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

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

[X] **Right of Way Permit**

[ ] **Commercial Driveway Permit**

Permit No: 2018-20515

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

(1) COMPLETE APPLICATION FORM:

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

(2) BOND:

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

(3) DRAINAGE DISTRICT APPROVAL (WHEN APPLICABLE):

_____ _____
Drainage District Approval Date

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

_____ 5/14/2018
Permit Administrator Date

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

REVIEW BY FORT BEND COUNTY COMMISSIONERS COURT

[X] **Right of Way Permit**

[ ] **Commercial Driveway Permit**

Permit No: 2018-20515

Applicant: **Millis Equipment, LLC**

Job Location Site: **21155 Southwest Freeway , Richmond , TX 77469**

Bond No. [redacted] **Date of Bond:** **5/2/2018** **Amount:** **$5,000.00**

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

Notes:

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

On this 22nd day of May, 2018, Upon Motion of Commissioner _____, seconded by Commissioner _____, duly put and carried, it is ORDERED, ADJUDGED AND DECREED that said notice of said above purpose is hereby acknowledged by the Commissioners Court of Fort Bend County, Texas, and that said notice be placed on record according to the regulation order thereof.

Signature

By: _____
County Engineer

N/A

By: _____
Drainage District Engineer/Manager

Presented to Commissioners Court and approved.

Date Recorded _____ Comm. Court No. _____

Clerk of Commissioners Court

By: _____
Deputy

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

BOND NO [redacted]

THE STATE OF TEXAS §

KNOW ALL MEN BY THESE PRESENTS:

COUNTY OF FORT BEND §

THAT WE, Millis Equipment, LLC **whose address is** 931 Pheasant Valley Dr., Suite 240 Missouri City, Texas 77489 **Texas, hereinafter called the Principal, And** Travelers Casualty and Surety Company of America **, a Corporation existing under and by virtue of the laws of the state of** Connecticut **and authorized to do an indemnifying business in the state of Texas, and whose principal office is located at** One Tower Square Hartford, Connecticut 06183 **, whose officer residing in the State of Texas, authorized to accept service in all suits and actions brought whining said state is** Texas **and Whose address is** 1301 E. Collins Blvd. Richardson, Texas 75081 **, hereinafter called the Surety, and held and firmly bound unto , Robert e. Hebert, County Judge of Fort Bend County, Texas, or his successors in office, in the full sum of** Five Thousand and No/100 ---------- **Dollars (**$ 5,000.00 -------- **) current, lawful money of the United Stated of America, to be paid to said Robert E. Hebert, County Judge of Fort Bend County, Texas, or his successors in office, to which payment well and truly to be made and done, we, the undersigned, bind ourselves and each of us, our heirs, executors, administrators, successors, assigns, and legal representatives, jointly and severally, by these presents.**

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

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

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

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

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

EXECUTED this 2nd **day of** May **, 20** 18 **.**

Millis Equipment, LLC

PRINCIPAL

BY

Travelers Casualty and Surety Company of America

SURETY

BY **Gloria Villa, Attorney-in-Fact**

TRAVELERS

POWER OF ATTORNEY

Travelers Casualty and Surety Company of America
Travelers Casualty and Surety Company
St. Paul Fire and Marine Insurance Company

KNOW ALL MEN BY THESE PRESENTS: That Travelers Casualty and Surety Company of America, Travelers Casualty and Surety Company, and St. Paul Fire and Marine Insurance Company are corporations duly organized under the laws of the State of Connecticut (herein collectively called the "Companies"), and that the Companies do hereby make, constitute and appoint **Gloria Villa**, of the City of **Houston**, State of **Texas**, their true and lawful Attorney-in-Fact to sign, execute, seal and acknowledge any and all bonds, recognizances, conditional undertakings and other writings obligatory in the nature thereof on behalf of the Companies in their business of guaranteeing the fidelity of persons, guaranteeing the performance ofcontracts and executing or guaranteeing bonds and undertakings required or permitted in any actions or proceedings allowed by law.

IN WITNESS WHEREOF, the Companies have caused this instrument to be signed and their corporate seals to be hereto affixed, this **3rd** day of **February, 2017.**

Travelers Casualty and Surety Company of America
Travelers Casualty and Surety Company
St. Paul Fire and Marine Insurance Company

State of Connecticut

City of Hartford ss.

By: _____
Robert L. Raney, Senior Vice President

On this the **3rd** day of **February, 2017**, before me personally appeared **Robert L. Raney**, who acknowledged himself to be the Senior Vice President of Travelers Casualty and Surety Company of America, Travelers Casualty and Surety Company, and St. Paul Fire and Marine Insurance Company, and that he, as such, being authorized so to do, executed the foregoing instrument for the purposes therein contained by signing on behalf of the corporations by himself as a duly authorized officer.

In Witness Whereof, I hereunto set my hand and official seal.

My Commission expires the **30th** day of **June, 2021**

MARIE C. TETREAULT NOTARY PUBLIC CONNECTICUT

Marie C Tetreault
Marie C. Tetreault, Notary Public

TRAVELERS

IMPORTANT NOTICE

TO OBTAIN INFORMATION OR MAKE A COMPLAINT:

You may contact Travelers Casualty & Surety Company of America, Travelers Casualty & Surety Company, Travelers Indemnity Company, Standard Fire Insurance Company and/or Farmington Casualty Company for information or to make a complaint at:

Travelers Bond
Attn: Claims
1500 Market Street
West Tower, Suite 2900
Philadelphia, PA 19102

(267) 675-3057
(267) 675-3102 Fax

You may contact the Texas Department of Insurance to obtain the information on companies, coverages, rights or complaints at:

Texas Department of Insurance
P.O. Box 149104
Austin, TX 78714-9104

(800) 252-3439

ATTACH THIS NOTICE TO YOUR BOND. This notice is for information only and does not become a part or a condition of the attached document and is given to comply with Section 2253-021, Government Code, and Section 53.202, Property Code, effective September 1, 2001.

CONSTRUCTION PLANS
FOR
MERCEDES BENZ SPRINTER
& CERTIFIED PRE-OWNED
CAR DEALERSHIP

8.320 ACRES

CITY OF RICHMOND, FORT BEND COUNTY, TEXAS

JANUARY 2018

THIS SET IS LIMITED TO PROPOSED BOX CULVERT INSTALLATION WITH ASSOCIATED GRADING AND PUBLIC SANITARY SEWER IMPROVEMENTS ONLY. ALL PROPOSED BUILDINGS, PAVING, WATER, AND PRIVATE SANITARY SEWER IS TO BE VOIDED AS PART OF THIS PLAN SET.

DRAWING SHEET INDEX

FOR

GOOD FULTON & FARRELL ARCHITECTS
2808 FAIRMONT STREET, SUITE 300
DALLAS, TX 75201

OWNER/DEVELOPER

MERCEDES BENZ OF SUGAR LAND
15625 SOUTHWEST FWY,
SUGAR LAND, TX 77478

PREPARED BY

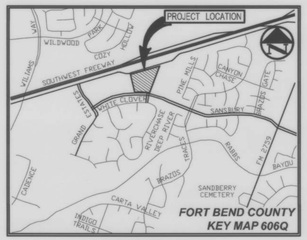
Pacheco Koch
20445 STATE HWY 249, SUITE 380
HOUSTON, TX 77070
TX REG. ENGINEERING FIRM F-14439
TX REG. SURVEYING FIRM LS-10193805
T: 281.883.0103
F: 972.235.9544

* OUTFALL STORM SEWER ALONG EAST PROPERTY APPROVAL ONLY

APPROVED:
CITY OF RICHMOND

KELLY R. KALUZA – CITY ENGINEER — DATE 3/1/18 *

TERI VELA – CITY MANAGER — DATE 3/7/18



VICINITY MAP
(NOT TO SCALE)

ALL ONSITE UNDERGROUND PIPING TO BE INSPECTED BY THE MUD OPERATOR PRIOR TO COVERING. CONTACT MARY HLAVACK WITH SI ENVIRONMENTAL, LLC, FOR INSPECTIONS VIA THE BUILDER'S SERVICES DEPARTMENT AT (832) 490–1610.

EQUIVALENT SINGLE FAMILY UNITS ARE BASED ON EXHIBIT C IN THE MUNICIPAL UTILITY DISTRICT'S RATE ORDER.

1 EQUIVALENT SINGLE–FAMILY UNIT = 315 GPD
GROSS SHOWROOM SQ FOOTAGE = 61,317 SQFT.
RETAIL SPACE = 0.07 GPD/SQFT.
1 COMMERCIAL CAR WASH W/O WATER RECLAIM = 1,200 GPD
TOTAL EQUIVALENT SINGLE FAMILY UNITS = [(61,317)(.07)+1200]/315
TOTAL EQUIVALENT SINGLE FAMILY UNITS = 17.44 UNITS

STATE OF TEXAS
KYLE F. WHITIS
101330
LICENSED
PROFESSIONAL ENGINEER
01/04/2018

THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY KYLE F. WHITIS, P.E. 101330 ON 01/04/2018. ALTERATION OF A SEALED DOCUMENT WITHOUT PROPER NOTIFICATION TO THE RESPONSIBLE ENGINEER IS AN OFFENSE UNDER THE TEXAS ENGINEERING PRACTICE ACT.

* APPROVAL IS FOR (2) 7'x4' RCB AND OUTFALL ONLY

FORT BEND COUNTY ENGINEER

ENGINEER: Richard Stollie, PE, PTOE
for RICHARD W. STOLLIES, P.E.
DATE: 4/13/18

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

APPROVED: Mary Hall
DEVELOPMENT COORDINATOR
DATE: 4/13/18

BEWING
1/2/2018 8:40 AM
O:\DWG-37\3787-16.277\DWG\CIVIL CSD 2015\3787-16.277-COVR.DWG

MB SPRINTER CPO

STATE OF TEXAS
COUNTY OF FORT BEND

WE, Farouk and Rima Alattar, hereinafter referred to as Owners of the 8.3201 acre tract described in the above and foregoing map of ALATTAR DEVELOPMENT, do hereby make and establish said subdivision and development plan of said property according to all lines, dedications, restrictions and notations on said maps or plat and hereby dedicate to the use of the public forever, all streets (except those streets designated as private streets, or permanent access easements), alleys, parks, water courses, drains, easements and public places shown thereon for the purposes and considerations expressed; and do hereby bind ourselves, our heirs, successors and assigns to warrant and forever defend the title to the land so so dedicated.

FURTHER, Owners do hereby dedicate for public utility purposes an unobstructed aerial easement five (5) feet in width from a place twenty (20) feet above the ground level upward, located adjacent to all public utility easements shown on the attached plat.

FURTHER, Owners do hereby covenant and agree that all of the property within the boundaries of this plat is hereby restricted to prevent the drainage of any septic tanks into any public or private street, permanent access easement, road or alley or any drainage ditch, either directly or indirectly.

FURTHER, Owners do hereby covenant and agree that all of the property within the boundaries of this plat and adjacent to any drainage easement, ditch, gully, creek or natural drainage way is hereby restricted to keep such drainage ways easements clear of fences, buildings, planting and other obstructions to the operations and maintenance of the drainage facility and that such abutting property shall not be permitted to drain directly into this easement except by means of an approved drainage structure.

FURTHER, Owner does hereby acknowledge the receipt of the "Order for Regulation of Outdoor Lighting in the Unincorporated Areas of Fort Bend County, Texas", and do hereby covenant and agree and shall and shall comply with this order as adopted by the Fort Bend County Commissioners Court on March 23, 2004, and any subsequent amendments.

WITNESS, our hand in the City of Richmond, Fort Bend County, Texas, this the 22 day of October, 2014.

Farouk Alattar, Owner

Rima Alattar, Owner

STATE OF TEXAS
COUNTY Fort Bend

BEFORE ME, the undersigned authority, on this day personally appeared Farouk Alattar, known to me to be the person whose name is subscribed to the foregoing instrument and acknowledgment to me that he executed the same for the purposes and considerations therein expressed and in the capacity therein and herein stated.

GIVEN UNDER MY HAND AND SEAL OF OFFICE, this the 22 day of October 2014.

NANCY TAVAREZ
Notary Public, State of Texas
My Commission Expires
May 02, 2017

Notary Public in and for the
State of Texas

My Commission Expires: May 2 2017

STATE OF TEXAS
COUNTY OF Fort Bend

BEFORE ME, the undersigned authority, on this day personally appeared Rima Alattar, known to me to be the person whose name is subscribed to the foregoing instrument and acknowledgment to me that he executed the same for the purposes and considerations therein expressed and in the capacity therein and herein stated.

GIVEN UNDER MY HAND AND SEAL OF OFFICE, this the 22 day of October 2014.

NANCY TAVAREZ
Notary Public, State of Texas
My Commission Expires
May 02, 2017

Notary Public in and for the
State of Texas

My Commission Expires: May 2 2014

I, Mike Kurkowski, am authorized under the laws of the State of Texas to practice the profession of surveying and hereby certify that the above subdivision is true and correct; was prepared from an actual survey of the property made under my supervision on the ground; that all boundary corners, angle points, points of curvature and other points of reference have been marked with iron (or other suitable permanent metal) pipes or rods have an outside diameter of not less than three quarter (3/4) inch and a length of not less than three (3) feet, unless otherwise noted, and that the plat boundary corners have been tied to the nearest survey corner and the Texas State Plane Coordinate System (NAD83).

STATE OF TEXAS
REGISTERED TO
MIKE KURKOWSKI
5101
PROFESSIONAL
LAND SURVEYOR

Mike Kurkowski
Registered Professional Land Surveyor
Texas Registration No. 5101

10-16-14
Date

I, Angela L. Howes, a Professional Engineer registered in the State of Texas, do hereby certify that this plat meets all requirements of Fort Bend County, Texas, to the best of my knowledge.

STATE OF TEXAS
ANGELA L. HOWES
88510
LICENSED
PROFESSIONAL ENGINEER

Angela L. Howes
Licensed Professional Engineer No. 88510
T.B.P.E. Registration No. F-467

10-17-14
Date

This plat of ALATTAR DEVELOPMENT is approved by the City Manager of the City of Richmond, Texas, this the 31st day of December, 2014.

Terri Vela, City Manager

This plat of ALATTAR DEVELOPMENT was approved on September 15, 2014 by the City of Richmond City Commission, and signed the 15th day of September, 2014, however, this approval shall be invalid, and null, and void, unless this plat is filed with the County Clerk of Fort Bend County, Texas, within six (6) months hereafter.

Evelyn W. Moore, Mayor

Laura Scarlato, City Secretary

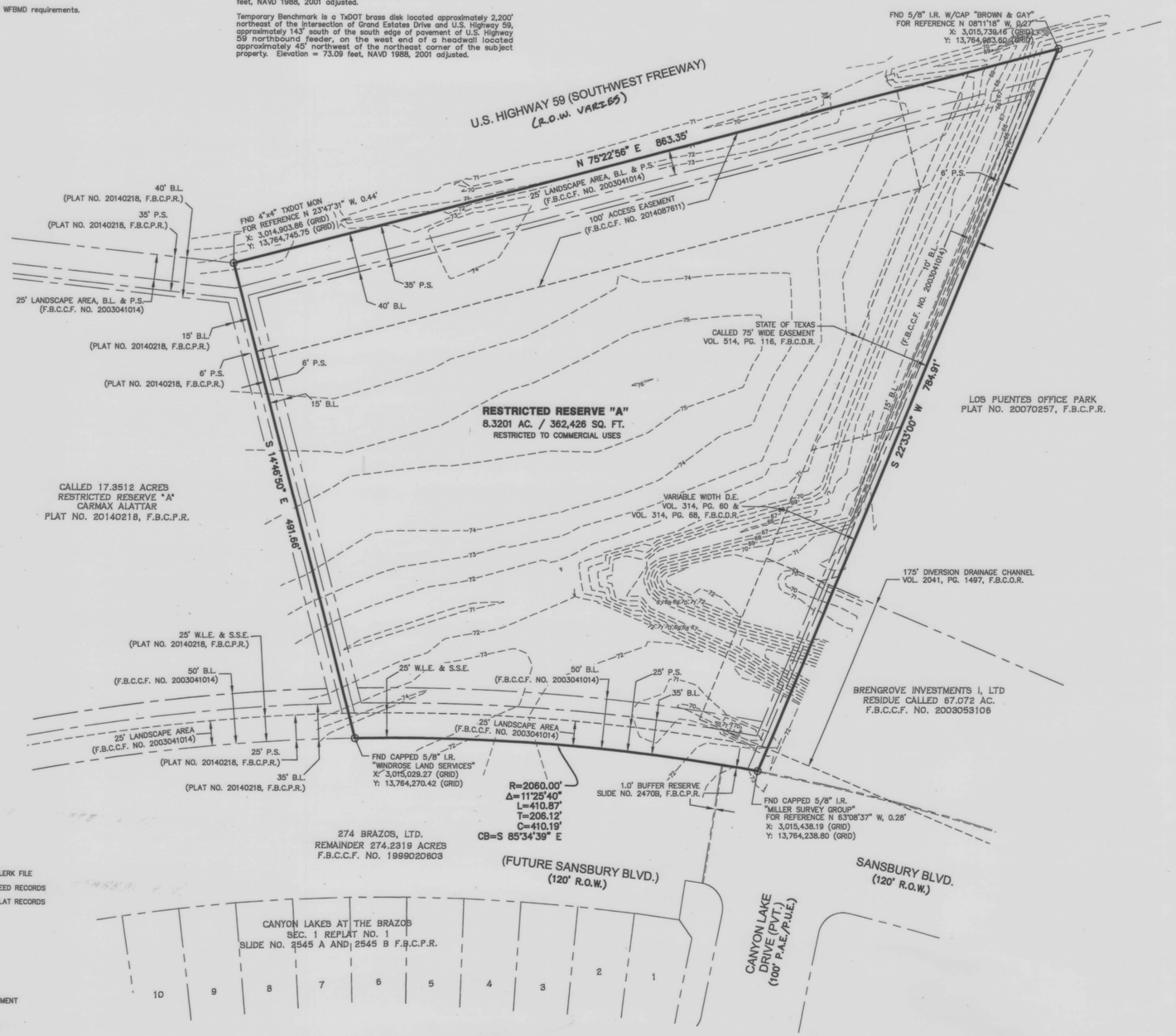
WEST FORT BEND MANAGEMENT DISTRICT ("WFBMD") PLAT NOTES

1. This plat is subject to the WFBMD Development Standards.
2. The WFBMD requires a tree survey and tree preservation plan prior to removal of any trees eighteen inches (18") in diameter or greater from property.
3. The WFBMD shall be notified prior to any site clearing or construction.
4. The WFBMD requires site plans to be submitted for staff review and approval prior to construction.
5. This plat was prepared to meet WFBMD requirements.

GENERAL NOTES

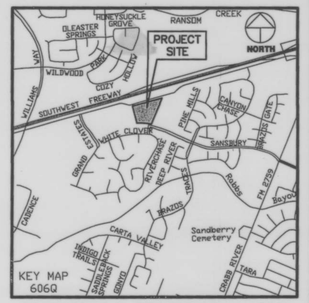
1. This property lies within Shaded Zone "X" according to FEMA FIRM Map No. 48157C0265L, effective date April 2, 2014. Shaded Zone "X" is defined as "Moderate risk areas within the 0.2-percent-annual-chance floodplain, areas of 1-percent-annual-chance flooding where average depths are less than 1 foot, areas of 1-percent-annual-chance flooding where the contributing drainage area is less than 1 square mile, and areas protected from the 1-percent-annual-chance flood by a levee." This determination was done by graphic plotting and is approximate only, and has not been field verified. This flood statement does not imply that the property or structures thereon will be free from flooding or flood damage. On rare occasions floods can and will occur and flood heights may be increased by man-made or natural causes. This flood statement shall not create liability on the part of Windrose Land Services, inc.
2. All visible easements and easements of record affecting this property as reflected on the title report from Stewart Title Guaranty Company, File No. 1415742622, effective date of August 8, 2014, issued August 14, 2014, are shown hereon. Surveyor has relied upon the above-mentioned title commitment with regard to any easements, setbacks, restrictions, or rights-of-way affecting the subject property. No additional research regarding the existence of easements, setbacks, restrictions, rights-of-way, or other matters of record has been performed by the surveyor.
3. Bearings were based on the Texas State Plane Coordinate System, South Central Zone (NAD83).
4. All coordinates shown hereon are Texas South Central Zone No. 4204 State Plane Grid Coordinates (NAD 83), and may brought to surface by applying the following scale factor 0.99987149325.
5. Primary Benchmark is NGS Monument "A 1212"/P.I.D. "AW4725", being a benchmark disk set in a culvert 3.25 miles northeast of Sugar Land at the northwest corner of the junction of a road north to Texas Department of Corrections Jester Unit in the top and 2.0 feet east of the west end of the north concrete headwall of double concrete pipe culverts. Elevation = 78.18 feet, NAVD 1988, 2001 adjusted.

   Temporary Benchmark is a TxDOT brass disk located approximately 2,200' northeast of the intersection of Grand Estates Drive and U.S. Highway 59, approximately 143' south of the south edge of pavement of U.S. Highway 59 northbound feeder, on the west end of a headwall located approximately 45' northwest of the northeast corner of the subject property. Elevation = 73.09 feet, NAVD 1988, 2001 adjusted.
6. The drainage system for this subdivision shall be designed in accordance with the Fort Bend County Drainage Criteria Manual which allows street ponding with intense rainfall events.
7. All drainage easements shall be kept clear of fences, building, vegetation, and other obstructions for the purpose of the operation and maintenance of the drainage facility. All property is required to drain into the drainage easements through an approved drainage structure.
8. There are no pipelines or pipeline easements on this property except as shown hereon.
9. The property is located within Fort Bend County, Fort Bend County Drainage District, Lamar Consolidated Independent School District, and Fort Bend MUD 116. This property is located in an area annexed by the City of Richmond for limited purposes.
10. This property is located in Lighting Zone No. 3, according to the "Order for Regulation of Outdoor Lighting."
11. The top of all floor slab elevations shall be a minimum of 74.76' feet above mean sea level. The top of slab elevation at any point on the perimeter of the slab shall not be less than eighteen (18) inches above natural ground.
12. In no case shall any slab be less than 12 inches above the extreme event sheet flow or ponding elevation as determined by the engineering site design.
13. Sidewalks shall be built or caused to be built not less than 5 feet in width on both sides of all dedicated rights-of-way within said plat and on the contiguous right-of-way of all perimeter roads surrounding said plat, in accordance with the A.D.A.
14. Subject to a 10' wide Sanitary Sewer Easement, as recorded in F.B.C.C.F. No. 2006018928 (Does not appear to affect the subject property.)



ABBREVIATIONS

FND	– FOUND
IP	– IRON PIPE
IR	– IRON ROD
R.O.W.	– RIGHT-OF-WAY
SQ. FT.	– SQUARE FEET
F.B.C.C.F.	– FORT BEND COUNTY CLERK FILE
F.B.C.D.R.	– FORT BEND COUNTY DEED RECORDS
F.B.C.P.R.	– FORT BEND COUNTY PLAT RECORDS
NO.	– NUMBER
PG.	– PAGE
VOL.	– VOLUME
B.L.	– BUILDING LINE
ESMT.	– EASEMENT
P.S.	– PARKING SETBACK
S.S.E.	– SANITARY SEWER EASEMENT
U.E.	– UTILITY EASEMENT
W.L.E.	– WATER LINE EASEMENT



CITY OF RICHMOND, FORT BEND COUNTY, TEXAS

VICINITY MAP

1" = 2,000'

NORTH

GRAPHIC SCALE: 1"= 60'

60 0 60 120 FEET

I, Richard Stolleis, P.E., Fort Bend County Engineer, do hereby certify that the plat of this subdivision complies with all the existing rules and regulations of this Office as adopted by the Fort Bend County Commissioners' Court. However, no certification is hereby given as to the effect of drainage from this subdivision on the intercepting drainage artery, parent stream, or any other area or subdivision within the watershed.

Richard W. Stolleis, P.E.
Fort Bend County Engineer

APPROVED by the Commissioners' Court of Fort Bend County, Texas, this, the 3rd day of February, 2015.

Richard Morrison
Commissioner, Precinct 1

Grady Prestage
Commissioner, Precinct 2

Robert E. Hebert, Ph.D
County Judge

W. A. "Andy" Meyers
Commissioner, Precinct 3

James Patterson
Commissioner, Precinct 4

I, LAURA RICHARD, County Clerk in and for Fort Bend County, do hereby certify that the foregoing instrument with its certificate of authentication was filed for recordation in my office on February 3, 2015, at 1:58 o'clock P m. , and duly recorded on February 3, 2015 in Plat No. 20150026 of the Map Records of Fort Bend County, for said county.

Witness my hand and seal of office, at Richmond, Texas, the day and date last above written.

Laura Richard
LAURA RICHARD
Clerk of the County Court
of Fort Bend County, Texas

By: D'Lila Almaraz
Deputy
D'LILA ALMARAZ

14 PGS 2015011675
PLAT ATTACH

FILED AND RECORDED
OFFICIAL PUBLIC RECORDS
Laura Richard
Laura Richard, County Clerk
Fort Bend County, Texas
February 03, 2015 01:58:07 PM
FEE: $198.00 DA
PLAT 20150026

ALATTAR DEVELOPMENT

A SUBDIVISION OF
8.3201 ACRES OR 362,426 SQ. FT. OF LAND,
SITUATED IN THE
JOSEPH KUYKENDAHL LEAGUE, ABSTRACT NO. 49,
FORT BEND COUNTY, TEXAS.

0 LOTS 1 RESERVE (8.3201 ACRES) 1 BLOCK

OCTOBER 09, 2014 JOB NO. 51953

Owners
Farouk and Rima Alattar
6890 Southwest Freeway
Houston, TX 77074
(713) 334-6400

Surveyor
Windrose Land Services, Inc.
3200 Wilcrest, Suite 325
Houston, Texas 77042
Phone (713) 458-2281 Fax (713) 461-1151

Professional Development Consultants
Land Surveying, Platting, Project Management, GIS Services
Firm Registration No. 10108800

MD 4/13/18

Y:\PROJECTS\51953-ALATTAR SITE ON US 59\P_LATTING\DRAWINGS\ALATTAR DEVELOPMENT - 51953 - 140924.DWG - MTUCKER - 10/16/14

SHEET 1 OF 1

0 20 40 80 120

GRAPHIC SCALE IN FEET

LEGEND

BL	BOLLARD	(C.M.)	CONTROLLING MONUMENT
EM	ELECTRIC METER		PROPERTY LINE
PP	POWER POLE	X	FENCE
LS	LIGHT STANDARD	OHL	OVERHEAD UTILITY LINE
WM	WATER METER	E	UNDERGROUND ELECTRIC LINE
WV	WATER VALVE	T	UNDERGROUND TELEPHONE LINE
ICV	IRRIGATION CONTROL VALVE	C	UNDERGROUND CABLE LINE
FH	FIRE HYDRANT	6"W	UNDERGROUND WATER LINE
CO	CLEANOUT	6"SS	UNDERGROUND SEWER LINE
MH	MANHOLE	613	EXIST CONTOUR
TSC	TRAFFIC SIGNAL CONTROL	612.39	EXIST SPOT ELEVATION
TSP	TRAFFIC SIGNAL POLE	TC 612.39 G 611.80	EXIST TOP OF CURB ELEVATION EXIST GUTTER ELEVATION
TELE	TELEPHONE BOX		DEMOLITION AREA
FL	FLOOD LIGHT		
FP	FLAG POLE		
SIGN	TRAFFIC SIGN		
IRS	1/2-INCH IRON ROD W/"PACHECO KOCH" CAP SET		

DEMOLITION GENERAL NOTES

1. CONTRACTOR IS TO REVIEW ALL GENERAL NOTES PRIOR TO BEGINNING WORK.
2. REMOVE ALL EXISTING PAVEMENT AND STRUCTURES WITHIN THE LIMITS OF DEMOLITION UNLESS OTHERWISE NOTED.
3. SAWCUT AND REMOVE ALL EXISTING DRIVE APPROACHES (WITHIN THE LIMITS OF DEMOLITION) TWO FEET FROM BACK OF CURB. SIDEWALKS, PAVEMENT, AND UTILITIES WITHIN THE PUBLIC RIGHT-OF-WAY ARE TO REMAIN UNLESS OTHERWISE NOTED.
4. CONSULT THE DIMENSIONAL CONTROL PLAN TO VERIFY THE PORTION OF EXISTING CONCRETE CURBS AND PAVEMENT WHICH ARE TO REMAIN.
5. CONTRACTOR TO COORDINATE WITH LOCAL POWER, TELEPHONE, CABLE, AND GAS COMPANIES PRIOR TO THE REMOVAL AND/OR RELOCATION OF EXISTING UTILITIES.
6. ALL UTILITIES SHOULD BE CUT AND PLUGGED IN ACCORDANCE WITH THEIR RESPECTIVE UTILITY COMPANY REQUIREMENTS AND PRIOR TO DEMOLITION OF ANY EXISTING BUILDINGS.
7. CONTRACTOR TO PLUG ALL EXISTING EXPOSED ENDS OF ABANDONED UTILITIES.
8. CONTRACTOR TO DETERMINE SOURCE OF ALL EXPOSED UTILITIES AND, IF REQUIRED, RECONNECT TO PROPOSED UTILITIES.
9. CONTRACTOR IS RESPONSIBLE FOR THE REMOVAL AND LEGAL DISPOSAL OF ALL THE UNSUITABLE MATERIALS FROM THE PROJECT SITE. CONTRACTOR SHALL CONTACT ALL LOCAL AUTHORITIES TO DETERMINE DISPOSAL REQUIREMENTS.
10. ALL TREES ON THE PROPERTY SHALL BE PROTECTED AGAINST DAMAGE DURING DEMOLITION OPERATIONS UNLESS OTHERWISE NOTED. THE TREE PROTECTION SHALL BE PLACED AROUND TREES PRIOR TO ANY DEMOLITION OR GRADING. TREE PROTECTION SHALL REMAIN UNTIL ALL WORK IS COMPLETED. REFER TO LANDSCAPE PLANS FOR TREE REMOVAL AND PROTECTION DETAILS.
11. ANY DAMAGE DONE TO EXISTING TREE CROWNS OR ROOT SYSTEMS SHALL BE REPAIRED IMMEDIATELY BY AN APPROVED TREE SURGEON AT THE OWNER'S DIRECTION. ROOTS EXPOSED AND/OR DAMAGED DURING DEMOLITION AND/OR GRADING OPERATIONS SHALL BE CUT OFF CLEANLY INSIDE THE EXPOSED OR DAMAGED AREA, CUT SURFACES PAINTED WITH AN APPROVED TREE PAINT, AND TOPSOIL AND MULCH PLACED OVER THE EXPOSED ROOT AREA IMMEDIATELY.
12. CONTRACTOR IS RESPONSIBLE FOR ESTABLISHING AND MAINTAINING EROSION CONTROL MEASURES ON THE SITE IN ACCORDANCE WITH FEDERAL, STATE, AND LOCAL REGULATIONS UNTIL THE SITE HAS BEEN STABILIZED.
13. CONTRACTOR IS RESPONSIBLE FOR GRADING ALL DISTURBED AREAS TO ALLOW FOR POSITIVE DRAINAGE. GRADING SLOPES ARE NOT TO EXCEED 4:1, UNLESS OTHERWISE NOTED.
14. AREAS EXCAVATED FOR FOUNDATION OR UNDERGROUND STRUCTURE REMOVAL SHALL BE BACK-FILLED AND COMPACTED TO A MINIMUM OF 95% STANDARD PROCTOR DENSITY.
15. CONTRACTOR IS RESPONSIBLE FOR SECURITY OF THE SITE DURING DEMOLITION ACTIVITIES AND UNTIL SUBSTANTIAL COMPLETION.
16. ALL WORK, UNLESS OTHERWISE NOTED, SHALL CONFORM TO THE CITY OF RICHMOND STANDARD CONSTRUCTION SPECIFICATIONS.
17. THE HORIZONTAL AND VERTICAL LOCATIONS OF EXISTING SUBSURFACE UTILITIES HAVE BEEN DETERMINED FROM DATA RECORDED BY OTHERS. IT WILL BE THE RESPONSIBILITY OF THE CONTRACTOR TO PROTECT ALL UTILITY MAINS, MANHOLES, CLEANOUTS, VALVE BOXES, AND FIRE HYDRANTS, ETC. IN THE AREA OF DEMOLITION.
18. THE CONTRACTOR IS RESPONSIBLE FOR COMPLIANCE WITH ALL FEDERAL, STATE, AND LOCAL REGULATIONS REGARDING TRENCH SAFETY.
19. BARRICADING AND PROJECT SIGNS SHALL CONFORM TO TEXAS DEPARTMENT OF TRANSPORTATION MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES AND LATEST UPDATES.
20. CONTRACTOR SHALL MAINTAIN EXISTING PAVEMENT AND ACCESS TO FIRE HYDRANTS ON SITE UNTIL THE BUILDINGS AND STRUCTURES IN THAT AREA HAVE BEEN DEMOLISHED AND REMOVED.
21. CONTRACTOR WILL PROVIDE ON-SITE PARKING FOR WORKERS. VEHICLE PARKING WILL NOT BE ALLOWED WITHIN THE PUBLIC RIGHT-OF-WAY.
22. CONTRACTOR WILL BE RESPONSIBLE FOR IMPLEMENTING AND MAINTAINING ADEQUATE DUST CONTROL MEASURES DURING DEMOLITION ACTIVITIES.
23. CONTRACTOR IS TO COORDINATE DEMOLITION ACTIVITIES WITH THE HAZARDOUS MATERIAL ABATEMENT CONTRACTORS' ACTIVITIES, IF APPLICABLE.
24. THE CONTRACTOR WILL BE RESPONSIBLE FOR OBTAINING ALL TEMPORARY UTILITY SERVICES REQUIRED TO COMPLETE THE SCOPE OF WORK.
25. IF REQUIRED DUE TO CONSTRUCTION, POWER POLES TO BE BRACED OR RELOCATED AT CONTRACTOR'S EXPENSE.

APPROVED: DEVELOPMENT COORDINATOR

DATE: 4|13|18

STATE OF TEXAS
KYLE F. WHITIS
101330
LICENSED PROFESSIONAL ENGINEER
01/04/2018

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NO.	DATE	REVISION

Pacheco Koch
20445 STATE HWY 249, SUITE 380
HOUSTON, TX 77070 281.883.0103
TX REG. ENGINEERING FIRM F-14439
TX REG. SURVEYING FIRM LS-10008000

DEMOLITION PLAN

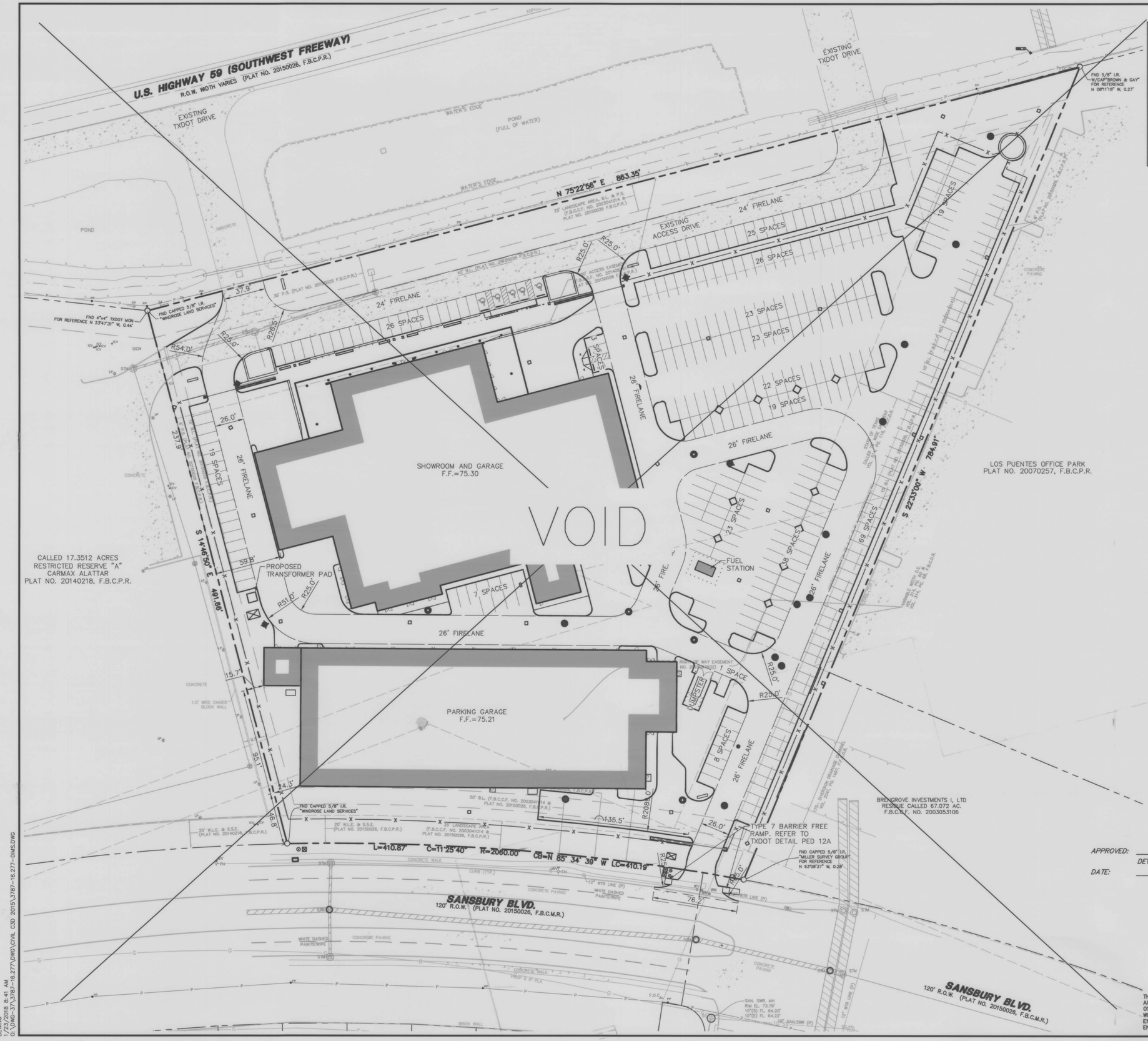
MERCEDES BENZ SPRINTER & CERTIFIED PRE-OWNED CAR DEALERSHIP

CITY OF RICHMOND, FORT BEND COUNTY, TEXAS

DESIGN	DRAWN	DATE	SCALE	NOTES	FILE	NO.
KFW	BKE	JAN 2018	1"=40'			C1.01

MB SPRINTER CPO

BENNG
1/23/2018 8:40 AM
C:\DWG-37\3787-16.277\DWG\CIVIL C3D 2015\3787-16.277-DEMO.DWG



VICINITY MAP
(NOT TO SCALE)

ALL DIMENSIONS ARE TO BACK-OF-CURB UNLESS OTHERWISE NOTED.

0 20 40 80 120
GRAPHIC SCALE IN FEET

LEGEND

- BOLLARD
- ELECTRIC METER
- POWER POLE
- LIGHT STANDARD
- WATER METER
- WATER VALVE
- IRRIGATION CONTROL VALVE
- FIRE HYDRANT
- CLEANOUT
- MANHOLE
- TRAFFIC SIGNAL CONTROL
- TRAFFIC SIGNAL POLE
- TELEPHONE BOX
- FLOOD LIGHT
- FLAG POLE
- TRAFFIC SIGN
- 1/2-INCH IRON ROD
- IRS W/"PACHECO KOCH" CAP SET
- (C.M.) CONTROLLING MONUMENT
- PROPERTY LINE
- FENCE
- (#) COORDINATE DESIGNATION
- PROPOSED FENCE

GENERAL NOTES

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APPROVED: _____ DEVELOPMENT COORDINATOR

DATE: _____

NO.	DATE	REVISION

Pacheco Koch
20445 STATE HWY 249, SUITE 380
HOUSTON, TX 77070 281.883.0103
TX REG. ENGINEERING FIRM F-14439
TX REG. SURVEYING FIRM LS-10008000

OVERALL SITE LAYOUT
MERCEDES BENZ SPRINTER & CERTIFIED PRE-OWNED CAR DEALERSHIP
CITY OF RICHMOND, FORT BEND COUNTY, TEXAS

DESIGN	DRAWN	DATE	SCALE	NOTES	FILE	NO.
KFW	BKE	JAN 2018	1"=40'			C2.01

STATE OF TEXAS
KYLE F. WHITIS
101330
LICENSED PROFESSIONAL ENGINEER
01/04/2018

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MB SPRINTER CPO

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1/23/2018 8:41 AM
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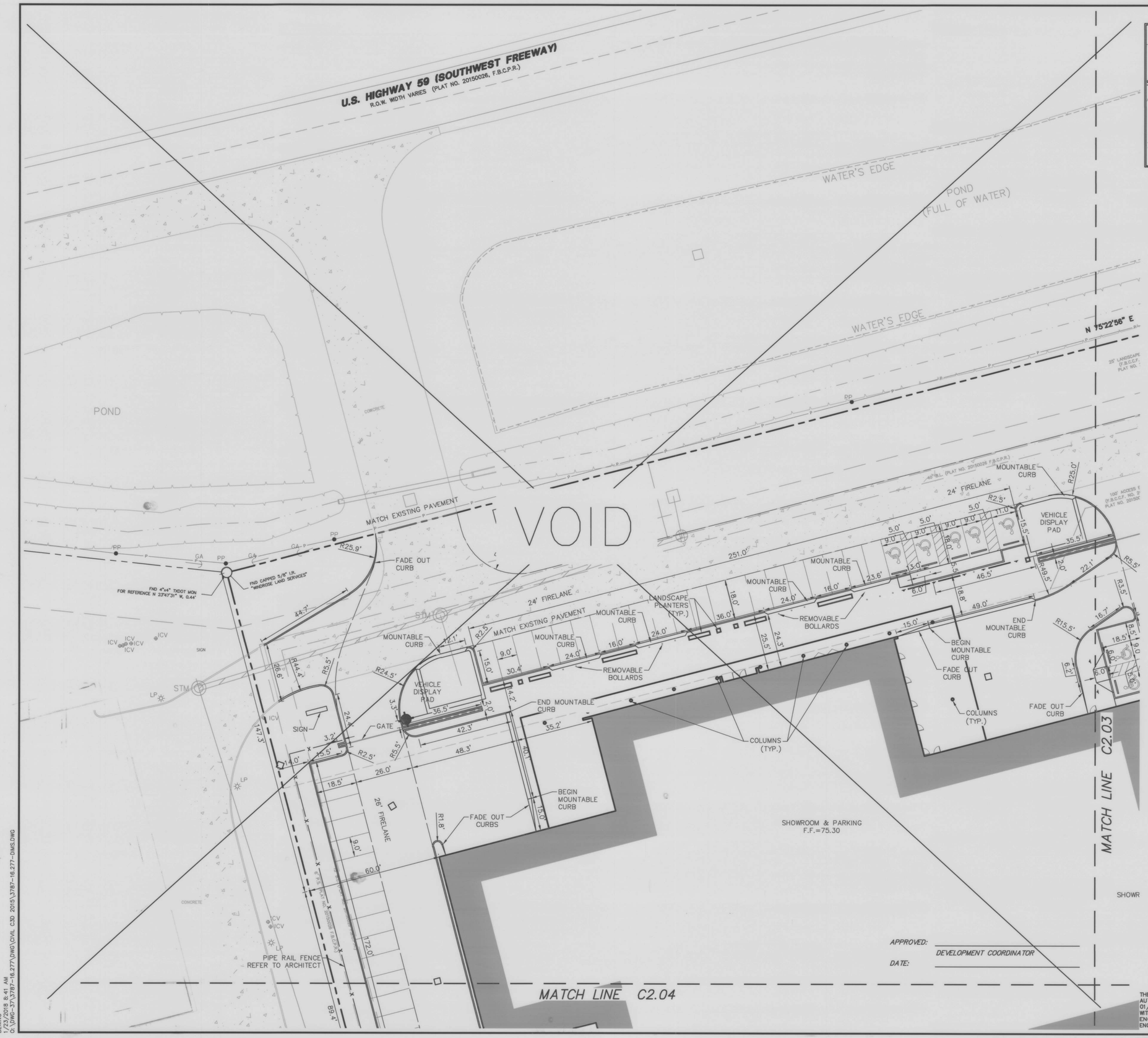

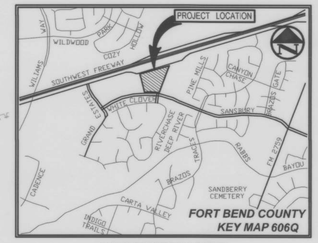

VICINITY MAP
(NOT TO SCALE)

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0 10 20 40 60
GRAPHIC SCALE IN FEET

LEGEND

B.	BOLLARD
EM	ELECTRIC METER
PP	POWER POLE
LS	LIGHT STANDARD
WM	WATER METER
WV	WATER VALVE
ICV	IRRIGATION CONTROL VALVE
FH	FIRE HYDRANT
CO	CLEANOUT
MH	MANHOLE
TSC	TRAFFIC SIGNAL CONTROL
TSP	TRAFFIC SIGNAL POLE
TELE	TELEPHONE BOX
FL	FLOOD LIGHT
FP	FLAG POLE
SIGN	TRAFFIC SIGN
IRS	1/2-INCH IRON ROD W/"PACHECO KOCH" CAP SET
(C.M.)	CONTROLLING MONUMENT
	PROPERTY LINE
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APPROVED: _____
DEVELOPMENT COORDINATOR
DATE: _____

STATE OF TEXAS
KYLE F. WHITIS
101330
LICENSED
PROFESSIONAL ENGINEER
01/04/2018

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NO.	DATE	REVISION
3	03/07/2017	ADDENDUM 3

Pacheco Koch
20445 STATE HWY 249, SUITE 380
HOUSTON, TX 77070 281.883.0103
TX REG. ENGINEERING FIRM F-14439
TX REG. SURVEYING FIRM LS-10008000

DIMENSIONAL CONTROL PLAN
MERCEDES BENZ SPRINTER & CERTIFIED PRE-OWNED CAR DEALERSHIP
CITY OF RICHMOND, FORT BEND COUNTY, TEXAS

DESIGN	DRAWN	DATE	SCALE	NOTES	FILE	NO.
KFW	BKE	JAN 2018	1"=20'			C2.02

MB SPRINTER CPO

BEWING
1/23/2018 8:41 AM
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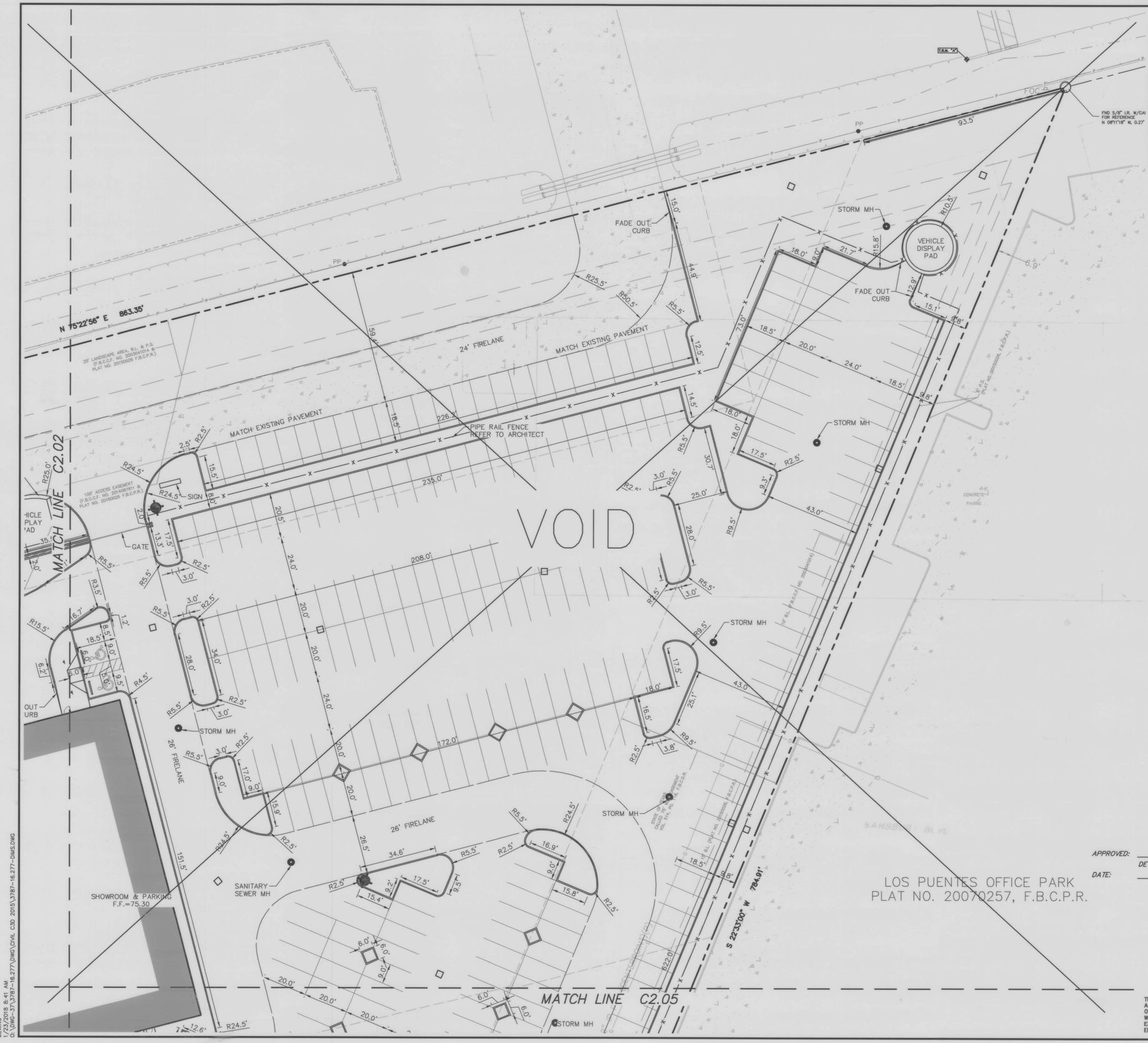

VICINITY MAP
(NOT TO SCALE)

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0 10 20 40 60
GRAPHIC SCALE IN FEET

LEGEND

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- WATER VALVE
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DIMENSIONAL CONTROL PLAN
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CITY OF RICHMOND, FORT BEND COUNTY, TEXAS

DESIGN	DRAWN	DATE	SCALE	NOTES	FILE	NO.
KFW	BKE	JAN 2018	1"=20'			C2.03

MB SPRINTER CPO

BEWING
1/23/2018 8:41 AM
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MATCH LINE C2.02

PIPE RAIL FENCE
REFER TO ARCHITECT

CALLED 17.3512 ACRES
RESTRICTED RESERVE "A"
CARMAX ALATTAR
PLAT NO. 20140218, F.B.C.P.R.

S 14°46'50" E 491.66'

72.0'
89.4'
59.8'
15.5'
113.0'
15.7'
9.5'
95.1'
24.3'
46.8'

26' FIRELANE

FADE OUT CURBS
R1.8'
PROPOSED 8'X8' TRANSFORMER
R25.0'
R51.5'
R14.5'
FADE OUT CURB
FADE OUT CURB
16.6'
FADE OUT CURB

SHOWROOM & PARKING
F.F.=75.30

26.5'
2.4'
2.9'
8.0'
44.8'
SANITARY SEWER MH
R19.5'
77.0'
R2.5'
26' FIRELANE
R5.5'
72.0'
11.0'
18.5'
30.5'
8
39.1'
50.6'
41.0'
38.1'
FADE OUT CURBS
R5.5'

PHOTOBOOTH
F.F.=75.21

MECHANICAL EQUIPMENT

PARKING GARAGE
F.F.=75.21

CONCRETE
1.0' WIDE CINDER BLOCK WALL

VOID

MATCH LINE C2.05

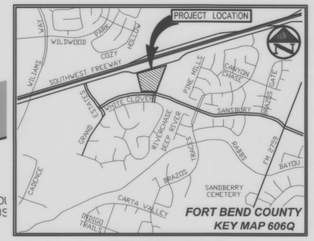
MECHANICAL EQUIPMENT
50' B.L. (F.B.C.C.F. NO. 2003041014 PLAT NO. 20150026, F.B.C.P.R.)
43.9'
27.0'
R=15.5'
3.0'
SANITARY SEWER MH

FND CAPPED 5/8" LR.
"WINDROSE LAND SERVICES"
PIPE RAIL FENCE
REFER TO ARCHITECT

25' W.L.E. & S.S.E.
(PLAT NO. 20140218, F.B.C.P.R.)
25' W.L.E. & S.S.E.
(PLAT NO. 20150026, F.B.C.P.R.)
25' LANDSCAPE AREA
(F.B.C.C.F. NO. 2003041014 & PLAT NO. 20150026, F.B.C.P.R.)

L=410.87'
C=11°25'40"
R=2060.00'
CB=N 85° 34' 39" W

CONCRETE WALK
CURB (TYP.)
12" WTR
CONCRETE PAVING
SANSBURY BLVD.
120' R.O.W. (PLAT NO. 20150026, F.B.C.M.R.)
WHITE DASHED PAINTSTRIPE
CONCRETE PAVING
CONCRETE WALK
PROP 6 IP PLA



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0 10 20 40 60
GRAPHIC SCALE IN FEET

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BL	BOLLARD
EM	ELECTRIC METER
PP	POWER POLE
LS	LIGHT STANDARD
WM	WATER METER
WV	WATER VALVE
ICV	IRRIGATION CONTROL VALVE
FH	FIRE HYDRANT
CO	CLEANOUT
MH	MANHOLE
TSC	TRAFFIC SIGNAL CONTROL
TSP	TRAFFIC SIGNAL POLE
TELE	TELEPHONE BOX
FL	FLOOD LIGHT
FP	FLAG POLE
SIGN	TRAFFIC SIGN
IRS	1/2-INCH IRON ROD W/"PACHECO KOCH" CAP SET
(C.M.)	CONTROLLING MONUMENT
	PROPERTY LINE
x	FENCE
x	PROPOSED FENCE

GENERAL NOTES

1. ALL WORK, UNLESS OTHERWISE NOTED, SHALL CONFORM TO THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION ISSUED BY THE NORTH CENTRAL TEXAS COUNCIL OF GOVERNMENTS AND THE CITY OF RICHMOND STANDARD CONSTRUCTION SPECIFICATIONS.
2. PRIOR TO ANY CONSTRUCTION, THE CONTRACTOR SHALL BE FAMILIAR WITH THE PLANS, ALL NOTES, THE CITY STANDARDS FOR CONSTRUCTION, AND ANY OTHER APPLICABLE STANDARDS AND SPECIFICATIONS RELEVANT TO THE PROPER COMPLETION OF THE WORK SPECIFIED. FAILURE ON THE PART OF THE CONTRACTOR TO BE FAMILIAR WITH ALL STANDARDS AND SPECIFICATIONS PERTAINING TO THIS WORK SHALL IN NO WAY RELIEVE THE CONTRACTOR OF RESPONSIBILITY OF PERFORMING THE WORK IN ACCORDANCE WITH ALL SUCH APPLICABLE STANDARDS AND SPECIFICATIONS.
3. THE HORIZONTAL AND VERTICAL LOCATIONS OF EXISTING SUBSURFACE UTILITIES HAVE BEEN DETERMINED FROM DATA RECORDED BY OTHERS. CONTRACTOR SHALL VERIFY THAT NECESSARY CROSSING CLEARANCES BETWEEN EXISTING AND PROPOSED UTILITIES EXIST PRIOR TO CONSTRUCTION OF ANY SUCH CROSSINGS. IT WILL BE THE RESPONSIBILITY OF THE CONTRACTOR TO PROTECT ALL UTILITIES IN THE CONSTRUCTION OF THIS PROJECT. CONTRACTOR TO VERIFY SIZE AND LOCATION OF ALL UTILITIES PRIOR TO CONSTRUCTION, AND NOTIFY ENGINEER OF ANY DISCREPANCIES.
4. IT WILL BE THE RESPONSIBILITY OF THE CONTRACTOR TO PROTECT ALL MANHOLES, CLEANOUTS, VALVE BOXES, AND FIRE HYDRANTS, ETC. CONTRACTOR TO ADJUST TO PROPER GRADE PRIOR TO AND AFTER THE PLACING OF PERMANENT PAVING AND GRADING. UTILITIES MUST BE MAINTAINED AT PROPER GRADE DURING THE CONSTRUCTION OF THE PAVING FOR THIS DEVELOPMENT.
5.
   5.1. PROTECT AND MAINTAIN ROADWAY TRAFFIC THROUGHOUT THE PROJECT, PROVIDING A MINIMUM OF ONE (1) LANE OPEN IN EACH DIRECTION;
   5.2. PROVIDE AND MAINTAIN INTERIM ACCESS FROM ROADWAYS CURRENTLY IN USE TO ALL DRIVEWAYS AND INTERSECTING STREETS OR ALLEYS;
   5.3. MAINTAIN NORMAL PROJECT DRAINAGE UNTIL NEW DRAINAGE FACILITIES ARE FUNCTIONAL, INCLUDING, WHERE NECESSARY, INTERIM REPLACEMENT OF EXISTING DRAINAGE STRUCTURES REMOVED FOR CONSTRUCTION OF NEW DRAINAGE FACILITIES;
   5.4. MAINTAIN ALL WORK AND MATERIAL STORAGE AREAS IN ORDERLY CONDITION, FREE OF DEBRIS AND WASTE. UPON COMPLETION OF CONSTRUCTION, CLEAN UP THE PROJECT AND ADJACENT AFFECTED AREAS TO AN ACCEPTABLE CONDITION AS PROVIDED IN THE GENERAL CONDITIONS.
6. PRIOR TO COMMENCEMENT OF CONSTRUCTION, BONDS AND THREE-WAY CONTRACTS SHALL BE SUBMITTED TO THE CITY AS REQUIRED.
7. THE CONTRACTOR IS RESPONSIBLE FOR COMPLIANCE WITH ALL FEDERAL, STATE, AND LOCAL REGULATIONS REGARDING TRENCH SAFETY.
8. REFER TO ARCHITECTURAL AND STRUCTURAL PLANS TO VERIFY ALL BUILDING DIMENSIONS.
9. REFER TO ARCHITECTURAL PLANS FOR DETAILED BUILDING ENTRANCE LAYOUTS, RAMPS, LANDSCAPE, AND SIDEWALKS.
10. BARRICADING AND PROJECT SIGNS SHALL CONFORM TO THE TEXAS DEPARTMENT OF TRANSPORTATION MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES AND LATEST UPDATES.
11. EXACT SAWCUT PAVEMENT REMOVAL AND REPLACEMENT LIMITS WITHIN THE PUBLIC RIGHT-OF-WAY SHALL BE IN ACCORDANCE WITH THE CITY PAVEMENT REPAIR MANUAL AND INCLUDED IN THE BASE BID.
12. CONTRACTOR WILL PROVIDE ON-SITE PARKING FOR WORKERS. VEHICLE PARKING WILL NOT BE ALLOWED WITHIN THE PUBLIC RIGHT-OF-WAY.

APPROVED: _____ DEVELOPMENT COORDINATOR

DATE: _____

STATE OF TEXAS
KYLE F. WHITIS
101330
LICENSED PROFESSIONAL ENGINEER
01/04/2018

THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY KYLE F. WHITIS, P.E. 101330 ON 01/04/2018. ALTERATION OF A SEALED DOCUMENT WITHOUT PROPER NOTIFICATION TO THE RESPONSIBLE ENGINEER IS AN OFFENSE UNDER THE TEXAS ENGINEERING PRACTICE ACT.

NO.	DATE	REVISION

Pacheco Koch
20445 STATE HWY 249, SUITE 380
HOUSTON, TX 77070 281.883.0103
TX REG. ENGINEERING FIRM F-14439
TX REG. SURVEYING FIRM LS-10008000

DIMENSIONAL CONTROL PLAN
MERCEDES BENZ SPRINTER & CERTIFIED PRE-OWNED CAR DEALERSHIP
CITY OF RICHMOND, FORT BEND COUNTY, TEXAS

DESIGN	DRAWN	DATE	SCALE	NOTES	FILE	NO.
KFW	BKE	JAN 2018	1"=20'			C2.04

MB SPRINTER CPO

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1/23/2018 8:41 AM
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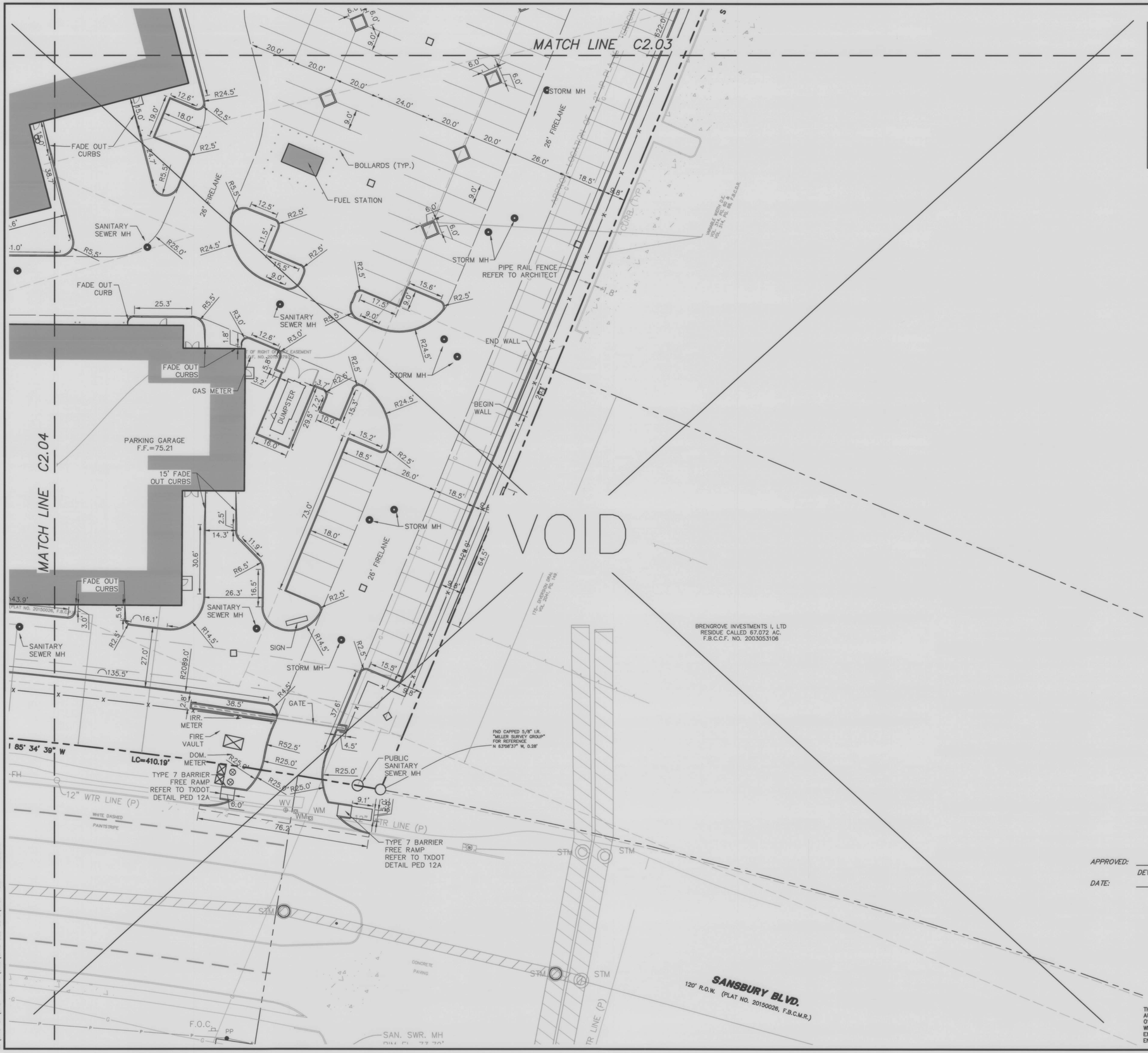

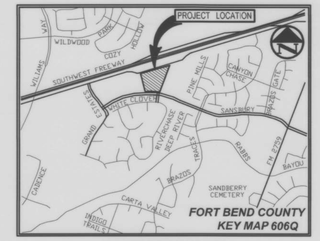

VICINITY MAP
(NOT TO SCALE)

ALL DIMENSIONS ARE TO BACK-OF-CURB UNLESS OTHERWISE NOTED.

GRAPHIC SCALE IN FEET
0 10 20 40 60

LEGEND

BL	BOLLARD
EM	ELECTRIC METER
PP	POWER POLE
LS	LIGHT STANDARD
WM	WATER METER
WV	WATER VALVE
ICV	IRRIGATION CONTROL VALVE
FH	FIRE HYDRANT
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	PROPERTY LINE
x	FENCE
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APPROVED: _____
DEVELOPMENT COORDINATOR

DATE: _____

STATE OF TEXAS
KYLE F. WHITIS
101330
LICENSED PROFESSIONAL ENGINEER
01/04/2018

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DIMENSIONAL CONTROL PLAN

MERCEDES BENZ SPRINTER & CERTIFIED PRE-OWNED CAR DEALERSHIP

CITY OF RICHMOND, FORT BEND COUNTY, TEXAS

DESIGN	DRAWN	DATE	SCALE	NOTES	FILE	NO.
KFW	BKE	JAN 2018	1"=20'			C2.05

MB SPRINTER CPO

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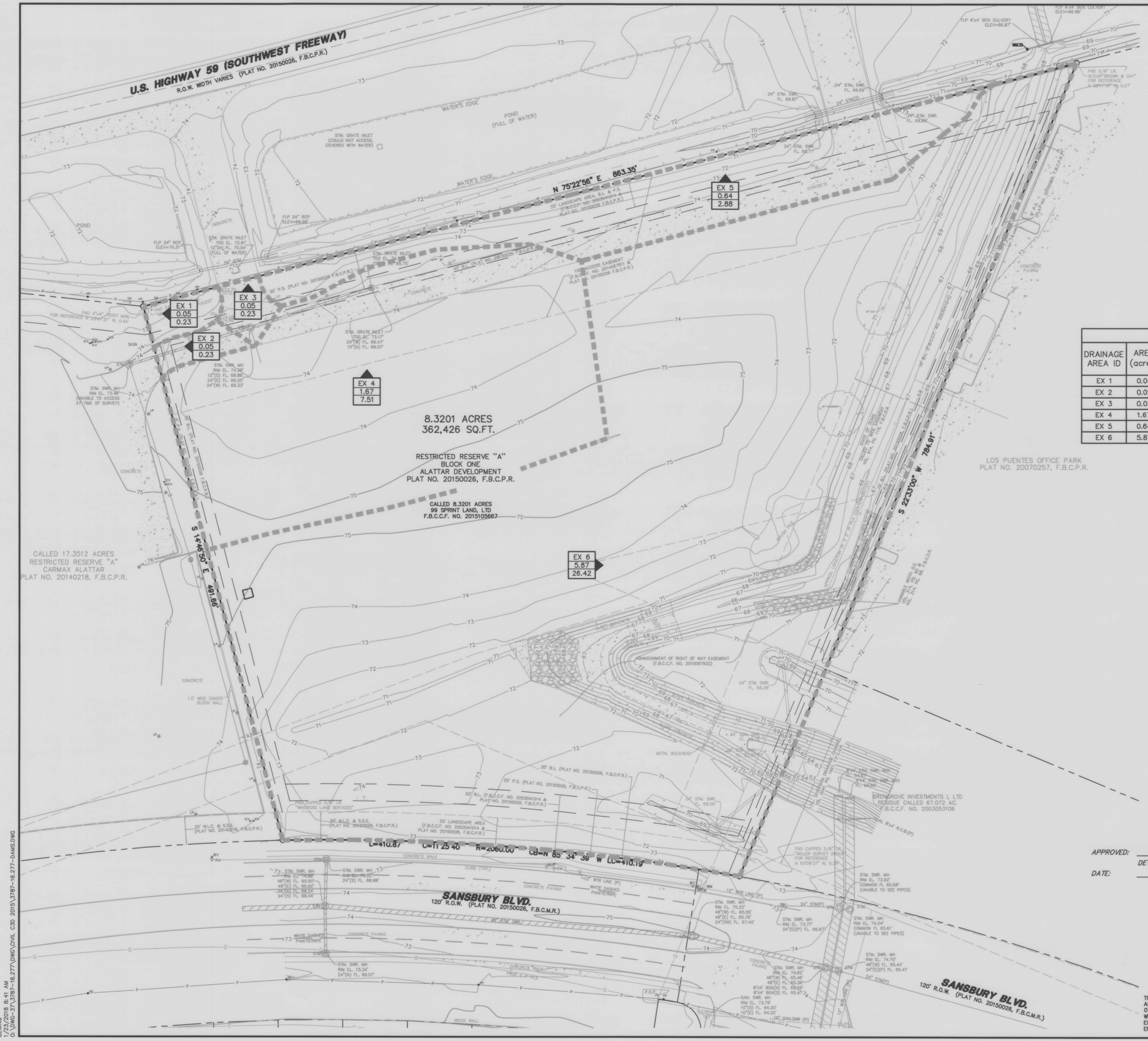

LEGEND

- BL — BOLLARD
- EM — ELECTRIC METER
- PP — POWER POLE
- LS — LIGHT STANDARD
- WM — WATER METER
- WV — WATER VALVE
- ICV — IRRIGATION CONTROL VALVE
- FH — FIRE HYDRANT
- CL — CLEANOUT
- MH — MANHOLE
- TSC — TRAFFIC SIGNAL CONTROL
- TSP — TRAFFIC SIGNAL POLE
- TELE — TELEPHONE BOX
- FL — FLOOD LIGHT
- FP — FLAG POLE
- SIGN — TRAFFIC SIGN

PROPERTY LINE
FENCE
EXISTING DRAINAGE DIVIDE

EX 8 / 1.00 / 7.99 — EXISTING DRAINAGE AREA ID, AREA IN ACRES, Q_{100} IN CUBIC FEET PER SECOND

EXISTING DRAINAGE CRITERIA:

Q=(C)(I)(A)

DRAINAGE AREA MAP

DRAINAGE AREA ID	AREA (acres)	C	Tc (minutes)	STORM FREQUENCY	I_{100} (inch/hour)	Q_{100} (cfs)	COMMENTS
EX 1	0.05	0.50	10	100	9.00	0.23	DRAINS TO NORTHERN PONDS
EX 2	0.05	0.50	10	100	9.00	0.23	DRAINS TO EXISTING GRATE INLET
EX 3	0.05	0.50	10	100	9.00	0.23	DRAINS TO TXDOT DRAINAGE CHANNEL
EX 4	1.67	0.50	10	100	9.00	7.51	DRAINS TO EXISTING GRATE INLET
EX 5	0.64	0.50	10	100	9.00	2.88	DRAINS TO EXIST. CURB INLET
EX 6	5.87	0.50	10	100	9.00	26.42	DRAINS TO TXDOT DRAINAGE CHANNEL

APPROVED: DEVELOPMENT COORDINATOR

DATE: 4/13/18

KYLE F. WHITIS, 101330, LICENSED PROFESSIONAL ENGINEER, STATE OF TEXAS — 01/04/2018

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Pacheco Koch
20445 STATE HWY 249, SUITE 380
HOUSTON, TX 77070 281.883.0103
TX REG. ENGINEERING FIRM F-14439
TX REG. SURVEYING FIRM LS-10008000

EX. DRAINAGE AREA MAP

MERCEDES BENZ SPRINTER & CERTIFIED PRE-OWNED CAR DEALERSHIP

CITY OF RICHMOND, FORT BEND COUNTY, TEXAS

DESIGN	DRAWN	DATE	SCALE	NOTES	FILE	NO.
KFW	BKE	JAN 2018	1"=40'			C3.01

MB SPRINTER CPO

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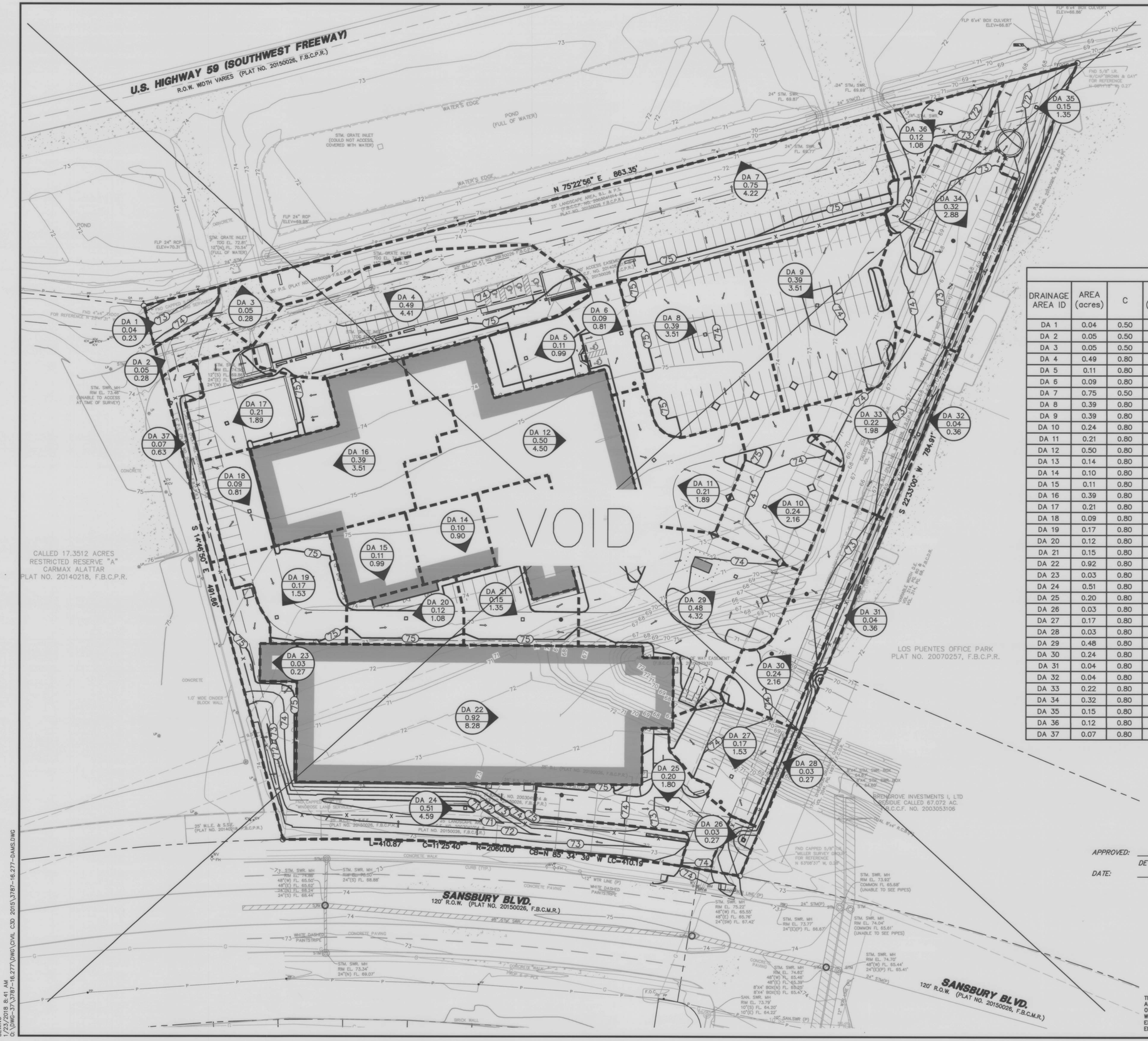

0 20 40 80 120

GRAPHIC SCALE IN FEET

LEGEND

- BL — BOLLARD
- EM — ELECTRIC METER
- PP — POWER POLE
- LS — LIGHT STANDARD
- WM — WATER METER
- WV — WATER VALVE
- ICV — IRRIGATION CONTROL VALVE
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- TELE — TELEPHONE BOX
- FL — FLOOD LIGHT
- FP — FLAG POLE
- SIGN — TRAFFIC SIGN

- PROPERTY LINE
- FENCE
- 450 — PROPOSED CONTOUR
- PROPOSED DRAINAGE FLOW DIRECTION
- PROPOSED 100-YR FLOODPLAIN LIMITS
- PROPOSED DRAINAGE DIVIDE
- DA 8 / 1.00 / 7.99 — PROPOSED DRAINAGE AREA ID, AREA IN ACRES, Q_{100} IN CUBIC FEET PER SECOND

PROPOSED DRAINAGE CRITERIA:

$Q=(C)(I)(A)$

DRAINAGE AREA MAP

DRAINAGE AREA ID	AREA (acres)	C	Tc (minutes)	STORM FREQUENCY	I_{100} (inch/hour)	Q_{100} (cfs)	Cf (C*Cf≤1.0)	Q_{100}*Cf (cfs)	COMMENTS
DA 1	0.04	0.50	10	100	9.00	0.18	1.25	0.23	SHEET FLOWS TO NORTHERN PONDS
DA 2	0.05	0.50	10	100	9.00	0.23	1.25	0.28	DRAINS TO EXISTING GRATE INLET
DA 3	0.05	0.50	10	100	9.00	0.23	1.25	0.28	DRAINS TO EXISTING GRATE INLET
DA 4	0.49	0.80	10	100	9.00	3.53	1.25	4.41	DRAINS TO EXISTING GRATE INLET
DA 5	0.11	0.80	10	100	9.00	0.79	1.25	0.99	DRAINS TO PROPOSED GRATE INLET
DA 6	0.09	0.80	10	100	9.00	0.65	1.25	0.81	DRAINS TO PROPOSED GRATE INLET
DA 7	0.75	0.50	10	100	9.00	3.38	1.25	4.22	SHEET FLOWS TO NORTHERN PONDS
DA 8	0.39	0.80	10	100	9.00	2.81	1.25	3.51	DRAINS TO PROPOSED GRATE INLET
DA 9	0.39	0.80	10	100	9.00	2.81	1.25	3.51	DRAINS TO PROPOSED GRATE INLET
DA 10	0.24	0.80	10	100	9.00	1.73	1.25	2.16	DRAINS TO PROPOSED GRATE INLET
DA 11	0.21	0.80	10	100	9.00	1.51	1.25	1.89	DRAINS TO PROPOSED GRATE INLET
DA 12	0.50	0.80	10	100	9.00	3.60	1.25	4.50	DRAINS TO ROOF DRAIN
DA 13	0.14	0.80	10	100	9.00	1.01	1.25	1.26	DRAINS TO ROOF DRAIN
DA 14	0.10	0.80	10	100	9.00	0.72	1.25	0.90	DRAINS TO ROOF DRAIN
DA 15	0.11	0.80	10	100	9.00	0.79	1.25	0.99	DRAINS TO ROOF DRAIN
DA 16	0.39	0.80	10	100	9.00	2.81	1.25	3.51	DRAINS TO ROOF DRAIN
DA 17	0.21	0.80	10	100	9.00	1.51	1.25	1.89	DRAINS TO PROPOSED GRATE INLET
DA 18	0.09	0.80	10	100	9.00	0.65	1.25	0.81	DRAINS TO PROPOSED GRATE INLET
DA 19	0.17	0.80	10	100	9.00	1.22	1.25	1.53	DRAINS TO PROPOSED GRATE INLET
DA 20	0.12	0.80	10	100	9.00	0.86	1.25	1.08	DRAINS TO PROPOSED GRATE INLET
DA 21	0.15	0.80	10	100	9.00	1.08	1.25	1.35	DRAINS TO PROPOSED GRATE INLET
DA 22	0.92	0.80	10	100	9.00	6.62	1.25	8.28	DRAINS TO ROOF DRAIN
DA 23	0.03	0.80	10	100	9.00	0.22	1.25	0.27	DRAINS TO PROPOSED GRATE INLET
DA 24	0.51	0.80	10	100	9.00	3.67	1.25	4.59	DRAINS TO PROPOSED GRATE INLET
DA 25	0.20	0.80	10	100	9.00	1.44	1.25	1.80	DRAINS TO PROPOSED GRATE INLET
DA 26	0.03	0.80	10	100	9.00	0.22	1.25	0.27	DRAINS TO PROPOSED GRATE INLET
DA 27	0.17	0.80	10	100	9.00	1.22	1.25	1.53	DRAINS TO PROPOSED GRATE INLET
DA 28	0.03	0.80	10	100	9.00	0.22	1.25	0.27	DRAINS TO EXISTING CHANNEL
DA 29	0.48	0.80	10	100	9.00	3.46	1.25	4.32	DRAINS TO PROPOSED GRATE INLET
DA 30	0.24	0.80	10	100	9.00	1.73	1.25	2.16	DRAINS TO PROPOSED GRATE INLET
DA 31	0.04	0.80	10	100	9.00	0.29	1.25	0.36	DRAINS TO EXISTING CHANNEL
DA 32	0.04	0.80	10	100	9.00	0.29	1.25	0.36	DRAINS TO PROPOSED GRATE INLET
DA 33	0.22	0.80	10	100	9.00	1.58	1.25	1.98	DRAINS TO PROPOSED GRATE INLET
DA 34	0.32	0.80	10	100	9.00	2.30	1.25	2.88	DRAINS TO PROPOSED GRATE INLET
DA 35	0.15	0.80	10	100	9.00	1.08	1.25	1.35	DRAINS TO PROPOSED GRATE INLET
DA 36	0.12	0.80	10	100	9.00	0.86	1.25	1.08	DRAINS TO PROPOSED GRATE INLET
DA 37	0.07	0.80	10	100	9.00	0.50	1.25	0.63	DRAINS TO PROPOSED GRATE INLET

APPROVED: _____ DEVELOPMENT COORDINATOR

DATE: _____

NO.	DATE	REVISION

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PROP. DRAINAGE AREA MAP

MERCEDES BENZ SPRINTER & CERTIFIED PRE-OWNED CAR DEALERSHIP

CITY OF RICHMOND, FORT BEND COUNTY, TEXAS

DESIGN	DRAWN	DATE	SCALE	NOTES	FILE	NO.
KFW	BKE	JAN 2018	1"=40'			C3.02

STATE OF TEXAS — KYLE F. WHITIS — 101330 — LICENSED PROFESSIONAL ENGINEER — 01/04/2018

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MB SPRINTER CPO

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1/22/2018 8:41 AM
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BENCH MARK LIST

BENCHMARK	PROJECT BENCHMARK IS NGS MONUMENT DESIGNATION "A 1212" /P.I.D. "AW4725", BEING A BENCH MARK SET IN A CULVERT HEADWALL 3.25 MI NE OF SUGARLAND AT THE NORTHWEST CORNER OF THE JUNCTION OF A ROAD NORTH TO TEXAS DEPT. OF CORRECTIONS JESTER UNIT IN THE TOP AND 2.0 FEET EAST OF THE WEST END OF THE NORTH CONCRETE HEADWALL OF DOUBLE CONCRETE PIPE CULVERTS. ELEV=78.18'
T.B.M. "A"	TEMPORARY BENCHMARK "A" IS A TXDOT BRASS DISK LOCATED APPROXIMATELY 2200' NORTHEAST OF THE INTERSECTION OF GRAND ESTATES DRIVE AND US HIGHWAY 59, APPROXIMATELY 143' SOUTH OF THE SOUTH EDGE OF PAVEMENT OF US HIGHWAY 59 NORTHBOUND FEEDER, ON THE WEST END OF A HEADWALL LOCATED APPROXIMATELY 45' NORTHWEST OF THE NORTHEAST CORNER OF THE SUBJECT PROPERTY. ELEV=73.09'

0 10 20 40 60
GRAPHIC SCALE IN FEET

LEGEND

- BOLLARD
- ELECTRIC METER
- POWER POLE
- LIGHT STANDARD
- WATER METER
- WATER VALVE
- IRRIGATION CONTROL VALVE
- FIRE HYDRANT
- CLEANOUT
- MANHOLE
- TRAFFIC SIGNAL CONTROL
- TRAFFIC SIGNAL POLE
- TELEPHONE BOX
- FLOOD LIGHT
- FLAG POLE
- TRAFFIC SIGN
- IRS — 1/2-INCH IRON ROD
- (C.M.) — W/"PACHECO KOCH" CAP SET / CONTROLLING MONUMENT
- PROPERTY LINE
- FENCE
- OVERHEAD UTILITY LINE
- 613 — EXIST CONTOUR
- 612.39 — EXIST SPOT ELEVATION
- TC 612.39 / G 611.89 — EXIST TOP OF CURB ELEVATION / EXIST GUTTER ELEVATION
- 400 — PROPOSED CONTOUR
- TC 614.50 / G 614.00 — PROPOSED TOP OF CURB ELEVATION / PROPOSED GUTTER ELEVATION
- EL 614.25 — PROPOSED SPOT ELEVATION
- M.G. — MATCH EXISTING GRADE
- TW 620.50 / EL 614.00 — PROPOSED TOP OF WALL ELEVATION / PROPOSED GROUND ELEVATION AT BOTTOM OF WALL
- PROPOSED SWALE
- PROPOSED FENCE
- PROPOSED DRAINAGE FLOW DIRECTION
- GRADE BREAK

GRADING & DRAINAGE GENERAL NOTES

1. REFER TO GEOTECHNICAL REPORT PREPARED BY GEOSCIENCE ENGINEERING & TESTING DATED 05/31/2016 FOR REQUIREMENTS REGARDING FILL COMPACTION AND MOISTURE CONTENT.
2. UNLESS NOTED, ALL FILL IS TO BE COMPACTED TO A MINIMUM OF 95% STANDARD PROCTOR DENSITY WITHIN 3% OF OPTIMUM MOISTURE CONTENT. FILL TO BE PLACED IN MAXIMUM LIFTS OF 6 INCHES.
3. SIDEWALKS AND ACCESSIBLE ROUTES SHALL HAVE A RUNNING SLOPE NO GREATER THAN 5% (UNLESS OTHERWISE NOTED) AND A CROSS SLOPE NO GREATER THAN 2%.
4. GRADING OF ALL HANDICAPPED SPACES AND ROUTES TO CONFORM TO FEDERAL, STATE, AND LOCAL GUIDELINES.
5. ALL PROPOSED AND EXISTING GRADES IN NON-PAVED AREAS ARE "FINISHED GRADE" (i.e. IN LANDSCAPE BEDS, TOP OF MULCH/BEDDING MATERIAL SHALL MATCH PROPOSED FINISHED GRADE).
6. UNLESS NOTED, STORM DRAIN LINES SHALL BE OF THE FOLLOWING MATERIALS AND INSTALLED IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS:
   - 6.A. RCP C-76, CLASS III
   - 6.B. ADS N-12
   - 6.C. HANCOR HI-Q
   - 6.D. CONTECH ALUMINIZED ULTRA FLOW
7. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO ASSURE PIPE STABILITY DURING CONSTRUCTION
8. UNLESS NOTED, GRATE INLETS TO BE "FORTERRA PIPE AND PRECAST" CATCH BASIN SIZED AS SHOWN, OR APPROVED EQUAL.
9. FINAL PAVING, CURB, AND SIDEWALK ELEVATIONS SHALL BE PLACED AT PLUS OR MINUS 0.03 FOOT.
10. REFER TO LANDSCAPE SPECIFICATIONS FOR SEEDING AND SODDING REQUIREMENTS.
11. ANY CONCRETE, ROCK, OR MATERIAL DEEMED BY THE ENGINEER TO BE UNSUITABLE FOR SUBGRADE SHALL BE DISPOSED OF OFFSITE AT CONTRACTOR'S EXPENSE.
12. TRENCH BACKFILL MATERIAL SHALL CONFORM TO STANDARD CITY REQUIREMENTS AND SHALL BE MECHANICALLY COMPACTED IN 6-INCH LIFTS TO THE TOP OF SUBGRADE TO A MINIMUM OF 95% STANDARD PROCTOR DENSITY UNLESS OTHERWISE SHOWN ON THESE PLANS OR STATED IN THE STANDARD CITY SPECIFICATIONS.
13. EMBEDMENT SHALL CONFORM TO STANDARD CITY REQUIREMENTS UNLESS OTHERWISE SHOWN ON THESE PLANS OR STATED IN THE STANDARD CITY SPECIFICATIONS.
14. A ROUND MANHOLE COVER MEETING CITY SPECIFICATIONS SHALL BE PLACED IN ALL INLET TOPS NEAR THE OUTLET PIPE.
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17. IF REQUIRED DUE TO CONSTRUCTION, POWER POLES TO BE BRACED OR RELOCATED AT CONTRACTOR'S EXPENSE.
18. CONTRACTOR IS RESPONSIBLE FOR GRADING ALL DISTURBED AREAS TO ALLOW FOR POSITIVE DRAINAGE. GRADING SLOPES ARE NOT TO EXCEED 4:1, UNLESS OTHERWISE NOTED.

NO.	DATE	REVISION

Pacheco Koch
20445 STATE HWY 249, SUITE 380
HOUSTON, TX 77070 281.883.0103
TX REG. ENGINEERING FIRM F-14439
TX REG. SURVEYING FIRM LS-10008000

GRADING PLAN
MERCEDES BENZ SPRINTER & CERTIFIED PRE-OWNED CAR DEALERSHIP
CITY OF RICHMOND, FORT BEND COUNTY, TEXAS

DESIGN	DRAWN	DATE	SCALE	NOTES	FILE	NO.
KFW	BKE	JAN 2018	1"=20'			C4.01

STATE OF TEXAS — KYLE F. WHITIS — 101330 — LICENSED PROFESSIONAL ENGINEER — 01/04/2018

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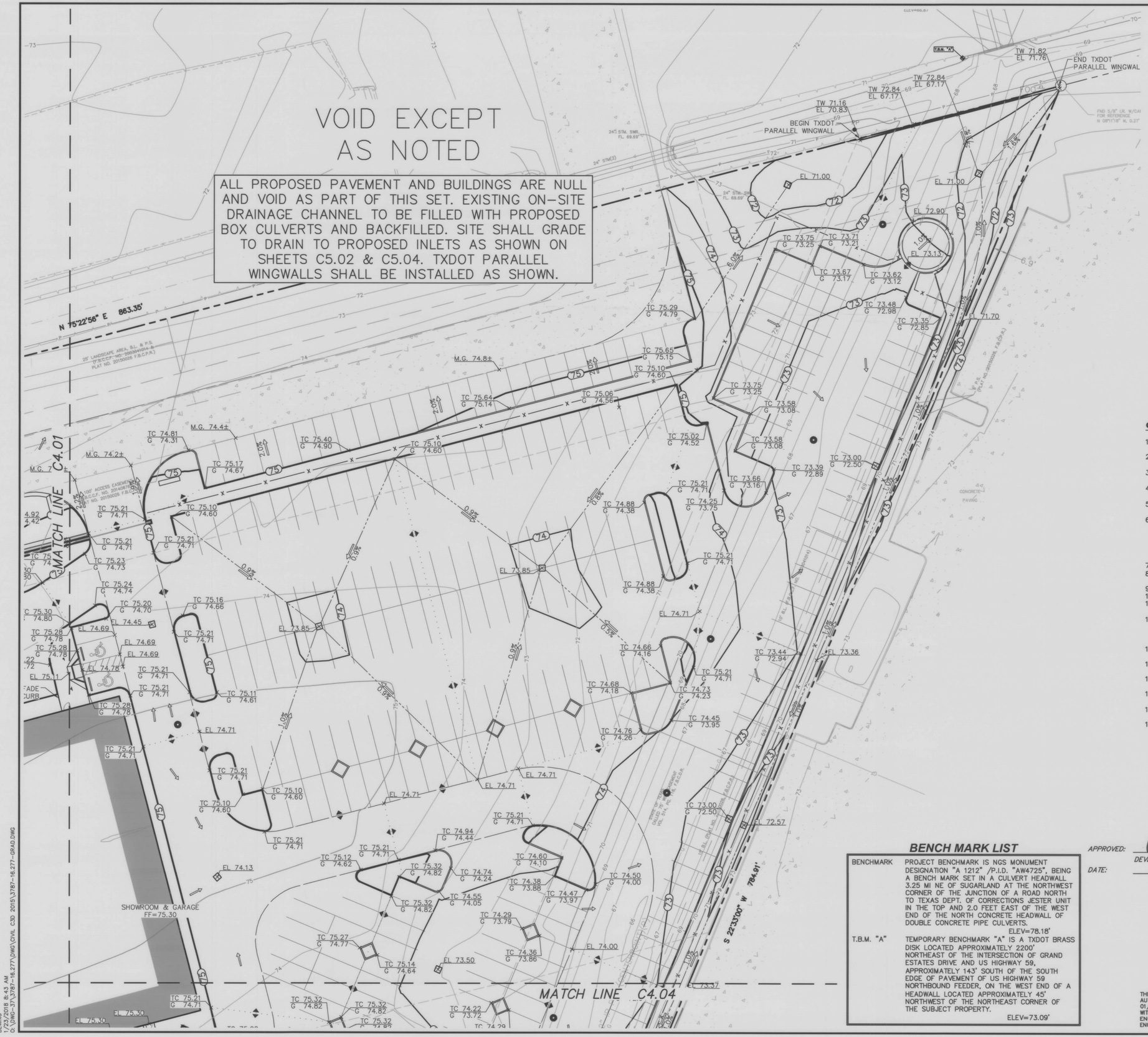
MB SPRINTER CPO



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BENCH MARK LIST

BENCHMARK	PROJECT BENCHMARK IS NGS MONUMENT DESIGNATION "A 1212" /P.I.D. "AW4725", BEING A BENCH MARK SET IN A CULVERT HEADWALL 3.25 MI NE OF SUGARLAND AT THE NORTHWEST CORNER OF THE JUNCTION OF A ROAD NORTH TO TEXAS DEPT. OF CORRECTIONS JESTER UNIT IN THE TOP AND 2.0 FEET EAST OF THE WEST END OF THE NORTH CONCRETE HEADWALL OF DOUBLE CONCRETE PIPE CULVERTS. ELEV=78.18'
T.B.M. "A"	TEMPORARY BENCHMARK "A" IS A TXDOT BRASS DISK LOCATED APPROXIMATELY 2200' NORTHEAST OF THE INTERSECTION OF GRAND ESTATES DRIVE AND US HIGHWAY 59, APPROXIMATELY 143' SOUTH OF THE SOUTH EDGE OF PAVEMENT OF US HIGHWAY 59 NORTHBOUND FEEDER, ON THE WEST END OF A HEADWALL LOCATED APPROXIMATELY 45' NORTHWEST OF THE NORTHEAST CORNER OF THE SUBJECT PROPERTY. ELEV=73.09'

APPROVED: DEVELOPMENT COORDINATOR
DATE: 4/13/18

STATE OF TEXAS
KYLE F. WHITIS
101330
LICENSED PROFESSIONAL ENGINEER
01/04/2018

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GRADING PLAN
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CITY OF RICHMOND, FORT BEND COUNTY, TEXAS

DESIGN	DRAWN	DATE	SCALE	NOTES	FILE	NO.
KFW	BKE	JAN 2018	1"=20'			C4.02

MB SPRINTER CPO

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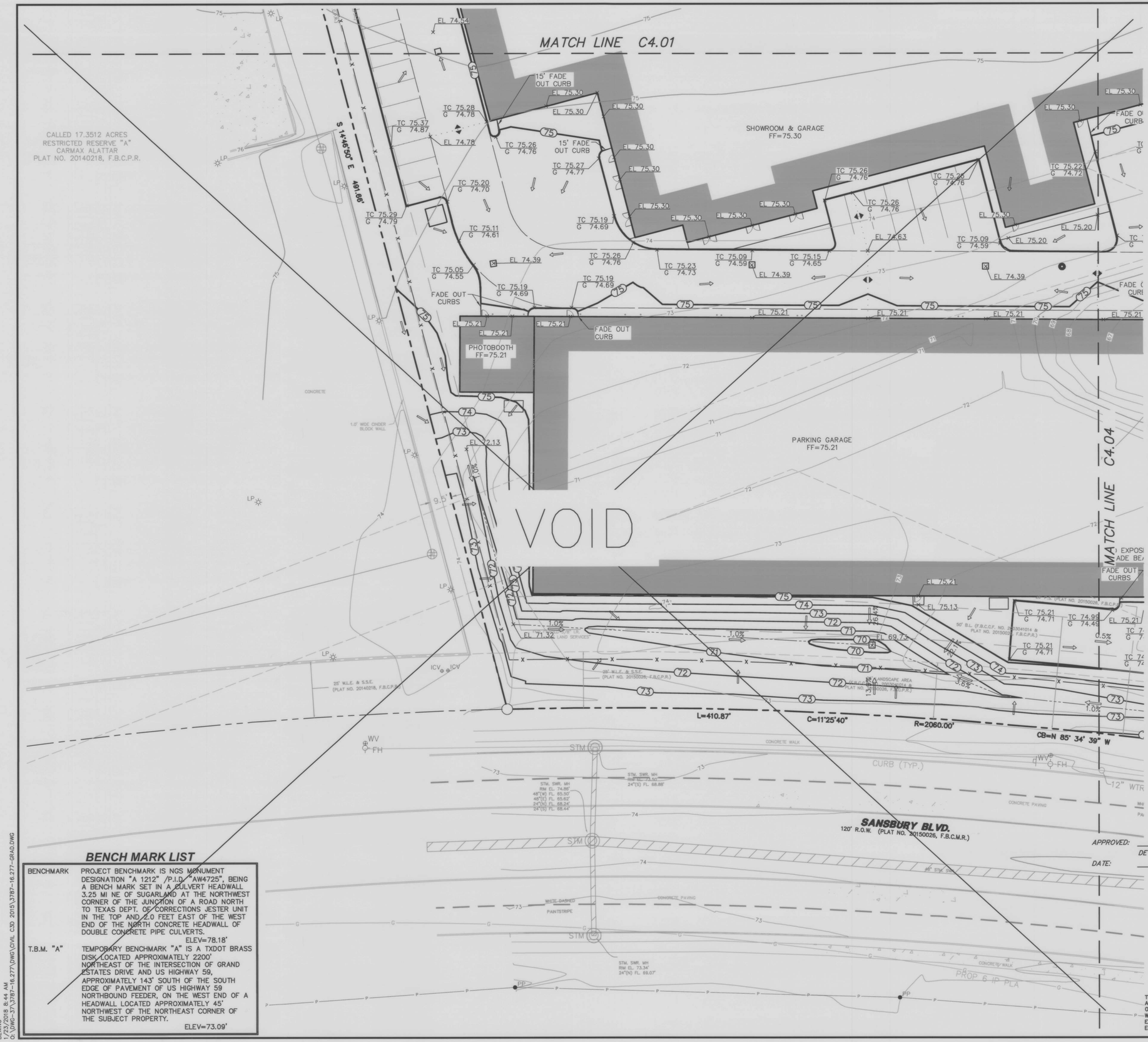

0 10 20 40 60
GRAPHIC SCALE IN FEET

LEGEND

	BOLLARD
EM	ELECTRIC METER
PP	POWER POLE
LS	LIGHT STANDARD
WM	WATER METER
WV	WATER VALVE
ICV	IRRIGATION CONTROL VALVE
FH	FIRE HYDRANT
CO	CLEANOUT
MH	MANHOLE
TSC	TRAFFIC SIGNAL CONTROL
TSP	TRAFFIC SIGNAL POLE
TELE	TELEPHONE BOX
	FLOOD LIGHT
FP	FLAG POLE
SIGN	TRAFFIC SIGN
IRS	1/2–INCH IRON ROD W/"PACHECO KOCH" CAP SET
(C.M.)	CONTROLLING MONUMENT
	PROPERTY LINE
X	FENCE
OHL	OVERHEAD UTILITY LINE
613	EXIST CONTOUR
612.39	EXIST SPOT ELEVATION
TC 612.39 G 611.89	EXIST TOP OF CURB ELEVATION EXIST GUTTER ELEVATION
400	PROPOSED CONTOUR
TC 614.50 G 614.00	PROPOSED TOP OF CURB ELEVATION PROPOSED GUTTER ELEVATION
EL 614.25	PROPOSED SPOT ELEVATION
M.G.	MATCH EXISTING GRADE
TW 620.50 EL 614.00	PROPOSED TOP OF WALL ELEVATION PROPOSED GROUND ELEVATION AT BOTTOM OF WALL
	PROPOSED SWALE
X	PROPOSED FENCE
	PROPOSED DRAINAGE FLOW DIRECTION
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BENCH MARK LIST

BENCHMARK	PROJECT BENCHMARK IS NGS MONUMENT DESIGNATION "A 1212" /P.I.D. "AW4725", BEING A BENCH MARK SET IN A CULVERT HEADWALL 3.25 MI NE OF SUGARLAND AT THE NORTHWEST CORNER OF THE JUNCTION OF A ROAD NORTH TO TEXAS DEPT. OF CORRECTIONS JESTER UNIT IN THE TOP AND 2.0 FEET EAST OF THE WEST END OF THE NORTH CONCRETE HEADWALL OF DOUBLE CONCRETE PIPE CULVERTS. ELEV=78.18'
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APPROVED: _____ DEVELOPMENT COORDINATOR

DATE: _____

STATE OF TEXAS
KYLE F. WHITIS
101330
LICENSED
PROFESSIONAL ENGINEER
01/04/2018

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GRADING PLAN
MERCEDES BENZ SPRINTER & CERTIFIED PRE-OWNED CAR DEALERSHIP
CITY OF RICHMOND, FORT BEND COUNTY, TEXAS

DESIGN	DRAWN	DATE	SCALE	NOTES	FILE	NO.
KFW	BKE	JAN 2018	1"=20'			C4.03

MB SPRINTER CPO

BEWING
1/23/2018 8:44 AM
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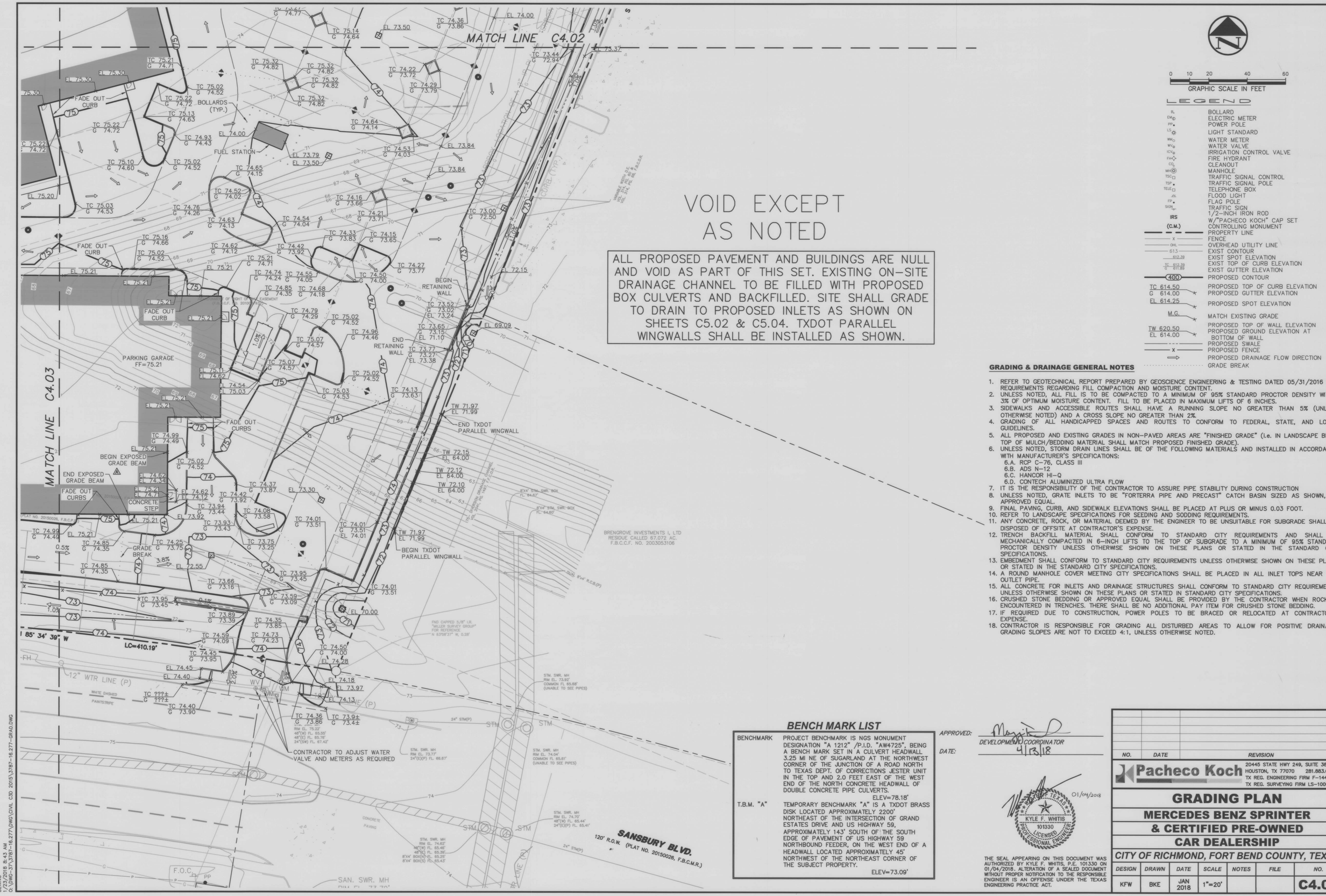

VOID EXCEPT AS NOTED

ALL PROPOSED PAVEMENT AND BUILDINGS ARE NULL AND VOID AS PART OF THIS SET. EXISTING ON-SITE DRAINAGE CHANNEL TO BE FILLED WITH PROPOSED BOX CULVERTS AND BACKFILLED. SITE SHALL GRADE TO DRAIN TO PROPOSED INLETS AS SHOWN ON SHEETS C5.02 & C5.04. TXDOT PARALLEL WINGWALLS SHALL BE INSTALLED AS SHOWN.

GRAPHIC SCALE IN FEET
0 10 20 40 60

LEGEND

- BOLLARD
- ELECTRIC METER
- POWER POLE
- LIGHT STANDARD
- WATER METER
- WATER VALVE
- IRRIGATION CONTROL VALVE
- FIRE HYDRANT
- CLEANOUT
- MANHOLE
- TRAFFIC SIGNAL CONTROL
- TRAFFIC SIGNAL POLE
- TELEPHONE BOX
- FLOOD LIGHT
- FLAG POLE
- TRAFFIC SIGN
- IRS — 1/2-INCH IRON ROD
- (C.M.) — W/"PACHECO KOCH" CAP SET CONTROLLING MONUMENT
- PROPERTY LINE
- FENCE
- OHL — OVERHEAD UTILITY LINE
- 613 — EXIST CONTOUR
- 612.39 — EXIST SPOT ELEVATION
- TC 612.39 / G 611.89 — EXIST TOP OF CURB ELEVATION / EXIST GUTTER ELEVATION
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- M.G. — MATCH EXISTING GRADE
- TW 620.50 / EL 614.00 — PROPOSED TOP OF WALL ELEVATION / PROPOSED GROUND ELEVATION AT BOTTOM OF WALL
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APPROVED: DEVELOPMENT COORDINATOR
DATE: 4/13/18

STATE OF TEXAS — KYLE F. WHITIS — 101330 — LICENSED PROFESSIONAL ENGINEER — 01/04/2018

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MB SPRINTER CPO

BEWING
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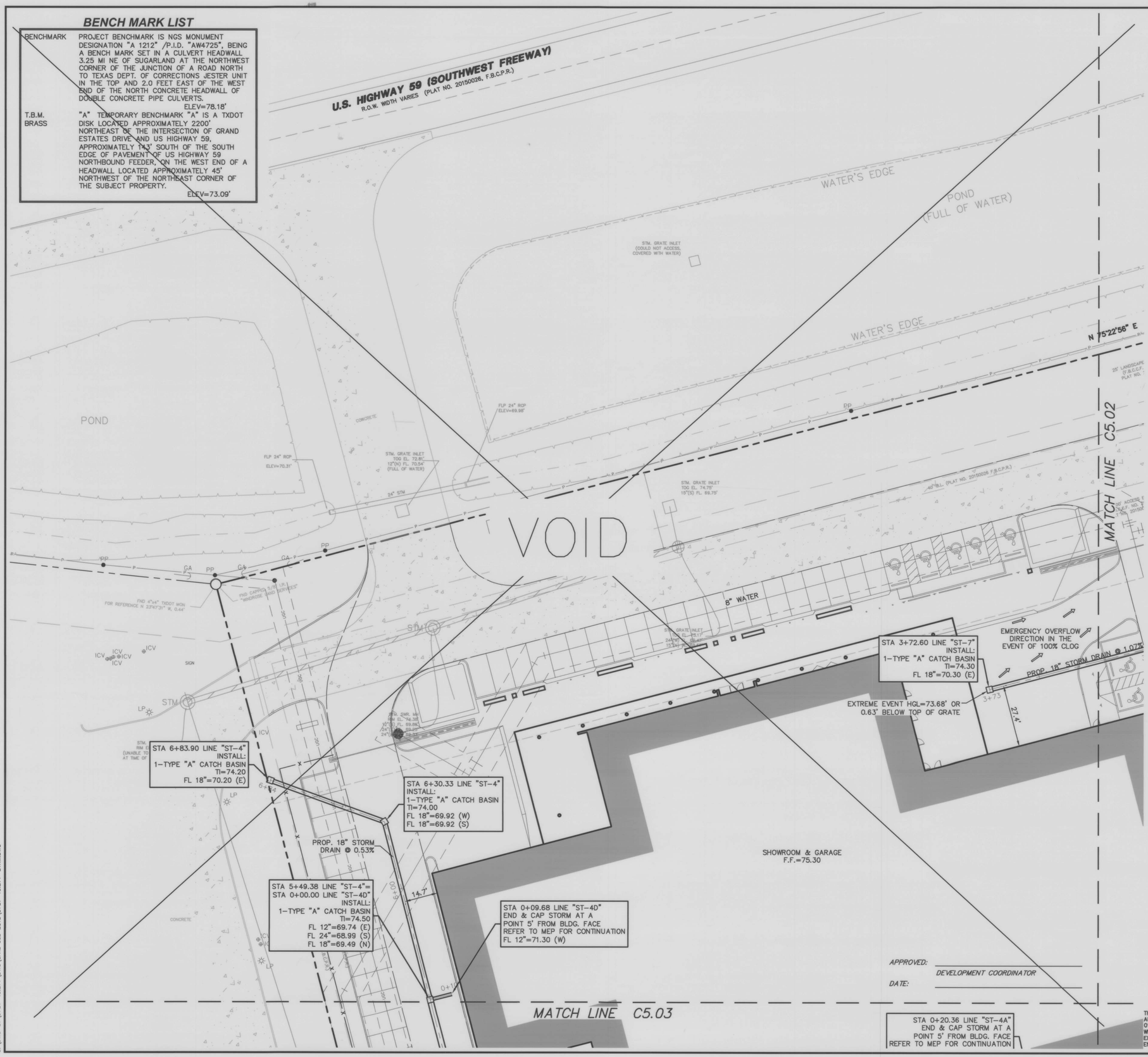

0 20 40 80 120
GRAPHIC SCALE IN FEET

LEGEND

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SIGN	TRAFFIC SIGN
IRS	1/2-INCH IRON ROD W/"PACHECO KOCH" CAP SET
(C.M.)	CONTROLLING MONUMENT
	PROPERTY LINE
X	FENCE
OHL	OVERHEAD UTILITY LINE
E	UNDERGROUND ELECTRIC LINE
T	UNDERGROUND TELEPHONE LINE
C	UNDERGROUND CABLE LINE
6"W	UNDERGROUND WATER LINE
6"SS	UNDERGROUND SANITARY SEWER LINE

GRADING & DRAINAGE GENERAL NOTES

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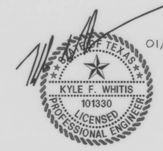
2. UNLESS NOTED, ALL FILL IS TO BE COMPACTED TO A MINIMUM OF 95% STANDARD PROCTOR DENSITY WITHIN 3% OF OPTIMUM MOISTURE CONTENT. FILL TO BE PLACED IN MAXIMUM LIFTS OF 6 INCHES.
3. SIDEWALKS AND ACCESSIBLE ROUTES SHALL HAVE A RUNNING SLOPE NO GREATER THAN 5% (UNLESS OTHERWISE NOTED) AND A CROSS SLOPE NO GREATER THAN 2%.
4. GRADING OF ALL HANDICAPPED SPACES AND ROUTES TO CONFORM TO FEDERAL, STATE, AND LOCAL GUIDELINES.
5. ALL PROPOSED AND EXISTING GRADES IN NON-PAVED AREAS ARE "FINISHED GRADE" (i.e. IN LANDSCAPE BEDS, TOP OF MULCH/BEDDING MATERIAL SHALL MATCH PROPOSED FINISHED GRADE).
6. UNLESS NOTED, STORM DRAIN LINES SHALL BE OF THE FOLLOWING MATERIALS AND INSTALLED IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS:
   - 6.A. RCP C-76, CLASS III
   - 6.B. ADS N-12
   - 6.C. HANCOR HI-Q
   - 6.D. CONTECH ALUMINIZED ULTRA FLOW
7. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO ASSURE PIPE STABILITY DURING CONSTRUCTION
8. UNLESS NOTED, GRATE INLETS TO BE "FORTERRA PIPE AND PRECAST" CATCH BASIN SIZED AS SHOWN, OR APPROVED EQUAL.
9. FINAL PAVING, CURB, AND SIDEWALK ELEVATIONS SHALL BE PLACED AT PLUS OR MINUS 0.03 FOOT.
10. REFER TO LANDSCAPE SPECIFICATIONS FOR SEEDING AND SODDING REQUIREMENTS.
11. ANY CONCRETE, ROCK, OR MATERIAL DEEMED BY THE ENGINEER TO BE UNSUITABLE FOR SUBGRADE SHALL BE DISPOSED OF OFFSITE AT CONTRACTOR'S EXPENSE.
12. TRENCH BACKFILL MATERIAL SHALL CONFORM TO STANDARD CITY REQUIREMENTS AND SHALL BE MECHANICALLY COMPACTED IN 6-INCH LIFTS TO THE TOP OF SUBGRADE TO A MINIMUM OF 95% STANDARD PROCTOR DENSITY UNLESS OTHERWISE SHOWN ON THESE PLANS OR STATED IN THE STANDARD CITY SPECIFICATIONS.
13. EMBEDMENT SHALL CONFORM TO STANDARD CITY REQUIREMENTS UNLESS OTHERWISE SHOWN ON THESE PLANS OR STATED IN THE STANDARD CITY SPECIFICATIONS.
14. A ROUND MANHOLE COVER MEETING CITY SPECIFICATIONS SHALL BE PLACED IN ALL INLET TOPS NEAR THE OUTLET PIPE.
15. ALL CONCRETE FOR INLETS AND DRAINAGE STRUCTURES SHALL CONFORM TO STANDARD CITY REQUIREMENTS UNLESS OTHERWISE SHOWN ON THESE PLANS OR STATED IN STANDARD CITY SPECIFICATIONS.
16. CRUSHED STONE BEDDING OR APPROVED EQUAL SHALL BE PROVIDED BY THE CONTRACTOR WHEN ROCK IS ENCOUNTERED IN TRENCHES. THERE SHALL BE NO ADDITIONAL PAY ITEM FOR CRUSHED STONE BEDDING.
17. IF REQUIRED DUE TO CONSTRUCTION, POWER POLES TO BE BRACED OR RELOCATED AT CONTRACTOR'S EXPENSE.
18. CONTRACTOR IS RESPONSIBLE FOR GRADING ALL DISTURBED AREAS TO ALLOW FOR POSITIVE DRAINAGE. GRADING SLOPES ARE NOT TO EXCEED 4:1, UNLESS OTHERWISE NOTED.

APPROVED: _____ DEVELOPMENT COORDINATOR

DATE: _____



THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY KYLE F. WHITIS, P.E. 101330 ON 01/04/2018. ALTERATION OF A SEALED DOCUMENT WITHOUT PROPER NOTIFICATION TO THE RESPONSIBLE ENGINEER IS AN OFFENSE UNDER THE TEXAS ENGINEERING PRACTICE ACT.

NO.	DATE	REVISION

Pacheco Koch
20445 STATE HWY 249, SUITE 380
HOUSTON, TX 77070 281.883.0103
TX REG. ENGINEERING FIRM F-14439
TX REG. SURVEYING FIRM LS-10008000

STORM SEWER PLAN
MERCEDES BENZ SPRINTER & CERTIFIED PRE-OWNED CAR DEALERSHIP
CITY OF RICHMOND, FORT BEND COUNTY, TEXAS

DESIGN	DRAWN	DATE	SCALE	NOTES	FILE	NO.
KFW	BKE	JAN 2018	1"=40'			C5.01

MB SPRINTER CPO

BEWING
01/23/2018 8:44 AM
D:\DWG_S\3787-16.277\DWG\CIVIL C3D 2015\3787-16.277-STRM.DWG

EXTREME EVENT PONDING WSEL=72.37

STA 6+84.10 LINE "ST-1"
TXDOT PARALLEL WINGWALL
REFER TO TXDOT DETAIL PW
FL (2) 7'x4' RCB'S=67.63 (SW)

25 YR WSEL=71.72
100 YR WSEL=72.37

STA 6+68.60 LINE "ST-12"=
STA 0+00.00 LINE "ST-12"
CONNECT TO 7'X4' RCB
FL 7'x [VOID] 54 (NE)
FL 18" STORM=67.87 (SE)
FL 7'x 4' RCB=67.54 (SW)

EXTREME EVENT PONDING WSEL=72.37

STA 0+26.91 LINE "ST-12"
INSTALL:
1-TYPE [VOID] BASIN
TI=71.00
FL 18"=68.00 (NW)

STA 0+50.35 LINE "ST-11"
INSTALL:
1-TYPE "A" CATCH BASIN
TI=71.00
FL 18"=68.00 (SE)

STA 6+30.84 LINE "ST-1"=
STA 0+00.00 LINE "ST-11"
CONNECT TO 7'X4' RCB
FL 7'x 4' RCB=67.34 (NE)
FL 18" STORM=67.75 (NW)
FL 7'x 4' RCB=67.34 (SW)

STA 0+04.17 LINE "ST-11"
CONTRACTOR TO KNOCK OUT HOLE IN
TOP OF 7'X4' RCB AND INSTALL
TYPE "C" MANHOLE
RIM=73.29
FL 18"=67.77 (NW)
FL 18"=67.77 (SE)

EXTREME EVENT PONDING WSEL=72.37

STA 5+29.93 LINE "ST-1"=
STA 0+00.00 LINE "ST-10"
CONNECT TO 7'X4' RCB
FL 7'x 4' RCB=66.81 (NE)
FL 24" STORM=67.46 (SE)
FL 7'x 4' RCB=66.81 (SW)

STA 0+04.17 LINE "ST-10"
CONTRACTOR TO KNOCK OUT HOLE IN
TOP OF 7'X4' RCB AND INSTALL
TYPE "C" MANHOLE
RIM=72.78
FL 24"=67.59 (SE)
FL 24"=67.59 (NW)

STA 0+34.32 LINE "ST-10"
INSTALL:
1-TYPE "A" CATCH BASIN
TI=72.50
FL 24"=68.50 (NW)

STA 0+86.21 LINE "ST-9"
INSTALL:
1-TYPE [VOID] BASIN
TI=73.85
FL 18"=68.48 (W)
FL 18"=68.48 (SE)

STA 1+89.71 LINE "ST-9"
INSTALL [VOID] BASIN
1-TYPE
TI=73.85
FL 18"=69.85 (E)

STA 2+84.44 LINE "ST-7"
INSTALL:
1-TYPE [VOID] BASIN
TI=74.4
FL 18"=69.36 (W)
FL 18"=69.36 (S)

STA 0+17.35 LINE "ST-7A"
END & CAP STORM AT A
POINT 5' FROM FACE
REFER TO MEP FOR CONTINUATION
FL 12"=71.30 (E)

STA 0+04.16 LINE "ST-9"
CONTRACTOR TO KNOCK OUT HOLE IN
TOP OF 7'X4' RCB AND INSTALL
[VOID] C" MANHOLE
RIM=74.31
FL 18"=67.39 (NW)
FL 18"=67.39 (SE)

STA 4+30.02 LINE "ST-1"=
STA 0+00.00 LINE "ST-9"
CONNECT [VOID] RCB
FL 7'x [illegible] 28 (NE)
FL 18" STORM=67.24 (NW)
FL 7'x 4' RCB=66.28 (SW)

STA 2+38.18 LINE "ST-7"=
STA 0+00.00 LINE "ST-7A"
INSTALL:
1-4' DIA [VOID]
RIM=74.7
FL 18"=68.86 (N)
FL 18"=68.86 (S)
FL 12"=69.11 (W)

STA 0+04.17 LINE "ST-8"
CONTRACTOR TO KNOCK OUT HOLE IN
TOP OF 7'X4' RCB AND INSTALL
[VOID] C" MANHOLE
RIM=73.28
FL 18"=67.08 (E)
FL 18"=67.08 (W)

STA 0+41.57 LINE "ST-8"
INSTALL:
1-TYPE [VOID] BASIN
TI=72.5
FL 18"=68.57 (NW)

STA 3+58.84 LINE "ST-1"=
STA 0+00.00 LINE "ST-8"
CONNECT [VOID] X4' RCB
FL 7'x [illegible] 90 (NE)
FL 18" STORM=66.91 (E)
FL 7'x 4' RCB=65.90 (SW)

STA 0+34.34 LINE "ST-8"
INSTALL:
1-TYPE "A" CATCH BASIN
TI=72.5
FL 18"=68.28 (SE)
FL 18"=68.28 (W)

STA 1+67.78 LINE "ST-7"
INSTALL:
1-TYPE [VOID] BASIN
RIM=74.
FL 18"=68.11 (N)
FL 18"=68.11 (SE)

STA 0+60.35 LINE "ST-7"
INSTALL:
~~TI=73.50~~ 72.14'
1-TYPE "A" CATCH BASIN
FL 18"=66.96 (NW)
FL 18"=66.96 (SE)

STA 2+46.45 LINE "ST-1"=
STA 0+00.00 LINE "ST-7"
CONNECT TO 7'X4' RCB'S

PROP. 7'x4' RCB'S @ 0.53%

PROP. 18" STORM DRAIN @ 1.33%

PROP. 18" STORM DRAIN @ 1.07%

PROP. 18" STORM DRAIN @ 1.07%

PROP. 18" STORM DRAIN @ 1.07%

24" STM. SWR. FL. 69.87

24" STM. SWR. FL. 69.77

24" STM. SWR. FL. 69.69

N 75°22'56" E 863.35'

25' LANDSCAPE AREA, B.L. & P.S. (F.B.C.C.F. NO. 2003041014 & PLAT NO. 20150035 F.B.C.P.R.)

100' ACCESS EASEMENT (F.B.C.C.F. NO. 2014087811 & PLAT NO. 20150035 F.B.C.P.R.)

MATCH LINE C5.01

MATCH LINE C5.04

8" WATER

SHOWROOM & GARAGE F.F.=75.30

OVERFLOW ↓ THE % CLOG

FND 5/8" I.R. W/CAP FOR REFERENCE N 08°11'18" W, 0.27'

FND BL PLAT NO. 20070257

FND BL PLAT NO. 20070257

S 22°33'00" W 784.91'

BENCH MARK LIST

BENCHMARK	PROJECT BENCHMARK IS NGS MONUMENT DESIGNATION "A 1212" /P.I.D. "AW4725", BEING A BENCH MARK SET IN A CULVERT HEADWALL 3.25 MI NE OF SUGARLAND AT THE NORTHWEST CORNER OF THE JUNCTION OF A ROAD NORTH TO TEXAS DEPT. OF CORRECTIONS JESTER UNIT IN THE TOP AND 2.0 FEET EAST OF THE WEST END OF THE NORTH CONCRETE HEADWALL OF DOUBLE CONCRETE PIPE CULVERTS. ELEV=78.18'
T.B.M. BRASS	"A" TEMPORARY BENCHMARK "A" IS A TXDOT DISK LOCATED APPROXIMATELY 2200' NORTHEAST OF THE INTERSECTION OF GRAND ESTATES DRIVE AND US HIGHWAY 59, APPROXIMATELY 143' SOUTH OF THE SOUTH EDGE OF PAVEMENT OF US HIGHWAY 59 NORTHBOUND FEEDER, ON THE WEST END OF A HEADWALL LOCATED APPROXIMATELY 45' NORTHWEST OF THE NORTHEAST CORNER OF THE SUBJECT PROPERTY. ELEV=73.09'

GRAPHIC SCALE IN FEET
0 20 40 80 120

LEGEND

	BOLLARD
EM	ELECTRIC METER
PP	POWER POLE
LS	LIGHT STANDARD
WM	WATER METER
WV	WATER VALVE
ICV	IRRIGATION CONTROL VALVE
FH	FIRE HYDRANT
CO	CLEANOUT
MH	MANHOLE
TSC	TRAFFIC SIGNAL CONTROL
TSP	TRAFFIC SIGNAL POLE
TELE	TELEPHONE BOX
	FLOOD LIGHT
FP	FLAG POLE
SIGN	TRAFFIC SIGN
IRS	1/2-INCH IRON ROD W/"PACHECO KOCH" CAP SET
(C.M.)	CONTROLLING MONUMENT
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OHL	OVERHEAD UTILITY LINE
E	UNDERGROUND ELECTRIC LINE
T	UNDERGROUND TELEPHONE LINE
C	UNDERGROUND CABLE LINE
W	UNDERGROUND WATER LINE
SS	UNDERGROUND SANITARY SEWER LINE

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   - 6.B. ADS N-12
   - 6.C. HANCOR HI-Q
   - 6.D. CONTECH ALUMINIZED ULTRA FLOW
7. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO ASSURE PIPE STABILITY DURING CONSTRUCTION
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APPROVED: _____ DEVELOPMENT COORDINATOR

DATE: _____

LOS PUENTES OFFICE PARK
PLAT NO. 20070257, F.B.C.P.R.

STATE OF TEXAS
KYLE F. WHITIS
101330
LICENSED
PROFESSIONAL ENGINEER
01/04/2018

THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY KYLE F. WHITIS, P.E. 101330 ON 01/04/2018. ALTERATION OF A SEALED DOCUMENT WITHOUT PROPER NOTIFICATION TO THE RESPONSIBLE ENGINEER IS AN OFFENSE UNDER THE TEXAS ENGINEERING PRACTICE ACT.

NO.	DATE	REVISION

Pacheco Koch
20445 STATE HWY 249, SUITE 380
HOUSTON, TX 77070 281.883.0103
TX REG. ENGINEERING FIRM F-14439
TX REG. SURVEYING FIRM LS-10008000

STORM SEWER PLAN
MERCEDES BENZ SPRINTER & CERTIFIED PRE-OWNED CAR DEALERSHIP
CITY OF RICHMOND, FORT BEND COUNTY, TEXAS

DESIGN	DRAWN	DATE	SCALE	NOTES	FILE	NO.
KFW	BKE	JAN 2018	1"=40'			C5.02

MB SPRINTER CPO

BEWING
1/23/2018 8:44 AM
O:\DWG-SJV\16-16.277\DWG\CIVIL CSD 2015\3787-16.277-STRM.DWG

MATCH LINE C5.01

MATCH LINE C5.04

CALLED 17.3512 ACRES
RESTRICTED RESERVE "A"
CARMAX ALATTAR
PLAT NO. 20140218, F.B.C.P.R.

S 14°46'50" E 491.66'

SHOWROOM & GARAGE
F.F.=75.30

PARKING GARAGE
F.F.=75.21

VOID

PROP. 24" STORM DRAIN @ 0.53%

PROP. 36" STO

8" SEWER

3" SAND/OIL LINE

8" WATER

12" WTR

1.0' WIDE CINDER BLOCK WALL

CONCRETE

STA 0+20.36 LINE "ST-4A"
END & CAP STORM AT A
POINT 5' FROM BLDG. FACE
REFER TO MEP FOR CONTINUATION
FL 12"=69.30 (S)

STA 0+11.22 LINE "ST-4A"
UTILITY CROSSING:
FL 8" SEWER=70.45
FL 12"=68.38 (N)
FL 12"=68.38 (S)

STA 0+50.23 LINE "ST-4B"
END & CAP STORM AT A
POINT 5' FROM BLDG. FACE
REFER TO MEP FOR CONTINUATION
FL 12"=69.30 (SE)

STA 0+12.97 LINE "ST-4C"
END & CAP STORM AT A
POINT 5' FROM BLDG. FACE
REFER TO MEP FOR CONTINUATION
FL 12"=69.30 (SE)

STA 0+13.02 LINE "ST-4B"
UTILITY CROSSING:
FL 8" SEWER=70.62
FL 12"=67.91 (NW)
FL 12"=67.91 (SE)

STA 4+51.92 LINE "ST-4"
INSTALL:
1-TYPE "A" CATCH BASIN
TI=74.39
FL 24"=68.48 (E)
FL 24"=68.48 (N)

STA 3+36.27 LINE "ST-4"=
STA 0+00.00 LINE "ST-4C"
INSTALL:
1-TYPE "A" CATCH BASIN
TI=74.39
FL 12"=68.37 (N)
FL 24"=67.87 (W)
FL 24"=67.87 (E)

STA 2+31.82 LINE "ST-4"=
STA 0+00.00 LINE "ST-4B"
INSTALL:
1-TYPE "A" CATCH BASIN
TI=74.39
FL 24"=67.31 (W)
FL 12"=67.81 (N)
FL 24"=67.31 (E)

STA 1+97.59 LINE "ST-4"=
STA 0+00.00 LINE "ST-4A"
INSTALL:
1-4' DIA. MANHOLE
RIM=74.77
FL 24"=67.13 (W)
FL 12"=67.63 (N)
FL 36"=66.13 (E)

STA 0+17.08 LINE "ST-2A1"
CONNECT TO 12" STORM.
REFER TO MEP FOR CONTINUATION
FL 12"=70.76 (S)

STA 2+28.90 LINE "ST-2A"
INSTALL:
1-TYPE "A" CATCH BASIN
TI=69.73
FL 12"=67.23 (N)
FL 24"=66.73 (E)

EXTREME EVENT
PONDING WSEL=73.06

PROP. 24" STORM DRAIN @ 0.57%

21.6'

L=410.87'
C=11°25'40"
R=2060.00'
CB=N 85° 34' 39" W

SANSBURY BLVD.
120' R.O.W. (PLAT NO. 20150026, F.B.C.M.R.)

CURB (TYP.)

CONCRETE WALK

CONCRETE PAVING

WHITE DASHED PAINTSTRIPE

PROP 6" IP PLA

STM. SWR. MH
RIM EL. 74.86'
48"(W) FL. 63.50'
48"(E) FL. 63.62'
24"(N) FL. 68.24'
24"(S) FL. 68.44'

STM. SWR. MH
RIM EL. 73.50'
24"(S) FL. 68.88'

STM. SWR. MH
RIM EL. 73.34'
24"(N) FL. 69.07'

25' W.L.E. & S.S.E.
(PLAT NO. 20140218, F.B.C.P.R.)

25' W.L.E. & S.S.E.
(PLAT NO. 20150026, F.B.C.P.R.)

25' LANDSCAPE AREA
(F.B.C.C.F. NO. 2003041014 & PLAT NO. 20150026, F.B.C.P.R.)

BENCH MARK LIST

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N

0 20 40 80 120
GRAPHIC SCALE IN FEET

LEGEND

- BOLLARD
- ELECTRIC METER
- POWER POLE
- LIGHT STANDARD
- WATER METER
- WATER VALVE
- IRRIGATION CONTROL VALVE
- FIRE HYDRANT
- CLEANOUT
- MANHOLE
- TRAFFIC SIGNAL CONTROL
- TRAFFIC SIGNAL POLE
- TELEPHONE BOX
- FLOOD LIGHT
- FLAG POLE
- TRAFFIC SIGN
- IRS: 1/2-INCH IRON ROD W/"PACHECO KOCH" CAP SET
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14. A ROUND MANHOLE COVER MEETING CITY SPECIFICATIONS SHALL BE PLACED IN ALL INLET TOPS NEAR THE OUTLET PIPE.
15. ALL CONCRETE FOR INLETS AND DRAINAGE STRUCTURES SHALL CONFORM TO STANDARD CITY REQUIREMENTS UNLESS OTHERWISE SHOWN ON THESE PLANS OR STATED IN STANDARD CITY SPECIFICATIONS.
16. CRUSHED STONE BEDDING OR APPROVED EQUAL SHALL BE PROVIDED BY THE CONTRACTOR WHEN ROCK IS ENCOUNTERED IN TRENCHES. THERE SHALL BE NO ADDITIONAL PAY ITEM FOR CRUSHED STONE BEDDING.
17. IF REQUIRED DUE TO CONSTRUCTION, POWER POLES TO BE BRACED OR RELOCATED AT CONTRACTOR'S EXPENSE.
18. CONTRACTOR IS RESPONSIBLE FOR GRADING ALL DISTURBED AREAS TO ALLOW FOR POSITIVE DRAINAGE. GRADING SLOPES ARE NOT TO EXCEED 4:1, UNLESS OTHERWISE NOTED.

APPROVED: _____ DEVELOPMENT COORDINATOR

DATE: _____

STATE OF TEXAS
KYLE F. WHITIS
101330
LICENSED PROFESSIONAL ENGINEER
01/04/2018

THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY KYLE F. WHITIS, P.E. 101330 ON 01/04/2018. ALTERATION OF A SEALED DOCUMENT WITHOUT PROPER NOTIFICATION TO THE RESPONSIBLE ENGINEER IS AN OFFENSE UNDER THE TEXAS ENGINEERING PRACTICE ACT.

NO.	DATE	REVISION

Pacheco Koch
20445 STATE HWY 249, SUITE 380
HOUSTON, TX 77070 281.883.0103
TX REG. ENGINEERING FIRM F-14439
TX REG. SURVEYING FIRM LS-10008000

STORM SEWER PLAN
MERCEDES BENZ SPRINTER & CERTIFIED PRE-OWNED CAR DEALERSHIP
CITY OF RICHMOND, FORT BEND COUNTY, TEXAS

DESIGN	DRAWN	DATE	SCALE	NOTES	FILE	NO.
KFW	BKE	JAN 2018	1"=40'			C5.03

MB SPRINTER CPO

BEWING
1/23/2018 8:44 AM
O:\DWG-37\3787-16.277\DWG\CIVIL C3D 2015\3787-16.277-STRM.DWG

MATCH LINE C5.02

MATCH LINE C5.03

PROP. 18" STORM DRAIN @ 1.07%

8" SEWER

STA 1+78.90 LINE "ST-1"= STA 0+00.00 LINE "ST-5" INSTALL: CONNECT TO 7'X4' RCB FL 7'x 4' RCB=64.95 (NE) FL 18" STORM=66.08 (NW) FL 7'x 4' RCB=64.95 (SW)

STA 0+60.34 LINE "ST-5" INSTALL: 1-TYPE "A" CATCH BASIN ~~TI=70.53~~ ~~TI=73.50~~ FL 18"=69.50 (SE)

PROP. 18" STORM DRAIN @ 5.67%

STA 1+18.60 LINE "ST-4" POINT OF TANGENCY & CROSSING: FL VOID =69.97 FL 36"=65.72 (E) FL 36"=65.72 (W)

STA 0+04.17 LINE "ST-5" CONTRACTOR TO KNOCK OUT HOLE IN TOP OF 7'X4' RCB AND INSTALL TYPE "C" MANHOLE RIM=73.69 FL 18"=66.32 (NW) FL 18"=66.32 (SE)

PROP. 36" STORM DRAIN @ 0.53%

R=200.00 L=77.38'

23.5'

STA 0+41.22 LINE "ST-4" POINT OF VOID VATURE =65.31 (SE) FL 36"=65.31 (NW)

STA 0+04.17 LINE "ST-4" CONTRACTOR TO KNOCK OUT HOLE IN TOP OF 7' VOID ND INSTALL MANHOLE RIM=73.79 FL 36"=65.11 (NW) FL 36"=65.11 (SE)

C.F. NO. 20170072

PARKING GARAGE F.F.=75.21

STA 0+41.27 LINE "ST-1"= STA 0+00.00 LINE "ST-2" CONNECT VOID 4' RCB FL 7'x 4' =64.22 (NW) FL 24" STORM=65.19 (SW) FL 7'x 4' RCB=64.22 (SE)

STA 0+45.93 LINE "ST-1" INSTALL: 2-90° HORIZ. BENDS PER MANUFACTUR'S SPECIFICATIONS CONTRACTOR TO KNOCK OUT HOLE IN TOP OF 7'X4' RCB AND INSTALL 2-TYPE "C" MANHOLES RIM=73.82 FL 7'x 4' RCB=64.24 (NE) FL 7'x 4' RCB=64.24 (SE)

STA 0+32.98 LINE "ST-2" INSTALL: 1-TYPE VOID BASIN =73.30 FL 24"=65.35 (SW) FL 24"=65.35 (NE)

STA 0+48.07 LINE "ST-2A" INSTALL: 1-TYPE "A" CATCH BASIN VOID =72.55 FL 24"=65.70 (W) FL 24"=65.70 (E)

PROP. 24" STORM DRAIN @ 0.20%

PROP. 7'x4' RCB'S @ 0.53%

PROP. 24" STORM DRAIN @ 0.53%

STA 0+32.01 LINE "ST-2A" UTILITY CROSSING: FL VOID =68.53 FL 24"=65.67 (W) FL 24"=65.67 (E)

PROP. 18" STORM DRAIN @ 1.01%

CAUTION! GAS LINE CROSSING DEPTH UNKNOWN

V_{100}=3.22 FPS

Q_{100}=214.23 FPS

STA 0+00.00 LINE "ST-1" TXDOT PARALLEL WINGWALL REFER TO TXDOT DETAIL PW FL (2) 7'x4' RCB'S=64.00 (NW)

CONTRACTOR TO INSTALL 1,290 SQFT OF 10" DRY STONE RIP-RAP PER DETAIL 1 SHEET C5.05

64.5'

20.0'

STA 2+46.45 LINE "ST-1"= STA 0+00.00 LINE "ST-7" CONNECT TO 7'X4' RCB'S FL 7'x 4' RCB=65.31 (NE) FL 18" STORM=66.32 (NW) FL 7'x 4' RCB"=65.31 (SW)

STA 1+89.00 LINE "ST-1"= STA 0+00.00 LINE "ST-6" INSTALL: CONNECT VOID RCB FL 7'x 4' RCB=65.00 (NE) FL 18" STORM=66.13 (SE) FL 7'x 4' RCB=65.00 (SW)

STA 0+04.17 LINE "ST-7" CONTRACTOR TO KNOCK OUT HOLE IN TOP OF 7'X4' RCB AND INSTALL TYPE "C" MANHOLE RIM=73.80 FL 18"=66.36 (SE) FL 18"=66.36 (NW)

STA 0+04.17 LINE "ST-6" CONTRACTOR TO KNOCK OUT HOLE IN TOP OF 7'X VOID INSTALL TYPE "C" M RIM=73.43 FL 18"=66.42 (SE) FL 18"=66.42 (NW)

STA 0+34.33 LINE "ST-6" INSTALL: 1-TYPE VOID BASIN TI=72.50 FL 18"=68.50 (NW)

STA 1+27.85 LINE "ST-1"= STA 0+00.00 LINE "ST-4" CONNE VOID RCB FL 7'x 4' RCB=64.68 (NE) FL 36" STORM=65.09 (NW) FL 7'x 4' RCB=64.68 (SW)

STA 1+23.04 LINE "ST-1"= STA 0+00.00 LINE "ST-3" CONNECT TO 7'X4' RCB FL 7'x 4' RCB=64.65 (NE) FL 18" STORM=64.86 (SE) FL 7'x 4' RCB=64.65 (SW)

STA 0+44.60 LINE "ST-3" INSTALL: 1-TYPE "A" CATCH BASIN TI=69.09 FL 18"=65.09 (NW)

STA 0+04.17 LINE "ST-3" CONTRACTOR TO KNOCK OUT HOLE IN TOP OF 7'X4' RCB AND INSTALL TYPE "C" MANHOLE RIM=73.73 FL 18"=64.88 (SE) FL 18"=64.88 (NW)

STA 0+57.75 LINE "ST-2"= STA 0+00.00 LINE "ST-2A" INSTALL: 1-4' DIA VOID RIM=73.1 FL 18"=66.10 (SE) FL 24"=65.60 (W) FL 24"=65.60 (NE)

STA 0+97.02 LINE "ST-2" INSTALL: 1-TYPE VOID BASIN TI=70.0 FL 18"=66.50 (NW)

25 YR WSEL=71.04
100 YR WSEL=71.88

BRENGROVE INVESTMENTS I, LTD RESIDUE CALLED 67.072 AC. F.B.C.C.F. NO. 2003053106

8'X4' STM. SWR. BOX FL 64.67'

8'X4' STM. SWR. BOX FL 64.60'

DUAL 8'X4' R.C.B.(P)

STM. SWR. MH RIM EL. 73.92' COMMON FL 65.58' (UNABLE TO SEE PIPES)

STM. SWR. MH RIM EL. 74.04' COMMON FL 65.81' (UNABLE TO SEE PIPES)

STM. SWR. MH RIM EL. 74.70' 48"(W) FL. 65.44' 24"(E)(P) FL. 65.41'

STM. SWR. MH RIM EL. 75.22' 48"(W) FL. 65.55' 48"(E)/FL. 65.76' 24"(S-P) FL. 67.42'

STM. SWR. MH RIM EL. 73.77' 24"(E)(P) FL. 66.87'

STM. SWR. MH RIM EL. 74.62' 48"(W) FL. 65.46' 48"(E) FL. 65.39' 8'X4' BOX(N) FL. 65.25' 8'X4' BOX(S) FL. 65.43'

24" STM(P)

STM

SANSBURY BLVD. 120' R.O.W. (PLAT NO. 20150026, F.B.C.M.R.)

TXDOT PARALLEL WINGWALL DRAWING, SHEET 2 OF 2, CSJ NO. 1401-77-0026

N 85° 34' 39" W LC=410.19'

12" WTR LINE (P)

WHITE DASHED PAINTSTRIPE

CONCRETE PAVING

F.O.C.

PP

SAN. SWR. MH

FH

WV

WM

STA 1+23.04 LINE "ST-1"= STA 0+00.00 LINE "ST-3" CONNECT TO 7'X4' RCB FL 7'x 4' RCB=64.65 (NE) FL 18" STORM=64.86 (SE) FL 7'x 4' RCB=64.65 (SW)

BENCH MARK LIST

BENCHMARK	PROJECT BENCHMARK IS NGS MONUMENT DESIGNATION "A 1212" /P.I.D. "AW4725", BEING A BENCH MARK SET IN A CULVERT HEADWALL 3.25 MI NE OF SUGARLAND AT THE NORTHWEST CORNER OF THE JUNCTION OF A ROAD NORTH TO TEXAS DEPT. OF CORRECTIONS JESTER UNIT IN THE TOP AND 2.0 FEET EAST OF THE WEST END OF THE NORTH CONCRETE HEADWALL OF DOUBLE CONCRETE PIPE CULVERTS. ELEV=78.18'
T.B.M. BRASS	"A" TEMPORARY BENCHMARK "A" IS A TXDOT DISK LOCATED APPROXIMATELY 2200' NORTHEAST OF THE INTERSECTION OF GRAND ESTATES DRIVE AND US HIGHWAY 59, APPROXIMATELY 143' SOUTH OF THE SOUTH EDGE OF PAVEMENT OF US HIGHWAY 59 NORTHBOUND FEEDER, ON THE WEST END OF A HEADWALL LOCATED APPROXIMATELY 45' NORTHWEST OF THE NORTHEAST CORNER OF THE SUBJECT PROPERTY. ELEV=73.09'

N

0 20 40 80 120

GRAPHIC SCALE IN FEET

LEGEND

BL	BOLLARD
EM	ELECTRIC METER
PP	POWER POLE
LS	LIGHT STANDARD
WM	WATER METER
WV	WATER VALVE
ICV	IRRIGATION CONTROL VALVE
FH	FIRE HYDRANT
CO	CLEANOUT
MH	MANHOLE
TSC	TRAFFIC SIGNAL CONTROL
TSP	TRAFFIC SIGNAL POLE
TELE	TELEPHONE BOX
	FLOOD LIGHT
FP	FLAG POLE
SIGN	TRAFFIC SIGN
	1/2-INCH IRON ROD
IRS	W/"PACHECO KOCH" CAP SET
(C.M.)	CONTROLLING MONUMENT
	PROPERTY LINE
X	FENCE
OHL	OVERHEAD UTILITY LINE
E	UNDERGROUND ELECTRIC LINE
T	UNDERGROUND TELEPHONE LINE
C	UNDERGROUND CABLE LINE
6"W	UNDERGROUND WATER LINE
6"SS	UNDERGROUND SANITARY SEWER LINE

GRADING & DRAINAGE GENERAL NOTES

1. REFER TO GEOTECHNICAL REPORT PREPARED BY GEOSCIENCE ENGINEERING & TESTING DATED 05/31/2016 FOR REQUIREMENTS REGARDING FILL COMPACTION AND MOISTURE CONTENT.
2. UNLESS NOTED, ALL FILL IS TO BE COMPACTED TO A MINIMUM OF 95% STANDARD PROCTOR DENSITY WITHIN 3% OF OPTIMUM MOISTURE CONTENT. FILL TO BE PLACED IN MAXIMUM LIFTS OF 6 INCHES.
3. SIDEWALKS AND ACCESSIBLE ROUTES SHALL HAVE A RUNNING SLOPE NO GREATER THAN 5% (UNLESS OTHERWISE NOTED) AND A CROSS SLOPE NO GREATER THAN 2%.
4. GRADING OF ALL HANDICAPPED SPACES AND ROUTES TO CONFORM TO FEDERAL, STATE, AND LOCAL GUIDELINES.
5. ALL PROPOSED AND EXISTING GRADES IN NON-PAVED AREAS ARE "FINISHED GRADE" (i.e. IN LANDSCAPE BEDS, TOP OF MULCH/BEDDING MATERIAL SHALL MATCH PROPOSED FINISHED GRADE).
6. UNLESS NOTED, STORM DRAIN LINES SHALL BE OF THE FOLLOWING MATERIALS AND INSTALLED IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS:
   - 6.A. RCP C-76, CLASS III
   - 6.B. ADS N-12
   - 6.C. HANCOR HI-Q
   - 6.D. CONTECH ALUMINIZED ULTRA FLOW
7. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO ASSURE PIPE STABILITY DURING CONSTRUCTION
8. UNLESS NOTED, GRATE INLETS TO BE "FORTERRA PIPE AND PRECAST" CATCH BASIN SIZED AS SHOWN, OR APPROVED EQUAL.
9. FINAL PAVING, CURB, AND SIDEWALK ELEVATIONS SHALL BE PLACED AT PLUS OR MINUS 0.03 FOOT.
10. REFER TO LANDSCAPE SPECIFICATIONS FOR SEEDING AND SODDING REQUIREMENTS.
11. ANY CONCRETE, ROCK, OR MATERIAL DEEMED BY THE ENGINEER TO BE UNSUITABLE FOR SUBGRADE SHALL BE DISPOSED OF OFFSITE AT CONTRACTOR'S EXPENSE.
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APPROVED: DEVELOPMENT COORDINATOR

DATE: 4/16/18

STATE OF TEXAS KYLE F. WHITIS 101330 LICENSED PROFESSIONAL ENGINEER 01/04/2018

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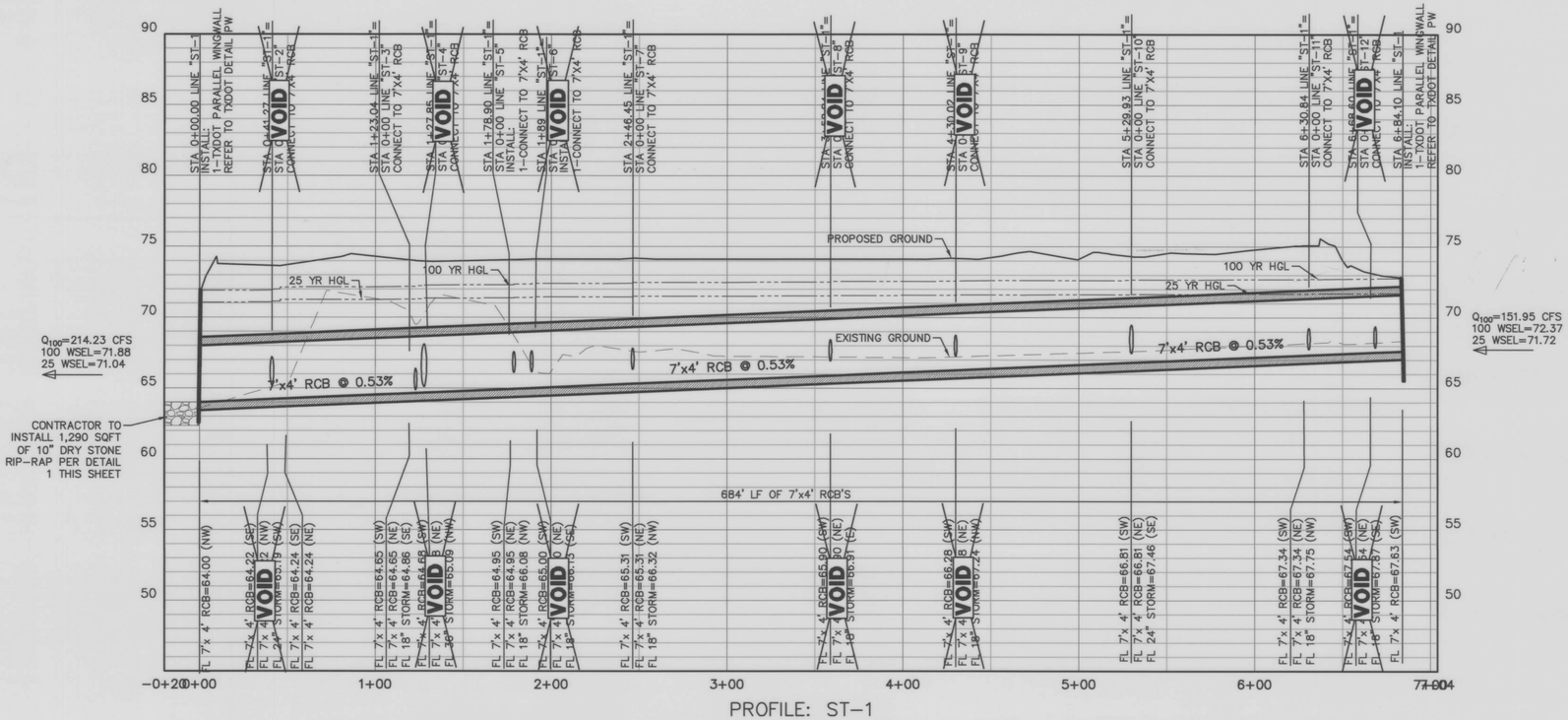
20445 STATE HWY 249, SUITE 380
HOUSTON, TX 77070 281.883.0103
TX REG. ENGINEERING FIRM F-14439
TX REG. SURVEYING FIRM LS-10008000

STORM SEWER PLAN
MERCEDES BENZ SPRINTER & CERTIFIED PRE-OWNED CAR DEALERSHIP
CITY OF RICHMOND, FORT BEND COUNTY, TEXAS

DESIGN	DRAWN	DATE	SCALE	NOTES	FILE	NO.
KFW	BKE	JAN 2018	1"=40'			C5.04

MB SPRINTER CPO

BEWING
01/04/2018 8:45 AM
C:\DWG-37\3787-16.277\DWG\CIVIL C3D 2015\3787-16.277-STRM.DWG



PROFILE: ST-1

1. Stone Movement Equations:

$V_{sa} = C\,[2g\,(\gamma_s - \gamma_w)\,/\,\gamma_w]^{1/2}\,(D_{50})^{1/2}$

$W = D^3(\pi * \gamma_s) / 6$

US Army Engineers Waterways Experiment Station, CE, Hydraulic Design Criteria, Sheet 712-1, 1970

Where:

V_{sa} = allowable velocity, fps

C = 0.86 for High Turbulence; = 1.2 for Low Turbulence

g = acceleration of gravity, ft/sec²

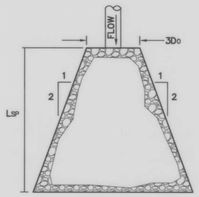
γ_s = specific weight of stone, 155-, 165-, 175-pcf, **use 155 for design**

γ_w = specific weight of water, lb/ft³

D_{50} = stone diameter, ft, minimum value = 8"

W_{50} = stone weight, lbs

D_{50} =	10	*inches*
C =	0.86	
γ_s =	155	*lb/ft³*
g =	32.2	*ft/s²*
γ_w =	62.4	*lb/ft³*
W_{50} =	47	*lbs*
V_{sa} =	7.67	*fps*



$L_{SP} = D_o\left[1.7\left(\frac{Q}{(D_o)^{5/2}}\right)+8\right]$

D_o = Width of Pipe Opening @ Discharge Point

Do (inches) 48

Q (cfs) 214.23

L_{sp} = 20 *ft*

2. Rip Rap Gradation:

100			90		50			30		15		
D_{100}	W_{100}	W_{50}	D_{90}	W_{90}	D_{50}	W_{50}	W_{30}	D_{30}	W_{30}	D_{15}	W_{15}	W_{70}
in	*lb*	*lb*	*in*	*lb*	*in*	*lb*	*lb*	*in*	*lb*	*in*	*lb*	*lb*
12	81	32	9	28	10	47	16	6	9	7	12	5

Rip rap gradation was selected based on the calculated W_{50} from above and Table 3-1, page 38, Hydraulic Design of Flood Control Channel, American Society of Civil Engineers, 1995.

3. Rip Rap Bed Thickness:

T = 2 D_{50} or 1.5 D_{100} which ever is greater

T =	20	*inches*

4. Resistance Coefficients:

$n = K[D_{50}(min)]^{1/6}$

Where:

K = 0.034 for velocity and stone size calculations and = 0.038 for capacity and freeboard calculations

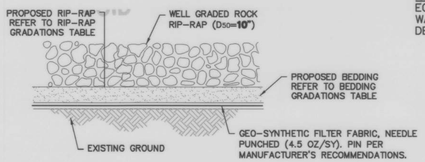
K =	0.034	
D_{50} =	0.07	*feet*
n =	0.032	

5. Specifications:

10" - DRY STONE RIP-RAP SPECIFICATIONS & GRADATIONS

Note: The following Specifications and gradations are minimums to be used in construction. Use field or quarry dry stone rip-rap. All stones shall weigh between 10 and 90 pounds with 60% of the stones weighing 50 pounds and having a nominal diameter of 10". Minimum bed depth of rip-rap shall be 20". Stones shall be placed in a single layer with closed joints. The upright axis of the stones shall be nearly perpendicular to the embankment slope. The courses shall be placed from the bottom of the embankment upwardly, with larger stones being placed in the lower courses. Open joints shall be filled with spalls. Stones that project more than the allowable amount in the finished work shall be replaced, embedded deeper, or chipped. Rip rap shall be stockpiled and approved prior to installation.

NOTE:
EQUATIONS CAME FROM THE US ARMY ENGINEERS WATERWAYS EXPERIMENT STATION, CE, HYDRAULIC DESIGN CRITERIA



1 RIP-RAP DETAIL
NOT TO SCALE

APPROVED: *DEVELOPMENT COORDINATOR*

DATE: 4/13/18

STATE OF TEXAS
KYLE F. WHITIS
101330
LICENSED PROFESSIONAL ENGINEER
01/04/2018

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STORM SEWER PROFILE
MERCEDES BENZ SPRINTER & CERTIFIED PRE-OWNED CAR DEALERSHIP
CITY OF RICHMOND, FORT BEND COUNTY, TEXAS

DESIGN	DRAWN	DATE	SCALE	NOTES	FILE	NO.
KFW	BKE	JAN 2018	H:1"=40' V:1"=5'			C5.05

MB SPRINTER CPO

BEWING
1/23/2018 8:45 AM
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Line ST-	1																				
Downstream Station	**Upstream Station**	**Q25 (cfs)**	**Pipe Type**	**Size Box (W x H) Pipe (")**	**'n" Value**	**Design Slope (ft/ft)**	**Upstream Junction Type (1)**	**Connect or FL**	**Dwn HGL (25yr)**	**Up HGL (25yr)**	**Up HGL w/ Jump**	**Dwn FL**	**Up FL**	**V (fps)**	**$V^2/_{2g}$ (ft)**	**S_f**	**Q_{cap} (cfs)**	**D_c (ft)**	**D_n (ft)**	**V_n (fps)**	**$V_n^2/_{2g}$ (ft)**	**Partial Station (2)**	**Partial Elevation (3)**
0+00.00	0+41.27	180.09	Box	14 x 4	0.013	0.0053	Manhole - Through	Flowlines	71.04	71.06	71.11	64.00	64.19	3.22	0.16	0.0004	582.86	1.46	N/A	N/A	N/A	N/A	N/A
0+41.27	0+45.93	167.62	Box	14 x 4	0.013	0.0053	Bend - 90°	Flowlines	71.11	71.12	71.23	64.19	64.21	2.99	0.14	0.0004	582.86	1.40	N/A	N/A	N/A	N/A	N/A
0+45.93	1+23.04	167.62	Box	14 x 4	0.013	0.0053	Manhole - Through	Flowlines	71.23	71.26	71.29	64.21	64.57	2.99	0.14	0.0004	582.86	1.40	N/A	N/A	N/A	N/A	N/A
1+23.04	1+27.85	167.42	Box	14 x 4	0.013	0.0053	Manhole - Through	Flowlines	71.29	71.29	71.34	64.57	64.59	2.99	0.14	0.0004	582.86	1.39	N/A	N/A	N/A	N/A	N/A
1+27.85	1+78.90	156.86	Box	14 x 4	0.013	0.0053	Manhole - Through	Flowlines	71.34	71.36	71.39	64.59	64.82	2.80	0.12	0.0003	582.86	1.34	N/A	N/A	N/A	N/A	N/A
1+78.90	1+89.00	153.59	Box	14 x 4	0.013	0.0053	Manhole - Through	Flowlines	71.39	71.40	71.43	64.82	64.87	2.74	0.12	0.0003	582.86	1.32	N/A	N/A	N/A	N/A	N/A
1+89.00	2+46.45	151.95	Box	14 x 4	0.013	0.0053	Manhole - Through	Flowlines	71.43	71.44	71.48	64.87	65.13	2.71	0.11	0.0003	582.86	1.31	N/A	N/A	N/A	N/A	N/A
2+46.45	3+58.84	144.11	Box	14 x 4	0.013	0.0053	Manhole - Through	Flowlines	71.48	71.51	71.54	65.13	65.65	2.57	0.10	0.0003	582.86	1.27	N/A	N/A	N/A	N/A	N/A
3+58.84	4+30.02	142.34	Box	14 x 4	0.013	0.0053	Manhole - Through	Flowlines	71.54	71.56	71.59	65.65	65.98	2.54	0.10	0.0003	582.86	1.26	N/A	N/A	N/A	N/A	N/A
4+30.02	5+29.93	137.02	Box	14 x 4	0.013	0.0053	Manhole - Through	Flowlines	71.59	71.62	71.64	65.98	66.44	2.45	0.09	0.0003	582.86	1.23	N/A	N/A	N/A	N/A	N/A
5+29.93	6+30.84	134.84	Box	14 x 4	0.013	0.0053	Manhole - Through	Flowlines	71.64	71.67	71.69	66.44	66.90	2.41	0.09	0.0002	582.86	1.21	N/A	N/A	N/A	N/A	N/A
6+30.84	6+68.60	134.02	Box	14 x 4	0.013	0.0053	Manhole - Through	Flowlines	71.69	71.70	71.72	66.90	67.08	2.39	0.09	0.0002	582.86	1.21	N/A	N/A	N/A	N/A	N/A
6+68.60	6+84.10	133.00	Box	14 x 4	0.013	0.0053	None	67.17	71.72	71.73	71.73	67.08	67.15	2.38	0.09	0.0002	582.86	1.20	N/A	N/A	N/A	N/A	N/A

Line ST-	2	Connects to Line ST-	1	At Station	0+41.27	Junction Type	Manhole - 90°	N/A

Downstream Station	**Upstream Station**	**Q100 (cfs)**	**Pipe Type**	**Size Box (W x H) Pipe (")**	**'n" Value**	**Design Slope (ft/ft)**	**Upstream Junction Type**	**Connect or FL**	**Dwn HGL (Auto Calc)**	**Up HGL**	**Up HGL w/ Jump**	**Dwn FL**	**Up FL**	**V (fps)**	**$V^2/_{2g}$ (ft)**	**S_f**	**Q_{cap} (cfs)**	**D_c (ft)**	**D_n (ft)**	**V_n (fps)**	**$V_n^2/_{2g}$ (ft)**	**Partial Station**	**Partial Elevation**
0+00.00	0+32.98	16.47	Pipe	24"	0.013	0.0050	Manhole - Through	Soffits	71.11	71.29	71.45	65.19	65.35	5.24	0.43	0.0053	16.47	1.70	N/A	N/A	N/A	N/A	N/A
0+32.98	0+57.75	14.94	Pipe	24"	0.013	0.0050	Manhole - Through	Centerlines	71.45	71.56	71.91	65.35	65.48	4.76	0.35	0.0044	16.00	1.53	N/A	N/A	N/A	N/A	N/A
0+57.75	0+97.02	0.27	Pipe	18"	0.013	0.0101	Inlet	66.50	71.91	71.91	71.91	65.73	66.13	0.15	0.00	0.0000	10.56	0.17	N/A	N/A	N/A	N/A	N/A

Line ST-	2A	Connects to Line ST-	2	At Station	0+57.75	Junction Type	Manhole - 45°	Centerlines

Downstream Station	**Upstream Station**	**Q100 (cfs)**	**Pipe Type**	**Size Box (W x H) Pipe (")**	**'n" Value**	**Design Slope (ft/ft)**	**Upstream Junction Type**	**Connect or FL**	**Dwn HGL (Auto Calc)**	**Up HGL**	**Up HGL w/ Jump**	**Dwn FL (Auto Calc)**	**Up FL**	**V (fps)**	**$V^2/_{2g}$ (ft)**	**S_f**	**Q_{cap} (cfs)**	**D_c (ft)**	**D_n (ft)**	**V_n (fps)**	**$V_n^2/_{2g}$ (ft)**	**Partial Station**	**Partial Elevation**
0+00.00	0+48.07	14.67	Pipe	24"	0.013	0.0020	Manhole - Through	Soffits	71.74	71.94	72.09	65.48	65.57	4.67	0.34	0.0042	14.67	N/A	N/A	N/A	N/A	N/A	N/A
0+48.07	2+28.90	12.87	Pipe	24"	0.013	0.0057	Inlet	66.73	72.09	72.67	73.06	65.57	66.61	4.10	0.26	0.0032	17.08	1.30	N/A	N/A	N/A	N/A	N/A

Line ST-	3	Connects to Line ST-	1	At Station	1+23.04	Junction Type	Manhole - 90°	Flowlines

Downstream Station	**Upstream Station**	**Q100 (cfs)**	**Pipe Type**	**Size Box (W x H) Pipe (")**	**'n" Value**	**Design Slope (ft/ft)**	**Upstream Junction Type**	**Connect or FL**	**Dwn HGL (Auto Calc)**	**Up HGL**	**Up HGL w/ Jump**	**Dwn FL (Auto Calc)**	**Up FL**	**V (fps)**	**$V^2/_{2g}$ (ft)**	**S_f**	**Q_{cap} (cfs)**	**D_c (ft)**	**D_n (ft)**	**V_n (fps)**	**$V_n^2/_{2g}$ (ft)**	**Partial Station**	**Partial Elevation**
0+00.00	0+44.60	0.36	Pipe	18"	0.013	0.0052	Inlet	65.09	71.40	71.40	71.40	64.57	64.80	0.20	0.00	0.0000	7.57	0.22	N/A	N/A	N/A	N/A	N/A

Line ST-	4	Connects to Line ST-	1	At Station	1+27.85	Junction Type	Manhole - 90°	N/A

Downstream Station	**Upstream Station**	**Q100 (cfs)**	**Pipe Type**	**Size Box (W x H) Pipe (")**	**'n" Value**	**Design Slope (ft/ft)**	**Upstream Junction Type**	**Connect or FL**	**Dwn HGL (Auto Calc)**	**Up HGL**	**Up HGL w/ Jump**	**Dwn FL**	**Up FL**	**V (fps)**	**$V^2/_{2g}$ (ft)**	**S_f**	**Q_{cap} (cfs)**	**D_c (ft)**	**D_n (ft)**	**V_n (fps)**	**$V_n^2/_{2g}$ (ft)**	**Partial Station**	**Partial Elevation**
0+00.00	1+97.59	13.95	Pipe	36"	0.013	0.0051	Manhole - Through	Soffits	71.42	71.50	71.50	65.09	66.10	1.97	0.06	0.0004	47.63	1.11	N/A	N/A	N/A	N/A	N/A
1+97.59	2+31.82	12.69	Pipe	24"	0.013	0.0051	Manhole - Through	Soffits	71.50	71.61	71.74	67.10	67.27	4.04	0.25	0.0031	16.16	1.34	N/A	N/A	N/A	N/A	N/A
2+31.82	3+36.27	10.44	Pipe	24"	0.013	0.0051	Manhole - Through	Soffits	71.74	71.96	72.05	67.27	67.80	3.32	0.17	0.0021	16.16	1.17	N/A	N/A	N/A	N/A	N/A
3+36.27	4+51.92	8.37	Pipe	24"	0.013	0.0051	Manhole - 90°	Soffits	72.05	72.21	72.30	67.80	68.39	2.66	0.11	0.0014	16.16	1.02	N/A	N/A	N/A	N/A	N/A
4+51.92	5+49.38	6.84	Pipe	24"	0.013	0.0051	Manhole - Through	Soffits	72.30	72.39	72.45	68.39	68.89	2.18	0.07	0.0009	16.16	0.91	N/A	N/A	N/A	N/A	N/A
5+49.38	6+30.33	2.52	Pipe	24"	0.013	0.0051	Manhole - 90°	Soffits	72.45	72.46	72.47	68.89	69.30	0.80	0.01	0.0001	16.16	0.53	N/A	N/A	N/A	N/A	N/A
6+30.33	6+83.90	0.63	Pipe	18"	0.013	0.0051	Inlet	70.20	72.47	72.47	72.48	69.80	70.08	0.36	0.00	0.0000	7.50	0.29	N/A	N/A	N/A	N/A	N/A

Line ST-	5	Connects to Line ST-	1	At Station	1+78.90	Junction Type	Manhole - 90°	N/A

Downstream Station	**Upstream Station**	**Q100 (cfs)**	**Pipe Type**	**Size Box (W x H) Pipe (")**	**'n" Value**	**Design Slope (ft/ft)**	**Upstream Junction Type**	**Connect or FL**	**Dwn HGL (Auto Calc)**	**Up HGL**	**Up HGL w/ Jump**	**Dwn FL**	**Up FL**	**V (fps)**	**$V^2/_{2g}$ (ft)**	**S_f**	**Q_{cap} (cfs)**	**D_c (ft)**	**D_n (ft)**	**V_n (fps)**	**$V_n^2/_{2g}$ (ft)**	**Partial Station**	**Partial Elevation**
0+00.00	0+60.34	4.32	Pipe	18"	0.013	0.0567	Inlet	69.50	71.46	71.56	71.70	66.08	69.50	2.44	0.09	0.0017	25.01	0.42	N/A	N/A	N/A	N/A	N/A

Line ST-	6	Connects to Line ST-	1	At Station	1+89.00	Junction Type	Manhole - 90°	Centerlines

Downstream Station	**Upstream Station**	**Q100 (cfs)**	**Pipe Type**	**Size Box (W x H) Pipe (")**	**'n" Value**	**Design Slope (ft/ft)**	**Upstream Junction Type**	**Connect or FL**	**Dwn HGL (Auto Calc)**	**Up HGL**	**Up HGL w/ Jump**	**Dwn FL (Auto Calc)**	**Up FL**	**V (fps)**	**$V^2/_{2g}$ (ft)**	**S_f**	**Q_{cap} (cfs)**	**D_c (ft)**	**D_n (ft)**	**V_n (fps)**	**$V_n^2/_{2g}$ (ft)**	**Partial Station**	**Partial Elevation**
0+00.00	0+34.33	2.16	Pipe	18"	0.013	0.0690	Inlet	68.50	71.51	71.52	71.56	66.12	68.49	1.22	0.02	0.0004	27.59	0.28	N/A	N/A	N/A	N/A	N/A

Line ST-	7	Connects to Line ST-	1	At Station	2+46.45	Junction Type	Manhole - 90°	N/A

Downstream Station	**Upstream Station**	**Q100 (cfs)**	**Pipe Type**	**Size Box (W x H) Pipe (")**	**'n" Value**	**Design Slope (ft/ft)**	**Upstream Junction Type**	**Connect or FL**	**Dwn HGL (Auto Calc)**	**Up HGL**	**Up HGL w/ Jump**	**Dwn FL**	**Up FL**	**V (fps)**	**$V^2/_{2g}$ (ft)**	**S_f**	**Q_{cap} (cfs)**	**D_c (ft)**	**D_n (ft)**	**V_n (fps)**	**$V_n^2/_{2g}$ (ft)**	**Partial Station**	**Partial Elevation**
0+00.00	0+60.35	10.35	Pipe	18"	0.013	0.0107	Manhole - Through	Soffits	71.44	72.03	72.31	66.32	66.97	5.86	0.53	0.0097	10.87	1.17	N/A	N/A	N/A	N/A	N/A
0+60.35	1+67.78	8.19	Pipe	18"	0.013	0.0107	Manhole - 45°	Soffits	72.31	72.97	73.20	66.97	68.12	4.63	0.33	0.0061	10.87	0.97	N/A	N/A	N/A	N/A	N/A
1+67.78	2+38.18	6.30	Pipe	18"	0.013	0.0107	Manhole - Through	Soffits	73.20	73.45	73.64	68.12	68.87	3.57	0.20	0.0036	10.87	0.82	N/A	N/A	N/A	N/A	N/A
2+38.18	2+84.44	1.80	Pipe	18"	0.013	0.0107	Manhole - 90°	Soffits	73.64	73.65	73.67	68.87	69.36	1.02	0.02	0.0003	10.87	0.41	N/A	N/A	N/A	N/A	N/A
2+84.44	3+72.60	0.99	Pipe	18"	0.013	0.0107	Inlet	70.30	73.67	73.68	73.68	69.36	70.31	0.56	0.00	0.0001	10.87	0.31	N/A	N/A	N/A	N/A	N/A

Line ST-	8	Connects to Line ST-	1	At Station	3+58.84	Junction Type	Manhole - 90°	Centerlines

Downstream Station	**Upstream Station**	**Q100 (cfs)**	**Pipe Type**	**Size Box (W x H) Pipe (")**	**'n" Value**	**Design Slope (ft/ft)**	**Upstream Junction Type**	**Connect or FL**	**Dwn HGL (Auto Calc)**	**Up HGL**	**Up HGL w/ Jump**	**Dwn FL (Auto Calc)**	**Up FL**	**V (fps)**	**$V^2/_{2g}$ (ft)**	**S_f**	**Q_{cap} (cfs)**	**D_c (ft)**	**D_n (ft)**	**V_n (fps)**	**$V_n^2/_{2g}$ (ft)**	**Partial Station**	**Partial Elevation**
0+00.00	0+34.34	0.36	Pipe	18"	0.013	0.0399	Inlet	Flowlines	71.62	71.62	71.62	66.90	68.27	0.20	0.00	0.0000	20.98	0.14	N/A	N/A	N/A	N/A	N/A
0+34.34	0+41.57	2.34	Pipe	18"	0.013	0.0399	Inlet	68.57	71.62	71.62	71.66	68.27	68.56	1.32	0.03	0.0005	20.98	0.34	N/A	N/A	N/A	N/A	N/A

Line ST-	9	Connects to Line ST-	1	At Station	4+30.02	Junction Type	Manhole - 90°	N/A

Downstream Station	**Upstream Station**	**Q100 (cfs)**	**Pipe Type**	**Size Box (W x H) Pipe (")**	**'n" Value**	**Design Slope (ft/ft)**	**Upstream Junction Type**	**Connect or FL**	**Dwn HGL (Auto Calc)**	**Up HGL**	**Up HGL w/ Jump**	**Dwn FL**	**Up FL**	**V (fps)**	**$V^2/_{2g}$ (ft)**	**S_f**	**Q_{cap} (cfs)**	**D_c (ft)**	**D_n (ft)**	**V_n (fps)**	**$V_n^2/_{2g}$ (ft)**	**Partial Station**	**Partial Elevation**
0+00.00	0+86.21	7.02	Pipe	18"	0.013	0.0133	Manhole - 45°	Soffits	71.60	71.98	72.20	67.24	68.39	3.97	0.25	0.0045	12.11	0.82	N/A	N/A	N/A	N/A	N/A
0+86.21	1+89.71	3.51	Pipe	18"	0.013	0.0133	Inlet	69.85	72.20	72.31	72.41	68.39	69.76	1.99	0.06	0.0011	12.11	0.55	N/A	N/A	N/A	N/A	N/A

Line ST-	10	Connects to Line ST-	1	At Station	5+29.93	Junction Type	Manhole - 90°	N/A

Downstream Station	**Upstream Station**	**Q100 (cfs)**	**Pipe Type**	**Size Box (W x H) Pipe (")**	**'n" Value**	**Design Slope (ft/ft)**	**Upstream Junction Type**	**Connect or FL**	**Dwn HGL (Auto Calc)**	**Up HGL**	**Up HGL w/ Jump**	**Dwn FL**	**Up FL**	**V (fps)**	**$V^2/_{2g}$ (ft)**	**S_f**	**Q_{cap} (cfs)**	**D_c (ft)**	**D_n (ft)**	**V_n (fps)**	**$V_n^2/_{2g}$ (ft)**	**Partial Station**	**Partial Elevation**
0+00.00	0+34.32	2.88	Pipe	24"	0.013	0.0303	Inlet	68.50	71.71	71.71	71.73	67.46	68.50	0.92	0.01	0.0002	39.38	0.37	N/A	N/A	N/A	N/A	N/A

Line ST-	11	Connects to Line ST-	1	At Station	6+30.84	Junction Type	Manhole - 90°	N/A

Downstream Station	**Upstream Station**	**Q100 (cfs)**	**Pipe Type**	**Size Box (W x H) Pipe (")**	**'n" Value**	**Design Slope (ft/ft)**	**Upstream Junction Type**	**Connect or FL**	**Dwn HGL (Auto Calc)**	**Up HGL**	**Up HGL w/ Jump**	**Dwn FL**	**Up FL**	**V (fps)**	**$V^2/_{2g}$ (ft)**	**S_f**	**Q_{cap} (cfs)**	**D_c (ft)**	**D_n (ft)**	**V_n (fps)**	**$V_n^2/_{2g}$ (ft)**	**Partial Station**	**Partial Elevation**
0+00.00	0+50.35	1.08	Pipe	18"	0.013	0.0050	Inlet	68.00	71.76	71.76	71.77	67.75	68.00	0.61	0.01	0.0001	7.43	0.39	N/A	N/A	N/A	N/A	N/A

Line ST-	12	Connects to Line ST-	1	At Station	6+68.60	Junction Type	Manhole - 90°	N/A

Downstream Station	**Upstream Station**	**Q100 (cfs)**	**Pipe Type**	**Size Box (W x H) Pipe (")**	**'n" Value**	**Design Slope (ft/ft)**	**Upstream Junction Type**	**Connect or FL**	**Dwn HGL (Auto Calc)**	**Up HGL**	**Up HGL w/ Jump**	**Dwn FL**	**Up FL**	**V (fps)**	**$V^2/_{2g}$ (ft)**	**S_f**	**Q_{cap} (cfs)**	**D_c (ft)**	**D_n (ft)**	**V_n (fps)**	**$V_n^2/_{2g}$ (ft)**	**Partial Station**	**Partial Elevation**
0+00.00	0+26.91	1.35	Pipe	18"	0.013	0.0050	Inlet	68.00	71.79	71.79	71.80	67.87	68.00	0.76	0.01	0.0002	7.43	0.43	N/A	N/A	N/A	N/A	N/A

APPROVED: _____
DEVELOPMENT COORDINATOR
DATE: 4/13/18

NO.	DATE	REVISION

Pacheco Koch
20445 STATE HWY 249, SUITE 380
HOUSTON, TX 77070 281.883.0103
TX REG. ENGINEERING FIRM F-14439
TX REG. SURVEYING FIRM LS-10008000

HYDRAULIC CALCULATIONS
MERCEDES BENZ SPRINTER & CERTIFIED PRE-OWNED CAR DEALERSHIP
CITY OF RICHMOND, FORT BEND COUNTY, TEXAS

DESIGN	DRAWN	DATE	SCALE	NOTES	FILE	NO.
KFW	BKE	JAN 2018	H:1"=40' V:1"=5'			C5.06

STATE OF TEXAS
KYLE F. WHITIS
101330
LICENSED PROFESSIONAL ENGINEER
01/04/2018

THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY KYLE F. WHITIS, P.E. 101330 ON 01/04/2018. ALTERATION OF A SEALED DOCUMENT WITHOUT PROPER NOTIFICATION TO THE RESPONSIBLE ENGINEER IS AN OFFENSE UNDER THE TEXAS ENGINEERING PRACTICE ACT.

MB SPRINTER CPO

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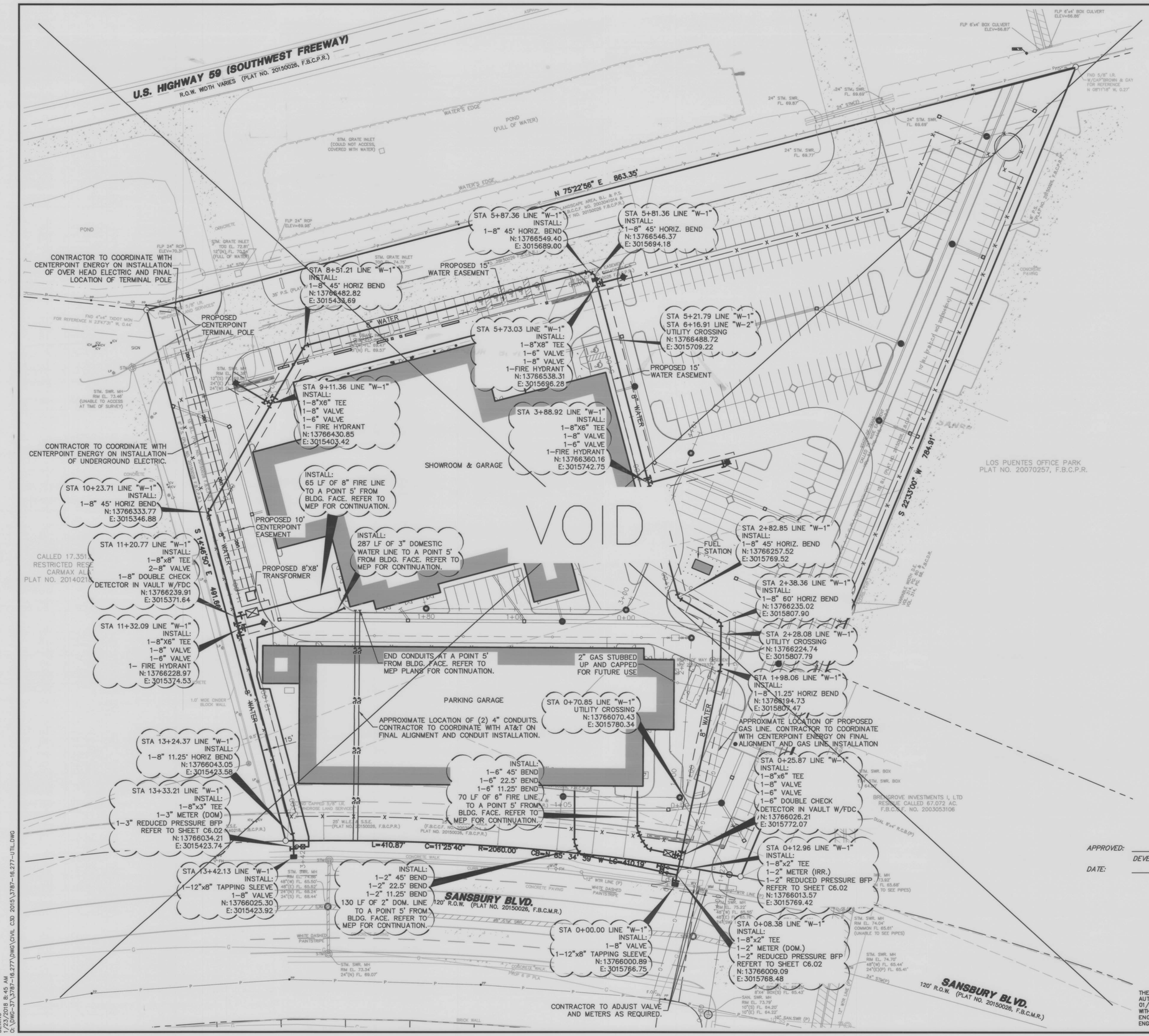

LEGEND

BL	BOLLARD
EM	ELECTRIC METER
PP	POWER POLE
LS	LIGHT STANDARD
WM	WATER METER
WV	WATER VALVE
ICV	IRRIGATION CONTROL VALVE
FH	FIRE HYDRANT
CO	CLEANOUT
MH	MANHOLE
TSC	TRAFFIC SIGNAL CONTROL
TSP	TRAFFIC SIGNAL POLE
TELE	TELEPHONE BOX
FL	FLOOD LIGHT
FP	FLAG POLE
SIGN	TRAFFIC SIGN
IRS	1/2-INCH IRON ROD W/"PACHECH KOCH" CAP SET
(C.M.)	CONTROLLING MONUMENT
	PROPERTY LINE
X	FENCE
OHL	OVERHEAD UTILITY LINE
E	UNDERGROUND ELECTRIC LINE
T	UNDERGROUND TELEPHONE LINE
C	UNDERGROUND CABLE LINE
6"W	UNDERGROUND WATER LINE
6"SS	UNDERGROUND CABLE LINE
613	EXIST CONTOUR

WATER & SANITARY SEWER GENERAL NOTES

1. ALL CONCRETE SHALL BE CLASS "A" (3000 PSI), UNLESS OTHERWISE NOTED.
2. ALL WATER MAINS SHALL BE PVC C900, DR 18, CLASS 235. FIRE PROTECTION SERVICES SHALL BE PVC C900, DR 14, CLASS 305 AND INSTALLED IN ACCORDANCE WITH THE DESIGN AND SPECIFICATIONS OF THE FIRE PROTECTION PLANS TO BE PREPARED BY A LICENSED FIRE PROTECTION CONTRACTOR.
3. WATER AND SANITARY SEWER SERVICES SHALL MEET PLUMBING CODE REQUIREMENTS.
4. ALL WATER MAINS SHALL HAVE A MINIMUM COVER OF 48 INCHES BELOW IMPROVED FINISHED GRADE, UNLESS OTHERWISE NOTED.
5. SANITARY SEWER PIPE SHALL BE PVC SDR-26.
6. WHEN WATER MAINS AND SANITARY SEWERS ARE INSTALLED, THEY SHALL BE INSTALLED NO CLOSER TO EACH OTHER THAN NINE FEET IN ALL DIRECTIONS AND PARALLEL LINES MUST BE INSTALLED IN SEPARATE TRENCHES. WHERE THE NINE FOOT SEPARATION DISTANCE CANNOT BE ACHIEVED, THE FOLLOWING GUIDELINES SHALL APPLY:
   - 6.A. WHERE A SANITARY SEWER PARALLELS A WATERLINE, THE SEWER SHALL BE CONSTRUCTED OF CAST IRON, DUCTILE IRON, OR PVC MEETING ASTM SPECIFICATIONS WITH A PRESSURE RATING OF 150 PSI FOR BOTH THE PIPE AND JOINTS. THE VERTICAL SEPARATION SHALL BE A MINIMUM OF TWO FEET BETWEEN OUTSIDE DIAMETERS AND THE HORIZONTAL SEPARATION SHALL BE A MINIMUM OF FOUR FEET BETWEEN OUTSIDE DIAMETERS. THE SEWER SHALL BE LOCATED BELOW THE WATERLINE.
   - 6.B. WHERE A SANITARY SEWER CROSSES A WATERLINE AND THE SEWER IS CONSTRUCTED OF CAST IRON, DUCTILE IRON, OR PVC WITH A MINIMUM PRESSURE RATING OF 150 PSI, AN ABSOLUTE MINIMUM DISTANCE OF 12 INCHES BETWEEN OUTSIDE DIAMETERS SHALL BE MAINTAINED AND WATERLINE SHALL BE ENCASED.
   - 6.C. WHERE A SANITARY SEWER CROSSES UNDER A WATERLINE AND THE SEWER IS CONSTRUCTED OF ABS TRUSS PIPE, SIMILAR SEMI-RIGID PLASTIC COMPOSITE PIPE, CLAY PIPE, OR CONCRETE PIPE WITH GASKETED JOINTS, A MINIMUM TWO FOOT SEPARATION DISTANCE SHALL BE MAINTAINED. IN ADDITION, THE SEWER SHALL BE LOCATED BELOW THE WATERLINE WHERE POSSIBLE AND ONE LENGTH OF THE SEWER PIPE MUST BE CENTERED ON THE WATERLINE.
   - 6.D. WHERE A SANITARY SEWER CROSSES OVER A WATERLINE ALL PORTIONS OF THE SEWER WITHIN NINE FEET OF THE WATERLINE SHALL BE CONSTRUCTED OF CAST IRON, DUCTILE IRON, OR PVC PIPE WITH A PRESSURE RATING OF AT LEAST 150 PSI USING APPROPRIATE ADAPTERS. IN LIEU OF THIS PROCEDURE, THE NEW CONVEYANCE MAY BE ENCASED IN A JOINT OF 150 PSI PRESSURE CLASS PIPE AT LEAST 18 FEET LONG AND TWO NOMINAL SIZES LARGER THAN THE NEW CONVEYANCE. THE SPACE AROUND THE CARRIER PIPE SHALL BE SUPPORTED AT FIVE FEET INTERVALS WITH SPACERS OR BE FILLED TO THE SPRING LINE WITH WASHED SAND. THE ENCASEMENT PIPE SHOULD BE CENTERED ON THE CROSSING AND BOTH ENDS SEALED WITH CEMENT GROUT OR MANUFACTURED SEAL.
   - 6.E. THE SANITARY SEWER NEED NOT BE DISTURBED WHERE A NEW WATERLINE IS TO BE INSTALLED PARALLEL TO AN EXISTING SEWER THAT SHOWS NO EVIDENCE OF LEAKAGE AND THE WATERLINE IS INSTALLED ABOVE THE SEWER A MINIMUM OF TWO FEET VERTICALLY AND FOUR FEET HORIZONTALLY.
   - 6.F. THE SANITARY SEWER NEED NOT BE DISTURBED WHERE A NEW WATERLINE IS TO CROSS OVER BY TWO FEET OR MORE AN EXISTING SEWER SHOWING NO EVIDENCE OF LEAKAGE. SHOULD EXCAVATION FOR THE WATERLINE PRODUCE EVIDENCE THAT THE SEWER IS LEAKING, THE SEWER MUST BE REPAIRED OR REPLACED AS DESCRIBED IN SUBPARAGRAPH (6.C) OR (6.D).
7. CONTRACTOR TO VERIFY ALL EXISTING SEWER FLOW LINES BEFORE BEGINNING CONSTRUCTION.
8. CONTRACTOR SHALL TIE A ONE INCH WIDE PIECE OF RED PLASTIC FLAGGING TO THE END OF SEWER SERVICE AND SHALL LEAVE A MINIMUM OF 36 INCHES OF FLAGGING EXPOSED AFTER BACKFILL. AFTER CURB AND PAVING IS COMPLETED, CONTRACTOR SHALL MARK THE LOCATION OF THE SEWER SERVICE ON THE CURB OR ALLEY IN ACCORDANCE WITH FORT BEND COUNTY M.U.D. No. 116 SPECIFICATIONS.
9. ALL SANITARY SEWER LINES SHALL BE TESTED IN ACCORDANCE WITH THE FORT BEND COUNTY M.U.D. No. 116 SPECIFICATIONS.
10. THE UTILITY CONTRACTOR SHALL INSTALL THE WATER SERVICES TO A POINT TWO FEET BACK OF THE CURB LINE AT A DEPTH OF 12 INCHES. THE METER BOX SHALL BE FURNISHED AND INSTALLED BY THE CONTRACTOR AFTER THE PAVING CONTRACTOR HAS COMPLETED THE FINE GRADING BEHIND THE BACK OF THE CURB. EACH SERVICE LOCATION SHALL BE MARKED ON THE CURB WITH A BLUE LETTER "W" BY THE UTILITY CONTRACTOR AND TIED TO PROPERTY CORNERS ON THE "RECORD DRAWINGS."
11. ALL METER BOXES SHALL BE LOCATED IN NON-TRAFFIC AREAS.
12. TRENCH BACKFILL MATERIAL SHALL CONFORM TO THE FORT BEND COUNTY M.U.D. No. 116 SPECIFICATIONS AND SHALL BE MECHANICALLY COMPACTED IN 6-INCH LIFTS TO THE TOP OF SUBGRADE TO A MINIMUM OF 95% STANDARD PROCTOR DENSITY IN ACCORDANCE WITH FORT BEND COUNTY M.U.D. No. 116 SPECIFICATIONS UNLESS OTHERWISE SHOWN ON THESE PLANS OR STATED IN THE FORT BEND COUNTY M.U.D. No. 116 SPECIFICATIONS.
13. EMBEDMENT SHALL CONFORM TO FORT BEND COUNTY M.U.D. No. 116 SPECIFICATIONS UNLESS OTHERWISE SHOWN ON THESE PLANS OR STATED IN THE FORT BEND COUNTY M.U.D. No. 116 SPECIFICATIONS.
14. VALVE BOXES SHALL BE FURNISHED AND SET ON EACH GATE VALVE. AFTER THE FINAL CLEAN-UP AND ALIGNMENT HAS BEEN COMPLETED, THE UTILITY CONTRACTOR SHALL POUR A 24"X24"X6" CONCRETE BLOCK AROUND ALL VALVE BOX TOPS LEVEL WITH THE FINISHED GRADE.
15. CONTRACTOR SHALL RECONNECT ALL EXISTING SERVICES AND MAINTAIN EXISTING SERVICES THROUGHOUT CONSTRUCTION.
16. IF REQUIRED DUE TO CONSTRUCTION, POWER POLES TO BE BRACED OR RELOCATED AT CONTRACTOR'S EXPENSE.

APPROVED: _____ DEVELOPMENT COORDINATOR

DATE: _____

NO.	DATE	REVISION

Pacheco Koch
20445 STATE HWY 249, SUITE 380
HOUSTON, TX 77070 281.883.0103
TX REG. ENGINEERING FIRM F-14439
TX REG. SURVEYING FIRM LS-10008000

WATER PLAN
MERCEDES BENZ SPRINTER & CERTIFIED PRE-OWNED CAR DEALERSHIP
CITY OF RICHMOND, FORT BEND COUNTY, TEXAS

DESIGN	DRAWN	DATE	SCALE	NOTES	FILE	NO.
KFW	BKE	JAN 2018	1"=40'			C6.01

STATE OF TEXAS
KYLE F. WHITIS
101330
LICENSED PROFESSIONAL ENGINEER
01/04/2018

THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY KYLE F. WHITIS, P.E. 101330 ON 01/04/2018. ALTERATION OF A SEALED DOCUMENT WITHOUT PROPER NOTIFICATION TO THE RESPONSIBLE ENGINEER IS AN OFFENSE UNDER THE TEXAS ENGINEERING PRACTICE ACT.

MB SPRINTER CPO

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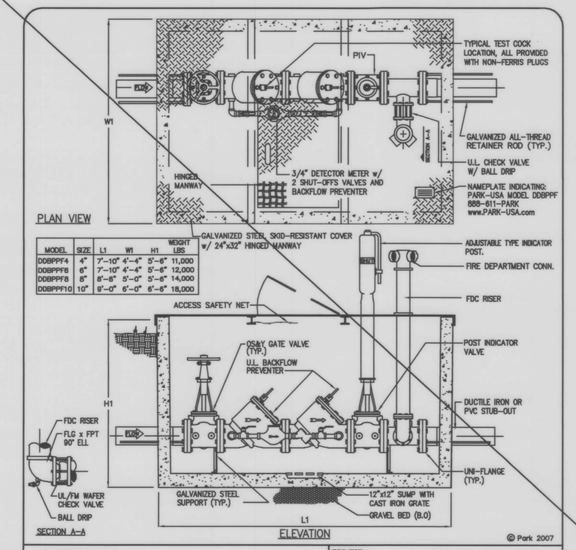


MODEL	SIZE	L1	W1	H1	WEIGHT LBS
DDBPPF4	4"	7'-10"	4'-4"	5'-8"	11,000
DDBPPF6	6"	7'-10"	4'-4"	5'-8"	12,000
DDBPPF8	8"	8'-6"	5'-0"	5'-8"	14,000
DDBPPF10	10"	9'-0"	5'-0"	6'-8"	18,000

Specifications

CONCRETE : Class 1 concrete with design strength of 4500 PSI at 28 days. Unit is of monolithic construction at floor and first stage of wall with sectional riser to required depth.

REINFORCEMENT: Grade 60 reinforced. Steel rebar conforming to ASTM A615 on required centers or equal.

STEEL COVER: 1/4" steel skid-resistant floor plate welded to 3" angle frame with (2) 3"x2-3/8" I beam supports.

Engineering Data

The backflow assembly shall be factory assembled in vault & hydrostatically tested prior to delivery. Field excavation & preparation shall be complete prior to delivery. Pipe, valves and fittings of the assembly shall be approved by one or more of the following associations:

AWWA UL FM

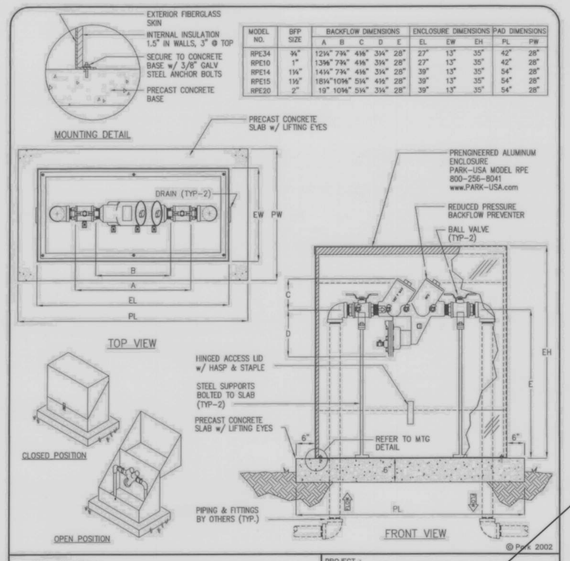
PROJECT :
CUSTOMER :
ARCHITECT :
ENGINEER :
ORDER # :
DATE :

PARK ENVIRONMENTAL EQUIPMENT 888-611-PARK www.park-USA.com

"Expect the Best"

4" THRU 10" DETECTOR CHECK BACKFLOW FLOW PREVENTER ASSEMBLY w/ PIV & FDC

SCALE	NONE	DWG. NO.	REV.
DATE	1/07	DDBPPF-1	A



MODEL NO.	BFP SIZE	BACKFLOW DIMENSIONS A	B	C	D	E	ENCLOSURE DIMENSIONS EL	EW	EH	PAD DIMENSIONS PL	PW
RPE34	9¾"	12¾"	7¾"	4⅛"	3¼"	28"	27"	13"	35"	42"	28"
RPE10	1"	13⅜"	7¾"	4⅛"	3¼"	28"	27"	13"	35"	42"	28"
RPE14	1¼"	14⅛"	7¾"	4⅛"	3¼"	28"	39"	13"	35"	54"	28"
RPE15	1½"	18⅛"	10⅝"	5¼"	4⅛"	28"	39"	13"	35"	54"	28"
RPE20	2"	19"	10⅝"	5¼"	3¼"	28"	39"	13"	35"	54"	28"

Specifications

CONCRETE : Class 1 concrete with design strength of 4500 PSI at 28 days.

REINFORCEMENT: Grade 60 reinforced. Steel rebar conforming to ASTM A615 on required centers or equal.

Typical Applications

RP devices are used to protect against high hazard (toxic) fluids in water services to industrial plants, hospital facilities, morgues, mortuaries, and chemical plants. They are also used in irrigation systems, boiler feed, water lines and other installations requiring maximum protection.

Engineering Data

The backflow assembly shall be factory assembled on pad & hydrostatically tested prior to delivery. Field excavation & preparation shall be complete prior to delivery. Pipe, valves and fittings of the assembly shall be approved by one or more of the following associations:

AWWA

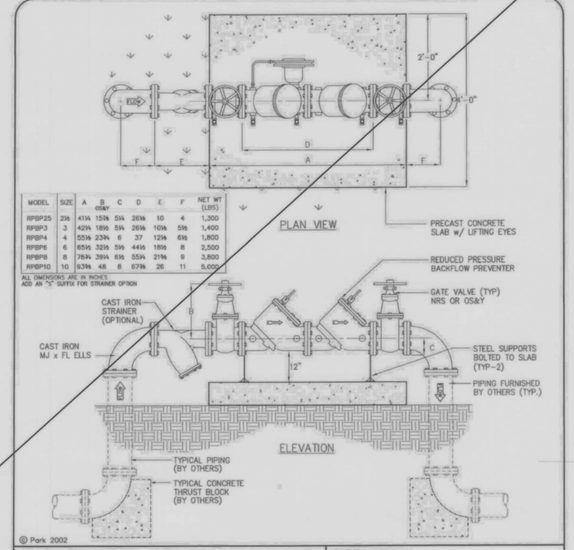
PROJECT :
CUSTOMER :
ARCHITECT :
ENGINEER :
ORDER # :
DATE :

PARK ENVIRONMENTAL EQUIPMENT 888-611-PARK www.park-USA.com

"Expect the Best"

REDUCED PRESSURE BACKFLOW PREVENTER ON PRECAST CONCRETE PAD

SCALE	NONE	DWG. NO.	REV.
		RPE-1	A



MODEL	SIZE	A	B OS&Y	C	D	E	F	NET WT (LBS)
RPBP25	2½	41¼	15⅞	5¼	26⅛	10	4	1,300
RPBP3	3	42¾	18⅝	5¼	26⅛	10½	5½	1,400
RPBP4	4	55⅛	23¾	6	37	12⅛	6½	1,800
RPBP6	6	65½	32⅜	5½	44⅛	18⅛	8	2,500
RPBP8	8	78¾	39⅛	6½	55¾	21⅛	9	3,800
RPBP10	10	93⅜	48	8	67⅜	26	11	5,000

ALL DIMENSIONS ARE IN INCHES
ADD AN "S" SUFFIX FOR STRAINER OPTION

Specifications

CONCRETE : Class 1 concrete with design strength of 4500 PSI at 28 days.

REINFORCEMENT: Grade 60 reinforced. Steel rebar conforming to ASTM A615 on required centers or equal.

Typical Applications

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Engineering Data

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AWWA UL FM

PROJECT :
CUSTOMER:
ARCHITECT :
ENGINEER :
ORDER # :
DATE :

PARK ENVIRONMENTAL EQUIPMENT 888-611-PARK www.park-USA.com

"Expect the Best"

REDUCED PRESSURE BACKFLOW PREVENTER w/ STRAINER ON PRECAST CONCRETE PAD

SCALE	NONE	DWG. NO.	REV.
DATE	1/06	RPBPS-1	A

VOID

APPROVED: _____
DEVELOPMENT COORDINATOR

DATE: _____

STATE OF TEXAS
KYLE F. WHITIS
101330
LICENSED PROFESSIONAL ENGINEER
01/04/2018

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NO.	DATE	REVISION

Pacheco Koch
20445 STATE HWY 249, SUITE 380
HOUSTON, TX 77070 281.883.0103
TX REG. ENGINEERING FIRM F-14439
TX REG. SURVEYING FIRM LS-10008000

WATER DETAILS
MERCEDES BENZ SPRINTER & CERTIFIED PRE-OWNED CAR DEALERSHIP
CITY OF RICHMOND, FORT BEND COUNTY, TEXAS

DESIGN	DRAWN	DATE	SCALE	NOTES	FILE	NO.
KFW	BKE	JAN 2018				C6.02

MB SPRINTER CPO

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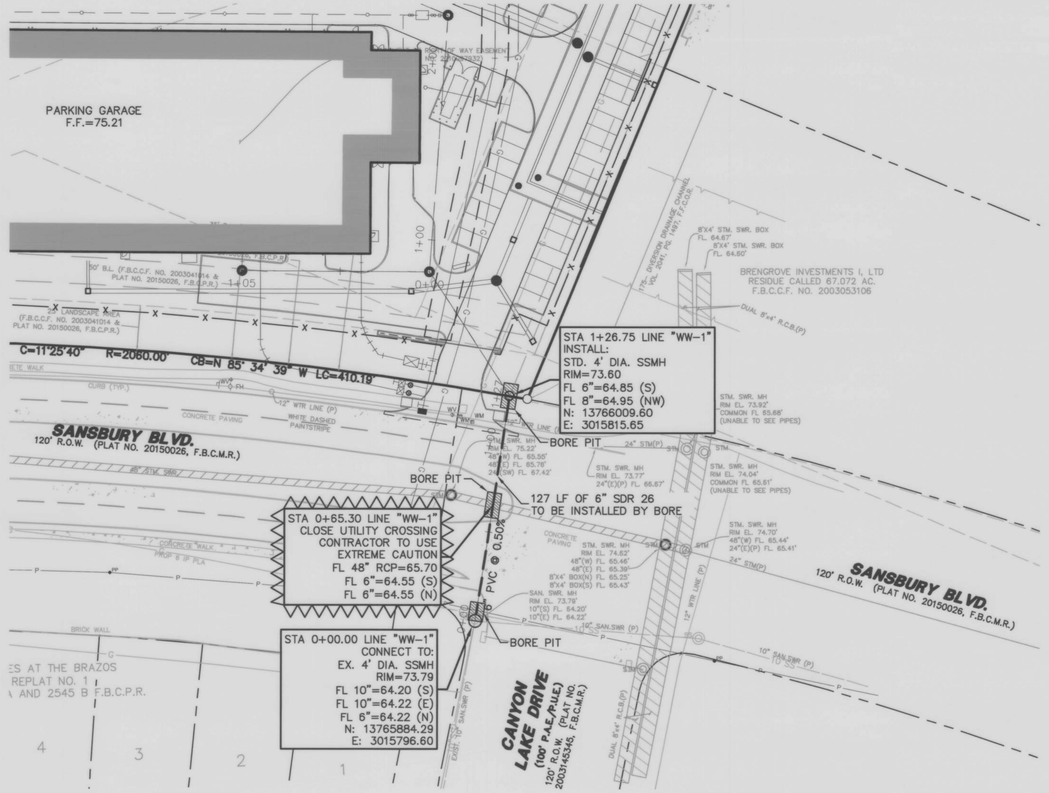
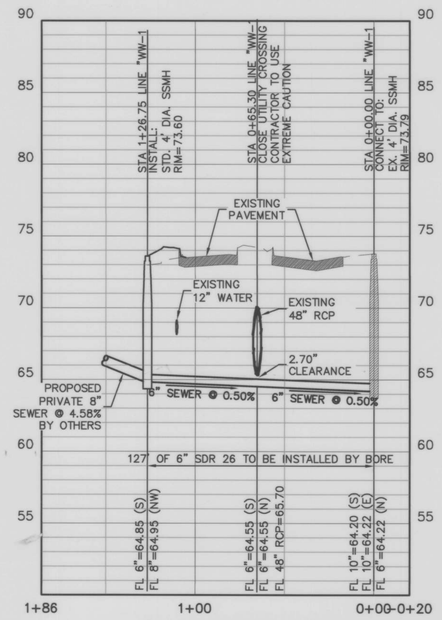




PROFILE: WW-1

LEGEND

	BOLLARD
EM	ELECTRIC METER
PP	POWER POLE
LS	LIGHT STANDARD
WM	WATER METER
WV	WATER VALVE
ICV	IRRIGATION CONTROL VALVE
FH	FIRE HYDRANT
CO	CLEANOUT
MH	MANHOLE
TSC	TRAFFIC SIGNAL CONTROL
TSP	TRAFFIC SIGNAL POLE
TELE	TELEPHONE BOX
	FLOOD LIGHT
FP	FLAG POLE
SIGN	TRAFFIC SIGN
IRS	1/2-INCH IRON ROD W/"PACHECH KOCH" CAP SET
(C.M.)	CONTROLLING MONUMENT
	PROPERTY LINE
X	FENCE
OHL	OVERHEAD UTILITY LINE
E	UNDERGROUND ELECTRIC LINE
T	UNDERGROUND TELEPHONE LINE
C	UNDERGROUND CABLE LINE
6"W	UNDERGROUND WATER LINE
6"SS	UNDERGROUND CABLE LINE
61.3	EXIST CONTOUR

REFER TO CITY OF RICHMOND STANDARD NOTES.

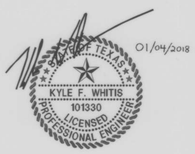
EQUIVALENT SINGLE FAMILY UNITS ARE BASED ON EXHIBIT C IN THE MUNICIPAL UTILITY DISTRICT'S RATE ORDER.

1 EQUIVALENT SINGLE-FAMILY UNIT = 315 GPD
GROSS SHOWROOM SQ FOOTAGE = 61,317 SQFT.
RETAIL SPACE = 0.07 GPD/SQFT.
1 COMMERCIAL CAR WASH W/O WATER RECLAIM = 1,200 GPD
TOTAL EQUIVALENT SINGLE FAMILY UNITS = [(61,317)(.07)+1200]/315
TOTAL EQUIVALENT SINGLE FAMILY UNITS = 17.44 UNITS

BENCH MARK LIST

BENCHMARK	PROJECT BENCHMARK IS NGS MONUMENT DESIGNATION "A 1212" /P.I.D. "AW4725", BEING A BENCH MARK SET IN A CULVERT HEADWALL 3.25 MI NE OF SUGARLAND AT THE NORTHWEST CORNER OF THE JUNCTION OF A ROAD NORTH TO TEXAS DEPT. OF CORRECTIONS JESTER UNIT IN THE TOP AND 2.0 FEET EAST OF THE WEST END OF THE NORTH CONCRETE HEADWALL OF DOUBLE CONCRETE PIPE CULVERTS. ELEV=78.18'
T.B.M. "A"	TEMPORARY BENCHMARK "A" IS A TXDOT BRASS DISK LOCATED APPROXIMATELY 2200' NORTHEAST OF THE INTERSECTION OF GRAND ESTATES DRIVE AND US HIGHWAY 59, APPROXIMATELY 143' SOUTH OF THE SOUTH EDGE OF PAVEMENT OF US HIGHWAY 59 NORTHBOUND FEEDER, ON THE WEST END OF A HEADWALL LOCATED APPROXIMATELY 45' NORTHWEST OF THE NORTHEAST CORNER OF THE SUBJECT PROPERTY. ELEV=73.09'

APPROVED: DEVELOPMENT COORDINATOR
DATE: 4/13/18



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NO.	DATE	REVISION

Pacheco Koch
20445 STATE HWY 249, SUITE 380
HOUSTON, TX 77070 281.883.0103
TX REG. ENGINEERING FIRM F-14439
TX REG. SURVEYING FIRM LS-10008000

PUBLIC SANITARY SEWER PLAN & PROFILE
MERCEDES BENZ SPRINTER & CERTIFIED PRE-OWNED CAR DEALERSHIP
CITY OF RICHMOND, FORT BEND COUNTY, TEXAS

DESIGN	DRAWN	DATE	SCALE	NOTES	FILE	NO.
KFW	BKE	JAN 2018	1"=40'			C6.03

MB SPRINTER CPO

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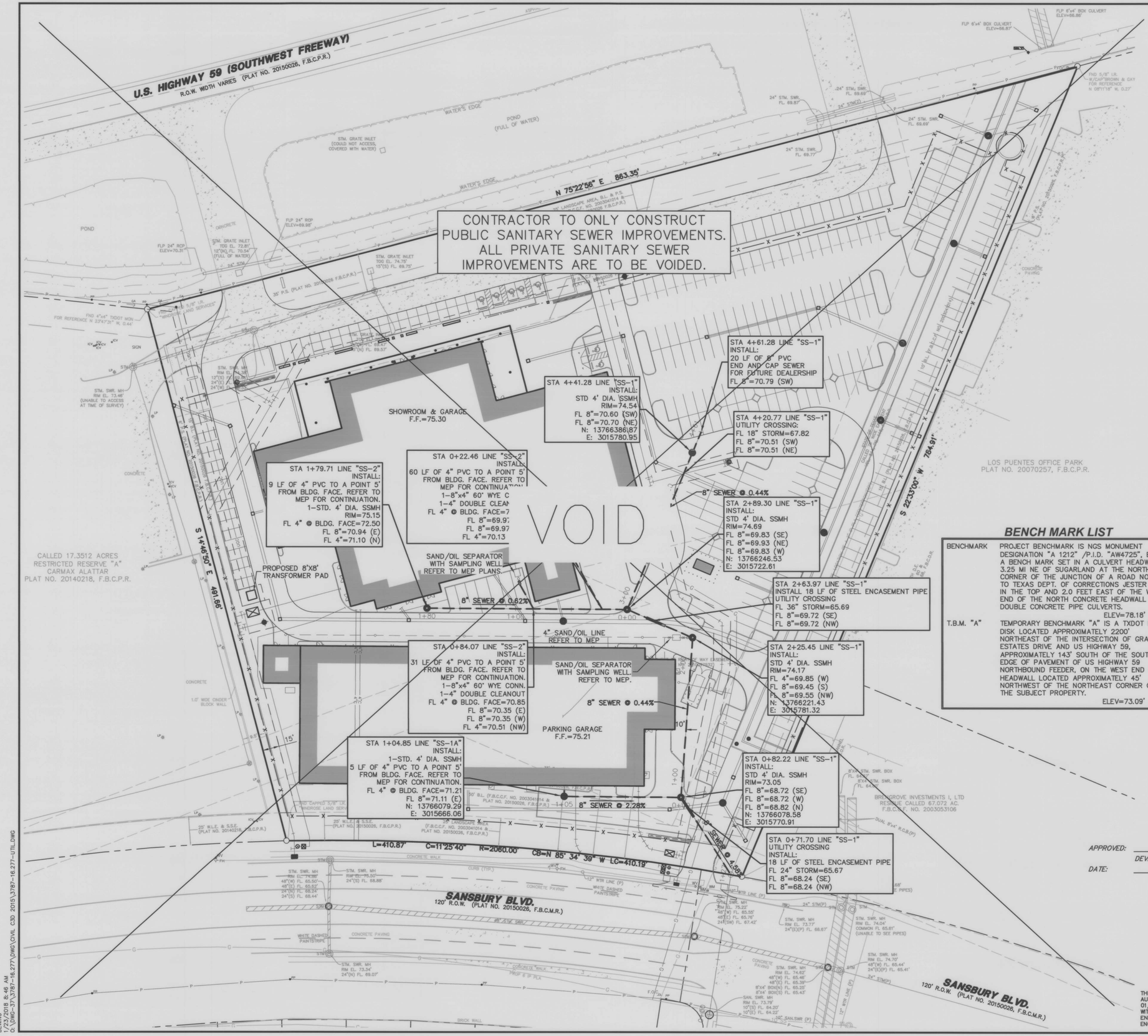

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GRAPHIC SCALE IN FEET

LEGEND

- BOLLARD
- ELECTRIC METER
- POWER POLE
- LIGHT STANDARD
- WATER METER
- WATER VALVE
- IRRIGATION CONTROL VALVE
- FIRE HYDRANT
- CLEANOUT
- MANHOLE
- TRAFFIC SIGNAL CONTROL
- TRAFFIC SIGNAL POLE
- TELEPHONE BOX
- FLOOD LIGHT
- FLAG POLE
- TRAFFIC SIGN
- IRS: 1/2-INCH IRON ROD W/"PACHECH KOCH" CAP SET
- (C.M.): CONTROLLING MONUMENT
- PROPERTY LINE
- X: FENCE
- OHL: OVERHEAD UTILITY LINE
- E: UNDERGROUND ELECTRIC LINE
- T: UNDERGROUND TELEPHONE LINE
- C: UNDERGROUND CABLE LINE
- 6"W: UNDERGROUND WATER LINE
- 6"SS: UNDERGROUND CABLE LINE
- 613: EXIST CONTOUR

WATER & SANITARY SEWER GENERAL NOTES

1. ALL CONCRETE SHALL BE CLASS "A" (3000 PSI), UNLESS OTHERWISE NOTED.
2. ALL WATER MAINS SHALL BE PVC C900, DR 18, CLASS 235. FIRE PROTECTION SERVICES SHALL BE PVC C900, DR 14, CLASS 305 AND INSTALLED IN ACCORDANCE WITH THE DESIGN AND SPECIFICATIONS OF THE FIRE PROTECTION PLANS TO BE PREPARED BY A LICENSED FIRE PROTECTION CONTRACTOR.
3. WATER AND SANITARY SEWER SERVICES SHALL MEET PLUMBING CODE REQUIREMENTS.
4. ALL WATER MAINS SHALL HAVE A MINIMUM COVER OF 48 INCHES BELOW IMPROVED FINISHED GRADE, UNLESS OTHERWISE NOTED.
5. SANITARY SEWER PIPE SHALL BE PVC SDR-26.
6. WHEN WATER MAINS AND SANITARY SEWERS ARE INSTALLED, THEY SHALL BE INSTALLED NO CLOSER TO EACH OTHER THAN NINE FEET IN ALL DIRECTIONS AND PARALLEL LINES MUST BE INSTALLED IN SEPARATE TRENCHES. WHERE THE NINE FOOT SEPARATION DISTANCE CANNOT BE ACHIEVED, THE FOLLOWING GUIDELINES SHALL APPLY:
   - 6.A. WHERE A SANITARY SEWER PARALLELS A WATERLINE, THE SEWER SHALL BE CONSTRUCTED OF CAST IRON, DUCTILE IRON, OR PVC MEETING ASTM SPECIFICATIONS WITH A PRESSURE RATING OF 150 PSI FOR BOTH THE PIPE AND JOINTS. THE VERTICAL SEPARATION SHALL BE A MINIMUM OF TWO FEET BETWEEN OUTSIDE DIAMETERS AND THE HORIZONTAL SEPARATION SHALL BE A MINIMUM OF FOUR FEET BETWEEN OUTSIDE DIAMETERS. THE SEWER SHALL BE LOCATED BELOW THE WATERLINE.
   - 6.B. WHERE A SANITARY SEWER CROSSES A WATERLINE AND THE SEWER IS CONSTRUCTED OF CAST IRON, DUCTILE IRON, OR PVC WITH A MINIMUM PRESSURE RATING OF 150 PSI, AN ABSOLUTE MINIMUM DISTANCE OF 12 INCHES BETWEEN OUTSIDE DIAMETERS SHALL BE MAINTAINED AND WATERLINE SHALL BE ENCASED.
   - 6.C. WHERE A SANITARY SEWER CROSSES UNDER A WATERLINE AND THE SEWER IS CONSTRUCTED OF ABS TRUSS PIPE, SIMILAR SEMI-RIGID PLASTIC COMPOSITE PIPE, CLAY PIPE, OR CONCRETE PIPE WITH GASKETED JOINTS, A MINIMUM TWO FOOT SEPARATION DISTANCE SHALL BE MAINTAINED. IN ADDITION, THE SEWER SHALL BE LOCATED BELOW THE WATERLINE WHERE POSSIBLE AND ONE LENGTH OF THE SEWER PIPE MUST BE CENTERED ON THE WATERLINE.
   - 6.D. WHERE A SANITARY SEWER CROSSES OVER A WATERLINE ALL PORTIONS OF THE SEWER WITHIN NINE FEET OF THE WATERLINE SHALL BE CONSTRUCTED OF CAST IRON, DUCTILE IRON, OR PVC PIPE WITH A PRESSURE RATING OF AT LEAST 150 PSI USING APPROPRIATE ADAPTERS. IN LIEU OF THIS PROCEDURE, THE NEW CONVEYANCE MAY BE ENCASED IN A JOINT OF 150 PSI PRESSURE CLASS PIPE AT LEAST 18 FEET LONG AND TWO NOMINAL SIZES LARGER THAN THE NEW CONVEYANCE. THE SPACE AROUND THE CARRIER PIPE SHALL BE SUPPORTED AT FIVE FEET INTERVALS WITH SPACERS OR BE FILLED TO THE SPRING LINE WITH WASHED SAND. THE ENCASEMENT PIPE SHOULD BE CENTERED ON THE CROSSING AND BOTH ENDS SEALED WITH CEMENT GROUT OR MANUFACTURED SEAL.
   - 6.E. THE SANITARY SEWER NEED NOT BE DISTURBED WHERE A NEW WATERLINE IS TO BE INSTALLED PARALLEL TO AN EXISTING SEWER THAT SHOWS NO EVIDENCE OF LEAKAGE AND THE WATERLINE IS INSTALLED ABOVE THE SEWER A MINIMUM OF TWO FEET VERTICALLY AND FOUR FEET HORIZONTALLY.
   - 6.F. THE SANITARY SEWER NEED NOT BE DISTURBED WHERE A NEW WATERLINE IS TO CROSS OVER BY TWO FEET OR MORE AN EXISTING SEWER SHOWING NO EVIDENCE OF LEAKAGE. SHOULD EXCAVATION FOR THE WATERLINE PRODUCE EVIDENCE THAT THE SEWER IS LEAKING, THE SEWER MUST BE REPAIRED OR REPLACED AS DESCRIBED IN SUBPARAGRAPH (6.C) OR (6.D).
7. CONTRACTOR TO VERIFY ALL EXISTING SEWER FLOW LINES BEFORE BEGINNING CONSTRUCTION.
8. CONTRACTOR SHALL TIE A ONE INCH WIDE PIECE OF RED PLASTIC FLAGGING TO THE END OF SEWER SERVICE AND SHALL LEAVE A MINIMUM OF 36 INCHES OF FLAGGING EXPOSED AFTER BACKFILL. AFTER CURB AND PAVING IS COMPLETED, CONTRACTOR SHALL MARK THE LOCATION OF THE SEWER SERVICE ON THE CURB OR ALLEY IN ACCORDANCE WITH FORT BEND COUNTY M.U.D. No. 116 SPECIFICATIONS.
9. ALL SANITARY SEWER LINES SHALL BE TESTED IN ACCORDANCE WITH THE FORT BEND COUNTY M.U.D. No. 116 SPECIFICATIONS.
10. THE UTILITY CONTRACTOR SHALL INSTALL THE WATER SERVICES TO A POINT TWO FEET BACK OF THE CURB LINE AT A DEPTH OF 12 INCHES. THE METER BOX SHALL BE FURNISHED AND INSTALLED BY THE CONTRACTOR AFTER THE PAVING CONTRACTOR HAS COMPLETED THE FINE GRADING BEHIND THE BACK OF THE CURB. EACH SERVICE LOCATION SHALL BE MARKED ON THE CURB WITH A BLUE LETTER "W" BY THE UTILITY CONTRACTOR AND TIED TO PROPERTY CORNERS ON THE "RECORD DRAWINGS."
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BENCH MARK LIST

BENCHMARK	PROJECT BENCHMARK IS NGS MONUMENT DESIGNATION "A 1212" /P.I.D. "AW4725", BEING A BENCH MARK SET IN A CULVERT HEADWALL 3.25 MI NE OF SUGARLAND AT THE NORTHWEST CORNER OF THE JUNCTION OF A ROAD NORTH TO TEXAS DEPT. OF CORRECTIONS JESTER UNIT IN THE TOP AND 2.0 FEET EAST OF THE WEST END OF THE NORTH CONCRETE HEADWALL OF DOUBLE CONCRETE PIPE CULVERTS. ELEV=78.18'
T.B.M. "A"	TEMPORARY BENCHMARK "A" IS A TXDOT BRASS DISK LOCATED APPROXIMATELY 2200' NORTHEAST OF THE INTERSECTION OF GRAND ESTATES DRIVE AND US HIGHWAY 59, APPROXIMATELY 143' SOUTH OF THE SOUTH EDGE OF PAVEMENT OF US HIGHWAY 59 NORTHBOUND FEEDER, ON THE WEST END OF A HEADWALL LOCATED APPROXIMATELY 45' NORTHWEST OF THE NORTHEAST CORNER OF THE SUBJECT PROPERTY. ELEV=73.09'

APPROVED: _____ DEVELOPMENT COORDINATOR

DATE: _____

NO.	DATE	REVISION

Pacheco Koch
20445 STATE HWY 249, SUITE 380
HOUSTON, TX 77070 281.883.0103
TX REG. ENGINEERING FIRM F-14439
TX REG. SURVEYING FIRM LS-10008000

STATE OF TEXAS — KYLE F. WHITIS — 101330 — LICENSED PROFESSIONAL ENGINEER — 01/04/2018

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PRIVATE SANITARY SEWER PLAN

MERCEDES BENZ SPRINTER & CERTIFIED PRE-OWNED CAR DEALERSHIP

CITY OF RICHMOND, FORT BEND COUNTY, TEXAS

DESIGN	DRAWN	DATE	SCALE	NOTES	FILE	NO.
KFW	BKE	JAN 2018	1"=40'			C6.04

MB SPRINTER CPO

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1/23/2018 8:46 AM
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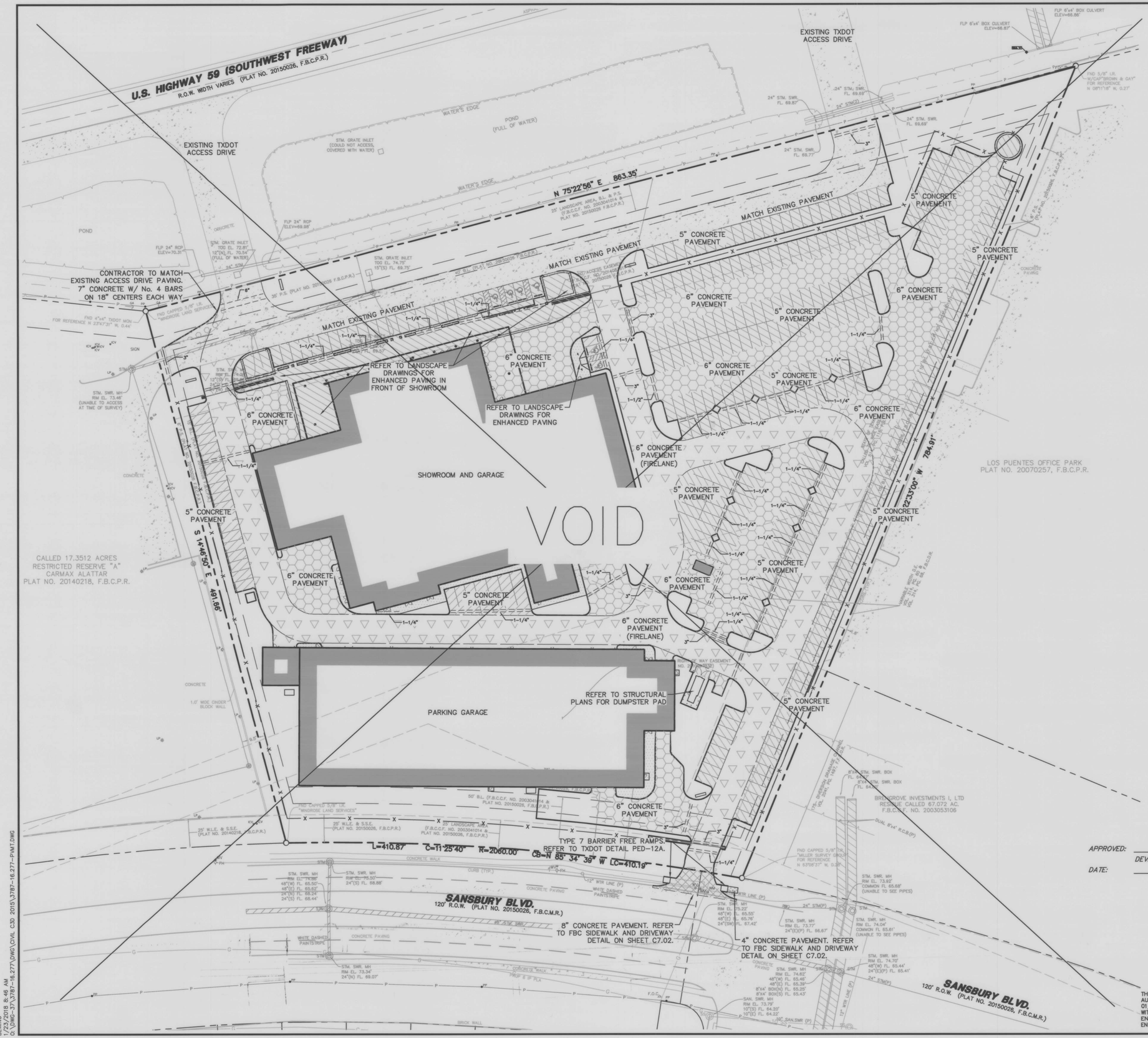

0 20 40 80 120

GRAPHIC SCALE IN FEET

LEGEND

- BL — BOLLARD
- EM — ELECTRIC METER
- PP — POWER POLE
- LS — LIGHT STANDARD
- WM — WATER METER
- WV — WATER VALVE
- ICV — IRRIGATION CONTROL VALVE
- FH — FIRE HYDRANT
- CO — CLEANOUT
- MH — MANHOLE
- TSC — TRAFFIC SIGNAL CONTROL
- TSP — TRAFFIC SIGNAL POLE
- TELE — TELEPHONE BOX
- JX — FLOOD LIGHT
- FP — FLAG POLE
- SIGN — TRAFFIC SIGN
- IRS — 1/2-INCH IRON ROD W/"PACHECO KOCH" CAP SET
- (C.M.) — CONTROLLING MONUMENT
- PROPERTY LINE
- FENCE
- 1-1/4" — IRRIGATION SLEEVE. REFER TO IRRIGATION PLANS FOR MORE INFORMATION
- PRIVATE SIDEWALK 4" REINFORCED CONCRETE PAVEMENT (5½" SACK CEMENT/CUYD., 3500 PSI)
- PUBLIC SIDEWALK 4" REINFORCED CONCRETE PAVEMENT (5½" SACK CEMENT/CUYD., 3500 PSI)
- PARKING AREAS, 5" REINFORCED CONCRETE PAVEMENT (5½" SACK CEMENT/CUYD., 3500 PSI)
- LIGHT ACCESS DRIVES, 6" REINFORCED CONCRETE PAVEMENT (5½" SACK CEMENT/CUYD., 3500 PSI)
- MEDIUM ACCESS DRIVES & FIRELANE, 6" REINFORCED CONCRETE PAVEMENT (5½" SACK CEMENT/CUYD., 3500 PSI)
- PUBLIC DRIVEWAY, 8" REINFORCED CONCRETE PAVEMENT (5½" SACK CEMENT/CUYD., 3500 PSI)

PAVING GENERAL NOTES

1. ALL DIMENSIONS ARE FROM BACK OF CURB UNLESS OTHERWISE NOTED.
2. ALL CONCRETE SHALL CONFORM TO STANDARD CITY SPECIFICATIONS UNLESS OTHERWISE SHOWN ON THESE PLANS OR STATED IN TXDOT STANDARD SPECIFICATIONS.
3. SUBGRADE PREPARATION IN RIGHT OF WAY SHALL CONFORM TO STANDARD CITY SPECIFICATIONS OR TXDOT STANDARD SPECIFICATIONS.
4. ALL FILL PLACED UNDER PAVING SHALL BE COMPACTED TO 95% STANDARD PROCTOR DENSITY IN 6 INCH LIFTS, UNLESS OTHERWISE NOTED, OR STATED IN GEOTECH REPORT. REFER TO STRUCTURAL SPECIFICATIONS FOR FILL PLACED BENEATH BUILDING AREAS. ALL OTHER FILL AREAS TO BE COMPACTED TO 90% STANDARD PROCTOR.
5. THE CONTRACTOR SHALL SUBMIT A JOINT SPACING PLAN TO THE ENGINEER FOR APPROVAL. EXPANSION JOINT SPACING SHALL BE 90' MAXIMUM EACH WAY WITH NO KEYWAYS AND SAWED DUMMY JOINTS SHALL BE 15' EACH WAY, UNLESS OTHERWISE NOTED.
6. TRANSVERSE CONSTRUCTION JOINTS SHALL BE USED AT THE END OF EACH DAYS PAVING AND WHERE INTERRUPTIONS SUSPEND OPERATIONS FOR 30 MINUTES OR MORE.
7. ALL PAVING TO BE REMOVED SHALL BE SAWCUT TO A NEAT LINE, MINIMUM 1-1/2" DEEP, AND THE PAVEMENT REMOVED IN SUCH A MANNER AS TO PRESERVE THE EXISTING TRANSVERSE REINFORCING STEEL TO THE MAXIMUM EXTENT POSSIBLE.
8. ALL CURB AND GUTTER SHALL BE INTEGRAL WITH THE PAVEMENT AND HAVE THE SAME COMPRESSIVE STRENGTH.
9. PAVEMENT REINFORCEMENT SHALL BE #3 BARS, SPACED AT 18 INCHES CENTER TO CENTER EACH WAY EXCEPT WHERE OTHERWISE NOTED IN THE PLANS OR GEOTECH REPORT.
10. BAR LAPS SHALL BE 30 DIAMETERS IN LENGTH.
11. ALL STRIPES SHALL BE 4 INCHES WIDE, UNLESS OTHERWISE NOTED.
12. INSTALLATION AND PLACEMENT OF IRRIGATION SLEEVES AND UTILITY CONDUITS SHALL BE IN ACCORDANCE WITH LANDSCAPE ARCHITECT AND MEP PLANS. CONTRACTOR TO VERIFY ALL SLEEVES HAVE BEEN PLACED PRIOR TO PAVING BEING PLACED.
13. SIDEWALKS AND ACCESSIBLE ROUTES SHALL HAVE A RUNNING SLOPE NO GREATER THAN 5% (UNLESS OTHERWISE NOTED) AND A CROSS SLOPE NO GREATER THAN 2%.

APPROVED: _____

DEVELOPMENT COORDINATOR

DATE: _____

NO.	DATE	REVISION
3	03/07/2017	ADDENDUM 3

LICENSED PROFESSIONAL ENGINEER — KYLE F. WHITIS — 101330 — STATE OF TEXAS — 01/04/2018

THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY KYLE F. WHITIS, P.E. 101330 ON 01/04/2018. ALTERATION OF A SEALED DOCUMENT WITHOUT PROPER NOTIFICATION TO THE RESPONSIBLE ENGINEER IS AN OFFENSE UNDER THE TEXAS ENGINEERING PRACTICE ACT.

Pacheco Koch
20445 STATE HWY 249, SUITE 380
HOUSTON, TX 77070 281.883.0103
TX REG. ENGINEERING FIRM F-14439
TX REG. SURVEYING FIRM LS-10008000

PAVING PLAN

MERCEDES BENZ SPRINTER & CERTIFIED PRE-OWNED CAR DEALERSHIP

CITY OF RICHMOND, FORT BEND COUNTY, TEXAS

DESIGN	DRAWN	DATE	SCALE	NOTES	FILE	NO.
KFW	BKE	JAN 2018	1"=40'			C7.01

MB SPRINTER CPO

BEWING
1/23/2018 8:46 AM
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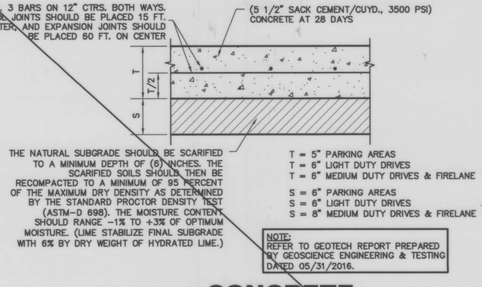
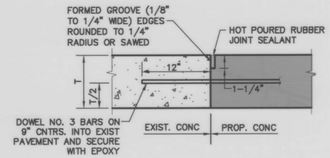


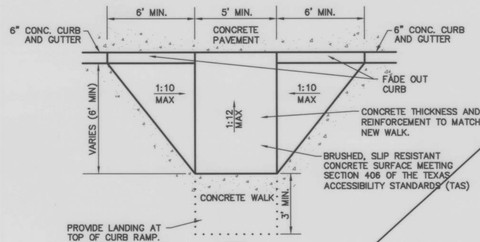
1 CONCRETE PAVEMENT SECTION

NOT TO SCALE



2 PAVEMENT CONNECTION

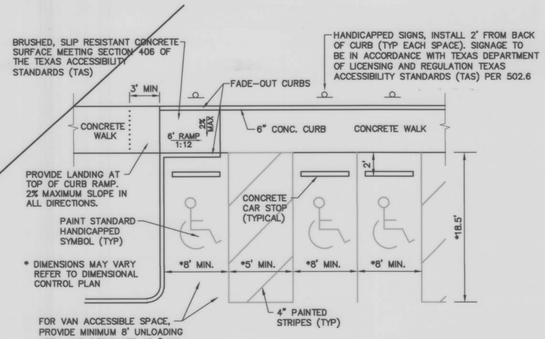
NOT TO SCALE



NOTES:
1. MAXIMUM RUNNING SLOPE FOR ALL PATHS IS 5% MAXIMUM CROSS SLOPE IS 2% FOR THE FIRST FIVE FEET FROM THE DOOR A 2% SLOPE (MAX) MUST BE MAINTAINED.
2. SIGNAGE AND MARKINGS TO BE IN ACCORDANCE WITH FEDERAL, STATE AND LOCAL REGULATIONS.

3 FLARED CURB RAMP

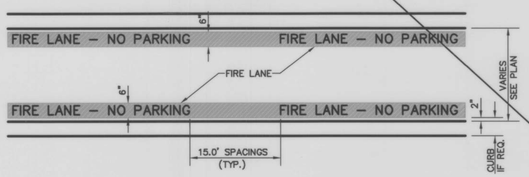
NOT TO SCALE (PRIVATE ONLY)



NOTES:
1. MAXIMUM RUNNING SLOPE FOR ALL PATHS IS 5% MAXIMUM CROSS SLOPE IS 2% FOR THE FIRST FIVE FEET FROM THE DOOR A 2% SLOPE (MAX) MUST BE MAINTAINED.
2. SIGNAGE AND MARKINGS TO BE IN ACCORDANCE WITH FEDERAL, STATE, AND LOCAL REGULATIONS.

4 90° HANDICAP PARKING & SINGLE CURB RAMP

NOT TO SCALE (PRIVATE ONLY)



GENERAL NOTE:

A. STRIPING TO BE DONE IN ACCORDANCE WITH CITY STANDARDS.

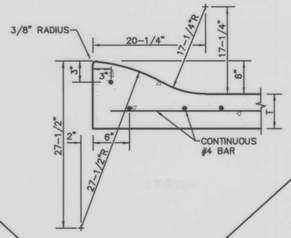
STRIPING DETAIL NOTE:

A. PAINT:
1. STRIPE SHALL BE SIX (6) INCHES WIDE PAINTED WITH AN EXTERIOR ACRYLIC LATEX PAINT.
   A. COLOR SHALL BE "TRAFFIC RED" GLIDDEN NO. 63251 OR EQUAL.
2. LETTERS SHALL BE FOUR (4) INCHES HIGH PAINTED WITH AN EXTERIOR ACRYLIC LATEX PAINT.
   B. COLOR SHALL BE "TRAFFIC WHITE" GLIDDEN NO. 563245 OR EQUAL.

B. APPLICATION:
1. STRIPE MAY BE BRUSHED OR SPRAYED, ONE COAT TO FINISH.
2. LETTERS SHALL BE STENCIL FORMED, BRUSH APPLIED AND SPACED AS DETAILED ON THIS SHEET.

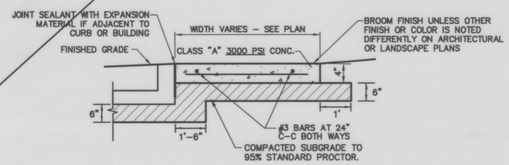
5 FIRE LANE STRIPING

NOT TO SCALE



MOUNTABLE CURB

VOID



PROVIDE BITUMINOUS EXPANSION MATERIAL WHERE WALK ABUTS EXISTING IMPROVEMENTS AND AT ALL CHANGES IN GRADE

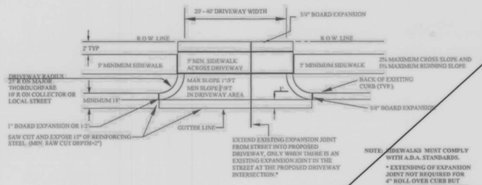
PROVIDE TOOLED JOINTS AT SPACING EQUAL TO WIDTH. PROVIDE REDWOOD EXPANSION JOINTS AT 32' SPACING UNLESS NOTED DIFFERENTLY ON ARCHITECTURAL OR LANDSCAPE PLANS

7 CONCRETE WALK PRIVATE

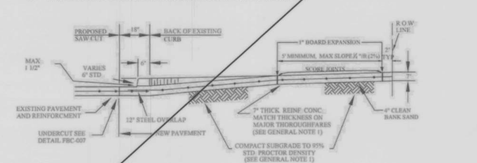
NOT TO SCALE

WHEN A COMMERCIAL SIDEWALK, DRIVEWAY, CURB OR GUTTER IS CONSTRUCTED, RECONSTRUCTED, REPAIRED OR REGRADED ON COUNTY RIGHT-OF-WAY. FOR USE WITH CONCRETE OR ASPHALT CURB TYPE STREETS, USE SECTIONS APPLICABLE.

A. USE FOR ALL PROPOSED EXISTING CURB REMOVAL FOR DRIVEWAYS (PLAN VIEW NOT TO SCALE)



B. USE FOR ALL PROPOSED DRIVES ON CURBED TYPE STREETS



GENERAL NOTES:

1. COMPACT SUBGRADE FOR PROPOSED DRIVEWAY CONNECTION FROM PROPOSED SAW CUT AT EXISTING PAVEMENT TO R.O.W. LINE, COMPACT TO 95% OF STANDARD PROCTOR DENSITY(+- 2% OPT. MOISTURE). THE COUNTY ENGINEER RESERVES THE RIGHT TO REQUIRE LABORATORY TESTS TO BE CONDUCTED.
2. PROPOSED DRIVEWAY REINFORCING STEEL IS TO BE #4 DEFORMED REINFORCING BARS (ASTM A615, GRADE 60, UNLESS NOTED) SPACED AT 24" O.C., EACH WAY, WITH 12" MINIMUM LAP FROM PROPOSED SAW CUT TO R.O.W. LINE.
3. PROPOSED DRIVEWAY SHALL BE CONSTRUCTED WITH PORTLAND CEMENT (5 SACKS 3500PSI OF CEMENT PER CUBIC YARD OF CONCRETE), CLASS "A" STRUCTURAL (REFER TO SPECIFICATION 03301), 7" THICK, FROM PROPOSED SAW CUT TO R.O.W. LINE.
4. PROPOSED SIDEWALK SHALL BE CONSTRUCTED WITH PORTLAND CEMENT (5 SACKS 560 PSI OF CEMENT PER CUBIC YARD OF CONCRETE), CLASS "A" STRUCTURAL (REFER TO SPECIFICATION 03301), 4" THICK.
5. FOR TYPICAL SIDEWALK DETAIL SEE FBC-051.

SIDEWALKS & DRIVEWAYS ON CURB TYPE STREETS COMMERCIAL AREA	DRAWN BY: L. BRDECKA DATE DRAWN: 2-1-94	REVISED BY:N. HATCHER DATE REVISED: 1-1-16
	APPROVED BY: L. HOOD DATE: 2-1-94	DRAWING NO. FBC-025A
FORT BEND COUNTY ENGINEERING DEPARTMENT		

GENERAL NOTES FOR SIDEWALKS AND DRIVEWAYS

1. SAW CUT EXISTING CURB AT EACH END AND KNOCK OUT CURB FROM BEGINNING TO END OF PROPOSED DRIVEWAY.
2. SAW CUT EXISTING PAVEMENT A MINIMUM OF 18" INCHES AWAY FROM BACK OF CURB (GUTTER LINE) AND BREAK OUT TO EXPOSE EXISTING REINFORCEMENT STEEL.
3. COMPACT SUBGRADE FOR PROPOSED DRIVEWAY CONNECTION FROM PROPOSED SAW CUT AT EXISTING PAVEMENT TO RIGHT-OF-WAY LINE, COMPACT TO 95% OF STANDARD PROCTER DENSITY (+/- 2% OPT. MOISTURE). THE COUNTY ENGINEER RESERVES THE RIGHT TO REQUIRE LABORATORY TESTS TO BE CONDUCTED.
4. PLACE AND COMPACT 4" CLEAN BANK SAND.
5. MAINTAIN GUTTER LINE WITH FACE OF EXISTING CURB.
6. PROPOSED DRIVEWAY REINFORCING STEEL IS TO BE TIED TO EXISTING ROADWAY REINFORCING STEEL WITH A MINIMUM LAP OF 12 INCHES.
7. PROPOSED DRIVEWAY REINFORCING STEEL IS TO BE #4 DEFORMED RE-INFORCING BARS (ASTM A615 GRADE 60, UNLESS NOTED) SPACED AT 24 INCHES C.C., EACH WAY, WITH 12 INCHES MINIMUM LAP (6" x 6" W6 x W6 AS ALTERNATE) FROM PROPOSED SAW CUT TO RIGHT-OF-WAY LINE.
8. PROPOSED DRIVEWAY, CURB, GUTTER LINE, AND GRADE SHALL MATCH EXISTING STREET.
9. PROPOSED DRIVEWAY SHALL BE CONSTRUCTED WITH PORTLAND CEMENT CONCRETE, CLASS "A" STRUCTURAL (REFER TO SPECIFICATION 03301), 7 INCHES THICK, FROM PROPOSED SAW CUT TO RIGHT-OF-WAY LINE (PROPERTY LINE).
10. PROPOSED SIDEWALK SHALL BE CONSTRUCTED WITH PORTLAND CEMENT CONCRETE, CLASS "A" STRUCTURAL (REFER TO SPECIFICATION 03301), 4 1/2 INCHES THICK AND 5 FEET MINIMUM WIDTH. SEE DRAWING NO. FBC 24A FOR ADDITIONAL INFORMATION AND DETAILS.

CONSTRUCTION NOTES FOR SIDEWALKS & DRIVEWAYS WITH CURB TYPE STREETS COMMERCIAL AREA	DRAWN BY: L. BRDECKA DATE DRAWN: 2-1-94	REVISED BY: N. HATCHER DATE REVISED: 1-1-16
	APPROVED BY: L. HOOD DATE: 2-1-94	DRAWING NO. FBC-025B
FORT BEND COUNTY ENGINEERING DEPARTMENT		

APPROVED: _____ DEVELOPMENT COORDINATOR

DATE: _____

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NO.	DATE	REVISION

Pacheco Koch
20445 STATE HWY 249, SUITE 380
HOUSTON, TX 77070 281.883.0103
TX REG. ENGINEERING FIRM F-14439
TX REG. SURVEYING FIRM LS-10008000

PAVEMENT DETAILS

MERCEDES BENZ SPRINTER & CERTIFIED PRE-OWNED CAR DEALERSHIP

CITY OF RICHMOND, FORT BEND COUNTY, TEXAS

DESIGN	DRAWN	DATE	SCALE	NOTES	FILE	NO.
KFW	BKE	JAN 2018				C7.02

MB SPRINTER CPO

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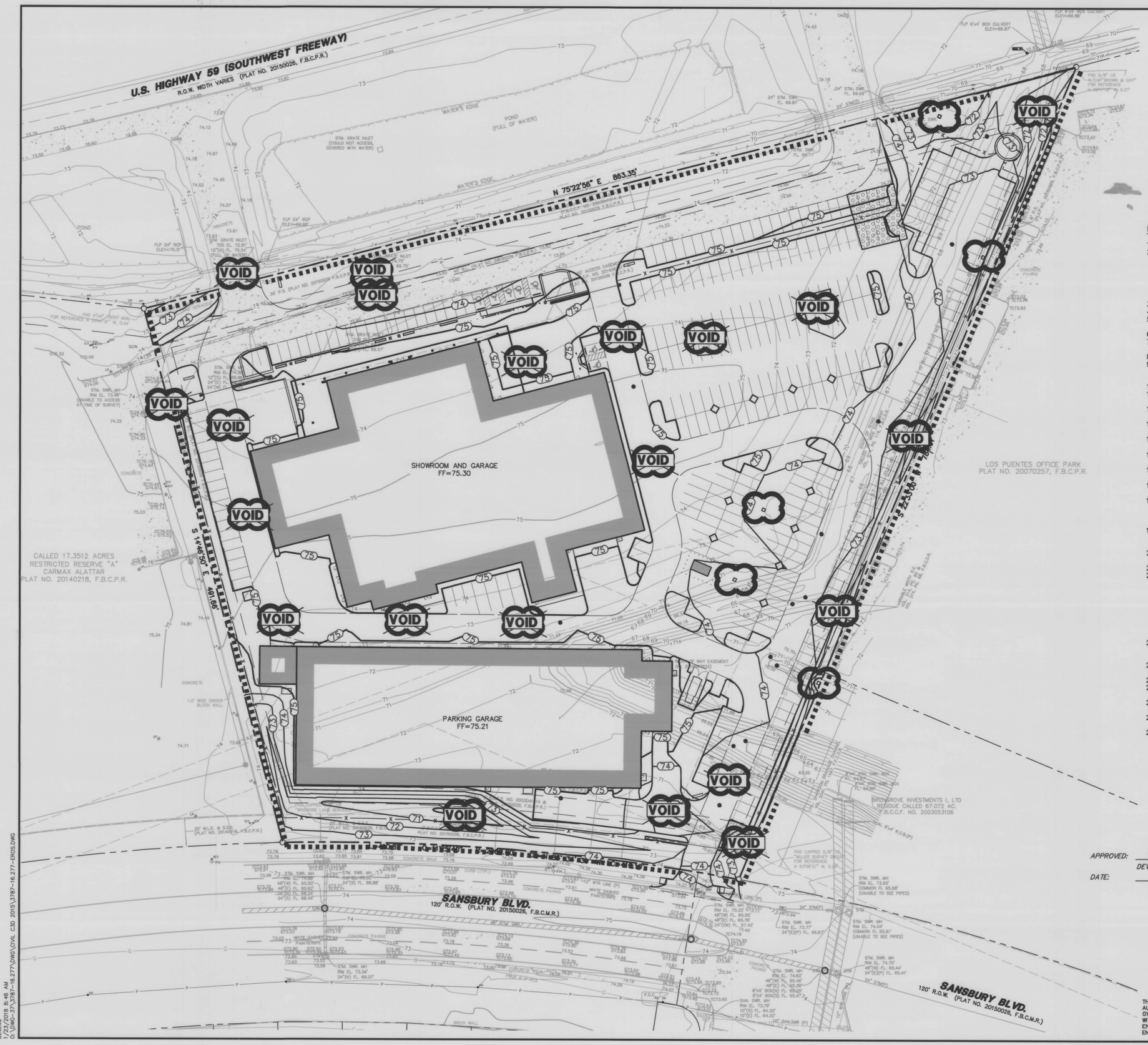

LEGEND

- BOLLARD
- ELECTRIC METER
- POWER POLE
- LIGHT STANDARD
- WATER METER
- WATER VALVE
- IRRIGATION CONTROL VALVE
- FIRE HYDRANT
- CLEANOUT
- MANHOLE
- TRAFFIC SIGNAL CONTROL
- TRAFFIC SIGNAL POLE
- TELEPHONE BOX
- FLOOD LIGHT
- FLAG POLE
- TRAFFIC SIGN
- 1/2-INCH IRON ROD
- IRS W/"PACHECO KOCH" CAP SET
- (C.M.) CONTROLLING MONUMENT
- PROPERTY LINE
- FENCE
- OVERHEAD UTILITY LINE
- EXIST CONTOUR
- PROPOSED CONTOUR

N

0 20 40 80 120
GRAPHIC SCALE IN FEET

- PROPOSED DRAINAGE FLOW DIRECTION
- PROPOSED CONSTRUCTION ENTRANCE
- INLET PROTECTION
- SILT FENCE (LIMITS OF DISTURBED AREA)
- CHECK DAM

POLLUTION CONTROL GENERAL NOTES

1. THIS PLAN HAS BEEN PREPARED TO PROVIDE MEANS TO PREVENT OR MINIMIZE POLLUTION OF STORM WATER.
2. THE CONSTRUCTION ACTIVITY INCLUDED IN THIS PLAN WILL INCLUDE:
   - 2.A. CLEARING AND GRUBBING
   - 2.B. ROUGH GRADING
   - 2.C. FINAL GRADING
   - 2.D. UTILITY INSTALLATION
   - 2.E. PAVEMENT INSTALLATION
   - 2.F. BUILDING CONSTRUCTION
3. THE TOTAL ESTIMATED LAND AREA TO BE DISTURBED IS 8.320 ACRES.
4. THE ESTIMATED RUNOFF COEFFICIENT UPON COMPLETION OF THE PROJECT IS 0.90.
5. THE STORM WATER EXITING THE SITE IS COLLECTED IN AN EXISTING DRAINAGE SYSTEM MAINTAINED BY THE CITY OF RICHMOND, TEXAS.
6. THE SOILS ON THE SITE ARE GENERALLY EXPANSIVE CLAYS.
7. THE CONTRACTOR SHALL PROVIDE AND MAINTAIN EROSION PROTECTION AROUND THE WORK AREA PERIMETER AND AT ALL INLET MOUTHS PRIOR TO COMMENCING WORK AND UNTIL THE WORK AREA HAS BEEN STABILIZED.
8. THE CONTRACTOR WILL REMOVE ALL EXCESS SOIL FROM CONSTRUCTION VEHICLES PRIOR TO EXITING THE SITE.
9. ALL DISTURBED AREAS WHICH WILL NOT BE RE-DISTURBED FOR 14 DAYS MUST BEGIN BEING STABILIZED IMMEDIATELY BY THE CONTRACTOR TO CONTROL EROSION. THE CONTRACTOR HAS 14 DAYS TO HAVE ALL STABILIZATION AND EROSION CONTROL DEVICES IN PLACE.
10. THE CONTRACTOR SHALL UNDERTAKE PROPER METHODS TO REDUCE DUST GENERATION FROM THE SITE.
11. THE CONTRACTOR MUST COMPLY WITH FEDERAL, STATE AND LOCAL REGULATIONS REGARDING SEDIMENT AND EROSION CONTROL.
12. A COPY OF THIS PLAN, AS PART OF THE SWPPP, MUST BE KEPT AT THE CONSTRUCTION FACILITY DURING THE ENTIRE CONSTRUCTION PERIOD.
13. CONSTRUCTION SEQUENCING MUST PROVIDE FOR THE EXCAVATION OF AN ON-SITE SEDIMENTATION BASIN FOR THE COLLECTION OF SEDIMENT PRIOR TO THE DISTURBANCE OF GREATER THAN 10 ACRES OF LAND.
14. ALL FINISHED GRADES ARE TO BE HYDROMULCHED, SPOT SODDED OR SEEDED AND WATERED UNTIL GROWTH IS ESTABLISHED ON AND OFF-SITE.
15. A PIT OR WASH OUT BASIN SHALL BE CONSTRUCTED ON-SITE BY THE CONTRACTOR FOR THE "WASH OUT" OF CONCRETE TRUCKS. BASIN SHALL CONFORM TO LOCAL, STATE, AND FEDERAL REGULATIONS.
16. A BERM OR OTHER SPILL PROTECTION MEASURE THAT CONFORMS TO LOCAL, STATE, AND FEDERAL REQULATIONS SHALL BE USED FOR ANY TEMPORARY FUEL STORAGE TANK ON-SITE.
17. IF "SUMP" PUMPS ARE USED TO REMOVE WATER FROM EXCAVATED AREAS, FILTER THE DISCHARGE TO REMOVE SEDIMENT AND OTHER POLLUTANTS BEFORE THE WATER LEAVES THE SITE.
18. TO PREVENT DAMAGE TO VEGETATION IN DOWNSTREAM WATER COURSES, LIMIT ANY PROPOSED LIME STABILIZATION OPERATIONS TO THAT WHICH CAN BE MIXED AND COMPACTED BY THE END OF EACH WORK DAY. GEOTEXTILE FABRIC IS NOT EFFECTIVE IN FILTERING LIME SINCE THE GRAIN SIZE IS SMALLER THAN THE OPENING IN THE FABRIC.
19. VEHICLE PARKING AREAS, STAGING AREAS, STOCKPILES, SPOILS, ETC. SHALL BE LOCATED SUCH THAT THEY WILL NOT ADVERSELY AFFECT STORM WATER QUALITY. OTHERWISE, COVERING OR ENCIRCLING THE AREAS WITH PROTECTIVE MEASURES SHALL BE NECESSARY.
20. STORE ALL TRASH AND BUILDING MATERIALS WASTE IN AN ENCLOSURE UNTIL IT CAN BE PROPERLY DISPOSED OF AT THE APPROPRIATE OFF-SITE FACILITIES.
21. TRACKING OF SEDIMENT OFF-SITE BY TRUCK TRAFFIC SHALL BE HANDLED THROUGH REGULAR CLEANING.
22. INSPECTIONS SHALL BE CONDUCTED BY THE PERMITEE ONCE EVERY TWO WEEKS AND WITHIN 24 HOURS AFTER STORM EVENT OF 0.5 INCHES OR MORE OR ONCE PER WEEK ON A SPECIFIC PRE-DEFINED DAY. THE INSPECTIONS WILL INCLUDE:
   - 22.A. DISTURBED AREAS OF THE SITE THAT HAVE NOT BEEN STABILIZED.
   - 22.B. AREAS USED FOR STORAGE OF MATERIALS THAT ARE EXPOSED TO PRECIPITATION.
   - 22.C. STRUCTURAL CONTROL MEASURES.
   - 22.D. LOCATIONS WHERE VEHICLES ENTER OR EXIT THE SITE.
   - 22.E. IDENTIFICATIONS OF MEASURES THAT NEED TO BE MAINTAINED, MODIFIED, OR ADDED TO CORRECT PROBLEMS.
23. CONTRACTOR SHALL MINIMIZE THE EXPOSURE OF BUILDING MATERIALS, BUILDING PRODUCTS, CONSTRUCTION WASTES, TRASH, LANDSCAPE MATERIALS, FERTILIZERS, PESTICIDES, HERBICIDES, DETERGENTS, SANITARY WASTE AND OTHER MATERIALS PRESENT ON THE SITE TO PRECIPITATION AND STORMWATER RUNOFF.
24. PERMANENTLY STABILIZE EXPOSED SOIL, WITHIN AND ADJACENT TO THE SITE, THAT IS DISTURBED BY VEHICLES, GRADING AND OTHER CONSTRUCTION ACTIVITIES.
25. CONTAIN ALL RUNOFF FROM MATERIAL USED IN SUBGRADE STABILIZATION.
26. MATERIAL STOCKPILES SHALL BE COVERED BY PLASTIC OR SURROUNDED BY EROSION CONTROL STRUCTURES TO CONTROL SEDIMENT RELEASES.
27. CONTRACTOR SHALL PROTECT SLOPES IN EXCESS OF 15% IN ORDER TO MINIMIZE EROSION OF SOILS AND THE DISTURBANCE OF SLOPES.
28. VEGETATION TO BE PRESERVED WHERE EVER POSSIBLE TO HELP REDUCE EROSION. WHERE VEGETATION MUST BE REMOVED, PRESERVE NATIVE TOPSOIL IN ALL AREAS POSSIBLE.
29. MINIMIZE SOIL COMPACTION IN AREAS INTENDED FOR POST CONSTRUCTION PERVIOUS SURFACE.

APPROVED: _____
DEVELOPMENT COORDINATOR

DATE: 4/13/18

01/04/2018
STATE OF TEXAS
KYLE F. WHITIS
101330
LICENSED PROFESSIONAL ENGINEER

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20445 STATE HWY 249, SUITE 380
HOUSTON, TX 77070 281.883.0103
TX REG. ENGINEERING FIRM F-14439
TX REG. SURVEYING FIRM LS-10008000

EROSION CONTROL PLAN

MERCEDES BENZ SPRINTER & CERTIFIED PRE-OWNED CAR DEALERSHIP

CITY OF RICHMOND, FORT BEND COUNTY, TEXAS

DESIGN	DRAWN	DATE	SCALE	NOTES	FILE	NO.
KFW	BKE	JAN 2018	1"=40'			C8.01

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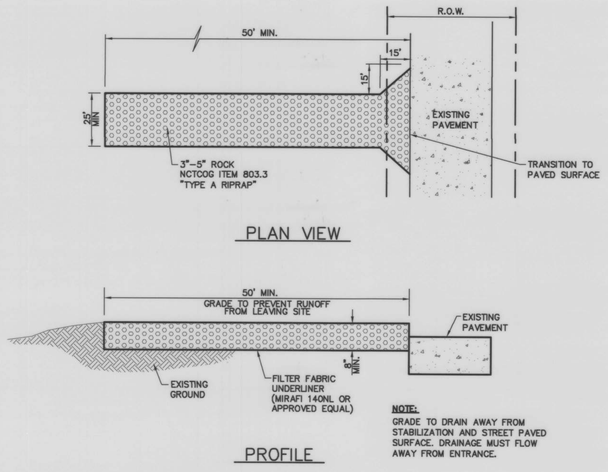
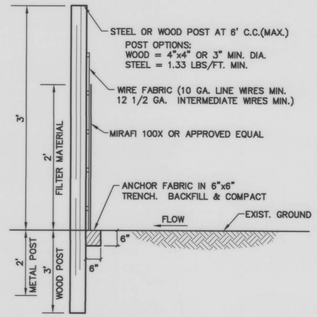
MB SPRINTER CPO



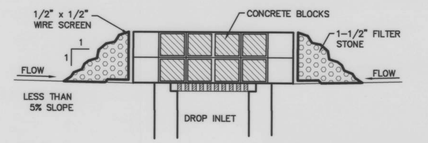
1 STABILIZED CONSTRUCTION ENTRANCE

NOT TO SCALE

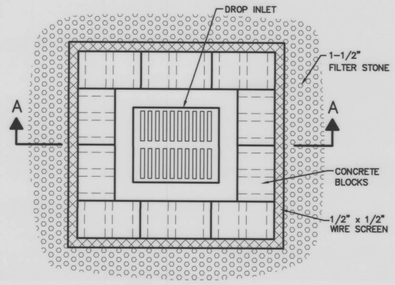


2 SILT FENCE

NOT TO SCALE



SECTION A-A



PLAN VIEW

3 DROP INLET PROTECTION

NOT TO SCALE

APPROVED: _____
DEVELOPMENT COORDINATOR

DATE: 4/13/18

STATE OF TEXAS
KYLE F. WHITIS
101330
LICENSED
PROFESSIONAL ENGINEER
01/04/2018

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NO.	DATE	REVISION

Pacheco Koch
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TX REG. ENGINEERING FIRM F-14439
TX REG. SURVEYING FIRM LS-10008000

EROSION CONTROL DETAILS

MERCEDES BENZ SPRINTER & CERTIFIED PRE-OWNED CAR DEALERSHIP

CITY OF RICHMOND, FORT BEND COUNTY, TEXAS

DESIGN	DRAWN	DATE	SCALE	NOTES	FILE	NO.
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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) 342-0559. 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 AGENTS(S). A FOLLOW-UP INSPECTION OF ALL PUBLIC INFRASTRUCTURE SHALL BE SCHEDULED WITHIN 60 DAYS OF THE INITIAL INSPECTION. A COMPLETE RE-INSPECTION WITH A NEW PUNCH LIST MAY BE REQUIRED AFTER THE 60 DAY PERIOD. THE CITY CONSTRUCTION INSPECTOR TO BE NOTIFIED A MINIMUM OF 24 HOURS, ON ALL PAVEMENT POURS, WATER, STORM AND SANITARY TESTING. TESTING WILL NOT BE DONE ON A SATURDAY, UNLESS PRIOR APPROVAL IS PROVIDED. 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. ALL REQUIRED PERMITS MUST BE LISTED ON SITE, PLACED IN A WATERPROOF ENCASEMENT.

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	6) AT&T	281-341-4312
4) CENTERPOINT ENERGY-GAS	281-342-8881	7) COMCAST	713-462-1900
5) CENTERPOINT ENERGY-ELECTRIC	281-341-4930	8) CITY OF RICHMOND	281-342-0559

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 AT&T 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
LOCATIONS 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, 1-800-669-8344 OR 811 A MINIMUM OF 48 HOURS PRIOR TO CONSTRUCTION TO HAVE MAIN AND SERVICE LINES FIELD LOCATED.

WHEN CENTERPOINT ENERGY PIPE LINE MARKINGS ARE NOT VISIBLE, CALL (713) 945-8036 OR (713) 945-8037 (7:00 A.M. TO 4:30 P.M.) FOR STATUS OF LINE LOCATION REQUEST BEFORE EXCAVATION BEGINS.

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

WHEN CENTERPOINT ENERGY FACILITIES ARE EXPOSED, SUFFICIENT SUPPORT MUST BE PROVIDED TO THE FACILITIES TO PREVENT EXCESSIVE STRESS ON THE PIPING.
FOR EMERGENCIES REGARDING GAS LINES CALL (713) 659-3552 OR (713) 207-4200

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

ACTIVITIES ON OR ACROSS CENTERPOINT ENERGY FEE OR EASEMENT PROPERTY NO APPROVAL TO USE, CROSS OR OCCUPY CENTERPOINT FEE OR EASEMENT PROPERTY IS GIVEN. IF YOU NEED TO USE CENTERPOINT PROPERTY, PLEASE CONTACT OUR SURVEYING & RIGHT OF WAY DIVISION AT (713) 207-6248 OR (713) 207-5769

G-29. COMCAST - THE CONTRACTOR SHALL NOTIFY COMCAST 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 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 ONE 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. A CONSTRUCTION PROJECT THAT REQUIRES THE SWPPP, IT MUST BE INSTALLED BEFORE THE WORK BEGINS. IT MUST BE MAINTAINED THROUGHOUT THE DURATION OF THE PROJECT.

G-37. CONTRACTOR SHALL CONTACT CITY PUBLIC WORKS DEPARTMENT IMMEDIATELY IF WET SAND CONDITIONS ARE ENCOUNTERED. NO BEDDING SHALL BE INSTALLED IN WET CONDITIONS. WHEN WELL POINTING OR IN WET SAND CONDITIONS, MAINTAIN GROUND WATER 1' (FT.) BELOW BOTTOM OF TRENCH FOR A MINIMUM OF 24 HOURS AFTER BEDDING AND BACKFILL IS IN PLACE.

G-38. IN THE EVENT OF CONFLICT BETWEEN THE CITY OF RICHMOND DETAIL SPECIFICATIONS, CONSTRUCTION NOTES, OR CITY OF RICHMOND PUBLIC INFRASTRUCTURE DESIGN MANUAL, OR THE MORE STRINGENT REQUIREMENTS WILL GOVERN.

WATER DISTRIBUTION NOTES

W-1. EXCEPT AS OTHERWISE REQUIRED, WATER MAINS FOUR INCHES (4") THROUGH TWELVE INCHES (12") SHALL BE AWWA C-900, AWWA C-909 CLASS 150, DR 18.
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, 235 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 WITH POLYWRAP 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). NIPPLES 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 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 TWELVE (12) 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 (2 SACKS OF CEMENT PER TON OF SAND) FROM THE TOP OF THE EMBEDMENT TO THE BASE OF PROPOSED BASE OF PROPOSED PAVING SUBGRADE LESS 6 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.

W-21. A TRAC-HOE IS NOT A COMPACTOR. USE PROPER COMPACTING METHODS, SUCH AS, SHEEPSFOOT, JUMPING JACK, PLATE, ETC..

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, DR18, CLASS 150, ASTM D3139, ASTM F477. (GREEN COLOR)

S-4. ALL D.I.P. SANITARY SEWER PIPES SHALL BE LINED WITH POLYWRAP AND 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 FOR 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 24-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 6 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 THE FORCE MAIN.

STORM SEWER NOTES

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

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

ST-3. 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. 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. (2 SACKS OF CEMENT PER TON OF SAND.)

ST-5. 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-6. CONTRACTOR SHALL ADJUST EXISTING WATER LINE VAMPS 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-7. ADJUST ALL STORM SEWER MANHOLE COVERS TO MATCH FINISHED GRADE ELEVATIONS.

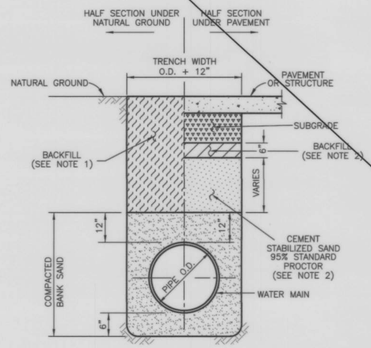
ST-8. ALL PRECAST CONCRETE STRUCTURES SHALL BE REINFORCED AND SHALL BE DESIGNED TO WITHSTAND AASHTO H-20 LOADINGS.

ST-9. ALTERNATIVE STORM SEWER PIPE MATERIAL (WITH APPROVAL OF THE CITY):
A) STEEL: AWWA C200, 150 PSI FOR LINES 4-INCHES TO 12-INCHES, 235 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 WITH POLYWRAP IN ACCORDANCE WITH AWWA C104 (ANSI A21.4).

STREET AND PAVING CONSTRUCTION NOTES

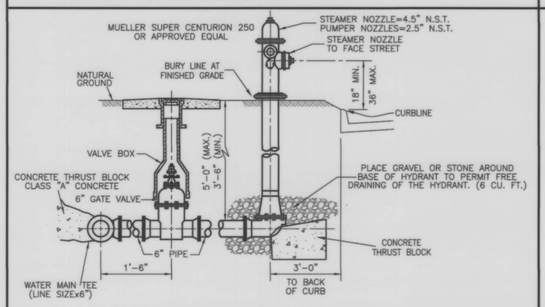
P-1. ALL PAVING SHALL BE CONSTRUCTED WITH THE PLANS AND SPECIFICATIONS AND CITY REQUIREMENT



NOTES

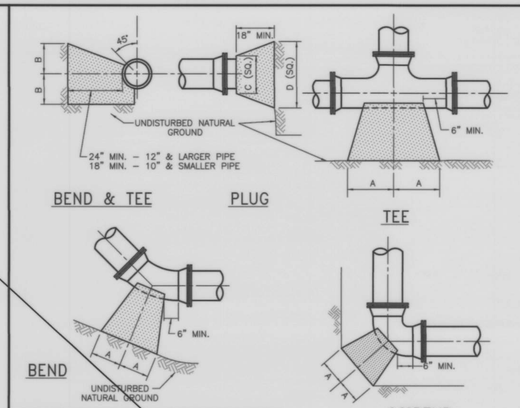
1. BACKFILL SHALL BE NATIVE SOIL, FREE OF DEBRIS, PLACED IN LIFTS, 8" THICK OR LESS, COMPACTED TO 90% STANDARD PROCTOR DENSITY, EXCEPT AS REQUIRED BELOW.
2. BACKFILL UNDER AND WITHIN 3 FEET OF DRIVEWAYS AND PUBLIC STREETS SHALL BE CEMENT STABILIZED SAND (1.5 SACKS OF CEMENT PER CUBIC YARD OF SAND), EXCEPT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

1. WATER LINE BEDDING



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).

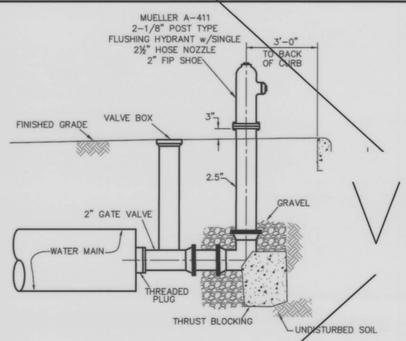
4. FIRE HYDRANT



SIZE	90° BEND		45° BEND		22½° BEND		TEES		PLUGS	
	A	B	A	B	A	B	A	B	C	D
2½"	12"	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"	14"	10"	21"
8"	22"	13"	12"	13"	8"	10"	13"	16"	12"	29"
12"	29"	21"	16"	21"	11"	16"	18"	24"	18"	41"
16"	38"	27"	21"	27"	12"	24"	24"	30"	20"	54"

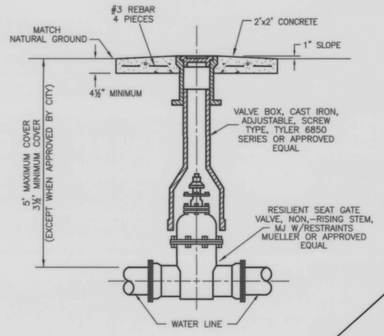
NOTES:
1. THRUST BLOCKS AT TRENCH FACE MUST HAVE A MINIMUM BEARING SURFACE OF 1.0 SQ. FOOT AND THE LEAST DIMENSION SHALL BE NO SMALLER THAN 1.5 TIMES PIPE DIAMETER, BUT NOT LESS THAN 1.0 FT.
2. THRUST BLOCKS SHALL BE PACKED AT ALL FITTINGS.
3. ALL FITTINGS SHALL BE M.J. RESTRAINED JOINT (EBAA IRON, SERIES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

2. THRUST BLOCK



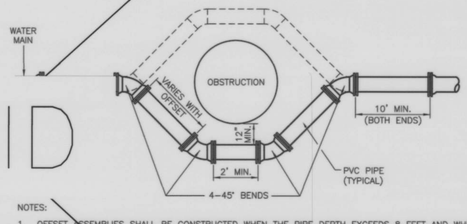
NOTE:
1. ON OPEN-DITCH ROADWAYS, SET THE FLUSHING HYDRANTS WITHIN 3 FEET OF ROAD RIGHT-OF-WAY LINE.
2. PAINT ALL FLUSH VALVES SILVER.

5. 2" BLOWOFF VALVE ASSEMBLY



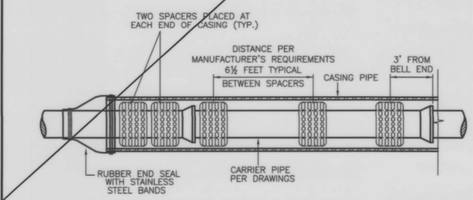
NOTES:
1. PROVIDE OPERATING NUT EXTENSION, AS NEEDED, TO APPROXIMATELY THREE (3) FEET BELOW FINISHED GRADE.
2. VALVE BOX SHALL NOT TRANSMIT ANY LOAD DIRECTLY TO THE VALVE OR PIPE.
3. GATE VALVES SHALL BE COUNTER-CLOCKWISE OPEN.
4. TAPPING VALVES ARE NOT ALLOWED WHEN TAP IS SAME SIZE AS THE EXISTING MAIN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

3. GATE VALVE AND BOX

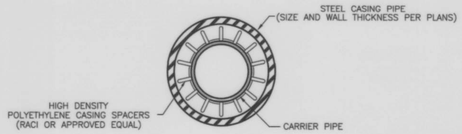


NOTES:
1. OFFSET ASSEMBLIES SHALL BE CONSTRUCTED WHEN THE PIPE DEPTH EXCEEDS 8 FEET AND WHEN THE LINE WILL BE CONSTRUCTED WITH A DEPTH GREATER THAN 6 FEET AT A FIRE HYDRANT OR SERVICE LEAD.
2. PIPE-AWWA C900 DR-18, 150 PSI WITH INTEGRAL PVC JOINT.
3. FITTINGS-DUCTILE IRON, EPOXY LINED AND COATED, MECHANICAL 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



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

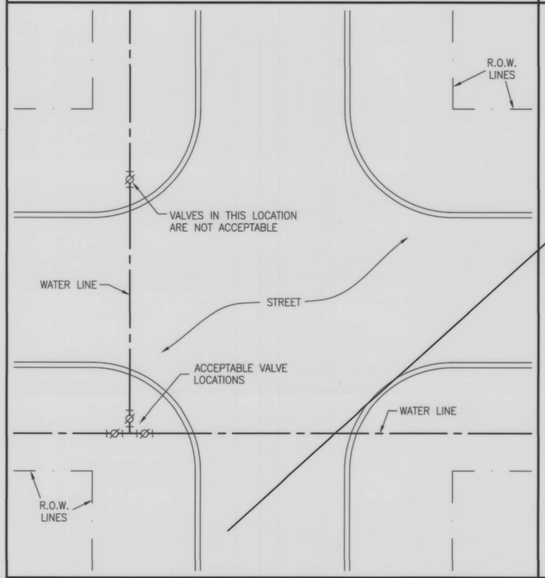


NOTES:
1. CASING SPACERS SHALL BE USED TO INSTALL THE CARRIER PIPE INSIDE THE ENCASEMENT PIPE TO PROVIDE SUPPORT AROUND THE PERIPHERY OF THE PIPE. MINIMUM CLEARANCE BETWEEN MAXIMUM O.D. OF CARRIER PIPE AND I.D. OF CASING SHALL BE ONE INCH.
2. SPACERS SHALL BE PROJECTION TYPE, WITH A MINIMUM NUMBER OF 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 PWM MODEL 1 WA WRAP AROUND END SEAL MADE OF 1/8" THICKNESS RUBBER AND STAINLESS STEEL BANDS, OR APPROVED EQUAL.

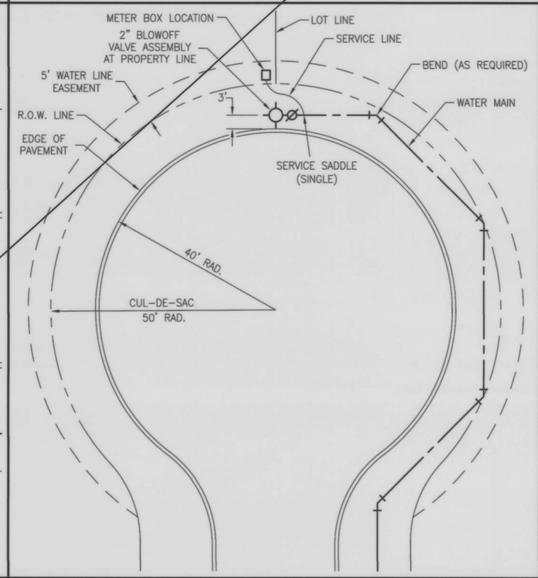
PVC PIPE IN CASING

DR18 C900/C905 PVC PIPE	OD"	BELL OD"	STEEL CASING DIAMETER	RACI 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"	13.97"	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



8. VALVE LOCATION PLAN



9. BLOWOFF LOCATION PLAN

VOID

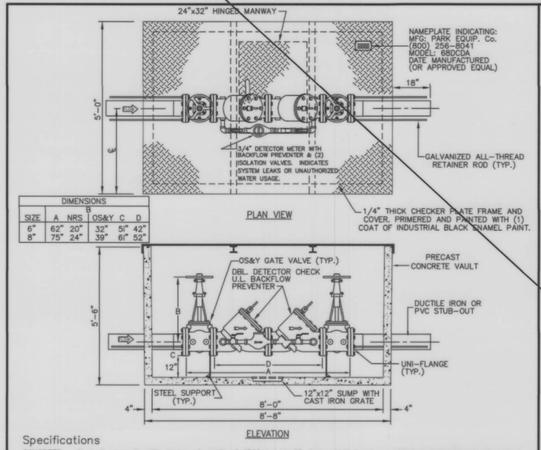
NO.	DATE	REVISIONS	APP.

CITY OF RICHMOND
APPROVALS

LENERT 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

CITY OF RICHMOND
STANDARD CONSTRUCTION DETAILS
WATER

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: R-2
		of



Specifications

CONCRETE – Class 1 concrete with design strength of 4500 psi at 28 days. Unit is of monolithic construction at floor and first stage of wall with sectional riser to required depth. Gross empty weight of approximately 9,000 pounds.

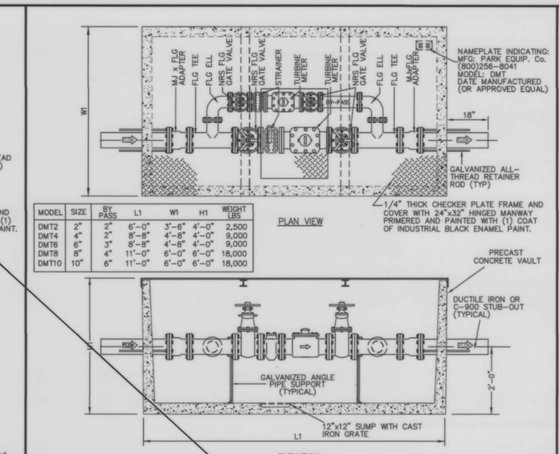
REINFORCEMENT – Grade 60 reinforced. Steel rebar conforming to ASTM A615 on required centers or equal.

STEEL COVER – 1/4" steel skid-resistant floor plate welded to 3" angle frame with (2) 3"x2-3/8" I beam supports.

Notes:

Backflow assembly shall be factory assembled complete with concrete vault and be tested prior to setting in excavation. Manufacturer shall provide certified engineering data and buoyancy calculation.

1. DOUBLE CHECK DETECTOR ASSEMBLY



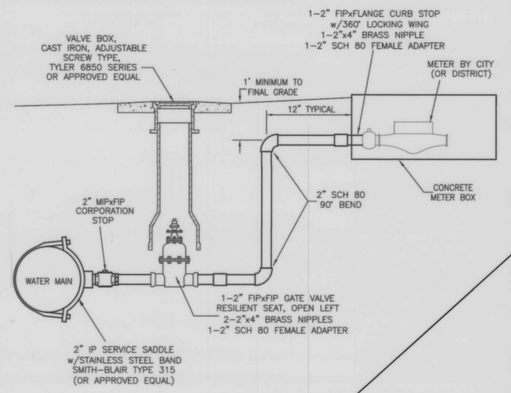
Specifications

CONCRETE – Class 1 concrete with design strength of 4,500 psi at 28 days. Unit is of monolithic construction at floor and first stage of wall with sectional riser to required depth.

REINFORCEMENT – Grade 60 reinforced. Steel rebar conforming to ASTM A615 on required centers or equal.

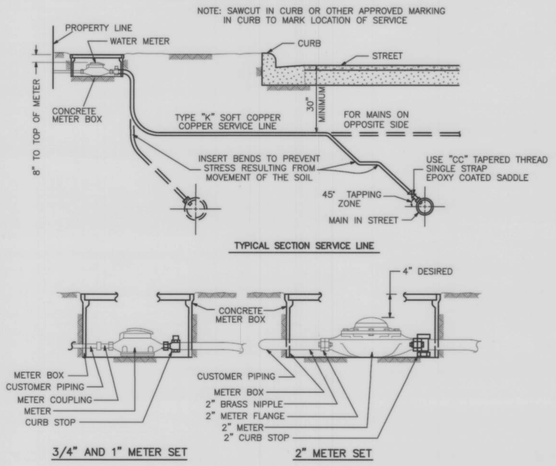
STEEL COVER – 1/4" steel skid-resistant floor plate welded to 3" angle frame with (2) 3"x3" angle supports (300 psf).

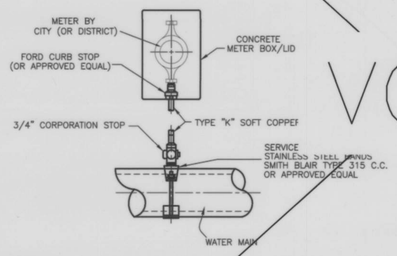
2. DOMESTIC TURBINE WATER METER ASSEMBLY



NOTE:
USE ONLY 2" SCH 80 PVC PIPE AND FITTINGS

3. 2" WATER SERVICE CONNECTION





NOTES:

1. SINGLE WATER SERVICES ONLY.
2. USE 3/4" COPPER TYPE "K" TUBING FROM CORPORATION STOP TO METER.
3. IN NEW DEVELOPMENTS, ALL RESIDENTIAL SERVICE LINES SHALL BE INSTALLED WITH INITIAL CONSTRUCTION AND SHALL BE MARKED WITH A 4"x4"x5'-0" TIMBER (PAINTED BLUE) AND EXTENDING TWO FEET (2') ABOVE FINISHED GRADE.
4. METER BOXES SHALL COMPLY WITH CITY OF RICHMOND REQUIREMENTS.

4. RESIDENTIAL WATER METER AND SERVICE LINE

VOID

NO.	DATE	REVISIONS	APP.

CITY OF RICHMOND
APPROVALS

LENERT 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

CITY OF RICHMOND
STANDARD CONSTRUCTION DETAILS

WATER

SCALE		
HORIZONTAL	1" = NTS	DESIGNED BY: RWS
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		DATE: OCTOBER 24, 2005
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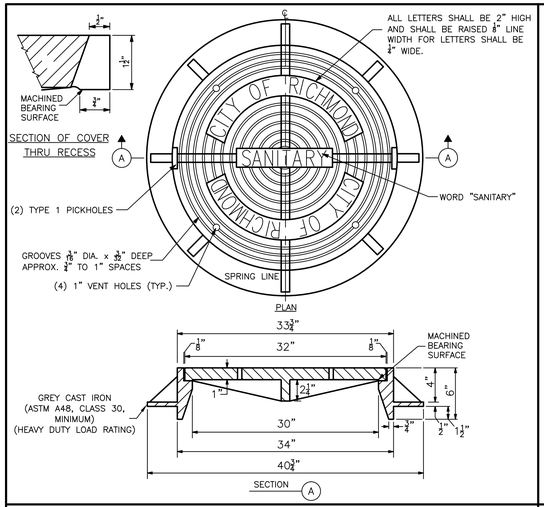
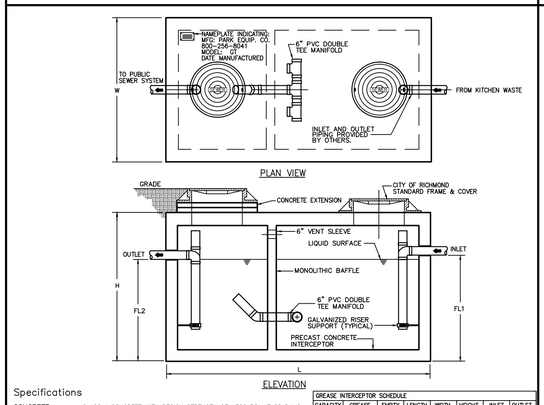
		Sheet: R-3 of



1. MANHOLE FRAME AND COVER



Specifications

CONCRETE : CLASS 1 CONCRETE WITH DESIGN STRENGTH OF 4500 PSI AT 28 DAYS. (AASHTO H-20 LOADING) UNIT IS MONOLITHIC CONSTRUCTION AT FLOOR FIRST STAGE OF WALL AND BAFFLE WITH SECTIONAL RISER TO REQUIRED DEPTH. (MONOLITHIC BAFFLE REQUIRED, SLIDE-IN TYPE IS NOT ACCEPTABLE).

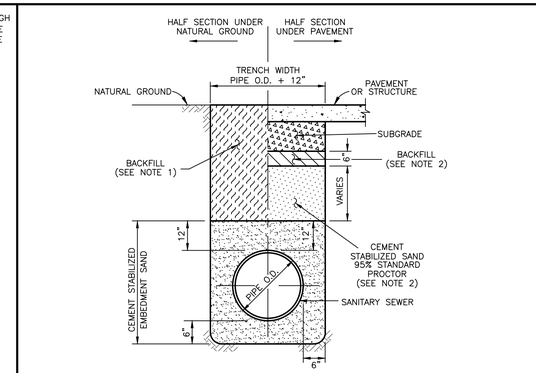
REINFORCEMENT: GRADE 60 REINFORCED WITH STEEL REBAR CONFORMING TO ASTM A615 ON REQUIRED CENTERS OR EQUAL.

C.I. CASTINGS: CITY OF RICHMOND STANDARD MANHOLE FRAME & COVERS. MANHOLE SHALL BE RATED FOR AASHTO H-20 LOADING.

GREASE INTERCEPTOR SCHEDULE

CAPACITY USGal	GREASE CAP. (LBS)	EMPTY WT (LBS)	LENGTH L	WIDTH W	HEIGHT H	INLET FL1	OUTLET FL2
500	1,200	7,000	7'-10"	4'-4"	4'-0"	3'-3"	3'-0"
750	4,900	10,000	7'-10"	4'-4"	6'-0"	4'-3"	4'-0"
1,000	6,600	13,200	8'-8"	5'-0"	6'-0"	4'-9"	4'-6"
1,500	10,300	20,000	9'-2"	5'-8"	7'-0"	5'-10"	5'-7"
2,000	15,000	24,000	13'-0"	7'-0"	6'-0"	4'-9"	4'-6"
2,500	17,500	27,000	13'-0"	7'-0"	7'-0"	5'-9"	5'-6"
3,000	21,400	30,000	13'-0"	7'-0"	8'-0"	6'-9"	6'-6"
3,500	24,000	33,000	13'-0"	7'-0"	9'-0"	7'-9"	7'-6"
4,000	26,400	36,000	13'-0"	7'-0"	10'-0"	8'-9"	8'-6"

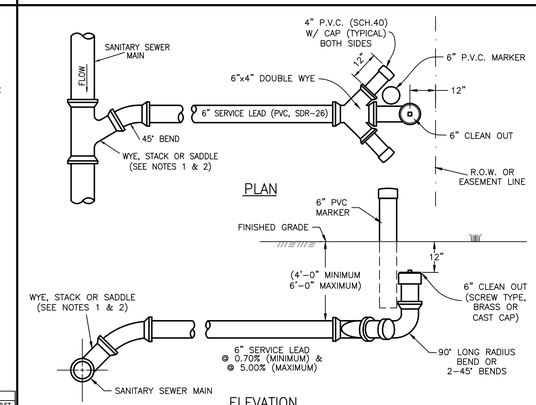
4. GREASE TRAP



NOTES

1. BACKFILL SHALL BE NATIVE SOIL, FREE OF DEBRIS, PLACED IN LIFTS, 8" THICK OR LESS, COMPACTED TO 95% STANDARD PROCTOR DENSITY. (CONTRACTOR TO USE PROPER COMPACTION EQUIPMENT TO ACHIEVE DESIRED DENSITY.) EXCEPT AS REQUIRED BELOW.
2. BACKFILL UNDER AND WITHIN 3 FEET OF DRIVEWAYS AND PUBLIC STREETS SHALL BE CEMENT STABILIZED SAND (2 SACKS OF CEMENT PER TON 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. SANITARY SEWER BEDDING



NOTES:

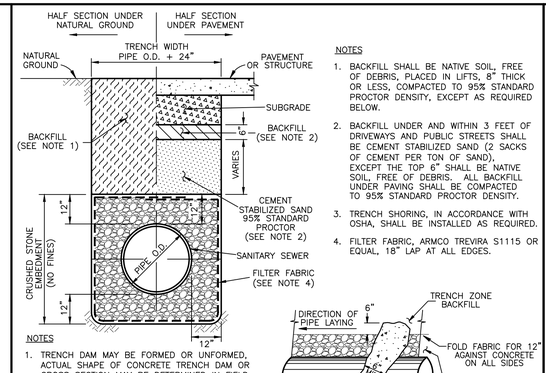
1. FOR NEW CONSTRUCTION "IN-LINE" WYES OR SERVICE STACKS SHALL BE USED FOR SERVICE CONNECTIONS TO SANITARY SEWERS.
2. FOR SERVICE CONNECTIONS ON EXISTING SANITARY SEWERS, PROPER SIZED SADDLES AND DRILLED TAP SHALL BE USED.
3. PROVIDE DOUBLE SERVICE CONNECTION WHERE POSSIBLE.
4. DELETE DOUBLE WYE ON SINGLE CONNECTION.
5. PROVIDE CEMENT STABILIZED BEDDING AND BACKFILL PER DETAILS.
6. 6" PVC MARKER (WITH SOLVENT WELD CAP) SHALL EXTEND FROM ADJOINING THE WYE TO 2'-0" ABOVE FINISHED GRADE.

5. SANITARY SEWER SERVICE CONNECTION

NOTES

1. BACKFILL SHALL BE NATIVE SOIL, FREE OF DEBRIS, PLACED IN LIFTS, 8" THICK OR LESS, COMPACTED TO 95% STANDARD PROCTOR DENSITY, (CONTRACTOR TO USE PROPER COMPACTION EQUIPMENT TO ACHIEVE DESIRED DENSITY.) EXCEPT AS REQUIRED BELOW.
2. BACKFILL UNDER AND WITHIN 3 FEET OF DRIVEWAYS AND PUBLIC STREETS SHALL BE CEMENT STABILIZED SAND (2 SACKS OF CEMENT PER TON 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. ALL EXCAVATED MATERIAL WITH A P.I. OF 12 OR LESS MAY BE USED AS BACKFILL WITH FIELD APPROVAL BY THE CITY.

8. SANITARY SEWER FORCE MAIN BEDDING

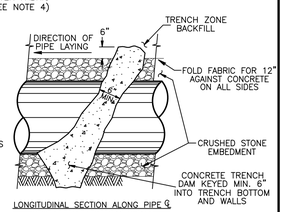


NOTES

1. TRENCH DAM MAY BE FORMED OR UNFORMED, ACTUAL SHAPE OF CONCRETE TRENCH DAM OR CROSS SECTION MAY BE DETERMINED IN FIELD, MEETING MINIMUM THICKNESS AND KEY DEPTH REQUIREMENTS.
2. TRENCH DAM SHALL BE PLACED AT LEAST 5 FT. AWAY FROM ANY STRUCTURE. SEE SPECIFICATIONS FOR OTHER REQUIREMENTS.
3. PLACE TRENCH DAMS AT THE MIDPOINT OF LINE SEGMENTS LONGER THAN 100 FEET BETWEEN MANHOLES.
4. TRENCH DAM CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 2500 PSI.

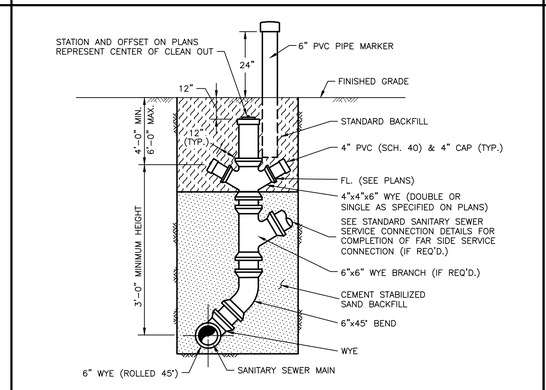
NOTES

1. BACKFILL SHALL BE NATIVE SOIL, FREE OF DEBRIS, PLACED IN LIFTS, 8" THICK OR LESS, COMPACTED TO 95% STANDARD PROCTOR DENSITY, EXCEPT AS REQUIRED BELOW.
2. BACKFILL UNDER AND WITHIN 3 FEET OF DRIVEWAYS AND PUBLIC STREETS SHALL BE CEMENT STABILIZED SAND (2 SACKS OF CEMENT PER TON 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.



LONGITUDINAL SECTION ALONG PIPE ℄ AT EMBEDMENT TRENCH DAM

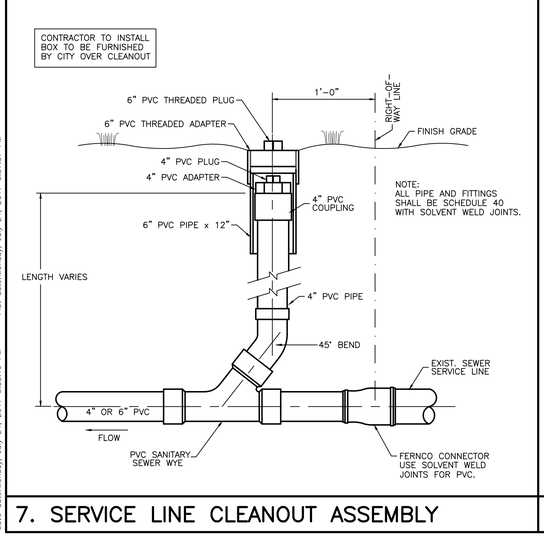
3. SANITARY SEWER BEDDING FOR WET CONDITIONS



NOTES:

1. ALL STACK CONNECTIONS SHALL BE "IN-LINE" FITTINGS.
2. NO STACKS TO BE CONSTRUCTED ON EXISTING SANITARY SEWER LINES; LINES GREATER THAN 12' DEEP OR IN WET TRENCH CONDITIONS.
3. ALL FITTINGS TO BE PVC, SDR-26.
4. 6" PVC MARKER (WITH SOLVENT WELD CAP) SHALL EXTEND FROM ADJOINING THE WYE TO 2'-0" ABOVE FINISHED GRADE.

6. SANITARY SEWER STACK



7. SERVICE LINE CLEANOUT ASSEMBLY

NO.	DATE	REVISIONS	APP.

CITY OF RICHMOND
STANDARD CONSTRUCTION DETAILS

SANITARY-1

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		R-4-17
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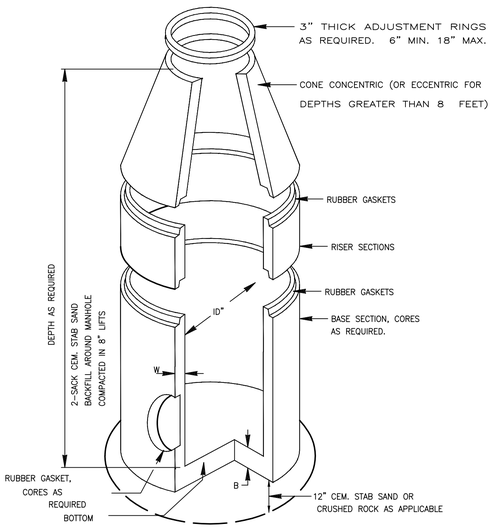
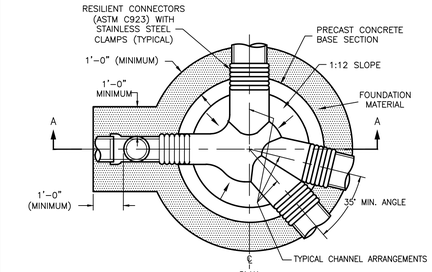


NOTES

1. LIFTING INSERTS AS REQUIRED.
2. ALL JOINTS SHALL BE SEALED WITH APPROVED RUBBER GASKET.
3. STRUCTURE TO BE PLACED ON 12" STABILIZED BASE.
4. C.S.S. SHALL BE BROUGHT TO WITHIN 2'-FT OF TOP OF MANHOLE.
5. PRE-CAST MANHOLE SHALL BE IN COMPLIANCE WITH APPROVED PRODUCT LIST.
6. THANE COAT SHALL BE IN COMPLIANCE WITH APPROVED PRODUCT LIST.
7. INVERTS SHALL COMPLY WITH C.O.M.C., INFRASTRUCTURE DESIGN MANUAL SPECIFICATIONS.
8. INFLOW PROTECTORS REQUIRED ON ALL SANITARY MANHOLES.
9. REFER TO SANITARY MANHOLE LIDS, C.S.S. NOTES, MODIFIED BEDDING DETAILS AND NOTES.

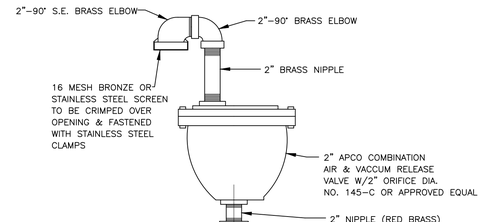
1. PRECAST SANITARY MANHOLE



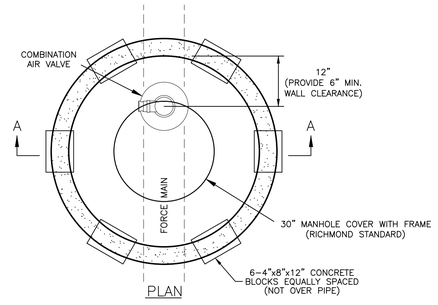
NOTES:

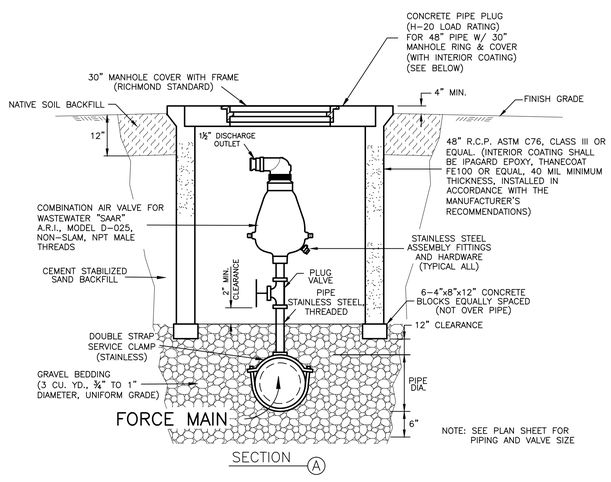
1. PRECAST CONCRETE RINGS SHALL BE PROVIDED FOR A COMBINED ADJUSTMENT HEIGHT OF AT LEAST 6". THE TOTAL HEIGHT OF THE ADJUSTMENT RINGS SHALL NOT EXCEED 12".
2. MANHOLE WALL THICKNESS FOR DEPTH EXCEEDING 12'-0" SHALL BE DETERMINED TO MEET AASHTO H-20 LOADING AND SOIL CONDITIONS OR AS OTHERWISE REQUIRED. MINIMUM THICKNESS 5".
3. MANHOLE DROP AND INTERSECTING PIPES SHALL BE INSTALLED WHEN CALLED FOR IN PLAN AND PROFILE DRAWING AND WHEN THE DROP ON INCOMING PIPE IS GREATER THAN 30".
4. SEAT MANHOLE FRAME USING AN APPROVED SEALANT.
5. ECCENTRIC PRECAST CONCRETE MANHOLE RISER SHALL BE USED.
6. OMIT CEMENT MORTAR WHEN MANHOLE IS LOCATED IN PAVED AREAS.
7. MINIMUM STEEL REINFORCING IN THE PRECAST CONCRETE BASE SHALL BE #5 @ 8" CENTERS EACH WAY.
8. PRECAST CONCRETE MANHOLES TO MEET ASTM C-478, CURRENT.
9. ALL JOINTS SHALL BE SEALED WITH RUBBER GASKETS (ASTM C443) OR APPROVED EQUAL.
10. BASE SHALL INCLUDE A 12" THICK CEMENT STABILIZED SAND BASE BENEATH THE STRUCTURE. ALTERNATE: USE CRUSHED STONE AND FILTER FABRIC IN WET TRENCH CONDITIONS.
11. BACKFILL AROUND MANHOLE & DROP CONNECTION WITH 2 SACKS OF CEMENT PER TON OF SAND (100 P.S.I. MINIMUM).
12. USE STANDARD CAST IRON FRAME AND COVER WITH THE WORDS "SANITARY - CITY OF RICHMOND".
13. MINIMUM 4000 P.S.I. CONCRETE TO BE USED FOR CAST-IN-PLACE (C.I.P.) CONCRETE BASE.
14. GROUT INSIDE AND OUTSIDE OR EXTENSION RING(S) AND FRAME.
15. ALL INTERIOR SURFACES SHALL BE COATED WITH IPAGARD EPOXY, THANECOAT FE100 OR APPROVED EQUAL, APPLIED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATION (40 MIL MINIMUM THICKNESS)
16. MANHOLES SHALL BE CONSTRUCTED USING PRECAST REINFORCED CONCRETE MANHOLE SECTIONS, CONE AND BOTTOM. BRICK WILL NOT BE ALLOWED.

2. SANITARY SEWER MANHOLE



3. AIR RELEASE VALVE





4. SEWERAGE AIR RELEASE VALVE MANHOLE

NO.	DATE	REVISIONS	APP.

CITY OF RICHMOND
STANDARD CONSTRUCTION DETAILS

SANITARY-2

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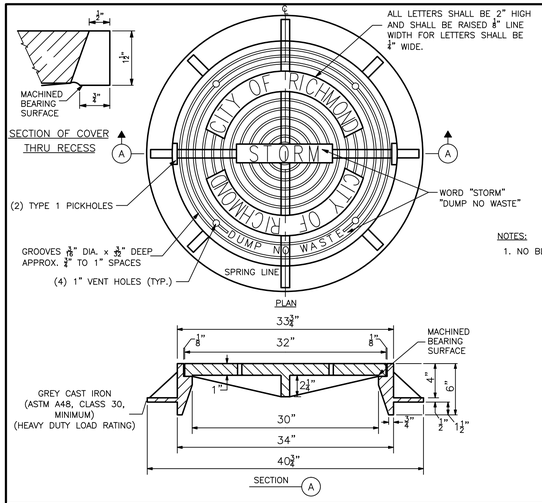
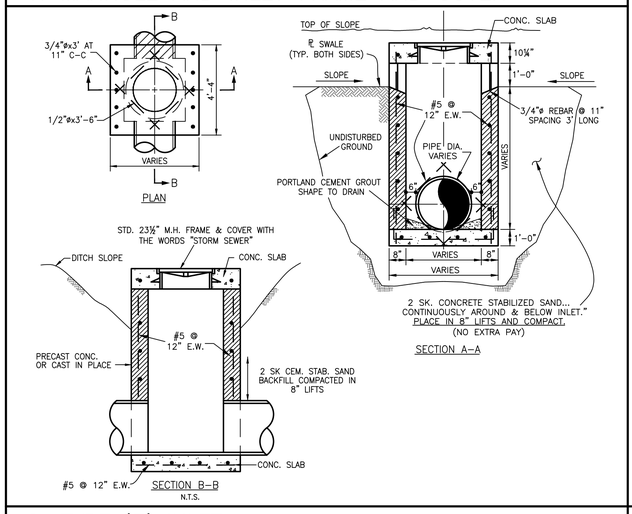


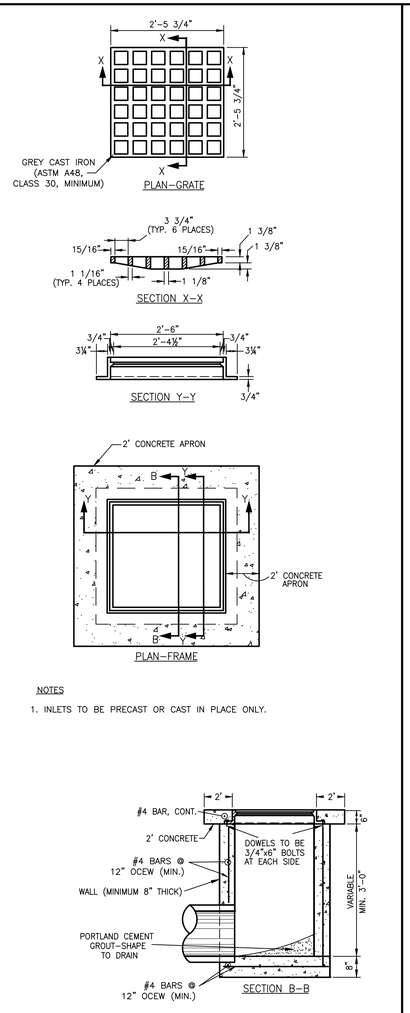
NOTES:

1. NO BLOCKOUTS

1. MANHOLE AND INLET FRAME AND COVER



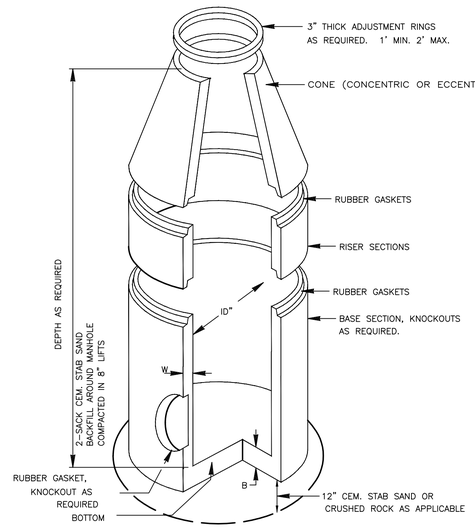
2. TYPE 'E' INLET



NOTES

1. INLETS TO BE PRECAST OR CAST IN PLACE ONLY.

3. TYPE 'A' INLET



SPECIFICATIONS:

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

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

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

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

NOTES

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

4. PRECAST CONCRETE MANHOLE

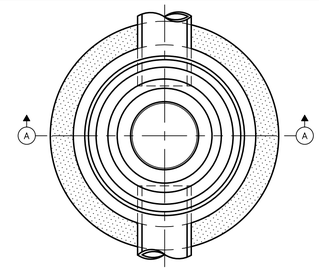
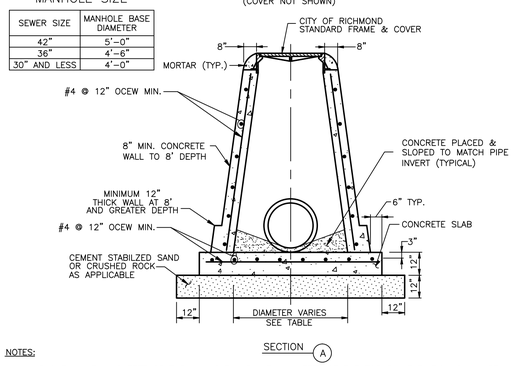


TABLE
SEWER SIZE VS MANHOLE SIZE

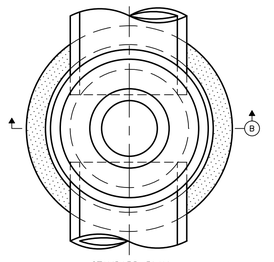
SEWER SIZE	MANHOLE BASE DIAMETER
42"	5'-0"
36"	4'-6"
30" AND LESS	4'-0"



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.
3. MANHOLE TO BE PRECAST OR CAST IN PLACE. BRICK MAY ONLY BE USED WITH CITY APPROVAL.

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



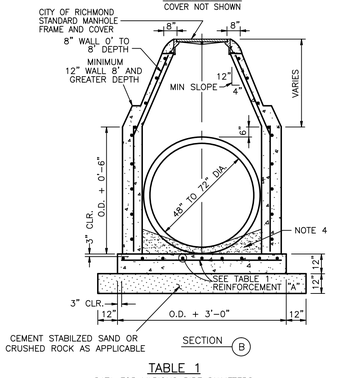


TABLE 1

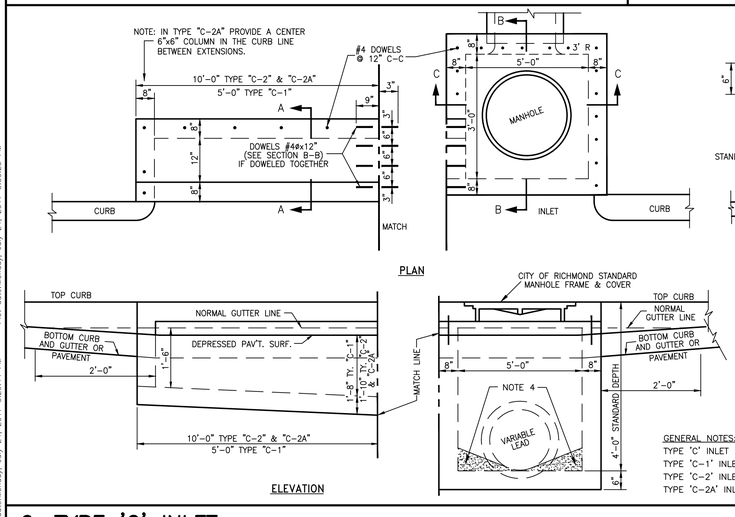
DATA FOR VARIOUS PIPE DIAMETERS

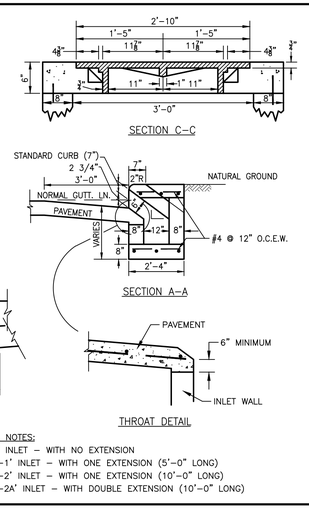
PIPE DIA (INCHES)	MIN. DEPTH	REINFORCEMENT ("A")	REINFORCEMENT ("B")
48"	8'-0"	#5 @ 12 E.W.	2-#6
54"	9'-4"	#5 @ 10 E.W.	2-#6
60"	10'-7"	#5 @ 8 E.W.	2-#7
66"	11'-10"	#5 @ 7 E.W.	2-#7
72"	13'-2"	#5 @ 6 E.W.	2-#7

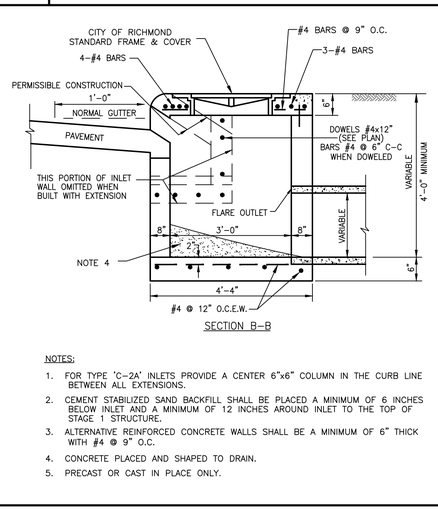
NOTES:

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. PORTLAND CEMENT GROUT TO MATCH INVERT OF PIPE.
4. CAST IN PLACE ONLY. BRICK MAY ONLY BE USED WITH CITY APPROVAL.

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







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. CONCRETE PLACED AND SHAPED TO DRAIN.
5. PRECAST OR CAST IN PLACE ONLY.

GENERAL NOTES:

TYPE 'C' INLET - WITH NO EXTENSION
TYPE 'C-1' INLET - WITH ONE EXTENSION (5'-0" LONG)
TYPE 'C-2' INLET - WITH ONE EXTENSION (10'-0" LONG)
TYPE 'C-2A' INLET - WITH DOUBLE EXTENSION (10'-0" LONG)

6. TYPE 'C' INLET

GENERAL CONSTRUCTION NOTES:

1. ALL CAST CONCRETE BASES SHALL HAVE #4 REBAR @ 12" C-C EW.
2. CONCRETE SHALL BE 3500 PSI MIN.
3. USE C.S.S. BEDDING AS PER DETAILS 2 SK, COMPACTED 8" LIFTS (MAX.), TO 95% STANDARD.

NOTE:

STORM MANHOLES AND INLETS SHALL BE PRECAST CONCRETE. 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.

A 4000 psi COLLAR IS REQUIRED TO BRIDGE A 3" OR LARGER GAP, DEFFLECTION OR CONNECTION OF DIFFERENT SIZE PIPES. THE COLLAR WILL BE 6" THICK 2 FT WIDE WITH #4 REBAR DOWELED INTO THE PIPE AND STRUCTURE. FOR A PIPE CONNECTION TO A MANHOLE OR BOX, THE COLLAR WILL BE 1 FOOT WIDE ON THE OUTSIDE OF THE STRUCTURE AND SEALED SMOOTHLY ON THE INSIDE OF THE STRUCTURE WITH NON-SHRINK GROUT.

NO.	DATE	REVISIONS	APP.

CITY OF RICHMOND
STANDARD CONSTRUCTION DETAILS

STORM SEWER-1

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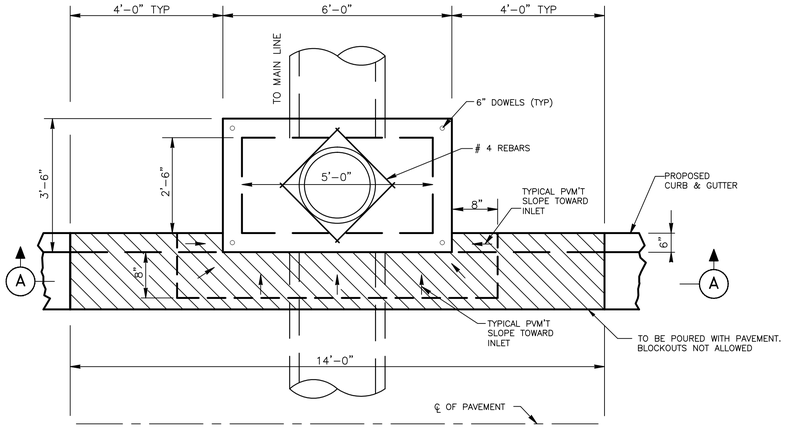
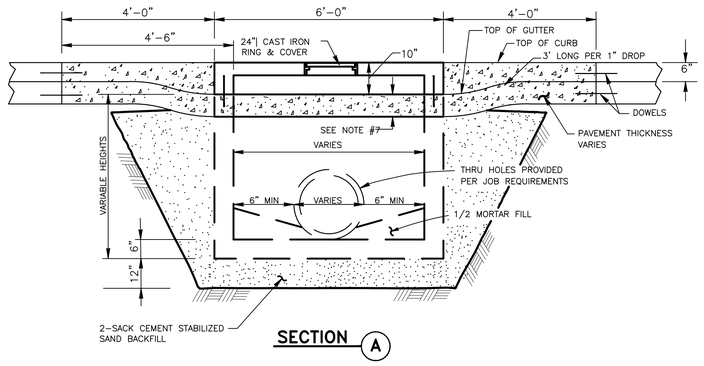
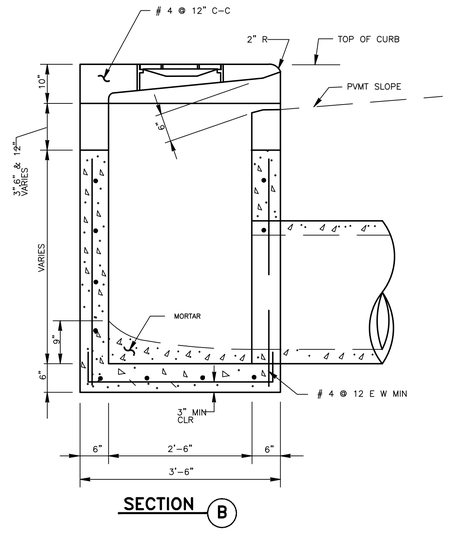


PLAN



SECTION A

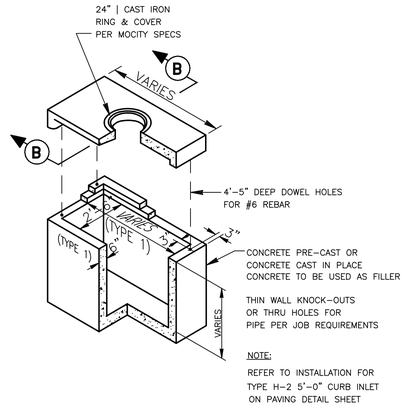


SECTION B

NOTES:

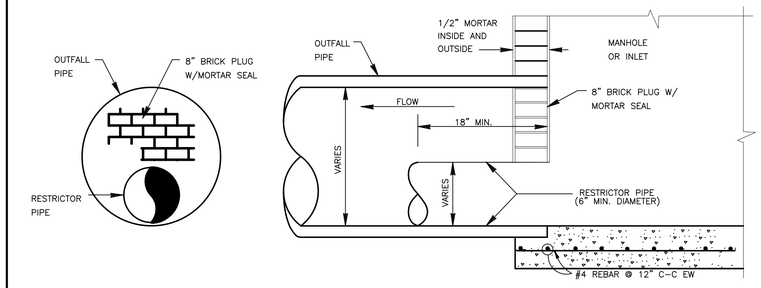
1. INLET WALLS MAY BE EXTENDED USING PRECAST RISER SECTION.
2. INLET TOPS MUST BE SECURED TO THE INLET WALL USING #6 DOWELS DRILLED AND GROUTED A MINIMUM DEPTH OF 5" INTO THE INLET WALL.
3. INLET BACKFILL SHALL BE CEMENT STABILIZED SAND TO THE TOP OF INLET FIRST STAGE.
4. GRADE 60 REINFORCED. #4 STEEL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

1. TYPE "H-2" PRECAST INLET

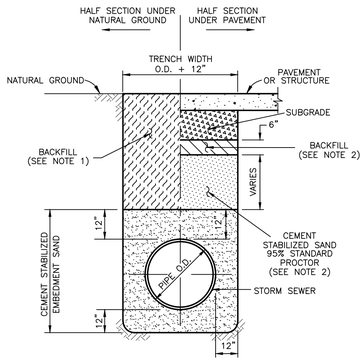


NOTE:

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



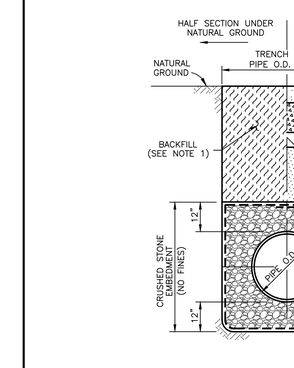
2. STORM SEWER CHOKE OUTFALL RESTRICTOR



NOTES

1. BACKFILL SHALL BE NATIVE SOIL, FREE OF DEBRIS, PLACED IN LIFTS, 8" THICK OR LESS, COMPACTED TO 95% STANDARD PROCTOR DENSITY, EXCEPT AS REQUIRED BELOW.
2. BACKFILL UNDER AND WITHIN 3 FEET OF DRIVEWAYS AND PUBLIC STREETS SHALL BE CEMENT STABILIZED SAND (2 SACKS OF CEMENT PER TON 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.

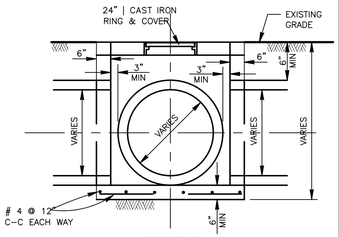
3. STORM SEWER BEDDING



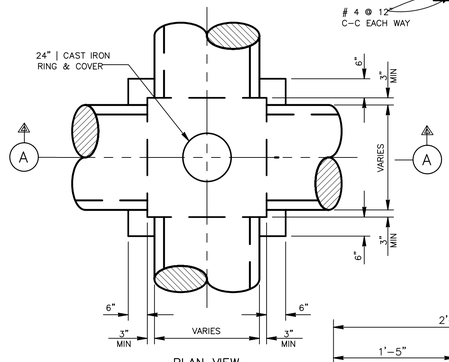
NOTES

1. BACKFILL SHALL BE NATIVE SOIL, FREE OF DEBRIS, PLACED IN LIFTS, 8" THICK OR LESS, COMPACTED TO 95% STANDARD PROCTOR DENSITY, EXCEPT AS REQUIRED BELOW.
2. BACKFILL UNDER AND WITHIN 3 FEET OF DRIVEWAYS AND PUBLIC STREETS SHALL BE CEMENT STABILIZED SAND (2 SACKS OF CEMENT PER TON 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.

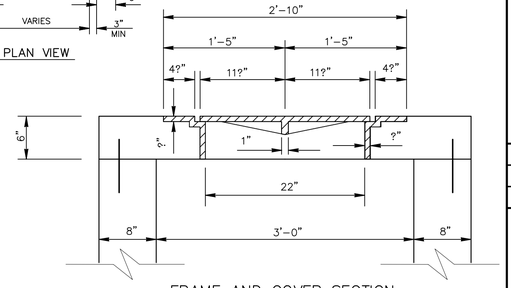
4. STORM SEWER BEDDING FOR WET CONDITIONS



SECTION A



PLAN VIEW



FRAME AND COVER SECTION

5. JUNCTION BOX

GENERAL CONSTRUCTION NOTES:

1. ALL CAST CONCRETE BASES SHALL HAVE #4 REBAR @ 12" C-C EW.
2. CONCRETE SHALL BE 3500 PSI MIN.
3. USE C.S.S. BEDDING AS PER DETAILS 2 SK, COMPACTED 8" LIFTS (MAX.), TO 95% STANDARD.

NOTE:

STORM MANHOLES AND INLETS SHALL BE PRECAST CONCRETE. 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.

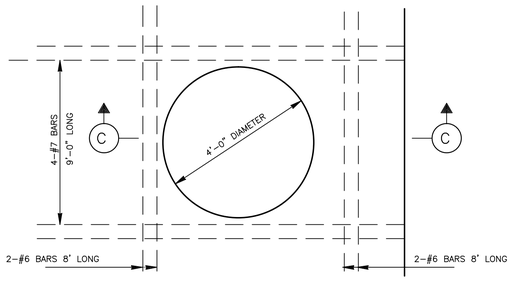
A 4000 psi COLLAR IS REQUIRED TO BRIDGE A 3" OR LARGER GAP, DEFFLECTION OR CONNECTION OF DIFFERENT SIZE PIPES. THE COLLAR WILL BE 6" THICK 2 FT WIDE WITH #4 REBAR DOWELED INTO THE PIPE AND STRUCTURE. FOR A PIPE CONNECTION TO A MANHOLE OR BOX, THE COLLAR WILL BE 1 FOOT WIDE ON THE OUTSIDE OF THE STRUCTURE AND SEALED SMOOTHLY ON THE INSIDE OF THE STRUCTURE WITH NON-SHRINK GROUT.

NO.	DATE	REVISIONS	APP.

CITY OF RICHMOND
STANDARD CONSTRUCTION DETAILS

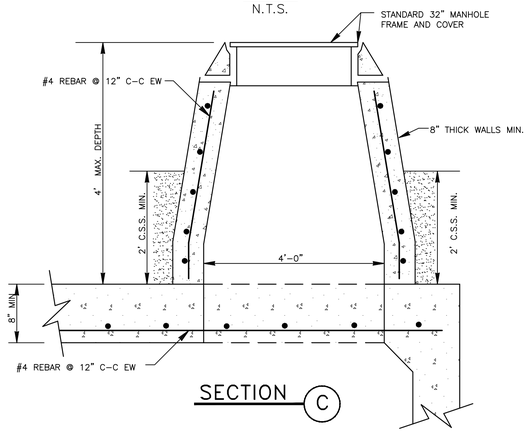
STORM SEWER-2

SCALE		DESIGNED BY:	LLT
HORIZONTAL	1" = NTS	DRAWN BY:	AJS
VERTICAL	1" = NTS	CHECKED BY:	KRK
		DATE:	7/24/17
		JOB NO:	
		DWG. NO:	
		Sheet:	R-7-17



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

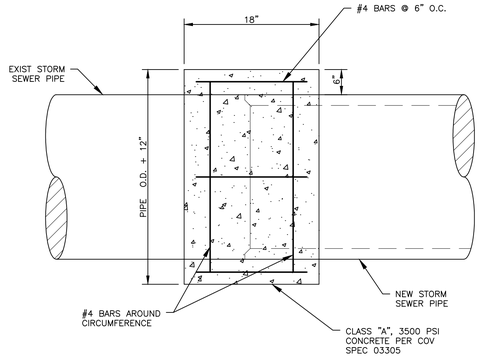
PLAN
N.T.S.



NOTES

1. MANHOLE TO BE PRECAST OR CAST IN PLACE ONLY.

1. MANHOLE FOR BOX SEWER



NOTES:
1. ANGLE OF PIPE NOT TO EXCEED 22½°. IF GREATER, INSTALL JUNCTION BOX.
2. AT THE CONNECTION TO A MANHOLE OR INLET, IF THE GAP IS 3" OR LARGER, A COLLAR IS REQUIRED. THE INSIDE SHALL BE SEALED WITH NON-SHRINK GROUT.

2. CONCRETE COLLAR CONNECTION

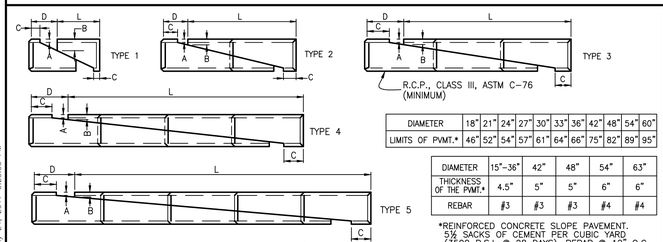
GENERAL CONSTRUCTION NOTES:

1. ALL CAST CONCRETE BASES SHALL HAVE #4 REBAR @ 12" C-C EW.
2. CONCRETE SHALL BE 3500 PSI MIN.
3. USE C.S.S. BEDDING AS PER DETAILS 2 SK, COMPACTED 8" LIFTS (MAX.), TO 95% STANDARD.

NOTE:

STORM MANHOLES AND INLETS SHALL BE PRECAST CONCRETE. 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.

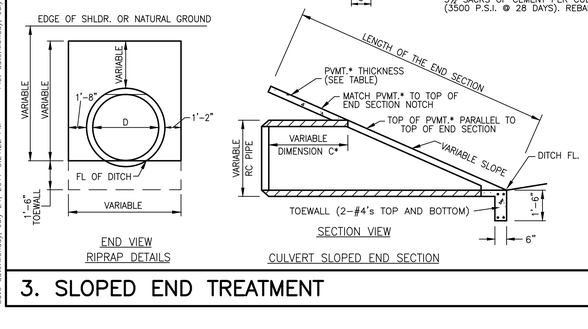
A 4000 psi COLLAR IS REQUIRED TO BRIDGE A 3" OR LARGER GAP, DEFFLECTION OR CONNECTION OF DIFFERENT SIZE PIPES. THE COLLAR WILL BE 6" THICK 2 FT WIDE WITH #4 REBAR DOWELED INTO THE PIPE AND STRUCTURE. FOR A PIPE CONNECTION TO A MANHOLE OR BOX, THE COLLAR WILL BE 1 FOOT WIDE ON THE OUTSIDE OF THE STRUCTURE AND SEALED SMOOTHLY ON THE INSIDE OF THE STRUCTURE WITH NON-SHRINK GROUT.



DIAMETER	18"	21"	24"	27"	30"	33"	36"	42"	48"	54"	60"
LIMITS OF PVMT.*	46"	52"	54"	57"	61"	64"	66"	75"	82"	89"	95"

DIAMETER	15"-36"	42"	48"	54"	63"
THICKNESS OF THE PVMT.*	4.5"	5"	5"	6"	6"
REBAR	#3	#3	#3	#4	#4

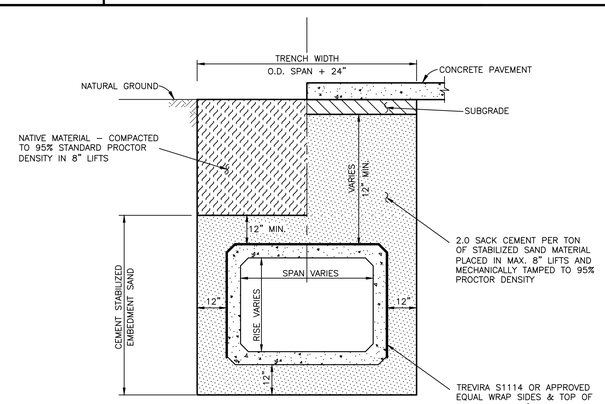
*REINFORCED CONCRETE SLOPE PAVEMENT. 5¼ SACKS OF CEMENT PER CUBIC YARD (3500 P.S.I. @ 28 DAYS). REBAR @ 12" O.C.



3. SLOPED END TREATMENT

DIA.	WALL	O.D.	SLOPE	PIPE LGTH	TYPE	A INCH	B INCH	C INCH	D INCH	L	LENGTH END SECT FT.	PVMT. DNT C.Y.**
24"	3"	30"	3:1	2'-6"	2	3	9	36	54	7'-6"	11.27	0.57
			4:1	2'-6"	2	3	9	24	48	5'-3"	12.33	0.56
			6:1	3'-6"	3	3	9	36	72	12'-2"	18.23	0.74
27"	3"	33"	3:1	2'-6"	2	3	9	31	49	7'-10"	11.6	0.6
			4:1	2'-7"	2	3	9	36	60	10'-0"	14.6	0.89
			6:1	3'-7"	3	3	9	54	90	15'-0"	21.54	0.91
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'-6"	15.29	0.72
			6:1	3'-7"	3	3	9	45	81	15'-9"	22.55	0.95
3"	3"	40"	3:1	2'-6"	2	3	9	22	40	6'-7"	12.65	0.66
			4:1	2'-7"	2	3	9	24	48	11'-0"	15.97	0.76
			6:1	3'-7"	3	3	9	36	72	16'-6"	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	10	26	60	13'-0"	18.21	0.88
			6:1	4'-6"	4	4	10	36	72	18'-0"	25.36	1.03
42"	4"	51"	3:1	2'-7"	2	4	10	27	45	11'-3"	15.81	0.96
			4:1	3'-7"	3	4	10	51	75	16'-5"	21.9	1.26
			6:1	4'-7"	4	4	10	54	90	22'-6"	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"	23.27	1.49
			6:1	4'-7"	4	5	11	36	72	24'-0"	32.44	1.82
54"	5"	65"	3:1	3'-6"	3	5	11	27	45	14'-3"	19.5	1.52
			4:1	4'-6"	4	5	11	36	60	19'-0"	25.43	2.19
			6:1	5'-7"	5	5	11	63	99	29'-3"	38.27	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	23'-0"	29.98	2.46
			6:1	5'-7"	5	6	12	45	81	30'-9"	40.28	2.65

**PVMT. QUANTITY FOR ONE END SECTION



NOTES:

1. 2.0 - SACK CEMENT PER TON OF STABILIZED SAND PLACED BEFORE PIPE IS PLACED.

4. REINFORCED CONCRETE BOX BEDDING DETAIL

NO.	DATE	REVISIONS	APP.

CITY OF RICHMOND
STANDARD CONSTRUCTION DETAILS

STORM SEWER-3

SCALE		DESIGNED BY:	LLT
HORIZONTAL	1" = NTS	DRAWN BY:	AJS
VERTICAL	1" = NTS	CHECKED BY:	KRK
		DATE:	7/24/17
		JOB NO:	
		DWG. NO:	R-8-17
		Sheet:	

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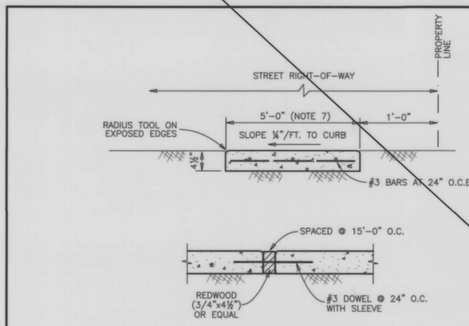
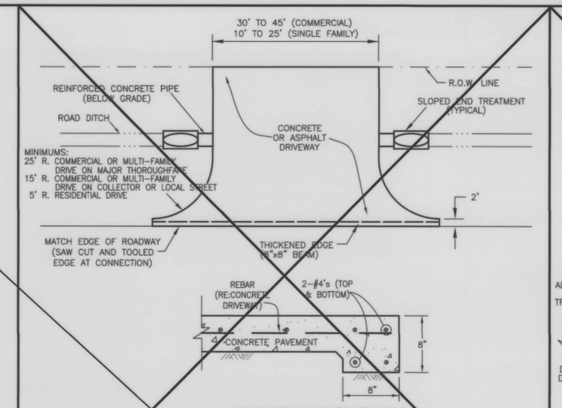


EXPANSION JOINT

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 200 FEET.

1. CONCRETE SIDEWALK

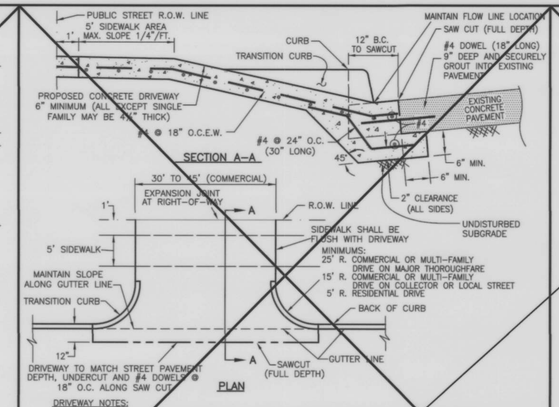


THICKENED EDGE (8'x8" BEAM)

NOTES:

1. CULVERT DIAMETER SHALL BE A MINIMUM OF 15" (IN CITY ONLY) OR 24" (IN ETJ).
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

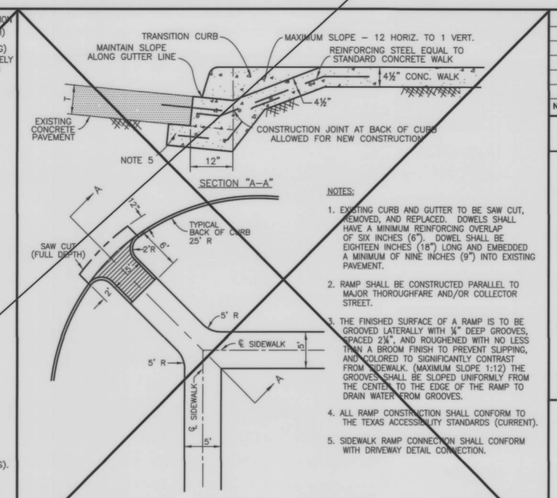


PLAN

DRIVEWAY NOTES:

1. SAW CUT & BREAK OUT 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.

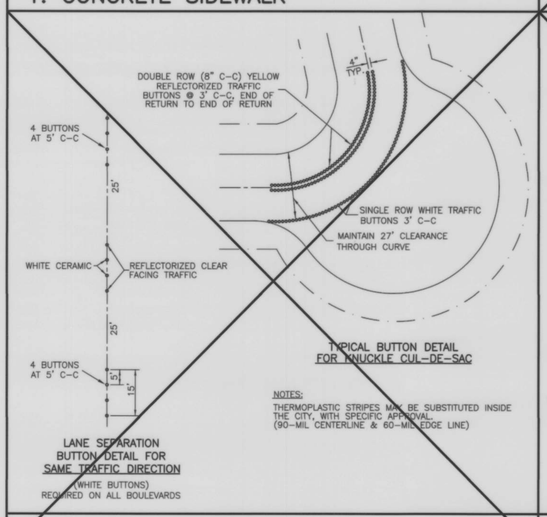
3. CONCRETE DRIVEWAY



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

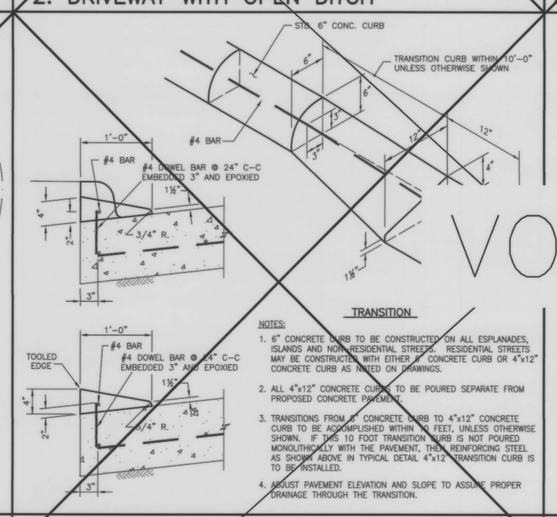
NOTES:

THERMOPLASTIC STRIPES MAY BE SUBSTITUTED INSIDE THE CITY, WITH SPECIFIC APPROVAL. (90-MIL CENTERLINE & 60-MIL EDGE LINE)

LANE SEPARATION BUTTON DETAIL FOR SAME TRAFFIC DIRECTION

(WHITE BUTTONS) REQUIRED ON ALL BOULEVARDS

5. TRAFFIC MARKINGS

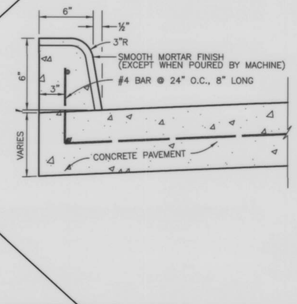


NOTES:

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

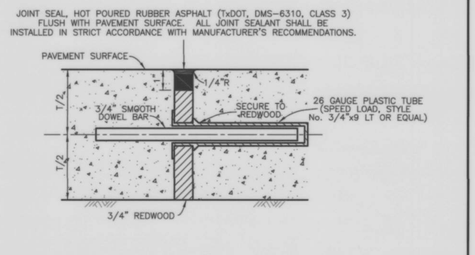
VOID



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.

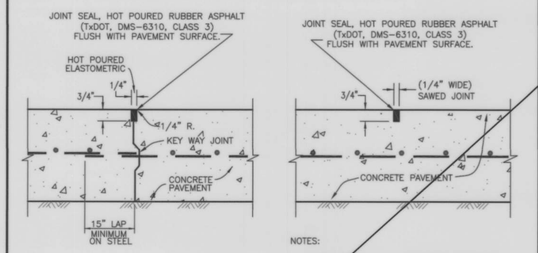
7. CONCRETE CURB



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



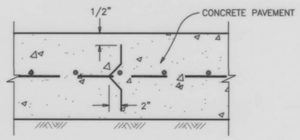
CONSTRUCTION

SAWED

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".

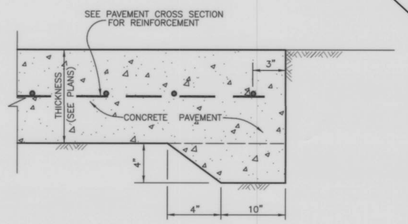
9. PAVEMENT JOINTS



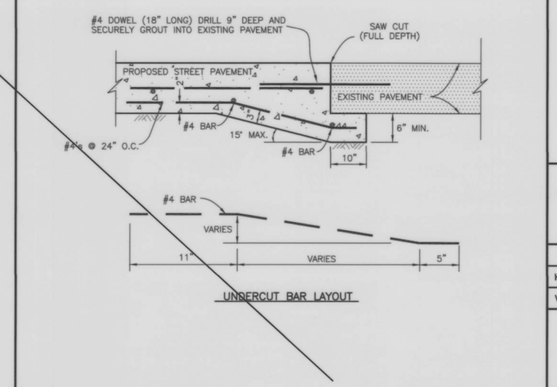
NOTES:

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

GARREN SCHMIDT, WATER SUPERINTENDENT — DATE

WADE WENDT, WASTEWATER SUPERINTENDENT — DATE

JIM WHITEHEAD, STREET SUPERINTENDENT — DATE

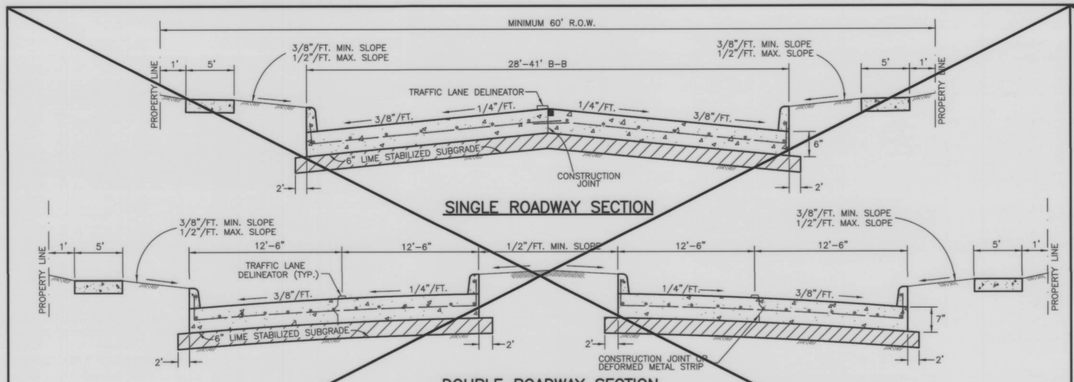
DWAYNE PRICE, PARKS SUPERINTENDENT — DATE

CITY OF RICHMOND
STANDARD CONSTRUCTION DETAILS

PAVING

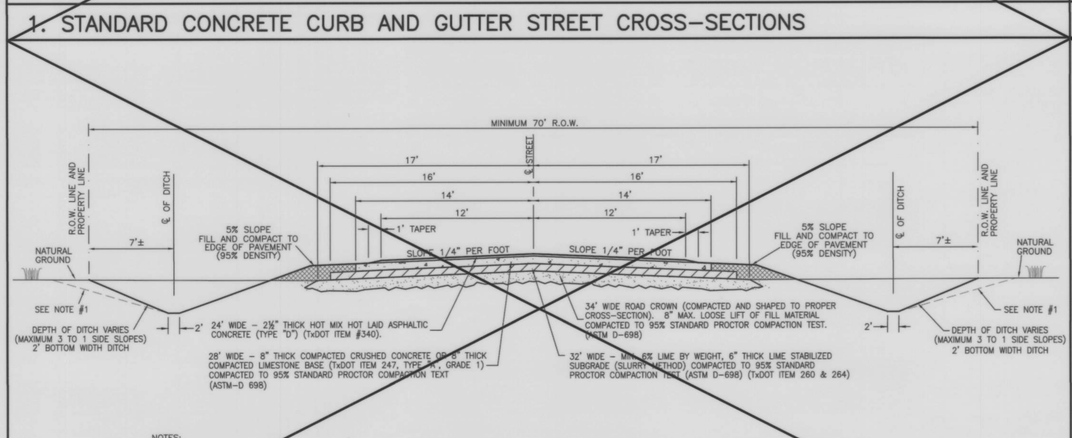
SCALE		DESIGNED BY:	RWS
HORIZONTAL	1" = NTS	DRAWN BY:	DCB
VERTICAL	1" = NTS	CHECKED BY:	KRK
		DATE:	OCTOBER 24, 2005
		JOB NO:	
		DWG. NO:	
		Sheet:	R-6
		of	

1. STANDARD CONCRETE CURB AND GUTTER STREET CROSS-SECTIONS



NOTE:

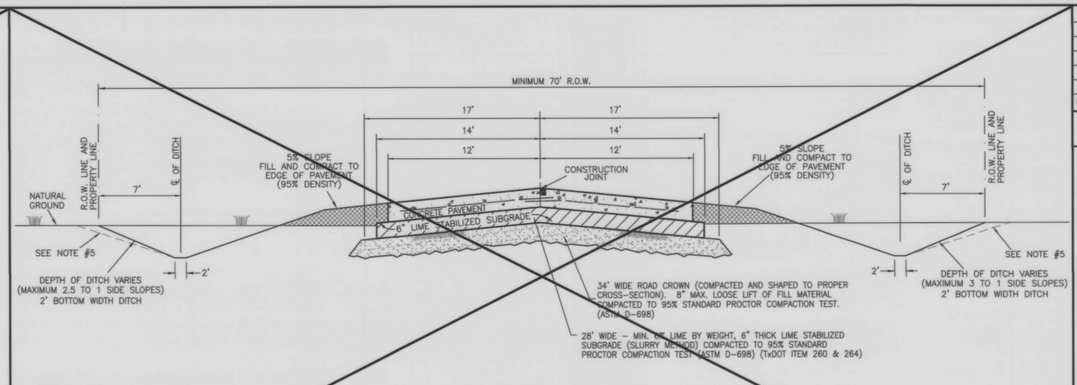
1. ALL REINFORCING STEEL SHALL CONFORM TO ASTM-615, CURRENT REVISION, GRADE 60. MINIMUM LAP AT ALL SPLICES SHALL BE FIFTEEN INCHES (15"). No. 4 BARS @ 18" O.C.E.W.
2. CONCRETE SHALL HAVE A 3500 P.S.I. COMPRESSIVE STRENGTH AT 28 DAYS AND A MINIMUM 550 P.S.I. FLEXURAL STRENGTH AT 7 DAYS, AND SHALL CONTAIN A MINIMUM OF FIVE AND ONE HALF (5½) SACKS OF CEMENT PER CUBIC YARD OF CONCRETE.
3. EXPANSION JOINTS SHALL BE SPACED AT 60'-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.



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.

2. STANDARD CONCRETE PAVEMENT WITH OPEN DITCH CROSS-SECTION



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 60'-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. 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.).

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

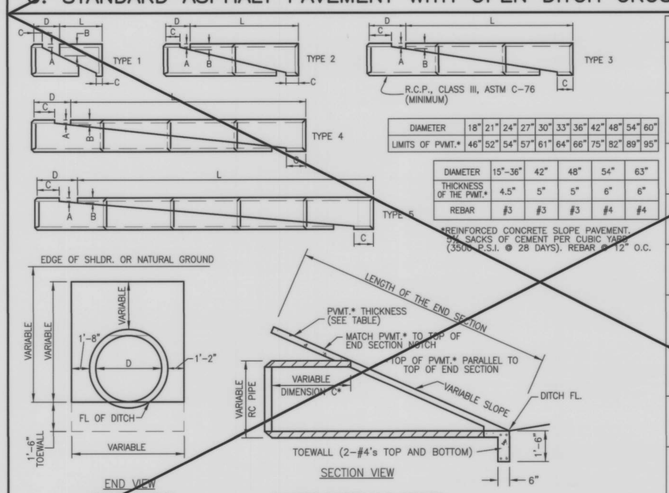
GARREN SCHMIDT, WATER SUPERINTENDENT — DATE

WADE WENDT, WASTEWATER SUPERINTENDENT — DATE

JIM WHITEHEAD, STREET SUPERINTENDENT — DATE

DWAYNE PRICE, PARKS SUPERINTENDENT — DATE

3. STANDARD ASPHALT PAVEMENT WITH OPEN DITCH CROSS-SECTION



DIAMETER	18"	21"	24"	27"	30"	33"	36"	42"	48"	54"	60"
LIMITS OF PVMT.*	46"	52"	54"	57"	61"	64"	66"	75"	82"	89"	95"

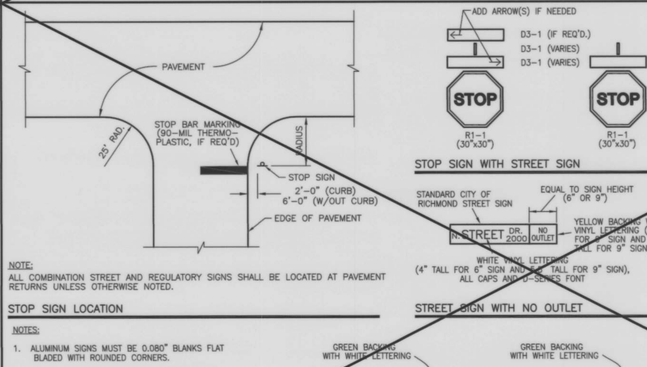
DIAMETER	15"-36"	42"	48"	54"	63"
THICKNESS OF THE PVMT.*	4.5"	5"	5"	6"	6"
REBAR	#3	#3	#3	#4	#4

*REINFORCED CONCRETE SLOPE PAVEMENT: 7½ SACKS OF CEMENT PER CUBIC YARD (3500 P.S.I. @ 28 DAYS). REBAR @ 12" O.C.

DIA.	WALL	O.D.	SLOPE	PIPE LGTH	TYPE	A INCH	B INCH	C INCH	D INCH	L	LENGTH END SECTION FT.	PVMT. QUANT. C.Y.**
24"	3"	30"	3:1	2'-6"	2	3	9	36	54	7'-6"	11.27	0.57
			4:1	2'-6"	2	3	9	24	42	5'-3"	12.33	0.56
			6:1	3'-6"	3	3	9	36	72	12'-2"	18.23	0.74
27"	3"	33"	3:1	2'-6"	2	3	9	31	49	7'-10"	11.6	0.6
			4:1	2'-7"	2	3	9	36	60	10'-0"	14.6	0.89
			6:1	3'-7"	3	3	9	54	90	15'-0"	21.54	0.91
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'-6"	15.29	0.72
			6:1	3'-7"	3	3	9	45	81	15'-9"	22.55	0.95
3"	3"	40"	3:1	2'-6"	2	3	9	22	40	6'-7"	12.65	0.66
			4:1	2'-7"	2	3	9	24	48	11'-0"	15.97	0.76
			6:1	3'-7"	3	3	9	36	72	16'-6"	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	10	26	60	13'-0"	18.21	0.88
			6:1	4'-6"	4	4	10	36	72	18'-0"	25.36	1.03
42"	4"	51"	3:1	2'-7"	2	4	10	27	45	11'-3"	15.81	0.96
			4:1	3'-7"	3	4	10	51	75	16'-5"	21.9	1.26
			6:1	4'-7"	4	4	10	54	90	22'-6"	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"	23.27	1.49
			6:1	4'-7"	4	5	11	36	72	24'-0"	32.44	1.82
54"	5"	65"	3:1	3'-6"	3	5	11	27	45	14'-3"	19.5	1.52
			4:1	4'-6"	4	5	11	36	60	19'-0"	25.43	2.19
			6:1	5'-7"	5	5	11	63	99	29'-3"	38.27	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	23'-0"	29.98	2.46
			6:1	5'-7"	5	6	12	45	81	30'-9"	40.28	2.65

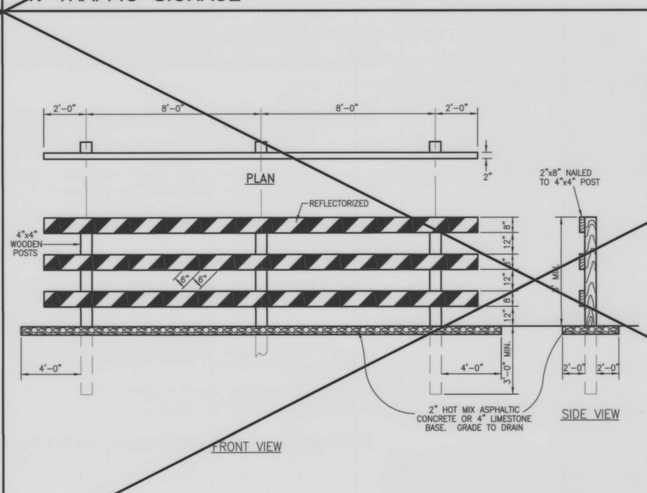
**PVMT. QUANTITY FOR ONE END SECTION

4. TRAFFIC SIGNAGE



5. SLOPED END TREATMENT

6. TYPE 'III' BARRICADE



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 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 2" 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.

CITY OF RICHMOND
STANDARD CONSTRUCTION DETAILS
PAVING

SCALE		DESIGNED BY:	RWS
HORIZONTAL	1" = NTS	DRAWN BY:	DCB
VERTICAL	1" = NTS	CHECKED BY:	KRK
		DATE:	OCTOBER 24, 2005
		JOB NO:	
		DWG. NO:	
		Sheet:	R-7
		of	

DATE:
FILE:

TABLE OF DIMENSIONS & REINFORCING STEEL
(Wings for One Structure End)

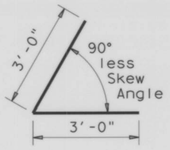
Dimensions					Variable Reinforcing				Estimated ④ Quantities per ft of wing (2~Wings)		Estimated Quantities per ft of Toewall (1~Toewall)	
					Bars J1		Bars J2					
Maximum Wingwall Height Hw	W	X	Y	Z	Size	Spa	Size	Spa	Reinf (Lb/Ft)	Conc (CY/Ft)	Reinf (Lb/Ft)	Conc (CY/Ft)
2'-6"	2'-10"	10"	1'- 0"	7"	#4	1'-0"	#4	1'-0"	48.64	0.406	6.85	0.071
2'-9"	2'-10"	10"	1'- 0"	7"	#4	1'-0"	#4	1'-0"	49.31	0.424	6.85	0.071
3'-0"	2'-10"	10"	1'- 0"	7"	#4	1'-0"	#4	1'-0"	49.98	0.444	6.85	0.071
3'-3"	2'-10"	10"	1'- 0"	7"	#4	1'-0"	#4	1'-0"	53.32	0.462	6.85	0.071
3'-6"	2'-10"	10"	1'- 0"	7"	#4	1'-0"	#4	1'-0"	53.98	0.480	6.85	0.071
4'-0"	3'- 2"	1'- 2"	1'- 0"	7"	#4	1'-0"	#4	1'-0"	55.77	0.532	6.85	0.071
4'-6"	3'- 2"	1'- 2"	1'- 0"	7"	#4	1'-0"	#4	1'-0"	59.77	0.568	6.85	0.071
5'-0"	3'- 9"	1'- 7"	1'- 2"	7"	#4	1'-0"	#4	1'-0"	63.45	0.632	6.96	0.075
5'-6"	3'- 9"	1'- 7"	1'- 2"	7"	#4	1'-0"	#4	1'-0"	67.46	0.668	6.96	0.075
6'-0"	4'- 4"	2'- 0"	1'- 4"	7"	#5	1'-0"	#5	1'-0"	80.67	0.730	7.07	0.078
6'-6"	4'- 4"	2'- 0"	1'- 4"	7"	#5	1'-0"	#5	1'-0"	85.05	0.768	7.07	0.078
7'-0"	5'- 0"	2'- 3"	1'- 9"	8"	#5	1'-0"	#5	1'-0"	92.15	0.864	8.07	0.093
7'-6"	5'- 0"	2'- 3"	1'- 9"	8"	#5	1'-0"	#5	1'-0"	96.54	0.902	8.07	0.093
8'-0"	5'- 6"	2'- 8"	1'-10"	8"	#5	6"	#5	6"	139.04	0.962	8.13	0.095
8'-6"	5'- 6"	2'- 8"	1'-10"	8"	#5	6"	#5	6"	144.47	1.000	8.13	0.095
9'-6"	6'- 0"	2'-10"	2'- 2"	9"	#5	6"	#5	6"	156.93	1.136	8.41	0.110
10'-6"	6'- 5"	3'- 0"	2'- 5"	9"	#6	6"	#5	6"	196.27	1.234	8.57	0.117
11'-6"	7'- 2"	3'- 6"	2'- 8"	11"	#6	6"	#6	6"	230.13	1.438	9.52	0.140
12'-6"	7'- 8"	3'- 9"	2'-11"	1'- 0"	#7	6"	#6	6"	283.41	1.592	9.74	0.157
13'-6"	8'- 2"	4'- 0"	3'- 2"	1'- 2"	#8	6"	#6	6"	348.72	1.804	10.02	0.186
14'-6"	8'-10"	4'- 5"	3'- 5"	1'- 4"	#9	6"	#6	6"	432.94	2.046	10.30	0.218
15'-6"	9'- 6"	4'-10"	3'- 8"	1'- 6"	#9	6"	#7	6"	489.52	2.302	11.24	0.253
16'-0"	9'-11"	5'- 0"	3'-11"	1'- 7"	#9	6"	#7	6"	505.72	2.448	11.47	0.279

TABLE OF WINGWALL REINFORCING (2~Wings)

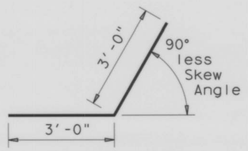
Bar	Size	No.	Spa
D1	#6	~	1'-0"
D2	#6	~	1'-0"
E1	#4	~	1'-0"
F	#4	~	1'-0"
G	#6	~	8"
M1	#4	4	~
P	#4	~	1'-0"
V	#4	~	1'-0"

TABLE OF TOEWALL REINFORCING

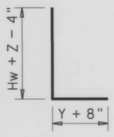
Bar	Size	No	Spa
J3	#4	~	1'-0"
M2	#4	2	~
E2	#4	~	1'-0"



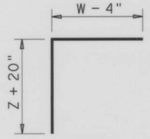
BARS D1



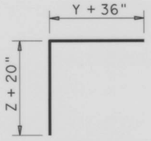
BARS D2



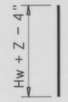
BARS J1



BARS J2



BARS J3



BARS V

WING DIMENSION CALCULATIONS:

Formulas: (All values are in Feet)

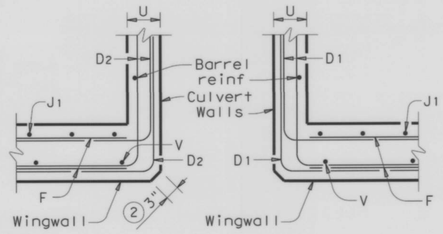
Hw = H + T + C
Lw = (Hw) (SL) ÷ Cosine θ for Ty PW-1
= (Hw - 1') (SL) ÷ Cosine θ for Ty PW-2 and Hw ≥ 4'
= (Hw - 0.5') (SL) ÷ Cosine θ for Ty PW-2 and Hw < 4'

For Cast-in-place culverts:
Ltw = [(N) (S) + (N + 1) (U)] ÷ Cosine θ

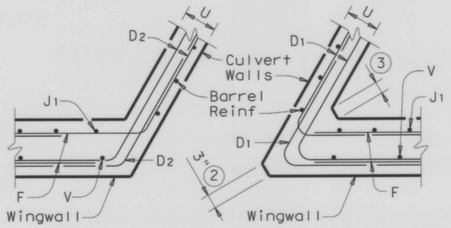
For Precast culverts:
Ltw = [(N) (2 U + S) + (N - 1) (0.5')] ÷ Cosine θ
Total Wingwall Area (Two Wings ~ SF)
= (2)(Hw)(Lw) for Ty PW-1
= (2)(Hw)(Lw) - 6 SF for Ty PW-2 and Hw ≥ 4'
= (2)(Hw)(Lw) - 1.5 SF for Ty PW-2 and Hw < 4'

Hw = Height of Wingwall
Lw = Length of Wingwall
Ltw = Culvert Toewall Length
N = Number of Culvert Spans
SL:1 = Channel Slope ratio. (Horizontal: 1 Vertical, Usual value is 2:1)
θ = Culvert Skew

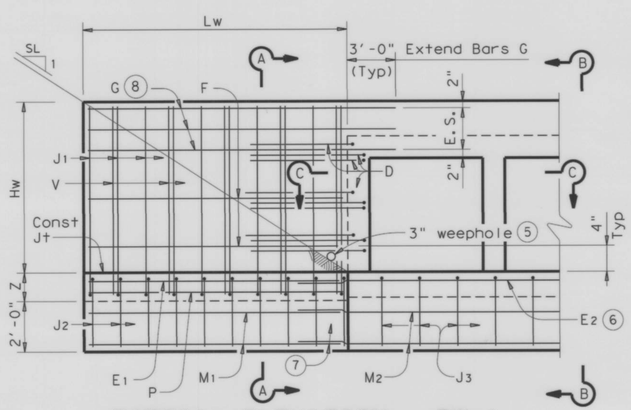
See applicable box culvert standard for S, H, T and U values.



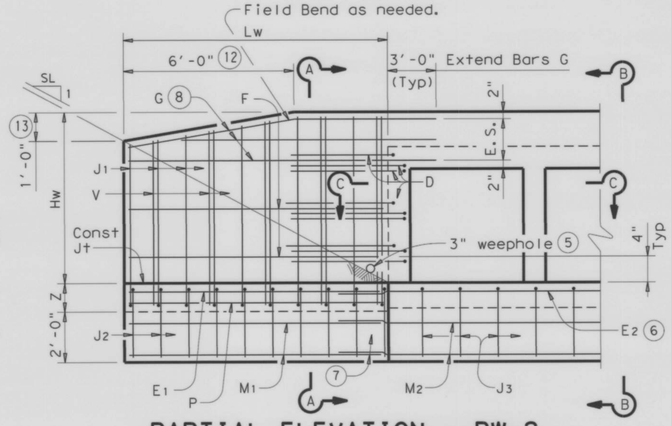
SECTION C-C



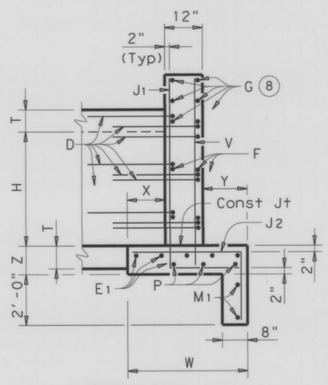
SECTION C-C



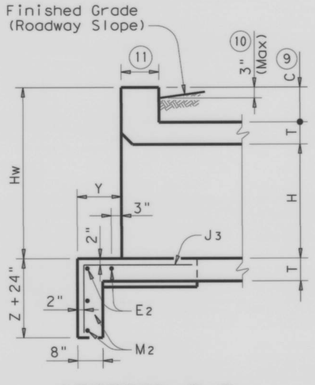
PARTIAL ELEVATION - PW-1



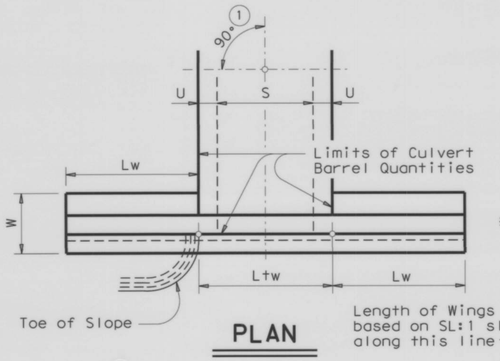
PARTIAL ELEVATION - PW-2



SECTION A-A
(Showing Wing Reinf)

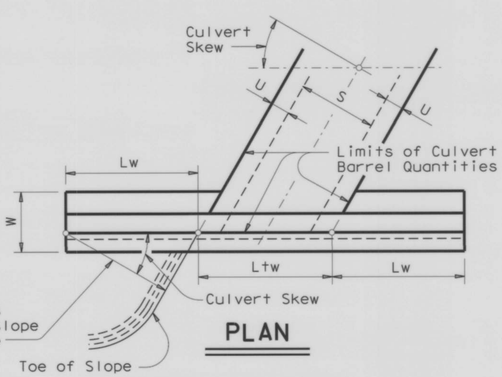


SECTION B-B
(Showing Wing Reinf)



PLAN

DETAILS FOR NON-SKEWED BOX CULVERTS



PLAN

DETAILS FOR SKEWED BOX CULVERTS
(Showing 30° Skew)

1. Skew Angle = 0°
2. At discharge end, chamfer may be ¾".
3. For 15° Skew ~ 1"
   For 30° Skew ~ 2"
   For 45° Skew ~ 3"
4. Quantities shown are for two Type PW-1 wings. Adjust concrete volume for Type PW-2 wings. To determine estimated quantities for two wings, multiply the tabulated values by Lw. Quantities shown do not include weight of Bars D.
5. Provide weepholes for Hw = 5'-0" and greater. Fill around weepholes with coarse gravel.
6. Extend Bars E2 1'-6" minimum into the wingwall footing.
7. Lap Bars M1 1'-6" minimum with Bars M2.
8. Bars G equally spaced at 8" maximum, place as shown. Provide at least two pair Bars G per wing.
9. 0" min to 5'-0" max. Estimated curb heights are shown elsewhere in the plans. For structures with pedestrian rail, bicycle rail or curbs taller than 1'-0", refer to ECD standard. For structures with T6 bridge rail, refer to T6-CM standard. For structures with traffic rail, other than T6, refer to RAC standard.
10. For vehicle safety, the following requirements must be met:
    - For structures without bridge rail, curbs cannot project more than 3" above finished grade.
    - For structures with bridge rail, build curbs flush with finished grade.

    Reduce curb heights, if necessary, to meet the above requirements. No changes will be made in quantities and no additional compensation will be allowed for this work.
11. 1'-0" typical. 2'-0" typical when RAC standard is referenced elsewhere in the plans.
12. 3'-0" for Hw < 4'.
13. 6" for Hw < 4'.

GENERAL NOTES:
Designed in accordance with AASHTO LRFD Bridge Design Specifications.
Provide Class "C" Concrete (f'c = 3,600 psi Min) and Grade 60 reinforcing steel.
Provide 1 ¼" Min clear cover to reinforcing steel.
Depth of toewalls for wingwalls and culverts may be reduced or eliminated when founded on solid rock, when directed by the Engineer.
See BCS sheet for wingwall type and additional dimensions and information.
The quantities for concrete and reinforcing steel resulting from the formulas given on this sheet are for the Contractor's information only.

DESIGNER NOTES:
Type PW-1 can be used for all applications and must be used if railing is to be mounted to the wingwall.
Type PW-2 can only be used for applications without a railing mounted to the wingwall.

Texas Department of Transportation — Bridge Division Standard

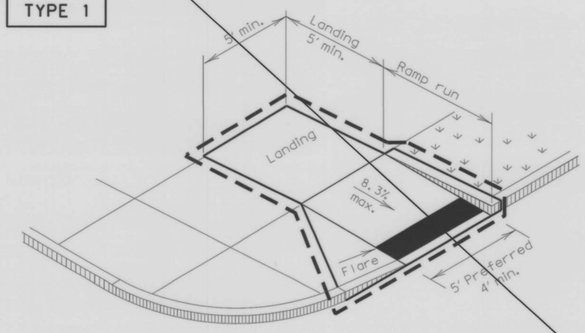
CONCRETE WINGWALLS
WITH PARALLEL WINGS FOR BOX CULVERTS TYPES PW-1 AND PW-2

PW

FILE: pwstde01.dgn	DN: GAF	CK: CAT	DW: TxDOT	CK: GAF
©TxDOT February 2010	CONT	SECT	JOB	HIGHWAY
REVISIONS 11-10: Reinforcing Quantities. 01-12: PW-1 & PW-2.	DIST	COUNTY		SHEET NO.

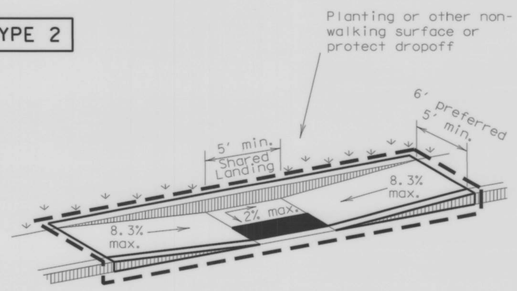
4/13/18

TYPE 1



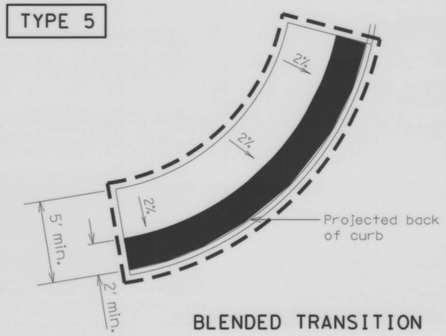
PERPENDICULAR CURB RAMP

TYPE 2



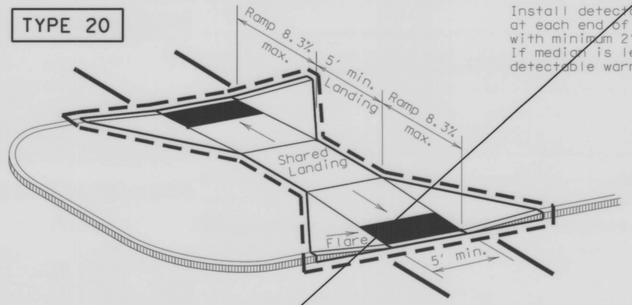
PARALLEL CURB RAMP
(Use only where water will not pond in the landing.)

TYPE 5



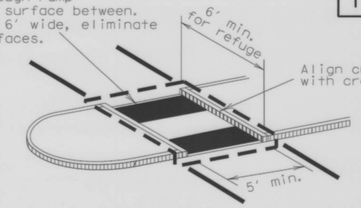
BLENDED TRANSITION

TYPE 20



Install detectable warning surface at each end of cut-through ramp with minimum 2' smooth surface between. If median is less than 6' wide, eliminate detectable warning surfaces.

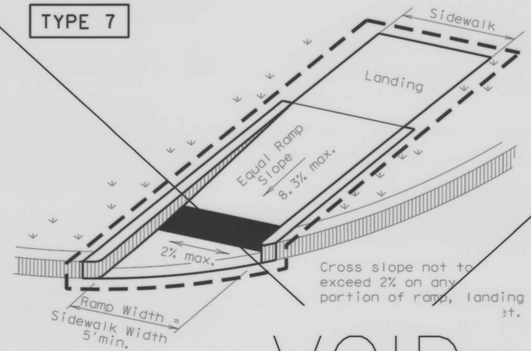
TYPE 21



Curb details are shown elsewhere in the plans.

CURB RAMPS AT MEDIAN ISLANDS

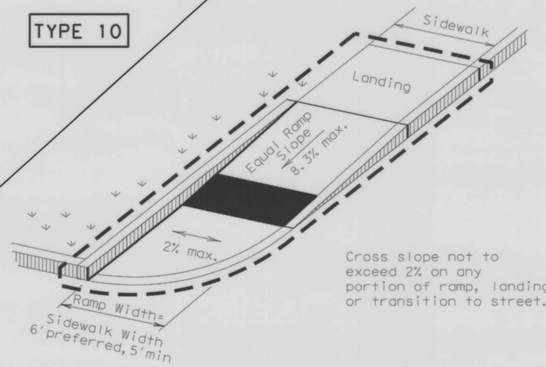
TYPE 7



Cross slope not to exceed 2% on any portion of ramp, landing

(Sidewalk set

TYPE 10

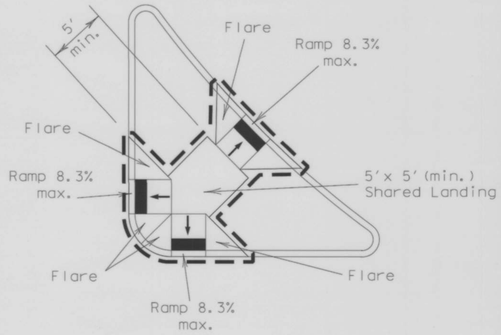


Cross slope not to exceed 2% on any portion of ramp, landing or transition to street.

(Sidewalk adjacent to curb)

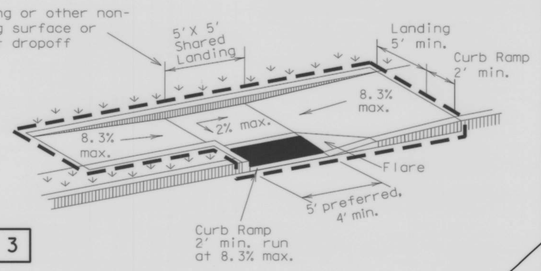
RAMPS WITHIN RADIUS

TYPE 22

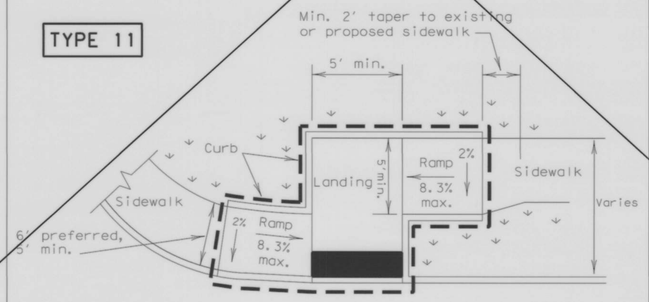


COMBINATION ISLAND RAMPS

TYPE 3

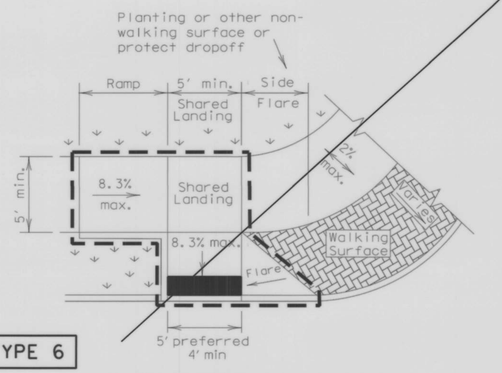


TYPE 11



OFFSET PARALLEL CURB RAMP

TYPE 6



COMBINATION CURB RAMPS

NOTES / LEGEND:

See General Notes on sheet 2 of 4 for more information.

Denotes planting or non-walking surface not part of pedestrian circulation path.

Ramp Limits of Payment

Detectable Warning Surface

SHEET 1 OF 4

Texas Department of Transportation

Design Division Standard

PEDESTRIAN FACILITIES CURB RAMPS

PED-12A

FILE: ped12a.dgn	DN: TxDOT	CK: RM	DW: TxDOT	CK: VP	
©TxDOT March 2002	CONT	SECT	JOB	HIGHWAY	
REVISIONS					
VP June 13, 2012	DIST	COUNTY		SHEET NO.	

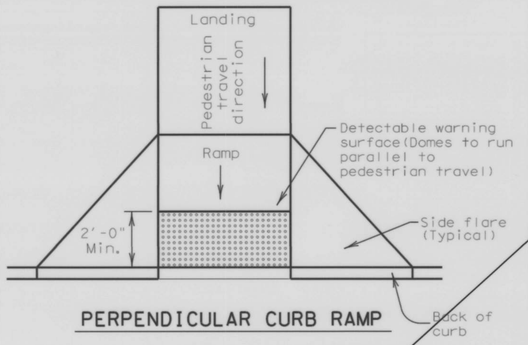
General Notes

Curb Ramps

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

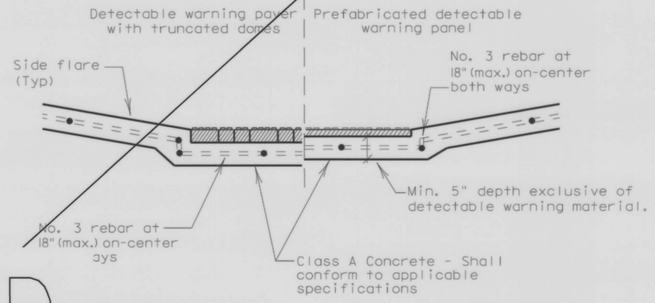
Detectable Warning Material

18. Curb ramps must contain a detectable warning surface that consists of raised truncated domes complying with Section 705 of the TAS. The surface must contrast visually with adjoining surfaces, including side flares. Furnish and install an approved cast-in-place dark brown or dark red detectable warning surface material adjacent to uncolored concrete, unless specified elsewhere in the plans.
19. Detectable Warning Materials must meet TxDOT Departmental Materials Specification DMS 4350 and be listed on the Material Producer List. Install products in accordance with manufacturer's specifications.
20. Detectable warning surfaces must be slip resistant and not allow water to accumulate.
21. Detectable warning surfaces shall be a minimum of 24" in depth in the direction of pedestrian travel, and extend the full width of the curb ramp or landing where the pedestrian access route enters the street.
22. Detectable warning surfaces shall be located so that the edge nearest the curb line is at the back of curb. Align the rows of domes to be perpendicular to the grade break between the ramp run and the street. Detectable warning surfaces may be curved along the corner radius.
23. Shaded areas on Sheet 1 of 4 indicate the approximate location for the detectable warning surface for each curb ramp type.

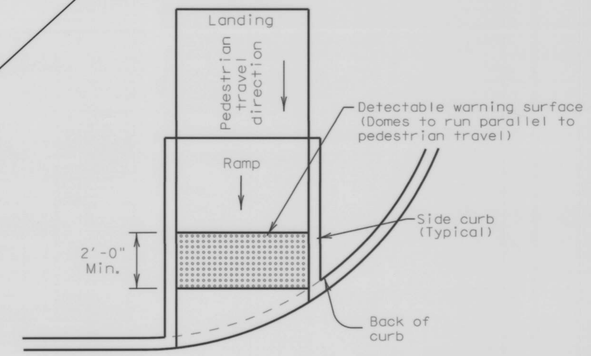


PERPENDICULAR CURB RAMP

Typical placement of detectable warning surface on sloping ramp run.

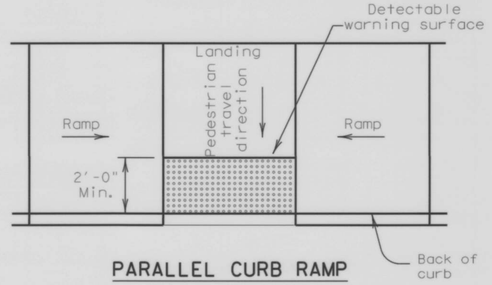


ON: CURB RAMP AT DETECTABLE WARNING



DIRECTIONAL CURB RAMP

Typical placement of detectable warning surface on sloping ramp run.



PARALLEL CURB RAMP

Typical placement of detectable warning surface on landing at street edge.

VOID

DETECTABLE WARNINGS

Detectable Warning Pavers

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

Sidewalks

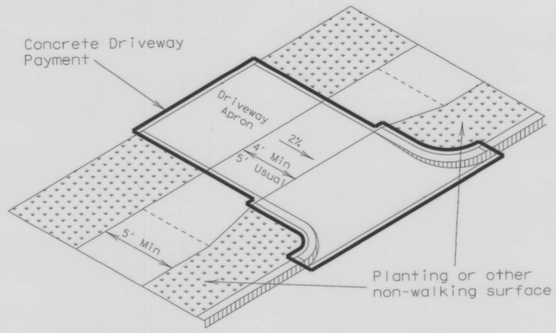
26. Provide clear ground space at operable parts, including pedestrian push buttons. Operable parts shall be placed within one or more reach ranges specified in TAS 308.
27. Place traffic signal or illumination poles, ground boxes, controller boxes, signs, drainage facilities and other items so as not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

Texas Department of Transportation | Design Division Standard

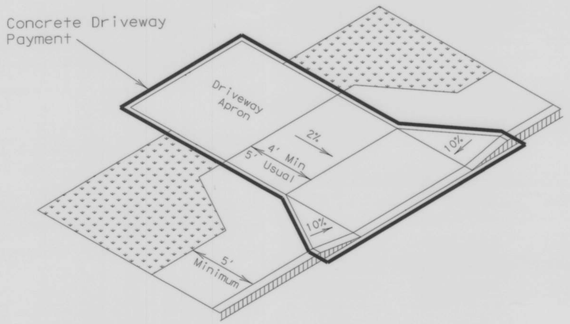
PEDESTRIAN FACILITIES CURB RAMPS

PED-12A

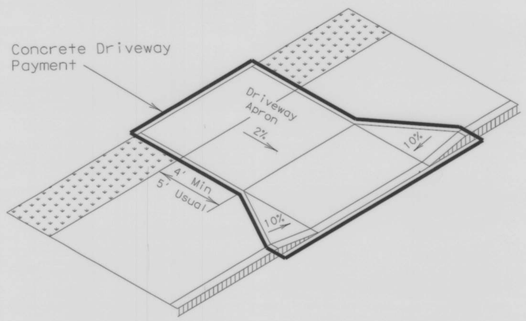
FILE: ped12a.dgn	DN: TxDOT	CK: RM	DW: TxDOT	CK: VP
© TxDOT March 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS				
VP June 13, 2012	DIST	COUNTY		SHEET NO.



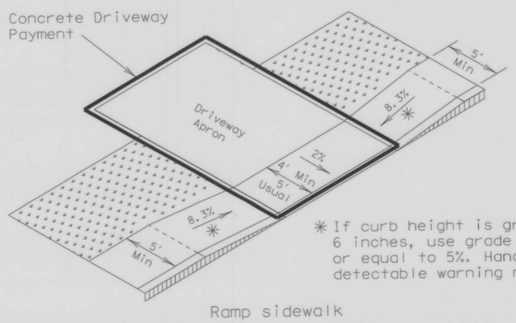
Setback sidewalk



Apron offset sidewalk



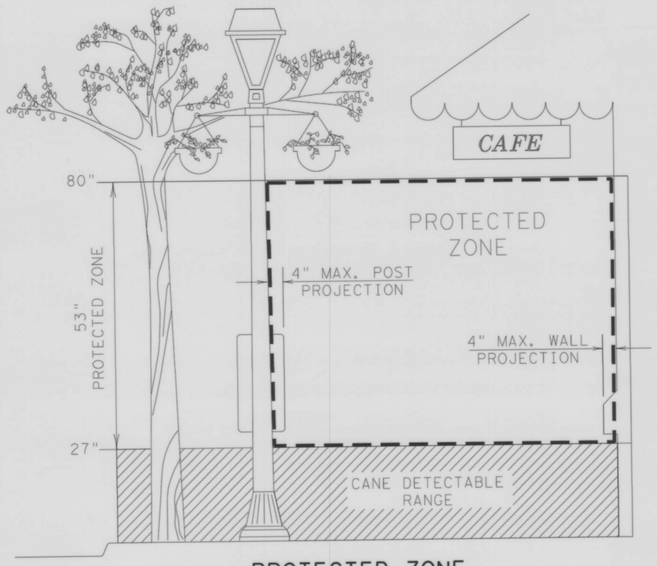
Wide sidewalk



* If curb height is greater than 6 inches, use grade less than or equal to 5%. Handrail and detectable warning not required.

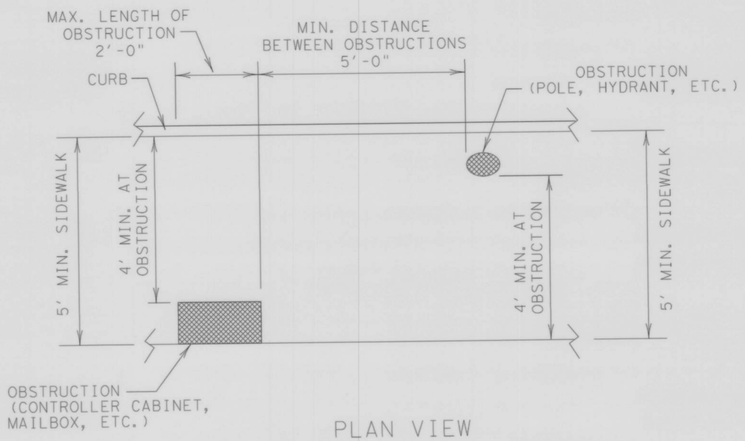
Ramp sidewalk

SIDEWALK TREATMENT AT DRIVEWAYS



PROTECTED ZONE

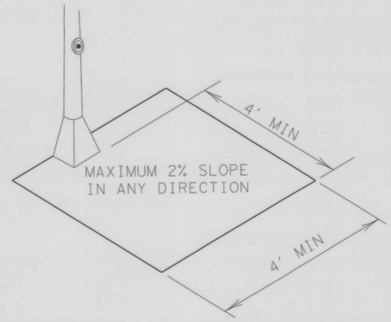
In pedestrian circulation area, maximum 4" projection for post or wall mounted objects between 27"and 80" above the surface.



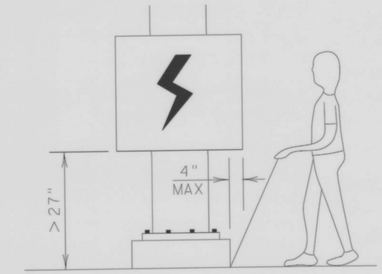
PLAN VIEW

PLACEMENT OF STREET FIXTURES

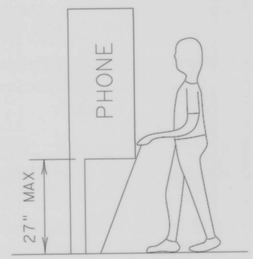
(ITEMS NOT INTENDED FOR PUBLIC USE. MINIMUM 4' x 4' CLEAR GROUND SPACE REQUIRED AT PUBLIC USE FIXTURES.)



CLEAR GROUND SPACE ADJACENT TO PEDESTRIAN PUSH BUTTON



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



Protruding objects of a height ≤ 27" are detectable by cane and do not require additional treatment.

DETECTION BARRIER FOR VERTICAL CLEARANCE < 80"

SHEET 3 OF 4

Texas Department of Transportation | Design Division Standard

PEDESTRIAN FACILITIES CURB RAMPS

PED-12A

FILE: ped12a.dgn	DN: TxDOT	CK: RM	DW: TxDOT	CK: VP
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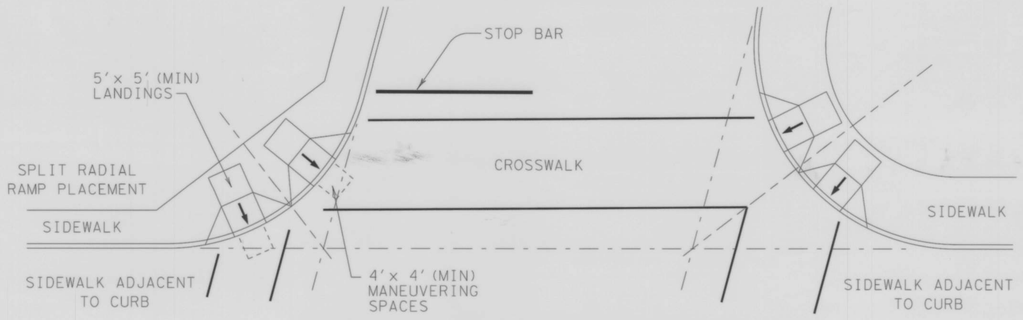
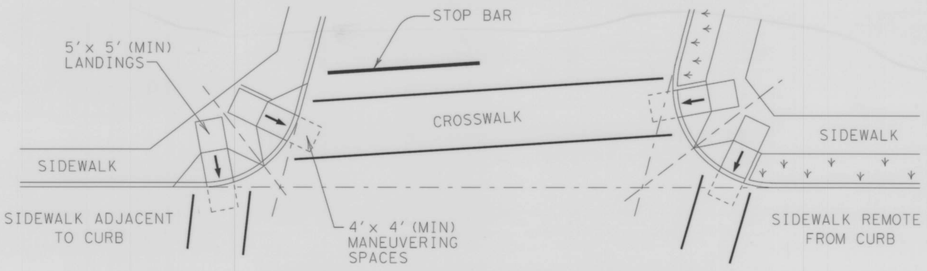
REVISIONS VP June 13, 2012	DIST	COUNTY		SHEET NO.

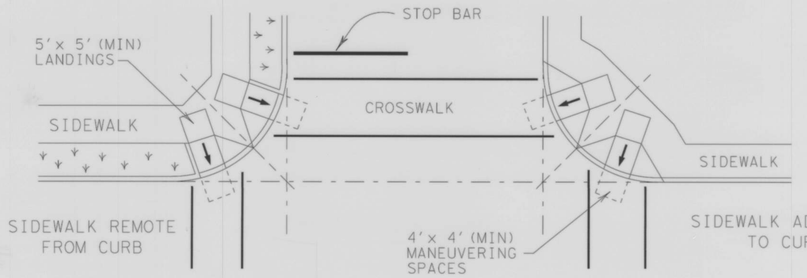
4/13/18



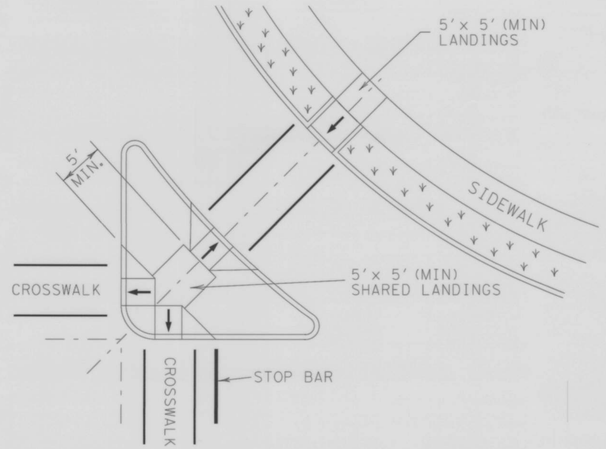
SKEWED INTERSECTION WITH "LARGE" RADIUS



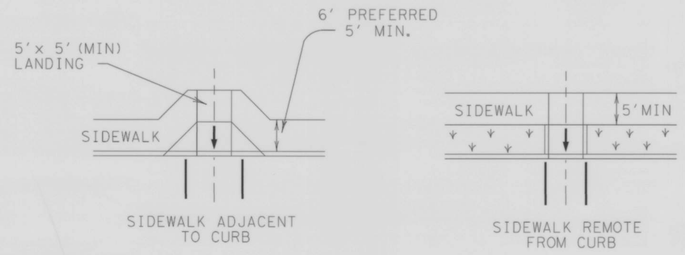
SKEWED INTERSECTION WITH "SMALL" RADIUS



NORMAL INTERSECTION WITH "SMALL" RADIUS



AT INTERSECTION
W/FREE RIGHT TURN & ISLAND



MID-BLOCK PLACEMENT
PERPENDICULAR RAMPS

TYPICAL CROSSING LAYOUTS

SHEET 4 OF 4

Texas Department of Transportation | Design Division Standard

PEDESTRIAN FACILITIES CURB RAMPS

PED-12A

FILE: ped12a.dgn	DN: TxDOT	CK: RM	DW: TxDOT	CK: VP
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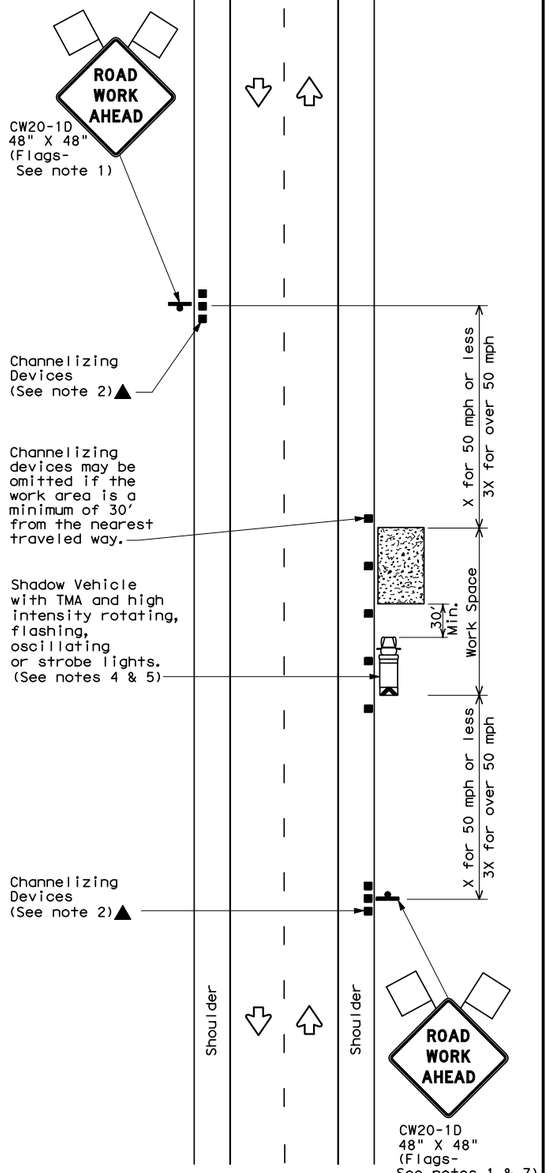
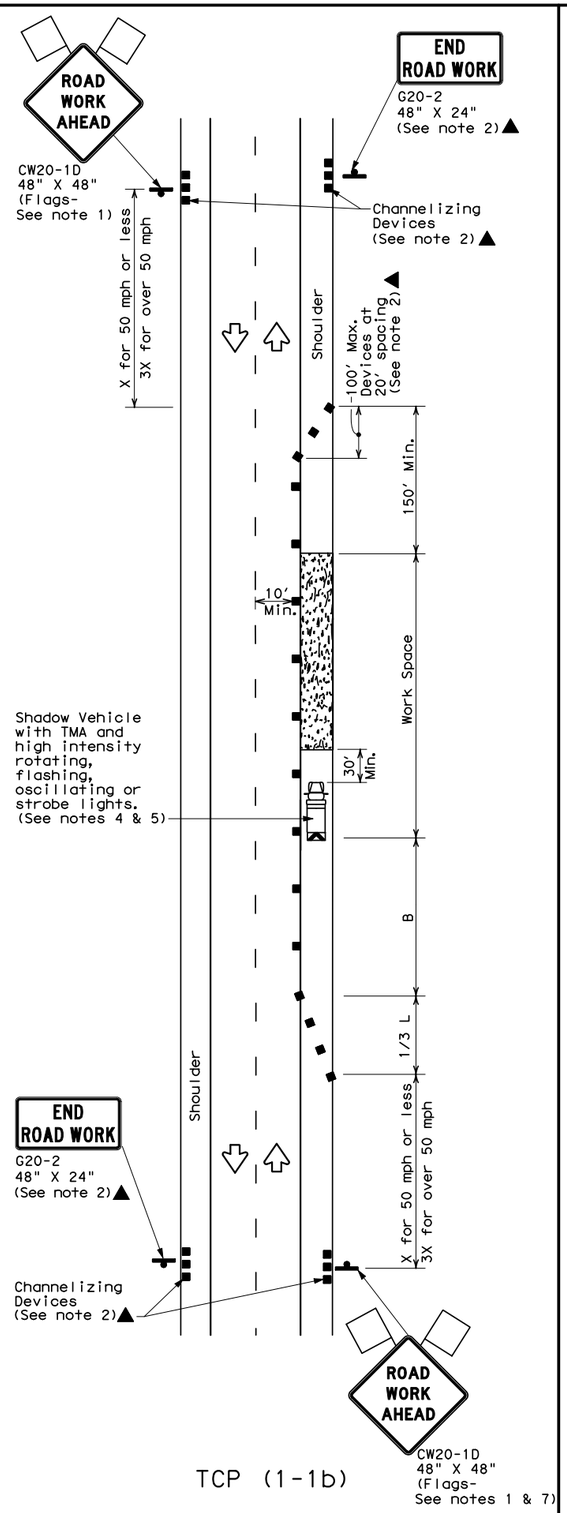
4/18/18

DATE:
FILE:



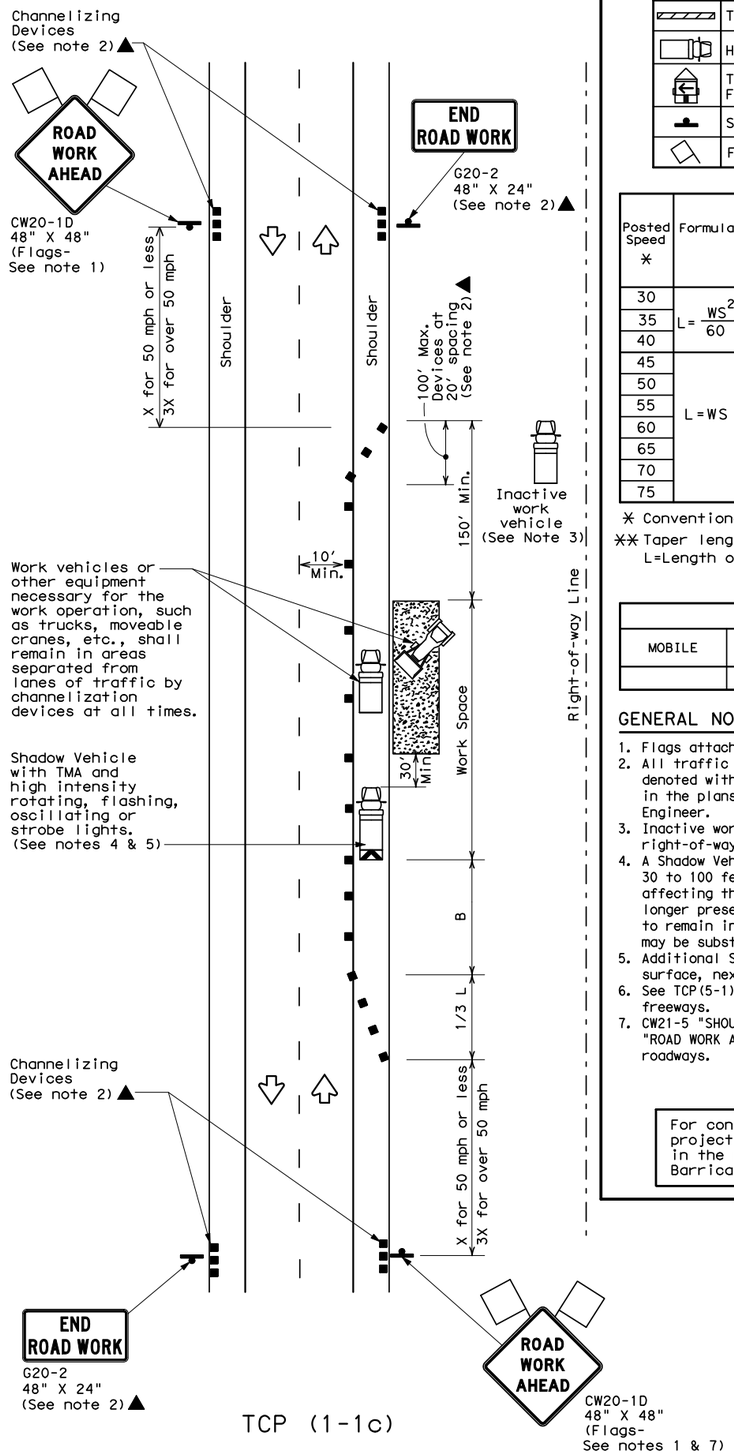
TCP (1-1a)

WORK SPACE NEAR SHOULDER
Conventional Roads



TCP (1-1b)

WORK SPACE ON SHOULDER
Conventional Roads



TCP (1-1c)

WORK VEHICLES ON SHOULDER
Conventional Roads

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

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

* Conventional Roads Only

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

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

GENERAL NOTES

1. Flags attached to signs where shown are REQUIRED.
2. All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
3. Inactive work vehicles or other equipment should be parked near the right-of-way line and not parked on the paved shoulder.
4. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and TMA.
5. Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect wider work spaces.
6. See TCP(5-1)for shoulder work on divided highways, expressways and freeways.
7. CW21-5 "SHOULDER WORK" signs may be used in place of CW20-1D "ROAD WORK AHEAD" signs for shoulder work on conventional roadways.

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

Texas Department of Transportation
Traffic Operations Division

TRAFFIC CONTROL PLAN CONVENTIONAL ROAD SHOULDER WORK

TCP(1-1)-12

DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT

REVISIONS	CONT	SECT	JOB	HIGHWAY
2-94 1-12				
8-95				
1-97	DIST	COUNTY		SHEET NO.
4-98				