REVIEW BY FORT BEND COUNTY COMMISSIONERS COURT

On this 5th day of July, 2016, Commissioners Court came on to be heard and reviewed the accompanying notice
of LECON, Inc.
Job Location 1231 Plantation Dr. , Richmond, TX 77406
Date 6/24/2016 Bond No. 6381897, Permit No. 2016-7959 to make use of certain Fort Bend County property subject to, "A Revised 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 the 3rd day of August, 1987, recorded in Volume _____ of the Minutes of the Commissioners Court of Fort Bend County, Texas, to the extent that such order is not inconsistent with Article 1436a, Vernon's Texas Civil Statutes. 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.

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

    Mail notices to: Permit Administrator
    Fort Bend County Engineering
    301 Jackson Street
    Richmond, Texas 77469
    281-633-7500
3. This permit expires one (1) year from date of permit if construction has not commenced.

By: Charles O. Dy
for County Engineer

By: Mark Vogler
Drainage District Engineer/Manager

Presented to Commissioners Court and approved.
Recorded in Volume
7/5/16 111
Minutes of Commissioners Court

Clerk of Commissioners Court

By: _____
Deputy RENEE MICHULKA

County of Fort Bend

Engineering Department

301 Jackson Street
Richmond, Texas 77469

Johnny Ortega
Permit Administrator

Phone: (281) 633-7500

Permit Application Review Form For
Cable, Conduit, and Pole Line Activity
In Fort Bend County

Permit No. 2016-7959

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.

X (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

X (2) Bond:

District Attorney, approval when applicable.

X Perpetual bond currently posted.

No: 6381897

Amount: $50,000.00

Performance bond submitted.

No:

Amount:

Cashier's Check

No:

Amount:

(3) Verbal permission given for emergencies, to start construction before approved in Commissioner's Court.

Precinct Engineer Acknowledgment — Date

Precinct Commissioner Acknowledgment — Date

(4)

X Drainage District Approval when applicable

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

Johnny Ortega CFM

Johnny Ortega CFM/Permit Administrator

6/24/2016

Date

2016-7959

CONFORMED CONSTRUCTION SET

CONSTRUCTION

OF

PECAN GROVE PLANTATION 4 & 5 DRAINAGE IMPROVEMENTS

FOR

PECAN GROVE MUNICIPAL UTILITY DISTRICT

FORT BEND COUNTY, TEXAS

INDEX OF DRAWINGS

NOTES:

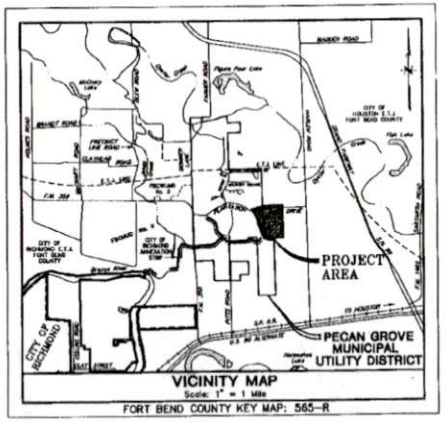
These plans were prepared to meet or exceed the specifications and requirements of City of Richmond and Fort Bend County as currently amended.

Approval by Fort Bend County will be deemed void if construction has not begun within one year of approval date.

Construction shall not begin before the plat of this section is filed in the Fort Bend County Map Records.

Construction will be monitored under the supervision of a licensed professional engineer of JONES & CARTER, INC.

Contractor shall notify the Fort Bend County Engineering Department at least 48 hours prior to commencement at construction@fortbendcountytx.gov.



VICINITY MAP
Scale: 1" = 1 Mile

FORT BEND COUNTY KEY MAP: 565-R

I, Stephen C. Reiter, a Professional Engineer licensed in the State of Texas do hereby certify that these plans were prepared under my supervision to meet or exceed the specifications and requirements of Fort Bend County, Texas.

Stephen C. Reiter, P.E. — 12/9/2014 Date

STATE OF TEXAS — STEPHEN C. REITER — 92546 — LICENSED PROFESSIONAL ENGINEER

DIG-TESS NOTIFICATION SYSTEM
CALL BEFORE YOU DIG!!!
www.digtess.org/
Texas811 or 1-800-JIG-TESS
1-800-344-8377

FORT BEND COUNTY ENGINEER

ENGINEER: _____ RICHARD W. STOLLIG, P.E.

DATE: 2/12/15

THESE SIGNATURES ARE VOID IF CONSTRUCTION HAS NOT COMMENCED IN ONE (1) YEAR FROM DATE OF APPROVAL.

APPROVED: _____ DEVELOPMENT COORDINATOR

DATE: 2/19/15

CITY OF RICHMOND, TEXAS
Department of Public Works

Terri Vela, City Manager — 12/23/14 DATE

Kelly R. Kaluza, P.E., City Engineer — 12/22/14 DATE

Approval Void One Year From Date Signed If Construction Has Not Begun.

DECEMBER 2014
JC JOB No. 00034-0367-01

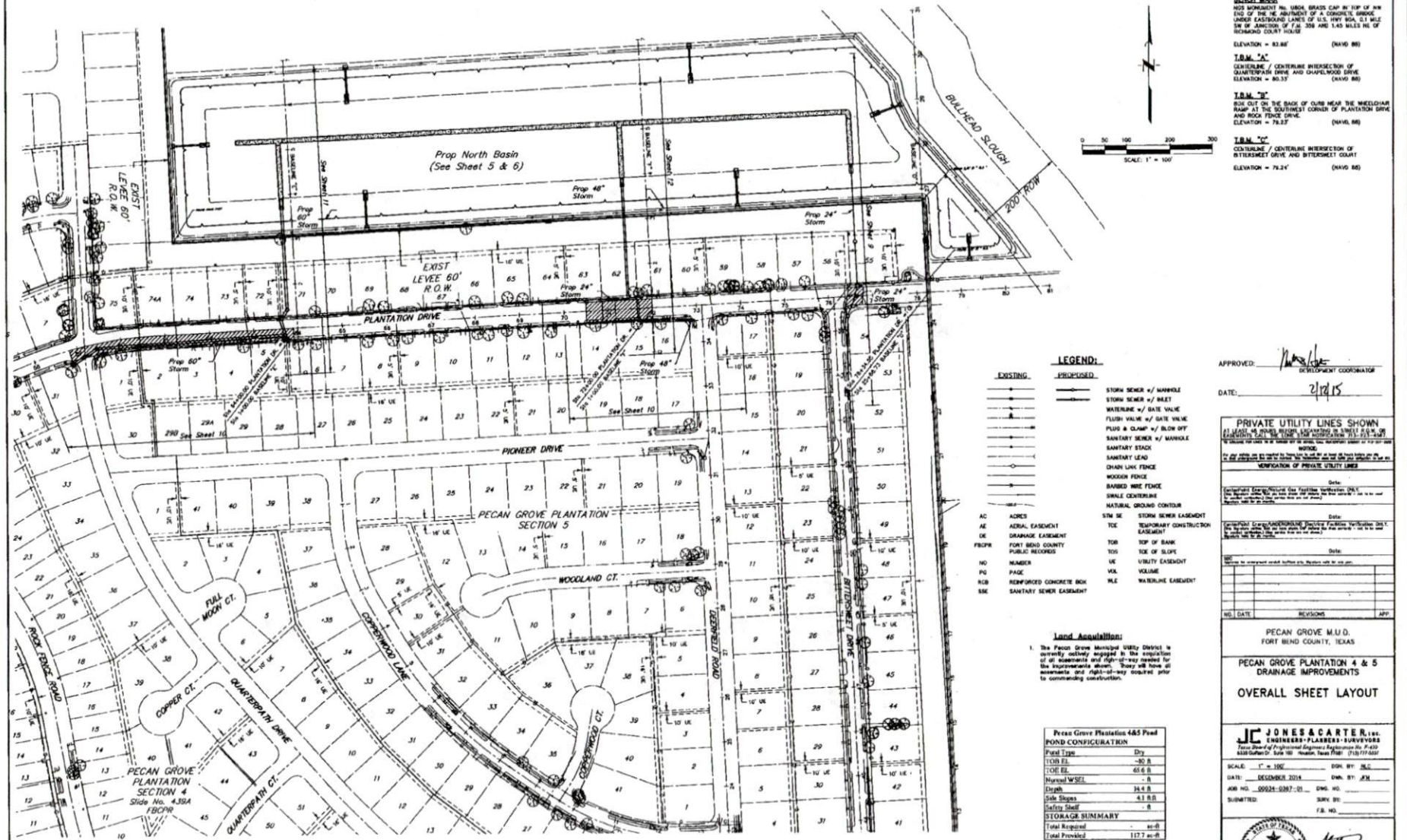
JONES & CARTER, INC.
ENGINEERS • PLANNERS • SURVEYORS
Texas Board of Professional Engineers Registration No. F-439
6335 Gulfton Dr., Suite 100 Houston, Texas 77081 (713) 777-5337

PECAN GROVE MUNICIPAL UTILITY DISTRICT ENGINEER — 12-11-14 DATE
SIGNATURE VALID FOR ONE (1) YEAR

PECAN GROVE M.U.D. – PECAN GROVE PLANTATION 4 & 5 DRAINAGE IMPROVEMENTS

JONES & CARTER, INC. ENGINEERS-PLANNERS-SURVEYORS

SHEET No. 1 OF 28



BENCH MARK

NGS MONUMENT No. U804, BRASS CAP IN TOP OF NW END OF THE NE ABUTMENT OF A CONCRETE BRIDGE UNDER EASTBOUND LANES OF U.S. HWY 90A, 0.1 MILE SW OF JUNCTION OF F.M. 359 AND 1.45 MILES NE OF RICHMOND COURT HOUSE

ELEVATION = 83.86' (NAVD 88)

T.B.M. "A"

CENTERLINE / CENTERLINE INTERSECTION OF QUARTERPATH DRIVE AND CHAPELWOOD DRIVE
ELEVATION = 80.33' (NAVD 88)

T.B.M. "B"

BOX CUT ON THE BACK OF CURB NEAR THE WHEELCHAIR RAMP AT THE SOUTHWEST CORNER OF PLANTATION DRIVE AND ROCK FENCE DRIVE.
ELEVATION = 79.23' (NAVD 88)

T.B.M. "C"

CENTERLINE / CENTERLINE INTERSECTION OF BITTERSWEET DRIVE AND BITTERSWEET COURT
ELEVATION = 79.24' (NAVD 88)

0 50 100 200 300
SCALE: 1" = 100'

LEGEND:

EXISTING	PROPOSED	
		STORM SEWER w/ MANHOLE
		STORM SEWER w/ INLET
		WATERLINE w/ GATE VALVE
		FLUSH VALVE w/ GATE VALVE
		PLUG & CLAMP w/ BLOW OFF
		SANITARY SEWER w/ MANHOLE
		SANITARY STACK
		SANITARY LEAD
		CHAIN LINK FENCE
		WOODEN FENCE
		BARBED WIRE FENCE
		SWALE CENTERLINE
		NATURAL GROUND CONTOUR

AC	ACRES	STM SE	STORM SEWER EASEMENT
AE	AERIAL EASEMENT	TCE	TEMPORARY CONSTRUCTION EASEMENT
DE	DRAINAGE EASEMENT	TOB	TOP OF BANK
FBCPR	FORT BEND COUNTY PUBLIC RECORDS	TOS	TOE OF SLOPE
NO	NUMBER	UE	UTILITY EASEMENT
PG	PAGE	VOL	VOLUME
RCB	REINFORCED CONCRETE BOX	WLE	WATERLINE EASEMENT
SSE	SANITARY SEWER EASEMENT		

Land Acquisition:

1. The Pecan Grove Municipal Utility District is currently actively engaged in the acquisition of all easements and right-of-way needed for the improvements shown. Those will have all easements and right-of-way acquired prior to commencing construction.

Pecan Grove Plantation 4&5 Pond	
POND CONFIGURATION	
Pond Type	Dry
TOB El.	-30 ft
TOE El.	65.6 ft
Normal WSEL	- ft
Depth	34.4 ft
Side Slopes	4:1 ft:ft
Safety Shelf	- ft
STORAGE SUMMARY	
Total Required	- ac-ft
Total Provided	117.7 ac-ft

APPROVED: _____ DEVELOPMENT COORDINATOR

DATE: 2/12/15

PRIVATE UTILITY LINES SHOWN

AT LEAST 48 HOURS PRIOR TO EXCAVATING IN STREET R.O.W. OR EASEMENTS, CALL "ONE CALL" FOR NOTIFICATION 713-223-4567

NOTICE!

VERIFICATION OF PRIVATE UTILITY LINES

Date:

CenterPoint Energy/Natural Gas Facilities Verification ONLY

Date:

CenterPoint Energy/ANDERSONLINE Electric Facilities Verification ONLY

Date:

NO.	DATE	REVISIONS	APP.

PECAN GROVE M.U.D.
FORT BEND COUNTY, TEXAS

PECAN GROVE PLANTATION 4 & 5
DRAINAGE IMPROVEMENTS

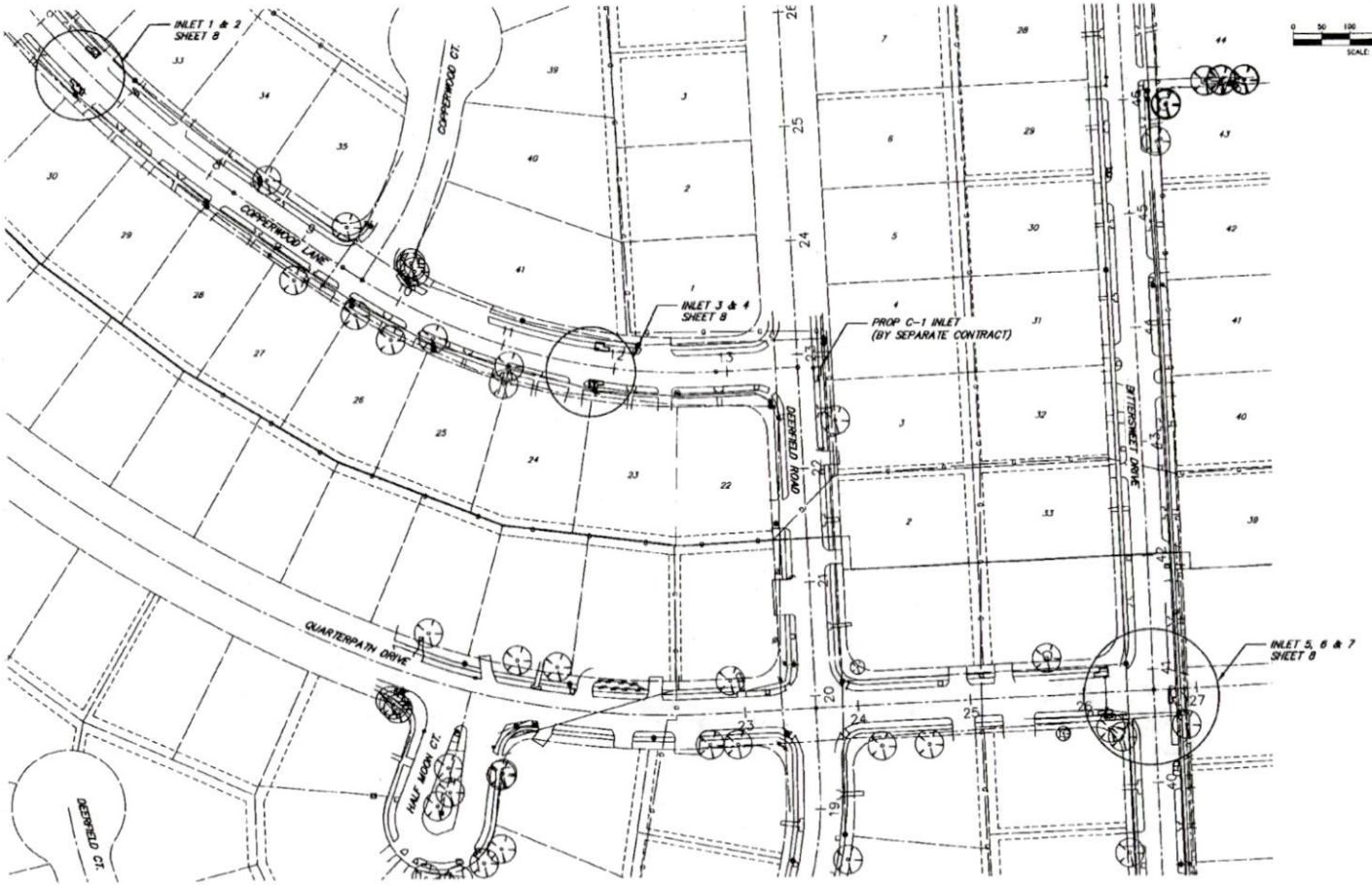
OVERALL SHEET LAYOUT

JONES & CARTER, Inc.
ENGINEERS • PLANNERS • SURVEYORS
Texas Board of Professional Engineers Registration No. F-439
6330 Gulfton Dr. Suite 100 Houston, Texas 77081 (713) 777-5337

SCALE: 1" = 100' DSN. BY: MLC
DATE: DECEMBER 2014 DWN. BY: JFH
JOB NO. 00034-0367-01 DWG. NO. _____
SUBMITTED: SURV. BY: _____
F.B. NO. _____

STATE OF TEXAS
STEPHEN C. REITER
100348
LICENSED
PROFESSIONAL ENGINEER
10/10/2014

SHEET NO.
2
OF 26



0 50 100 200 300
SCALE: 1" = 100'

BENCH MARK

NGS MONUMENT No. UB06, BRASS CAP IN TOP OF NW END OF THE NE ABUTMENT OF A CONCRETE BRIDGE UNDER EASTBOUND LANES OF U.S. HWY 90A, 0.1 MILE SW OF JUNCTION OF F.M. 359 AND 1.45 MILES NE OF RICHMOND COURT HOUSE.

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ELEVATION = 79.24' (NAVD 88)

APPROVED: _____ DEVELOPMENT COORDINATOR

DATE: 2/12/15

PRIVATE UTILITY LINES SHOWN

AT LEAST 48 HOURS BEFORE EXCAVATING IN STREET R.O.W. OR EASEMENTS CALL THE LONE STAR NOTIFICATION 713-223-4567

NOTICE!

VERIFICATION OF PRIVATE UTILITY LINES

Date:

Date:

Date:

NO.	DATE	REVISIONS	APP.

PECAN GROVE M.U.D.
FORT BEND COUNTY, TEXAS

PECAN GROVE PLANTATION 4 & 5
DRAINAGE IMPROVEMENTS

COPPERWOOD LANE & BITTERSWEET INLET OVERALL PLAN

JONES & CARTER, INC.
ENGINEERS • PLANNERS • SURVEYORS
Texas Board of Professional Engineers Registration No. F-439
5330 Griffin Dr., Suite 100 · Houston, Texas 77081 · (713) 777-5337

SCALE: 1"=50' DGN. BY: BLC
DATE: DECEMBER 2014 DWN. BY: AW
JOB NO. 00034-0367-01 DWG. NO:
SUBMITTED: SURV. BY:
F.B. NO.

STATE OF TEXAS
STEPHEN C. FEITER
102348
LICENSED
PROFESSIONAL ENGINEER

12/11/2014

SHEET NO.
3
OF 26

GENERAL NOTES

G-1. THE CONTRACTOR SHALL NOTIFY CITY OF RICHMOND (REFERRED TO AS THE "CITY") DIRECTOR OF PUBLIC WORKS AT LEAST 48 HOURS PRIOR TO COMMENCEMENT OF WORK AT (281) 342-0509. CONTRACTOR SHALL ATTEND A PRECONSTRUCTION MEETING WITH CITY AND THE PROJECT ENGINEER PRIOR TO INITIATING CONSTRUCTION. PRECONSTRUCTION MEETINGS SHALL BE HELD AT 600 MORTON STREET OR AT A LOCATION APPROVED BY THE DIRECTOR OF PUBLIC WORKS.

G-2. ALL PUBLIC INFRASTRUCTURE SHALL BE INSPECTED BY PUBLIC WORKS INSPECTOR(S) OR AUTHORIZED AGENT(S). THE CONTRACTOR SHALL GIVE 24-HOUR ADVANCE NOTIFICATION TO THE PUBLIC WORKS DEPARTMENT FOR INSPECTION OF WORK. COMPLETED WORK SHALL NOT BE BACKFILLED WITHOUT APPROVAL OF THE CITY.

G-3. CONTRACTOR MUST OBTAIN ALL PERMITS AND SUPPLY ALL BONDS REQUIRED BY THE CITY, PRIOR TO BEGINNING CONSTRUCTION.

G-4. UPON COMPLETION OF A PROJECT, THE CONTRACTOR AND/OR PROJECT ENGINEER SHALL PROVIDE THE DIRECTOR OF PUBLIC WORKS AND CITY ENGINEER DETAILED, "RECORD DRAWINGS" IN REPRODUCTIVE AND ELECTRONIC FORMAT.

G-5. THE CONTRACTOR SHALL FURNISH ALL MATERIALS, EQUIPMENT AND LABOR FOR EXCAVATION, INSTALLATION AND BACKFILLING OF WATER, SANITARY AND STORM SEWER LINES AND RELATED APPURTENANCES AS SHOWN ON THE PLANS AND/OR DESCRIBED IN THE SPECIFICATIONS.

G-6. ALL MATERIALS AND WORKMANSHIP SHALL CONFORM TO THE TEXAS DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS (2004) AND REVISIONS THERETO.

G-7. ALL WORK PERFORMED SHALL COMPLY WITH CURRENT NATIONAL SPECIFICATIONS AND STANDARD PRACTICES, APPROVED PROJECT PLANS AND SPECIFICATIONS AND ALL APPLICABLE CITY STANDARDS, CODES AND ORDINANCES.

G-8. ALL CONSTRUCTION TRAFFIC CONTROL IN THE PROJECT AREA SHALL MEET THE REQUIREMENTS OF THE TEXAS MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES AND SHALL BE APPROVED BY THE CITY FOR ALL PROJECTS WITHIN THE CITY LIMITS.

G-9. CONTRACTOR SHALL NOTIFY ALL UTILITY COMPANIES IN THE AREA PRIOR TO COMMENCING WORK IN ANY RIGHT-OF-WAY OR EXISTING EASEMENT. A VERIFICATION NUMBER FROM THE ONE-CALL UTILITY COORDINATING COMMITTEE IS REQUIRED.

G-10. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE LOCATIONS OF ALL EXISTING UTILITIES PRIOR TO EXCAVATION AND UNCOVER EXISTING UTILITIES AT ALL "POINTS OF CROSSING" TO DETERMINE IF CONFLICTS EXIST PRIOR TO COMMENCING ANY CONSTRUCTION. NOTIFY THE PROJECT ENGINEER, CITY ENGINEER AND DIRECTOR OF PUBLIC WORKS IMMEDIATELY OF ANY CONFLICT.

G-11. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO LOCATE SUCH UNDERGROUND FEATURES SUFFICIENTLY IN ADVANCE OF OPERATIONS TO PRECLUDE DAMAGE IN THE EVENT THAT UNDERGROUND FACILITIES NOT SHOWN ON THE DRAWINGS ARE ENCOUNTERED.

G-12. IN THE EVENT OF DAMAGE TO UNDERGROUND FACILITIES, WHETHER OR NOT IT IS SHOWN ON THE DRAWINGS, THE CONTRACTOR SHALL MAKE THE NECESSARY REPAIRS TO REPLACE THE FACILITY BACK IN SERVICE. ALL SUCH REPAIRS SHALL CONFORM TO THE REQUIREMENTS OF THE OWNER OF THE FACILITY.

G-13. THE CONTRACTOR SHALL PROVIDE SHEETING, SHORING AND BRACING NECESSARY TO PROTECT WORKMEN AND EXISTING UTILITIES DURING ALL PHASES OF CONSTRUCTION AS MAY BE REQUIRED BY O.S.H.A, FEDERAL, STATE AND LOCAL LAWS, CODES AND ORDINANCES.

G-14. CONTRACTOR SHALL COVER OPEN EXCAVATIONS WITH ANCHORED STEEL PLATES DURING NON-WORKING HOURS ALONG EXISTING ROADWAYS AND WITHIN TRAFFIC AREAS.

G-15. ALL TESTING FOR THIS PROJECT SHALL CONFORM TO THE CITY REQUIREMENTS. SHOULD ANY TEST RESULTS NOT MEET THE TESTING REQUIREMENTS, IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO REMOVE OR REPLACE SUCH MATERIALS AND INSTALLATIONS, SO THAT THE TESTING REQUIREMENTS ARE MET.

G-16. THE LOADING, UNLOADING AND HANDLING OF ALL PIPE, VALVES, HYDRANTS, FITTINGS, MANHOLES AND OTHER MATERIALS SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDED PRACTICES AND SHALL BE PERFORMED WITH CARE TO AVOID ANY DAMAGE TO THE MATERIALS. THE CONTRACTOR SHALL LOCATE AND PROVIDE THE NECESSARY STORAGE AREAS FOR MATERIALS AND EQUIPMENT.

G-17. THE CONTRACTOR SHALL BE RESPONSIBLE FOR SAFEGUARDING AND PROTECTING ALL MATERIAL AND EQUIPMENT STORED ON THE JOB SITE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE STORAGE OF MATERIALS IN A SAFE AND WORKMANLIKE MANNER TO PREVENT INJURIES, DURING AND AFTER WORKING HOURS, UNTIL PROJECT COMPLETION.

G-18. THE CONTRACTOR SHALL NOT UNLOAD ANY TRACK-TYPE CONSTRUCTION MACHINERY ON ANY EXISTING PAVEMENT OR CROSS OVER ANY EXISTING PAVEMENT OR CURB DURING ANY PROJECT.

G-19. IT IS THE CONTRACTOR'S RESPONSIBILITY TO SUPERVISE AND COORDINATE ALL WORK TO INSURE THE PROPER EXECUTION. ALL WORK IS TO BE ACCOMPLISHED IN A NEAT, WORKMANLIKE MANNER, AND ALL EXCESS MATERIALS, TRASH AND DEBRIS, ETC. SHALL BE REMOVED FROM THE JOB BY THE CONTRACTOR, AT HIS EXPENSE.

G-20. CONTRACTOR SHALL REMOVE DIRT AND/OR DEBRIS DEPOSITED ON EXISTING PAVEMENT DUE TO HIS CONSTRUCTION ACTIVITY ON A DAILY BASIS. ALL EQUIPMENT AND CONSTRUCTION DEBRIS SHALL BE REMOVED FROM THE SITE AT THE END OF THE PROJECT.

G-21. EXISTING ROADS, RIGHT-OF-WAYS, EASEMENTS AND PROPERTY DISTURBED DURING CONSTRUCTION SHALL BE RESTORED AS GOOD OR BETTER THAN THE CONDITION PRIOR TO STARTING THE WORK.

G-22. UNLESS OTHERWISE REQUIRED, ALL DISTURBED AREAS SHALL BE SEEDED WITH HYDROMULCH SEEDING AND PROVIDE WATERING UNTIL VEGETATION IS ESTABLISHED.

G-23. ALL EXCESS AND/OR UNSUITABLE SOIL, AND DEBRIS AND/OR WASTE MATERIALS SHALL BE REMOVED FROM THE SITE AND DISPOSED OF PROPERLY.

G-24. ADJUST MANHOLES, INLETS, FLUSHING VALVES AND WATER VALVE BOXES TO MATCH FINAL GRADE IN ACCORDANCE WITH THE REQUIREMENTS OF THE CITY.

G-25. UTILITY SERVICE LINES

1) ALL UTILITY SERVICE LINES ARE NOT SHOWN ON THE DRAWINGS. CONTRACTORS SHALL ANTICIPATE THAT SUCH SERVICE LINES EXIST AND REPAIR THEM IF DAMAGED DURING CONSTRUCTION. IT IS ALSO THE CONTRACTOR'S RESPONSIBILITY TO MAKE ARRANGEMENTS WITH THE OWNERS OF SUCH UTILITIES PRIOR TO WORKING IN THE AREA TO CONFIRM THEIR EXACT LOCATIONS AND/OR DEPTHS, AND TO DETERMINE WHETHER ANY ADDITIONAL UTILITIES OTHER THAN THOSE SHOWN ON THESE PLANS MAY BE PRESENT. THE CONTRACTOR SHALL DETERMINE IF ANY OF THESE UTILITIES ARE CLEAR, AND SHALL PRESERVE AND PROTECT ALL OF THESE UTILITIES SHOWN OR FOUND. IF CONFLICTS ARISE REGARDING PUBLIC UTILITIES, THE CONTRACTOR SHOULD IMMEDIATELY NOTIFY THE PROJECT ENGINEER.

2) UTILITY RELOCATIONS REQUIRED BY CONSTRUCTION SHALL BE PERFORMED BY THE APPROPRIATE UTILITY COMPANY. ANY RELOCATIONS OR TEMPORARY BRACING NOT DEEMED NECESSARY BY THE ENGINEER, BUT DESIRED FOR CONVENIENCE BY THE CONTRACTOR, SHALL BE PERFORMED BY THE APPROPRIATE UTILITY COMPANY AT THE CONTRACTOR'S EXPENSE.

3) TEXAS ONE CALL	1-800-245-4545
4) CENTERPOINT ENERGY-GAS	281-342-8881
5) CENTERPOINT ENERGY-ELECTRIC	281-341-4930
6) AT&T	281-341-4312
7) COMCAST	713-462-1900
8) CITY OF RICHMOND	281-342-0509

G-26. AT&T TELEPHONE

1) THE CONTRACTOR SHALL DETERMINE THE ACTUAL LOCATION OF UTILITIES BY CALLING TEXAS ONE-CALL SYSTEM AT LEAST 72 HOURS BEFORE COMMENCING WORK. CONTRACTOR AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO LOCATE AND PRESERVE THE UNDERGROUND UTILITIES.

2) CONTRACTOR SHALL HAND DIG WITHIN ONE (1) FOOT OF SBC UNDERGROUND CONDUIT OR CABLE SYSTEMS.

G-27. CENTERPOINT ENERGY (ELECTRIC)

1. OVERHEAD LINES EXIST ON THE PROPERTY AND APPROXIMATE LOCATIONS ARE SHOWN ON THE DRAWINGS. CONTRACTOR SHALL VERIFY THEIR LOCATION PRIOR TO BEGINNING ANY CONSTRUCTION. TEXAS LAW, SECTION 752, HEALTH AND SAFETY CODE, FORBIDS ALL ACTIVITIES IN WHICH PERSONS OR THINGS MAY COME WITHIN SIX (6) FEET OF LIVE OVERHEAD HIGH VOLTAGE LINES. CONTRACTOR IS LEGALLY RESPONSIBLE FOR SAFETY OF CONSTRUCTION WORKERS UNDER THIS LAW TO ARRANGE FOR LINES TO BE TURNED OFF OR MOVED AND LOCATE EXISTING UNDERGROUND UTILITIES, CALL CENTERPOINT ENERGY AT LEAST 72 HOURS BEFORE COMMENCING WORK.

2. CONSTRUCTION THAT WILL REQUIRE EXCAVATION CLOSER THAN THREE (3) FEET TO CENTERPOINT FACILITIES SHALL BE BORED AND JACKED WITH THE WRITTEN APPROVAL FROM CENTERPOINT.

3. CONTRACTOR SHALL HAND DIG WITHIN ONE (1) FOOT OF CENTERPOINT ENERGY UNDERGROUND CONDUIT OR AS OTHERWISE REQUIRED BY CENTERPOINT.

G-28. CENTERPOINT ENERGY (GAS)

CAUTION: UNDERGROUND GAS FACILITIES
LOCATION OF CENTERPOINT ENERGY MAIN LINES (TO INCLUDE CENTERPOINT ENERGY, INTRASTATE PIPELINE, LLC. WHERE APPLICABLE) ARE SHOWN IN AN APPROXIMATE LOCATION ONLY. SERVICE LINES ARE USUALLY NOT SHOWN. OUR SIGNATURE ON THESE PLANS ONLY INDICATES THAT OUR FACILITIES ARE SHOWN IN APPROXIMATE LOCATION. IT DOES NOT IMPLY THAT A CONFLICT ANALYSIS HAS BEEN MADE. THE CONTRACTOR SHALL CONTACT THE UTILITY COORDINATING COMMITTEE AT (713)223-4567 OR 1-800-669-8344 A MINIMUM OF 48 HOURS PRIOR TO CONSTRUCTION TO HAVE MAIN AND SERVICE LINES FIELD LOCATED.

1. WHEN CENTERPOINT ENERGY PIPE LINE MARKINGS ARE NOT VISIBLE, CALL (713) 967-8037 (7:00 A.M. TO TO 4:30 P.M.) FOR STATUS OF LINE LOCATION REQUEST BEFORE EXCAVATION BEGINS.

2. WHEN EXCAVATING WITHIN EIGHTEEN INCHES (18") OF THE INDICATED LOCATION OF CENTERPOINT ENERGY FACILITIES, ALL EXCAVATION MUST BE ACCOMPLISHED USING NON-MECHANIZED EXCAVATION PROCEDURES.

3. WHEN CENTERPOINT ENERGY FACILITIES ARE EXPOSED, SUFFICIENT SUPPORT MUST BE PROVIDED TO THE FACILITIES TO PREVENT EXCESSIVE STRESS ON THE PIPING.

THE CONTRACTOR IS FULLY RESPONSIBLE FOR ANY DAMAGES CAUSED BY HIS FAILURE TO EXACTLY LOCATE AND PRESERVE THESE UNDERGROUND FACILITIES.

G-29. COMCAST - THE CONTRACTOR SHALL NOTIFY TIME WARNER AT LEAST 72 HOURS BEFORE COMMENCING WORK TO LOCATE EXISTING UNDERGROUND CABLE.

G-30. ALL PIPE AND REINFORCEMENT STEEL SHALL BE KEPT FREE OF DIRT AND DEBRIS. ANY DAMAGE TO THE COATINGS OF THE VARIOUS MATERIALS MUST BE REPAIRED OR REPLACED BY THE CONTRACTOR WITH APPROVAL BY THE CITY.

G-31. CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING ADEQUATE AND POSITIVE DRAINAGE AT ALL TIMES DURING CONSTRUCTION.

G-32. NO CONNECTIONS SHALL BE MADE TO THE EXISTING WATER LINES OR SANITARY SEWERS UNTIL ALL PROPOSED LINES HAVE BEEN THOROUGHLY CLEANED, TESTED AND APPROVED BY THE CITY.

G-33. CONTRACTOR SHALL VERIFY PUBLIC INFRASTRUCTURE ALIGNMENT, CENTERLINE CURVE DATA AND STATIONING WITH APPROVED SUBDIVISION PLAT AND APPROVED PLANS.

G-34. ALL BEDDING AND BACKFILL (INCLUDING CEMENT STABILIZED SAND) SHALL BE PLACED IN LIFTS THAT DO NOT EXCEED 8" (LOOSE), SHALL BE COMPACTED TO 95% STANDARD PROCTOR DENSITY AND BE TESTED BY A CERTIFIED TESTING LABORATORY.

G-35. ALL TRENCH BACKFILL SHALL BE TESTED AT A MINIMUM RATE OF ONE DENSITY TEST PER THREE LIFTS OF TRENCH BACKFILL PER 300 FEET OF TRENCH. TESTS SHALL BE TAKEN AT RANDOM LOCATION SELECTED BY THE LAB OR AS AS OTHERWISE REQUESTED BY THE CITY.

G-36. CONTRACTOR SHALL INSTALL AND MAINTAIN ALL POLLUTION CONTROLS FOR THE DURATION OF THE PROJECT.

WATER DISTRIBUTION NOTES

W-1. EXCEPT AS OTHERWISE REQUIRED, WATER MAINS SHALL BE PVC, AWWA C900 OR C905, MINIMUM THICKNESS DR-18, CLASS 200 FOR WATER MAINS LESS THAN SIX INCHES (6"), CLASS 150 FOR WATER MAINS SIX INCHES (6") AND LARGER. WATER MAINS LESS THAN 4 INCHES (4") DIAMETER SHALL BE PVC, ASTM D-2241, SDR-21 (PR-200), WITH RUBBER GASKET JOINTS OR APPROVED EQUAL. ALL POTABLE WATER PIPE USED IN THE PROJECT MUST MEET THE REQUIREMENTS OF AMERICAN NATIONAL STANDARDS INSTITUTE/NATIONAL SANITATION FOUNDATION STANDARD 61 (ANSI/NSF61). PIPE SHALL BE CERTIFIED TO CONFORM TO ANSI/NSF-61 AND SHALL BE MARKED "NSF-PW".

W-2. ALTERNATIVE WATER MAIN PIPE MATERIAL (WITH APPROVAL OF THE CITY):
A) STEEL: AWWA C200, 150 PSI FOR LINES 4-INCHES TO 12-INCHES, 250 PSI FOR LINES GREATER THAN 12-INCHES. ALL PIPE COATINGS SHALL BE IN ACCORDANCE WITH AWWA C210. ALL NUTS AND BOLTS SHALL BE EPOXY COATED.

B) DUCTILE IRON: AWWA C151 (ANSI A21.51) FOR LINES 4-INCHES TO 54-INCHES. PIPE SHALL BE LINED IN ACCORDANCE WITH AWWA C104 (ANSI A21.4).

W-3. INSTALLATION OF WATER MAINS SHALL BE IN ACCORDANCE WITH CURRENT AWWA APPROVED METHODS, STANDARDS AND MATERIALS, TEXAS COMMISSION ON ENVIRONMENTAL QUALITY (T.C.E.Q.) REGULATIONS AND CITY STANDARDS, CODES AND ORDINANCES.

W-4. ALL WATER MAINS SHALL HAVE A MINIMUM 3.5 FEET AND A MAXIMUM 5 FEET OF COVER WHEN CONSTRUCTED IN STREET RIGHTS-OF-WAY OR EASEMENTS, UNLESS APPROVED BY THE CITY.

W-5. FIRE HYDRANTS SHALL BE SET BEHIND BACK OF CURB AT APPROVED LOCATIONS. CENTER LINE OF FIRE HYDRANTS SHALL BE THREE (3) FEET FROM BACK OF CURB OF THE STREET UNLESS OTHERWISE REQUIRED IN THE PLANS. FIRE HYDRANTS SHALL BE INSTALLED A MINIMUM OF TEN (10) FEET FROM ALL SANITARY SEWERS AND APPURTENANCES. FIRE HYDRANTS SHALL BE LOCATED OPPOSITE PROPERTY LINES OR RIGHT-OF-WAY LINE EXTENSIONS, UNLESS OTHERWISE APPROVED BY THE CITY.

W-6. GATE VALVES, FIRE HYDRANTS AND BLOWOFFS SHALL BE COUNTER-CLOCKWISE OPENING.

W-7. ALL FITTINGS, VALVES AND FIRE HYDRANTS SHALL BE CAST IRON MECHANICAL JOINT TYPE UNLESS APPROVED IN WRITING BY THE CITY. ALL MECHANICAL JOINTS SHALL BE INSTALLED WITH MECHANICAL RESTRAINED JOINTS (EBAA IRON, INC., SERIES 2000PV OR EQUAL). APPLIES FROM FITTING TO FITTING AT GATE VALVES SHALL BE 18" IN LENGTH.

W-8. A MINIMUM HORIZONTAL CLEARANCE OF NINE FEET (9') BETWEEN WATER MAINS AND SANITARY SEWER LINES SHALL BE MAINTAINED BY THE CONTRACTOR, EXCEPT AS APPROVED BY THE CITY.

W-9. THE CONTRACTOR SHALL PROVIDE FOR A MINIMUM OF SIX INCHES (6") CLEARANCE AT STORM SEWER AND WATER LINE CROSSINGS AND TWENTY-FOUR INCHES (24") MINIMUM CLEARANCE AT SANITARY SEWER AND WATER LINE CROSSINGS. WATER LINES SHALL BE LOCATED AT A HIGHER ELEVATION THAN THE SEWER WHEREVER POSSIBLE. WHEN NOT POSSIBLE, T.C.E.Q. "RULES AND REGULATIONS FOR PUBLIC WATER SYSTEMS", ARTICLE 290.44 WILL TAKE PRECEDENCE. IF A CONFLICT EXISTS, THE CONTRACTOR SHALL ADVISE THE DIRECTOR OF PUBLIC WORKS AND WATER SUPERINTENDENT IMMEDIATELY AND SHALL NOT CONTINUE FURTHER CONSTRUCTION WITHOUT CITY APPROVAL.

W-10. ABANDONMENT OF EXISTING WATER LINES SHALL BE PERFORMED BY THE CONTRACTOR IN ACCORDANCE WITH APPROVED PLANS OR WHEN APPROVAL FROM THE CITY PUBLIC WORKS DIRECTOR OR WATER SUPERINTENDENT IS OBTAINED IN WRITING.

W-11. TAPPING SLEEVE & VALVES ON THE EXISTING CITY WATER SYSTEM WILL BE INSTALLED BY A CITY APPROVED TAPPING CONTRACTOR.

W-12. NO CONNECTION SHALL BE MADE TO ANY EXISTING WATER LINES UNTIL THE NEW WATER LINES HAVE BEEN THOROUGHLY STERILIZED, CLEANED AND TESTED AND FINAL APPROVAL FROM THE CITY'S AUTHORIZED AGENT HAS BEEN OBTAINED IN WRITING.

W-13. ALL VALVES AND HYDRANTS SHALL BE STORED SO THAT THEY ARE PROTECTED FROM FREEZING.

W-14. ALL PRESSURE PIPE INSTALLATIONS SHALL BE TESTED FOR LEAKAGE. TEST PRESSURE SHALL BE 1.5 TIMES THE MAXIMUM DESIGN PRESSURE OR 150 PSIG, WHICHEVER IS GREATER. THE TEST SHALL HAVE A MINIMUM DURATION OF FOUR HOURS AND SHALL BE OBSERVED BY THE AUTHORIZED REPRESENTATIVE OF THE CITY PUBLIC WORKS DEPARTMENT.

W-15. STERILIZATION OF NEW WATER LINES SHALL BE DONE IN ACCORDANCE WITH AWWA C-651, LATEST EDITION. A MINIMUM OF ONE SAMPLE PER 1000 FEET OF WATER MAIN OR ONE SAMPLE PER SEPARATION SECTION OF WATER MAIN SHALL BE COLLECTED. IF THE SAMPLES FAIL TO MEET THE T.C.E.Q. DRINKING WATER STANDARD REQUIREMENTS, THE FLUSHING AND TESTING PROCESS SHALL BE REPEATED.

W-16. WATER LINES SHALL HAVE SAND EMBEDMENT TO SIX (6) INCHES ABOVE THE TOP OF PIPE.

W-17. WATER LINE TRENCHES UNDER PAVEMENT OR WITHIN THREE (3) FEET FROM EDGE OF PAVEMENT TO BE BACKFILLED WITH CEMENT STABILIZED SAND (1.5 SACKS PER CUBIC YARD) FROM THE TOP OF THE EMBEDMENT TO THE BASE OF PROPOSED BASE OF PROPOSED PAVING SUBGRADE LESS 4 INCHES.

W-18. ALL WATER LINE CONSTRUCTION CROSSING EXISTING ASPHALT AND/OR CONCRETE STREETS SHALL BE BORED AND JACKED, UNLESS OTHERWISE APPROVED BY THE PROJECT ENGINEER AND THE CITY.

W-19. TRENCH SAFETY SYSTEM IS REQUIRED FOR ALL WATER MAIN CONSTRUCTION.

W-20. CONCRETE THRUST BLOCKING IS REQUIRED FOR ALL VALVES, FIRE HYDRANTS AND FITTINGS.

SANITARY SEWER CONSTRUCTION NOTES

S-1. SANITARY SEWERS SHALL BE CONSTRUCTED ACCORDING TO THESE PLANS AND SPECIFICATIONS AND THE CITY AND THE TEXAS COMMISSION ON ENVIRONMENTAL QUALITY (T.C.E.Q.) RULES AND REGULATIONS.

S-2. ALL MANHOLES SHALL BE PRECAST IN ACCORDANCE WITH DETAILS INCLUDING THE INTERIOR COATING. BRICK MANHOLES ARE NOT ALLOWED. ALL SANITARY MANHOLES SHALL BE INSTALLED WITH INFLOW PROTECTORS.

S-3. ALLOWABLE SANITARY SEWER PIPE MATERIAL:

A) GRAVITY LINES

1. POLYVINYL CHLORIDE (PVC), PIPE AND FITTINGS MEETING THE REQUIREMENTS OF ASTM D2241 (SDR 26, PR160), ASTM D1784, ASTM D3212 AND ASTM F477. FOR DEPTH LESS THAN 4 FEET AND GREATER THAN 20 FEET, INSTALL ASTM D2241 (SDR21, PR200).

2. DUCTILE IRON (D.I.P.), AWWA C-151, AWWA C-111, STANDARD CLASS 150, WITH BELL AND SPIGOT PUSH-ON JOINTS, ALL PIPE SHALL HAVE AN INTERIOR POLYETHYLENE COATING OF 40-MILS AND AN EXTERIOR POLYETHYLENE WRAP OF 8-MILS.

B) FORCE MAINS

1. PVC, 4-INCH TO 12-INCH, AWWA C900, C818, CLASS 150, ASTM D3139, ASTM F477. (GREEN COLOR)

S-4. ALL D.I.P. SANITARY SEWER PIPES SHALL BE INSTALLED WITH CATHODIC PROTECTION.

S-5. THE CONTRACTOR SHALL NOTIFY THE CITY PUBLIC WORKS DEPARTMENT AT LEAST 24 HOURS PRIOR TO PRESSURE AND DEFLECTION TESTS ON ALL GRAVITY SANITARY SEWERS. ALL TESTS SHALL BE MONITORED BY AN AUTHORIZED AGENT OF THE CITY.

S-6. ALL GRAVITY SANITARY SEWER PIPE SHALL BE LOW PRESSURE AIR TESTED AND MANHOLES VACUUM TESTED IN ACCORDANCE WITH T.C.E.Q. REQUIREMENTS. FORCE MAINS SHALL BE HYDROSTATIC TESTED AT A MINIMUM OF 150 PSI.

S-7. DEFLECTION TESTS SHALL BE PERFORMED ON ALL FLEXIBLE AND SEMI-RIGID PIPE. THE CITY MAY REQUIRE SERVICE LEADS TO BE RANDOMLY TESTED. DEFLECTION TESTS SHALL BE CONDUCTED AFTER THE FINAL BACKFILL HAS BEEN IN PLACE AT LEAST 30 DAYS. NO PIPE SHALL EXCEED A DEFLECTION OF 5%. THE TEST SHALL BE CONDUCTED USING A MANDREL HAVING AN OUTSIDE DIAMETER EQUAL TO 95% OF THE AVERAGE INSIDE DIAMETER OF THE PIPE. THE MANDREL SHALL HAVE A MINIMUM OF 9 RUNNERS WITH THE CONTACT LENGTH OF EACH RUNNER EQUAL TO OR GREATER THAN THE PIPE'S NOMINAL DIAMETER. THE TEST SHALL BE PERFORMED WITHOUT MECHANICAL PULLING DEVICES.

S-8. SANITARY SEWER MANHOLE RIMS, EXCEPT IN PAVED AREAS, SHALL BE SET 4-INCHES ABOVE FINISHED GRADE WITHIN STREET RIGHT-OF-WAY, AND 6-INCHES ABOVE FINISHED LOT GRADES WITHIN EASEMENTS. CLEAN FILL MAY BE PLACED ADJOINING THE MANHOLE AND GRADED AWAY FROM THE RIM FOR SURFACE WATER DRAINAGE.

S-9. SANITARY MANHOLES BELOW THE 100-YEAR FLOOD PLAIN (OR WHERE OTHERWISE REQUIRED) SHALL BE WATERPROOFED USING A NEOPRENE GASKET. ONLY STAINLESS STEEL SCREWS OR NUTS & BOLTS CAN BE USED TO HOLD DOWN THE COVER. A VENT PIPE EXTENDING ONE FOOT ABOVE THE FLOODPLAIN ELEVATION SHALL BE PROVIDED, UNLESS OTHERWISE APPROVED.

S-10. SANITARY LINES AND MANHOLES PARALLEL TO WATER LINES SHALL BE INSTALLED WITH AT LEAST A 9-FOOT HORIZONTAL SEPARATION (OUTSIDE TO OUTSIDE). SANITARY SEWERS INSTALLED CROSSING UNDER WATER MAIN SHALL COMPLY WITH T.C.E.Q. REQUIREMENTS.

S-11. ALL SANITARY SEWERS SHALL BE CONSTRUCTED ON A STRAIGHT ALIGNMENT AND ON A UNIFORM GRADE. GRAVITY SEWERS SHALL BE CONSTRUCTED WITH THE PIPE BELL FACING UPSTREAM. ALL 6-INCH SANITARY SERVICE LEADS SHALL BE LAID WITH A MINIMUM GRADE OF 0.70%

S-12. ALL SEWER LEADS AND STUBOUTS SHALL BE MARKED IN ACCORDANCE WITH THE DETAILS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING THE MARKERS IN GOOD AND PLUMB CONDITION WITH A VERTICAL ALIGNMENT. IF DAMAGED, THE CONTRACTOR SHALL REPLACE THE MARKER.

S-13. ALL SEWER LINES (INCLUDING SERVICE LEADS) ENTERING A MANHOLE AT AN ELEVATION GREATER THAN 30-INCHES ABOVE THE MANHOLE INVERT MUST BE CONSTRUCTED WITH AN EXTERIOR DROP PIPE IN ACCORDANCE WITH THE DETAILS.

S-14. STEPS IN MANHOLES ARE PROHIBITED.

S-15. CONTRACTOR SHALL PROVIDE ADEQUATE CONCRETE THRUST BLOCKING AT ALL FORCE MAIN BENDS.

S-16. AT ALL LOTS WHERE TOP OF PIPE IS GREATER THAN 8-FEET BELOW FINISHED GRADE, PROVIDE A 6-INCH SANITARY SEWER STACK OR RISER. STACKS AND RISERS SHALL BE EXTENDED TO WITHIN 8 FEET OF FINISHED GRADE. STACKS SHALL BE MARKED FOR LOCATION AS INDICATED ON THE DETAILS.

S-17. FORCE MAIN SHALL BE LAID WITH DETECTOR TAPE LAID AT 6" ABOVE THE PIPE. THE DETECTOR TAPE MUST BEAR THE LABEL "PRESSURIZED WASTEWATER" IN 1.5 INCH HIGH LETTERS, REPEATED CONTINUOUSLY, FOR THE ENTIRE LENGTH OF

STREET AND PAVING CONSTRUCTION NOTES

P-1. ALL PAVING SHALL BE CONSTRUCTED WITH THE PLANS AND SPECIFICATIONS AND CITY REQUIREMENTS.

P-2. THE CONTRACTOR SHALL NOTIFY CITY PUBLIC WORKS DEPARTMENT AT LEAST 48 HOURS PRIOR TO ANY AND ALL SUBGRADE TESTING AND CONCRETE POURS.

P-3. ALL TEMPORARY AND PERMANENT SIGNAGE MUST COMPLY WITH THE LATEST REVISION OF THE "TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES".

P-4. CONTRACTOR SHALL PROTECT ALL UTILITIES, SIDEWALKS, PAVEMENT, ETC. AND SHALL REPAIR OR REPLACE ANY FACILITIES DAMAGED DURING PAVING OR GRADING OPERATIONS.

P-5. EXISTING PAVEMENTS, CURBS, SIDEWALKS DRIVEWAYS, ETC., DAMAGED OR REMOVED DURING CONSTRUCTION SHALL BE REPLACED TO THE CITY STANDARDS.

P-6. ALL DISTURBED AREAS WITHIN STREET RIGHT-OF-WAY AND EASEMENTS NOT COVERED BY PAVEMENT OR STRUCTURE SHALL BE HYDRO-MULCHED AND WATERED UNTIL VEGETATION ESTABLISHMENT.

P-7. AREAS TO BE FILLED SHALL BE CLEARED AND GRUBBED, SCARIFIED AND COMPACTED TO AT LEAST 95% OF MAXIMUM DENSITY (+/- 2% OF OPTIMUM MOISTURE) PER ASTM D-698, TO A DEPTH OF 6" PRIOR TO FILL PLACEMENT. FILL MATERIAL SHALL BE PLACED IN MAXIMUM 8" THICK LIFTS (MEASURED LOOSE) AND COMPACTED TO AT LEAST 95% OF MAXIMUM DENSITY (+/- 2% OF OPTIMUM MOISTURE) PER ASTM D-698. FILL SHALL BE CLEAN EARTH AND BE FREE FROM TRASH, VEGETATION AND LARGE STONES. TEST REPORTS INDICATING COMPLIANCE WITH DENSITY REQUIREMENTS SHALL BE SUBMITTED TO THE CITY PRIOR TO PLACEMENT OF PAVEMENT.

P-8. THE 8-INCH SUBGRADE IS TO BE SCARIFIED AND COMPACTED TO 95% STANDARD PROCTOR DENSITY (+/- 2% OF OPTIMUM MOISTURE) PER ASTM D-698. THE 8-INCH SUBGRADE SHALL BE STABILIZED WITH A MINIMUM SIX PERCENT (6%) LIME BY WEIGHT OR AS REQUIRED TO ACHIEVE A STABILIZED SOIL P.I. OF 20 OR LESS. LIME REQUIREMENTS SUBGRADE SHALL EXTEND A MINIMUM OF 2-FEET BEHIND THE BACK OF ALL CURB AND BEYOND THE EDGE OF PAVEMENT.

P-9. TESTING OF FILL, SUBGRADE AND PAVEMENT TO DOCUMENT COMPLIANCE WITH THE CITY REQUIREMENTS SHALL BE COMPLETED BY A CERTIFIED (REFERENCE: THE ASSOCIATION FOR LABORATORY ACCREDITATION) TESTING LABORATORY APPROVED BY THE CITY. A COPY OF ALL TEST RESULTS SHALL BE SUBMITTED TO THE CITY PUBLIC WORKS DIRECTOR.

P-10. ALL INTERSECTION EDGE RETURN RADII SHALL BE 25 FEET AND ALL CUL-DE-SAC RETURN RADII SHALL BE 30 FEET UNLESS NOTED OTHERWISE. MINIMUM GRADES AT INTERSECTIONS AND IN CUL-DE-SACS SHALL BE 1.00%. MINIMUM GRADE ON CURB AND GUTTER STREETS SHALL BE 0.30%.

P-11. PAVING JOINTS (TRANSVERSE AND LONGITUDINAL) SHALL BE IN ACCORDANCE WITH THE DETAILS.

P-12. WHEN A THICKER PAVEMENT ROADWAY INTERSECTS WITH A THINNER PAVEMENT ROADWAY, THE THICKER PAVEMENT SHALL BE CONSTRUCTED FOR THE ENTIRE INTERSECTION TO THE CURB RETURNS ON ALL INTERSECTING STREETS.

P-13. WHERE PROPOSED PAVEMENT IS TO CONNECT TO EXISTING CONCRETE PAVEMENT, THE CONNECTION SHALL BE COMPLETED IN ACCORDANCE WITH THE PAVEMENT UNDERCUT DETAIL.

P-14. SIDEWALKS SHALL BE LOCATED AS SHOWN ON THE PLANS. SIDEWALK RAMP CONSTRUCTION SHALL BE IN CONFORMANCE WITH THE TEXAS ACCESSIBILITY STANDARDS (T.A.S.) AND CITY REQUIREMENTS.

P-15. ALL INTERSECTIONS SHALL BE CONSTRUCTED WITH SIDEWALK RAMPS IN ACCORDANCE WITH THE TEXAS ACCESSIBILITY STANDARDS, THE AMERICAN DISABILITIES ACT AND THE CITY REQUIREMENTS.

P-16. CONCRETE SHALL CONTAIN A MINIMUM 5-1/2 SACKS OF PORTLAND CEMENT PER CUBIC YARD OF CONCRETE WITH A MINIMUM 3500 PSI COMPRESSIVE STRENGTH AT 28 DAYS. CONCRETE SHALL HAVE A MAXIMUM SLUMP OF 4 INCHES AND AN AIR CONTENT OF 4.5 PERCENT. AIR ENTRAINMENT ADMIXTURES SHALL CONFORM TO ASTM C260. FLYASH IS NOT ALLOWED.

P-17. CONCRETE PAVEMENT THICKNESSES SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE DETAILS. REINFORCING STEEL SHALL CONFORM TO ASTM A-615, GRADE 60. A MINIMUM OF 15" LAPS SHALL BE PROVIDED. ALL REINFORCING STEEL SHALL BE SECURELY TIED AND SUPPORTED WITH BAR CHAIRS IN ACCORDANCE WITH ACI STANDARDS. SPACING FOR REINFORCING STEEL SHALL BE AS FOLLOWS:

1. 7" CONCRETE PAVEMENT - #4 BAR ON 18" CENTER EACH WAY.

2. 6" CONCRETE PAVEMENT AND DRIVEWAYS - #4 BAR ON 18" CENTER EACH WAY.

3. SIDEWALKS AND CONCRETE SLOPE PAVEMENT - MINIMUM 4-1/2" THICK CONCRETE - #3 BAR ON 24" CENTER EACH WAY.

P-18. CONCRETE SHALL NOT BE PLACED WHEN THE AMBIENT TEMPERATURE IS 40 DEGREES FAHRENHEIT AND FALLING. CONCRETE MAY BE PLACED IF THE AMBIENT TEMPERATURE IS 35 DEGREES AND RISING. CONTRACTOR SHALL PROVIDE AN APPROVED COVERING MATERIAL (COTTON MATS, POLYETHYLENE SHEETING, ETC.) IN THE EVENT TEMPERATURE SHOULD FALL BELOW 32 DEGREES FAHRENHEIT WITHIN 72 HOURS OF PLACING CONCRETE. NO SALT OR OTHER CHEMICALS SHALL BE ADDED TO CONCRETE TO PREVENT FREEZING. NO CONCRETE SHALL BE PLACED WHEN THE MIXTURE TEMPERATURE IS ABOVE 95 DEGREES FAHRENHEIT. CONCRETE SHALL BE PLACED WITHIN 90 MINUTES OF THE BATCH TIME.

P-19. ALL CONCRETE PLACED SHALL BE UNIFORMLY SPRAYED WITH A MEMBRANE CURING COMPOUND (TXDOT DMS-4650, TYPE 2, WHITE). CURING COMPOUND SHALL BE APPLIED IN ACCORDANCE WITH TXDOT STANDARD SPECIFICATIONS.

P-20. CONCRETE SAMPLES: CYLINDERS (SET OF 4), SLUMP AND AIR ENTRAINMENT TESTS ARE REQUIRED FOR EACH 100 CUBIC YARDS AND EACH FRACTION THEREOF. A MINIMUM OF ONE SET OF SAMPLES IS REQUIRED PER CONCRETE POUR. THE CITY RESERVES THE RIGHT TO REQUEST ADDITIONAL TESTS.

P-21. CORE SAMPLE FOR CONCRETE PAVEMENT TO CONSIST OF ONE CORE TAKEN FOR EACH 1,000 SQUARE YARDS OF FINISHED PAVEMENT (MINIMUM ONE CORE PER STREET). EACH CORE SHALL BE MEASURED FOR THICKNESS.

P-22. PROPER TESTING AND LABORATORY DOCUMENTATION IS REQUIRED. FAILURE TO MEET THE MINIMUM PAVEMENT REQUIREMENTS WILL RESULT IN THE REJECTION OF PAVEMENT. IMMEDIATE REMOVAL AND REPLACEMENT OF SUBSTANDARD PAVEMENT SECTIONS WILL BE NECESSARY TO SATISFY THESE REQUIREMENTS.

P-23. CRACKS 1/16 INCH OR LARGER ARE NOT ACCEPTABLE IN NEW PAVEMENT. CRACKS 1/16 INCH OR LESS WILL BE ADDRESSED AN INDIVIDUAL BASIS, SUBJECT TO APPROVAL OR REJECTION.

P-24. STREET NAME SIGNS SHALL BE LOCATED AT ALL INTERSECTIONS. CONTRACTOR SHALL VERIFY STREET NAME WITH RECORDED PLAT. STOP SIGNS AND OTHER TRAFFIC SIGNAGE SHALL BE PLACED IN ACCORDANCE WITH THE PLANS AND THE "TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES".

P-25. A DOUBLE-REFLECTORIZED BLUE TRAFFIC MARKER SHALL BE PLACED ONE FOOT OFFSET OF THE PAVEMENT CENTERLINE ON FIRE HYDRANT SIDE, AT ALL FIRE HYDRANT LOCATIONS, BY THE PAVING CONTRACTOR. FIRE HYDRANTS LOCATED AT INTERSECTIONS SHALL HAVE A MARKER PLACED ON EACH STREET.

P-26. ALL STRIPING SHALL BE REFLECTORIZED, PERMANENT PREFABRICATED PAVEMENT MARKINGS MEETING THE MINIMUM REQUIREMENTS OF TXDOT, DMS-8240, TYPE A OR B, INSTALLED IN ACCORDANCE WITH TXDOT STANDARD SPECIFICATION ITEM 666. CENTERLINE STRIPES, STOP BARS AND MISCELLANEOUS MARKINGS SHALL HAVE A MINIMUM THICKNESS OF 90 MILS. LANE DELINEATION AND ROAD EDGE STRIPES SHALL HAVE A MINIMUM THICKNESS OF 60 MILS. ALL STRIPING SHALL BE INSTALLED WITH DOUBLE ADHESIVE AS REQUIRED BY THE CITY. OUTSIDE THE CITY (IN THE ETJ) COMPLY WITH FORT BEND COUNTY REQUIREMENTS.

P-27. ALL DRIVEWAYS SHALL BE LOCATED TO AVOID EXISTING CURB INLET STRUCTURES.

STORM SEWER NOTES

ST-1. ALL STORM SEWERS SHALL MEET THE REQUIREMENTS OF THE CITY, FORT BEND COUNTY AND FORT BEND COUNTY DRAINAGE DISTRICT (WHICH APPLICABLE).

ST-2. ALL STORM SEWER MANHOLE AND INLET COVERS SHALL BE LABELED "STORM SEWER" IN ACCORDANCE WITH THE DETAILS.

ST-3. STORM SEWER WITHIN PUBLIC ROAD RIGHT-OF-WAY:
ALL STORM SEWER PIPE SHALL BE REINFORCED CONCRETE PIPE, A.S.T.M. C-76, CLASS III (MINIMUM) INSTALLED, BEDDED AND BACKFILLED IN ACCORDANCE WITH THE CITY DETAILS AND FORT BEND COUNTY DRAINAGE DISTRICT CRITERIA. ALL REINFORCED CONCRETE PIPE 42-INCH DIAMETER AND GREATER SHALL HAVE WATER-TIGHT RUBBER GASKET JOINTS. CONTRACTOR MAY USE TAL-COAT OR EQUAL FOR PIPE JOINTS WITH PIPE LESS THAN 42" DIAMETER. ALL STORM SEWER SHALL BE BACKFILLED WITH SELECT FILL MATERIAL COMPACTED TO 95% STANDARD PROCTOR COMPACTION, ASTM D-698, IN ACCORDANCE WITH THE DETAILS. CONTRACTOR SHALL USE MECHANICAL ROLLER OR MECHANICAL TAMPER IN COMPACTING ALL BACKFILL FOR PROJECT.

ST-4. STORM SEWER OUTSIDE OF PUBLIC ROAD RIGHT-OF-WAY:
ALL STORM SEWER PIPE SHALL BE HIGH DENSITY POLYETHYLENE PIPE (HDPE), A.S.T.M. D-3350 (ASSHTO M-294). MANUFACTURING SHALL MEET REQUIREMENTS OF A.S.T.M. F-2306. ALL HDPE SHALL BE INSTALLED, BEDDED, AND AND BACKFILLED IN ACCORDANCE A.S.T.M. D-2774, THE DETAIL SHOWN AND THE TECHNICAL SPECIFICATIONS. PIPES SHALL BE INSTALLED WITH WATERTIGHT JOINTS IN ACCORDANCE WITH THE REQUIREMENTS OF A.S.T.M D-3212. ALL TESTING AND MATERIAL REQUIREMENTS SHALL BE IN ACCORDANCE WITH A.S.T.M. F-2306. CONTRACTOR TO JOIN CONTRACTOR TO USE ONLY WORKMEN TRAINED IN THE INSTALLATION OF HDPE PIPE.

ST-5. ALL STORM SEWER STRUCTURES SUCH AS MANHOLES AND INLETS SHALL BE BACKFILLED WITH CEMENT STABILIZED SAND. CEMENT STABILIZED SAND BACKFILL SHALL EXTEND A MINIMUM OF TWENTY-FOUR INCHES (24") FROM THE OUTSIDE WALL OF ALL STRUCTURES. (1-1/2 SACKS OF CEMENT PER CUBIC YARD.)

ST-6. AREAS ADJACENT TO THE PAVEMENT SHALL BE GRADED TO POSITIVELY DRAIN TOWARD INLETS, CONCRETE CURB AND/OR ROAD DITCHES IF DISTURBED DURING CONSTRUCTION. CONTRACTOR SHALL PROVIDE MATERIALS, LABOR AND EQUIPMENT TO PERFORM ALL GRADING OPERATIONS.

ST-7. CONTRACTOR SHALL ADJUST EXISTING WATER LINE MAINS AND WATER LINE SERVICES IN CONFLICT WITH A STORM SEWER. CONTRACTOR SHALL COORDINATE THE DISRUPTION OF WATER SERVICE DURING THE WATER LINE LOWERING OPERATION WITH THE CITY PUBLIC WORKS DEPARTMENT.

ST-8. ADJUST ALL STORM SEWER MANHOLE COVERS TO MATCH FINISHED GRADE ELEVATIONS.

ST-9. ALL PRECAST CONCRETE STRUCTURES SHALL BE REINFORCED AND SHALL BE DESIGNED TO WITHSTAND AASHTO H-20 LOADINGS.

APPROVED: [signature]
DEVELOPMENT COORDINATOR

DATE: 2/12/15

PRIVATE UTILITY LINES SHOWN
AT LEAST 48 HOURS BEFORE EXCAVATING IN STREET R.O.W. OR EASEMENTS CALL THE LONE STAR NOTIFICATION 713-223-4567.

NOTICE:

VERIFICATION OF PRIVATE UTILITY LINES

Date:

CenterPoint Energy/Natural Gas Facilities Verification ONLY

Date:

CenterPoint Energy/UNDERGROUND Electrical Facilities Verification ONLY

Date:

NO.	DATE	REVISIONS	APP.

PECAN GROVE M.U.D.
FORT BEND COUNTY, TEXAS

PECAN GROVE PLANTATION 4 & 5
DRAINAGE IMPROVEMENTS

GENERAL NOTES

JONES & CARTER, INC.
ENGINEERS • PLANNERS • SURVEYORS
Texas Board of Professional Engineers Registration No. F-439
6335 Gulfton Dr., Suite 100 Houston, Texas 77081 (713) 777-5337

SCALE:	N.T.S.	DGN. BY:	RLC
DATE:	DECEMBER 2014	DWN. BY:	JFM
JOB NO.	00034-0367-01	DWG. NO.	
SUBMITTED:		SURV. BY:	
		F.B. NO.	

STATE OF TEXAS
STEPHEN C. REITER
102848
LICENSED
PROFESSIONAL ENGINEER
12/11/2014

SHEET NO.
4
OF 26

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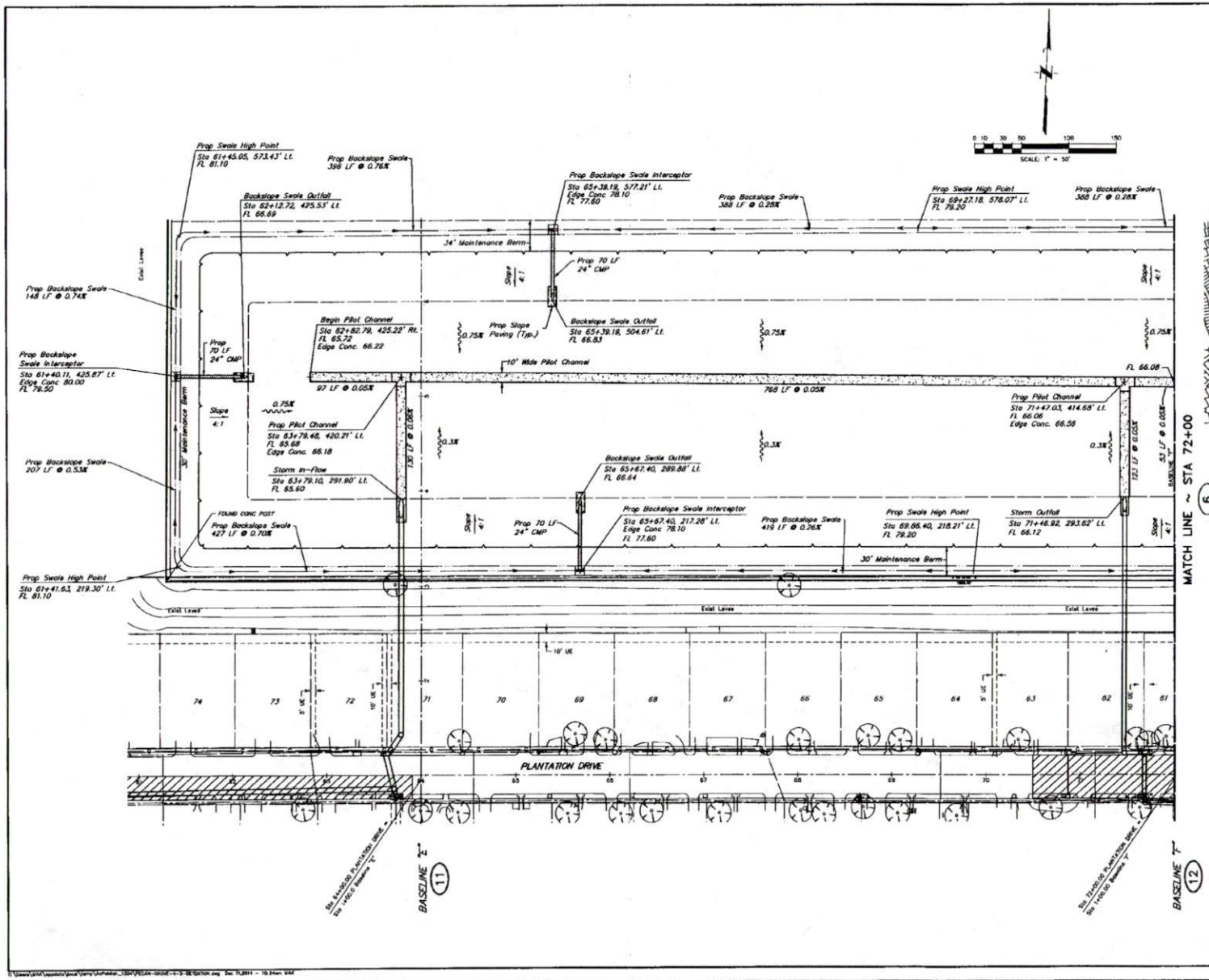


BENCH MARK

NGS MONUMENT No. U1024, BRASS CAP IN TOP OF NW END OF THE NE ABUTMENT OF A CONCRETE BRIDGE UNDER EASTBOUND LANES OF U.S. HWY 90A, 0.1 MILE SW OF JUNCTION OF F.M. 359 AND 1.45 MILES NE OF RICHMOND COURT HOUSE.

ELEVATION = 82.88' (NAVD 88)

T.B.M. "A"

CENTERLINE / CENTERLINE INTERSECTION OF QUARTERPATH DRIVE AND CHAPELWOOD DRIVE.

ELEVATION = 80.33' (NAVD 88)

T.B.M. "B"

BOX CUT ON THE BACK OF CURB NEAR THE WHEELCHAIR RAMP AT THE SOUTHWEST CORNER OF PLANTATION DRIVE AND ROCK FENCE DRIVE.

ELEVATION = 78.23' (NAVD 88)

T.B.M. "C"

CENTERLINE / CENTERLINE INTERSECTION OF BITTERSWEET DRIVE AND BITTERSWEET COURT.

ELEVATION = 79.24' (NAVD 88)

KEY-MAP

APPROVED: _____ DEVELOPMENT COORDINATOR

DATE: 2/12/15

PRIVATE UTILITY LINES SHOWN

AT LEAST 48 HOURS BEFORE EXCAVATING IN STREET R.O.W. OR EASEMENTS CALL THE ONE CALL NOTIFICATION 713-223-4567

NOTICE!

VERIFICATION OF PRIVATE UTILITY LINES

Date:

CenterPoint Energy/Natural Gas Facilities Verification ONLY:

Date:

CenterPoint Energy/UNDERGROUND Electrical Facilities Verification ONLY:

Date:

SBC

NO.	DATE	REVISIONS	APP.

PECAN GROVE M.U.D.
FORT BEND COUNTY, TEXAS

PECAN GROVE PLANTATION 4 & 5
DRAINAGE IMPROVEMENTS

PROPOSED BASIN LAYOUTS – NORTH BASIN SHEET 1 OF 2

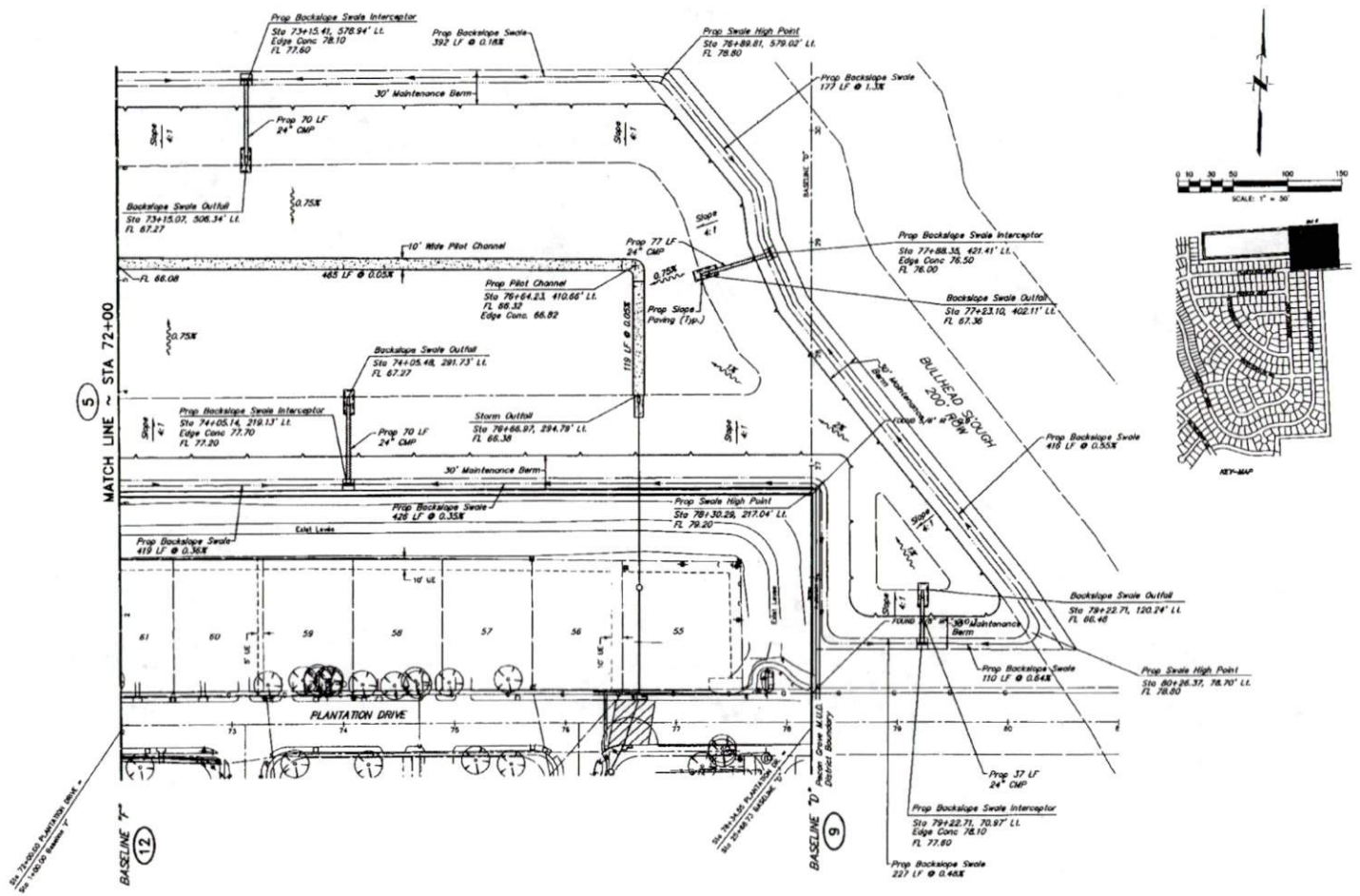
JONES & CARTER, INC.
ENGINEERS • PLANNERS • SURVEYORS
Texas Board of Professional Engineers Registration No. F-439
6330 Dunham Dr., Suite 100 Houston, Texas 77081 (713) 777-5337

SCALE: 1"=50' DSN. BY: RLC
DATE: DECEMBER 2014 DWN. BY: JKW
JOB NO. 000.34-0367-01 DWG. NO.
SUBMITTED SURV. BY:
F.B. NO.

STATE OF TEXAS
STEPHEN C. REITER
102348
LICENSED PROFESSIONAL ENGINEER

12/12/2014

SHEET NO 5 OF 26



BENCH MARK

NGS MONUMENT No. U804, BRASS CAP IN TOP OF NW END OF THE NE ABUTMENT OF A CONCRETE BRIDGE UNDER EASTBOUND LANES OF U.S. HWY 90A, 0.1 MILE SW OF JUNCTION OF F.M. 359 AND 1.45 MILES NE OF RICHMOND COURT HOUSE.

ELEVATION = 82.86' (NAVD 88)

T.B.M. "A"

CENTERLINE / CENTERLINE INTERSECTION OF QUARTERPATH DRIVE AND CHAPELWOOD DRIVE.

ELEVATION = 80.35' (NAVD 88)

T.B.M. "B"

BOX CUT ON THE BACK OF CURB NEAR THE WHEELCHAIR RAMP AT THE SOUTHWEST CORNER OF PLANTATION DRIVE AND ROCK FENCE DRIVE.

ELEVATION = 79.23' (NAVD 88)

T.B.M. "C"

CENTERLINE / CENTERLINE INTERSECTION OF BITTERSWEET DRIVE AND BITTERSWEET COURT.

ELEVATION = 79.24' (NAVD 88)

APPROVED: _____ DEVELOPMENT COORDINATOR

DATE: 2/12/15

PRIVATE UTILITY LINES SHOWN

AT LEAST 48 HOURS BEFORE EXCAVATING IN STREET R.O.W. OR EASEMENTS CALL ONE CALL STAR NOTIFICATION 713-223-4567.

NOTICE!

VERIFICATION OF PRIVATE UTILITY LINES

Date:

Date:

Date:

NO.	DATE	REVISIONS	APP.

PECAN GROVE M.U.D.
FORT BEND COUNTY, TEXAS

PECAN GROVE PLANTATION 4 & 5
DRAINAGE IMPROVEMENTS

PROPOSED BASIN LAYOUTS – NORTH BASIN SHEET 2 OF 2

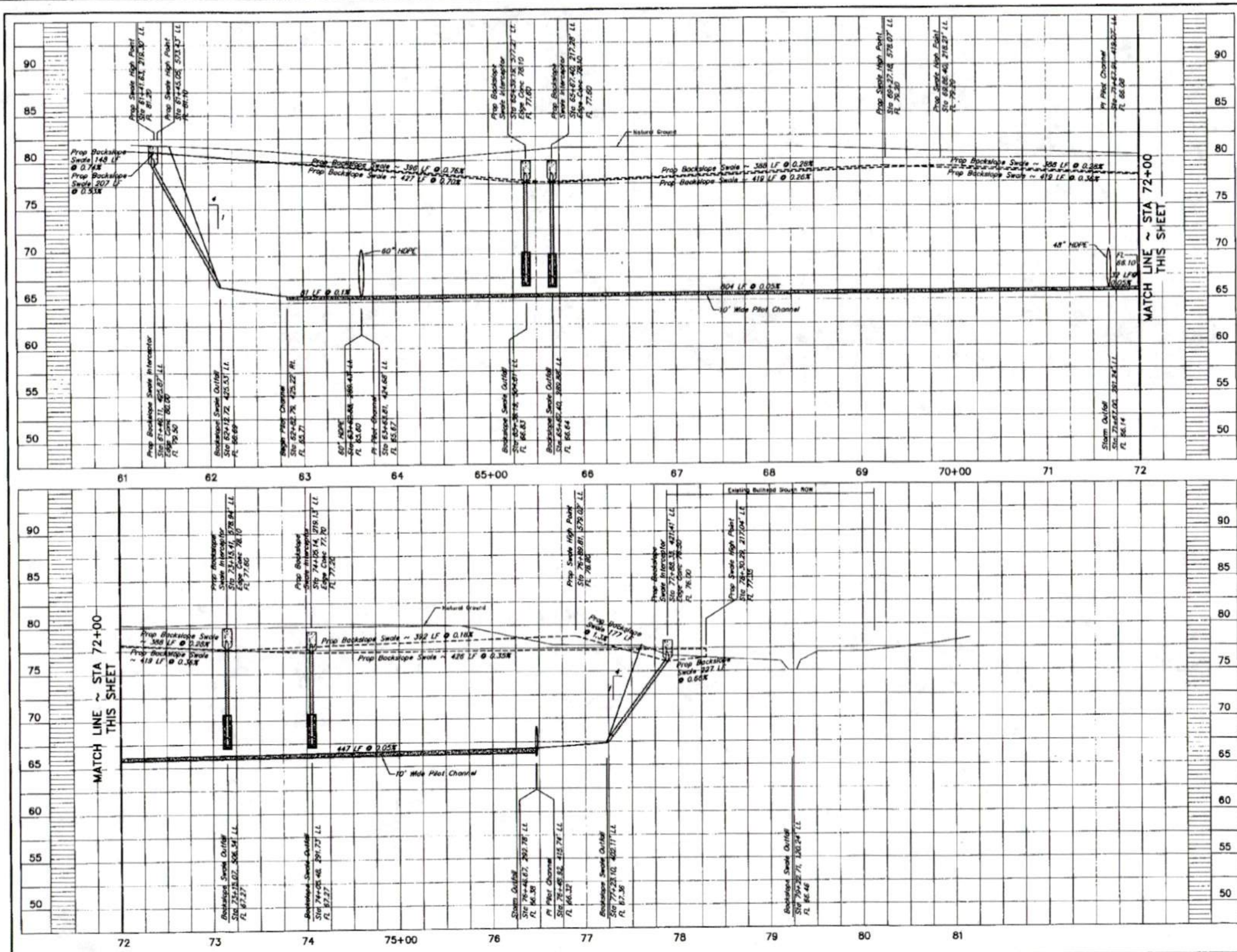
JONES & CARTER, Inc.
ENGINEERS • PLANNERS • SURVEYORS
Texas Board of Professional Engineers Registration No. F-439
6330 Gulfton Dr., Suite 100 Houston, Texas 77081 (713) 777-5337

SCALE: 1"=50' DSN. BY: RLC
DATE: DECEMBER 2014 DWN. BY: JFM
JOB NO. 00034-0387-01 CHK. NO.
SUBMITTED: SURV. BY:
F.B. NO.

STATE OF TEXAS
STEPHEN C. REITER
102948
LICENSED
PROFESSIONAL ENGINEER

12/11/2014

SHEET NO.
6
OF 26



BENCH MARK

NGS MONUMENT No. U804, BRASS CAP IN TOP OF NW END OF THE NE ABUTMENT OF A CONCRETE BRIDGE UNDER EASTBOUND LANES OF U.S. HWY 90A, 0.1 MILE SW OF JUNCTION OF F.M. 359 AND 1.45 MILES NE OF RICHMOND COURT HOUSE.

ELEVATION = 82.88' (NAVD 88)

SCALE: 1" = 50'

APPROVED: [signature] DEVELOPMENT COORDINATOR

DATE: 2/12/15

PRIVATE UTILITY LINES SHOWN

AT LEAST 48 HOURS BEFORE EXCAVATING IN STREET R.O.W. OR EASEMENTS CALL THE LONE STAR NOTIFICATION 713-223-4567.

NOTICE:

VERIFICATION OF PRIVATE UTILITY LINES

Date:

CenterPoint Energy/Richmond Gas Facilities Verification ONLY.

Date:

CenterPoint Energy/UNDERGROUND Electrical Facilities Verification ONLY

Date:

NO.	DATE	REVISIONS	APP.

PECAN GROVE M.U.D.
FORT BEND COUNTY, TEXAS

PECAN GROVE PLANTATION 4 & 5
DRAINAGE IMPROVEMENTS

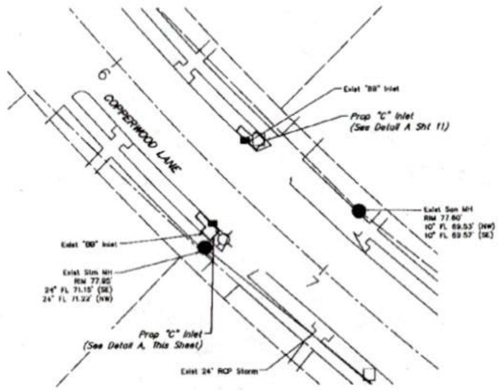
NORTH BASIN CROSS SECTION

JONES & CARTER, INC.
ENGINEERS · PLANNERS · SURVEYORS
Texas Board of Professional Engineers Registration No. F-439
6335 Gulfton Dr., Suite 100 Houston, Texas 77081 (713) 777-5337

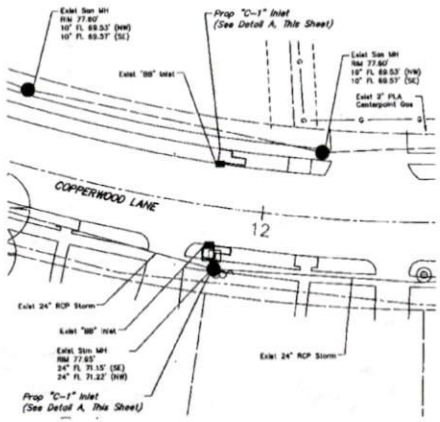
SCALE: 1"=50' DGN. BY: RLC
DATE: DECEMBER 2014 DWN. BY: JFM
JOB NO. 00034-0387-01 DWG. NO
SUBMITTED: SURV. BY:
F.B. NO.

STATE OF TEXAS · STEPHEN C. REITER · 102348 · LICENSED PROFESSIONAL ENGINEER
12/11/2014

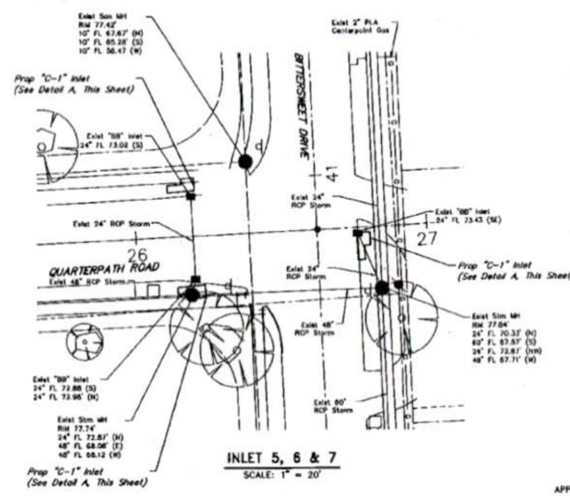
SHEET NO 7 OF 26



INLET 1 & 2
SCALE: 1" = 20'



INLET 3 & 4
SCALE: 1" = 20'



INLET 5, 6 & 7
SCALE: 1" = 20'

BENCH MARK

NGS MONUMENT No. U804, BRASS CAP IN TOP OF NW END OF THE NE ABUTMENT OF A CONCRETE BRIDGE UNDER EASTBOUND LANES OF U.S. HWY 90A, 0.1 MILE SW OF JUNCTION OF F.M. 359 AND 1.45 MILES NE OF RICHMOND COURT HOUSE.

ELEVATION = 82.88' (NAVD 88)

T.B.M. "A"

CENTERLINE / CENTERLINE INTERSECTION OF QUARTERPATH DRIVE AND CHAPELWOOD DRIVE.
ELEVATION = 80.33' (NAVD 88)

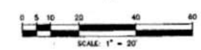
T.B.M. "B"

BOX CUT ON THE BACK OF CURB NEAR THE WHEELCHAIR RAMP AT THE SOUTHWEST CORNER OF PLANTATION DRIVE AND ROCK FENCE DRIVE.
ELEVATION = 79.23' (NAVD 88)

T.B.M. "C"

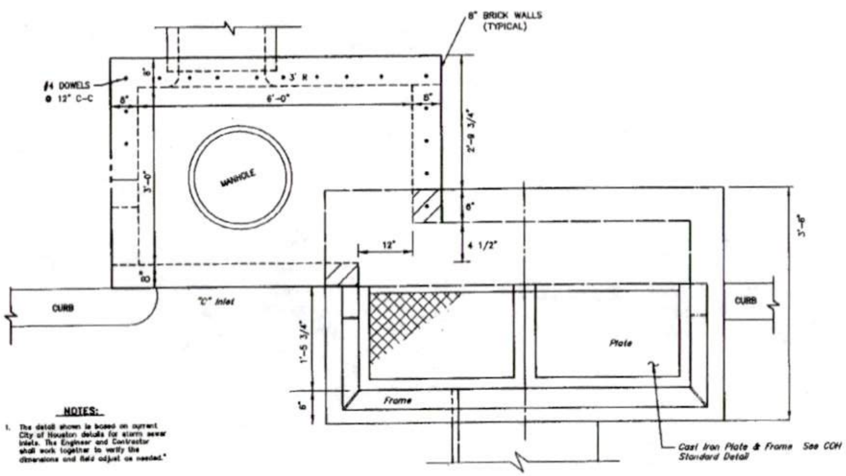
CENTERLINE / CENTERLINE INTERSECTION OF BITTERSWEET DRIVE AND BITTERSWEET COURT

ELEVATION = 79.24' (NAVD 88)



APPROVED: [signature] DEVELOPMENT COORDINATOR

DATE: 2/14/15



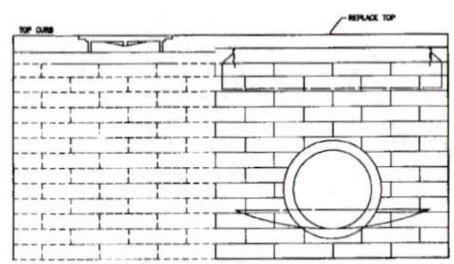
NOTES:

1. The detail shown is based on current City of Houston details for storm sewer inlets. The Engineer and Contractor shall work together to verify the dimensions and field adjust as needed."

PLAN VIEW DETAIL A: STORM SEWER TYPE "C" INLET ONTO "BB" INLET
NOT TO SCALE

NOTES:

1. Contractor shall remove existing B-B Inlet and cut or extend 24" RCP to connect to Prop Type C-1 Inlet area under pavement to be backfilled with cement stabilized sand.
2. Contractor to use extreme caution to prevent silt and sediment from containing area.
3. Contractor to re-pour and pave top



DETAIL A – ADDITION OF A C-INLET ONTO EXISTING "B-B" INLET
NOT TO SCALE

PRIVATE UTILITY LINES SHOWN

AT LEAST 48 HOURS BEFORE EXCAVATING IN STREET R.O.W. OR EASEMENTS CALL THE LONE STAR NOTIFICATION 713-223-4567.

NOTICE:

VERIFICATION OF PRIVATE UTILITY LINES

Date:

CenterPoint Energy/Natural Gas Facilities Verification ONLY.

Date:

CenterPoint Energy/UNDERGROUND Electrical Facilities Verification ONLY.

Date:

NO.	DATE	REVISIONS	APP.

PECAN GROVE M.U.D.
FORT BEND COUNTY, TEXAS

PECAN GROVE PLANTATION 4 & 5
DRAINAGE IMPROVEMENTS

COPPERWOOD LANE & BITTERSWEET INLET PLAN & DETAIL

JONES & CARTER, INC.
ENGINEERS • PLANNERS • SURVEYORS
Texas Board of Professional Engineers Registration No. F-439
6335 Gulfton Dr., Suite 100 Houston, Texas 77081 (713) 777-5337

SCALE: AS SHOWN — DGN. BY: RLC
DATE: DECEMBER 2014 — DWN. BY: JFM
JOB NO. 00034-0387-01 — DWG. NO.
SUBMITTED: — SURV. BY:
F.B. NO.

STATE OF TEXAS
STEPHEN C. REITER
122348
LICENSED
PROFESSIONAL ENGINEER
12/11/2014

SHEET NO.
8
OF 26

LEVEE FILL NOTES

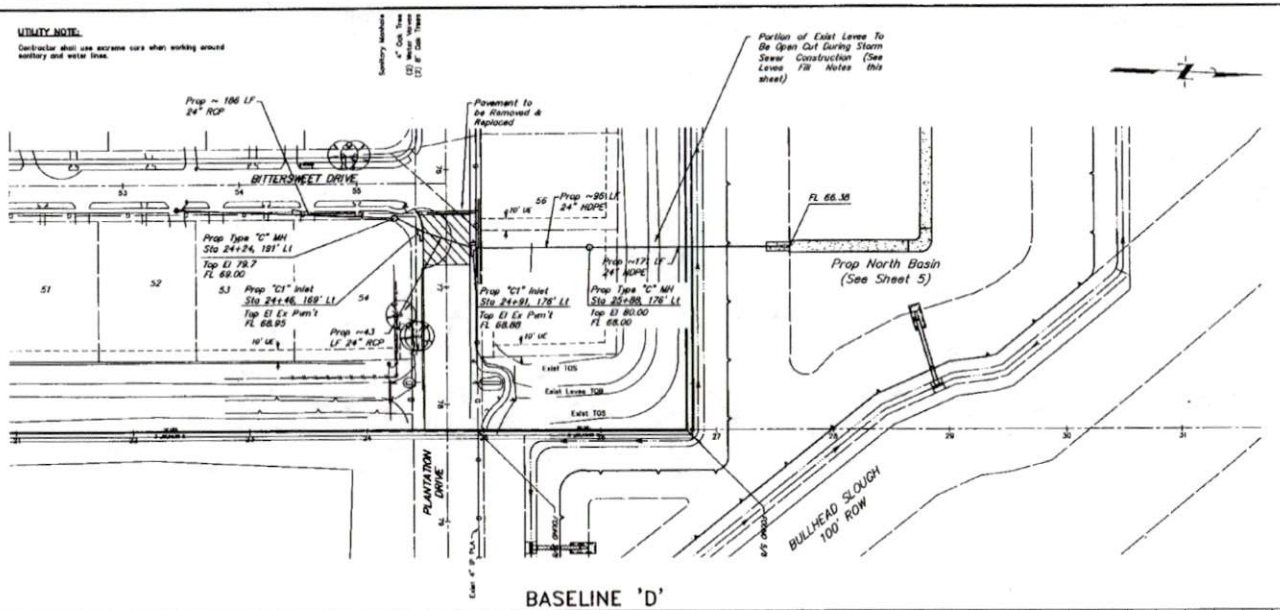
1. ALL FILL SHALL BE PLACED AS SHOWN IN MAXIMUM 8" LOOSE LIFTS AND COMPACTED TO 95% PROCTOR DENSITY AT OPTIMUM TO +3% MOISTURE CONTENT AS PER AASHTO TEST METHOD T-99.
2. EMBANKMENT MATERIAL SHALL BE CH OR CL AS CLASSIFIED UNDER THE UNIFIED SOIL CLASSIFICATION SYSTEM AND SHALL HAVE THE FOLLOWING PROPERTIES: A LIQUID LIMIT GREATER THAN OR EQUAL TO 30, A PLASTICITY INDEX GREATER THAN OR EQUAL TO 15, C, PERCENT PASSING No. 200 SIEVE BETWEEN 80 AND 90 AND SHOULD BE THOROUGHLY PULVERIZED SO THAT CLAY CLODS ARE LESS THAN 2 INCHES IN DIAMETER.
3. THE FOUNDATION AREA SHALL BE A MINIMUM OF 6 INCHES STRIPPED FOR THE FULL WIDTH OF THE LEVEE RIGHT-OF-WAY. STRIPPING SHALL INCLUDE REMOVAL OF EXISTING VEGETATION, TREES, ROOTS, AND OTHER DELETERIOUS MATERIALS. DURING THE SITE PREPARATION, THE CONTRACTOR SHALL INCREASE THE DEPTH AS NEEDED TO ENSURE THE COMPLETE REMOVAL OF ALL ORGANICS AND DELETERIOUS MATERIALS WHICH ARE DEEPER THAN THE MINIMUM 6 INCH REQUIREMENT.

MANHOLE CONNECTION NOTE:

Contractor shall use care to make opening in exist. manhole. Opening shall not be more than 3 inches nor less than 1 inch larger diameter than prop. pipe. Pipe shall not protrude more than 3 inches past inside face of manhole wall. Fill void around pipe with non-shrink waterproof grout. Backfill manhole with cement-sand.

UTILITY NOTE:

Contractor shall use extreme care when working around sanitary and water lines.



BENCH MARK

NOS MONUMENT No. U804, BRASS CAP IN TOP OF NW END OF THE NE ABUTMENT OF A CONCRETE BRIDGE UNDER EASTBOUND LANES OF U.S. HWY 90A, 0.1 MILE SW OF JUNCTION OF F.M. 359 AND 1.45 MILES NE OF RICHMOND COURT HOUSE.

ELEVATION = 82.88' (NAVD 88)

T.B.M. "A"
CENTERLINE / CENTERLINE INTERSECTION OF QUARTERPATH DRIVE AND CHAPELWOOD DRIVE.
ELEVATION = 80.33' (NAVD 88)

T.B.M. "B"
BOX OUT ON THE BACK OF CURB NEAR THE WHEELCHAIR RAMP AT THE SOUTHWEST CORNER OF PLANTATION DRIVE AND ROCK FENCE DRIVE.
ELEVATION = 78.23' (NAVD 88)

T.B.M. "C"
CENTERLINE / CENTERLINE INTERSECTION OF BITTERSWEET DRIVE AND BITTERSWEET COURT
ELEVATION = 78.24' (NAVD 88)

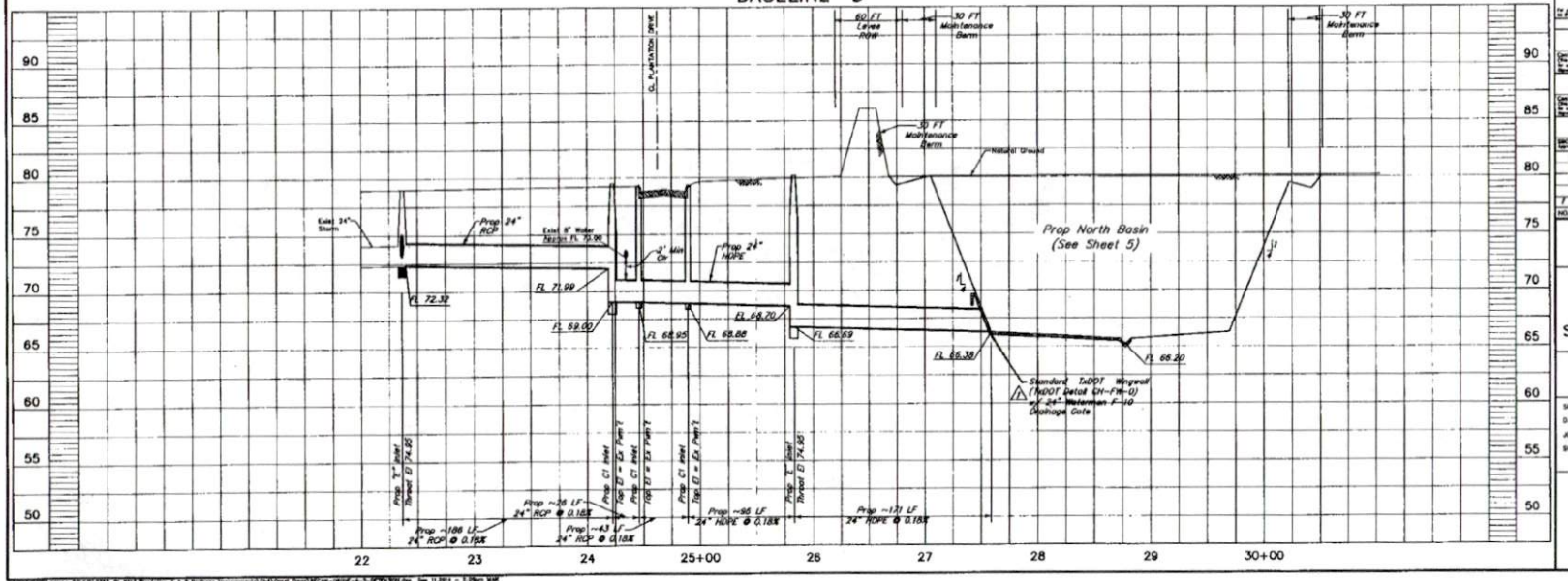
LEGEND

Limits of pavement to be removed and replaced

APPROVED: _____ DEVELOPMENT COORDINATOR

DATE: 2/12/15

BASELINE 'D'



PRIVATE UTILITY LINES SHOWN

AT LEAST 48 HOURS BEFORE EXCAVATING IN STREET R.O.W. OR EASEMENTS CALL THE LINE STAR NOTIFICATION (713-223-4567)

NOTICE:

VERIFICATION OF PRIVATE UTILITY LINES

Date:
CenterPoint Energy/Natural Gas Facilities Verification ONLY

Date:
CenterPoint Energy/UNDERGROUND Electrical Facilities Verification ONLY

Date:

NO.	DATE	REVISIONS	APP.
1	2/10	Added Wingwall Callout	CWK

PECAN GROVE M.U.D.
FORT BEND COUNTY, TEXAS

PECAN GROVE PLANTATION 4 & 5
DRAINAGE IMPROVEMENTS

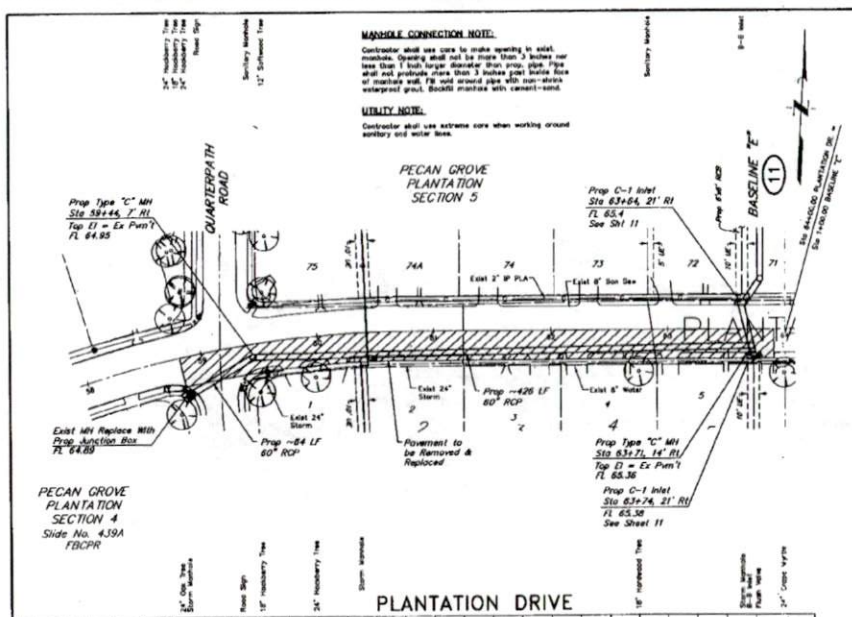
BASELINE 'D'
STA 22+00 TO STA 30+00

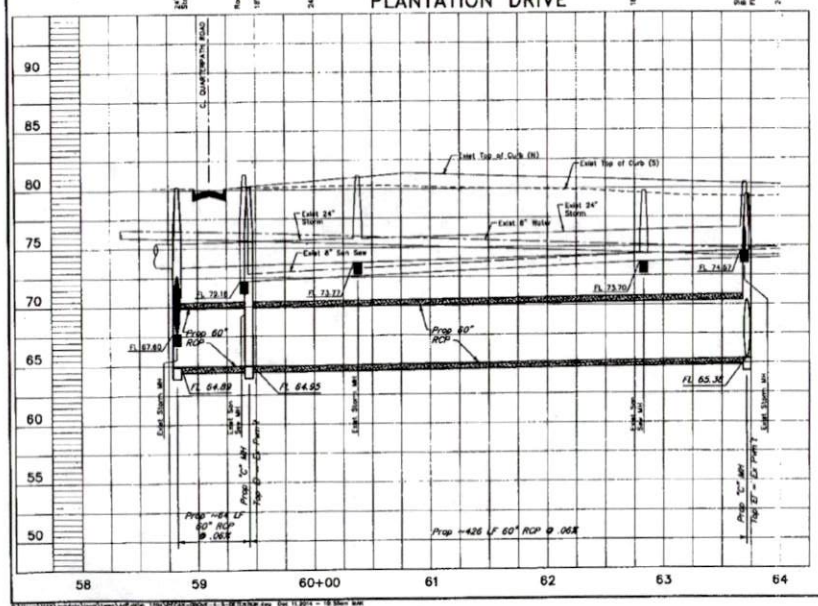
JONES & CARTER, INC.
ENGINEERS • PLANNERS • SURVEYORS
Texas Board of Professional Engineers Registration No. F-439
6330 Gulfton Dr., Suite 100 Houston, Texas 77081 (713) 777-5337

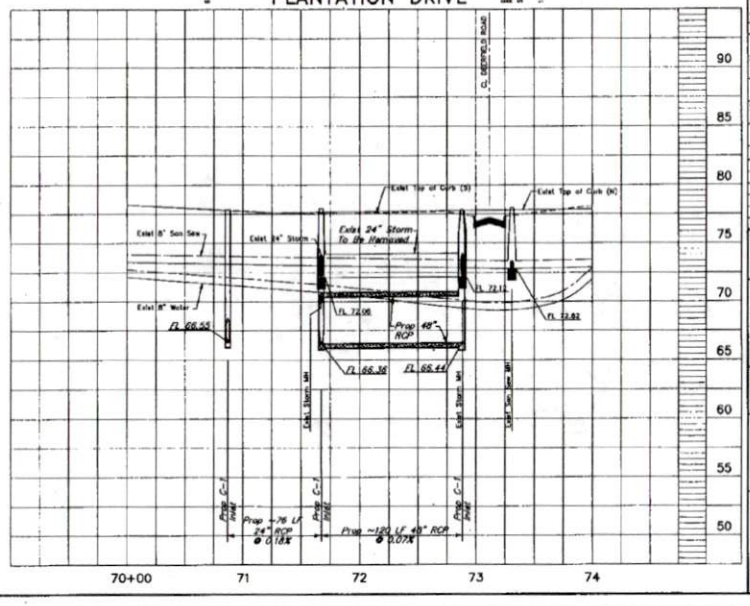
SCALE: 1"=30' H, 1"=5' V. DSN. BY: RJC
DATE: DECEMBER 2014 DWG. BY: RW
JOB NO. 00034-0347-01 DWG. NO.
SUBMITTED: SURV. BY:
F.B. NO.

STATE OF TEXAS
STEPHEN C. REITER
103948
LICENSED PROFESSIONAL ENGINEER
12/1/2014

SHEET NO. 9 OF 26







BENCH MARK

HGS MONUMENT No. USO4, BRASS CAP IN TOP OF NW END OF THE NE ABUTMENT OF A CONCRETE BRIDGE UNDER EASTBOUND LANES OF U.S. HWY 90A, 0.1 MILE SW OF JUNCTION OF F.M. 359 AND 1.45 MILES NE OF RICHMOND COURT HOUSE.

ELEVATION = 82.88' (NAVD 88)

T.B.M. "A"

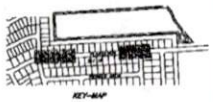
CENTERLINE / CENTERLINE INTERSECTION OF QUARTERPATH DRIVE AND CHAPULLWOOD DRIVE
ELEVATION = 80.33' (NAVD 88)

T.B.M. "B"

BOX OUT ON THE BACK OF CURB NEAR THE WHEELCHAIR RAMP AT THE SOUTHWEST CORNER OF PLANTATION DRIVE AND ROCK FENCE DRIVE.
ELEVATION = 79.33' (NAVD 88)

T.B.M. "C"

CENTERLINE / CENTERLINE INTERSECTION OF BITTERSWEET DRIVE AND BITTERSWEET COURT
ELEVATION = 78.24' (NAVD 88)



APPROVED: _____ DEVELOPMENT COORDINATOR

DATE: 2/12/15

LEGEND

Limits of pavement to be removed and replaced

PRIVATE UTILITY LINES SHOWN

AT LEAST 48 HOURS BEFORE EXCAVATING IN STREET R.O.W. OR EASEMENTS, CALL TEX DIG ONE CALL NOTIFICATION (713-223-4567)

NOTICE!

VERIFICATION OF PRIVATE UTILITY LINES

Date:

CenterPoint Energy/Reliant Gas Facilities Verification Only !!

Date:

CenterPoint Energy/UNDERGROUND Electrical Facilities Verification ONLY

Date:

SBC

NO.	DATE	REVISIONS	APP.

PECAN GROVE M.U.D.
FORT BEND COUNTY, TEXAS

PECAN GROVE PLANTATION 4 & 5
DRAINAGE IMPROVEMENTS
PLANTATION DRIVE
STA 58+00 TO STA 64+00
PLANTATION DRIVE
STA 70+00 TO STA 74+00

JONES & CARTER, Inc.
ENGINEERS • PLANNERS • SURVEYORS
Texas Board of Professional Engineers Registration No. F-439
6330 Gulfton Dr. Suite 100 Houston, Texas 77081 (713) 777-5337

SCALE: 1"=50' H, 1"=5' V. DGN. BY: RLG
DATE: DECEMBER 2014 DWN. BY: JFM
JOB NO. 00034-0367-01 DWG. NO.
SUBMITTED: SURV BY:
F.B. NO.

STATE OF TEXAS
STEPHEN G. REITER
102948
LICENSED
PROFESSIONAL ENGINEER
12/11/2014

SHEET NO. 10 OF 26

LEVEE FILL NOTES

1. ALL FILL SHALL BE PLACED AS SHOWN IN MAXIMUM 8" LOOSE LIFTS AND COMPACTED TO 95% PROCTOR DENSITY AT OPTIMUM TO +3% MOISTURE CONTENT AS PER AASHTO TEST METHOD T-99.
2. EMBANKMENT MATERIAL SHALL BE CH OR CL AS CLASSIFIED UNDER THE UNIFIED SOIL CLASSIFICATION SYSTEM AND SHALL HAVE THE FOLLOWING PROPERTIES: A. LIQUID LIMIT GREATER THAN OR EQUAL TO 30. B. PLASTICITY INDEX GREATER THAN OR EQUAL TO 15. C. PERCENT PASSING No. 200 SIEVE BETWEEN 60 AND 90 AND SHOULD BE THOROUGHLY PULVERIZED SO THAT CLAY CLODS ARE LESS THAN 2 INCHES IN DIAMETER.
3. THE FOUNDATION AREA SHALL BE A MINIMUM OF 6 INCHES STRIPPED FOR THE FULL WIDTH OF THE LEVEE RIGHT-OF-WAY. STRIPPING SHALL INCLUDE REMOVAL OF EXISTING VEGETATION, TREES, ROOTS, AND OTHER DELETERIOUS MATERIALS. DURING THE SITE PREPARATION, THE CONTRACTOR SHALL INCREASE THE DEPTH AS NEEDED TO ENSURE THE COMPLETE REMOVAL OF ALL ORGANICS AND DELETERIOUS MATERIALS WHICH ARE DEEPER THAN THE MINIMUM 6 INCH REQUIREMENT.

MANHOLE CONNECTION NOTE:

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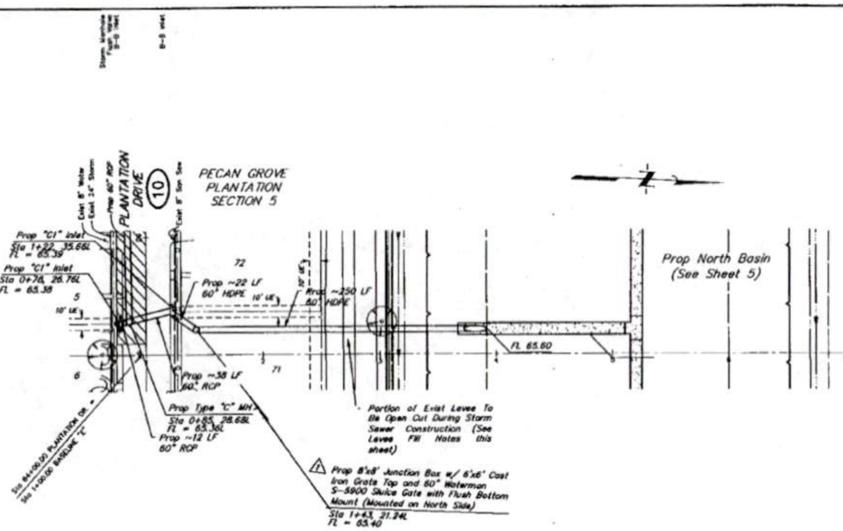

UTILITY NOTE:

Contractor shall use extreme care when working around sanitary and water lines.

BENCH MARK

NGS MONUMENT No. U804, BRASS CAP IN TOP OF NW END OF THE NE ABUTMENT OF A CONCRETE BRIDGE UNDER EASTBOUND LANES OF U.S. HWY 90A, 0.1 MILE SW OF JUNCTION OF F.M. 359 AND 1.45 MILES NE OF RICHMOND COURT HOUSE.

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CENTERLINE / CENTERLINE INTERSECTION OF QUARTERPATH DRIVE AND CHAPELWOOD DRIVE
ELEVATION = 80.33' (NAVD 88)

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BOX CUT ON THE BACK OF CURB NEAR THE WHEELCHAIR RAMP AT THE SOUTHWEST CORNER OF PLANTATION DRIVE AND ROCK FENCE DRIVE.
ELEVATION = 79.23' (NAVD 88)

T.B.M. "C"

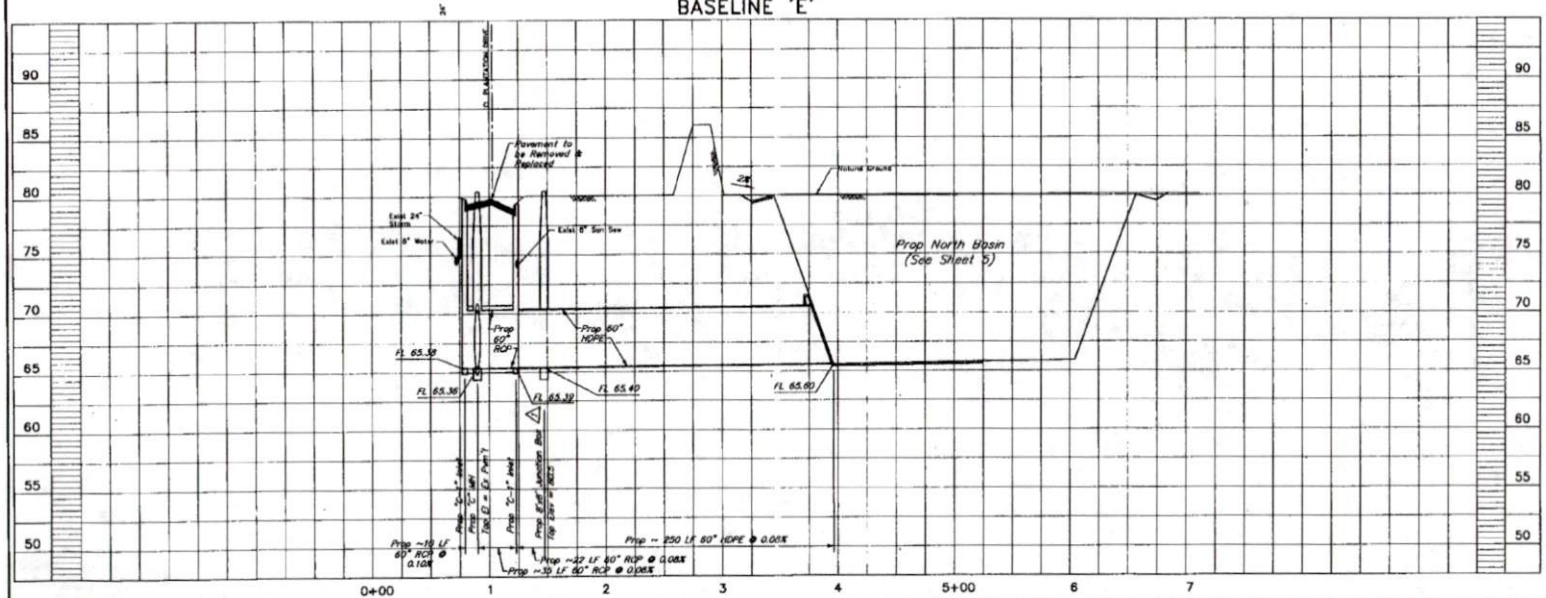
CENTERLINE / CENTERLINE INTERSECTION OF BITTERSWEET DRIVE AND BITTERSWEET COURT

ELEVATION = 79.24' (NAVD 88)

APPROVED: ____________ DEVELOPMENT COORDINATOR

DATE: 2/12/15

BASELINE 'E'



LEGEND

Limits of pavement to be removed and replaced

PRIVATE UTILITY LINES SHOWN

AT LEAST 48 HOURS BEFORE EXCAVATING IN STREET R.O.W. OR EASEMENTS CALL THE LONE STAR NOTIFICATION 713-223-4567.

NOTICE:

VERIFICATION OF PRIVATE UTILITY LINES

Date:

CenterPoint Energy/Natural Gas Facilities Verification ONLY

Date:

CenterPoint Energy/UNDERGROUND Electrical Facilities Verification ONLY

Date:

NO.	DATE	REVISIONS	APP.
1	2/10	Added Junction Box Callout	CMK

PECAN GROVE M.U.D.
FORT BEND COUNTY, TEXAS

PECAN GROVE PLANTATION 4 & 5
DRAINAGE IMPROVEMENTS

BASELINE 'E'
STA 0+00 TO STA 7+00

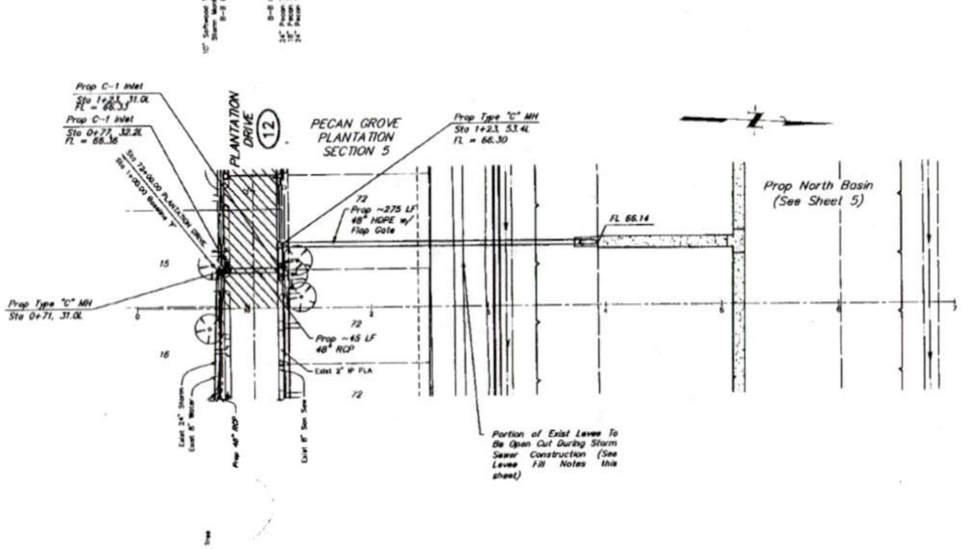
JONES & CARTER, Inc.
ENGINEERS • PLANNERS • SURVEYORS
Texas Board of Professional Engineers Registration No. F-439

SCALE: 1"=30' H., 1"=3' V. DGN. BY: RLC
DATE: DECEMBER 2014 DWN. BY: JFM
JOB NO. 00034-0387-01 DWG. NO.
SUBMITTED: SURV. BY:
F.B. NO.

STATE OF TEXAS
STEPHEN C. REITER
102848
LICENSED PROFESSIONAL ENGINEER

12/11/2014

SHEET NO.
11
OF 26



LEVEE FILL NOTES

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UTILITY NOTE:

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BENCH MARK

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CENTERLINE / CENTERLINE INTERSECTION OF QUARTERPATH DRIVE AND CHAPELWOOD DRIVE
ELEVATION = 80.33' (NAVD 88)

T.B.M. "B"

BOX OUT ON THE BACK OF CURB NEAR THE WHEELCHAIR RAMP AT THE SOUTHWEST CORNER OF PLANTATION DRIVE AND ROCK FENCE DRIVE.
ELEVATION = 79.23' (NAVD 88)

T.B.M. "C"

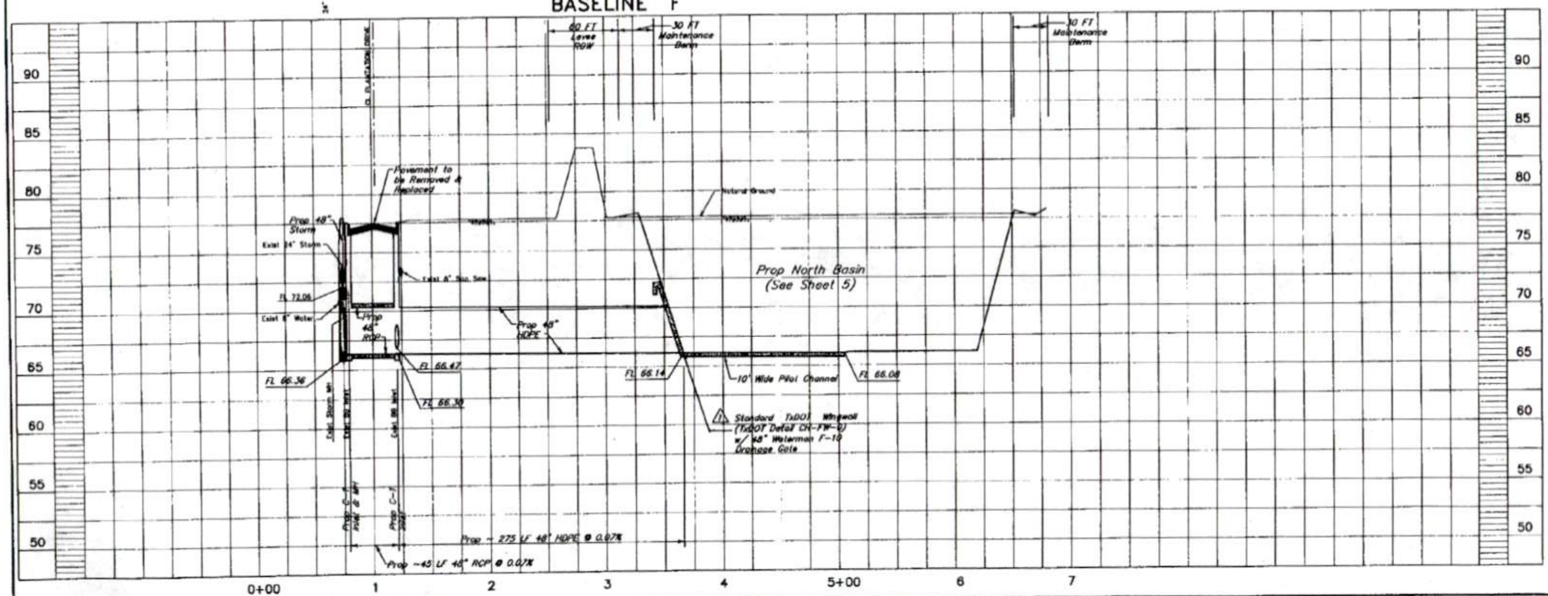
CENTERLINE / CENTERLINE INTERSECTION OF BITTERSWEET DRIVE AND BITTERSWEET COURT

ELEVATION = 79.24' (NAVD 88)

APPROVED: [signature] DEVELOPMENT COORDINATOR

DATE: 2/12/15

BASELINE 'F'



LEGEND

Limits of pavement to be removed and replaced

PRIVATE UTILITY LINES SHOWN

AT LEAST 48 HOURS BEFORE EXCAVATING IN STREET R.O.W. OR EASEMENTS CALL THE LONE STAR NOTIFICATION 713-223-4567.

NOTICE:

VERIFICATION OF PRIVATE UTILITY LINES

Date:

CenterPoint Energy/Natural Gas Facilities Verification ONLY.

Date:

CenterPoint Energy/UNDERGROUND Electrical Facilities Verification ONLY.

Date:

NO.	DATE	REVISIONS	APP.
1	2/10	Added Wingwall Callout	CWK

PECAN GROVE M.U.D.
FORT BEND COUNTY, TEXAS

PECAN GROVE PLANTATION 4 & 5
DRAINAGE IMPROVEMENTS

BASELINE 'F'
STA 0+00 TO STA 7+00

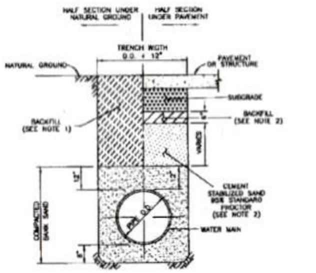
JONES & CARTER, INC.
ENGINEERS • PLANNERS • SURVEYORS
Texas Board of Professional Engineers Registration No. F-439
6335 Gulfton Dr., Suite 100 Houston, Texas 77081 (713) 777-5337

SCALE: 1"=50' H., 1"=5' V. DGN. BY: RLC
DATE: DECEMBER 2014 DWN. BY: JFN
JOB NO. 00034-0367-01 DWG. NO.
SUBMITTED: SURV BY:
F.B. NO.

STATE OF TEXAS
STEPHEN C. REITER
102948
LICENSED
PROFESSIONAL ENGINEER

12/11/2014

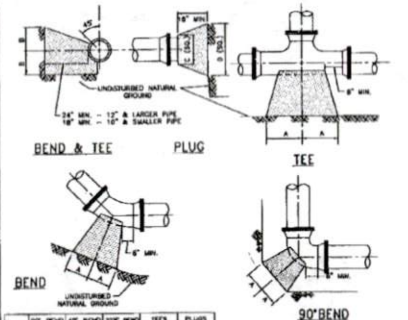
SHEET NO.
12
OF 26



NOTES

1. BACKFILL SHALL BE NATIVE SOIL, FREE OF DEBRIS, PLACED IN LIFTS, 8" THICK OR LESS, COMPACTED TO 90% STANDARD PROCTOR DENSITY, EXCEPT AS REQUIRED BELOW.
2. BACKFILL UNDER AND WITHIN 3 FEET OF DRIVEWAYS AND PUBLIC STREETS SHALL BE CEMENT STABILIZED SAND (1.5 SACKS OF CEMENT PER CUBIC YARD OF SAND), EXCEPT THE TOP 5" SHALL BE NATIVE SOIL, FREE OF DEBRIS. ALL BACKFILL UNDER PAVING SHALL BE COMPACTED TO 95% STANDARD PROCTOR DENSITY.
3. TRENCH SHORING, IN ACCORDANCE WITH OSHA, SHALL BE INSTALLED AS REQUIRED.

1. WATER LINE BEDDING

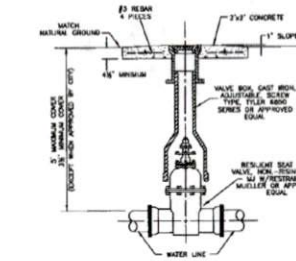


SIZE	90° BEND		45° BEND		22½° BEND		TEES		PLUGS	
	A	B	A	B	A	B	A	B	C	D
2½"	13"	7"	6"	7"	6"	6"	7"	8"	8"	14"
4"	14"	8"	7"	9"	6"	6"	8"	11"	8"	18"
6"	16"	10"	9"	10"	6"	8"	10"	12"	10"	21"
8"	22"	13"	12"	13"	8"	10"	13"	18"	12"	29"
12"	29"	21"	18"	21"	11"	18"	18"	24"	18"	41"
16"	36"	27"	21"	27"	12"	24"	24"	30"	20"	54"

NOTES:

1. THRUST BLOCKS AT TRENCH FACE MUST HAVE A MINIMUM BEARING SURFACE OF 1.0 SQ. FOOT AND THE LEAST DIMENSION SHALL BE NO SMALLER THAN 1.5 TIMES PIPE DIAMETER, BUT NOT LESS THAN 1.0 FT.
2. THRUST BLOCKS SHALL BE PACKED AT ALL FITTINGS.
3. ALL FITTINGS SHALL BE M.J. RESTRAINED JOINT (EBAA IRON, SERIES 2000PV, OR APPROVED EQUAL).

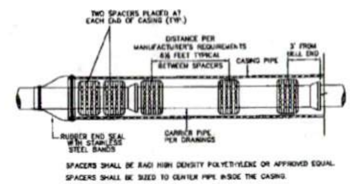
2. THRUST BLOCK



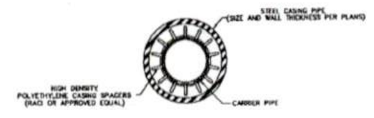
NOTES:

1. PROVIDE OPERATING NUT EXTENSION, AS NEEDED, TO APPROXIMATELY THREE (3) FEET BELOW FINISHED GRADE.
2. VALVE BOX SHALL NOT TRANSMIT ANY LOAD DIRECTLY TO THE VALVE OR PIPE.
3. GATE VALVES SHALL BE COUNTER-CLOCKWISE OPEN.
4. TAPPING VALVES ARE NOT ALLOWED WHEN TAP IS SAME SIZE AS THE EXISTING MAIN EXCEPT WHEN APPROVED BY PUBLIC WORKS.

3. GATE VALVE AND BOX



SPACERS SHALL BE RAD HIGH DENSITY POLYETHYLENE OR APPROVED EQUAL.
SPACERS SHALL BE SIZED TO CENTER PIPE INSIDE THE CASING.



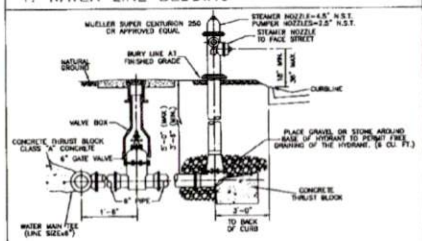
NOTES

1. CASING SPACERS SHALL BE USED TO INSTALL THE CARRIER PIPE INSIDE THE ENCASEMENT PIPE TO PROVIDE SUPPORT AROUND THE PERIPHERY OF THE PIPE. MINIMUM CLEARANCE BETWEEN MAXIMUM O.D. OF CARRIER PIPE AND I.D. OF CASING SHALL BE ONE INCH.
2. SPACERS SHALL BE PROJECTION TYPE, WITH A MINIMUM NUMBER OF PROJECTIONS AROUND THE CIRCUMFERENCE EQUAL TO THE NUMBER OF DIAMETER INCHES OF THE CARRIER PIPE. CASING SPACERS SHALL BE TOTALLY NON-METALLIC SPACERS CONSTRUCTED OF INTERLOCKING PREFORMED SECTIONS OF HIGH DENSITY POLYETHYLENE. SPACERS SHALL BE ISO 9002 CERTIFIED FOR STRENGTH AND QUALITY.
3. THE ENDS OF THE CASING SHALL BE SEALED USING PSI MODEL 1 WA WRAP AROUND END SEAL MADE OF 1/8" THICKNESS RUBBER AND STAINLESS STEEL BANDS, OR APPROVED EQUAL.

PVC PIPE IN CASING

DR18 C900/C905 PVC PIPE	OD"	BELL OD"	STEEL CASING DIAMETER	RAD SPACERS MODEL*
4"	4.80"	6.38"	10"	2F 41
6"	6.90"	8.88"	12"	2F, 1G 41
8"	9.05"	11.38"	14"	3F, 1G 41
10"	11.10"	13.87"	16"	4F 41
12"	13.20"	16.34"	20"	5F 60
14"	15.30"	18.23"	22"	6F 60
16"	17.40"	20.58"	24"	7F 60

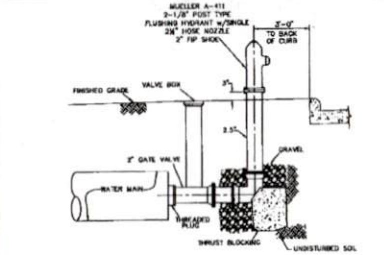
7. WATER LINE CASING



NOTES

1. 5/8" ALL-THREAD IS TO BE USED TO TIE VALVE TO TEE AND VALVE TO HYDRANT.
2. PROVIDE MECHANICAL RESTRAINED JOINTS (EBBA IRON, SERIES 2000PV, OR APPROVED EQUAL).
3. PAINT ALL FIRE HYDRANT BARRELS SILVER. PAINT BONNET AND CAPS IN ACCORDANCE WITH CITY OF RICHMOND REQUIREMENTS BASED ON FLOW CAPACITIES. (COLORS: BLUE-1500 GPM AND ABOVE; GREEN-1000 GPM TO 1499 GPM; ORANGE-500 GPM TO 999 GPM; RED-LESS THAN 500 GPM).

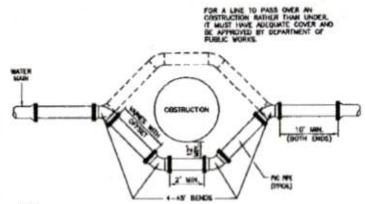
4. FIRE HYDRANT



NOTE

1. ON OPEN-DITCH ROADWAYS, SET THE FLUSHING HYDRANTS WITHIN 3 FEET OF ROAD RIGHT-OF-WAY LINE.
2. PAINT ALL FLUSH VALVES SILVER.

5. 2" BLOWOFF VALVE ASSEMBLY

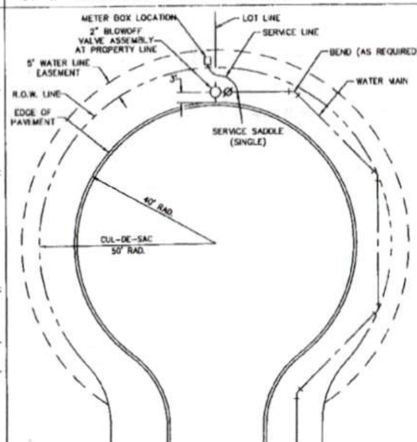


NOTES:

1. OFFSET ASSEMBLIES SHALL BE CONSTRUCTED WHEN THE PIPE DEPTH EXCEEDS 6 FEET AND WHEN THE LINE WILL BE CONSTRUCTED WITH A DEPTH GREATER THAN 6 FEET AT A FIRE HYDRANT OR SERVICE LEAD.
2. PIPE-AWWA C900 DR-18, 150 PSI WITH INTEGRAL PVC JOINT.
3. FITTINGS-DUCTILE IRON EPOXY LINED AND COATED, MECHANICAL RESTRAINED JOINT (EBAA IRON, SERIES 2000PV, OR APPROVED EQUAL).
4. PROVIDE 2-5/8" ALL-THREAD RODS BETWEEN ALL FITTINGS.

6. WATER PIPE OFFSET ASSEMBLY

8. VALVE LOCATION PLAN



9. BLOWOFF LOCATION PLAN

NO.	DATE	REVISIONS	APP.

CITY OF RICHMOND
APPROVALS

LEMERT KURTZ, DIRECTOR OF PUBLIC WORKS — DATE

GARREN SCHMIDT, WATER SUPERINTENDENT — DATE

WADE WENDT, WASTEWATER SUPERINTENDENT — DATE

JIM WHITEHEAD, STREET SUPERINTENDENT — DATE

DWAYNE PRICE, PARKS SUPERINTENDENT — DATE

APPROVED: [signature] DEVELOPMENT COORDINATOR

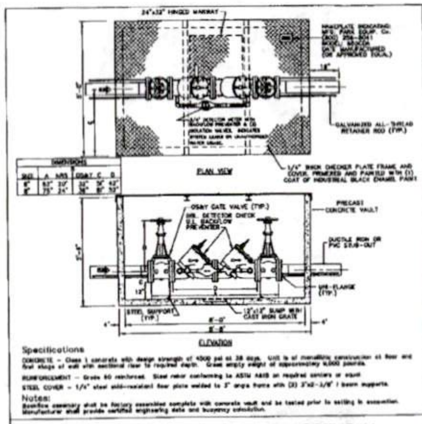
DATE: 2/12/15

STEPHEN G. HOTER 102048 LICENSED PROFESSIONAL ENGINEER 12/18/2014

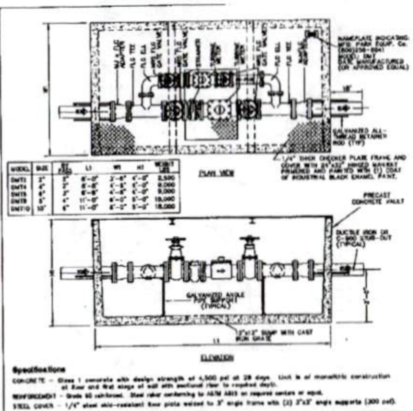
JONES & CARTER, INC.
ENGINEERS • PLANNERS • SURVEYORS
Texas Board of Professional Engineers Registration No. F-439
6335 Gulfton Dr., Suite 100 Houston, Texas 77081 (713) 777-5337

CITY OF RICHMOND
STANDARD CONSTRUCTION DETAILS
WATER
SHEET 1 OF 2

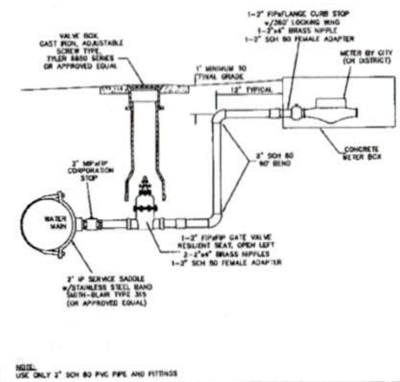
SCALE		
HORIZONTAL	1" = NTS	DESIGNED BY: RWS
VERTICAL	1" = NTS	DRAWN BY: DCB
		CHECKED BY: KRK
		DATE: OCTOBER 24, 2005
		JOB NO:
		DWG. NO:
		Sheet 13 of 36



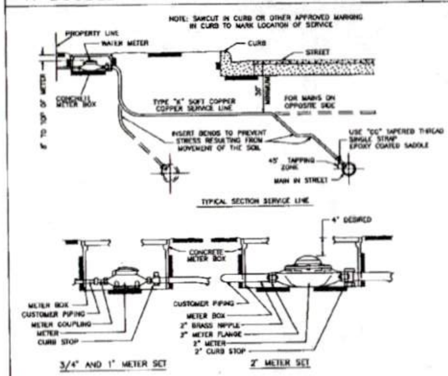
1. DOUBLE CHECK DETECTOR ASSEMBLY

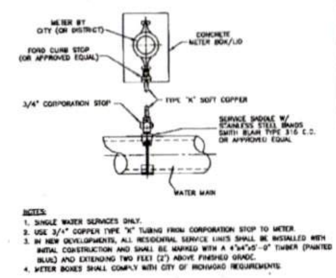


2. DOMESTIC TURBINE WATER METER ASSEMBLY



3. 2" WATER SERVICE CONNECTION





4. RESIDENTIAL WATER METER AND SERVICE LINE

NO.	DATE	REVISIONS	APP.

CITY OF RICHMOND
APPROVALS

LEVERT KURTZ, DIRECTOR OF PUBLIC WORKS — DATE

GARREN SCHMIDT, WATER SUPERINTENDENT — DATE

WADE WENDT, WASTEWATER SUPERINTENDENT — DATE

JIM WHITEHEAD, STREET SUPERINTENDENT — DATE

DWAYNE PRICE, PARKS SUPERINTENDENT — DATE

APPROVED: ________ DEVELOPMENT COORDINATOR

DATE: 2/12/15

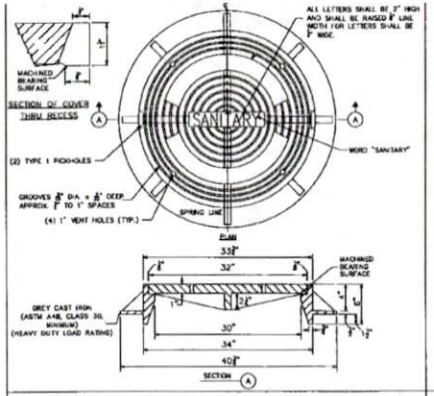
JONES & CARTER, INC.
ENGINEERS • PLANNERS • SURVEYORS

CITY OF RICHMOND
STANDARD CONSTRUCTION DETAILS

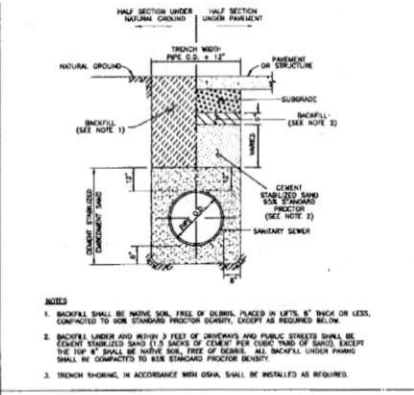
WATER

SHEET 2 OF 2

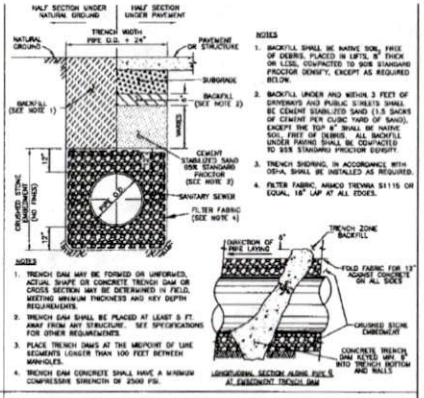
SCALE		
HORIZONTAL	1" = NTS	DESIGNED BY: RNS
VERTICAL	1" = NTS	DRAWN BY: DCB
		CHECKED BY: KRK
		DATE: OCTOBER 24, 2005
		JOB NO:
		DWG. NO:
		Sheet 14 of 28



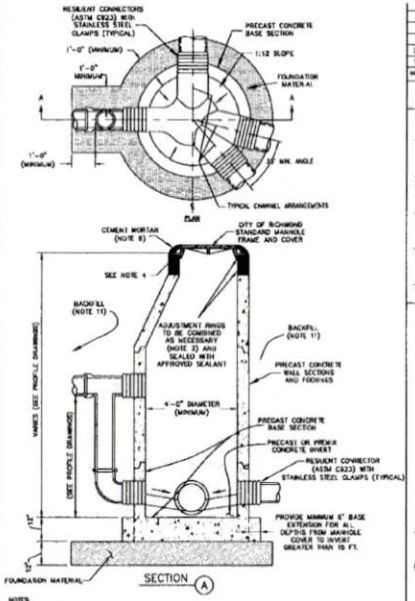
1. MANHOLE FRAME AND COVER



2. SANITARY SEWER BEDDING



3. SANITARY SEWER BEDDING FOR WET CONDITIONS



7. SANITARY SEWER MANHOLE

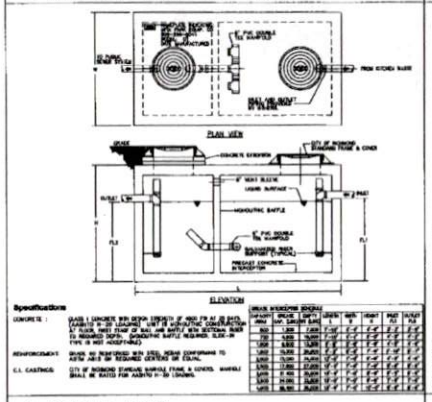
NO.	DATE	REVISIONS	APP.
2	3/28/12	ADD AIR RELEASE VALVE MANHOLE	RWS
1	8/03/08	REVISE MANHOLE FRAME/COVER	RWS

CITY OF RICHMOND
APPROVALS

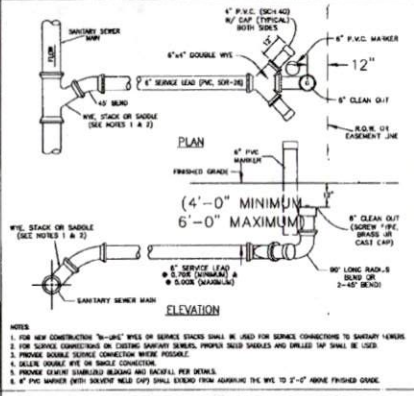
LEHERT KURTZ, DIRECTOR OF PUBLIC WORKS	DATE
SANDY SCHMIDT, WATER SUPERINTENDENT	DATE
MIKE WEEKS, WASTEWATER SUPERINTENDENT	DATE
JIM WHITEHEAD, STREET SUPERINTENDENT	DATE
SHAYNE PRICE, PARKS SUPERINTENDENT	DATE

APPROVED: _____ DEVELOPMENT COORDINATOR

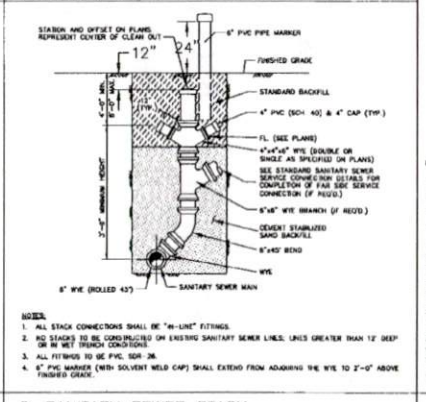
DATE: 7/14/15



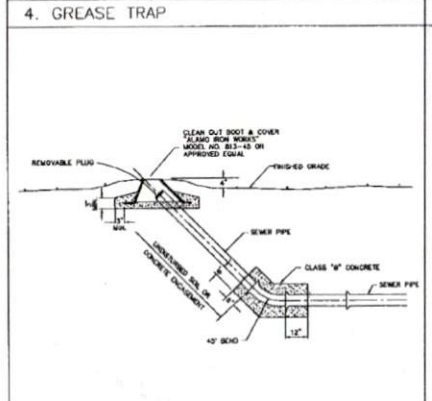
4. GREASE TRAP



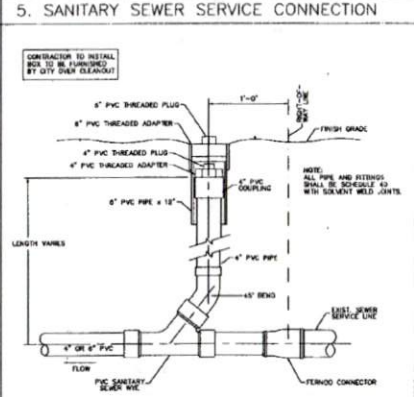
5. SANITARY SEWER SERVICE CONNECTION



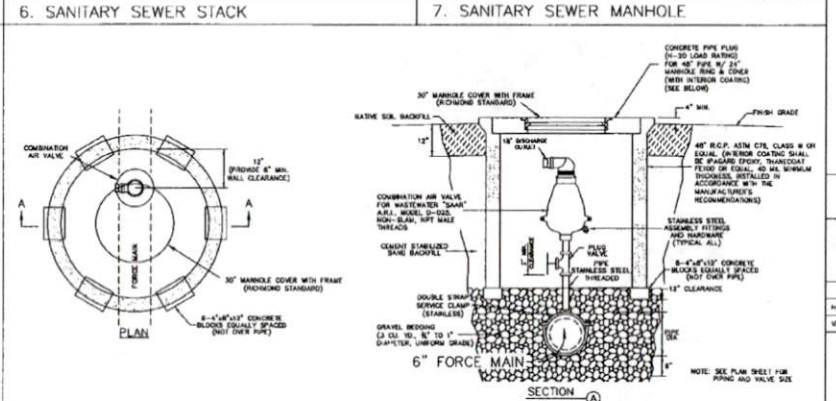
6. SANITARY SEWER STACK



8. STANDARD CLEANOUT FOR SAN. SEWER (MAIN LINE)



9. SERVICE LINE CLEANOUT ASSEMBLY



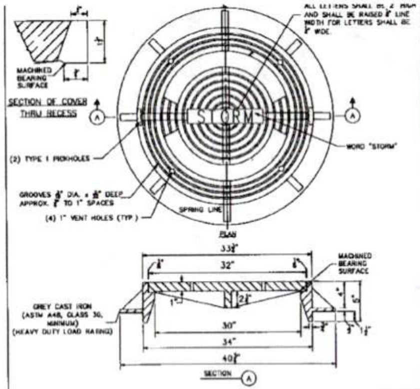
10. SEWERAGE AIR RELEASE VALVE MANHOLE

STEPHEN C. REITER 102348 LICENSED PROFESSIONAL ENGINEER
12/10/2014

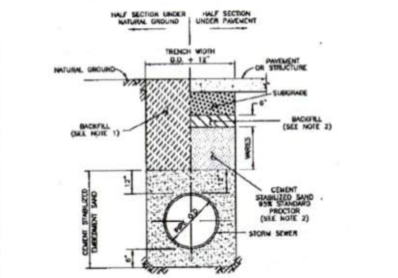
JONES&CARTER, INC.
ENGINEERS • PLANNERS • SURVEYORS
Texas Board of Professional Engineers Registration No. F-439
6330 Gulfton St., Suite 100 Houston, Texas 77081 (713) 777-5337

CITY OF RICHMOND
STANDARD CONSTRUCTION DETAILS
SANITARY

SCALE		DESIGNED BY:	RWS
HORIZONTAL	1" = NTS	DRAWN BY:	DCB
VERTICAL	1" = NTS	CHECKED BY:	KRK
		DATE:	OCTOBER 24, 2003
		JOB NO:	
		DWG. NO:	
		Sheet:	15
			of 25



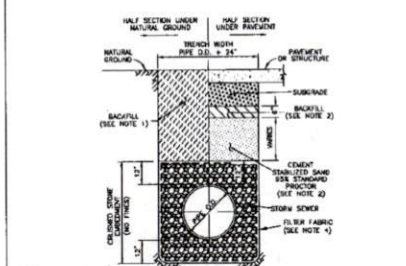
1. MANHOLE AND INLET FRAME AND COVER



NOTES

1. BACKFILL SHALL BE NATIVE SOIL, FREE OF DEBRIS, PLACED IN LIFTS, 6" THICK OR LESS, COMPACTED TO 90% STANDARD PROCTOR DENSITY, EXCEPT AS REQUIRED BELOW.
2. BACKFILL UNDER AND WITHIN 3 FEET OF DRIVEWAYS AND PUBLIC STREETS SHALL BE CEMENT STABILIZED SAND (1.5 SACKS OF CEMENT PER CUBIC YARD OF SAND), EXCEPT THE TOP 6" SHALL BE NATIVE SOIL, FREE OF DEBRIS. ALL BACKFILL UNDER PAVING SHALL BE COMPACTED TO 95% STANDARD PROCTOR DENSITY.
3. TRENCH SHORING, IN ACCORDANCE WITH OSHA, SHALL BE INSTALLED AS REQUIRED.

2. STORM SEWER BEDDING



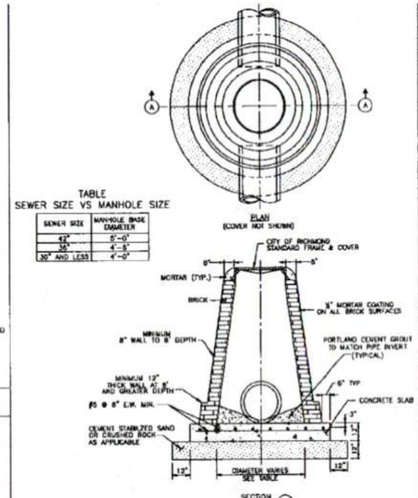
NOTES

1. BACKFILL SHALL BE NATIVE SOIL, FREE OF DEBRIS, PLACED IN LIFTS, 6" THICK OR LESS, COMPACTED TO 90% STANDARD PROCTOR DENSITY, EXCEPT AS REQUIRED BELOW.
2. BACKFILL UNDER AND WITHIN 3 FEET OF DRIVEWAYS AND PUBLIC STREETS SHALL BE CEMENT STABILIZED SAND (1.5 SACKS OF CEMENT PER CUBIC YARD OF SAND), EXCEPT THE TOP 6" SHALL BE NATIVE SOIL, FREE OF DEBRIS. ALL BACKFILL UNDER PAVING SHALL BE COMPACTED TO 95% STANDARD PROCTOR DENSITY.
3. TRENCH SHORING, IN ACCORDANCE WITH OSHA, SHALL BE INSTALLED AS REQUIRED.
4. FILTER FABRIC, ARMCO TREVIRA S1115 OR EQUAL, 18" LAP AT ALL EDGES.

3. STORM SEWER BEDDING FOR WET CONDITIONS

TABLE
SEWER SIZE VS MANHOLE SIZE

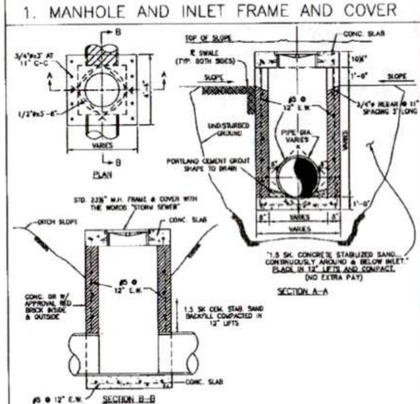
SEWER SIZE	MANHOLE BASE DIAMETER
42"	5'-0"
36"	4'-6"
30" AND LESS	4'-0"



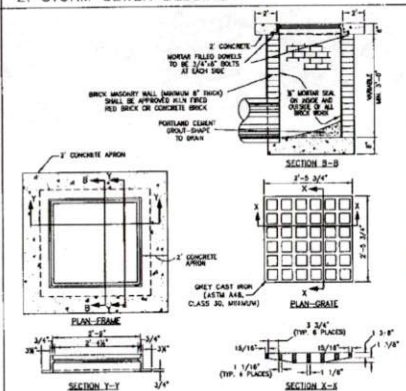
NOTES:

1. ALL BACKFILL WITHIN 2 FEET OF THE MANHOLE AND WITHIN 4 FEET OF THE TOP RIM ELEVATION SHALL BE CEMENT STABILIZED SAND (SEE BEDDING DETAIL).
2. BACKFILL UNDER AND WITHIN 3 FEET OF PAVING SHALL MEET THE BACKFILL REQUIREMENTS FOR STORM SEWERS.

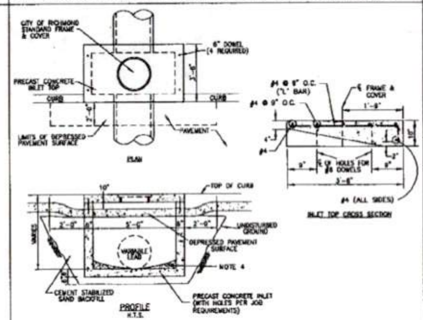
4. MANHOLE TYPE "C" FOR 42" DIA. R.C.P. AND SMALLER



5. TYPE 'E' INLET



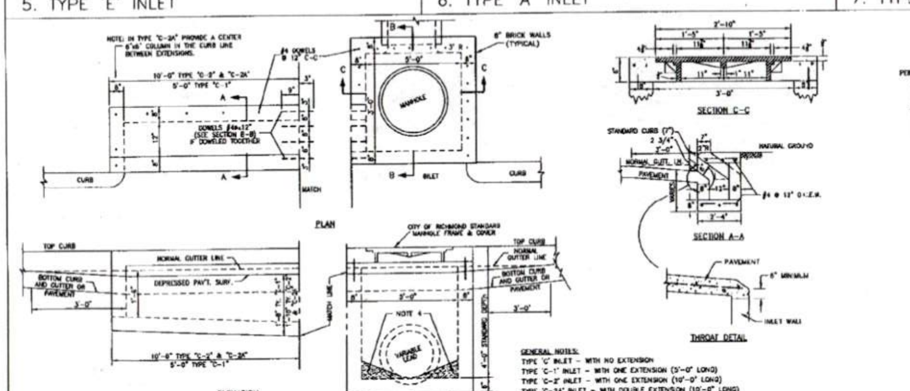
6. TYPE 'A' INLET

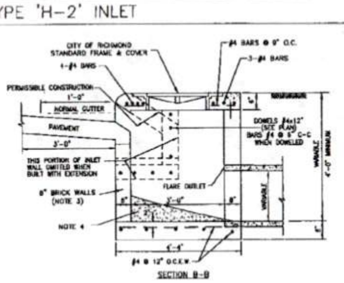


NOTES:

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. PORTLAND CEMENT GROUT-SHAPE TO DRAIN.

7. TYPE 'H-2' INLET





NOTES:

1. FOR TYPE 'C-2A' INLETS PROVIDE A CENTER 6"x6" COLUMN IN THE CURB LINE BETWEEN ALL EXTENSIONS.
2. CEMENT STABILIZED SAND BACKFILL SHALL BE PLACED A MINIMUM OF 6 INCHES BELOW INLET AND A MINIMUM OF 12 INCHES AROUND INLET TO THE TOP OF STAGE 1 STRUCTURE.
3. ALTERNATIVE REINFORCED CONCRETE WALLS SHALL BE A MINIMUM OF 6" THICK WITH #4 @ 9" O.C.
4. PORTLAND CEMENT GROUT-SHAPE TO DRAIN.

8. TYPE 'C' INLET

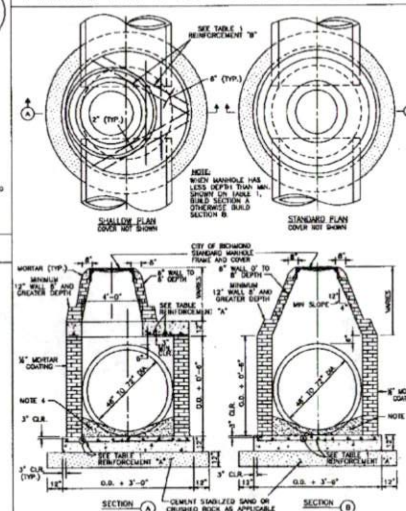


TABLE 1
DATA FOR VARIOUS PIPE DIAMETERS

PIPE DIA. (INCHES)	MIN. DEPTH	REINFORCEMENT ("A")	REINFORCEMENT ("B")
48"	8'-0"	#5 @ 12 E.W.	3-#6
54"	9'-4"	#5 @ 10 E.W.	3-#6
60"	10'-7"	#5 @ 8 E.W.	3-#7
66"	11'-10"	#5 @ 7 E.W.	3-#7
72"	13'-2"	#5 @ 6 E.W.	3-#7

NOTES:

1. ALL BACKFILL WITHIN 2 FEET OF THE MANHOLE AND WITHIN 4 FEET OF THE TOP RIM ELEVATION SHALL BE CEMENT STABILIZED BACKFILL (SEE BEDDING DETAIL).
2. BACKFILL UNDER AND WITHIN 3 FEET OF PAVING SHALL MEET THE BACKFILL REQUIREMENTS FOR STORM SEWERS.
3. 12 INCHES OF BEDDING IS NOT REQUIRED IF BASE IS CAST IN PLACE ON UNDISTURBED SOIL.
4. PORTLAND CEMENT GROUT TO MATCH INVERT OF PIPE.

9. TYPE "C" MANHOLE FOR 48" TO 72" DIA. R.C.P.

NO.	DATE	REVISIONS	APP.
1	8/03/06	REVISE MANHOLE FRAME/COVER	RWS

CITY OF RICHMOND
APPROVALS

LENORE KURTZ, DIRECTOR OF PUBLIC WORKS — DATE

DARREN SCHMIDT, WATER SUPERINTENDENT — DATE

WADE WENDT, WASTEWATER SUPERINTENDENT — DATE

JIM WHITEHEAD, STREET SUPERINTENDENT — DATE

DWAYNE PRICE, PARKS SUPERINTENDENT — DATE

NOTE:

STORM MANHOLES AND INLETS SHALL BE PRECAST CONCRETE OR BRICK. POURED IN PLACE, REINFORCED CONCRETE STRUCTURES MAY BE SUBSTITUTED WHEN THE PROPOSED CONSTRUCTION DETAIL IS SUBMITTED BY THE DESIGN ENGINEER FOR APPROVAL BY THE CITY.

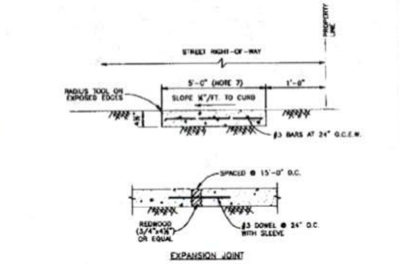
APPROVED: [signature] DEVELOPMENT COORDINATOR

DATE: 2/11/15

JONES & CARTER, INC.
ENGINEERS • PLANNERS • SURVEYORS
Texas Board of Professional Engineers Registration No. F-439
6335 Gulfton Dr., Suite 100 Houston, Texas 77081 (713) 777-5337

CITY OF RICHMOND
STANDARD CONSTRUCTION DETAILS
STORM SEWER

SCALE		
HORIZONTAL	1" = NTS	DESIGNED BY: RWS
VERTICAL	1" = NTS	DRAWN BY: DCB
		CHECKED BY: KKR
		DATE: OCTOBER 24, 2005
		JOB NO:
		DWG. NO:
		Sheet: 16 of 28

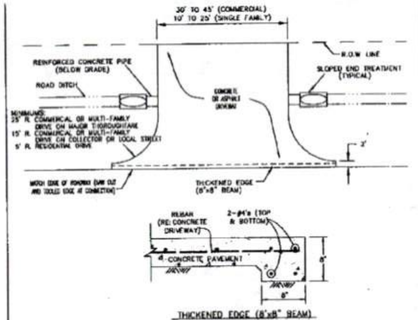


EXPANSION JOINT

NOTES:

1. CONCRETE SHALL CONTAIN A MINIMUM OF FIVE AND ONE HALF (5½) SACKS OF CEMENT PER CUBIC YARD OF CONCRETE, 3500 P.S.I. @ 28 DAYS.
2. TIE TO EXISTING STEEL IN CONNECTION TO EXISTING WALK.
3. FINISH CONCRETE IN ACCORDANCE WITH CITY REQUIREMENTS.
4. SCORED CONTRACTION JOINTS AT 4'-0" O.C.
5. MAXIMUM SLOPE ALONG LENGTH OF SIDEWALK AT ANY LOCATION IS 5%. MAXIMUM SLOPE ACROSS SIDEWALK AT ANY LOCATION IS 2%.
6. SIDEWALK THICKNESS AND REINFORCEMENT SHALL MATCH DRIVEWAY REQUIREMENTS WITHIN THE LIMITS OF A DRIVEWAY.
7. WIDTH MAY BE REDUCED TO 4'-0" IF A SIDEWALK PEDESTRIAN PLAN IS INCLUDED IN THE PLANS SHOWING 5'-0"x5'-0" PASSING AREAS AT A MAXIMUM SPACING OF 300 FEET.

1. CONCRETE SIDEWALK

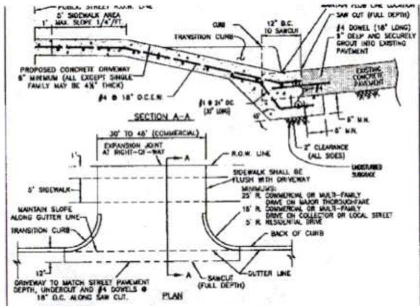


THICKENED EDGE (8"x8" BEAM)

NOTES:

1. CULVERT DIAMETER SHALL BE A MINIMUM OF 15" (IN CITY ONLY) OR 24" (IN E.T.J.).
2. SLOPED END TREATMENTS SHALL BE INSTALLED ON ALL CULVERTS. SLOPED END TREATMENTS ON CULVERTS WITHIN COLLECTOR OR RESIDENTIAL STREET RIGHT-OF-WAYS SHALL HAVE A MINIMUM SLOPE OF 3 TO 1. SLOPED END TREATMENTS ON CULVERTS WITHIN MAJOR THOROUGHFARE RIGHT-OF-WAYS SHALL HAVE A MINIMUM SLOPE OF 6 TO 1.

2. DRIVEWAY WITH OPEN DITCH



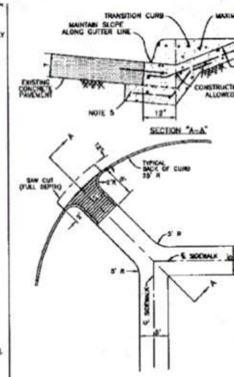
SECTION A-A

PLAN

DRIVEWAY NOTES:

1. SAW CUT & BREAKOUT NO MORE THAN 48 HOURS PRIOR TO PROPOSED CONCRETE PLACEMENT.
2. UNACCEPTABLE SUBGRADE SHALL BE OVEREXCAVATED AND REPLACED WITH CONCRETE.
3. EDGE ALL SIDES WITH EDGING TOOL AND BROOM FINISH.
4. PROVIDE BARRICADES AND TRAFFIC WARNING DEVICES DURING CONSTRUCTION.
5. PORTLAND CEMENT CONCRETE CONTAIN A MINIMUM 5½ SACKS PER CUBIC YARD (3500 P.S.I. AT 28 DAYS).
6. REINFORCING SHALL BE ASTM A-615 GRADE WITH 10" MINIMUM OVERLAP AT JOINTS.
7. COMPACT SUBGRADE TO 95% OF STANDARD PROCTOR DENSITY (+/- 2% OF OPTIMUM MOISTURE).
8. EXTEND EXPANSION JOINT FROM STREET TO THE RIGHT-OF-WAY.

3. CONCRETE DRIVEWAY

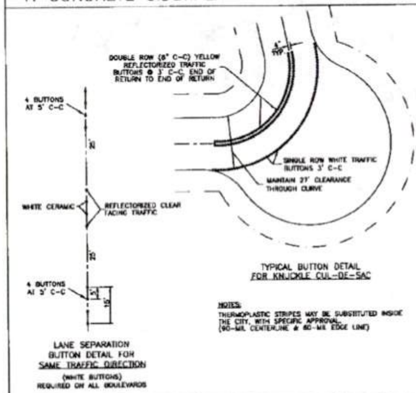


SECTION "A-A"

NOTES:

1. EXISTING CURB AND GUTTER TO BE SAW CUT, REMOVED, AND REPLACED. DOWELS SHALL HAVE A MINIMUM REINFORCING OVERLAP OF SIX INCHES (6"). DOWEL SHALL BE EIGHTEEN INCHES (18") LONG AND EMBEDDED A MINIMUM OF NINE INCHES (9") INTO EXISTING PAVEMENT.
2. RAMP SHALL BE CONSTRUCTED PARALLEL TO MAJOR THOROUGHFARE AND/OR COLLECTOR STREET.
3. THE FINISHED SURFACE OF A RAMP IS TO BE GROOVED LATERALLY WITH ¼" DEEP GROOVES, SPACED 2¼", AND ROUGHENED WITH NO LESS THAN A BROOM FINISH TO PREVENT SLIPPING, AND COLORED TO SIGNIFICANTLY CONTRAST FROM SIDEWALK. (MAXIMUM SLOPE 1:12) THE GROOVES SHALL BE SLOPED UNIFORMLY FROM THE CENTER TO THE EDGE OF THE RAMP TO DRAIN WATER FROM GROOVES.
4. ALL RAMP CONSTRUCTION SHALL CONFORM TO THE TEXAS ACCESSIBILITY STANDARDS (CURRENT).
5. SIDEWALK RAMP CONNECTION SHALL CONFORM WITH DRIVEWAY DETAIL CONNECTION.

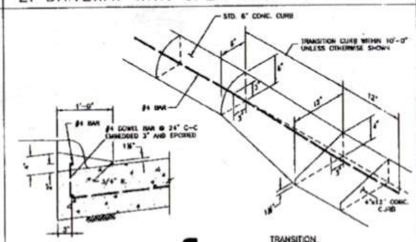
4. CONCRETE SIDEWALK RAMP



TYPICAL BUTTON DETAIL FOR KNUCKLE CUL-DE-SAC

LANE SEPARATION BUTTON DETAIL FOR SAME TRAFFIC DIRECTION

5. TRAFFIC MARKINGS

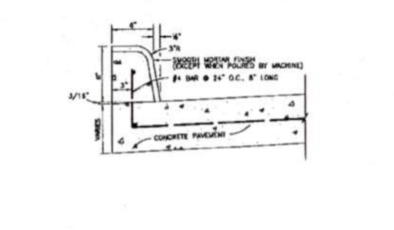


TRANSITION

NOTES:

1. 6" CONCRETE CURB TO BE CONSTRUCTED ON ALL ESPLANADES, ISLANDS AND NON-RESIDENTIAL STREETS. RESIDENTIAL STREETS MAY BE CONSTRUCTED WITH EITHER 6" CONCRETE CURB OR 4"x12" CONCRETE CURB AS NOTED ON DRAWINGS.
2. ALL 4"x12" CONCRETE CURBS TO BE POURED SEPARATE FROM PROPOSED CONCRETE PAVEMENT.
3. TRANSITIONS FROM 6" CONCRETE CURB TO 4"x12" CONCRETE CURB TO BE ACCOMPLISHED WITHIN 10 FEET, UNLESS OTHERWISE SHOWN. IF THIS 10 FOOT TRANSITION CURB IS NOT POURED MONOLITHICALLY WITH THE PAVEMENT, THEN REINFORCING STEEL AS SHOWN ABOVE IN TYPICAL DETAIL 4"x12" TRANSITION CURB IS TO BE INSTALLED.
4. ADJUST PAVEMENT ELEVATION AND SLOPE TO ASSURE PROPER DRAINAGE THROUGH THE TRANSITION.

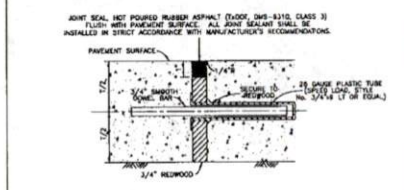
6. 4"x12" TRANSITION CURB



NOTES:

1. MORTAR FINISH NOT REQUIRED WHEN CURB IS POURED BY A MACHINE, BUT CURB SHALL HAVE THE SAME OUTSIDE DIMENSIONS.
2. WHEN CONCRETE CURB IS TO BE PLACED ON EXISTING CONCRETE BASE, USE #4 DEFORMED BARS, 8" LONG, 24" O.C., DOWELLED, AND SET IN QUICK SETTING CEMENT GROUT.
3. REDWOOD EXPANSION JOINTS SHALL BE INSTALLED AT ALL PAVEMENT EXPANSION JOINTS.

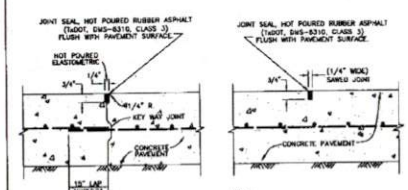
7. CONCRETE CURB



NOTES:

1. EXPANSION JOINT TO BE PLACED AT THE END OF EACH CURB RADIUS AND SPACED A MAXIMUM OF 60'-0" APART.
2. STAKES FOR TRANSVERSE JOINTS SHALL NOT BE PLACED CLOSER THAN 6" TO A LONGITUDINAL JOINT. THE TOP OF EACH STAKE SHALL NOT BE LESS THAN 2" BELOW THE FINISHED SURFACE.
3. DOWEL SHALL BE SECURED IN A HORIZONTAL ALIGNMENT PRIOR TO POURING CONCRETE.
4. INSTALL BACKER RODS (TxDOT, DMS-6310) IN ACCORDANCE WITH SEALANT MANUFACTURER'S RECOMMENDATIONS.

8. DOWEL TYPE EXPANSION JOINT



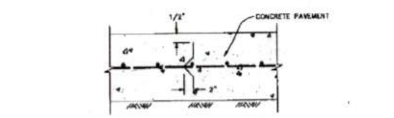
NOTES:

1. SAWCUT SHALL BE COMPLETED IN 6 TO 12 HOURS AFTER PLACEMENT OF CONCRETE.
2. MAXIMUM SPACING OF LATERAL SAWED JOINTS SHALL BE 20'0".

CONSTRUCTION

SAWED

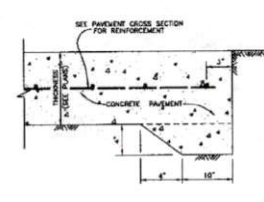
9. PAVEMENT JOINTS



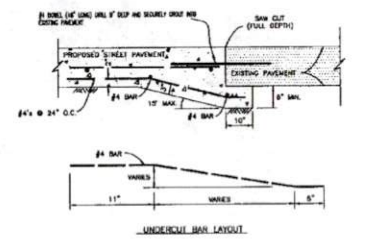
NOTES:

1. THE LOCATION OF DEFORMED STRIPS MAY BE VARIED, WITH THE APPROVAL OF THE CITY. MAXIMUM LONGITUDINAL SPACING FOR DEFORMED STRIPS SHALL BE 14'-0". DEFORMED METAL STRIPS SHALL BE PLACED VERTICALLY ALONG A STRAIGHT ALIGNMENT.

10. DEFORMED METAL STRIP



11. PAVEMENT HEADER



UNDERCUT BAR LAYOUT

12. PAVEMENT UNDERCUT

NO.	DATE	REVISIONS	APP.

CITY OF RICHMOND
APPROVALS

LENERT KURTZ, DIRECTOR OF PUBLIC WORKS — DATE

GARRETH SCHMIDT, WATER SUPERINTENDENT — DATE

WADE REDDIT, WASTEWATER SUPERINTENDENT — DATE

JIM WHITEHEAD, STREET SUPERINTENDENT — DATE

DWAYNE PRICE, PARKS SUPERINTENDENT — DATE

APPROVED: [signature] DEVELOPMENT COORDINATOR

DATE: 2/12/15

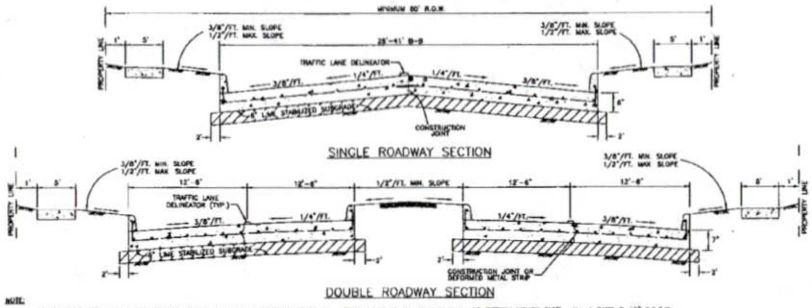
STATE OF TEXAS — STEPHEN C. RUTER — 102948 — LICENSED PROFESSIONAL ENGINEER — 12/8/2014

JONES & CARTER, INC.
ENGINEERS • PLANNERS • SURVEYORS

CITY OF RICHMOND
STANDARD CONSTRUCTION DETAILS
PAVING

SHEET 1 OF 2

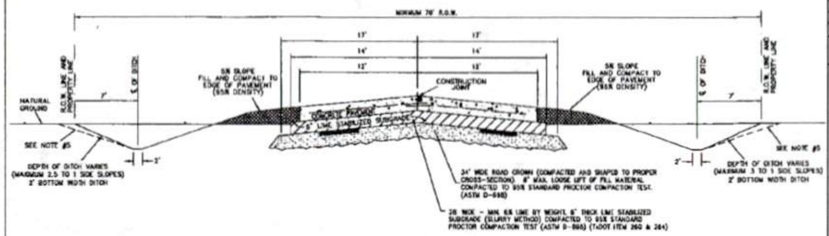
SCALE			
HORIZONTAL	1" = NTS	DRAWN BY:	DCB
VERTICAL	1" = NTS	CHECKED BY:	KRK
		DESIGNED BY:	RWS
		DATE:	OCTOBER 24, 2005
		JOB NO:	
		DWG. NO:	
		Sheet:	17 of 28



NOTE:

1. ALL REINFORCING STEEL SHALL CONFORM TO ASTM-615, CURRENT REVISION, GRADE 60. MINIMUM LAP AT ALL SPLICES SHALL BE FIFTEEN INCHES (15"). No. 4 BARS @ 18" O.C.E.W.
2. CONCRETE SHALL HAVE A 3500 P.S.I. COMPRESSIVE STRENGTH AT 28 DAYS AND A MINIMUM 550 P.S.I. FLEXURAL STRENGTH AT 7 DAYS, AND SHALL CONTAIN A MINIMUM OF FIVE AND ONE HALF (5½) SACKS OF CEMENT PER CUBIC YARD OF CONCRETE.
3. EXPANSION JOINTS SHALL BE SPACED AT 80'-0" O.C. (MAXIMUM) WITH LATERAL, SAWED JOINTS AT 20'-0" O.C. (MAXIMUM). ALL JOINTS SHALL BE SEALED. THE LOCATION OF CONSTRUCTION JOINTS AND DEFORMED METAL STRIPS MAY BE VARIED WITH CITY APPROVAL.
4. 6" LIME STABILIZED SUBGRADE SHALL BE A MINIMUM OF 6% LIME, UNLESS SPECIFICALLY APPROVED BY THE CITY.
5. THE SLOPE BETWEEN PAVEMENT AND THE SIDEWALK/PROPERTY LINE MAY BE INCREASED, WITH APPROVAL FROM THE CITY.

1. STANDARD CONCRETE CURB AND GUTTER STREET CROSS-SECTIONS



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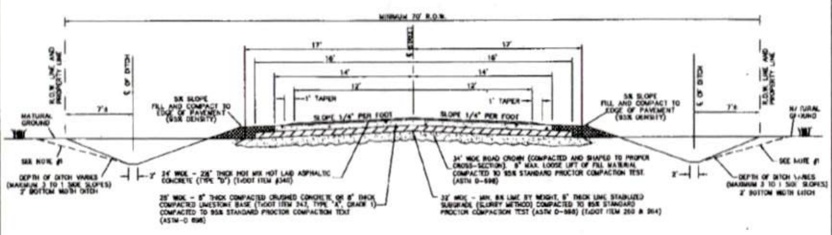
4. 6" LIME STABILIZED SUBGRADE SHALL BE A MINIMUM OF 6% LIME, UNLESS SPECIFICALLY APPROVED BY THE CITY.
5. PROVIDE DRAINAGE EASEMENT ADJOINING THE R.O.W. AND EXTEND BACK SLOPE OF DITCH WITHIN THE EASEMENT AS NECESSARY TO MAINTAIN 3 TO 1 SIDE SLOPE (TYP.).

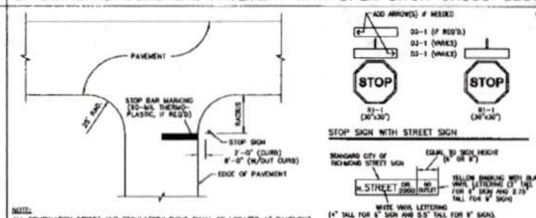
2. STANDARD CONCRETE PAVEMENT WITH OPEN DITCH CROSS-SECTION



NOTES:

1. PROVIDE DRAINAGE EASEMENT ADJOINING THE R.O.W. AND EXTEND BACK SLOPE OF DITCH WITHIN THE EASEMENT AS NECESSARY TO MAINTAIN 3 TO 1 SIDE SLOPE (TYP.).
2. PAVING MARKINGS REQUIRED AS PER CITY OF RICHMOND (IN CITY) OR FORT BEND COUNTY SPECIFICATIONS.

3. STANDARD ASPHALT PAVEMENT WITH OPEN DITCH CROSS-SECTION



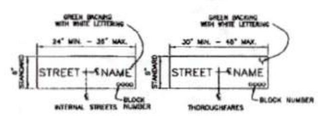
NOTE:
ALL COMBINATION STREET AND REGULATORY SIGNS SHALL BE LOCATED AT PAVEMENT RETURNS UNLESS OTHERWISE NOTED.

STOP SIGN LOCATION

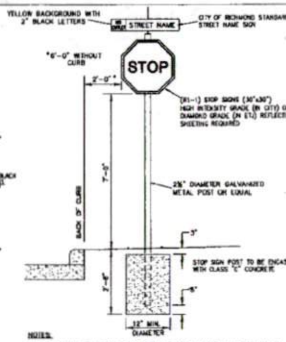
STREET SIGN WITH NO OUTLET

NOTES:

1. ALUMINUM SIGNS MUST BE 0.080" BLANKS FLAT BLADED WITH ROUNDED CORNERS.
2. SIGN DIMENSIONS FOR 6" TALL SIGNS: 6"x24", 6"x30", OR 6"x36".
3. SIGN DIMENSIONS FOR 9" TALL SIGNS: 9"x30", 9"x36", 9"x42", OR 9"x48".
4. STREETS WITHOUT OUTLET MUST HAVE NO OUTLET SIGN POSTED.
5. HIGH INTENSITY GRADE (IN CITY) OR DIAMOND GRADE (IN ETJ) REFLECTIVE SHEETING REQUIRED.



STREET NAME SIGN

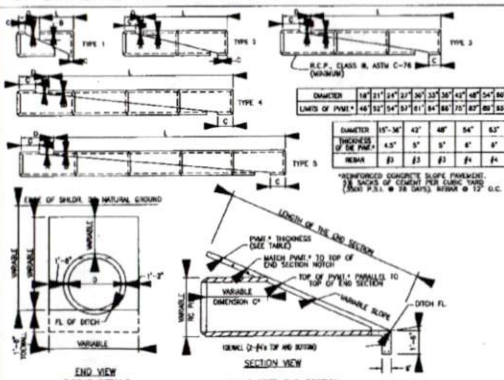


NOTES:

1. STREET NAME SIGNS AND STOP SIGNS TO BE INSTALLED AT INTERSECTION OF ALL STREETS. PROVIDE NO OUTLET SIGN ON DEAD END STREETS.
2. UTILIZE SIGN MATERIALS, POST, FOUNDATION AND LOCATION FOR ALL SIGNAGE.

SIGN MOUNT

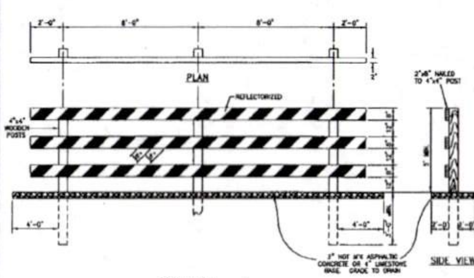
4. TRAFFIC SIGNAGE



DIA.	WALL	O.D.	SLOPE	PIPE LGTH	TYPE	A (INCH)	B (INCH)	C (INCH)	E (INCH)	L	LENGTH END SECT. FT.	PVMT. QNT. C.Y.**
24"	3"	30"	3:1	3-6"	3	3	9	36	54	7'-6"	11.27	0.57
			4:1	3-6"	2	3	9	24	48	5'-3"	12.33	0.58
			6:1	3-6"	3	3	9	36	72	12'-3"	18.23	0.74
27"	3"	33"	3:1	2-6"	2	3	9	31	49	7'-10"	11.6	0.8
			4:1	2-7"	2	3	9	36	60	10'-0"	14.6	0.69
			6:1	3-7"	3	3	9	54	80	15'-0"	21.54	0.81
30"	3"	37"	3:1	2-6"	2	3	9	27	45	8'-5"	12.12	0.63
			4:1	2-7"	2	3	9	30	54	10'-4"	15.29	0.72
			6:1	3-7"	3	3	9	45	81	15'-9"	22.55	0.85
3"	3"	40"	3:1	2-6"	2	3	9	22	40	8'-7"	12.65	0.66
			4:1	2-7"	2	3	9	24	48	11'-0"	15.87	0.76
			6:1	3-7"	3	3	9	36	72	16'-4"	23.57	0.98
36"	4"	44"	3:1	2-7"	2	4	10	36	54	10'-8"	14.75	0.8
			4:1	3-6"	3	4	16	26	50	13'-0"	18.21	0.88
			6:1	4-6"	4	4	16	36	72	18'-0"	25.36	1.03
42"	4"	51"	3:1	2-7"	2	4	10	27	45	11'-3"	15.81	0.98
			4:1	3-7"	3	4	10	51	75	15'-9"	21.9	1.26
			6:1	4-7"	4	4	10	54	90	22'-4"	30.41	1.57
48"	5"	58"	3:1	3-6"	3	5	11	36	54	13-6"	18.44	1.28
			4:1	3-7"	3	5	11	39	63	17'-3"	23.2'	1.49
			6:1	4-7"	4	5	11	36	72	24'-0"	32.44	1.82
54"	5"	65"	3:1	3-8"	3	5	11	27	45	14'-3"	19.5	1.52
			4:1	4-6"	4	5	11	36	60	19-0"	25.4	2.19
			6:1	5-7"	5	5	11	63	99	29-3"	38.2	2.57
60"	6"	72"	3:1	3-7"	3	6	12	45	63	17'-3"	22.64	1.96
			4:1	4-7"	4	6	12	60	84	22'-6"	29.91	2.46
			6:1	5-7"	5	6	12	45	81	30'-9"	40.28	2.65

**PVMT. QUANTITY FOR ONE END SECTION

5. SLOPED END TREATMENT



NOTES:

BARRICADES SHALL BE CONSTRUCTED OF CLEAN SOUND LUMBER CUT TO THE NOMINAL DIMENSION SHOWN ON THESE DETAILS. BARRICADES SHALL BE OF FIRST CLASS WORKMANSHIP. ALL SURFACES ABOVE GROUND SHALL BE PAINTED WITH PRIME COAT AND TWO COATS OF AN APPROVED WHITE PAINT TO OBTAIN THOROUGH COVERAGE AND PROVIDE A UNIFORM WHITE COLOR. BARRICADE STRIPES SHALL SLOPE DOWNWARD AT AN ANGLE OF 45 DEGREES IN THE DIRECTION OF TRAFFIC. PERMANENT BARRICADES SHALL HAVE RED AND WHITE STRIPING. TEMPORARY CONSTRUCTION BARRICADES SHALL HAVE ORANGE AND WHITE STRIPING. BARRICADES CONSTRUCTED OUTSIDE OF THE CITY LIMITS SHALL COMPLY WITH FORT BEND COUNTY REQUIREMENTS.

SIGNS FOR BARRICADES SHALL BE MADE FROM WOOD, HARDBOARD OR METAL CONFORMING WITH THESE REQUIREMENTS:

1. METAL - SIGN PLATES SHALL CONSIST OF STEEL, OR ALUMINUM ALLOY, OR PLASTIC TYPE OF SUFFICIENT THICKNESS TO RETAIN RIGIDITY UNDER NORMAL CONDITIONS.
2. WOOD - SIGN STOCK SHALL BE 1" STOCK B & B GRADE KILN-DRIED LUMBER, OR EQUAL, OR WATERPROOF RESIN-BONDED EXTERIOR GRADE PLYWOOD, DOUGLAS FIR PLYWOOD ASSOCIATION OR EQUAL. ALL WOODEN SIGNS CONSTRUCTED OF TWO OR MORE BOARDS SHALL HAVE A 1"x6" CLEAT FASTENED TO THE BACK OF THE SIGN AT EACH END AND EXTENDING THE FULL DEPTH OF THE SIGN. IN ADDITION TO CLEATS, THE BOARDS SHALL BE FASTENED TOGETHER WITH 1/2" CORRUGATED FASTENERS SPACED AT NOT MORE THAN 12" CENTERS DRIVEN FROM THE BACK OF THE SIGN. BARRICADE TYPE III SHALL BE TREATED WITH 8 LB. PENTACHLOROPHENOL WOOD PRESERVATIVE AND PAINTED WITH A PRIME COAT CONSISTING OF SPAR VARNISH VEHICLE ALUMINUM PAINT, FOLLOWED WITH TWO COAT APPROVED EXTERIOR PAINT. ALL WOOD PRESERVATIVES SHALL BE OF A TYPE WHICH PROHIBIT THE BLEEDING OF PRESERVATIVE.
3. HARDBOARD - SIGN STOCK SHALL BE TEMPERED DUOLUX, 3/8" NOMINAL THICKNESS, LAMINATED WITH WATERPROOF (ENCASE IN GLUE, OR EQUIVALENT).

REFLECTORIZATION SHALL CONSIST OF HIGH INTENSITY GRADE REFLECTIVE SHEETING OR AS REQUIRED BY FORT BEND COUNTY (OUTSIDE OF THE CITY).

ALL BARRICADES EXTENDING ACROSS MOVING LANES SHALL BE SUPPLEMENTED BY LIGHTS PLACED SO AS NOT TO INTERFERE WITH THE VISIBILITY OF REFLECTOR BUTTONS OR REFLECTORIZED SURFACES. THESE LIGHTS SHALL BE MAINTAINED IN CONTINUOUS OPERATION FROM SUNSET TO SUNRISE AND SHALL BE OF THE FLASHING ELECTRIC OR BUTANE TYPE, WITH THE RATE OF FLASHING BETWEEN 70 AND 120 FLASHES PER MINUTE. FLASHING ELECTRIC LIGHTS SHALL NOT BE CONNECTED IN SERIES. ALL LIGHTS SHALL BE OF THE COLOR YELLOW.

6. TYPE 'III' BARRICADE

NO.	DATE	REVISIONS	APP.
1	8/16/11	REVISE DETAIL 3 (REMOVE MODIFIED)	KRK

CITY OF RICHMOND
APPROVALS

LENERT KURTZ, DIRECTOR OF PUBLIC WORKS — DATE

DARREN SCHMIDT, WATER SUPERINTENDENT — DATE

WADE WENDT, WASTEWATER SUPERINTENDENT — DATE

JIM WHITEHEAD, STREET SUPERINTENDENT — DATE

DWAYNE PRICE, PARKS SUPERINTENDENT — DATE

APPROVED: [signature] DEVELOPMENT COORDINATOR

DATE: 2/12/15

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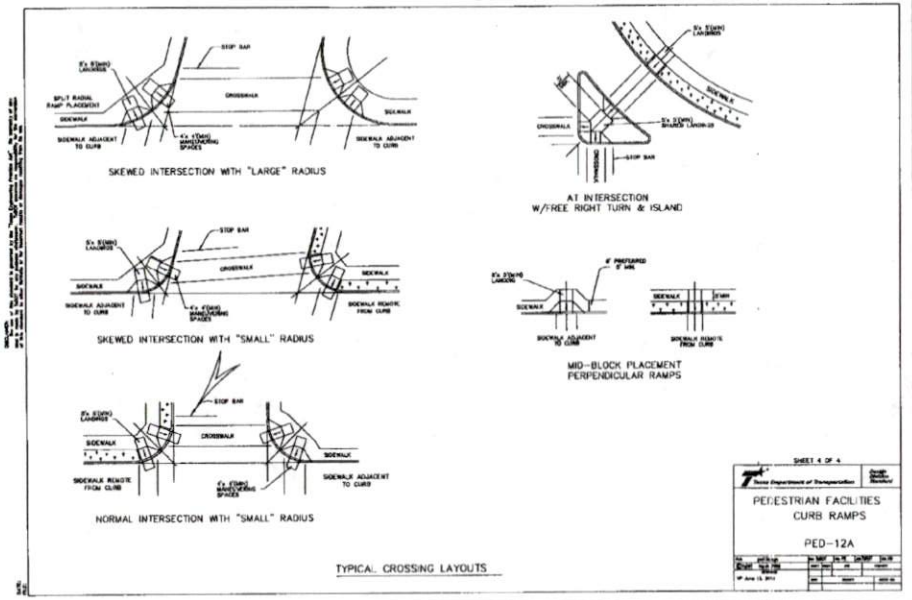
Texas Board of Professional Engineers Registration No. F-439
6335 Gulfton Dr., Suite 100 Houston, Texas 77081 (713) 777-5337

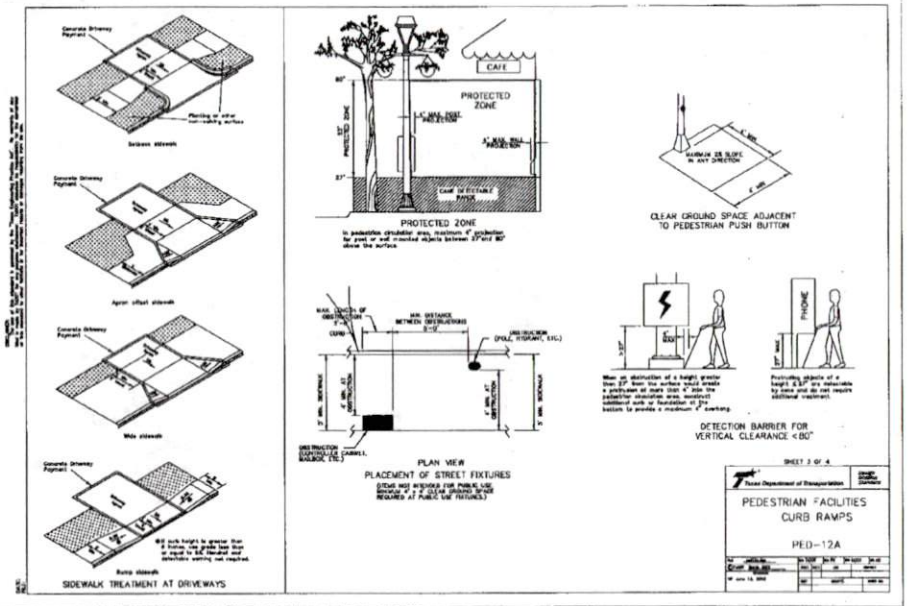
CITY OF RICHMOND
STANDARD CONSTRUCTION DETAILS

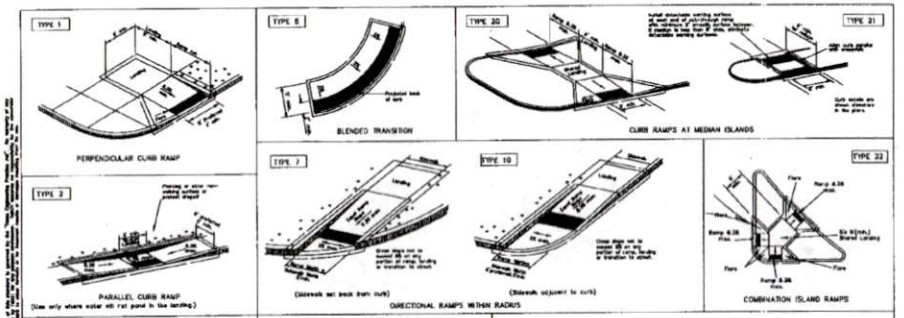
PAVING

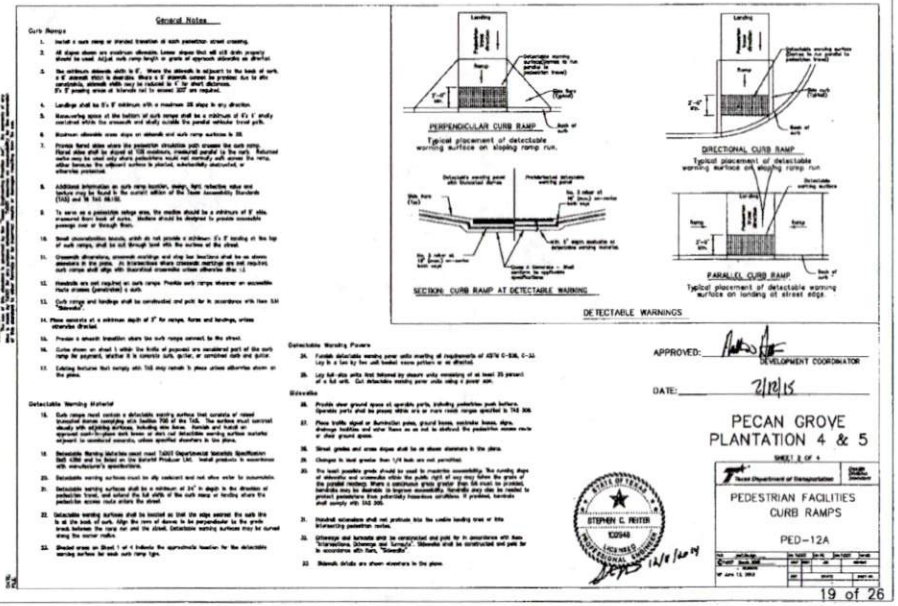
SHEET 2 OF 2

SCALE		
HORIZONTAL	1" = NTS	DESIGNED BY: RWS
VERTICAL	1" = NTS	DRAWN BY: DCB
		CHECKED BY: KRK
		DATE: OCTOBER 24, 2005
		JOB NO:
		DWG. NO:
		Sheet: 18 of 28









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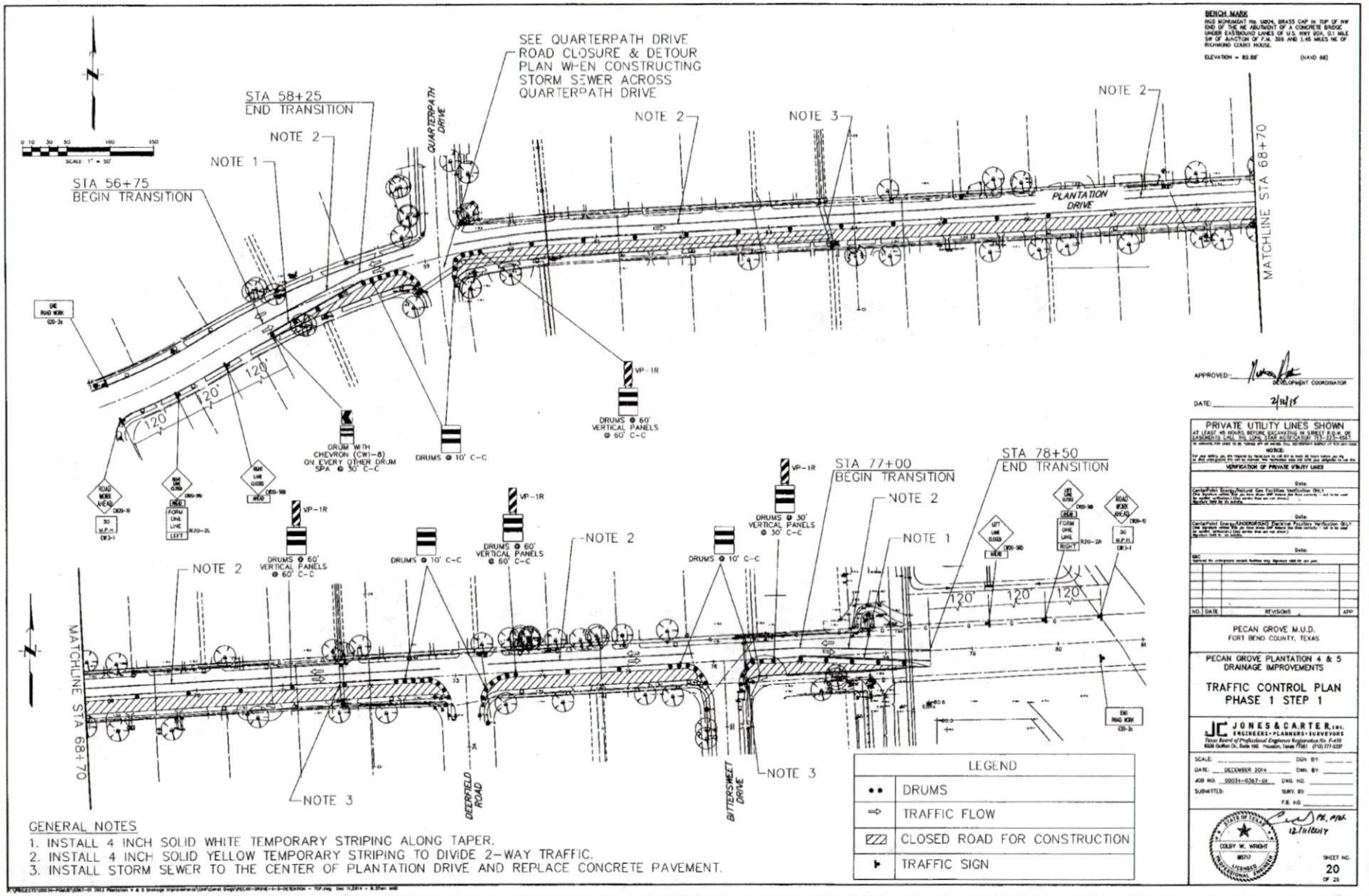


BENCH MARK

NGS MONUMENT No. U6124, BRASS CAP IN TOP OF NW END OF THE NE ABUTMENT OF A CONCRETE BRIDGE UNDER EASTBOUND LANES OF U.S. HWY 90A, 0.1 MILE S# OF JUNCTION OF F.M. 359 AND I-45 MILES NE OF RICHMOND COUNTY HOUSE.

ELEVATION = 82.68' (NAVD 88)

APPROVED: _____ DEVELOPMENT COORDINATOR

DATE: 2/24/15

PRIVATE UTILITY LINES SHOWN

AT LEAST 48 HOURS BEFORE EXCAVATING IN STREET R.O.W. OR EASEMENTS CALL 811 LONE STAR NOTIFICATION 713-223-4567

NOTICE:

VERIFICATION OF PRIVATE UTILITY LINES

Date: _____

Date: _____

Date: _____

NO.	DATE	REVISIONS	APP

PECAN GROVE M.U.D.
FORT BEND COUNTY, TEXAS

PECAN GROVE PLANTATION 4 & 5 DRAINAGE IMPROVEMENTS

TRAFFIC CONTROL PLAN PHASE 1 STEP 1

JONES & CARTER, INC. ENGINEERS • PLANNERS • SURVEYORS
Texas Board of Professional Engineers Registration No. F-439
6330 Gulfton Dr., Suite 100, Houston, Texas 77081 (713) 777-5337

SCALE: _____ DSN BY: _____
DATE: DECEMBER 2014 DWN. BY: _____
JOB NO. 09031-6367-01 DWG. NO. _____
SUBMITTED: _____ SURV. BY: _____
F.B. NO. _____

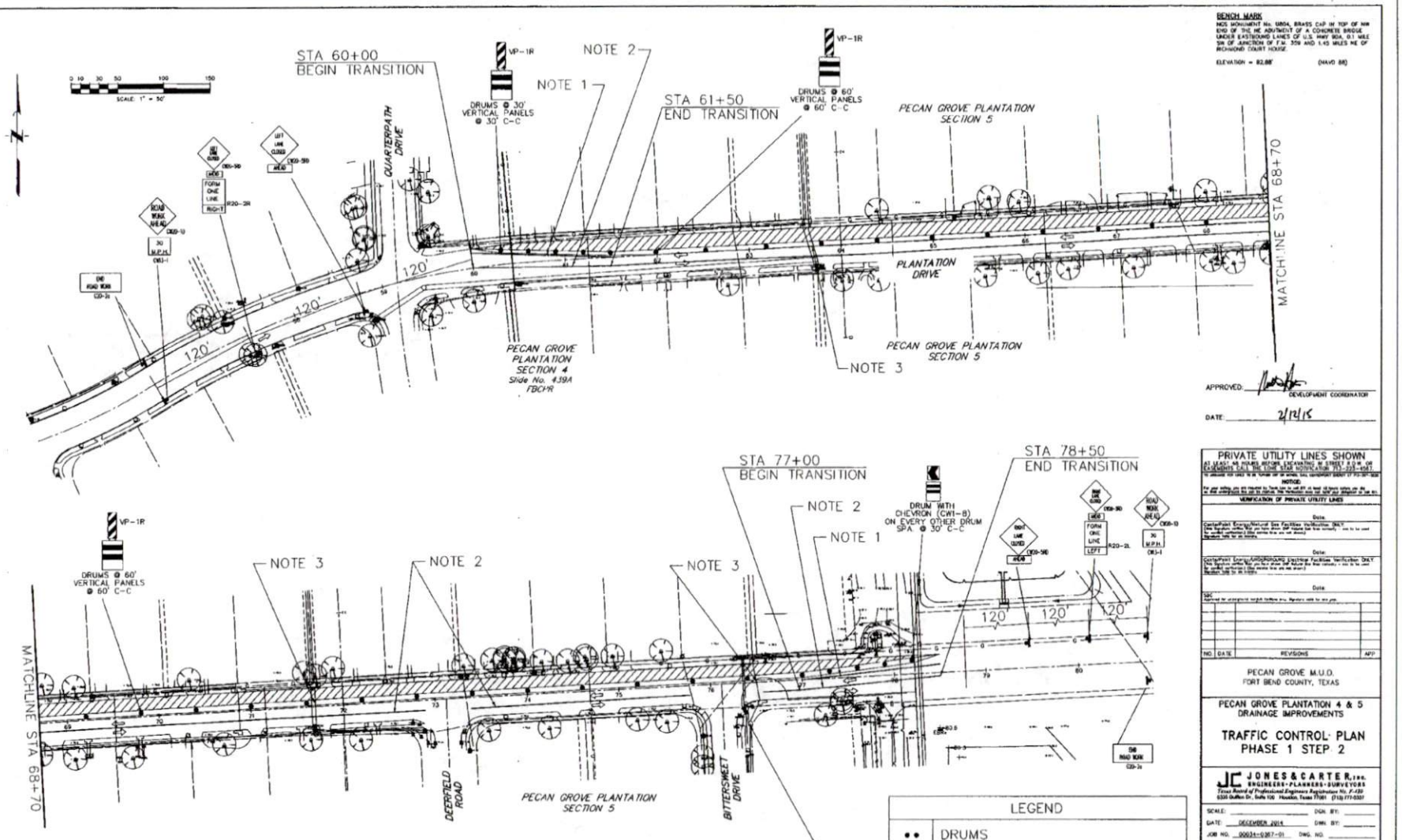
COLBY W. WRIGHT 96217 LICENSED PROFESSIONAL ENGINEER
12/11/2014

SHEET NO. 20 OF 25

LEGEND	
••	DRUMS
⇨	TRAFFIC FLOW
▨	CLOSED ROAD FOR CONSTRUCTION
▶	TRAFFIC SIGN

GENERAL NOTES

1. INSTALL 4 INCH SOLID WHITE TEMPORARY STRIPING ALONG TAPER.
2. INSTALL 4 INCH SOLID YELLOW TEMPORARY STRIPING TO DIVIDE 2-WAY TRAFFIC.
3. INSTALL STORM SEWER TO THE CENTER OF PLANTATION DRIVE AND REPLACE CONCRETE PAVEMENT.



BENCH MARK

NGS MONUMENT No. U804, BRASS CAP IN TOP OF NW END OF THE NE ABUTMENT OF A CONCRETE BRIDGE UNDER EASTBOUND LANES OF U.S. HWY 90A, 0.1 MILE SW OF JUNCTION OF F.M. 359 AND 1.45 MILES NE OF RICHMOND COURT HOUSE.

ELEVATION = 82.88' (NAVD 88)

APPROVED: _____ DEVELOPMENT COORDINATOR

DATE: 2/12/15

PRIVATE UTILITY LINES SHOWN

AT LEAST 48 HOURS BEFORE EXCAVATING IN STREET R.O.W. OR EASEMENTS CALL ONE CALL NOTIFICATION 713-223-4567

NOTICE:

VERIFICATION OF PRIVATE UTILITY LINES

Date:

CenterPoint Energy/Natural Gas Facilities Verification ONLY

Date:

CenterPoint Energy/AIRBORNE Electrical Facilities Verification ONLY

Date:

SBC

NO.	DATE	REVISIONS	APP.

PECAN GROVE M.U.D.
FORT BEND COUNTY, TEXAS

PECAN GROVE PLANTATION 4 & 5
DRAINAGE IMPROVEMENTS

TRAFFIC CONTROL PLAN
PHASE 1 STEP 2

JONES & CARTER, INC.
ENGINEERS • PLANNERS • SURVEYORS
Texas Board of Professional Engineers Registration No. F-439
6330 Gulfton Dr., Suite 100 Houston, Texas 77081 (713) 777-5337

SCALE: _____ DGN. BY: _____

DATE: DECEMBER 2014 DWN. BY: _____

JOB NO. 00034-0267-01 DWG. NO. _____

SUBMITTED: _____ SURV. BY: _____

F.B. NO. _____

STATE OF TEXAS
COLBY W. WRIGHT
92717
LICENSED PROFESSIONAL ENGINEER

12/11/2014

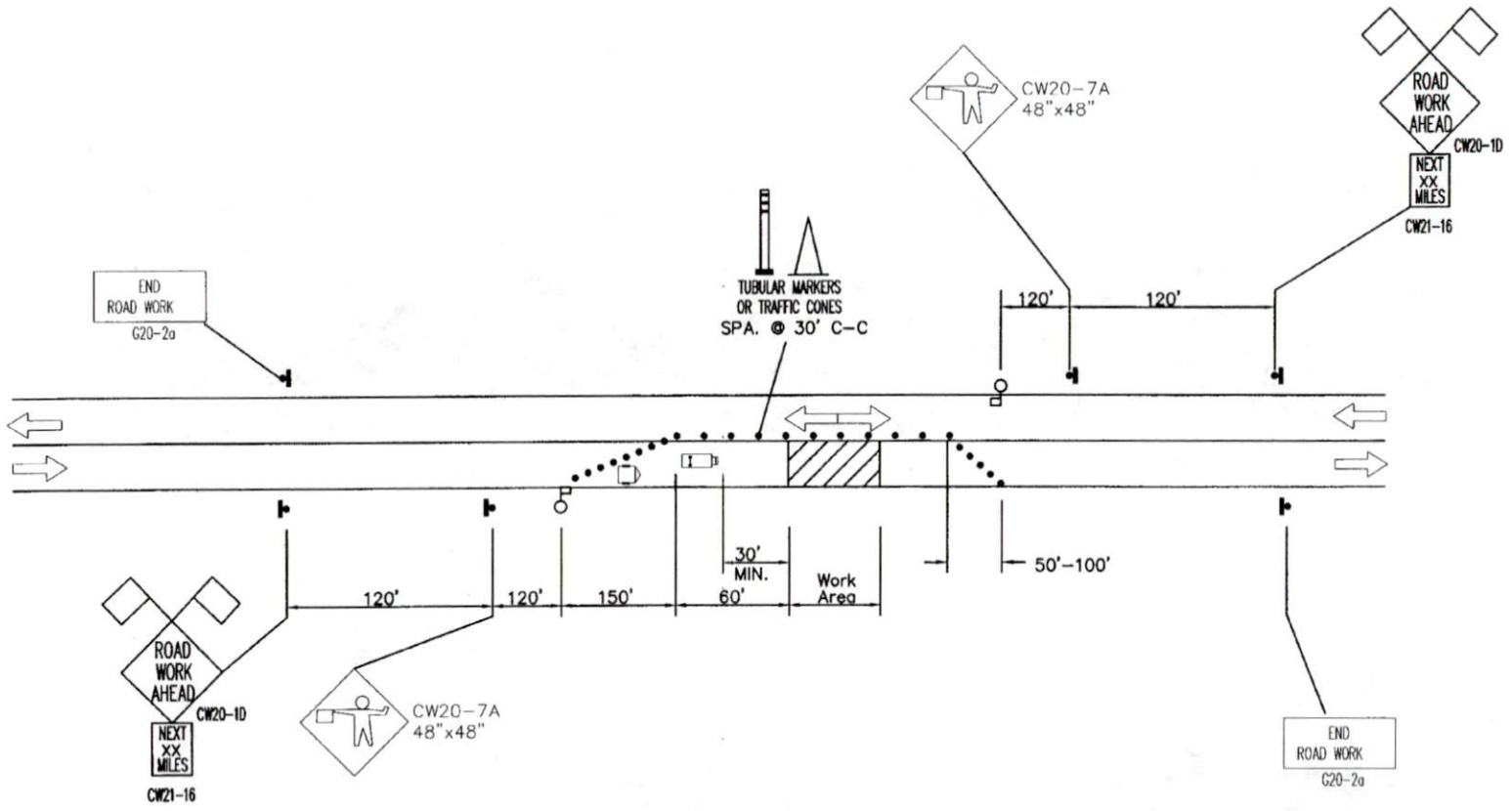
SHEET NO. 21 OF 26

GENERAL NOTES

1. INSTALL 4 INCH SOLID WHITE TEMPORARY STRIPING ALONG TAPER.
2. INSTALL 4 INCH SOLID YELLOW TEMPORARY STRIPING TO DIVIDE 2-WAY TRAFFIC.
3. INSTALL STORM SEWER FROM THE CENTERLINE OF PLANTATION DRIVE TO THE INLET AND REPLACE THE CONCRETE PAVEMENT.

SEE TYPICAL FLAGGING AND MOVING OPERATION DETAIL ON SHEET 22 FOR TCP OPERATION

LEGEND	
••	DRUMS
⇨	TRAFFIC FLOW
▨	CLOSED ROAD FOR CONSTRUCTION
▶	TRAFFIC SIGN



DAYTIME ONLY
TYPICAL FLAGGING / MOVING OPERATION
FOR CONSTRUCTION ALONG BITTERSWEET DRIVE (TWO LOCATIONS) AND
DAYTIME ONLY CONSTRUCTION ALONG PLANTATION DRIVE,
DURING PHASE 1 STEP 2 CONSTRUCTION
WHEN CONNECTION TO THE NEW STORM SEWER AND
INLET RECONSTRUCTION AREAS

LEGEND

- CONSTRUCTION AREA
- OPEN TO TRAFFIC
- HEAVY WORK VEHICLE
- FLASHING ARROW BOARD (OPTIONAL)
- SIGN POST
- TUBULAR MARKERS ,CONES OR DRUMS
- FLAGGER

BENCH MARK

NGS MONUMENT No. U804, BRASS CAP IN TOP OF NW END OF THE NE ABUTMENT OF A CONCRETE BRIDGE UNDER EASTBOUND LANES OF U.S. HWY 90A, 0.1 MILE SW OF JUNCTION OF F.M. 359 AND 1.45 MILES NE OF RICHMOND COURT HOUSE.

ELEVATION = 82.88' (NAVD 88)

APPROVED: _____ DEVELOPMENT COORDINATOR

DATE: 2/24/15

PRIVATE UTILITY LINES SHOWN

NOTICE:

VERIFICATION OF PRIVATE UTILITY LINES

Date:

CenterPoint Energy/Natural Gas Facilities Verification ONLY

Date:

CenterPoint Energy/ARKLAHOMA Electrical Facilities Verification ONLY

Date:

NO.	DATE	REVISIONS	APP.

PECAN GROVE M.U.D.
FORT BEND COUNTY, TEXAS

PECAN GROVE PLANTATION 4 & 5
DRAINAGE IMPROVEMENTS

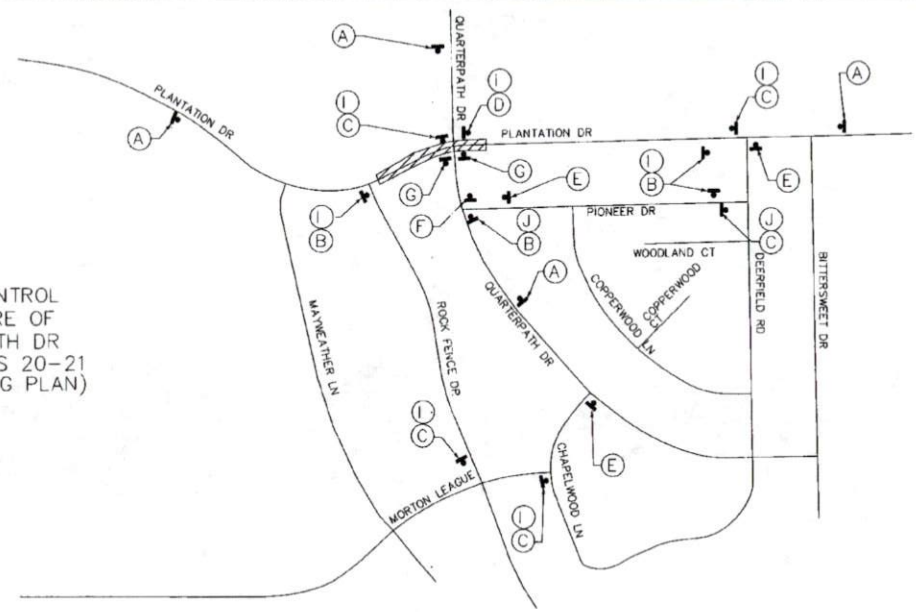
TRAFFIC CONTROL PLAN
TYPICAL FLAGGING OR
MOVING OPERATION

JONES & CARTER, INC.
ENGINEERS · PLANNERS · SURVEYORS
Texas Board of Professional Engineers Registration No. F-439
6330 Gulfton Dr., Suite 100, Houston, Texas 77081 (713) 777-5337

SCALE: _____ DGN. BY: _____
DATE: DECEMBER 2014 DWN. BY: _____
JOB NO. 90024-0267-01 DWG. NO. _____
SUBMITTED: SURV. BY: _____
F.B. NO. _____

COLBY W. WRIGHT
95717
LICENSED PROFESSIONAL ENGINEER
AS AMC 12/11/2014

SHEET NO
22
OF 28



TRAFFIC CONTROL FOR CLOSURE OF QUARTERPATH DR (SEE SHEETS 20-21 FOR PHASING PLAN)

BENCH MARK
NGS MONUMENT No: U804, BRASS CAP IN TOP OF NW END OF THE NE ABUTMENT OF A CONCRETE BRIDGE UNDER EASTBOUND LANES OF U.S. HWY 90A, 0.1 MILE SW OF JUNCTION OF F.M. 359 AND 1.45 MILES NE OF RICHMOND COURT HOUSE

ELEVATION = 82.88' (NAVD 88)

N.T.S.

APPROVED: [signature] DEVELOPMENT COORDINATOR

DATE: 2/12/15

LEGEND

(A)	DETOUR AHEAD — CW20-2D DETOUR AHEAD	(D)	DETOUR ↑ — M4-9S	(G)	ROAD CLOSED — R11-2 ROAD CLOSED	(J)	PLANTATION DR — M4-9N
(B)	DETOUR → — M4-9S	(E)	END DETOUR — M4-8a	(H)	COPPERWOOD LN — M4-9N		
(C)	DETOUR ← — M4-9S	(F)	ROAD CLOSED TO THRU TRAFFIC — R11-4 ROAD CLOSED TO THRU TRAFFIC	(I)	QUARTERPATH DR — M4-9N		

PRIVATE UTILITY LINES SHOWN
AT LEAST 48 HOURS BEFORE EXCAVATING IN STREET R.O.W. OR EASEMENTS CALL THE LONE STAR NOTIFICATION 713-223-4567.

NOTICE:

VERIFICATION OF PRIVATE UTILITY LINES

CenterPoint Energy/Natural Gas Facilities Verification ONLY — Date:

CenterPoint Energy/UNDERGROUND Electrical Facilities Verification ONLY — Date:

SBC — Date:

NO	DATE	REVISIONS	APP.

PECAN GROVE M.U.D.
FORT BEND COUNTY, TEXAS

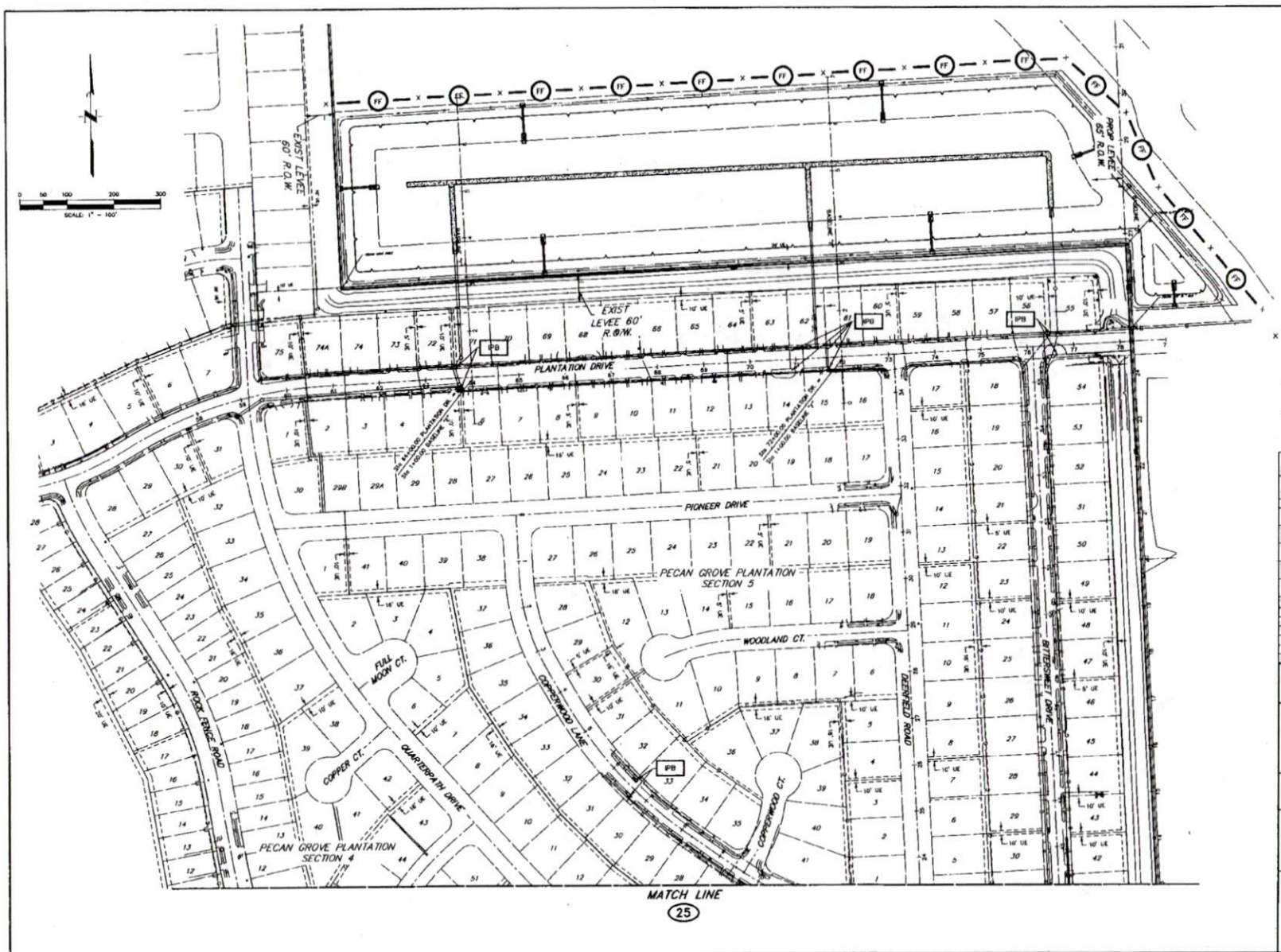
PECAN GROVE PLANTATION 4 & 5
DRAINAGE IMPROVEMENTS

DETOUR PLAN FOR QUARTERPATH DRIVE

JONES & CARTER, INC.
ENGINEERS • PLANNERS • SURVEYORS
Texas Board of Professional Engineers Registration No. F-439
6330 Gulfton Dr., Suite 100 Houston, Texas 77081 (713) 777-5337

SCALE: DSGN. BY:
DATE: DECEMBER 2014 DWN. BY:
JOB NO. 00034-0367-01 DWG. NO.
SUBMITTED: SURV. BY:
F.B. NO.

STATE OF TEXAS — COLBY W. WRIGHT — 95717 — LICENSED PROFESSIONAL ENGINEER
[signature] PE, PMS 12/11/2014



BENCH MARK

HGS MONUMENT No. U804, BRASS CAP IN TOP OF NW END OF THE NE ABUTMENT OF A CONCRETE BRIDGE UNDER EASTBOUND LANES OF U.S. HWY 90A, 0.1 MILE SW OF JUNCTION OF F.M. 359 AND 1.45 MILES NE OF RICHMOND COURT HOUSE.

ELEVATION = 82.88' (NAVD 88)

T.B.M. "A"

CENTERLINE / CENTERLINE INTERSECTION OF QUARTERPATH DRIVE AND CHAPELWOOD DRIVE
ELEVATION = 80.33' (NAVD 88)

T.B.M. "B"

BOX CUT ON THE BACK OF CURB NEAR THE WHEELCHAIR RAMP AT THE SOUTHWEST CORNER OF PLANTATION DRIVE AND ROCK FENCE DRIVE.
ELEVATION = 76.23' (NAVD 88)

T.B.M. "C"

CENTERLINE / CENTERLINE INTERSECTION OF BITTERSWEET DRIVE AND BITTERSWEET COURT

ELEVATION = 78.24' (NAVD 88)

LEGEND:

- IPB — INLET PROTECTION BARRIERS FOR STAGE II INLETS
- SC — STABILIZED CONSTRUCTION ACCESS
- CTW — CONCRETE TRUCK WASHOUT AREA
- X — FF — X FILTER FABRIC FENCE

APPROVED: _____ DEVELOPMENT COORDINATOR

DATE: 2/11/15

PRIVATE UTILITY LINES SHOWN

AT LEAST 48 HOURS BEFORE EXCAVATING IN STREET R.O.W. OR EASEMENTS, CALL THE ONE CALL STAR NOTIFICATION 713-223-4567

NOTICE:

VERIFICATION OF PRIVATE UTILITY LINES

Date:

Date:

Date:

NO.	DATE	REVISIONS	APP.

PECAN GROVE M.U.D.
FORT BEND COUNTY, TEXAS

PECAN GROVE PLANTATION 4 & 5
- DRAINAGE IMPROVEMENTS

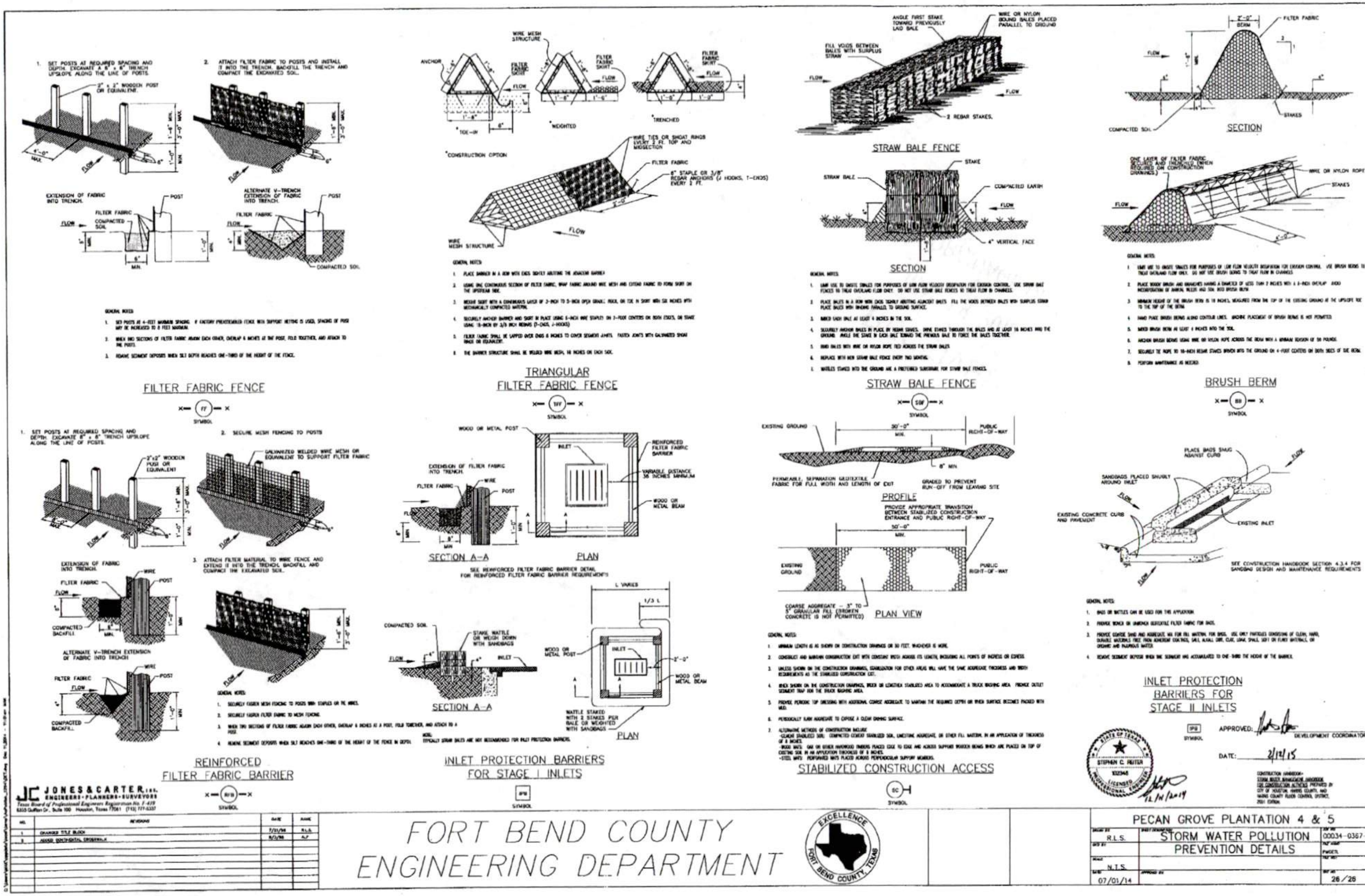
STORM WATER POLLUTION PREVENTION PLAN
SHEET 1 OF 2

JONES & CARTER, INC.
ENGINEERS • PLANNERS • SURVEYORS
Texas Board of Professional Engineers Registration No. F-439
8300 Gaffney Dr., Suite 100 Houston, Texas 77041 (713) 777-5337

SCALE: 1" = 100' DGN. BY: RLG
DATE: DECEMBER 2014 DWN. BY: JEM
JOB NO. 20034-0367-01 DWG. NO.
SUBMITTED: SURV. BY:
T.B. NO.

STATE OF TEXAS
STEPHEN C. REITER
102548
PROFESSIONAL ENGINEER
12/10/2014

SHEET NO. 24 OF 26


FILTER FABRIC FENCE
TRIANGULAR
FILTER FABRIC FENCE
STRAW BALE FENCE
SECTION
STRAW BALE FENCE
SECTION
BRUSH BERM
PROFILE
PLAN VIEW
REINFORCED
FILTER FABRIC BARRIER
SECTION A-A
PLAN
SECTION A-A
PLAN
INLET PROTECTION BARRIERS
FOR STAGE I INLETS
STABILIZED CONSTRUCTION ACCESS
INLET PROTECTION
BARRIERS FOR
STAGE II INLETS
APPROVED:
DEVELOPMENT COORDINATOR
DATE: 2/12/15
STEPHEN C. REITER
JONES&CARTER, INC.
ENGINEERS · PLANNERS · SURVEYORS
FORT BEND COUNTY
ENGINEERING DEPARTMENT
EXCELLENCE
FORT BEND COUNTY, TEXAS
PECAN GROVE PLANTATION 4 & 5
STORM WATER POLLUTION
PREVENTION DETAILS
R.L.S.
N.T.S.
07/01/14
00034-0367-01
28/28