Attachment A: Construction Drawings
CITY OF NEW BRAUNFELS, TEXAS
PROPOSED
LAMAR AREA STREET PROJECT

PROJECT LIMITS: E. NORTH ST., E. COMMERCE ST., E. MAIN ST., N. GRANT AVE., N. VERAMENDI AVE. AND S. HOUSTON AVE.

100% SUBMITTAL

NEW BRAUNFELS CITY COUNCIL
BARRON CASTEEL  MAYOR / AT LARGE
SHANE HINES  DISTRICT 1
JUSTIN MEADOWS  DISTRICT 2
HARRY BOWERS  DISTRICT 3
MATTHEW E. HOYT  DISTRICT 4
LEAH A GARICA  DISTRICT 6

UTILITIES
NEW BRAUNFELS UTILITIES (NBU)
203 E. MAIN PLAZA
NEW BRAUNFELS, TX 78130
830-629-4NBU

ATMOS ENERGY
P.O. BOX 650205
DALLAS, TX 75265
888-286-6700

COBB, FENDLEY & ASSOCIATES, INC.

GARRY FORD, JR., P.E.  DATE  CITY OF NEW BRAUNFELS, TEXAS

ENRIQUE S. VALDEZ, P.E.  DATE  COBB, FENDLEY & ASSOCIATES, INC.
GENERAL NOTES

The most current editions of the City of San Antonio Standard Specifications and the Texas Department of Transportation Standard Specifications for Construction of Highways, Streets, and Bridges shall be followed for all construction except as amended by the City of New Braunfels Standard Details.

Prior to the start of construction the contractor shall contact the City of New Braunfels to set a preconstruction meeting. A 48-hour advanced notification is required for all inspection and meeting requests.

- All inspections are to be called in at 830-221-4008 or,
- Faxed in at 830-608-2117 or,
- E-mailed at inspections@nb逡.org

It is the Contractor’s responsibility to see that all temporary and permanent traffic control devices are properly installed and maintained in accordance with the plans and latest edition of the Texas Manual on Uniform Traffic Control Devices. If, in the opinion of the engineering representative and the construction inspector, the barricades and signs do not conform to established standards or are incorrectly placed or are insufficient in quantity to protect the general public, the construction inspector shall have the option to stop operations until such time as the conditions are corrected. If the need arises, additional temporary traffic control devices may be ordered by the Engineering representative at the Contractor’s expense.

A TxDOT Type II B-B blue reflective mixed pavement marker shall be installed in the center of the roadway adjacent to all fire hydrants. In locations where hydrants are situated on corners, blue reflective mixed pavement markers shall be installed on both approaches which front the hydrant. The raised pavement marker shall meet TxDOT material, epoxy and adhesive specifications.

Groundwater

It shall be the responsibility of the developer, contractor, subcontractors, builders, Geo-technical engineer, and project engineer to immediately notify the Office of the City Engineer and project engineer if the presence of groundwater within the site is evident. Upon notification the project engineer shall provide the developer with an acceptable groundwater management plan.

Record Drawings

As per Platteville Ordinance Section 118-38m: When all of the improvements are found to be completed and accepted in accordance with the approved plans and specifications and with the City’s standards, and upon receipt of each set of “Record Drawing” plans, and a digital copy of all plans (AutoCad 2000 minimum and PDF) the City Engineer shall accept such improvements for the City of New Braunfels, subject to the guarantees of material and workmanship provisions in this Section.

Construction Note

The Contractor is responsible to ensure that erosion control measures and stormwater control are sufficient to mitigate off site impacts in place at all stages of construction.

Drainage Note

Drainage improvements sufficient to mitigate the impact of construction shall be installed prior to adding impervious cover.

 Finished Floor Elevations

The elevation of the lowest floor shall be at least 10 inches above the finished grade of the surrounding ground, which shall be sloped in a fashion so as to direct stormwater away from the structure. Properly adjusted to stormwater collection systems must have floor slab elevation on or below floor joists a minimum of one foot above the 100-year water flow elevation in the structure. Driveways serving homes on the downhill side of the street shall have a properly sized crown across prevailing runoff from the garage.

Soils Testing

Prescribed shall be sampled from on site material (on site is defined as limits of construction for this plan set) and a copy of the procisor results shall be delivered to the developer of New Braunfels Street Inspector prior to any density tests.

Roadway

All roadway construction tests shall be the responsibility of the developer’s Geo-technical engineer. Flexible base or fill material shall be placed in uniform layers not to exceed six inches (6”) compacted. Each layer of material, inclusive of subgrade, shall be compacted as specified and tested for density and moisture in accordance with Test Methods TEx 113-3E, TEx 114-E, TEx 115-E. The number and location of required tests shall be determined by the Geo-technical Engineer and approved by the City of New Braunfels Street Inspector. At a minimum, tests shall be taken every 100’ for each lift. Upon completion of testing the Geo-technical Engineer will provide the City of New Braunfels Street Inspector with all testing documentation and a certification stating that the placement of flexible base, fill material, and subgrade, has been completed in accordance with the plans.

Item 340

Asphaltic concrete pavement shall be type “D” hot mix asphalt as defined in TxDOT’s standard specifications for current TxDOT Standard Specifications For Construction Of Highways, Street and Bridges. 

The City of New Braunfels will not accept the use of Recycled Asphalt Pavement (RAP) or Recycled Asphalt Shingles (RAS) in asphalt mixtures for new roadways. Any debris included within new asphalt pavements will result in asphalt removal and replacement from curb to curb for limits to be determined by the City of New Braunfels.

The asphaltic concrete surface course shall be plant mixed, hot laid type “D” meeting the specification requirements of TxDOT Item 340. The mix shall be designed for a stability of at least 35 and shall be compacted to between 91 and 95 percent of the maximum theoretical density as determined by TxDOT test method TEx 222-F. The asphalt cement content by percent of total mixture weight shall fall within a tolerance of ±0.5 percent from a specific mix design.

Utility Trench Compaction (added to the construction plans On All Utility Plan Sheets).

All utility trench compaction tests within the street pavement section shall be the responsibility of the developer’s Geo-technical Engineer. Fill material shall be placed in uniform layers not to exceed six inches (6”) compacted. Each layer of material shall be compacted to a minimum 95% density and tested for density and moisture in accordance with Test Methods TEx 113-3E, TEx 114-E, TEx 115-E. The number and location of required tests shall be determined by the Geo-technical Engineer and approved by the City of New Braunfels Street Inspector. At a minimum, tests shall be taken every 100’ for each lift. Upon completion of testing the Geo-technical Engineer shall provide the City of New Braunfels Street Inspector with all testing documentation and a certification stating that the placement of fill material has been completed in accordance with the plans.

Curb Cut Due To Construction Of New Right-Of-Way Construction

(Indicate the 2 Options on the construction plans)

1. Sawcut existing street and match to new construction.
2. Sawcut existing curb to tie into existing construction.

Construction Stabilized Embankment

Sawcut for construction entrance.

Stabilized construction area shall be constructed of 3”x5” rock to be placed a minimum length of 25’-R, and maintained so that construction debris does not fall within the city right-of-way. Right-of-way must be cleared from mud, rocks, etc. at all times.

(Notes To Be Placed On All WW Plan & Detail Sheets)

Ensure all driveway approaches are built in general accordance with A.D.A. specifications.

No valves, hydrants, etc. shall be constructed within curbs, sidewalks, or driveways.

Signs and Pavement Marking Plan Notes

The Contractor shall furnish and install all regulatory and warning signs, streets name signs and sign mounts in accordance with approved engineering plans. The City will inspect all signs at final inspection.

The Contractor shall install all pavement markings in accordance with approved engineering plans. The Contractor shall notify the City at least twenty-four (24) hours prior to the installation of all markings and final markings. The City will inspect all markings at final application.

Extra payment shall be allowed for work called for on the plans, but not included in the bid proposal. This incidental work will be required and shall be included in the pay item to which it relates.
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<th>PLAN SHEET NO.</th>
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<th>DIMENSIONS</th>
<th>PLT ALUMINUM TYPE</th>
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PROPOSED EDGE OF PAVEMENT AT FULL DEPTH REPLACEMENT TO MATCH EXISTING PAVEMENT ELEVATION TO ALLOW FOR SMOOTH TRANSITION AND ACHIEVE POSITIVE DRAINAGE. CROSS SLOPES WILL VARY TO MAINTAIN EXISTING GUTTERS/FLOW LINE ELEVATIONS TO ALLOW FOR POSITIVE GUTTER FLOWS AND TO AVOID PONDING AT EXISTING PRIVATE DRIVEWAYS, PRIVATE YARDS, AND CROSS STREETS.

PROPOSED EDGE OF PAVEMENT AT SPOT REPAIR TO MATCH EXISTING PAVEMENT ELEVATION TO ALLOW FOR SMOOTH TRANSITION AND ACHIEVE POSITIVE DRAINAGE.

PROPOSED EDGE OF PAVEMENT AT MILL AND OVERLAY TO MATCH EXISTING PAVEMENT ELEVATION TO ALLOW FOR SMOOTH TRANSITION AND ACHIEVE POSITIVE DRAINAGE. CROSS SLOPES WILL VARY TO MAINTAIN EXISTING GUTTERS/FLOW LINE ELEVATIONS TO ALLOW FOR POSITIVE GUTTER FLOW AND TO AVOID PONDING AT EXISTING PRIVATE DRIVEWAYS, PRIVATE YARDS, AND CROSS STREETS.
CAUTION!!!

PROPOSED EDGE OF PAVEMENT TO MATCH EXISTING PAVEMENT

10+13.73 E. NORTH ST.

EXIST. DRIVEWAY

ELEV. = 647.45

EX. CURB

NEW PAVEMENT ELEV. = 647.15

15.04' LT.

EXIST. SIGN

ASPH

POSITIVE DRAINAGE

EXISTING PAVEMENT

PAVEMENT TO MATCH PROPOSED EDGE OF PAVEMENT

PROPOSED EDGE OF PAVEMENT TO WATCH EXISTING DRIVEWAY AND PAVEMENT ELEVATIONS TO ALLOW FOR POSITIVE DRAINAGE

SECTION A-A

NTS

EXIST. DRIVeway

PROPOSED EDGE OF PAVEMENT TO MATCH EXISTING PAVEMENT ELEVATION TO ALLOW FOR POSITIVE DRAINAGE

EXIST. DRIVEWAY

ELEV. = 647.45

EX. CURB

NEW PAVEMENT ELEV. = 647.15

15.04' LT.

EXIST. SIGN

ASPH

POSITIVE DRAINAGE

EXISTING PAVEMENT

PAVEMENT TO MATCH PROPOSED EDGE OF PAVEMENT

PROPOSED EDGE OF PAVEMENT TO WATCH EXISTING DRIVEWAY AND PAVEMENT ELEVATIONS TO ALLOW FOR POSITIVE DRAINAGE

SECTION B-B

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EXIST. DRIVeway

PROPOSED EDGE OF PAVEMENT TO MATCH EXISTING PAVEMENT ELEVATION TO ALLOW FOR POSITIVE DRAINAGE

EXIST. DRIVEWAY

ELEV. = 647.45

EX. CURB

NEW PAVEMENT ELEV. = 647.15

15.04' LT.

EXIST. SIGN

ASPH

POSITIVE DRAINAGE

EXISTING PAVEMENT

PAVEMENT TO MATCH PROPOSED EDGE OF PAVEMENT

PROPOSED EDGE OF PAVEMENT TO WATCH EXISTING DRIVEWAY AND PAVEMENT ELEVATIONS TO ALLOW FOR POSITIVE DRAINAGE

CAUTION!!! GAS LINE

MATCHLINE - STA. 13+00

1. THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROPRIATE WAY ONLY. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK AND AGREES TO BE FULLY RESPONSIBLE FOR THE INSTALLATION, COORDINATION, AND COORDINATION/PROTECTION/BRACING. ANY DISCREPANCIES FROM WHAT IS SHOWN SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER.

2. CONTRACTOR TO SEED OR INSTALL SOIL RETENTION BLANKETS OVER ALL DISTURBED AREAS OUTSIDE OF PROPOSED EASEMENT TO ALLOW FOR POSITIVE DRAINAGE AND AVOID PONDING AT THE DOWNSTREAM AND UPSTREAM EDGES OF PAVEMENT.

3. CONTRACTOR TO TRANSITION CONCRETE SWALES TO ALLOW FOR POSITIVE DRAINAGE AND AVOID PONDING AT THE DOWNSTREAM AND UPSTREAM EDGES OF EXISTING PAVEMENT.

4. ANY DISCREPANCIES FROM WHAT IS SHOWN SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER.

5. DRIVEWAYS SHALL BE REBUILT WITH "ADA" COMPLIANT SIDEWALK CROSSING.

6. CONTRACTOR TO INSTALL REPLACEMENT CURB/FRONT CURB.

7. EDGE OF PAVEMENT ELEVATIONS TO BE FIELD VERIFIED BY THE CONTRACTOR AND AGREED UPON WITH THE ENGINEER.
PROPOSED CONCRETE SWALES TO ALLOW FOR POSITIVE DRAINAGE, AVOID PONDING ALONG PRIVATE DRIVES AND EXISTING PRIVATE EARTHEN AREAS.

SECTION B-B

12' TRAVEL LANE
SLOPE VARIES
12' TRAVEL LANE
SLOPE VARIES
PROPR. 2' CONC. SWALE
PROJECT 2 CONC. SWALE TO ALLOW FOR POSITIVE DRAINAGE, AVOID PONDING AT THE DOWNSTREAM AND UPSTREAM SWALE/EXISTING PAVEMENT INTERFACE.

SECTION C-C

12' TRAVEL LANE
SLOPE VARIES
12' TRAVEL LANE
SLOPE VARIES
PROPR. 2' CONC. SWALE
PROJECT 2 CONC. SWALE TO ALLOW FOR POSITIVE DRAINAGE, AVOID PONDING AT THE DOWNSTREAM AND UPSTREAM SWALE/EXISTING PAVEMENT INTERFACE.

GENERAL NOTES:
1. THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK AND, THEREAFTER, ONLY BE FULLY RESPONSIBLE FOR THEIR PROTECTION. THE CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR THE FAILURE TO COMMENCE WORK AND BE FULLY RESPONSIBLE FOR THE FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES. WHEN THE CONTRACTOR IS USING TRENCHLESS INSTALLATION METHODS, THE CONTRACTOR SHALL LOCATE ALL UTILITIES FOR THE ENTIRE LENGTH OF THE INSTALLATION PRIOR TO ANY ACTIVITIES.
2. CONTRACTOR TO SEED OR INSTALL SOIL RETENTION BLANKETS OVER ALL COSTURED AREAS OUTSIDE OF PAVEMENTS AND REVEGETATE PER SPECIFICATIONS.
3. CONTRACTOR TO ENSURE THAT ALL CONSTRUCTION ACTIVITIES ARE CONTINUED IN GOOD CONDITION.
4. ANY DISCREPANCIES FROM WHAT IS SHOWN SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER.
5. CONTRACTOR TO REGRADE TO LINE-OF-CENTER CONDITIONS AND ANY GAPS BETWEEN PROPOSED CONSTRUCTION AND EXISTING NATURAL GROUND.
6. ANY GRADING CHANGES FROM WHAT IS SHOWN SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER.
7. EDGE OF PAVEMENT ELEVATIONS TO BE FIELD VERIFIED BY THE CONTRACTOR AND ADJUSTED AS NEEDED TO ACHIEVE POSITIVE DRAINAGE AND AVOID PONDING.
PROPOSED CONCRETE SWALES TO ALLOW FOR POSITIVE DRAINAGE AND AVOID PONDING AT THE DOWNSTREAM AND UPSTREAM SWALE/EXISTING PAVEMENT INTERFACE.

EXISTING CURB TO REMAIN.

CONTRACTOR TO COORDINATE WITH UTILITY POLE INSTALLATION PRIOR TO ANY ACTIVITIES.

GENERAL NOTES:

1. THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE BAY ONLY. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK AND SHALL BE RESPONSIBLE FOR ANY DAMAGES THAT MIGHT BE OCCASIONED BY THE FAILURE TO EXACTLY LOCATE AND PRESERVE ALL UNDERGROUND UTILITIES. WHEN THE CONTRACTOR IS USING TRENDLESS INSTALLATION METHODS, THE CONTRACTOR SHALL LOCATE ALL UTILITIES FOR THE ENTIRE LENGTH OF THE INSTALLATION PRIOR TO ANY ACTIVITIES.

2. CONTRACTOR TO SEED OR INSTALL SOIL RETENTION BLANKETS OVER ALL DISTURBED AREAS OUTSIDE OF PAVEMENT AND REVEGETATE PER SPECIFICATIONS.

3. CONTRACTOR TO REGRADE TO LINE OR BETTER CONDITIONS ANY GAPS BETWEEN PROPOSED CONSTRUCTION AND EXITING NATURAL GROUND.

4. ANY DISCREPANCIES FROM WHAT IS SHOWN SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER.

5. DRIVEWAYS SHALL BE REBUILT WITHADA COMPLIANT SIDEWALK CROSSING.

6. CONTRACTOR TO COORDINATE WITH UTILITY POLE OWNER WHEN EXCAVATING WITHIN 6 FEET OF AN EXISTING POLE AND IMPLEMENT APPROPRIATE POLE PROTECTION.

7. EDGE OF PAVEMENT ELEVATIONS TO BE FIELD VERIFIED BY THE CONTRACTOR AND ADJUSTED AS NEEDED TO ACHIEVE POSITIVE DRAINAGE AND AVOID PONDING.
PROPOSED CONCRETE SWALES TO ALLOW FOR POSITIVE DRAINAGE ALONG PRIVATE DRIVEWAYS AND EXISTING PRIVATE EASEMENT AREAS/YARDS AND CROSS STREETS.

MATCHLINE - STA. 27+00

LOC 655.16 E.O.P. 655.30 TP LOC

TRAVEL LANE

MOUNTABLE CURB. SEE SHT. C-301

SLOPE VARIES

TP 12.00' W

SECTION G-G

END PROP. 2' CONC. SWALE

G

ELEV.=655.18

16.97' RT.

END PROP. 2' CONC. SWALE

G

= 10+16.65 N. GRANT AVE.

NEW PAVEMENT

SEE SHT. C-301

4" WHITE STRIPE

THEM PAV M&R NON-REMOV (60, 24" RAL)

OVERHEAD ELECTRIC

FULL DEPTH REPLACEMENT 

NEW PAVEMENT

PAVEMENT SPOT REPAIR

MILL AND OVERLAY

SEALANT

GOOD CONDITION

CONC. SIDEWALK

CONC. SWALE

PROPOSED EASEMENT

EXISTING EASEMENT

EXISTING RIGHT OF WAY

PROJECT ALIGNMENT

LIMITS OF CONSTRUCTION

EXISTING POLE AND IMPLEMENT APPROPRIATE POLE TRANSITION TO PROP. CONC. SWALE

CONTRACTOR TO TRANSITION CONCRETE SWALE TO ALLOW FOR POSITIVE DRAINAGE AND AVOID PONDING AT THE SWALE/EXISTING PAVEMENT INTERFACE

CONTRACTOR TO SEED OR INSTALL SOIL RETENTION BLANKETS OVER ALL COSTURED AREAS OUTSIDE OF PAVERMENT AND REVETEALG PER SPECIFICATIONS.

CONTRACTOR TO COORDINATE WITH UTILITY POLE OWNERS WHEN EXCAVATING WITHIN 5-FEET OF AN EXISTING POLE AND AGREE TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES THAT MIGHT BE OCCASIONED OR ARISE FROM THIS ACTIVITY.

CONTRACTOR TO REGRADE TO LIKE OR BETTER CONDITION ANY GAPS BETWEEN PROPOSED AND EXISTING EASEMENTS.

CONTRACTOR TO TRANSITION 2' CONCRETE SWALE TO ALLOW FOR POSITIVE DRAINAGE AND AVOID PONDING AT THE SWALE/EXISTING PAVEMENT INTERFACE.

CONTRACTOR IS USING TRENCHLESS INSTALLATION OF ALL EXISTING UTILITIES BEFORE COMMENCING ANY WORK AND AGREES TO BE FULLY RESPONSIBLE FOR THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES. WHEN THE CONTRACTOR IS USING TRENCHLESS INSTALLATION METHODS, THE CONTRACTOR SHALL LOCATE ALL UTILITIES FOR THE ENTIRE LENGTH OF THE INSTALLATION PRIOR TO ANY ACTIVITIES.

ANY AND ALL DISCREPANCIES FROM WHAT IS SHOWN SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER.

CONTRACTOR TO TRANSITION CONCRETE SWALE TO ALLOW FOR POSITIVE DRAINAGE AND AVOID PONDING ALONG PRIVATE DRIVEWAYS AND EXISTING PRIVATE EASEMENT AREAS/YARDS AND CROSS STREETS.
These design documents are not to be used for construction prior to regulatory signature and permit.
POSITIVE DRAINAGE, AVOID PONDING ALONG PRIVATE DRIVES AND EXISTING PRIVATE SIDEWALKS.

TIE TO PROP. 6' SIDEWALK END PROP. 6' SIDEWALK

PI: 13+78.87

SEE SHEET C-406

EX. CONC VG ELEV.=653.12

TEL 44.25' LT.

6.00'

EX. CONC VG 3' VG

14+08.33 E. COMMERCE ST. = 16+91.13 N. CENTRAL AVE.

TIE TO PROP. STRIPE 44.45' LT.

6.73'

6.00'

WATER VALVE

SLOW BOX

FIRE HYDRANT

WATER VALVE

SEE SHEET C-406

CONTRACTOR TO TRANSITION VALLEY GUTTERS TO ALLOW FOR POSITIVE DRAINAGE AND AVOID PONDING AT THE DOWNSTREAM AND UPSTREAM SWALE/EXISTING PAVEMENT INTERFACE.

CONTRACTOR TO REGRADE TO LIKE OR BETTER. CONSTRUCTION SHALL BE REBUILT WITH "ADA" COMPLIANT SIDEWALK CROSSING.

GENERAL NOTES:

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2. CONTRACTOR TO SEED OR INSTALL SOIL RETENTION BLANKETS OVER ALL EXPOSED AREAS OUTSIDE NEW PAVEMENT AND REVEGETATE ACCORDING TO SPECIFICATIONS.

3. CONTRACTOR TO REGRADE TO LEVEL AND SLOPE \pm 6:1 (W) 24" (SLD) TO ALLOW FOR POSITIVE DRAINAGE AND AVOID PONDING AT THE DOWNSTREAM AND UPSTREAM SWALE/EXISTING PAVEMENT INTERFACE.

4. ANY DISCREPANCIES FROM WHAT IS SHOWN SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER.

5. EDGES OF GRAVEL PAVEMENT AND REVEGETATE PER SPECIFICATIONS.

6. CONTRACTOR TO TRANSITION VALLEY GUTTERS TO ALLOW FOR POSITIVE DRAINAGE AND AVOID PONDING AT THE DOWNSTREAM AND UPSTREAM SWALE/EXISTING PAVEMENT INTERFACE.

7. CONTRACTOR TO REGRADE TO LIKE OR BETTER. CONSTRUCTION SHALL BE REBUILT WITH "ADA" COMPLIANT SIDEWALK CROSSING.

8. CONTRACTOR TO TRANSITION VALLEY GUTTERS TO ALLOW FOR POSITIVE DRAINAGE AND AVOID PONDING AT THE DOWNSTREAM AND UPSTREAM SWALE/EXISTING PAVEMENT INTERFACE.

9. CONTRACTOR TO TRANSITION VALLEY GUTTERS TO ALLOW FOR POSITIVE DRAINAGE AND AVOID PONDING AT THE DOWNSTREAM AND UPSTREAM SWALE/EXISTING PAVEMENT INTERFACE.
EXISTING PAVEMENT

EARTHEN AREAS/YARDS

PRIVATE DRIVES AND EXISTING PRIVATE

POSITIVE DRAINAGE, AVOID PONDING ALONG

PROPOSED CONCRETE SWALES TO ALLOW FOR

MATCHLINE - STA. 16+83

EXISTING PAVEMENT

PAVEMENT TO MATCH

E.O.P.

2' CONC. SWALE

W

FOR POSITIVE DRAINAGE.

EXISTING PAVEMENT

LOC

E. MAIN ST.

BEGIN FULL DEPTH PAVEMENT

= 21+31.15 N. CENTRAL AVE.

E.O.P.

LOC

ELEV.=654.21

13.83' RT.

11.00'

11.00'

8.00'

8.00'

17+13.00 E. MAIN ST.

53.89' LT.

TIE TO EXIST. SIDEWALK

654.08

E.O.P.

LOC

E.O.P.

CAUTION!

GAS LINE

SLOPE VARIES

11'

SECTION B-B

LOC

LOC

LOC

LOC

LOC

LOC

LOC

LOC

LOC

LOC

LOC

W

W

W

W

W

W

W

W

W

W

W

E.O.P.

17+63.35 E. MAIN ST.

ELEV.=654.65

= 14+43.66 N. VERAMENDI AVE

TIE TO PROP. SIDEWALK

25.67' RT.

17+66.87 E. MAIN ST.

END PROP. 6' SIDEWALK

SEE SHEET C-402

TIE TO PROP. SIDEWALK

19.67' RT.

17+63.35 E. MAIN ST.

BEGIN TRANSITION TO MOUNTABLE CURB

ELEV.=654.53

= 14+37.66 N. VERAMENDI AVE

SEE SHEET C-403

TIE TO PROP. STRIPE

17+70.50 E. MAIN ST.

END PROP. 2' CONC. SWALE

ELEV.=654.23

21.00' LT.

17+70.54 E. MAIN ST.

REPLACEMENT NEW PAVEMENT

ELEV.=654.20

= 14+05.33 N. VERAMENDI AVE

SEE SHEET C-402

9.62' LT.

17+95.79 E. MAIN ST.

END PROP. 4'' STRIPE (WHITE)

= 14+17.81 N. VERAMENDI AVE

SEE SHEET C-402

TIE TO PROP. STRIPE

17+71.31 E. MAIN ST.

END PROP. 4'' STRIPE (WHITE)

= 14+25.90 N. VERAMENDI AVE

SEE SHEET C-402

TIE TO PROP. STRIPE

TYPICAL 2' CONCRETE SWALE DETAIL

SAWCUT 1' OF

EXIST. PAVEMENT

PROPOSED EDGE OF

EXIST. PAVEMENT

PROPOSED EDGE OF

EXIST. PAVEMENT TO MATCH

EXISTING PAVEMENT ELEVATION TO ALLOW FOR

POSITIVE DRAINAGE.

CONTRACTOR TO TRANSITION CONCRETE SWALES TO ALLOW FOR POSITIVE DRAINAGE AND AVOID PONDING AT THE DOWNSTREAM AND UPSTREAM SWALE/EXISTING PAVEMENT INTERFACE

CONTRACTOR TO SEED OR INSTALL SOIL RETENTION BLANKETS OVER ALL DISTURBED AREAS OUTSIDE OF PAVEMENT AND REVEGETATION PER SPECIFICATIONS.

CONTRACTOR TO INSTALL ADDITIONAL 4'' STRIPE (WHITE) WHERE INDICATED.

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1. THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY. THE CONTRACTOR SHALL DETERMINE WITH GREAT ACCURACY THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK AND AGREES TO BE FULLY RESPONSIBLE FOR THE RESULTING DAMAGE. THE CONTRACTOR SHALL NOTIFY THE ENGINEER IN WRITING WITHIN 5 DAYS OF THE FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES. WHEN THE CONTRACTOR IS USING TRENCHLESS INSTALLATION METHODS, THE CONTRACTOR SHALL LOCATE ALL UTILITIES FOR THE ENTIRE LENGTH OF THE INSTALLATION PRIOR TO ANY ACTIVITIES.

2. CONTRACTOR TO SEED OR INSTALL SOIL RETENTION BLANKETS OVER ALL DISTURBED AREAS OUTSIDE OF PAVEMENT AND REVEGETATION PER SPECIFICATIONS.

3. CONTRACTOR TO REGRADE TO LIKE OR BETTER CONDITIONS ANY GAPS BETWEEN PROPOSED CONSTRUCTION AND EXISTING NATURAL GROUND.

4. ANY DISCREPANCIES FROM WHAT IS SHOWN SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER.

5. DRIVEWAYS SHALL BE REBUILT WITH "ADA" COMPLIANT SIDEWALK CROSSING.

6. CONTRACTOR TO COORDINATE WITH UTILITY POLE OWNER WHEN EXCAVATING WITHIN 5 FEET OF AN EXISTING POLE AND PROVIDE APPROPRIATE PROTECTION/BRACING.

7. EDGE OF PAVEMENT ELEVATIONS TO BE FIELD VERIFIED BY THE CONTRACTOR AND ADJUSTED AS NEEDED TO ACHIEVE POSITIVE DRAINAGE AND AVOID PONDING.
1. The locations of existing underground utilities are shown in an approximate way only. The Contractor shall determine the exact location of all existing utilities before commencing work and shall be solely responsible for the exact location of any and all underground utilities. If any and all underground utilities are not exactly located by the failure to exactly locate and preserve the locations of existing underground utilities, when the Contractor is using trenchless installation methods, the Contractor shall relocate all utilities for the entire length of the installation prior to any activities.

2. Contractor to seed or install soil retention blankets on all disturbed areas outside of pavement to prevent erosion.

3. Any discrepancies from what is shown shall be brought to the attention of the Engineer.

4. Any discrepancies from what is shown shall be brought to the attention of the City of New Braunfels.

5. The Contractor shall be responsible for any gaps between proposed pavement and any adjacent portions of roadway.

6. The Contractor shall coordinate with utility poles in compliance with the City of New Braunfels.

7. The Contractor shall coordinate with utility poles in compliance with the City of New Braunfels.
GENERAL NOTES:
1. THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCEMENT OF WORK AND AGREES TO BE FULLY RESPONSIBLE FOR THE PROTECTION/BRACING OF ALL EXISTING UTILITIES. THE CONTRACTOR SHALL COORDINATE WITH UTILITY POLES BY THE FAILURE TO EXACTLY LOCATE AND PRESERVE THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES. WHEN ANY AND ALL DAMAGES THAT MIGHT BE OCCASIONED ARE SHOWN IN AN APPROXIMATE WAY ONLY. THE CONTRACTOR TO REGRADE TO LIKE OR BETTER CONDITION ANY GAPS BETWEEN PROPOSED CONTRACTIONS AND EXITING NATURAL GROUND.
2. CONTRACTOR TO SEED OR INSTALL SOIL RETENTION BLANKETS OVER ALL DISTURBED AREAS OUTSIDE OF REVEGETATION.
3. CONTRACTOR TO TRANSITION CONCRETE SIDEWALKS TO ALLOW FOR POSITIVE DRAINAGE AND AVOID PONDING AT THE SWALE/EXISTING PAVEMENT INTERFACE.
4. ANY DISCREPANCIES FROM WHAT IS SHOWN IN THIS SHEET SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER.
5. DRIVeways SHALL BE REBUILT WITH "ADA" COMPLIANT SIDEWALK CROSSING.
6. CONTRACTOR TO COORDINATE WITH UTILITY POLE OWNER WHEN EXCAVATING WITHIN 5' FEET OF AN EXISTING POLE AND IMPLEMENT APPROPRIATE POLE PROTECTION.
7. EDGE OF PAVEMENT ELEVATIONS TO BE FIELD VERIFIED BY THE CONTRACTOR AND ADJUSTED AS NEEDED TO ACHIEVE POSITIVE DRAINAGE AND AVOID PONDING.
8. NEW PAVEMENT TO MATCH EXISTING CURB AND EDGE OF PAVEMENT.
9. CONTRACTOR IS USING TRENCHLESS INSTALLATION OF ALL EXISTING UTILITIES BEFORE COMMENCEMENT OF WORK AND AGREES TO BE FULLY RESPONSIBLE FOR THE PROTECTION/BRACING OF ALL EXISTING UTILITIES.
10. CONTRACTOR TO SEED OR INSTALL SOIL RETENTION BLANKETS OVER ALL DISTURBED AREAS OUTSIDE OF REVEGETATION.
11. CONTRACTOR TO TRANSITION CONCRETE SIDEWALKS TO ALLOW FOR POSITIVE DRAINAGE AND AVOID PONDING AT THE SWALE/EXISTING PAVEMENT INTERFACE.
12. CONTRACTOR TO SEED OR INSTALL SOIL RETENTION BLANKETS OVER ALL DISTURBED AREAS OUTSIDE OF REVEGETATION.
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23. CONTRACTOR TO TRANSITION CONCRETE SIDEWALKS TO ALLOW FOR POSITIVE DRAINAGE AND AVOID PONDING AT THE SWALE/EXISTING PAVEMENT INTERFACE.
24. CONTRACTOR TO SEED OR INSTALL SOIL RETENTION BLANKETS OVER ALL DISTURBED AREAS OUTSIDE OF REVEGETATION.
CONC. SWALE TO ALLOW FOR POSITIVE DRAINAGE. AVOID PONDING ALONG PROPOSED CONCRETE SWALES TO ALLOW FOR ...

BEGIN PROP. 4" STRIPE (WHITE) LOC 10+64.23 N. VERAMENDI AVE.

BEGIN PROP. 2' CONC. SWALE LOC 10+68.78 N. VERAMENDI AVE.

NEW PAVEMENT EX. CONC VG ELEV.=654.72

EX. WATER VALVE SANITARY CLEAN-OUT GAS VALVE PARKING METER

COLUMN ELECTRIC METER BURIED CABLE MARKER BACKFLOW PREVENTER AIR CONDITIONER GUY WIRE MONITOR METER POWDER POLE SPRINKLER VALVE TRED WATER METER

PROPOSED EASEMENT TO ALLOW FOR POSITIVE DRAINAGE. AVOID PONDING ALONG PRIVATE DRIVEWAY.

EXISTING PAVEMENT TO MATCH SWALES TO ALLOW FOR POSITIVE DRAINAGE.

CONTRACTOR TO TRANSITION CONCRETE UPSTREAM SWALE/EXISTING PAVEMENT.

BEGIN PROP. 4" STRIPE (WHITE) LOC 10+64.98 N. VERAMENDI AVE.

BEGIN PROP. 4" STRIPE (WHITE) LOC 10+68.67 N. VERAMENDI AVE.

MATCHLINE - STA. 13+00.

GENERAL NOTES:

1. THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK AND AGREES TO BE FULLY RESPONSIBLE FOR THE CORRECT INSTALLATION OF ALL UTILITIES. THE CONTRACTOR WILL BE FULLY RESPONSIBLE FOR THE CORRECT INSTALLATION OF ALL UTILITIES. THE CONTRACTOR WILL BE FULLY RESPONSIBLE FOR THE CORRECT INSTALLATION OF ALL UTILITIES. THE CONTRACTOR WILL BE FULLY RESPONSIBLE FOR THE CORRECT INSTALLATION OF ALL UTILITIES. THE CONTRACTOR WILL BE FULLY RESPONSIBLE FOR THE CORRECT INSTALLATION OF ALL UTILITIES. THE CONTRACTOR WILL...
CONTRACTOR TO TRANSITION CONCRETE SWALES TO ALLOW FOR POSITIVE DRAINAGE AND AVOID PONDING ALONG PRIVATE DRIVEWAYS AND EXISTING PRIVATE GARDEN AREAS.

BEGIN PROP. 4" WHITE STRIPE (WHITE)

10+14.06 N. CENTRAL AVE. = 20+33.99 E. NORTH ST.

UPSTREAM SWALE/EXISTING PAVEMENT

BEGIN FULL DEPTH PAVEMENT

10+13.86 N. CENTRAL AVE. = 21.39' RT.

ELEV.=652.47

LOC

W

PRIVATE DRIVES AND EXISTING PRIVATE EASTING PAVEMENT

BEGIN FULL DEPTH PAVEMENT

10+13.97 N. CENTRAL AVE. = 19.44' LT.

ELEV.=652.57

LOC

W

PAVEMENT INTERFACE

12.00' LT.

0.00'

12.00' RT.

ELEV.=652.69

LOC

W

EXISTING PAVEMENT

END PROP. 2' CONC. SWALE

10+26.63 N. CENTRAL AVE.

10+27.04 N. CENTRAL AVE.

PROPOSED EDGE OF PAVEMENT TO MATCH EXISTING PAVEMENT ELEVATION TO ALLOW FOR POSITIVE DRAINAGE.

10+13.93 N. CENTRAL AVE. = 20+33.99 E. NORTH ST.

BEGIN PROP. 2' CONC. SWALE

10+13.97 N. CENTRAL AVE.

10+27.12 N. CENTRAL AVE.

BEGIN PROP. 6' SIDEWALK

REPLACE EXISTING UTILITY POLES/STORM SEWER VALVES

REPLACE EXISTING UTILITY POLES/STORM SEWER VALVES

REPLACE EXISTING UTILITY POLES/STORM SEWER VALVES

REPLACE EXISTING UTILITY POLES/STORM SEWER VALVES

END PROP. 2' CONC. SWALE

13+33.46 N. CENTRAL AVE.

13+00 N. CENTRAL AVE.

CONTRACTOR TO TRANSITION CONCRETE SWALE TO ALLOW FOR POSITIVE DRAINAGE AND AVOID PONDING ALONG UPSTREAM SWALE/EXISTING PAVEMENT INTERFACE.

PROPOSED CONCRETE SWALES TO ALLOW FOR POSITIVE DRAINAGE, AVOID PONDING ALONG PRIVATE DRIVES AND EXISTING PRIVATE GARDEN AREAS.
RESIDENTIAL COLLECTOR PARKING BOTH SIDES

ONE & TWO FAMILY RESIDENTIAL LOCAL PARKING BOTH SIDES

DRIVEWAY APRON (RESIDENTIAL - ONE OR TWO FAMILY)

DRIVEWAY APRON

SIDEWALK

RESIDENTIAL COLLECTOR PARKING BOTH SIDES

NOTES:

1. STRUCTURAL SECTION REQUIREMENTS DEPEND ON THE FUNCTION OF THE ROADWAY, THE CITY ADOPTS BEFORE THEY ARE APPROVED AND ISSUED.
2. SEE DETAIL AT 0-0 IN.
3. MATERIALS REQUIREMENTS SHOWN IN DETAIL ADOPTED BY THE CITY ADOPTED BEFORE THEY ARE APPROVED AND ISSUED.
4. AIRPORT CONCRETE REQUIRES ALL MATERIALS TO MEET AIRPORT REQUIREMENTS.
5. MATERIALS REQUIRED TO MEET AIRPORT REQUIREMENTS TO MEET AIRPORT REQUIREMENTS.
6. ALL MATERIALS AND SUPERINTENDENT CONSTRUCTION SHALL BE IN THE SPECIFICATIONS.
7. SEED ON DIRT FOR THE ROADWAY USES A LAYER OF SEED ON DIRT.
8. SEED ON DIRT FOR THE ROADWAY USES A LAYER OF SEED ON DIRT.

THESE DESIGN DOCUMENTS ARE NOT TO BE USED FOR CONSTRUCTION PRIOR TO REGULATORY SIGNATURE AND PERMIT.
STANDARD DETAILS - CITY OF NEW BRAUNFELS

1. The existing paving surface shall be saw cut in a straight line at a 4" depth to prevent heaving of the trench symmetrical with the sides of the trench.
2. Placement and finishing shall be in the form and manner based on sectional characteristics and the grade of the existing pavement.
3. Damaged pavement beneath the street shall be removed and replaced.
4. The newly constructed street pavement shall be of the same width as the existing pavement.
5. New asphalt shall be laid at least 4" thick.
6. If an existing forming pipe is used, the surface shall be finished flush with the new asphalt, with waves reduced and on edge.
7. If the existing forming material shall not be usable to support the new asphalt, the forming material shall be replaced.

NOTES:
1. Reinforcing bars shall be lapped a minimum of 18".
2. Reinforcing bars shall be continuous at intersections.
3. Reinforcing bars shall not cross expansion joints.
4. All concrete shall be placed in lifts not to exceed 6" thick with at least 1" ofembedment of the reinforcing bars.
5. Minimum 6" flexible base compacted to 95%.
STANDARD DETAILS - NBU UTILITY
ADJUSTMENTS

2' TYPICAL 2' CONCRETE SWALE DETAIL

BASE MATERIAL

WASTEWATER MANHOLE

BASE MATERIAL

REUSE MANHOLE RING AND COVER

2" MIN. TYPE "D" HMAC

NOTE:
CONCRETE PATCH (SEE NBU WATER VALVE AND MANHOLE ADJUSTMENT DETAILS, THIS SHEET, FOR ADDITIONAL INFORMATION)

SANITARY SEWER MANHOLE ENCASEMENT DETAIL

NOTE:
CONCRETE PATCH (SEE NBU WATER VALVE AND MANHOLE ADJUSTMENT DETAILS, THIS SHEET, FOR ADDITIONAL INFORMATION)

TYPICAL 2' CONCRETE SWALE DETAIL

TYPICAL 4' CONCRETE SWALE DETAIL
CASE 1. OFF TRAVEL WAY DELIVERY

CASE 2. BACK SIDE DELIVERY

CASE 3. DELIVERY NEAR RIGHT OF WAY LINE

GENERAL NOTES:

1. CASE 1 IS THE MOST COMMON METHOD.

2. TURN OUT BEHIND MAILBOX FOR CASE 2 WILL NORMALLY BE ALLOWED FOR NATURAL TERRAIN THAT WILL SERVE AS AN ALL WEATHER SURFACE.

3. ALL WEATHER DRIVEWAYS FOR CASE 3 MAILBOXES LOCATED AT THE RIGHT OF WAY LINE SHOULD NORMALLY BE PLACED IN CONJUNCTION WITH COUNTY ROADS OR OTHER CONNECTING COMMUNITY ROADS OR STREETS. IF THE NUMBER OF MAILBOXES EXCEEDS FOUR, A COMMUNITY MAIL BOX SHOULD BE ENCOURAGED AT THESE LOCATIONS.

PLAN CASE 1

TYPICAL SECTION CASE 1

MAIL DELIVERY VEHICLE TRAVEL DIRECTION
MAILBOX SIDEWALK INSTALLATION RELATIVE TO ANY OTHER OBSTRUCTION SUCH AS A SIGN (MINIMUM BORDER DISTANCE)

SIGN POST OUTSIDE DIA. = 2.875"

MAILBOX SECURED WITH COLD MIX OR SIMILAR SEALER

Width 11.5"

6" DIA. PVC CURB & GUTTER

PLAN VIEW

SEE MB-15(1)

SHEET 3 OF 4
TRIANGULAR SLIPBASE INSTALLATION GENERAL REQUIREMENTS

NOTE
There are various devices approved for the Triangular Slipbase System. Please reference the Material Producer List for approved slip base systems. The devices shall be installed per manufacturers' recommendations. Installation procedures shall be provided to the Engineer by Contractor.

GENERAL NOTES:
1. Slip base shall be permanently marked to indicate manufacturer, method, design, and location of marking per Approval of the TxDOT Test Standards Engineer.
2. Material used in this system shall conform to the following specifications:
   a. 10 BMG Tubing (2.875" outside diameter) or Schedule 80 Pipe (See General Note 3)
   b. 0.132" nominal wall thickness
   c. stainless or electric-resistance welded steel tubing or pipe
   d. Steel shall be AISI-45 or 55 per ASTM A45 or A588
   e. Other steels may be used if they meet the following:
      - 50,000 PSI minimum yield strength
      - 40,000 PSI minimum elongation
      - 250 minimum elongation in 2"
      - Bolt thickness (uncalculated) shall be within the range of 0.122" to 0.138"
      - Outside diameter (uncalculated) shall be within the range of 2.875" to 3.083"
      - Concentration per ASTM A45 or ASTM A588 E210. For speckled steel tubing, ASTM A833, recess tube outside diameter weld be seen by nitriding with zinc wire per ASTM A833.
      - Schedule 80 Pipe (2.875" outside diameter)
      - 0.132" nominal wall thickness
      - Stainless or electric-resistance welded steel tubing or pipe with equivalent outside diameter and wall thickness may be used if they meet the following:
      - 60,000 PSI minimum yield strength
      - 40,000 PSI minimum elongation
      - 250 minimum elongation in 2"
      - Bolt thickness (uncalculated) shall be within the range of 0.132" to 0.138"
      - Outside diameter (uncalculated) shall be within the range of 2.875" to 3.083"
3. See manufacturer’s website for detailed drawings of sign stands and Texas Universal Slipbase System components. The website address is:
   https://www.txdot.gov/business/producer_list.htm
4. Sign supports shall not be shipped except where shown. Sign support posts shall not be shipped.

ASSEMBLY PROCEDURE
Foundation
1. Proper 12"-inch diameter by 42"-inch deep hole. If solid rock is encountered, the depth of the foundation may be reduced such that it is embedded a minimum of 8 inches into the solid rock.
2. The engineer may require bolts of concrete less than 2 cubic yards to be mixed with a portable, motor-driven concrete mixer, for small placements less than 0.5 cubic yards, hand mixing in a suitable container may be allowed by Engineer. Concrete is Class C.
3. Push the pipe and the slip base slab into the center of the concrete. Rotate the stub back and forth slowly washing it down into the concrete to assure good contact between the concrete and stub. Continue to work the stub into the concrete until it is between 2 to 4 inches above the surface of the slab. Place the slab, allowing a minimum of 4 days to set, unless otherwise directed by the Engineer.
4. The TxDOT Slipbase System is multi-directional and is designed to release when struck from any direction.

Support
1. Cut support so that the portion of the sign shall be 7 to 1.5 feet above the edge of the travelway (i.e., edge of the crown) when slip plate is below the edge of pavement or 7 to 1.5 feet above slip plate when the slip plate is above the edge of the travelway. The cut shall be plumb and straight.
2. Attach sign to support using connections shown. When multiple signs are installed on the same support, ensure the minimum clearance between each sign is maintained. See SMD(SLP)-21 for clearances based on sign types.

CONCRETE ANCHOR

Concrete anchor consists of 5/8" diameter stud bolt with UNC series bolt threads on the upper end. Heavy hex nut per ASTM A663, and hex washer washer per ASTM F200. The stud bolt shall have a minimum yield and ultimate tensile strength of 50 and 75 KSI, respectively. Nuts, bolts and washers shall be galvanized per item 465, "Galvanizing." Adhesive anchors shall have studs bolts installed with Type III epoxy per TxDOT-910, "Concrete and Adhesives." Adhesive anchors may be loaded after substrate epoxy cure. See anchor manufacturer’s recommendations. Top of bolt shall be flush with top of the nut when installed. The anchor, when installed in 4000 psi normal-weight concrete with a 5/8" minimum embedment, shall have a minimum ordinate tension and shear of 3000 and 1500 psi, respectively.
**Universal Anchor System with Fiberglass Reinforced Plastic (FRP) Post**

Concrete anchor consists of 5/8" diameter stud bolt with UNC series bolt threads on the upper end. A heavy hex nut per ASTM 4503 and hardener washer per ASTM F858. The stud bolt should have ultimate yield and ultimate tensile strengths of 50 and 75ksi, respectively. Nuts, bolts and washers shall be galvanized per Item 443, "Galvanizing." The anchor base shall extend inward from the concrete. Concrete anchor with FRP post shall be in accordance with this specification. A 3 m x 10 m x 600 mm Concrete brick shall be used. Adhesive anchors shall be in accordance with Type III epoxy per SDS-610, "Epoxy and Adhesives." Adhesive anchors may be loaded after adequate epoxy cure time per the manufacturer’s recommendations.

**BOLT-DOWN DETAILS**

1. Dril 3/8" hole in FRP post and anchor base. Insert 5/8" hex nut and washer into anchor base. Use hammer to ensure the coupler is firmly seated. Top of coupler should be level with top of base post in most instances. Check to ensure there is no twist. If loose, increase the tightening of coupler.

**Typical Sign Mounting Detail for FRP Support with Back-to-Back Signs**

1. Position base plate with coupler on existing concrete.
2. Drill holes into concrete and insert 5/8" diameter bolt with washer, and tighten nuts.
3. Attach sign to FRP post.
4. Install bolts into new base post. Lower until the plate comes rest on steel rod.
5. Use hammer to ensure the coupler is firmly seated. Top of coupler should be level with top of base post in most instances. Check to ensure there is no twist. If loose, increase the tightening of coupler.

**Universal Anchor System with with Small Roadside Signs**

1. Position base plate with coupler on existing concrete.
2. Drill holes into concrete and insert 5/8" diameter bolt with washer, and tighten nuts.
3. Attach sign to FRP post.
4. Install bolts into new base post. Lower until the plate comes rest on steel rod.
5. Use hammer to ensure the coupler is firmly seated. Top of coupler should be level with top of base post in most instances. Check to ensure there is no twist. If loose, increase the tightening of coupler.

**GENERAL NOTES**

1. Frp sign supports for a simple type sign support may be used for signs up to 18" wide and including 16 square feet. Dual post尽快 may be used for signs up to 32 square feet.
2. All nuts, bolts and washers shall be galvanized per Item 443, "Galvanizing."
3. See the Traffic Operations Division website for detailed drawings of sign supports. The website address is [http://www.txdot.gov/publications/traffic.htm](http://www.txdot.gov/publications/traffic.htm)

**FRP POST REQUIREMENTS**

1. Materials shall conform to the requirements of Material Specification MD-415 and shall be furnished in a yellow or gray color as specified elsewhere in the plans.
2. Thickness of FRP sign support is 0.125\*0.0375" - 0.060".
3. FRP sign supports are prequalified by the Traffic Operations Division. Prequalification procedures are detailed in writing.