





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

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

- ☐ Right of Way Permit  
☒ Commercial Driveway Permit

Permit No: 2018-24190

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:**

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

**(2) BOND:**

- ☐ County Attorney, approval when applicable.
- ☐ Perpetual bond currently posted. Bond No: \_\_\_\_\_ Amount: \_\_\_\_\_
- ☒ Performance bond submitted. Bond No: [REDACTED] Amount: \$10,000.00
- ☐ 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.**

  
\_\_\_\_\_  
Permit Administrator

11/5/2018

\_\_\_\_\_  
Date



**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, United Constructors of Texas, Inc whose address is 6989 W. Little York, Suite F, Houston, TX 77040 Texas, hereinafter called the Principal, And Insurors Indemnity Company, a Corporation existing under and by virtue of the laws of the state of Texas and authorized to do an indemnifying business in the state of Texas, and whose principal office is located at 225 South 5th Street, Waco, TX 76701, whose officer residing in the State of Texas, authorized to accept service in all suits and actions brought whining said state is Insurors Indemnity Co and Whose address is 225 South 5th Street, Waco, TX 76701, 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 Dollars and Zero Cents Dollars (\$ 5,000.00 ) current, lawful money of the United States 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 21st day of September, 20 2018.

United Constructors of Texas, Inc

PRINCIPAL

BY [Signature]

Insurors Indemnity Company

SURETY

BY [Signature]

CCM 11-13-2018 #14K

Fort Bend County Clerk

Return Admin Serv Coord RAC

Permit # 2018-24190

**POWER OF ATTORNEY of INSURORS INDEMNITY COMPANY  
Waco, Texas**

**KNOW ALL PERSONS BY THESE PRESENTS:**

Number: [REDACTED]

That INSURORS INDEMNITY COMPANY, Waco, Texas, organized and existing under the laws of the State of Texas, and authorized and licensed to do business in the State of Texas and the United States of America, does hereby make, constitute and appoint

Andrea M. Penaloza of the City of Houston, State of TX

as Attorney in Fact, with full power and authority hereby conferred upon him to sign, execute, acknowledge and deliver for and on its behalf as Surety and as its act and deed, all of the following classes of document, to-wit:

Indemnity, Surety and Undertakings that may be desired by contract, or may be given in any action or proceeding in any court of law or equity; Indemnity in all cases where indemnity may be lawfully given and with full power and authority to execute consents and waivers to modify or change or extend any bond or document executed for this Company.

INSURORS INDEMNITY COMPANY

Attest:

Tammy Tieperman  
Tammy Tieperman, Secretary

By:

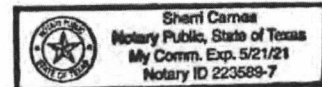
Dave E. Talbert  
Dave E. Talbert, President

State of Texas

County of McLennan

On the 11<sup>th</sup> day of November, 2014, before me a Notary Public in the State of Texas, personally appeared Dave E. Talbert and Tammy Tieperman, who being by me duly sworn, acknowledged that they executed the above Power of Attorney in their capacities as President, and Corporate Secretary, respectively, of Insurors Indemnity Company, and acknowledged said Power of Attorney to be the voluntary act and deed of the Company.

Sherril Carnes  
Notary Public, State of Texas



Insurors Indemnity Company certifies that this Power of Attorney is granted under and by authority of the following resolutions of the Company adopted by the Board of Directors on November 11, 2014:

RESOLVED, that all bonds, undertakings, contracts or other obligations may be executed in the name of the Company by persons appointed as Attorney in Fact pursuant to a Power of Attorney issued in accordance with these Resolutions. Said Power of Attorney shall be executed in the name and on behalf of the Company either by the Chairman and CEO or the President, under their respective designation. The signature of such officer and the seal of the Company may be affixed by facsimile to any Power of Attorney, and, unless subsequently revoked and subject to any limitation set forth therein, any such Power of Attorney or certificate bearing such facsimile signature and seal shall be valid and binding upon the Company and any such power so executed and certified by facsimile signature and seal shall be valid and binding upon the Company with respect to any bond or undertaking to which it is validly attached.

RESOLVED, that Attorneys in Fact shall have the power and authority, subject to the terms and limitations of the Power of Attorney issued to them, to execute and deliver on behalf of the Company and to attach the seal of the Company to any and all bonds and undertakings, and any such instrument executed by such Attorneys in Fact shall be binding upon the Company as if signed by an Executive Officer and sealed and attested to by the Secretary or Assistant Secretary of the Company.

I, Tammy Tieperman, Secretary of Insurors Indemnity Company, do hereby certify that the foregoing is a true excerpt from the Resolutions of the said Company as adopted by its Board of Directors on November 11, 2014, and that this Resolution is in full force and effect. I certify that the foregoing Power of Attorney is in full force and effect and has not been revoked.

In Witness Whereof, I have set my hand and the seal of INSURORS INDEMNITY COMPANY on this 21st day of September, 2018.

Tammy Tieperman  
Tammy Tieperman, Secretary

NOTE: IF YOU HAVE ANY QUESTION REGARDING THE VALIDITY OR WORDING OF THIS POWER OF ATTORNEY, PLEASE CALL 800.933.7444 OR WRITE TO US AT P. O. BOX 2683, WACO, TEXAS 76702-2683 OR EMAIL US AT [CONFIRMATION@INSURORS.COM](mailto:CONFIRMATION@INSURORS.COM).



P&C 877 282 1625  
Bonds 800 933 7444

225 South Fifth Street  
PO Box 2683  
Waco, Texas 76702-2683

## IMPORTANT NOTICE - AVISO IMPORTANTE

To obtain information or make a complaint:

You may call Insurors Indemnity Company's toll-free telephone number for information or to make a complaint at:

1-800-933-7444

You may also write to Insurors Indemnity Company at:

P.O. Box 2683  
Waco, TX 76702-2683  
Or  
225 South Fifth Street  
Waco, TX 76701

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

1-800-252-3439

You may write the Texas Department of Insurance at:

Consumer Protection (111-1A)  
P.O. Box 149091  
Austin, TX 78714-9091  
Fax: 512-490-1007

Web: <http://www.tdi.texas.gov>

E-mail: [ConsumerProtection@tdi.texas.gov](mailto:ConsumerProtection@tdi.texas.gov)

### PREMIUM OR CLAIM DISPUTES:

Should you have a dispute concerning your premium or about a claim, you should contact the agent or the company first. If the dispute is not resolved, you may contact the Texas Department of Insurance.

### ATTACH THIS NOTICE TO YOUR POLICY:

This notice is for information only and does not become a part or condition of the attached document.

Para obtener informacion o para someter una queja:

Usted puede llamar al numero de telefono gratis de Insurors Indemnity Company's para informacion o para someter una queja al

1-800-933-7444

Usted tambien puede escribir a Insurors Indemnity Company:

P.O. Box 2683  
Waco, TX 76702-2683  
O  
225 South Fifth Street  
Waco, TX 76701

Puede comunicarse con el Departamento de Seguros de Texas para obtener informacion acerca de companias, coberturas, derechos o quejas al

1-800-252-3439

Puede escribir al Departamento de Seguros de Texas:

Consumer Protection (111-1A)  
P.O. Box 149091  
Austin, TX 78714-9091  
Fax: 512-490-1007

Web: <http://www.tdi.texas.gov>

E-mail: [ConsumerProtection@tdi.texas.gov](mailto:ConsumerProtection@tdi.texas.gov)

### DISPUTAS SOBRE PRIMAS O RECLAMOS:

Si tiene una disputa concemiente a su prima o a un reclamo, debe comunicarse con el agente o la compania primero. Si no se resuelve la disputa, puede entonces comunicarse con el departamento (TDI).

### UNA ESTE AVISO A SU POLIZA:

Este aviso es solo para proposito de informacion y no se convierte en parte o condicion del documento adjunto.

# RIDER

It is hereby agreed and understood that Insurors Indemnity Company gives consent to revise the information contained in the original bond as follows:

Name of Principal: United Constructors of Texas, Inc  
dba  
Address of Principal: 6989 W. Little York, Suite F, Houston, TX 77040  
Bond Effective Date: 09/21/2018  
Bond Expiration Date: 09/21/2019  
Penalty Amount: Ten Thousand Dollars and Zero Cents (\$10,000.00)

Notes:

Penalty has been amended to: Ten Thousand Dollars (\$10,000.00)

Nothing herein contained shall be held to vary, alter, waive or extend any of the terms, limits or conditions of the Cables, Conduits & Poles, except as hereinabove set forth.

This rider becomes effective on 11/05/2018, at twelve and one minute o'clock a.m., Standard Time.

Attached to and forming part of Bond Number [REDACTED] dated 09/21/2018  
issued by Insurors Indemnity Company of Waco, Texas, to United Constructors of Texas, Inc.

Signed this 5th day of November, 2018.

Insurors Indemnity Company

By: Andrea M. Penaloza  
Andrea M. Penaloza, Attorney-in-Fact

**POWER OF ATTORNEY of INSURORS INDEMNITY COMPANY  
Waco, Texas**

**KNOW ALL PERSONS BY THESE PRESENTS:**

Number:                     

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Andrea M. Penaloza of the City of Houston, State of TX

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INSURORS INDEMNITY COMPANY

Attest:

Tammy Tieperman  
Tammy Tieperman, Secretary

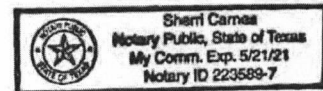
By:

Dave E. Talbert  
Dave E. Talbert, President

State of Texas  
County of McLennan

On the 11<sup>th</sup> day of November, 2014, before me a Notary Public in the State of Texas, personally appeared Dave E. Talbert and Tammy Tieperman, who being by me duly sworn, acknowledged that they executed the above Power of Attorney in their capacities as President, and Corporate Secretary, respectively, of Insurors Indemnity Company, and acknowledged said Power of Attorney to be the voluntary act and deed of the Company.

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Tammy Tieperman  
Tammy Tieperman, Secretary

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FILED AND RECORDED  
OFFICIAL PUBLIC RECORDS

*Laura Richard*

Laura Richard, County Clerk

Fort Bend County Texas

November 16, 2018 02:02:28 PM



FEE: \$0.00

EW

**2018128456**

PROPOSED PAVING, UTILITIES, DRAINAGE,  
AND GRADING CONSTRUCTION PLANS

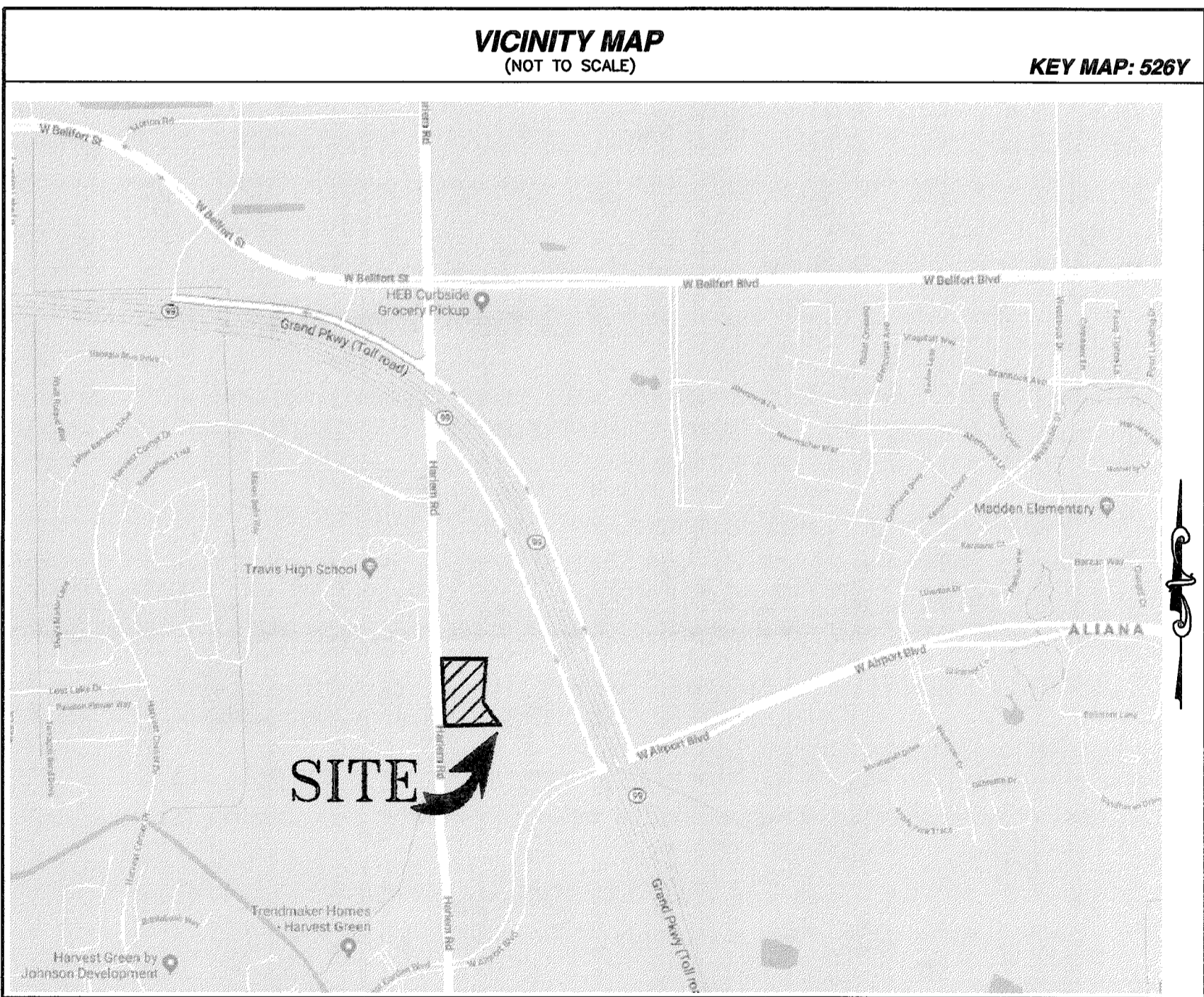
TO SERVE

COMMONS AT HARVEST GREEN

AT

11131 AND 11135 HARLEM ROAD  
HOUSTON, TEXAS 77406

APRIL, 2018



| INDEX OF DRAWINGS                        | SHEET |
|--|-------|
| COVER SHEET                              | C1.0  |
| TOPOGRAPHIC MAP                          | C2.0  |
| SITE PLAN                                | C3.1  |
| DRAINAGE AREA MAP                        | C4.0  |
| DRAINAGE CALCULATIONS                    | C4.1  |
| SITE DRAINAGE PLAN                       | C4.2  |
| SITE GRADING PLAN                        | C4.3  |
| SITE PAVING PLAN                         | C4.4  |
| STORM WATER POLLUTION PREVENTION PLAN    | C5.1  |
| STORM WATER POLLUTION PREVENTION DETAILS | C5.2  |
| SITE UTILITIES PLAN                      | C6.1  |
| GENERAL NOTES                            | C7.1  |
| CONSTRUCTION DETAILS                     | C7.2  |
| CONSTRUCTION DETAILS                     | C7.3  |
| TRAFFIC CONTROL PLAN                     | C8.0  |
| TRAFFIC CONTROL PLAN                     | C8.1  |
| LEFT TURN LANE PLAN                      | C9.1  |

FORT BEND COUNTY ENGINEER

ENGINEER: *Richard W. Stangle, P.E., PTOE 10/19/18*  
for RICHARD W. STOLLEIS, P.E.

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

APPROVED: *[Signature]*  
DEVELOPMENT SERVICES MANAGER

DATE: 10/18/18

**RSG ENGINEERING**

2825 WILCREST DRIVE  
SUITE 100  
HOUSTON, TEXAS 77042  
TEL: 713-763-7777

project  
COMMONS AT HARVEST GREEN  
at  
11131 AND 11135 HARLEM ROAD  
RICHMOND, TEXAS 77406

REVISIONS

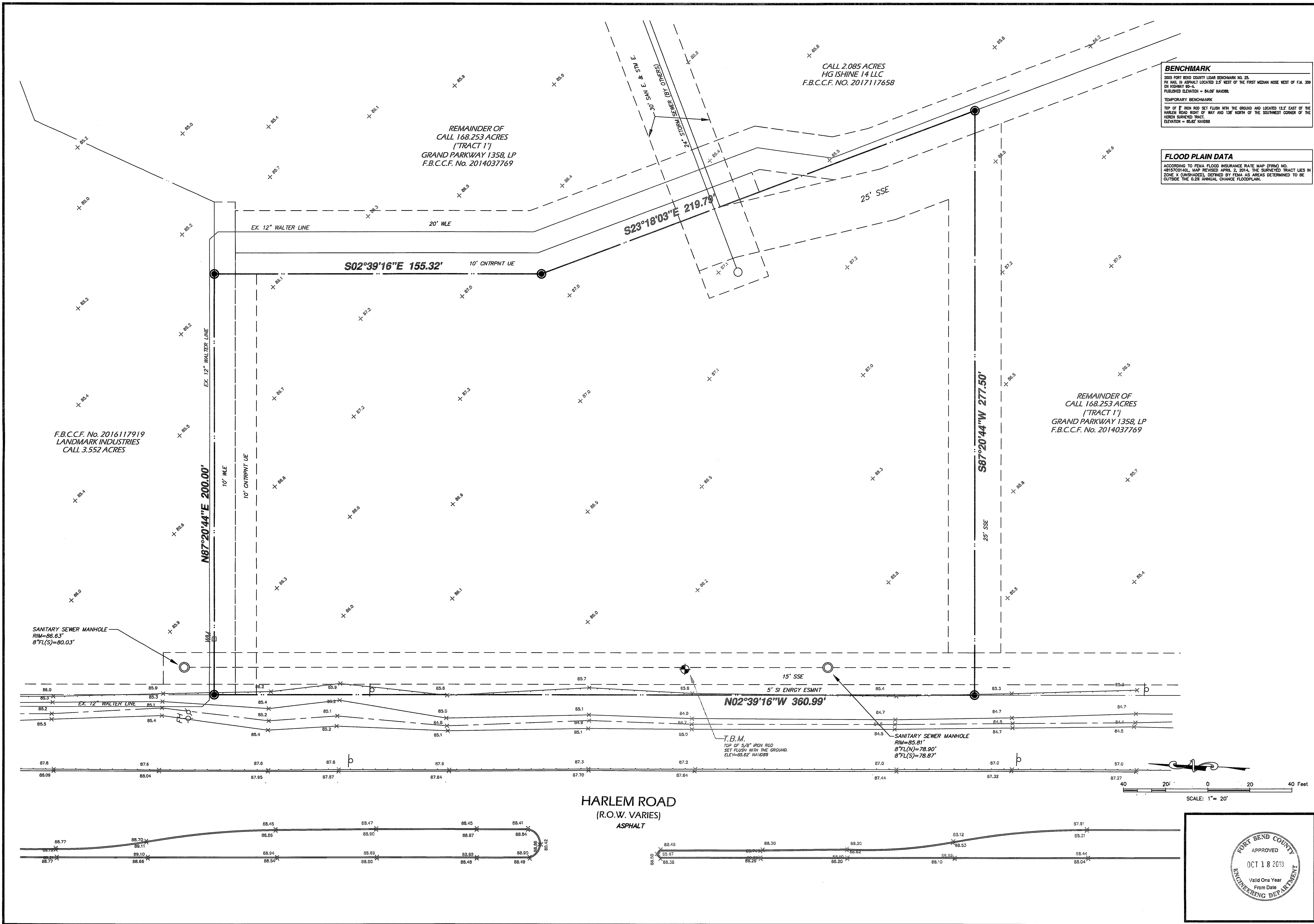
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|  |  |  |  |  |

STATE OF TEXAS  
SALIM NAZIH OBEID  
118889  
LICENSED PROFESSIONAL ENGINEER

10/08/18 *[Signature]*

COVER SHEET

|                       |                   |
|-----------------------|-------------------|
| DRAWN BY:<br>FA       | CHECKED:<br>SNO   |
| PROJECT No<br>1877.01 | SHEET No:<br>C1.0 |



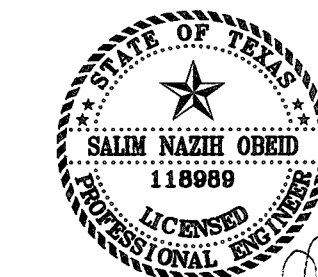
**BENCHMARK**  
2005 FORT BEND COUNTY LEARN BENCHMARK NO. 25.  
PG. MAIL IN ASPHALT LOCATED 2.5' WEST OF THE FIRST MEDIAN NOSE WEST OF F.M. 359  
ON HIGHWAY 60-A.  
PUBLISHED ELEVATION = 84.08' NAVD83.  
**TEMPORARY BENCHMARK**  
TOP OF 1" IRON ROD SET FLUSH WITH THE GROUND AND LOCATED 13.2' EAST OF THE  
HARLEM ROAD RIGHT OF WAY AND 138' NORTH OF THE SOUTHWEST CORNER OF THE  
HIGHER SURVEYED ROAD.  
ELEVATION = 85.62' NAVD83

**FLOOD PLAIN DATA**  
ACCORDING TO FEMA FLOOD INSURANCE RATE MAP (FIRM) NO.  
48157C0140L, MAP REVISED APRIL 2, 2014, THE SURVEYED TRACT LIES IN  
ZONE X (UNSHADED), DEFINED BY FEMA AS AREAS DETERMINED TO BE  
OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN.

**RSG ENGINEERING**

project  
**COMMONS AT HARVEST GREEN**  
at  
**11131 AND 11135 HARLEM ROAD**  
**RICHMOND, TEXAS 77406**

REVISIONS



08/15/18

**TOPOGRAPHIC MAP**

**DRAWN BY:** FA  
**CHECKED:** SNO

**PROJECT No:** 1877.01  
**SHEET No:** C2.0

TYPE FIRM #: 16408

2025 WILCREST DRIVE  
SUITE 100  
RICHMOND, TEXAS 77042  
TEL: 713-783-7777



REMAINDER OF  
CALL 168.253 ACRES  
(TRACT 1)  
GRAND PARKWAY 1358, LP  
F.B.C.C.F. No. 2014037769

CALL 2.085 ACRES  
HG ISHINE 14 LLC  
F.B.C.C.F. NO. 2017117658

### KEYED PLAN NOTES

1 RECESSED CONCRETE AND FLUSH BRICK PAVERS IN  
SIDEWALKS. RE: DETAIL SHEET C4.4

F.B.C.C.F. No. 2016117919  
LANDMARK INDUSTRIES  
CALL 3.552 ACRES

REMAINDER OF  
CALL 168.253 ACRES  
(TRACT 1)  
GRAND PARKWAY 1358, LP  
F.B.C.C.F. No. 2014037769

PROPOSED BUILDING  
AREA: 9,845 SF  
FF = 68.80

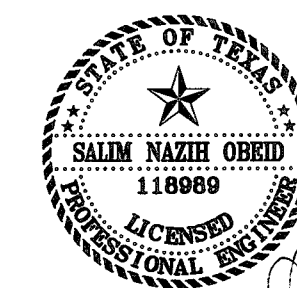
PROPOSED BUILDING  
AREA: 7,365 SF  
FF = 68.80

RSG ENGINEERING

2825 WILCREST DRIVE  
SUITE 678  
HOUSTON, TEXAS 77042  
TEL. 713-783-7777

project  
COMMONS AT HARVEST GREEN  
at  
11131 AND 11135 HARLEM ROAD  
RICHMOND, TEXAS 77406

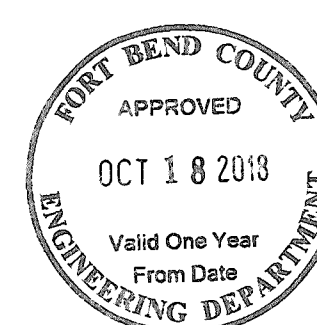
| REVISIONS | REV.                       | DATE     | DESCRIPTION |
|-----------|----------------------------|----------|-------------|
| 1         | REV. SIDEWALK AND PAVEMENT | 07.05.18 |             |
| 2         | MUD COMMENT RESPONSE       | 08.15.18 |             |



08/15/18

SITE PLAN

DRAWN BY: FA  
CHECKED BY: SNO  
PROJECT No: 1877.01  
SHEET No: C3.1

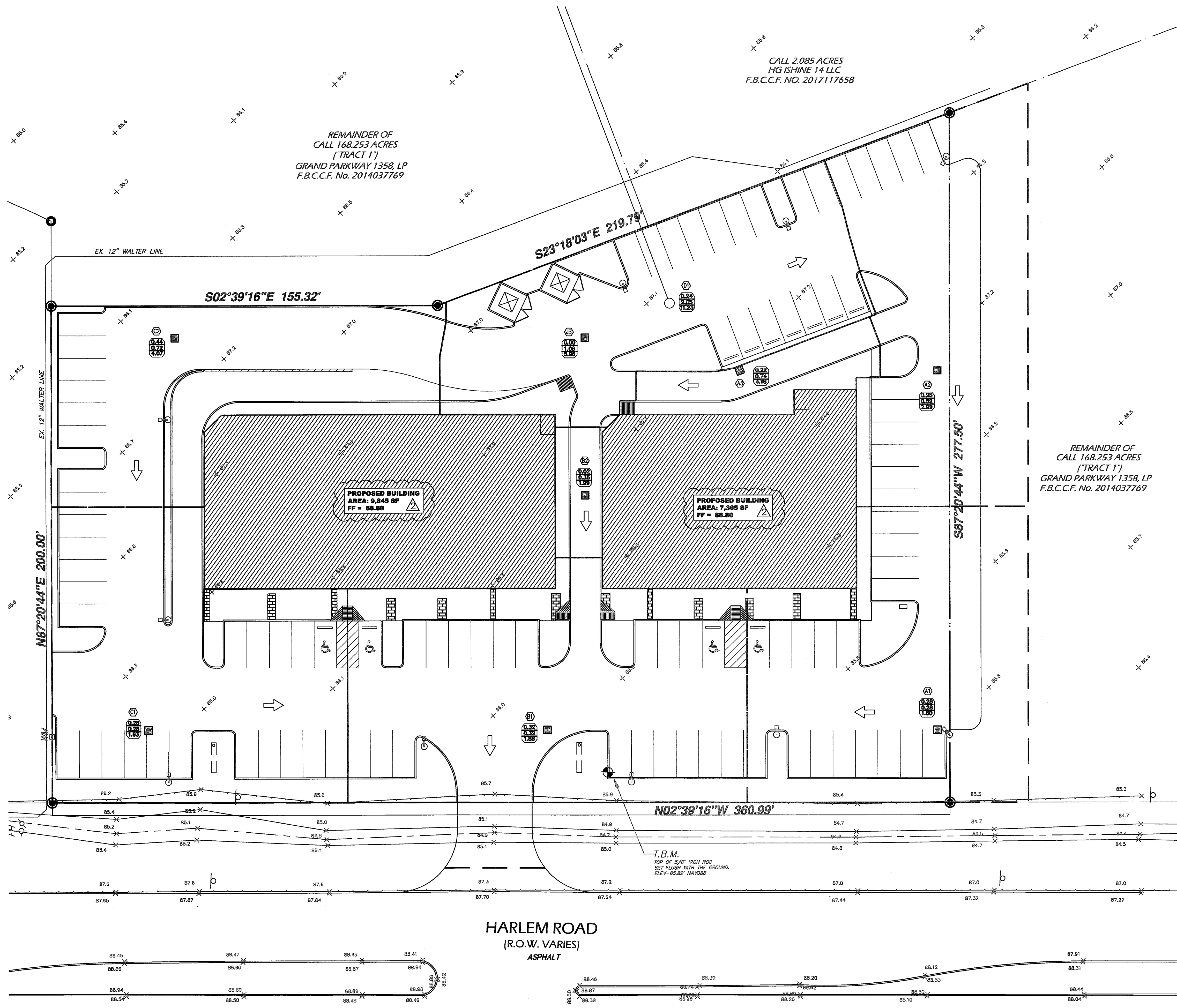


HARLEM ROAD  
(R.O.W. VARIES)  
ASPHALT

SCALE: 1" = 20'

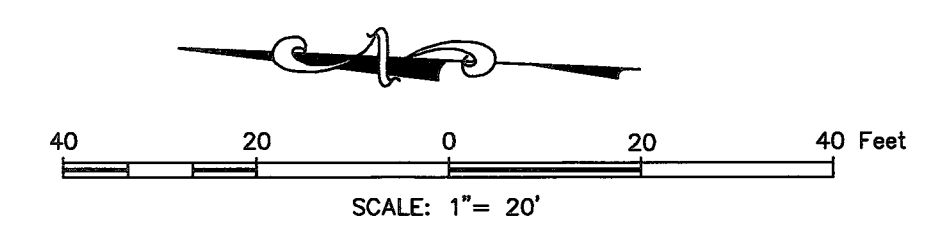
EXISTING DITCH SHALL BE REGRADED TO MOVE EAST  
HIGH BANK TO BE 6" WEST OF EAST R.O.W. LINE. DITCH  
CENTERLINE SHALL BE RELOCATED ACCORDINGLY WHILE  
MAINTAINING A MAXIMUM SIDE SLOPE OF 4:1

EXISTING DITCH SHALL BE REGRADED TO MOVE EAST  
HIGH BANK TO BE 6" WEST OF EAST R.O.W. LINE. DITCH  
CENTERLINE SHALL BE RELOCATED ACCORDINGLY WHILE  
MAINTAINING A MAXIMUM SIDE SLOPE OF 4:1



**LEGEND**

|  |   |
|--|---|
|  | PROPOSED STORM SEWER (PVC SCHEDULE 40 U.N.O.) |
|  | EXISTING STORM SEWER                          |
|  | PROPERTY LINE                                 |
|  | GRADE BREAK (G.B.)                            |
|  | DENOTES DETENTION AREA                        |
|  | OFFSITE SHEET FLOW                            |
|  | STORM SEWER MANHOLE                           |
|  | DRAINAGE AREA DESIGNATION                     |
|  | CATCH BASIN (RE: DETAIL & SCHEDULE)           |
|  | EXISTING NATURAL GRADE ELEVATIONS             |
|  | INLET DRAINAGE AREA                           |
|  | CUMULATIVE DRAINAGE AREA                      |
|  | CUMULATIVE FLOW RATE 100-YR                   |
|  | EXTREME EVENT FLOW DIRECTION                  |



**FORT BEND COUNTY**  
APPROVED  
OCT 18 2018  
Valid One Year  
From Date  
**ENGINEERING DEPARTMENT**

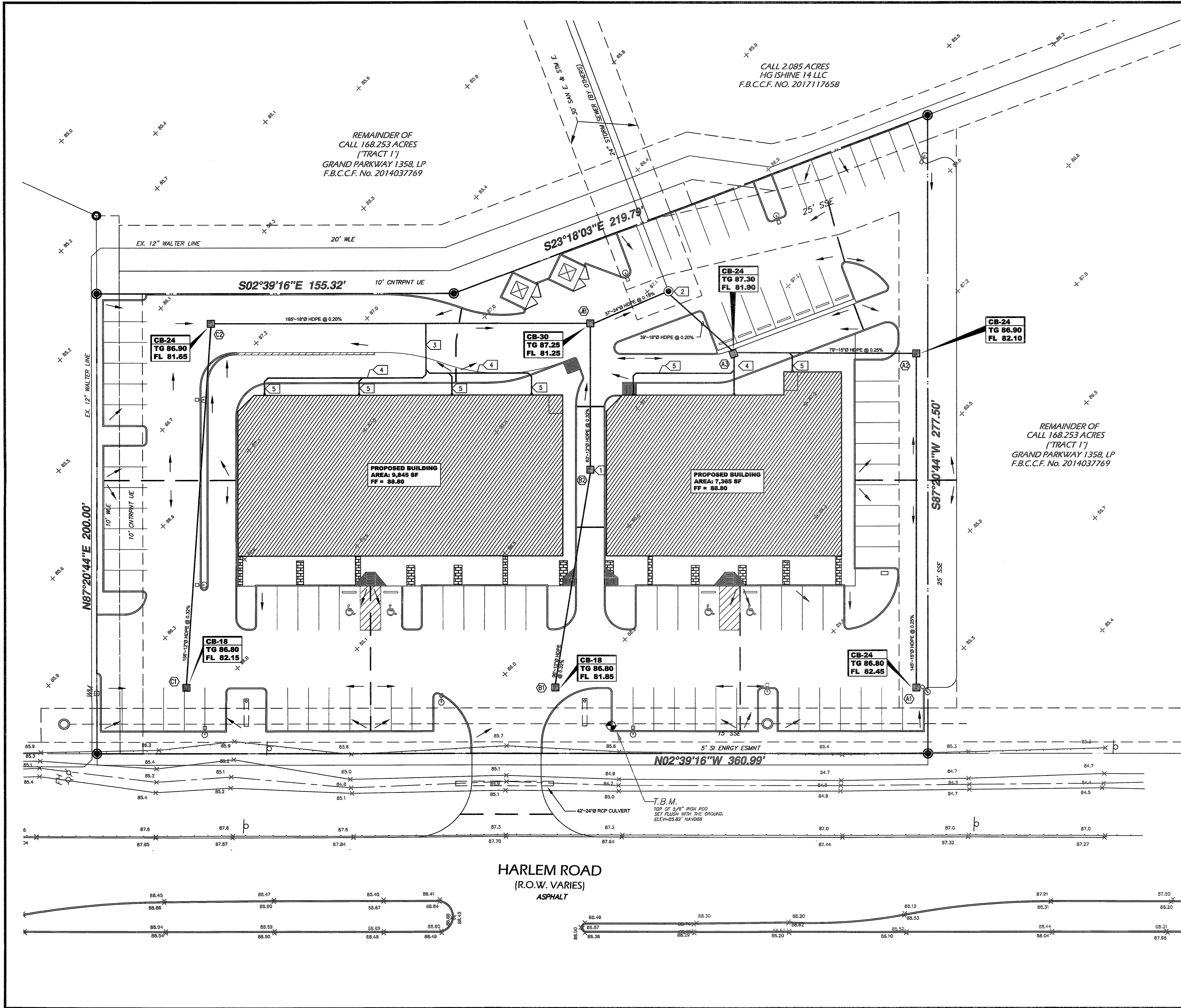
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|--|---|---|-------------------------------------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| <b>RSG ENGINEERING</b>   |   |   |                                     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 2825 WILCREST DRIVE<br>SUITE 100<br>RICHMOND, TEXAS 77042<br>TEL: 713-783-7777                           |   |   |                                     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| TYPE FORM #: 15498   |   |   |                                     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| <b>project</b><br>COMMONS AT HARVEST GREEN<br>at<br>11131 AND 11135 HARLEM ROAD<br>RICHMOND, TEXAS 77406 |   |   |                                     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| <b>REVISIONS</b>   | <table><tr><td>1</td><td>FBC &amp; MUD COMMENT RESPONSE 08.02.18</td><td></td><td></td></tr><tr><td> </td><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td><td> </td></tr></table> | 1 | FBC & MUD COMMENT RESPONSE 08.02.18 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 1  | FBC & MUD COMMENT RESPONSE 08.02.18   |   |                                     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |   |   |                                     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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|  |   |   |                                     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 08/15/18   |   |   |                                     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| <b>DRAINAGE AREA MAP</b>   |   |   |                                     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| <b>DRAWN BY:</b><br>FA   | <b>CHECKED:</b><br>SNO  |   |                                     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| <b>PROJECT No:</b><br>1877.01  | <b>SHEET No:</b><br>C4.0  |   |                                     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

| Inlet Capacity Calculations |                                |           |           |                                 |                            |
|-----------------------------|--------------------------------|-----------|-----------|---------------------------------|----------------------------|
| INLET#                      | MAX<br>PONDING<br>ELEV<br>(FT) | H<br>(FT) | A<br>(SF) | Q<br>INLET<br>CAPACITY<br>(CFS) | REQUIRED<br>FLOWS<br>(CFS) |
| A1                          | 87.5                           | 1.27      | 2         | 14.48                           | 1.60                       |
| A2                          | 87.5                           | 1.33      | 2         | 14.83                           | 2.99                       |
| A3                          | 87.8                           | 1.76      | 2         | 17.01                           | 4.18                       |
|                             |                                |           |           |                                 |                            |
| B1                          | 87.5                           | 1.15      | 1.125     | 7.76                            | 1.86                       |
| B2                          | 88.3                           | 2.14      | 1.125     | 10.57                           | 1.99                       |
|                             |                                |           |           |                                 |                            |
| C1                          | 87.5                           | 1.07      | 1.125     | 7.46                            | 1.63                       |
| C2                          | 87.5                           | 1.30      | 2         | 14.67                           | 4.07                       |

| MAXIMUM PONDING LEVEL |                                     |       |                                     |
|-----------------------|-------------------------------------|-------|-------------------------------------|
| INLET #               | MAXIMUM<br>PONDING<br>ELEV.<br>(FT) | TG    | MAXIMUM<br>PONDING<br>DEPTH<br>(FT) |
| A1                    | 87.5                                | 86.80 | 0.70                                |
| A2                    | 87.5                                | 86.90 | 0.60                                |
| A3                    | 87.8                                | 87.40 | 0.40                                |
|                       |                                     |       |                                     |
| B1                    | 87.5                                | 86.80 | 0.70                                |
| B2                    | 88.3                                | 87.90 | 0.40                                |
|                       |                                     |       |                                     |
| C1                    | 87.5                                | 86.80 | 0.70                                |
| C2                    | 87.5                                | 86.80 | 0.70                                |

| Storm Sewer Calculations  |          |                 |                          |                       |                 |              |                           |                          |                         |                          |            |                                  |                             |                              |              |                           |                           |                              |                          |                           |                           |                   |                          |
|---------------------------|----------|-----------------|--------------------------|-----------------------|-----------------|--------------|---------------------------|--------------------------|-------------------------|--------------------------|------------|----------------------------------|-----------------------------|------------------------------|--------------|---------------------------|---------------------------|------------------------------|--------------------------|---------------------------|---------------------------|-------------------|--------------------------|
| PROJECT: HARVEST GREEN    |          |                 |                          |                       |                 |              |                           |                          |                         |                          |            | DESIGN STORM                     |                             |                              |              |                           |                           |                              |                          |                           |                           |                   |                          |
| JOB NO: 1877.01           |          |                 |                          |                       |                 |              |                           |                          |                         |                          |            | 2-YR 10-YR 100-YR                |                             |                              |              |                           |                           |                              |                          |                           |                           |                   |                          |
| SYSTEM: 100 YR STM DESIGN |          |                 |                          |                       |                 |              |                           |                          |                         |                          |            | b= 75.01 93.53 125.4             |                             |                              |              |                           |                           |                              |                          |                           |                           |                   |                          |
| BY: FA                    |          |                 |                          |                       |                 |              |                           |                          |                         |                          |            | d= 16.20 18.9 21.8               |                             |                              |              |                           |                           |                              |                          |                           |                           |                   |                          |
| CHCKD BY: SALIM OBEID     |          |                 |                          |                       |                 |              |                           |                          |                         |                          |            | e= 0.832 0.7742 0.75             |                             |                              |              |                           |                           |                              |                          |                           |                           |                   |                          |
|                           |          |                 |                          |                       |                 |              |                           |                          |                         |                          |            | I = b/(d+TC) <sup>1/e</sup>      |                             |                              |              |                           |                           |                              |                          |                           |                           |                   |                          |
|                           |          |                 |                          |                       |                 |              |                           |                          |                         |                          |            | Tc = 10xA <sup>0.1761</sup> + 15 |                             |                              |              |                           |                           |                              |                          |                           |                           |                   |                          |
|                           |          |                 |                          |                       |                 |              |                           |                          |                         |                          |            | C = 0.60 la + 0.20               |                             |                              |              |                           |                           |                              |                          |                           |                           |                   |                          |
|                           |          |                 |                          |                       |                 |              |                           |                          |                         |                          |            | Q = C x l x A                    |                             |                              |              |                           |                           |                              |                          |                           |                           |                   |                          |
|                           |          |                 |                          |                       |                 |              |                           |                          |                         |                          |            | FL=Flowline                      |                             |                              |              |                           |                           |                              |                          |                           |                           |                   |                          |
|                           |          |                 |                          |                       |                 |              |                           |                          |                         |                          |            | HG= Hydraulic Gradient           |                             |                              |              |                           |                           |                              |                          |                           |                           |                   |                          |
|                           |          |                 |                          |                       |                 |              |                           |                          |                         |                          |            | UP=Upstream                      |                             |                              |              |                           |                           |                              |                          |                           |                           |                   |                          |
|                           |          |                 |                          |                       |                 |              |                           |                          |                         |                          |            | G=Gutter                         |                             |                              |              |                           |                           |                              |                          |                           |                           |                   |                          |
|                           |          |                 |                          |                       |                 |              |                           |                          |                         |                          |            | R=Top of Rim                     |                             |                              |              |                           |                           |                              |                          |                           |                           |                   |                          |
| DA<br>FROM                | DA<br>TO | AREA<br>(ACRES) | TOTAL<br>AREA<br>(ACRES) | RUNOFF<br>COEFF.<br>C | SUM OF<br>C * A | TC<br>(MIN.) | INTENSITY<br>I<br>(IN/HR) | SUM OF<br>FLOWS<br>(CFS) | REACH<br>LENGTH<br>(FT) | DIAM.<br>OR RISE<br>(IN) | Slope<br>% | Manning's<br>"n"                 | Design<br>Capacity<br>(CFS) | Design<br>Velocity<br>(ft/s) | Fall<br>(FT) | FL<br>Elev.<br>UP<br>(FT) | FL<br>Elev.<br>DS<br>(FT) | Actual<br>Velocity<br>(ft/s) | Friction<br>Loss<br>(ft) | HGL<br>Elev<br>UP<br>(FT) | HGL<br>Elev<br>DS<br>(FT) | HGL<br>Slope<br>% | TG<br>Elev<br>UP<br>(FT) |
| A1                        | A2       | 0.28            | 0.28                     | 0.80                  | 0.22            | 22.97        | 7.25                      | 1.60                     | 145                     | 15                       | 0.25       | 0.011                            | 3.83                        | 3.12                         | 0.36         | 82.44                     | 82.08                     | 1.30                         | 0.06                     | 86.23                     | 86.17                     | 0.04              | 86.80                    |
| A2                        | A3       | 0.25            | 0.52                     | 0.80                  | 0.42            | 23.92        | 7.13                      | 2.99                     | 79                      | 15                       | 0.25       | 0.011                            | 3.83                        | 3.12                         | 0.20         | 82.08                     | 81.88                     | 2.43                         | 0.12                     | 86.17                     | 86.04                     | 0.15              | 86.90                    |
| A3                        | D1       | 0.22            | 0.74                     | 0.80                  | 0.59            | 24.48        | 7.07                      | 4.18                     | 39                      | 18                       | 0.20       | 0.011                            | 5.57                        | 3.15                         | 0.08         | 81.88                     | 81.80                     | 2.37                         | 0.04                     | 86.04                     | 86.00                     | 0.11              | 87.30                    |
|                           |          |                 |                          |                       |                 |              |                           |                          |                         |                          |            |                                  |                             |                              |              |                           |                           |                              |                          |                           |                           |                   |                          |
| B1                        | B2       | 0.32            | 0.32                     | 0.80                  | 0.26            | 23.19        | 7.22                      | 1.86                     | 96                      | 12                       | 0.32       | 0.011                            | 2.39                        | 3.04                         | 0.31         | 81.83                     | 81.52                     | 2.37                         | 0.19                     | 86.35                     | 86.16                     | 0.20              | 86.80                    |
| B2                        | JB       | 0.02            | 0.35                     | 0.80                  | 0.28            | 23.29        | 7.21                      | 1.99                     | 63                      | 12                       | 0.32       | 0.011                            | 2.39                        | 3.04                         | 0.20         | 81.52                     | 81.32                     | 2.53                         | 0.14                     | 86.16                     | 86.02                     | 0.22              | 87.50                    |
|                           |          |                 |                          |                       |                 |              |                           |                          |                         |                          |            |                                  |                             |                              |              |                           |                           |                              |                          |                           |                           |                   |                          |
| C1                        | B2       | 0.28            | 0.28                     | 0.80                  | 0.23            | 23.00        | 7.24                      | 1.63                     | 158                     | 12                       | 0.32       | 0.011                            | 2.39                        | 3.04                         | 0.51         | 82.15                     | 81.65                     | 2.08                         | 0.24                     | 86.43                     | 86.20                     | 0.15              | 86.80                    |
| C2                        | JB       | 0.44            | 0.72                     | 0.80                  | 0.58            | 24.44        | 7.07                      | 4.07                     | 165                     | 18                       | 0.20       | 0.011                            | 5.57                        | 3.15                         | 0.33         | 81.65                     | 81.32                     | 2.30                         | 0.18                     | 86.20                     | 86.02                     | 0.11              | 86.90                    |
|                           |          |                 |                          |                       |                 |              |                           |                          |                         |                          |            |                                  |                             |                              |              |                           |                           |                              |                          |                           |                           |                   |                          |
| JB                        | D1       | 0.00            | 1.06                     | 0.80                  | 0.85            | 25.11        | 7.00                      | 5.96                     | 37                      | 24                       | 0.18       | 0.011                            | 11.37                       | 3.62                         | 0.07         | 81.32                     | 81.25                     | 1.90                         | 0.02                     | 86.02                     | 86.00                     | 0.05              | 87.25                    |
| D1                        | OUT      | 0.24            | 2.05                     | 0.80                  | 1.64            | 26.34        | 6.86                      | 11.23                    | 44                      | 24                       | 0.18       | 0.011                            | 11.37                       | 3.62                         | 0.08         |                           |                           | 3.57                         | 0.08                     |                           |                           |                   | 87.00                    |

| Storm Sewer Calculations |       |              |                    |                 |              |              |                     |                    |                   |                         |                           |               |                       |                        |                        |                  |                  |                        |                    |                  |                  |             |                 |
|--------------------------|-------|--------------|--------------------|-----------------|--------------|--------------|---------------------|--------------------|-------------------|-------------------------|---------------------------|---------------|-----------------------|------------------------|------------------------|------------------|------------------|------------------------|--------------------|------------------|------------------|-------------|-----------------|
| PROJECT: HARVEST GREEN   |       |              |                    |                 |              | DESIGN STORM |                     |                    |                   |                         |                           |               |                       |                        |                        |                  |                  |                        |                    |                  |                  |             |                 |
| JOB NO: 1877.01          |       |              |                    |                 |              | 2-YR         |                     |                    | 10-YR             | 100-YR                  | I = b/(d+TC) <sup>e</sup> |               |                       |                        |                        | FL=Flowline      |                  |                        |                    |                  |                  |             |                 |
| SYSTEM: 2 YR STM DESIGN  |       |              |                    |                 |              | b=           | 75.01               | 93.53              | 125.4             | Tc = 10xA^(0.1761) + 15 |                           |               |                       |                        | HG= Hydraulic Gradient |                  |                  |                        |                    |                  |                  |             |                 |
| BY: FA                   |       |              |                    |                 |              | d=           | 16.20               | 18.9               | 21.8              | C = 0.60 la + 0.20      |                           |               |                       |                        | UP=Upstream            |                  |                  |                        |                    |                  |                  |             |                 |
| CHCKD BY: SALIM OBEID    |       |              |                    |                 |              | e=           | 0.832               | 0.7742             | 0.75              | Q = C x l x A           |                           |               |                       |                        | G=Gutter               |                  |                  |                        |                    |                  |                  |             |                 |
|                          |       |              |                    |                 |              | R=Top of Rim |                     |                    |                   |                         |                           |               |                       |                        |                        |                  |                  |                        |                    |                  |                  |             |                 |
| DA FROM                  | DA TO | AREA (ACRES) | TOTAL AREA (ACRES) | RUNOFF COEFF. C | SUM OF C * A | TC (MIN.)    | INTENSITY I (IN/HR) | SUM OF FLOWS (CFS) | REACH LENGTH (FT) | DIAM. OR RISE (IN)      | Slope %                   | Manning's "n" | Design Capacity (CFS) | Design Velocity (ft/s) | Fall (FT)              | FL Elev. UP (FT) | FL Elev. DS (FT) | Actual Velocity (ft/s) | Friction Loss (ft) | HGL Elev UP (FT) | HGL Elev DS (FT) | HGL Slope % | TG Elev UP (FT) |
| A1                       | A2    | 0.28         | 0.28               | 0.80            | 0.22         | 22.97        | 3.55                | 0.78               | 145               | 15                      | 0.25                      | 0.011         | 3.83                  | 3.12                   | 0.36                   | 82.44            | 82.08            | 0.64                   | 0.02               | 83.69            | 83.41            | 0.19        | 86.80           |
| A2                       | A3    | 0.25         | 0.52               | 0.80            | 0.42         | 23.92        | 3.48                | 1.46               | 79                | 15                      | 0.25                      | 0.011         | 3.83                  | 3.12                   | 0.20                   | 82.08            | 81.88            | 1.19                   | 0.03               | 83.41            | 83.38            | 0.04        | 86.90           |
| A3                       | D1    | 0.22         | 0.74               | 0.80            | 0.59         | 24.48        | 3.44                | 2.04               | 39                | 18                      | 0.20                      | 0.011         | 5.57                  | 3.15                   | 0.08                   | 81.88            | 81.80            | 1.15                   | 0.01               | 83.38            | 83.30            | 0.20        | 87.30           |
|                          |       |              |                    |                 |              |              |                     |                    |                   |                         |                           |               |                       |                        |                        |                  |                  |                        |                    |                  |                  |             |                 |
| B1                       | B2    | 0.32         | 0.32               | 0.80            | 0.26         | 23.19        | 3.54                | 0.91               | 96                | 12                      | 0.32                      | 0.011         | 2.39                  | 3.04                   | 0.31                   | 81.83            | 81.52            | 1.16                   | 0.05               | 83.40            | 83.35            | 0.05        | 86.80           |
| B2                       | JB    | 0.02         | 0.35               | 0.80            | 0.28         | 23.29        | 3.53                | 0.97               | 63                | 12                      | 0.32                      | 0.011         | 2.39                  | 3.04                   | 0.20                   | 81.52            | 81.32            | 1.24                   | 0.03               | 83.35            | 83.32            | 0.05        | 87.50           |
|                          |       |              |                    |                 |              |              |                     |                    |                   |                         |                           |               |                       |                        |                        |                  |                  |                        |                    |                  |                  |             |                 |
| C1                       | B2    | 0.28         | 0.28               | 0.80            | 0.23         | 23.00        | 3.55                | 0.80               | 158               | 12                      | 0.32                      | 0.011         | 2.39                  | 3.04                   | 0.51                   | 82.15            | 81.65            | 1.02                   | 0.06               | 83.42            | 83.36            | 0.04        | 86.80           |
| C2                       | JB    | 0.44         | 0.72               | 0.80            | 0.58         | 24.44        | 3.45                | 1.98               | 165               | 18                      | 0.20                      | 0.011         | 5.57                  | 3.15                   | 0.33                   | 81.65            | 81.32            | 1.12                   | 0.04               | 83.36            | 83.32            | 0.03        | 86.90           |
|                          |       |              |                    |                 |              |              |                     |                    |                   |                         |                           |               |                       |                        |                        |                  |                  |                        |                    |                  |                  |             |                 |
| JB                       | D1    | 0.00         | 1.06               | 0.80            | 0.85         | 25.11        | 3.40                | 2.89               | 37                | 24                      | 0.18                      | 0.011         | 11.37                 | 3.62                   | 0.07                   | 81.32            | 81.25            | 0.92                   | 0.00               | 83.32            | 83.25            | 0.18        | 87.25           |
|                          |       |              |                    |                 |              |              |                     |                    |                   |                         |                           |               |                       |                        |                        |                  |                  |                        |                    |                  |                  |             |                 |
| D1                       | OUT   | 0.24         | 2.05               | 0.80            | 1.64         | 26.34        | 3.32                | 5.43               | 44                | 24                      | 0.18                      | 0.011         | 11.37                 | 3.62                   | 0.08                   |                  |                  | 1.73                   | 0.02               |                  |                  |             | 87.00           |

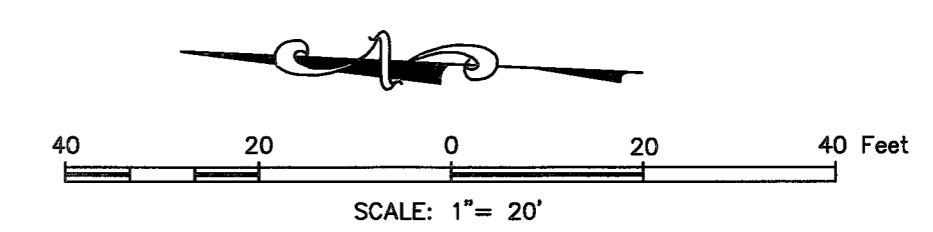


**LEGEND**

|  |   |
|--|---|
|  | PROPOSED STORM SEWER (PVC SCHEDULE 40 U.N.O.) |
|  | EXISTING STORM SEWER                          |
|  | PROPERTY LINE                                 |
|  | GRADE BREAK (G.B.)                            |
|  | DENOTES DETENTION AREA                        |
|  | SLOPE OF PAVEMENT OR FINISH GRADE             |
|  | STORM SEWER MANHOLE                           |
|  | DRAINAGE AREA DESIGNATION                     |
|  | CATCH BASIN (RE: DETAIL & SCHEDULE)           |
|  | EXISTING NATURAL GRADE ELEVATIONS             |
|  | DRAINAGE AREA                                 |
|  | CUMULATIVE DRAINAGE AREA                      |
|  | CUMULATIVE FLOW RATE                          |
|  | PROPOSED 0.25' CONTOURS                       |
|  | DENOTES FLOW LINE ELEVATION                   |
|  | DENOTES TOP OF PAVEMENT ELEVATION             |
|  | DENOTES TOP OF SIDEWALK ELEVATION             |
|  | DENOTES FINISH GRADE ELEVATION                |
|  | DENOTES HIGH BANK ELEVATION                   |

**KEYED PLAN NOTES**

1. PROPOSED CB-18 CATCH BASIN  
TG 86.80  
FL 81.30
2. PUBLIC STORM SEWER MANHOLE (BY OTHERS)  
REPLACE MANHOLE COVER TO AN OPEN GRATE COVER  
ADJUST MANHOLE RIM TO ELEVATION = 87.00
3. PROPOSED 10" HDPE STORM SEWER
4. PROPOSED 8" PVC STORM SEWER
5. PROPOSED 6" PVC DOWNSPOUT DRAINAGE PIPE



APPROVED  
OCT 18 2018  
Valid One Year  
From Date  
FORT BEND COUNTY  
ENGINEERING DEPARTMENT

**RS&G ENGINEERING**

2825 WILCREST DRIVE  
SUITE 676  
HOUSTON, TEXAS 77042  
TEL: 713-683-7777

project  
**COMMONS AT HARVEST GREEN**  
at  
**11131 AND 11135 HARLEM ROAD**  
RICHMOND, TEXAS 77406

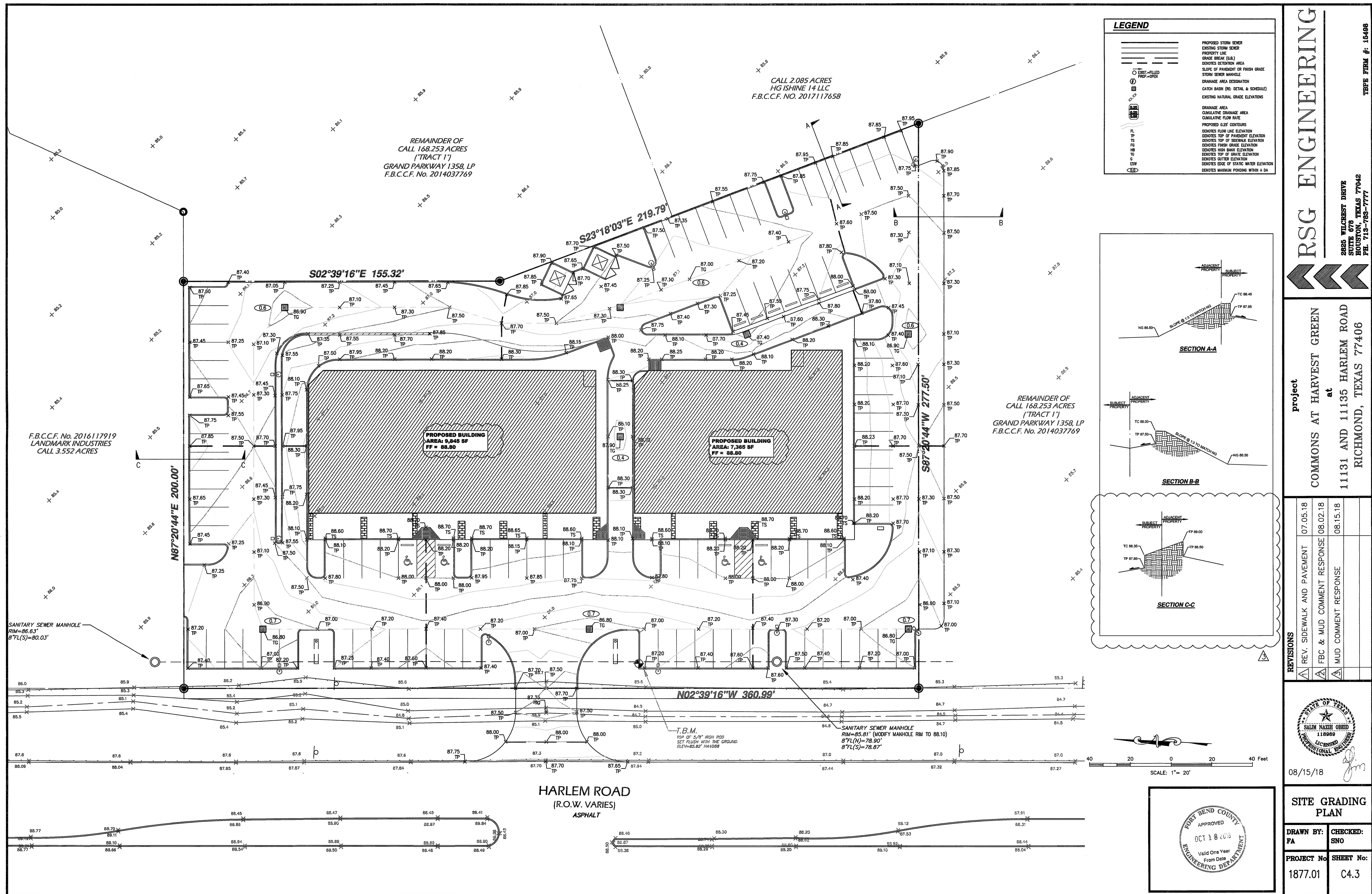
REVISIONS

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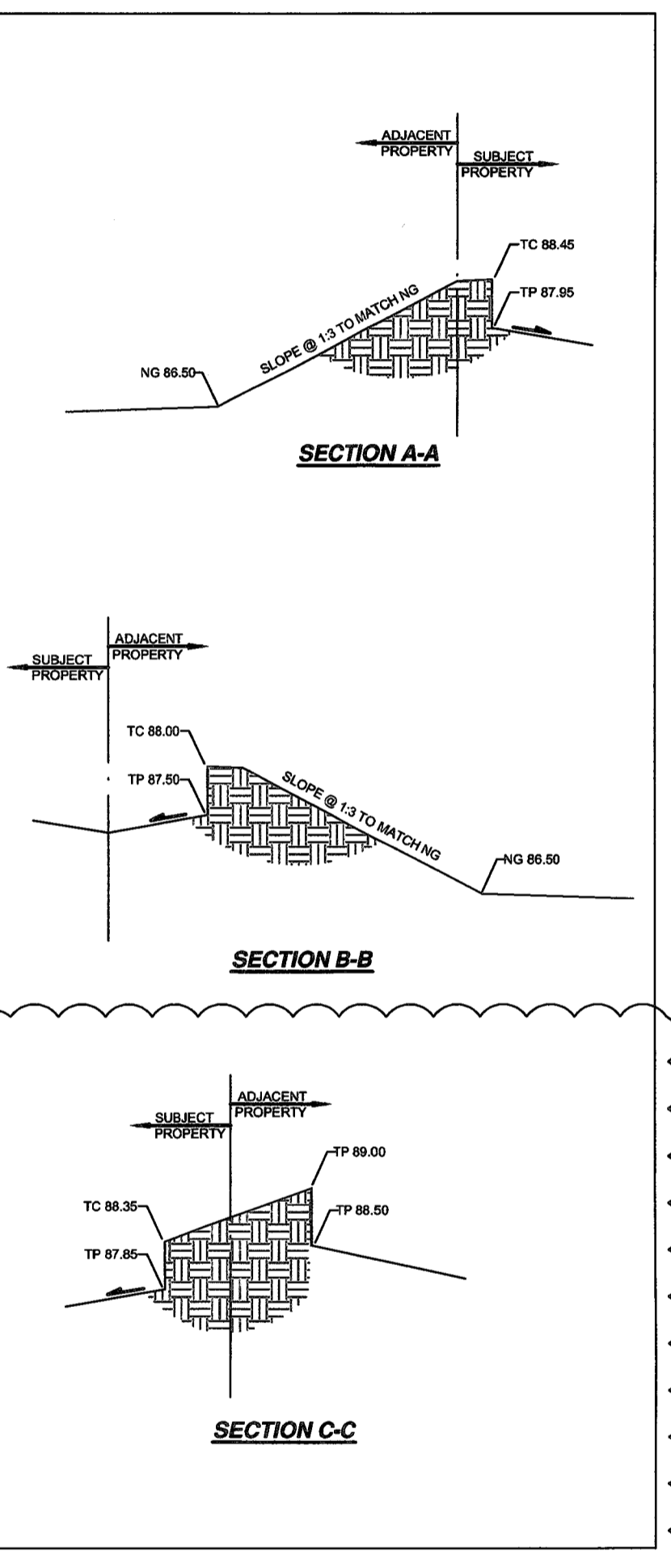
08/15/18

**SITE DRAINAGE PLAN**

|                       |                  |
|-----------------------|------------------|
| DRAWN BY:<br>FA       | CHECKED:<br>SNO  |
| PROJECT No<br>1877.01 | SHEET No<br>C4.2 |



| LEGEND |  |
|--------|--|
|        | PROPOSED STORM SEWER                   |
|        | EXISTING STORM SEWER                   |
|        | PROPERTY LINE                          |
|        | GRADE BREAK (G.B.)                     |
|        | DETENTION AREA                         |
|        | SLOPE OF PANDANT OR FINISH GRADE       |
|        | STORM SEWER MANHOLE                    |
|        | DRAINAGE AREA DESIGNATION              |
|        | CATCH BASIN (SEE DETAIL & SCHEDULE)    |
|        | EXISTING NATURAL GRADE ELEVATIONS      |
|        | DRAINAGE AREA                          |
|        | CUMULATIVE DRAINAGE AREA               |
|        | CUMULATIVE FLOW RATE                   |
|        | PROPOSED 0.25' CONTOURS                |
|        | DENOTES FLOW LINE ELEVATION            |
|        | DENOTES TOP OF PAVEMENT ELEVATION      |
|        | DENOTES TOP OF SIDEWALK ELEVATION      |
|        | DENOTES FINISH GRADE ELEVATION         |
|        | DENOTES HIGH BANK ELEVATION            |
|        | DENOTES TOP OF GRATE ELEVATION         |
|        | DENOTES OUTER ELEVATION                |
|        | DENOTES EDGE OF STATIC WATER ELEVATION |
|        | DENOTES MAXIMUM PAVING WITHIN A.D.A.   |



**RSG ENGINEERING**  
2025 WILCREST DRIVE  
SUITE 678  
HOUSTON, TEXAS 77042  
PH. 713-783-7777  
TBE FIRM #: 15498

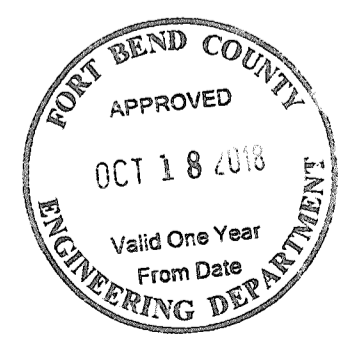
**COMMONS AT HARVEST GREEN**  
at  
11131 AND 11135 HARLEM ROAD  
RICHMOND, TEXAS 77406

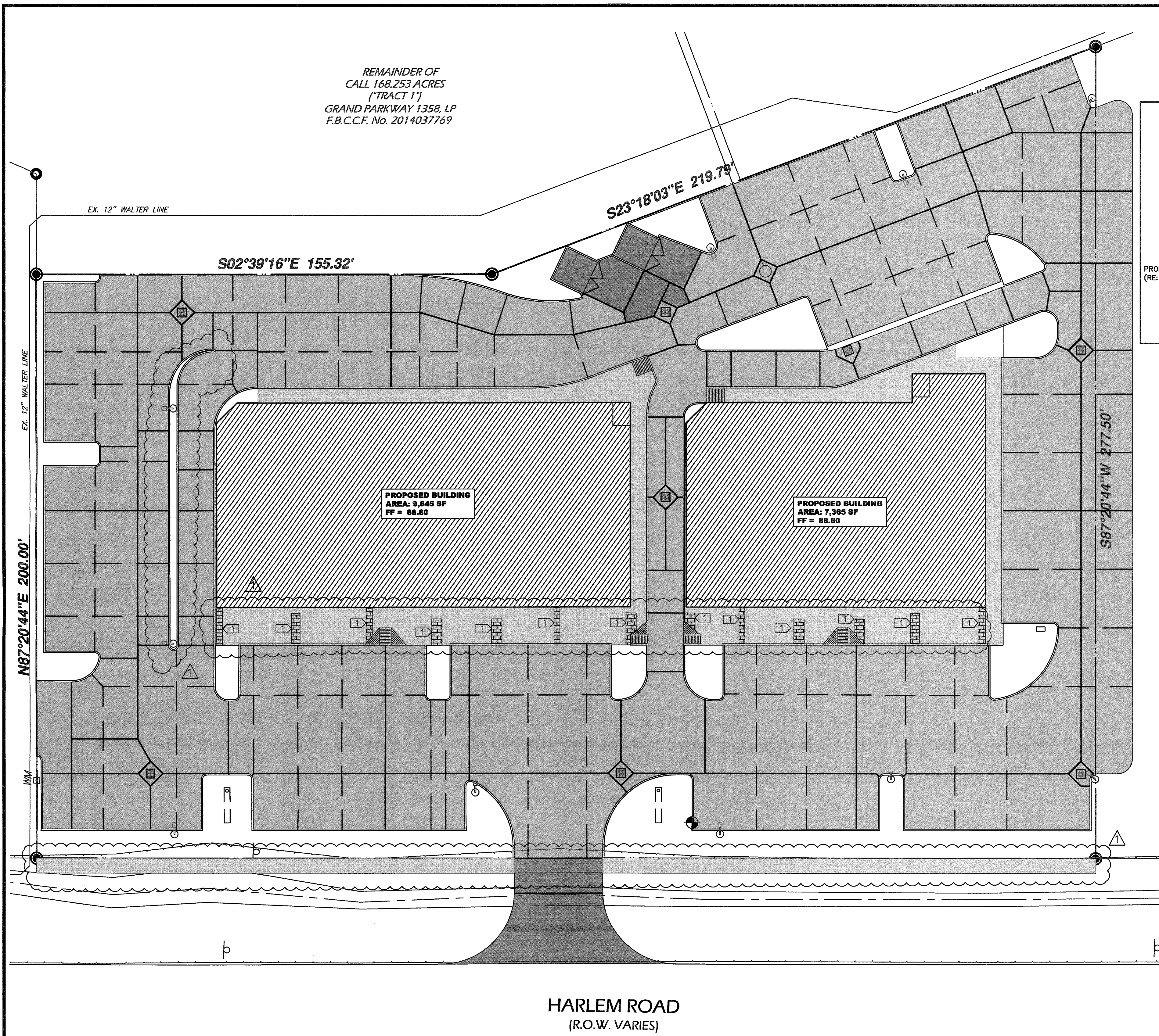
| REVISIONS                  |          |
|----------------------------|----------|
| REV. SIDEWALK AND PAVEMENT | 07.05.18 |
| FBC & MUD COMMENT RESPONSE | 08.02.18 |
| MUD COMMENT RESPONSE       | 08.15.18 |

08/15/18

**SITE GRADING PLAN**

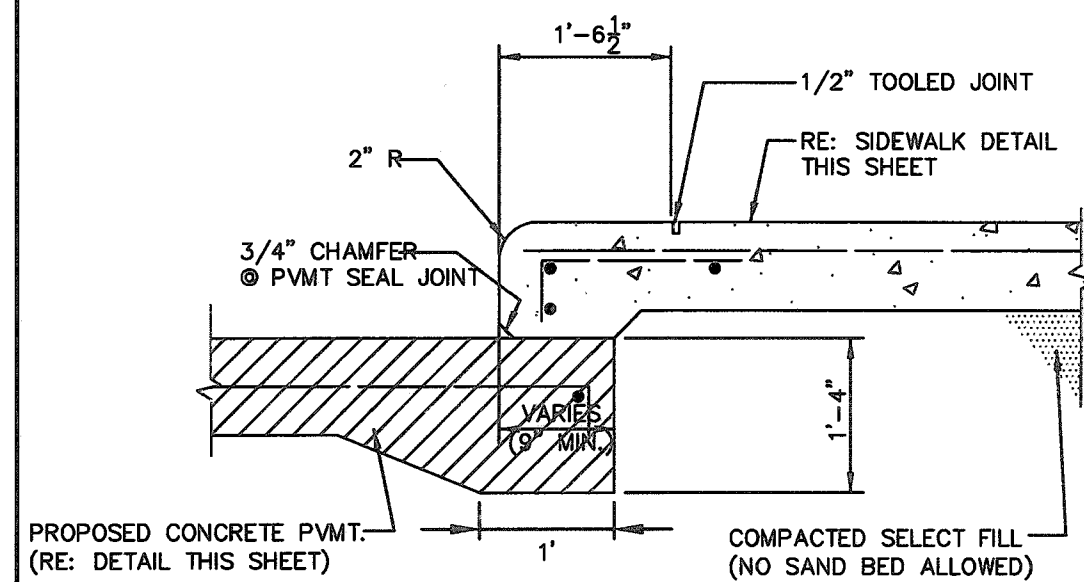
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| DRAWN BY:<br>FA        | CHECKED:<br>SNO   |
| PROJECT NO:<br>1877.01 | SHEET NO:<br>C4.3 |



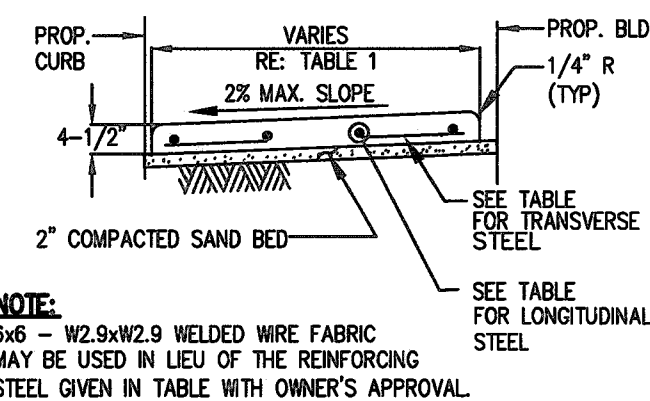


### KEYED PLAN NOTES

- ① RECESSED CONCRETE AND FLUSH BRICK PAVERS IN  
SIDEWALKS. RE: DETAIL THIS SHEET



### SIDEWALK TIE-IN AT PAVEMENT (NOT TO SCALE)

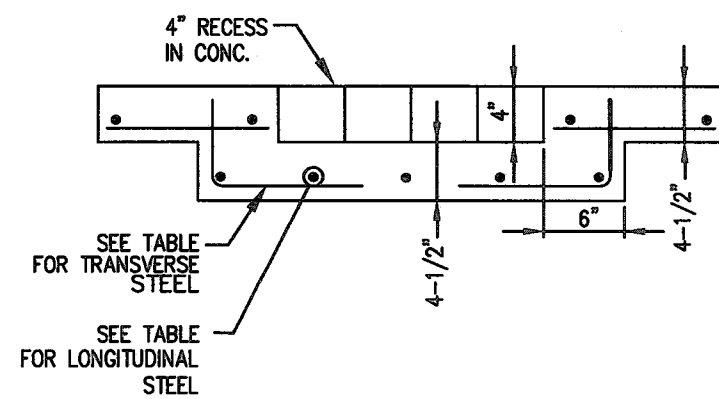


TABLE

REINFORCING STEEL INFORMATION  
FOR 4-1/2" THICK SIDEWALKS  
EXPANSION JOINT SPACING = 40 FT  
f<sub>c</sub> = 3,000 PSI AND f<sub>y</sub> = 60,000 PSI

| SIDEWALK<br>THICKNESS<br>(IN) | SIDEWALK<br>WIDTH<br>(FT) | LONGITUDINAL STEEL<br># 3 BARS |                 |                            | TRANSVERSE<br>STEEL<br># 3 BARS |
|-------------------------------|---------------------------|--------------------------------|-----------------|----------------------------|---------------------------------|
|                               |                           | NUMBER<br>OF<br>BARS           | SPACING<br>(IN) | END BAR<br>SPACING<br>(IN) | SPACING<br>(IN)                 |
| 4.5                           | 4                         | 3                              | 21              | 3                          | 48                              |
| 4.5                           | 5                         | 3                              | 21              | 3                          | 48                              |
| 4.5                           | 6                         | 4                              | 22              | 3                          | 48                              |
| 4.5                           | 7                         | 4                              | 19.5            | 3                          | 48                              |
| 4.5                           | 8                         | 4                              | 22.5            | 3                          | 48                              |
| 4.5                           | 9                         | 5                              | 20              | 3                          | 48                              |
| 4.5                           | 10                        | 6                              | 19              | 3                          | 48                              |

### CONCRETE SIDEWALK DETAIL (NOT TO SCALE)

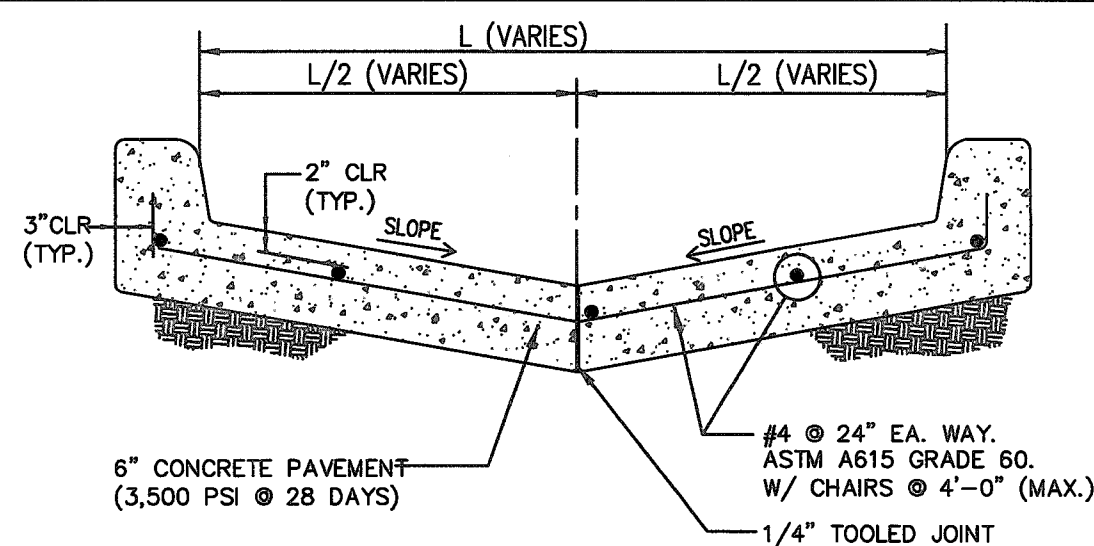


TABLE

REINFORCING STEEL INFORMATION  
FOR 4-1/2" THICK SIDEWALKS  
EXPANSION JOINT SPACING = 40 FT  
f<sub>c</sub> = 3,000 PSI AND f<sub>y</sub> = 60,000 PSI

| SIDEWALK<br>THICKNESS<br>(IN) | SIDEWALK<br>WIDTH<br>(FT) | LONGITUDINAL STEEL<br># 3 BARS |                 |                            | TRANSVERSE<br>STEEL<br># 3 BARS |  |
|-------------------------------|---------------------------|--------------------------------|-----------------|----------------------------|---------------------------------|--|
|                               |                           | NUMBER<br>OF<br>BARS           | SPACING<br>(IN) | END BAR<br>SPACING<br>(IN) | SPACING<br>(IN)                 |  |
| 4.5                           | 4                         | 3                              | 21              | 3                          | 48                              |  |
| 4.5                           | 5                         | 3                              | 21              | 3                          | 48                              |  |
| 4.5                           | 6                         | 4                              | 22              | 3                          | 48                              |  |
| 4.5                           | 7                         | 4                              | 19.5            | 3                          | 48                              |  |
| 4.5                           | 8                         | 4                              | 22.5            | 3                          | 48                              |  |
| 4.5                           | 9                         | 5                              | 20              | 3                          | 48                              |  |
| 4.5                           | 10                        | 6                              | 19              | 3                          | 48                              |  |

### RECESSED CONCRETE SIDEWALK DETAIL (NOT TO SCALE)



### TYPICAL PAVEMENT SECTION (NOT TO SCALE)

### LEGEND

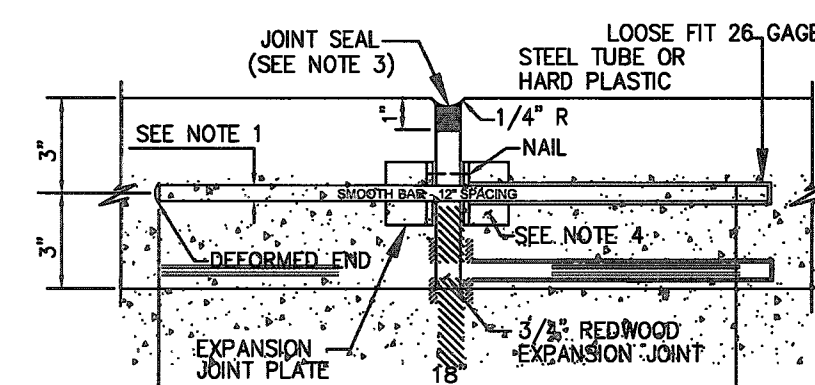
- EXPANSION JOINT
- CONTROL JOINT
- PROPOSED 4-1/2" CONCRETE SIDEWALK
- PROPOSED 6" CONCRETE PAVEMENT
- PROPOSED 7" CONCRETE PAVEMENT
- PROPOSED BUILDING SLAB

### PAVING & GRADING CONSTRUCTION NOTES

- SUBGRADE PREPARATION:  
\*STRIP PAVEMENT AREAS TO REMOVE ALL TOP SOIL, DEBRIS AND VEGETATION. REMOVE TREE STUMPS AND ROOTS.  
\*OVER-EXCAVATE SOFT AREAS AND REPLACE WITH SELECT FILL, FREE OF ORGANIC MATTER, WITH PLASTICITY INDEX OF 7 TO 20 AND A MINIMUM LIQUID LIMIT OF 28 PERCENT. FILL SHALL BE PLACED IN SIX(6) TO EIGHT(8) INCH LOOSE LIFTS AND COMPACTED TO 95% OF STD. PROCTOR MAX. DRY DENSITY.  
\*STABILIZE SUBGRADE PER SOILS REPORT OR GEOTECHNICAL ENGINEERS RECOMMENDATION.  
\*PROOF-ROLL TO 95% OF STD. PROCTOR (ASTM D698-78) MAX. DRY DENSITY.  
\*COMPACT TO 95% OF STD. PROCTOR (ASTM D698-78) MAX. DRY DENSITY.
- PROVIDE 6" THICK CONCRETE PAVEMENT, UNLESS NOTED OTHERWISE ON PLANS.
- CONCRETE COMPRESSIVE STRENGTH = 3,500 PSI (5 SACK) @ 28 DAYS.
- REINFORCEMENT: #4 @ 18" EA. WAY. ASTM A615 GRADE 60.
- REINFORCEMENT SHALL BE SUPPORTED ON METAL OR PLASTIC CHAIRS, SPACED AT A MAXIMUM OF THREE (3) FEET EACH WAY.
- PROVIDE EXPANSION JOINTS @ A MAXIMUM SPACING OF FORTY (40) FEET EACH WAY WITH CONSTRUCTION JOINT @ EVERY TWENTY (20) FEET. FORM JOINTS WITH METAL KEY -WAYS AND PROVIDE 3/4" SMOOTH DOWELS x 2'-0" @ 24" O.C., GREASE & WRAP ONE END.
- RECOMMENDED PAVEMENT SLOPE TO DRAIN IS 0.50%, BUT IN NO INSTANCE LESS THAN 0.35% OR GREATER THAN 5% UNLESS NOTED OTHERWISE ON PLANS.
- EXCESS SOIL MATERIAL IS THE RESPONSIBILITY OF THE CONTRACTOR & IS TO BE DISPOSED OFFSITE RESPONSIBLY AT NO EXTRA COST TO OWNER.

### PLAN NOTES:

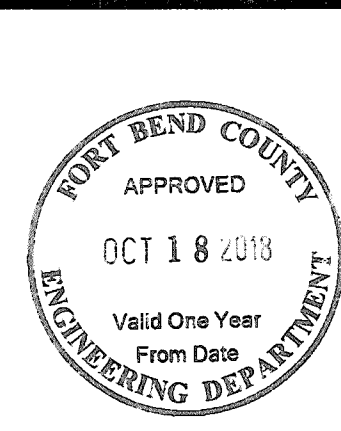
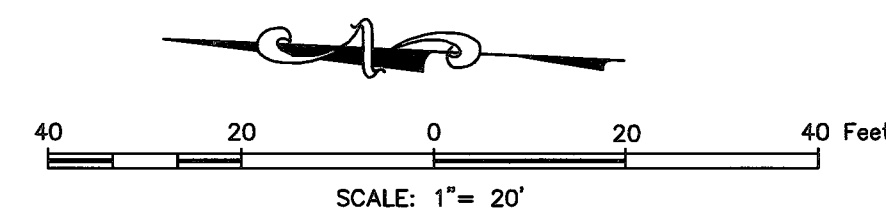
- JOINTING LAYOUTS INDICATED ARE APPROXIMATE IN NATURE AND ARE INTENDED TO INDICATE THE ENGINEER'S RECOMMENDATION TO THE JOINTING OF THE PROPOSED PAVEMENT. THE JOINTING LAYOUT MAY BE REVISED BY CONTRACTOR TO SUIT HIS VARIOUS CONSTRUCTION NEEDS WITH THE APPROVAL OF THE ENGINEER AND OWNER.
- EXPANSION JOINTS, CONTROL JOINTS AND CONSTRUCTION JOINTS ADJACENT TO A CURB SHOULD EXTEND INTO THE CURB.
- JOINTS SHOULD TIE RADIALLY TO ALL CURVES. THIS DRAWING MAY NOT INDICATE SUCH RADIAL TIES DUE TO THE SCALE OF THE DRAWING.
- CONTRACTOR SHALL MATCH AND CONTINUE ANY EXPANSION JOINTS ALREADY EXISTING AT LOCATIONS WHERE PROPOSED PAVEMENT CONNECTS TO EXISTING PAVEMENT.
- ALL CONTROL JOINTS MUST BE SAWCUT AND SEALED AS PER SPECIFICATIONS.
- BLOCKOUTS ARE INDICATED LARGER THAN REQUIRED FOR CLARITY.



### NOTES:

- DOWELS FOR PAVEMENT EXPANSION JOINTS SHALL BE 3/4" Ø.
- EXPANSION JOINT SHALL BE PLACED AT THE END OF EACH RADIUS PART OF CURB RETURN AND AT MAXIMUM OF 40' SPACING.
- ALL JOINT SEAL MATERIAL SHALL BE ASPHALT RUBBER IN ACCORDANCE WITH ASTM DESIGNATION D3405.
- PRE-MANUFACTURED JOINT PLATE.

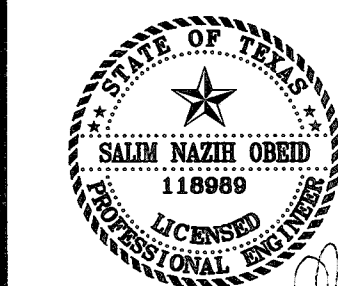
### DOWEL TYPE EXPANSION JOINT DETAIL (NOT TO SCALE)



RS&G ENGINEERING

project  
COMMONS AT HARVEST GREEN  
at  
11131 AND 11135 HARLEM ROAD  
RICHMOND, TEXAS 77406

REVISIONS  
REV. SIDEWALK AND PAVEMENT 07.05.18



08/15/18

SITE PAVING  
PLAN

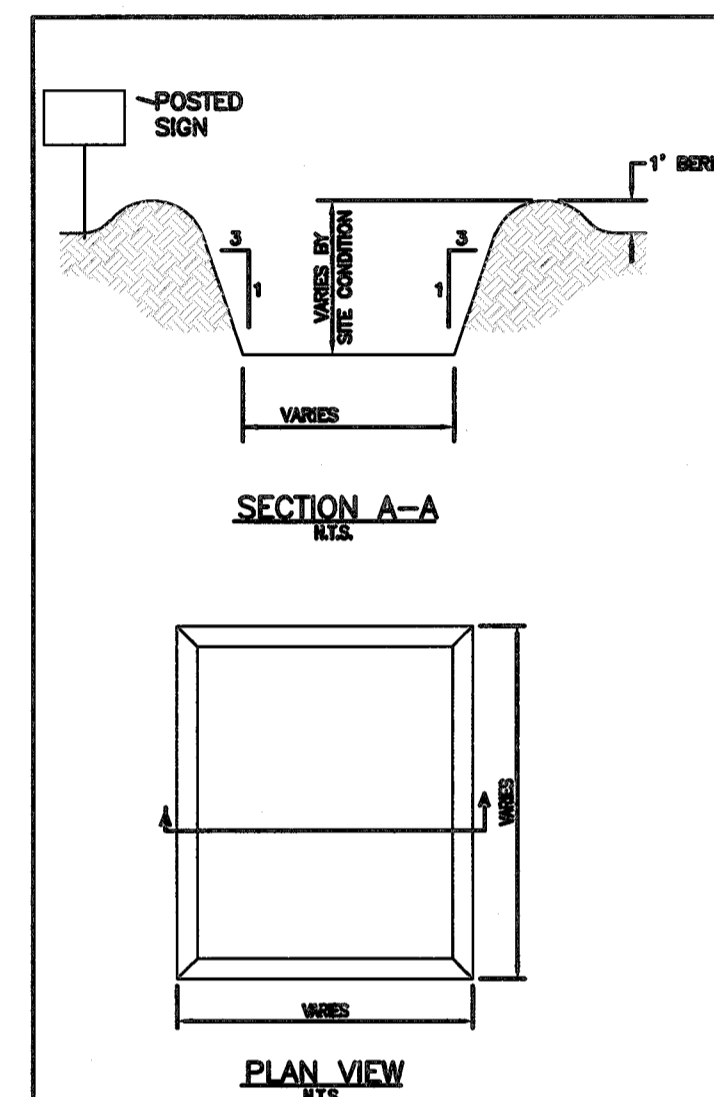
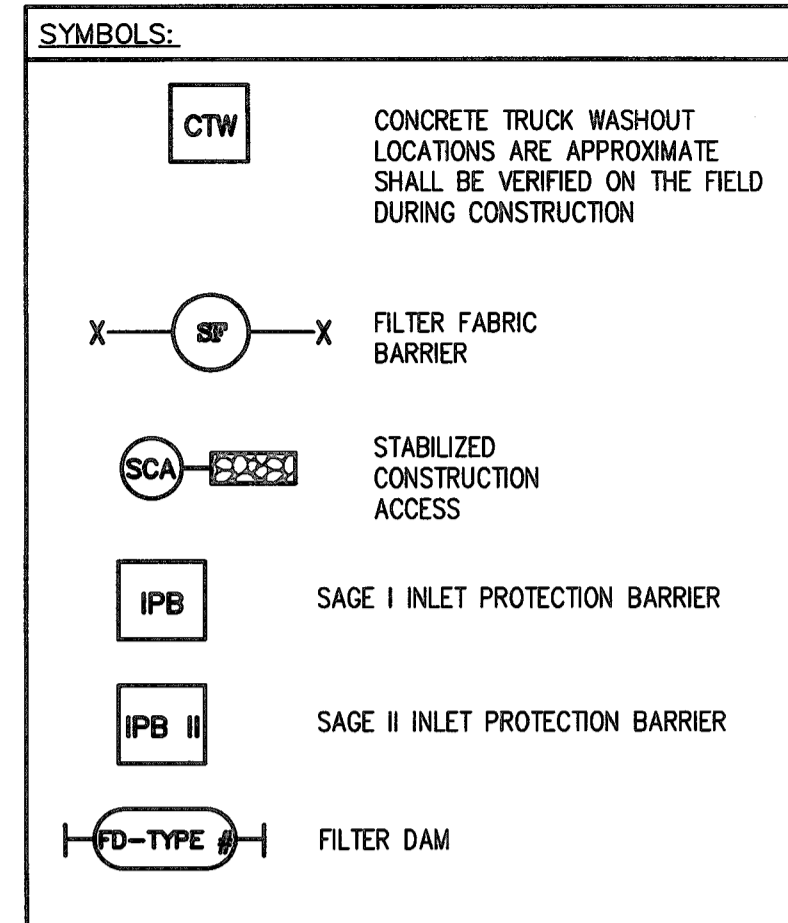
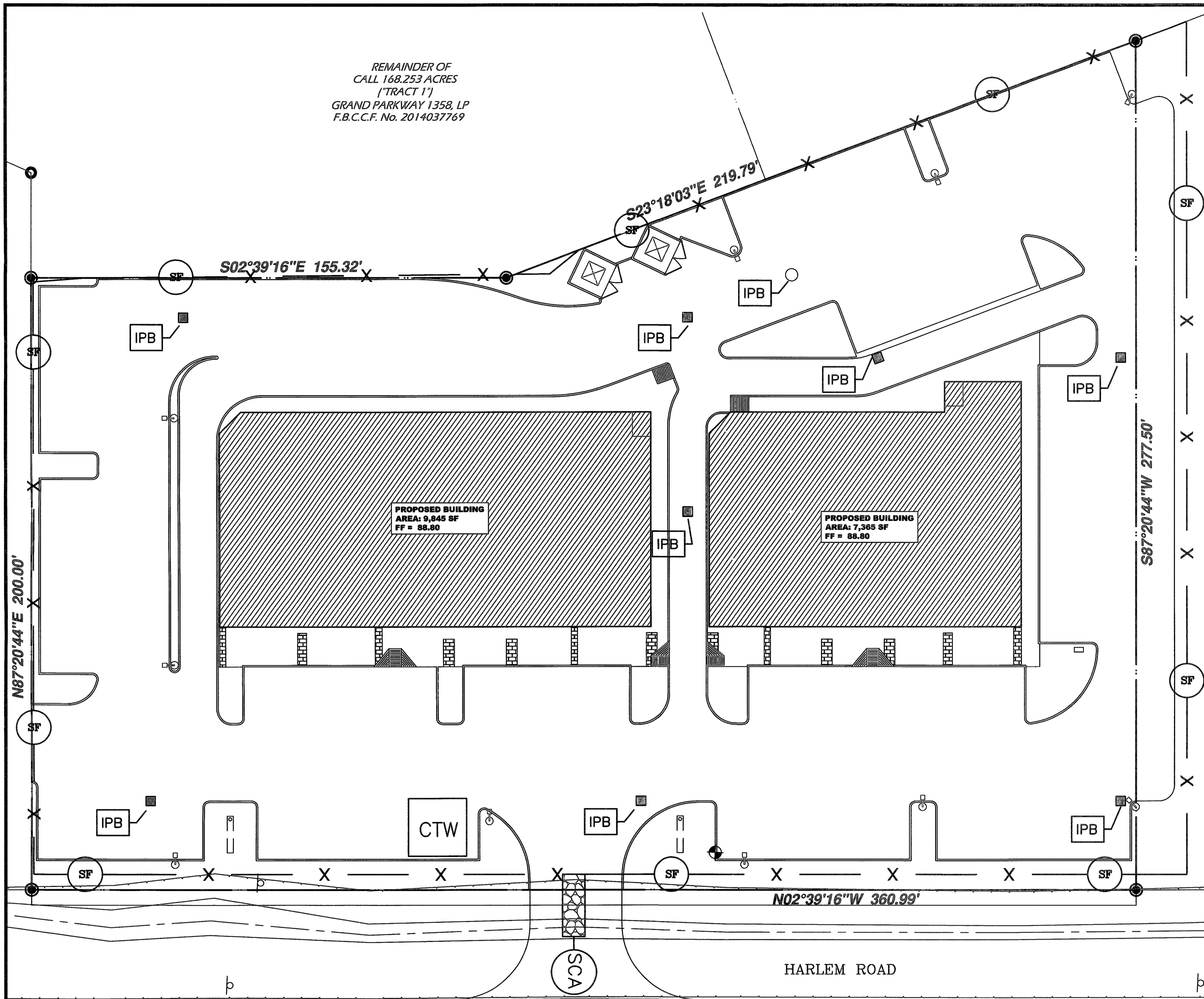
DRAWN BY:  
FA

CHECKED:  
SNO

PROJECT No  
1877.01

SHEET No  
C4.4

TBPE FIRM #: 16488



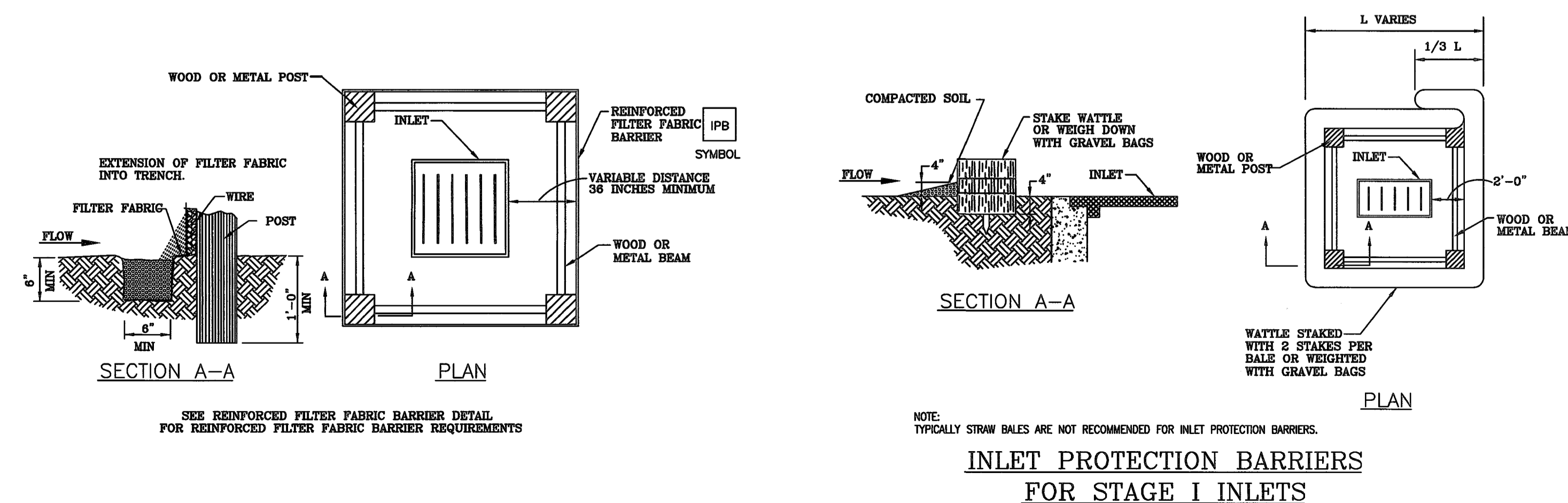
GENERAL NOTES:

1. POST A SIGN READING "CONCRETE WASH OUT PIT" NEXT TO THE PIT.
2. VERBALLY INSTRUCT THE CONCRETE TRUCK DRIVERS WHERE THE PIT IS AND TO WASH OUT THEIR TRUCKS IN THE PIT AND NO WHERE ELSE.
3. UNPON THE CONCRETE SETTING UP (CURING, DRYING OUT), THE CONCRETE WASTE SHALL BE REMOVED FROM THE PROJECT SITE AND DISPOSED OF PROPERLY BY THE CONTRACTOR. AFTER REMOVAL OF THE CONCRETE WASTE, THE WASH OUT PIT SHALL BE FILLED WITH CLEAN FILL MATERIAL AND COMPACTED TO IN-SITU CONDITIONS, OR AS DIRECTED BY THE PROJECT SPECIFICATIONS.
4. CONCRETE WASH OUT PITS SHALL NOT BE LOCATED DIRECTLY ADJACENT TO, NOR AT ANY TIME DRAIN INTO THE STORM SEWER SYSTEM OR ANY OTHER SWALE, DITCH, OR WATERWAY.
5. CONSTRUCT ENTRY ROAD AND BOTTOM OF WASHOUT AREA TO SUPPORT EXPECTED LOADINGS FROM TRUCKS EQUIPMENT.

CONCRETE TRUCK  
WASHOUT AREA

EROSION CONTROL SYSTEM NOTES :

1. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING BERMS, SILT FENCES, STRAW BALES, OR OTHER MEANS TO PREVENT EROSION FROM REACHING ADJACENT PROPERTY. IN THE EVENT THE PREVENTION MEASURES ARE NOT EFFECTIVE, THE CONTRACTOR SHALL REMOVE ANY EROSION DEBRIS AND RESTORE ADJACENT PROPERTY AND/ OR THE RIGHT-OF-WAY TO ORIGINAL OR BETTER CONDITION.
2. EROSION CONTROL FEATURES SHOWN ARE THE MINIMUM REQUIREMENTS ACCEPTABLE. PLACE ADDITIONAL EROSION CONTROL DEVICES AS RUNOFF AND DRAINAGE PATTERNS CHANGE DURING CONSTRUCTION TO PROHIBIT LOSS OF SOIL FROM THE SITE. A RERECORD OF REVISION FORM MUST BE COMPLETED WHEN EROSION CONTROL FEATURES ARE MODIFIED. RED-LINED REVISIONS OF SWPPP/ECP WILL BE NEEDED WITHIN 7 DAYS OF WHEN MODIFICATION NEEDS ARE IDENTIFIED.
3. MINIMIZE THE AMOUNT OF SURFACE AREA EXPOSED TO THE EXTENT PRACTICABLE.
4. LEAVE GRADED AREAS WITH A ROUGH TEXTURE TO PROMOTE INFILTRATION.
5. LIMIT UNNECESSARY TRAFFIC ON GRADED AREAS.
6. INSTALL SILT FENCES OR STRAW BALE DIKES ON DOWNSTREAM SLOPES FOR THE EXTENT OF THE CONSTRUCTION LIMITS PRIOR TO BEGINNING ANY GRADING OPERATIONS.
7. SILT FENCES:
  - A. INSTALL SILT FENCES AT LOCATIONS SHOWN GENERALLY ALONG THE CONTOUR OF DOWNSTREAM SLOPES.
  - B. INSTALL POSTS ANGLING SLIGHTLY UPSTREAM. SPACE POSTS AT 10 FEET IF WIRE FENCING IS TO BE USED TO SUPPORT FABRIC, OTHERWISE SPACE POSTS AT 6 FEET.
  - C. EXCAVATE 4 INCH BY 4 INCH TRENCH ON UPSTREAM SIDE, EMBED FABRIC 8 INCHES, BACKFILL TRENCH AND COMPACT.
  - D. FASTEN FABRIC (AND WIRE FENCE, IF USED) SECURELY TO POSTS.
8. STRAW BALE DIKES:
  - A. INSTALL STRAW BALE DIKES AT LOCATION SHOWN GENERALLY ALONG THE CONTOUR OF DOWNSTREAM SLOPES.
  - B. INSTALL STRAW BALE DIKES AND DITCH CHECKS AS SHOWN.
  - C. EXCAVATE TO 4 INCH DEPTH, PLACE BALES FIRMLY AGAINST DOWNSTREAM FACE OF EXCAVATION AND BACKFILL UPSTREAM SIDE OF TRENCH TO 4 INCHES ABOVE EXISTING GROUND.
  - D. PLACE BALES FIRMLY ABUTTING DOWNSTREAM FACE OF EXCAVATION AND EACH OTHER.
  - E. ANCHOR EACH BALE WITH TWO STAKES. ANGLE FIRST STAKE TOWARDS PREVIOUSLY ANCHORED BALE TO FORCE BALES TOGETHER.
  - F. CHINK SPACES BETWEEN BALES WITH LOOSE STRAW.
  - G. STRAW BALES SHOULD BE REPLACED EVERY TWO MONTHS OR WHEN REQUIRED BY WET WEATHER.
9. MAINTAIN EROSION CONTROL DEVICES IN GOOD CONDITION AT ALL TIMES. INSPECT FREQUENTLY AND AFTER EACH RAINFALL.
10. REDISTRIBUTE ACCUMULATED SEDIMENT UPSTREAM OF DEVICES.
11. EROSION CONTROL DEVICES SHALL BE REMOVED AFTER FINAL STABILIZATION IS ACHIEVED.
12. PROPERLY DISPOSE OF SOLID WASTE, PAINTS, SOLVENTS, CLEANING COMPOUNDS, ETC.
13. STORE CONSTRUCTION MATERIALS AWAY FROM LOW AREAS AND DRAINAGEWAYS.
14. PROVIDE PORTABLE TOILETS AND PROPERLY DISPOSE OF SANITARY SEWAGE. PROVIDE MINIMUM 2 ADJACENT TO OFFICE TRAILER.
15. CONSTRUCT CONTAINMENT BERMS AND USE DRIP PANS AT FUEL AND LIQUID STORAGE TANKS.
16. LOCATE FUEL/MATERIAL STORAGE AREAS AWAY FROM STORM WATER CONVEYANCE SYSTEMS. USE A LINER UNDER ABOVE GROUND STORAGE TANKS. USE SILT FENCING, HAY BALES, OR BERMS AROUND FUEL STORAGE AREAS. (NO SEPARATE PAY)  
FUEL AND MATERIAL STORAGE AREAS SHALL BE LOCATED AT LEAST 100 FEET AWAY FROM STREAM BANKS AND WETLANDS. MATERIAL STORAGE AREAS SHALL BE LOCATED UNDER ROOF OR OTHER ENCLOSURE STRUCTURE. FUELING MUST BE ATTENDED BY PERSONNEL AT ALL TIMES TO REPORT ANY SPILLS.
17. CONTRACTOR WILL ADVISE OWNER IMMEDIATELY, VERBALLY, AND IN WRITING, OF ANY FUEL SPILLS ONTO THE PROJECT/ CONSTRUCTION AREA AND THE ACTIONS TAKEN TO REMEDY THE PROBLEM.
18. CONTRACTOR IS RESPONSIBLE FOR COMPLYING WITH ALL ENVIRONMENTAL LAWS.
19. CONTRACTOR IS RESPONSIBLE FOR DISPOSING FUELS, MATERIALS, AND EXCAVATIONS IN A LEGALLY APPROVED MANNER.
20. CONTRACTOR IS TO INSPECT ALL STRUCTURAL CONTROLS SPECIFIED HEREIN, AT A MINIMUM, ONCE EVERY 7 CALENDAR DAYS OR WITHIN 24 HOURS AFTER EVERY STORM EVENT THAT MEETS OR EXCEEDS 0.5 INCHES/24 HOUR PERIOD.
21. CONTRACTOR WILL PROVIDE STORAGE AREAS FOR CHEMICALS, PAINTS, SOLVENTS, FERTILIZERS, AND OTHER POTENTIALLY TOXIC MATERIALS.
22. FILTER FABRIC (SILT FENCE) FLOWRATE WILL BE 30 GALLONS PER SQUARE FOOT PER MINUTE.
23. FILTER FABRIC WILL BE STAPLED OVER BOARDS ON ALL STAGE ONE STORM SEWER INLETS.



RS&G ENGINEERING

project  
COMMONS AT HARVEST GREEN  
at  
11131 AND 11135 HARLEM ROAD  
RICHMOND, TEXAS 77406

| REVISIONS |  |  |  |  |
|-----------|--|--|--|--|
|           |  |  |  |  |
|           |  |  |  |  |
|           |  |  |  |  |

08/15/18

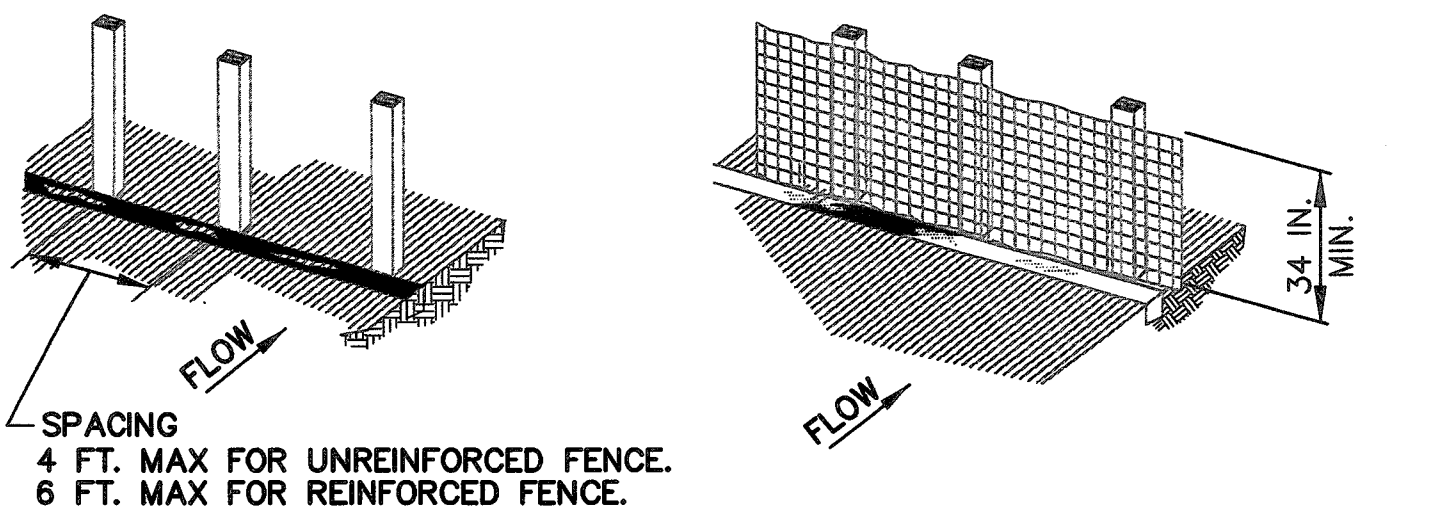
STATE OF TEXAS  
SALIM NAZIH OBEIDI  
118988  
LICENSED PROFESSIONAL ENGINEER

STORM WATER  
POLLUTION  
PREVENTION PLAN

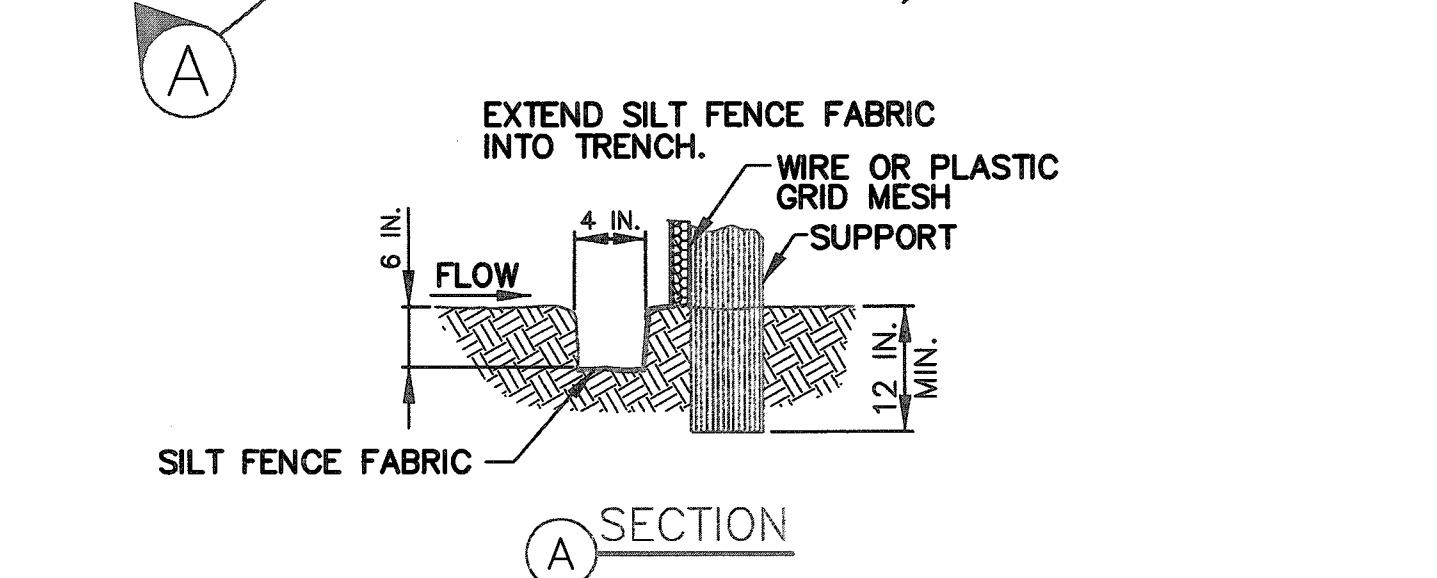
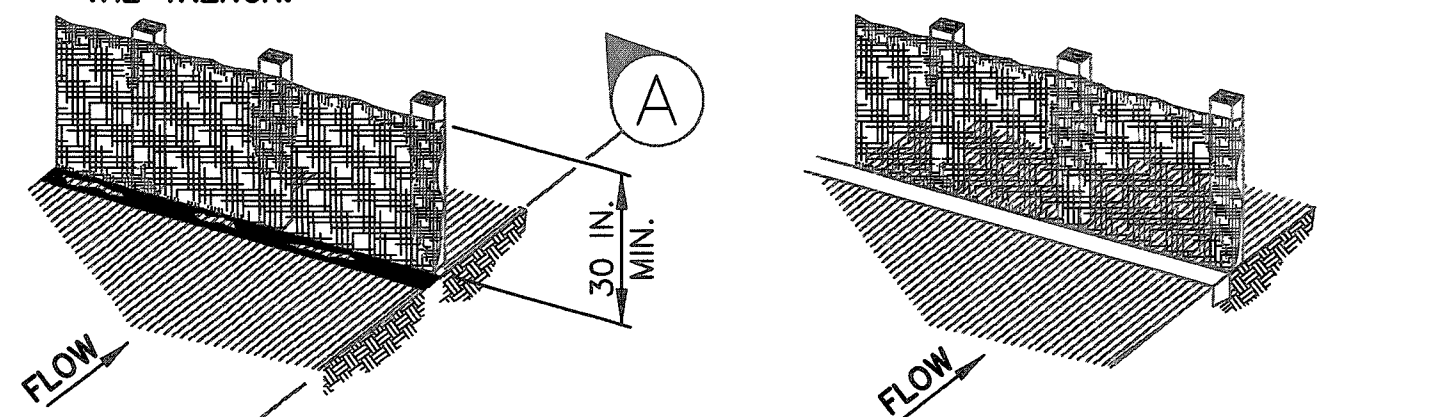
DRAWN BY: FA  
PROJECT No: 1877.01

CHECKED: SNO  
SHEET No: C5.1

1. SET SUPPORTS AND EXCAVATE 4 IN. X 6 IN. TRENCH UPSLOPE ALONG LINE OF SUPPORTS.
2. SECURE WIRE FENCING TO SUPPORTS.

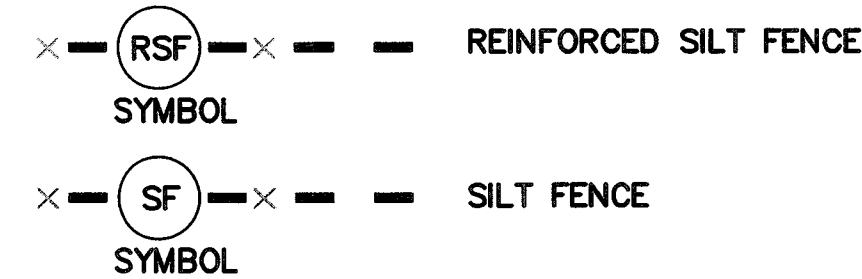


3. ATTACH SILT FENCE FABRIC TO WIRE FENCE AND EXTEND INTO THE TRENCH.
4. BACKFILL AND COMPACT THE EXCAVATED SOIL.

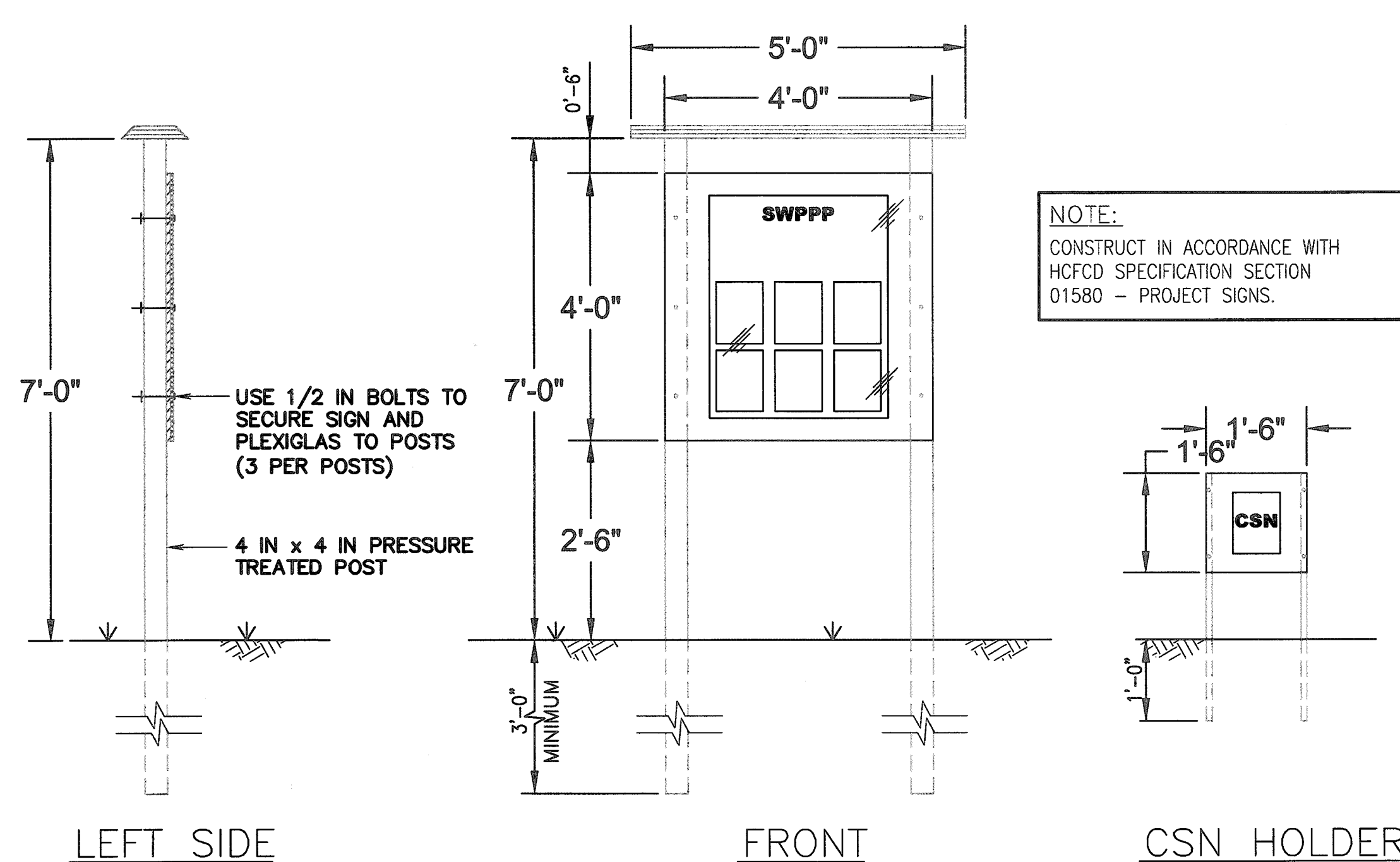


CONSTRUCTION NOTES:

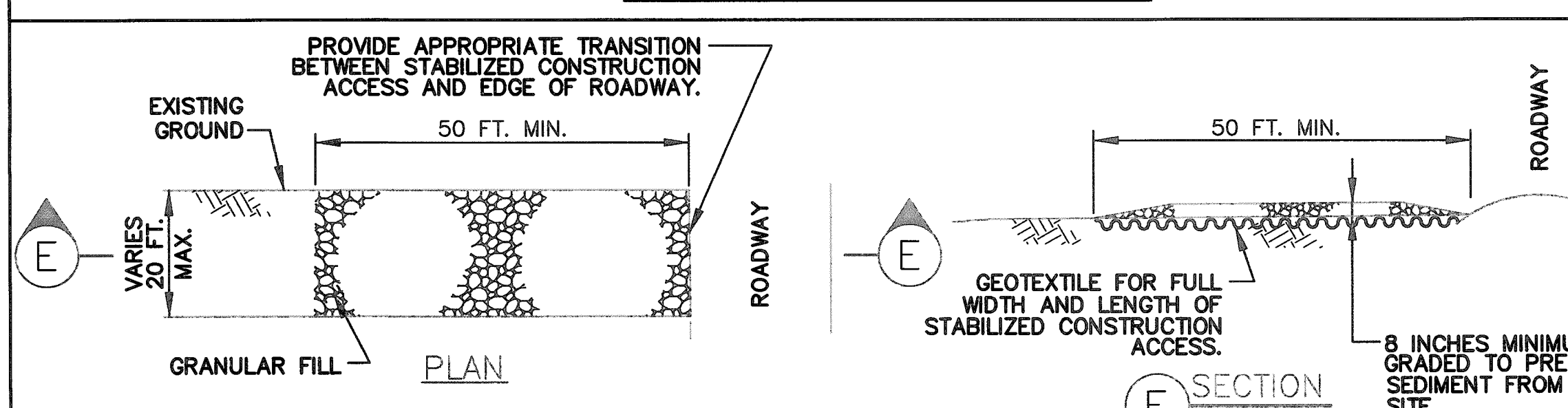
1. SEE SPECIFICATION SECTION NO. 02361-SILT FENCES.



SILT FENCE



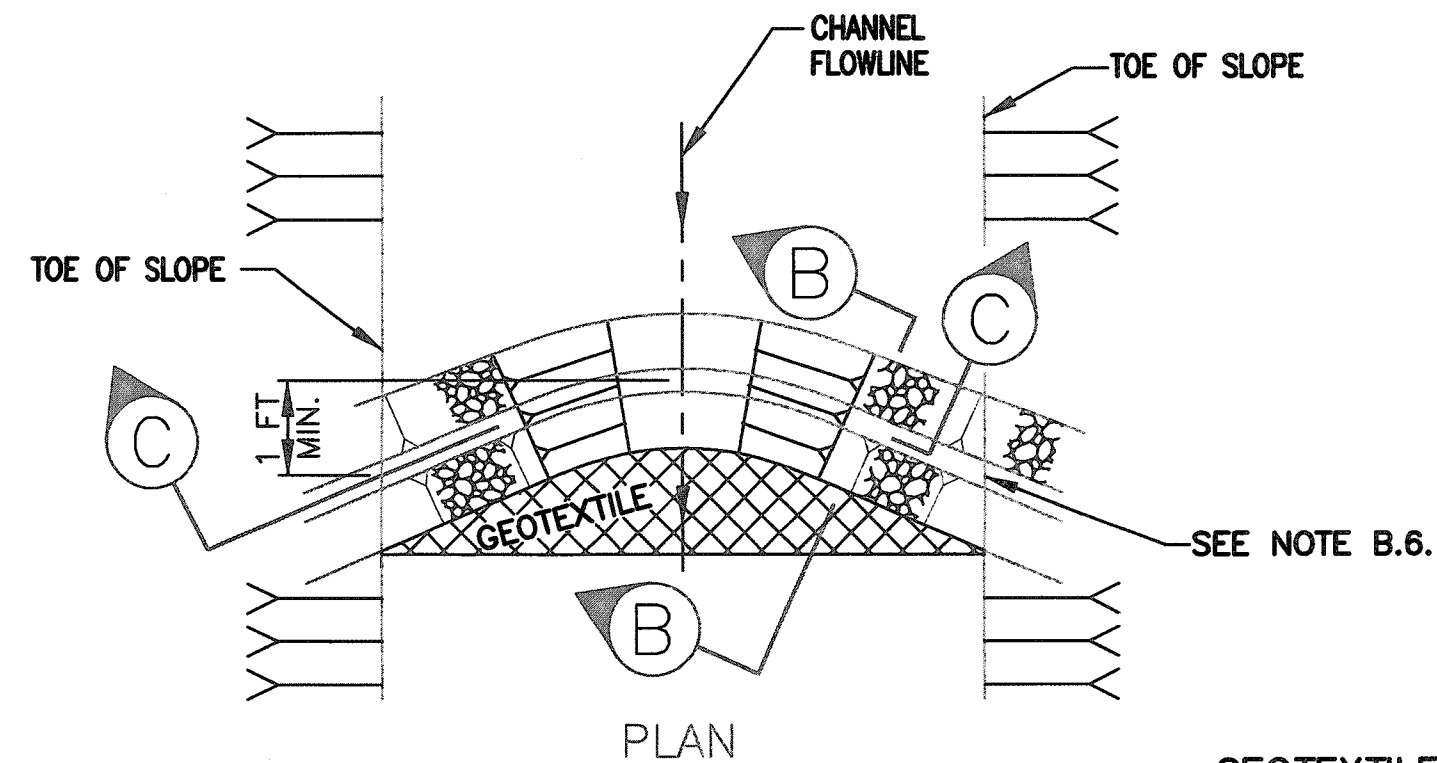
SWPPP / BMP SIGN AND CONSTRUCTION  
SITE NOTICE HOLDER DETAILS



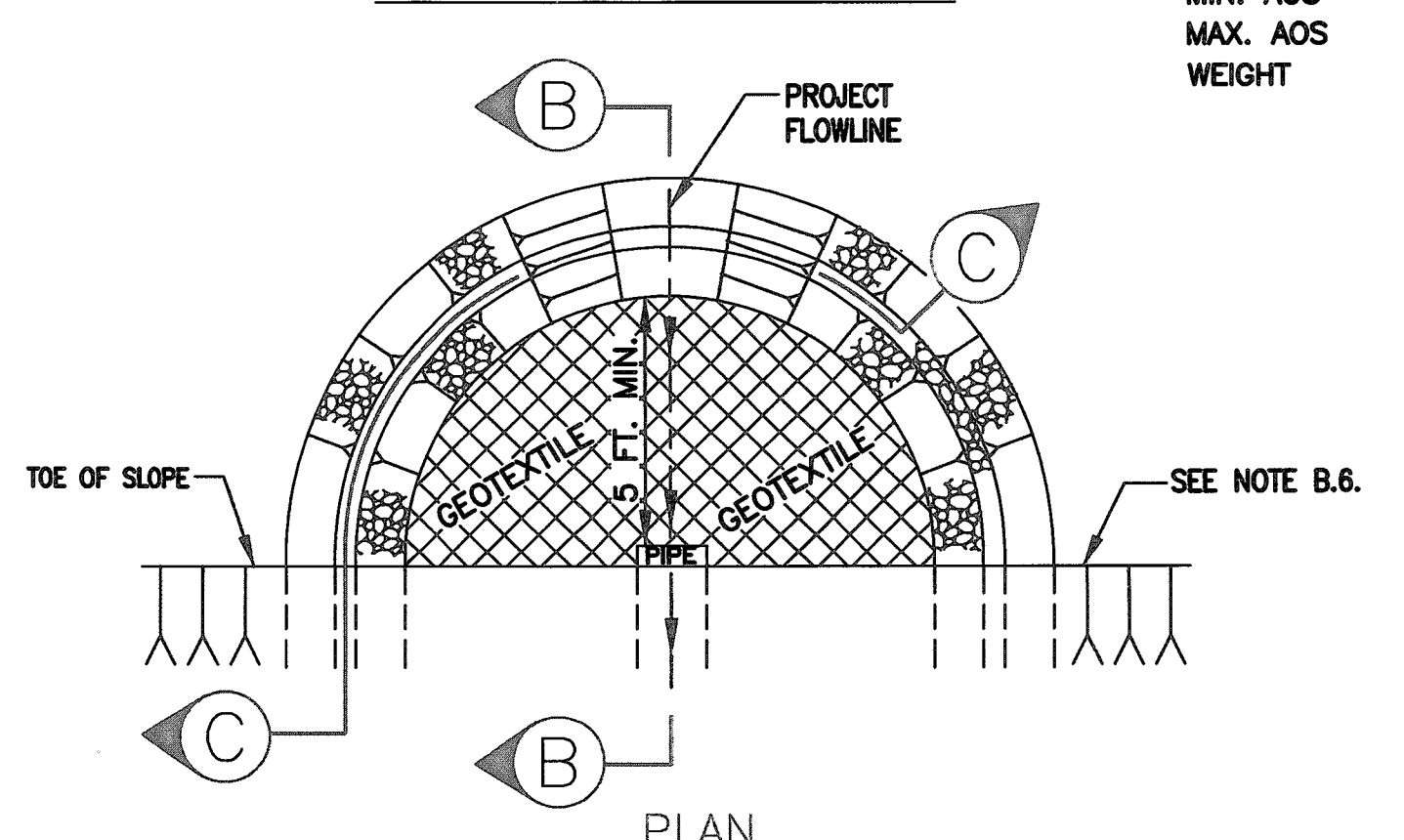
CONSTRUCTION NOTES:

1. SEE SPECIFICATION SECTION NO. 02365-STABILIZED CONSTRUCTION ACCESS.

STABILIZED CONSTRUCTION ACCESS



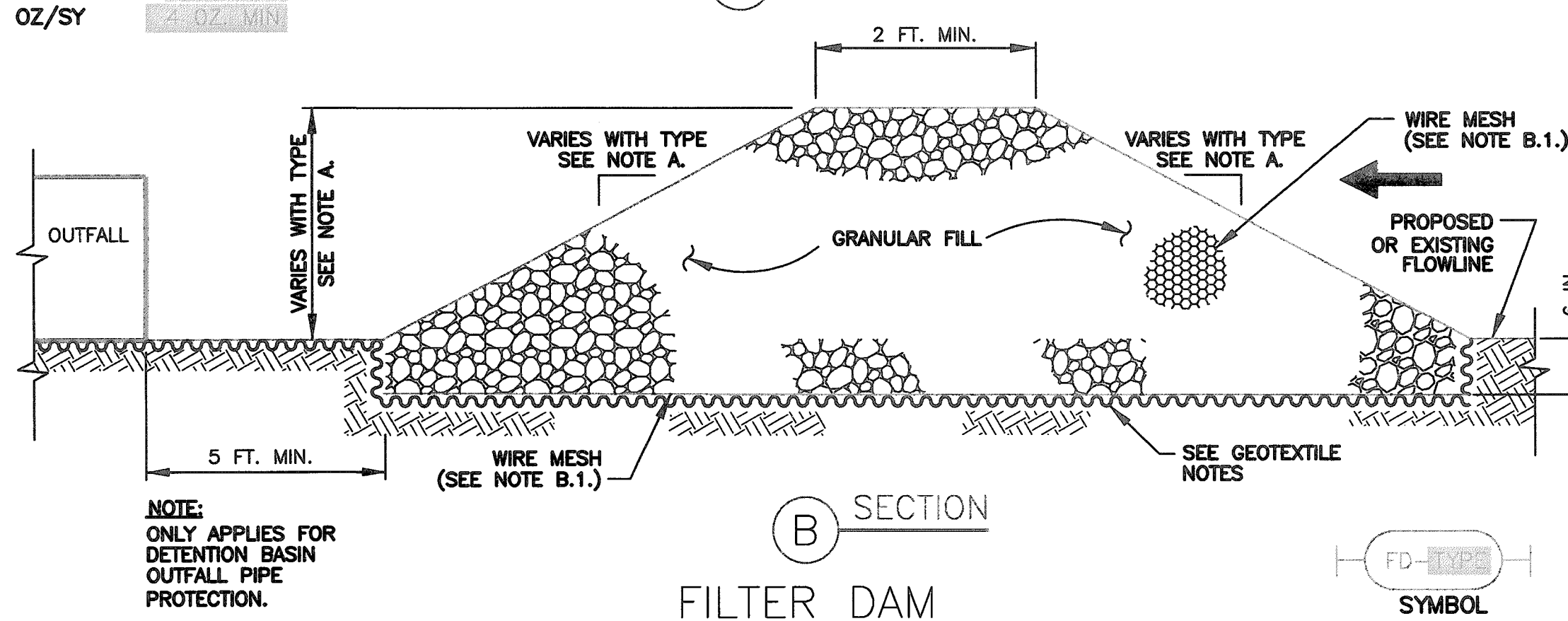
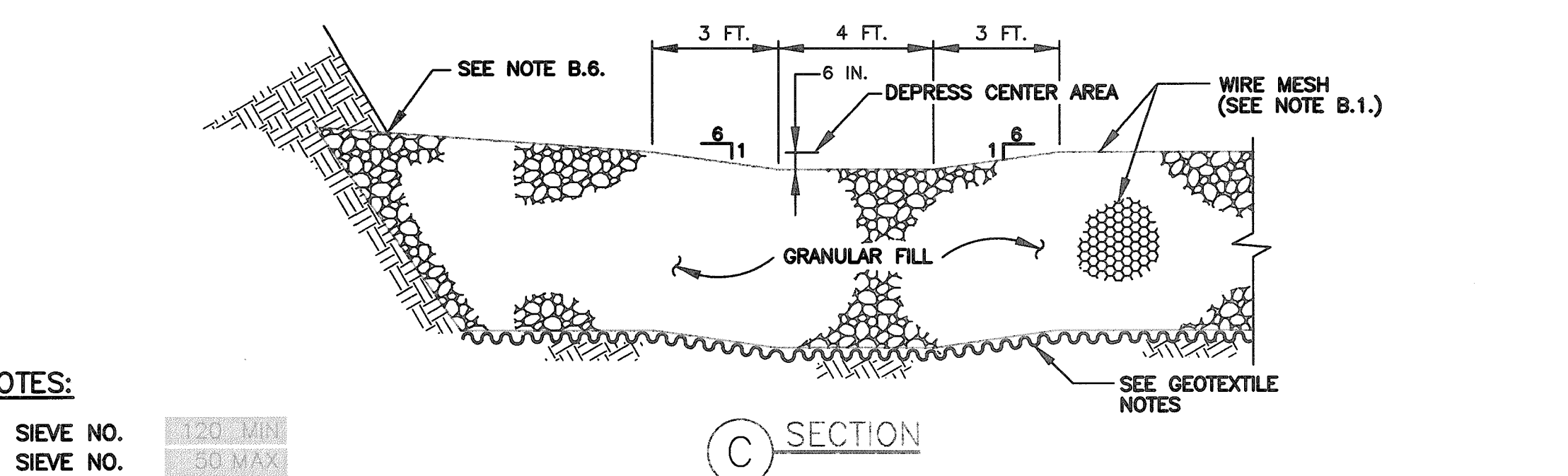
IN-CHANNEL FILTER DAM



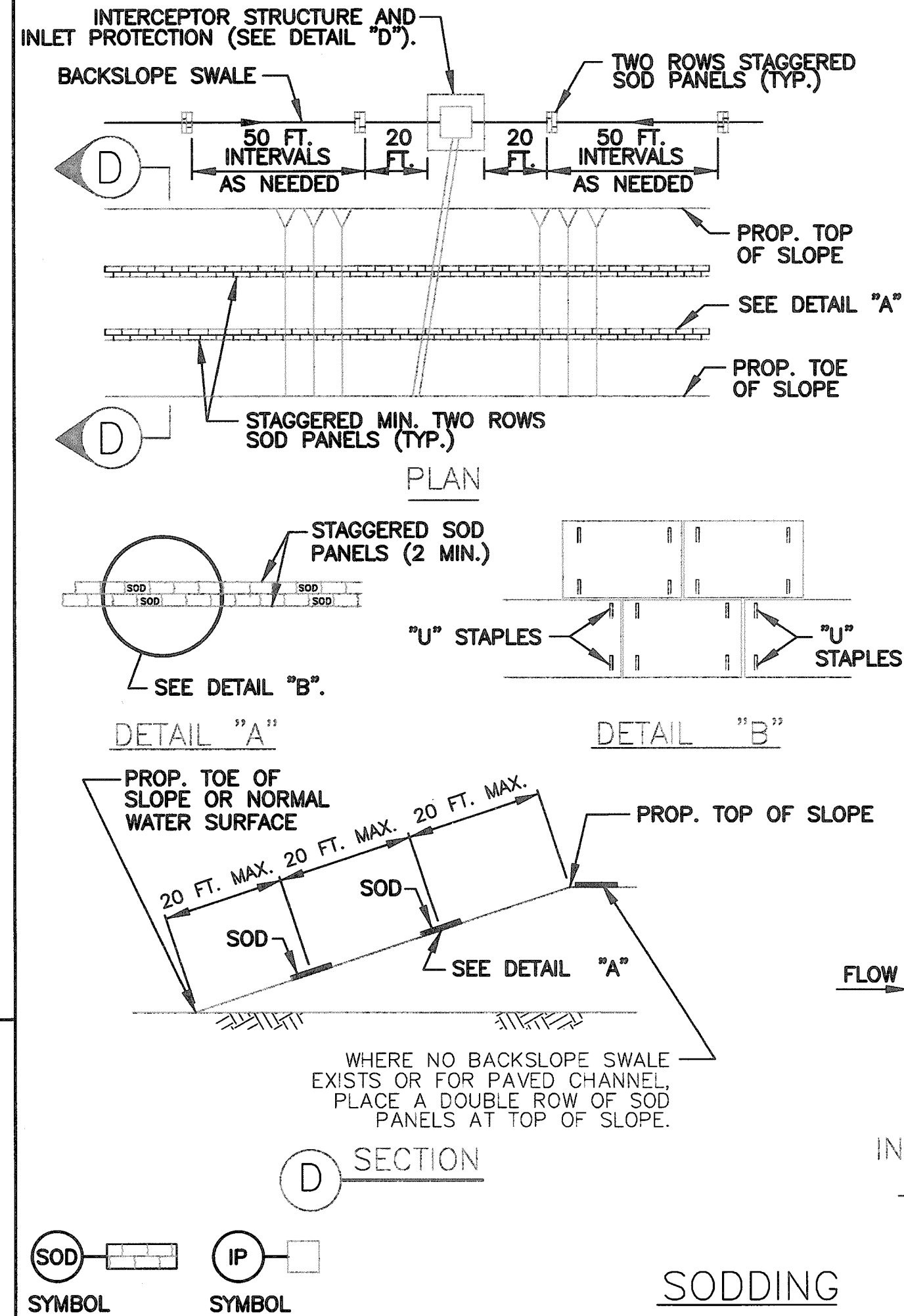
FILTER DAM AT DETENTION BASIN OUTFALL PIPE

GEOTEXTILE NOTES:

|          |           |             |
|----------|-----------|-------------|
| MIN. AOS | SIEVE NO. | 120 MIN     |
| MAX. AOS | SIEVE NO. | 80 MAX      |
| WEIGHT   | OZ/SY     | 2.4 OZ. MIN |

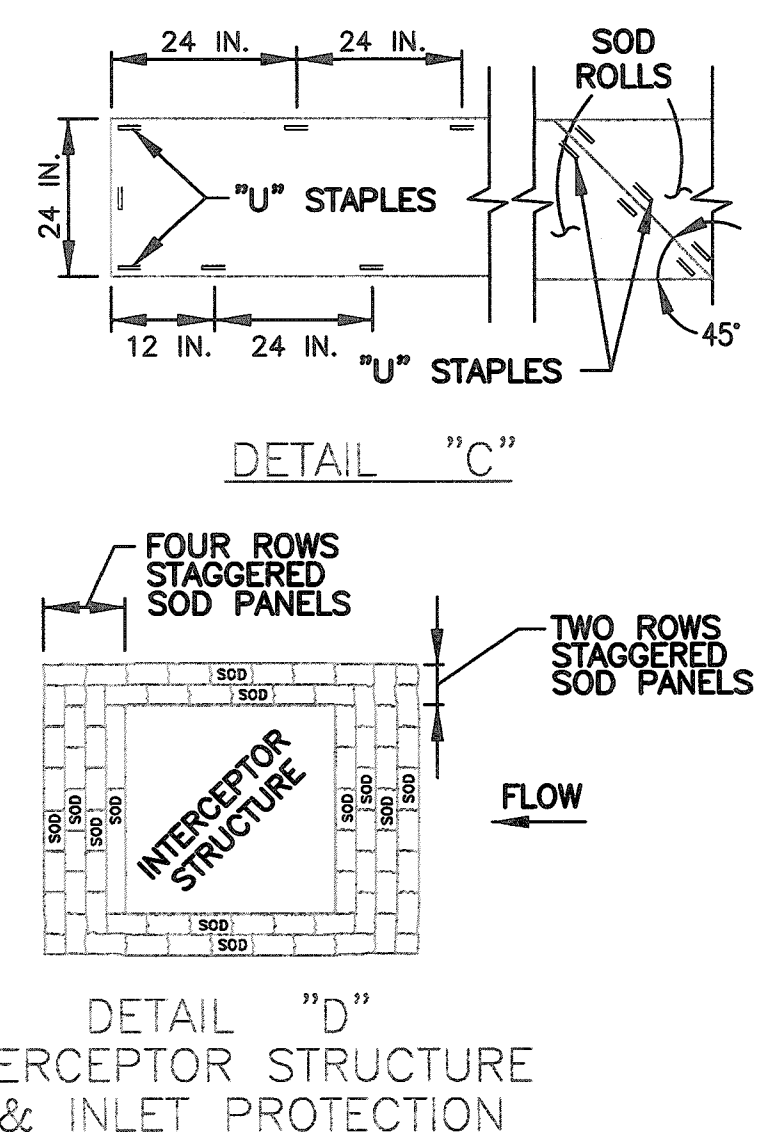


FILTER DAM



NOTES:

1. FOR SOD ROLLS, 24 INCHES WIDE, PLACE STAPLES ON 24 INCH CENTERS NEAR THE EDGES. STAGGER STAPLES ON OPPOSING SIDES. PLACE ADDITIONAL STAPLES IN CORNERS AT ENDS OF ROLL AND ONE IN MIDDLE AT BOTH ENDS OF ROLL.
2. PROVIDE STAPLES PER SPECIFICATION SECTION NO. 02922-SOD.
3. SOD ROLL AS SHOWN IN DETAIL "C" EQUIVALENT TO TWO ROWS OF SOD PANELS.

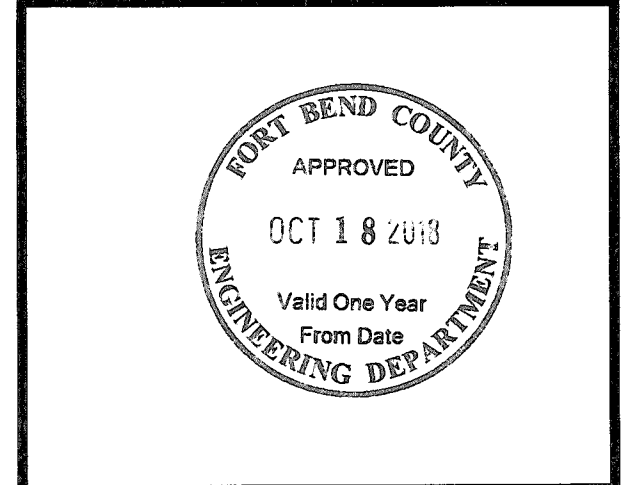


SODDING

FILTER DAM NOTES:

- A. TYPES OF FILTER DAMS
- TYPE 1 (NON-REINFORCED)
    - HEIGHT - 18-24 INCHES. MEASURE VERTICALLY FROM EXISTING GROUND TO TOP OF FILTER DAM.
    - TOP WIDTH - 2 FEET (MINIMUM)
    - SLOPES - 2:1 (MAXIMUM).
  - TYPE 2 (REINFORCED)
    - HEIGHT - 18-36 INCHES. MEASURE VERTICALLY FROM EXISTING GROUND TO TOP OF FILTER DAM.
    - TOP WIDTH - 2 FEET (MINIMUM).
    - SLOPES - 2:1 (MAXIMUM).
  - TYPE 3 (REINFORCED)
    - HEIGHT - 36-48 INCHES. MEASURE VERTICALLY FROM EXISTING GROUND TO TOP OF FILTER DAM.
    - TOP WIDTH - 2 FEET (MINIMUM).
    - SLOPES - 3:1 (MAXIMUM).
  - TYPE 4 (GABION)
    - HEIGHT - 30 INCHES (MINIMUM). MEASURE VERTICALLY FROM EXISTING GROUND TO TOP OF FILTER DAM.
    - TOP WIDTH - 2 FEET (MINIMUM).
  - TYPE 5. AS SHOWN ON THE PLANS.
- B. CONSTRUCT FILTER DAMS ACCORDING TO THE FOLLOWING CRITERIA UNLESS SHOWN OTHERWISE ON THE PLANS.
- TYPE 2 AND 3 FILTER DAMS: SECURE WITH 20 GAUGE GALVANIZED WOVEN WIRE MESH WITH 1 INCH DIAMETER HEXAGONAL OPENINGS.
  - GRANULAR FILL:
    - PLACE ON MESH TO HEIGHT AND SLOPES SHOWN ON PLANS OR AS SPECIFIED BY THE ENGINEER.
    - 3-5 INCHES FOR ROCK FILTER DAM TYPES 1,2, AND 4 AND 4-8 INCHES FOR ROCK FILTER DAM TYPE 3. REFER TO GRANULAR FILL IN SPECIFICATION SECTION NO. 02378-RIPRAP AND GRANULAR FILL.
  - WIRE MESH: FOLD AT UPSTREAM SIDE OVER GRANULAR FILL AND TIGHTLY SECURE TO ITSELF ON THE DOWNSTREAM SIDE USING WIRE TIES OR HOG RINGS.
  - IN STREAMS: SECURE OR STAKE MESH TO STREAM BED PRIOR TO AGGREGATE PLACEMENT.
  - SEE SPECIFICATION SECTION NO. 02364-FILTER DAMS.
  - EMBED ONE FOOT MINIMUM INTO SLOPE AND AT SLOPE RAISE ONE FOOT HIGHER THAN CENTER OF DEPRESSED AREA.

THIS DETAIL SHEET HAS BEEN PREPARED FOR USE ON HCFCD PROJECTS OR PROJECTS TO BE MAINTAINED BY THE HCFCD WHEN COMPLETED BY OTHERS. AN ENGINEER WHO INCORPORATES THE DETAILS ON THIS SHEET BECOMES RESPONSIBLE FOR ITS USE IN THE END PRODUCT IN ACCORDANCE WITH RULE 137.33 (b) AND (c) OF THE TEXAS STATE BOARD OF REGISTRATION FOR PROFESSIONAL ENGINEERS.



project

COMMONS AT HARVEST GREEN  
at  
11131 AND 11135 HARLEM ROAD  
RICHMOND, TEXAS 77406

REVISIONS



08/15/18

SWPPP  
DETAILS

|                        |                   |
|------------------------|-------------------|
| DRAWN BY:<br>FA        | CHECKED:<br>SNO   |
| PROJECT No:<br>1877.01 | SHEET No:<br>C5.2 |

RSG ENGINEERING

2885 WILCREST DRIVE  
SUITE 676  
HOUSTON, TEXAS 77042  
TEL 713-768-7777

TYPE FIRM #: 15488

## WASTEWATER NOTES

- 1 PROPOSED SANITARY SEWER CLEAN-OUT  
RIM 87.80  
FL 83.05
- 2 65'~6" PVC SANITARY SEWER LINE  
@ 0.8%
- 3 12'~6" PVC SANITARY SEWER LEAD  
@ 0.8%
- 4 PROPOSED SANITARY SEWER CLEAN-OUT  
RIM 88.30  
FL 83.65
- 5 4'~6" PVC SANITARY SEWER LEAD  
@ 0.8%
- 6 PROPOSED SANITARY SEWER CLEAN-OUT  
RIM 87.80  
FL 83.60
- 7 45° BEND
- 8 LOCATION OF FUTURE GREASE TRAP  
AND SAMPLING WELL

RE: ARCHITECTURAL PLANS FOR THE LOCATION OF LIGHT POLES  
CONTRACTOR SHALL MAINTAIN A MINIMUM CLEARANCE OF 5' BETWEEN  
LIGHT POLE FOUNDATIONS AND EXISTING 12" WATER LINE.

F.B.C.C.F. No. 2016117919  
LANDMARK INDUSTRIES  
CALL 3.552 ACRES

REMAINDER OF  
CALL 168.253 ACRES  
(TRACT 1)  
GRAND PARKWAY 1358, LP  
F.B.C.C.F. No. 2014037769

**NOTE:**  
WATER TAP AND WATER METERS SHALL  
BE INSTALLED BY DISTRICT OPERATOR

SANITARY SEWER MANHOLE  
RIM=86.63'  
8"FL(S)=80.03'

HARLEM ROAD  
(R.O.W. VARIES)

### GENERAL NOTES: SITEWORK

(THESE NOTES CONTROL EXCEPT AS NOTED OTHERWISE IN PLANS & DETAILS)

1. CONTRACTOR SHALL FIELD VERIFY LOCATION AND ELEVATION OF ALL EXISTING UTILITIES PRIOR TO CONSTRUCTION OF PROPOSED FACILITIES. NOTIFY ENGINEER IMMEDIATELY OF ANY DISCREPANCIES.
2. CONTRACTOR SHALL NOTIFY THE APPROPRIATE UTILITY COMPANY 48 HOURS PRIOR TO EXCAVATING NEAR THEIR UTILITY.
3. CONTRACTOR SHALL TAKE ALL DUE PRECAUTIONS TO PROTECT EXISTING FACILITIES FROM DAMAGE. ANY DAMAGE TO EXISTING FACILITIES INCURRED AS A RESULT OF CONSTRUCTION OPERATIONS WILL BE REPAIRED BY THE CONTRACTOR AT HIS OWN EXPENSE.
4. CONTRACTOR SHALL TAKE EXTRA CARE TO PROTECT TREES IN AREAS ADJACENT TO CONSTRUCTION.

### 8. DOMESTIC WATER SYSTEM

1. ALL WATER LINE MAINS SIZES 1 THRU 3 INCH SHALL BE PVC SCH 40.
2. ALL WATER MAINS SIZES 4 THRU 12 INCH SHALL BE ANWHA C-900 CLASS 150 DR-18.
3. ALL WATER METERS SHALL BE FIRE RATED ACCORDING TO HARRIS COUNTY STANDARDS.
4. WATER LINE SHALL BE CONSTRUCTED AND TESTED IN ACCORDANCE WITH HARRIS COUNTY SPECIFICATION FOR WATER MAIN CONSTRUCTION AS CURRENTLY AMENDED.
5. WATER LINE SHALL HAVE BANK SAND BEDDING AND BACKFILL.
6. PROVIDE THRUST BLOCKING ACCORDING TO HARRIS COUNTY STANDARDS & SPECIFICATIONS.
7. PROVIDE A MINIMUM 6-INCHES OF CLEARANCE AT STORM SEWER AND WATER LINE CROSSING.

### C. SANITARY SEWER SYSTEM

1. POLY-VINYL-CHLORIDE (PVC) PIPE SHALL CONFORM TO ASTM SPECIFICATIONS D3034 AND BE INSTALLED ACCORDING TO ASTM D2321.
2. ALL SANITARY SEWER SERVICE LINES SHALL BE CONSTRUCTED TO TRUE ALIGNMENT AND GRADE. WRAPPED AND SAGGING LINES WILL NOT BE PERMITTED.
3. BUILDING TIE-ON CONNECTION WILL BE MADE DIRECTLY TO THE STUB-OUT FROM THE BUILDING PLUMBING AT THE FOUNDATION ON ALL WASTES OUTLETS.
4. WATER-TIGHT ADAPTERS OF A TYPE COMPATIBLE WITH THE MATERIALS BEING JOINED WILL BE USED AT THE POINT OF CONNECTION OF THE SERVICE LINE TO THE BUILDING PLUMBING. NO CEMENT GROUT MATERIALS ARE PERMITTED.
5. NO BENDS OR TURNS AT ANY POINT WILL BE GREATER THAN 45 DEGREES.
6. EACH CLEANOUT WILL BE INSTALLED SO THAT IT OPENS IN A DIRECTION OPPOSITE TO THE FLOW OF THE WASTE AND, EXCEPT IN THE CASE OF "WYE" BRANCH AND END-OF-THE-LINE CLEANOUTS, CLEANOUTS WILL BE INSTALLED VERTICALLY ABOVE THE FLOW LINE OF THE PIPE.

7. CLEANOUT WILL BE MADE WITH AIRTIGHT MECHANICAL PLUG.
8. THE PHYSICAL CONNECTION TO THE DISTRICT'S SEWER MAIN WILL BE MADE BY USE OF AN ADAPTER OF A TYPE COMPATIBLE WITH MATERIALS BEING JOINED. THE CONNECTION SHALL BE WATERTIGHT. NO CEMENT GROUT MATERIALS ARE PERMITTED.
9. BACKFILLING OF SERVICE LINES TRENCH MUST BE ACCOMPLISHED WITHIN TWENTY-FOUR (24) HOURS OF INSPECTION AND APPROVAL. NO DEBRIS WILL BE PERMITTED IN THE TRENCH.
10. INLINE CLEAN OUTS SHALL BE INSTALLED AT EVERY 90° FEET.
11. ALL SANITARY SEWER LINES 6" OR SMALLER SHALL BE PVC SCHEDULE 40 PIPE SIZES 8" OR LARGER SHALL BE PVC SDR 35.

### NOTES:

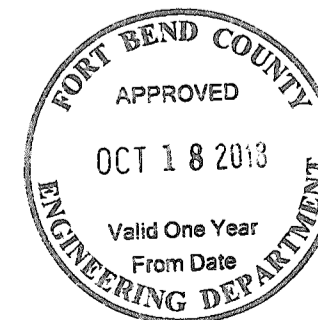
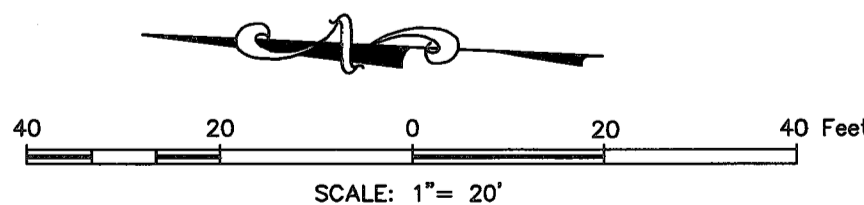
1. ALL WATER, SANITARY SEWER, STORM PIPING, GAS/ELECTRICAL SERVICES AND PAVING LOCATED IN THE COMMON AREA(S) ARE TO BE MAINTAINED BY THE IC MUD. (COMMON AREA: ALL AREAS OUTSIDE THE BUILDING FOOTPRINT ARE CONSIDERED COMMON AREA.)
2. OWNER/CONTRACTOR SHALL ALSO REFER TO GENERAL NOTES AND DETAILS.
3. OWNER/CONTRACTOR SHALL REFER TO ARCHITECTURAL SITE PLAN FOR ALL DIMENSIONS, PAD LOCATIONS AND ALL OTHER SITE RELATED ITEMS.
4. OVERHEAD AND UNDERGROUND UTILITIES MAY EXIST IN THE VICINITY OF THIS PROJECT. LOCATIONS SHOWN FOR EXISTING UTILITIES ARE APPROXIMATE AND OTHER UTILITIES MAY EXIST IN THE VICINITY OF THE PROJECT WHICH ARE NOT SHOWN ON THE PLANS. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO LOCATE ALL EXISTING UTILITIES IN THE VICINITY OF THE PROJECT, PRIOR TO BEGINNING CONSTRUCTION. IF ANY DISCREPANCIES EXIST, NOTIFY ENGINEER IMMEDIATELY.
5. WHEN CONCRETE IS PLACED OVER AN EASEMENT A SAWCUT OR EXPANSION JOINT MUST BE PLACED AT THE EASEMENT LINE AND CROSS THE EASEMENT EVERY 10'.

## LEGEND

- PROPERTY LINE  
STORM SEWER  
WASTEWATER {6" OR SMALLER-PVC SCH 40  
8" OR LARGER-PVC SDR 35  
WATER LINE  
FIRE HYDRANT (FH)  
GATE VALVE  
WASTEWATER MANHOLE  
STORM SEWER MANHOLE  
CLEAN-OUT  
INLINE CLEAN OUT
- EXIST.=FILLED  
PROP.=OPEN  
EXIST.=FILLED  
PROP.=OPEN  
C.O.  
C.O.

## WATER NOTES

- 1 2"x12" STANDARD CONNECTION
- 2 4'~2" DOMESTIC WATER LINE
- 3 2"x1½" TEE FITTING  
3'~1½" IRRIGATION WATER LINE
- 4 90° BEND  
1'~1½" IRRIGATION WATER LINE
- 5 1½" IRRIGATION WATER METER ASSEMBLY
- 6 5'~1½" IRRIGATION WATER LINE
- 7 1½" REDUCED PRESSURE ZONE BACK FLOW PREVENTOR
- 8 PLUG WATER LINE
- 9 2" DOMESTIC WATER METER ASSEMBLY
- 10 5'~2" DOMESTIC WATER LINE
- 11 2" REDUCED PRESURE ZONE BACK FLOW PREVENTOR
- 12 10'~2" DOMESTIC WATER LINE
- 13 11.25° BEND
- 14 46'~2" DOMESTIC WATER LINE
- 15 45° BEND
- 16 31'~2" DOMESTIC WATER LINE
- 17 TEE FITTING
- 18 3'~2" DOMESTIC WATER LINE  
PLUG WATER LINE.  
CONNECTION TO BUILDING BY MEP ENGINEER
- 19 14'~2" DOMESTIC WATER LINE  
PLUG WATER LINE.  
CONNECTION TO BUILDING BY MEP ENGINEER
- 20 90° BEND
- 21 75'~6" PVC C-900 DR-18 PIPE
- 22 96'~6" PVC C-900 DR-18 PIPE
- 23 7'~6" PVC C-900 DR-18 PIPE  
90° BEND - VERTICAL  
BRING PIPELINE TO AN ELEVATION OF 89.00' AND PLUG FOR FUTURE USE
- 24 3'~6" PVC C-900 DR-18 PIPE  
90° BEND - VERTICAL  
BRING PIPELINE TO AN ELEVATION OF 89.00' AND PLUG FOR FUTURE USE



RSG ENGINEERING



project  
COMMONS AT HARVEST GREEN  
at  
11131 AND 11135 HARLEM ROAD  
RICHMOND, TEXAS 77406

| REVISIONS | FBC & MUD COMMENT RESPONSE | 08.02.18 |
|-----------|----------------------------|----------|
| 1         | WATER & LTL REVISION       | 10.08.18 |



10/08/18

## SITE UTILITIES PLAN

DRAWN BY: FA  
CHECKED: SNO  
PROJECT No: 1877.01  
SHEET No: C6.1

TERRE FIRM #: 15408

2825 WILCREST DRIVE  
SUITE 670  
HOUSTON, TEXAS 77042  
TEL: 713-783-7777

GENERAL

1. ALL WATER LINES, WASTEWATER COLLECTION SYSTEMS, PAVING, TRAFFIC SIGNALS AND DRAINAGE SYSTEMS SHALL BE CONSTRUCTED IN ACCORDANCE WITH CITY OF HOUSTON, DEPARTMENT OF PUBLIC WORKS AND ENGINEERING'S "STANDARD CONSTRUCTION SPECIFICATIONS (MOST RECENT ISSUE OCTOBER 2002) AND "STANDARD CONSTRUCTION DETAILS FOR WASTEWATER COLLECTION SYSTEMS, WATER DRAINAGE AND STREET PAVING" (MOST RECENT ISSUE OCTOBER 2002) WITH ALL SUBSEQUENT AMENDMENTS ADDED THERETO UNLESS OTHERWISE NOTED AND APPROVED ON THESE PLANS. THE DESIGN MUST AGREE WITH THE MINIMUM STANDARDS ESTABLISHED IN THE LATEST ISSUE OF THE "INFRASTRUCTURE DESIGN MANUAL" (MOST RECENT ISSUE OCTOBER 2002) REVISED NOV 2008. NOTE THAT PLAN SIGNATURES AND LETTERS OF CAPACITY AVAILABILITY FOR STORM, WASTEWATER AND WATER EXPIRE AFTER ONE YEAR AND THAT THE LATEST EDITIONS OF DESIGN RULES, SPECIFICATIONS, STANDARD DETAILS AND MANUALS SHALL GOVERN AS OF THE DATES FOR RESIGNING.

2. THE CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGE TO EXISTING PUBLIC PRIVATE UTILITY LINES, INCLUDING BUT NOT LIMITED TO PAVING, WATER LINES, WASTEWATER COLLECTION SYSTEMS, STORM SEWER AND TRAFFIC SIGNALS DURING CONSTRUCTION. ALL DAMAGES SHALL BE REPAIRED IN ACCORDANCE WITH CURRENT EDITIONS OF CITY OF HOUSTON STANDARD CONSTRUCTION SPECIFICATIONS, DESIGN DETAILS AND DESIGN MANUALS. REPAIRS SHALL BE AT NO COST TO THE DISTRICT.

3. CONTRACTOR SHALL COMPLY WITH OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION STANDARDS AND ANY OTHER FEDERAL, STATE AND LOCAL REGULATIONS REGARDING TRENCH SAFETY SYSTEMS FOR TRENCH EXCAVATION.

4. ADEQUATE DRAINAGE SHALL BE MAINTAINED AT ALL TIMES DURING CONSTRUCTION AND ANY DRAINAGE DITCH OR STRUCTURE DISTURBED DURING CONSTRUCTION SHALL BE RESTORED TO THE SATISFACTION OF THE OWNING AUTHORITY. ALL CONSTRUCTION STORM RUNOFF SHALL COMPLY WITH THE FINAL DRAFT OF STORMWATER MANAGEMENT HANDBOOK FOR CONSTRUCTION ACTIVITIES AS PREPARED BY FORT BEND COUNTY/HCFCD, AND THE CITY OF HOUSTON, ALL IN COMPLIANCE WITH THE TEXAS POLLUTANT DISCHARGE ELIMINATION SYSTEM (TPDES) REQUIREMENTS.

5. CONDITION OF THE ROAD AND/OR RIGHT-OF-WAY, UPON COMPLETION OF JOB, SHALL BE AS GOOD OR BETTER THAN CONDITION PRIOR TO STARTING WORK.

6. THE EXISTENCE AND LOCATION OF ANY UNDERGROUND UTILITY PIPES OR STRUCTURES SHOWN ON THESE PLANS ARE OBTAINED BY A SEARCH OF AVAILABLE RECORDS. CONTRACTOR IS REQUIRED TO TAKE PRECAUTIONARY MEASURES TO PROTECT THE UTILITY LINE SHOWN AND ANY OTHER LINES NOT OF RECORD OR NOT SHOWN ON THESE DRAWINGS. EXISTING UTILITIES ARE LOCATED ON THE PLANS ONLY FOR THE CONVENIENCE OF THE CONTRACTOR. EXISTING UTILITY SERVICE LATERALS ARE NOT SHOWN ON THE PLANS AND CONTRACTOR IS ADVISED TO CALL THE APPLICABLE UTILITIES/AGENCIES BEFORE DIGGING.

7. THE CONTRACTOR SHALL TAKE ALL PRECAUTIONARY MEASURES NECESSARY TO PROTECT EXISTING IMPROVEMENTS WHICH ARE TO REMAIN IN PLACE FROM DAMAGE, AND ALL SUCH IMPROVEMENTS MUST BE PROTECTED BY THE CONTRACTOR'S OPERATIONS SHALL BE REPAIRED OR RECONSTRUCTED TO THE SATISFACTION OF THE ENGINEER AT THE EXPENSE OF THE CONTRACTOR.

8. THE CONTRACTOR IS TO FIELD VERIFY ALL EXISTING SITE CONDITIONS PRIOR TO CONSTRUCTION. IF A CONFLICT EXISTS BETWEEN WHAT IS SHOWN ON THESE PLANS AND WHAT EXISTS IN THE FIELD, CONTRACTOR IS TO NOTIFY THE ARCHITECT AND ENGINEER IMMEDIATELY. CONTRACTOR SHALL VERIFY THE INVERT AND/OR FLOW LINE ELEVATIONS OF POINTS OF CONNECTIONS PRIOR TO THE COMMENCEMENT OF WORK AND SHALL IMMEDIATELY REPORT ANY DEVIATIONS TO THE ENGINEER.

PRIVATE UTILITY NOTES

NOTICE

THE CONTRACTOR SHALL CONTACT THE UTILITY COORDINATING COMMITTEE AT 713-223-4567 OR TOLL FREE 1-800-344-8377 AND THE FORT BEND COUNTY MUNICIPAL UTILITY DISTRICT NO 189, A MINIMUM OF 48 HOURS PRIOR TO CONSTRUCTION TO HAVE UNDERGROUND LINES FIELD LOCATED.

CAUTION: SBC CABLES

THE LOCATION OF SBC FACILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION BEFORE COMMENCING WORK. HE AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THIS FAILURE TO EXACTLY LOCATE AND PRESERVE THESE UNDERGROUND UTILITIES.

WHEN EXCAVATING WITHIN EIGHTEEN INCHES (18") OF THE INDICATED LOCATION OF SBC FACILITIES, ALL EXCAVATIONS MUST BE ACCOMPLISHED USING NON-MECHANIZED EXCAVATION PROCEDURES. WHEN BORING THE CONTRACTOR SHALL EXPOSE THE SBC FACILITIES.

WHEN SBC FACILITIES ARE EXPOSED, THE CONTRACTOR WILL PROVIDE SUPPORT TO PREVENT DAMAGE TO THE CONDUIT DUCTS OR CABLES. WHEN EXCAVATING NEAR TELEPHONE POLES THE CONTRACTOR SHALL BRACE THE POLE FOR SUPPORT.

CAUTION: UNDERGROUND GAS FACILITIES

LOCATION OF CENTERPOINT/ENTEX MAIN LINES (TO INCLUDE UNIT GAS TRANSMISSION AND/OR INDUSTRIAL GAS SUPPLY CORPORATION WHERE APPLICABLE) ARE SHOWN IN AN APPROXIMATE LOCATION ONLY. SERVICE LINES ARE USUALLY NOT SHOWN. THE CONTRACTOR SHALL CONTACT THE UTILITY COORDINATING COMMITTEE AT 223-4567 OR 1-800-669-8344 A MINIMUM OF 48 HOURS PRIOR TO CONSTRUCTION TO HAVE MAIN AND SERVICE LINES FIELD LOCATED.

WHEN CENTERPOINT/ENTEX PIPE LINE MARKINGS AR NOT VISIBLE, CALL 713-967-8037 (7:00 am to 4:30 pm) FOR STATUS OF LINE LOCATION REQUEST BEFORE EXCAVATION BEGINS.

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

WHEN CENTERPOINT/ENTEX FACILITIES ARE EXPOSED SUFFICIENT SUPPORT MUST BE PROVIDED TO THE FACILITIES TO PREVENT EXCESSIVE STRESS ON THE PIPING.

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

ANY UTILITY OUTAGES CAUSED BY CONTRACTOR SHALL BE RESTORED WITHIN 4 HOURS OF NOTICE BY TENANT OR OWNER.

CAUTION: OVERHEAD POWER LINES

OVERHEAD LINES EXIST ON THE PROPERTY. WE HAVE NOT ATTEMPTED TO MARK THOSE LINES SINCE THEY ARE CLEARLY VISIBLE, BUT YOU SHOULD LOCATE THEM 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. PARTIES RESPONSIBLE FOR THE WORK, INCLUDING CONTRACTORS, ARE LEGALLY RESPONSIBLE FOR THE SAFETY OF CONSTRUCTION WORKERS UNDER THIS LAW. THIS LAW CARRIES BOTH CRIMINAL AND CIVIL LIABILITY. TO ARRANGE FOR LINES TO BE TURNED OFF OR REMOVED, CALL RELIANT ENERGY/HL&P AT 713-207-7777.

CONTRACTOR TO NOTIFY THE "UNDERGROUND UTILITY COORDINATING COMMITTEE" (TELEPHONE: 713-223-4567) AND CITY OF HOUSTON DEPARTMENT OF PUBLIC WORKS (TELEPHONE: 713-754-0767) 48 HOURS BEFORE STARTING WORK IN STREET RIGHT-OF-WAY OR EASEMENTS.

CONTRACTOR TO NOTIFY THE MUD OPERATOR AND IS RESPONSIBLE FOR SCHEDULING AND COORDINATING ALL NECESSARY INSPECTIONS, REVIEWS OF WORK AND APPROVAL.

PAVING

1. GUIDELINES SET FORTH IN THE TWOT MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES SHALL BE OBSERVED.

2. EXISTING PAVEMENTS, CURBS, SIDEWALKS AND DRIVEWAYS DAMAGED OR REMOVED DURING CONSTRUCTION SHALL BE REPLACED TO FORT BEND COUNTY STANDARDS WITH LATEST ADDENDA AND AMENDMENTS THERETO.

3. PAVING CONSTRUCTION SHALL BE IN ACCORDANCE WITH CITY OF HOUSTON "STANDARD CONSTRUCTION SPECIFICATIONS" DATED OCTOBER, 2002 AND ALL APPLICABLE AMENDMENTS AND REVISIONS THERETO.

4. CONTRACTOR SHALL BLOCK OUT (SQUARE) AROUND ALL INLETS AND MANHOLES IN PROPOSED PAVING AS SHOWN ON TYPE "A" INLET AND TYPE "C" MANHOLE DETAILS.

5. EXPANSION JOINT SHALL BE PLACED AT THE END OF EACH CURB RETURN AND A MAXIMUM 60' SPACING.

6. PROPOSED DRIVEWAYS TO BE CONSTRUCTED PER FORT BEND COUNTY DRIVEWAY DETAIL.

7. CONTRACTOR SHALL CONSULT THE SOILS REPORT PREPARED BY THE MURILLO COMPANY, SEPTEMBER 2012, REPORT NO. G0630112, ENTITLED "GEOTECHNICAL INVESTIGATION, DISCOVERY AT VINTAGE PARK APARTMENTS, FORT BEND COUNTY, TEXAS.

8. CONTRACTOR SHALL SUBMIT JOINT PLAN TO ENGINEER FOR APPROVAL.

STORM SEWERS

1. STORM SEWER PIPE USED FOR CONNECTION TO STORM SEWER IN PUBLIC RIGHT-OF-WAY SHALL BE REINFORCED CONCRETE PIPE ASTM C-76, CLASS III, AND SHALL EXTEND TO FIRST INLET OR MANHOLE. ALL OTHER PRIVATE STORM SEWERS SHALL BE HDPE AND BEDDED PER CITY OF HOUSTON STANDARDS. PIPE GRADES ARE BASED ON CONCRETE PIPE TO PRODUCE THREE (3) FPS MINIMUM VELOCITY.

2. STORM SEWERS SHALL BE INSTALLED, BEDDED, AND BACKFILLED IN ACCORDANCE WITH CITY OF HOUSTON DRAWINGS NOS. 02317-02, 02317-03, 02317-05, 02317-06, 02317-07, & 02081-07 AS APPLICABLE UNLESS OTHERWISE SHOWN ON DRAWINGS.

3. STORM SEWERS SHALL BE CONSTRUCTED IN ACCORDANCE WITH CITY OF HOUSTON "STANDARD CONSTRUCTION SPECIFICATIONS" OCTOBER, 2002 ISSUE, AS CURRENTLY AMENDED.

4. ALL SEWERS UNDER PROPOSED OR FUTURE PAVEMENT AND TO A POINT ONE (1) FOOT BACK OF ALL PROPOSED OR FUTURE CURBS SHALL BE BACKFILLED WITH 1 1/2 SACK CEMENT/C.Y. STABILIZED SAND TO WITHIN ONE (1) FOOT OF SUBGRADE. THE REMAINING DEPTH OF TRENCH SHALL BE BACKFILLED WITH SUITABLE EARTH MATERIAL IN 8 INCH LIFTS, WITH TESTS TAKEN AT 100 FOOT INTERVALS ON EACH LIFT, AND MECHANICALLY COMPACTED TO A DENSITY OF NOT LESS THAN 95% OF THE MAXIMUM DRY DENSITY AS DETERMINED BY THE STANDARD PROCTOR COMPACTION TEST (ASTM DESIGNATION D-698/AASHTO T99). MOISTURE CONTENT OF BACKFILL SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE CEMENT- STABILIZED SAND SPECIFICATION ASTM C33, LATEST EDITION.

5. CONCRETE PIPE SHALL BE INSTALLED USING RUBBER GASKET JOINTS ONLY CONFORMING TO ASTM C443.

6. "STM.S.E." INDICATES "STORM SEWER EASEMENT."

7. ALL PROPOSED PIPE STUB-OUTS FROM MANHOLES OR INLETS ARE TO BE PLUGGED WITH 8" BRICK WALLS UNLESS OTHERWISE NOTED.

SANITARY SEWERS

1. ALL SEWERS SHALL BE CONSTRUCTED IN ACCORDANCE WITH CITY OF HOUSTON "STANDARD CONSTRUCTION SPECIFICATION FOR WASTEWATER COLLECTION SYSTEMS, WATER LINES, STORM DRAINAGE AND STREET PAVING" OCTOBER, 2002 ISSUE AND ALL CURRENT AMENDMENTS THERETO AND BE SUBJECT TO A STANDARD EXFILTRATION TEST. NO PART OF THE WORK TO BE PERFORMED ON THE TOTAL FOOTAGE OF SEWER LINE INCLUDED IN THE PROJECT. REQUIREMENTS OF TEXAS ADMINISTRATIVE CODE, TITLE 30 CHAPTER 317, "DESIGN CRITERIA FOR SEWERAGE SYSTEMS" SHALL GOVERN WHERE CONFLICTS EXIST EXCEPT WHERE CITY REQUIREMENTS ARE OF HIGHER STANDARDS.

2. SANITARY SEWER PIPE TO BE SDR 26 P.V.C. PIPE MEETING ASTM SPECIFICATION D2241 WITH RUBBER GASKET JOINTS, UNLESS OTHERWISE NOTED.

3. SANITARY SEWERS MANHOLES WILL HAVE BEDDING AND BACKFILL PER CITY OF HOUSTON STANDARDS UNLESS OTHERWISE NOTED.

4. ALL SANITARY SEWER LINES UNDER PROPOSED OR FUTURE PAVEMENT AND TO A POINT ONE (1) FOOT BACK OF ALL PROPOSED OR FUTURE CURBS SHALL HAVE BEDDING PER CITY OF HOUSTON STANDARDS AS APPLICABLE, WITH 1 1/2 SACK CEMENT/C.Y. STABILIZED SAND TO WITHIN ONE (1) FOOT OF BOTTOM OF THE PAVEMENT SUBGRADE. 100 PSI PERFORMANCE RESULTS ARE STILL REQUIRED.

5. ALL MANHOLES ARE TO BE PER CITY OF HOUSTON STANDARDS.

6. ALL SANITARY SEWERS CROSSING WATER LINES WITH A CLEARANCE BETWEEN 6 INCHES AND 9 FEET SHALL HAVE A MINIMUM OF ONE 18" JOINT OF 150 P.S.I. DUCTILE IRON OR 18 P.V.C. PIPE MEETING ASTM SPECIFICATION D2241 CENTERED ON WATER LINE. WHEN WATER LINE IS BELOW SANITARY SEWER PROVIDE MINIMUM 2 FOOT SEPARATION.

7. CONTRACTOR SHALL PROVIDE FOR A MINIMUM HORIZONTAL CLEARANCE OF 9' FEET BETWEEN WATER LINES AND SANITARY SEWER MANHOLES AND LINES.

8. SANITARY SEWER MANHOLE RIMS OUTSIDE OF PROPOSED PAVING WILL BE SET 3" - 6" ABOVE THE SURROUNDING LEVEL FINISHED GRADE AFTER PAVING WITH SLOPED BACKFILL ADDED FOR STORMWATER DRAINAGE AWAY FROM MANHOLE RIM.

9. "SAN. S. E." INDICATES "SANITARY SEWER EASEMENT"

10. IN WET STABLE TRENCH AREAS USE BEDDING PER CITY OF HOUSTON STANDARDS.

11. ALL SDR P.V.C. PIPE IS TO HAVE D.I.P. SIZE O.D. AND RUBBER GASKET BELL-AND- SPIGOT TYPE JOINT ENDS.

12. SDR 26 P.V.C. PIPE USES "FULL BODIED" SDR 26 P.V.C. FITTINGS WITH APPROPRIATE ADAPTERS. AWWA C-900 DR-18 P.V.C. PIPE USES EITHER AWWA C900 DR-18 P.V.C. FITTINGS OR D.I.P. FITTINGS. SDR-26 P.V.C. PIPE SHALL HAVE A CELL CLASSIFICATION OF 12364-B AS DEFINED IN ASTM D-1784.

13. DEFLECTION TEST: DEFLECTION TESTS SHALL BE PERFORMED ON ALL FLEXIBLE AND SEMI-RIGID SEWER PIPE. THE TEST SHALL BE CONDUCTED AFTER THE FINAL BACKFILL HAS BEEN IN PLACE AT LEAST 30 DAYS. NO PIPE SHALL EXCEED A DEFLECTION OF 5% IF THE DEFLECTION TEST IS TO BE RUN USING A RIGID MANDREL, IT SHALL HAVE A DIAMETER EQUAL TO 95% OF THE INSIDE DIAMETER OF THE PIPE. THE TEST SHALL BE PERFORMED AS PER 30 TAC 317.2 LATEST AMENDMENT AND WITHOUT MECHANICAL PULLING DEVICES.

14. INFILTRATION, EXFILTRATION OR LOW-PRESSURE AIR TEST: EITHER OF THE FOLLOWING TESTS SHALL BE PERFORMED AS PER TAC, TITLE 30 317.2 WITHIN THE SPECIFIED TOLERANCES ON ALL GRAVITY SEWERS. A. INFILTRATION OR EXFILTRATION TEST: TOTAL LEAKAGE AS DETERMINED BY A HYDROSTATIC HEAD TEST SHALL NOT EXCEED 50 GALLONS PER INCH DIAMETER PER MILE OF PIPE PER 24 HOURS AT A MINIMUM TEST HEAD OF TWO (2) FEET.

B. LOW-PRESSURE AIR TEST: PERFORM TEST ACCORDING TO UNI-B-6-90 OR OTHER APPROPRIATE PROCEDURES. FOR SECTIONS OF PIPE LESS THAN 36"(INCH) AVERAGE INSIDE DIAMETER, THE MINIMUM ALLOWABLE TIME FOR PRESSURE DROP FROM 3.5 PSIG TO 2.5 PSIG SHALL BE AS FOLLOWS:

6" 340 SECONDS OR 0.855(L) FOR TEST LENGTHS GREATER THAN 398'  
8" 454 SECONDS OR 1.520(L) FOR TEST LENGTHS GREATER THAN 298'  
10" 567 SECONDS OR 2.374(L) FOR TEST LENGTHS GREATER THAN 239'  
12" 680 SECONDS OR 3.419(L) FOR TEST LENGTHS GREATER THAN 199'  
15" 850 SECONDS OR 5.342(L) FOR TEST LENGTHS GREATER THAN 153'  
18" 1020 SECONDS OR 7.693(L) FOR TEST LENGTHS GREATER THAN 133'

WHERE L = LENGTH OF LINE OF SAME PIPE SIZE IN FEET.

BACKFILL/COMPACTION OF FILL

1. ALL GRADING/BACKFILL/COMPACTION SHALL BE IN ACCORDANCE WITH THE SOILS REPORT AND ANY ADDENDUMS THERETO AS PREPARED BY THE MURILLO COMPANY, SEPTEMBER 2012, REPORT NO. G0630112, ENTITLED "GEOTECHNICAL INVESTIGATION, DISCOVERY AT VINTAGE PARK APARTMENTS, FORT BEND COUNTY, TEXAS.

2. ALL AREAS TO BE FILLED ARE TO BE FREE OF VEGETATION, DEBRIS, PONDING WATER, LOOSE SOILS, MUD & MUCK (STRIP 4").

3. ALL FILL OR DISPOSAL OF EXCESS MATERIAL SHALL BE COMPACTED IN 8" LIFTS, 95% STANDARD PROCTOR DENSITY.

4. THE BUILDING AND PAVEMENT AREAS SHOULD BE STRIPPED OF ANY REMAINING TREES AND STUMPS, VEGETATION, ORGANICS, LOOSE TOPSOIL, AND/OR OTHER DEBRIS. CARE SHOULD BE TAKEN TO REPLACE OR RECOMPACT ALL SOIL REMOVED OR LOOSEENED BY REMOVAL OF TREE ROOTS AND STUMPS. THE LOOSEENED SOILS SHOULD BE MOISTURE CONDITIONED IF NECESSARY AND COMPACTED TO AT LEAST 95 PERCENT MAXIMUM DRY DENSITY TO WITHIN 1% DRY TO 3% WET OF THE OPTIMUM MOISTURE CONTENT AS OUTLINED BELOW.

5. FOLLOWING A PERIOD OF RAIN, THE MOISTURE SENSITIVE SILTY SAND SUBGRADE WILL BE OBVIOUSLY WEAK AND NOT CAPABLE OF SUPPORTING CONSTRUCTION EQUIPMENT. THE SOIL WILL THEN REQUIRE IMPROVEMENT AS OUTLINED IN THE GEOTECHNICAL REPORT. IF THE SUBGRADE IS REASONABLY DRY AND STABLE, THE EXPOSED SOIL SUBGRADE AREA SHOULD BE PROOF ROLLED TO DETECT WEAK AREAS ONCE FINAL SUBGRADE ELEVATIONS HAVE BEEN ACHIEVED THROUGHOUT THE SITE. WEAK AREAS DETECTED DURING PROOF ROLLING, AS WELL AS ZONES OF DEBRIS AND ORGANICS SHOULD BE REMOVED AND REPLACED WITH SOILS EXHIBITING SIMILAR CLASSIFICATION, MOISTURE CONTENT, AND DENSITY AS THE ADJACENT IN-SITU SOILS. SUBSEQUENT TO PROOF ROLLING, AND JUST PRIOR TO PLACEMENT OF FILL, THE EXPOSED SUBGRADE SHOULD BE MOISTURE CONDITIONED AND COMPACTED TO AT LEAST 95 PERCENT OF THE MAXIMUM DENSITY (ASTM D 698) AT 1% DRY TO 3% WET OF THE OPTIMUM MOISTURE CONTENT. THE PURPOSE IS TO PROVIDE SUPPORT FOR COMPACTION OF THE INITIAL FILL LIFT IN THE BUILDING AREA OR FOR CHEMICAL STABILIZATION IN THE PAVEMENT AREAS. FOR WET WEATHER CONSIDERATIONS, SEE GEOTECH REPORT.

6. GRADE ADJUSTMENTS WITHIN THE BUILDING LIMITS SHOULD BE ACCOMPLISHED WITH SELECT, STRUCTURAL FILL COMPOSED OF CLEAN, INACTIVE SANDY CLAY (NOT A SILT) WITH A PLASTICITY INDEX RANGING BETWEEN 10 AND 20. ALL FILL SHOULD BE FREE OF ORGANIC AND DEBRIS. ALL STRUCTURAL FILL SHOULD BE PLACED ON REPAIRED SURFACES IN LIFTS NOT TO EXCEED EIGHT INCHES LOOSE MEASURE, WITH COMPACTED THICKNESS NOT TO EXCEED SIX INCHES. ALL FILL SHOULD BE COMPACTED TO AT LEAST 95 PERCENT (ASTM D 698) MAXIMUM DRY DENSITY AT AT MOISTURE CONTENT WITHIN 1% DRY TO 3% WET OF OPTIMUM MOISTURE CONTENT.

WATERLINE CONSTRUCTION NOTES:

1. WATER MAINS SHALL BE CONSTRUCTED IN ACCORDANCE WITH CITY OF HOUSTON, DEPARTMENT OF PUBLIC WORKS AND ENGINEERING STANDARD CONSTRUCTION SPECIFICATIONS DATED OCTOBER 2002 WITH LATEST ADDENDA AND AMENDMENTS THERETO.

2. 4" THRU 12" WATER LINES SHALL BE AWWA C-900 AND 1" THRU 3" WATER LINES SHALL BE SCHEDULE 40 PVC.

3. ALL WATER LINES SHALL BE BEDDED AND BACKFILLED IN ACCORDANCE WITH CITY OF HOUSTON WATER DWG. NO. 02317-04.

4. ALL WATER LINES UNDER PROPOSED OR FUTURE PAVING AND TO A POINT ONE (1) FOOT BACK OF ALL PROPOSED OR FUTURE CURBS SHALL BE ENCASED IN BANK SAND TO 12" OVER PIPE AND BACKFILLED WITH BANK SAND TO THE BOTTOM OF THE PAVEMENT SUBGRADE.

5. CONTRACTOR SHALL PROVIDE FOR A MINIMUM HORIZONTAL CLEARANCE OF 9' (NINE FEET) BETWEEN WATER LINES AND SANITARY SEWER MANHOLES AND LINES.

6. "W.L.E." INDICATES "WATER LINE EASEMENT"

7. ALL WATER LINES TO BE DISINFECTED IN CONFORMANCE WITH AWWA C-651. A MINIMUM OF ONE BACTERIOLOGICAL SAMPLE SHALL BE COLLECTED FOR EACH 1,000 FEET OF COMPLETED WATER LINE, OR FRACTION THEREOF, TO CHECK EFFICIENCY OF DISINFECTION PROCEDURES AND SHALL BE REPEATED IF CONTAMINATION PERSISTS.

8. ALL WATER PIPE AND RELATED PRODUCTS MUST CONFORM TO ANSI/NSF STANDARD 61.

9. 4" THRU 12" FITTINGS SHALL BE CEMENT MORTAR LINED COMPACT DUCTILE IRON PRESSURE FITTINGS PER ANSI A21.53 OR PUSH ON FITTINGS PER ANSI A21.10 PRESSURE RATED AT 250 PSIG CONFORMING TO THE REQUIREMENTS OF CITY OF HOUSTON STANDARD SPECIFICATION SECTION 02501-DUCTILE IRON PIPE AND FITTINGS.

10. HYDROSTATIC TESTING: ALL WATER PIPE SHALL BE TESTED FOR LEAKAGE IN ACCORDANCE WITH AWWA STANDARDS. LEAKAGE SHALL BE DEFINED AS THE QUANTITY OF WATER THAT MUST BE SUPPLIED INTO THE NEWLY LAID PIPE OR ANY VALVED SECTION THEREOF, TO MAINTAIN PRESSURE WITHIN 5 PSI OF THE SPECIFIED TEST PRESSURE AFTER THE PIPE HAS BEEN FILLED WITH WATER AND THE AIR HAS BEEN EXPELLED. THE TEST PRESSURE SHALL BE EITHER A MINIMUM OF 125 PSIG OR 1.5 TIMES THE MAXIMUM DESIGN PRESSURE WHICHEVER IS LARGER. THE MAXIMUM LEAKAGE SHALL BE CALCULATED USING THE FORMULA AS FOLLOWS:

WHERE L = (S)(D)(P<sup>1/2</sup>)/1.72/133,200

L = ALLOWABLE LEAKAGE IN GAL./HR.  
S = LENGTH OF PIPE TESTED IN FEET  
D = INSIDE DIAMETER OF PIPE IN INCHES  
P = PRESSURE IN POUNDS PER SQUARE INCH (GAUGE)

11. ALL WATER LINES TO HAVE 4' MINIMUM COVER TO FINISHED GRADE AND MINIMUM 12" CLEAR TO OTHER UTILITIES AT CROSSINGS UNLESS OTHERWISE NOTED ON PLANS.

12. ALL FLANGES BELOW GRADE SHALL BE INSULATED.

13. ALL WATERLINES SHALL BE ENCASED IN BANK SAND AT LEAST 12" ABOVE THE PIPE. COST OF BANK SAND TO BE INCLUDED IN THE UNIT PRICE OF WATERLINE.

14. CENTER OF FIRE HYDRANT TO BE LOCATED 3'-0" FROM BACK OF CURB.

15. UTILITY CONTRACTOR TO TURN FIRE HYDRANTS AND MAKE ALL FINAL ADJUSTMENTS AFTER COMPLETION OF PAVING. NO SEPARATE PAY.

16. SANITARY PRECAUTIONS MUST BE TAKEN DURING WATER LINE CONSTRUCTION, AS CALLED FOR BY AWWA STANDARDS. PRECAUTIONS INCLUDE KEEPING PIPE CLEAN AND CAPPING OR OTHERWISE EFFECTIVELY SEALING OPEN PIPE ENDS TO EXCLUDE INSECTS, ANIMALS OR OTHER SOURCES OF CONTAMINATION FROM UNFINISHED PIPE LINES AT TIMES WHEN CONSTRUCTION IS NOT IN PROGRESS.

STORM WATER QUALITY PRE-CONSTRUCTION INSPECTION REQUIREMENTS

THE CONTRACTOR SHALL CONTACT THE FORT BEND COUNTY STORM WATER QUALITY PERMITTING SECTION AT 713-956-3000 FOR A PRE-CONSTRUCTION INSPECTION PRIOR TO COMMENCING ANY CLEARING OR CONSTRUCTION ACTIVITIES ON THE SITE.

FORT BEND COUNTY NOTES

1. CONTRACTOR TO OBTAIN ALL PERMITS REQUIRED BY THE "REGULATIONS OF FORT BEND COUNTY, TEXAS FOR FLOOD PLAIN MANAGEMENT" PRIOR TO STARTING CONSTRUCTION.

2. OWNER TO OBTAIN ALL PERMITS REQUIRED BY FORT BEND COUNTY, TEXAS PRIOR TO STARTING CONSTRUCTION OF UTILITIES AND/OR CULVERTS WITHIN FORT BEND COUNTY ROAD RIGHTS-OF-WAY.

3. PAVING SHALL BE IN ACCORDANCE WITH THE "REGULATIONS OF FORT BEND COUNTY, TEXAS FOR THE APPROVAL AND ACCEPTANCE OF INFRASTRUCTURE" AND/OR AMENDMENTS OF SAME.

4. AUTHORIZATION NOTICE ISSUED BY FORT BEND COUNTY PUBLIC INFRASTRUCTURE DEPARTMENT - ENGINEERING DIVISION - PERMIT OFFICE - REQUIRED PRIOR TO CONSTRUCTION OF UTILITIES OR LEFT TURN LANES WITHIN FORT BEND COUNTY RIGHTS-OF-WAY. CONTACT FORT BEND COUNTY PERMIT OFFICE (713) 274-3731.

MUD NOTES:

CONTACT CAMERON MILLER, PE (JONES AND CARTER, INC.) AT 832-813-4032 AND LARRY KELLER (ST ENVIRONMENTAL) AT 281-732-6614, 48 HOURS PRIOR TO COMMENCING CONSTRUCTION.

Fort Bend County  
Construction - General Notes

- Fort Bend County must be invited to the Pre-Construction Meeting.
- Contractor shall notify Fort Bend County Engineering Department 48 hours prior to commencing construction and 48 hour notice to any construction activity within the limits of the paving at [Construction@fortbendcountytexas.gov](mailto:Construction@fortbendcountytexas.gov).
- Contractor is responsible for obtaining all permits required from Fort Bend County prior to commencing construction of any improvements within County road right of ways.
- All Paving Improvements shall be constructed in accordance with Fort Bend County "Rules, Regulations and Requirements" relating to the Approval and Acceptance of Improvements in Subdivisions as currently amended.
- All road widths, curb radii and curb alignment shown indicates back of curb
- A continuous longitudinal reinforcing bar shall be used in the curbs.
- All concrete pavement shall be 5 ½ sack cement with a minimum compressive strength of 3500 psi at 28 days. Transverse expansion joints shall be installed at each curb return and at a maximum spacing of 60 feet.
- All weather access to all existing streets and driveways shall be maintained at all times.
- 4"x 12" reinforced concrete curb shall be placed in front of single family lots only. All other areas shall be 6" reinforced concrete curb.
- At all intersection locations, Type 7 ramps shall be place in accordance with TxDOT Ped-12a standard detail sheet. A.D.A. - Handicap Ramps shall be installed with street paving at all intersections and comply with current A.D.A. regulations.
- Curb headers are required at curb connections to Handicap Ramps, with no construction joint within 5' of ramps.
- All intersections utilizing Traffic Control measures shall have A.D.A. wheel chair ramps installed.
- Guidelines are set forth in the Texas "Manual on Uniform Traffic Control Devices", as currently amended, shall be observed. The Contractor shall be responsible for providing adequate flagmen, signing, striping and warning devices, etc, during construction - both day and night.
- All R1-1 stop signs shall be 30"x30" with diamond grade sheeting per Texas manual on uniform traffic control devices.
- Street name signage shall be on a 9" high sign flat blade w/reflective green background. Street names shall be upper and lowercase lettering with uppercase letters of 6" minimum and lowercase letters of 4.5" minimum. The letters shall be reflective white. Street name signs shall be mounted on stop sign post.
- A Blue Double Reflectorized button shall be placed at all Fire Hydrant locations. The Button shall be placed 12 inches off of the centerline of the street on the same side as the hydrant.
- The project and all parts thereof shall be subject to inspection from time to time by inspectors designated by Fort Bend County. No such inspections shall relieve the Contractor of any of its obligations hereunder. Neither failure to inspect nor failure to discover or reject any of the work as not in accordance with the drawings and specifications, requirements and specifications of Fort Bend County or any provision of this project shall be construed to imply an acceptance of such work or to relieve the Contractor of any of its obligations hereunder.

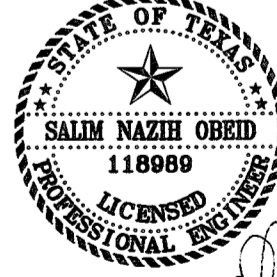
NOTE: Fort Bend County notes supersede any conflicting notes.

RSG ENGINEERING



project  
COMMONS AT HARVEST GREEN  
at  
11131 AND 11135 HARLEM ROAD  
RICHMOND, TEXAS 77406

| REVISIONS | DATE     | DESCRIPTION          |
|-----------|----------|----------------------|
| 1         | 08.15.18 | MUD COMMENT RESPONSE |
|           |          |                      |
|           |          |                      |
|           |          |                      |



08/15/18

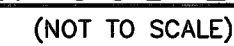
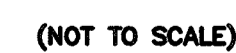
GENERAL NOTES

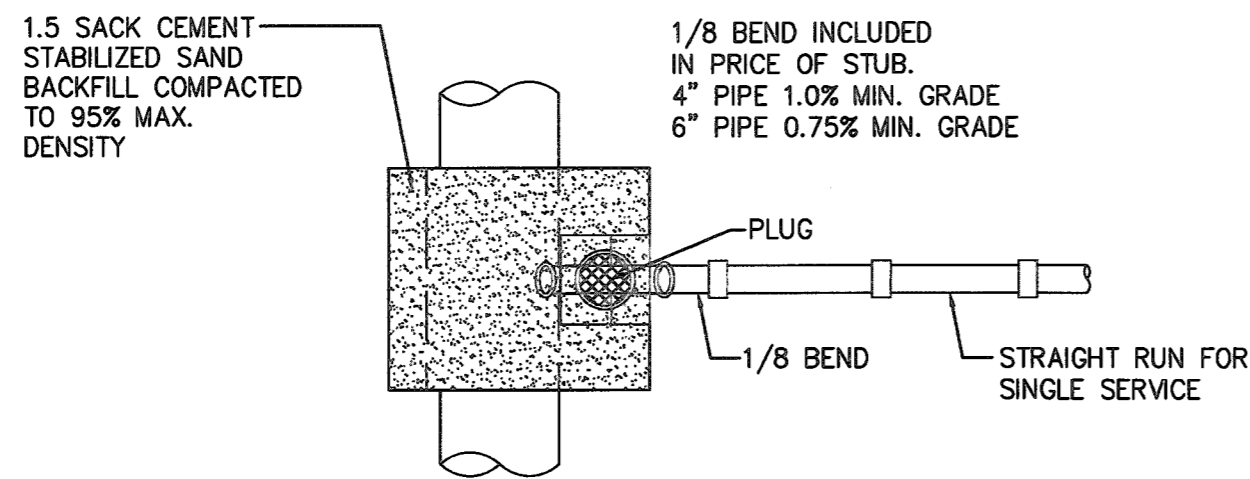
|                       |                   |
|-----------------------|-------------------|
| DRAWN BY:<br>FA       | CHECKED:<br>SNO   |
| PROJECT No<br>1877.01 | SHEET No:<br>C7.1 |



TERP FIRM #: 15498

2826 WILCREST DRIVE  
SUITE 676  
HOUSTON, TEXAS 77042  
PH: 713-768-7777





NOTES:  
1. ALL SINGLE SEWER SERVICES AND DOUBLE SEWER SERVICES, AS SHOWN, ARE INTERCHANGEABLE, AS REQUIRED, TO CONNECT WITH STACKS, DOUBLE WYES AND WYES, AS REQUIRED, TAPS FOR PVC PIPE TO BE PVC "T" OR "Y" SADDLE.  
2. PROVIDE LOCATOR WIRE LOOPS FROM EACH SERVICE CONNECTION TO NEAREST MANHOLE.

**STANDARD SANITARY SEWER  
SERVICE LEAD DETAIL**  
(NOT TO SCALE)

**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 REINFORCING 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 INCHES THICK AND 4 FEET MINIMUM WIDTH. SEE DRAWING NO. FBC 24A FOR ADDITIONAL INFORMATION AND DETAILS.

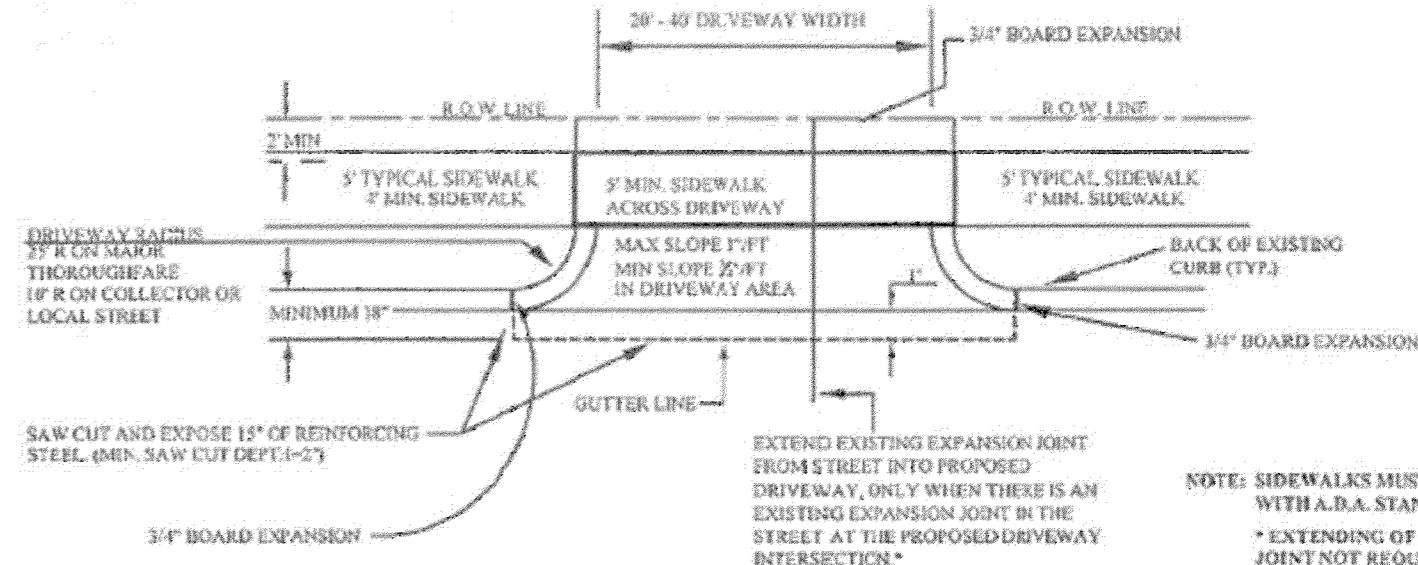
CONSTRUCTION NOTES FOR  
SIDEWALKS & DRIVEWAYS WITH  
CURB TYPE STREETS  
COMMERCIAL AREA

DRAWN BY: L. BRDECKA  
DATE DRAWN: 2-1-94  
REVISED BY: L. BRDECKA  
DATE REVISED: 3-10-05  
APPROVED BY: L. HOOD  
DATE: 2-1-94  
DRAWING NO.  
FBC-025B

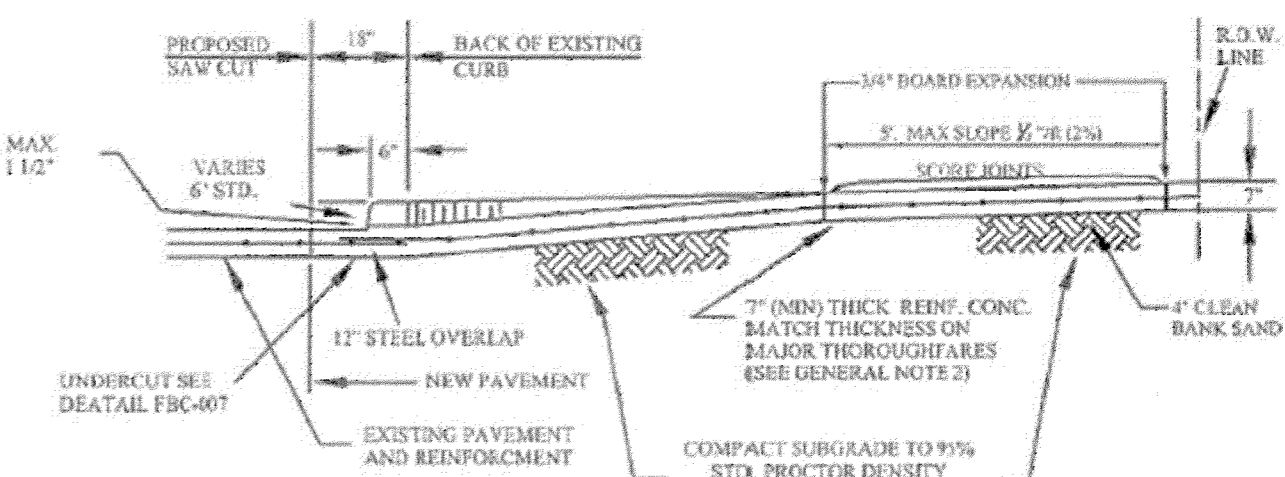
FORT BEND COUNTY ENGINEERING DEPARTMENT

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 PROCTER 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\"/>
  3. PROPOSED DRIVEWAY SHALL BE CONSTRUCTED WITH PORTLAND CEMENT & SACKS (900 PSF) OF CEMENT PER CUBIC YARD OF CONCRETE, CLASS "A" STRUCTURAL (REFER TO SPECIFICATION 03301), 7\"/>
  4. PROPOSED SIDEWALK SHALL BE CONSTRUCTED WITH PORTLAND CEMENT (SACKS (900 PSF) OF CEMENT PER CUBIC YARD OF CONCRETE), CLASS "A" STRUCTURAL (REFER TO SPECIFICATION 03301), 4\"/>
  5. FOR TYPICAL SIDEWALK DETAIL SEE FBC-24A.

SIDEWALKS & DRIVEWAYS ON  
CURB TYPE STREETS  
COMMERCIAL AREA

DRAWN BY: L. BRDECKA  
DATE DRAWN: 2-1-94  
REVISED BY: J. NETARDUS  
DATE REVISED: 4-7-09  
APPROVED BY: L. HOOD  
DATE: 2-1-94  
DRAWING NO.  
FBC-025A

FORT BEND COUNTY ENGINEERING DEPARTMENT

**RSG ENGINEERING**

project  
**COMMONS AT HARVEST GREEN**  
at  
**11131 AND 11135 HARLEM ROAD**  
**RICHMOND, TEXAS 77406**

REVISIONS



08/15/18

**CONSTRUCTION  
DETAILS**

DRAWN BY: **FA**  
CHECKED: **SNO**  
PROJECT No: **1877.01**  
SHEET No: **C7.3**



TYPE FIRM #: 15498

2825 WILCREST DRIVE  
SUITE 670  
HOUSTON, TEXAS 77042  
PH. 713-783-7777

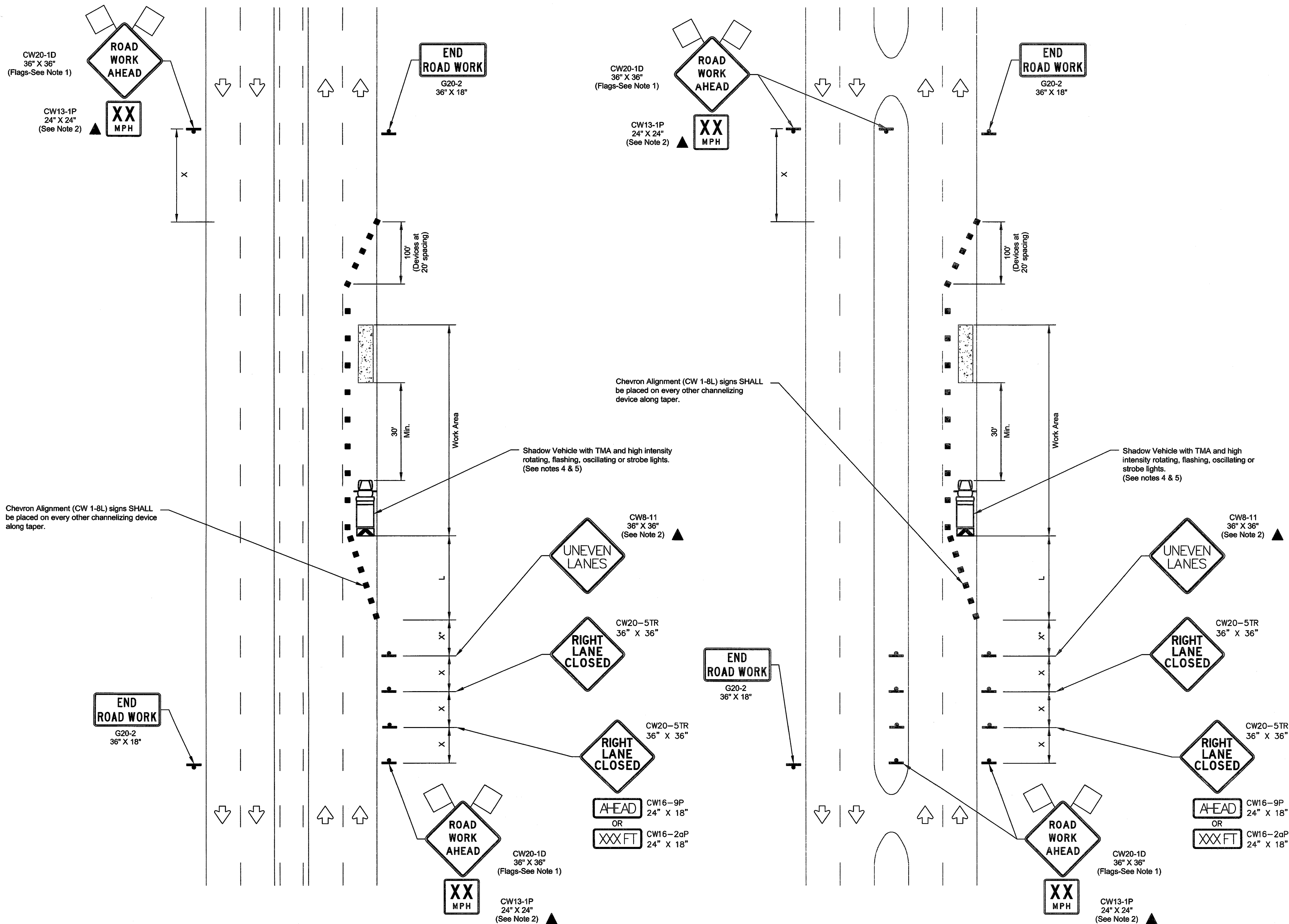


Table with 7 columns: ROADWAY, POSTED SPEED, TAPER LENGTH, SPACING CHANNELIZING DEVICES (TAPER, TANGENT), SIGN SPACING, BUFFER SPACE. Row 1: HARLEM ROAD, 45, 450, 49, 90, 320, 195.

LEGEND table with 2 columns: Symbol, Description. Includes Type 3 Barricade, Heavy Work Vehicle, Trailer Mounted Flashing Arrow Board, Sign, Flag, Channelizing Devices, Truck Mounted Attenuator (TMA), Portable Changeable Message Sign (PCMS), Traffic Flow, and Flagger.

Table with 6 columns: Posted Speed, Formula, Minimum Desirable Taper Lengths 'L', Suggested Maximum Spacing of Channelizing Devices, Minimum Sign Spacing 'S', Suggested Longitudinal Buffer Space 'B'. Rows for speeds 30 to 75.

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

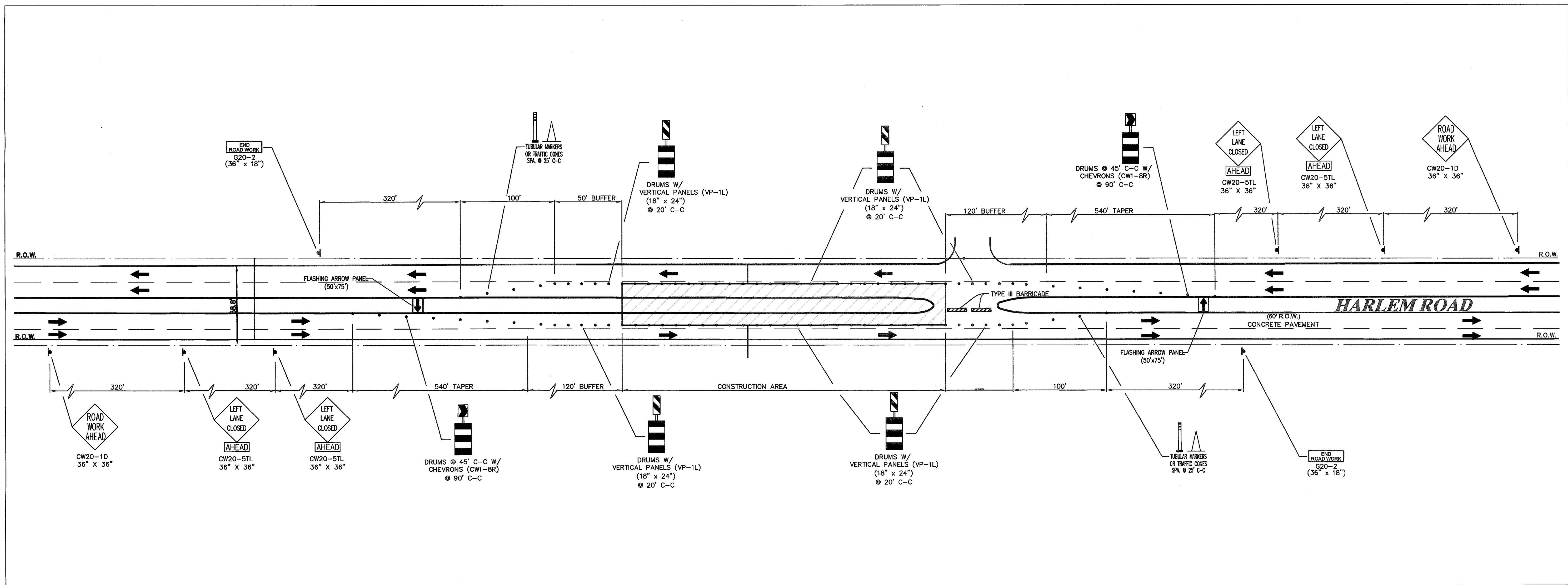
- GENERAL NOTES
1. Flags attached to signs where shown are OPTIONAL.
2. All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol are OPTIONAL.
3. Inactive work vehicles or other equipment should be parked near the right-of-way line and not parked on the paved 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. Contractor shall provide and install traffic control devices in conformance with part VI of Texas Manual on Uniform Traffic Control Devices (TMUTCD) - Latest edition with revisions during construction.
7. No lanes shall be blocked from 7 am to 9 am and 2:30pm to 5:00pm Monday thru Friday.
8. Off duty police officers/flaggers are required to direct traffic when applicable.

Table with 2 columns: REVISIONS, Description. Empty table.

Professional Engineer Seal for SALIM NAZIH OBEID, License No. 118996, State of Texas. Date: 10/08/18.

FOOT BEND COUNTY ENGINEERING DEPARTMENT stamp. APPROVED OCT 18 2018. Valid One Year From Date.

TRAFFIC CONTROL PLAN
DRAWN BY: FA
CHECKED: SNO
PROJECT No: 1877.01
SHEET No: C8.0



#### TRAFFIC NOTES

- CONTRACTOR SHALL PROVIDE AND INSTALL TRAFFIC CONTROL DEVICES IN CONFORMANCE WITH PART VI OF THE TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (TMUTCD - LATEST EDITION WITH REVISIONS) DURING CONSTRUCTION.
- NO LANES SHALL BE BLOCKED FROM 7:00 AM TO 9:00 AM AND 2:30 PM TO 4:00 PM MONDAY THRU FRIDAY.
- OFF DUTY POLICE OFFICER(S)/CERTIFIED FLAGGER(S) IS/ARE REQUIRED TO DIRECT TRAFFIC WHEN LANES ARE BLOCKED.
- CONTRACTOR SHALL COVER THE EXCAVATIONS WITH STEEL PLATES ANCHORED PROPERLY DURING NON-WORKING HOURS AND ALLOW NORMAL TRAFFIC FLOW. IF COVERING IS NOT FEASIBLE, USE TRANTEX FR 336 EFX 36" DELINEATOR OR APPROVED EQUAL WITH SHEETING AND BASE EPOXIED TO PAVEMENT NEXT TO EXCAVATION DURING NON-WORKING HOURS.
- APPROVED COPIES OF THE "TRAFFIC CONTROL PLANS" SHALL BE AVAILABLE FOR INSPECTION AT ALL TIMES.
- IF THE CONTRACTOR CHOOSES TO USE A DIFFERENT METHOD OF "TRAFFIC CONTROL PLANS" DURING THE CONSTRUCTION THAN WHAT IS OUTLINED IN THE CONTRACT DRAWINGS, HE/SHE SHALL BE RESPONSIBLE TO PREPARE AND SUBMIT ALTERNATIVE PLANS\* TO TRAFFIC SECTION OF F.B.C. FOR APPROVAL TEN WORKING DAYS PRIOR TO IMPLEMENTATION.

\*THESE PLANS SHALL BE DRAWN TO SCALE ON REPRODUCIBLE MYLARS AND SEALED BY A LICENSED ENGINEER IN THE STATE OF TEXAS. PLANS WILL BECOME A PART OF THE CONTRACT DRAWINGS.

- IF PROJECT IS WITHIN 400 FEET FROM A SIGNALIZED INTERSECTION, THE CONTRACTOR SHALL CONTACT FORT BEND COUNTY PUBLIC INFRASTRUCTURE DEPARTMENT, SIGNAL DIVISION FIVE (5) DAYS PRIOR TO THE START OF CONSTRUCTION.

#### CONSTRUCTION WARNING SIGN SPACING

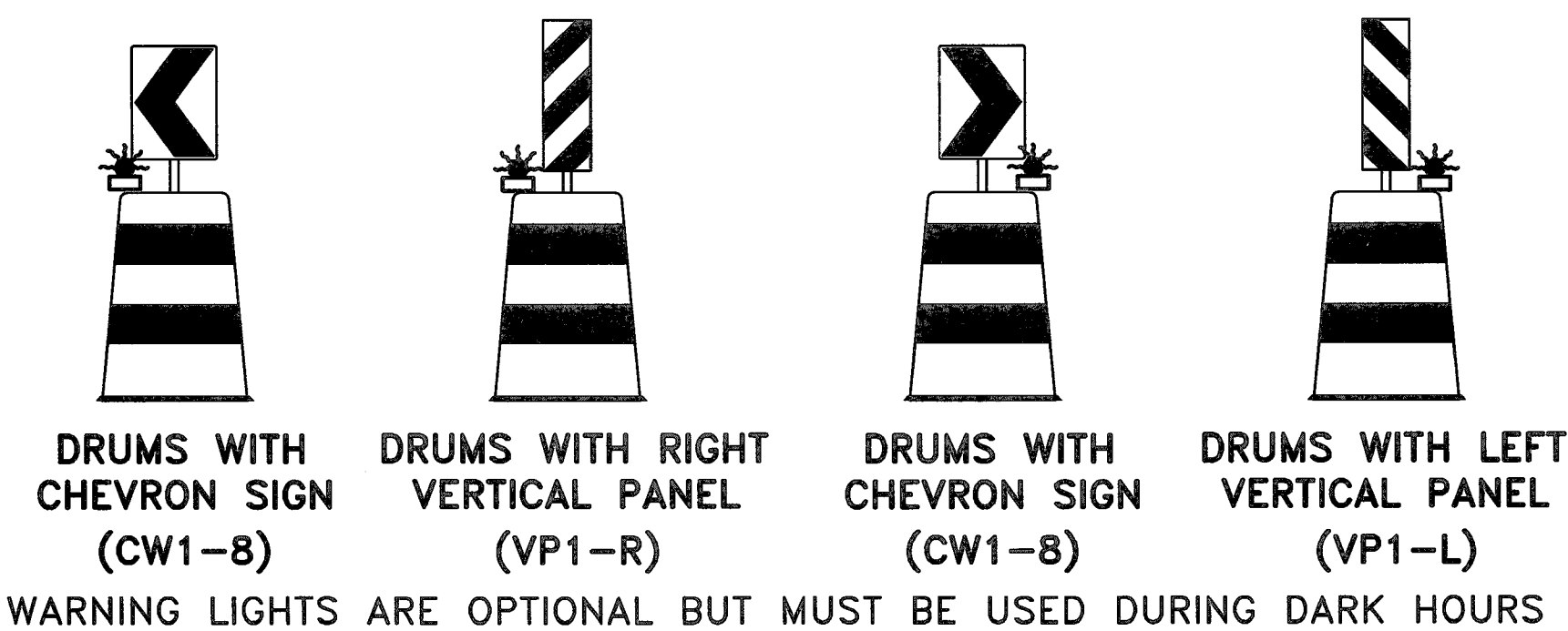
| Posted Speed or 85% Speed (MPH) | X Min. Distance (feet) |
|---------------------------------|------------------------|
| 30 OR LESS                      | 120                    |
| 35                              | 160                    |
| 40                              | 240                    |
| <b>45</b>                       | <b>320</b>             |
| 50                              | 400                    |
| 55                              | 500                    |
| 65                              | 750                    |

X=SIGN SPACING  
L=TAPER  
2XL=TANGENT

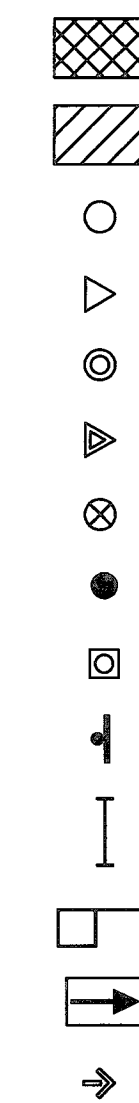
#### TYPICAL TRANSITION LENGTHS AND SUGGESTED MAXIMUM SPACING OF DEVICES

| Posted Speed * | Formula               | Minimum Desirable Taper Lengths ** |             |             | Suggested Maximum Spacing of Device |                 |
|----------------|-----------------------|------------------------------------|-------------|-------------|-------------------------------------|-----------------|
|                |                       | 10' Offset                         | 11' Offset  | 12' Offset  | On a Taper                          | On a Tangent    |
| 30             | $L = \frac{WS^2}{60}$ | 150'                               | 165'        | 180'        | 30'                                 | 60'-75'         |
| 35             |                       | 205'                               | 225'        | 245'        | 35'                                 | 70'-90'         |
| 40             |                       | 265'                               | 295'        | 320'        | 40'                                 | 80'-100'        |
| <b>45</b>      | L=WS                  | <b>450'</b>                        | <b>495'</b> | <b>540'</b> | <b>45'</b>                          | <b>90'-110'</b> |
| 50             |                       | 500'                               | 550'        | 600'        | 50'                                 | 100'-125'       |
| 55             |                       | 550'                               | 605'        | 660'        | 55'                                 | 110'-140'       |
| 60             |                       | 600'                               | 660'        | 720'        | 60'                                 | 120'-150'       |
| 65             |                       | 650'                               | 715'        | 780'        | 65'                                 | 130'-175'       |

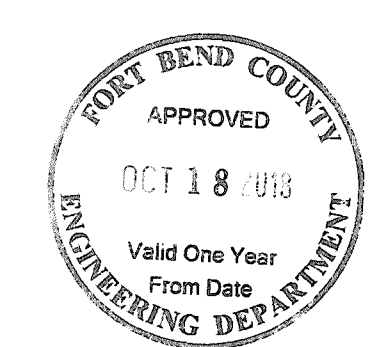
\* 85th Percentile Speed may be used on roads where traffic speeds normally exceed the posted speed limit.  
\*\* Taper lengths have been rounded off.



#### LEGENDS:



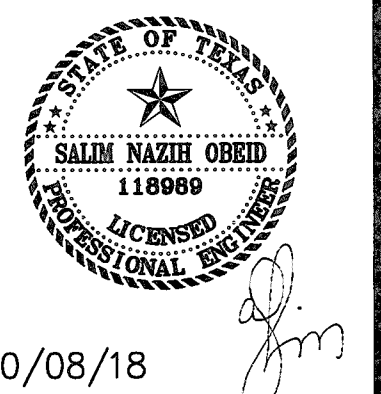
WORK AREA  
AREAS BLOCKED TO TRAFFIC  
DRUMS WITH LEFT CHEVRON SIGN  
DRUMS WITH RIGHT VERTICAL PANEL  
DRUMS WITH RIGHT CHEVRON SIGN  
DRUMS WITH LEFT VERTICAL PANEL  
PLASTIC DRUMS  
28" TUBULAR MARKERS  
28" TRAFFIC CONES  
TRAFFIC CONSTRUCTION SIGNS  
TYPE III BARRICADE WITH 2 TYPE "A" WARNING LIGHTS  
FLAGGER = OFF DUTY POLICE OFFICER  
FLASHING ARROW PANEL  
DIRECTION OF TRAFFIC FLOW



RSG ENGINEERING

project  
COMMONS AT HARVEST GREEN  
at  
11131 AND 11135 HARLEM ROAD  
RICHMOND, TEXAS 77406

| REVISIONS | DATE     | DESCRIPTION          |
|-----------|----------|----------------------|
| 1         | 10.08.18 | WATER & LTL REVISION |



TRAFFIC CONTROL PLAN

|                        |                   |
|------------------------|-------------------|
| DRAWN BY:<br>FA        | CHECKED:<br>SNO   |
| PROJECT No:<br>1877.01 | SHEET No:<br>C8.1 |

TYPE FIRM #: 16498

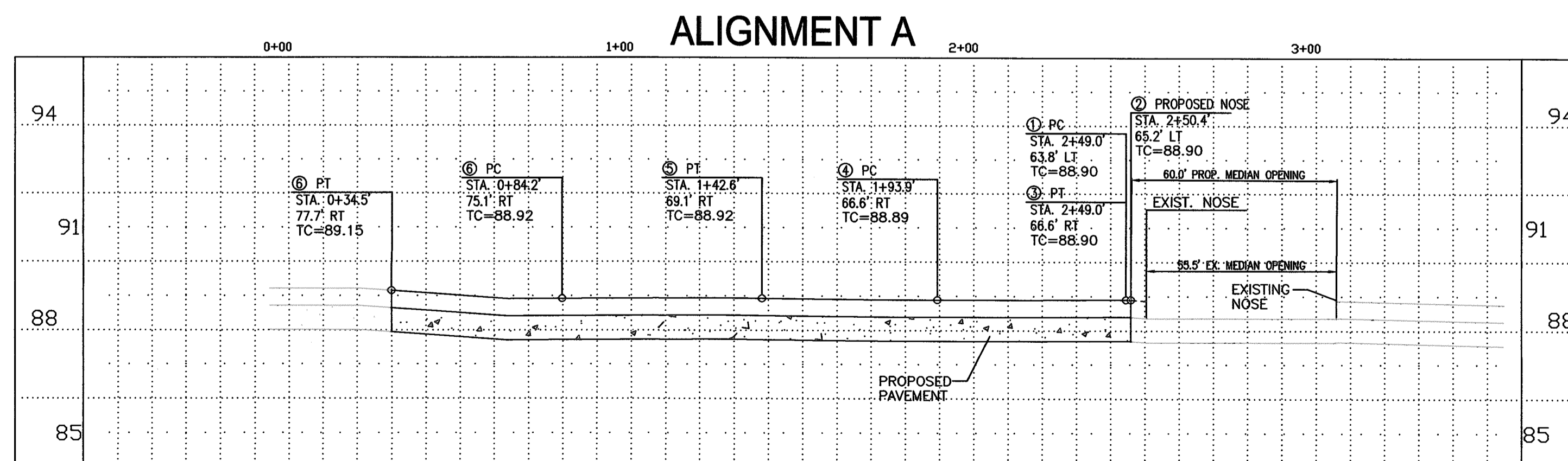
2825 WILCREST DRIVE  
SOUTH 076  
HOUSTON, TEXAS 77042  
PH. 713-788-7777

IMPORTANT NOTE: ALL PROPOSED ELEVATIONS NOTED ARE TO FINISHED PAVEMENT GRADE. FOR TOP OF CURB GRADE, WHERE APPLICABLE, ADD 6"

ALL DIMENSIONS SHOWN ARE TO THE FACE OF CURB UNLESS OTHERWISE NOTED. ALL CURB RADIUS DIMENSIONS ARE TO FACE OF CURB.

1. CONTRACTOR SHALL MAINTAIN SITE DRAINAGE AT ALL TIMES.
2. ALL MATERIALS FROM DEMOLITION/REMOVALS AS WELL AS EXCESS MATERIALS FROM THE EXCAVATIONS SHALL BECOME THE PROPERTY OF THE CONTRACTOR WHO SHALL DISPOSE OFF-SITE IN A LAWFUL MANNER.
3. GRADE PAVINGS UNIFORMLY BETWEEN INDICATED ELEVATIONS. ADJUST ELEVATIONS AS DIRECTED BY THE ENGINEER AND AS REQUIRED TO ACHIEVE POSITIVE DRAINAGE AND PLEASING APPEARANCE THROUGHOUT.
4. ADJUST STRUCTURES (JUNCTION BOXES, VALVE BOXES, PULL BOXES, ETC.) AS REQUIRED TO CONFORM TO NEW FINISHED GRADES.
5. ANY WATER VALVE, MANHOLES TO BE LOCATED IN CONCRETE, WILL NEED THE APPROPRIATE EXPANSION JOINT CUTOUT, PER CITY STANDARDS.

- 1 CONTRACTOR TO RESTORE EXISTING LANDSCAPE AND IRRIGATION SYSTEM TO PRE-CONSTRUCTION OR BETTER CONDITIONS. PROVIDE SLEEVES AND APPURTENANCES AS NECESSARY (NO SEPARATE PAY).
- 2 CONTRACTOR TO FULL DEPTH SAWCUT FULL PAVEMENT DEPTH PER CITY STANDARDS AND SPECIFICATIONS AND TIE IN PROPOSED CONCRETE PAVEMENT. CONTRACTOR SHALL DOWELL INTO THE CENTER OF EXISTING PAVING AND EPOXY WITH "PO-ROC" OR APPROVED EQUAL DOWELS SHALL BE EMBEDDED A MINIMUM OF 9".
- 3 CONTRACTOR TO MATCH ELEVATION AT EXISTING PAVEMENT.
- 4 CONTRACTOR TO INSTALL 6" CURB.
- 5 CONSTRUCT 8" REINFORCED CONCRETE OVER 8" STABILIZED SUB-GRADE WITH JOINT CONTROL PER FORT BEND COUNTY STANDARDS.
- 6 CONTRACTOR TO REMOVE EXISTING 6" CONCRETE CURB.
- 7 85" WIDE SOLID WHITE STRIPE.
- 8 TRAFFIC FLOW ARROW.
- 9 SLOPE PROPOSED PAVEMENT AT 2%



PLAN VIEW SCALE: 1"=30'  
PROFILE VIEW SCALE: H:1"=30' V:1"=3'



COMMONS AT HARVEST GREEN  
at  
11131 AND 11135 HARLEM ROAD  
RICHMOND, TEXAS 77406

## VISIONS



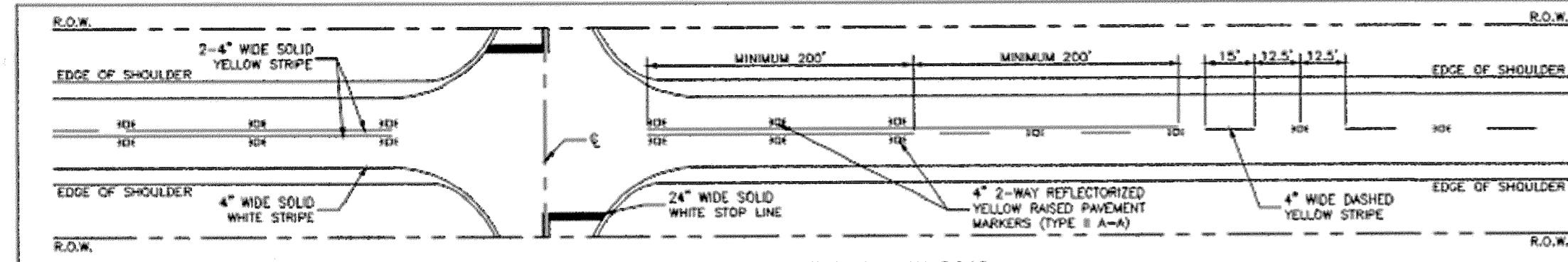
**LEFT TURN  
LANE PLAN**

|                        |                        |
|------------------------|------------------------|
| <b>DRAWN BY:</b><br>FA | <b>CHECKED:</b><br>SNO |
|------------------------|------------------------|

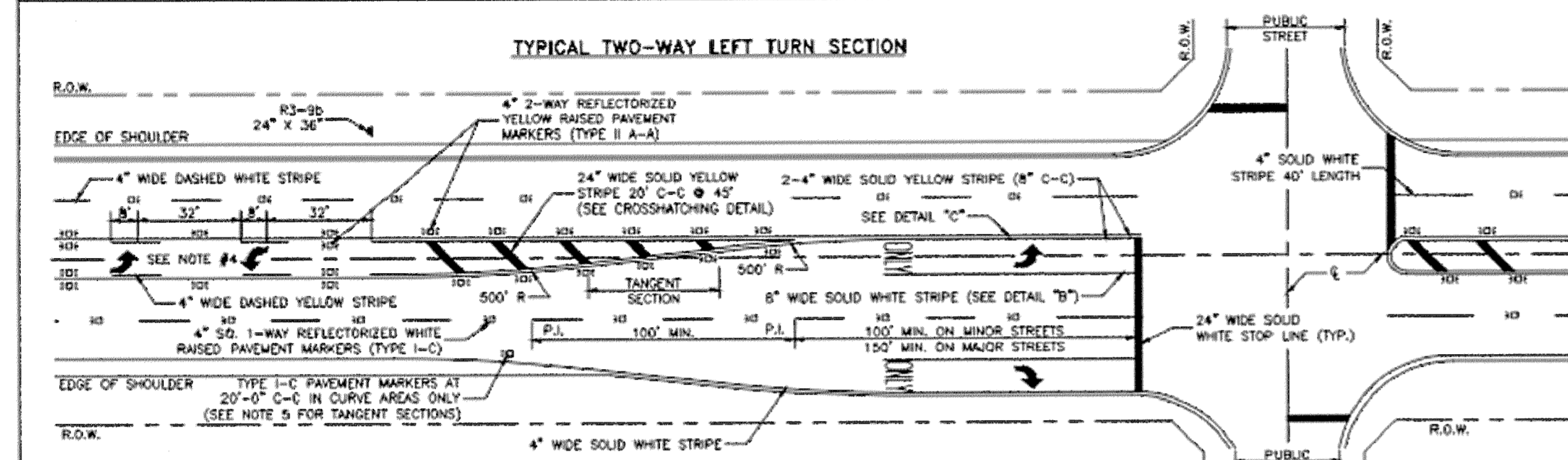
|                   |                 |
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| <b>PROJECT No</b> | <b>SHEET No</b> |
| 1877.01           | C9.1            |

**TAPE FROM #: 15498**

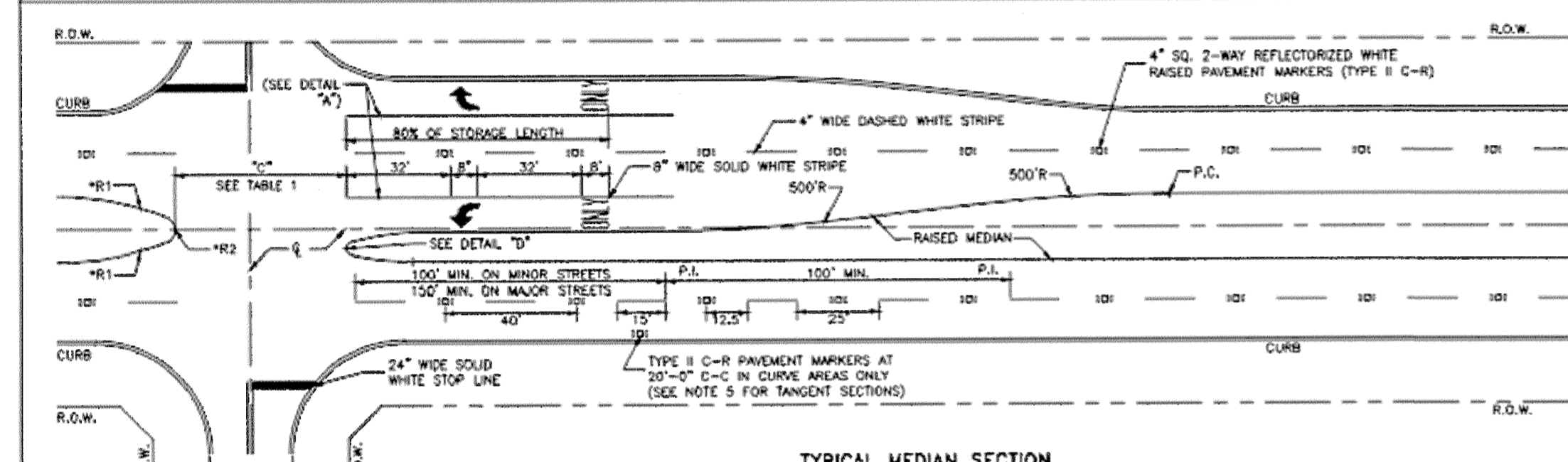
2825 WILCREST DRIVE  
SUITE 678  
HOUSTON, TEXAS 77042  
PH. 713-783-7777



TYPICAL TWO-LANE TWO-WAY ROAD



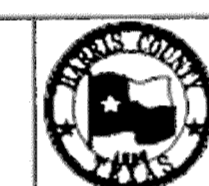
TYPICAL TWO-WAY LEFT TURN SECTION



TYPICAL MEDIAN SECTION

| NO. | REVISIONS               | DATE    | NAME |
|-----|-------------------------|---------|------|
| 1   | UPDATED DEPARTMENT NAME | 2/17/15 | RS   |

HARRIS COUNTY  
ENGINEERING DEPARTMENT



CONSULTANT  
LOGO/INFORMATION

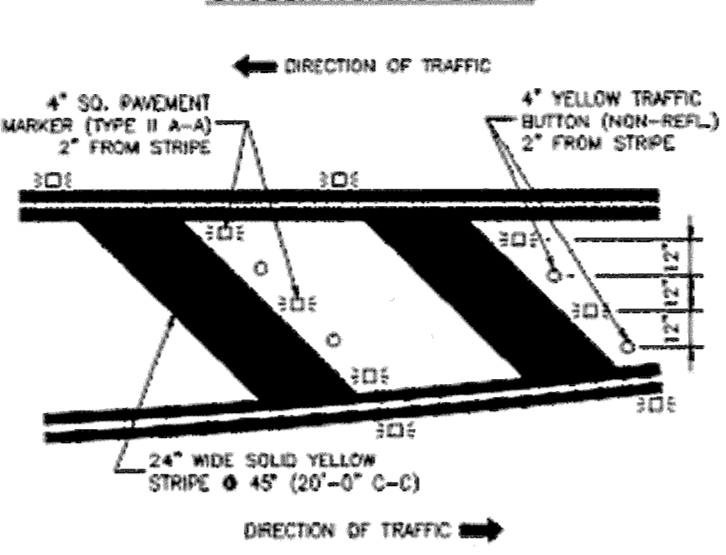
FOR INTERIM REVIEW ONLY  
DOCUMENT INCOMPLETE  
NOT INTENDED FOR CONSTRUCTION,  
BIDDING, OR PERMIT PURPOSES  
ENGINEER:  
P.E. SERIAL NO.:  
DATE: 6/7/13

PROJECT TITLE:  
DRAWN BY:  
CHECKED BY:  
SHEET DESCRIPTION:  
PAVEMENT MARKING DETAILS  
SCALE:  
DATE: 6/7/13  
APPROVED BY:  
SHEET 1 OF 2  
SHEET NO.: /

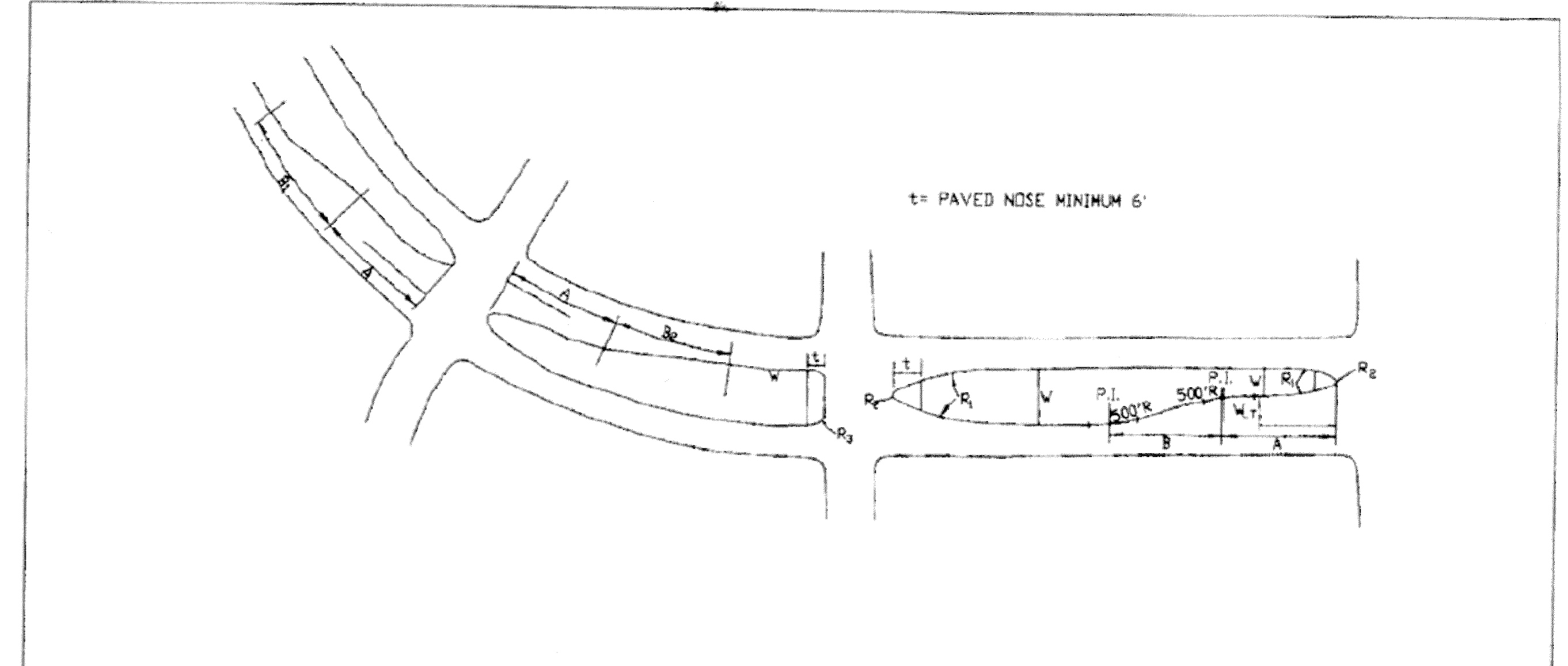
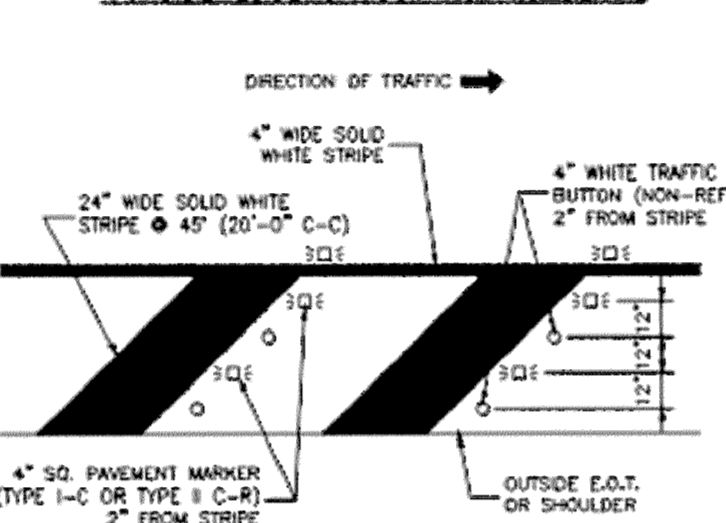
NOTES:

1. ALL PAVEMENT MARKINGS SHALL CONFORM TO THE LATEST EDITION OF THE TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS (TMUD-2009).
2. ALL TRAFFIC BUTTONS AND MARKERS SHALL BE INSTALLED ADJACENT TO STREETS (APPROXIMATELY 2' FROM STRIPE).
3. LEFT TURN STORAGE BAYS SHALL BE A MIN. OF 100' ON MINOR STREETS AND A MIN. 150' ON MAJOR STREETS.
4. REPEAT ARROWS AT APPROXIMATELY 1000' INTERVALS WITHIN TWO-WAY LEFT TURN SECTION.
5. WITHIN A TANGENT SECTION THE TYPE I-C PAVEMENT MARKERS SHALL BE PLACED AT 40' C-C ON ROADWAYS WITHOUT CURBS AND GUTTERS.
6. WHEN PAVEMENT MARKINGS EXTEND INTO OR CONTINUE THROUGH AN INTERSECTION AREA THEY SHALL BE THE SAME COLOR AND AT LEAST THE SAME WIDTH AS THE LINE MARKINGS THEY EXTEND.
7. WHEN CROSSWALK MARKINGS ARE USED WITHIN AN ESTABLISHED SCHOOL ZONE AREA, CONTINENTAL TYPE MARKINGS SHALL BE USED.
8. ADDITIONAL SET OF "WIDE" AND "NARROW" PAVEMENT MARKINGS SHALL BE USED WHEN TURN LANE STORAGE LENGTH IS 160 FEET OR GREATER.

CROSSHATCHING DETAIL



OUTSIDE EDGE CROSSHATCHING DETAIL



MEDIAN DIMENSIONS

| W           | R <sub>1</sub> | R <sub>2</sub> | R <sub>3</sub> |
|-------------|----------------|----------------|----------------|
| ≤ 10'       | NONE           | W/2            | NONE           |
| > 10' < 40' | 90             | W/5            | NONE           |
| > 40'       | NONE           | NONE           | 15             |

LEFT TURN BAY DIMENSIONS

- A = 150' MINIMUM AT INTERSECTION OF TWO MAJOR STREETS.
- = 100' MINIMUM AT ALL OTHER INTERSECTIONS.
- B = 100' MINIMUM ON STRAIGHT ROADWAY.
- B<sub>1</sub> = TAPER LENGTH MAY BE SHORTER IF IT IS ON A HORIZONTAL CURVE TO THE LEFT.
- B<sub>2</sub> = TAPER LENGTH MAY BE LONGER IF CURVE IS TO THE RIGHT.
- W<sub>L</sub> = 10' MINIMUM

NOTE: DIMENSIONS MAY BE ADJUSTED AS DETERMINED BY AGENCY ENGINEER.

CITY OF HOUSTON  
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

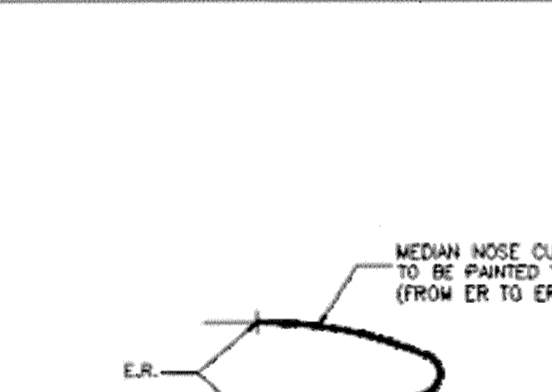
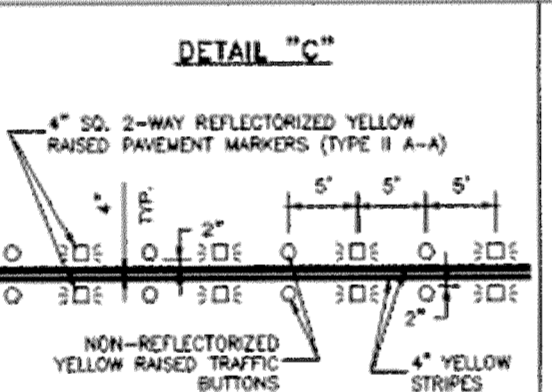
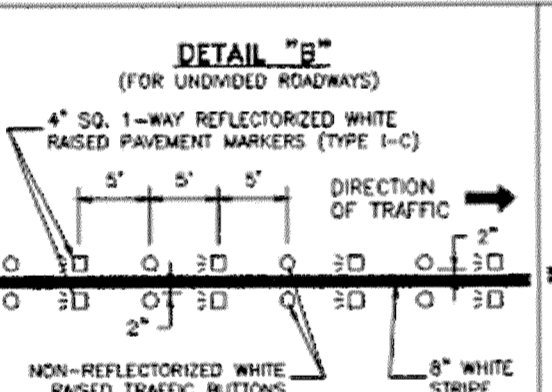
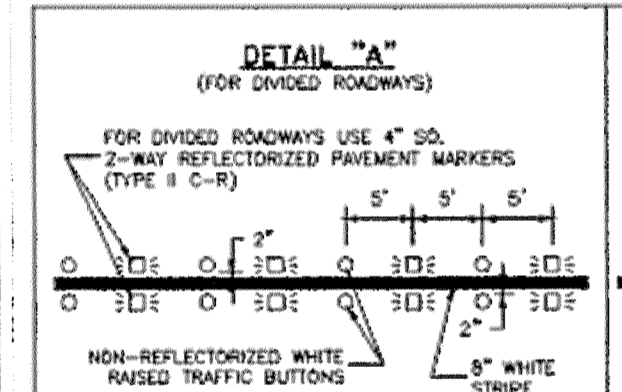
MEDIAN DESIGN  
MEDIAN NOSE AND LEFT TURN BAY

(NOT TO SCALE)

APPROVED BY: [Signature]  
CITY ENGINEER

APPROVED BY: [Signature]  
DIRECTOR OF PUBLIC WORKS AND ENGINEERING

EFF DATE: JULY-01-2009 DWG NO: 10.06-07

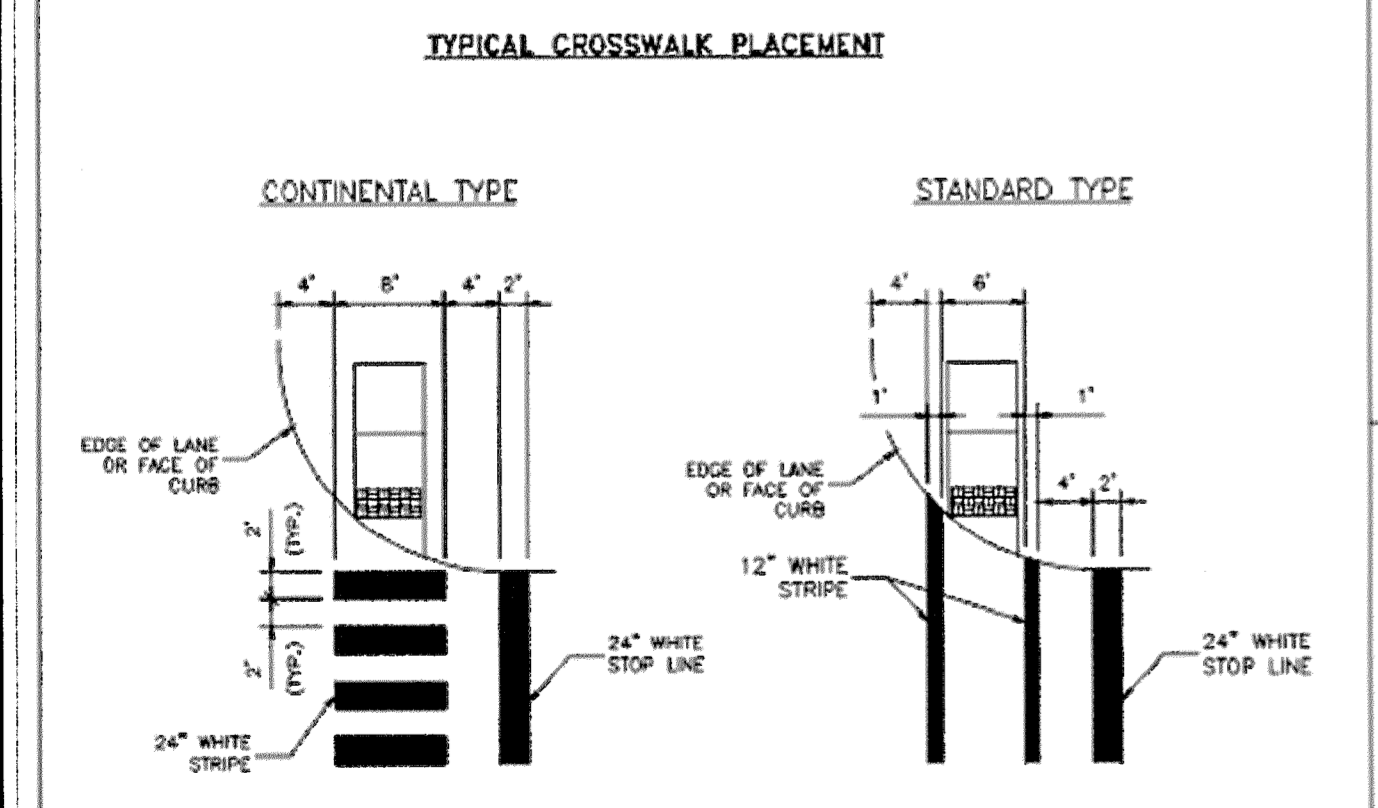
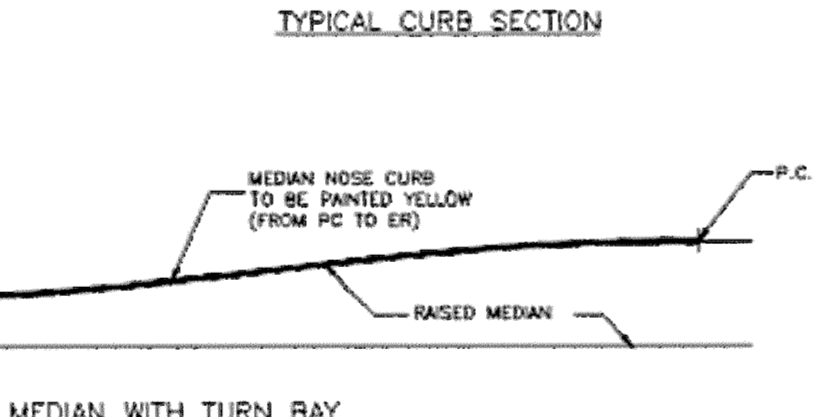
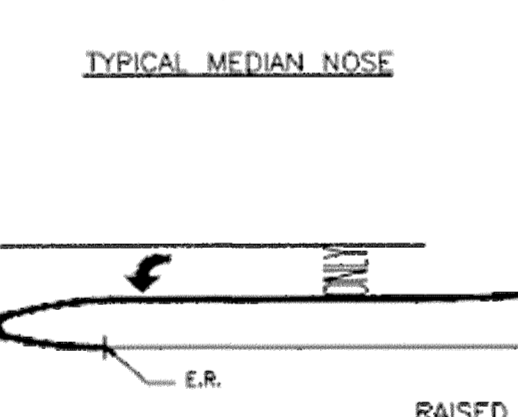


| SYMBOL | DESCRIPTION                                  |
|--------|--|
| 3DE    | 4" x 4" REFLECTORIZED RAISED PAVEMENT MARKER |
| DE     | INDICATED DIRECTION OF TRAFFIC FLOW          |
| O      | NON-REFLECTIVE 4" DIA. RAISED TRAFFIC BUTTON |

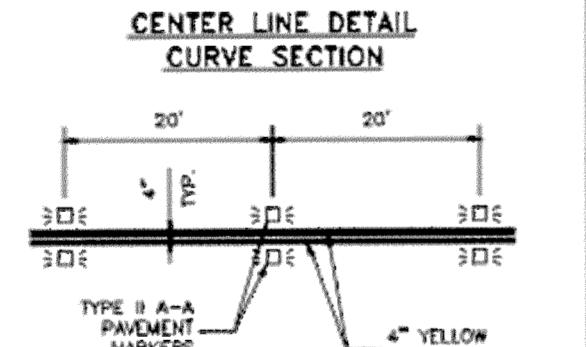
| RADIUS DIMENSIONS |                               |
|-------------------|-------------------------------|
| MEDIAN            | R <sub>1</sub> R <sub>2</sub> |
| ≤ 10'             | N/A N/2                       |
| > 10' < 40'       | 90 W/5                        |
| > 40'             | N/A N/A                       |

| TABLE 1<br>TYPICAL MEDIAN OPENING "O" |                     |
|---------------------------------------|---------------------|
| MEDIAN INTERUPTION                    | (1) 1 LTB (2) 2 LTB |
| PRIVATE DRIVE                         | 45' 52.5' 60'       |
| UNDIVIDED STREET                      | 44' 50' 50' (2) 60' |
| DIVIDED STREET                        | D+22' D+22' D+22'   |

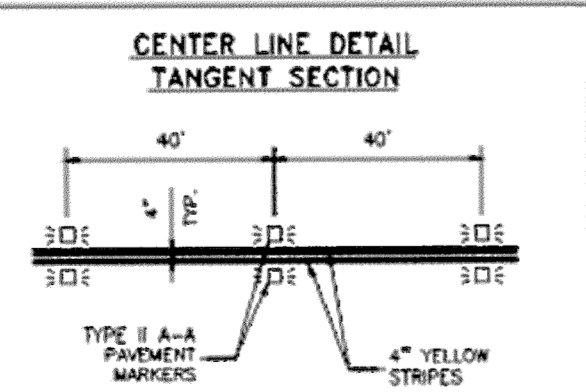
NOTES:  
(1) LTB = LEFT TURN BAY  
(2) DISTANCE FROM CENTERLINE OF OPENING TO MEDIAN NOSE WITH LEFT TURN LANE IS 30' FOR RIGHT ANGLE INTERSECTIONS, FOR INTERSECTIONS OTHER THAN 90°, APPLY DESIGN VEHICLE TURNING TEMPLATE TO DETERMINE DIMENSION TO MEDIAN NOSE CUT OFF.  
(3) D = WIDTH OF DIVIDED STREET



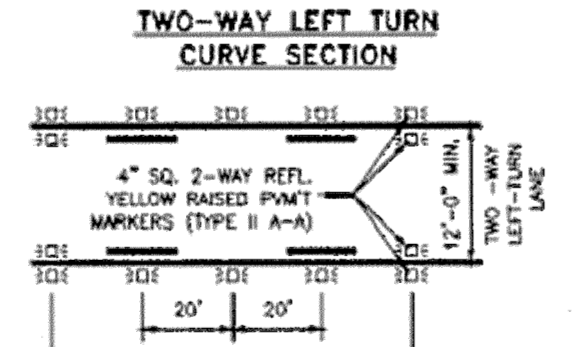
TYPICAL CROSSWALK PLACEMENT



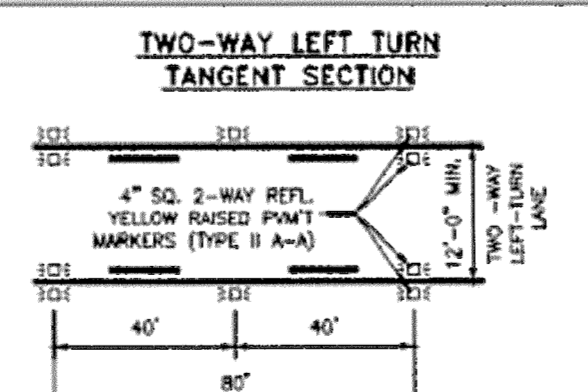
CENTER LINE DETAIL CURVE SECTION



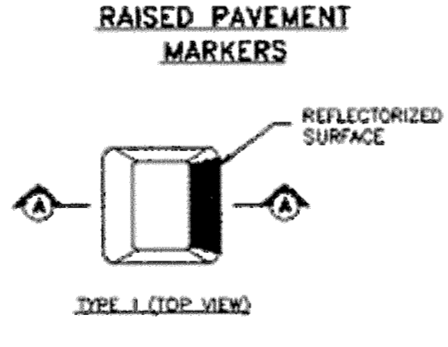
CENTER LINE DETAIL TANGENT SECTION



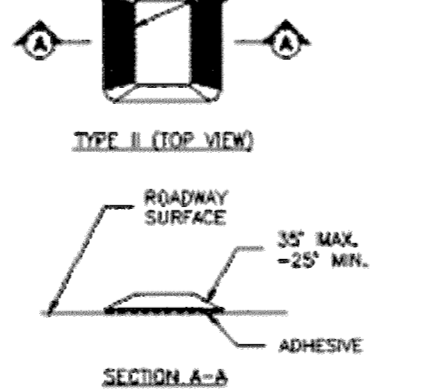
TWO-WAY LEFT TURN CURVE SECTION



TWO-WAY LEFT TURN TANGENT SECTION



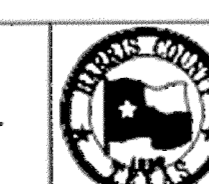
RAISED PAVEMENT MARKERS



SECTION A-A

| NO. | REVISIONS               | DATE    | NAME |
|-----|-------------------------|---------|------|
| 1   | UPDATED DEPARTMENT NAME | 2/17/15 | RS   |

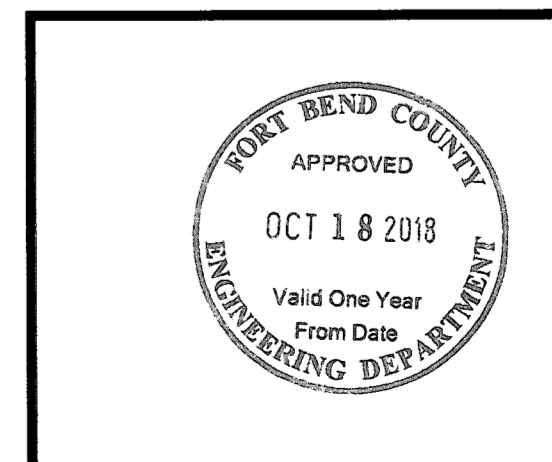
HARRIS COUNTY  
ENGINEERING DEPARTMENT



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PAVEMENT MARKING DETAILS  
SCALE:  
DATE: 6/7/13  
APPROVED BY:  
SHEET 2 OF 2  
SHEET NO.: /



**RS&G ENGINEERING**

2885 WILCREST DRIVE  
SUITE 878  
HOUSTON, TEXAS 77042  
TEL: 713-763-7777

project  
COMMONS AT HARVEST GREEN  
at  
11131 AND 11135 HARLEM ROAD  
RICHMOND, TEXAS 77406

| REVISED | DATE | BY | REASON |
|---------|------|----|--------|
|         |      |    |        |
|         |      |    |        |
|         |      |    |        |

10/08/18

LEFT TURN  
LANE DETAILS

|                        |                   |
|------------------------|-------------------|
| DRAWN BY:<br>FA        | CHECKED:<br>SNO   |
| PROJECT NO:<br>1877.01 | SHEET NO:<br>C9.2 |

TYPE FIRM #: 15498