY:

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Houston, Texas 77042
(713) 783-7788 (713) 783-3580, Fax

TBPE FIRM REG. No. 280
TBPLS FIRM REG. No. 100486

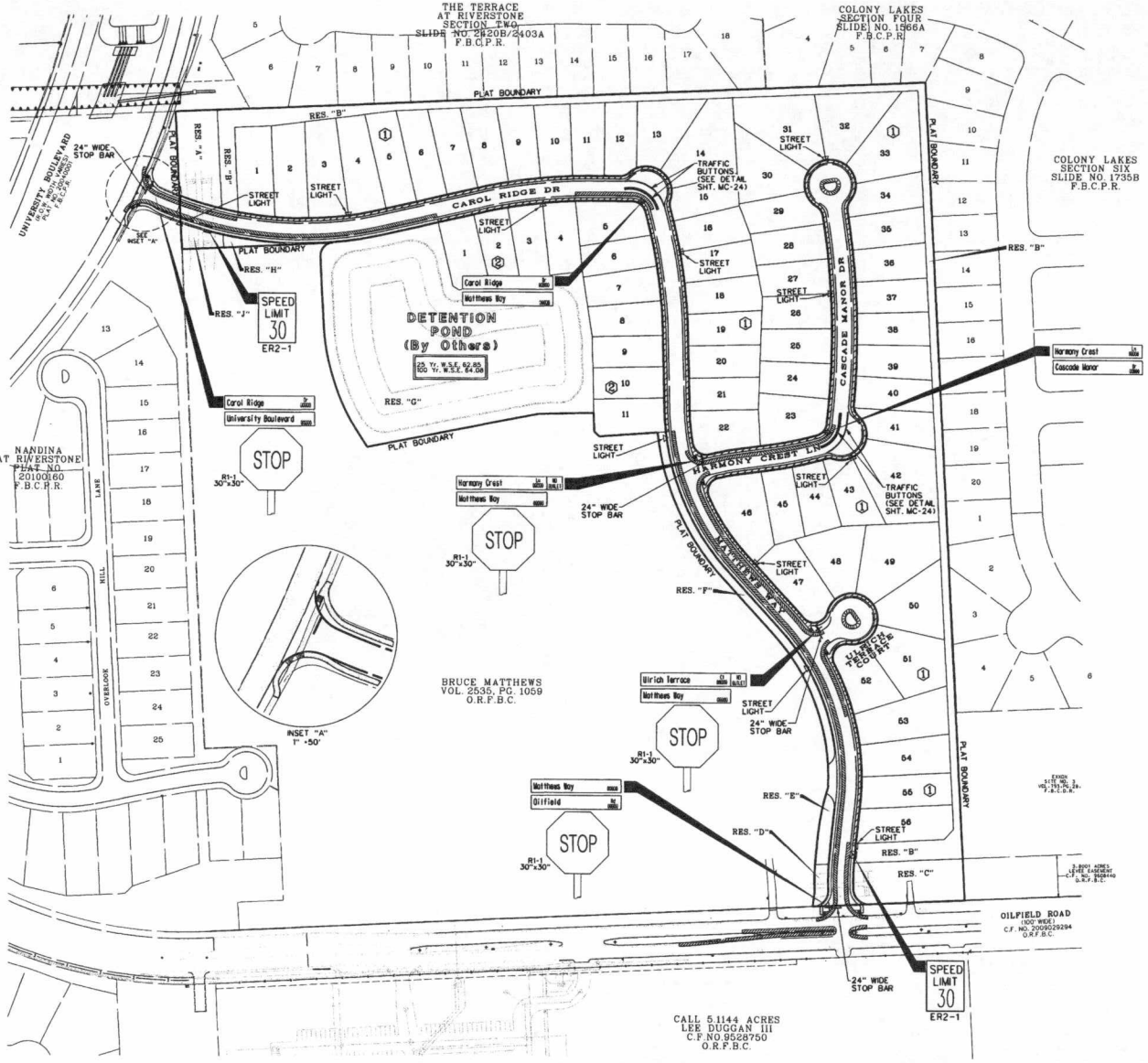
THE GROVE AT RIVERSTONE SECTION ONE

WATER AND SANITARY SEWER LAYOUT

3.16.17
STATE OF TEXAS
RON J. DECHERT
98544
LICENSED PROFESSIONAL ENGINEER

SHEET 5
OF 16 SHEETS
JOB NO. 2016-159-001/101

JOB NO. 2016-159-001/101 THE GROVE AT RIVERSTONE SECTION ONE NOVEMBER 2016



CONTROL BENCHMARK
Missouri City Survey Marker No. PCM-001
4-inch brass disk set in concrete located at the northeastern corner of the intersection of Texas Parkway (FM 2234) and Missouri City Dr.
Elev.- 72.96 (NAVD 1988 (2001 Adj.)

SITE BENCHMARK 2644-52-1
Bench Tie in East face of 36" Pecan Tree located +/- 300' NW of 2nd Born & +/- 80' NE of Pond "Ditch"
Elev.- 65.29

N

100 50 0 100 200
SCALE: 1"= 100'

LEGEND

- LOT NUMBER
- BLOCK NUMBER
- STREET SIGN w/STREET NAMES
- STREET SIGN
- SPEED LIMIT & KEEP RIGHT SIGNS
- STREET NAME CHANGE SIGN
- WHEELCHAIR RAMPS (PED-12A TYPE 7) (SEE SHEET 13)
- PROPOSED SIDEWALK (WIDTH VARIES)
- PROPOSED SIDEWALK (5' WIDE) (BY OTHERS)
- PROP. 6" CURB
- PROP. 4" CURB

STREET LIGHTS

- 9500 LUMEN STREET LIGHT (200'-500' MINIMUM-MAXIMUM DISTANCE SPACING)

NOTES:

1. SOLID 24-INCH WIDE REFLECTORIZED WHITE STOP BAR PLACED 4-FEET IN ADVANCE OF AND PARALLEL TO CROSSWALKS OR NEAREST EDGE OF INTERSECTING ROADWAY.
2. SIGN POSTS SHALL BE IN ACCORDANCE WITH DETAIL SHEET.
3. ALL SIDEWALKS SHALL HAVE A CROSS-SLOPE OF 2%. ALL SIDEWALK RAMPS SHALL CONFORM WITH ADA REQUIREMENTS. PED-12A TxDOT DETAIL. SIDEWALK RAMPS SHALL TERMINATE AT A PORTION OF SIDEWALK (MINIMUM 5' LENGTH) HAVING A MAXIMUM 2% SLOPE IN ALL DIRECTIONS. THE MAXIMUM RUNNING SLOPE OF ANY SIDEWALK IS TO BE 5%. THE CONTRACTOR IS RESPONSIBLE FOR GRADING AND LAYING OUT SIDEWALKS TO CONFORM TO THIS CRITERIA.
4. DIAMOND GRADE REFLECTIVE SHEETING REQUIRED ON ALL STOP SIGNS AND STREET NAME SIGNS.

CITY OF MISSOURI CITY
DIRECTOR OF PUBLIC WORKS/ CITY ENGINEER — DATE: 3/25/17

APPROVED: DEVELOPMENT COORDINATOR
DATE: 3/20/17

APPROVAL IS VOID IF NO PROGRESS HAS BEEN MADE TOWARDS COMPLETION OF THE PROJECT WITHIN TWO YEARS OF DATE OF SIGNATURE

NO.	REVISION	DATE	BY

DESIGNED BY: RD
DESIGN CHECKED BY: RD
DRAWN BY: CB
COGO CHECKED BY:
SURVEY CHECKED BY:
QA/QC BY: RS DATE: 4-4-17
QA/QC REVISIONS BY:

Costello
Engineering and Surveying
9990 Richmond Avenue, Suite 450 N
Houston, Texas 77042
(713) 783-7788 (713) 783-3580, Fax
TBPE FIRM REG. No. 280
TBPLS FIRM REG. No. 100486

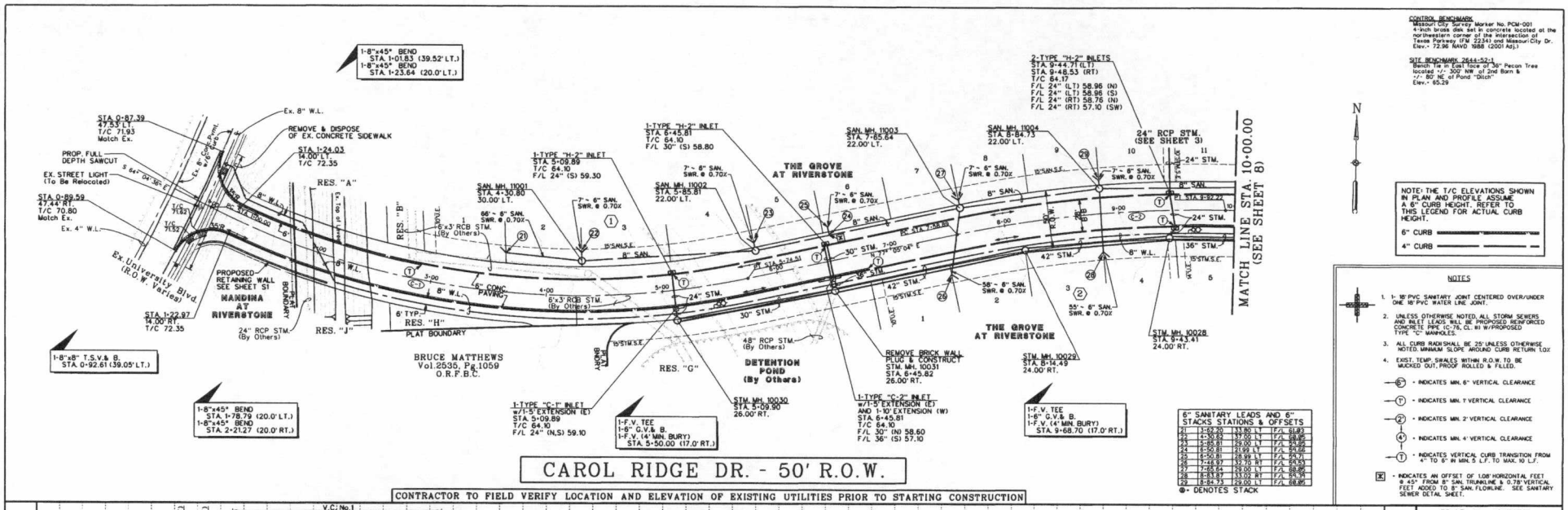
THE GROVE AT RIVERSTONE SECTION ONE

TRAFFIC CONTROL, SIDEWALK AND STREET LIGHTING PLAN

STATE OF TEXAS — RON J. DECHERT — 96544 — LICENSED PROFESSIONAL ENGINEER — 3-21-17

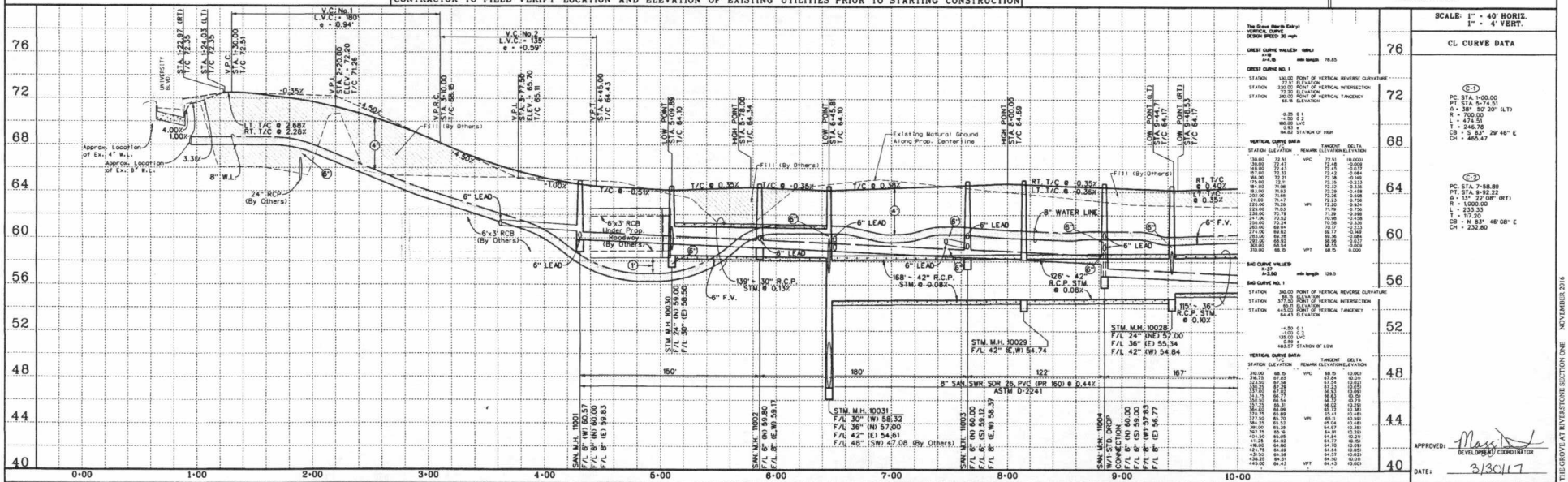
SHEET 6 OF 16 SHEETS
JOB NO. 2016-159-001/101

JOB NO. 2016-159-001/101 THE GROVE AT RIVERSTONE SECTION ONE NOVEMBER 2016



CAROL RIDGE DR. - 50' R.O.W.

CONTRACTOR TO FIELD VERIFY LOCATION AND ELEVATION OF EXISTING UTILITIES PRIOR TO STARTING CONSTRUCTION



SCALE: 1" = 40' HORIZ. 1" = 4' VERT.

CL CURVE DATA

C-1: PC. STA. 1+00.00; PT. STA. 5+74.51; Δ = 38° 50' 20" (LT); R = 700.00; L = 474.51; T = 246.78; CH = S 83° 29' 48" E; CH = 465.47

C-2: PC. STA. 7+58.89; PT. STA. 9+82.22; Δ = 13° 22' 08" (RT); R = 1,000.00; L = 233.33; T = 117.20; CH = N 83° 48' 08" E; CH = 232.80

APPROVED: DEVELOPMENT COORDINATOR

DATE: 3/30/17

NO	REVISION	DATE	BY

DESIGNED BY: RD
DESIGN CHECKED BY: RD
DRAWN BY: CB
COGO CHECKED BY:
SURVEY CHECKED BY:
QA/QC BY: RS DATE: 4-4-17
QA/QC REVISIONS BY:

Costello

Engineering and Surveying
9990 Richmond Avenue, Suite 450 N
Houston, Texas 77042
(713) 783-7788 (713) 783-3580, Fax

TBPE FIRM REG. No. 280
TBPLS FIRM REG. No. 100486

THE GROVE AT RIVERSTONE SECTION ONE

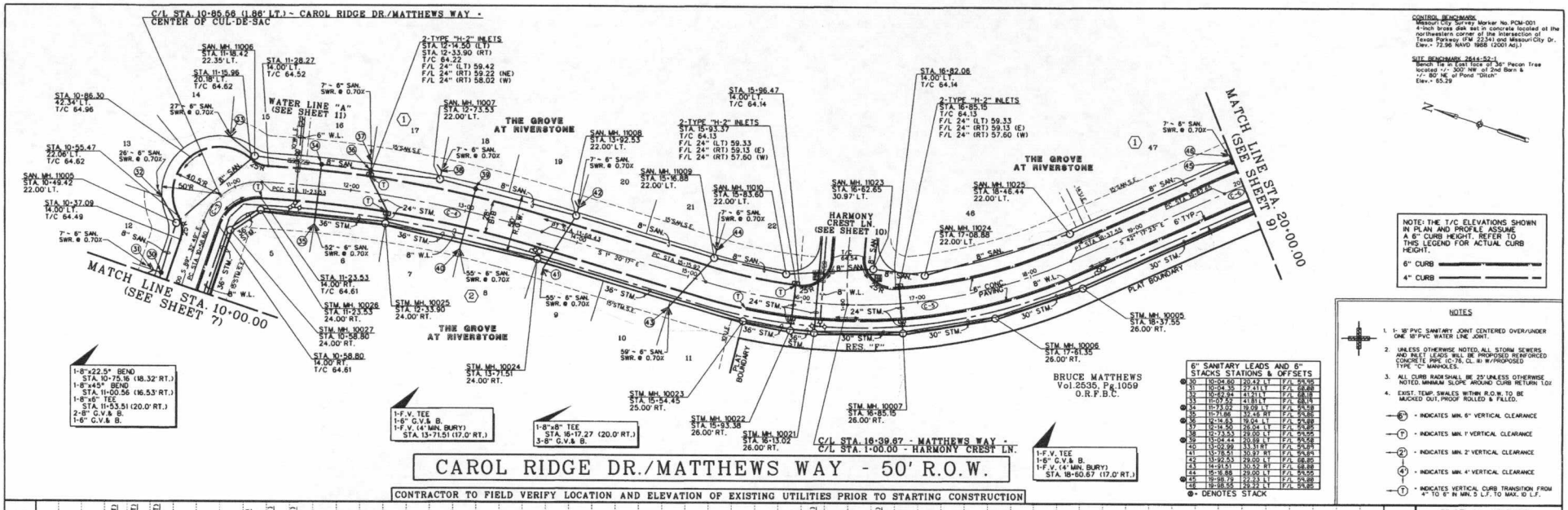
CAROL RIDGE DR.
STA. 0+87.39 TO STA. 10+00.00

STATE OF TEXAS — RON J. DECHERT — 96544 — LICENSED PROFESSIONAL ENGINEER — 2-3-17

SHEET 7 OF 16 SHEETS

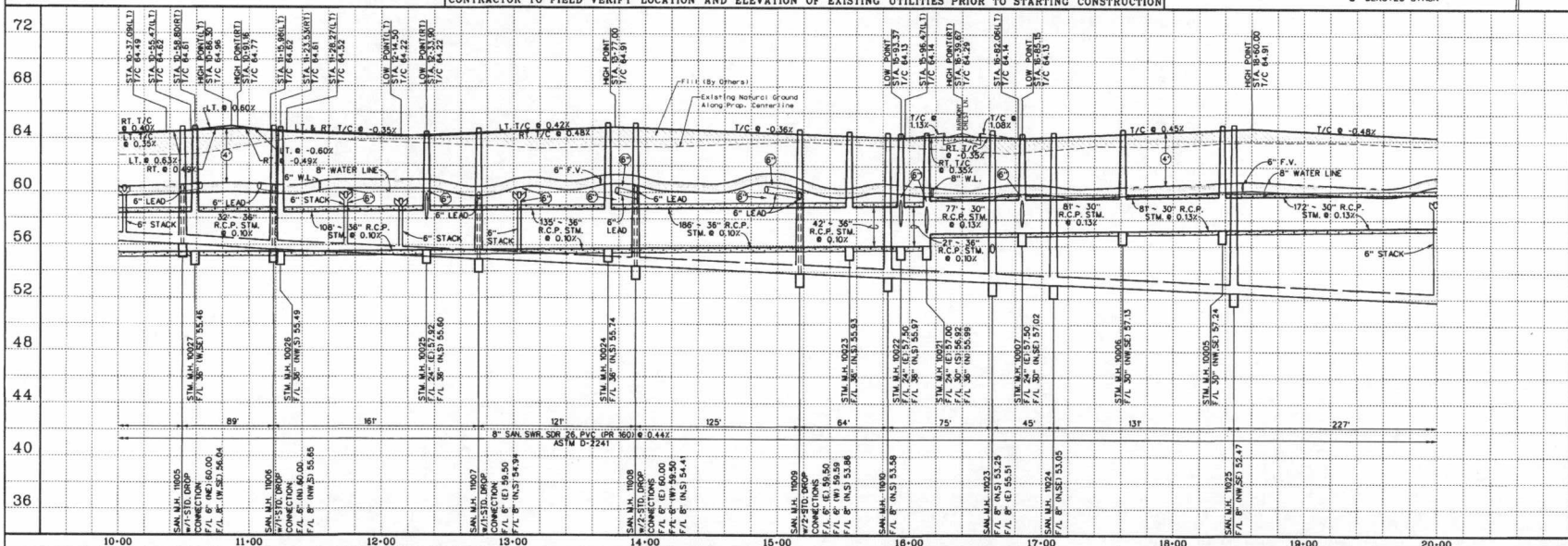
JOB NO. 2016-159-001/101

JOB NO. 2016-159-001/101 THE GROVE AT RIVERSTONE SECTION ONE NOVEMBER 2016



CAROL RIDGE DR./MATTHEWS WAY - 50' R.O.W.

CONTRACTOR TO FIELD VERIFY LOCATION AND ELEVATION OF EXISTING UTILITIES PRIOR TO STARTING CONSTRUCTION



SCALE: 1" = 40' HORIZ. 1" = 4' VERT.

CL CURVE DATA

C-3: PC. STA. 10+58.80; PCC. STA. 11+23.53; Δ = 74° 10' 37" (RT); R = 50.00; L = 64.73; T = 37.80; CB = S. 52° 27' 30" E; CH = 60.30

C-4: PCC. STA. 11+23.53; PT. STA. 13+68.43; Δ = 14° 01' 55" (RT); R = 1,000.00; L = 244.90; T = 123.07; CB = S. 8° 21' 14" E; CH = 244.29

C-5: PC. STA. 15+15.92; PT. STA. 18+37.55; Δ = 40° 57' 08" (LT); R = 450.00; L = 321.63; T = 168.03; CB = S. 21° 48' 50" E; CH = 314.83

C-6: PC. STA. 19+82.65; PT. STA. 23+61.44; Δ = 48° 13' 46" (RT); R = 450.00; L = 378.79; T = 201.43; CB = S. 18° 10' 30" E; CH = 367.71

APPROVED: _____ DEVELOPMENT COORDINATOR

DATE: 3/30/17

NO.	REVISION	DATE	BY

DESIGNED BY: RD
DESIGN CHECKED BY: RD
DRAWN BY: CB
COGO CHECKED BY:
SURVEY CHECKED BY:
QA/QC BY: RS DATE: 4.4.17
QA/QC REVISIONS BY:

Costello
Engineering and Surveying
9990 Richmond Avenue, Suite 450 N
Houston, Texas 77042
(713) 783-7788 (713) 783-3580, Fax
TBPE FIRM REG. No. 280
TBPLS FIRM REG. No. 100486

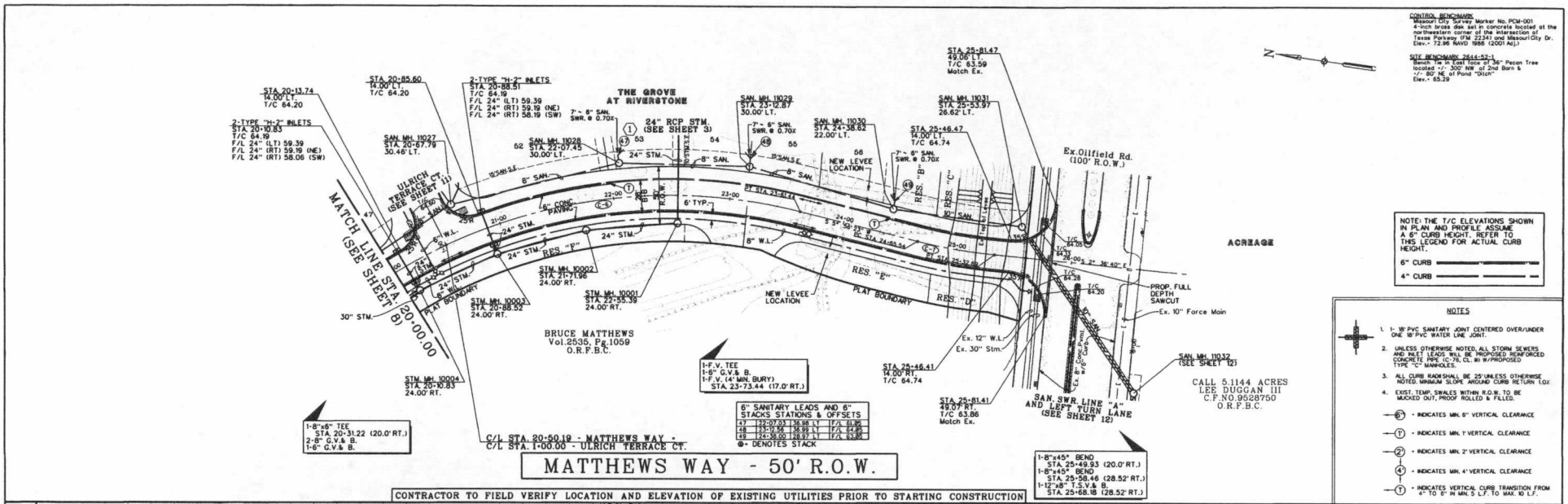
THE GROVE AT RIVERSTONE SECTION ONE

CAROL RIDGE DR./MATTHEWS WAY
STA. 10+00.00 TO STA. 20+00.00

1-25-17
STATE OF TEXAS
RON J. DECHERT
96644
LICENSED PROFESSIONAL ENGINEER

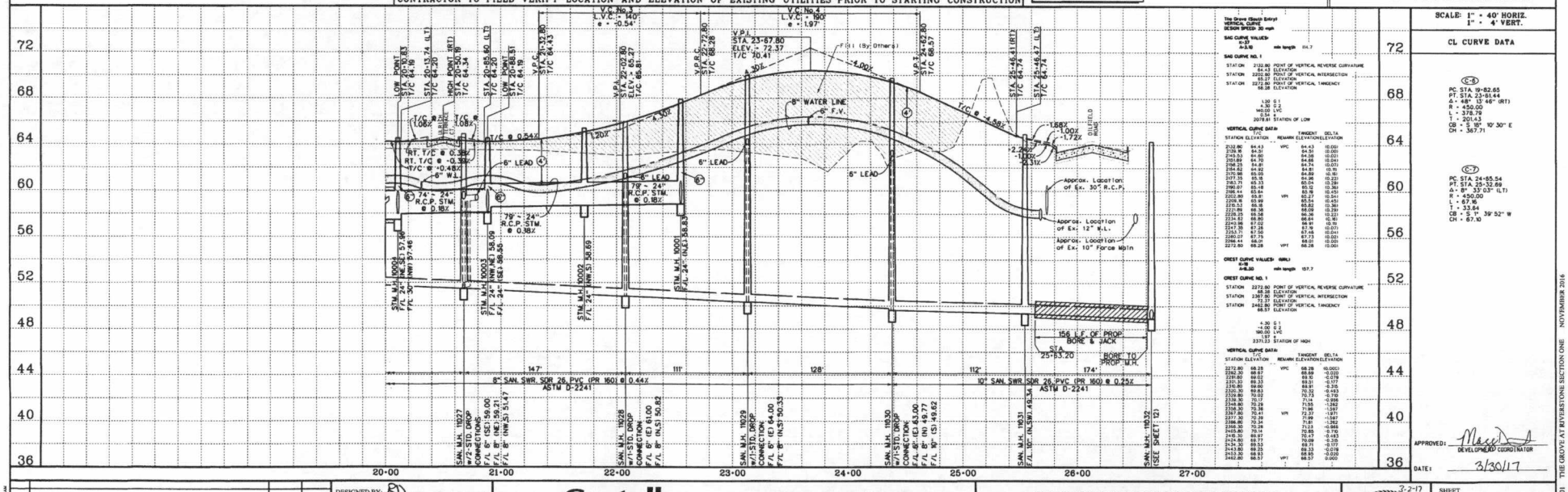
SHEET 8
OF 16 SHEETS
JOB NO. 2016-159-001/101

JOB NO. 2016-159-001/101 THE GROVE AT RIVERSTONE SECTION ONE NOVEMBER 2016



MATTHEWS WAY - 50' R.O.W.

CONTRACTOR TO FIELD VERIFY LOCATION AND ELEVATION OF EXISTING UTILITIES PRIOR TO STARTING CONSTRUCTION



SCALE: 1" = 40' HORIZ.
1" = 4' VERT.

CL CURVE DATA

C-6
PC STA. 19+82.65
PT STA. 23+81.44
Δ = 48° 13' 46" (RT)
R = 450.00
L = 378.79
T = 201.43
CB = S 18° 10' 30" E
CH = 367.71

C-7
PC STA. 24+65.54
PT STA. 25+32.69
Δ = 8° 33' 03" (LT)
R = 450.00
L = 67.16
T = 33.64
CB = S 1° 39' 52" W
CH = 67.10

APPROVED: DEVELOPMENT COORDINATOR
DATE: 3/30/17

NO.	REVISION	DATE	BY

DESIGNED BY: RD
DESIGN CHECKED BY:
DRAWN BY:
COGO CHECKED BY:
SURVEY CHECKED BY:
QA/QC BY: RS DATE: 4-4-17
QA/QC REVISIONS BY:

Costello
Engineering and Surveying
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Houston, Texas 77042
(713) 783-7788 (713) 783-3580, Fax
TBPE FIRM REG. No. 280
TBPLS FIRM REG. No. 100486

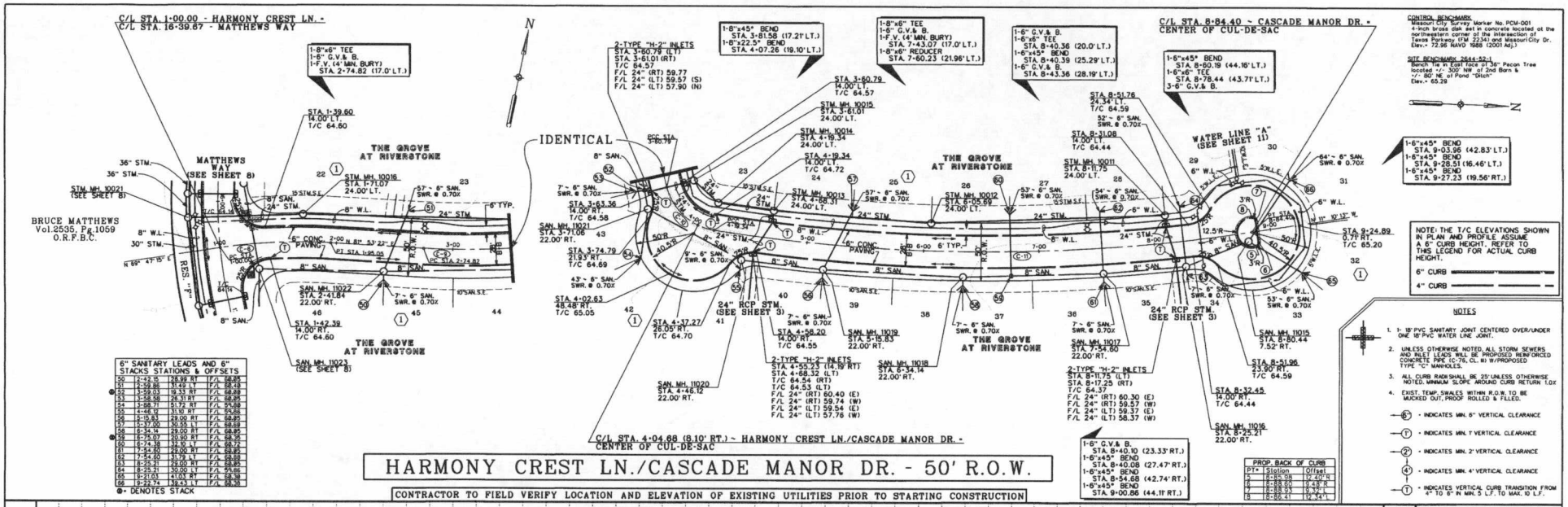
THE GROVE AT RIVERSTONE SECTION ONE

MATTHEWS WAY
STA. 20+00.00 TO STA. 25+81.47

2-2-17
STATE OF TEXAS
RON J. DECHERT
96544
LICENSED
PROFESSIONAL ENGINEER

SHEET 9 OF 16 SHEETS
JOB NO. 2016-159-001/101

JOB NO. 2016-159-001/101 THE GROVE AT RIVERSTONE SECTION ONE NOVEMBER 2016



6" SANITARY LEADS AND 6" STACKS STATIONS & OFFSETS

50	1+42.15	28.99 RT	F/L 68.26
51	1+59.86	31.49 LT	F/L 68.49
●52	1+59.03	19.33 RT	F/L 68.49
53	3+58.58	26.31 RT	F/L 68.95
54	3+58.71	51.72 RT	F/L 69.59
55	4+46.12	31.10 RT	F/L 69.68
56	5+15.83	29.00 RT	F/L 68.85
57	5+17.00	50.35 LT	F/L 69.69
58	6+34.14	29.00 RT	F/L 68.95
●59	6+75.07	20.90 RT	F/L 68.95
60	6+74.38	32.10 LT	F/L 68.72
61	7+54.80	29.00 RT	F/L 68.85
62	7+54.60	51.79 LT	F/L 69.68
63	8+25.21	29.00 RT	F/L 68.85
64	8+25.21	50.00 LT	F/L 69.68
65	9+21.03	41.03 RT	F/L 68.38
66	9+22.74	19.33 LT	F/L 68.38

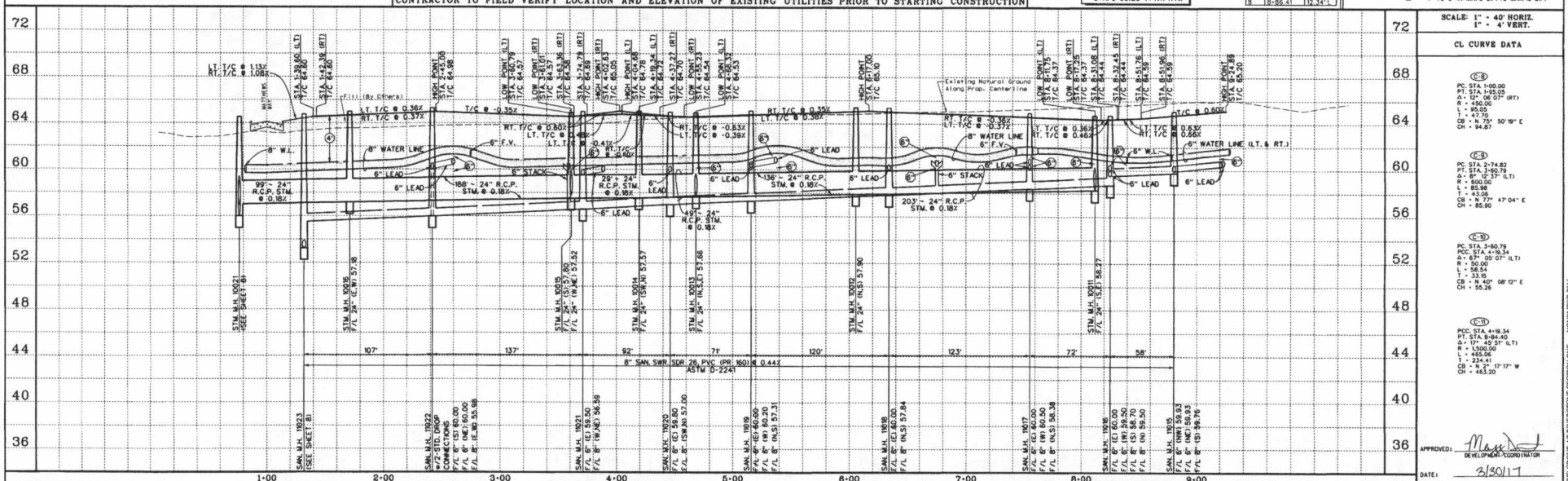
●• DENOTES STACK

PROP. BACK OF CURB

PT•	Station	Offset
5	6+85.08	19.47' R
6	6+88.00	19.48' R
7	6+88.93	19.32' L
8	6+86.41	19.34' L

HARMONY CREST LN./CASCADE MANOR DR. - 50' R.O.W.

CONTRACTOR TO FIELD VERIFY LOCATION AND ELEVATION OF EXISTING UTILITIES PRIOR TO STARTING CONSTRUCTION



SCALE: 1" = 40' HORIZ.
1" = 4' VERT.

CL CURVE DATA

C-8
PC: STA 1+00.00
PT: STA 1+95.05
Δ = 12° 06' 07" (RT)
R = 450.00
L = 95.05
T = 47.70
CB = N 75° 50' 19" E
CH = 94.87

C-9
PC: STA 2+74.82
PT: STA 3+60.79
Δ = 8° 12' 37" (LT)
R = 600.00
L = 85.98
T = 43.06
CB = N 77° 47' 04" E
CH = 85.90

C-10
PC: STA. 3+60.79
PCC: STA. + 19.34
Δ = 67° 05' 07" (LT)
R = 50.00
L = 58.54
T = 33.15
CB = N 40° 08' 12" E
CH = 55.26

C-11
PCC: STA. 4+19.34
PT: STA. 8+84.40
Δ = 17° 45' 51" (LT)
R = 1,500.00
L = 465.06
T = 234.41
CB = N 2° 17' 17" W
CH = 463.20

APPROVED: _____ DEVELOPMENT COORDINATOR
DATE: 3/30/17

DESIGNED BY: RD
DESIGN CHECKED BY: RD
DRAWN BY: ⊄
COGO CHECKED BY: _____
SURVEY CHECKED BY: _____
QA/QC BY: RS DATE: 4-4-17
QA/QC REVISIONS BY: _____

NO.	REVISION	DATE	BY

Costello

Engineering and Surveying
9990 Richmond Avenue, Suite 450 N
Houston, Texas 77042
(713) 783-7788 (713) 783-3580, Fax

TBPE FIRM REG. No. 280
TBPLS FIRM REG. No. 100486

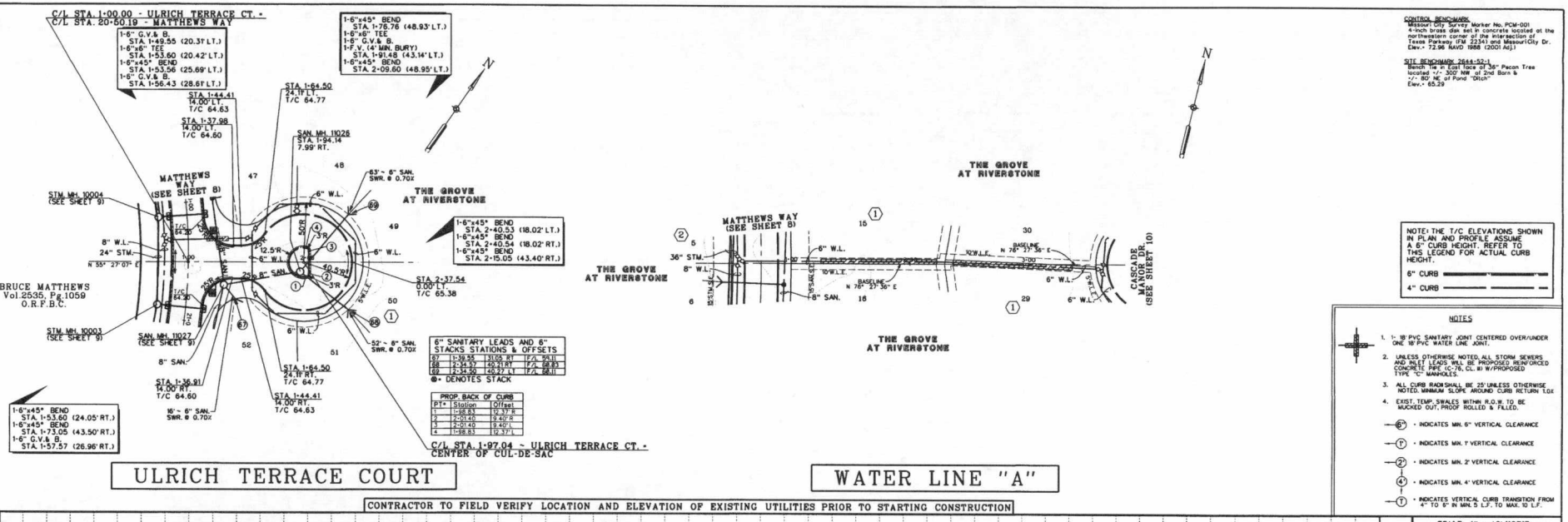
THE GROVE AT RIVERSTONE SECTION ONE

HARMONY CREST LN./CASCADE MANOR DR.
STA. 1+00.00 TO STA. 9+24.89

4-16-17
STATE OF TEXAS
RON J. DECHERT
98544
LICENSED PROFESSIONAL ENGINEER

SHEET 10
OF 16 SHEETS
JOB NO. 2016-159-001/101

JOB NO. 2016-159-001/101 THE GROVE AT RIVERSTONE SECTION ONE NOVEMBER 2016



ULRICH TERRACE COURT

WATER LINE "A"

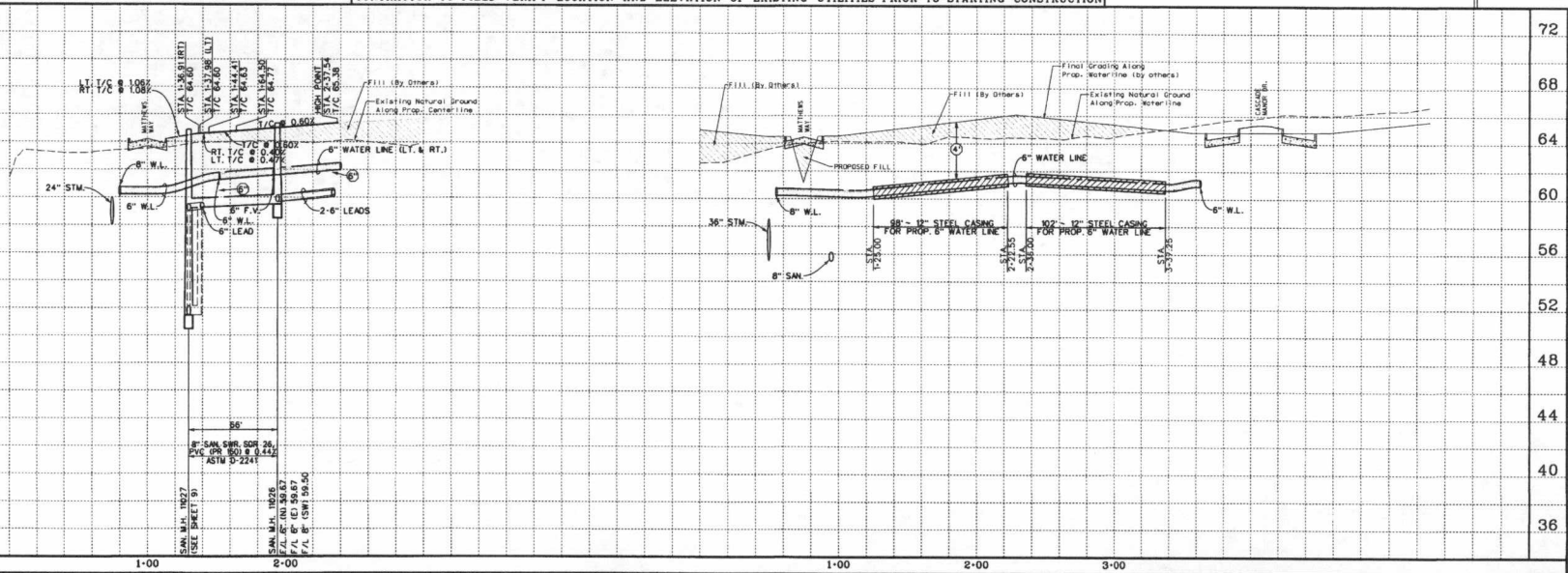
CONTRACTOR TO FIELD VERIFY LOCATION AND ELEVATION OF EXISTING UTILITIES PRIOR TO STARTING CONSTRUCTION

CONTROL BENCHMARK:
Missouri City Survey Marker No. PCM-001
4-inch brass dak set in concrete located at the northeastern corner of the intersection of Texas Parkway (FM 2234) and Missouri City Dr.
Elev.= 72.96 NAVD 1988 (2001 Adj.)

SITE BENCHMARK 2644-52-1
Bench Tie in East face of 36" Pecan Tree located +/- 300' NW of 2nd Barn & +/- 80' NE of Pond "Ditch"
Elev.= 65.29

NOTE: THE T/C ELEVATIONS SHOWN IN PLAN AND PROFILE ASSUME A 6" CURB HEIGHT. REFER TO THIS LEGEND FOR ACTUAL CURB HEIGHT.
6" CURB
4" CURB

NOTES
1. 1'- 18' PVC SANITARY JOINT CENTERED OVER/UNDER ONE 18' PVC WATER LINE JOINT.
2. UNLESS OTHERWISE NOTED, ALL STORM SEWERS AND INLET LEADS WILL BE PROPOSED REINFORCED CONCRETE PIPE (C-76, CL. III) W/PROPOSED TYPE "C" MANHOLES.
3. ALL CURB RADII SHALL BE 25' UNLESS OTHERWISE NOTED. MINIMUM SLOPE AROUND CURB RETURN 1.0%
4. EXIST. TEMP. SWALES WITHIN R.O.W. TO BE MUCKED OUT, PROOF ROLLED & FILLED.
⑥T • INDICATES MIN. 6" VERTICAL CLEARANCE
T • INDICATES MIN. 1' VERTICAL CLEARANCE
② • INDICATES MIN. 2' VERTICAL CLEARANCE
④ • INDICATES MIN. 4' VERTICAL CLEARANCE
T • INDICATES VERTICAL CURB TRANSITION FROM 4" TO 5" IN MIN. 5 L.F. TO MAX. 10 L.F.



SCALE: 1" = 40' HORIZ.
1" = 4' VERT.

CL CURVE DATA

APPROVED: DEVELOPMENT COORDINATOR
DATE: 3/30/17

NO.	REVISION	DATE	BY

DESIGNED BY: RD
DESIGN CHECKED BY: RM
DRAWN BY: CB
COGO CHECKED BY:
SURVEY CHECKED BY:
QA/QC BY: RS DATE: 4-4-17
QA/QC REVISIONS BY:

Costello
Engineering and Surveying
9990 Richmond Avenue, Suite 450 N
Houston, Texas 77042
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TBPE FIRM REG. No. 280
TBPLS FIRM REG. No. 100486

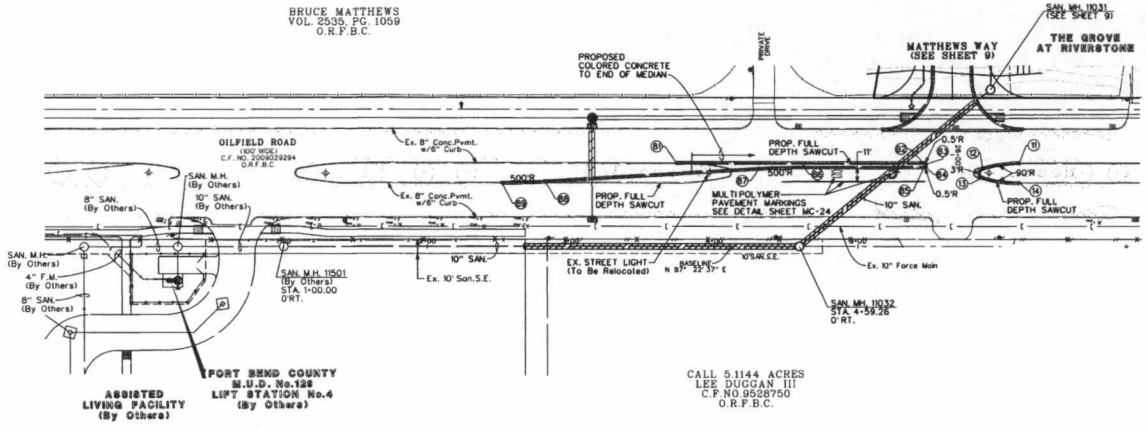
THE GROVE AT RIVERSTONE SECTION ONE

ULRICH TERRACE COURT
STA. 1+00.00 TO STA. 2+37.54
WATER LINE "A"
STA. 1+00.00 TO STA. 3+63.07

STATE OF TEXAS · RON J. DECHERT · 98544 · LICENSED · PROFESSIONAL ENGINEER
2-16-17

SHEET 11
OF 16 SHEETS
JOB NO. 2016-159-001/101

JOB NO. 2016-159-001/101 THE GROVE AT RIVERSTONE SECTION ONE NOVEMBER 2016



CONTROL BENCHMARK
Missouri City Survey Marker No. PCM-001
4-inch brass disk set in concrete located at the northeastern corner of the intersection of Texas Parkway (FM 2234) and Missouri City Dr.
Elev.= 72.98 NAVD 1988 (2001 Adj.)

SITE BENCHMARK 2644-52-1
Bench Tie in East face of 36" Pecan Tree located +/- 300' NW of 2nd Barn & +/- 80' NE of Pond "Ditch"
Elev.= 65.29

PROP. BACK OF CURB		
PT*	Station	Offset
11	6+13.33	58.75' L
12	5+87.09	54.50' L
L3	5+87.09	48.80' L
14	6+12.60	43.10' L
B1	5+74.31	58.42' L
B2	5+46.45	58.28' L
B3	5+46.95	57.79' L
B4	5+46.95	56.66' L
B5	5+46.45	56.16' L
B6	4+67.44	56.21' L
B7	4+71.50	45.27' L
B8	2+82.04	46.10' L
B9	2+51.84	45.18' L

NOTE: THE T/C ELEVATIONS SHOWN IN PLAN AND PROFILE ASSUME A 6" CURB HEIGHT. REFER TO THIS LEGEND FOR ACTUAL CURB HEIGHT.

6" CURB

4" CURB

NOTES

1. 1- 18' PVC SANITARY JOINT CENTERED OVER/UNDER ONE 18' PVC WATER LINE JOINT.
2. UNLESS OTHERWISE NOTED, ALL STORM SEWERS AND INLET LEADS WILL BE PROPOSED REINFORCED CONCRETE PIPE (C-76, CL. III) W/PROPOSED TYPE "C" MANHOLES.
3. ALL CURB RADII SHALL BE 25' UNLESS OTHERWISE NOTED. MINIMUM SLOPE AROUND CURB RETURN 1.0%
4. EXIST. TEMP. SWALES WITHIN R.O.W. TO BE MUCKED OUT, PROOF ROLLED & FILLED.

(6) = INDICATES MIN. 6' VERTICAL CLEARANCE

(1) = INDICATES MIN. 1' VERTICAL CLEARANCE

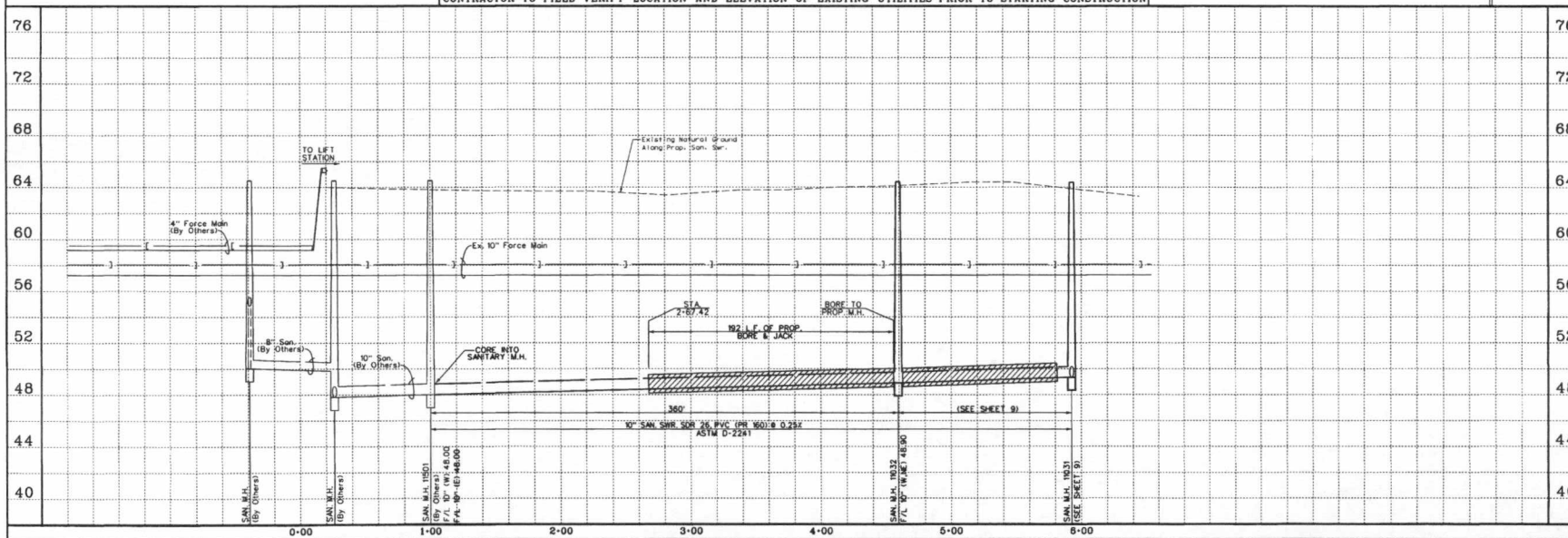
(2) = INDICATES MIN. 2' VERTICAL CLEARANCE

(4) = INDICATES MIN. 4' VERTICAL CLEARANCE

(1) = INDICATES VERTICAL CURB TRANSITION FROM 4" TO 6" IN MIN. 5 L.F. TO MAX. 10 L.F.

SANITARY SEWER LINE "A" AND LEFT TURN LANE

CONTRACTOR TO FIELD VERIFY LOCATION AND ELEVATION OF EXISTING UTILITIES PRIOR TO STARTING CONSTRUCTION



SCALE: 1" = 40' HORIZ.
1" = 4' VERT.

CL CURVE DATA

APPROVED: _____ DEVELOPMENT COORDINATOR

DATE: 3/30/17

NO.	REVISION	DATE	BY

DESIGNED BY: RD
DESIGN CHECKED BY: RD
DRAWN BY: S
COGO CHECKED BY: _____
SURVEY CHECKED BY: _____
QA/QC BY: RS DATE: 4-4-17
QA/QC REVISIONS BY: _____

Costello
Engineering and Surveying
9990 Richmond Avenue, Suite 450 N
Houston, Texas 77042
(713) 783-7788 (713) 783-3580, Fax
TBPE FIRM REG. No. 280
TBPLS FIRM REG. No. 100486

THE GROVE AT RIVERSTONE SECTION ONE

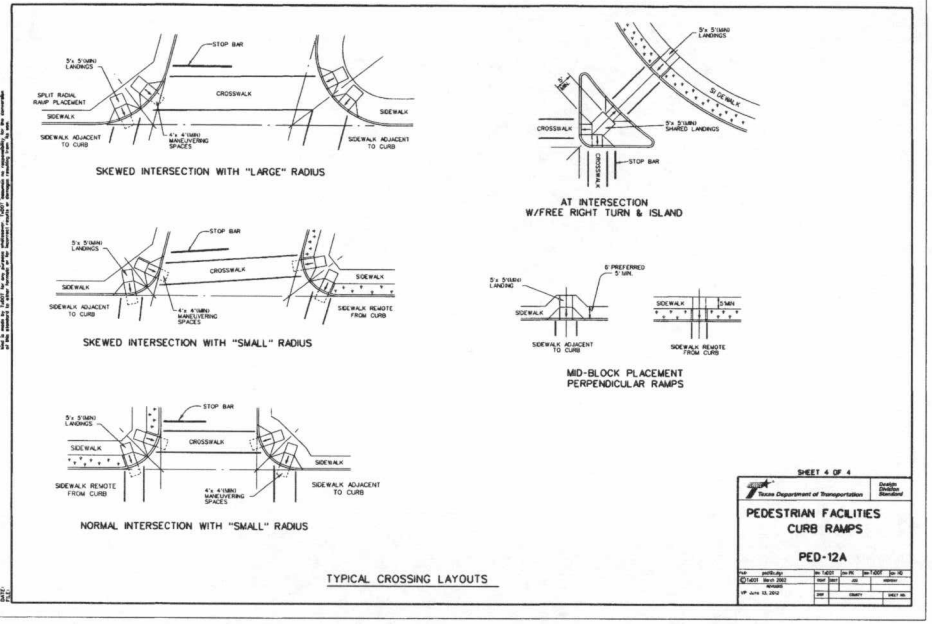
SANITARY SEWER LINE "A"
AND LEFT TURN LANE
STA. 1+00.00 TO STA. 5+88.44

4-25-17

STATE OF TEXAS
RON J. DECHERT
96544
LICENSED
PROFESSIONAL ENGINEER

SHEET 12
OF 16 SHEETS
JOB NO. 2016-159-001/101

JOB NO. 2016-159-001/101 THE GROVE AT RIVERSTONE SECTION ONE NOVEMBER 2016



TYPICAL CROSSING LAYOUTS

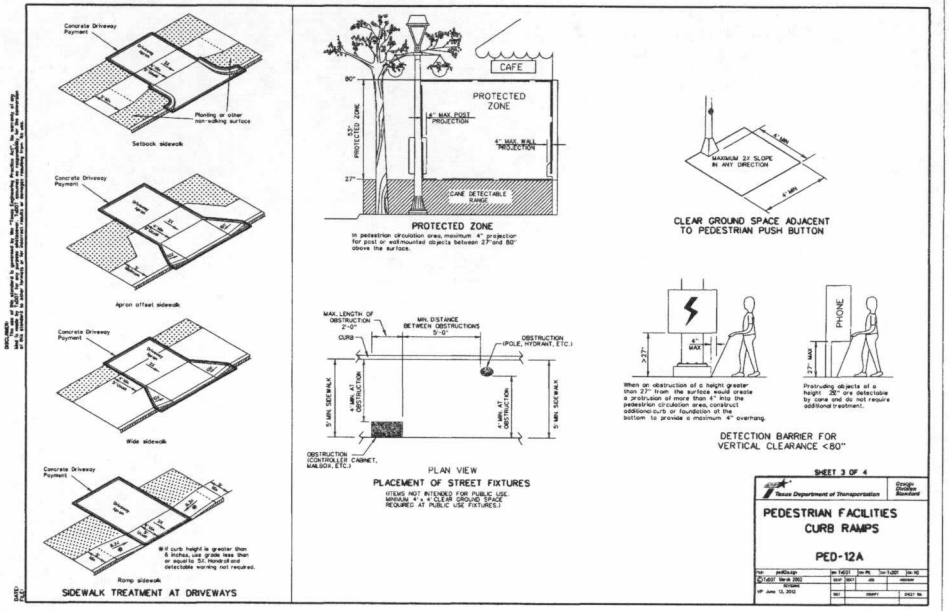
SHEET 4 OF 4

Texas Department of Transportation — Design Division Standard

PEDESTRIAN FACILITIES
CURB RAMPS

PED-12A

File:	ped12a.dgn		Dn: TxDOT	Dn: PK	Dn: TxDOT	Dn: JG
©TxDOT March 2002		CONT	SECT	JOB		HIGHWAY
REVISIONS						
4/1 June 13, 2012			DIST	COUNTY		SHEET NO.



PROTECTED ZONE
In pedestrian circulation area, maximum 4" projection for post or wall-mounted objects between 27" and 80" above the surface.

PLAN VIEW
PLACEMENT OF STREET FIXTURES
(ITEMS NOT INTENDED FOR PUBLIC USE. MINIMUM 4' x 4' CLEAR GROUND SPACE REQUIRED AT PUBLIC USE FIXTURES.)

CLEAR GROUND SPACE ADJACENT TO PEDESTRIAN PUSH BUTTON

When an obstruction of a height greater than 27" from the surface would create a protrusion of more than 4" into the pedestrian circulation area, construct additional curb or foundation at the bottom to provide a maximum 4" overhang.

Protruding objects of a height 28" are detectable by cane and do not require additional treatment.

DETECTION BARRIER FOR VERTICAL CLEARANCE <80"

SIDEWALK TREATMENT AT DRIVEWAYS

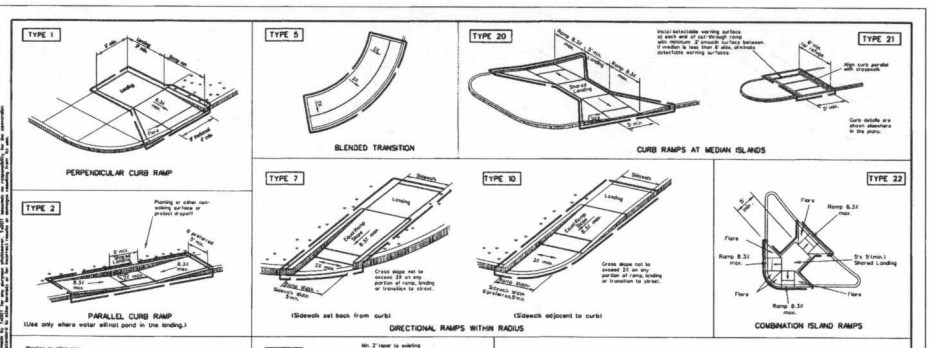
SHEET 3 OF 4

Texas Department of Transportation — Design Division Standard

PEDESTRIAN FACILITIES
CURB RAMPS

PED-12A

File:	ped12a.dgn		Dn: TxDOT	Dn: PK	Dn: TxDOT	Dn: JG
©TxDOT March 2002		CONT	SECT	JOB		HIGHWAY
REVISIONS						
4/1 June 13, 2012			DIST	COUNTY		SHEET NO.



NOTES / LEGEND:
See General Notes on sheet 2 of 4 for more information.

Ramp Limits of Payment

Detectable Warning Surface

SHEET 1 OF 4

Texas Department of Transportation — Design Division Standard

PEDESTRIAN FACILITIES
CURB RAMPS

PED-12A

File:	ped12a.dgn		Dn: TxDOT	Dn: PK	Dn: TxDOT	Dn: JG
©TxDOT March 2002		CONT	SECT	JOB		HIGHWAY
REVISIONS						
4/1 June 13, 2012			DIST	COUNTY		SHEET NO.

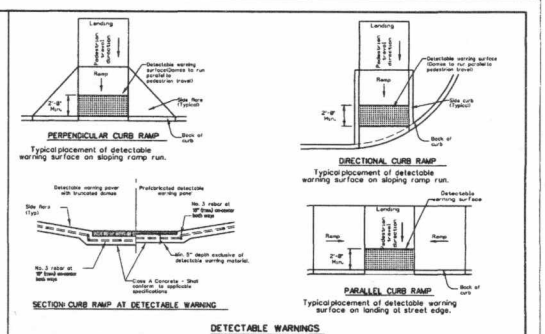
General Notes

Curb Ramps

1. Install a curb ramp or blended transition at each pedestrian street crossing.
2. All slopes shown are maximum allowable. Lesser slopes that will still drain properly should be used. Adjust curb ramp length or grade of approach sidewalks as directed.
3. The minimum sidewalk width is 5'. Where the sidewalk is adjacent to the back of curb, a 5' sidewalk width is desirable. Where a 5' sidewalk cannot be provided due to site constraints, sidewalk width may be reduced to 4' for short distances. 5' x 5' passing areas at intervals not to exceed 200' are required.
4. Landings shall be 5' x 5' minimum with a maximum 2% slope in any direction.
5. Maneuvering space at the bottom of curb ramps shall be a minimum of 4' x 4' wholly contained within the crosswalk and wholly outside the parallel vehicular travel path.
6. Maximum allowable cross slope on sidewalk and curb ramp surfaces is 2%.
7. Provide flared sides where the pedestrian circulation path crosses the curb ramp. Flared sides shall be sloped at 10% maximum, measured parallel to the curb. Returned curbs may be used only where pedestrians would not normally walk across the ramp, either because the adjacent surface is planted, substantially obstructed, or otherwise protected.
8. Additional information on curb ramp location, design, light reflective value and texture may be found in the current edition of the Texas Accessibility Standards (TAS) and 16 TAC §68.102.
9. To serve as a pedestrian refuge area, the median should be a minimum of 5' wide, measured from back of curbs. Medians should be designed to provide accessible passage over or through them.
10. Small channelization islands, which do not provide a minimum 5' x 5' landing at the top of curb ramps, shall be cut through level with the surface of the street.
11. Crosswalk dimensions, crosswalk markings and stop bar locations shall be as shown elsewhere on the plans. At intersections where crosswalk markings are not required, curb ramps shall align with theoretical crosswalks unless otherwise directed.
12. Handrails are not required on curb ramps. Provide curb ramps wherever an accessible route crosses lowered areas of a curb.
13. Curb ramps and landings shall be constructed and paid for in accordance with Item 531 "Sidewalks".
14. Place concrete at a minimum depth of 5" for ramps, flares and landings, unless otherwise directed.
15. Provide a smooth transition where the curb ramps connect to the streets.
16. Curbs shown on sheet 1 within the limits of payment are considered part of the curb ramp for payment, whether it is concrete curb, gutter, or combined curb and gutter.
17. Existing features that comply with TAS may remain in place unless otherwise shown on the plans.

Detectable Warning Material

18. Curb ramps must contain a detectable warning surface that consists of raised truncated domes complying with Section 705 of the TAS. The surface must contrast visually with adjoining surfaces, including side flares. Furnish and install an approved concrete paver dark brown or dark red detectable warning surface material adjacent to uncolored concrete, unless specified elsewhere on the plans.
19. Detectable Warning Materials must meet Tx.DOT Departmental Materials Specification DMS 4358 and be listed on the Material Producer List. Install products in accordance with manufacturer's specifications.
20. Detectable warning surfaces must be slip resistant and not allow water to accumulate.
21. Detectable warning surfaces shall be a minimum of 24" in depth in the direction of pedestrian travel, and extend the full width of the curb ramp or landing where the pedestrian access route enters the streets.
22. Detectable warning surfaces shall be located so that the edge nearest the curb line is at the back of curb. Align the rows of domes to be perpendicular to the grade break between the ramp run and the street. Detectable warning surfaces may be curved along the corner radius.
23. Shaded areas on Sheet 1 of 4 indicate the approximate location for the detectable warning surface for each curb ramp type.



DETECTABLE WARNINGS

Detectable Warning Pavers

24. Furnish detectable warning paver units meeting all requirements of ASTM C-936, C-33. Lug, in a bat by bat unit basket weave pattern or as directed.
25. Lay full-size units first followed by closure units consisting of at least 25 percent of a full unit. Cut detectable warning paver units using a power saw.

Sidewalks

26. Provide clear ground space at operable parts, including pedestrian push buttons. Operable parts shall be placed within one or more reach ranges specified in TAS 308.
27. Place traffic signal or illumination poles, ground boxes, controller boxes, signs, drainage facilities and other items so as not to obstruct the pedestrian access route or clear ground space.
28. Street grades and cross slopes shall be as shown elsewhere on the plans.
29. Changes in level greater than 1/4 inch are not permitted.
30. The least possible grade should be used to maximize accessibility. The running slope of sidewalks and crosswalks within the public right of way may follow the grade of the parallel roadway. Where a continuous grade greater than 5% must be provided, handrails may be desirable to improve accessibility. Handrails may also be needed to protect pedestrians from potentially hazardous conditions. If provided, handrails shall comply with TAS 505.
31. Handrail extensions shall not protrude into the usable landing area or into intersecting pedestrian routes.
32. Driveways and turnouts shall be constructed and paid for in accordance with Item "Intersections, Driveways and Turnouts". Sidewalks shall be constructed and paid for in accordance with Item "Sidewalks".
33. Sidewalk details are shown elsewhere on the plans.

SHEET 2 OF 4

Texas Department of Transportation — Design Division Standard

PEDESTRIAN FACILITIES
CURB RAMPS

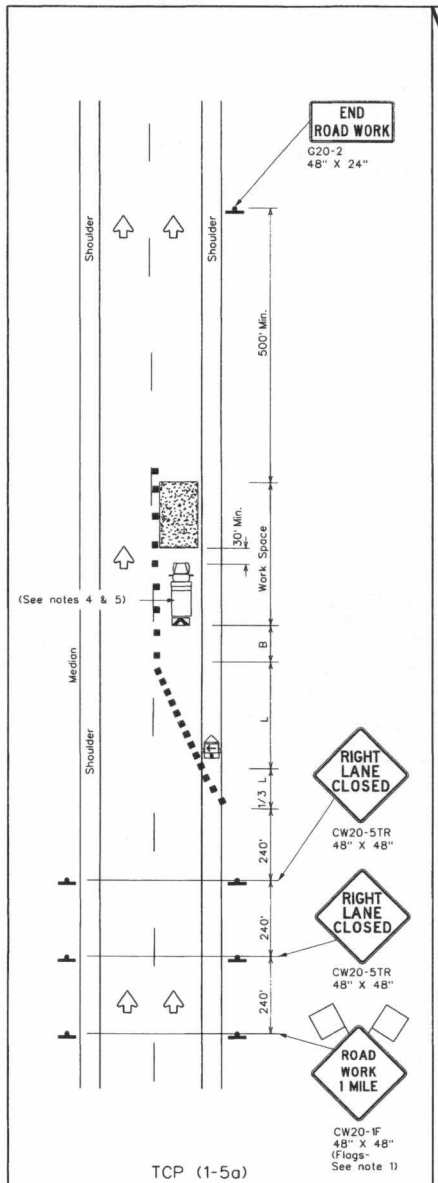
PED-12A

File:	ped12a.dgn		Dn: TxDOT	Dn: PK	Dn: TxDOT	Dn: JG
©TxDOT March 2002		CONT	SECT	JOB		HIGHWAY
REVISIONS						
4/1 June 13, 2012			DIST	COUNTY		SHEET NO.

SHEET NO. 13 OF 16

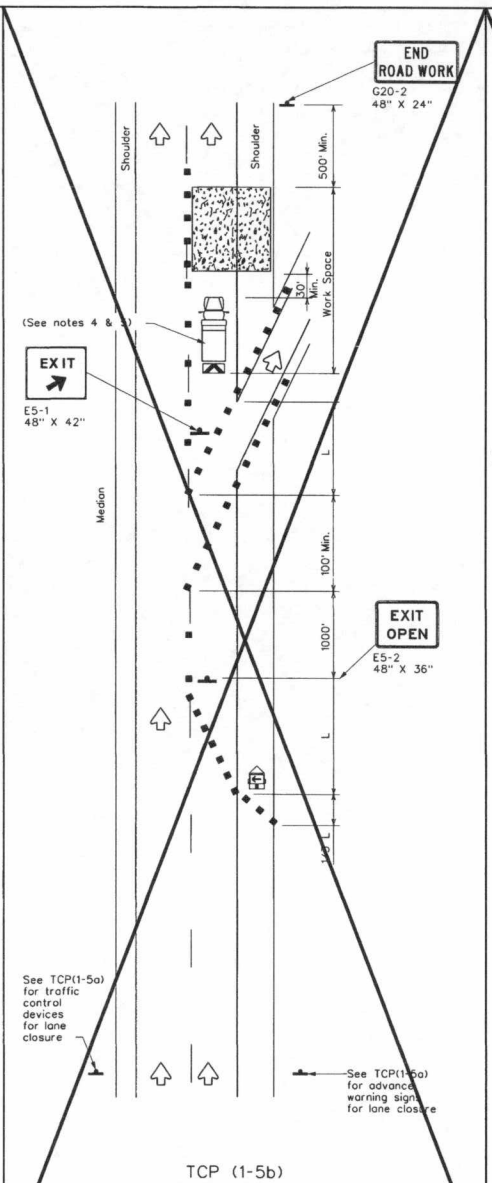
Maggie D 3/30/17

DATE:
FILE:



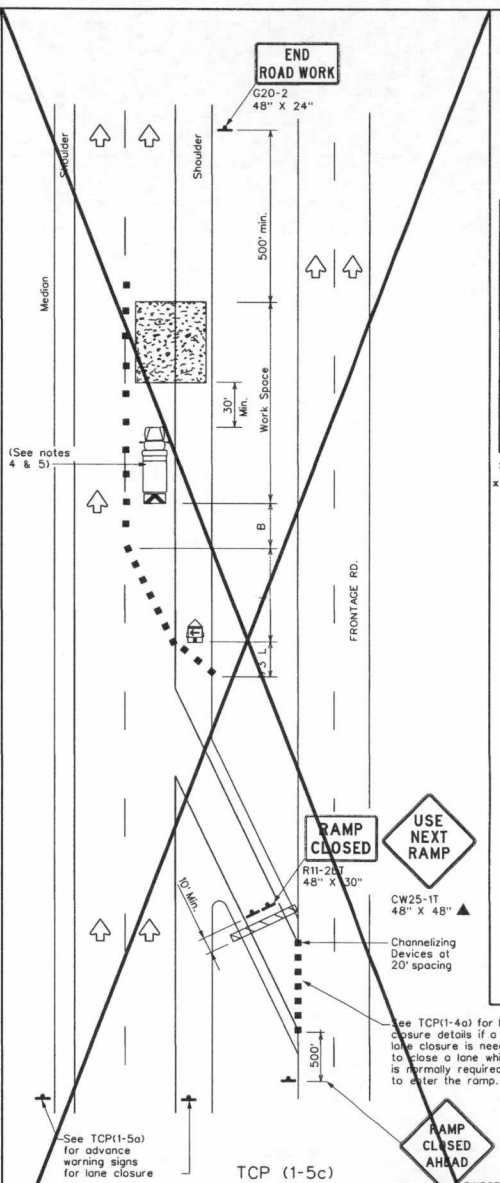
TCP (1-5a)

ONE LANE CLOSURE



TCP (1-5b)

LANE CLOSURE NEAR EXIT RAMPS



TCP (1-5c)

LANE CLOSURE NEAR ENTRANCE RAMPS

LEGEND			
	Type 3 Barricade		Channelizing Devices
	Heavy Work Vehicle		Truck Mounted Attenuator (TMA)
	Trailer Mounted Flashing Arrow Board	M	Portable Changeable Message Sign (PCMS)
	Sign		Traffic Flow
	Flag		Flagger

Posted Speed *	Formula	Minimum Desirable Taper Lengths * * 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Channelizing Devices On a Taper	On a Tangent	Minimum Sign Spacing "X" Distance	Suggested Longitudinal Buffer Space "B"
30	$L=\frac{WS^2}{60}$	150'	165'	180'	30'	60'	120'	90'
35		205'	225'	245'	35'	70'	160'	120'
40		265'	295'	320'	40'	80'	240'	155'
45	L=WS	450'	495'	540'	45'	90'	320'	195'
50		500'	550'	600'	50'	100'	400'	240'
55		550'	605'	660'	55'	110'	500'	295'
60		600'	660'	720'	60'	120'	600'	350'
65		650'	715'	780'	65'	130'	700'	410'
70		700'	770'	840'	70'	140'	800'	475'
75		750'	825'	900'	75'	150'	900'	540'

* Conventional Roads Only

* * Taper lengths have been rounded off.
L=Length of Taper(FT) W=Width of Offset(FT) S=Posted Speed(MPH)

TYPICAL USAGE				
MOBILE	SHORT DURATION	SHORT TERM STATIONARY	INTERMEDIATE TERM STATIONARY	LONG TERM STATIONARY
		✓		

GENERAL NOTES

1. Flags attached to signs where shown, are REQUIRED.
2. All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
3. Channelizing devices used to close lanes may be supplemented with the Chevron Alignment Sign placed on every other channelizing device. Chevrons may be attached to plastic drums as per BC Standards.
4. Shadow Vehicle with TMA and high intensity rotating, flashing, oscillating or strobe lights. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and TMA.
5. Additional Shadow Vehicles with TMAs may be positioned in each closed lane, on the shoulder or off the paved surface, next to those shown in order to protect a wider work space.

For construction or maintenance contract work, specific project requirements for shadow vehicles can be found in the project GENERAL NOTES for Item 502, Barricades, Signs and Traffic Handling.

Texas Department of Transportation
Traffic Operations Division

TRAFFIC CONTROL PLAN LANE CLOSURES FOR DIVIDED HIGHWAYS

TCP(1-5)-12

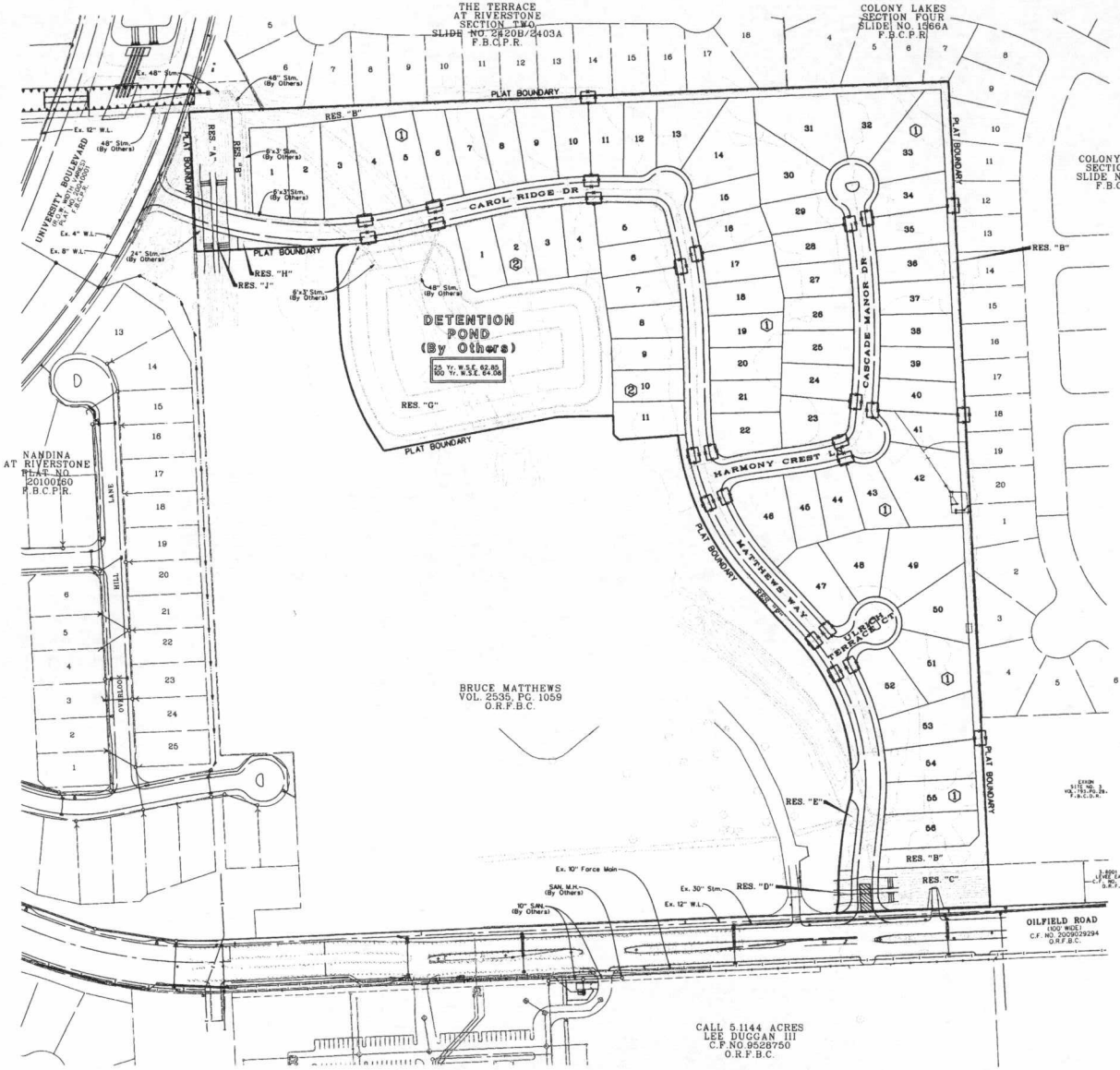
REVISIONS

DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
CONT	SECT	JOB	HIGHWAY
DIST	COUNTY		SHEET NO.

155

Maggie 3/30/17

SHEET No. 13A OF 16

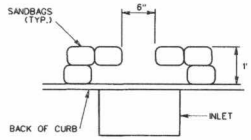


CONTROL BENCHMARK
Missouri City Survey Marker No. PCM-001
4-inch brass disk set in concrete located at the northeastern corner of the intersection of Texas Parkway (FM 2234) and Missouri City Dr.
Elev.- 72.96 NAVD 1988 (2001 Adj.)

SITE BENCHMARK 2644-52-1
Bench Tie in East face of 36" Pecan Tree located +/- 300' NW of 2nd Born & +/- 80' NE of Pond "Ditch"
Elev.- 85.29

N

100 50 0 100 200
SCALE: 1"= 100'



N.T.S.

LEGEND

- ②/12 — BLOCK NUMBER/LOT NUMBER
- 12 — EXISTING CONTOUR (1' INTERVAL)
- —x—x— FILTER FABRIC FENCE
- INLET PROTECTION BARRIER
- PROPOSED STORM SEWER
- STABILIZED CONSTRUCTION ENTRANCE/EXIT

POLLUTION PREVENTION NOTES:

1. PLACE FILTER FABRIC SILT FENCE +/- 5 FEET AROUND ALL INLETS.
2. ALL SOIL STOCKPILES OF SIGNIFICANT SIZE SHALL BE PROTECTED BY A SILT FENCE.
3. ALL PROPOSED SWALES TO BE CONSTRUCTED BY THE CONTRACTOR TO FACILITATE SITE DRAINAGE SHALL HAVE SILT FENCES PLACED ACROSS THE ENTIRE SWALE JUST UPSTREAM OF THE OUTFALL LOCATION.
4. A VEHICLE WASHDOWN AREA MAY BE LOCATED BY THE CONTRACTOR TO FACILITATE THE PROJECT. WHILE UTILIZING THE WASHDOWN AREA, THE CONTRACTOR SHALL PROTECT THE INLET WHERE THE WASH-DOWN IS DIRECTED AS PER PPP TEXT. THE LOCATION OF THE WASH-DOWN IS AT THE CONTRACTOR'S OPTION.
5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING ALL FACILITIES INDICATED ON THIS PLAN.
6. THE CONTRACTOR SHALL CONSTRUCT SILT BARRIERS INDICATED ON THIS PLAN IN ADDITION TO CONFORMING WITH ALL ITEMS DISCUSSED IN THE WRITTEN STORMWATER POLLUTION PREVENTION PLAN TEXT.
7. UPON PROJECT COMPLETION, THE ENTIRE DISTURBED AREA NOT PROPOSED FOR IMMEDIATE RECONSTRUCTION SHALL BE RESEEDED AS PER THE POLLUTION PREVENTION PLAN.
8. THE CONTRACTOR SHALL PROVIDE A SILT FENCE AROUND ALL OPEN PIPES/OPEN EXCAVATIONS IF WEATHER IS INCLEMENT.
9. IF DIRECTED BY THE OWNER, PAVING CONTRACTOR IS RESPONSIBLE FOR REMOVING ALL SILT FENCE AND INLET PROTECTION DEVICES AT THE END OF THE PROJECT.
10. THE CONTRACTOR SHALL REMOVE AND REPLACE SILT FENCE AS MANY TIMES AS REQUIRED IN ORDER TO CONSTRUCT PROPOSED FACILITIES. PAYMENT FOR SILT FENCE WILL BE THE TOTAL LENGTH INSTALLED ALONG A GIVEN ALIGNMENT, REGARDLESS OF THE NUMBER OF TIMES THE FENCE IS REMOVED AND REPLACED.

APPROVED: _____ DEVELOPMENT COORDINATOR
DATE: 3/30/17

NO.	REVISION	DATE	BY

DESIGNED BY: RD
DESIGN CHECKED BY: RD
DRAWN BY: SE
COGO CHECKED BY:
SURVEY CHECKED BY:
QA/QC BY: RS DATE: 4-7-17
QA/QC REVISIONS BY:

Costello
Engineering and Surveying
9990 Richmond Avenue, Suite 450 N
Houston, Texas 77042
(713) 783-7788 (713) 783-3580, Fax
TBPE FIRM REG. No. 280
TBPLS FIRM REG. No. 100486

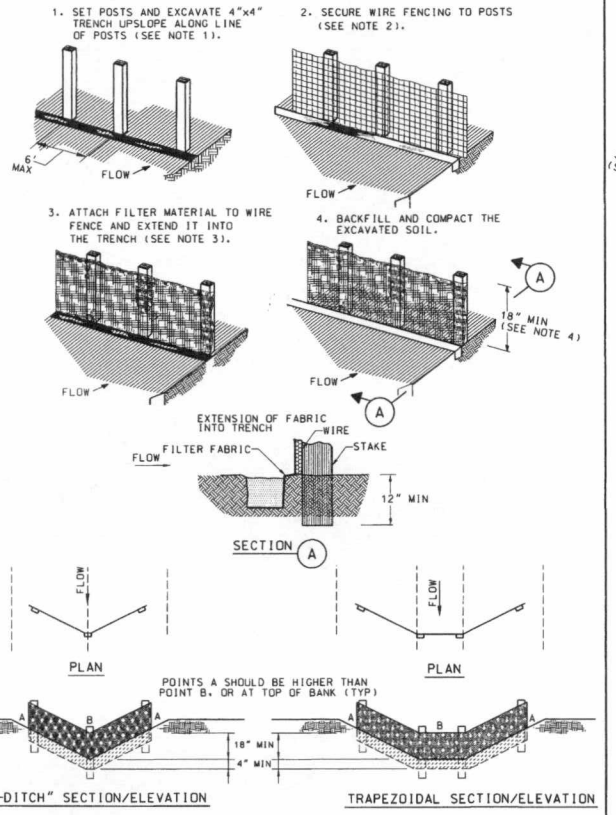
THE GROVE AT RIVERSTONE SECTION ONE

POLLUTION PREVENTION PLAN

4-23-17
STATE OF TEXAS
RON J. DECHERT
96544
LICENSED
PROFESSIONAL ENGINEER

SHEET 14
OF 16 SHEETS
JOB NO. 2016-159-001/101

JOB NO. 2016-159-001/101 THE GROVE AT RIVERSTONE SECTION ONE NOVEMBER 2016

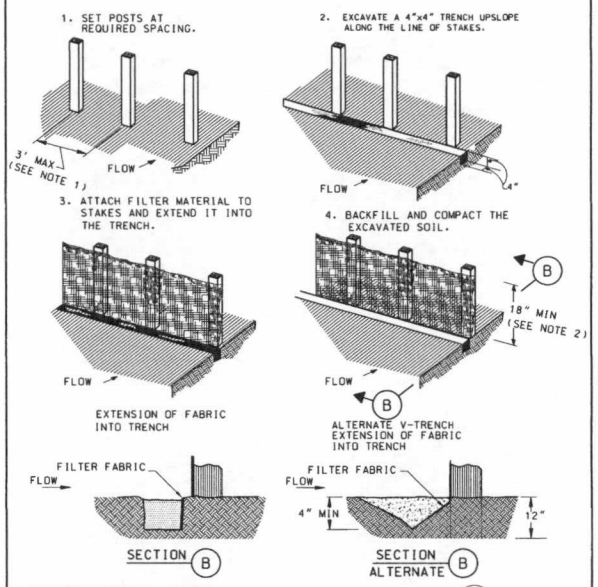


CONSTRUCTION NOTES:

1. SET 2 INCH BY 2 INCH WOODEN STAKES SPACED A MAX OF 6 FEET APART AND EMBEDDED A MIN OF 12 INCHES.
2. WOVEN WIRE FENCE TO BE FASTENED SECURELY TO FENCE POSTS WITH STAPLES.
3. FILTER CLOTH TO BE FASTENED SECURELY TO WOVEN WIRE FENCE, WITH TIES SPACED EVERY 24 INCHES AT TOP AND MIDSECTION.
4. MINIMUM HEIGHT OF FILTER SHOULD BE 18 INCHES AND A MAXIMUM OF 36 INCHES ABOVE NATURAL GROUND.
5. WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EACH OTHER THEY SHALL BE OVERLAPPED 6 INCHES AT THE POSTS, AND FOLDED.
6. SEE SECTION 01568 - REINFORCED FILTER FABRIC BARRIER.

SYMBOL

REINFORCED FILTER FABRIC BARRIER

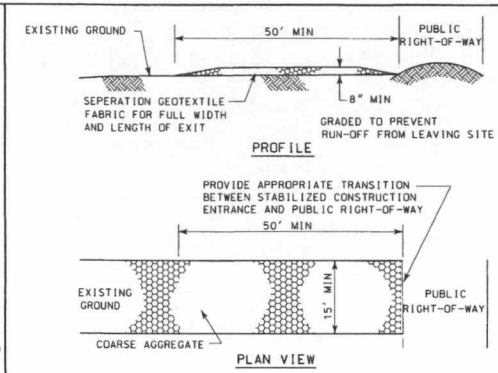


CONSTRUCTION NOTES:

1. 2 INCH THICK BY 2 INCH WOODEN STAKES TO BE SET AT MAX SPACING OF 3 FEET AND EMBEDDED A MIN OF 8 INCHES. IF PREASSEMBLED FENCE WITH SUPPORT NETTING IS USED, SPACING OF POST MAY BE INCREASED TO 8 FEET MAX.
2. ATTACH FILTER FABRIC TO WOODEN STAKES. FILTER FABRIC FENCE SHALL HAVE A MIN HEIGHT OF 18 INCHES AND MAX HEIGHT OF 36 INCHES ABOVE NATURAL GROUND.
3. WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EACH OTHER THEY SHOULD BE OVERLAPPED 6 INCHES AT THE POSTS, AND FOLDED.
4. SEE SECTION 01567 - FILTER FABRIC FENCE.

SYMBOL

FILTER FABRIC FENCE

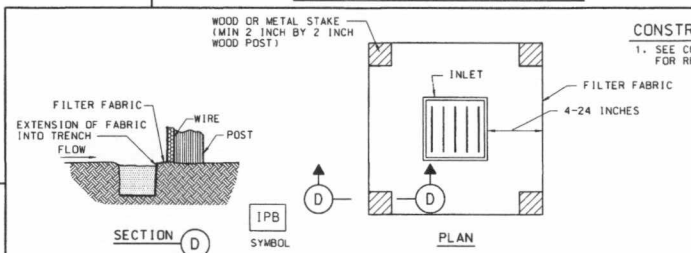


CONSTRUCTION NOTES:

1. LENGTH SHALL BE AS SHOWN ON THE CONSTRUCTION DRAWINGS, BUT NOT LESS THAN 50 FEET.
2. THICKNESS SHALL BE NOT LESS THAN 8 INCHES.
3. WIDTH SHALL BE NOT LESS THAN FULL WIDTH OF ALL POINTS OF INGRESS OR EGRESS.
4. STABILIZATION FOR OTHER AREAS SHALL HAVE THE SAME AGGREGATE THICKNESS AND WIDTH REQUIREMENTS AS THE STABILIZED CONSTRUCTION EXIT, UNLESS OTHERWISE SHOWN ON THE CONSTRUCTION DRAWINGS.
5. STABILIZED AREA MAY BE WIDENED OR LENGTHENED TO ACCOMODATE A TRUCK WASHING AREA. AN OUTLET SEDIMENT TRAP MUST BE PROVIDED FOR THE TRUCK WASHING AREA.
6. SEE SECTION 01569 - STABILIZED CONSTRUCTION EXIT.
7. STABILIZED CONSTRUCTION EXIT SHALL BE MAINTAINED FREE OF SEDIMENT FOR THE DURATION OF THE PROJECT.

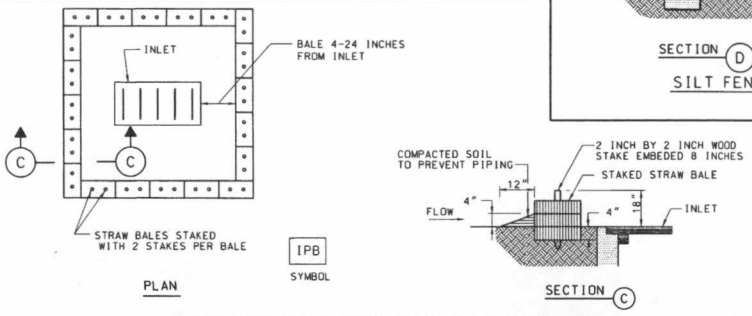
SC
SYMBOL

STABILIZED CONSTRUCTION EXIT



CONSTRUCTION NOTE:

1. SEE CONSTRUCTION NOTES FOR RFB.



APPROVED: DEVELOPMENT COORDINATOR

DATE: 3/30/17

NO.	REVISION	DATE	BY

DESIGNED BY: RD
DESIGN CHECKED BY: RD
DRAWN BY: [illegible]
COGO CHECKED BY:
SURVEY CHECKED BY:
QA/QC BY: RS DATE: 4-4-17
QA/QC REVISIONS BY:

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Houston, Texas 77042
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TBPE FIRM REG. No. 280
TBPLS FIRM REG. No. 100486

THE GROVE AT RIVERSTONE SECTION ONE

POLLUTION PREVENTION DETAILS

STATE OF TEXAS RON J. DECHERT 96544 LICENSED PROFESSIONAL ENGINEER 12-8-16

SHEET 15 OF 16 SHEETS

JOB NO. 2016-159-001/101

JOB NO. 2016-159-001/101 THE GROVE AT RIVERSTONE SECTION ONE NOVEMBER 2016

NOTES:

1. CONTROL BENCHMARK: CITY OF MISSOURI CITY SURVEY MARKER # PCM-008; BRASS DISK. IN CONCRETE LOCATED APPROXIMATELY 215 FEET WEST OF THE CENTERLINE OF EAST CREEK CLUB, 18 FEET SOUTH OF THE CURB OF GLEN LAKES LANE, AND 21.5 FEET WEST OF THE WEST EDGE OF A DRIVE TO A LIFT STATION. ELEV. 66.09 NAVD 88,2001 ADJ.
2. THE TOP OF ALL FLOOR SLABS SHALL BE A MINIMUM 66.1 FEET ABOVE SEA LEVEL. THE TOP OF SLAB ELEVATION AT ANY POINT ON THE PERIMETER OF THE SLAB SHALL NOT BE LESS THAN EIGHTEEN (18) INCHES ABOVE NATURAL GROUND.
3. THE CONTOURS AND SLAB ELEVATIONS SHOWN HEREON ARE BASED ON THE VERTICAL DATUM OF NAVD, 1988, 2001 ADJUSTMENT.
4. THIS PROPERTY LIES WITHIN THE LIMITS OF SHADED ZONE "X" AS PER FLOOD INSURANCE RATE MAP NUMBER 48157C0290L DATED APRIL 2, 2014.
5. ALL OF THE PROPERTY SUBDIVIDED IN THE ABOVE AND FOREGOING PLAT IS LOCATED WITHIN THE BOUNDARIES OF FORT BEND COUNTY, FORT BEND I.S.D., THE CITY OF MISSOURI CITY ETJ, AND TO BE ANNEXED INTO FORT BEND COUNTY L.I.D. NO. 19 AND FORT BEND COUNTY M.U.D. NO. 129.
6. THE CITY OF MISSOURI CITY SHALL NOT BE RESPONSIBLE FOR MAINTENANCE OF DRIVEWAYS, EMERGENCY ACCESS EASEMENTS, RECREATIONAL AREAS, OPEN SPACES AND SIDEWALKS.
7. THERE ARE NO PIPELINE OR PIPELINE EASEMENTS WITHIN THE LIMITS OF THIS SUBDIVISION.
8. SIDEWALKS AND TRAILS SHALL REFER TO SECTION 82-164 OF THE SUBDIVISION ORDINANCE OF THE CITY OF MISSOURI CITY, TEXAS.
   (a) IN GENERAL, PAVEMENT MARKINGS, SEPARATORS, SIGNAGE, FENCING AND LANDSCAPING MAY ALSO BE REQUIRED WHERE NECESSARY TO PROMOTE CIRCULATION, SCREENING, BUFFERING AND SAFETY.
   (b) SIDEWALKS. SIDEWALKS SHALL BE INSTALLED ALONG ALL STREETS IN EACH SUBDIVISION AND SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE CITY DESIGN MANUAL.
   (c) TRAILS. TRAILS MAY BE INSTALLED IN A VARIETY OF AREAS INCLUDING PEE STRIPS AS WELL AS ON ADJACENT LEVEES, WITHIN DRAINAGE EASEMENTS AND PIPELINE EASEMENTS, ALONG ROAD RIGHT-OF-WAY AND IN ANY OTHER LOCATION AND MANNER CONSISTENT WITH THE CITY PARK AND RECREATION MASTER PLAN AND CITY TRAIL PLAN.
9. THE FOLLOWING UTILITY COMPANIES HAVE BEEN CONTACTED AND THE EASEMENTS SHOWN HEREON CONSTITUTE ALL THE EASEMENTS REQUESTED BY THE UTILITY COMPANIES AT THIS TIME:
   VERIZON, CENTERPOINT ENERGY, FORT BEND COUNTY C.A.D., TIME WARNER CABLE CO., FBC DRAINAGE DISTRICT, CENTERPOINT GAS, SIENERGY, L.P.
10. NO BUILDING OR OTHER PERMIT, EXCEPT PERMITS FOR CONSTRUCTION OF PUBLIC IMPROVEMENTS, WILL BE ISSUED BY THE CITY OF MISSOURI CITY, TEXAS FOR CONSTRUCTION WITHIN THIS SUBDIVISION UNTIL SUCH TIME AS ALL PUBLIC IMPROVEMENTS OF THE SUBDIVISION HAVE BEEN CONSTRUCTED BY THE DEVELOPER AND ACCEPTED BY THE CITY OR THE GUARANTEE OF CONSTRUCTION OF PUBLIC IMPROVEMENTS REQUIRED BY SECTION 82-206 OF THE CODE OF ORDINANCES OF THE CITY OF MISSOURI CITY, TEXAS, IS SUBMITTED TO AND APPROVED BY THE CITY.
11. B.L. INDICATES BUILDING SETBACK LINE, ST.M.S.E. INDICATES STORM SEWER EASEMENT, S.S.E. INDICATES SANITARY SEWER EASEMENT, W.L.E. INDICATES WATER LINE EASEMENT, U.E. INDICATES UTILITY EASEMENT, U.E.&E. INDICATES UTILITY EASEMENT WITH AERIAL EASEMENT, CP.E.E. INDICATES CENTERPOINT ENERGY EASEMENT; L.I.D. INDICATES LEVEE IMPROVEMENT DISTRICT, M.U.D. INDICATES MUNICIPAL UTILITY DISTRICT AND D.E. INDICATES DRAINAGE EASEMENT.
12. ALL BEARINGS ARE REFERENCED TO THE CITY OF MISSOURI CITY G.P.S. MONUMENTATION PROGRAM, TEXAS COORDINATE SYSTEM, SOUTH CENTRAL ZONE (NAD 83), USING CITY SURVEY MARKER NO. 7096 AND 7076.
13. ALL BUILDING LINE TRANSITIONS ARE AT 45-DEGREE ANGLES TO THE STRAIGHT SIDE LOT LINE WHERE THE TRANSITION OCCURS.
14. IN ACCORDANCE WITH CENTER POINT ENERGY ELECTRICAL SERVICE MANUAL, ARTICAL 421.2 ELECTRIC METERS SHALL BE LOCATED IN A POSITION THAT IS ACCESSIBLE AT ALL TIMES WITHOUT CUSTOMER ASSISTANCE. ACCESS TO THE METER SHALL NOT BE BLOCKED BY GATES, WALLS OR FENCES.
15. ALL SLAB ELEVATIONS SHALL BE ONE FOOT ABOVE THE 100-YEAR FLOOD ELEVATION AS ESTABLISHED BY FEMA AS PER SECTION 82-97 (11).
16. DRIVEWAY APPROACHES SHALL BE PROVIDED IN ACCORDANCE WITH THE MISSOURI CITY DRIVEWAY APPROACH POLICY AS REQUIRED UNDER THE PROVISIONS OF SUBSECTION 82-160 OF THE CODE OF ORDINANCES OF THE CITY OF MISSOURI CITY, TEXAS.
17. PIPELINES CONSTRUCTED WITHIN THE SIENERGY, L.P., GAS EASEMENT TO BE BURIED WITH A COVER OF AT LEAST 36-INCHES FROM THE TOP OF PIPE TO THE SURFACE OF THE GROUND.
18. REQUIRED FIRE FLOWS SHALL BE PROVIDED BASED ON THE SIZE AND CONSTRUCTION OF ALL BUILDINGS AS REQUIRED BY THE INTERNATIONAL FIRE CODE AS ADOPTED BY THE CITY.
19. THE DRAINAGE SYSTEM FOR THIS SUBDIVISION IS DESIGNED IN ACCORDANCE WITH THE FORT BEND COUNTY DRAINAGE CRITERIA MANUAL WHICH ALLOWS STREET PONDING WITH INTENSE RAINFALL EVENTS.
20. ALL DRAINAGE EASEMENTS TO BE KEPT CLEAR OF FENCES, BUILDINGS, VEGETATION AND OTHER OBSTRUCTIONS TO THE OPERATION AND MAINTENANCE OF THE DRAINAGE FACILITY.
21. ALL PROPERTY TO DRAIN INTO DRAINAGE EASEMENT ONLY THROUGH AN APPROVED DRAINAGE STRUCTURE.
22. THIS PLAT WAS PREPARED WITH THE BENEFIT OF A CITY PLANNING LETTER PREPARED BY UNIVERSAL TITLE PARTNERS, LLC., FILE NUMBER CPL#2016-16, ISSUED AUGUST 10, 2016, AND IS SUBJECT TO ALL TERMS, CONDITIONS, LEASES AND ENCUMBRANCES STIPULATED THEREIN.
23. THE PLACEMENT OF FIRE HYDRANTS SHALL BE PROVIDED BASED ON THE MINIMUM DISTANCE REQUIREMENTS AS ESTABLISHED IN THE INTERNATIONAL FIRE CODE AS ADOPTED BY THE CITY (300 FT. FOR RESIDENTIAL DEVELOPMENT AND 300 FT. FOR COMMERCIAL DEVELOPMENT). ALL FIRE HYDRANTS SHALL BE INSTALLED ACCORDING TO THE INTERNATIONAL FIRE CODE AS ADOPTED BY THE CITY.
24. BUILDING SHALL BE SET BACK A MINIMUM DISTANCE OF 30 FEET FROM ANY PIPELINE OR 15 FEET FROM ANY PIPELINE EASEMENT, WHICHEVER DISTANCE IS GREATER.
25. SIDEWALKS SHALL BE BUILT OR CAUSED TO BE BUILT NOT LESS THAN 5 FEET IN WIDTH ON BOTH SIDES OF ALL DEDICATED RIGHTS-OF-WAY WITHIN SAID PLAT AND ON THE CONTIGUOUS RIGHT-OF-WAY OF ALL PERIMETER ROADS SURROUNDING SAID PLAT, IN ACCORDANCE WITH THE A.D.A.
26. A ONE-FOOT RESERVE DEDICATED FOR BUFFER PURPOSES TO THE PUBLIC IN FEE AS A BUFFER SEPARATION BETWEEN THE SIDE OR END OF STREETS WHERE SUCH STREETS ABUT ADJACENT ACREAGE TRACTS, THE CONDITIONS OF SUCH DEDICATION BEING THAT WHEN THE ADJACENT PROPERTY IS SUBDIVIDED BY A RECORDED PLAT, THE ONE-FOOT RESERVE SHALL THEREUPON BECOME VESTED IN THE PUBLIC FOR STREET RIGHT-OF-WAY PURPOSES AND THE FEE TITLE THERETO SHALL REVERT AND REVEST IN THE DEDICATOR, HIS HEIRS, ASSIGNS, OR SUCCESSORS.

THE GROVE AT RIVERSTONE SECTION ONE

BEING 26.44 ACRES
LOCATED IN THE
WILLIAM STAFFORD SURVEY, A-89
FORT BEND COUNTY, TEXAS

67 LOTS 2 BLOCKS 9 RESERVES

SCALE: 1"=100' DATE: JANUARY, 2017

OWNER:
NEWMARK HOMES HOUSTON, LLC
A TEXAS LIMITED LIABILITY COMPANY
MIKE MOSEY, MANAGER
10455 BRIAR FOREST, SUITE 200
HOUSTON, TEXAS 77042
713-346-0200

KERRY R. GILBERT & ASSOCIATES
- Land Planning Consultants -
23501 Cinco Ranch Blvd., Suite A-250
Katy, Texas 77494
Tel: 281-579-0340

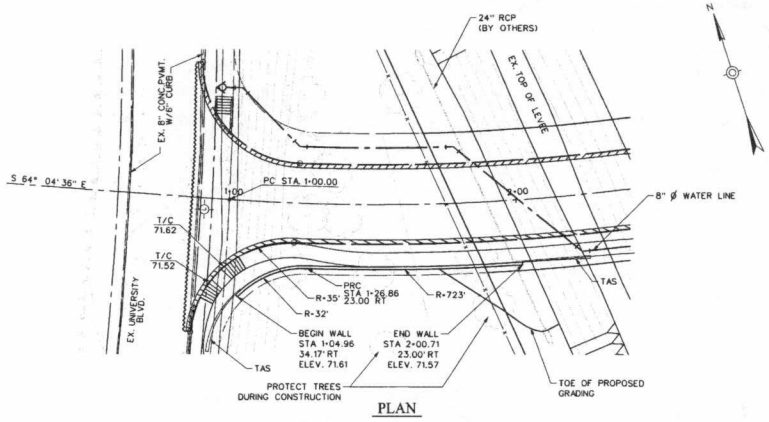
Costello
ENGINEERING AND SURVEYING
9990 RICHMOND AVENUE, SUITE 450
NORTH BUILDING
HOUSTON, TEXAS 77042
(713) 783-7788 (713) 783-3580, Fax
TEXAS PE BOARD FIRM REG. NO. 280
TBPLS FIRM REG. NO. 100486

MARK D. ARMSTRONG
REGISTERED PROFESSIONAL LAND SURVEYOR
TEXAS REGISTRATION NUMBER - 5363

CHAD HABLINSKI
LICENSED PROFESSIONAL ENGINEER
TEXAS LICENSE NUMBER - 85466

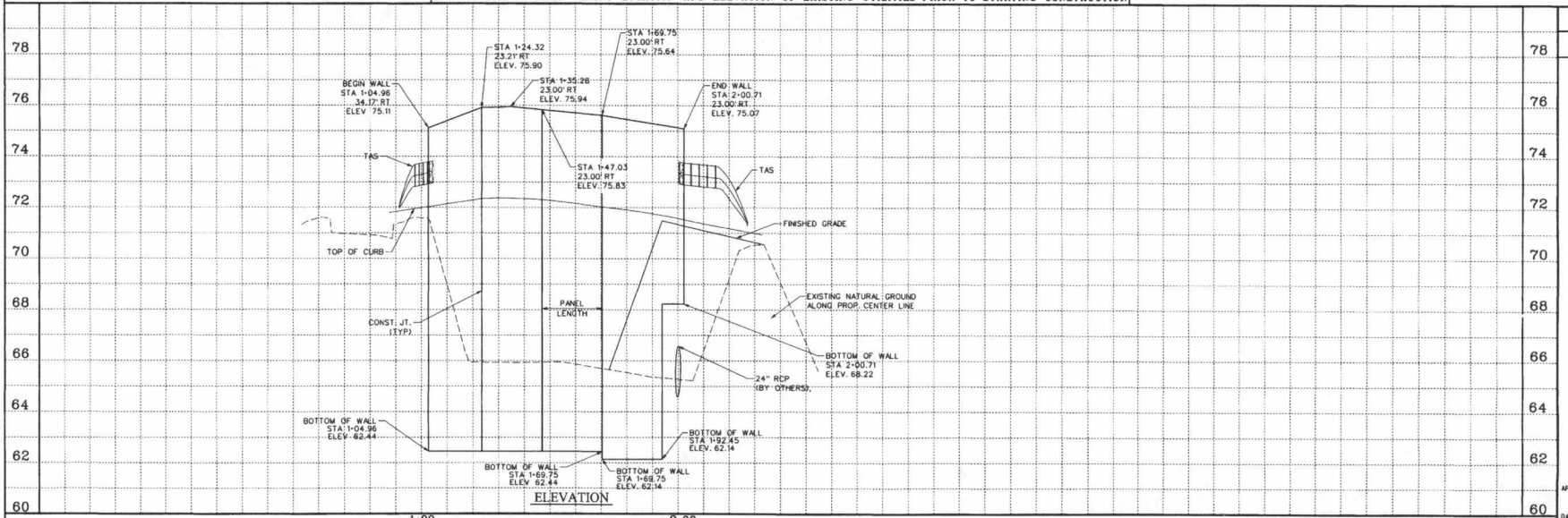
missouri CITY TEXAS

JOB NO.* 2016-159-012
S:\NEW\RIVERSTONE\2016159\012\159012PLAT.DGN



PLAN

CONTRACTOR TO FIELD VERIFY LOCATION AND ELEVATION OF EXISTING UTILITIES PRIOR TO STARTING CONSTRUCTION



ELEVATION

SCALE: 1" = 20' HORIZ.
1" = 2' VERT.

CL CURVE DATA

APPROVED: _____ DEVELOPMENT COORDINATOR

DATE: 3/30/17

NO.	REVISION	DATE	BY

DESIGNED BY: MAW
DESIGN CHECKED BY: CLF
DRAWN BY: HHT
COGO CHECKED BY:
SURVEY CHECKED BY:
QA/QC BY: RS DATE: 4-4-17
QA/QC REVISIONS BY:

Costello

Engineering and Surveying
9990 Richmond Avenue, Suite 450 N
Houston, Texas 77042
(713) 783-7788 (713) 783-3580, Fax

TBPE FIRM REG. No. 280
TBPLS FIRM REG. No. 100486

THE GROVE AT RIVERSTONE SECTION ONE

CAROL RIDGE DR.
RETAINING WALL

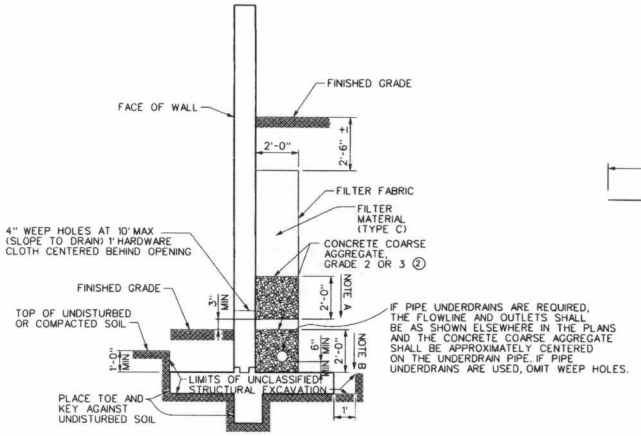
STATE OF TEXAS
CORBETT L. FREEMAN
86913
LICENSED PROFESSIONAL ENGINEER
4/6/17

SHEET S1

OF SHEETS

JOB NO. 2016-159-001/101

JOB NO. 2016-159-001/101 THE GROVE AT RIVERSTONE SECTION ONE NOVEMBER 2016

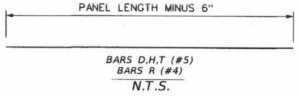


DRAINAGE DETAILS AND EXCAVATION DIAGRAM

N.T.S.

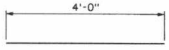
NOTE A: STOP COARSE AGGREGATE AT THIS LEVEL WHEN WEEP HOLES ARE USED.

NOTE B: USE COARSE AGGREGATE TO HERE WITH FILTER MATERIAL ABOVE WHEN UNDERDRAINS ARE USED.



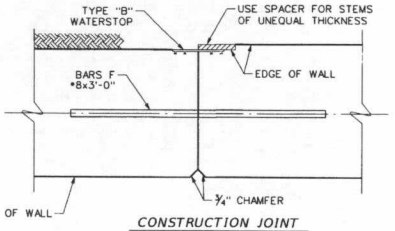
BARS D,H,T (#5)
BARS R (#4)

N.T.S.



BARS C (#4)

N.T.S.



CONSTRUCTION JOINT

N.T.S.

GENERAL NOTES:

WALLS ARE DESIGNED ASSUMING UNIT WEIGHT OF SOIL = 120 PCF, AND COEFFICIENT OF HORIZONTAL EARTH PRESSURE = 0.33.

WALLS ARE DESIGNED TO PROVIDE A MINIMUM FACTOR OF SAFETY AGAINST SLIDING OF 1.5. THE UNDISTURBED OR COMPACTED SOIL DEPTH IN FRONT OF WALLS, FROM BOTTOM OF KEY UP, SHALL NOT BE LESS THAN 2'-9".

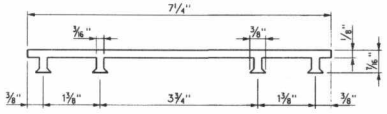
RETAINING WALLS ARE DETAILED TO BE PLACED ON GRADES UP THRU 10% WITH FOOTING LEVEL, WITH NO CHANGES IN REINFORCING STEEL.

DESIGNED IN ACCORDANCE WITH CURRENT AASHTO STANDARD AND INTERIM SPECIFICATIONS.

ALL CONCRETE TO BE CLASS "C".

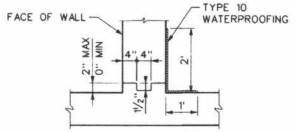
ALL REINFORCING STEEL TO BE GRADE 60.

COVER DIMENSIONS ARE CLEAR DIMENSIONS, UNLESS NOTED OTHERWISE. REINFORCING BAR DIMENSIONS SHOWN ARE OUT-TO-OUT OF BAR



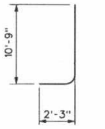
PVC WATERSTOP TYPE "B"

N.T.S.



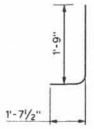
JOINT AND WATERSTOP DETAILS

N.T.S.



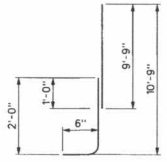
BARS A1(#5)

N.T.S.



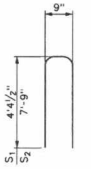
BARS A2(#6)

N.T.S.



BARS B (#5)

N.T.S.



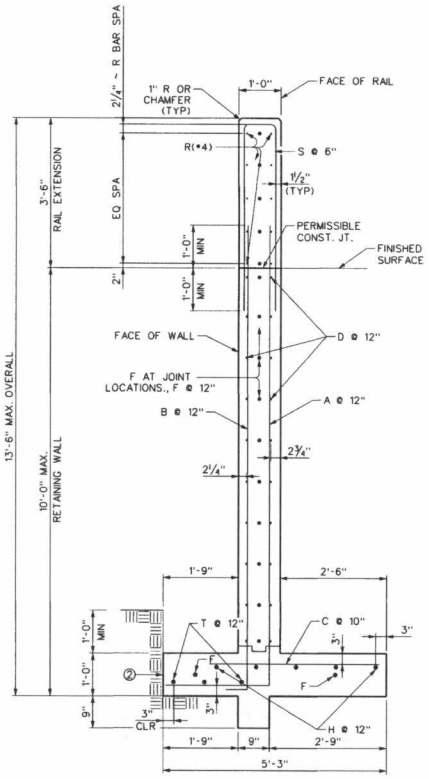
BARS S (#4)

N.T.S.

① PLACE VERTICAL BARS INSIDE OF HORIZONTAL BARS (TYP BOTH FACES).

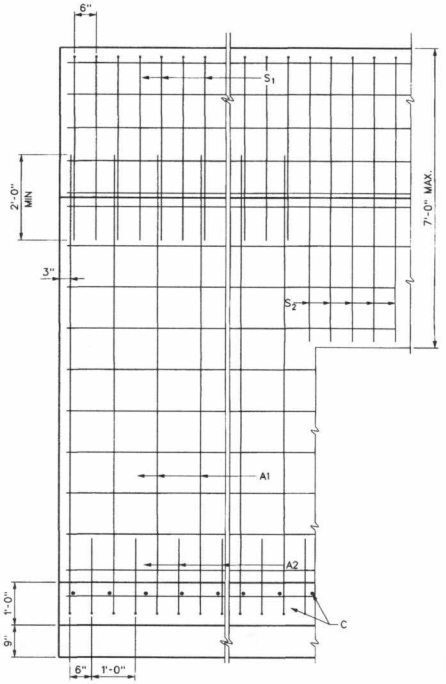
② PLACE FOOTING TOE AGAINST UNDISTURBED SOIL.

③ SEE CONSTRUCTION JOINT DETAIL FOR SIZE



SECTION

N.T.S.



PARTIAL WALL ELEVATIONS

N.T.S.

(SHOWING VERTICAL REINFORCING PATTERN IN BACK FACE)

APPROVED: _____ DEVELOPMENT COORDINATOR

DATE: 3/30/17

NO.	REVISION	DATE	BY

DESIGNED BY: MMW
DESIGN CHECKED BY: CJF
DRAWN BY: HHT
COGO CHECKED BY:
SURVEY CHECKED BY: RS DATE: 4-4-17
QA/QC BY: DATE:
QA/QC REVISIONS BY:

Costello

Engineering and Surveying
9990 Richmond Avenue, Suite 450 N
Houston, Texas 77042
(713) 783-7788 (713) 783-3580, Fax

TBPE FIRM REG. No. 280
TBPLS FIRM REG. No. 100486

THE GROVE AT RIVERSTONE SECTION ONE

RETAINING WALL DETAILS

1/6/17

STATE OF TEXAS
CORBETT L. FREEMAN
86913
LICENSED PROFESSIONAL ENGINEER

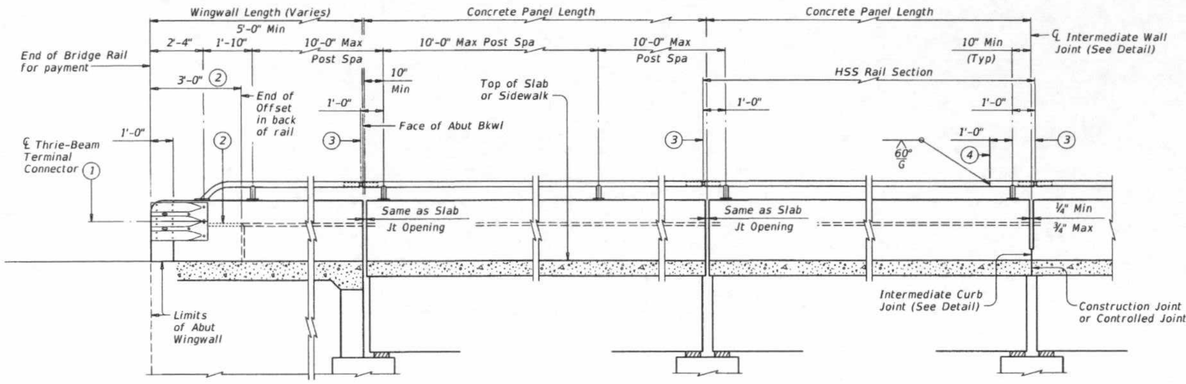
SHEET S2

OF SHEETS

JOB NO. 2016-159-001/101

JOB NO. 2016-159-001/101 THE GROVE AT RIVERSTONE SECTION ONE NOVEMBER 2016

12/7/2016
R:\Projects\2016-159_Grove Riverstone\Dgn\Structure\rlstd018.dgn

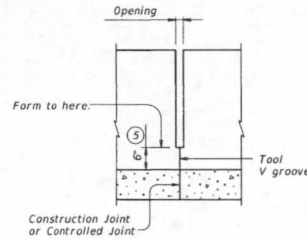

Wingwall Length (Varies)
5'-0" Min
Concrete Panel Length
Concrete Panel Length
End of Bridge Rail for payment
2'-4"
1'-10"
10'-0" Max Post Spa
10'-0" Max Post Spa
10'-0" Max Post Spa
10" Min (Typ)
℄ Intermediate Wall Joint (See Detail)
3'-0" (2)
10" Min
HSS Rail Section
End of Offset in back of rail
1'-0"
Top of Slab or Sidewalk
Face of Abut Bkwl
1'-0"
1'-0"
1'-0"
℄ Thrie-Beam Terminal Connector (1)
(2)
(3)
(3)
(3)
(4)
60° G
Same as Slab Jt Opening
Same as Slab Jt Opening
¼" Min
¾" Max
Limits of Abut Wingwall
Intermediate Curb Joint (See Detail)
Construction Joint or Controlled Joint

AT ABUTMENTS

AT BENTS WITH SLAB EXP JOINTS

AT BENTS WITHOUT SLAB EXP JOINTS

ROADWAY ELEVATION OF RAIL



INTERMEDIATE WALL JOINT DETAIL

Provide at all interior bents without slab expansion joints. Location independent of HSS rail splices.

(1) Terminal Connectors and associated hardware are to be paid for under the Item "Metal Beam Guard Fence". Attach Metal Beam Guard Fence Transitions to the bridge rail and extend along the embankment unless otherwise shown in the plans.

(2) Back of rail offset may, with Engineer's approval, be continued to the end of the railing.

(3) ℄ Exp Joint or Splice Joint as required.

(4) One shop splice per HSS rail section is permitted with minimum 85 percent penetration. The weld may be square groove, or single vee groove. Grind smooth.

(5) Increase 2" for structures with overlay.

(6) Provide bolts of sufficient length to extend ½" to ¾" beyond nut.

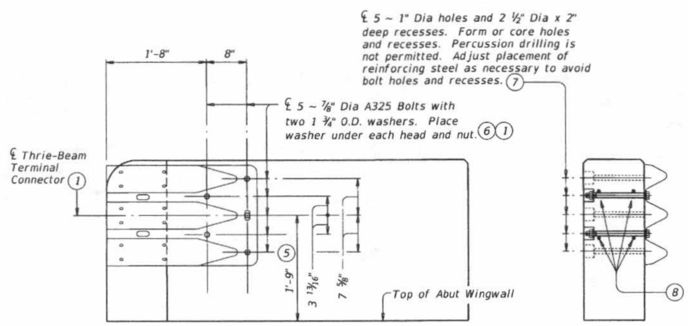
(7) Bolt recesses are only required when pedestrian sidewalks are adjacent to back of rail.

(8) Place 4 additional Bars R(#4) 3'-8" in length inside Bars S(#4) and centered 2'-0" from end of rail when Terminal Connections are required. Field bend as needed.

(9) HSS 2.875 x 0.203

(10) HSS 2.375 x 0.154

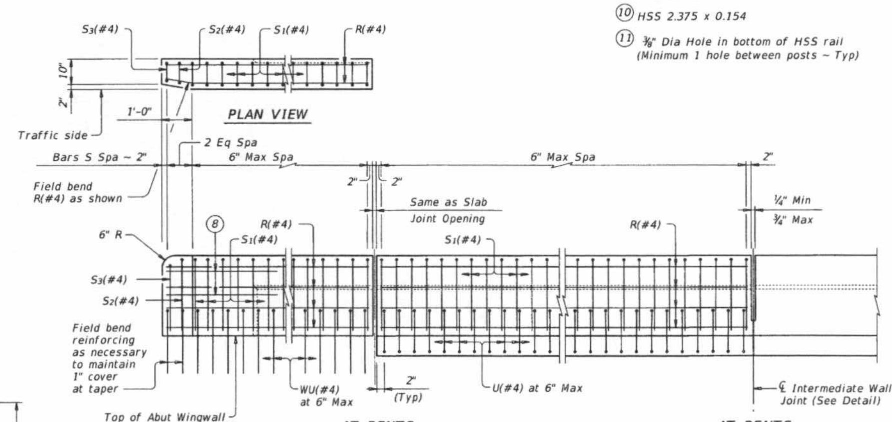
(11) ⅜" Dia Hole in bottom of HSS rail (Minimum 1 hole between posts ~ Typ)


1'-8"
8"
℄ 5 ~ 1" Dia holes and 2 ½" Dia x 2" deep recesses. Form or core holes and recesses. Percussion drilling is not permitted. Adjust placement of reinforcing steel as necessary to avoid bolt holes and recesses. (7)
℄ 5 ~ ⅞" Dia A325 Bolts with two 1 ¾" O.D. washers. Place washer under each head and nut. (6)(1)
℄ Thrie-Beam Terminal Connector (1)
(5)
1'-9"
3 13/16"
7 ⅝"
Top of Abut Wingwall
(8)

ELEVATION

SECTION

TERMINAL CONNECTION DETAILS


S3(#4)
S2(#4)
S1(#4)
R(#4)
10"
2"
1'-0"
PLAN VIEW
Traffic side
2 Eq Spa
Bars S Spa ~ 2"
6" Max Spa
6" Max Spa
2"
2"
2"
Field bend R(#4) as shown
Same as Slab Joint Opening
¼" Min
¾" Max
6" R
(8)
R(#4)
S1(#4)
S1(#4)
R(#4)
S3(#4)
S2(#4)
Field bend reinforcing as necessary to maintain 1" cover at taper
WU(#4) at 6" Max
2" (Typ)
U(#4) at 6" Max
℄ Intermediate Wall Joint (See Detail)
Top of Abut Wingwall

AT ABUT WINGWALL

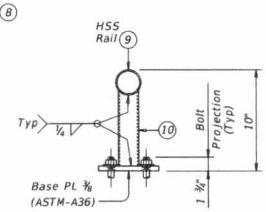
AT BENTS WITH SLAB EXP JOINTS

AT SLAB

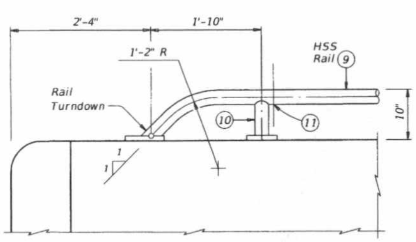
AT BENTS WITHOUT SLAB EXP JOINTS

ELEVATION SHOWING TYPICAL REINFORCING PLACEMENT

(Showing without raised sidewalk)

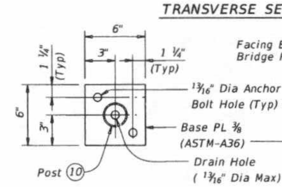


TRANSVERSE SECTION

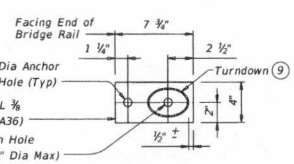


Note that at least two anchor points (as shown) are required for the Bridge Rail on the Abutment Wingwall. Longer Wingwalls may require more than two Rail anchorages.

HSS RAIL TERMINAL DETAIL



POST BASE PLATE PLAN



RAIL TURNDOWN BASE PLATE PLAN

HSS RAIL DETAILS

SHEET 1 OF 3

Texas Department of Transportation	Bridge Division Standard

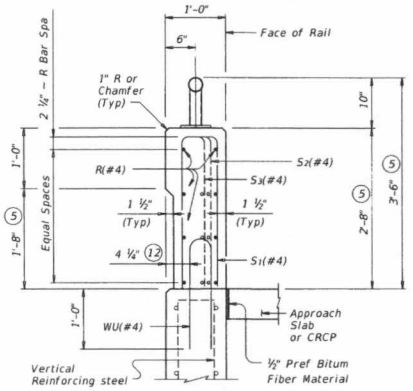
COMBINATION RAIL

TYPE C221

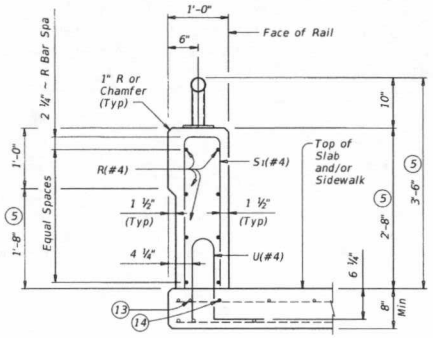
FILE: rlstd018.dgn	DN: TxDOT	CK: TxDOT	DW: JTR	CK: JMH
©TxDOT July 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS 03-16: Removed shop drawing note. Added MASH TL-3 in General Notes. Added additional epoxy classes.	DIST	COUNTY		SHEET NO. S3

[signature] 3/30/17

12/7/2016
R:\Projects\2016-159_Grove Riverstone\Dgn\Structure\rlstd018.dgn

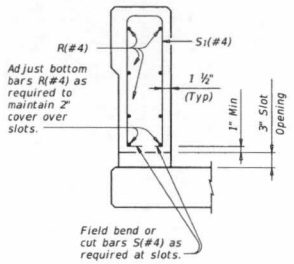


ON ABUTMENT WINGWALLS OR CIP RETAINING WALLS

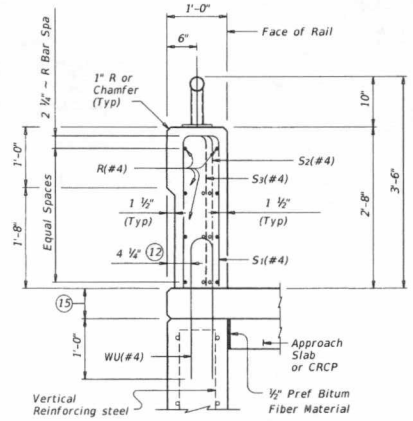


ON BRIDGE SLAB

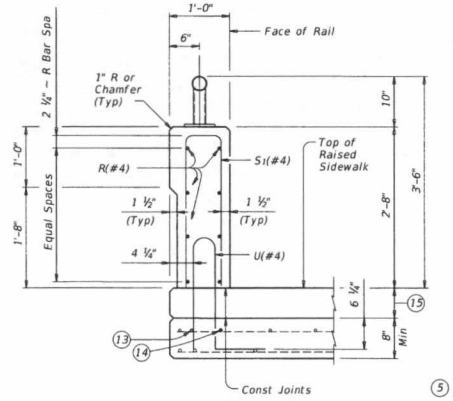
SECTIONS THRU RAIL WITHOUT RAISED SIDEWALK



SECTION THRU OPTIONAL SIDE SLOT DRAIN

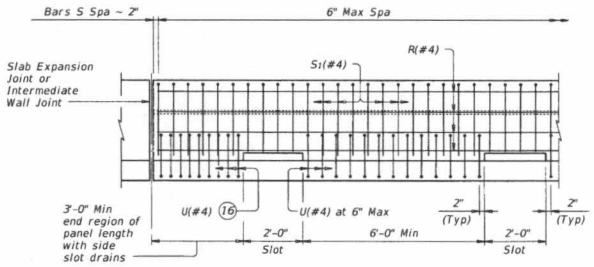


ON ABUTMENT WINGWALLS OR CIP RETAINING WALLS



ON BRIDGE SLAB

SECTIONS THRU RAIL WITH RAISED SIDEWALK



OPTIONAL SIDE SLOT DRAIN DETAIL

Note: Side Slot Drains may be used where shown elsewhere on the plans or as directed by the Engineer. Drains should not be placed over railroad tracks, lower roadways, or sidewalks. When this rail is used as a separator between a roadway surface and a sidewalk surface, side drain slots will not be permitted.

(5) Increase 2" for structures with overlay.

(12) S ½" when vertical reinforcing has closer clear cover over horizontal reinforcing in abutment wingwalls or retaining walls on traffic side of wall.

(13) As an aid in supporting reinforcement, additional longitudinal bars may be used in the slab with the approval of the Engineer. Such bars must be furnished at the Contractors expense.

(14) Top longitudinal slab bar may be adjusted laterally 3" plus or minus to tie reinforcing.

(15) Raised Sidewalk

(16) Space U(#4) bars at 4" Max when end region of panel length is less than 6'-0" to side slot drain. Space U(#4) bars at 6" Max when end region of panel length is 6'-0" and greater to side slot drain.

Texas Department of Transportation | Bridge Division Standard

COMBINATION RAIL

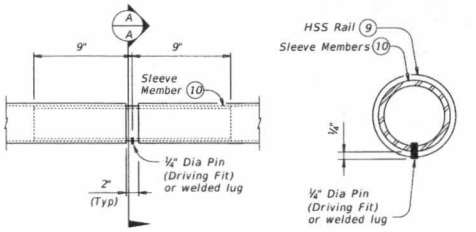
TYPE C221

FILE: rlstd018.dgn	DN: TxDOT	CK: TxDOT	DW: JTR	CK: JMH
©TxDOT July 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS 03-16: Removed shop drawing note. Added MASH TL-3 in General Notes. Added additional epoxy classes.	DIST	COUNTY		SHEET NO. 54

Maggy D 3/30/17

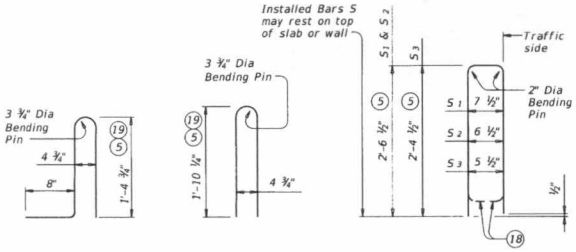
RAIL DATA FOR HORIZONTAL CURVES

	RADIUS TO FACE OF RAIL	MAX CHORD LENGTH	CONSTRUCT OR FABRICATE
HSS Rail	Over 2800'	29'-0"	Straight rail panels
	Over 1400' thru 2800'	14'-6"	To required radius or to chords shown
	Over 700' thru 1400'	7'-3"	
	Thru 700'	Zero	To required radius

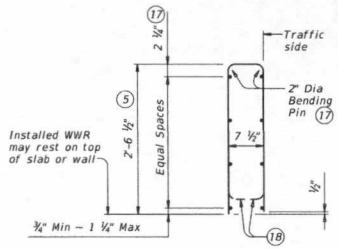


AT SPLICE OR EXP JTS SECTION A-A

PIPE SPLICE DETAILS

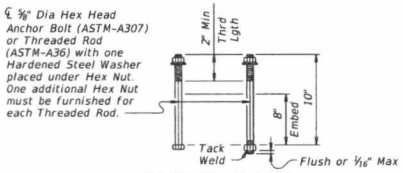


BARS U (#4) BARS WU (#4) BARS S (#4)



OPTIONAL WELDED WIRE REINFORCEMENT (WWR)

DESCRIPTION	LONGITUDINAL WIRES	VERTICAL WIRES
Minimum (Cumulative Total) Wire Area	1.067 Sq In.	0.267 Sq In. per Ft
	No. of Wires	Spacing
Minimum	8	4"
Maximum	10	8"
Maximum Wire Size Differential	The smaller wire must have an area of 40% or more of the larger wire.	



CAST-IN-PLACE ANCHOR BOLT OPTIONS (20)

(5) Increase 2" for structures with overlay.

(9) HSS 2.875 x 0.203

(10) HSS 2.375 x 0.154

(17) No longitudinal wires may be in top center of cage.

(18) Bend or cut as required to clear drain slots.

(19) For raised sidewalks, add sidewalk height to total bar height. Use sidewalk height at rail's location.

(20) See "Material Notes" for anchor bolt information.

CONSTRUCTION NOTES:

This railing may be constructed with slip-forms when approved by the Engineer, with equipment approved by the Engineer and when epoxy adhesive anchor bolts are used. Slip-forming parapet is not allowed if anchor bolts are cast with parapet wall. Provide sensor control for both line and grade. Tack welding to provide bracing for slip-form operations is acceptable. Welding can be performed at a minimum spacing of 3 ft between the cage and the anchorage. It is permissible to weld to U, WU and S bars at any location on the cage. If increased bracing is needed, additional anchorage devices must be added and welding must be performed in the upper two thirds of the cage.

Face of rail, parapet must be plumb unless otherwise approved by the Engineer. HSS rail posts must be square to the top of parapet. Use epoxy mortar under post base plates if gaps larger than 1/16" exist.

Round or chamfer exposed edges of HSS rail and HSS rail posts to approximately 1/16" by grinding.

At the contractor's option anchor bolts may be cast with the parapet (See Cast-in-Place Anchor Bolt Options).

HSS rail sections must not include less than two posts, and no more than four (except at Abutments).

Chamfer all parapet exposed corners.

MATERIAL NOTES:

Galvanize all steel components except reinforcing steel unless otherwise shown on plans.

Provide Class "C" concrete. Povide Class "C" (HPC) if required elsewhere.

Provide Grade 60 reinforcing steel.

Epoxy coat all rail reinforcement if slab bars are epoxy coated.

Deformed Welded Wire Reinforcement (WWR) (ASTM A1064) of equal size and spacing may be substituted for Bars U and WU unless noted otherwise. Deformed WWR (ASTM 1064) may be substituted for Bars R and S, as shown. Combinations of reinforcing steel and WWR or configurations of WWR other that shown are permitted if conditions in the table are satisfied. Provide the same laps as required for reinforcing bars.

Provide ASTM-A1085 or A500 Grade B or A53 Grade B for all HSS.

Anchor bolts must be ⅝" Dia ASTM A36 fully threaded rods with one hex nut and one hardened steel washer at each bolt. Embed threaded rods into parapet wall with a Type III, Class C, D, E, or F epoxy anchorage system. Minimum embedment depth is 3". Anchorage system chosen must be able to achieve an ultimate tensile resistance of 8.4 kips per bolt. The Contractor must provide evidence to the Engineer that this can be achieved. Evidence of adequate tensile resistance can be based on the manufacturer's published values of ultimate tensile strength (anchor spacing and edge distance must be accounted for). Anchor installation, including hole size, drilling, and clean-out, must be in accordance with the manufacturer's instructions.

Optional cast-in-place anchor bolts must be ⅝" Dia ASTM A307 Grade A bolts (or A36 threaded rods with one tack welded hex nut each) with one hex nut and one hardened steel washer at each bolt.

Provide bar laps, where required, as follows:

Uncoated ~ #4 = 1'-5"
Epoxy coated ~ #4 = 2'-1"

GENERAL NOTES:

This rail has been evaluated and accepted to be of equal strength to railings with like geometry, which have been crash tested to meet MASH TL-3 criteria. This rail can be used for speeds of 50 mph and greater when a TL-3 rated guard fence transition is used. When a TL-2 rated guard fence transition is used, this rail can only be used for speeds of 45 mph and less.

Do not use this railing on bridges with expansion joints providing more than 5" movement.

Rail anchorage details shown on this standard may require modification for select structure types. See appropriate details elsewhere in plans for these modifications.

Submit erection drawings showing panel lengths, rail post spacing, and anchor bolt setting to the Engineer for approval.

Average weight of railing with no overlay: 380 plf (total)
370 plf (Conc)
10 plf (Steel)

Cover dimensions are clear dimensions, unless noted otherwise. Reinforcing bar dimensions shown are out-to-out of bar.

SHEET 3 OF 3

Texas Department of Transportation | Bridge Division Standard

COMBINATION RAIL

TYPE C221

FILE: rlstd018.dgn	DN: TxDOT	CK: TxDOT	DW: JTR	CK: JMH
©TxDOT July 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS 03-16: Removed shop drawing note. Added MASH TL-3 in General Notes. Added additional epoxy classes.	DIST	COUNTY		SHEET NO. 55

3/30/17

12/7/2016
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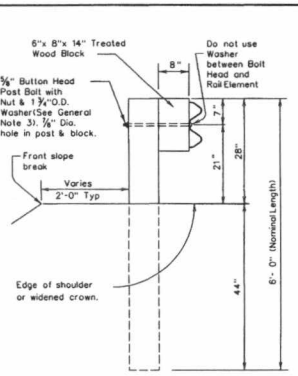
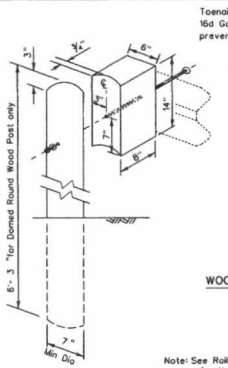
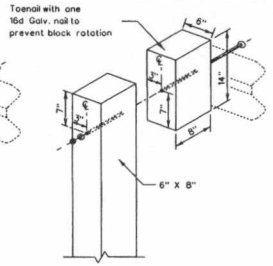


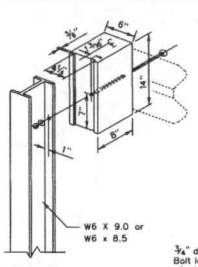
TYPICAL POST



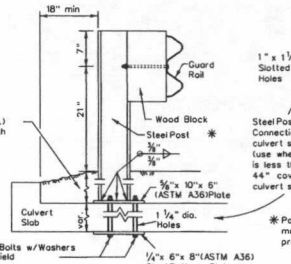
WOOD BLOCK TO ROUND WOOD POST



WOOD BLOCK TO RECTANGULAR WOOD POST

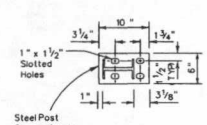


WOOD BLOCK TO STEEL POST

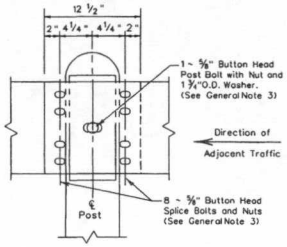


*LOW FILL CULVERT POST

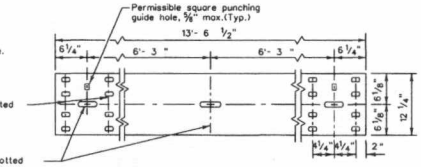
FOR USE ON NON-BRIDGE CLASS CULVERTS ONLY



* Post(s) may require field modifications to ensure proper guardrail height.

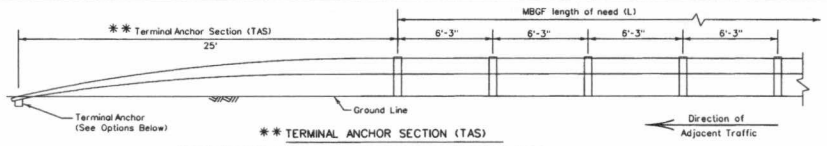


RAIL SPLICE DETAIL



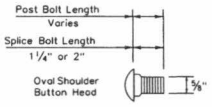
ELEVATION 12 1/2'(NOM.) W-BEAM SECTION

25 foot sections may also be supplied (See General Note 2)



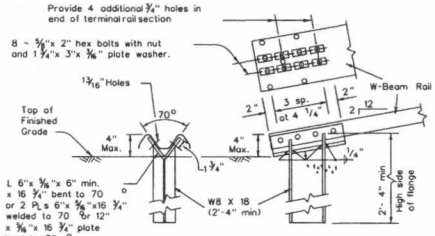
** TERMINAL ANCHOR SECTION (TAS)

Terminal anchor sections are only for downstream use, when located outside the horizontal clearance area of opposing traffic.



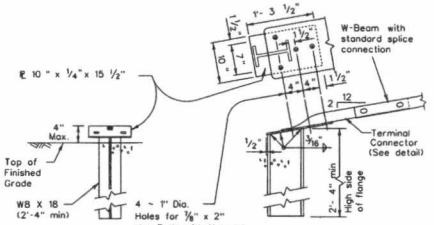
BUTTON HEAD BOLT

Post and Splice Bolts (See General Note 3)



OPTION (1)

Note: This anchor post requires four additional 3/4" holes (shop or field) in the rail member with eight 5/8" hex bolts with nut and plate washer.



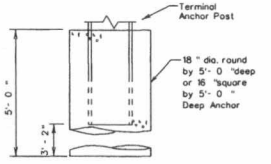
4 ~ 1" Dia. Holes for 5/8" x 2" Hex Bolts with Nut and 1 3/4" O.D. Washer.

OPTION (2)

Note: This anchor post requires the use of the 10 ga. terminal connector with four 7/8" hex bolts with nut and washer.

TERMINAL ANCHOR POST OPTIONS

(See General Note 11)



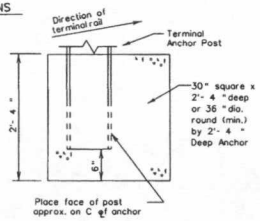
Notes :

Either concrete anchor may be used with either post option above.

No construction joint is allowed in the concrete anchor.

Terminal rail may be bolted to post and in twist position prior to placing concrete anchor.

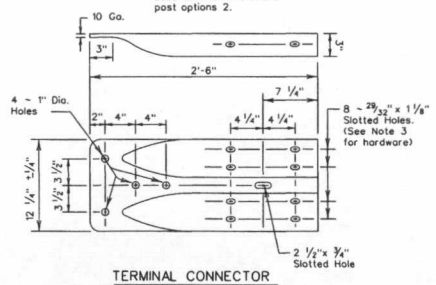
If concrete anchor is precast, the area should be compacted as directed by the Engineer, when placed in the field.



TERMINAL CONCRETE ANCHOR OPTIONS

(See General Note 11)

Note: Terminal Connector to be used with terminal anchor post options 2.



TERMINAL CONNECTOR

For connection hardware to concrete rails, see the MBGF transition standards.

GENERAL NOTES

1. The type of post (round wood post, rectangular wood post, or steel post) will be shown elsewhere in the plans. The exact position of MBGF shall be shown elsewhere in the plans or as directed by the Engineer. Steel posts to be galvanized in accordance with Item 445, "Galvanizing."
2. Rail element shall meet the requirements of Item 540,"Metal Beam Guard Fence" except as modified on the plans. The Contractor may furnish rail elements of 12 1/2 or 25 foot nominal lengths.
3. Button head "post" bolts (ASTM A307) shall be of sufficient length to extend through the full thickness of the nut (ASTM A563) and Type A (1 3/4" O.D.)washer and not more than 1" beyond it. Button head "splice" bolts (ASTM A307) are 5/8" x 1 1/4" (or 2" long at triple rail splices) with a 5/8" double recessed nut (ASTM A563).
4. Fittings (bolts, nuts, and washers) shall be galvanized in accordance with Item 445, "Galvanizing." Fittings shall be subsidiary to the bid item.
5. Crown shall be widened to accommodate the Metal Beam Guard Fence.
6. The lateral approach to the guard fence, shall have a slope rate of not more than 1V:10H.
7. Unless otherwise shown in the plans, guard fence placed in the vicinity of curbs shall be positioned so that the face of curb is located directly below or behind the face of the block. Rail placed over curbs shall be installed so that the post bolt is located approximately 21 inches above the gutter pan or roadway surface.
8. If solid rock is encountered within 0 to 18" of the finished grade, drill a 22" dia. hole, 24" into the rock, or drill two 12" dia. front to back overlapping holes, 24" into the rock. If solid rock is encountered below 18",drill a 12" dia. hole, 12" into the rock or to the standard embedment depth, whichever is less. Any excess post length, after meeting these depths, may be field cut to ensure proper guardrail mounting height. Backfill with a cohesionless material.
9. Posts shall not be set in concrete, of any depth.
10. Special fabrication will be required at installations having a curvature of less than 150 ft. radius.
11. The terminal anchor section (TAS) post shall be set in Class A concrete (unless otherwise shown in the plans) in accordance with Item 421,"Hydraulic Cement Concrete." Concrete shall be subsidiary to the bid item requiring construction of the terminal anchor section (TAS). Terminal anchor post to be galvanized in accordance with Item 445, "Galvanizing."
12. Unless otherwise shown in the plans, a composite material post and/or block that meets the requirements of DMS-7210,"Composite Material Posts and Blocks for Metal Beam Guard Fence" may be substituted for posts and/or blocks of similar dimensions. The Construction Division, TxDOT maintains a Material Producer List (MPL) for producers of materials conforming to DMS-7210. Only producers on the MPL can furnish composite material posts and/or blocks.

12/7/2016
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Texas Department of Transportation
Design Division (Roadway)

METAL BEAM GUARD FENCE

MBGF-09

FILE: mbgf09.dgn	DN: AM	CK: AM	DW: BD	CK:	
©TxDOT JULY 1994	DIST	FEDERAL AID PROJECT			SHEET
REVISIONS					56
	COUNTY		CONTROL	SECT	JOB	HIGHWAY

Maggie Dot 3/30/17

PLOT TIME

GENERAL NOTES

1. CONTRACTOR IS RESPONSIBLE FOR HAVING ALL BURIED UTILITIES IDENTIFIED, PROTECTED, REPLACED AND/OR PROPERLY REPAIRED IF DAMAGED. REPAIRS/REPLACEMENT SHALL BE AT CONTRACTOR'S EXPENSE.
2. CONTRACTOR SHALL OBTAIN AND MAINTAIN ON SITE ALL APPLICABLE PERMITS AND AN APPROVED COPY OF THE PLANS AND SPECIFICATIONS NOTIFY THE CITY PUBLIC WORKS DEPARTMENT 48 HOURS PRIOR TO COMMENCEMENT OF WORK.
3. CONTRACTOR IS RESPONSIBLE FOR NOTIFYING THE CITY OF MISSOURI CITY PUBLIC WORKS 24 HOURS PRIOR TO WEEKDAY WORK REQUIRING INSPECTION INCLUDING, BUT NOT LIMITED TO, LINING, PAVING OPERATIONS, CONCRETE PLACEMENT, FORMING AND SET-UP, DENSITIES, PIPE INSTALLATION, AND ANY TESTING BY LABORATORIES. DEPARTMENT OF PUBLIC WORKS MAY BE REACHED AT 281-403-8570 OR BY CONTACTING THE ASSIGNED INSPECTOR.
4. ALL SATURDAY WORK SHALL BE REQUESTED, IN WRITING, WITH THE DEPARTMENT OF PUBLIC WORKS AT LEAST 48-HOURS IN ADVANCE. SUNDAY AND HOLIDAY WORK REQUIRES 72 HR WRITTEN REQUESTS AND MUST BE APPROVED BY THE PUBLIC WORKS DIRECTOR. FAXES MAY BE SENT TO 281-403-0676. REQUIRED INSPECTIONS MAY BE SUBJECT TO INSPECTION FEES. NON-NOTIFICATIONS MAY RESULT IN NON-COMPLIANCE, WORK ORDERED STOPPAGE AND DOUBLE INSPECTION FEES.
5. FULL-TIME RESIDENT INSPECTION BY THE PROJECT ENGINEER'S REPRESENTATIVE SHALL BE PROVIDED AT ALL CRITICAL POINTS OF CONSTRUCTION AND AS DEEMED NECESSARY BY THE CITY OF MISSOURI CITY.
6. DESIGN AND CONSTRUCTION SHALL CONFORM TO THE TEXAS COMMISSION OF ENVIRONMENTAL QUALITY RULES AND REGULATIONS FOR PUBLIC WATER SYSTEMS, THE CITY OF MISSOURI CITY DESIGN MANUAL (ISSUED 2015), AND THE CITY OF MISSOURI CITY STANDARD DETAIL SHEETS. THE CITY OF MISSOURI CITY DESIGN MANUAL SHALL BE ACQUIRED (AND USED) FROM THE DEPARTMENT OF PUBLIC WORKS, 1522 TEXAS PARKWAY, PHONE 281-403-8570. THE LATEST REVISIONS AND/OR AMENDMENTS SHALL BE OBSERVED. WHERE CONFLICT MAY ARISE BETWEEN INFORMATION ON APPROVED CONSTRUCTION DRAWINGS AND/OR PROJECT SPECIFICATIONS, AND CITY OF MISSOURI CITY STANDARDS, THEN THE CITY OF MISSOURI CITY STANDARDS SHALL GOVERN.
7. ALL STATIONS ARE CENTERLINE OF STREET RIGHT-OF-WAY UNLESS OTHERWISE NOTED ON THE PLANS EXCEPT IN SIDE OR BACK LOT EASEMENTS WHERE CENTERLINE IS CENTER OF PIPE. IN EASEMENTS WHERE SANITARY AND STORM SEWER ARE PRESENT PARALLEL, STATIONS SHALL BE BASED ON CENTERLINE OF STORM SEWER PIPING.
8. ADEQUATE DRAINAGE SHALL BE MAINTAINED AT ALL TIMES DURING CONSTRUCTION. ANY DRAINAGE AREA OR STRUCTURE DISTURBED, DURING CONSTRUCTION, SHALL BE RESTORED TO THE SATISFACTION OF THE CITY OF MISSOURI CITY.
   ALL CONSTRUCTION STORM RUNOFF SHALL COMPLY WITH THE REQUIREMENTS OF C.O.M.C. STORM WATER QUALITY MANUAL. IF NON-COMPLIANCE OCCURS, CONTRACTOR SHALL REMEDY IMMEDIATELY AT HIS OWN EXPENSE.
9. ANY POLLUTION CONTROL DEVICE, SOD, OR SEEDED AREA DAMAGED, DISTURBED, OR REMOVED SHALL BE REPLACED OR REPAIRED AT THE CONTRACTOR'S EXPENSE. THE CONTRACTOR IS RESPONSIBLE FOR WATERING ANY SEED OR SOD WHICH HE HAS INSTALLED UNTIL ADEQUATE GROWTH IS ACHIEVED TO PREVENT EROSION.
10. STORM WATER POLLUTION PROTECTION SHALL BE DESIGNED, CONSTRUCTED, MAINTAINED AND SHALL BE IN TOTAL COMPLIANCE WITH THE STORM WATER QUALITY MANUAL OF THE CITY OF MISSOURI CITY.
11. ANY MATERIALS OR WORKMANSHIP NOT MEETING OR EXCEEDING CITY OF MISSOURI CITY STANDARDS IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR AND WILL BE REPAIRED OR REPLACED AT THE CONTRACTOR'S EXPENSE.
12. THE CONTRACTOR SHALL KEEP THE STREETS, RIGHT-OF-WAY, AND WORK AREA CLEAN OF DIRT, MUD, AND DEBRIS.
13. THE CONTRACTOR SHALL PROVIDE AND MAINTAIN ALL REQUIRED TRAFFIC SAFETY CONTROL DEVICES UP TO AND INCLUDING FLAGMEN OR POLICE OFFICERS, IF DEEMED NECESSARY BY THE CITY OF MISSOURI CITY.
14. THE CONTRACTOR SHALL CONTACT THE CITY OR LOCAL MUNICIPAL UTILITY DISTRICT AS APPROPRIATE TO OPERATE EXISTING UTILITIES AND PRIOR TO MAKING TIE-INS.
15. ALL BACKFILL WITHIN PUBLIC RIGHTS-OF-WAY OR EASEMENTS SHALL BE ENGINEERED TO 95% STANDARD PROCTOR DENSITY (IN 8 INCH LIFTS) AND TESTED FOR ±2PTIMUM BY AN APPROVED LAB.
16. IT IS PERMISSIBLE TO USE A BACKHOE FOR TRENCH EXCAVATION IN LIEU OF A TRENCHING MACHINE.
17. THE CONTRACTOR SHALL NEVER UNDERMINE ANY CURB, CURB-AND-GUTTER, OR EQUIPMENT ON ANY EXISTING PAVEMENT OR CROSS OVER ANY EXISTING PAVEMENT OR CURB.
18. ALL FINISH GRADES ARE TO CONFORM TO A MINIMUM SLOPE OF 6" PER 100 FT. POSITIVE DRAINAGE IS DEPICTED BY ARROWS.
19. CONTRACTOR SHALL UNCOVER EXISTING UTILITIES AT ALL "POINTS OF CROSSING" TO DETERMINE IF CONFLICTS EXIST BEFORE COMMENCING ANY CONSTRUCTION. NOTIFY THE ENGINEER AT ONCE OF ANY CONFLICT.
20. ALL FINISHED GRADES SHALL VARY UNIFORMLY BETWEEN FINISHED ELEVATIONS.
21. ALL TESTING PROCEDURES SHALL CONFORM TO THE CITY OF MISSOURI CITY STANDARDS. THE INITIAL TESTING EXPENSE SHALL BE BORNE BY THE OWNER. IF ANY OF THE TESTS DO NOT MEET THE TESTING STANDARDS, IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO REMOVE OR REPLACE SUCH MATERIAL SO THE TESTING STANDARDS CAN BE MET. ADDITIONAL TESTING TO MEET COMPLIANCE SHALL BE AT THE CONTRACTOR'S EXPENSE.
22. CONTRACTOR SHALL PROVIDE SHEETING, SHORING, AND BRACING AS NECESSARY TO PROTECT WORKMEN AND EXISTING UTILITIES DURING ALL PHASES OF CONSTRUCTION AS PER O.S.H.A. REQUIREMENTS.
23. ALL MATERIALS AND WORKMANSHIP SHALL CONFORM TO THE TXDOT STANDARD SPECIFICATIONS, 2003, AND THE TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (2006), AND ANY REVISIONS THERETO.
24. THE CONTRACTOR SHALL BE RESPONSIBLE FOR SAFEGUARDING AND PROTECTING ALL MATERIALS AND EQUIPMENT STORED ON THE WEBSITE IN A SAFE AND WORKMAN-LIKE MANNER (DURING AND AFTER WORKING HOURS), UNTIL JOB COMPLETION.
25. THE LOADING AND UNLOADING OF ALL PIPE, VALVES, HYDRANTS, MANHOLES, AND OTHER ACCESSORIES SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDED PRACTICES AND SHALL BE PERFORMED WITH CARE TO AVOID ANY DAMAGE THE CONTRACTOR SHALL LOCATE AND PROVIDE THE NECESSARY STORAGE AREAS FOR MATERIAL AND EQUIPMENT.
26. THE CONTRACTOR SHALL FURNISH ALL MATERIALS, EQUIPMENT, AND LABOR FOR EXCAVATION, INSTALLATION, AND COMPLETION OF THE PROJECT AS SHOWN ON THE PLANS AND SPECIAL PROVISIONS TO COMPLY WITH CITY OF MISSOURI CITY STANDARDS.
27. NO PRIVATE UTILITIES (I.E., PHONE, CABLE T.V., ELECTRICITY, ETC.) SHALL BE INSTALLED WITHIN 4 FEET BACK OF CURB.
28. PLANS DO NOT EXTEND TO OR INCLUDE DESIGNS OR SYSTEMS PERTAINING TO THE SAFETY OF THE CONTRACTOR OR ITS EMPLOYEES, AGENTS, OR REPRESENTATIVES IN THE PERFORMANCE OF THE WORK. THE SEAL OF THE REGISTERED PROFESSIONAL ENGINEER(S) HEREON DOES NOT EXTEND TO ANY SUCH SYSTEMS THAT MAY NOW OR HEREAFTER BE INCORPORATED IN THE PLANS. THE CONTRACTOR SHALL PREPARE OR OBTAIN THE APPROPRIATE SAFETY SYSTEMS, INCLUDING CURRENT OSHA STANDARDS FOR TRENCH SAFETY SYSTEMS, SEALED BY A LICENSED PROFESSIONAL ENGINEER APPROPRIATE TRENCH SAFETY PLANS SHALL BE SUBMITTED BY THE CONTRACTOR PRIOR TO EXECUTION OF A CONTRACT FOR HIS WORK. THE TRENCH SAFETY SYSTEM SHALL CONFORM TO THE CITY OF MISSOURI CITY TRENCH ORDINANCE.
29. ALL CHANGES IN DIRECTION FOR SIDEWALK SHALL BE DONE IN A CURVILINEAR FASHION, NOT ANGULAR.
30. PROVIDE ONE LANE OPEN TO TRAFFIC AT ALL TIMES.
31. THE CONTRACTOR SHALL NOTIFY ALL PROPERTY OWNERS A MINIMUM OF 24 HOURS PRIOR TO STARTING CONSTRUCTION ON ALL DRIVEWAYS. INGRESS AND EGRESS SHALL BE PROVIDED AT ALL DRIVEWAYS AT NO SEPARATE PAY.
32. OPEN TRENCHES SHALL BE ALLOWED ONLY DURING ACTIVE CONSTRUCTION AND SHALL NOT BE LEFT OPEN OVER NIGHT AND SHALL BE FENCED OFF/BARRICATED AT END OF SHIFT. NO MORE THAN 100 FEET OF TRENCH WILL BE OPEN AT ONE TIME.
33. PROTECT ALL TREES NOT CALLED OUT TO BE REMOVED.
34. IRON RODS DISTURBED DURING CONSTRUCTION ARE TO BE REPLACED BY A REGISTERED PUBLIC LAND SURVEYOR FOR THE PROPERTY OWNER AT NO SEPARATE PAY.
35. THE CONTRACTOR SHALL FIELD VERIFY EXISTING CONDITIONS BEFORE BEGINNING CONSTRUCTION.

CONCRETE/PAVING NOTES

1. CONTRACTOR IS RESPONSIBLE FOR OBTAINING ALL PERMITS AND AUTHORIZATION REQUIRED BY CITY OF MISSOURI CITY.
2. CONTRACTOR SHALL HAVE ALL UTILITIES LOCATED PRIOR TO CONSTRUCTION AND WILL REPAIR OR REPLACE ANY DAMAGE AT CONTRACTOR'S EXPENSE.
3. PAVING CONTRACTOR SHALL PROTECT WATER, SEWER, AND DRAINAGE FACILITIES AND WILL REPLACE ANY DAMAGED FACILITIES AT HIS OWN EXPENSE. ALL MANHOLES AND VALVES WITHIN THE PAVEMENT AREA SHALL BE ADJUSTED TO FINISH GRADE BY THE PAVING CONTRACTOR WITH THE USE OF APPROVED BLOCKOUTS.
4. WHEN THE TOP OF CURB OR BOTTOM OF SIDEWALK SLAB ELEVATION VARIES FROM THE NATURAL GROUND, THE PAVING CONTRACTOR SHALL BACKFILL IN LAYERS NOT EXCEEDING 8-INCHES IN DEPTH. EACH LAYER WILL BE COMPACTED TO A MINIMUM OF 95% STANDARD PROCTOR DENSITY. THE DISTURBED AREA SHALL BE SEEDED, SODDED, FERTILIZED, AND/OR SILT BARRIER FENCED WITHIN 10 WORKING DAYS. THE TYPE OF POLLUTION CONTROL WILL BE DETERMINED BY THE APPROVED PLANS, PROJECT ENGINEER AND/OR THE CITY OF MISSOURI CITY ENGINEER.
5. ALL PAVING SHALL BE IN ACCORDANCE WITH THE CITY OF MISSOURI CITY INFRASTRUCTURE ORDINANCES, APPROVED PLANS AND SPECIFICATIONS WITH THE LATEST REVISIONS OR AMENDMENTS. IN THE EVENT OF A CONFLICT, THE CITY OF MISSOURI CITY INFRASTRUCTURE ORDINANCE GOVERNS.
6. PAVING CONTRACTOR SHALL PROVIDE AND MAINTAIN SILT PROTECTION FENCES ON ALL STAGE I CURB INLETS. THE PAVING CONTRACTOR SHALL MAINTAIN ANY OTHER POLLUTION CONTROLS ESTABLISHED, I.E., ADDITIONAL SILT BARRIERS, SAND BAGS, ETC., FOR THE DURATION OF THE PROJECT. ANY DAMAGED OR MISSING DEVICES SHALL BE REPAIRED OR REPLACED AT THE CONTRACTOR'S EXPENSE.
7. EXISTING PAVEMENTS, CURBS, SIDEWALKS, DRIVEWAYS, ETC., DAMAGED OR REMOVED DURING CONSTRUCTION SHALL BE REPLACED TO THE CITY OF MISSOURI CITY STANDARDS AT THE CONTRACTOR'S EXPENSE.
8. CONDITION OF THE WORK AREA (INCLUDING ROADS, RIGHT-OF-WAYS, ETC.) UPON COMPLETION OF THE JOB SHALL BE AS GOOD OR BETTER THAN THE CONDITION PRIOR TO STARTING THE WORK.
9. ALL DRIVEWAYS WILL BE LOCATED TO AVOID EXISTING CURB INLET STRUCTURES.
10. REDWOOD AND KEYWAYS SHALL NOT INTERSECT WITHIN 2 FEET OF AN INLET. CURB INLETS ARE NOT ALLOWED AT "TEE" INTERSECTIONS.
11. FLY-ASH PAVEMENT IS ALLOWED AS DISCRIBED IN THE INFRASTRUCTURE DESIGN MANUAL.
12. ALL CONCRETE PLACED SHALL BE UNIFORMLY SPRAYED WITH A MEMBRANE CURING COMPOUND AS DESCRIBED IN ITEM 526 IN THE TXDOT STANDARD SPECIFICATIONS FOR CONSTRUCTION. IMPROPER APPLICATION WILL RESULT IN THE REJECTION OF THE CONCRETE.
13. SIX (6) INCH, 5.5 SK, 3500 PSI @ 28 DAYS, REINFORCED WITH #4 REBAR, 24" O.C. EACH WAY IS THE MINIMUM ACCEPTABLE PAVEMENT CONSTRUCTION FOR RESIDENTIAL STREETS.
14. SEVEN (7) INCH, 5.5 SK, 3500 PSI @ 28 DAYS, REINFORCED WITH #4 REBAR, 24" O.C. IS THE MINIMUM ACCEPTABLE PAVEMENT CONSTRUCTION FOR MAJOR COLLECTOR STREETS.
15. EIGHT (8) INCH, 5.5 SK, 3500 PSI @ 28 DAYS, WITH #4 O.C. EACH WAY IS THE MINIMUM ACCEPTABLE FOR MAJOR THOROUGHFARE STREETS.
16. WHEN 6" CONCRETE PAVEMENT INTERSECTS 7" PAVEMENT, 7" PAVEMENT SHALL BE CONSTRUCTED TO THE ENDS OF ALL CURB RETURNS.
17. ALL RETURNS SHALL HAVE A MIN. 25 FT. RADIUS AT THE BACK OF CURB UNLESS OTHERWISE NOTED.
18. ALL INTERSECTIONS SHALL BE CONSTRUCTED WITH WHEELCHAIR RAMPS IN ACCORDANCE WITH THE TEXAS ACCESSIBILITY STANDARD, THE AMERICAN DISABILITIES ACT, AND THE CITY OF MISSOURI CITY STANDARDS (LATEST REVISIONS).
19. CONCRETE SIDEWALKS SHALL BE CONSTRUCTED WITHIN EACH STREET RIGHT-OF-WAY IN ACCORDANCE WITH CITY OF MISSOURI CITY, THE A.D.A., AND THE T.A.S. STANDARDS (LATEST REVISIONS).
20. CRACKS 1/16-INCH OR LARGER ARE NOT ACCEPTABLE IN NEW PAVEMENT. CRACKS 1/16-INCH OR LESS SHALL BE ADDRESSED ON AN INDIVIDUAL BASIS, SUBJECT TO APPROVAL OR REJECTION.
21. PROPER TESTING AND LAB DOCUMENTATION IS REQUIRED. FAILURE TO MEET THE MINIMUM PAVEMENT REQUIREMENTS WILL RESULT IN THE REJECTION OF SAID PAVEMENT. IMMEDIATE REMOVAL AND REPLACEMENT OF SUBSTANDARD PAVEMENT SECTIONS WILL BE NECESSARY TO SATISFY THESE REQUIREMENTS.
22. LIME DEPTH DETERMINATIONS WILL BE CONDUCTED AT EACH LOCATION OF DENSITY TESTING. LIME-STABILIZED SUBGRADE SHALL BE A MINIMUM OF 6% AT 6" UNLESS OTHERWISE DIRECTED BY CITY ENGINEER. DENSITY TESTING SHALL BE DONE IMMEDIATELY PRIOR TO PLACEMENT OF REINFORCING STEEL, AND SHALL BE COMPACTED TO A MINIMUM OF 95%. SUBGRADE DENSITY TESTS SHALL BE RETAKEN IN THE EVENT OF A > 1/2-INCH RAINFALL EVENT AT THE CONTRACTOR'S EXPENSE. NO CONCRETE SHALL BE PLACED IN STANDING WATER OR IF MOISTURE CONTENT OF SUBGRADE IS IN NON-COMPLIANCE WITH SPECIFICATIONS FOR ± 2% OF OPTIMUM.
23. 4-CONCRETE CYLINDERS, SLUMP, AND AIR ENTRAPMENT TESTS ARE REQUIRED FOR EACH 150 CUBIC YARDS OF CONCRETE PAVING WITH A MINIMUM OF ONE SET OF 4 PER PLACEMENT. THE CITY OF MISSOURI CITY RESERVES THE RIGHT TO REQUEST ANY-ADDITIONAL TESTS AT THE CONTRACTOR'S EXPENSE, IF ANY MATERIAL APPEARS BELOW STANDARDS.
24. NO. 3 REBAR, 18-INCH C.C. E.W. IS THE MINIMUM ACCEPTABLE FOR SIDEWALKS. NUMBER 4-REBAR, 24-INCH C-C EACH WAY IS THE MINIMUM ACCEPTABLE FOR COMMERCIAL APPROACHES, HANDICAP RAMPS, RESIDENTIAL APPROACHES AND DRIVEWAYS.
25. COLD WEATHER PRECAUTIONS. CONCRETE PAVEMENT SHALL NOT BE PLACED WHEN THE AMBIENT TEMPERATURE IS 40°F AND FALLING. CONCRETE MAY BE PLACED IF THE AMBIENT TEMPERATURE IS 35° AND RISING. CONTRACTOR SHALL PROVIDE AN APPROVED COVERING MATERIAL (COTTON MATS, POLYETHYLENE SHEETING, ETC.) IN THE EVENT TEMPERATURE SHOULD FALL BELOW 32°F. NO SALT OR OTHER CHEMICALS SHALL BE ADDED TO CONCRETE TO PREVENT FREEZING.
26. HOT WEATHER. NO CONCRETE PAVEMENT MIXTURE SHALL BE PLACED IF THE MIXTURE TEMPERATURE IS ABOVE 95°F. AIR AND WATER REDUCER ARE REQUIRED IF MIXTURE TEMPERATURE REACHES 85°F OR ABOVE.
27. IF NO AIR AND WATER REDUCER HAS BEEN ADDED, NO CONCRETE SHALL BE PLACED IF MORE THAN 60 MINUTES PAST BATCH TIME. IF AIR AND WATER REDUCER HAS BEEN ADDED, NO CONCRETE SHALL BE PLACED IF MORE THAN 90 MINUTES PAST BATCH TIME.
28. STRUCTURE TEMPERATURES AND TIMING FOR CONCRETE PLACEMENT MAY VARY. REFER TO TXDOT STANDARDS ITEM 420 FOR DETAILS.
29. TRANSVERSE EXPANSION JOINTS ARE REQUIRED AT A MAXIMUM SPACING OF SIXTY (60) FT. C-C WITH VERT-CAL REDWOOD JOINTS EXTENDING THROUGH THE CURB @ EVERY EXPANSION JOINT. ALL JOINTS AND VERTICAL CURB JOINTS TO BE SEALED WITH LIQUID RUBBER CONFORMING TO TXDOT ITEM 380 2(B)C, CLASS-2 (HOT POURED RUBBER).
30. EXPANSION JOINT LAYOUT FOR INTERSECTIONS SHALL BE PROVIDED BY ENGINEER FOR CITY APPROVAL.
31. NO WIRE MESH IS ALLOWED IN ANY CONCRETE WITHIN THE CITY LIMITS OR ETJ.
32. ALL REBAR SHALL BE 100% TIED. OVERLAPS SHALL BE DOUBLE TIED MINIMUM.
33. ALL NEW CURB REQUIRES 3,500 P.S.I. @ 28-DAYS, AND A MINIMUM OF 1-LB/CY OF APPROVED POLYPROPYLENE FIBER MESH.

ASPHALT – OILS AND EMULSIONS

1. CONTRACTOR SHALL VERIFY LINES AND GRADES AND THAT COMPACTED BASE IS READY TO SUPPORT PAVING.
2. BASE MATERIAL SHALL BE DRY AND THOROUGHLY CLEAN OF LOOSE MATERIAL PRIOR TO APPLICATION.
3. OILS & EMULSION SHALL BE DISTRIBUTED EVENLY AND SMOOTHLY UNDER PRESSURE NECESSARY FOR PROPER DISTRIBUTION.
4. MAINTAIN REQUIRED SURFACE CONDITIONS UNTIL ACCEPTED BY THE CITY OF MISSOURI CITY.
5. PRIME COAT SHALL BE M.C.-30, M.C.-70 OR E.P.R.1. PRIME AND SHALL COMPLY WITH TXDOT STANDARD SPECIFICATIONS FOR CONSTRUCTION OF HIGHWAYS, STREETS, AND BRIDGES (1993) AND ITS LATEST REVISIONS.
6. TACK COAT SHALL BE SS-1 AND SHALL COMPLY TO TXDOT, S.S.C.H.S. & B. (1993) AND ITS LATEST REVISIONS.
7. M.C.-30 AND M.C.-70 AND EPR-1 PRIME SHALL BE DISTRIBUTED AT A RATE OF .25 TO .35 GALLONS PER SQUARE YARD AND MAY NOT BE APPLIED WHEN AMBIENT TEMPERATURE IS 50°F AND FALLING. (NOTICE: CUTBACK ASPHALTS MAY NOT BE USED DURING THE PERIOD OF APRIL 16 THROUGH SEPT. 15 AS PER ASTM D-244).
8. EPR-1 MAXIMUM WATER DILUTION IS 3 PARTS WATER TO ONE PART EPR-1.
9. SS-1 TACK COAT SHALL BE APPLIED AT A RATE NOT TO EXCEED 0.06 GAL. PER SQUARE YARD OF SURFACE AREA. CONTACT JOINTS, CURBS, ETC. SHALL BE PAINTED WITH AN EVEN THIN COAT APPLIED BY BRUSH OR BROOM. COATING MATERIAL SHALL BE HEATED TO 125°F TO 180°F WHEN APPLIED. TACK COAT MAY BE APPLIED WHEN AMBIENT TEMPERATURES ARE 40°F AND RISING. TACK COAT MAY NOT BE APPLIED IF AMBIENT AIR IS 50°F AND FALLING.

CEMENT STABILIZED SAND

1. **ALL STABILIZED SAND SHALL BE A MINIMUM OF 1 1/2 SK PER TN.**
2. CEMENT STABILIZED SAND (C.S.S.) SHALL ACHIEVE A MINIMUM OF 100 PSI WITHIN 48 HOURS.
3. A MINIMUM OF 2 RANDOM SAMPLES SHALL BE TAKEN EACH WEEK. (FOR SMALLER PROJECTS, ONE SAMPLE MAY SUFFICE WITH CITY OF MISSOURI CITY APPROVAL.) THE CITY OF MISSOURI CITY RESERVES THE RIGHT TO REQUIRE ADDITIONAL TESTS, AT THE CONTRACTORS EXPENSE IF IT IS DEEMED NECESSARY.
4. ANY C.S.S. NOT MEETING CITY OF MISSOURI CITY STANDARDS SHALL BE REMOVED AND REPLACED AT THE CONTRACTOR'S EXPENSE.
5. BOTH CEMENT CONTENT AND COMPRESSIVE TESTS SHALL BE CONDUCTED ON C.S.S. SAMPLES.
6. ALL C.S.S. SHALL BE COMPACTED IN MAXIMUM OF 8-INCH LIFTS AND REQUIRED TO REACH A MINIMUM DENSITY OF 95%.
7. CEMENT STAB. SAND MAY NOT BE STORED FOR LONG PERIODS.
   MAXIMUM ALLOWED TIME - 3 HRS FROM BATCH TIME TO HAVING BEEN INSTALLED.

BANK SAND

1. BANK SAND IS DEFINED AS A WELL-GRADED SAND, FREE OF SILT, CLAY, FRIABLE OR SOLUBLE MATERIALS AND ORGANIC MATER, MEETING THE UNIFIED SOILS CLASSIFICATIONS SYSTEM GROUP SYMBOL SW. CRITERIA WITH A PLASTICITY INDEX OF LESS THAN 10. NO MORE THAN 12P MATERIAL CAN PASS THE No. 200 SIEVE.

HOT MIX ASPHALTIC BASE COURSE

1. NO HOT MIX ASPHALTIC BASE MAY BE INSTALLED UNTIL THE SUBGRADE HAS BEEN PROPERLY PREPARED AND TESTED AS PER THE PLANS AND SPECIFICATIONS. THE SUBGRADE SHALL BE INSPECTED AND APPROVED BY THE CITY OF MISSOURI CITY BEFORE ANY BASE MATERIALS ARE INSTALLED.
2. HOT MIX ASPHALTIC BASE MATERIALS, HANDLING, AND INSTALLATION SHALL COMPLY WITH TXDOT STANDARDS FOR CONSTRUCTION OF HIGHWAYS, STREETS, AND BRIDGES 1995 (SECTION 02711) AND ITS LATEST REVISIONS.
3. HOT MIX ASPHALTIC MATERIALS SHALL BE AT TEMPERATURES BETWEEN 250°F AND 325°F, WHEN PLACED.
4. MATERIALS MAY NOT BE PLACED IN WET CONDITIONS OR IF THE AMBIENT TEMPERATURE IS BELOW 50°F AND FALLING. MATERIALS MAY BE INSTALLED IF THE AMBIENT TEMPERATURE IS TAKEN IN THE SHADE AND IS 40°F AND RISING.
5. PLACE BASE COURSES 4 INCHES OR GREATER IN THICKNESS IN TWO OR MORE LAYERS, EACH HAVING A COMPACTED THICKNESS OF NOT GREATER THAN 6 INCHES.
6. BASE MATERIAL MAY ONLY BE PLACED AGAINST CLEAN, STRAIGHT EDGES. SAW CUTTING, FULL DEPTH, IS REQUIRED IF EXISTING EDGES ARE ROUGH OR UNEVEN.
7. COMPACTION SHALL BEGIN WHILE MATERIAL IS STILL HOT AND AS SOON AS IT WILL BEAR THE ROLLER OR COMPACTOR WEIGHT WITHOUT UNDUE DISPLACEMENT OR HAIR CRACKING.
8. COMPACT SURFACE UNIFORMLY WITH ROLLERS OR TAMPERS IN LOCATIONS NOT READILY ACCESSIBLE (I.E., ALONG CURBS, WALLS, ETC.).
9. UNLESS OTHERWISE SPECIFIED, COMPACT DENSITY TO NOT LESS THAN 95P MAXIMUM POSSIBLE DENSITY.
10. A CERTIFIED LAB SHALL BE ON SITE AT ALL TIMES TO TEST AND PROPERLY DOCUMENT THE CONSTRUCTION METHODS AND QUALITY OF MATERIALS.
11. ALL MATERIALS AND WORKMANSHIP SHALL COMPLY TO A.S.T.M. ASPHALT INSTITUTE AND CITY OF MISSOURI CITY REQUIREMENTS. FAILURE TO COMPLY WILL RESULT IN REJECTION OF SAID MATERIALS AND SUCH SHALL BE REPLACED AT THE CONTRACTOR'S EXPENSE.
12. NO HOT MIX BASE, IF TRAFFIC UNTIL IT CAN BE MAINTAINED IN GOOD CONDITION AND IS CAPABLE OF SUPPORTING VEHICLE WEIGHT WITHOUT DAMAGE OR DEGRADATION.
13. DENSITIES SHALL BE TAKEN AT A MINIMUM OF AT LEAST ONCE PER 300 LF OF DRIVE LANE OR ONCE PER 250 SQ. YD., WHICHEVER MAY APPLY AND SHALL BE STAGGERED RELATIVE TO TESTING SITES IN ABUTTING TRAFFIC LANES. FAILURE TO MEET MINIMUM REQUIREMENTS SHALL RESULT IN THE REPLACEMENT OF SAID MATERIAL AT CONTRACTOR'S EXPENSE.

EROSION AND SEDIMENTATION CONTROL NOTES:

1. PRIOR TO START OF CONSTRUCTION, CONTRACTOR SHALL INSTALL EROSION AND SEDIMENTATION CONTROLS AT LOCATIONS SHOWN ON THE PLANS.
2. CONTRACTOR SHALL INSPECT ALL EROSION AND SEDIMENTATION CONTROL SYSTEMS SPECIFIED HEREIN, AT A MINIMUM OF ONCE EVERY CALENDAR DAY.
3. CONTRACTOR SHALL MAINTAIN, REPAIR AND/OR REPLACE DAMAGED EROSION AND SEDIMENTATION CONTROL SYSTEM THROUGHOUT THE DURATION OF THE CONTRACT. (NO SEPARATE PAY).
4. CONTRACTOR SHALL PROVIDE PROTECTED STORAGE AREAS FOR CHEMICALS, PAINTS, SOLVENTS, FERTILIZERS, AND OTHER POTENTIALLY TOXIC MATERIALS.
5. CONTRACTOR SHALL LOCATE FUEL/MATERIAL STORAGE AREAS AWAY FROM STORM WATER CONVEYANCE SYSTEM. CONTRACTOR SHALL USE SILT FENCING, HAY BALES, OR BERMS AROUND FUEL STORAGE AREAS. (NO SEPARATE PAY).
6. CONTRACTOR SHALL ADVISE OWNER IMMEDIATELY, VERBALLY, AND IN WRITING OF ANY FUEL OR TOXIC MATERIAL SPILLS ONTO THE PROJECT/CONSTRUCTION AREA AND THE ACTION TAKEN TO REMEDY THE PROBLEM.
7. CONTRACTOR IS RESPONSIBLE FOR DISPOSING OF HIS FUELS, MATERIALS, AND CONTAMINATED EXCAVATIONS IN A LEGALLY APPROVED MANNER. (NO SEPARATE PAY).
8. CONTRACTOR IS RESPONSIBLE FOR COMPLYING WITH ALL APPLICABLE ENVIRONMENTAL LAWS.
9. CONTRACTOR IS RESPONSIBLE FOR PROVIDING ADEQUATELY MAINTAINED SANITARY FACILITIES.
10. AT COMPLETION OF THE CONTRACT, OWNER AND/OR OWNER'S REPRESENTATIVE WITH THE CONTRACTOR SHALL EXAMINE EROSION AND SEDIMENTATION CONTROL SYSTEM BEFORE RELIEVING CONTRACTOR OF HIS MAINTENANCE RESPONSIBILITIES.
11. IF EROSION AND SEDIMENTATION CONTROL SYSTEM IS EXISTING FROM PRIOR CONTRACTS, OWNER AND/OR OWNER'S REPRESENTATIVES WITH THE CONTRACTOR SHALL EXAMINE THE EXISTING EROSION AND SEDIMENTATION CONTROL SYSTEM FOR DAMAGE PRIOR TO CONTRACTOR STARING CONSTRUCTION OF THE CONTRACT. ANY DAMAGE NOTED AT THIS TIME SHALL BE REPAIRED AT OWNER'S EXPENSE.
12. CONTRACTOR SHALL BE RESPONSIBLE FOR STREET CLEANING, ON A DAILY BASIS. THE CONTRACTOR SHALL REMOVE ALL MUD AND DIRT DEPOSITED ON THE EXISTING PAVEMENT DUE TO HIS CONSTRUCTION ACTIVITY.

LIMING SUBGRADE

1. LIME SHALL BE A "SLURRY" AS PER TXDOT 260 UNLESS SPECIFICALLY RECOMMENDED BY THE GEOTECHNICAL ENGINEER AND APPROVED BY THE PUBLIC WORKS ENGINEER.
2. ALL LIME SLURRIES SHALL BE FURNISHED AT OR ABOVE THE MINIMUM "DRY SOLIDS" CONTENTS AS APPROVED BY THE ENGINEER.
3. SUBGRADES SHALL BE STABILIZED WITH A MINIMUM SIX PERCENT (6%) LIME BY WEIGHT, SIX INCHES (6") THICK TO REDUCE PLASTICITY INDEX (PI) TO FIFTEEN (15) AS DETERMINED LIME SERIES. ADD ONE PERCENT (1%) FOR FIELD VARIATION. IF PI OF 15 OR LESS CANNOT BE OBTAINED, THEN THE LIME TREATED SOILS MUST OBTAIN A pH OF 12.4, MUST BE INCREASED TO EIGHT INCHES (8") THICK AND COMPATED TO NINETY-FIVE PERCENT (95%) STANDARD PROCTOR DENSITY.
4. LIME DRY SOLID CONTENT TESTS SHALL BE CONDUCTED ON SITE, ONCE PER ONE-HUNDRED (100) TONS OF MATERIAL DISTRIBUTED, UNLESS OTHERWISE NOTED.
5. THE SUBGRADE SHALL BE SHAPED AND GRADED TO CONFORM TO THE TYPICAL SECTIONS, AS SHOWN ON THE PLANS, PRIOR TO TREATING THE EXISTING MATERIAL.
6. UNLESS APPROVED BY THE CITY ENGINEER, LIME OPERATIONS SHALL NOT BE STARTED WHEN THE AMBIENT AIR TEMPERATURE IS BELOW 40°F. AND FALLING. LIMING MAY, WITH APPROVAL, BE STARTED WHEN THE AMBIENT AIR TEMPERATURE IS 35°F AND RISING. LIME SHALL NOT BE PLACED WHEN WEATHER CONDITIONS, IN THE ENGINEER'S OPINION, ARE UNSUITABLE.
7. WHEN AS APPROVED BY THE CITY ENGINEER, THE SUBGRADE MATERIAL AND LIME SHALL BE THOROUGHLY MIXED, BROUGHT TO THE PROPER MOISTURE CONTENT (+ OR - 2) AND LEFT TO CURE USUALLY 3 DAYS (72 HRS.)
8. AFTER CURING, THE SUBGRADE SHALL BE REMIXED UNTIL PULVERIZATION REQUIREMENTS ARE MET, AS PER TXDOT.
   TEX-101-E, PART III.

	PERCENT
MINIMUM PASSING 1-3/4" SIEVE	100
MINIMUM PASSING 3/4" SIEVE	85
MINIMUM PASSING NO 4 SIEVE	60

9. SIEVE TESTS SHALL BE CONDUCTED EVERY 150 LF ON ALTERNATING LANES OF TRAFFIC OR EVERY 300 LF ON SINGLE LANES AS REQUIRED. AT LEAST ONE TEST SHALL BE CONDUCTED ON EACH ROADWAY OR CUL-DE-SAC.
10. THE MATERIAL SHALL BE AERATED OR MOISTENED TO + OR -2PTIMUM PRIOR TO COMPACTION. COMPACTION TO A MINIMUM 95% DENSITY SHALL BEGIN IMMEDIATELY AFTER ALL PULVERIZATION AND MOISTURE REQUIREMENTS ARE MET, THRO

PLOT TIME - TIME STAMP

ASPHALTIC CONCRETE PAVEMENT

1. ASPHALTIC MATERIAL AND WORKMANSHIP SHALL COMPLY WITH ASTM C 33, ASTM C 131, ASTM C 136, AND TXDOT STANDARD SPECIFICATIONS FOR CONSTRUCTION OF HIGHWAYS, STREETS AND BRIDGES (1993) AND ITS LATEST REVISIONS. ASPHALT SHALL BE TYPE D-100 UNLESS SPECIFICALLY NOTED AND APPROVED BY CITY OF MISSOURI CITY ENGINEER.
2. CONTRACTOR SHALL VERIFY ELEVATIONS AND GRADES AND THAT BASE COURSE IS READY TO SUPPORT IMPOSED LOADS.
3. APPLY A PRIME COAT AS PER CITY OF MISSOURI CITY AND TXDOT STANDARDS. DO NOT APPLY TACK COAT UNTIL PRIMED BASE COURSE HAS CURED AND IS APPROVED BY THE CONSTRUCTION INSPECTOR.
4. TACK COAT SHALL COMPLY TO CITY OF MISSOURI CITY AND TXDOT STANDARDS.
5. DO NOT USE CUTBACK ASPHALT APRIL 16 THROUGH SEPTEMBER 15.
6. DO NOT PLACE ASPHALT WHEN AMBIENT TEMPERATURE IS BELOW 50°F AND FALLING. MIXTURE MAY BE PLACED WHEN AMBIENT TEMPERATURE IS 40°F AND RISING.
7. ON PUBLIC ROADS, STREETS, AND RIGHT-OF-WAY, ASPHALT SHALL BE PLACED IN MAXIMUM 2-INCH LIFTS. IN THE EVENT MORE THAN ONE LIFT IS REQUIRED, EACH LIFT SHALL BE COMPACTED, TESTED, AND GIVEN ADEQUATE TIME FOR THE PREVIOUS LIFT TO CURE AND DRY BEFORE THE NEXT LIFT IS PLACED. IF COMPLETELY CURED AND DRIED, A TACK COAT WILL BE REQUIRED BETWEEN LIFTS.
8. A CERTIFIED LAB SHALL BE ON SITE AT ALL TIMES TO TEST AND PROPERLY DOCUMENT THE CONSTRUCTION METHODS AND QUALITY OF MATERIALS.
9. ROLLING PATTERNS SHALL BE ESTABLISHED BY THE CONTRACTOR, AS RECOMMENDED BY THE LAB, TO ACHIEVE THE MAXIMUM COMPACTION. THE SELECTED ROLL PATTERN SHALL BE FOLLOWED UNLESS CHANGES IN THE PLACEMENT OR MIXTURE OCCUR, WHICH AFFECT COMPACTION. COMPACTION OF 95% SHALL BE ACHIEVED.
10. ASPHALT SHALL NOT BE PLACED ON WET BASE.
11. NO "BIRDBATHS" ARE ALLOWED.
12. IF THE SURFACE RAVELS (SEPARATES), FLUSHES, RUTS, OR DETERIORATES IN ANY MANNER PRIOR TO FINAL ACCEPTANCE, THE CONTRACTOR WILL CORRECT THIS CONDITION AT HIS EXPENSE TO THE SATISFACTION OF THE CITY OF MISSOURI CITY ENGINEER.
13. THE CONTRACTOR SHALL PROTECT THE PAVEMENT UNTIL DIRECTED BY THE CITY ENGINEER TO OPEN SAID PAVEMENT TO TRAFFIC.
14. RIDE QUALITY SHALL COMPLY WITH TXDOT ITEM 585, "RIDE QUALITY FOR PAVEMENT SURFACES".
15. SPECIAL NOTE: CONTRACTOR, WHILE MAXIMIZING COMPACTION, SHALL USE CAUTION NOT TO "OVER-ROLL" ASPHALT. PAVEMENT STRETCHED OR OVER-ROLLED, WHERE COMPACTION IS BROKEN, SHALL NOT BE ACCEPTED AND SHALL BE REPAIRED OR REPLACED TO THE CITY ENGINEER'S SATISFACTION AT THE CONTRACTOR'S EXPENSE.
16. CORE SAMPLES SHALL BE TAKEN RANDOMLY AT A MINIMUM OF EVERY 300 LF PER LANE OF ROADWAY OR ONE PER EVERY 250 SQ. YD., WHICHEVER IS APPLICABLE AND SHALL BE STAGGERED RELATIVE TO TESTING SITES IN ABUTTING TRAFFIC LANES.
17. ALL ASPHALTIC CONCRETE PAVEMENT REPAIRS SHALL BE SAW CUT TO FULL ASPHALT DEPTH. REFER TO ASPHALT, STABILIZED BASE, FLEXIBLE BASE, ASPHALT BASE, AND OIL AND EMULSION NOTES. ALL DAMAGED BASE AND SUBGRADES SHALL BE REMOVED AND REPLACED TO THE CITY'S ENGINEER SATISFACTION, AT THE CONTRACTOR'S EXPENSE. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY AREA DAMAGED DURING CONSTRUCTION, INCLUDING AREAS OUTSIDE THE DESIGNATED REPAIR.

STABILIZED CRUSHED CONCRETE

1. TEST AND ANALYSIS OF AGGREGATE AND BINDER MATERIALS WILL BE PERFORMED IN ACCORDANCE WITH ASTMD 1557 AND ASTMD 4318. CEMENT SHALL BE ASTMC 150 TYPE I.
2. ALL MATERIALS AND WORKMANSHIP SHALL COMPLY WITH TXDOT STANDARD SPECIFICATIONS FOR CONSTRUCTION OF HIGHWAYS, STREETS AND BRIDGES (1993) AND ITS LATEST REVISIONS AND CITY OF MISSOURI CITY STANDARDS.
3. PRIME COAT SHALL BE M.C. 30 OR EPR-1 PRIME.
4. DESIGN MIX FOR MINIMUM AVERAGE COMPRESSIVE STRENGTH OF 200 PSI IN 48 HRS. PROVIDE MINIMUM CEMENT CONTENT OF 2 SK PER TON OF MIX. CEMENT CONTENT MAY BE RAISED AT THE CONTRACTOR'S EXPENSE IF TESTS ON FIELD SAMPLES FALL BELOW 200 PSI.
5. THREE SAMPLES SHALL BE MOLDED EACH DAY FOR EACH 300 TONS OF PRODUCTION. COMPRESSIVE STRENGTH SHALL BE THE AVERAGE OF THREE TESTS FOR EACH PRODUCTION LOT. CONTRACTOR SHALL REPLACE, AT HIS OWN EXPENSE, ANY MATERIAL BELOW MINIMUM REQUIREMENTS.
6. CONTRACTOR SHALL VERIFY LINES, GRADES, AND COMPACTED SUBGRADING AS READY TO RECEIVE MATERIALS PRIOR TO ITS PLACEMENT.
7. CEMENT STABILIZED BASE MAY NOT BE PLACED IF AMBIENT TEMPERATURE IS 40°F AND FALLING. BASE MATERIAL MAY BE PLACED IF AMBIENT TEMPERATURE IS 35°F AND RISING.
8. MATERIAL MAY NOT BE PLACED IN LIFTS EXCEEDING 6 INCHES IN DEPTH. EACH LIFT SHALL HAVE DENSITIES TAKEN.
9. CEMENT STABILIZED BASE MAY NOT BE STORED FOR LONG PERIODS. DELIVERY OF MATERIAL AND UTILIZATION SHOULD BE TIMED ACCORDINGLY. MAXIMUM TIME ALLOWED 3 HRS. FROM BATCH TIME TO HAVING BEEN INSTALLED.
10. CEMENT STABILIZED BASE SHALL NOT BE INSTALLED IN WET OR SOFT AREAS.
11. COMPACT TO MINIMUM DENSITY OF 95% MAXIMUM DRY DENSITY UNLESS OTHERWISE INDICATED ON DRAWINGS, MOISTURE SHALL BE BETWEEN + OR -2% OPTIMUM AS DETERMINED BY ASTMD 698.
12. AFTER COMPACTING FINAL COURSE, BLADE SURFACE TO FINAL GRADE. ANY IRREGULARITIES, WEAK SPOTS, AREAS OF EXCESSIVE WETNESS, OR SURFACE HAIR LINE CRACKING SHALL BE REPAIRED AND/OR REPLACED AT CONTRACTOR'S EXPENSE.
13. A CERTIFIED LAB SHALL BE ON SITE AT ALL TIMES TO TEST AND PROPERLY DOCUMENT THE CONSTRUCTION METHODS AND QUALITY OF MATERIALS.
14. COMPACTION TESTING WILL BE PERFORMED IN ACCORDANCE WITH ASTM D 1556 OR ASTM D 2922 AND ASTM D 3017 AT RANDOMLY SELECTED LOCATIONS AS DIRECTED BY CITY OF MISSOURI CITY CONSTRUCTION INSPECTOR.
15. A MINIMUM OF ONE CORE SHALL BE TAKEN AT RANDOM LOCATIONS PER 300 LF PER LANE OF ROADWAY OR ONE PER 250 SQ. YD., WHICHEVER MAY APPLY AND SHALL BE STAGGERED RELATIVE TO TESTING SITES IN ABUTTING TRAFFIC LANES.
16. CURE FOR A MINIMUM OF 7 DAYS BEFORE ADDING ASPHALT PAVEMENT COURSES.
17. COVER SURFACE WITH CURING MEMBRANES AT THE FOLLOWING RATES: MC-30: 0.1 GAL. PER SQ. YD., OR EPR-1 PRIME: 0.15 GAL. PER SQ. YD. DO NOT USE CUTBACK ASPHALT APRIL 16 TO SEPTEMBER 15. PROTECT THE MEMBRANE BY ALLOWING MEMBRANE TO FULLY CURE PRIOR TO PERMITTING TRAFFIC TO DRIVE ON IT.
18. UNSTABILIZED CRUSHED CONCRETE MAY NOT BE USED ON PUBLIC STREETS, ROADS, OR RIGHTS-OF-WAY.
19. STABILIZED LIMESTONE BASE MAY BE SUBSTITUTED FOR STABILIZED CRUSHED CONCRETE IF SUBMITTED AND APPROVED BY CITY ENGINEER.

STORM SEWER NOTES

1. STORM SEWERS SHALL BE DESIGNED AND CONSTRUCTED WITH CITY OF MISSOURI CITY INFRASTRUCTURE DESIGN MANUAL AND IN ACCORDANCE WITH CITY OF MISSOURI CITY STANDARD CONSTRUCTION DETAILS.
2. ALL PIPE STORM SEWERS SHALL BE INSTALLED, BEDDED, AND BACKFILLED IN ACCORDANCE WITH CITY OF MISSOURI CITY STANDARD DETAIL DRAWINGS.
3. ALL CEMENT STABILIZED SAND (C.S.S.) SHALL BE 2 SK PER CUBIC YD. AND MEET MINIMUM C.S.S. STANDARDS COMPACTED TO 95%.
4. ALL STORM SEWERS UNDER AND WITHIN TWO (2) FOOT OF PROPOSED OR FUTURE PAVEMENTS SHALL BE BACKFILLED AND COMPACTED WITH 2 SK C.S.S. TO BOTTOM OF SUBGRADE.
5. ALL PROPOSED PIPE STUB-OUTS FROM MANHOLES ON INLETS ARE TO BE PLUGGED WITH 8" BRICK WALLS WITH FULL MORTAR HEAD AND BED JOINTS AND GROUTED WITH A MINIMUM OF 1/2-INCH MORTAR INSIDE AND OUTSIDE, UNLESS OTHERWISE NOTED.
6. MANHOLES IN HANDICAP RAMPS ARE NOT ALLOWED.
7. ALL STORM SEWER MANHOLES SHALL BE OF MISSOURI CITY TYPE "C" UNLESS OTHERWISE NOTED AND SHALL BE LOCATED A MINIMUM OF THREE (3) FEET BACK OF CURB. IF CONFLICT EXISTS, RACK OVER MANHOLE TO MISS PROPOSED CURB. (MAXIMUM RACK OF 1-INCH PER COURSE OF BRICK.)
8. RIM ELEVATIONS SHOWN ON THE PLANS ARE APPROXIMATE ONLY. UTILITY CONTRACTOR SHALL ADJUST RIM ELEVATIONS TO 0.4 FEET ABOVE THE FINISH GRADE AT EACH LOCATION AFTER CONTRACTOR HAS COMPLETED FINAL GRADING. SLOPED FILL SHALL BE ADDED FOR STORM WATER DRAINAGE AWAY FROM RIM.
9. RIM ELEVATIONS SHALL BE PROPERLY ADJUSTED TO GRADE IN PAVEMENT AND SIDEWALKS. APPROVED BLOCKOUTS SHALL BE USED IN PAVEMENT.
10. ALL STORM SEWER MANHOLE COVERS MUST INCLUDE "STORM SEWER" AND "DUMP NO WASTE", "DRAINS TO WATERWAYS" WITH CITY OF MISSOURI CITY EMBLEM.
11. MINIMUM STORM SEWER SIZE SHALL BE 24-INCH DIAMETER. ALL STORM SEWER PIPES 24" AND LARGER ARE TO BE REINFORCED CONCRETE PIPE ASTM C-76 CLASS III, INCLUDING INLET LEADS CROSSING UNDER EXISTING OR PROPOSED PAVEMENTS. ALL INLET LEADS SHALL BE 24" R.C.P. OR LARGER. ALL STORM SEWER PIPE SHALL BE RUBBER GASKETED. ALL CMP PIPE SHALL BE IN ACCORDANCE WITH C.O.M.C. APPROVED PRODUCT LIST AND STANDARD DETAILS.
12. CONTRACTOR SHALL VERIFY NATURAL GROUND SHOTS PRIOR TO MANHOLE CONSTRUCTION.
13. CONTRACTOR TO PROVIDE A MINIMUM OF 6-INCHES CLEARANCE AT STORM AND WATER LINE CROSSINGS AND A MINIMUM OF TWELVE (12) INCHES AT SANITARY SEWER CROSSING.
14. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING, MAINTAINING, AND RESTORING ANY BACKSLOPE DRAINAGE SYSTEM DISTURBED AS A RESULT OF HIS WORK.
15. ALL DITCHES SHALL BE RESTORED TO PROPOSED ELEVATIONS TO INSURE PROPER DRAINAGE. ALL OUTFALLS SHALL BE COMPACTED AND ALL DISTURBED AREAS SHALL BE RESEEDED OR RESODDED WITHIN 10 WORKING DAYS OF EACH OCCURRENCE (NO SEPARATE PAY).
16. THE UTILITY CONTRACTOR SHALL ROUGH CUT ALL ROADSIDE SWALES IN PROPER ALIGNMENT AND SLOPE TO WITHIN 0.2 FT. OF FINISH GRADE. THE PAVING CONTRACTOR, UPON COMPLETION OF PAVING, SHALL COMPLETE FINAL GRADING ALIGNMENT OF SWALES AND RESTORE ALL AREAS WITHIN RIGHT-OF-WAY FOR SEEDING OR SODDING AND FERTILIZATION.
17. REFER TO GENERAL NOTES AND C.S.S. NOTES.

SANITARY SEWER NOTES

1. SANITARY SEWERS, FORCE MAINS, MANHOLES, LIFT STATIONS AND WASTEWATER TREATMENT PLANTS SHALL BE DESIGNED AND CONSTRUCTED AS PER THE REQUIREMENTS OF THE CITY OF MISSOURI CITY INFRASTRUCTURE STANDARDS AND CORRESPONDING STANDARD CONSTRUCTION DETAILS SHEETS AND AS PER THE REQUIREMENTS OF THE TEXAS COMMISSION ON ENVIRONMENTAL QUALITY "DESIGN CRITERIA FOR SEWERAGE SYSTEMS". SHOULD A CONFLICT ARISE BETWEEN INFORMATION DEPICTED ON APPROVED CONSTRUCTION DRAWINGS AND/OR INFORMATION INCLUDED IN PROJECT SPECIFICATIONS, CITY OF MISSOURI CITY INFRASTRUCTURE STANDARDS SHALL GOVERN.
2. ALL MATERIALS AND PRODUCTS USED IN THE CONSTRUCTION OF SANITARY SEWERS, FORCE MAINS, MANHOLES, LIFT STATIONS AND WASTEWATER TREATMENT PLANTS SHALL COMPLY WITH THE CITY OF MISSOURI CITY INFRASTRUCTURE DESIGN MANUAL AND THE CURRENT APPROVED PRODUCTS LIST AS MAINTAINED BY THE DEPARTMENT OF PUBLIC WORKS.
3. STACKS SHALL BE BUILT IN ACCORDANCE WITH THE CITY OF MISSOURI CITY STANDARD DETAIL DRAWING REQUIREMENTS. EXACT LOCATION OF THE STACK SHALL BE SUPPLIED TO THE CITY ENGINEER OF MISSOURI CITY BY THE PROJECT ENGINEER ON SEALED AS-BUILT DRAWINGS AT COMPLETION OF CONSTRUCTION. ALL STACKS SHALL BE INSTALLED WITHIN 3° OF TRUE RELATIVE TO VERTICAL PLANE AND WILL BE CAPPED AND TERMINATED AT A DEPTH OF 4 FEET BELOW FINISHED GRADE, UNLESS OTHERWISE DIRECTED BY THE CITY ENGINEER.
4. EACH SANITARY SEWER SERVICE LEAD STUB, PLUGGED WYE BRANCH OUTLET AND STACK SHALL 4" PVC PIPE AT THE TIME OF CONSTRUCTION. BEGINNING AT THE INVERT ELEVATION OF THE STUB OR WYE AND AT AN ELEVATION TWO FEET BELOW THE CAPPED TERMINATION POINT OF THE STACK AND EXTENDING TWO FEET ABOVE FINISHED GRADE. EACH MARKER SHALL BE PAINTED RED AND LABELED "SANITARY SEWER STUB", "SANITARY SEWER WYE" OR "SANITARY SEWER STACK" AS APPROPRIATE WITH STUB, WYE BRANCH OUTLET OR STACK SIZE NOTED.
5. SANITARY SEWER MANHOLES SHALL BE CONSTRUCTED AS PER DRAWINGS INCORPORATED IN CITY OF MISSOURI CITY STANDARD CONSTRUCTION DETAILS SHEETS. SUCH MANHOLES SHALL BE CONSTRUCTED A MINIMUM OF ONE FOOT FROM BACK OF CURB ON CURB AND GUTTER ROADWAYS AND THREE FEET FROM EDGE OF TRAVELLED ROADWAY ON THOSE THOROUGHFARES HAVING NO CURBING, MEASURED FROM OUTSIDE DIAMETER OF MANHOLE. ALL SANITARY SEWER MANHOLES SHALL INCORPORATE INFLOW PROTECTORS. SANITARY SEWER MANHOLES SHALL NOT BE INSTALLED BENEATH STREET PAVING EXCEPT WHERE SPECIFICALLY AUTHORIZED BY CITY ENGINEER AND SO DESIGNATED ON APPROVED CONSTRUCTION DRAWINGS. CAST IN PLACE MANHOLES AND FIBERGLASS MANHOLES ARE PROHIBITED. ALL MANHOLES SHALL HAVE ECCENTRIC CONES.
6. SANITARY SEWER MANHOLE COVERS SHALL BE MINIMUM OF 32 INCHES IN DIAMETER. ALL SUCH MANHOLE COVERS SHALL HAVE THE CITY OF MISSOURI CITY EMBLEM AND THE WORDS "MISSOURI CITY" AND "SANITARY SEWER" CAST IN RAISED RELIEF AS DEPICTED IN CITY OF MISSOURI CITY STANDARD CONSTRUCTION DETAILS SHEETS.
7. MANHOLE RIM ELEVATIONS SHOWN ON PLANS ARE APPROXIMATE ONLY. UTILITY CONTRACTORS SHALL ADJUST RIM ELEVATIONS TO 0.4 FEET ABOVE FINISHED GRADE, AND 0.5 FEET ABOVE NATURAL GROUND WITHIN RIGHTS-OF-WAY AND EASEMENTS AT EACH MANHOLE LOCATION AFTER PAVEMENT CONTRACTOR HAS COMPLETED FINAL GRADING. THE AREA ADJACENT TO SANITARY SEWER MANHOLE LOCATIONS SHALL BE GRADED AWAY FROM SUCH MANHOLES SO AS PREVENT ENTRY OF STORM WATER RUNOFF TO THE SANITARY SEWER SYSTEM.
8. MINIMUM SEPARATION DISTANCES AS REQUIRED BY TCEQ SECTION 317.13, APPENDIX E MUST BE MAINTAINED BETWEEN POTABLE WATER LINES AND SANITARY SEWERS, FORCE MAINS, MANHOLES, LIFT STATIONS AND WASTEWATER TREATMENT PLANTS. INSTALLATION OF FIRE HYDRANTS WITHIN NINE FEET OF A SANITARY SEWER SYSTEM IS PROHIBITED. REFER TO THE CITY OF MISSOURI CITY INFRASTRUCTURE STANDARDS AND CORRESPONDING STANDARD CONSTRUCTION DETAILS SHEETS FOR CONSTRUCTION REQUIREMENTS OF OTHER INSTALLATIONS WHERE SEPARATION DISTANCES OF GREATER THAN NINE FEET CANNOT BE MAINTAINED.
9. TESTING OF SANITARY SEWERS, FORCE MAINS, MANHOLES, LIFT STATIONS AND WASTEWATER TREATMENT PLANTS SHALL BE CONDUCTED AS NOTED IN SANITARY SEWER CHAPTER OF THE CITY OF MISSOURI CITY INFRASTRUCTURE STANDARDS AND AS PER THE REQUIREMENTS OF THE TEXAS COMMISSION ON ENVIRONMENTAL QUALITY "DESIGN CRITERIA FOR SEWERAGE SYSTEMS".
10. CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING LOCATION OF ALL EXISTING UTILITIES PRIOR TO EXCAVATION. DURING THE COURSE OF ANY AND ALL CLEARING, GRUBBING, FILL, GRADING, EXCAVATION OR OTHER CONSTRUCTION, CONTRACTOR SHALL ENSURE THAT STORM DRAINAGE PATHWAYS ARE MAINTAINED AND REMAIN OPEN TO ENSURE POSITIVE DRAINAGE AND THAT SUCH CONVEYANCES ARE NOT IMPEDED OR BLOCKED IN ANY WAY. STORM SEWER INLETS SHALL BE PROTECTED FROM ENTRY OF SILT, TRASH, DEBRIS AND ANY SUBSTANCES DELETERIOUS TO THE STORM SEWER SYSTEM AND/OR WATERWAYS RECEIVING STORM WATER RUNOFF. CONTRACTOR SHALL AT COMPLETION OF WORK, FILL LOW SPOTS AND GRADE ALL RIGHTS-OF-WAY AND UTILITY EASEMENTS AND REGRADE/RESTORE DITCHES AS NECESSARY TO MAINTAIN AND/OR ESTABLISH POSITIVE DRAINAGE.
11. ALL SANITARY SEWER PIPING AND BEDDING SHALL BE INSPECTED BY CITY CONSTRUCTION INSPECTOR FOR CONFORMANCE WITH CITY INFRASTRUCTURE STANDARDS PRIOR TO BACKFILLING OF PIPING IN TRENCH. CONTRACTOR SHALL NOT COVER PIPING UNTIL SUCH TIME AS INSPECTOR HAS NOTIFIED CONTRACTOR THAT RESULTS OF PIPING INSPECTION ARE SATISFACTORY AND THAT BACKFILLING MAY BE ACCOMPLISHED. ANY PIPING INSTALLED AND/OR BACKFILLED WITHOUT INSPECTOR'S SPECIFIC APPROVAL SHALL BE UNCOVERED AT INSPECTOR'S DIRECTION AND INSPECTED ACCORDINGLY. CONTRACTOR SHALL NOTIFY INSPECTOR 24-HOURS PRIOR TO INSPECTION.

WATER DISTRIBUTION NOTES

1. WATER MAINS, WATER SERVICE LINES AND ASSOCIATED APPURTENANCES SHALL BE DESIGNED AND CONSTRUCTED AS PER REQUIREMENTS OF THE CITY OF MISSOURI CITY INFRASTRUCTURE DESIGN MANUAL AND CORRESPONDING STANDARD CONSTRUCTION DETAILS SHEETS AND AS PER THE REQUIREMENTS OF THE TEXAS COMMISSION ON ENVIRONMENTAL QUALITY. SHOULD A CONFLICT ARISE BETWEEN INFORMATION DEPICTED ON APPROVED CONSTRUCTION DRAWINGS AND/OR INFORMATION INCLUDED IN PROJECT SPECIFICATIONS, CITY OF MISSOURI CITY INFRASTRUCTURE STANDARDS SHALL GOVERN.
2. ALL MATERIALS AND PRODUCTS USED IN THE CONSTRUCTION OF WATER MAINS, WATER SERVICE LINES AND ASSOCIATED APPURTENANCES SHALL COMPLY WITH THE CITY OF MISSOURI CITY INFRASTRUCTURE STANDARDS AND THE CURRENT APPROVED PRODUCTS LIST AS MAINTAINED BY THE DEPARTMENT OF PUBLIC WORKS.
3. ALL GATE VALVES INSTALLED BELOW GRADE SHALL BE OF NON-RISING STEM DESIGN.
4. ALL FIRE HYDRANTS SHALL BE FACTORY PAINTED WITH POLYUREMANE GRAY WITH WHITE CAPS AND BONNET. SHOULD THE HYDRANT BONNET AND CAPS REQUIRE A DIFFERENT COLOR, THE CAPS AND BONNET SHALL COME FROM THE FACTORY PRIME COATED OR ORDERED WITH THE CORRECT COLOR. PAINT SHALL BE APPLIED PRIOR TO INSTALLATION. FIELD PAINTING OF THE HYDRANTS IS NOT ALLOWED OTHER THAN TOUCH-UP. CAP AND BONNET COLOR CHART IS LISTED IN THE INFRASTRUCTURE ORDINCE.
6. MINIMUM SEPARATION DISTANCES AS REQUIRED BY TCEQ SECTION 317.13, 290. APPENDIX E MUST BE MAINTAINED BETWEEN POTABLE WATER LINES AND SANITARY SEWERS, FORCE MAINS, LIFT STATIONS AND WASTEWATER TREATMENT PLANTS. INSTALLATION OF FIRE HYDRANTS WITHIN 9' (FT) OF A SANITARY SEWER SYSTEM IS PROHIBITED. REFER TO MOCITY STANDARDS FOR CONSTRUCTION REQUIREMENTS OF OTHER INSTALLATIONS WHERE DISTANCES ARE GREATHER THAN 9' (NINE) FT. CANNOT BE MAINTAINED.
7. EACH WATER SERVICE LEAD STUB SHALL BE MARKED WITH A PRESSURE TREATED 4 X 4 TIMBER AT THE TIME OF CONSTRUCTION, BEGINNING AT THE INVERT ELEVATION OF THE STUB AND EXTENDING TWO FEET ABOVE FINISHED GRADE. EACH TIMBER MARKER SHALL BE PAINTED BLUE AND LABELED "POTABLE WATER" WITH PIPE SIZE NOTED.
8. TESTING OF WATER MAINS, WATER SERVICE LINES AND ASSOCIATED APPURTENANCES SHALL BE CONDUCTED AS PER REQUIREMENTS OF AWWA C605, CURRENT REVISION.
9. DISINFECTION OF WATER MAINS, WATER SERVICE LINES AND ASSOCIATED APPURTENANCES SHALL BE CONDUCTED AS PER REQUIREMENTS OF AWWA C651 AND TCEQ. NO CONNECTIONS SHALL BE MADE TO EXISTING WATER LINES UNTIL NEWLY CONSTRUCTED WATER LINES HAVE BEEN THOROUGHLY DISINFECTED, TESTED, FLUSHED, AND SAMPLED AND CONNECTION HAS BEEN AUTHORIZED BY THE CITY ENGINEER.
10. CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING LOCATION OF ALL EXISTING UTILITIES PRIOR TO EXCAVATION. DURING THE COURSE OF ANY AND ALL CLEARING, GRUBBING, FILL, GRADING, EXCAVATION OR OTHER CONSTRUCTION, CONTRACTOR SHALL ENSURE THAT STORM DRAINAGE PATHWAYS ARE MAINTAINED AND REMAIN OPEN TO ENSURE POSITIVE DRAINAGE AND THAT SUCH CONVEYANCES ARE NOT IMPEDED OR BLOCKED IN ANY WAY. STORM SEWER INLETS SHALL BE PROTECTED FROM ENTRY OF SILT, TRASH, DEBRIS AND ANY SUBSTANCES DELETERIOUS TO THE STORM SEWER SYSTEM AND/OR WATERWAYS RECEIVING STORM WATER RUNOFF. CONTRACTOR SHALL AT COMPLETION OF WORK, FILL LOW SPOTS AND GRADE ALL RIGHTS-OF-WAY AND UTILITY EASEMENTS AND REGRADE/RESTORE DITCHES AS NECESSARY TO MAINTAIN AND/OR ESTABLISH POSITIVE DRAINAGE.
11. ALL WATER PIPING AND BEDDING SHALL BE INSPECTED BY CITY CONSTRUCTION INSPECTOR FOR CONFORMANCE TO INFRASTRUCTURE STANDARDS PRIOR TO BACKFILLING OF PIPING IN TRENCH. CONTRACTOR SHALL NOT COVER PIPING UNTIL SUCH TIME AS INSPECTOR HAS NOTIFIED CONTRACTOR THAT RESULTS OF PIPING INSPECTION ARE SATISFACTORY AND THAT BACKFILLING MAY BE ACCOMPLISHED. ANY PIPING INSTALLED AND/OR BACKFILLED WITHOUT INSPECTOR'S SPECIFIC APPROVAL SHALL BE UNCOVERED AT INSPECTOR'S DIRECTION AND INSPECTED ACCORDINGLY. 24-HOUR NOTICE REQUIRED.

no.	DATE	REVISION

GENERAL CONSTRUCTION NOTES

missouri CITY TEXAS

SEAL: STATE OF TEXAS — RON J. DECHERT — 96544 — REGISTERED — ENGINEER

DESIGN ENGINEER: _____ DATE 12-8-16

CONSTRUCTION PLANS FOR:

THE GROVE AT RIVERSTONE SECTION ONE

JOB No.:
SCALE: AS NOTED
SUBMITTED:
DATE: FEBRUARY 2015

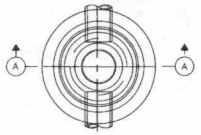
MC-2-15

SHEET OF

3/30/17

CAD FILE PATH: CADD_FILE_PATH
PLOT DATE: DATE

PLOT TIME: TIME STAMP



PLAN
N.T.S.
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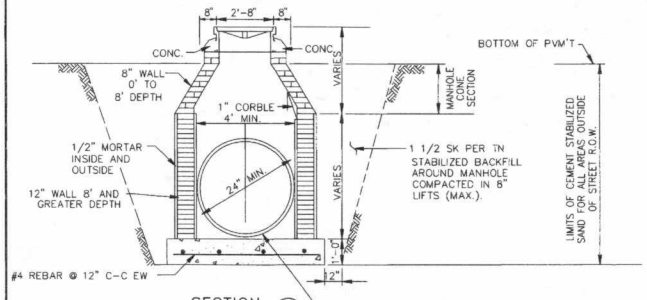
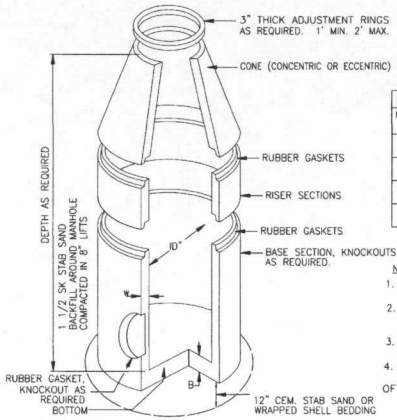
NOTES:
ALL MANHOLE CHIMNEYS SHALL BE BRICK OR THROAT RINGS.
STD. FRAME & COVER SHALL BE PER MOCITY STANDARD MH COVER



SECTION (A)

TYPE "C" MANHOLE



DIMENSIONS AND WEIGHTS			
I.D. SIZE (in)	W (in)	B (in)	RISER Wt/LF (lb)
48	5	6	868
60	6	8	1300
72	7	8	1811
96	9	8	3090

NOTES
1. LIFTING INSERTS AS REQUIRED.
2. ALL JOINTS SHALL BE SEALED WITH APPROVED RUBBER GASKET
3. STRUCTURE TO BE PLACED ON 12" STABILIZED BASE.
4. C.S.S. SHALL BE BROUGHT TO WITHIN 2-FT OF TOP OF MANHOLE.

SPECIFICATIONS:

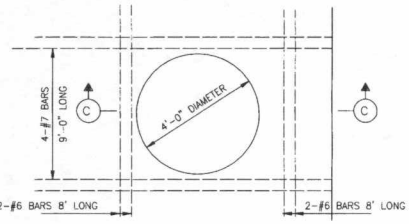
CONCRETE: CLASS 1 CONCRETE WITH A DESIGN STRENGTH OF 4500 PSI AT 28 DAYS. RATES FOR H-20 LOADING.

REINFORCEMENT: STRUCTURAL REINFORCEMENT CONFORMING TO ASTM-C-478.

C.I. CASTINGS: CAST IRON FRAMES AND GRATES ARE MANUFACTURED OF GREY CAST IRON CONFORMING TO ASTM A48-76 CLASS 35.

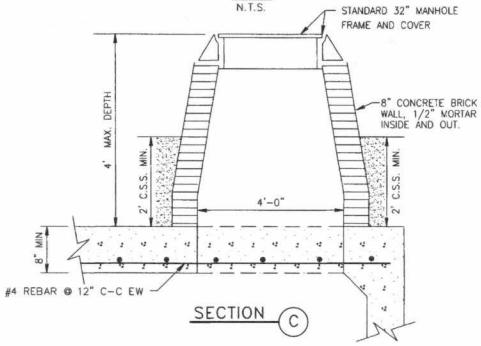
PRECAST CONCRETE MANHOLE

N.T.S.



STANDARD TYPE "C" INLET MAY BE USED AT TOP OF MANHOLE.

PLAN
N.T.S.

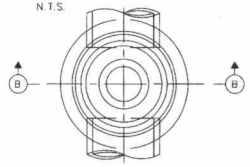


SECTION (C)

MANHOLE FOR BOX SEWER

N.T.S.

N.T.S.



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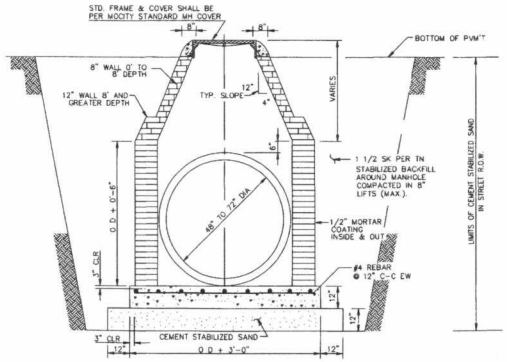
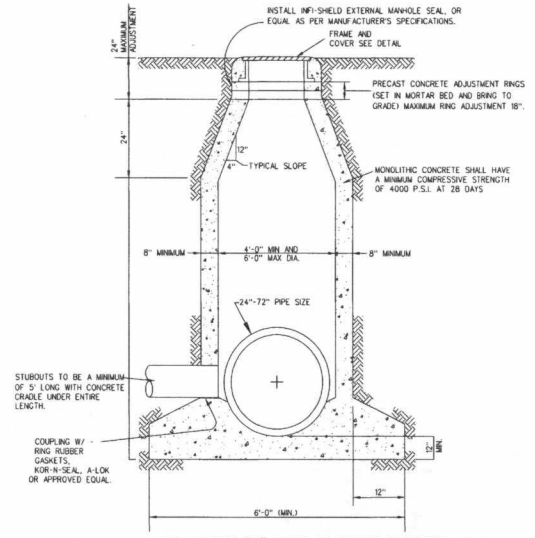


SECTION (B)

TYPE "C" MANHOLE FOR 48" TO 72" DIA RCP

N.T.S.

NOTE:
1. C.S.S. SHALL BE BROUGHT TO WITHIN 2 FEET MINIMUM OF TOP OF MANHOLE.



CIP - TYPE "C" CAST-IN-PLACE MANHOLE

N.T.S.

NOTES:
1. CONCRETE SHALL BE A MONOLITHIC POUR.
2. #4 REBAR TO BE PLACED IN BASE AND WALLS @ 12" C-C EW.
3. 1.0 LBS OF APPROVED POLYPROPYLGNE FIBER MESH PER C/Y OF CONCRETE MAY BE USED IN L REBAR
4. 1-1/2" C.S.S. BACKFILL TO BE PLACED AROUND MANHOLE COMPACTED IN 8" LIFTS (MAX).

CAST IN PLACE MANHOLE

GENERAL CONSTRUCTION NOTES:

1. BRICK WALLS 12'-0" BELOW TOP CASING TO BE 12 IN. THICK.
2. ALL BRICK CONSTRUCTION SHALL USE APPROVED CONCRETE BRICK WITH 1/2" (IN.) MORTAR INSIDE AND OUT. 1/4" TO 1/2" MORTAR JOINT. 3/8" MORTAR JOINT IS STANDARD.
3. ALL CAST CONCRETE BASES SHALL HAVE # 4 REBAR @ 12" C-C EW
4. CONCRETE SHALL BE 4000 PSI MIN.
5. USE C.S.S. BEDDING AS PER DETAILS 1 1/2 SK PER TN, COMPACTED 8" LIFTS (MAX.). TO 95% STANDARD.

REFER TO:

1. *GENERAL NOTES, C.S.S & CONCRETE NOTES.*
2. *STORM SEWER NOTES*

No.	DATE	REVISION

STORM SEWER MANHOLE CONSTRUCTION DETAILS

missouri CITY TEXAS

SEAL: STATE OF TEXAS — RON J. DECHERT — 96544 — LICENSED PROFESSIONAL ENGINEER

DESIGN ENGINEER: DATE 12-9-16

CONSTRUCTION PLANS FOR:

THE GROVE AT RIVERSTONE SECTION ONE

JOB No.:
SCALE: AS NOTED
SUBMITTED:
DATE: FEBRUARY 2015

MC-3-15

SHEET OF

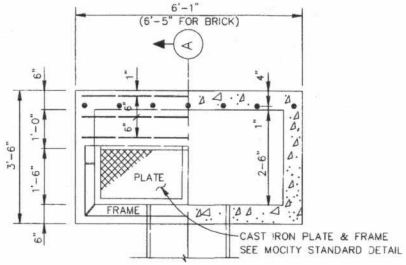
3/30/17

CAD FILE PATH: CADD_FILE_PATH
PLOT DATE: DATE

PLOT TIME, TIME STAMP

CAD FILE PATH, CADD_FILE PATH
PLOT DATE, DATE

"B-B" INLET
(REPLACEMENT ONLY)



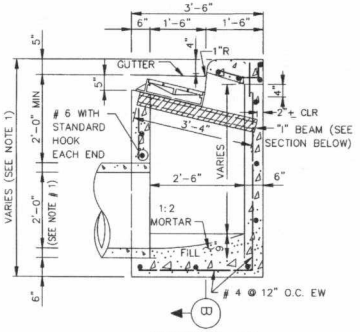
HALF PLAN HALF-SECTION PLAN

GENERAL NOTES:

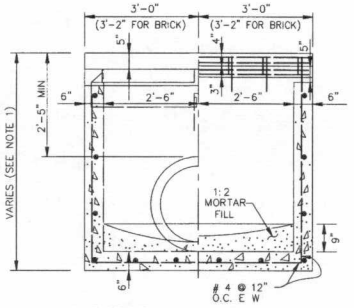
USE STD CAST IRON FRAME & PLATES.
LEAD SHALL LEAVE INLET AT LOCATION AND GRADE REQUIRED.
WHEN BRICK INLETS ARE BUILT EXTEND DOWELS 4 INCHES FROM CURB BEAM INTO BRICKWORK.
WHEN BRICK INLETS ARE BUILT, WALLS SHALL BE INCREASED TO 8 INCHES, AND INLET BEAMS TO BE 4 INCHES LONGER.

NOTES:

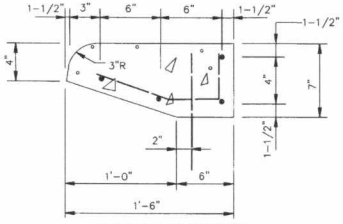
1. DIMENSION VARIES BASED ON PIPE DIAMETER AND WALL THICKNESS.
2. CENTER REINFORCING IN SLAB AND WALLS.
3. CENTER STEEL BEAM ON INLET AND CAST INTO WALLS AS SHOWN.



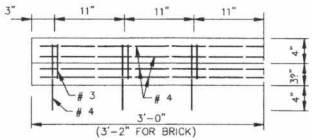
SECTION A



HALF FRONT ELEVATION HALF-SECTION B



TRANSVERSE SECTION



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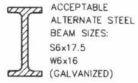
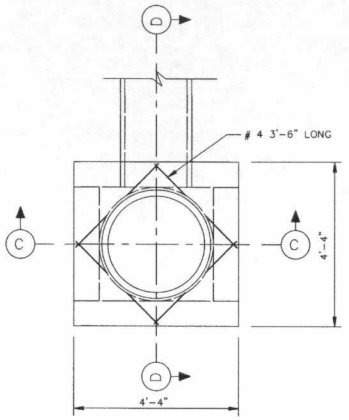


ACCEPTABLE ALTERNATE STEEL BEAM SIZES:
S6x17.5
W6x16
(GALVANIZED)

I-BEAM SECTION

PRECAST CURB BEAM

CURB BEAM BAR LIST				
NO	SIZE	LENGTH	SHAPE	LOC
4	# 4	5'-10"	ST	HOR
7	# 4	0'-10"	ST	VERT
7	# 3	1'-6"	BT	



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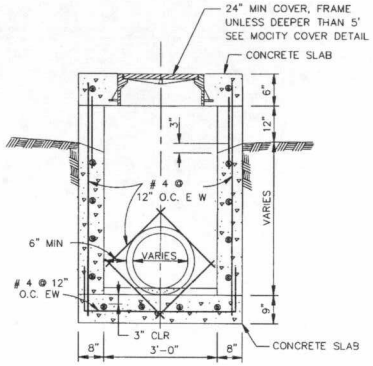
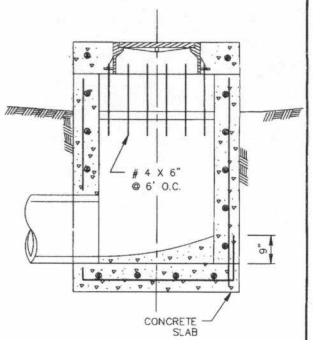


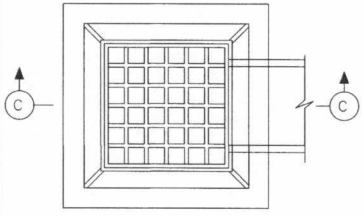
SECTION C



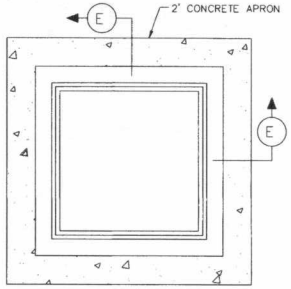
SECTION D

TYPE "E" INLET

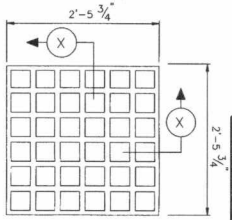
N.T.S.



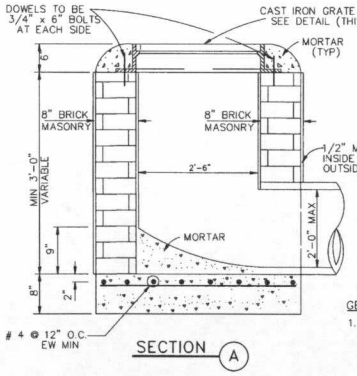
PLAN



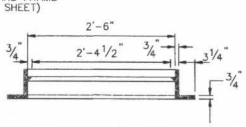
FRAME



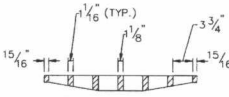
GRATE



SECTION A



SECTION E



SECTION X

TYPE "A" INLET

N.T.S.

GENERAL CONSTRUCTION NOTES:

1. ALL BRICK CONSTRUCTION SHALL USE APPROVED CONCRETE BRICK WITH 1/2" (IN.) MORTAR INSIDE AND OUT. 1/4" TO 1/2" MORTAR JOINT, 3/8" (IN.) IS THE STANDARD.

REFER TO:

1. *GENERAL NOTES*
2. *STORM SEWER NOTES*

No.	DATE	REVISION

STORM SEWER INLET CONSTRUCTION DETAILS I

missouri CITY TEXAS

SEAL: STATE OF TEXAS — RON J. DECHERT — 96544 — LICENSED PROFESSIONAL ENGINEER

DESIGN ENGINEER: DATE 12-8-16

CONSTRUCTION PLANS FOR:

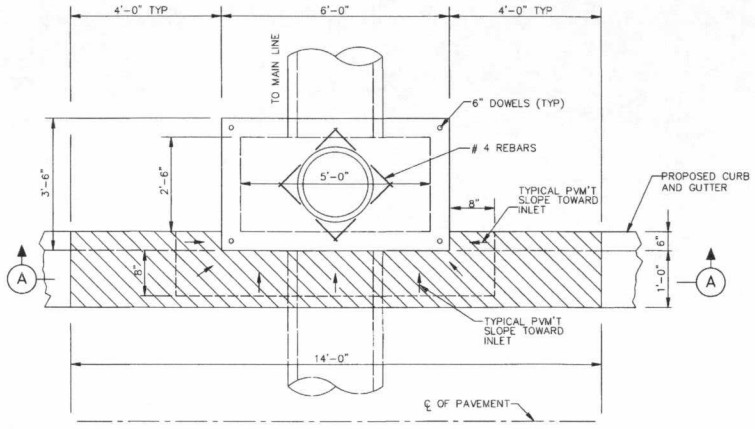
THE GROVE AT RIVERSTONE SECTION ONE

JOB No.:
SCALE: AS NOTED
SUBMITTED:
DATE: FEBRUARY 2015

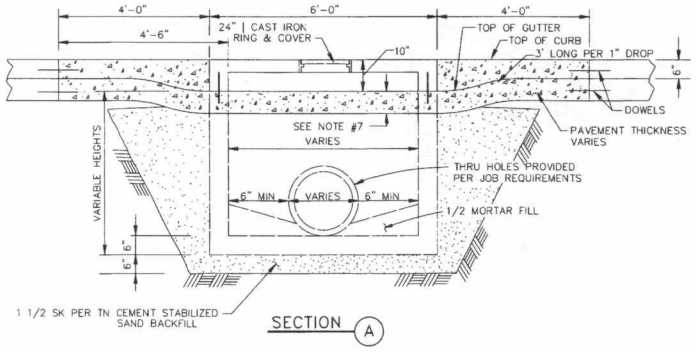
MC-5-15

SHEET OF

3/30/17



PLAN

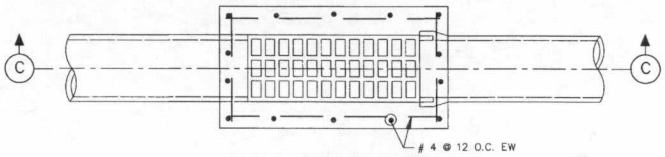


SECTION A

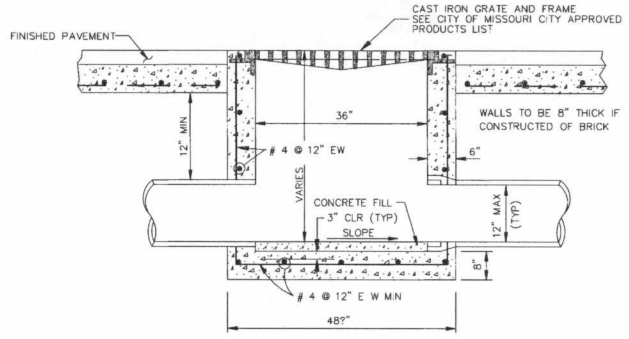
TYPE "H-2" INLET

NOTES:

1. INLET WALLS MAY BE EXTENDED USING PRECAST RISER SECTION.
2. INLET TOPS MUST BE SECURED TO THE INLET WALL USING #6 DOWELS DRILLED AND GROUTED A MINIMUM DEPTH OF 5" INTO THE INLET WALL.
3. INLET BACKFILL SHALL BE CEMENT STABILIZED SAND TO THE TOP OF INLET FIRST STAGE.
4. GRADE 60 REINFORCED. #4 STEEL REBAR TO CONFORM TO ASTM A615 ON REQUIRED CENTERS OR EQUAL.
5. PRECAST INLET MUST BE CONSTRUCTED TO SPECIFICATIONS REQUIRED BY APPROVED DRAWINGS. (SEE GENERAL NOTES)
6. TOPS POURED-IN-PLACE REQUIRE #4 REBAR @ 12" O.C. EACH WAY, 3,500 PSI CONCRETE MINIMUM AND 3" THICK MINIMUM.
7. PAVEMENT DEPTH AT INLET SHALL BE EQUAL TO OR GREATER THAN REQUIRED PAVEMENT DEPTH.
8. DEPRESS

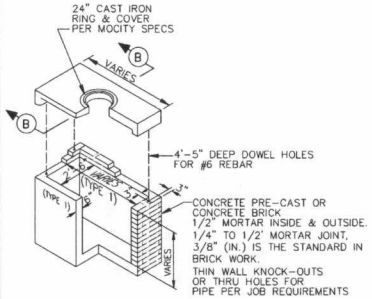


PLAN

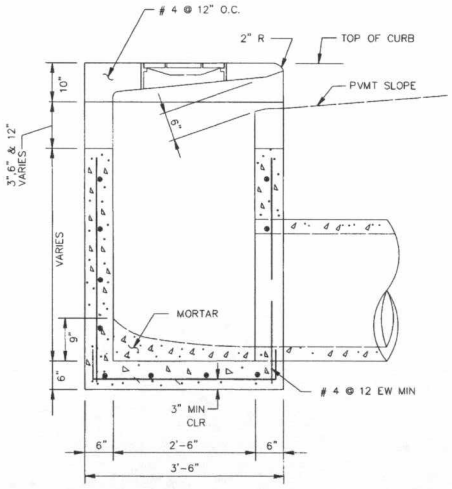


SECTION C

TYPE "D" INLET



NOTE:
REFER TO INSTALLATION FOR TYPE H-2 5'-0" CURB INLET ON PAVING DETAIL SHEET



SECTION B

TYPE "H-2" PRECAST INLET

N.T.S.

REFER TO:

1. *GENERAL NOTES*
2. *SEE C.S.S., PAVEMENT NOTES*

No.	DATE	REVISION

STORM SEWER INLET CONSTRUCTION DETAILS II

missouri CITY TEXAS

SEAL: STATE OF TEXAS — RON J. DECHER — 96544 — LICENSED PROFESSIONAL ENGINEER

DESIGN ENGINEER: DATE 12-8-16

CONSTRUCTION PLANS FOR:

THE GROVE AT RIVERSTONE SECTION ONE

JOB No.:
SCALE: AS NOTED
SUBMITTED:
DATE: JUNE 2010

MC-6-10

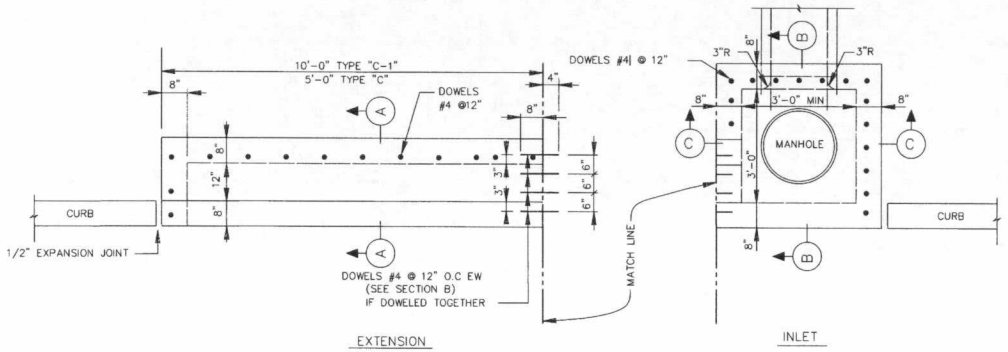
SHEET OF

3/30/17

PLOT TIME: TIME STAMP

FILE PATH: CADD_FILE_PATH
PLOT DATE: DATE

PLOT TIME: TIME STAMP



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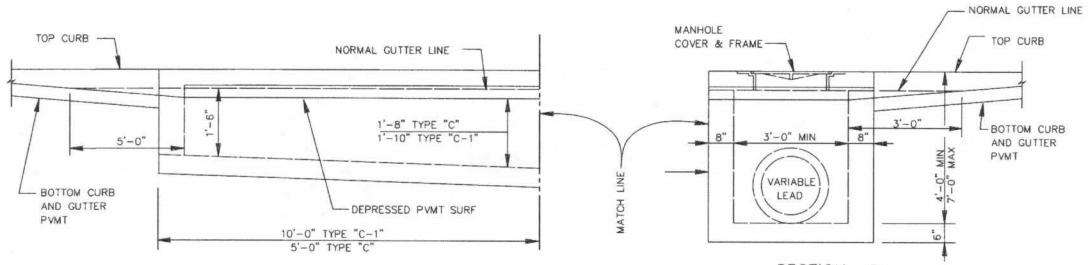


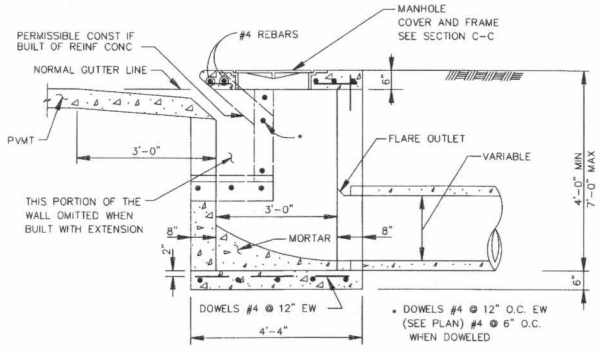
PLAN SECTION C

GENERAL NOTES:

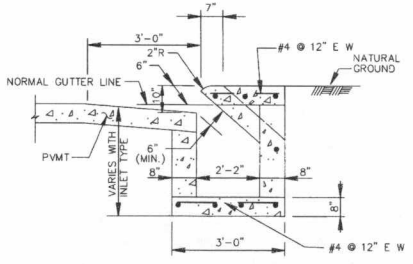
TYPE "C" INLET WITH ONE EXTENSION
TYPE "C-1" INLET WITH DOUBLE EXTENSION
TYPE "C-2" INLET WITH EXTEN. ON EACH SIDE
TYPE "C-2A" INLET WITH NO EXTENSION

NOTES:

1. FOR TYPE "C-1" INLETS PROVIDE A CENTER 6"X6" COLUMNS IN THE CURB LINE BETWEEN ALL EXTENSIONS.
2. WALLS TO BE 6" IF BUILT WITH REINFORCED CONCRETE. WHEN BUILT WITH BRICK WALL, USE STRAIGHT WALL IN BACK WITH 6" REINFORCED CONCRETE TOP SLABS DOWELLED INTO BRICK WALLS WITH #4 X 8" @ 12 O.C.



SECTION B



SECTION A

TYPE "C" INLET
N.T.S.

REFER TO:

1. *GENERAL NOTES*
2. *STORM SEWER NOTES*

No.	DATE	REVISION

STORM SEWER INLET
CONSTRUCTION DETAILS III

missouri CITY
TEXAS

SEAL: STATE OF TEXAS — RON J. DECHERT — 96544 — LICENSED — PROFESSIONAL ENGINEER

DESIGN ENGINEER: DATE 12-9-16

CONSTRUCTION PLANS FOR:

THE GROVE
AT RIVERSTONE
SECTION ONE

JOB No.:
SCALE: AS NOTED
SUBMITTED:
DATE: FEBRUARY 2015

MC-7-15
SHEET OF

3/30/17

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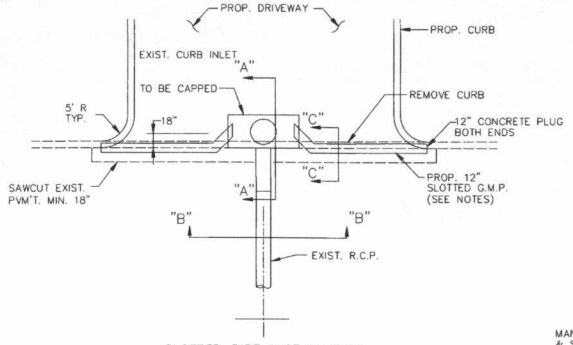
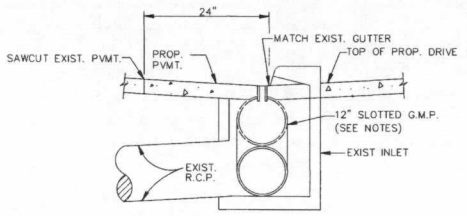
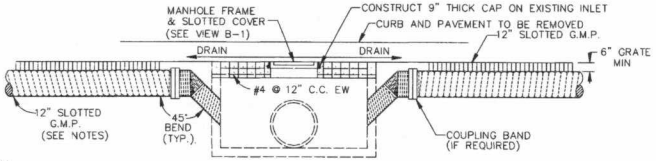


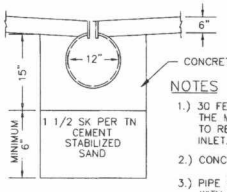
SLOTTED PIPE INSTALLATION FOR DRIVEWAY CONSTRUCTION



SECTION A–A



SECTION B–B



SECTION C–C

NOTES

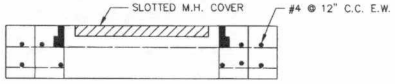
1.) 30 FEET OF SLOT IS THE MINIMUM REQUIREMENT TO REPLACE A TYPE B-B INLET.

2.) CONCRETE MIN. 3000 P.S.I.

3.) PIPE TO BE GALVANIZED TYPE II WITH GALVANIZED SLOT

4.) CONDITIONS MAY VARY. CONTRACTOR TO ROLL FITTING AND ENTER BOX BELOW 9" CAP.

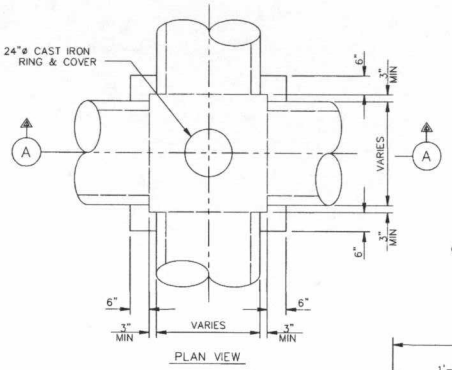
5.) SEE C.S.S. NOTES.



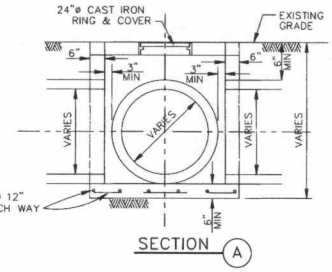
VIEW B–1

SLOTTED DRAIN DETAIL

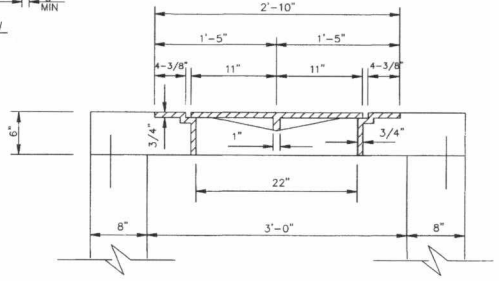
N.T.S.



PLAN VIEW



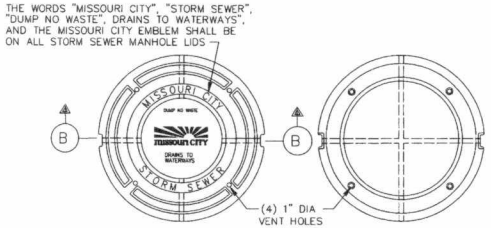
SECTION A



FRAME AND COVER SECTION

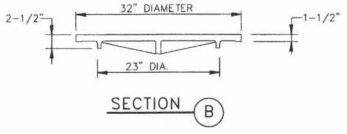
JUNCTION BOX

N.T.S.



TOP VIEW COVER

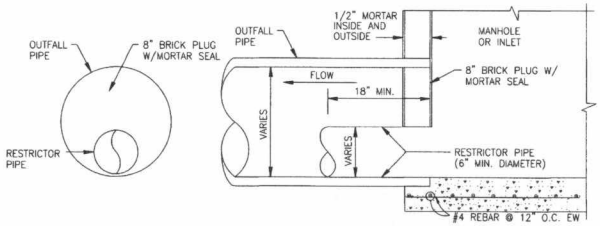
BOTTOM VIEW COVER



SECTION B

STORM SEWER MANHOLE LID

N.T.S.



CHOKE OUTFALL RESTRICTOR DETAIL

STORM SEWER CHOKE RESTRICTOR

N.T.S.

REFER TO:

1. *GENERAL NOTES*
2. *STORM SEWER NOTES*

No.	DATE	REVISION

STORM SEWER CONSTRUCTION DETAILS

missouri CITY TEXAS

SEAL: STATE OF TEXAS — RON J. DECHER — 96544 — LICENSED PROFESSIONAL ENGINEER

DATE 12-9-16

DESIGN ENGINEER:

CONSTRUCTION PLANS FOR:

THE GROVE AT RIVERSTONE SECTION ONE

JOB No.:

SCALE: AS NOTED

SUBMITTED:

DATE: FEBRUARY 2015

MC-8-15

SHEET OF

3/30/17

PLOT TIME: TIME STAMP

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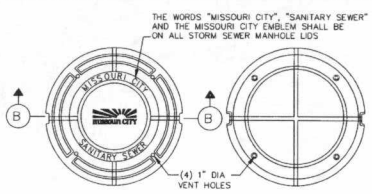
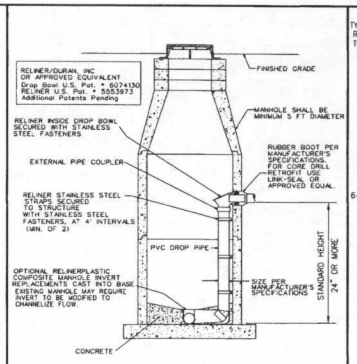
PLOT DATE: DATE



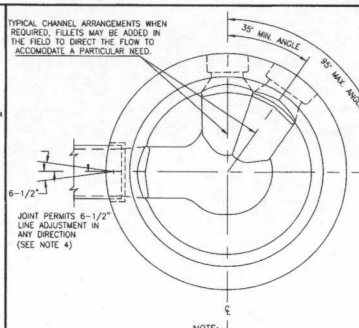
SANITARY SEWER MANHOLE LID

N.T.S.



STANDARD DROP DETAIL

(SEE C.S.S. NOTES)



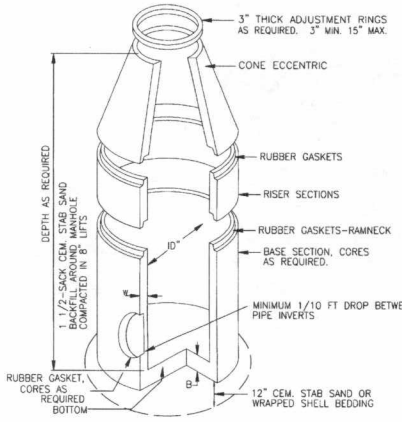
PIPING CONNECTIONS DETAIL

NOTE:

1. INLET AND OUTLET PIPING CONNECTIONS TO MANHOLE SHALL BE ALIGNED TO PREVENT REVERSE FLOW.
2. INLET AND OUTLET CONNECTIONS ARE LIMITED TO A MAXIMUM 90° INCLUDED ANGLE OF CONVERGENCE. ANGLES LESS THAN 90° MEASURED BETWEEN THE INLET AND OUTLET WILL NOT BE ALLOWED.
3. MINIMUM 35° AND MAXIMUM 90° INCLUDED ANGLES MUST BE PROVIDED BETWEEN MULTIPLE INFLUENT CONNECTIONS.
4. ANGLE OF DEFLECTION AT PIPING JOINTS AS PER MANUFACTURE'S RECOMMENDATIONS.
5. MANHOLE SHALL HAVE A MINIMUM OF 1/10 FT FALL FROM INLET TO OUTLET.

NOTES:

1. CONTRACTOR SHALL CONTACT CITY OF MISSOURI CITY DEPARTMENT OF PUBLIC WORKS AT (281) 403-8570 IF WET SAND OR OTHER UNSTABLE SOIL CONDITIONS, HIGH WATER TABLE AND/OR UNDERGROUND OBSTRUCTIONS ARE ENCOUNTERED.
2. SHOULD A CONFLICT ARISE BETWEEN INFORMATION DEPICTED ON APPROVED CONSTRUCTION DRAWINGS AND INFORMATION INCLUDED IN PROJECT SPECIFICATIONS, CITY OF MISSOURI CITY INFRASTRUCTURE STANDARDS SHALL GOVERN.
3. SANITARY SEWER MANHOLES SHALL BE CONSTRUCTED A MINIMUM OF FOUR FOOT FROM BACK OF CURB ON CURB AND GUTTER ROADWAYS AND THREE FEET FROM EDGE OF TRAVELLED ROADWAY ON THOSE THOROUGHFARES HAVING NO CURBING, MEASURED FROM OUTSIDE DIAMETER OF MANHOLE. SANITARY SEWER MANHOLES SHALL NOT BE INSTALLED BENEATH STREET PAVING EXCEPT WHERE SPECIFICALLY AUTHORIZED BY CITY ENGINEER AND SO DESIGNATED ON APPROVED CONSTRUCTION DRAWINGS.
4. SANITARY SEWER MANHOLE COVERS SHALL BE A MINIMUM OF 32 INCHES IN DIAMETER. ALL SUCH MANHOLE COVERS SHALL HAVE THE CITY OF MISSOURI CITY EMBLEM AND THE WORDS "MISSOURI CITY" AND "SANITARY SEWER" CAST IN RAISED RELIEF AS DEPICTED IN CITY OF MISSOURI CITY STANDARD CONSTRUCTION DETAILS SHEETS. ALL SANITARY SEWER MANHOLES SHALL INCORPORATE INFLOW PROTECTORS.
5. MANHOLE RIM ELEVATIONS SHOWN ON PLANS ARE APPROXIMATE ONLY. CONTRACTORS SHALL ADJUST RIM ELEVATIONS TO 0.4 FEET ABOVE FINISHED GRADE WITHIN RIGHTS-OF-WAY AND EASEMENTS AT EACH MANHOLE LOCATION AFTER FINAL GRADING. ADJUSTMENTS TO MANHOLE RIM ELEVATIONS SHALL BE ACCOMPLISHED BY THE USE OF THROAT RINGS ONLY (MAX. OF TWELVE INCHES PERMITTED). THE AREA ADJACENT TO SANITARY SEWER MANHOLE LOCATIONS SHALL BE GRADED AWAY FROM SUCH MANHOLES SO AS PREVENT ENTRY OF STORM WATER RUNOFF TO THE SANITARY SEWER SYSTEM.
6. DROP CONNECTIONS ARE REQUIRED WHEN INVERT ELEVATION OF SEWER LINE TO BE CONNECTED EXCEEDS 24 INCHES DISTANCE ABOVE INVERT ELEVATION OF MANHOLE BASE. ALL DROP CONNECTIONS SHALL BE CONSTRUCTED OF SAME MATERIALS AS SEWER AND SHALL BE CONSTRUCTED INTERIOR TO MANHOLE. PIPE CONNECTIONS TO MANHOLES SHALL BE SO CONSTRUCTED AS BE WATERTIGHT AND TO ALIGN UPPER INSIDE PIPE WALL ELEVATIONS OF ALL PIPING CONNECTED TO BASE OF MANHOLE UNIFORMLY, REGARDLESS OF PIPE DIAMETERS.
7. CONNECTIONS TO EXISTING AND/OR NEW SANITARY SEWER MANHOLES CONSTRUCTED OF PRECAST CONCRETE NOT HAVING PRECORED HOLES OF CORRECT DIAMETER AND LOCATION. FIELD CORING ONLY SHALL ACCOMPLISH AT THE INVERT ELEVATION. IN NO INSTANCE WILL EITHER MANUAL OR PNEUMATIC CHISELS AND/OR HAMMER DRILLS BE UTILIZED TO BREAK HOLES IN PRECAST CONCRETE MANHOLES, PIPE SEGMENTS OR OTHER PRECAST STRUCTURES SUCH AS LIFT STATIONS. PIPE SHALL BE PLACED IN THE CORED HOLE AND SECURED WITH THE USE OF LINK-SEAL, GROUTED SMOOTH AND THE INTERIOR LINING SHALL BE REPAIRED.
8. BEDDING AND BACKFILL OF SANITARY SEWER PIPING AND MANHOLES SHALL BE ACCOMPLISHED IN ACCORDANCE WITH CITY OF MISSOURI CITY INFRASTRUCTURE STANDARDS. A 1.5 SACK PER TON MIX IS REQUIRED FOR ALL CEMENT STABILIZED SAND BEDDING AND SUCH BEDDING SHALL BE INSTALLED IN LIFTS OF EIGHT INCHES MAXIMUM.
9. SOLVENT WELDED JOINTS ARE NOT AN ACCEPTABLE JOINING METHOD FOR SANITARY SEWERS CONSTRUCTED OF PVC PIPING MATERIALS AND LOCATED WITHIN RIGHTS-OF-WAY OR EASEMENTS. RUBBER GASKETED BELL AND SPIGOT SANITARY SEWER JOINTS ARE MANDATORY. BELL (FEMALE) ENDS OF PIPE SHALL BE INSTALLED ON UPSTREAM SIDE WITH SPIGOT (MALE) ENDS ORIENTED DOWNSTREAM.
10. SANITARY SEWER SERVICE LEADS SHALL BE EXTENDED TO RIGHTS-OF-WAY AND/OR EASEMENT LINES AS APPLICABLE AND CAPPED/PLUGGED FOR FUTURE CONNECTIONS. SERVICE LEADS ARE TO BE INSTALLED SO AS TO PASS UNDER POTABLE WATER PIPING AT CROSSINGS WHERE POSSIBLE.
11. EACH SANITARY SEWER SERVICE LEAD STUB, PLUGGED WYE BRANCH OUTLET AND STACK SHALL BE MARKED WITH A 4" PVC AT THE TIME OF CONSTRUCTION, BEGINNING AT THE INVERT ELEVATION OF THE STUB OR WYE AND AT AN ELEVATION TWO FEET BELOW THE CAPPED TERMINATION POINT OF THE STACK AND EXTENDING TWO FEET ABOVE FINISHED GRADE. EACH MARKER SHALL BE PAINTED RED AND LABELED "SANITARY SEWER STUB", "SANITARY SEWER WYE" OR SANITARY SEWER STACK" AS AS APPROPRIATE WITH STUB, WYE BRANCH OUTLET OR STACK SIZE NOTED.
12. CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING LOCATION OF ALL EXISTING UTILITIES PRIOR TO EXCAVATION. DURING THE COURSE OF ANY AND ALL CLEARING, GRUBBING, FILL, GRADING, EXCAVATION OR OTHER CONSTRUCTION, CONTRACTOR SHALL ENSURE THAT STORM DRAINAGE PATHWAYS ARE MAINTAINED AND REMAIN OPEN TO ENSURE POSITIVE DRAINAGE AND THAT SUCH CONVEYANCES ARE NOT IMPEDED OR BLOCKED IN ANY WAY. STORM SEWER INLETS SHALL BE PROTECTED FROM ENTRY OF SILT, TRASH, DEBRIS AND ANY SUBSTANCES DELETERIOUS TO THE STORM SEWER SYSTEM AND/OR WATERWAYS RECEIVING STORM WATER RUNOFF. CONTRACTOR SHALL AT COMPLETION OF WORK, FILL LOW SPOTS AND GRADE ALL RIGHTS-OF-WAY AND UTILITY EASEMENTS AND REGRADE/RESTORE DITCHES AS NECESSARY TO MAINTAIN AND/OR ESTABLISH POSITIVE DRAINAGE.
13. ALL SANITARY SEWER PIPING AND BEDDING SHALL BE INSPECTED BY CITY CONSTRUCTION INSPECTOR FOR CONFORMANCE WITH CITY INFRASTRUCTURE STANDARDS. IT IS THE CONTRACTOR'S RESPONSIBILITY TO PROPERLY NOTIFY THE CITY OF ALL CONSTRUCTION ACTIVITIES AND TO CONFORM TO CITY OF MISSOURI CITY PUBLIC WORKS DEPARTMENT INSPECTION POLICY.
14. POURED IN PLACE MANHOLES REQUIRE THE SPECIFIC APPROVAL OF THE CITY OF MISSOURI CITY ENGINEER.
15. C.S.S. 1' ABOVE PIPE AND 6" BELOW PIPE MINIMUM.
16. SEE GENERAL NOTES AND C.S.S. NOTES.



NOTES

1. LIFTING INSERTS AS REQUIRED.
2. ALL JOINTS SHALL BE SEALED WITH APPROVED RUBBER GASKET/RAMNECK
3. STRUCTURE TO BE PLACED ON 12" STABILIZED BASE.
4. C.S.S. SHALL BE BROUGHT TO WITHIN 2-FT OF TOP OF MANHOLE.
5. PRE-CAST MANHOLE SHALL BE IN COMPLAINCE APPROVED PRODUCT LIST.
6. INTERIOR LINING SHALL BE IN COMPLANCE WITH APPROVED PRODUCT LIST.
7. INVERTS SHALL COMPLY WITH C.O.M.C., INFRASTRUCTURE DESIGN MANUAL SPECIFICATIONS.
8. INFLOW PROTECTORS REQUIRED ON ALL SANITARY MANHOLES.
9. REFER TO SANITARY MANHOLE LIDS, C.S.S. NOTES, MODIFIED BEDDING DETAILS AND NOTES.
10. PRIOR TO INTERIOR LINING, GROUT ALL JOINTS TO A SMOOTH SURFACE.
11. VACCUM TESTING OF MANHOLE SHALL BE AFTER GROUTING AND PRIOR TO INTERIOR LINING.

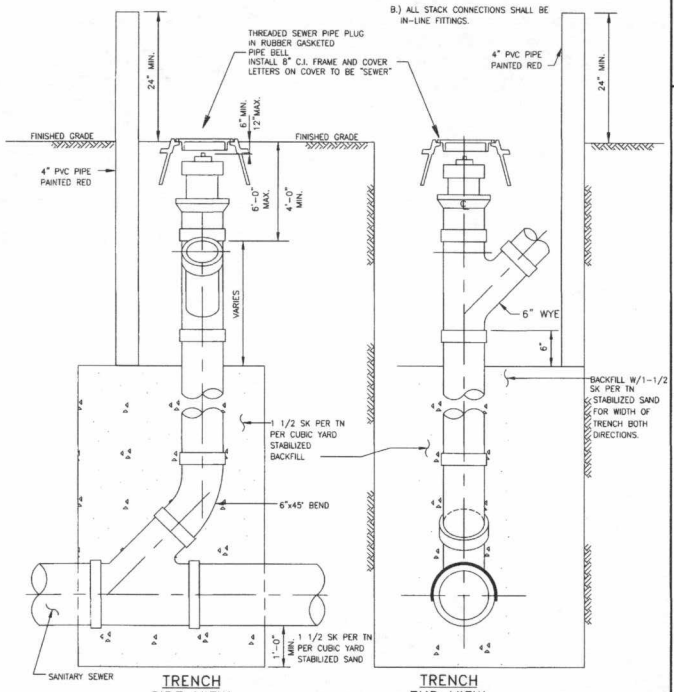
PRECAST SANITARY MANHOLE

N.T.S.

NOTES:

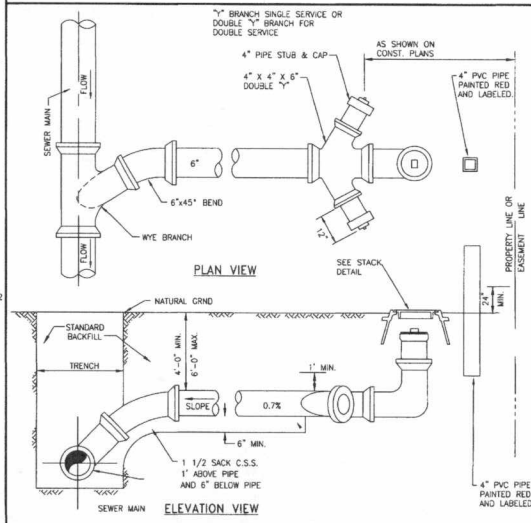
A.) NO STACKS ON MAINS OVER 16' DEEP or IN WET SAND CONDITIONS.

B.) ALL STACK CONNECTIONS SHALL BE IN-LINE FITTINGS.



STACK DETAIL

N.T.S.



SANITARY SEWER SERVICE CONNECTION

N.T.S.

No.	DATE	REVISION

SANITARY SEWER CONSTRUCTION DETAILS

missouri CITY TEXAS

SEAL: STATE OF TEXAS — RON J. DECHERT — 96544 — LICENSED PROFESSIONAL ENGINEER

DESIGN ENGINEER: DATE 12-8-16

CONSTRUCTION PLANS FOR:

THE GROVE AT RIVERSTONE SECTION ONE

JOB No.:

SCALE: AS NOTED

SUBMITTED:

DATE: FEBRUARY 2015

MC-10-15

SHEET OF

3/30/17

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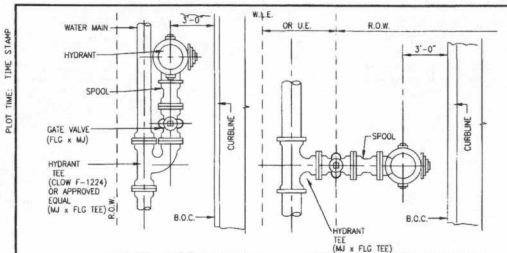
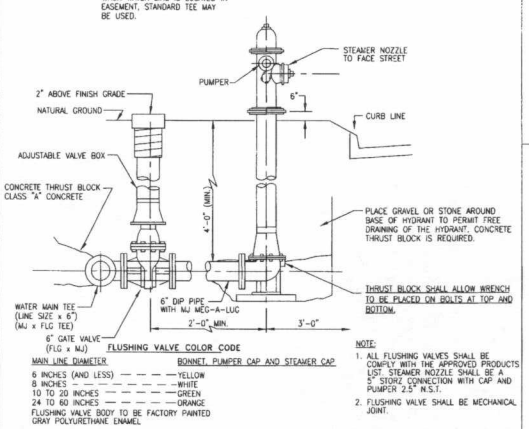


R.O.W. INSTALLATION
N.T.S.

EASEMENT INSTALLATION
N.T.S.

NOTE:
WHEN WATER LINE IS LOCATED IN EASEMENT, STANDARD TEE MAY BE USED.



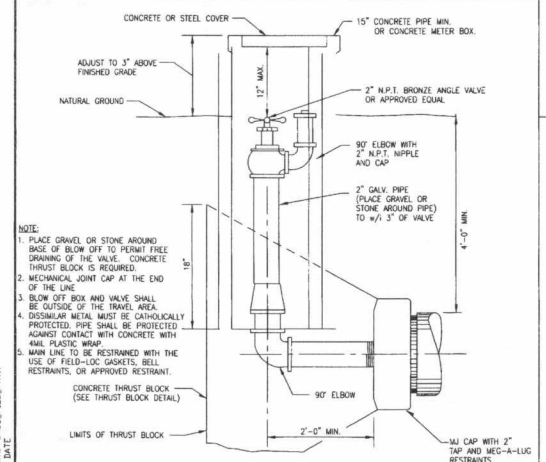
FLUSHING VALVE COLOR CODE

MAIN LINE DIAMETER	BONNET, PUMPER CAP AND STEAMER CAP
6 INCHES (AND LESS)	YELLOW
8 INCHES	WHITE
10 TO 20 INCHES	GREEN
24 TO 60 INCHES	ORANGE

FLUSHING VALVE BODY TO BE FACTORY PAINTED GRAY POLYURETHANE ENAMEL

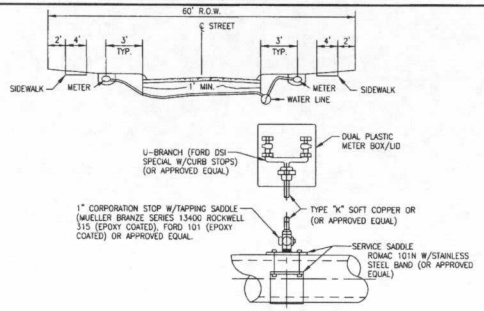
NOTE:
1. ALL FLUSHING VALVES SHALL BE COMPLY WITH THE APPROVED PRODUCTS LIST. STEAMER NOZZLE SHALL BE A 5" STORZ CONNECTION WITH CAP AND PUMPER 2.5" N.S.T.
2. FLUSHING VALVE SHALL BE MECHANICAL JOINT.

TYPICAL GATE & FLUSHING VALVE INSTALLATION
N.T.S.



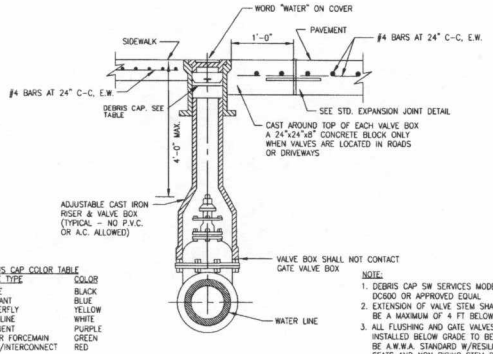
NOTE:
1. PLACE GRAVEL OR STONE AROUND BASE OF BLOW OFF TO PERMIT FREE DRAINING OF THE VALVE. CONCRETE THRUST BLOCK IS REQUIRED.
2. MECHANICAL JOINT CAP AT THE END OF THE LINE
3. BLOW OFF BOX AND VALVE SHALL BE OUTSIDE OF THE TRAVEL AREA.
4. DISSIMILAR METAL MUST BE CATHOLICALLY PROTECTED. PIPE SHALL BE PROTECTED AGAINST CONTACT WITH CONCRETE WITH 4MIL PLASTIC WRAP.
5. MAIN LINE TO BE RESTRAINED WITH THE USE OF FIELD-LOC GASKETS, BELL RESTRAINTS, OR APPROVED RESTRAINT.

2" BLOW OFF VALVE ASSEMBLY
N.T.S.



NOTE:
USE COPPER OR APPROVED TUBING OF 1" MINIMUM SIZE FOR SINGLE AND DOUBLE LEADS TO METER.

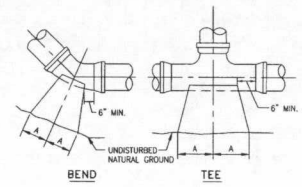
WATER SERVICE CONNECTION (DOUBLE SERVICE)
AND
WATER SERVICE TAPPING ASSEMBLY DETAIL
N.T.S.



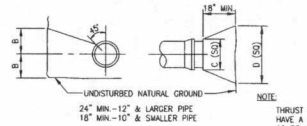
DEBRIS CAP COLOR TABLE	
VALVE TYPE	COLOR
INLINE	BLACK
HYDRANT	BLUE
BUTTERFLY	YELLOW
FIRE LINE	WHITE
EFFLUENT	PURPLE
SEWER FORCEMAIN	GREEN
ZONE/INTERCONNECT	RED

NOTE:
1. DEBRIS CAP SW SERVICES MODEL DC600 OR APPROVED EQUAL.
2. EXTENSION OF VALVE STEM SHALL BE A MAXIMUM OF 4 FT BELOW GRADE
3. ALL FLUSHING AND GATE VALVES TO INSTALLED BELOW GRADE TO BE BE A.W.W.A. STANDARD W/RESILIENT SEATS AND NON RISING STEM DESIGN.

VALVE BOX INSTALLATION DETAIL
N.T.S.



BEND TEE



24" MIN.-12" & LARGER PIPE
18" MIN.-10" & SMALLER PIPE

BEND & TEE PLUG

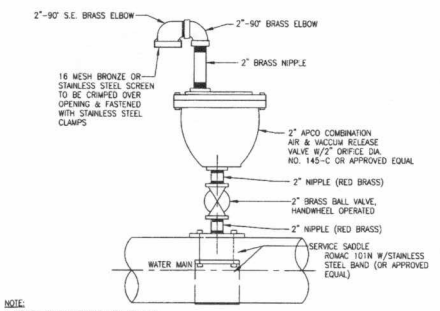
THRUST BLOCK DETAIL
N.T.S.

NOTE:
1. POLYETHYLENE FILM SHALL BE USED AS A WRAP TO PROTECT CAST IRON AND OTHER METALS IN A CORROSIVE SOIL ENVIRONMENT.
2. AN 8 MIL POLYETHYLENE FILM WRAP SHALL BE REQUIRED AROUND ALL METAL PIPE AND APPURTENANCES (EXCEPT FIRE HYDRANTS).
3. POLYETHYLENE FILM SHALL BE FURNISHED AND INSTALLED EITHER IN TUBULAR FORM PRIOR TO LOWERING THE PIPE IN TRENCH OR IN SHEET FORM.
4. POLYETHYLENE TUBE ENCASEMENT SHALL CONFORM WITH THE MINIMUM REQUIREMENTS OF "POLYETHYLENE ENCASEMENT FOR GRAY AND DUCTILE CAST-IRON PIPING FOR WATER AND OTHER LIQUIDS", ANSI/AWWA C105, CURRENT REVISION. SOILS WITHIN A PROJECT SHALL BE TESTED IN ACCORDANCE WITH APPENDIX A OF ANSI/AWWA C105 TO ADEQUATELY DETERMINE THE REQUIREMENTS FOR ENCASEMENT.

POLYETHYLENE WRAP FOR IRON PIPE

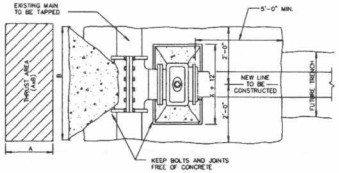
SIZE	90° BEND		45° BEND		22 1/2° BEND		TEES		PLUGS	
	A	B	A	B	A	B	A	B	A	B
2 1/2"	12"	7"	6"	7"	6"	6"	7"	8"	8"	14"
6"	16"	10"	9"	10"	6"	12"	10"	12"	10"	21"
8"	22"	13"	12"	13"	8"	10"	13"	16"	12"	29"
10"	26"	17"	14"	17"	10"	13"	16"	20"	14"	36"
12"	29"	21"	16"	21"	11"	16"	18"	24"	16"	41"
14"	35"	24"	19"	24"	12"	20"	22"	27"	18"	48"
16"	38"	27"	21"	27"	12"	24"	24"	30"	20"	54"

BENDS, TEES & PLUGS
FOR PIPE OF VARIOUS SIZES



NOTE:
1. BELOW GROUND CONNECTION TO MAIN SHALL BE WITH A 2" SERVICE SADDLE.
2. ABOVE GROUND CONNECTION WITH A SERVICE SADDLE OR A TEE WITH A TAPPED FLANGE.

AIR RELEASE VALVE DETAIL
N.T.S.



NOTES:
1. BLOCKING IS TO EXTEND TO UNDISTURBED GROUND.
2. ALL TAPS SHALL BE COORDINATED THROUGH THE UTILITY OWNER
3. INSTALL TEMPORARY BLOCKING UNDER VALVE BEFORE TAP IS MADE. ALL FLANGE BOLTS SHALL BE CLEAR OF FOOTING.
4. TAPPING SLEEVES ARE TO BE FULL CIRCLE STAINLESS STEEL, CLASS 200 PSI.
5. INSTALLATION SHALL BE LEAK TESTED PRIOR TO TAP LEAK TEST SHALL CONSIST OF A 200 PSI TEST FOR 2 HOURS
6. TAPPING SLEEVE SHALL BE PLACED AT A MINIMUM OF 18" FROM ANY BELL, COUPLING, VALVE, FITTING, OR OTHER OBSTRUCTION
7. PROTECT ALL CONCRETE CONTACT AREAS WITH 8 MIL SHEET PLASTIC
8. THRUST BLOCKING PER STD SPECIFICATIONS
9. INSTALL VALVE RISER & FRANGE & COVER PER SPECIFICATIONS AND DETAILS
10. CONCRETE SHALL BE 5.0 SACK MIN. 3,500 PSI AND SHALL CURE 24 HOURS BEFORE BACKFILL
11. VALVE SHALL BE FLG x MJ
12. SIZE ON SIZE TAPPING IS ALLOWED
13. ENGINEER SHALL VERIFY AND PROVIDE AREA OF THRUST BLOCKING FOR TAPPING SADDLE. TABLE IS FOR REFERENCE.

SIZE OF PIPE BEING CONNECTED	MINIMUM THRUST AREA REQUIRED EQUALS (AxB)
4" AND LESS	3 SF
6"	4 SF
8"	6 SF
12"	13 SF
15"	23 SF

TAPPING SLEEVE & VALVE DETAIL
N.T.S.

CONSTRUCTION NOTES:

1. WATER LINE 6" (IN.) AND LESS SHALL BE AWWA C-900 DR14 CLASS 200 WATER LINE GREATER THAN 6 IN BUT LESS THAN 14 IN # SHALL BE AWWA C-900 DR 18 CLASS 150 WATER LINE 14 IN AND GREATER SHALL BE AWWA C-905
2. ALL FLUSHING VALVES AND GATE VALVES TO BE AMERICAN WATER WORKS ASSOC. (AWWA) STANDARD COUNTERCLOCKWISE OPENING WITH NON-RISING STEM DESIGN.
3. THE MAXIMUM ALLOWABLE SIZE OF A TAPPING SLEEVE AND VALVE ON AN EXISTING PIPE IS SIZE ON SIZE.
4. ALL DUCTILE IRON PIPE SHALL BE MORTAR LINED. DIP SHALL BE CLASS 350 4 IN-12 IN AND CLASS 250 14 IN ANC GREATER. NO A.C. PIPE WILL BE ALLOWED AND ALL DUCTILE IRON FITTINGS SHALL BE MORTAR LINED MECHANICAL JOINTS.
5. ALL BACKFILL WITHIN THE R.O.W. SHALL BE COMPACTED TO 95% STANDARD PROCTOR DENSITY.

No.	DATE	REVISION

WATER LINE
CONSTRUCTION DETAILS

missouri CITY
TEXAS

SEAL: STATE OF TEXAS — RON J. DECHERT — 96544 — LICENSED PROFESSIONAL ENGINEER

DESIGN ENGINEER: DATE 12-5-16

CONSTRUCTION PLANS FOR:

THE GROVE
AT RIVERSTONE
SECTION ONE

JOB No.:
SCALE: AS NOTED
SUBMITTED:
DATE: FEBRUARY 2015

MC-11-15

SHEET OF

3/30/17

PLOT TIME: TIME STAMP
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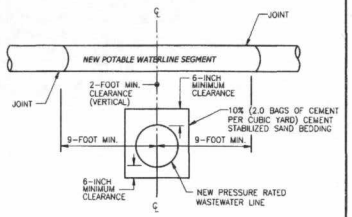
PLOT DATE: DATE

PLOT TIME: TIME STAMP

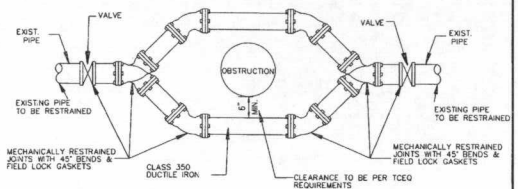
I

NEW POTABLE WATERLINE CROSSING NEW PRESSURE RATED WASTEWATER LINE WITH SEGMENT LENGTHS OF EIGHTEEN (18) FEET OR GREATER, HAVING 2 FEET OF VERTICAL CLEARANCE AND 4 FEET OF HORIZONTAL CLEARANCE



- WHENEVER POSSIBLE, THE CROSSING SHALL BE CENTERED BETWEEN JOINTS OF THE WASTEWATER LINE.
- MINIMUM WASTEWATER PIPE STIFFNESS OF 115 PSI AT 5% DEFLECTION.
- EMBED WASTEWATER LINE IN CEMENT STABILIZED SAND TO AT LEAST 12" INCHES BEYOND EACH JOINT OF CROSSED SECTION OF PIPE.

II



1. NO SERVICE CONNECTIONS SHALL BE LOCATED WITHIN VERTICAL REALIGNMENT
2. AIR RELEASE VALVE TO BE INSTALLED ON THE VERTICAL REALIGNMENT AT THE HIGH POINT OF THE LOW SIDE.

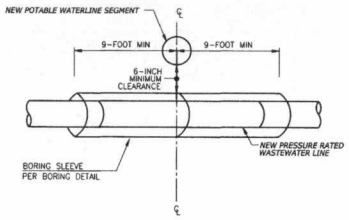
BOTTOM OF VERTICAL ALIGNMENT SHALL BE ONE PIECE. IF JOINTS ARE REQUIRED, WATER MAIN SEGMENT SHALL BE CENTERED BELOW PIPE OR IN A BORE SLEEVE. ALL JOINTS SHALL BE FIELD LOCK GASKET & WATER MAIN SHALL BE EQUIPPED WITH STAINLESS STEEL SPACERS & END CAPS.

VERTICAL REALIGNMENT ASSEMBLY

III

ENCASED WASTEWATER LINE

NEW POTABLE WATERLINE CROSSING NEW PRESSURE RATED WASTEWATER LINE WITH SEGMENT LENGHTS OF OF LESS THAN EIGHTEEN (18) FEET

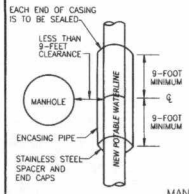


- MINIMUM CASING PIPE STIFFNEESS OF 115 PSI AT 5% DELECTION.
- MINIMUM CASING PIPE DIAMETER ≥ 2 X WASTEWATER LINE DIAMETER.
- UTILIZE BORING SLEEVE DETAIL

GENERAL NOTES:

1. CONTRACTOR SHALL CONTACT CITY OF MISSOURI CITY DEPARTMENT OF PUBLIC WORKS AT (281) 403-8570 IF WET SAND OR OTHER UNSTABLE SOIL CONDITIONS, HIGH WATER TABLE AND/OR UNDERGROUND OBSTRUCTIONS ARE ENCOUNTERED.
2. SHOULD A CONFLICT ARISE BETWEEN INFORMATION DEPICTED ON APPROVED CONSTRUCTION DRAWINGS AND INFORMATION INCLUDED IN PROJECT SPECIFICATIONS, CITY OF MISSOURI CITY INFRASTRUCTURE STANDARDS SHALL GOVERN.
3. ALL NEW POTABLE WATER LINES AND SANITARY SEWER FORCE MAINS SHALL BE BEDDED IN COMPACTED BANK SAND A MINIMUM OF 6 INCHES BELOW, ABOVE AND TO EITHER SIDE OF SUCH PIPING.
4. ALL NEW SANITARY SEWER GRAVITY DRAIN LINES SHALL BE BEDDED IN CEMENT STABILIZED SAND CONFORMING TO THE REQUIREMENTS FOR EITHER CLASS "A" STANDARD BEDDING OR CLASS "A-A" BEDDING AS APPLICABLE. USE OF MODIFIED "A" OR MODIFIED "A-A" BEDDING FOR SANITARY SEWER INSTALLATIONS WHERE WET SAND CONDITIONS ARE ENCOUNTERED AND SEPARATION DISTANCE TO POTABLE WATER LINES IS LESS THAN 9 FEET REQUIRES APPROVAL BY CITY ENGINEER.
5. CEMENT STABILIZED BEDDING SHALL BE A MINIMUM 2 SACK PER CUBIC YARD C.S.S., INSTALLED IN MAXIMUM LIFTS OF 8 INCHES AND MECHANICALLY TAMPED TO 95% PROCTOR.
6. WHERE REQUIRED, SLEEVING (ENCASEMENT) OF POTABLE WATER PIPING AND/OR SANITARY SEWER GRAVITY DRAIN LINES AND FORCE MAINS SHALL BE PROVIDED. SUCH SLEEVING (ENCASEMENT) SHALL BE CONSTRUCTED OF APPROVED PIPING MATERIALS HAVING A MINIMUM PRESSURE RATING OF 150 PSI AND ANNULAR SPACES AT EACH END SHALL BE SEALED WITH A MATERIAL APPROVED FOR SUCH USE.
7. ALL NEW POTABLE WATER LINES SHALL BE SLEEVED (ENCASED) WHERE A MINIMUM OF 9 FEET SEPARATION DISTANCE TO EXISTING OR PROPOSED SANITARY SEWER MANHOLE, LIFT STATION OR WASTEWATER TREATMENT PLANT CANNOT BE MAINTAINED. SLEEVING SHALL BE A MINIMUM OF 18 FEET IN LENGTH AND CENTERED ON THE POINT OF CLOSEST PROXIMITY.
8. ALL NEW POTABLE WATER LINES SHALL BE SLEEVED (ENCASED) WHERE LESS THAN 2 FEET VERTICAL OR 4 FEET HORIZONTAL CLEARANCE TO EXISTING OR PROPOSED SANITARY SEWER GRAVITY LINES OR FORCE MAINS CANNOT BE MAINTAINED. SLEEVING SHALL BE A MINIMUM OF 18 FEET IN LENGTH AND CENTERED ON THE POINT OF CROSSING. WHERE PIPING IS LAID PARALLEL AND MINIMUM SEPARATION DISTANCES CANNOT BE MAINTAINED, SLEEVING SHALL EXTEND AT LEAST 9 FEET PAST THE POINT WHERE MINIMUM SEPARATION DISTANCES ARE ACHIEVED.
9. ALL NEW POTABLE WATER LINES SHALL BE CONSTRUCTED ABOVE EXISTING OR PROPOSED SANITARY SEWER GRAVITY LINES OR FORCE MAINS WHERE POSSIBLE. WHERE INSTALLATION BENEATH SANITARY SEWER GRAVITY LINES OR FORCE MAINS IS UNAVOIDABLE AT POINTS OF CROSSING, SLEEVING (ENCASEMENT) IS REQUIRED FOR ALL NEW POTABLE WATER LINES CONSTRUCTED OF PVC PIPING MATERIALS, REGARDLESS OF SEPARATION DISTANCE. SLEEVING SHALL BE A MINIMUM OF 18 FEET IN LENGTH AND CENTERED ON THE POINT OF CROSSING.
10. ALL NEW SANITARY SEWER GRAVITY LINES AND/OR FORCE MAINS CONSTRUCTED OF PVC PIPING MATERIALS SHALL BE SLEEVED (ENCASED) WHERE LESS THAN 2 FEET VERTICAL OR 4 FEET HORIZONTAL CLEARANCE TO EXISTING POTABLE WATER PIPING CANNOT BE MAINTAINED. SLEEVING SHALL BE A MINIMUM OF 18 FEET IN LENGTH AND CENTERED ON THE POINT OF CLOSEST PROXIMITY.
11. ALL NEW SANITARY SEWER GRAVITY LINES AND/OR FORCE MAINS SHALL BE CONSTRUCTED BELOW EXISTING POTABLE WATER LINES WHERE POSSIBLE. WHERE INSTALLATION ABOVE POTABLE WATER LINES IS UNAVOIDABLE, SLEEVING (ENCASEMENT) IS REQUIRED FOR ALL SUCH SANITARY SEWER LINES CONSTRUCTED OF PVC PIPING MATERIALS, REGARDLESS OF SEPARATION DISTANCE. SLEEVING SHALL BE A MINIMUM OF 18 FEET IN LENGTH AND CENTERED ON THE POINT OF CROSSING.
12. WHERE NEW SANITARY SEWER SIZING (24 INCH AND GREATER) PRECLUDES THE USE OF PVC PIPING MATERIALS AND SLEEVING (ENCASEMENT) OF THE SANITARY SEWER WOULD OTHERWISE BE REQUIRED BUT IS IMPRACTICAL, THE EXISTING POTABLE WATER PIPING SHALL EITHER BE OFFSET TO PROVIDE THE REQUIRED MINIMUM CLEARANCES OR SLEEVED (ENCASED) IN LIEU OF SLEEVING (ENCASING) THE SANITARY SEWER LINE. SLEEVING SHALL BE A MINIMUM OF 18 FEET IN LENGTH AND CENTERED ON THE POINT OF CROSSING.
13. IN NO INSTANCE SHALL A FIRE HYDRANT BE INSTALLED WITHIN 9 LINEAR FEET OF A SANITARY SEWER SYSTEM.
14. NOTE: SEPARATION DISTANCES ARE MEASURED FROM THE OUTSIDE DIAMETERS OF EACH PIPE AND FROM THE EXTERIOR SURFACES OF MANHOLES, LIFT STATIONS, WASTEWATER TREATMENT PLANTS AND ASSOCIATED APPURTENANCES.
15. REFER TO GENERAL SANITARY, WATER AND C.S.S. NOTES.

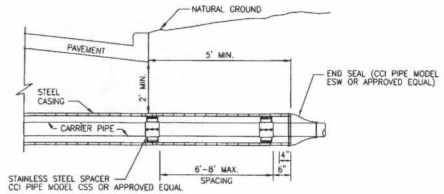
DETAIL OF WATER LINE CROSSING WASTEWATER FACILITIES WHERE SEPARATION IS LESS THAN 9' (NINE FEET)



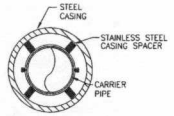
ENCASING PIPE

- 150 PSI PRESSURE CLASS PIPE MINIMUM 18 FEET LONG DIAMETER = 2 X WATERLINE DIAMETER
- SPACE AROUND CARRIER PIPE SHALL BE SUPPORTED AT 6 FT TO 8 FT INTERVALS MAXIMUM WITH STAINLESS STEEL SPACERS (CCI PIPE MODLE CSS OR APPROVED EQUAL).
- CENTERED ON CROSSING
- BOTH ENDS SEALED WITH END CAPS (CCI PIPE MODEL ESW OR APPROVED EQUAL)

MANHOLE CLEARANCE



ELEVATION



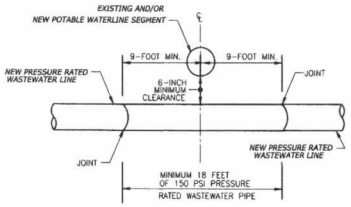
CASING SCHEDULE		
CARRIER PIPE	NOMINAL CASING ID	MIN. WALL THICKNESS (IN.)
6"	12"	0.11
8"	14"	0.15
10"	16"	0.18
12"	18"	0.20

1. CASING SIZE AND THICKNESS SHALL CONFORM TO THE MINIMUM REQUIREMENTS AS SHOWN ON CASING SCHEDULE, OTHER PERMITS AS REQUIRED.
2. MAINTAIN ½" MINIMUM CLEARANCE BETWEEN THE MAXIMUM OUTSIDE DIAMETER OF CARRIER PIPE AND CASING AT ALL LOCATIONS.
3. DIMENSIONS ARE APPROXIMATE ONLY. CONTRACTOR SHALL INSTALL ADEQUATELY SIZED CASING TO ACCOMMODATE THE CARRIER PIPE AND SPACER.
4. IF JOINTS ARE REQUIRED IN THE BORING SLEEVE THEN THE PIPE SHALL BE JOINT RESTRAINED.

BORING SLEEVE DETAIL

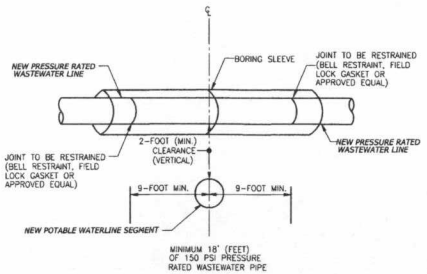
ALTERNATIVE A:

PRESSURE RATED WASTEWATER PIPE



ALTERNATIVE B:

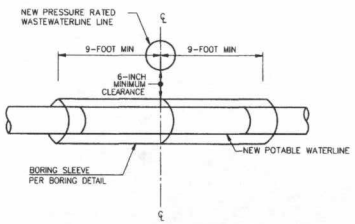
EXISTING POTABLE WATERLINE CROSSING EXISTING PRESSURE RATED WASTEWATER LINE



- NEW WATERLINE (WITHOUT CASING) TO BE CONSTRUCTED DUCTILE IRON WITH MECHANICAL JOINTS OR RESTRAINED JOINTS
- BOTH WATERLINE AND WASTEWATER LINE MUST PASS A PRESSURE AND LEAKAGE TEST AS SPECIFIED IN AWWA C600 STANDARDS.

ALTERNATIVE C:

ENCASE NEW POTABLE WATERLINE UNDER A NEW PRESSURE RATED WASTEWATER LINE



- SAME ENCASEMENT CRITERIA AS "ALTERNATIVE B" OR
- NEW WATERLINE (WITHOUT CASING) TO BE CONSTRUCTED DUCTILE IRON WITH MECHANICAL JOINTS OR RESTRAINED JOINTS
- BOTH WATERLINE AND WASTEWATER LINE MUST PASS A PRESSURE AND LEAKAGE TEST AS SPECIFIED IN AWWA C600 STANDARDS.

NO.	DATE	REVISION

WATER LINE CROSSING DETAILS

missouri CITY TEXAS

SEAL: STATE OF TEXAS — RON J. DECHERT — 96544 — LICENSED PROFESSIONAL ENGINEER

DESIGN ENGINEER: DATE 12-8-16

CONSTRUCTION PLANS FOR:

THE GROVE AT RIVERSTONE SECTION ONE

JOB No.:

SCALE: AS NOTED

SUBMITTED:

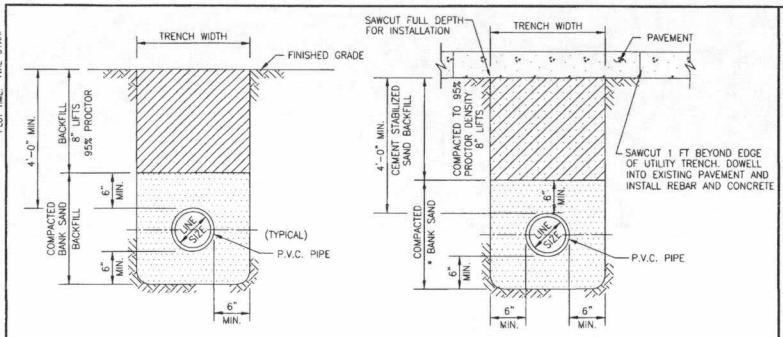
DATE: FEBRUARY 2015

MC-12-15

SHEET OF

3/30/17

CAD FILE PATH: CADD_FILE_PATH
PLOT DATE: DATE

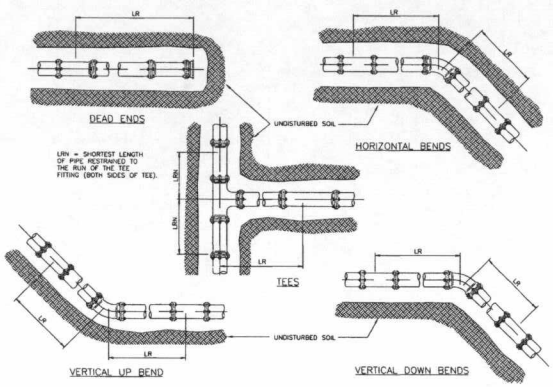


P.V.C. PIPE BEDDING & BACKFILL
N.T.S.

P.V.C. PIPE BEDDING & BACKFILL
PAVING DETAIL
CLASS "A-A"
N.T.S.

* SEE C.S.S. AND BANK SAND NOTES

SANITARY FORCE MAIN & WATER LINE BEDDING AND BACKFILL



RESTRAINED LENGTHS, LR, FOR DUCTILE IRON PIPE

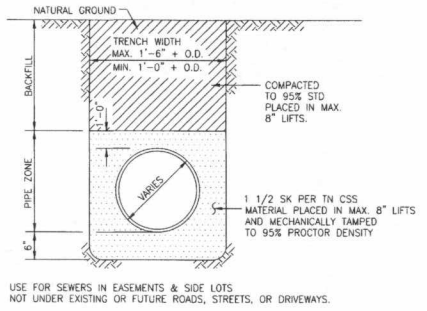
NOMINAL PIPE SIZE INCHES	HORIZONTAL BENDS			TEES		VERTICAL OFFSETS						DEAD ENDS
						90° BEND FITTINGS		45° BEND FITTINGS		22-1/2° BEND FITTINGS		
	90°	45°	22-1/2°	LRN=0'	LRN=10'	DOWN BEND	UP BEND	DOWN BEND	UP BEND	DOWN BEND	UP BEND	
4	18	7	4	30	8	31	18	13	7	6	3	31
6	25	10	5	43	20	44	25	18	10	9	5	44
8	32	13	6	56	34	58	32	24	13	11	6	58
10	38	16	8	68	45	69	38	29	16	14	8	69
12	45	19	9	80	57	81	45	34	19	16	9	81
14	51	21	10	91	68	92	51	38	21	18	10	92
16	57	24	11	103	79	104	57	43	24	21	11	104
18	62	26	12	113	90	115	62	48	26	23	12	115
20	68	28	14	125	100	126	68	52	28	25	14	126
24	79	33	16	145	121	147	79	61	33	29	16	147

RESTRAINED LENGTHS, LR, FOR DUCTILE IRON PIPE WITH POLYETHYLENE WRAP

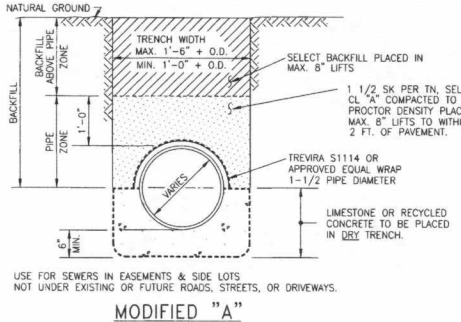
NOMINAL PIPE SIZE INCHES	HORIZONTAL BENDS			TEES		VERTICAL OFFSETS						DEAD ENDS
						90° BEND FITTINGS		45° BEND FITTINGS		22-1/2° BEND FITTINGS		
	90°	45°	22-1/2°	LRN=0'	LRN=10'	DOWN BEND	UP BEND	DOWN BEND	UP BEND	DOWN BEND	UP BEND	
4	26	11	5	66	18	72	28	30	11	14	5	72
6	36	15	7	99	47	102	36	42	15	20	7	102
8	47	19	9	130	78	133	47	55	19	26	9	133
10	56	23	11	157	103	159	56	66	23	32	11	159
12	65	27	13	185	131	187	65	77	27	37	13	187
14	74	31	15	211	156	214	74	89	31	42	15	214
16	82	34	16	235	183	241	82	100	34	48	16	241
18	90	37	18	263	207	266	90	110	38	53	18	266
20	98	41	20	289	233	292	98	121	41	58	20	292
24	113	47	22	337	280	340	113	141	47	68	22	340

NOTES:
1. ALL JOINTS WITHIN THE SPECIFIED LENGTH LR MUST BE RESTRAINED. ALL LENGTHS ARE GIVEN IN FEET. THESE ARE MINIMUM LENGTHS AND THE DESIGN ENGINEER IS TO VERIFY.
2. THE MAXIMUM TEST PRESSURE SHALL NOT EXCEED 200 PSI
3. RESTRAINED LENGTHS MAY BE REDUCED WHEN SUPPORTED BY ENGINEERING CALCULATIONS.
4. FOR PVC WATER LINES USE THE DIP WITH POLYETHYLENE WRAP TABLE.

JOINT RESTRAINT FOR DUCTILE IRON PIPE AND POLYETHYLENE WRAPPED DUCTILE IRON WATER PIPES

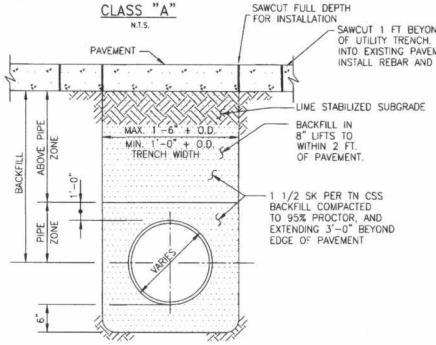


USE FOR SEWERS IN EASEMENTS & SIDE LOTS NOT UNDER EXISTING OR FUTURE ROADS, STREETS, OR DRIVEWAYS.



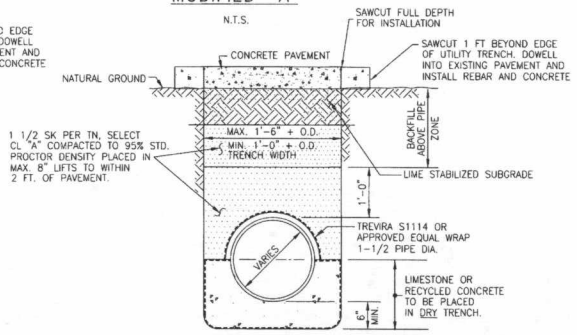
USE FOR SEWERS IN EASEMENTS & SIDE LOTS NOT UNDER EXISTING OR FUTURE ROADS, STREETS, OR DRIVEWAYS.

CLASS "A"
N.T.S.



USE FOR SEWERS UNDER EXISTING OR FUTURE ROADS STREETS OR DRIVEWAYS.

MODIFIED "A"
N.T.S.



USE FOR SEWERS UNDER EXISTING OR FUTURE ROADS STREETS OR DRIVEWAYS.

MODIFIED "A-A"
N.T.S.

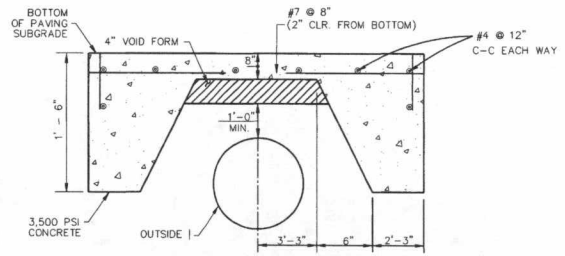
SANITARY SEWER BEDDING AND BACKFILL

REFER TO:

1. GENERAL NOTES
2. C.S.S. NOTES

CONSTRUCTION NOTES

1. CONTRACTOR SHALL CONTACT MISSOURI CITY DEPARTMENT OF PUBLIC WORKS IMMEDIATELY IF WET SAND CONDITIONS ARE ENCOUNTERED.
2. LIMESTONE AND RECYCLED CONCRETE DIMENSIONS SHOWN ARE TYPICAL BUT MAY BE VARIED BY ORDER OF CITY ENGINEER.
3. LIMESTONE OR RECYCLED CONCRETE SHALL BE IN ACCORDANCE WITH TXDOT SPECIFICATION No. 248 FLEXIBLE BASE, TYPE A, GRADE 2 AGGREGATE.
4. NO BEDDING SHALL BE INSTALLED IN WET CONDITIONS. WHEN WELL POINTING OR IN WET SAND CONDITIONS, MAINTAIN GROUND WATER 1 (FT) BELOW BOTTOM OF TRENCH FOR A MINIMUM OF 24-HRS AFTER BEDDING AND BACKFILL IS IN PLACE.
5. ALL MATERIALS SHALL BE FROM THE APPROVED PRODUCTS LIST UNLESS SPECIFICALLY APPROVED BY THE CITY ENGINEER.
6. SANITARY SEWER BEDDING FOR WET SAND CONDITIONS SHALL BE AS PER MODIFIED "A" OR "A-A".
7. ALL SAND BEDDING FOR WATER LINES SHALL BE CLEAN, MECHANICALLY COMPACTED BANK SAND.
8. REFER TO: MANHOLE DETAILS, SANITARY, C.S.S., GENERAL, WATER CROSSING, WATER DISTRIBUTION DETAILS AND NOTES.



PROTECTIVE SLAB DETAIL
ZERO LOAD TRANSFER CONCRETE SLAB

No.	DATE	REVISION

WATER LINE, SANITARY SEWER FORCE MAIN BEDDING DETAILS

missouri CITY TEXAS

SEAL: STATE OF TEXAS — RON J. DECHERT — 96544 — LICENSED PROFESSIONAL ENGINEER

DESIGN ENGINEER: _____ DATE 12-8-16

CONSTRUCTION PLANS FOR:

THE GROVE AT RIVERSTONE SECTION ONE

JOB No.:
SCALE: AS NOTED
SUBMITTED:
DATE: FEBRUARY 2015

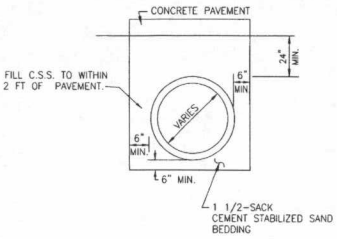
MC-15-15

SHEET OF

3/30/17

PLOT TIME: TIME STAMP

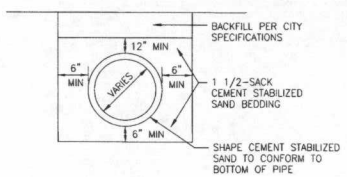
CAD FILE PATH: CADD_FILE_PATH
PLOT DATE: DATE



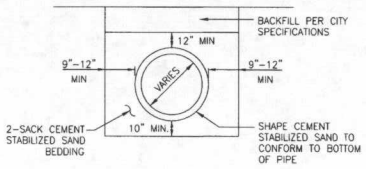
BEDDING DETAIL FOR
CONCRETE CULVERT USED
UNDER ROADWAY PAVEMENT

CLASS "A-A"

N.T.S.



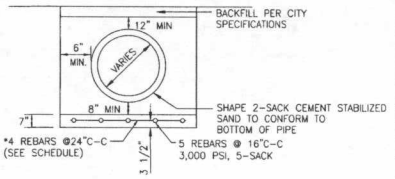
BEDDING DETAIL FOR
REINFORCED CONCRETE PIPE
STORM SEWER
36" DIAMETER & SMALLER



NOTES

1. 1.5-SACK CEMENT PER TON STABILIZED SAND PLACED BEFORE PIPE IS PLACED (10" MINIMUM FOR 42" TO 60", 14" MINIMUM FOR 66" TO 108")

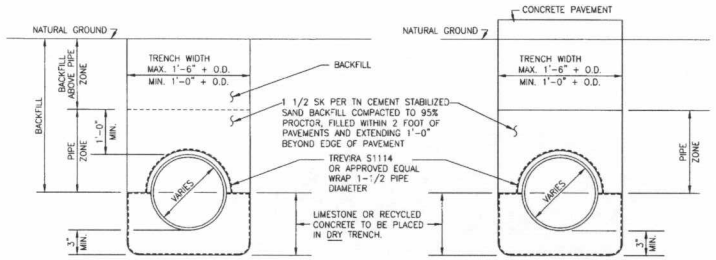
BEDDING DETAIL FOR
REINFORCED CONCRETE PIPE
STORM SEWER
42" TO 108" DIAMETER
WHERE SATISFACTORY SOIL CONDITIONS EXIST



NOTES

1. 1 1/2 SK PER TN STABILIZED SAND PLACED BEFORE PIPE IS PLACED (8" MINIMUM FOR 42" TO 60", 12" MINIMUM FOR 66" TO 108").

SEAL SLAB
BEDDING DETAIL FOR
REINFORCED CONCRETE PIPE
STORM SEWER
42" TO 108" DIAMETER
WHERE UNSATISFACTORY SOIL CONDITIONS EXIST



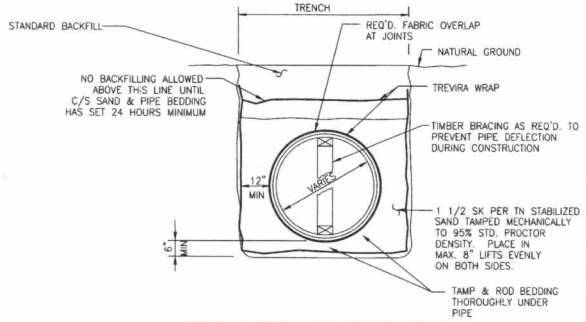
MODIFIED "A"

N.T.S.

USE FOR SEWERS UNDER EXISTING OR FUTURE ROADS, STREETS, DRIVEWAYS OR OTHER PVMT.

MODIFIED "A-A"

N.T.S.



BEDDING DETAIL FOR STORM SEWER-
CORREGATED METAL PIPE

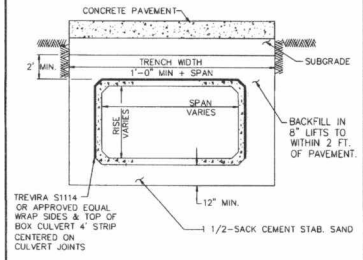
N.T.S.

CONSTRUCTION NOTES

1. CONTRACTOR SHALL CONTACT MISSOURI CITY DEPARTMENT OF PUBLIC WORKS IMMEDIATELY IF WET SAND CONDITIONS ARE ENCOUNTERED.
2. LIMESTONE AND RECYCLED CONCRETE DIMENSIONS SHOWN ARE TYPICAL BUT MAY BE VARIED BY ORDER OF CITY ENGINEER.
3. LIMESTONE OR RECYCLED CONCRETE SHALL BE IN ACCORDANCE WITH TXDOT SPECIFICATION No. 248 FLEXIBLE BASE, TYPE A, GRADE 2 AGGREGATE.
4. NO BEDDING SHALL BE INSTALLED IN WET CONDITIONS. WHEN WELL POINTING OR IN WET SAND CONDITIONS, MAINTAIN GROUND WATER 1' (FT.) BELOW BOTTOM OF TRENCH FOR A MINIMUM OF 24-HRS AFTER BEDDING AND BACKFILL IS IN PLACE.
5. R.C.P. AND BOX CULVERTS SHALL BE INSTALLED WITH APPROVED GASKETS ONLY.
6. MANHOLES SHALL BE PROVIDED WHERE MODIFIED "A" OR MODIFIED "A-A" BEDDING IS USED. STACKS ARE NOT ALLOWED.
7. REFER TO: MANHOLE DETAILS, INLETS, OUTFALL AND END TREATMENT DETAILS, C.S.S., GENERAL NOTES, AND STORM NOTES.
8. SPECIFIC DESIGNS MUST BE SUBMITTED AND APPROVED BY THE CITY ENGINEER FOR MANHOLE ACCESS TO BOX CULVERTS AS REQUIRED.
9. ALL BACKFILL WITHIN THE R.O.W. SHALL BE COMPACTED TO 95% STANDARD PROCTOR DENSITY.

TYPICAL SEAL SLAB
BAR SCHEDULE
(OR AS DIRECTED BY ENGINEER)

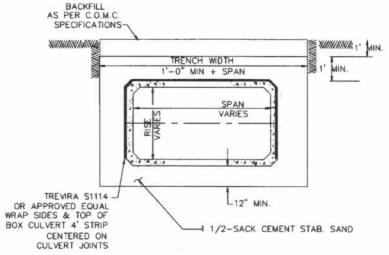
PIPE SIZE	LGT LAT #4 BARS	NO LONGIT #5 BARS
42"	5'4"	5
48"	6'8"	6
54"	6'8"	6
60"	8'0"	7
66"	8'0"	7
72"	9'4"	8
78"	9'4"	8
84"	9'4"	8
90"	10'8"	9
96"	10'8"	9
102"	12'0"	10
108"	12'0"	10



BEDDING DETAIL FOR
REINFORCED CONCRETE BOX
CULVERT UNDER ROADWAY PAVEMENT

NOTES

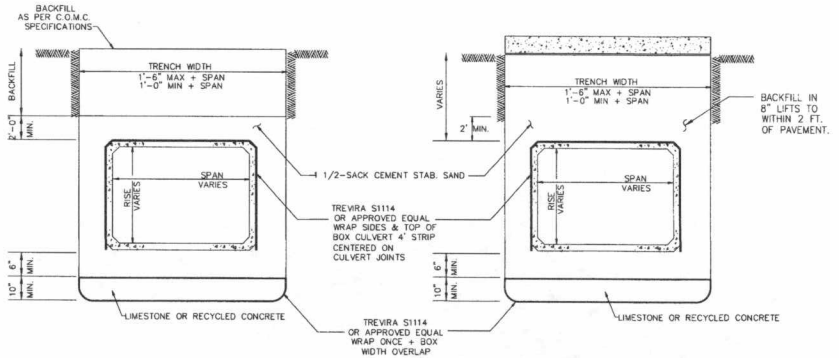
1. 2-SACK CEMENT PER CUBIC YARD STABILIZED SAND PLACED BEFORE PIPE IS PLACED (8" MINIMUM FOR 42" TO 60", 12" MINIMUM FOR 66" TO 108").



BEDDING DETAIL FOR
REINFORCED CONCRETE BOX
PLACED IN EASEMENT

NOTES

1. 2-SACK CEMENT PER CUBIC YARD STABILIZED SAND PLACED BEFORE PIPE IS PLACED (8" MINIMUM FOR 42" TO 60", 12" MINIMUM FOR 66" TO 108").



BEDDING DETAIL FOR
REINFORCED CONCRETE BOX CULVERT
W/MODIFIED BEDDING

BEDDING DETAIL FOR
REINFORCED CONCRETE BOX CULVERT
W/MODIFIED BEDDING
UNDER ROADWAY PAVEMENT

No.	DATE	REVISION

STORM SEWER PIPE BEDDING
AND BACKFILL DETAILS

missouri CITY
TEXAS

SEAL:

STATE OF TEXAS
RON J. DECHERT
96544
LICENSED
PROFESSIONAL ENGINEER

DESIGN ENGINEER:

DATE 12-8-16

CONSTRUCTION PLANS FOR:

THE GROVE
AT RIVERSTONE
SECTION ONE

JOB No.:

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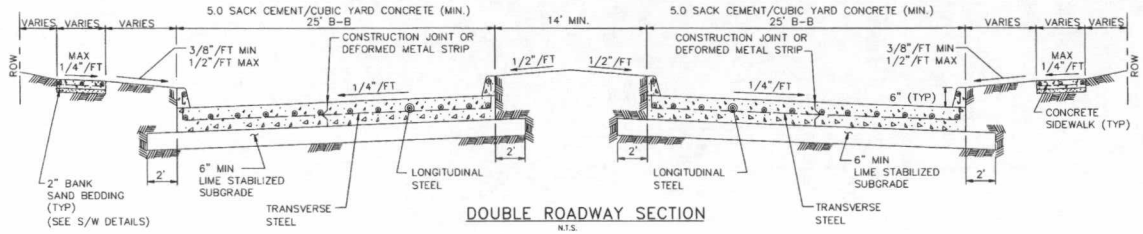
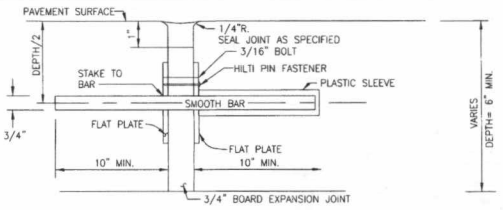


DOUBLE ROADWAY SECTION
N.T.S.

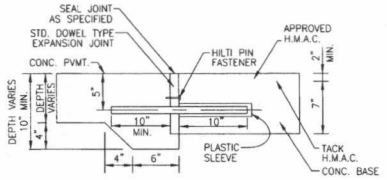
CONSTRUCTION NOTES:

1. 6 INCH, 5.5 SACK CEMENT PER CUBIC YARD CONCRETE, 3500 PSI REINFORCED CONCRETE WITH #4 BARS 24 INCHES O.C., E.W. IS THE MINIMUM ACCEPTABLE PAVEMENT CONSTRUCTION FOR RESIDENTIAL STREETS.
2. 7 INCH, 5.5 SACK CEMENT PER CUBIC YARD CONCRETE, 3500 PSI REINFORCED CONCRETE WITH #4 BARS 24 INCHES O.C., IS THE MINIMUM ACCEPTABLE PAVEMENT CONSTRUCTION FOR COLLECTOR AND THOROUGHFARE STREETS.
3. HARD AGGREGATE IS NOT ALLOWED IN STREET PAVEMENT MIX. ADMIXTURES REQUIRE CITY OF MISSOURI CITY PUBLIC WORKS DEPARTMENT APPROVAL.
4. TRANSVERSE EXPANSION JOINTS ARE REQUIRED AT MAXIMUM SPACING OF 60'-0" O.C., AND VERTICAL CURB JOINTS TO BE SEALED WITH SPECIAL JOINT SEALANT ASTM-D-1190-74 OR AASHTO-M173-60 (ELASTOMERIC TYPE, HOT POURED)
5. FOR PAVEMENT FINISH USE BURLAP DRAG OR BELTED FINISH. CURING COMPOUND REQUIRED ON ALL CONCRETE.
6. PAVEMENT DEPTHS >7" REQUIRED BASED ON GEOTECH REPORT AND CITY ENGINEER'S APPROVAL.
7. STORM WATER POLLUTION PROTECTION SHALL BE DESIGNED, CONSTRUCTED, MAINTAINED AND SHALL BE IN TOTAL COMPLIANCE WITH THE STORM QUALITY MANUAL OF THE CITY OF MISSOURI CITY.
8. REFER TO GENERAL, C.S.S., AND PAVEMENT NOTES.

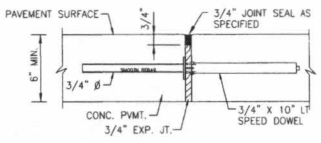


STEEL TO MEET ASTM STD. SPEC. FOR CONC. REBAR UNIT TO BE 24" O.C., AND 10" MIN.

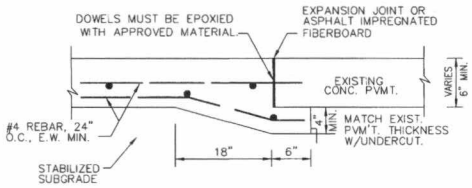
DOWEL TYPE EXPANSION JOINT
N.T.S.



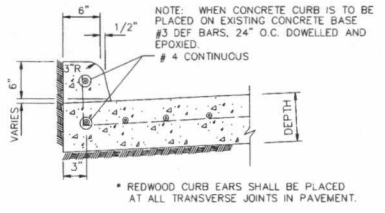
DOWEL TYPE EXPANSION JOINT
N.T.S.
(CONC. PAVING TO CONC. BASE)



SPEED DOWEL EXPANSION JOINT
N.T.S.

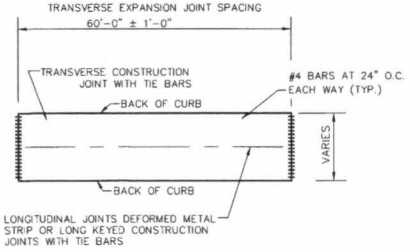


UNDERCUT DETAIL WITH HEADER
N.T.S.

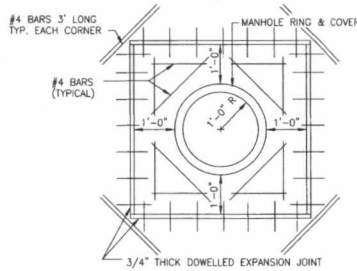


CONCRETE CURB
N.T.S.

CONSTRUCTION NOTE:
ALL NEW CURB REQUIRES 3,500 P.S.I. @ 28-DAYS, AND A MINIMUM OF 1-LB/CY OF APPROVED POLYPROYLENE FIBER MESH.

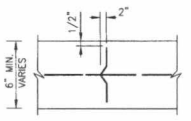


PAVING PANEL FOR 6" & 7" PAVEMENT
N.T.S.



MANHOLE BLOCKOUT
N.T.S.
(STORM & SANITARY) IN PAVEMENT

THE LOCATION OF CONSTRUCTION JOINTS AND DEFORMED STRIPS MAY BE VARIED, WITH THE APPROVAL OF THE DEPARTMENT OF PUBLIC WORKS, TO SUIT THE PROPOSED CONSTRUCTION METHODS OF THE CONTRACTOR. MAXIMUM SPACING FOR LONGITUDINAL CONTROL JOINTS IS 15'-0".

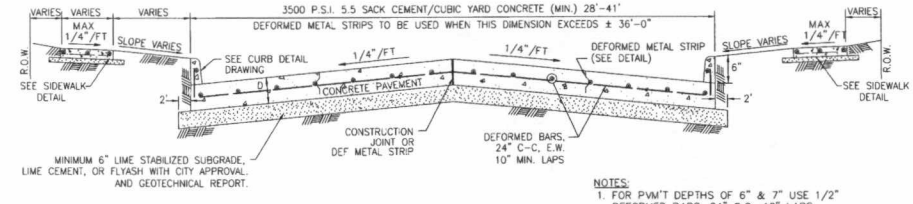


DEFORMED METAL STRIP
N.T.S.

No.	DATE	REVISION

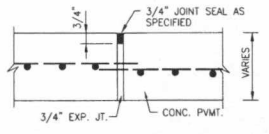
CONCRETE PAVEMENT CONSTRUCTION DETAILS

missouri CITY TEXAS

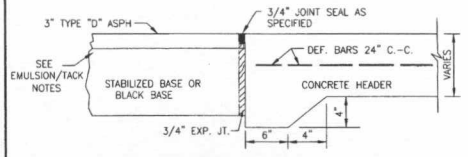


SINGLE ROADWAY SECTION
N.T.S.

NOTES:
1. FOR PVM'T DEPTHS OF 6" & 7" USE 1/2" DEFORMED BARS, 24" O.C., 10" LAPS. ALL REINFORCING STEEL SHALL CONFORM TO A.S.T.M. NO. A-15-54T AND A-305-53T. LAP SPLICES TO BE A MINIMUM OF 10 INCHES. STAGGER SPLICES IN ADJACENT BARS.



CONSTRUCTION JOINT SEAL
N.T.S.



PAVING HEADER
(FOR USE IN CONNECTING CONC. PVMT. TO ASPHALT PVMT.)
(PROP. OR EXIST.)

SEAL:
RON J. DECHERT
96544
LICENSED PROFESSIONAL ENGINEER
DESIGN ENGINEER:
DATE 12-8-16

CONSTRUCTION PLANS FOR:

THE GROVE AT RIVERSTONE SECTION ONE

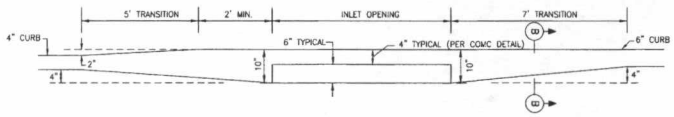
JOB No.:
SCALE: AS NOTED
SUBMITTED:
DATE: FEBRUARY 2015

MC-17-15
SHEET OF

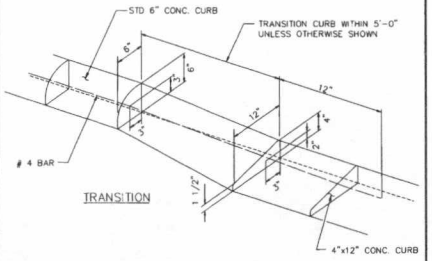
3/30/17

CAD FILE PATH: CADD_FILE_PATH
PLOT DATE: DATE

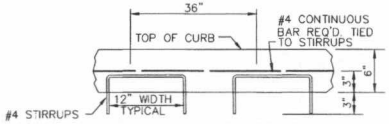
PLOT TIME: TIME STAMP



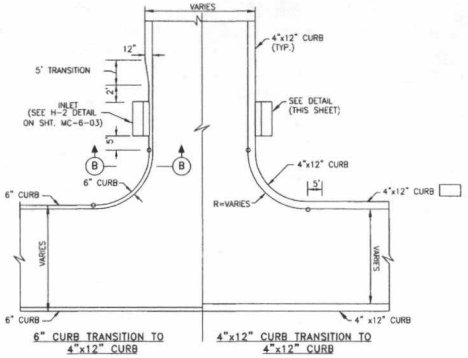
TYPICAL CURB TRANSITION FOR INLET INSTALLATION



TYPICAL CURB TRANSITION



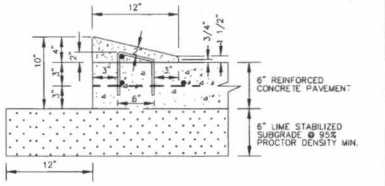
TYPICAL CONCRETE CURB REINFORCING
N.T.S.



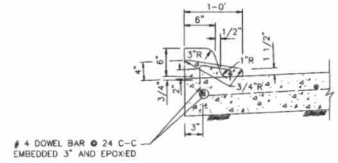
TYPICAL 4"X12" CURB W/INLET TRANSITION FOR CURB RETURNS
N.T.S.

CONSTRUCTION NOTES:

1. 6 INCH, 5.5 SACK CEMENT PER CUBIC YARD CONCRETE, 3500 PSI REINFORCED CONCRETE WITH #4 BARS 24 INCHES C-C, E.W. IS THE MINIMUM ACCEPTABLE PAVEMENT CONSTRUCTION FOR RESIDENTIAL STREETS.
2. 7 INCH, 5.5 SACK CEMENT PER CUBIC YARD CONCRETE, 3500 PSI REINFORCED CONCRETE WITH #4 BARS 24 INCHES C-C, IS THE MINIMUM ACCEPTABLE PAVEMENT CONSTRUCTION FOR COLLECTOR AND THOROUGHFARE STREETS.
3. TRANSVERSE EXPANSION JOINTS ARE REQUIRED AT MAXIMUM SPACING OF 60'-0" C-C, AND VERTICAL CURB JOINTS TO BE SEALED WITH SPECIAL JOINT SEALANT ASTM-D-1190-74 OR AASHTO-M173-60 (ELASTOMERIC TYPE, HOT POURED)
4. FOR PAVEMENT FINISH USE BURLAP DRAG OR BELTED FINISH. CURING COMPOUND REQUIRED ON ALL CONCRETE.
5. GEOTECH REPORT OR CITY ENGINEER MAY REQUIRE PAVEMENT DEPTHS GREATER THAN 7" (IN.).
6. STORM WATER POLLUTION PROTECTION SHALL BE DESIGNED, CONSTRUCTED, MAINTAINED AND SHALL BE IN TOTAL COMPLIANCE WITH THE STORM WATER QUALITY MANUAL OF THE CITY OF MISSOURI CITY.
7. UNSTABLE SUBGRADE SHALL BE EXCAVATED AND REPLACED WITH CEMENT STABILIZED SAND.
8. USE 1"x2" REDWOOD STAKES FOR HEADERS.
9. EDGE ALL SIDES WITH EDGING TOOL.
10. DOWEL SHALL BE 3/4" DIAMETER, WITH MINIMUM 8" PENETRATION (BOTH SIDES).
11. IT IS THE CONTRACTOR'S RESPONSIBILITY TO NOTIFY THE CITY OF MISSOURI CITY OF ANY BIRDBATH PROBLEMS PRIOR TO CONSTRUCTION OF DRIVEWAY.
12. REFER TO GENERAL, C.S.S., AND PAVEMENT NOTES.
13. **1.0 LBS. OF APPROVED POLYPROPYLENE FIBER MESH PER C/Y IN 4"X12" CURBS REQUIRED.**



4"x12" MOUNTABLE CONCRETE CURB



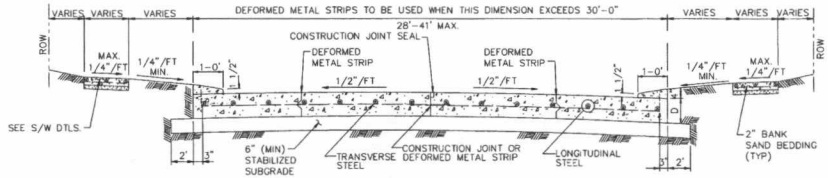
4-INCH x 12-INCH TRANSITION CURB

NOTES:

1.) 1.0 LBS. OF APPROVED NON-METALLIC FIBER MESH PER C/Y IN 4"X12" CURBS.
2.) #3 RE-BAR STIRRUPS TO BE PLACED AT INTERVALS OF 2' (FT) C-C.
3.) #4 RE-BAR LONGITUDINAL SHALL BE TIED TO EACH STIRRUP
4.) MOUNTABLE CURB ONLY ALLOWED ON ≤ 41' (FT), UNDIVIDED, RESIDENTIAL ROADWAYS WITHIN SUBDIVISIONS.

4"x12" MOUNTABLE CONCRETE CURB AND TRANSITION CURB NOTES:

1. 6-INCH CONCRETE CURB TO BE CONSTRUCTED ON ALL ESPLANADES, ISLANDS AND NON-RESIDENTIAL STREETS. RESIDENTIAL STREETS WITH LOT FRONTAGE MAY BE CONSTRUCTED WITH EITHER 6-INCH CONCRETE CURB OR 4-INCH x 12-INCH CONCRETE CURB AS NOTED ON PLANS. 4-INCH X 12-INCH CONCRETE CURB MAY ONLY BE CONSTRUCTED ON THE LOT FRONTAGE ADJCENT TO THE RESIDENTIAL STREET.
2. ALL 4-INCH x 12-INCH CONCRETE CURBS TO BE POURED SEPARATE FROM PROPOSED CONCRETE PAVEMENT.
3. TRANSITIONS FROM 6-INCH CONCRETE CURB TO 4-INCH x 12-INCH CONCRETE CURB TO BE ACCOMPLISHED WITHIN 5 FEET (TYP.), UNLESS OTHERWISE SHOWN. REINFORCING STEEL AS SHOWN IN "4-INCH x 12-INCH TRANSITION CURB" DETAIL IS TO BE INSTALLED.
4. 1.0 LB OF APPROVED FIBER MESH PER C/Y IN ALL NEW CURB.



TYPICAL SINGLE ROADWAY SECTION FOR CONCRETE PAVEMENT WITH 4"X12" CURB

* SEE 4" x 12" MOUNTABLE CURB DETAIL (THIS SHEET)

No.	DATE	REVISION

RESIDENTIAL CURB CONSTRUCTION DETAILS

missouri CITY TEXAS

SEAL: STATE OF TEXAS RON J. DECHERT 96544 LICENSED PROFESSIONAL ENGINEER

DESIGN ENGINEER: _____ DATE 12-8-16

CONSTRUCTION PLANS FOR:

THE GROVE AT RIVERSTONE SECTION ONE

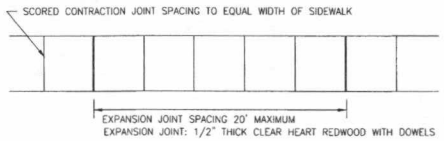
JOB No.:
SCALE: AS NOTED
SUBMITTED:
DATE: FEBRUARY 2015

MC-18-15

SHEET OF

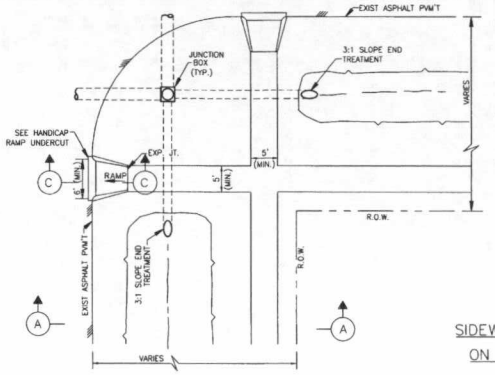
3/30/17

CAD FILE PATH: CADD_FILE_PATH
PLOT DATE: DATE



SIDEWALK JOINT DETAILS

N.T.S.



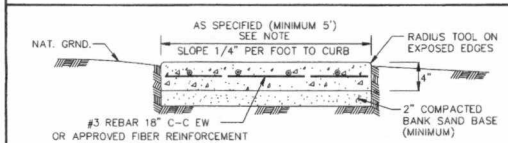
CROSS RAMP SIDEWALK CONNECTION ON OPEN DITCH

NOTES:

1. EXISTING CURB AND GUTTER TO BE SAW CUT, REMOVED AND REPLACED. DOWEL STEEL FOR MINIMUM REINFORCING OVERLAP OF 10 INCHES (10") DOWELS SHALL BE EIGHTEEN INCHES (18") LONG AND EPOXIED A MINIMUM OF (8") EIGHT INCHES INTO EXISTING PAVEMENT.
2. IF SIDEWALKS ARE NEITHER EXISTING NOR PROPOSED WHERE WHEELCHAIR RAMP ACCESS IS REQUIRED, CONCRETE SIDEWALKS SURFACE 4 1/2" THICK SHALL BE INSTALLED TO PROVIDE ACCESS TO THE PEDESTRIAN PUSH BUTTONS.
3. DETECTABLE WARNINGS REQUIRED BY T.A.S. SECTIONS 4.1 AND 4.7 SHALL COMPLY WITH T.A.S. SECTION 4.29
4. THE MATERIAL USED TO PROVIDE CONTRAST SHALL BE AN INTEGRAL PART OF THE WALKING SURFACE. DETECTABLE WARNINGS USED ON INTERIOR SURFACE SHALL DIFFER FROM ADJOINING WALKING SURFACES IN RESILIENCY OR SOUND-ON-CANE.
5. DETECTABLE WARNING SURFACE SHALL COVER THE ENTIRE WIDTH AND 2' FOR THE DEPTH OF THE RAMP.
6. DETECTABLE WARNINGS SHALL BE INSTALLED WITH PAVERS IN ACCORDANCE WITH MANUFACTURER'S REQUIREMENTS.
7. CONCRETE PAVER UNITS SHALL MEET ALL REQUIREMENTS OF ASTM C-936, C-33, AND SHALL BE PLACED IN A TWO BY TWO UNIT BASKET WEAVE PATTERN, UNLESS SHOWN OTHERWISE IN THE PLANS.
8. CONCRETE PAVER UNITS SHALL HAVE A TRUNCATED DOME TOP SURFACE FOR DETECTABLE WARNING TO PEDESTRIANS. DOMES SHALL BE ALIGNED IN THE DIRECTION OF PEDESTRIAN TRAVEL.
9. CONCRETE PAVER UNIT COLOR FOR THE RAMP SHALL BE A CONTRASTING COLOR THAT PROVIDES A LIGHT REFLECTIVE THAT SIGNIFICANTLY CONTRASTS WITH THE ADJACENT SURFACES. ADJACENT SURFACES INCLUDE SIDE FLARES. COLORS OTHER THAN RED-BROWN REQUIRE C.O.M.C. APPROVAL.
10. CONCRETE PAVER UNITS SHALL BE SAW CUT ONLY, AND ANY CUT UNIT SHALL NOT BE LESS THAN 25F A FULL UNIT.

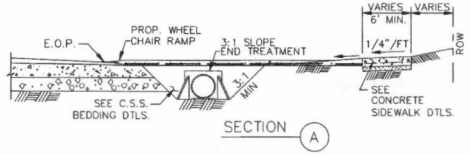
CONSTRUCTION NOTES:

1. THE MAXIMUM WIDTH BETWEEN EXPANSION JOINTS SHALL NOT EXCEED 20'-0"
2. EXPANSION JOINT IS TO BE 1/2" THICK CLEAR HEART REDWOOD WITH DOWELS.
3. SCORED CONTRACTION JOINTS SHALL BE EVERY 5' OR EQUAL TO WIDTH OF SIDEWALK.
4. ALL EARTHEN AREAS ARE TO BE SODDED UNLESS SHOWN OTHERWISE ON DRAWINGS.
5. 6 INCH, 5.5 SACK CEMENT PER CUBIC YARD CONCRETE, 3500 PSI. REINFORCED CONCRETE WITH #3 BARS, 18 INCHES C-C, FOR SIDEWALKS, #4 BARS 18' C-C FOR WHEEL CHAIR RAMPS IS THE MINIMUM ACCEPTED. MINIMUM 3 LONGITUDINAL BARS. FIBER REINFORCING SIDEWALKS-STEEL AND POLYPROPYLENE BLENDED FIBER REINFORCEMENT SYSTEM SUCH AS NOVOMESH #3 AS MANUFACTURED BY S.I. CONCRETE SYSTEMS (OR PRE-APPROVED EQUAL) MAY BE USED AS AN ALTERNATE TO CONVENTIONAL REBAR REINFORCING AT A DOSAGE RATE OF 24 LBS. PER CUBIC YARD OF CONCRETE.
6. USE RADIUS TOOL ON ALL EXPOSED EDGES.
7. TOP OF THE SIDEWALK ELEVATION TO BE TOP OF CURB.
8. MEMBRANE CURING COMPOUND IS REQUIRED AS DESCRIBED IN ITEM 526 IN THE TXDOT STANDARD SPECIFICATIONS FOR CONSTRUCTION.
9. REFER TO GENERAL NOTES AND CONCRETE/PAVING NOTES.
10. SIDEWALK EXPANSION JOINTS SHALL CONFORM TO STREET EXPANSION JOINT STANDARDS.

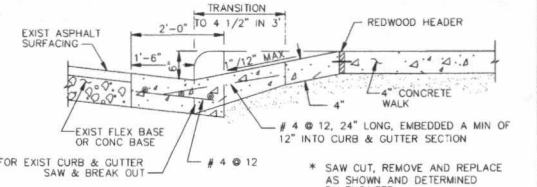


CONCRETE SIDEWALK

NOTE:
BANK SAND IS DEFINED AS A WELL-GRADED SAND, FREE OF SILT, CLAY, LOAM, FRIABLE OR SOLUBLE MATERIALS AND ORGANIC MATTER, MEETING THE UNIFIED SOILS CLASSIFICATION SYSTEM GROUP SYMBOL SW CRITERIA W/ A PLASTICITY INDEX OF < 10, AND NO MORE THAN 12F MATERIAL CAN PASS THE No. 200 SIEVE.

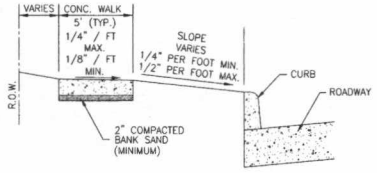


SECTION (A)



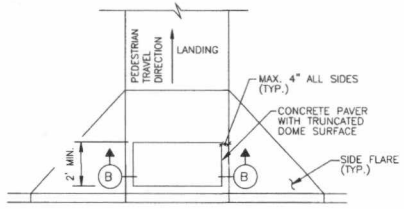
SECTION (C)

HANDICAP RAMP CURB & GUTTER*

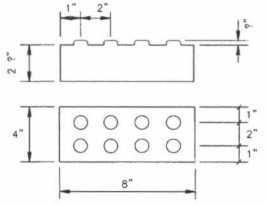


NOTE:
SEE SIDEWALK, CONC/PAVING, AND GENERAL NOTES

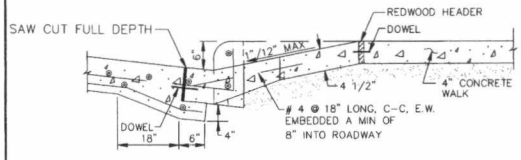
TYPICAL SINGLE ROADWAY SIDEWALK



TRUNCATED DOME PATTERN CURB RAMP

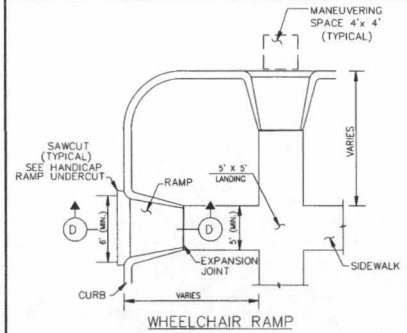


CONCRETE PAVER WITH TRUNCATED DOME SURFACE

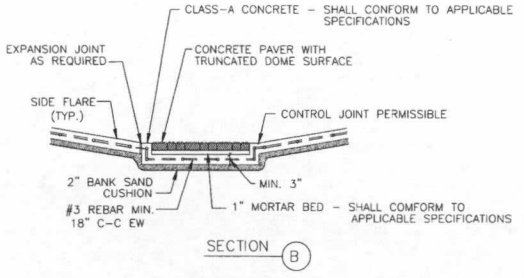


SECTION (D)

HANDICAP RAMP UNDERCUT



WHEELCHAIR RAMP SIDEWALK CONNECTION



SECTION (B)

No.	DATE	REVISION

WHEEL CHAIR RAMP & SIDEWALK DETAILS I

missouri CITY TEXAS

SEAL: STATE OF TEXAS RON J. DECHERT 96544 LICENSED PROFESSIONAL ENGINEER

DESIGN ENGINEER: DATE 12-6-16

CONSTRUCTION PLANS FOR:

THE GROVE AT RIVERSTONE SECTION ONE

JOB No.:
SCALE: AS NOTED
SUBMITTED:
DATE: FEBRUARY 2015

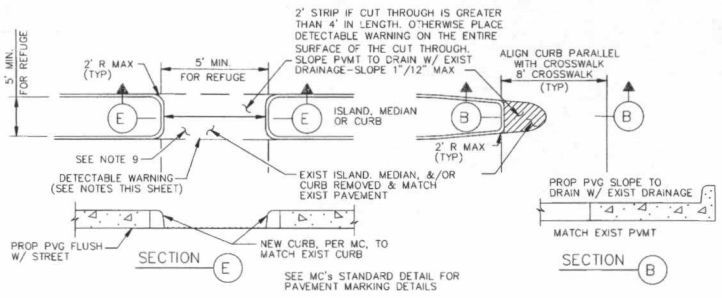
MC-20-15

SHEET OF

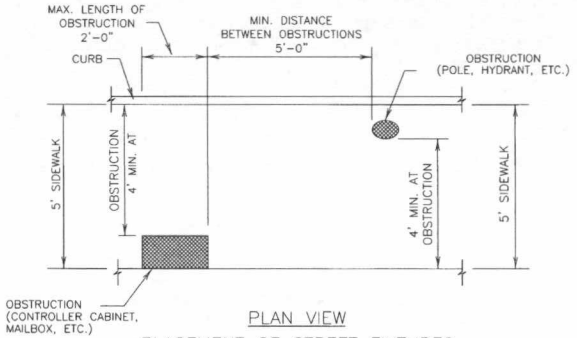
3/30/17

PLOT TIME:

CAD FILE PATH:
PLOT DATE:



FOR ISLAND, MEDIAN, OR CURB MODIFICATIONS FOR CROSSWALKS



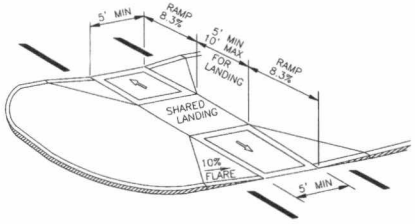
PLAN VIEW

PLACEMENT OF STREET FIXTURES

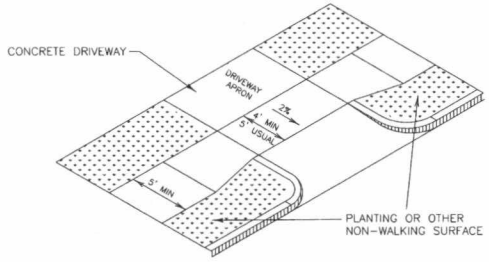
(ITEMS NOT INTENDED FOR PUBLIC USE. MINIMUM 4' x 4' CLEAR GROUND SPACE REQUIRED AT PUBLIC USE FIXTURES.)

NOTES:

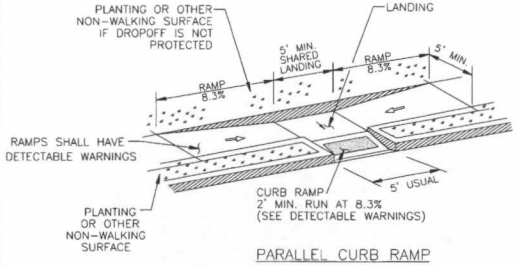
1. ALL SLOPES ARE MAXIMUM ALLOWABLE. THE LEAST POSSIBLE SLOPE THAT WILL STILL DRAIN PROPERLY SHOULD BE USED. RAMP LENGTH OR GRADE OF APPROACH SIDEWALKS MAY BE ADJUSTED AS DIRECTED.
2. THE MINIMUM SIDEWALK WIDTH IS 5' (FEET). THE LANDING SHALL BE 5' x 5' WITH A MAXIMUM SLOPE OF 2% IN ANY DIRECTION. MAXIMUM ALLOWABLE CROSS SLOPE ON SIDEWALK AND RAMP SURFACES IS 2%. USUAL SIDEWALK CROSS SLOPE EQUALS 1.5%. CHANGES IN LEVEL GREATER THAN 1/4" (IN.) ARE NOT PERMITTED.
3. MANEUVERING SPACE AT THE BOTTOM OF CURB RAMPS SHALL BE A MINIMUM OF 5' x 5' WHOLLY CONTAINED WITHIN THE CROSSWALK AND WHOLLY OUTSIDE THE PARALLEL VEHICULAR TRAVEL PATH.
4. ANY PART OF THE ACCESSIBLE ROUTE WITH A SLOPE GREATER THAN 1:20 (5%) SHALL BE CONSIDERED A RAMP. IF A RAMP HAS A RISE GREATER THAN 6" (IN.) OR A HORIZONTAL PROJECTION GREATER THAN 72 INCHES, THEN IT SHALL HAVE HANDRAILS ON BOTH SIDES, WITH THE FOLLOWING EXCEPTIONS:
   A.) HANDRAILS ARE NOT REQUIRED ON CURB RAMPS. CURB RAMPS SHALL BE PROVIDED WHEREVER AN ACCESSIBLE ROUTE CROSSES (PENETRATES) A CURB.
   B.) THE LEAST POSSIBLE GRADE SHOULD BE USED TO MAXIMIZE ACCESSIBILITY. WHERE STRUCTURALLY IMPRACTICAL TO ACHIEVE TEXAS ACCESSIBILITY STANDARDS (TAS) COMPLIANCE, THE RUNNING SLOPE OF SIDEWALKS AND CROSSWALKS, WITHIN THE PUBLIC R.O.W., MAY FOLLOW THE GRADE OF THE PARALLEL ROADWAY WITHOUT INVOKING TEXAS ACCESSIBILITY STANDARDS (TAS) VARIANCES FOR LANDINGS OR HANDRAILS. WHERE A CONTINUOUS GRADE GREATER THAN 5% MUST BE PROVIDED, HANDRAILS MAY BE DESIRABLE ON ONE OR BOTH SIDES OF THE SIDEWALK TO IMPROVE ACCESSIBILITY. HANDRAILS MAY ALSO BE NEEDED TO PROTECT PEDESTRIANS FROM POTENTIALLY HAZARDOUS CONDITIONS.
5. CURB RAMPS WITH RETURNED CURBS MAY BE USED ONLY WHERE PEDESTRIANS WOULD NOT NORMALLY WALK ACROSS THE RAMP. OTHERWISE, FLARED SIDES SHALL BE PROVIDED. ALL CONCRETE SURFACES SHALL RECEIVE A LIGHT BROOM FINISH UNLESS NOTED OTHERWISE IN THE PLANS.
6. RAMP TEXTURES MUST CONSIST OF TRUNCATED DOME SURFACES, IN ACCORDANCE WITH ADA AND TEXAS DEPARTMENT OF LICENSING AND REGULATIONS (TDLR), TEXTURES ARE REQUIRED TO BE DETECTABLE UNDERFOOT. TEXTURES ALSO SHALL CONTRAST VISUALLY WITH ADJOINING SURFACES. SURFACES THAT WOULD ALLOW WATER TO ACCUMULATE ARE PROHIBITED.
7. ADDITIONAL INFORMATION ON CURB RAMP LOCATION, DESIGN, LIGHT REFLECTIVE VALUE AND TEXTURE MAY BE FOUND IN THE CURRENT EDITION OF THE TEXAS ACCESSIBILITY STANDARDS (TAS) PREPARED AND ADMINISTERED BY THE TEXAS DEPARTMENT OF LICENSING AND REGULATION (TDLR).
8. RAISED MEDIANS SEPARATE OPPOSING DIRECTIONS OF TRAFFIC AND PROVIDE A REFUGE AREA FOR PEDESTRIANS UNABLE TO CROSS THE ENTIRE ROADWAY IN THE ALLOTTED SIGNAL PHASE. TO SERVE AS A REFUGE AREA, THE MEDIAN SHALL BE A MINIMUM OF 5' (FT.) WIDE. MEDIANS SHOULD BE DESIGNED TO PROVIDE ACCESSIBLE PASSAGE OVER OR THROUGH THEM.
9. SMALL CHANNELIZATION ISLANDS, WHICH CAN NOT PROVIDE A MINIMUM 5' x 5' LANDING AT THE TOP OF RAMPS, SHALL BE CUT THROUGH LEVEL WITH THE SURFACE OF THE STREET.
10. CROSSWALK DIMENSIONS, CROSSWALK MARKINGS AND STOP BAR LOCATIONS SHALL BE AS SHOWN IN THE PLANS. AT INTERSECTIONS WHERE CROSSWALK MARKINGS ARE NOT REQUIRED, RAMPS SHALL BE ALIGNED WITH THEORETICAL CROSSWALKS, OR AS DIRECTED BY THE ENGINEER.
11. EXISTING FEATURES THAT COMPLY WITH T.A.S. MAY REMAIN IN PLACE UNLESS OTHERWISE SHOWN ON THE PLANS.
12. TRAFFIC SIGNAL OR ILLUMINATION POLES, GROUND BOXES, CONTROLLER BOXES, SIGNS, DRAINAGE FACILITIES AND OTHER ITEMS SHALL BE PLACED SO NOT TO OBSTRUCT THE ACCESSIBLE ROUTE.



CURB RAMPS AT MEDIAN ISLANDS



SIDEWALK TREATMENT AT DRIVEWAYS



PARALLEL CURB RAMP

No.	DATE	REVISION

WHEEL CHAIR RAMP & SIDEWALK DETAILS II

missouri CITY TEXAS

SEAL: STATE OF TEXAS RON J. DECHER 96544 LICENSED PROFESSIONAL ENGINEER

DESIGN ENGINEER: DATE 1-17-17

CONSTRUCTION PLANS FOR:

THE GROVE AT RIVERSTONE SECTION ONE

JOB No.:
SCALE: AS NOTED
SUBMITTED:
DATE: FEBRUARY 2015

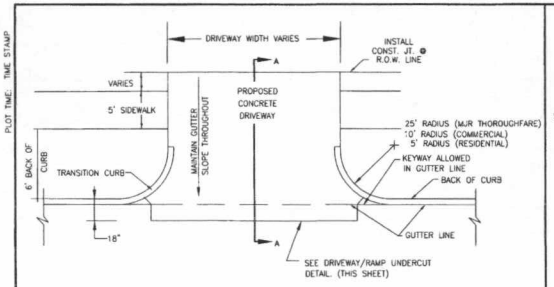
MC-21-15

SHEET OF

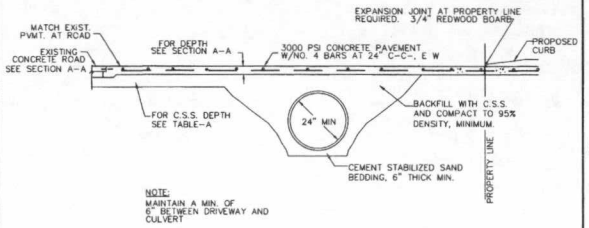
3/30/17

PLOT TIME:

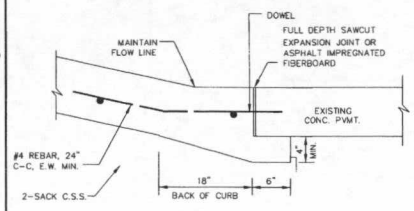
CAD FILE PATH:
PLOT DATE:



6" CONCRETE CURB
DRIVEWAY PLAN
N.T.S.



CONCRETE APRON DETAIL – DRIVEWAY PROFILE
FOR CULVERT DRAINAGE
N.T.S.



DRIVEWAY/RAMP UNDERCUT
N.T.S.

NOTES:

1.) SAW CUT & BREAKOUT NO MORE THAN 72 HOURS PRIOR TO PROPOSED CONCRETE PLACEMENT. NOTIFY MISSOURI CITY PRIOR TO CUT.

2.) UNSTABLE SUBGRADE SHALL BE OVER EXCAVATED & REPLACED WITH CONCRETE.

3.) IT IS CONTRACTOR'S RESPONSIBILITY TO NOTIFY MISSOURI CITY OF ANY BIRD BATH PROBLEMS PRIOR TO CONSTRUCTION OF DRIVEWAY.

4.) USE 1"x2" TREATED STAKES FOR HEADER.

5.) EDGE ALL SIDES WITH EDGING TOOL AND BROOM FINISH

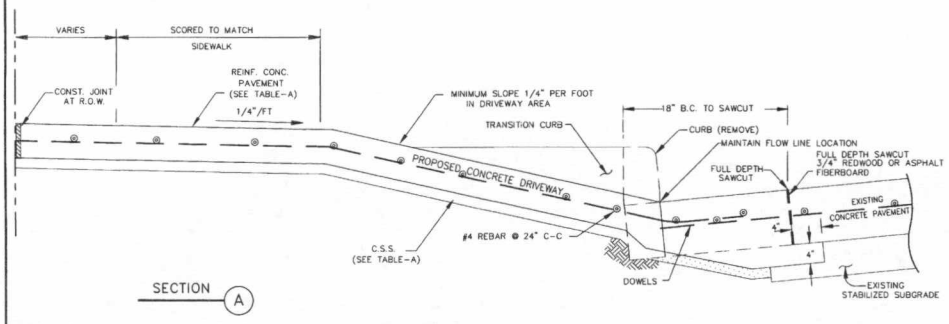
6.) FOR INDUSTRIAL DRIVES, PAVEMENT SHALL HAVE A DEPTH OF 8" (IN).

7.) EXPANSION JOINT AT PROPERTY LINE REQUIRED. 3/4" REDWOOD BOARD WITH No. 4 DOWELS MINIMUM.

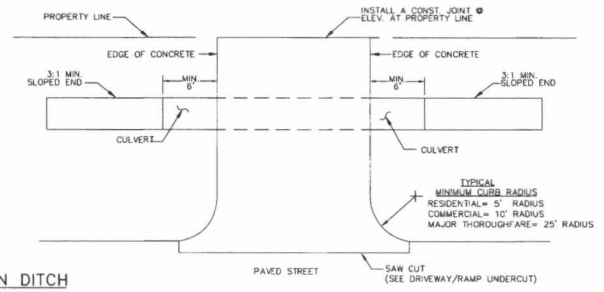
8.) MAXIMUM ALLOWABLE DRIVEWAY GRADE IN PULIC R.O.W. IS 5%

9.) DRIVEWAY GRADE MUST MEET A.D.A AND T.A.S. SIDEWALK SLOPE, SIDEWALKS MUST BE SCORED TO MATCH ADJACENT SIDEWALK. IF SLOPE IS CONTINUED THROUGH THE R.O.W. LINE, PROVIDE A 3/4" REDWOOD EXPANSION JOINT WITH DOWELS AT R.O.W. LINE.

10.) REFER TO GENERAL , C.S.S., ASPHALT, AND CONCRETE PAVEMENT NOTES.



SECTION (A)

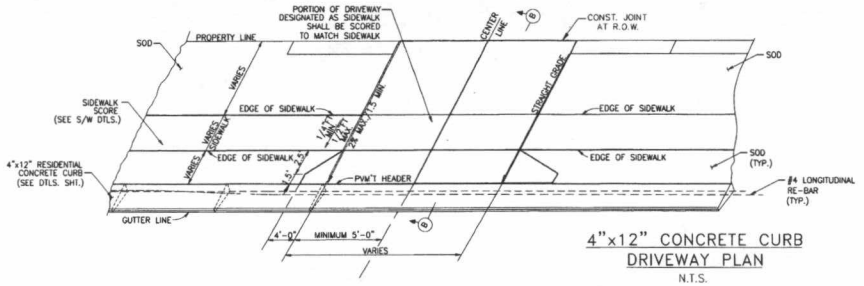


OPEN DITCH
CONCRETE DRIVEWAY PLAN
(USED ONLY WHEN CONNECTING TO A CONCRETE ROADWAY)
N.T.S.

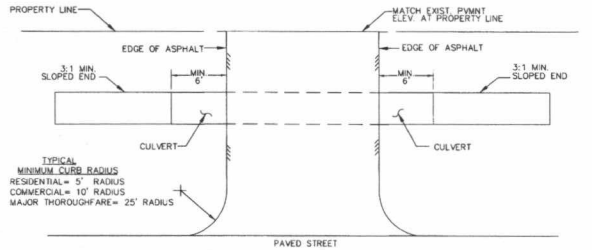
TABLE-A

CEMENT STABILIZED SAND 1 1/2 SK PER TN	
RESIDENTIAL	4" MINIMUM
COMMERCIAL	6" MINIMUM
INDUSTRIAL	8" MINIMUM
REINFORCED CONCRETE PAVEMENT AND APPROACHES 3,000 PSI MIN	
RESIDENTIAL	6" MINIMUM
COMMERCIAL	7" MINIMUM
INDUSTRIAL	8" MINIMUM

DRIVEWAY
PAVEMENT
CONSTRUCTION TABLE



4"x12" CONCRETE CURB
DRIVEWAY PLAN
N.T.S.

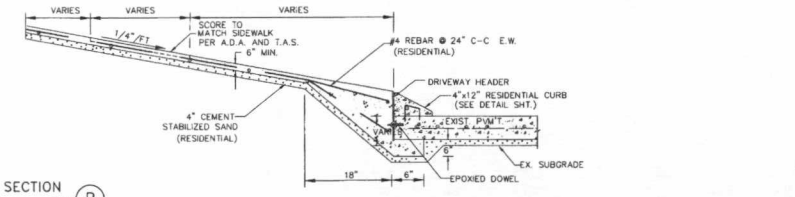


ASPHALT DRIVEWAY PLAN
(USED ONLY WHEN CONNECTING TO AN ASPHALT ROADWAY)
N.T.S.

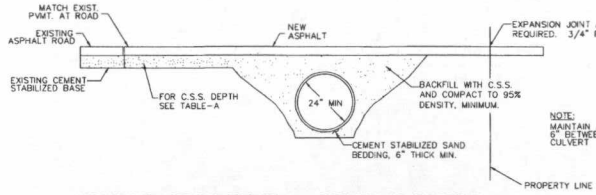
No.	DATE	REVISION

DRIVEWAY
CONSTRUCTION DETAILS

missouri CITY
TEXAS



SECTION (B)



ASPHALT APRON DETAIL – DRIVEWAY PROFILE
FOR CULVERT DRAINAGE
N.T.S.

SEAL:
STATE OF TEXAS
RON J. DECHERT
96544
LICENSED PROFESSIONAL ENGINEER
DATE 12-8-16
DESIGN ENGINEER:

CONSTRUCTION PLANS FOR:

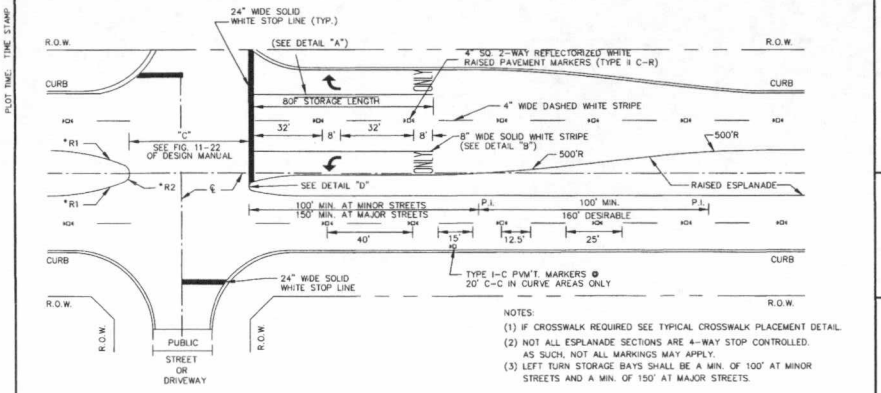
THE GROVE
AT RIVERSTONE
SECTION ONE

JOB No.:
SCALE: AS NOTED
SUBMITTED:
DATE: FEBRUARY 2015

MC-22-15
SHEET OF

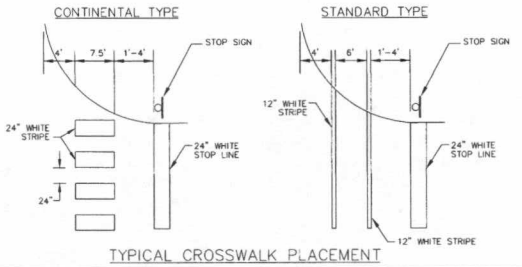
3/30/17

PLOT TIME: TIME STAMP
CAD FILE PATH: CADD_FILE_PATH
PLOT DATE: DATE

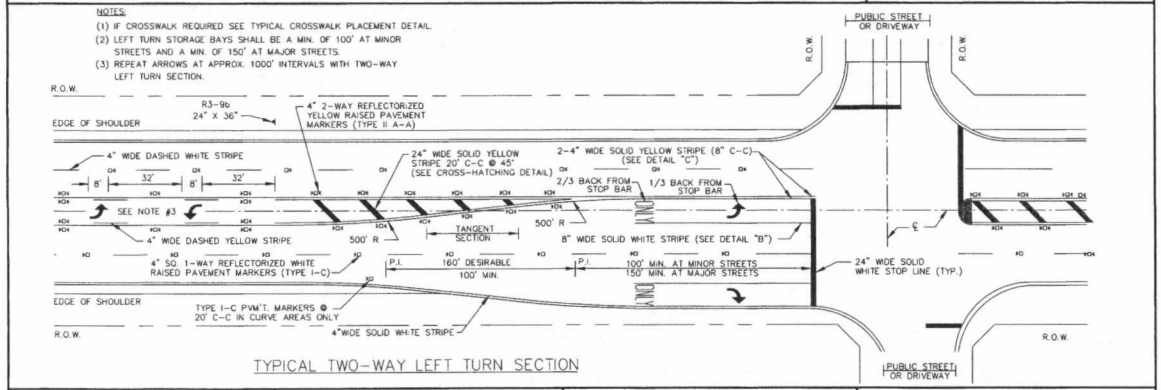


TYPICAL ESPLANADE SECTION

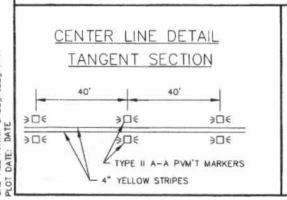
NOTES:
(1) IF CROSSWALK REQUIRED SEE TYPICAL CROSSWALK PLACEMENT DETAIL.
(2) NOT ALL ESPLANADE SECTIONS ARE 4-WAY STOP CONTROLLED. AS SUCH, NOT ALL MARKINGS MAY APPLY.
(3) LEFT TURN STORAGE BAYS SHALL BE A MIN. OF 100' AT MINOR STREETS AND A MIN. OF 150' AT MAJOR STREETS.

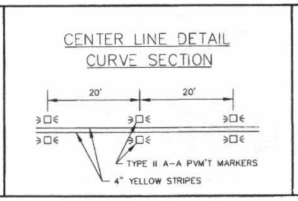


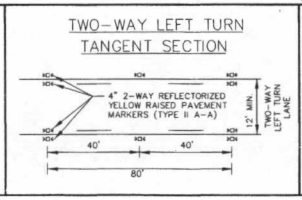
TYPICAL CROSSWALK PLACEMENT

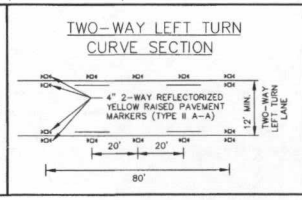


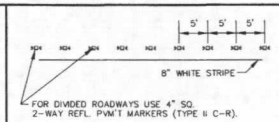
TYPICAL TWO-WAY LEFT TURN SECTION



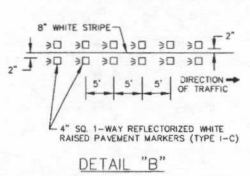




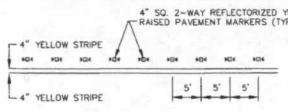




DETAIL "A"



DETAIL "B"



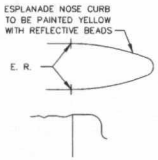
DETAIL "C"

RADIUS DIMENSIONS

ESPLANADE	*R1	*R2
<8'	N/A	W/2
8'-38'	90'	W/5
>38'	N/A	15'

PAVEMENT MARKER LEGEND

SYMBOL	DESCRIPTION
□	4" x 4" REFLECTORIZED RAISED PAVEMENT MARKER
□∈	INDICATES DIRECTION OF TRAFFIC FLOW



TYPICAL CURB SECTION

PAINT FROM THE BACK OF CURB TO THE GUTTER LINE

DETAIL "D"

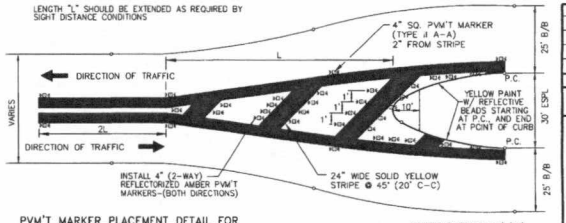
GENERAL NOTES:

1. ALL INTERSECTIONS WHERE A STOP SIGN IS LOCATED SHALL HAVE A STOP BAR. STOP BARS SHALL BE LOCATED WHERE PEDESTRIAN CROSSWALKS ARE PROVIDED, 1'-4" BEHIND CROSSWALKS.
2. STOP BARS SHALL BE 24" WIDE, AND CONSIST OF SOLID WHITE LINES EXTENDING ACROSS APPROACH LANES TO INDICATE THE POINT AT WHICH THE STOP IS INTENDED OR REQUIRED TO BE MADE.
3. ON APPROACH - BEGINNING WITH STOP BAR, INSTALL A 4" WIDE SOLID WHITE LINE FOR 50 FT BACK FROM STOP BAR SKIP 25' AND BEGIN NORMAL LANE LINES.
4. ON EXIT - BEGINNING WITH CROSSWALK, OR 12' FROM CURB LINE OF INTERSECTING STREET, INSTALL A 4" WIDE SOLID WHITE LINE FOR 50 FT. AND BEGIN NORMAL LANE LINE.
5. CROSSWALKS SHALL BE A MINIMUM INSIDE WIDTH OF 5'(FT.). AT LOCATIONS WHERE ADDITIONAL VISIBILITY IS REQUIRED, WHERE TRAFFIC CONTROL DEVICES ARE NOT PRESENT, AND IN SCHOOL ZONES CONTINENTAL CROSSWALKS SHALL BE USED.
6. ALL PAVEMENT MARKINGS AT INTERSECTIONS SHALL BE THERMOPLASTIC IN ACCORDANCE WITH C.O.M.C. APPROVED PRODUCT LIST.
7. PAVEMENT MARKINGS MUST BE SHOWN ON THE APPROVED CONSTRUCTION PLANS. ALL PAVEMENT MARKINGS MUST BE RETRO-REFLECTIVE MATERIAL APPLIED TO THE ROAD SURFACE IN A MOLTEN STATE BY SCREED/EXTRUSION, SUSPENDED EXTRUSION, OR SPRAY MEANS, WITH A SURFACE APPLICATION OF GLASS BEADS.
8. THE COLOR OF RAISED PAVEMENT MARKERS UNDER BOTH DAYLIGHT AND NIGHTTIME CONDITIONS SHALL CONFORM TO THE COLOR OF THE MARKING FOR WHICH THEY SERVE AS A POSITIONING GUIDE OR FOR WHICH THEY SUPPLEMENT OR SUBSTITUTE.
9. ALL TRAFFIC BUTTONS AND MARKERS SHALL BE INSTALLED ADJACENT TO STRIPES (APPROX. 2")
10. ALL BUTTONS SHALL BE INSTALLED WITH AN APPROVED EPOXY.
11. A BLUE REFLECTORIZED BUTTON SET 6" OFF CENTERLINE OF ROADWAY SHALL BE INSTALLED ADJACENT TO ALL FIRE HYDRANTS.
12. PAVEMENT SURFACE AREAS PRIOR TO PLACEMENT OF PAVEMENT MARKINGS, AND/OR RAISED PAVEMENT MARKERS SHALL BE CLEANED IN ACCORDANCE WITH C.O.M.C. STANDARDS. CONCRETE SURFACES SHALL BE CLEANED BY ABRASIVE BLASTING MEDIUM. ASPHALT PAVEMENT SURFACES SHALL BE CLEANED BY BRUSHING, WASHING, COMPRESSED AIR, AND/OR HIGH-PRESSURE WATER. AREAS MUST BE FREE OF CURING MEMBRANCE, DIRT, GREASE, LOOSE AND/OR FLAKING EXISTING MARKERS AND OTHER FORMS OF DEBRIS.
13. ALL ESPLANADE NOSES, AND CURBS IN LEFT TURN BAY'S SHALL BE PAINTED WITH YELLOW REFLECTORIZED PAINT, AND SHALL COMPLY WITH THE TEXAS MANUAL ON UNIFORM TRAFFIC DEVICES, A.D.A., T.A.S., AND C.O.M.C. STANDARDS AND ALL REVISIONS THEREOF.
14. ALL ROADWAYS WITHOUT CURB SHALL HAVE A SOLID 4" WHITE REFLECTORIZED STRIPE 12" INSIDE THE EDGE OF PAVEMENT.
15. WITHIN A TANGENT SECTION THE TYPE I-C PAVEMENT MARKERS CAN BE PLACED AT 40' C-C ON ROADWAYS WITHOUT CURB AND GUTTERS.
16. ALL STREET CROSSINGS SHALL COMPLY WITH T.A.S. AND A.D.A., SEE HANDICAP CROSS DETAIL.
17. ALL PAVEMENT MARKINGS, AND/OR RAISED PAVEMENT MARKERS SHALL COMPLY WITH THE TEXAS MANUAL ON UNIFORM TRAFFIC DEVICES, A.D.A., T.A.S., AND C.O.M.C. STANDARDS AND ALL REVISIONS THEREOF.
18. ALL MARKINGS SHALL HAVE A UNIFORM CROSS-SECTION, AND THE DENSITY AND QUALITY OF THE MARKING'S SHALL BE UNIFORM THROUGHOUT THEIR THICKNESS.
19. PAVEMENT MARKING'S PLACED THAT ARE NOT IN ALIGNMENT OR SEQUENCE, AS SHOWN ON THE PLANS OR STATED IN THE PROJECT SPECIFICATION'S SHALL BE REMOVED AND REPLACED AT THE CONTRACTOR'S EXPENSE.
20. FOR SKEW INTERSECTIONS AND STREET WIDTHS NOT SHOWN, COORDINATE WITH THE C.O.M.C., DEPT. OF PUBLIC WORKS, (281) 403-8570.

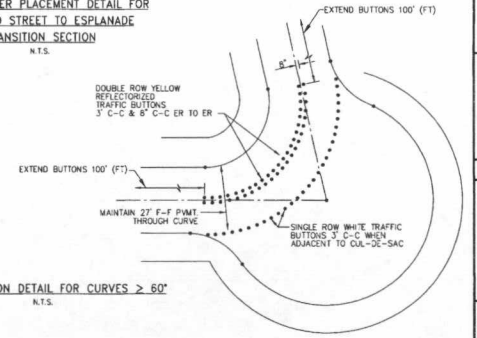
NOTE:
FOR SPEEDS 45 MPH OR MORE L=0.62 WS (L=WS)
FOR SPEEDS LESS THAN 45 MPH L= WS²/155 (L=WS²/60)
S=POSTED, 85TH-PERCENTILE, OR STATUTORY SPEED IN MPH
W= OFFSET DISTANCE IN FEET

MAXIMUM LENGTH OF: L= 100 FT IN URBAN AREAS
L= 200 FT IN RURAL AREAS

LENGTH "L" SHOULD BE EXTENDED AS REQUIRED BY SIGHT DISTANCE CONDITIONS



PVM'T MARKER PLACEMENT DETAIL FOR UNDIVIDED STREET TO ESPLANADE TRANSITION SECTION
N.T.S.



TYPICAL BUTTON DETAIL FOR CURVES > 60°
N.T.S.

No.	DATE	REVISION

PAVEMENT MARKING DETAILS

missouri CITY TEXAS

SEAL: STATE OF TEXAS RON J. DECHERT 96544 LICENSED PROFESSIONAL ENGINEER

DESIGN ENGINEER:

DATE 12-8-16

CONSTRUCTION PLANS FOR:

THE GROVE AT RIVERSTONE SECTION ONE

JOB No.:
SCALE: AS NOTED
SUBMITTED:
DATE: FEBRUARY 2015

MC-24-15
SHEET OF

3/30/17

PLOT TIME: TIME STAMP
CAD FILE PATH: CADD_FILE_PATH
PLOT DATE: DATE

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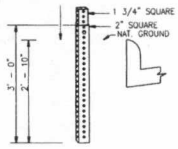
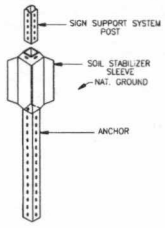
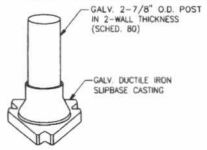
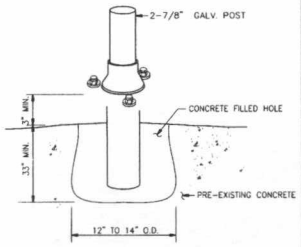


SIGN POST DETAIL
NTS

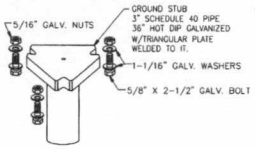


SIGN SUPPORT STABILIZATION ANCHOR SLEEVE



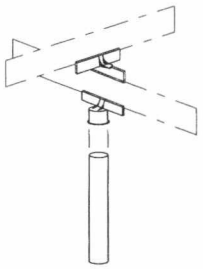


CONCRETE SIGN PEDESTAL
NTS

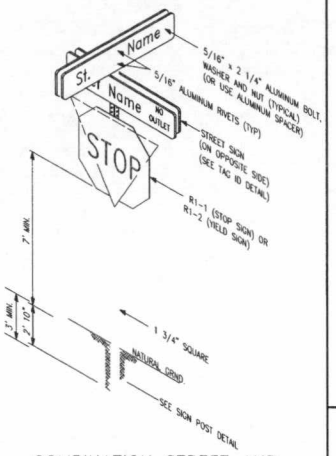


NOTES:
1.) FILL HOLE TO GROUND LEVEL.
2.) PRESS BASE INTO CENTER OF CONCRETE.
3.) LEVEL BASE 3" ABOVE GROUND.
4.) TIGHTEN (TORQUE) NUTS BETWEEN 60 TO 80 FT/LB MAX.

POZ-LOCK SLIPBASE SYSTEM
NTS

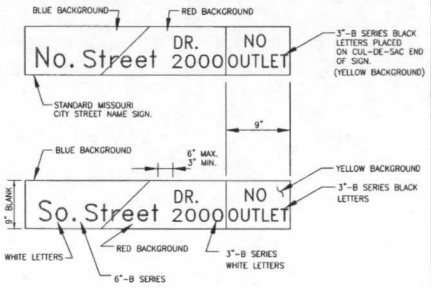


SIGN MOUNTING DETAIL
NTS



COMBINATION STREET AND REGULATORY SIGN
NTS

NOTE:
1.) ALL COMBINATION STREET AND REGULATORY SIGNS SHALL BE LOCATED AS SHOWN IN THE CROSSWALK DETAILS, UNLESS OTHERWISE NOTED.



DETAIL OF STANDARD STREET NAME SIGN

NOTICE TO BE AFFIXED TO THE BACK OF ALL MOCITY STREET SIGNS

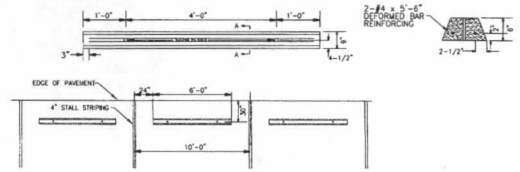
CITY OF MISSOURI CITY
ANY PERSON WHO ATTEMPS TO, OR IN FACT ALTERS, DEFACES, INJURES, KNOCKS, DOWN OR REMOVES ANY OFFICAL TRAFFIC CONTROL DEVICE WILL BE PROSECUTED IN ACCORDANCE TO THE TEXAS CRIMINAL LAWS PENAL CODE SECTION 29.03.

MONTH		YEAR
1 2 3 4 5 6	missouri CITY	9 0 1 2 3 4
7 8 9 10 11 12		0 5 6 7 8 9

SIGN I.D. TAG DETAIL

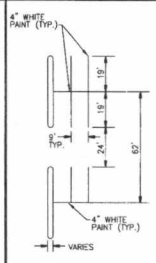
GENERAL CONSTRUCTION NOTES:

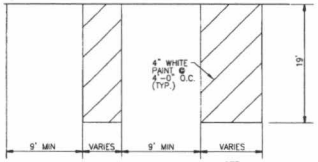
1. SECURELY ATTACH STREET NAME SIGN TO TRAFFIC SIGNAL SUPPORT WIRES WITH MULTI-LEVELING, WIND DUMPING BRACKETS.
2. SUPPORT WIRES SHOULD NOT BE PROHIBITED FROM INDEPENDENT MOVEMENT.
3. INSTALL ONE STREET NAME SIGN APPROXIMATE 2' FROM POLE ABOVE ON-COMING TRAFFIC ON EACH TRAFFIC SIGNAL SPAN.
4. THE FIRST LETTER OF EACH WORD SHALL BE UPPER CASE, SUBSEQUENT LETTERS SHALL BE LOWER CASE, ALL INDIVIDUAL LETTERS FOR EXAMPLE "F.M." SHALL BE UPPER CASE. STREET SUFFIXES & "NO OUTLET" SHALL BE UPPER CASE.
5. ALL SHEETING SHALL BE "DIAMOND GRADE" OR APPROVED EQUAL.
6. USE ANODIZED BLANKS ONLY.
7. MINIMUM SIGN THICKNESS:
   9" SIGNS = .080"
   14" SIGNS = .1875"



NOTE:
SECURE EACH WHEEL STOP TO PAVEMENT WITH TWO #5 BARS DEFORMED 10" IN LENGTH.

CONCRETE WHEEL STOPS



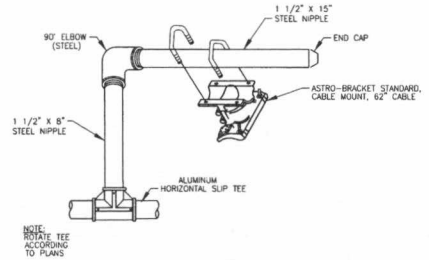


NOTE:
ALL PAVEMENT MARKINGS SHOULD BE TXDOT TYPE II MARKINGS IN ACCORDANCE WITH DMS-8200 "TRAFFIC PAINT"

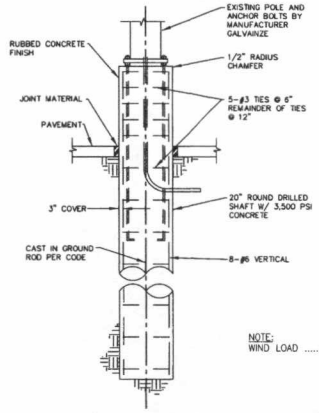
PARKING LOT STRIPING

MAST ARM:

1. 2-EACH ASTRO FOR 4 SECTION AND LARGER TRAFFIC SIGNAL HEADS.



ASTRO BRACKET CABLE MOUNT DETAIL



NOTE:
WIND LOAD ..... PER SECTION 1609 OF THE INTERNATIONAL BUILDING CODE. 110 M.P.H. BASIC WIND SPEED.

LIGHT POLE BASE DETAIL

No.	DATE	REVISION

SIGN CONSTRUCTION DETAILS

missouri CITY TEXAS

SEAL: STATE OF TEXAS — RON J. DECHERT — 96544 — LICENSED PROFESSIONAL ENGINEER

DESIGN ENGINEER: DATE 12-8-16

CONSTRUCTION PLANS FOR:

THE GROVE AT RIVERSTONE SECTION ONE

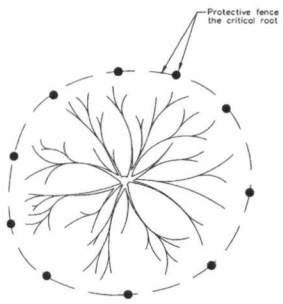
JOB No.:
SCALE: AS NOTED
SUBMITTED:
DATE: FEBRUARY 2015

MC-25-10

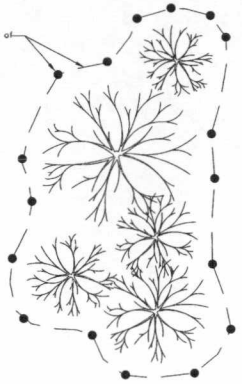
SHEET OF

3/30/17

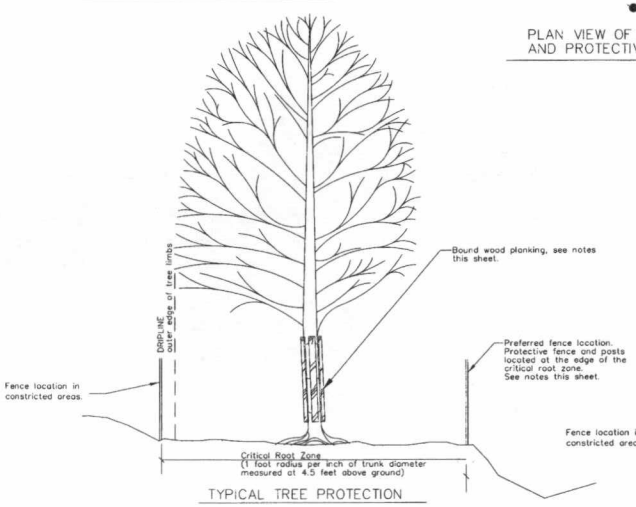
CAD FILE PATH: CADD_FILE_PATH
PLOT DATE: DATE



PLAN VIEW OF INDIVIDUAL TREE AND PROTECTIVE FENCE



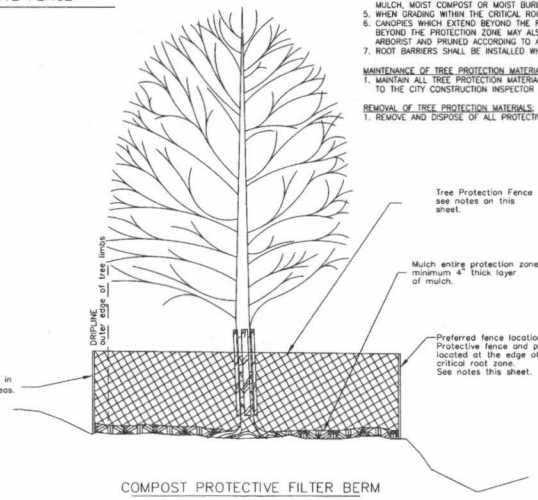
PLAN VIEW OF TREE GROUP AND PROTECTIVE FENCE



TYPICAL TREE PROTECTION

1 TREE PROTECTION

NO SCALE



COMPOST PROTECTIVE FILTER BERM

TREE PROTECTION GENERAL NOTES:

1. PROTECT AND ENSURE THE CONTINUED HEALTH OF EXISTING TREES IDENTIFIED ON THE PLANS OR DIRECTED BY THE CITY OR OTHER INDIVIDUALS DESIGNATED BY THE CITY. PROTECTIVE MEASURES INCLUDE PROVIDING, INSTALLING, MAINTAINING AND REMOVING PROTECTIVE FENCES, BOUND WOODEN PLANKING, COMPOST BERM PRUNING, BORING AND WATERING.
2. IT IS A MATTER OF PRIME IMPORTANCE THAT THE CONTRACTOR PROTECTS EXISTING TREES AND SHRUBS NOT DESIGNATED TO BE REMOVED.
3. ALL TREE PROTECTION MUST BE INSTALLED BEFORE ANY HEAVY EQUIPMENT ARRIVES ON THE SITE AND REMAINS IN PLACE FOR THE DURATION OF THE PROJECT.
4. THE CONTRACTOR IS REQUIRED TO ATTEND A PRE-CONSTRUCTION MEETING WITH THE ENGINEER, CITY PROJECT MANAGER, CITY CONSTRUCTION INSPECTOR AND THE CITY FORESTER TO DETERMINE THE LENGTH AND EXTENT OF PROTECTION THAT WILL BE PERFORMED TO EACH TREE WITHIN THE CONSTRUCTION ZONE. ALL WORK TO BE PERFORMED PER ANSI A300. ALL PRUNING SHALL BE CONDUCTED OR SUPERVISED BY AN INTERNATIONAL SOCIETY ARBORICULTURE (ISA) CERTIFIED ARBORIST.

PROTECTIVE FENCE:

1. CRITICAL ROOT ZONE (CRZ) – 1 FOOT RADIUS PER INCH OF TRUNK DIAMETER AT 4.5 FEET ABOVE THE GROUND
2. PLACE PROTECTIVE FENCE AT THE EDGE OF THE CRZ OF THE TREES TO BE PROTECTED. ALL TREES TO BE PRESERVED WITH A 6-FOOT HIGH CHAIN LINK FENCE OR 4-FOOT HIGH VINYL/PLASTIC MESH FENCE AS DETERMINED AT THE PRE-CONSTRUCTION MEETING. FENCES ARE TO BE MOUNTED ON 2-INCH DIAMETER GALVANIZED IRON POSTS, DRIVEN INTO THE GROUND TO A DEPTH OF AT LEAST 2 FEET AND SPACED NO MORE THAN 10 FEET APART.
3. WHEN A CONSTRUCTION ZONE OVERLAPS THE ROOT ZONE DUE TO A LACK OF SPACE, PLACE FENCE WITHIN 2 FEET OF THE CONSTRUCTION ZONE.
4. INSTALL PROTECTIVE COMPOST FILTER BERM AT THE BASE OF THE PROTECTIVE FENCE A SHOWN IN DETAIL AND DESCRIBED IN THESE NOTES UNDER "ROOT ZONE PROTECTION". CHIPPED HARDWOOD MULCH IS TO BE USED FOR THE ENTIRE PROTECTION ZONE TO A DEPTH OF 4-INCHES.

VEGETATIVE WATERING FOR TREE PROTECTION:

1. WATER TREES AT A RATE OF 10 GALLONS PER INCH OF TRUNK DIAMETER PER WEEK FOR EVERY WEEK DURING CONSTRUCTION ACTIVITIES DURING THE TIME PERIOD APRIL-OCTOBER. WATERING IS INCIDENTAL TO THE PROJECT/TREE PROTECTION.

TRUNK PROTECTION:

1. IF CONSTRUCTION IS REQUIRED WITHIN THE CRZ, BOUND WOOD PLANKING SHALL BE INSTALLED AROUND THE TRUNK OF THE TREE TO A HEIGHT OF 10-FEET OR TO THE HEIGHT OF THE LOWEST MAJOR BRANCH.
2. ROOTS AND BRANCHES EXTENDING PAST THE TREE PROTECTION ZONE, THAT ARE DAMAGED OR EXPOSED AS A RESULT OF CONSTRUCTION ACTIVITY, SHALL BE CAREFULLY AND CLEANLY CUT WIT A HAND SAW OR CHAIN SAW TO PREVENT FURTHER DAMAGE.
3. ALL WOUNDS TO OAK SPECIES MUST BE PAINTED WITHIN 30-MINUTES TO PREVENT OAK WILT INFECTION. USE ASPHALT PAINT FOR WOUND DRESSING. WOUND TREATMENT IS ONLY NECESSARY FEBRUARY THROUGH SEPTEMBER.
4. WHERE ROOTS MUST BE CUT WITHIN THE CRZ, THE FOLLOWING APPLIES:
A. ROOTS SHOULD BE BENT AND RELOCATED, IF AT ALL POSSIBLE.
B. ROOT CUTS SHOULD BE MADE BY HAND SAW OR CHAIN SAW. HEAVY EQUIPMENT WILL NOT BE USED TO PRUNE OR RELOCATE ROOTS. CLEAN CUTS WILL BE MADE TO LIMIT THE AMOUNT OF OPEN SURFACE WOUNDS AND HORIZONTAL TEARING.
C. ASPHALT PAINT SHALL BE APPLIED DIRECTLY TO THE CUT SURFACE WITHIN 30-MINUTES OF PRUNING.
D. BACKFILL ROOT AREAS WITH GOOD QUALITY TOPSOIL AS SOON AS POSSIBLE. IF EXPOSED ROOT AREAS ARE EXPOSED FOR LONGER THAN 12-HOURS, THEN COVER EXPOSED ROOTS WITH AT LEAST 4-INCHES OF MOIST MULCH, MOIST COMPOST OR MOIST BURLAP. THE ROOT AREA MUST REMAIN MOIST UNTIL TOPSOIL IS REPLACED.

BORING, TRENCHING, GRADING AND PRUNING

1. WHERE BORING IS REQUIRED FOR UNDERGROUND UTILITIES UNDER PROTECTED AREAS THIS WILL REQUIRE ALL BORING TO TAKE PLACE BENEATH THE CRZ.
2. NO EXCAVATION, GRADING, FILLING, SOIL COMPACTION, PARKING OR EQUIPMENT STORAGE IS ALLOWED WITHIN THE CRZ UNLESS IDENTIFIED IN THE PLANS AND APPROVED BY THE ENGINEER AND CITY FORESTER.
3. WHEN EXISTING GRADE MUST BE CUT WITHIN THE CRZ, CONTACT THE ENGINEER PRIOR TO BEGINNING WORK. BEFORE GRADING OR EXCAVATION WORK, SAW CUT ROOTS TO THE DEPTH OF THE PROPOSED DISTURBANCE ALONG THE EDGE OF THE PROPOSED DISTURBANCE BEFORE EXCAVATION IS STARTED.
4. BACKFILL ROOT AREAS WITH GOOD QUALITY TOPSOIL AS SOON AS POSSIBLE. IF EXPOSED ROOT AREAS ARE EXPOSED FOR LONGER THAN 12 HOURS, THEN COVER EXPOSED ROOTS WITH AT LEAST 4-INCHES OF MOIST MULCH, MOIST COMPOST OR MOIST BURLAP. COVER MATERIAL SHALL BE KEPT MOIST UNTIL TOPSOIL IS REPLACED.
5. WHEN GRADING WITHIN THE CRITICAL ROOT ZONE, USE HAND OR SMALL EQUIPMENT AND ALTER GRADE NO MORE THAN TWO INCHES. NO SOIL DISTURBANCE IS ALLOWED ON THE ROOT FLARE UNDER ANY CIRCUMSTANCES.
6. CANOPIES WHICH EXTEND BEYOND THE ROOT PROTECTION ZONE MAY BE PRUNED TO REMOVE DEAD OR CONFLICTING BRANCHES THAT POSE A RISK TO WORKERS, PEDESTRIAN, OR STRUCTURE SAFETY. BRANCHES EXTENDING BEYOND THE PROTECTION ZONE MAY ALSO BE RAISED TO A HEIGHT OF 13-FEET TO AVOID VEHICLES OR PEDESTRIAN CONFLICT. ALL PRUNING SHALL BE CONDUCTED BY INTERNATIONAL SOCIETY OF ARBORICULTURE CERTIFIED ARBORIST AND PRUNED ACCORDING TO ANSI A300 STANDARDS.
7. ROOT BARRIERS SHALL BE INSTALLED WHEN REQUIRED BY THE GUIDELINES ESTABLISHED IN CHAPTER 13 OF THE CITY INFRASTRUCTURE DESIGN MANUAL.

MAINTENANCE OF TREE PROTECTION MATERIALS:

1. MAINTAIN ALL TREE PROTECTION MATERIALS THROUGHOUT ENTIRE LENGTH OF PROJECT. REPAIR DAMAGE OR AFFECTED TREE PROTECTION MATERIALS. TREE PROTECTION MATERIALS SHALL BE INSPECTED AND STATUS REPORTED TO THE CITY CONSTRUCTION INSPECTOR WEEKLY.

REMOVAL OF TREE PROTECTION MATERIALS:

1. REMOVE AND DISPOSE OF ALL PROTECTIVE FENCING AND TRUNK PROTECTION AT THE END OF THE PROJECT.

No.	DATE	REVISION

TREE PROTECTION PLAN

missouri CITY TEXAS

SEAL:

STATE OF TEXAS
RON J. DECHERT
96544
LICENSED
PROFESSIONAL ENGINEER

DESIGN ENGINEER: _____ DATE 12-8-16

CONSTRUCTION PLANS FOR:

THE GROVE AT RIVERSTONE SECTION ONE

JOB No.:

SCALE: AS NOTED

SUBMITTED:

DATE: FEBRUARY 2015

MC-26-15

SHEET OF

3/30/17

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