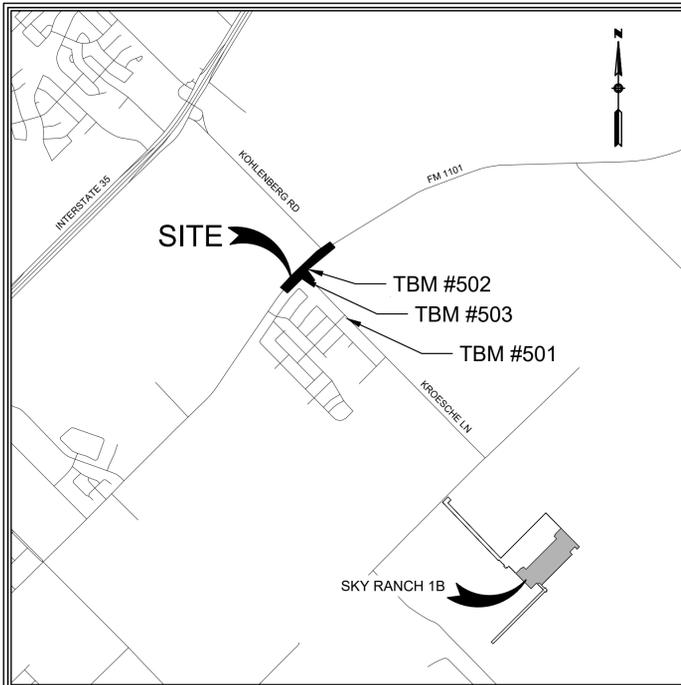


SKY RANCH M.U.D. FM 1101 AND KROESCHE LN TURN LANES CIVIL SITE CONSTRUCTION PLANS

LENNAR HOMES OF TEXAS, LLC
KROESCHE LN & FM 1101
NEW BRAUNFELS, TX 78130



PROJECT LOCATION MAP SCALE: 1" = 2,000'

PROJECT BENCHMARKS

TBM #503	TBM #502	TBM #501
4 MAG W/ WASHER IN SIDEWALK	THD BM DISK	4 MAG WITH WASHER IN CURB
N: 13816292.56815 E: 2270097.02640 ELEV: 670.89	N: 13816383.04903 E: 2270131.37180 ELEV: 670.26	N: 13815293.21005 E: 2271085.80386 ELEV: 686.93

REVIEW OF THE PLANS BY THE DISTRICT IS LIMITED TO WATER, WASTEWATER AND DRAINAGE AND DOES NOT INDICATE A REVIEW OF THE ADEQUACY OF THE DESIGN FOR THE FACILITIES. IN APPROVING THESE PLANS, THE DISTRICT MUST RELY ON THE ADEQUACY OF THE WORK OF THE DESIGN ENGINEER.

DISTRICT ENGINEER

REQUIRED PERMITS NUMBER

1. CITY OF NEW BRAUNFELS
2. TxDOT
3. COMAL COUNTY

MARCH 2026

ALL RESPONSIBILITY FOR THE ADEQUACY OF THESE PLANS REMAINS WITH THE ENGINEER OF RECORD. IN ACCEPTING THESE PLANS, THE CITY OF NEW BRAUNFELS MUST RELY UPON THE ADEQUACY OF THE WORK OF THE ENGINEER OF RECORD.

ERIC S. PLY
P.E. Registration No. 123317

PREPARED BY:



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TBPELS FIRM F-10961
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C0.2	NOTES (SHEET 2 OF 2)
C1.0	EXISTING CONDITIONS & DEMOLITION PLAN (SHEET 1 OF 2)
C1.1	EXISTING CONDITIONS & DEMOLITION PLAN (SHEET 2 OF 2)
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WATER IS A PRECIOUS COMMODITY IN THE STATE OF TEXAS AND NEW BRAUNFELS UTILITIES (NBU) IS PASSIONATE ABOUT PROTECTING THE LOCAL RESOURCE. NBU'S CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR ACQUIRING A FIRE HYDRANT METER SO THAT ALL WATER USED FOR CONSTRUCTION OR TESTING PURPOSES ARE PROPERLY ACCOUNTED FOR. NBU WILL NOT TOLERATE ANY WATER THEFT, REGARDLESS OF THE AMOUNT. IF WATER THEFT IS DISCOVERED NBU'S CONTRACTOR SHALL BE SUBJECT TO MONETARY PENALTIES, CRIMINAL CHARGES, AND STOPPAGE OF ALL CONSTRUCTION ACTIVITIES RELATED TO THE PROJECT. COSTS ASSOCIATED WITH ANY WORK STOPPAGE RESULTING FROM WATER THEFT SHALL BE AT THE FULL EXPENSE OF THE CONTRACTOR.

CITY OF NEW BRAUNFELS GENERAL NOTES

ALL MATERIALS AND CONSTRUCTION PROCEDURES WITHIN THE SCOPE OF THIS CONTRACT SHALL COMPLY WITH:

A. CURRENT CITY OF NEW BRAUNFELS CONSTRUCTION SPECIFICATIONS AND STANDARDS AS OF THE DATE OF THIS CONTRACT

B. THE MOST CURRENT EDITION OF TEXAS DEPARTMENT OF TRANSPORTATION "STANDARD SPECIFICATIONS FOR CONSTRUCTION OF HIGHWAYS, STREETS, AND BRIDGES".

ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE MOST CURRENT TEXAS DEPARTMENT OF TRANSPORTATION "STANDARD SPECIFICATIONS FOR CONSTRUCTION OF HIGHWAYS, STREETS, AND BRIDGES." ALONG WITH CURRENT CITY OF NEW BRAUNFELS AND GUADALUPE COUNTY SPECIFICATIONS. ANY DISCREPANCIES BETWEEN SPECIFICATIONS SHALL BE RESOLVED BY THE ENGINEER PRIOR TO PROCEEDING WITH CONSTRUCTION.

CONTRACTOR SHALL PROCURE ALL PERMITS AND LICENSES, PAY ALL CHARGES, FEES, AND TAXES AREA AND GIVE ALL NOTICES NECESSARY AND INCIDENTAL TO THE DUE AND LAWFUL PROSECUTION OF THE WORK.

ANY EXISTING OFF-SITE IMPROVEMENTS THAT ARE DAMAGED OR UNDERCUT BY THE CONTRACTOR'S OPERATIONS SHALL BE REPAIRED OR REPLACED AS DIRECTED BY THE ENGINEER AND APPROVED BY THE OWNER OF THE EXISTING IMPROVEMENT AT THE CONTRACTOR'S EXPENSE. (NO SEPARATE PAY ITEM)

WORK COMPLETED BY THE CONTRACTOR WHICH HAS NOT RECEIVED A WORK ORDER OR CONSENT OF THE OWNER OR ENGINEER WILL BE SUBJECT TO REMOVAL AND REPLACEMENT BY AND AT THE EXPENSE OF THE CONTRACTOR.

CONTRACTOR IS RESPONSIBLE FOR REMOVAL OF ALL WASTE MATERIALS UPON PROJECT COMPLETION. THE CONTRACTOR SHALL NOT PLACE ANY WASTE MATERIAL IN THE 100YR FLOOD PLAIN WITHOUT FIRST OBTAINING AN APPROVED FLOOD PLAIN DEVELOPMENT PERMIT.

BARRICADES AND WARNING SIGNS SHALL CONFORM TO THE "TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" AND SHALL BE LOCATED TO PROVIDE MAXIMUM PROTECTION TO THE PUBLIC AS WELL AS CONSTRUCTION PERSONNEL AND EQUIPMENT WHILE PROVIDING CONTINUOUS TRAFFIC FLOW AT ALL TIMES DURING CONSTRUCTION. THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING ALL DEVICES DURING CONSTRUCTION.

CONTRACTOR IS REQUIRED TO VERIFY PROJECT ELEVATIONS. THE TERM "MATCH EXISTING" SHALL BE UNDERSTOOD TO SIGNIFY BOTH HORIZONTAL AND VERTICAL ALIGNMENT.

WHEN MATCHING EXISTING PAVEMENTS, CURBS, DRIVES, AND WALKS, THEY SHALL BE SAW CUT FULL DEPTH AND REMOVED TO ALLOW FOR PROPOSED CONSTRUCTION. IF ANY EXISTING JOINT IS ENCOUNTERED, PRECAUTION SHALL BE TAKEN DURING REMOVAL OF CONCRETE SO AS NOT TO DAMAGE EXISTING DOWELS. ALL EXISTING DOWELS SHALL BE EXPOSED AND CLEANED.

ITEM OF WORK DESIGNATED "BY OTHERS" SHALL NOT BE CONSIDERED PART OF THIS CONTRACT.

ALL "COMPACTED SUBGRADE" SHALL CONSIST OF NATIVE MATERIAL SCARIFIED TO A MINIMUM DEPTH OF SIX INCHES AND COMPACTED TO 95% DENSITY ACCORDING TO DENSITY TEST METHOD TEX-115E OR ACCORDING TO ASTM D-698 AND TESTED BY ASTM D-2922.

ALL "FLEXIBLE BASE" SHALL BE TYPE "A", GRADE 4, ACCORDING TO TXDOT ITEM 247, COMPACTED TO 95% MODIFIED DENSITY AT A MOISTURE CONTENT BETWEEN -2 AND +3 OF OPTIMUM PERCENT MOISTURE ACCORDING TO ASTM D-1557 (MODIFIED PROCTOR) AND TESTED BY ASTM D-2922.

ASPHALT PAVEMENT SHALL BE THE TYPE SPECIFIED ON THE PLANS AND ACCORDING TO TXDOT ITEM 340 "HOT MIX ASPHALT CONCRETE PAVEMENT".

PRIME COAT USING MC-30 AT A RATE OF 0.2 GALLONS PER SQUARE YARD SHALL BE PLACED OVER PREPARED BASE AT LEAST ONE DAY PRIOR TO LAYING ASPHALTIC CONCRETE PAVEMENT. ANY NECESSARY TACK COAT SHALL BE MC-30 AT 0.05 GALLONS PER SQUARE YARD. IT IS REQUIRED THAT BOTH THE PRIME COAT AND THE TACK COAT BE APPLIED AT THE TEMPERATURE SPECIFIED UNDER TXDOT ITEM 300.3.

CONCRETE SHALL BE CLASS "A" ACCORDING TO TXDOT ITEM 421 UNLESS OTHERWISE ON PLANS.

REINFORCING STEEL SHALL BE FROM NEW BILLET AND SHALL CONFORM TO TXDOT ITEM 440. ALL DIMENSIONS RELATING TO REINFORCING STEEL ARE TO CENTER OF BARS EXCEPT WHEN REFERRING TO CLEARANCE.

ALL SAWED JOINTS SHALL BE SAWED WITHIN 24 HOURS OF POURING.

ABSOLUTELY NO WELDING OF REINFORCING BARS OR TORCHING TO BEND REINFORCING BARS SHALL BE ALLOWED WITHOUT THE SPECIFIC APPROVAL OF THE ENGINEER.

ORDINARY COMPACTION CONTROL IS REQUIRED ON THIS PROJECT.

ALL ROLLING FOR COMPACTION OF ASPHALTIC CONCRETE PAVEMENT SHALL BE COMPLETED BEFORE THE MIXTURE TEMPERATURE DROPS BELOW 175 DEG. (F).

ALL FILL MATERIAL SHALL BE SUBJECT TO THE ENGINEER'S APPROVAL.

CONTRACTOR AGREES TO ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE CONSTRUCTION OF THE PROJECT INCLUDING SAFETY OF ALL PERSONS AND PROPERTY. THAT THIS REQUIREMENT SHALL APPLY CONTINUOUSLY AND SHALL NOT BE LIMITED TO THE NORMAL WORKING HOURS; AND THAT THE CONTRACTOR SHALL DEFEND, INDEMNIFY AND HOLD THE OWNERS AND THE ENGINEER AND HIS EMPLOYEES, PARTNERS, OFFICES, DIRECTORS, OR CONSULTANTS, HARMLESS FROM ANY AND ALL LIABILITY, REAL OR ALLEGED, IN CONNECTION WITH THE PERFORMANCE OF THE WORK ON THIS PROJECT, EXCEPTING FROM LIABILITY ARISING FROM SOLE NEGLIGENCE OF THE OWNER OR ENGINEER, ENGINEER'S DIRECTORS, OFFICERS, EMPLOYEES, OR CONSULTANTS.

ALL CMP (CORRUGATED METAL PIPE) USED ON THIS PROJECT SHALL HAVE A MANNING'S "N" VALUE OF 0.024., UNLESS OTHERWISE SHOWN ON PLANS.

CONTRACTOR WILL BE RESPONSIBLE FOR ALL CONSTRUCTION TESTING PER CURRENT CITY OF NEW BRAUNFELS REQUIREMENTS. ALL TEST RESULTS SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW AND APPROVAL. ENGINEER AND OWNER RESERVE THE RIGHT TO HAVE THE CONTRACTOR REMOVE AND REPLACE ANY MATERIAL THAT WAS NOT TESTED OR FAILED TESTING. ALL COST ASSOCIATED WITH THE REMOVAL, REPLACEMENT AND TESTING SHALL BE PAID BY THE CONTRACTOR.

ALL PVC SLEEVES SHALL BE INSTALLED 3 FEET BELOW FINISHED GRADE AND ENDS SHALL BE MARKED SO THAT LOCATIONS OF SLEEVES CAN BE EASILY IDENTIFIED.

PRE-CONSTRUCTION CONFERENCE IS REQUIRED, ENGINEER WILL ARRANGE SUCH CONFERENCE IN COORDINATION WITH CITY OF NEW BRAUNFELS STREET INSPECTOR & NEW BRAUNFELS UTILITIES INSPECTOR. NO CONSTRUCTION MAY BEGIN PRIOR TO THE PRE-CONSTRUCTION CONFERENCE.

CONTRACTOR SHALL COORDINATE WITH DRY UTILITY INSTALLERS AND SHARED TRENCHING SHALL BE UTILIZED. CUTTING THE STREETS AFTER COMPLETION BY DRY UTILITIES SHALL NOT BE ACCEPTABLE.

AS PER PLATTING ORDINANCE SECTION 118-38M.: WHEN ALL IMPROVEMENTS ARE FOUND TO BE CONSTRUCTED AND COMPLETED IN ACCORDANCE WITH THE APPROVED PLANS AND SPECIFICATIONS AND WITH THE CITY'S STANDARDS, AND UPON RECEIPT OF ONE SET OF "RECORD DRAWINGS" PLANS, AND A DIGITAL COPY OF ALL PLANS (AUTOCAD 2000 MINIMUM) THE CITY ENGINEER SHALL ACCEPT SUCH IMPROVEMENTS FOR THE CITY OF NEW BRAUNFELS, SUBJECT TO THE GUARANTY OF MATERIAL AND WORKMANSHIP PROVISIONS IN THIS SECTION.

EROSION / SEDIMENTATION CONTROL

AT A MINIMUM, THESE CONTROLS SHALL CONSIST OF ROCK BERMS AND/OR SILT FENCES CONSTRUCTED PARALLEL TO AND DOWN GRADIENT FROM THE TRENCHES. THE ROCK BERM OR SILT FENCES SHALL BE INSTALLED IN A MANNER SUCH THAT ANY RAINFALL RUNOFF SHALL BE FILTERED. HAY BALES SHALL NOT BE USED FOR TEMPORARY EROSION AND SEDIMENTATION CONTROLS.

ALL TEMPORARY EROSION AND SEDIMENTATION CONTROLS MUST BE INSTALLED PRIOR TO CONSTRUCTION AND SHALL BE MAINTAINED DURING CONSTRUCTION BY THE CONTRACTOR. THE CONTRACTOR SHALL REMOVE THE CONTROLS WHEN VEGETATION IS ESTABLISHED AND THE CONSTRUCTION AREA IS STABILIZED {31 TAC 313.5 (C)(12)}. ADDITIONAL PROTECTION MAY BE REQUIRED IF EXCESSIVE SOLIDS ARE BEING DISCHARGED FROM THE SITE.

ALL TEMPORARY EROSION AND SEDIMENTATION CONTROLS SHALL BE REMOVED BY THE CONTRACTOR AT FINAL ACCEPTANCE OF THE PROJECT BY THE OWNER/ENGINEER.

PLACEMENT OF TEMPORARY EROSION AND SEDIMENTATION CONTROLS SHALL BE IN ACCORDANCE WITH THE CONSTRUCTION PLANS. ACTUAL LOCATIONS MAY VARY SLIGHTLY FROM THE PLANS, BUT WILL BE VERIFIED BY THE ENGINEER/INSPECTOR IN THE FIELD PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL INSPECT THE CONTROLS AT WEEKLY INTERVALS AND AFTER EVERY SIGNIFICANT RAINFALL TO INSURE DISTURBANCE OF THE STRUCTURES HAS NOT OCCURRED. SEDIMENT DEPOSITED AFTER A RAINFALL SHALL BE REMOVED FROM THE SITE OR PLACED IN AN ENGINEER APPROVED DESIGNATED DISPOSAL AREA.

CONTRACTOR SHALL BE RESPONSIBLE TO INSURE THAT NO EROSION CONTROL MEASURES BLOCK THE DRAINAGE SYSTEM FROM WORKING AS DESIGNED.

CITY OF NEW BRAUNFELS CONSTRUCTION NOTES

REVISED 03/2020

IF CONSTRUCTION HAS NOT COMMENCED WITHIN ONE-YEAR OF CITY APPROVAL FOR CONSTRUCTION INSPECTION, THAT APPROVAL IS NO LONGER VALID.

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.

ALL RESPONSIBILITY FOR THE ADEQUACY OF THESE PLANS REMAINS WITH THE ENGINEER OF RECORD. IN ACCEPTING THESE PLANS, THE CITY OF NEW BRAUNFELS MUST RELY UPON THE ADEQUACY OF THE WORK OF THE ENGINEER OF RECORD.

PRIOR TO THE START OF CONSTRUCTION, THE CONTRACTOR SHALL CONTACT THE CITY OF NEW BRAUNFELS TO SCHEDULE A PRECONSTRUCTION MEETING.

FOR PUBLIC INFRASTRUCTURE PERMIT OR GRADING PERMIT PROJECTS:

- FOR INSPECTIONS, YOU MUST CALL BEFORE 12:00 P.M., 48 HOURS PRIOR TO YOUR INSPECTION REQUEST.
EACH INSPECTION WILL BE ALLOTTED 1 HOUR UNLESS YOU REQUEST FOR MORE TIME.
ONCE YOUR REQUEST HAS BEEN ACCEPTED, YOU WILL RECEIVE A CALL FROM THE CITY OF NEW BRAUNFELS INSPECTOR.

FOR COMMERCIAL PERMIT (CP) PROJECTS:

- ALL INSPECTIONS ARE TO BE CALLED IN AT 830-221-4068 OR,
FAXED IN AT 830-608-2117 OR,
E-MAILED AT INSPECTIONS@NBTEXAS.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 RAISED 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 RAISED 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 RESPOND WITH PLAN REVISIONS FOR THE MITIGATION OF THE GROUNDWATER ISSUE. THE CITY ENGINEER SHALL RESPOND WITHIN TWO (2) BUSINESS DAYS UPON RECEIPT OF THE MITIGATION PLAN. ALL CONSTRUCTION ACTIVITY, IMPACTED BY THE DISCOVERY OF GROUNDWATER, SHALL BE SUSPENDED UNTIL THE CITY ENGINEER GRANTS A WRITTEN APPROVAL OF THE GROUNDWATER MITIGATION PLAN.

RECORD DRAWINGS

AS PER PLATTING ORDINANCE SECTION 118-38M.: WHEN ALL OF THE IMPROVEMENTS ARE FOUND TO BE CONSTRUCTED AND COMPLETED IN ACCORDANCE WITH THE APPROVED PLANS AND SPECIFICATIONS AND WITH THE CITY'S STANDARDS, AND UPON RECEIPT OF ONE SET OF "RECORD DRAWING" PLANS, AND A DIGITAL COPY OF ALL PLANS (PDF COPY) THE CITY ENGINEER SHALL ACCEPT SUCH IMPROVEMENTS FOR THE CITY OF NEW BRAUNFELS, SUBJECT TO THE GUARANTY OF MATERIAL AND WORKMANSHIP PROVISIONS IN THIS SECTION.

CONSTRUCTION NOTE

ENGINEER OF RECORD IS RESPONSIBLE TO ENSURE THAT EROSION CONTROL MEASURES AND STORMWATER CONTROL SUFFICIENT TO MITIGATE OFF SITE IMPACTS ARE 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. PROPERTIES ADJACENT TO STORMWATER CONVEYANCE STRUCTURES MUST HAVE FLOOR SLAB ELEVATION OR BOTTOM OF FLOOR JOISTS A MINIMUM OF ONE FOOT ABOVE THE 100-YEAR WATER FLOW ELEVATION IN THE STRUCTURE. DRIVEWAYS SERVING HOUSES ON THE DOWNHILL SIDE OF THE STREET SHALL HAVE A PROPERLY SIZED CROSS SWALE PREVENTING RUNOFF FROM ENTERING THE GARAGE.

SOILS TESTING

PROCTORS SHALL BE SAMPLED FROM ON-SITE MATERIAL (ON-SITE IS DEFINED AS LIMITS OF CONSTRUCTION FOR THIS

-PLAN SET) AND A COPY OF THE PROCTOR RESULTS SHALL BE DELIVERED TO THE CITY OF NEW BRAUNFELS STREET INSPECTOR PRIOR TO ANY DENSITY TESTS.

ROADWAY

ALL ROADWAY COMPACTION TESTS SHALL BE THE RESPONSIBILITY OF THE DEVELOPER'S GEOTECHNICAL ENGINEER. FLEXIBLE BASE OR FILL/EMBANKMENT MATERIAL SHALL BE PLACED IN UNIFORM LAYERS NOT TO EXCEED EIGHT INCHES (8") LOOSE. THE REQUIRED DENSITY FOR THE FILL/EMBANKMENT MATERIAL SHALL MEET THE REQUIREMENTS OF TXDOT'S SPECIFICATION ITEM 132. THE REQUIRED DENSITY FOR THE FLEXIBLE BASE MATERIAL SHALL MEET THE REQUIREMENTS OF TXDOT'S SPECIFICATION ITEM 247. 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-E, TEX-114-E, TEX-115-E. THE NUMBER AND LOCATION OF REQUIRED TESTS SHALL BE DETERMINED BY THE GEOTECHNICAL ENGINEER AND APPROVED BY THE CITY OF NEW BRAUNFELS STREET INSPECTOR. AT A MINIMUM, TESTS SHALL BE TAKEN EVERY 200 LF FOR EACH LIFT. UPON COMPLETION OF TESTING, THE GEOTECHNICAL ENGINEER WILL PROVIDE THE CITY OF NEW BRAUNFELS STREET INSPECTOR WITH ALL TESTING DOCUMENTATION AND A CERTIFICATION STATING THAT THE PLACEMENT OF FLEXIBLE BASE, AND FILL MATERIAL, AND SUBGRADE, HAS BEEN COMPLETED IN ACCORDANCE WITH THE PLANS. ADDITIONAL DENSITY TESTS MAY BE REQUESTED BY THE CITY OF NEW BRAUNFELS INSPECTOR.

ITEM 340

ASPHALTIC CONCRETE PAVEMENT SHALL BE THE TYPE OF 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 INCLUSIONS 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 PAVEMENT SURFACE COURSE SHALL BE PLANT MIXED, HOT LAID TYPE "D" MEETING THE SPECIFICATION REQUIREMENTS OF TXDOT ITEM 340. THE ASPHALTIC CONCRETE PAVEMENT SUB-SURFACE COURSES SHALL BE PLANT MIXED, HOT LAID TYPE "B" MEETING THE SPECIFICATION REQUIREMENTS OF TXDOT ITEM 340. THE MIXTURE SHALL BE DESIGNED PER THE DESIGN REQUIREMENTS SPECIFIED IN TXDOT ITEM 340 AND SHALL BE COMPACTED TO BETWEEN 91 AND 95 PERCENT OF THE MAXIMUM THEORETICAL DENSITY AS DETERMINED BY TXDOT TEST METHOD TEX-227-F. PLACE THE MIXTURE WHEN THE ROADWAY SURFACE TEMPERATURE IS AT OR ABOVE 60F. COMPLETE ALL COMPACTION OPERATIONS BEFORE THE PAVEMENT TEMPERATURE DROPS BELOW 160F. THE ASPHALT CEMENT CONTENT BY PERCENT OF TOTAL MIXTURE WEIGHT SHALL FALL WITHIN A TOLERANCE OF +0.5 PERCENT FROM A SPECIFIC MIX DESIGN.

UTILITIES

LOCATION AND DEPTH OF EXISTING UTILITIES SHOWN HERE ARE APPROXIMATE ONLY. ACTUAL LOCATIONS AND DEPTHS MUST BE VERIFIED BY THE CONTRACTOR PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTION OF ALL EXISTING UTILITIES ENCOUNTERED DURING CONSTRUCTION, INCLUDING THOSE NOT SHOWN ON THE DRAWINGS.

ANY EXISTING UTILITIES, ON OR OFF THE SITE, THAT ARE DAMAGED OR UNDERCUT BY THE CONTRACTOR'S OPERATIONS SHALL BE REPAIRED OR REPLACED AS DIRECTED BY THE ENGINEER AND APPROVED BY THE RESPECTIVE UTILITY COMPANY AT THE CONTRACTOR'S EXPENSE. CONTRACTOR SHALL NOTIFY APPROPRIATE UTILITY COMPANIES AND GOVERNMENTAL AGENCIES AT LEAST 48 HOURS PRIOR TO CONSTRUCTION AT:

THE CONTRACTOR SHALL NOTIFY THE FOLLOWING UTILITY COMPANIES 48 HOURS PRIOR TO EXCAVATION

Table with utility names and phone numbers: NEW BRAUNFELS UTILITIES (WATER AND SEWER) (830) 608-8971, NEW BRAUNFELS UTILITIES (ELECTRIC) (830) 608-8951, SPECTRUM CABLE (800) 245-4545, CENTERPOINT ENERGY (GAS) (830) 643-6434, AT&T (830) 303-1333, TEXAS ONE CALL SYSTEM (800) 245-4545, ENERGY TRANSFER (PETROLEUM PIPELINE) (210) 262-2486

CONTRACTOR SHALL REFERENCE NEW BRAUNFELS UTILITIES PLANS FOR FINAL ELECTRICAL LINE DESIGNS AND LAYOUT.

SEQUENCE OF CONSTRUCTION

- 1. INSTALL EROSION CONTROLS PER APPROVED PLAN.
2. TEMPORARY CONTROLS TO BE INSPECTED AND MAINTAINED WEEKLY AND PRIOR TO ANTICIPATED RAINFALL EVENTS, AND AFTER RAINFALL EVENTS, AS NEEDED. CONTRACTOR/OWNER SHALL PROVIDE A CONTACT NAME AND NUMBER FOR EROSION CONTROL ISSUES.
3. CONDUCT DEMOLITION ACTIVITIES, IF APPLICABLE.
4. CONSTRUCT DRAINAGE IMPROVEMENTS, IF APPLICABLE.
5. CONSTRUCT CURB INLET PROTECTION AT THE TIME OF CURB INLET INSTALLATION.
6. CONSTRUCT DEVELOPMENT PER APPROVED PLANS.
7. INSTALL STREETScape AND/OR LANDSCAPING IMPROVEMENTS.
8. CONTRACTOR TO VEGETATE ANY DISTURBED AREAS ONCE FINAL GRADING IS COMPLETE, AND ESTABLISH A MIN OF 70% VEGETATION PRIOR TO COMPLETION
9. REMOVE ALL TEMPORARY EROSION CONTROL MEASURES.
10. TPOES REQUIREMENTS - DISTURBED AREAS ON WHICH CONSTRUCTION ACTIVITIES HAVE CEASED (TEMPORARY OR PERMANENTLY) SHALL BE STABILIZED WITHIN 14 DAYS UNLESS ACTIVITY WILL BEGIN AGAIN WITHIN 21 DAYS

SKY RANCH MUNICIPAL UTILITY DISTRICT NOTES

THE DISTRICT ENGINEER, JONES-HEROY AND ASSOCIATES, INC. (KEN HEROY, P.E. PHONE 512-989-2200) SHALL BE CONTACTED 48 HOURS PRIOR TO

- I) PRE-CONSTRUCTION MEETINGS
II) BEGINNING EACH STAGE OF CONSTRUCTION
III) TESTING OF WATER AND/OR WASTEWATER LINES; AND
IV) FINAL WALK-THROUGH OF FACILITIES

Vertical text on the left margin: Drawing Name: M:_Projects\337 - Sky Ranch Unit 2A (94 Lots)\FM 1101 Turn Lane CDA\CDA\337.078_COVER.dwg User: adrian Oct 06, 2025 - 10:34am

290 S. CASTELL AVE., STE. 100
NEW BRAUNFELS, TX 78130
TBPELS FIRM F-10961
TBPELS FIRM 10153600



NOTES (SHEET 1 OF 2)

SKY RANCH MUD FM 1101 AND
KROESCHE LN TURN LANES

Table with 2 columns: NO., REVISION DESCRIPTION and 10 columns: REVISION DATE

DATE:
DRAWN BY:
DESIGNED BY: BP
REVIEWED BY: ESP
HMT PROJECT NO.: 337.078

SHEET
C0.1

UTILITY TRENCH COMPACTION (ADDED TO THE CONSTRUCTION PLANS ON ALL UTILITY PLAN SHEETS).
ALL UTILITY TRENCH COMPACTION TESTS WITHIN THE STREET PAVEMENT/SIDEWALK SECTION SHALL BE THE RESPONSIBILITY OF THE DEVELOPER'S GEOTECHNICAL ENGINEER. FILL MATERIAL SHALL BE PLACED IN UNIFORM LAYERS NOT TO EXCEED TWELVE INCHES (12") LOOSE. DETERMINE THE MAXIMUM LIFT THICKNESS BASED ON THE ABILITY OF THE COMPACTING OPERATION AND EQUIPMENT USED TO MEET THE REQUIRED DENSITY. 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-E, TEX-114-E, TEX-115-E. THE NUMBER AND LOCATION OF REQUIRED TESTS SHALL BE DETERMINED BY THE GEOTECHNICAL ENGINEER AND APPROVED BY THE CITY OF NEW BRAUNFELS STREET INSPECTOR. AT A MINIMUM, TESTS SHALL BE TAKEN EVERY 200 LF FOR EACH LIFT AND EVERY OTHER SERVICE LINE. UPON COMPLETION OF TESTING THE GEOTECHNICAL 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. ADDITIONAL DENSITY TESTS MAY BE REQUESTED BY THE CITY OF NEW BRAUNFELS INSPECTOR.

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 ENTRANCE

SAWCUT CURB FOR CONSTRUCTION ENTRANCE.
STABILIZED CONSTRUCTION AREA SHALL BE CONSTRUCTED OF 3'x5' ROCK TO BE PLACED A MINIMUM LENGTH OF 25-FT. 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.

SIGNING 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 SEALER AND FINAL MARKINGS. THE CITY WILL INSPECT ALL MARKINGS AT FINAL APPLICATION.

SEEDING AND ESTABLISHMENT OF VEGETATION WITHIN EARTHEN CHANNELS, STORMWATER BASINS AND DISTURBED AREAS

SEEDING FOR THE PURPOSE OF ESTABLISHING VEGETATION WITHIN CONSTRUCTED EARTHEN CHANNELS, BASINS AND DISTURBED AREAS SHALL BE CONDUCTED IN ACCORDANCE WITH ITEM 164 (SEEDING FOR EROSION CONTROL OF TXDOT'S STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MAINTENANCE OF HIGHWAYS, STREETS AND BRIDGES MANUAL. ONLY SEED TYPES AND MIXES SPECIFIED FOR THE SAN ANTONIO DISTRICT (DISTRICT 15 IN TABLES 1 AND 2 UNDER ITEM 164 SHALL BE UTILIZED. DURING THE COOL SEASON (SEPT 1-NOV 30, CEREAL RYE AND SEED SPECIES SPECIFIED FOR THE SAN ANTONIO DISTRICT IN TABLE 3 MAY BE USED. FOR COOL SEASON SEEDING APPLICATIONS, COOL SEASON SEED MIXES SHALL BE USED IN CONJUNCTION WITH SEED MIXES FOR THE SAN ANTONIO DISTRICT AS SPECIFIED IN TABLE 1 AND 2 UNDER ITEM 164.

IT MAY BE DEEMED NECESSARY TO INCORPORATE TOPSOIL AND SOIL AMENDMENTS (I.E. COMPOST/ FERTILIZER

INTO EXISTING SOIL IN ORDER TO FACILITATE VEGETATION GROWTH. TOPSOIL, COMPOST AND FERTILIZER ADDITIONS SHALL BE CONDUCTED ACCORDING TO ITEMS 160, 161 AND 166 OF TXDOT'S STANDARD SPECIFICATIONS MANUAL, RESPECTIVELY.

AREAS REQUIRING PERMANENT VEGETATION (EARTHEN CHANNELS, PONDS, ETC.) ARE REQUIRED TO MEET TXDOT SPECIFICATIONS FOR ITEM 160 TOPSOIL. TESTING PER TEX-128-E WILL BE REQUIRED AT THE CITY'S REQUEST.

WATERING MAY ALSO BE NECESSARY TO FACILITATE AND EXPEDITE THE SPROUTING AND GROWTH OF VEGETATION. ITEM 168 OF TXDOT'S STANDARD SPECIFICATIONS MANUAL SHALL BE ADHERED TO FOR VEGETATIVE WATERING.

IF EXTENDED DROUGHT CONDITIONS EXIST THAT HINDER OR PROHIBIT THE GROWTH AND ESTABLISHMENT OF VEGETATION, THE CONTRACTOR/ DEVELOPER SHALL PROVIDE A PLAN TO THE CITY OF NEW BRAUNFELS

DESCRIBING THE MEASURES THAT WILL BE TAKEN TO STABILIZE EARTHEN DRAINAGE INFRASTRUCTURE UNTIL A TIME WHEN GROWING CONDITIONS BECOME MORE FAVORABLE.

SKY RANCH MUNICIPAL UTILITY DISTRICT NOTES

THE DISTRICT ENGINEER, JONES-HEROY AND ASSOCIATES, INC. (KEN HEROY, P.E. PHONE 512-989-2200) SHALL BE CONTACTED 48 HOURS PRIOR TO

- I) PRE-CONSTRUCTION MEETINGS
- II) BEGINNING EACH STAGE OF CONSTRUCTION
- III) TESTING OF WATER AND/OR WASTEWATER LINES; AND
- IV) FINAL WALK-THROUGH OF FACILITIES

1. THE DESIGN AND CONSTRUCTION WILL PROVIDE FOR PRESERVING ALL EXISTING FEATURES IN OR NEAR THE STATE RIGHT OF WAY BEING AFFECTED BY THE WIDENING. THIS INCLUDES BUT IS NOT LIMITED TO, EXISTING DRIVEWAY GATE SET-BACKS, RELOCATION OF ELECTRONIC PRIVATE PROPERTY GATES, MAILBOX TURNOUTS, MAILBOXES AND SUPPORTS, CATTLE GUARDS, ROADWAY SIGNING, EXISTING RIP-RAP OR OTHER PERMANENT EROSION CONTROL FEATURES, DIVERSIONARY BERMS, SWALES, DITCHES, AMOUNT AND CONFIGURATION OF DRIVEWAY FLARES AND DRIVEWAY CENTERLINE PROFILE, METAL BEAM GUARD FENCE AND END TREATMENTS, ETC. EXISTING DRIVEWAY CULVERTS AND SAFETY END TREATMENTS IF EFFECTED BY ROADWAY WIDENING WILL BE RECONSTRUCTED TO PRESERVE EXISTING FRONT SLOPE RATES. THE COORDINATION OF ITEMS THAT AFFECT EXISTING PRIVATE PROPERTY ACCESS, MAIL DELIVERY, ETC. IS THE RESPONSIBILITY OF THE DEVELOPER. THE WRITTEN CONCURRENCE OF ANY AFFECTED PROPERTY OWNERS FOR CONSTRUCTION AFFECTING THEIR DRIVEWAYS OR MAILBOX. TURNOUTS MUST BE OBTAINED AND PROVIDED TXDOT PRIOR TO TXDOT DRIVEWAY PERMITS BEING ISSUED.

2. FOR WORK IN STATE RIGHT OF WAY, THE DEVELOPER IS RESPONSIBLE FOR COORDINATION OF, OBTAINING PERMITS FOR, AND COMPLYING WITH ANY AND ALL STATE AND FEDERAL REGULATORY AGENCIES AND ALL APPLICABLE LAWS, RULES AND REGULATIONS PERTAINING TO THE REGULATION OF DRAINAGE, PRESERVATION OF CULTURAL RESOURCES, NATURAL RESOURCES AND THE ENVIRONMENT. THE DEVELOPER IS RESPONSIBLE FOR DETERMINING IF THE PROJECT IS IN AN ENVIRONMENTALLY SENSITIVE AREA SUCH AS WITHIN THE RECHARGE OR CONTRIBUTING ZONE OF PROTECTED AQUIFERS, AND ACT IN ACCORDANCE WITH ALL RESOURCE AGENCY REGULATIONS.

a. IF TXDOT HAS A CZP OR WPAP ON FILE WITH TCEQ, THE DEVELOPER IS RESPONSIBLE FOR AMENDING TXDOT'S PERMIT, OBTAINING TCEQ APPROVAL AND PROVIDING TXDOT WITH THE APPROVED AMENDED PERMIT. THE AMENDED PERMIT WILL ADDRESS THE RELOCATION OF TXDOT PERMANENT BMP'S INCLUDING VEGETATIVE FILTER STRIPS THAT MAY BE IMPACTED BY WORK DONE WITHIN TXDOT.

b. IF TXDOT DOES NOT HAVE A CZP OR WPAP ON FILE WITH TCEQ, ANY PERMANENT BMP'S INCLUDING VEGETATIVE FILTER STRIPS, THAT MAY BE REQUIRED IN ORDER TO TREAT ADDITIONAL IMPERVIOUS COVER PLACED IN TXDOT ROW WILL BE LOCATED IN PRIVATE PROPERTY AND THE DEVELOPER WILL PROVIDE TXDOT WITH EVIDENCE OF TCEQ APPROVAL OF THE ADDITIONAL IMPERVIOUS COVER."

c. THE DEVELOPER MAY NOT OPERATE UNDER RESOURCE AGENCY ENVIRONMENTAL CLEARANCE OF A PREVIOUS OR ONGOING TXDOT PROJECT, BUT WILL BE REQUIRED TO OBTAIN SEPARATE RESOURCE/ENVIRONMENTAL AGENCY CLEARANCE.

3. IF WASTE AREAS OR MATERIAL SOURCE AREAS RESULT FROM THIS PROJECT, THE CONTRACTOR IS REMINDED TO FOLLOW SUPERSEDES ALL OTHER SPECIFICATIONS IN THE PLANS THE REQUIREMENTS OF THE TEXAS AGGREGATE QUARRY AND PIT SAFETY ACT. IN ADDITION, IT IS REQUESTED THAT THESE AREAS NOT BE VISIBLE FROM ANY HIGHWAY ON THE STATE SYSTEM.

a. ANY MATERIALS REMOVED AND NOT REUSED AND DETERMINED TO BE SALVAGEABLE SHALL BE STORED WITHIN THE PROJECT LIMITS AT AN APPROVED LOCATION OR DELIVERED UNDAMAGED TO THE STORAGE YARD AS DIRECTED. PROPERLY DISPOSE UNSALVAGEABLE MATERIALS IN ACCORDANCE WITH LOCAL, STATE, AND FEDERAL REGULATIONS. DEFACE TRAFFIC SIGNS SO THAT THEY WILL NOT REAPPEAR IN PUBLIC AS SIGNS.

4. ANY TREES EXISTING WITHIN STATE RIGHT OF WAY ARE THE NATURAL RESOURCES OF THE STATE AND WILL BE PROTECTED. IN THE EVENT THAT TREES MUST BE REMOVED, TXDOT WRITTEN PERMISSION WILL BE RECEIVED IN ADVANCE AND WILL IDENTIFY THE SPECIFIC TREES BY SPECIES, DIAMETER AND LOCATION TO BE REMOVED. THE DEVELOPER WILL BE FINED FOR ANY UNPERMITTED REMOVAL OF TREES.

a. IN THE EVENT THAT THERE ARE AREAS OF PUBLIC ROW DEDICATION RESULTING FROM THE PLATTING PROCESS, THE AREA WITHIN THE PUBLIC ROW DEDICATION DOES NOT PASS INTO TXDOT OWNERSHIP AS A RESULT OF PLATTING. HOWEVER, THE DEVELOPER WILL REMOVE ANY OLD FENCING, GATES AND UNSIGHTLY VEGETATION WITHIN THE AREA OF THE ROW DEDICATION, LEAVING IT IN AN AESTHETICALLY PLEASING CONDITION THE AREA OF ROW DEDICATION WILL NOT BE MOWED OR OTHERWISE MAINTAINED BY TXDOT. PRIOR TO REMOVAL OF TREES IN THE AREA OF ROW DEDICATION, THE TREES WILL FIRST BE EVALUATED IN ACCORDANCE WITH THE REQUIREMENTS OF LOCAL TREE PROTECTION ORDINANCES AND THE WRITTEN CONCURRENCE OF THE LOCAL JURISDICTION WILL BE PROVIDED TO TXDOT.

5. THE DEVELOPER WILL MAINTAIN AT THE PROJECT SITE, AND MAKE AVAILABLE UPON REQUEST, COPIES OF ALL APPROVED JOINT ENVIRONMENTAL PLANS AND PERMITS RELATING TO WORK IN STATE RIGHT OF WAY.

6. PRIOR TO BEGINNING GRADING ACTIVITY, THE CONTRACTOR WILL SET AND MAINTAIN ROADWAY STATIONING, CONTROL POINTS, MARKS, STAKES TO ESTABLISH LINES, SLOPES, GRADES AND CENTERLINES.

7. ANY SLOPES IN STATE RIGHT OF WAY WHICH BECOME STEEPER THAN 3:1 AS A RESULT OF THE WORK WILL BE TREATED WITH 4" THICK REINFORCED CONCRETE RIP-RAP AND BE TREATED WITH METAL BEAM GUARD FENCE. THIS MAY ENTAIL ADDITIONAL RIP-RAP BEYOND THAT SHOWN IN THE PLANS.

a. UNLESS OTHERWISE SHOWN ON THE PLANS, WHERE EXISTING CONCRETE RIP-RAP IS REMOVED, MODIFIED OR EXTENDED, THE PORTION TO BE REMOVED WILL BE NEARLY SAW-CUT PRIOR TO REMOVAL, AND THE NEW RIP-RAP WILL BE FORMED TO MATCH THE EXISTING LINES AND GRADES OF THE EXISTING RIP-RAP AND WILL BE DOWELED INTO THE EXISTING RIP-RAP WITH #3 BARS ON 12" CENTERS. THE DOWEL BARS WILL BE EPOXIED IN PLACE WITH EPOXY MEETING TXDOT REQUIREMENTS. THE MINIMUM EMBEDMENT LENGTH IS 9 INCHES. THIS APPLIES TO ANY TYPE OF CONCRETE RIP-RAP INCLUDING METAL BEAM GUARD FENCE OR CABLE BARRIER MOW STRIPS.

8. DUANE HOFFERRICHTER (830) 609-0707 IN NEW BRAUNFELS, TRAVIS YOUNG (830) 303-0130 IN SEGUIN, CHAD LUX (830) 816-2430 IN BOERNE, MARK ANDREWS (830) 393-3144 IN FLORESVILLE, TXDOT MAINTENANCE OFFICE WILL BE CONTACTED BY THE CONTRACTOR 48 HOURS PRIOR TO WORK OCCURRING IN STATE RIGHT OF WAY.

9. STATE RIGHT OF WAY WILL NOT BE USED AS AN AREA FOR CONTRACTOR PARKING OR FOR STAGING THE RECEIPT OF MATERIALS OR EQUIPMENT.

10. TRAFFIC CONTROL AND CONSTRUCTION BARRICADES WILL MEET THE REQUIREMENTS OF THE TEXAS MUTCD.

11. THE CONTRACTOR WILL PROVIDE ADVANCE NOTIFICATION TO THE ENGINEER OF IMPENDING/UPCOMING LANE CLOSURES FOR ALL TEMPORARY AND/OR PERMANENT LANE, RAMP, CONNECTOR, FRONTAGE, SHOULDER, MEDIAN CROSSOVER, ETC. CLOSURES OR DETOURS.

12. ACCESS TO ADJOINING PROPERTY MUST BE MAINTAINED AT ALL TIMES.

13. UNLESS OTHERWISE NOTED IN THE PLANS AND/OR AS DIRECTED BY THE AREA ENGINEER OR MAINTENANCE SUPERVISOR, DAILY LANE CLOSURES SHALL BE LIMITED ACCORDING TO THE FOLLOWING RESTRICTIONS:
a. NIGHTTIME: MAINTENANCE SUPERVISOR AND/OR AREA ENGINEER APPROVAL REQUIRED. (WITH UNIFORMED OFF DUTY LAW ENFORCEMENT OFFICERS)
b. WEEKEND CLOSURES: MAINTENANCE SUPERVISOR AND/OR AREA ENGINEER APPROVAL REQUIRED.

14. NO LANE CLOSURES OR ROADWAY CLOSURES WILL BE PERMITTED FOR THE FOLLOWING KEY DATES AND/OR SPECIAL EVENTS:

- a. BETWEEN DECEMBER 15 AND JANUARY 1.
- b. WEDNESDAY BEFORE THANKSGIVING THRU THE SUNDAY AFTER THANKSGIVING
- c. SATURDAY AND SUNDAY BEFORE MEMORIAL DAY AND LABOR DAY
- d. SATURDAY OR SUNDAY WHEN JULY 4 FALLS ON A FRIDAY OR MONDAY.

15. AT NO TIME WILL THE ROADWAY TRAVEL WAY BE BLOCKED.

16. LANE CLOSURES WILL ONLY BE PERMITTED WITH 48 HOUR PRIOR APPROVAL OF THE TXDOT MAINTENANCE SUPERVISOR LANE CLOSURES WILL BE PERMITTED ONLY BETWEEN 9: 00 A.M. AND 4: 00 P.M. MONDAY THROUGH FRIDAY.

a. FOR LANE CLOSURES ON TWO-LANE TWO-WAY ROADWAYS, INCLUDING DURING PILOT CAR OPERATIONS, FLAGGERS WILL BE PLACED AT THE BEGINNING AND END OF THE WORK ZONE AS WELL AS AT EACH INDIVIDUAL DRIVEWAY AND SIDE ROAD INTERSECTION WITHIN THE LIMITS OF THE WORK ZONE AND EXTENDING FOR A MINIMUM OF THE BEGINNING OF ADVANCED WARNING SIGNS EITHER END OF THE WORK ZONE TO CONTROL, WARN AND DIRECT SIDE ROAD AND DRIVEWAY TRAFFIC OF THE CHANGE IN TRAFFIC OPERATIONS. WHENEVER ONE WAY TRAFFIC CONTROL IS ACCOMPLISHED BY TRAFFIC SIGNALS WORK

ZONE FLAGGERS WILL BE SIMILARLY STATIONED AT EACH INDIVIDUAL DRIVEWAY AND SIDE ROAD INTERSECTION WITHIN THE LIMITS OF THE WORK ZONE AND EXTENDING FOR A MINIMUM OF THE BEGINNING OF THE ADVANCED WARNING SIGNS EITHER END OF THE WORK ZONE. ALL FLAGGERS WILL BE IN CONSTANT RADIO CONTACT.

17. A MINIMUM 3:1(H:V) TEMPORARY SAFETY SLOPE OF STABLE COMPACTED MATERIAL WILL BE REQUIRED ADJACENT TO THE STATE HIGHWAY EDGE OF PAVEMENT AT ALL TIMES DURING NON-WORKING HOURS.

18. ONLY ONE SIDE OF THE ROADWAY WILL BE OPEN TO CONSTRUCTION AT A TIME. WORK WILL BE COMPLETED, AND PAVEMENT EDGES BACKFILLED ON ONE SIDE OF THE ROAD BEFORE WORK WILL BEGIN ON THE OPPOSITE SIDE OF THE ROADWAY.

19. ALL MILLING, PAVING AND SEAL COAT OPERATIONS SHALL PROCEED IN THE DIRECTION OF TRAFFIC.

20. ANY PAVEMENT EDGE DROP-OFFS BETWEEN 1 AND 2 INCHES IN HEIGHT WILL HAVE CW 8-11 WARNING SIGNS. ANY PAVEMENT EDGE DROP-OFF 2 INCHES OR GREATER WILL HAVE A 3:1 COMPACTED SAFETY SLOPE AND CW 8-9A OR CW 8-11 SIGNS PLUS CHANNELIZING DEVICES. PAVEMENT EDGES WILL BE SHOULDERED UP WITH COMPACTED EMBANKMENT MATERIAL AND 4 INCHES OF TOPSOIL AS SOON AS POSSIBLE AFTER PAVING IS COMPLETED ON THE SIDE OF THE ROAD BEING WIDENED.

21. PROOF ROLLING OF SUBGRADE IS REQUIRED AND SHALL BE WITNESSED BY TXDOT PRIOR TO PLACEMENT OF PAVEMENT STRUCTURE UNLESS OTHERWISE APPROVED BY THE TXDOT MAINTENANCE SUPERVISOR. THE REQUIREMENT FOR PROOF-ROLLING OF SUBGRADE IS NOT SUPERSEDED BY ANY OTHER REQUIREMENTS INCLUDING THOSE OF ANY GEOTECHNICAL REPORT.

22. ALL FLEXIBLE BASE WILL HAVE A MINIMUM PLASTICITY INDEX OF 4.

23. ALL COURSES OF ASPHALTIC CONCRETE PAVEMENT (REGARDLESS OF TYPE) WILL BE PLACED WITH AN ASPHALT PAVING EQUIPMENT MEETING THE REQUIREMENTS OF TXDOT ITEM 320, "EQUIPMENT FOR ASPHALT CONCRETE PAVEMENT", UNLESS OTHERWISE APPROVED BY THE MAINTENANCE SUPERVISOR.

a. TACK COAT WILL BE APPLIED WITH AN ASPHALT DISTRIBUTOR AND SPREAD ACROSS THE SURFACE RECEIVING THE TACK COAT BY MULTIPLE PASSES OF A PNEUMATIC ROLLER. THE APPLICATION OF TACK COAT AND THE NUMBER OF PASSES OF THE PNEUMATIC ROLLER WILL BE SUFFICIENT TO MAKE THE SURFACE AND EXPOSED EDGES CONSISTENTLY BLACK WITH NO AREAS DEVOID OF TACK. ASPHALT FOR TACK COAT SHALL MEET TXDOT SPECS AND BE FROM A TXDOT APPROVED SOURCE.

24. ALL SURFACE AGGREGATES WILL MEET THE REQUIREMENTS OF TXDOT FRICTION CLASSIFICATION "B" AND WILL MEET PG BINDER GRADE 70-22.

25. ALL SURFACE ASPHALT CONCRETE PAVEMENT WILL BE UNDER-SEALED WITH A ONE COURSE SURFACE TREATMENT.

26. ALL ASPHALTIC CONCRETE PAVEMENT USED IN BASE COURSES WILL BE TYPE "A" OR "B" AND WILL MEET PG BINDER GRADE 64-22.

27. ALL PAVEMENT WIDENING INCLUDING SHOULDERS WILL MATCH THE EXISTING PAVEMENT CROSS SLOPE.

28. ALL PAVEMENT MARKINGS WILL BE TYPE 1 THERMOPLASTIC (100ML) WILL UNDER-SEAL MEETING THE REQUIREMENTS OF TXDOT ITEM 666, REFLECTORIZED PAVEMENT MARKINGS. THE CONTRACTOR WILL PLACE GUIDE MARKS IN ACCORDANCE WITH ITEM 666 AND WILL MAKE ARRANGEMENTS FOR TXDOT INSPECTION OF THE PAVEMENT MARKING LAYOUT PRIOR TO PLACEMENT OF STRIPING. EQUIPMENT USED FOR THE PLACEMENT OF STRIPING WILL MEET THE PRODUCTION REQUIREMENTS OF ITEM 666 UNLESS OTHERWISE APPROVED IN ADVANCE BY THE TXDOT MAINTENANCE SUPERVISOR.

29. EXISTING PAVEMENT MARKINGS THAT CONFLICT WITH PROPOSED PAVEMENT MARKINGS WILL BE LIGHTLY GROUND IN A MANNER THAT DOES NOT DAMAGE THE PAVEMENT SURFACE, TO REMOVE ANY PAVEMENT MARKING ACCUMULATION, AND WILL BE COVERED WITH A STRIP SEAL OF 18" MINIMUM WIDTH, CONSISTING OF PRECOATED GRADE 5, FRICTION CLASS B AGGREGATE.

30. ALL MATERIALS AND CONSTRUCTION METHODS USED IN STATE RIGHT OF WAY WILL MEET TXDOT SPECIFICATIONS. THIS SUPERSEDES ALL OTHER SPECIFICATIONS IN THE PLANS.

31. ALL TURN LANE CONCRETE PAVEMENT IN STATE ROW WILL MEET THE REQUIREMENTS OF TXDOT ITEM 360 CONCRETE AND WILL BE BATCHED AT CONCRETE PLANTS HAVING A CURRENT APPROVED MIX DESIGN. CLASS P CONCRETE SHALL HAVE 7 AND 28 DAY COMPRESSIVE STRENGTH OF 3200 PSI AND 4400 PSI RESPECTIVELY.

32. WHEN WIDENING EXISTING CONCRETE PAVEMENTS, JOINTS IN THE NEW PAVEMENT WILL MATCH JOINTS IN EXISTING PAVEMENT AND CURB.

33. THE CONTRACTOR IS RESPONSIBLE FOR ENSURING THAT TXDOT APPROVED MATERIALS, MIX DESIGNS, APPROVED SOURCES AND PRODUCTS ARE USED FOR ALL WORK IN STATE ROW. THE CONTRACTOR WILL ARRANGE FOR THE SERVICES OF A QUALIFIED TESTING LABORATORY FOR ALL ITEMS REQUIRING TESTING AND WILL NOTIFY TXDOT OF ANY DISCREPANCIES BETWEEN TEST RESULTS AND TXDOT SPECS IN A TIMELY MANNER. THE CONTRACTOR WILL PROVIDE TO TXDOT INVOICES AND TESTING RESULTS AS SOON THEY ARE AVAILABLE. FAILURE TO DO THIS WILL RESULT IN REJECTION OF THE WORK.

34. SAWING OF CONTRACTION/CONSTRUCTION JOINTS IN CONCRETE PAVEMENT WILL BE ACCOMPLISHED AS SOON AS PERSONNEL CAN WALK ON THE CONCRETE WITHOUT DAMAGING THE SURFACE REGARDLESS OF TIME OF DAY OR WEATHER CONDITIONS. STAND-BY POWER DRIVEN CONCRETE SAWS WILL BE PROVIDED DURING THE SAWING OPERATION. CURING COMPOUND WILL BE RE-APPLIED TO THE SAWED JOINT IMMEDIATELY UPON SAWING THE JOINT.

35. GUARDRAIL SET'S WILL BE TYPE 3 UNLESS OTHERWISE APPROVED BY THE TXDOT MAINTENANCE SUPERVISOR. GUARDRAIL MOWSTRIP PLACED ADJACENT TO OTHER CONCRETE RIP-RAP WILL BE SEPARATED BY A FORMED CONSTRUCTION JOINT.

36. ANY CONCRETE CURB TO BE REMOVED WILL BE SAW-CUT AT THE LIMITS OF REMOVAL AND BE REMOVED ENTIRELY, SLICING THE TOP PORTION OF THE CURB OFF AND LEAVING REMAINING PORTION OF CURB IN PLACE IS UNACCEPTABLE.

37. ANY DAMAGE TO TXDOT FACILITIES WILL BE REPAIRED AT NO EXPENSE TO THE STATE, TO TXDOT'S SATISFACTION.

38. SIDEWALKS PLACED IN THE HIGHWAY RIGHT-OF-WAY WILL BE A MINIMUM WIDTH OF FIVE FEET OR COMPLY WITH THE MORE STRINGENT WIDTH AS REQUIRED BY CITY ORDINANCE AND WILL MEET ALL OTHER REQUIREMENTS OF THE AMERICANS WITH DISABILITIES ACT. PEDESTRIAN RAMPS WILL BE PROVIDED AT STREET AND DRIVEWAY INTERSECTIONS AS SHOWN ON THE CURRENT STATE STANDARD FOR PEDESTRIAN FACILITIES. COLOR CONTRAST AND TEXTURING OF PEDESTRIAN RAMPS WILL BE PLACE AT STREET INTERSECTION RAMPS ONLY AS SHOWN ON THE CURRENT STATE STANDARD FOR PEDESTRIAN FACILITIES. PEDESTRIAN RAMPS AT DRIVEWAY INTERSECTIONS WILL NOT RECEIVE ANY COLOR CONTRAST OR TEXTURING. METAL PLATING FOR SIDEWALK BRIDGES WILL MATCH THE TYPICAL WIDTH OF THE APPROACH SIDEWALK. THIS MAY RESULT IN A WIDTH THAT IS GREATER THAN SHOWN IN THE STANDARD DETAILS INCLUDED IN THE PLANS.

39. THE CONTRACTOR WILL USE BEST MANAGEMENT PRACTICES (BMP'S) TO MINIMIZE EROSION AND SEDIMENTATION IN THE STATE RIGHT OF WAY RESULTING FROM THE PROPOSED CONSTRUCTION. RE-VEGETATION OF DISTURBED AREAS WILL BE COMPLETED IN ACCORDANCE WITH TXDOT STANDARD SPECIFICATIONS. PERMANENT VEGETATIVE COVER MUST ACHIEVE 70% COVERAGE PRIOR TO PROJECT ACCEPTANCE. SOIL RETENTION BLANKETS MAY BE REQUIRED TO PREVENT EROSION OF TOPSOIL PRIOR TO VEGETATION RE-ESTABLISHMENT.

40. PRIOR TO SEEDING OR RE-VEGETATION THE FRONT SLOPES WILL BE SHOULDERED UP WITH TOPSOIL TO ELIMINATE ANY PAVEMENT EDGE DROP-OFF.

41. MUD TRACKED ONTO THE ROADWAY FROM THE SITE WILL BE IMMEDIATELY REMOVED TO THE SATISFACTION OF TXDOT.

42. IT WILL BE THE DEVELOPER/OWNER'S RESPONSIBILITY TO CLEAN OUT, TO THE STATE'S SATISFACTION, ANY DRAINAGE STRUCTURE OR STORM SEWER SYSTEM THAT BECOMES SILTED AS A RESULT OF THEIR OPERATIONS.

43. THE ADJUSTMENT OF ANY UTILITIES IN STATE RIGHT OF WAY OR ADJACENT PRIVATE EASEMENT WILL BE THE RESPONSIBILITY OF THE DEVELOPER/OWNER.

44. THE CONTRACTOR IS RESPONSIBLE FOR PLACING AND MAINTAINING EXISTING SIGNS ON TXDOT APPROVED TEMPORARY MOUNTS UNTIL PERMANENT SIGNS ARE PLACED.

45. THE FINAL PLACEMENT OF PERMANENT SIGNS WILL BE COORDINATED PRIOR TO PLACEMENT WITH THE LOCAL TXDOT MAINTENANCE SUPERVISOR.

46. FOR WORK WITHIN THE STATE RIGHT OF WAY WHERE REMOVAL OF MATERIALS OR DEBRIS WITHIN THE CONSTRUCTION LIMITS AND NOT INCORPORATED IN THE FINISHED ROADWAY SECTION OF RIGHT OF WAY, WILL BE DISPOSED OF IN A MANNER ACCEPTABLE TO THE MAINTENANCE SUPERVISOR AT NO EXPENSE TO THE STATE. MATERIALS THAT ARE NOT DETERMINED TO BE SALVAGEABLE BY THE MAINTENANCE SUPERVISOR BECOME THE PROPERTY OF THE CONTRACTOR FOR PROPER DISPOSAL AT THEIR EXPENSE. MATERIALS DETERMINED TO BE SALVAGEABLE WILL BE RETURNED TO THE STATE AND DELIVERED TO THE LOCATION AS DETERMINED BY THE MAINTENANCE SUPERVISOR.

47. REGARDLESS OF ERRORS AND OMISSIONS IN INFORMATION PROVIDED IN THE PLANS OR CROSS-SECTIONS THE PERMITEE IS RESPONSIBLE FOR PROVIDING FOR POSITIVE DRAINAGE OUTFALLS WITHIN AND OFF THE LIMITS OF THE PROJECT.

a. KEEP THE SIGNALS IN OPERATION AT ALL TIMES EXCEPT WHEN NECESSARY FOR SPECIFIC INSTALLATION OPERATIONS, INCLUDING ANY MODIFICATIONS TO EXISTING SIGNAL HEADS TO MAINTAIN CLEAR VISIBILITY AT ALL TIMES. WHEN IT IS NECESSARY FOR A SIGNAL TO BE TURNED OFF, HIRE OFF DUTY POLICE OFFICERS TO CONTROL THE TRAFFIC UNTIL THE SIGNALS ARE BACK IN SATISFACTORY CONDITION.

48. (FOR WORK IN CITY OF NEW BRAUNFELS) ALL TRAFFIC SIGNALS ON THE STATE HIGHWAY SYSTEM WITHIN THE NEW BRAUNFELS CITY LIMITS, WITH THE EXCEPTION OF SIGNALS ON IH 35, ARE THE RESPONSIBILITY OF THE CITY OF NEW BRAUNFELS AND THE CITY OF NEW BRAUNFELS WILL PERFORM CONSTRUCTION INSPECTION. CONTACT GARRY FORD, P.E. AT (830) 221-4645, 48 HOURS PRIOR TO THE NEED FOR ANY INSPECTIONS. ALSO, WHEN NON- TRAFFIC SIGNAL WORK IS BEING PERFORMED WITHIN 400 FEET OF AN EXISTING SIGNALIZED INTERSECTION, FLASHING BEACON OR SCHOOL ZONE FLASHER OR OTHER TYPE OF SIGNAL, IF WITHIN THE CITY OF NEW BRAUNFELS AREA OF RESPONSIBILITY CONTACT GARRY FORD, P.E. TO DETERMINE/VERIFY THE LOCATION OF LOOP DETECTORS, CONDUIT, GROUND-BOXES, ETC. FOR ALL OTHER LOCATIONS, CONTACT TXDOT REPRESENTATIVE, MIKE GARZA, AT (210) 615-6028, E-MAIL IS MIKE.GARZA@TXDOT.GOV. THE CONTRACTOR IS RESPONSIBLE FOR REPAIR OR REPLACEMENT OF ANY SIGNAL EQUIPMENT DAMAGED BY CONSTRUCTION OPERATIONS. THE METHOD OF REPAIR OR REPLACEMENT SHALL BE PRE-APPROVED AND INSPECTED. DEPENDING ON THE TYPE AND EXTENT OF THE DAMAGE, THE ENGINEER RESERVES THE RIGHT TO PERFORM THE REPAIR OR REPLACEMENT WORK AND THE CONTRACTOR WILL BE BILLED FOR THIS WORK. WHEN WORKING NEAR AERIAL ELECTRICAL LINES OR UTILITY POLES, COMPLY WITH FEDERAL, STATE AND LOCAL REGULATIONS.

49. (FOR AREAS OTHER THAN CITY OF NEW BRAUNFELS) WHEN NON- TRAFFIC SIGNAL WORK IS BEING PERFORMED WITHIN 400 FEET OF AN EXISTING SIGNALIZED INTERSECTION, FLASHING BEACON OR SCHOOL ZONE FLASHER OR OTHER TYPE OF SIGNAL, CONTACT TXDOT REPRESENTATIVE, MIKE GARZA, AT (210) 615-6028, E-MAIL IS MIKE.GARZA@TXDOT.GOV. THE CONTRACTOR IS RESPONSIBLE FOR REPAIR OR REPLACEMENT OF ANY SIGNAL EQUIPMENT DAMAGED BY CONSTRUCTION OPERATIONS. THE METHOD OF REPAIR OR REPLACEMENT SHALL BE PRE-APPROVED AND INSPECTED. DEPENDING ON THE ON THE TYPE AND EXTENT OF THE DAMAGE, TXDOT RESERVE THE RIGHT TO PERFORM THE REPAIR OR REPLACEMENT WORK AND THE CONTRACTOR WILL BE BILLED FOR THIS WORK WHEN WORKING NEAR AERIAL ELECTRICAL LINES OR UTILITY POLES, COMPLY WITH FEDERAL, STATE AND LOCAL REGULATIONS.

290 S. CASTELL AVE., STE. 100
NEW BRAUNFELS, TX 78130
TBPBLS FIRM F-10961
TBPBLS FIRM 10153600



10/06/2025



NOTES (SHEET 2 OF 2)

SKY RANCH MUD FM 1101 AND KROESCHE LN TURN LANES

NO.	REVISION DESCRIPTION	REVISION DATE

DATE:

DRAWN BY:

DESIGNED BY: **BP**

REVIEWED BY: **ESP**

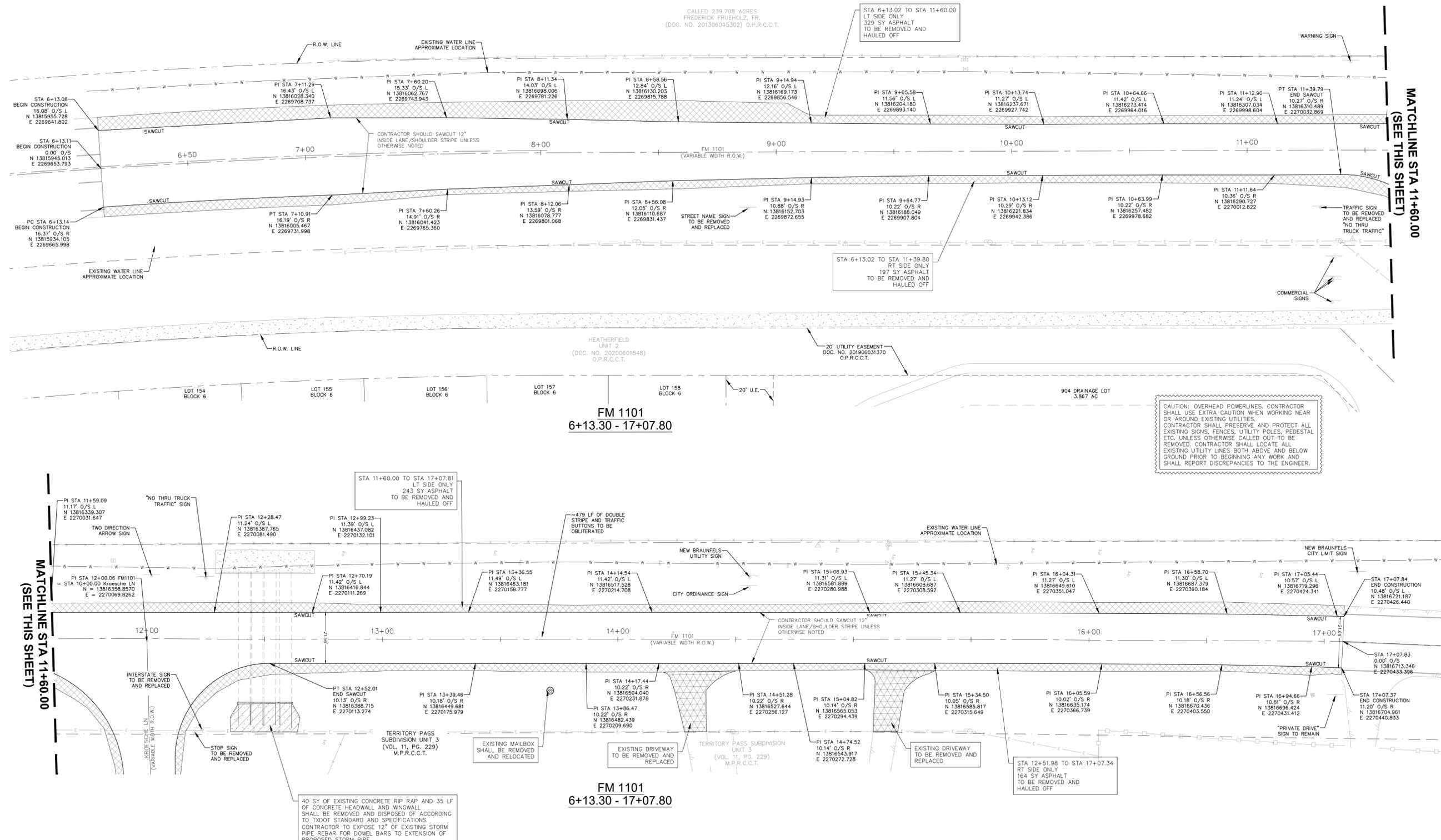
HMT PROJECT NO.:

337.078

SHEET

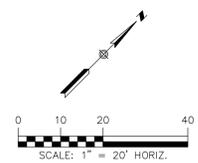
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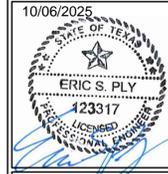


LEGEND

- ADJOINER BOUNDARY
- EASEMENT
- CENTERLINE
- EDGE OF ASPHALT
- EXISTING WATER
- EXISTING WASTEWATER
- EXISTING ELECTRIC
- EXISTING WIRE FENCE
- EXISTING CHAINLINK FENCE
- EXISTING FIRE HYDRANT
- EXISTING POWER POLE
- EXISTING WATER VALVE
- EXISTING MAILBOX
- EXISTING ELECTRIC BOX
- EXISTING CABLE PEDESTAL
- EXISTING TELEPHONE PEDESTAL
- EXISTING WATER METER
- EXISTING STREET SIGN
- PIN FLAG (PURPOSE OR UTILITY UNIDENTIFIED)
- REMOVE AND HAULED OFF
- EXISTING DRIVEWAY TO BE REMOVED AND HAULED OFF
- EXISTING CONCRETE
- EXISTING RIPRAP TO BE REMOVED



290 S. CASTELL AVE., STE. 100
NEW BRAUNFELS, TX 78130
TBPELS FIRM F-10961
TBPELS FIRM 10153600



EXISTING CONDITIONS & DEMOLITION PLAN
(SHEET 1 OF 2)

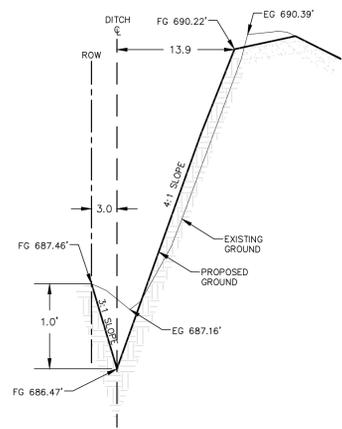
NO.	REVISION DESCRIPTION	REVISION DATE

DATE: _____
DRAWN BY: BP
DESIGNED BY: BP
REVIEWED BY: ESP
HMT PROJECT NO.: 337-078

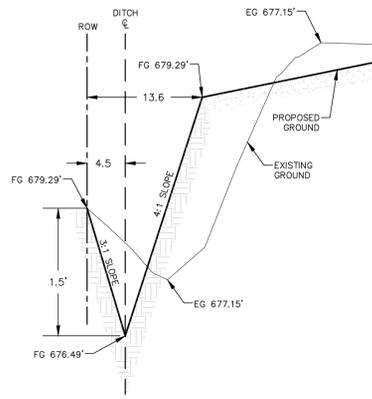
SHEET
C1.0

SKY RANCH MUD FM 1101 AND
KROESCHE LN TURN LANES

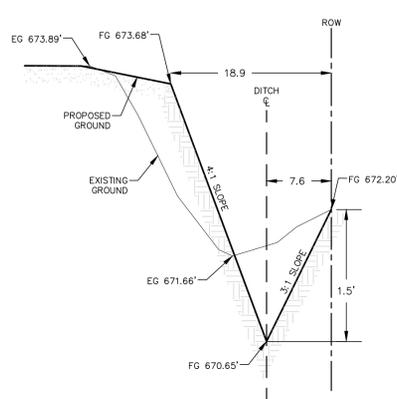
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SECTION A1-A1
DITCH A1
V-SWALE @ 3%
N.T.S.



SECTION A2-A2
DITCH A2
V-SWALE @ 3%
N.T.S.

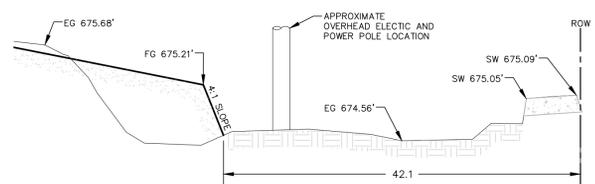
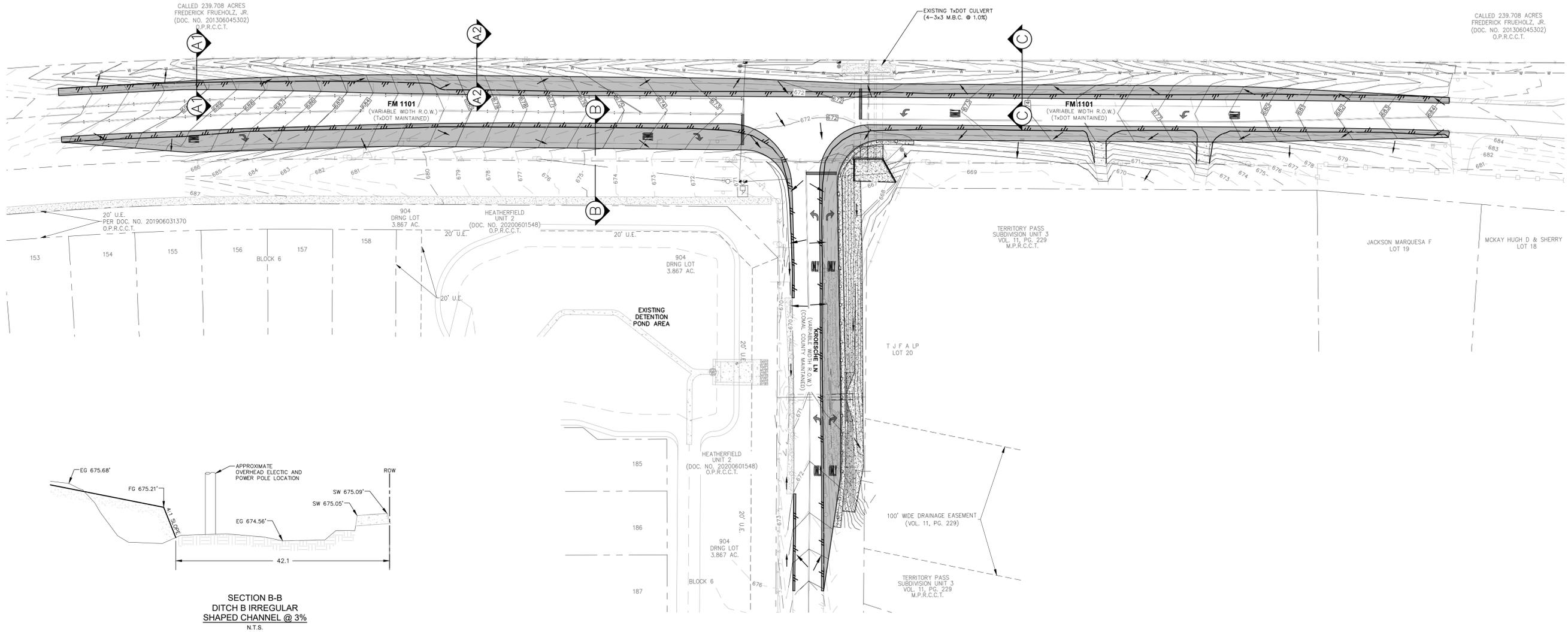
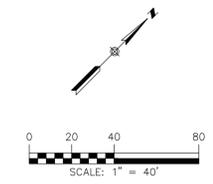


SECTION C-C
DITCH C
V-SWALE @ 3%
N.T.S.

NOTE:
REFER TO C1.3 FOR DITCH
HYDRAULIC CALCULATIONS

LEGEND

- ADJOINER BOUNDARY
- EASEMENT
- CENTERLINE
- EDGE OF ASPHALT
- EXISTING WATER
- EXISTING WASTEWATER
- EXISTING ELECTRIC
- EXISTING WIRE FENCE
- EXISTING CHAINLINK FENCE
- EXISTING METAL RAILING
- EXISTING CONTOUR LINES
- PROPOSED CONTOUR LINES
- U.E. UTILITY EASEMENT
- FLOW ARROWS
- EXISTING FIRE HYDRANT
- EXISTING POWER POLE
- EXISTING GUY ANCHOR
- EXISTING WATER VALVE
- EXISTING MAILBOX
- EXISTING ELECTRIC BOX
- EXISTING CABLE PEDESTAL
- EXISTING TELEPHONE PEDESTAL
- EXISTING WATER METER
- EXISTING STREET SIGN
- EXISTING CONCRETE
- PROPOSED PAVING
- PROPOSED ASPHALT
- NATURAL GROUND



SECTION B-B
DITCH B IRREGULAR
SHAPED CHANNEL @ 3%
N.T.S.

290 S. CASTELL AVE., STE. 100
NEW BRAUNFELS, TX 78130
TBPELS FIRM F-10961
TBPELS FIRM 10153600

10/06/2025
STATE OF TEXAS
ERIC S. PLY
123317
LICENSED PROFESSIONAL SURVEYOR

10/06/2025
CALLED 239.708 ACRES
FREDERICK FRUEHOLZ, JR.
(DOC. NO. 201306045302)
O.P.R.C.C.T.

10/06/2025
CALLED 239.708 ACRES
FREDERICK FRUEHOLZ, JR.
(DOC. NO. 201306045302)
O.P.R.C.C.T.

ROADSIDE DITCH SECTIONS

SKY RANCH MUD FM 1101 AND
KROESCHE LN TURN LANES

NO.	REVISION DESCRIPTION	REVISION DATE

DATE: _____
DRAWN BY: _____
DESIGNED BY: **BP**
REVIEWED BY: **ESP**

HMT PROJECT NO.: **337.078**

SHEET
C1.2

THE LOCATION OF ALL EXISTING UNDERGROUND UTILITIES ARE SHOWN IN APPROXIMATE LOCATIONS ONLY. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK. THE CONTRACTOR WILL AGREE TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE INCURRED BY THEIR FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES, STRUCTURES OR FACILITIES. CONTRACTOR SHALL NOTIFY ENGINEER OF ANY DISCREPANCIES 24-HOURS PRIOR TO COMMENCING CONSTRUCTION.

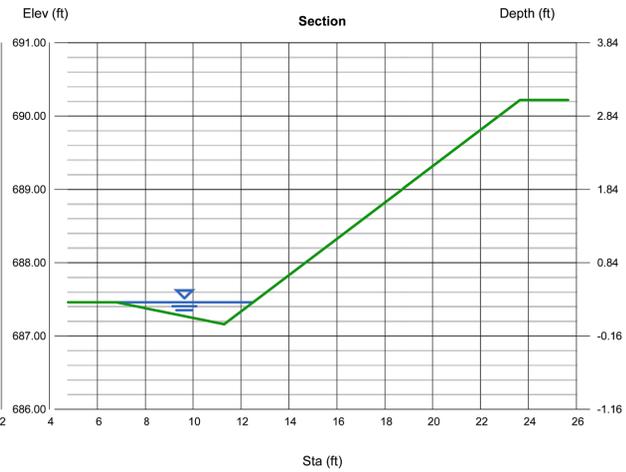
Channel Report

Hydraulix Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Thursday, Oct 2 2025

EXISTING DITCH A, SECTION A1-A1, MAXIMUM CAPACITY

User-defined		Highlighted	
Invert Elev (ft)	= 687.16	Depth (ft)	= 0.30
Slope (%)	= 3.00	Q (cfs)	= 1.776
N-Value	= 0.035	Area (sqft)	= 0.86
		Velocity (ft/s)	= 2.07
Calculations		Wetted Perim (ft)	= 5.78
Compute by:	Known Depth	Crit Depth, Yc (ft)	= 0.30
Known Depth (ft)	= 0.30	Top Width (ft)	= 5.73
		EGL (ft)	= 0.37

(Sta, El, n)-(Sta, El, n)...
(6.78, 687.46)-(11.30, 687.16, 0.035)-(23.65, 690.22, 0.035)



EXISTING SECTION A1-A1
DITCH A, VSWALE
SHAPED CHANNEL @ 3%

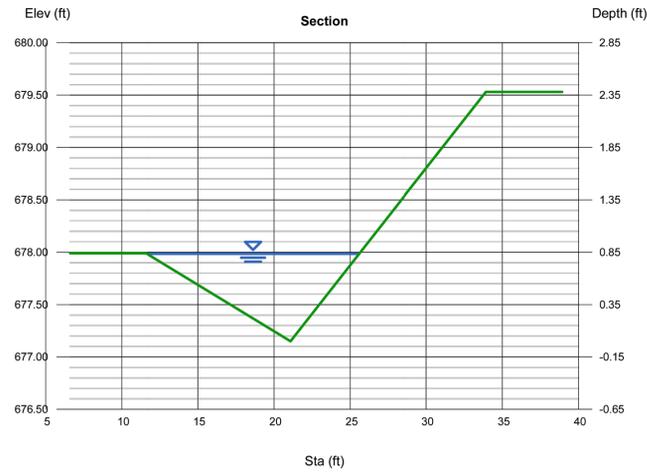
Channel Report

Hydraulix Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Thursday, Oct 2 2025

EXISTING DITCH A, SECTION A2-A2, MAXIMUM CAPACITY

User-defined		Highlighted	
Invert Elev (ft)	= 677.15	Depth (ft)	= 0.84
Slope (%)	= 3.00	Q (cfs)	= 23.78
N-Value	= 0.035	Area (sqft)	= 5.81
		Velocity (ft/s)	= 4.09
Calculations		Wetted Perim (ft)	= 14.03
Compute by:	Known Depth	Crit Depth, Yc (ft)	= 0.87
Known Depth (ft)	= 0.84	Top Width (ft)	= 13.92
		EGL (ft)	= 1.10

(Sta, El, n)-(Sta, El, n)...
(11.61, 677.89)-(21.08, 677.15, 0.035)-(33.92, 679.53, 0.035)



EXISTING SECTION A2-A2
DITCH A, VSWALE
SHAPED CHANNEL @ 3%

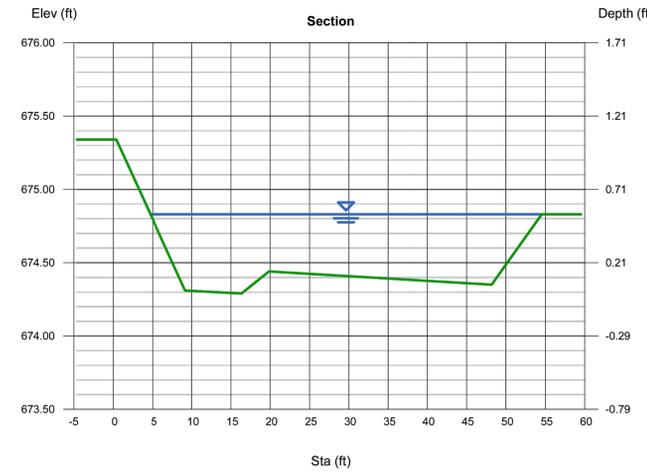
Channel Report

Hydraulix Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Thursday, Oct 2 2025

EXISTING DITCH B, SECTION B-B, MAXIMUM CAPACITY

User-defined		Highlighted	
Invert Elev (ft)	= 674.29	Depth (ft)	= 0.54
Slope (%)	= 3.00	Q (cfs)	= 83.06
N-Value	= 0.035	Area (sqft)	= 20.44
		Velocity (ft/s)	= 4.06
Calculations		Wetted Perim (ft)	= 49.86
Compute by:	Known Depth	Crit Depth, Yc (ft)	= 0.58
Known Depth (ft)	= 0.54	Top Width (ft)	= 49.81
		EGL (ft)	= 0.80

(Sta, El, n)-(Sta, El, n)...
(0.38, 675.34)-(9.16, 674.31, 0.035)-(16.34, 674.29, 0.035)-(19.84, 674.44, 0.035)-(48.19, 674.35, 0.035)-(54.54, 674.83, 0.035)



EXISTING SECTION B-B
DITCH B, IRREGULAR CHANNEL
SHAPED CHANNEL @ 3%

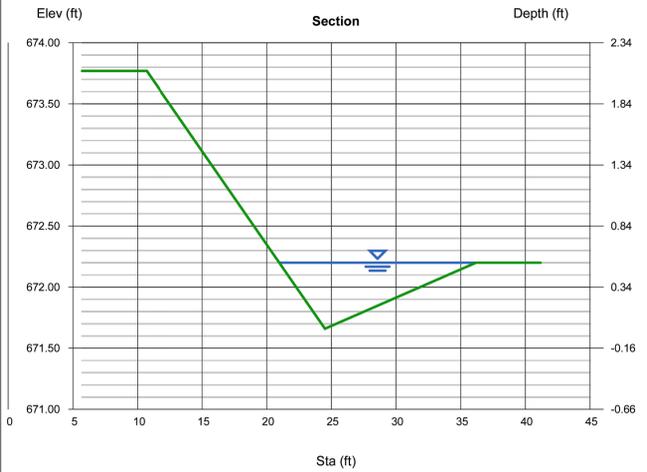
Channel Report

Hydraulix Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Thursday, Oct 2 2025

EXISTING DITCH C, SECTION C-C, MAXIMUM CAPACITY

User-defined		Highlighted	
Invert Elev (ft)	= 671.66	Depth (ft)	= 0.54
Slope (%)	= 3.00	Q (cfs)	= 12.59
N-Value	= 0.035	Area (sqft)	= 4.10
		Velocity (ft/s)	= 3.07
Calculations		Wetted Perim (ft)	= 15.25
Compute by:	Known Depth	Crit Depth, Yc (ft)	= 0.55
Known Depth (ft)	= 0.54	Top Width (ft)	= 15.19
		EGL (ft)	= 0.69

(Sta, El, n)-(Sta, El, n)...
(10.70, 673.77)-(24.51, 671.66, 0.035)-(36.17, 672.20, 0.035)



EXISTING SECTION C-C
DITCH C, VSWALE
SHAPED CHANNEL @ 3%

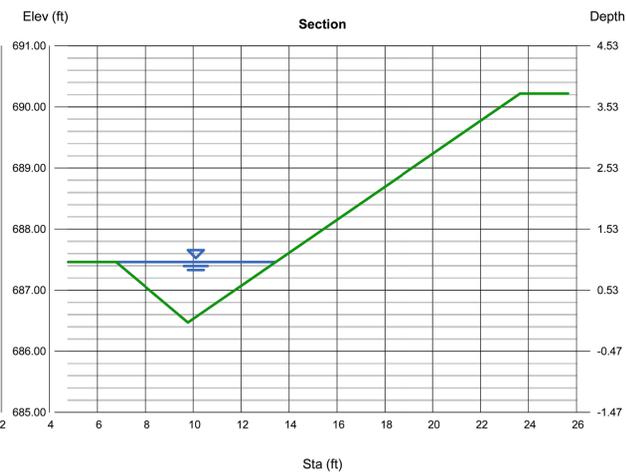
Channel Report

Hydraulix Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Thursday, Oct 2 2025

PROPOSED DITCH A, SECTION A1-A1, MAXIMUM CAPACITY

User-defined		Highlighted	
Invert Elev (ft)	= 686.47	Depth (ft)	= 0.99
Slope (%)	= 3.00	Q (cfs)	= 14.77
N-Value	= 0.035	Area (sqft)	= 3.30
		Velocity (ft/s)	= 4.48
Calculations		Wetted Perim (ft)	= 6.95
Compute by:	Known Depth	Crit Depth, Yc (ft)	= 1.04
Known Depth (ft)	= 0.99	Top Width (ft)	= 6.66
		EGL (ft)	= 1.30

(Sta, El, n)-(Sta, El, n)...
(6.78, 687.46)-(9.78, 686.47, 0.035)-(23.65, 690.22, 0.035)



PROPOSED SECTION A1-A1
DITCH A, VSWALE
SHAPED CHANNEL @ 3%

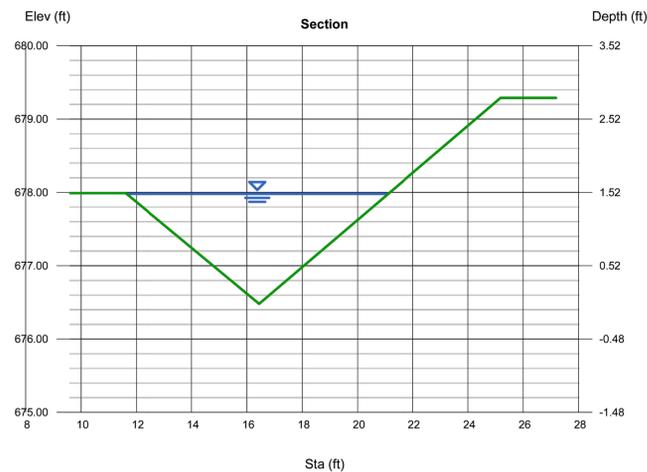
Channel Report

Hydraulix Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Thursday, Oct 2 2025

PROPOSED DITCH A, SECTION A2-A2, MAXIMUM CAPACITY

User-defined		Highlighted	
Invert Elev (ft)	= 676.48	Depth (ft)	= 1.50
Slope (%)	= 3.00	Q (cfs)	= 41.80
N-Value	= 0.035	Area (sqft)	= 7.10
		Velocity (ft/s)	= 5.89
Calculations		Wetted Perim (ft)	= 9.93
Compute by:	Known Depth	Crit Depth, Yc (ft)	= 1.61
Known Depth (ft)	= 1.50	Top Width (ft)	= 9.46
		EGL (ft)	= 2.04

(Sta, El, n)-(Sta, El, n)...
(11.61, 677.89)-(16.44, 676.48, 0.035)-(25.18, 679.29, 0.035)



PROPOSED SECTION A2-A2
DITCH A, VSWALE
SHAPED CHANNEL @ 3%

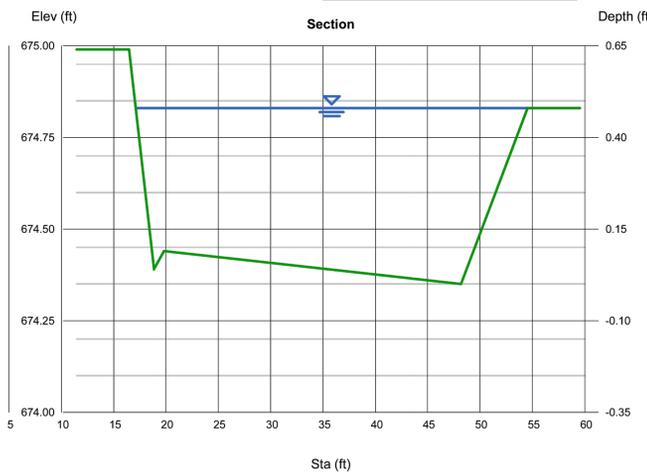
Channel Report

Hydraulix Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Thursday, Oct 2 2025

PROPOSED DITCH B, SECTION B-B, MAXIMUM CAPACITY

User-defined		Highlighted	
Invert Elev (ft)	= 674.35	Depth (ft)	= 0.48
Slope (%)	= 3.00	Q (cfs)	= 57.63
N-Value	= 0.035	Area (sqft)	= 14.65
		Velocity (ft/s)	= 3.93
Calculations		Wetted Perim (ft)	= 37.51
Compute by:	Known Depth	Crit Depth, Yc (ft)	= 0.51
Known Depth (ft)	= 0.48	Top Width (ft)	= 37.44
		EGL (ft)	= 0.72

(Sta, El, n)-(Sta, El, n)...
(16.46, 674.89)-(18.86, 674.36, 0.035)-(19.84, 674.44, 0.035)-(48.19, 674.35, 0.035)-(54.54, 674.83, 0.035)



PROPOSED SECTION B-B
DITCH B, IRREGULAR CHANNEL
SHAPED CHANNEL @ 3%

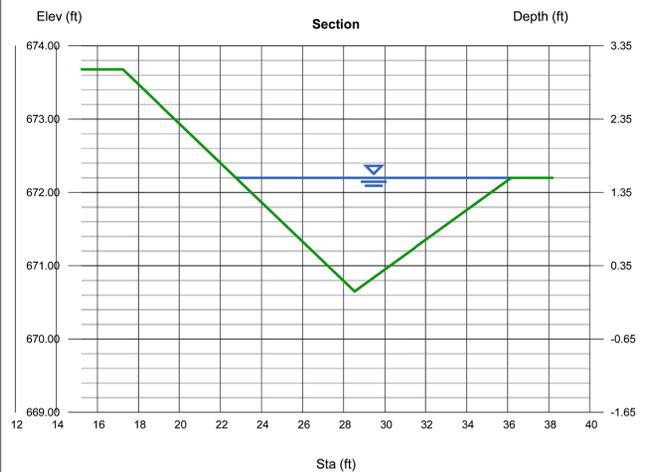
Channel Report

Hydraulix Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Thursday, Oct 2 2025

PROPOSED DITCH C, SECTION C-C, MAXIMUM CAPACITY

User-defined		Highlighted	
Invert Elev (ft)	= 670.65	Depth (ft)	= 1.55
Slope (%)	= 3.00	Q (cfs)	= 63.48
N-Value	= 0.035	Area (sqft)	= 10.40
		Velocity (ft/s)	= 6.11
Calculations		Wetted Perim (ft)	= 13.78
Compute by:	Known Depth	Crit Depth, Yc (ft)	= 1.67
Known Depth (ft)	= 1.55	Top Width (ft)	= 13.42
		EGL (ft)	= 2.13

(Sta, El, n)-(Sta, El, n)...
(17.24, 673.69)-(28.53, 670.65, 0.035)-(36.17, 672.20, 0.035)



PROPOSED SECTION C-C
DITCH A, VSWALE
SHAPED CHANNEL @ 3%

290 S. CASTELL AVE., STE. 100
NEW BRAUNFELS, TX 78130
TBPELS FIRM F-10961
TBPELS FIRM 10153600



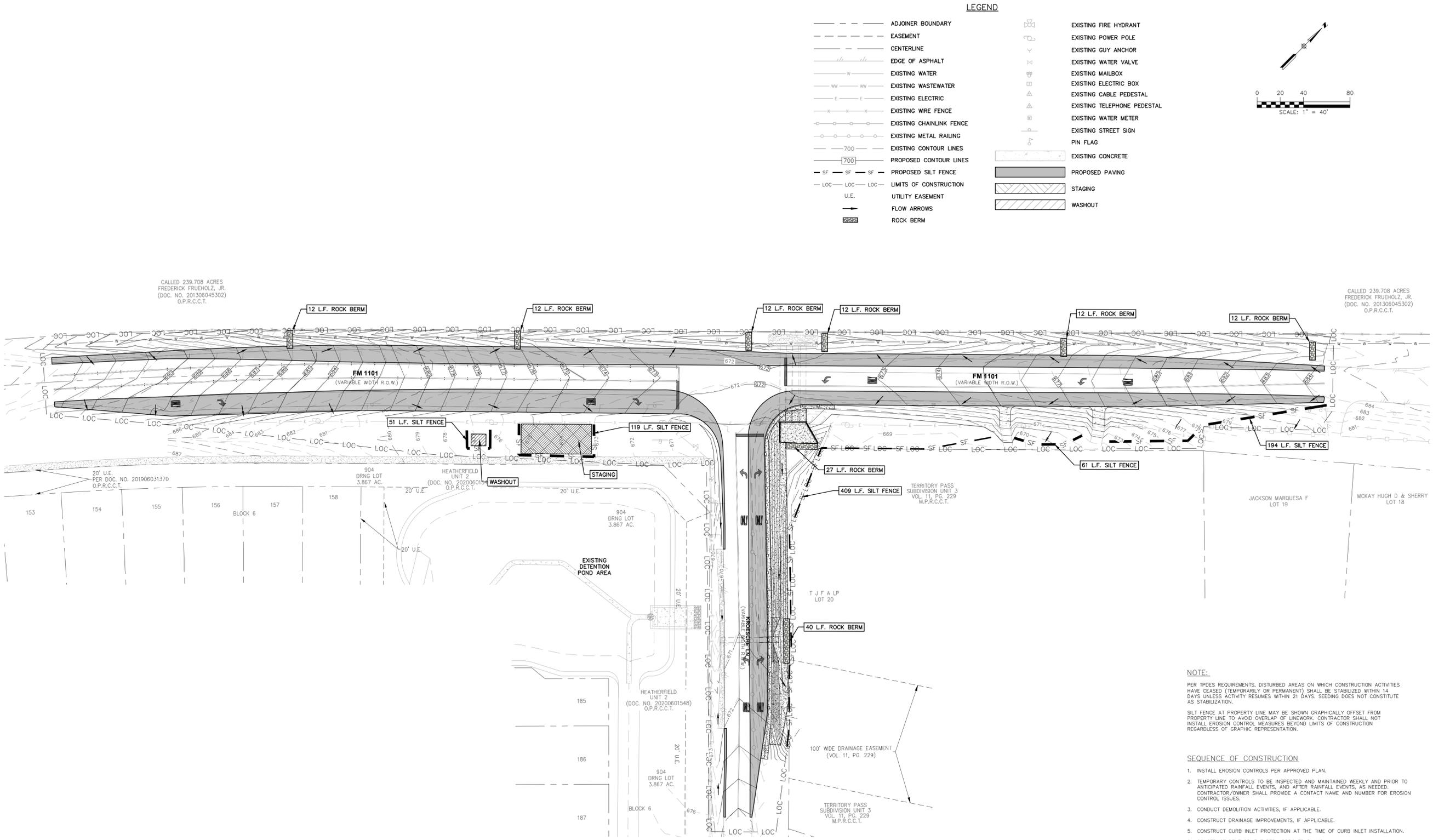
ROADSIDE DITCH HYDRAULICS
SKY RANCH MUD FM 1101 AND
KROESCHE LN TURN LANES

NO.	REVISION DESCRIPTION	DATE

DATE: _____
DRAWN BY: BP
REVIEWED BY: ESP
HMT PROJECT NO.: 337.078

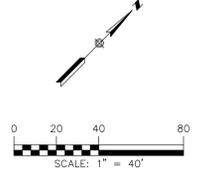
SHEET
C1.3

Drawing Name: M:\Projects\337 - Sky Ranch Unit 2A (94 Lots)\PM 1101 Turn Lane CDS\CD\337.078.EROSION.dwg User: jshauk Oct 20, 2025 - 11:54am



LEGEND

- ADJOINER BOUNDARY
- - - EASEMENT
- CENTERLINE
- EDGE OF ASPHALT
- EXISTING WATER
- EXISTING WASTEWATER
- EXISTING ELECTRIC
- EXISTING WIRE FENCE
- EXISTING CHAINLINK FENCE
- EXISTING METAL RAILING
- EXISTING CONTOUR LINES
- PROPOSED CONTOUR LINES
- SF --- SF --- SF --- PROPOSED SILT FENCE
- LOC --- LOC --- LOC --- LIMITS OF CONSTRUCTION
- U.E. --- UTILITY EASEMENT
- FLOW ARROWS
- ROCK BERM
- EXISTING FIRE HYDRANT
- EXISTING POWER POLE
- EXISTING GUY ANCHOR
- EXISTING WATER VALVE
- EXISTING MAILBOX
- EXISTING ELECTRIC BOX
- EXISTING CABLE PEDESTAL
- EXISTING TELEPHONE PEDESTAL
- EXISTING WATER METER
- EXISTING STREET SIGN
- PIN FLAG
- EXISTING CONCRETE
- PROPOSED PAVING
- STAGING
- WASHOUT



CALLED 239.708 ACRES
FREDERICK FRUEHOLZ, JR.
(DOC. NO. 201306045302)
O.P.R.C.C.T.

CALLED 239.708 ACRES
FREDERICK FRUEHOLZ, JR.
(DOC. NO. 201306045302)
O.P.R.C.C.T.

20' U.E.
PER DOC. NO. 201906031370
O.P.R.C.C.T.

904 DRNG LOT
3.867 AC.
(DOC. NO. 202200601)
O.P.R.C.C.T.

HEATHERFIELD
UNIT 2
(DOC. NO. 20200901548)
O.P.R.C.C.T.

TERRITORY PASS
SUBDIVISION UNIT 3
VOL. 11, PG. 229
M.P.R.C.C.T.

JACKSON MARQUESA F
LOT 19

MCKAY HUGH D & SHERRY
LOT 18

HEATHERFIELD
UNIT 2
(DOC. NO. 20200901548)
O.P.R.C.C.T.

904 DRNG LOT
3.867 AC.

TERRITORY PASS
SUBDIVISION UNIT 3
VOL. 11, PG. 229
M.P.R.C.C.T.

100' WIDE DRAINAGE EASEMENT
(VOL. 11, PG. 229)

NOTE:

PER TPDES REQUIREMENTS, DISTURBED AREAS ON WHICH CONSTRUCTION ACTIVITIES HAVE CEASED (TEMPORARILY OR PERMANENT) SHALL BE STABILIZED WITHIN 14 DAYS UNLESS ACTIVITY RESUMES WITHIN 21 DAYS. SEEDING DOES NOT CONSTITUTE AS STABILIZATION.

SILT FENCE AT PROPERTY LINE MAY BE SHOWN GRAPHICALLY OFFSET FROM PROPERTY LINE TO AVOID OVERLAP OF LINWORK. CONTRACTOR SHALL NOT INSTALL EROSION CONTROL MEASURES BEYOND LIMITS OF CONSTRUCTION REGARDLESS OF GRAPHIC REPRESENTATION.

SEQUENCE OF CONSTRUCTION

1. INSTALL EROSION CONTROLS PER APPROVED PLAN.
2. TEMPORARY CONTROLS TO BE INSPECTED AND MAINTAINED WEEKLY AND PRIOR TO ANTICIPATED RAINFALL EVENTS, AND AFTER RAINFALL EVENTS, AS NEEDED. CONTRACTOR/OWNER SHALL PROVIDE A CONTACT NAME AND NUMBER FOR EROSION CONTROL ISSUES.
3. CONDUCT DEMOLITION ACTIVITIES, IF APPLICABLE.
4. CONSTRUCT DRAINAGE IMPROVEMENTS, IF APPLICABLE.
5. CONSTRUCT CURB INLET PROTECTION AT THE TIME OF CURB INLET INSTALLATION.
6. CONSTRUCT DEVELOPMENT PER APPROVED PLANS.
7. INSTALL STREETSCAPE AND/OR LANDSCAPING IMPROVEMENTS.
8. CONTRACTOR TO VEGETATE ANY DISTURBED AREAS ONCE FINAL GRADING IS COMPLETE, AND ESTABLISH A MIN OF 70% VEGETATION PRIOR TO COMPLETION. PER TPDES REQUIREMENTS, DISTURBED AREAS ON WHICH CONSTRUCTION ACTIVITIES HAVE CEASED (TEMPORARILY OR PERMANENTLY) SHALL BE STABILIZED WITHIN 14 DAYS UNLESS ACTIVITY RESUMES WITHIN 21 DAYS. SEEDING DOES NOT CONSTITUTE AS STABILIZATION.
9. REMOVE ALL TEMPORARY EROSION CONTROL MEASURES.

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TBPELS FIRM F-10961
TBPELS FIRM 10153600

HMT
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10/20/2025

ERIC S. PLY
123317
LICENSED PROFESSIONAL ENGINEER
STATE OF TEXAS

EROSION CONTROL PLAN

**SKY RANCH MUD FM 1101 AND
KROESCHE LN TURN LANES**

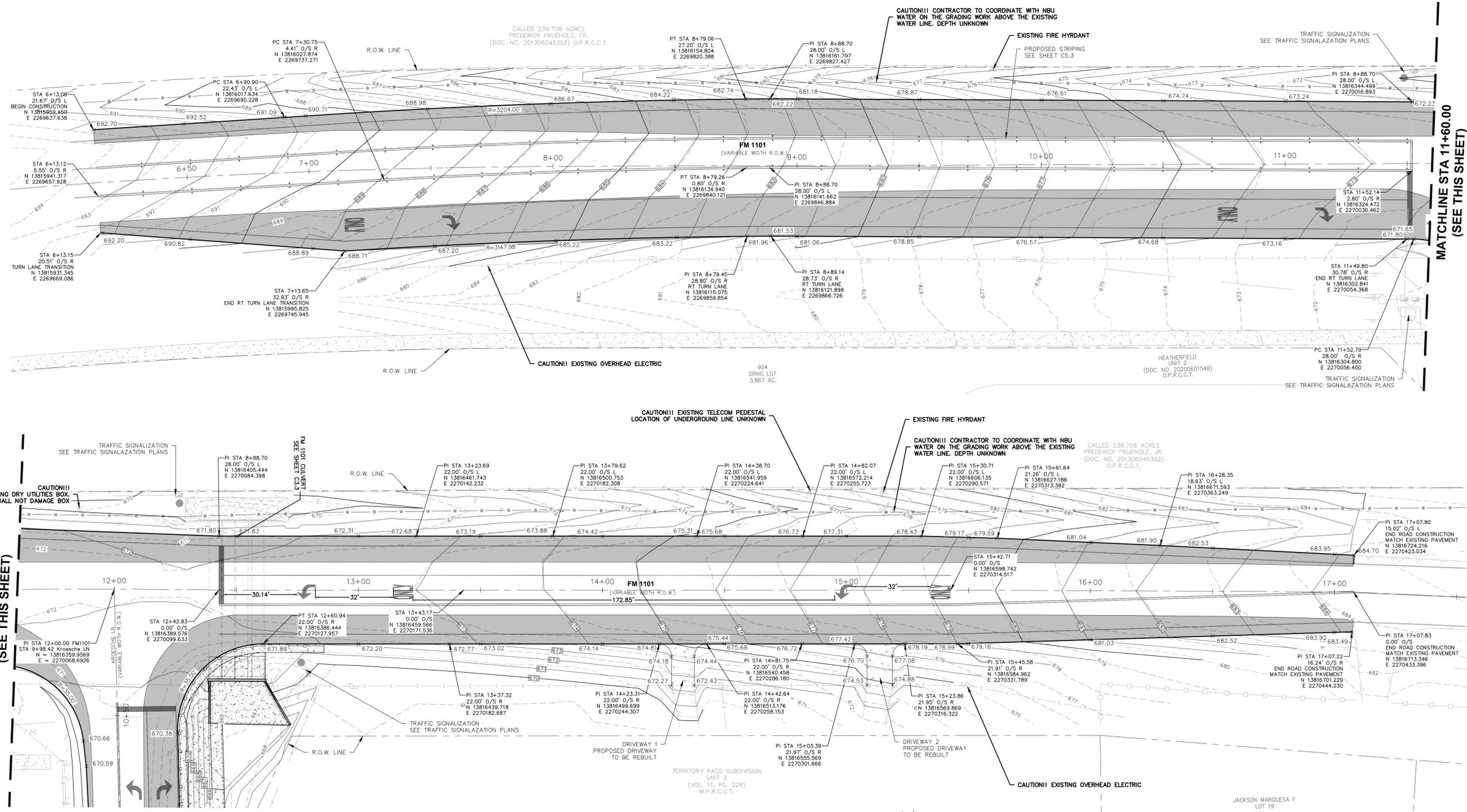
NO.	REVISION DESCRIPTION	REVISION DATE

DATE: _____
DRAWN BY: **BP**
REVIEWED BY: **ESP**
HMT PROJECT NO.: **337.078**

SHEET

C2.0

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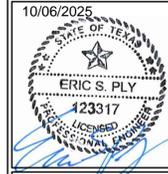


LEGEND

- ADJOINER BOUNDARY
- EASEMENT
- CENTERLINE
- EDGE OF ASPHALT
- EXISTING WATER
- EXISTING WASTEWATER
- EXISTING ELECTRIC
- EXISTING WIRE FENCE
- EXISTING CHAINLINK FENCE
- EXISTING FIRE HYDRANT
- EXISTING POWER POLE
- EXISTING GUY ANCHOR
- EXISTING WATER VALVE
- EXISTING MAILBOX
- EXISTING ELECTRIC BOX
- EXISTING CABLE PEDESTAL
- EXISTING TELEPHONE PEDESTAL
- EXISTING WATER METER
- EXISTING STREET SIGN
- PIN FLAG
- DOUBLE STRIPE W/ TRAFFIC BUTTONS
- EXISTING CONCRETE
- TURN ARROW MARKING
- "ONLY" TURN MARKING
- PAVEMENT WIDENING

SCALE: 1" = 20' HORIZ.

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10/06/2025
GRADING PLAN (1 OF 2)
 SKY RANCH MUD FM 1101 AND
 KROESCHE LN TURN LANES

MATCHLINE STA 11+60.00
 (SEE THIS SHEET)

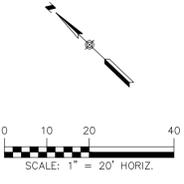
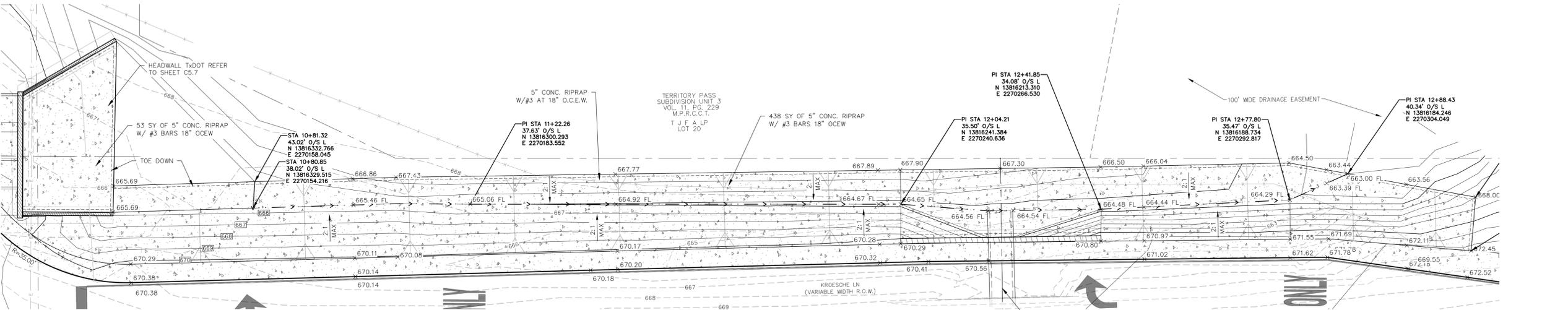
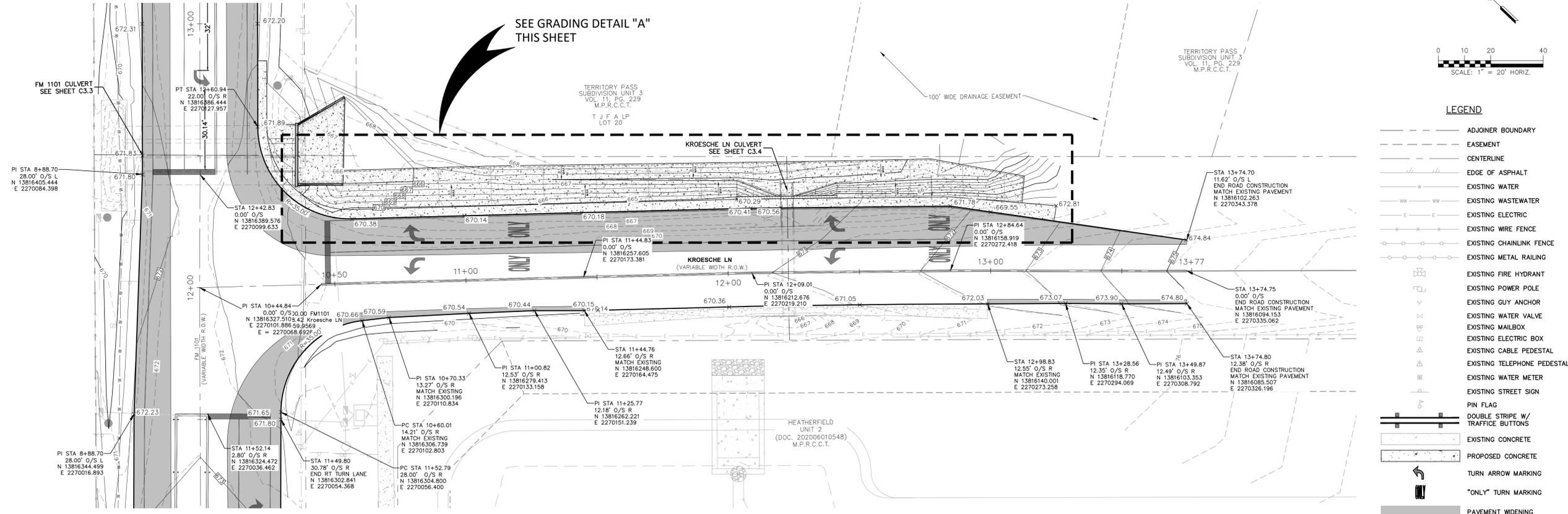
MATCHLINE STA 11+60.00
 (SEE THIS SHEET)

THE LOCATION OF ALL EXISTING UNDERGROUND UTILITIES ARE SHOWN IN APPROXIMATE LOCATIONS ONLY. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK. THE CONTRACTOR WILL AGREE TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE INCURRED BY THEIR FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES, STRUCTURES OR FACILITIES. CONTRACTOR SHALL NOTIFY ENGINEER OF ANY DISCREPANCIES 24-HOURS PRIOR TO COMMENCING CONSTRUCTION.

NO.	REVISION DESCRIPTION	REVISION DATE

DATE: _____
 DRAWN BY: **BP**
 DESIGNED BY: **BP**
 REVIEWED BY: **ESP**
 HMT PROJECT NO.: **337.078**
SHEET
C3.0

Drawing Name: M:\Projects\337 - Sky Ranch Unit 2A (94 Lots)\FM 1101 Turn Lane CDS\CDS\337.078_GRADES.dwg User: matt-p Mar 04, 2026 - 9:47am



- LEGEND**
- ADJOINER BOUNDARY
 - - - EASEMENT
 - - - CENTERLINE
 - - - EDGE OF ASPHALT
 - - - EXISTING WATER
 - - - EXISTING WASTEWATER
 - - - EXISTING ELECTRIC
 - - - EXISTING WIRE FENCE
 - - - EXISTING CHAINLINK FENCE
 - - - EXISTING METAL RAILING
 - - - EXISTING FIRE HYDRANT
 - - - EXISTING POWER POLE
 - - - EXISTING GUY ANCHOR
 - - - EXISTING WATER VALVE
 - - - EXISTING MAILBOX
 - - - EXISTING ELECTRIC BOX
 - - - EXISTING CABLE PEDESTAL
 - - - EXISTING TELEPHONE PEDESTAL
 - - - EXISTING WATER METER
 - - - EXISTING STREET SIGN
 - - - PIN FLAG
 - - - DOUBLE STRIPE W/ TRAFFIC BUTTONS
 - - - EXISTING CONCRETE
 - - - PROPOSED CONCRETE
 - - - TURN ARROW MARKING
 - - - "ONLY" TURN MARKING
 - - - PAVEMENT WIDENING

GRADING DETAIL "A"
SCALE: 1" = 10'

THE LOCATION OF ALL EXISTING UNDERGROUND UTILITIES ARE SHOWN IN APPROXIMATE LOCATIONS ONLY. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK. THE CONTRACTOR WILL AGREE TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE INCURRED BY THEIR FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES, STRUCTURES OR FACILITIES. CONTRACTOR SHALL NOTIFY ENGINEER OF ANY DISCREPANCIES 24-HOURS PRIOR TO COMMENCING CONSTRUCTION.

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GRADING PLAN (2 OF 2)
SKY RANCH MUD FM 1101 AND KROESCHE LN TURN LANES

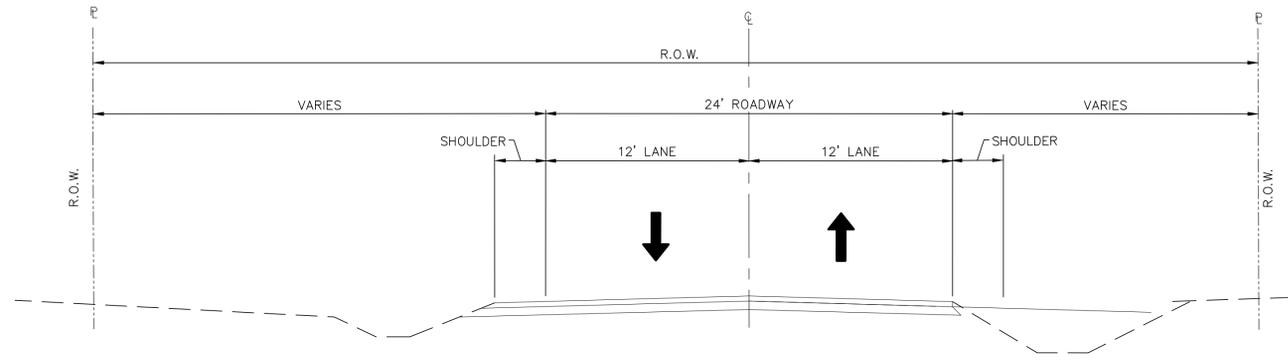
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DESIGNED BY: **BP**
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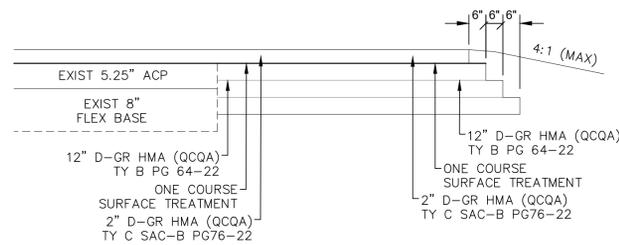
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SHEET
C3.1

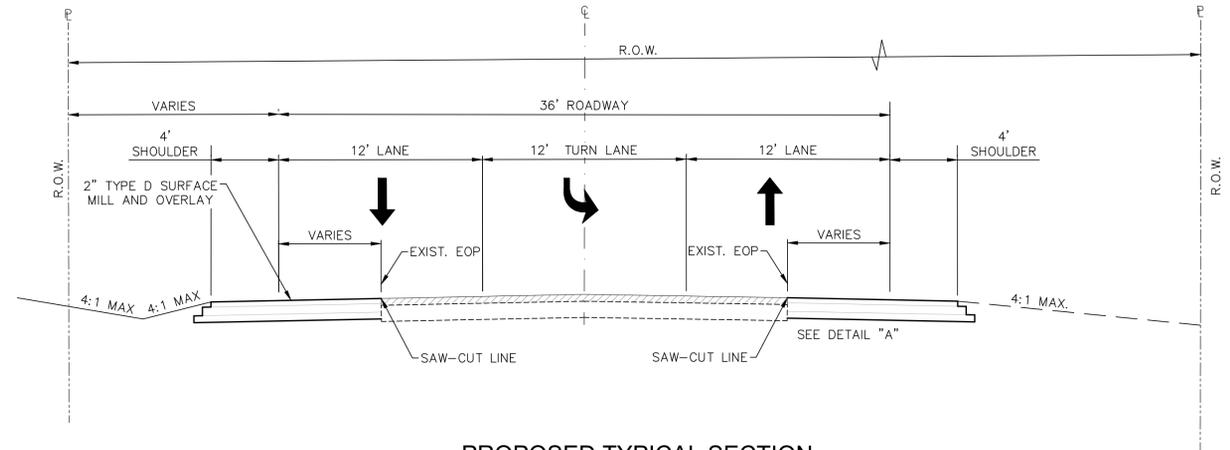
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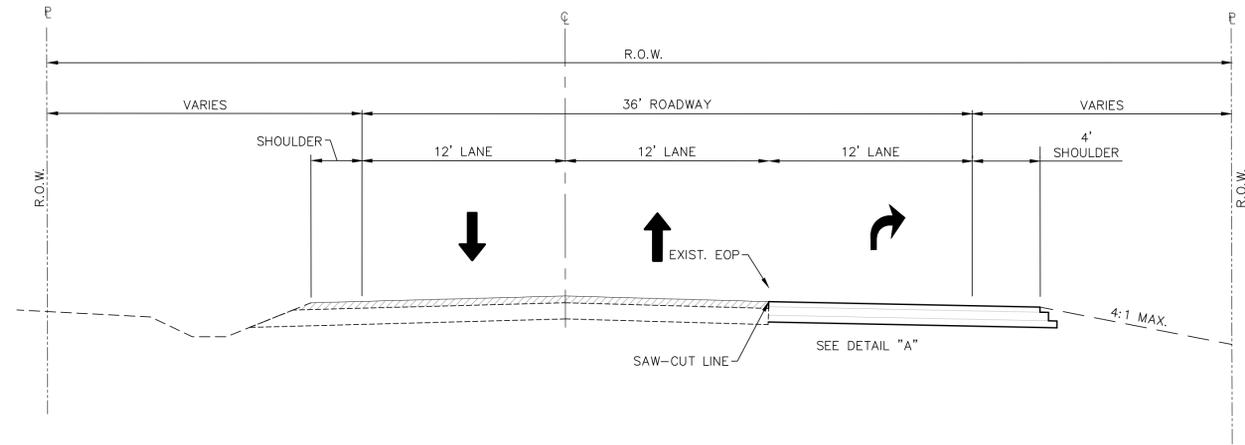
EXISTING TYPICAL SECTION
NOT TO SCALE



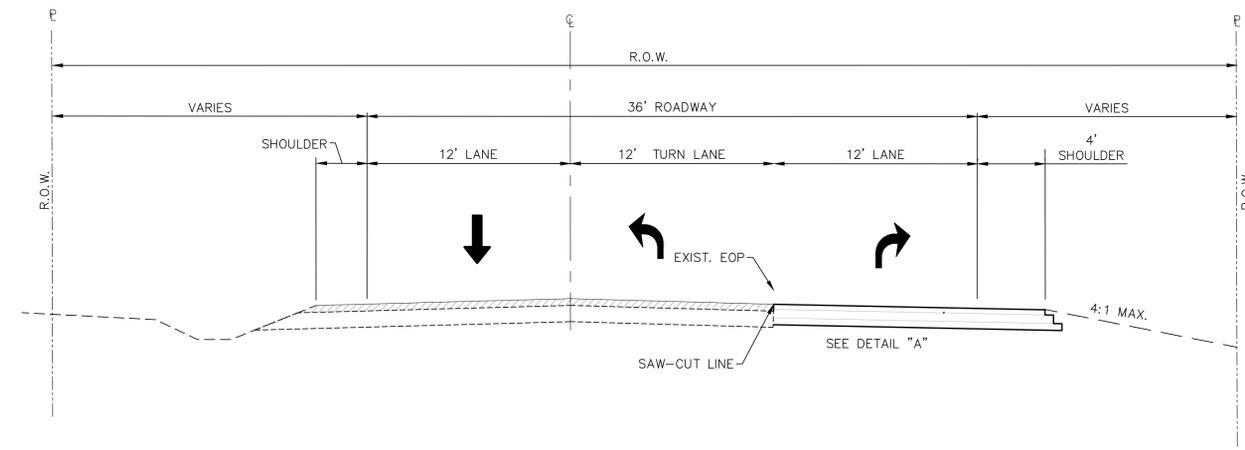
DETAIL "A"
NOT TO SCALE



PROPOSED TYPICAL SECTION
SOUTH BOUND LEFT TURN LANE FM 1101
NOT TO SCALE



PROPOSED TYPICAL SECTION
NORTH BOUND RIGHT TURN LANE FM 1101
NOT TO SCALE



PROPOSED TYPICAL SECTION
NORTH BOUND LEFT TURN LANE KROESCHE LN
NOT TO SCALE

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TBPELS FIRM 10153600

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TYPICAL CROSS SECTIONS

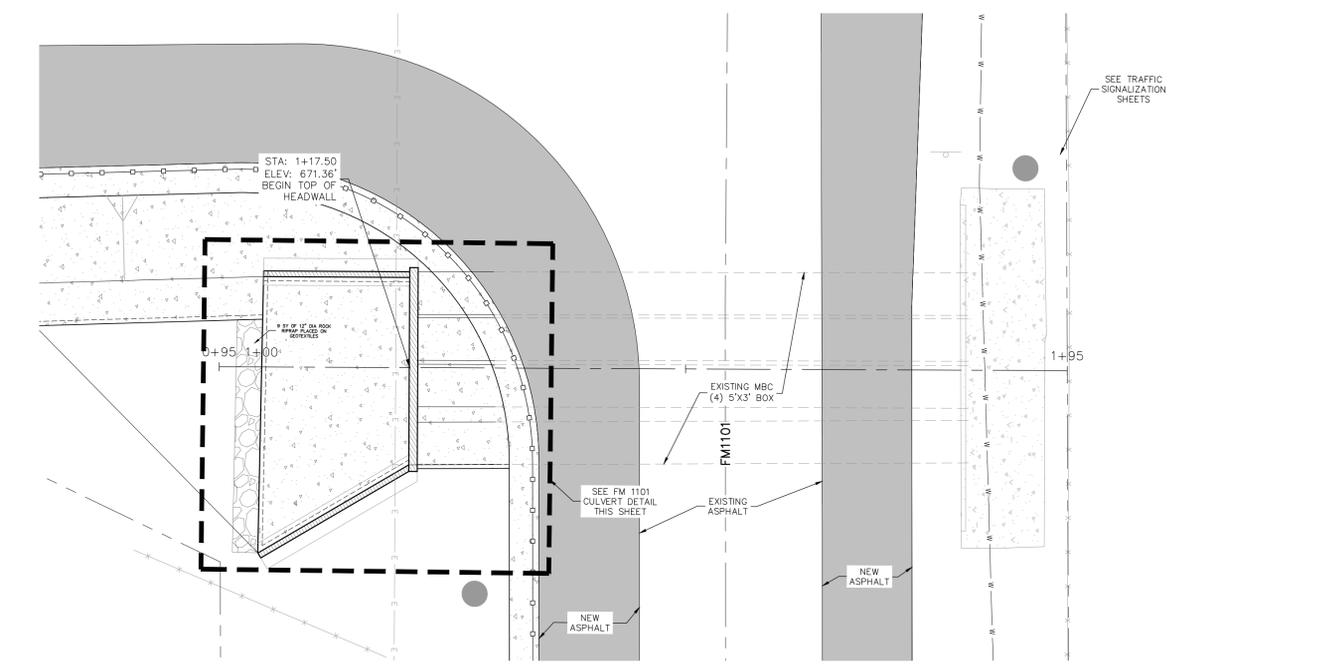
SKY RANCH MUD FM 1101 AND
KROESCHE LN TURN LANES

NO.	REVISION DESCRIPTION	REVISION DATE

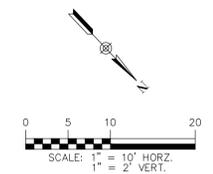
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REVIEWED BY: **ESP**
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SHEET
C3.2

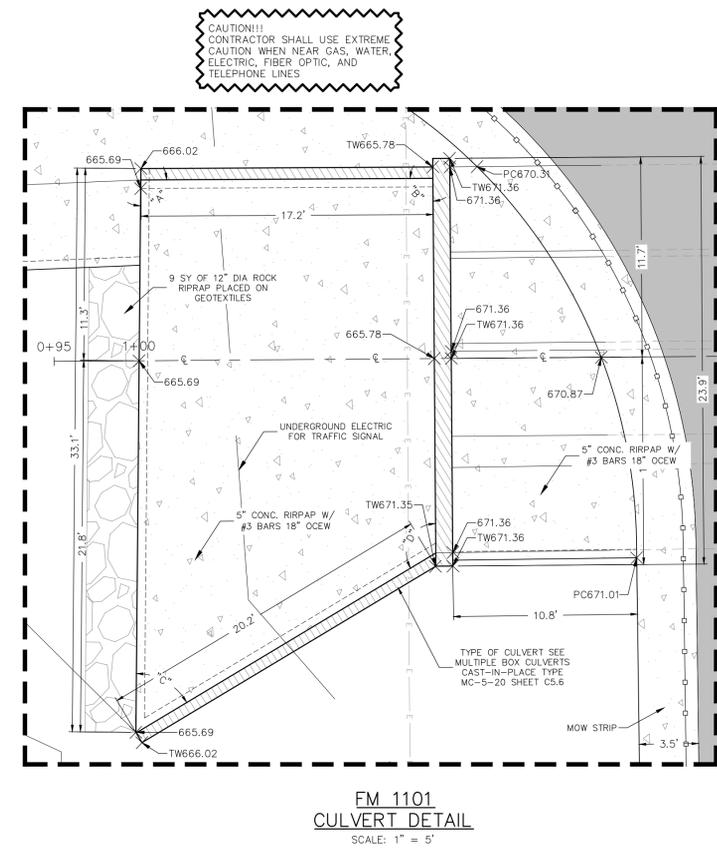
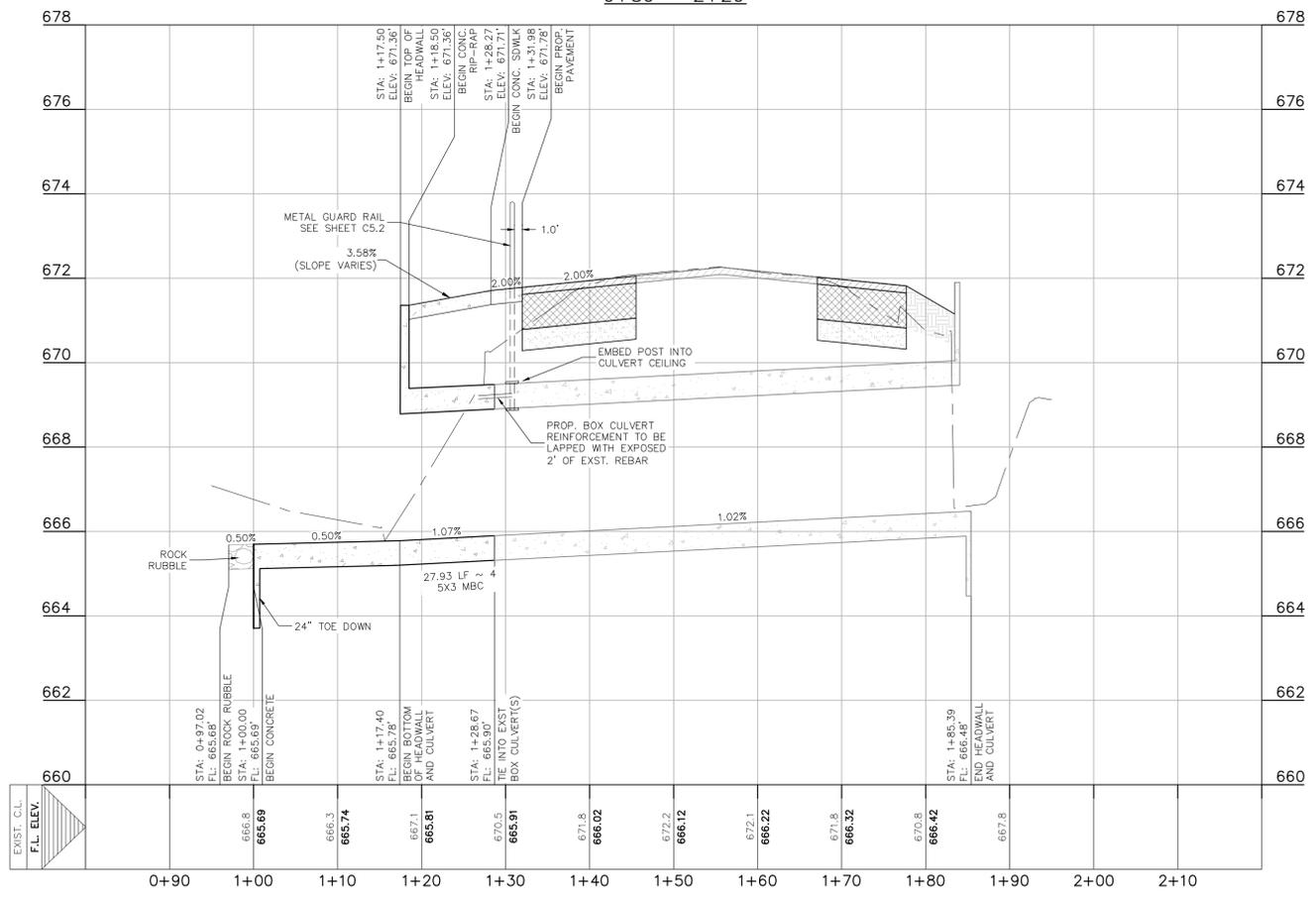
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- LEGEND**
- ADJOINER BOUNDARY
 - - - EASEMENT
 - CENTERLINE
 - EDGE OF ASPHALT
 - EXISTING WATER
 - EXISTING WASTEWATER
 - EXISTING ELECTRIC
 - EXISTING WIRE FENCE
 - EXISTING CHAINLINK FENCE
 - PROPOSED GUARDRAIL
 - EXISTING METAL RAILING
 - 700 EXISTING CONTOUR LINES
 - 700 PROPOSED CONTOUR LINES
 - EXISTING CONCRETE
 - PROPOSED CONCRETE



**FM 1101 CULVERT
0+80 - 2+20**



FM 1101 CULVERT ANGLE TABLE

LABEL	ANGLE
"A"	90°50'08"
"B"	90°05'54"
"C"	58°37'06"
"D"	120°25'52"

**FM 1101
CULVERT DETAIL**
SCALE: 1" = 5'

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TBPELS FIRM F-10961
TBPELS FIRM 10153600



**FM 1101 CULVERT
CROSSING**
**SKY RANCH MUD FM 1101 AND
KROESCHE LN TURN LANES**

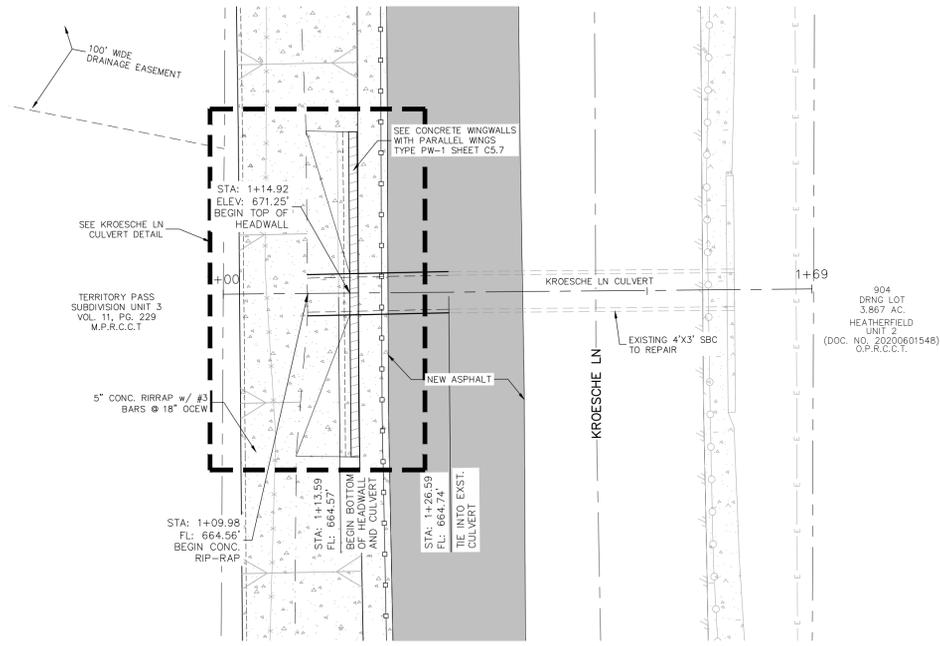
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DATE: _____
DRAWN BY: _____
DESIGNED BY: **BP**
REVIEWED BY: **ESP**

HMT PROJECT NO.: **337.078**

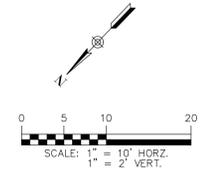
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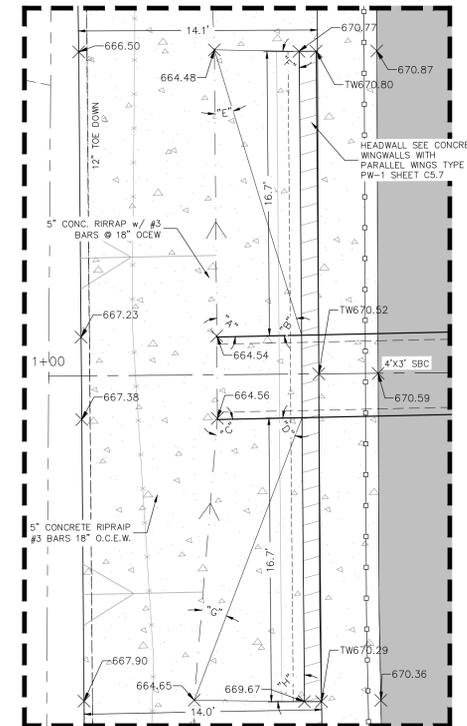
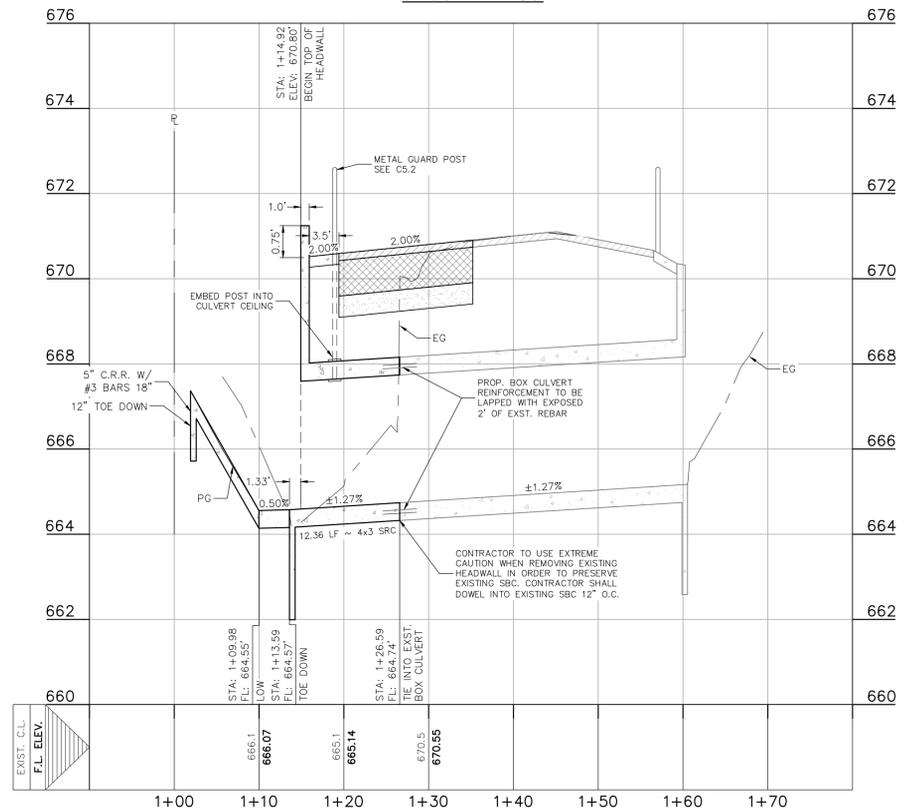


LEGEND

- ADJOINER BOUNDARY
- - - EASEMENT
- CENTERLINE
- SWALE
- EDGE OF ASPHALT
- EXISTING WATER
- EXISTING WASTEWATER
- EXISTING ELECTRIC
- EXISTING WIRE FENCE
- EXISTING CHAINLINK FENCE
- EXISTING METAL RAILING
- EXISTING CONTOUR LINES
- 700
- PROPOSED CONTOUR LINES
- EXISTING CONCRETE
- PROPOSED CONCRETE



KROESCHE LN CULVERT
0+90 - 1+80



KROESCHE CULVERT ANGLE TABLE	
LABEL	ANGLE
"A"	89°15'09"
"B"	74°08'15"
"C"	95°55'54"
"D"	67°48'58"
"E"	16°36'36"
"F"	91°29'37"
"G"	16°15'08"
"H"	88°45'16"

KROESCHE LN CULVERT
CULVERT DETAIL

SCALE: 1" = 5'

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NEW BRAUNFELS, TX 78130
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KROESCHE LN CULVERT
CROSSING
SKY RANCH MUD FM 1101 AND
KROESCHE LN TURN LANES

NO.	REVISION DESCRIPTION	REVISION DATE

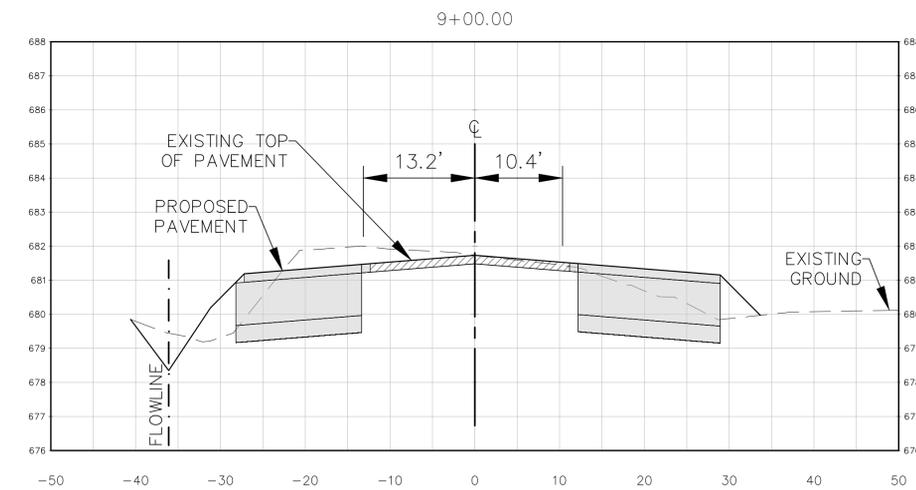
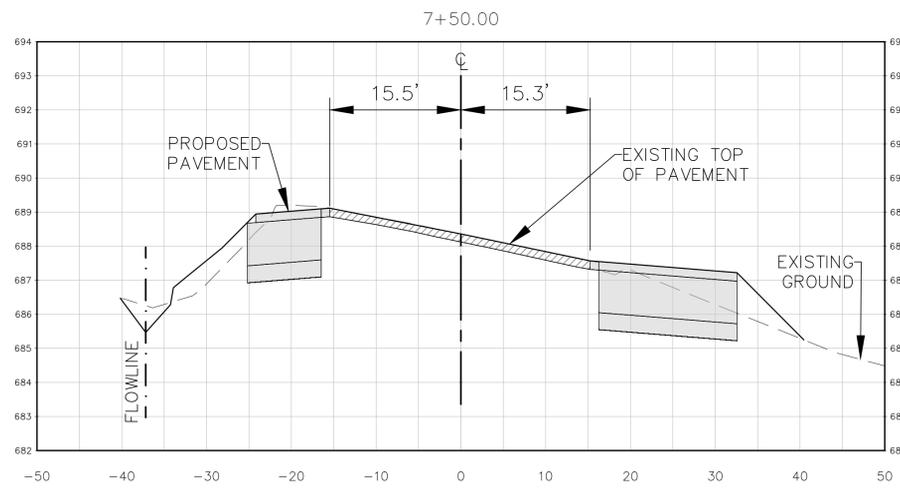
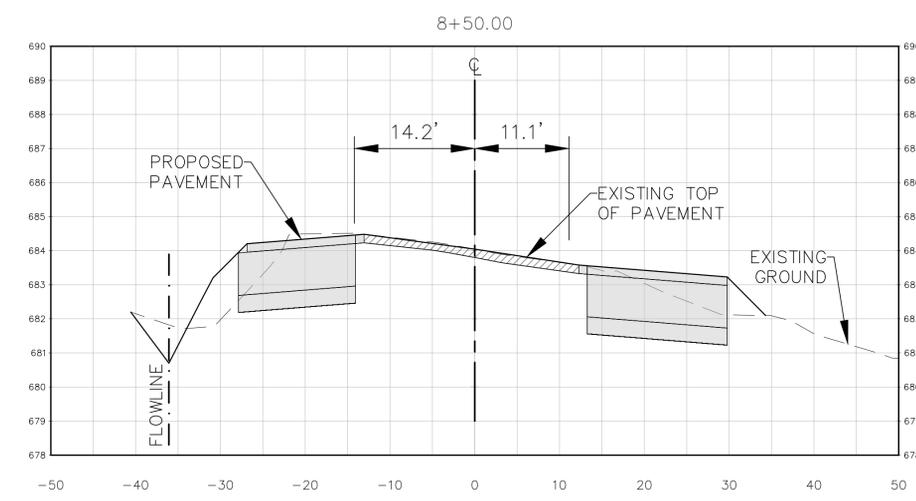
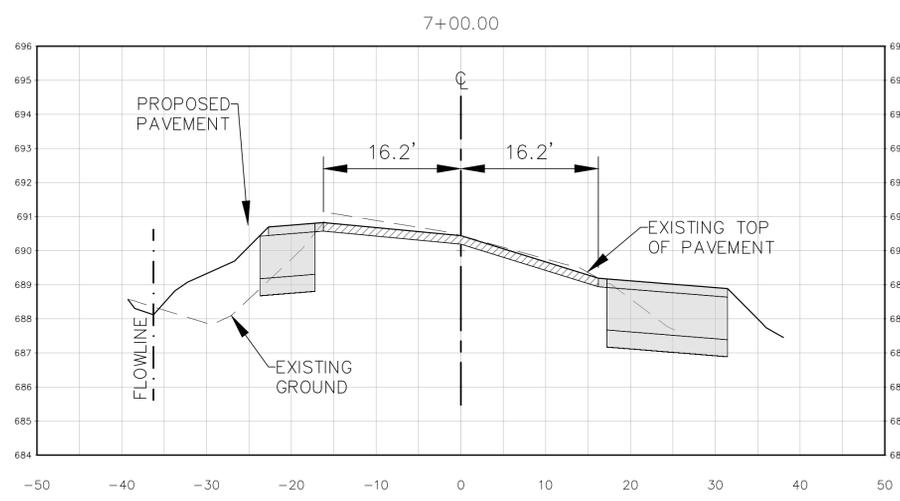
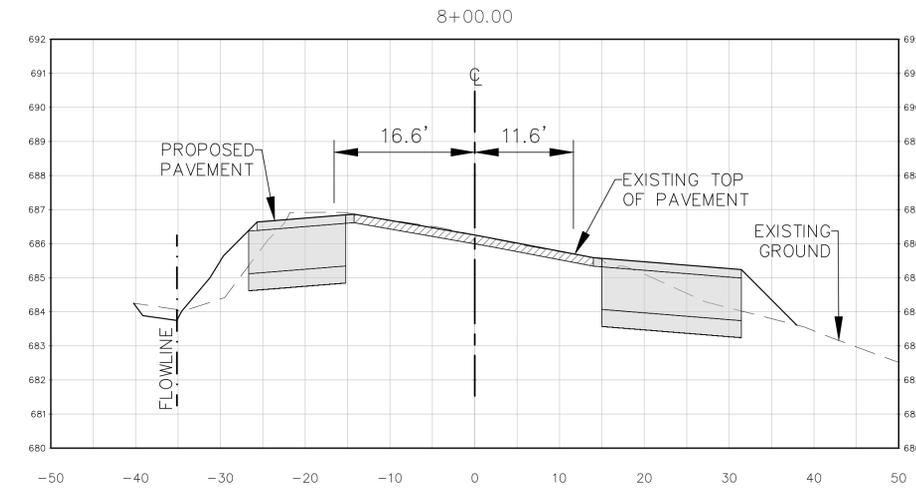
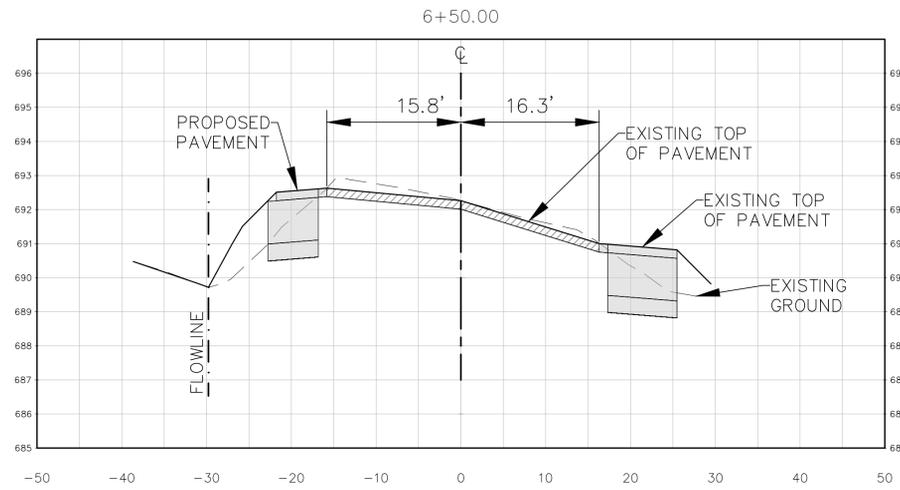
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DRAWN BY: _____
DESIGNED BY: **BP**
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HMT PROJECT NO.: **337.078**

SHEET
C3.4

THE LOCATION OF ALL EXISTING UNDERGROUND UTILITIES ARE SHOWN IN APPROXIMATE LOCATIONS ONLY. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK. THE CONTRACTOR WILL AGREE TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE INCURRED BY THEIR FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES, STRUCTURES OR FACILITIES. CONTRACTOR SHALL NOTIFY ENGINEER OF ANY DISCREPANCIES 24-HOURS PRIOR TO COMMENCING CONSTRUCTION.

Drawing Name: M:_Projects\337 - Lencor Homes\078 - Sky Ranch Unit 2A (94 Lots)\FM 1101 Turn Lane CDA\CDA\337\078_RWD X-SECTION.dwg User: adfior Oct 06, 2023 - 10:35am



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**FM 1101 CROSS-SECTION
 (1 OF 4)**

**SKY RANCH MUD FM 1101 AND
 KROESCHE LN TURN LANES**

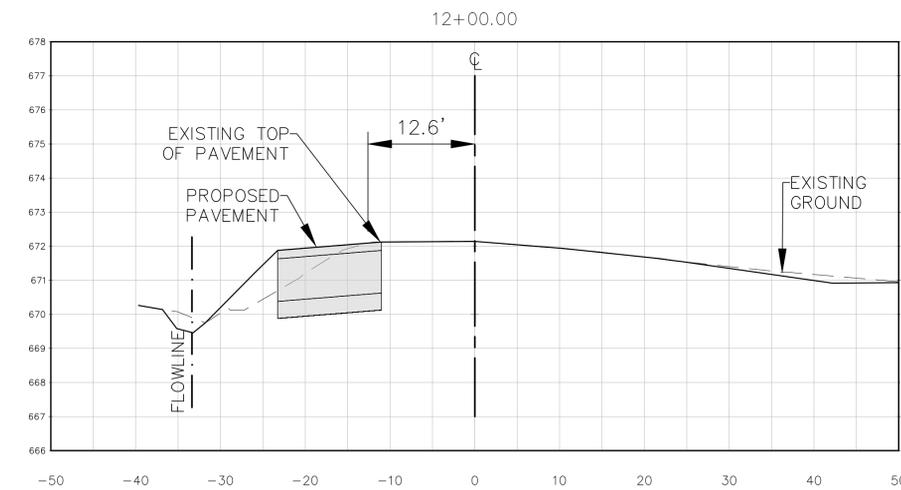
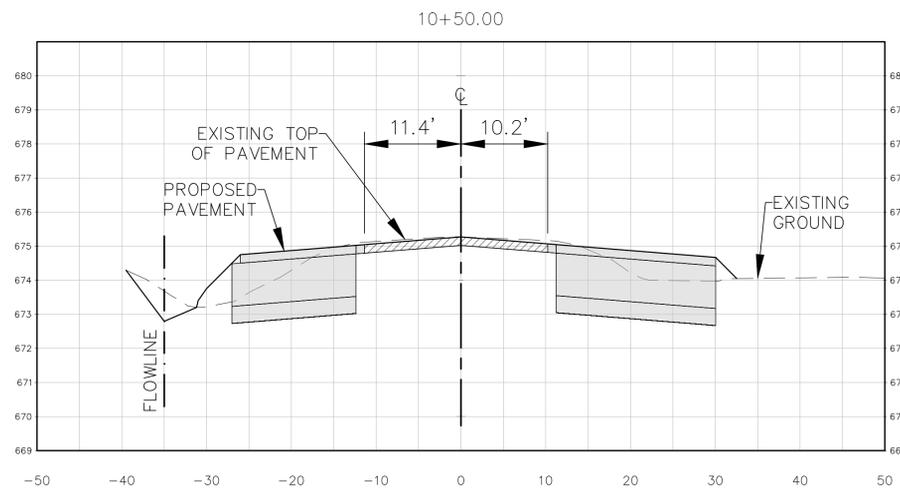
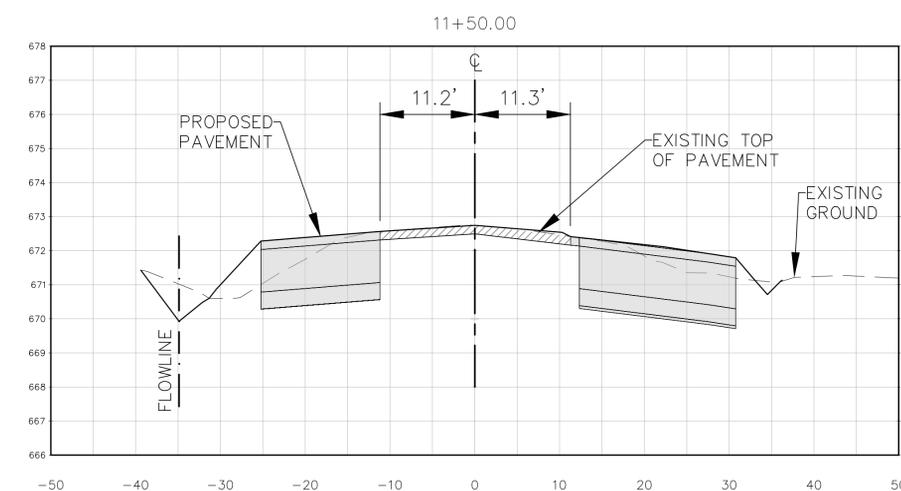
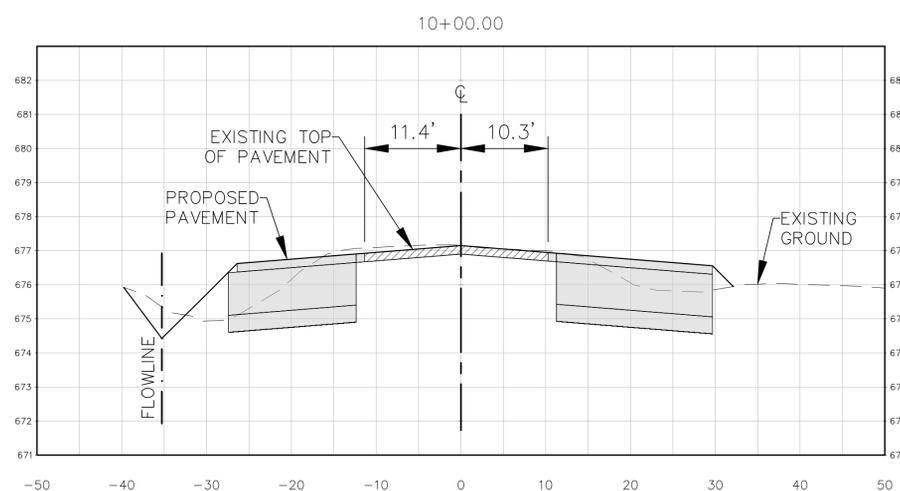
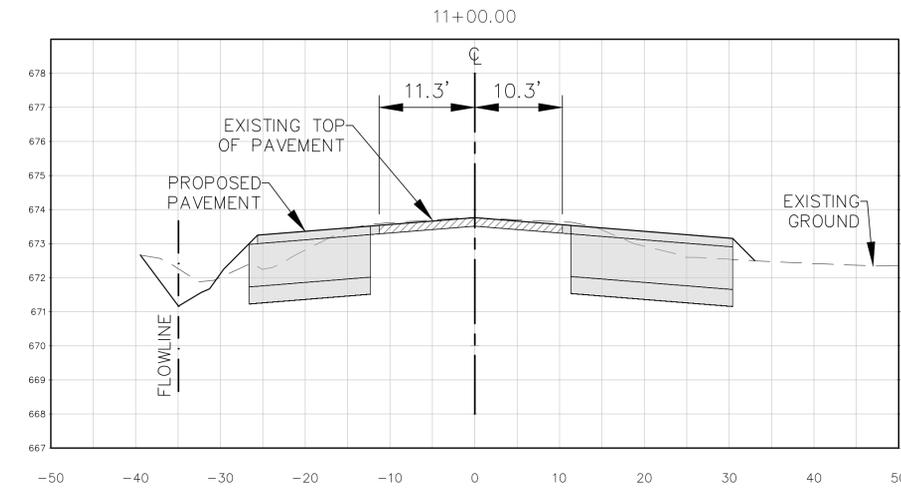
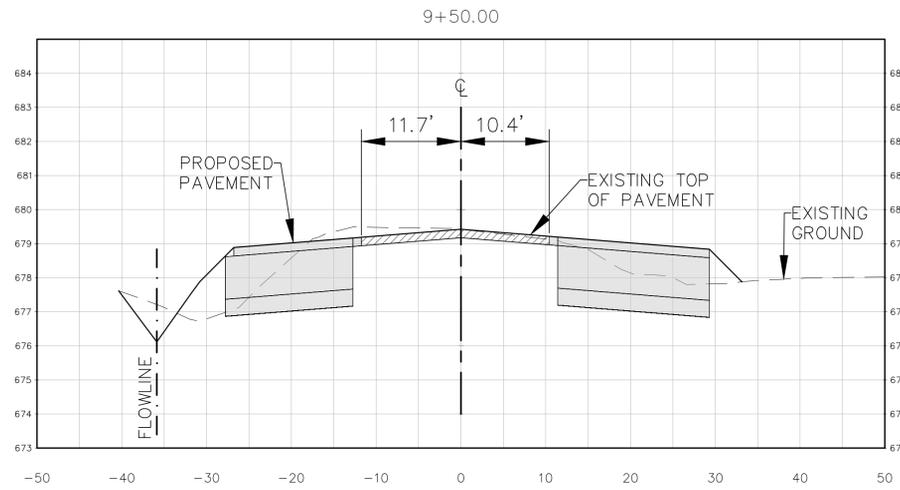
NO.	REVISION DESCRIPTION	REVISION DATE

DATE: _____
 DRAWN BY: _____
 DESIGNED BY: **BP**
 REVIEWED BY: **ESP**
 HMT PROJECT NO.: **337.078**

**SHEET
 C3.5**

SCALE: 1" = 10' HORIZONTAL
 1" = 2.5' VERTICAL

Drawing Name: M:\Projects\337 - Lessor Homes\078 - Sky Ranch Unit 2A (94 Lots)\FM 1101 Turn Lane CDA\CDA\337.078.ROAD X-SECTION.dwg User: adfior Oct 06, 2023 - 10:35am



SCALE: 1" = 10' HORIZONTAL
1" = 2.5' VERTICAL

290 S. CASTELL AVE., STE. 100
NEW BRAUNFELS, TX 78130
TBPELS FIRM F-10961
TBPELS FIRM 10153600



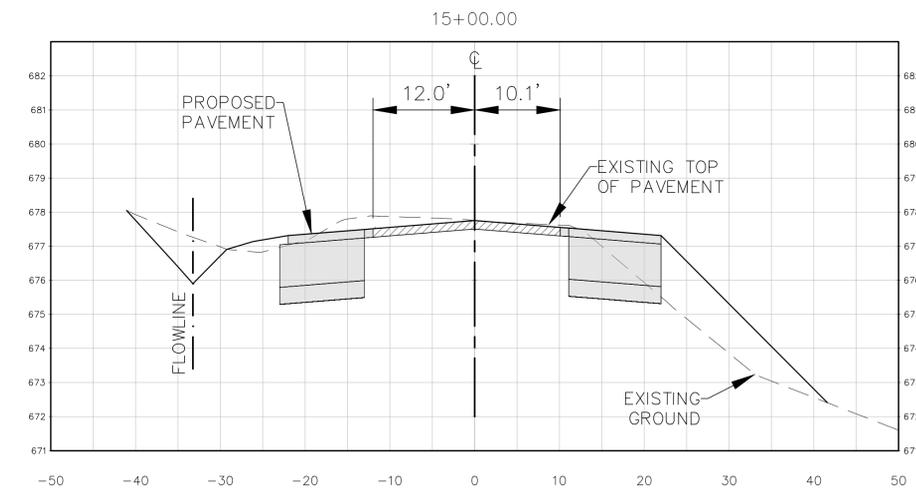
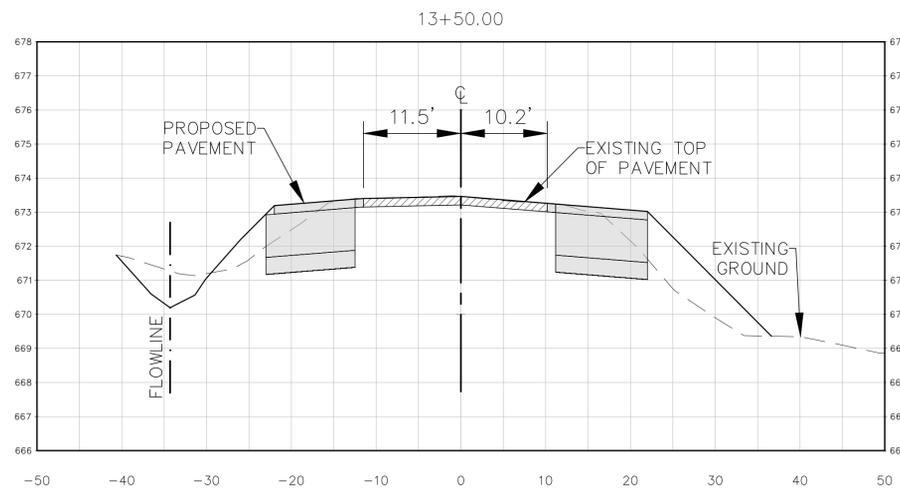
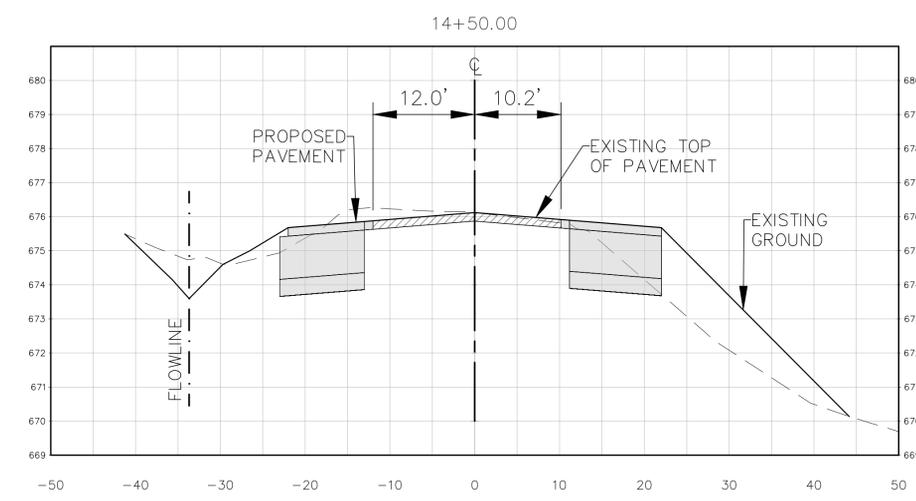
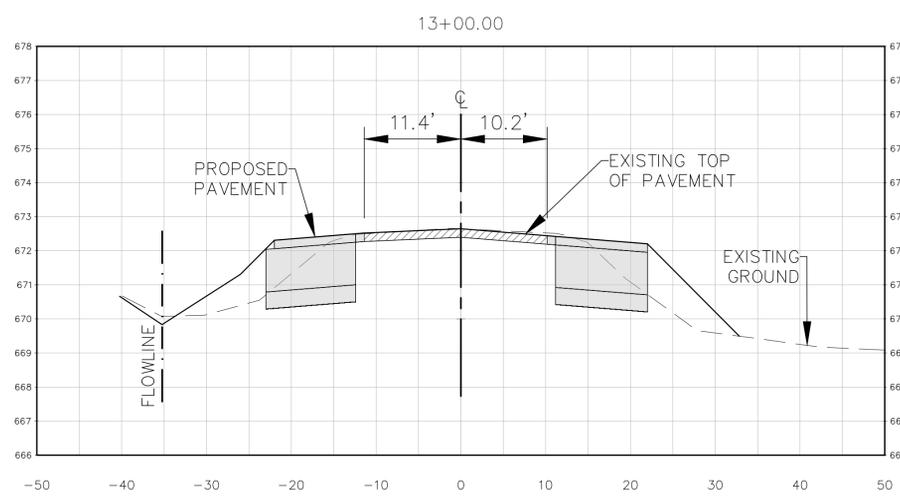
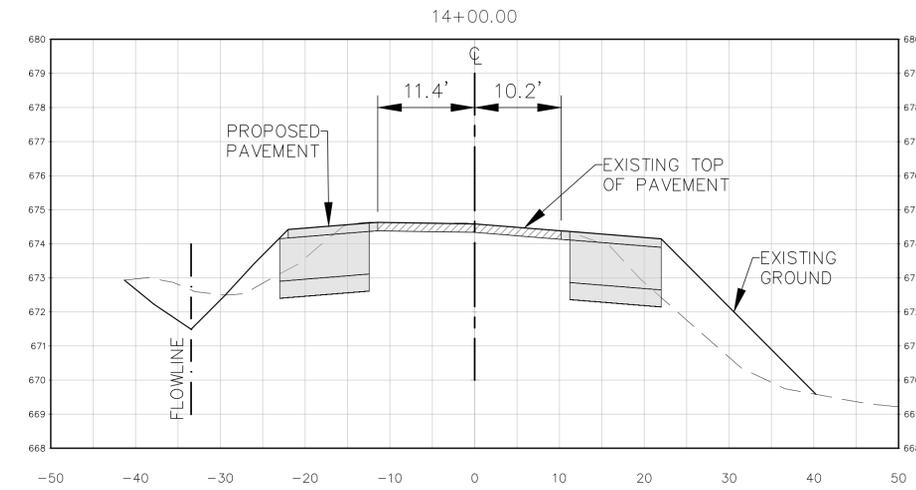
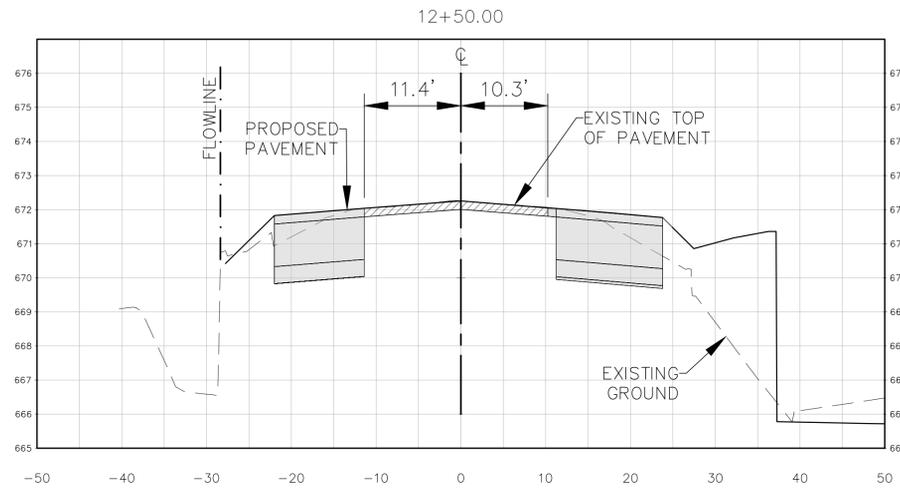
**FM 1101 CROSS-SECTION
(2 OF 4)**
**SKY RANCH MUD FM 1101 AND
KROESCHE LN TURN LANES**

NO.	REVISION DESCRIPTION	REVISION DATE

DATE: _____
DRAWN BY: _____
DESIGNED BY: **BP**
REVIEWED BY: **ESP**
HMT PROJECT NO.: **337.078**

SHEET
C3.6

Drawing Name: M:_Projects\337 - Lessor Homes\078 - Sky Ranch Unit 2A (94 Lots)\FM 1101 Turn Lane CDA\337.078.ROAD X-SECTION.dwg User: adriano Oct 06, 2025 - 1:35pm



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TBPELS FIRM 10153600



FM 1101 CROSS-SECTION (3 OF 4)
SKY RANCH MUD FM 1101 AND KROESCHE LN TURN LANES

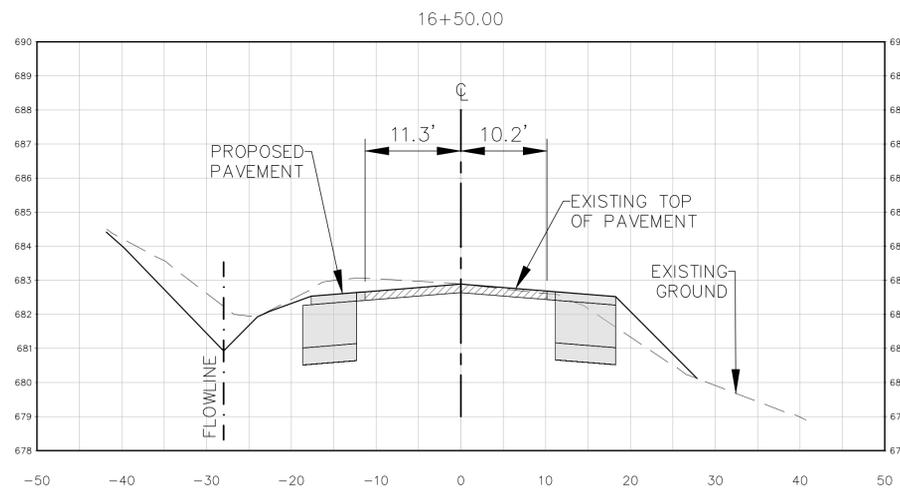
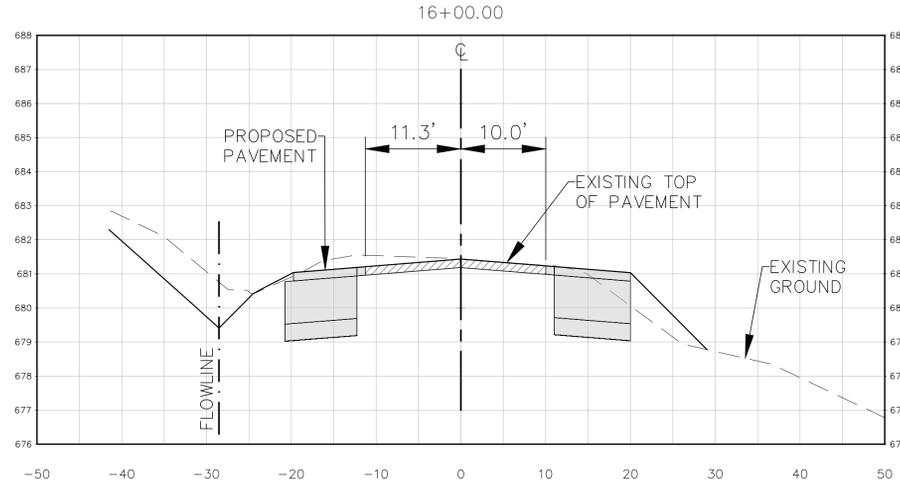
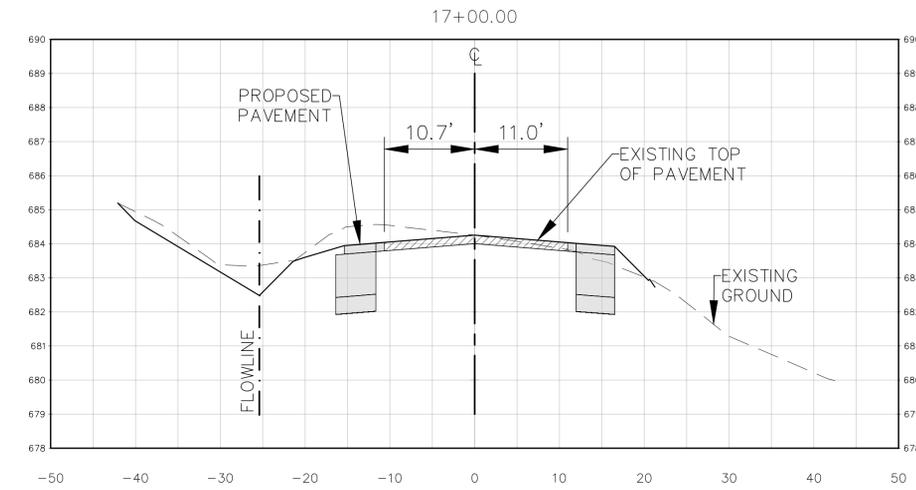
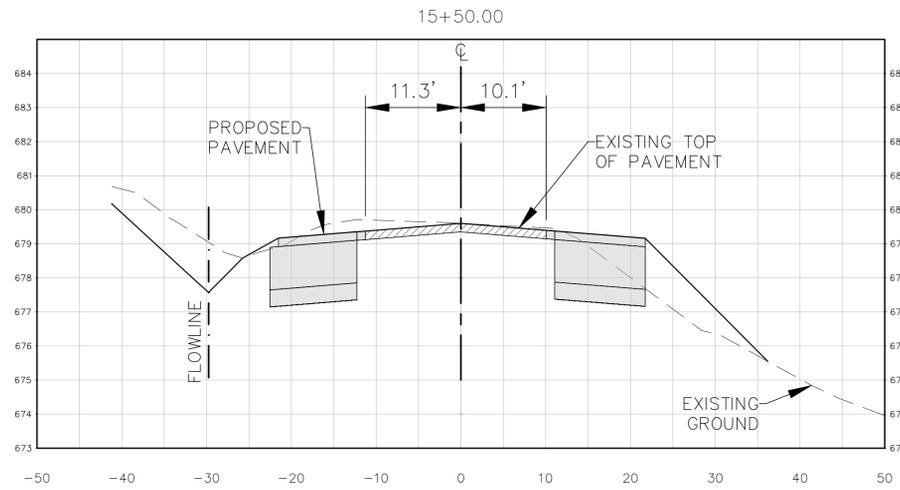
NO.	REVISION DESCRIPTION	REVISION DATE

DATE: _____
DRAWN BY: _____
DESIGNED BY: **BP**
REVIEWED BY: **ESP**
HMT PROJECT NO.: **337.078**

SHEET C3.7

SCALE: 1" = 10' HORIZONTAL
1" = 2.5' VERTICAL

Drawing Name: M:_Projects\337 - Lessor Home\078 - Sky Ranch Unit 2A (94 Lots)\FM 1101 Turn Lane CDA\CDA\337.078.ROAD X-SECTION.dwg User: adrian Oct 06, 2025 - 1:36pm



290 S. CASTELL AVE., STE. 100
NEW BRAUNFELS, TX 78130
TBPELS FIRM F-10961
TBPELS FIRM 10153600



FM 1101 CROSS-SECTION (4 OF 4)
SKY RANCH MUD FM 1101 AND KROESCHE LN TURN LANES

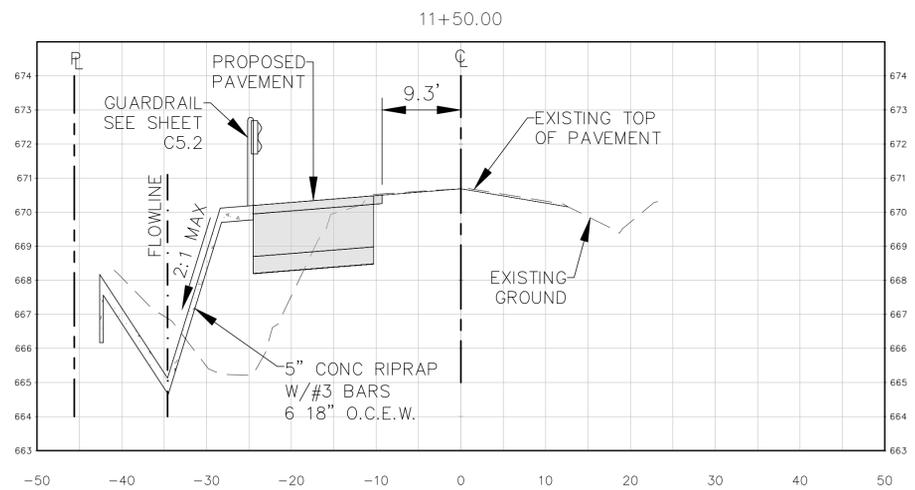
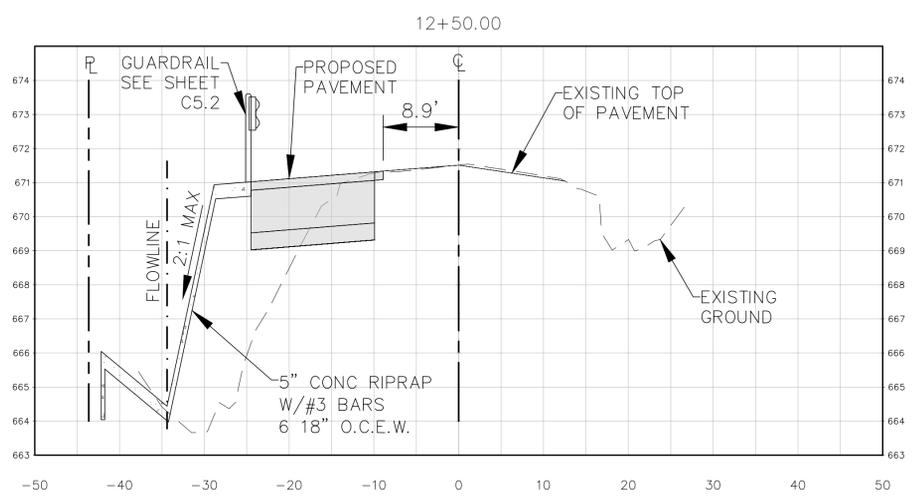
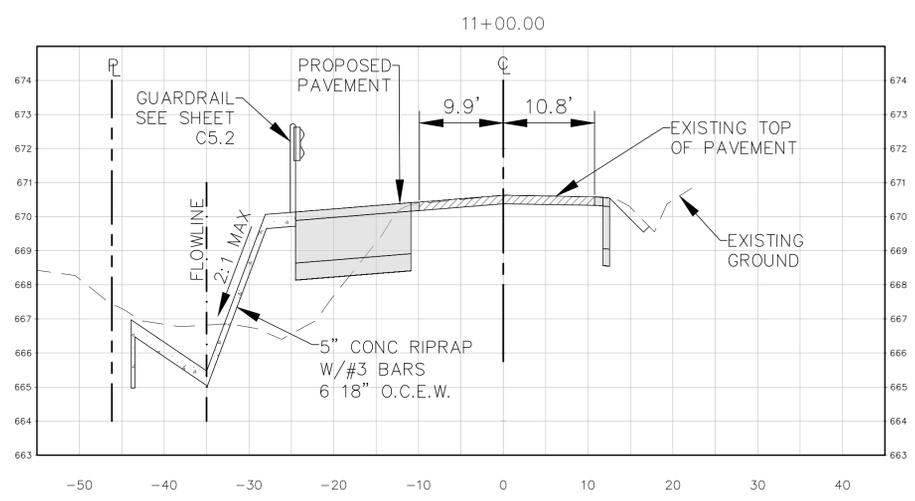
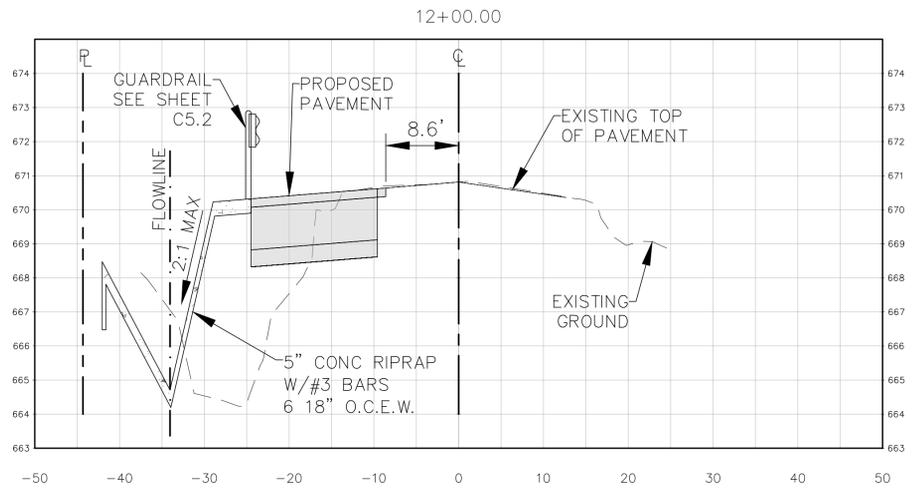
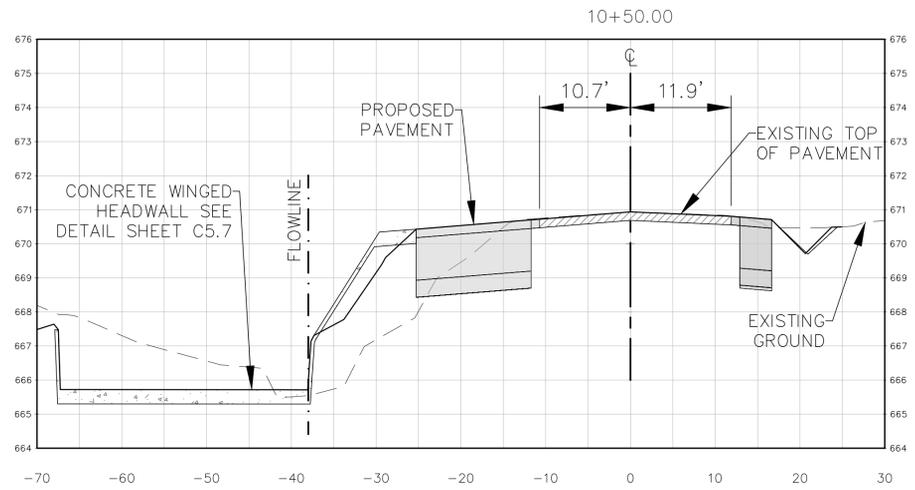
NO.	REVISION DESCRIPTION	REVISION DATE

DATE: _____
DRAWN BY: _____
DESIGNED BY: **BP**
REVIEWED BY: **ESP**
HMT PROJECT NO.: **337.078**

SHEET
C3.8

SCALE: 1" = 10' HORIZONTAL
1" = 2.5' VERTICAL

Drawing Name: W:\Projects\337 - Sky Ranch Unit 2A (94 Lots)\FM 1101 Turn Lane CDA\CDA\337.078.ROAD X-SECTION.dwg User: editor Oct 06, 2025 - 13:37pm



290 S. CASTELL AVE., STE. 100
 NEW BRAUNFELS, TX 78130
 TBPELS FIRM F-10961
 TBPELS FIRM 10153600

HMT
 ENGINEERING & SURVEYING



KROESCHE LN CROSS-SECTION (1 OF 2)

SKY RANCH MUD FM 1101 AND
 KROESCHE LN TURN LANES

NO.	REVISION DESCRIPTION	REVISION DATE

DATE: _____

DRAWN BY: _____

DESIGNED BY: **BP**

REVIEWED BY: **ESP**

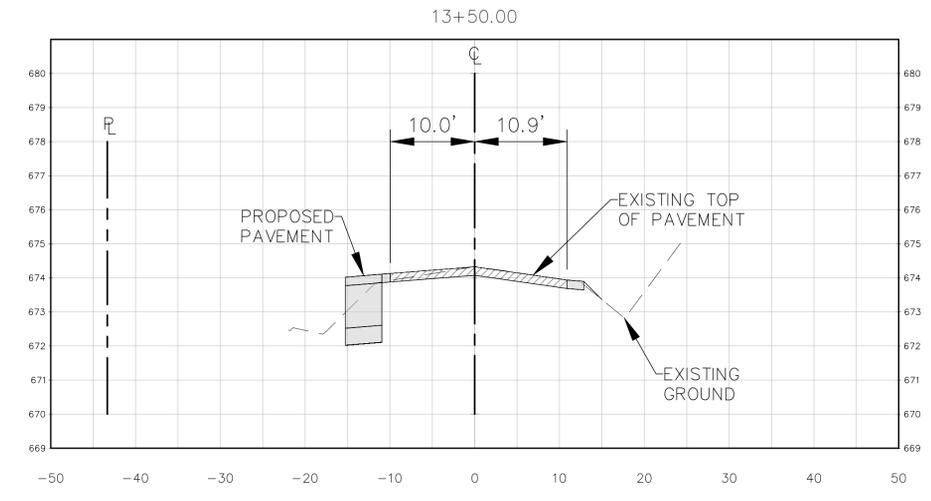
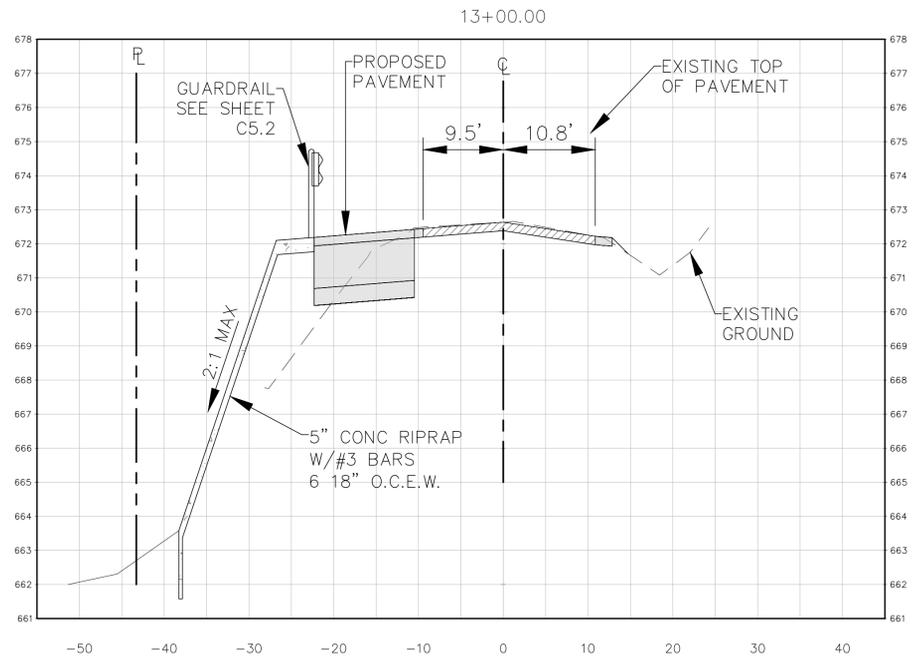
HMT PROJECT NO.: **337.078**

SHEET

C3.9

SCALE: 1" = 10' HORIZONTAL
 1" = 2.5' VERTICAL

Drawing Name: M:\Projects\337 - Sky Ranch Unit 2A (94 Lots)\FM 1101 Turn Lane CDA\CDA\337.078_ROW X-SECTION.dwg User: editor Oct 06, 2025 - 1:38pm



SCALE: 1" = 10' HORIZONTAL
1" = 2.5' VERTICAL

290 S. CASTELL AVE., STE. 100
NEW BRAUNFELS, TX 78130
TBPELS FIRM F-10961
TBPELS FIRM 10153600



KROESCHE LN CROSS-SECTION (2 OF 2)

SKY RANCH MUD FM 1101 AND
KROESCHE LN TURN LANES

NO.	REVISION DESCRIPTION	REVISION DATE

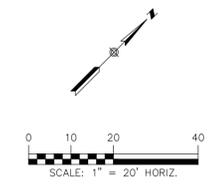
DATE: _____
DRAWN BY: _____
DESIGNED BY: **BP**
REVIEWED BY: **ESP**
HMT PROJECT NO.:
337.078

SHEET
C3.10

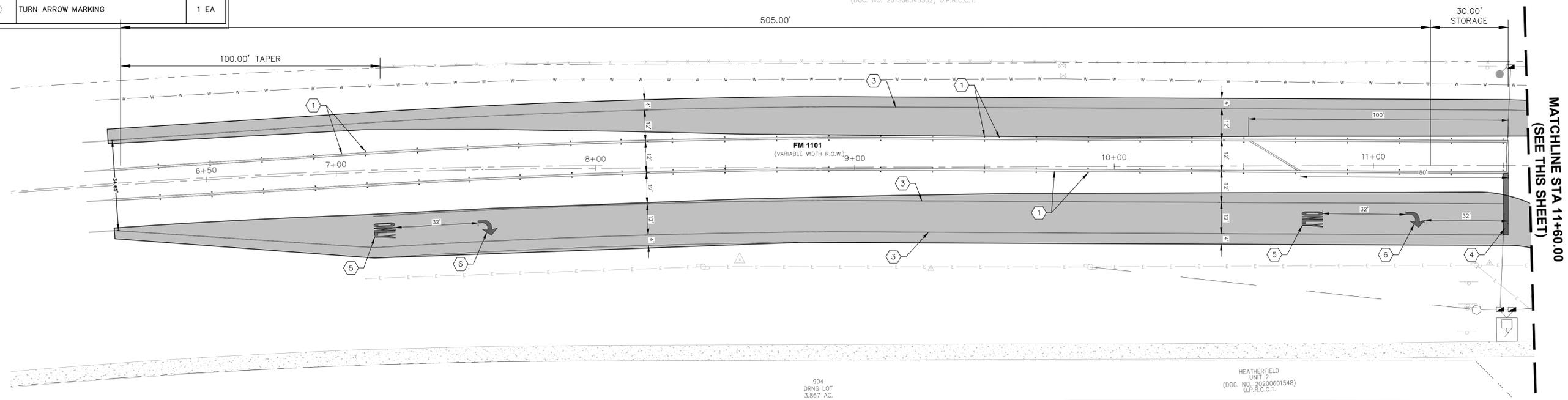
SUMMARY OF PAVEMENT MARKINGS		
KEYNOTE	DESCRIPTION	QTY
1	DOUBLE 6" YELLOW SOLID WITH TYPE-II-A-A REFL. PAVEMENT MARKERS	330 LF
2	8" WHITE SOLID WITH TYPE-I-C REFL. PAVEMENT MARKERS	1079 LF
3	6" WHITE SOLID WITHOUT REFL. PAVEMENT MARKERS	2767 LF
4	24" WHITE STOP BAR	72 LF
5	"ONLY" TURN MARKING	1 EA
6	TURN ARROW MARKING	1 EA

LEGEND

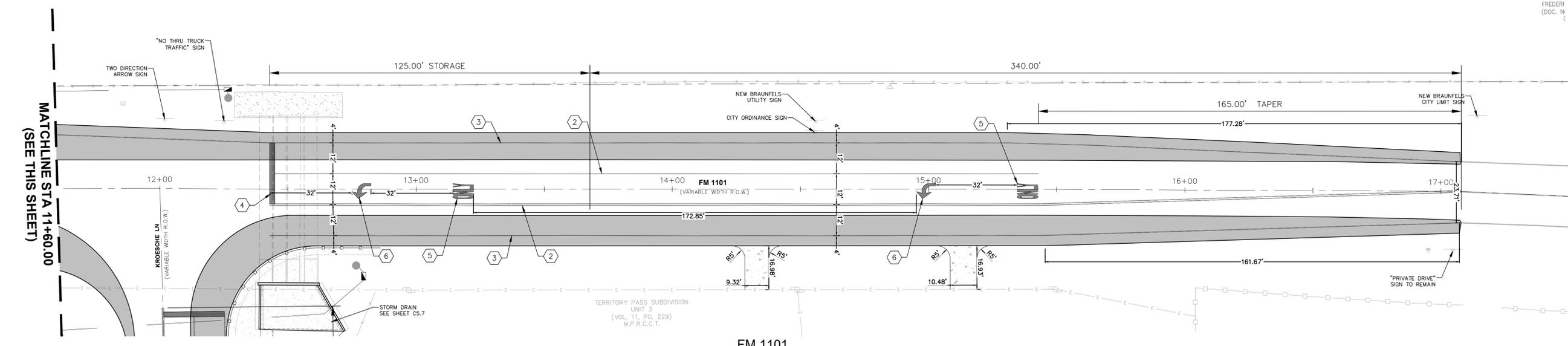
- ADJOINER BOUNDARY
- - - EASEMENT
- CENTERLINE
- EDGE OF ASPHALT
- EXISTING WATER
- EXISTING WASTEWATER
- EXISTING ELECTRIC
- EXISTING WIRE FENCE
- EXISTING CHAINLINK FENCE
- PROPOSED GUARDRAIL
- EXISTING FIRE HYDRANT
- EXISTING POWER POLE
- Y EXISTING GUY ANCHOR
- ⊗ EXISTING WATER VALVE
- ⊕ EXISTING MAILBOX
- ⊠ EXISTING ELECTRIC BOX
- ⊡ EXISTING CABLE PEDESTAL
- ⊢ EXISTING TELEPHONE PEDESTAL
- ⊣ EXISTING WATER METER
- ⊤ EXISTING STREET SIGN
- ⊥ PIN FLAG
- ▭ EXISTING CONCRETE
- ▩ DOUBLE STRIPE W/ TRAFFICE BUTTONS (OUT)



CALLED 239.708 ACRES
FREDERICK FRUEHOLZ, FR.
(DOC. NO. 201306045302) O.P.R.C.C.T.



FM 1101
STA 6+13.11 TO STA 11+60.00



FM 1101
STA 11+60.00 TO STA 17+07.83

THE LOCATION OF ALL EXISTING UNDERGROUND UTILITIES ARE SHOWN IN APPROXIMATE LOCATIONS ONLY. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK. THE CONTRACTOR WILL AGREE TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE INCURRED BY THEIR FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES, STRUCTURES OR FACILITIES. CONTRACTOR SHALL NOTIFY ENGINEER OF ANY DISCREPANCIES 24-HOURS PRIOR TO COMMENCING CONSTRUCTION.

Drawing Name: M:\Projects\337 - Lennor Homes\078 - Sky Ranch Unit 2A (94 Lots)\PM 1101 Turn Lane CDS\CD\337.078_STRIPING PLAN.dwg User: cadnor Oct 06, 2025 - 10:37am

290 S. CASTELL AVE., STE. 100
NEW BRAINFELDS, TX 78130
TBPELS FIRM F-10961
TBPELS FIRM 10153600

10/06/2025

PAVING & STRIPING PLAN (SHEET 1 OF 2)
SKY RANCH MUD FM 1101 AND
KROESCHE LN TURN LANES

NO.	REVISION DESCRIPTION	DATE

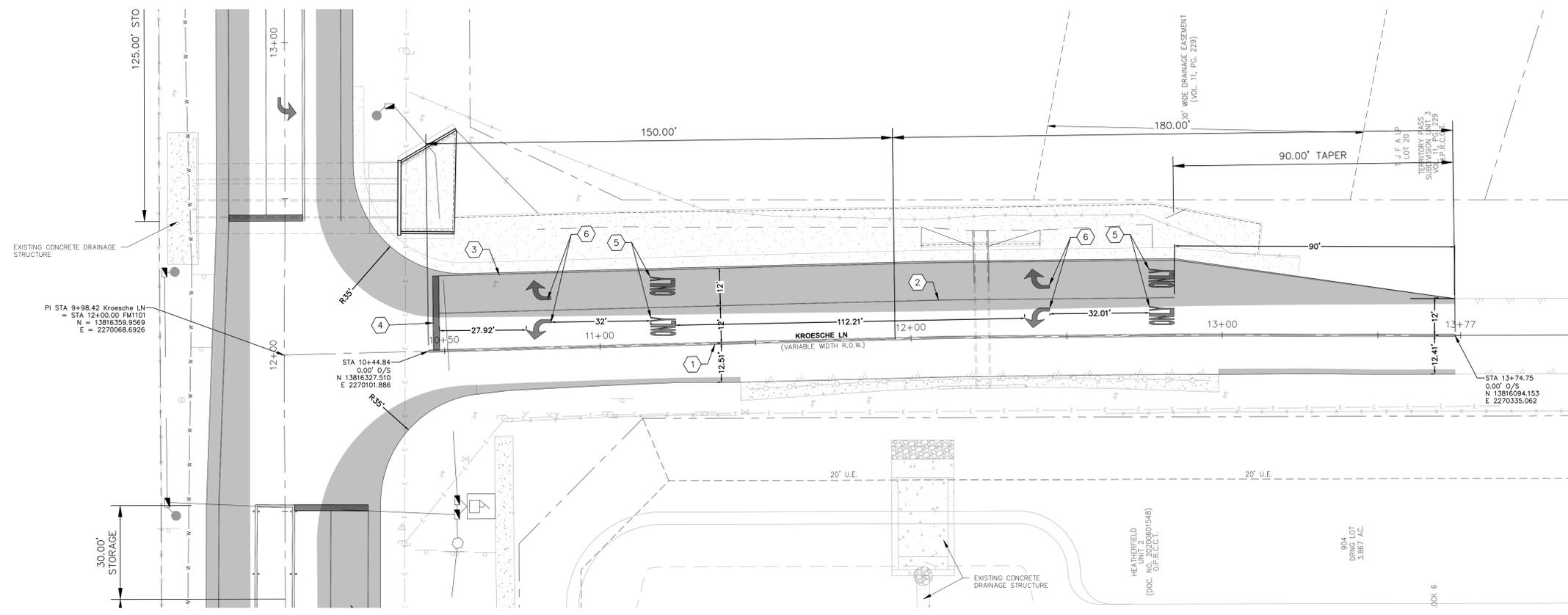
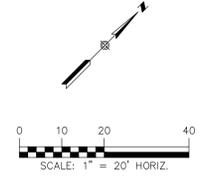
DATE: _____
DRAWN BY: BP
DESIGNED BY: BP
REVIEWED BY: ESP

HMT PROJECT NO.: 337.078
SHEET C4.0

Drawing Name: M:\Projects\337 - Lennor Homes\078 - Sky Ranch Unit 2A (94 Lots)\PM 1101 Turn Lane CDS\CDS\337\078_STRIPING PLAN.dwg User: cadnor Oct 06, 2025 - 10:37am

SUMMARY OF PAVEMENT MARKINGS		
KEYNOTE	DESCRIPTION	QTY
①	DOUBLE 6" YELLOW SOLID WITH TYPE-II-A-A REFL. PAVEMENT MARKERS	330 LF
②	8" WHITE SOLID WITH TYPE-I-C REFL. PAVEMENT MARKERS	1079 LF
③	6" WHITE SOLID WITHOUT REFL. PAVEMENT MARKERS	2767 LF
④	24" WHITE STOP BAR	72 LF
⑤	"ONLY" TURN MARKING	1 EA
⑥	TURN ARROW MARKING	1 EA

- LEGEND**
- ADJOINER BOUNDARY
 - - - EASEMENT
 - CENTERLINE
 - /—/— EDGE OF ASPHALT
 - W — EXISTING WATER
 - WW — EXISTING WASTEWATER
 - E — EXISTING ELECTRIC
 - X — EXISTING WIRE FENCE
 - O — EXISTING CHAINLINK FENCE
 - O — EXISTING METAL RAILING
 - O — EXISTING FIRE HYDRANT
 - O — EXISTING POWER POLE
 - O — EXISTING GUY ANCHOR
 - O — EXISTING WATER VALVE
 - O — EXISTING MAILBOX
 - O — EXISTING ELECTRIC BOX
 - O — EXISTING CABLE PEDESTAL
 - O — EXISTING TELEPHONE PEDESTAL
 - O — EXISTING WATER METER
 - O — EXISTING STREET SIGN
 - O — PIN FLAG
 - O — EXISTING CONCRETE
 - O — DOUBLE STRIPE W/ TRAFFIC BUTTONS (IN)
 - O — DOUBLE STRIPE W/ TRAFFIC BUTTONS (OUT)



**KROESCHE LANE
STA 9+98.42 TO STA 13+74.75**

290 S. CASTELL AVE., STE. 100
NEW BRAUNFELS, TX 78130
TBPELS FIRM F-10961
TBPELS FIRM 10153600



PAVING & STRIPING PLAN (SHEET 2 OF 2)
**SKY RANCH MUD FM 1101 AND
KROESCHE LN TURN LANES**

NO.	REVISION DESCRIPTION	REVISION DATE

DATE: _____
DRAWN BY: _____
DESIGNED BY: **BP**
REVIEWED BY: **ESP**

HMT PROJECT NO.: **337.078**

**SHEET
C4.1**

THE LOCATION OF ALL EXISTING UNDERGROUND UTILITIES ARE SHOWN IN APPROXIMATE LOCATIONS ONLY. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK. THE CONTRACTOR WILL AGREE TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE INCURRED BY THEIR FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES, STRUCTURES OR FACILITIES. CONTRACTOR SHALL NOTIFY ENGINEER OF ANY DISCREPANCIES 24-HOURS PRIOR TO COMMENCING CONSTRUCTION.

DISCLAIMER: This standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other forms or for incorrect results or damages resulting from its use.

EROSION CONTROL LOG SPACING TABLE

SLOPE	LOG DIAMETER			
	6"	8"	12"	18"
1:1 OR STEEPER	5'	10'	15'	20'
2:1	10'	20'	30'	40'
3:1	15'	30'	45'	60'
4:1 OR FLATTER	20'	40'	60'	80'

* ADJUSTMENTS CAN BE MADE FOR SOIL TYPES:
 SOFT, LOAMY SOILS - ADJUST ROWS CLOSER TOGETHER;
 HARD, ROCKY SOILS - ADJUST ROWS FARTHER APART

TRENCH DEPTH TABLE

LOG DIAMETER	DEPTH
6"	2"
8"	3"
12"	4"
18"	5"

STAKE NOTCH DETAIL

STAKE: 2" x 1/2" x 1/2" NOTCH

DATE: _____
FILE: _____

DESIGN DIVISION

Texas Department of Transportation
 Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES
EROSION CONTROL LOG
EC (9) - 16

FILED: 06/11/16	DATE: 06/11/16	BY: [initials]	CHK: [initials]	DATE: 06/11/16	BY: [initials]
NO.:	DATE:	BY:	CHK:	DATE:	BY:

SHEET 2 OF 3

EROSION CONTROL LOG AT CURB & GRADE INLET

EROSION CONTROL LOG AT CURB INLET

EROSION CONTROL LOG AT DROP INLET

SANDBAG DETAIL

SECTION B-B: 6"-8" x 24"-30" x 16"-18"

NOTE:
 EROSION CONTROL LOGS USED AT CURB INLETS SHOULD ONLY BE USED IF THEY WILL NOT IMPEDE TRAFFIC OR FLOOD THE ROADWAY OR WHEN THE STORM SEWER SYSTEM IS NOT FULLY FUNCTIONAL.

DATE: _____
FILE: _____

DESIGN DIVISION

Texas Department of Transportation
 Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES
EROSION CONTROL LOG
EC (9) - 16

FILED: 06/11/16	DATE: 06/11/16	BY: [initials]	CHK: [initials]	DATE: 06/11/16	BY: [initials]
NO.:	DATE:	BY:	CHK:	DATE:	BY:

SHEET 3 OF 3

290 S. CASTELL AVE., STE. 100
 NEW BRAUNFELS, TX 78130
 TBPELS FIRM F-10961
 TBPELS FIRM 10153600

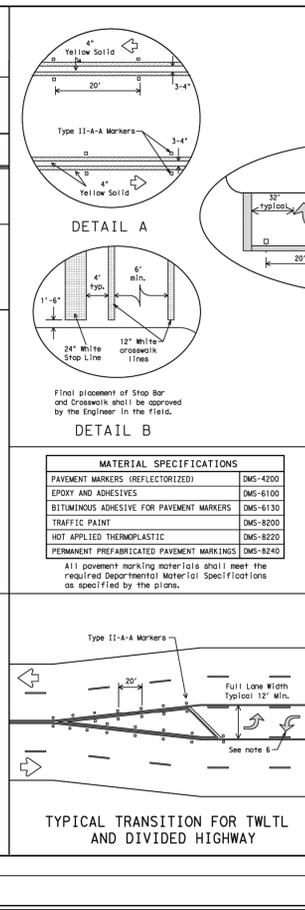
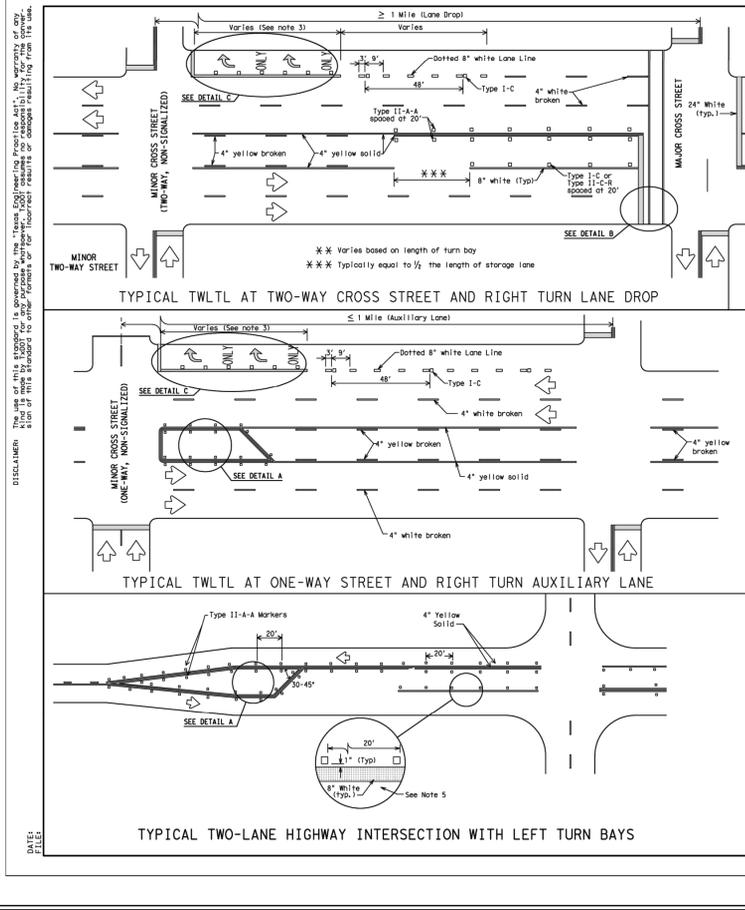


TxDOT EROSION CONTROL DETAILS (2 OF 2)
SKY RANCH MUD FM 1101 AND KROESCHE LN TURN LANES

NO.	REVISION DATE	DESCRIPTION

DATE: _____
 DRAWN BY: _____
 DESIGNED BY: BP
 REVIEWED BY: ESP
 HMT PROJECT NO.: 337.078

DISCLAIMER: The use of this drawing is governed by the Texas Engineering Practice Act. No warranty, express or implied, is made by the Engineer for any use of this drawing for any purpose other than that intended. The Engineer shall not be responsible for any consequences resulting from the use of this drawing for any purpose other than that intended.

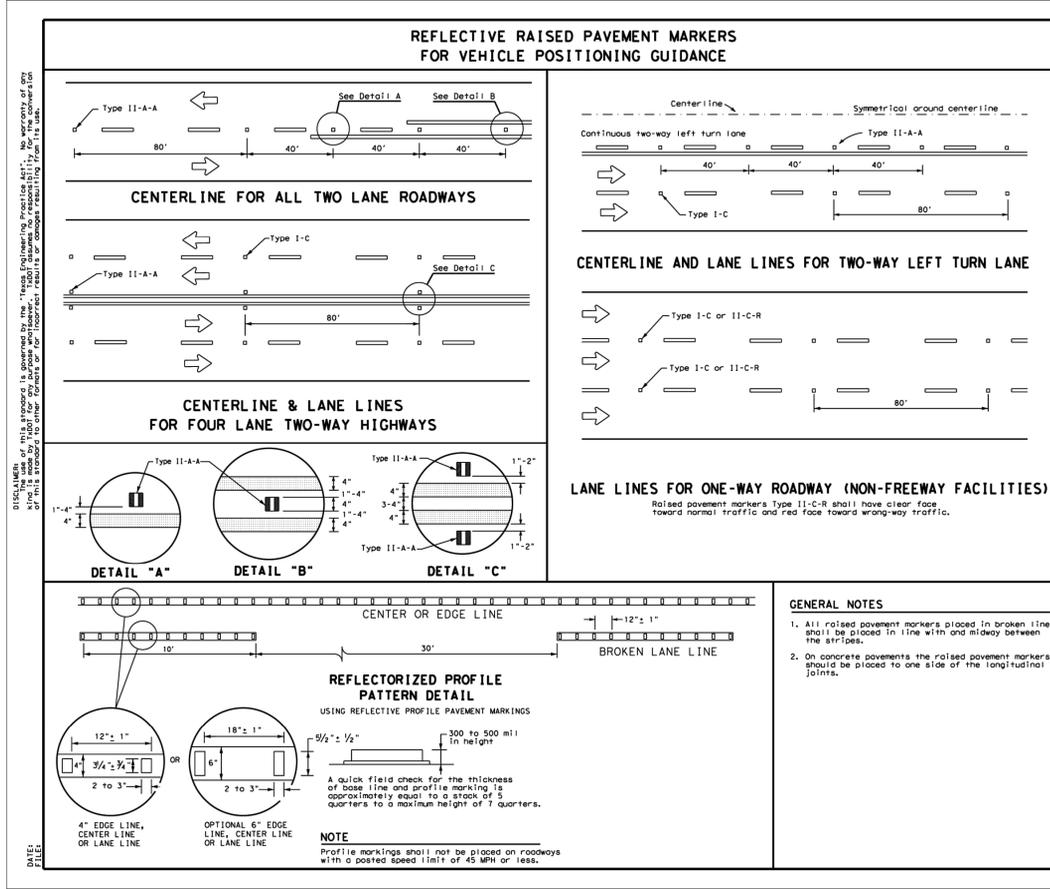


GENERAL NOTES

- Refer elsewhere in plans for additional RPM placement and detail (s).
- Lane use word and arrow markings shall be used where through lanes approaching an intersection become secondary turn lanes. Lane use word and arrow markings should be used in auxiliary lanes of substantial length. Lane use arrow markings or word and arrow markings may be used in other lanes and turn bays for emphasis. Details for words and arrows as shown in the Standard Highway Sign Designs for Texas.
- When lane use word and arrow markings are used, the sets of arrows should be used if the length of the bay is greater than 180 feet. When a single lane use arrow or word and arrow marking is used for a short turn bay, it should be located at or near the upstream end of the full-width turn lane.
- Other crosswalk patterns as shown in the "Texas Manual on Uniform Traffic Control Devices" may be used.
- Reflective pavement marker Type I-C with undivided highway, flush medians and two-way left turn lanes. Reflective pavement marker Type II-C-R with divided highways and raised medians.
- A two-way left-turn (TWLTL) lane-use arrow pavement marking should be used at or just downstream from the beginning of a two-way left-turn lane within a corridor. Respecting the marking after each intersection or decelerated turn bay is not required unless stated elsewhere in the plans.

PAVEMENT MARKINGS FOR TWO-WAY LEFT TURN LANES DIVIDED HIGHWAYS AND RURAL LEFT TURN BAYS
PM(3)-12

FILED	APR 11 1988	NOV 1987	NOV 1987	NOV 1987	NOV 1987
2-10	2-12	2-10	2-10	2-10	2-10
2-10	2-10	2-10	2-10	2-10	2-10



MATERIAL SPECIFICATIONS

PAVEMENT MARKERS (REFLECTORIZED)	DMS-4200
EPXY AND ADHESIVES	DMS-6100
BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS	DMS-6130
TRAFFIC PAINT	DMS-8200
HOT APPLIED THERMOPLASTIC	DMS-8220
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240

All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.

REFLECTORIZED PROFILE PATTERN DETAIL

USING REFLECTORIZED PROFILE PAVEMENT MARKINGS

A quick field check for the thickness of base line and profile marking is approximately equal to a stack of 5 quarters to a maximum height of 7 quarters.

NOTE

Profile markings shall not be placed on roadways with a posted speed limit of 45 MPH or less.

GENERAL NOTES

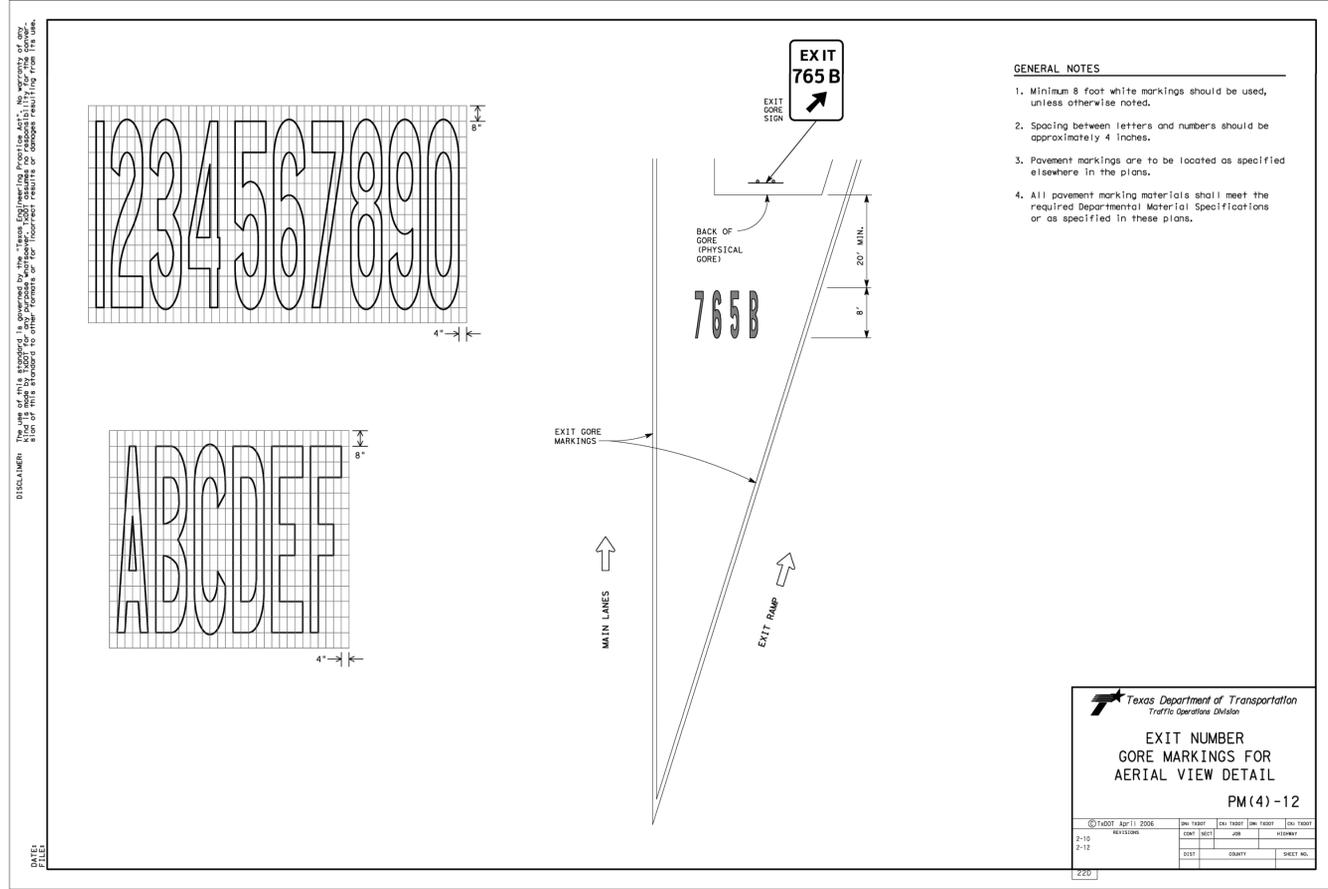
- All raised pavement markers placed in broken lines shall be placed in line with and midway between the stripes.
- On concrete pavements the raised pavement markers should be placed to one side of the longitudinal joints.

RAISED PAVEMENT MARKERS

Texas Department of Transportation Traffic Safety Division Standard

POSITION GUIDANCE USING RAISED PAVEMENT RELECTORIZED PROFILE MARKINGS
PM(2)-20

FILED	APR 11 1988	NOV 1987	NOV 1987	NOV 1987	NOV 1987
2-10	2-12	2-10	2-10	2-10	2-10
2-10	2-10	2-10	2-10	2-10	2-10



GENERAL NOTES

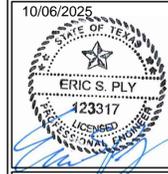
- Minimum 8 foot white markings should be used, unless otherwise noted.
- Spacing between letters and numbers should be approximately 4 inches.
- Pavement markings are to be located as specified elsewhere in the plans.
- All pavement marking materials shall meet the required Departmental Material Specifications as specified in these plans.

EXIT NUMBER GORE MARKINGS FOR AERIAL VIEW DETAIL
PM(4)-12

FILED	APR 11 2006	NOV 1987	NOV 1987	NOV 1987	NOV 1987
2-10	2-10	2-10	2-10	2-10	2-10
2-10	2-10	2-10	2-10	2-10	2-10

DATE: FILE: 2-10

DATE: FILE: 2-10



HIGH-VISIBILITY LONGITUDINAL CROSSWALK AT CONTROLLED APPROACH

UNSIGNALED MID BLOCK HIGH-VISIBILITY LONGITUDINAL CROSSWALK

GENERAL NOTES

- Longitudinal crosswalk lines should not be placed in the wheel path of vehicles. Center the crosswalk lines on travel lanes, lane lines, and shoulder lines (if present).
- A minimum 6' clear distance shall be provided to the curb face. If the last crosswalk line falls into this distance it must be omitted.
- For divided roadways, adjustments in spacing of the crosswalk lines should be made in the median so that the crosswalk lines are maintained in their proper location across the travel portion of the roadway.
- At skewed crosswalks, the crosswalk lines are to remain parallel to the lane lines.
- Each crosswalk shall be a minimum of 6' wide.
- The High-Visibility Longitudinal Crosswalk is the preferred crosswalk pattern on State Highways. Other crosswalk patterns as shown in the "Texas Manual on Uniform Traffic Control Devices" may be used. All crosswalk designs and dimensions shall comply with the "Texas Manual on Uniform Traffic Control Devices."
- Final placement of Stop Bar/Field Triangles and Crosswalk shall be approved by the Engineer in the field.

MATERIAL SPECIFICATIONS

PAVEMENT MARKERS (REFLECTORIZED)	DMS-4200
EPoxy AND ADHESIVES	DMS-6100
BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS	DMS-6130
TRAFFIC PAINT	DMS-8200
HOT APPLIED THERMOPLASTIC	DMS-8220
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240

NOTES

- Use yield triangles with "Yield Here to Pedestrians" signs at unsignaled mid block crosswalks.
- Use stop bars with stop signs on one-way streets and mid block crosswalks controlled by traffic signals or pedestrian hybrid beacons.

CROSSWALK PAVEMENT MARKINGS

PM (4) -20

Texas Department of Transportation Traffic Safety Division Standard

FILED: 04-20-09
 DATE: 01/01/2020
 COUNTY: DALLAS
 SHEET NO. 0001

TYPICAL MEDIAN LEFT TURN BAY (FOR USE ON RURAL ROADS)

SIGNALIZED AND NON-SIGNALIZED CROSS STREETS WITH LEFT TURN BAY

TYPICAL TRANSITION

LEFT TURN BAY END CONDITION AND ROADWAY TRANSITION

LEGEND

NOTES

- PAVEMENT MARKERS SHOULD BE IN ACCORDANCE WITH STATE STANDARDS PM(2)-20 (POSITIONING GUIDANCE).
- PAVEMENT MARKING ARROWS SHALL COMPLY TO TEXAS MUTCD.
- LEFT TURN BAY LAYOUT, TWO SETS OF "WORDS" AND "ARROWS" SHALL BE USED IF THE LENGTH OF THE BAY IS EQUAL TO OR GREATER THAN 180 FEET. THE BOTTOM OF THE FIRST "ONLY" SHALL BE PLACED AT THE BEGINNING OF THE TURN BAY LANE LINE AS SHOWN ABOVE.
- REFER TO TxDOT STANDARD PM(3)-20 FOR MORE TURN LANE DETAILS.
- REFER TO TxDOT ROADWAY DESIGN MANUAL FOR DECELERATION AND STORAGE LENGTH.

San Antonio District Standard

TWO WAY LEFT TURN LANE AND LEFT TURN BAYS - RURAL ROADS

SCALE(S): TMLTL(11)-22

REVISION	DATE	BY	DESCRIPTION
MAY 2010			
MAY 2018			
MAY 2022			

FILED: 04-20-09
 DATE: 01/01/2020
 COUNTY: DALLAS
 SHEET NO. 0001

LANE REDUCTION

Posted Speed	D (ft)	L (ft)
30 MPH	460	L=WS ²
35 MPH	565	L=WS ²
40 MPH	670	L=WS ²
45 MPH	775	L=WS ²
50 MPH	885	L=WS ²
55 MPH	990	L=WS ²
60 MPH	1,100	L=WS ²
65 MPH	1,200	L=WS ²
70 MPH	1,250	L=WS ²
75 MPH	1,350	L=WS ²

TYPICAL TWLTL AT ONE-WAY STREET AND RIGHT TURN AUXILIARY LANE

TYPICAL TWO-LANE HIGHWAY INTERSECTION WITH LEFT TURN BAYS

TYPICAL TWLTL AT TWO-WAY CROSS STREET AND RIGHT TURN LANE DROP

GENERAL NOTES

- Lane use word and arrow markings shall be used where through lanes approaching an intersection or because of a section of on-street parking in which otherwise be a through lane. For Texas Super 2 Passing Lanes, see TxDOT's standard sheets.
- On divided highways, an optional third lane reduction arrow may be added based on engineering judgement. If used, the optional third lane reduction arrow should be centered between the first and last lane reduction arrows.
- Lane reduction arrows are required for speeds of 45 mph or greater; an optional third lane reduction arrow may be added based on engineering judgement. If used, the optional third lane reduction arrow should be centered between the first and last lane reduction arrows.
- For lane reductions on Freeways and Expressways, signing shall conform to the TxDOT Freeway Signing Handbook.

MATERIAL SPECIFICATIONS

PAVEMENT MARKERS (REFLECTORIZED)	DMS-4200
EPoxy AND ADHESIVES	DMS-6100
BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS	DMS-6130
TRAFFIC PAINT	DMS-8200
HOT APPLIED THERMOPLASTIC	DMS-8220
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240

TWO-WAY LEFT TURN LANES, RURAL LEFT TURN BAYS, AND LANE REDUCTION PAVEMENT MARKINGS

PM (3) -20

Texas Department of Transportation Traffic Safety Division Standard

FILED: 04-20-09
 DATE: 01/01/2020
 COUNTY: DALLAS
 SHEET NO. 0001

TYPICAL MEDIAN LEFT TURN BAY

SIGNALIZED AND NON-SIGNALIZED CROSS STREETS AT BEGINNING AND END OF TWO WAY CENTER LEFT TURN LANE

TYPICAL TRANSITION

AT BEGINNING AND END OF TWO WAY CENTER LEFT TURN LANE

LEGEND

NOTES

- PAVEMENT MARKERS SHOULD BE IN ACCORDANCE WITH STATE STANDARDS PM(2)-20 (POSITIONING GUIDANCE).
- PAVEMENT MARKING ARROWS SHALL COMPLY TO TEXAS MUTCD.
- LEFT TURN BAY LAYOUT, TWO SETS OF "WORDS" AND "ARROWS" SHALL BE USED IF THE LENGTH OF THE BAY IS EQUAL TO OR GREATER THAN 180 FEET. THE BOTTOM OF THE FIRST "ONLY" SHALL BE PLACED AT THE BEGINNING OF THE TURN BAY LANE LINE AS SHOWN ABOVE.
- REFER TO TxDOT STANDARD PM(3)-20 FOR MORE TURN LANE DETAILS.
- REFER TO TxDOT ROADWAY DESIGN MANUAL FOR DECELERATION AND STORAGE LENGTH.

San Antonio District Standard

TWO WAY LEFT TURN LANE AND LEFT TURN BAYS - URBAN ROADS

SCALE(S): TMLTL(12)-22

REVISION	DATE	BY	DESCRIPTION
MAY 2010			
MAY 2018			
MAY 2022			

FILED: 04-20-09
 DATE: 01/01/2020
 COUNTY: DALLAS
 SHEET NO. 0001



NO.	REVISION DESCRIPTION	DATE

DATE: MARCH 31, 2025
 DRAWN BY: BP
 DESIGNED BY: BP
 REVIEWED BY: ESP
 HMT PROJECT NO.: 337-078

TABLE OF DIMENSIONS AND REINFORCING STEEL
Wings for one structure end

Dimensions	Variable Reinforcing				Estimated Quantities		Estimated Quantities	
	W	X	Y	Z	Reinf. (lb/ft)	Conc. (CY/ft)	Reinf. (lb/ft)	Conc. (CY/ft)
2'-0" 2'-10" 1'-0" 1'-0"	#4	1'-0"	#4	1'-0"	48.64	0.56	6.85	0.071
2'-0" 2'-10" 1'-0" 1'-0"	#4	1'-0"	#4	1'-0"	49.31	0.424	6.85	0.071
3'-0" 2'-10" 1'-0" 1'-0"	#4	1'-0"	#4	1'-0"	49.98	0.444	6.85	0.071
3'-0" 2'-10" 1'-0" 1'-0"	#4	1'-0"	#4	1'-0"	53.32	0.462	6.85	0.071
3'-0" 2'-10" 1'-0" 1'-0"	#4	1'-0"	#4	1'-0"	53.98	0.480	6.85	0.071
4'-0" 3'-2" 1'-2" 1'-2"	#4	1'-0"	#4	1'-0"	55.77	0.532	6.85	0.071
4'-0" 3'-2" 1'-2" 1'-2"	#4	1'-0"	#4	1'-0"	59.77	0.568	6.85	0.071
5'-0" 3'-9" 1'-2" 1'-2"	#4	1'-0"	#4	1'-0"	63.45	0.632	6.85	0.075
5'-0" 3'-9" 1'-2" 1'-2"	#4	1'-0"	#4	1'-0"	67.46	0.668	6.85	0.075
6'-0" 4'-4" 2'-0" 1'-4"	#5	1'-0"	#5	1'-0"	80.67	0.730	7.07	0.078
6'-0" 4'-4" 2'-0" 1'-4"	#5	1'-0"	#5	1'-0"	85.05	0.768	7.07	0.078
7'-0" 5'-0" 2'-3" 1'-9"	#5	1'-0"	#5	1'-0"	92.15	0.864	6.07	0.093
7'-0" 5'-0" 2'-3" 1'-9"	#5	1'-0"	#5	1'-0"	96.54	0.902	6.07	0.093
8'-0" 6'-0" 2'-8" 1'-10"	#5	1'-0"	#5	1'-0"	109.04	0.962	6.13	0.095
8'-0" 6'-0" 2'-8" 1'-10"	#5	1'-0"	#5	1'-0"	114.47	1.000	6.13	0.095
9'-0" 6'-0" 2'-10" 2'-2"	#5	1'-0"	#5	1'-0"	126.93	1.136	6.41	0.110
10'-0" 6'-5" 3'-0" 2'-5"	#6	1'-0"	#6	1'-0"	196.27	1.234	6.57	0.117
11'-0" 7'-2" 3'-6" 2'-8"	#6	1'-0"	#6	1'-0"	230.13	1.438	6.92	0.140
12'-0" 7'-8" 3'-9" 2'-11"	#6	1'-0"	#6	1'-0"	283.41	1.592	9.74	0.157
13'-0" 8'-2" 4'-0" 3'-2"	#6	1'-0"	#6	1'-0"	348.72	1.804	10.02	0.186
14'-0" 8'-10" 4'-5" 3'-5"	#6	1'-0"	#6	1'-0"	432.94	2.046	10.30	0.218
15'-0" 9'-0" 4'-10" 3'-8"	#6	1'-0"	#6	1'-0"	489.52	2.302	11.24	0.253
16'-0" 9'-11" 5'-0" 3'-11"	#6	1'-0"	#6	1'-0"	505.72	2.448	11.47	0.279

WING DIMENSION FORMULAS:
 W = H + T + C
 Lw = (H)(S) + (N + 1)(O) + cosine θ
 B = (A) [tangent (B + 15°)]
 Lw = (A) [cosine (B + 15°)]

TABLE OF ESTIMATED CURVELENGTH QUANTITIES

Bar Size	No.	Spa.
D1 #4	1'-0"	1'-0"
D2 #6	1'-0"	1'-0"
E1 #4	1'-0"	1'-0"
F #4	1'-0"	1'-0"
G #6	1'-0"	1'-0"
H #4	1'-0"	1'-0"
I #4	1'-0"	1'-0"
J #4	1'-0"	1'-0"
K #4	1'-0"	1'-0"
L #4	1'-0"	1'-0"
M #4	1'-0"	1'-0"
N #4	1'-0"	1'-0"
O #4	1'-0"	1'-0"
P #4	1'-0"	1'-0"
Q #4	1'-0"	1'-0"
R #4	1'-0"	1'-0"
S #4	1'-0"	1'-0"
T #4	1'-0"	1'-0"
U #4	1'-0"	1'-0"
V #4	1'-0"	1'-0"
W #4	1'-0"	1'-0"
X #4	1'-0"	1'-0"
Y #4	1'-0"	1'-0"
Z #4	1'-0"	1'-0"

CONSTRUCTION NOTES:
 Do not use permanent forms.
 Chamfer the bottom edge of the top slab 3" at the entrance.
 Optionally, raise construction joints shown at the flow line by a maximum of 6". If this option is taken, Bars M may be cut off or raised. Bars C and D may be reversed, and Bars Y and Z may be reversed.

MATERIAL NOTES:
 Provide Class 60 reinforcing steel.
 Provide Class C concrete (f'c = 3600 psi) for culvert barrels and curbs, with the following exceptions: provide Class S concrete (f'c = 4000 psi) for top slabs of:
 • curbs with 1-to-2 course surface treatment, or
 • curbs with the top of the final rising surface.
 Provide bar laps, where required, as follows:
 • Uncolored or galvanized - #5 = 2'-3" Min
 • Uncolored or galvanized - #6 = 2'-6" Min
 • Uncolored or galvanized - #8 = 2'-6" Min

GENERAL NOTES:
 Designed according to AASHTO LRFD Bridge Design Specifications for the range of fill heights shown.
 See the Multiple Box Culverts Cast-in-Place Miscellaneous Detail (MC-5-20) standard sheet for details pertaining to skewing, miscellaneous lengthening.
 Cover dimensions are clear dimensions, unless noted otherwise.
 Reinforcing bar dimensions shown are out-to-out of bar.

TABLE OF BAR DIMENSIONS

H	T	U	W
2'-0"	2'-6"	3'-8"	3'-8"
3'-0"	3'-6"	3'-8"	3'-8"
4'-0"	4'-6"	3'-8"	3'-8"
5'-0"	5'-6"	3'-8"	3'-8"

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

CONCRETE WINGWALLS WITH FLARED WINGS FOR SKEWED BOX CULVERTS FW-S

TABLE OF DIMENSIONS AND REINFORCING STEEL
Wings for one structure end

Dimensions	Variable Reinforcing				Estimated Quantities		Estimated Quantities	
	W	X	Y	Z	Reinf. (lb/ft)	Conc. (CY/ft)	Reinf. (lb/ft)	Conc. (CY/ft)
2'-0" 2'-5" 1'-0" 9"	#4	1'-0"	#4	1'-0"	37.73	0.248	3.73	0.248
3'-0" 2'-5" 1'-0" 9"	#4	1'-0"	#4	1'-0"	37.01	0.261	3.74	0.273
4'-0" 2'-5" 1'-0" 9"	#4	1'-0"	#4	1'-0"	37.41	0.273	3.74	0.273
4'-0" 2'-5" 1'-0" 9"	#4	1'-0"	#4	1'-0"	38.01	0.285	3.74	0.285
4'-0" 2'-5" 1'-0" 9"	#4	1'-0"	#4	1'-0"	41.75	0.330	3.74	0.330
5'-0" 2'-5" 1'-0" 9"	#4	1'-0"	#4	1'-0"	45.76	0.414	3.74	0.414
6'-0" 2'-5" 1'-0" 9"	#4	1'-0"	#4	1'-0"	46.42	0.367	3.74	0.367
7'-0" 2'-5" 1'-0" 9"	#4	1'-0"	#4	1'-0"	47.19	0.414	3.74	0.414
8'-0" 2'-5" 1'-0" 9"	#4	1'-0"	#4	1'-0"	60.19	0.406	3.74	0.406
9'-0" 2'-5" 1'-0" 9"	#4	1'-0"	#4	1'-0"	61.40	0.414	3.74	0.414
10'-0" 2'-5" 1'-0" 9"	#5	1'-0"	#5	1'-0"	67.25	0.584	3.74	0.584
11'-0" 2'-5" 1'-0" 9"	#5	1'-0"	#5	1'-0"	68.63	0.634	3.74	0.634
12'-0" 2'-5" 1'-0" 9"	#5	1'-0"	#5	1'-0"	162.29	0.721	3.74	0.721
13'-0" 2'-5" 1'-0" 9"	#5	1'-0"	#5	1'-0"	178.80	0.856	3.74	0.856
14'-0" 2'-5" 1'-0" 9"	#5	1'-0"	#5	1'-0"	216.76	0.939	3.74	0.939
15'-0" 2'-5" 1'-0" 9"	#5	1'-0"	#5	1'-0"	263.08	1.068	3.74	1.068
16'-0" 2'-5" 1'-0" 9"	#5	1'-0"	#5	1'-0"	297.02	1.234	3.74	1.234

WING DIMENSION FORMULAS:
 W = H + T + C - 0.250
 Lw = (H)(S) + (N + 1)(O) + cosine θ
 B = (A) [tangent (B + 15°)]
 Lw = (A) [cosine (B + 15°)]

TABLE OF ESTIMATED CURVELENGTH QUANTITIES

Bar Size	No.	Spa.
D1 #4	1'-0"	1'-0"
D2 #4	1'-0"	1'-0"
E #4	1'-0"	1'-0"
F #4	1'-0"	1'-0"
G #4	1'-0"	1'-0"
H #4	1'-0"	1'-0"
I #4	1'-0"	1'-0"
J #4	1'-0"	1'-0"
K #4	1'-0"	1'-0"
L #4	1'-0"	1'-0"
M #4	1'-0"	1'-0"
N #4	1'-0"	1'-0"
O #4	1'-0"	1'-0"
P #4	1'-0"	1'-0"
Q #4	1'-0"	1'-0"
R #4	1'-0"	1'-0"
S #4	1'-0"	1'-0"
T #4	1'-0"	1'-0"
U #4	1'-0"	1'-0"
V #4	1'-0"	1'-0"
W #4	1'-0"	1'-0"
X #4	1'-0"	1'-0"
Y #4	1'-0"	1'-0"
Z #4	1'-0"	1'-0"

CONSTRUCTION NOTES:
 Do not use permanent forms.
 Chamfer the bottom edge of the top slab 3" at the entrance.
 Optionally, raise construction joints shown at the flow line by a maximum of 6". If this option is taken, Bars M may be cut off or raised. Bars C and D may be reversed, and Bars Y and Z may be reversed.

MATERIAL NOTES:
 Provide Class 60 reinforcing steel.
 Provide Class C concrete (f'c = 3600 psi) for culvert barrels and curbs, with the following exceptions: provide Class S concrete (f'c = 4000 psi) for top slabs of:
 • curbs with 1-to-2 course surface treatment, or
 • curbs with the top of the final rising surface.
 Provide bar laps, where required, as follows:
 • Uncolored or galvanized - #4 = 1'-6" Min
 • Uncolored or galvanized - #5 = 2'-3" Min
 • Uncolored or galvanized - #6 = 2'-6" Min

GENERAL NOTES:
 Designed according to AASHTO LRFD Bridge Design Specifications.
 When structure is founded on solid rock, depth of toe/walls for culverts and wingwalls may be reduced or eliminated as directed by the Engineer.
 See Box Culvert Supplement (BCS) standard sheet for additional dimensions and information.
 The quantities for concrete and reinforcing steel resulting from the formulas given in this sheet are for the Contractor's information only.

CONCRETE WINGWALLS WITH FLARED WINGS FOR SKEWED BOX CULVERTS FW-S

SECTION THRU CURB

TABLE OF BAR DIMENSIONS

H	T	U	W
2'-0"	2'-6"	3'-8"	3'-8"
3'-0"	3'-6"	3'-8"	3'-8"
4'-0"	4'-6"	3'-8"	3'-8"
5'-0"	5'-6"	3'-8"	3'-8"

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

CONCRETE WINGWALLS WITH FLARED WINGS FOR SKEWED BOX CULVERTS FW-S

TABLE OF DIMENSIONS AND REINFORCING STEEL
Wings for one structure end

Dimensions	Variable Reinforcing				Estimated Quantities		Estimated Quantities	
	W	X	Y	Z	Reinf. (lb/ft)	Conc. (CY/ft)	Reinf. (lb/ft)	Conc. (CY/ft)
2'-0" 2'-5" 1'-0" 9"	#4	1'-0"	#4	1'-0"	37.73	0.248	3.73	0.248
3'-0" 2'-5" 1'-0" 9"	#4	1'-0"	#4	1'-0"	37.01	0.261	3.74	0.273
4'-0" 2'-5" 1'-0" 9"	#4	1'-0"	#4	1'-0"	37.41	0.273	3.74	0.273
4'-0" 2'-5" 1'-0" 9"	#4	1'-0"	#4	1'-0"	38.01	0.285	3.74	0.285
4'-0" 2'-5" 1'-0" 9"	#4	1'-0"	#4	1'-0"	41.75	0.330	3.74	0.330
5'-0" 2'-5" 1'-0" 9"	#4	1'-0"	#4	1'-0"	45.76	0.414	3.74	0.414
6'-0" 2'-5" 1'-0" 9"	#4	1'-0"	#4	1'-0"	46.42	0.367	3.74	0.367
7'-0" 2'-5" 1'-0" 9"	#4	1'-0"	#4	1'-0"	47.19	0.414	3.74	0.414
8'-0" 2'-5" 1'-0" 9"	#4	1'-0"	#4	1'-0"	60.19	0.406	3.74	0.406
9'-0" 2'-5" 1'-0" 9"	#4	1'-0"	#4	1'-0"	61.40	0.414	3.74	0.414
10'-0" 2'-5" 1'-0" 9"	#5	1'-0"	#5	1'-0"	67.25	0.584	3.74	0.584
11'-0" 2'-5" 1'-0" 9"	#5	1'-0"	#5	1'-0"	68.63	0.634	3.74	0.634
12'-0" 2'-5" 1'-0" 9"	#5	1'-0"	#5	1'-0"	162.29	0.721	3.74	0.721
13'-0" 2'-5" 1'-0" 9"	#5	1'-0"	#5	1'-0"	178.80	0.856	3.74	0.856
14'-0" 2'-5" 1'-0" 9"	#5	1'-0"	#5	1'-0"	216.76	0.939	3.74	0.939
15'-0" 2'-5" 1'-0" 9"	#5	1'-0"	#5	1'-0"	263.08	1.068	3.74	1.068
16'-0" 2'-5" 1'-0" 9"	#5	1'-0"	#5	1'-0"	297.02	1.234	3.74	1.234

WING DIMENSION FORMULAS:
 W = H + T + C - 0.250
 Lw = (H)(S) + (N + 1)(O) + cosine θ
 B = (A) [tangent (B + 15°)]
 Lw = (A) [cosine (B + 15°)]

TABLE OF ESTIMATED CURVELENGTH QUANTITIES

Bar Size	No.	Spa.
D1 #4	1'-0"	1'-0"
D2 #4	1'-0"	1'-0"
E #4	1'-0"	1'-0"
F #4	1'-0"	1'-0"
G #4	1'-0"	1'-0"
H #4	1'-0"	1'-0"
I #4	1'-0"	1'-0"
J #4	1'-0"	1'-0"
K #4	1'-0"	1'-0"
L #4	1'-0"	1'-0"
M #4	1'-0"	1'-0"
N #4	1'-0"	1'-0"
O #4	1'-0"	1'-0"
P #4	1'-0"	1'-0"
Q #4	1'-0"	1'-0"
R #4	1'-0"	1'-0"
S #4	1'-0"	1'-0"
T #4	1'-0"	1'-0"
U #4	1'-0"	1'-0"
V #4	1'-0"	1'-0"
W #4	1'-0"	1'-0"
X #4	1'-0"	1'-0"
Y #4	1'-0"	1'-0"
Z #4	1'-0"	1'-0"

CONSTRUCTION NOTES:
 Do not use permanent forms.
 Chamfer the bottom edge of the top slab 3" at the entrance.
 Optionally, raise construction joints shown at the flow line by a maximum of 6". If this option is taken, Bars M may be cut off or raised. Bars C and D may be reversed, and Bars Y and Z may be reversed.

MATERIAL NOTES:
 Provide Class 60 reinforcing steel.
 Provide Class C concrete (f'c = 3600 psi) for culvert barrels and curbs, with the following exceptions: provide Class S concrete (f'c = 4000 psi) for top slabs of:
 • curbs with 1-to-2 course surface treatment, or
 • curbs with the top of the final rising surface.
 Provide bar laps, where required, as follows:
 • Uncolored or galvanized - #4 = 1'-6" Min
 • Uncolored or galvanized - #5 = 2'-3" Min
 • Uncolored or galvanized - #6 = 2'-6" Min

GENERAL NOTES:
 Designed according to AASHTO LRFD Bridge Design Specifications.
 When structure is founded on solid rock, depth of toe/walls for culverts and wingwalls may be reduced or eliminated as directed by the Engineer.
 See Box Culvert Supplement (BCS) standard sheet for additional dimensions and information.
 The quantities for concrete and reinforcing steel resulting from the formulas given in this sheet are for the Contractor's information only.

CONCRETE WINGWALLS WITH FLARED WINGS FOR SKEWED BOX CULVERTS FW-S

CONCRETE WINGWALLS WITH FLARED WINGS FOR SKEWED BOX CULVERTS FW-S

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

290 S. CASTELL AVE., STE. 100
 NEW BRAUNFELS, TX 78130
 TBPE FIRM F-10961
 TBPLS FIRM 1053600

HMT
 ENGINEERING & SURVEYING

10/06/2025

ERIC S. PLY
 123317
 LICENSED

10/06/2025

DATE: MARCH 31, 2025

DRAWN BY: BP

DESIGNED BY: BP

REVIEWED BY: ESP

HMT PROJECT NO.: 337.078

SHEET C5.6

TXDOT DETAILS (SHEET 5 OF 6)

SKY RANCH UNIT 2A

REVISION DATE

NO.

REVISION DESCRIPTION

DATE: MARCH 31, 2025

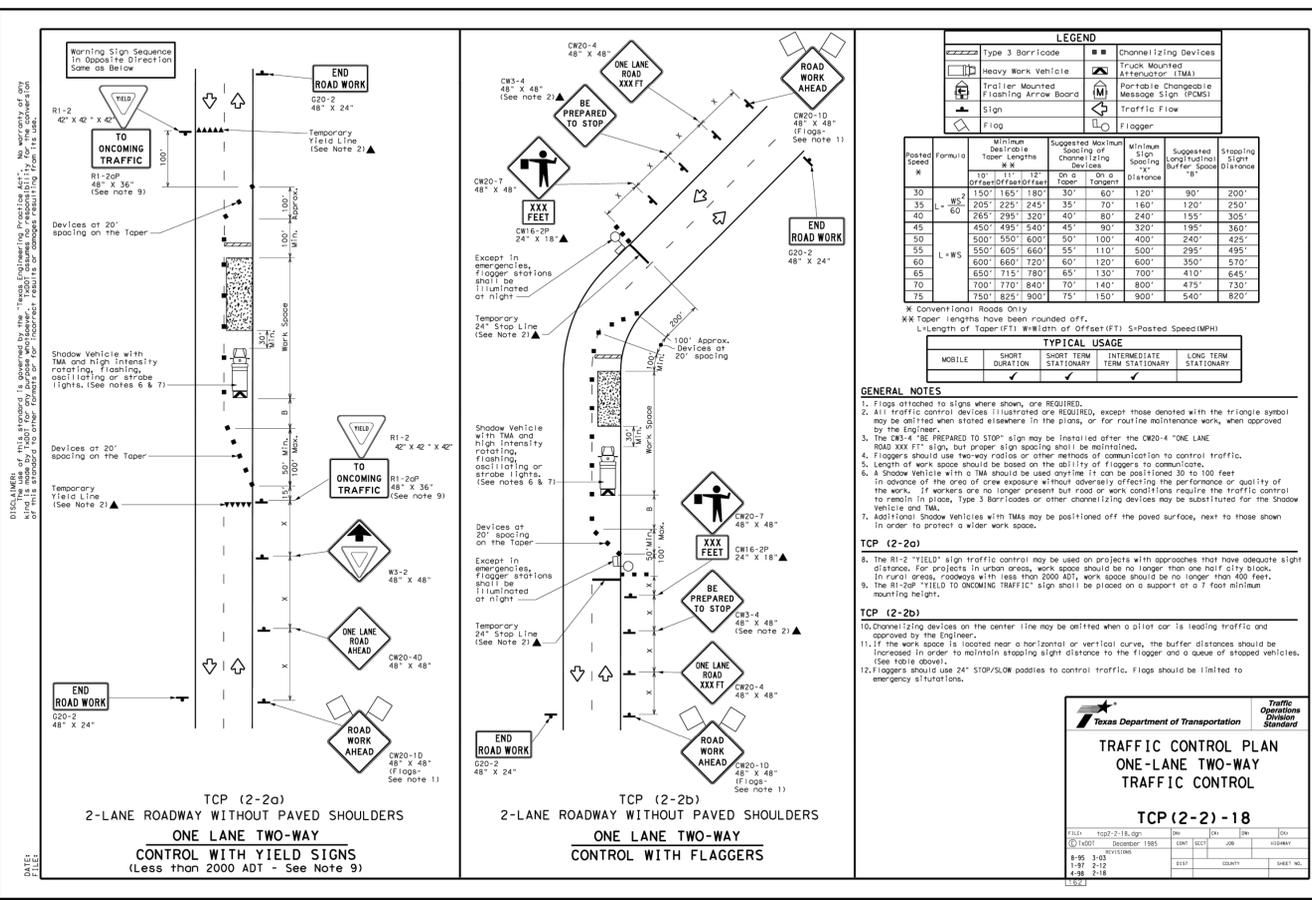
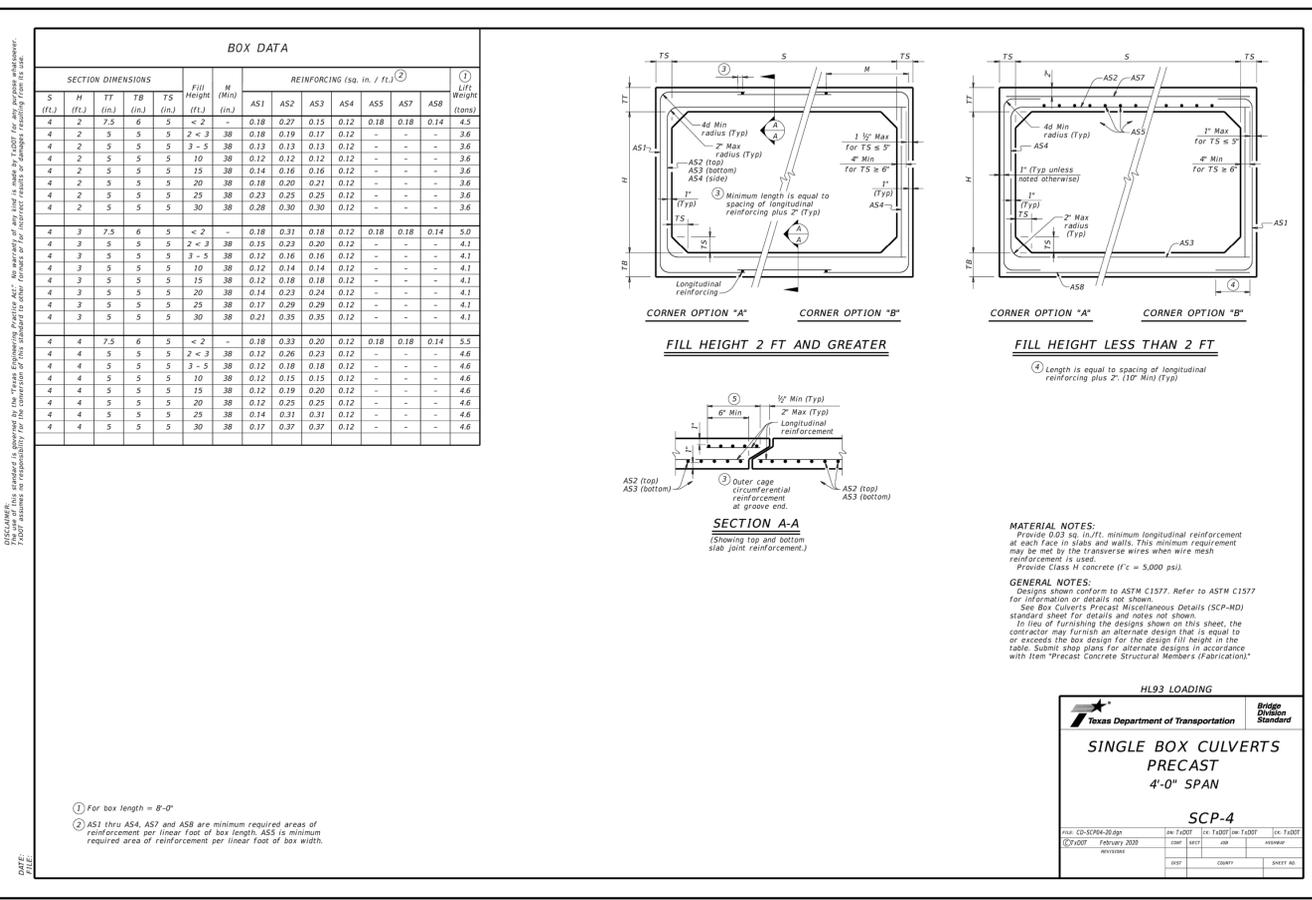
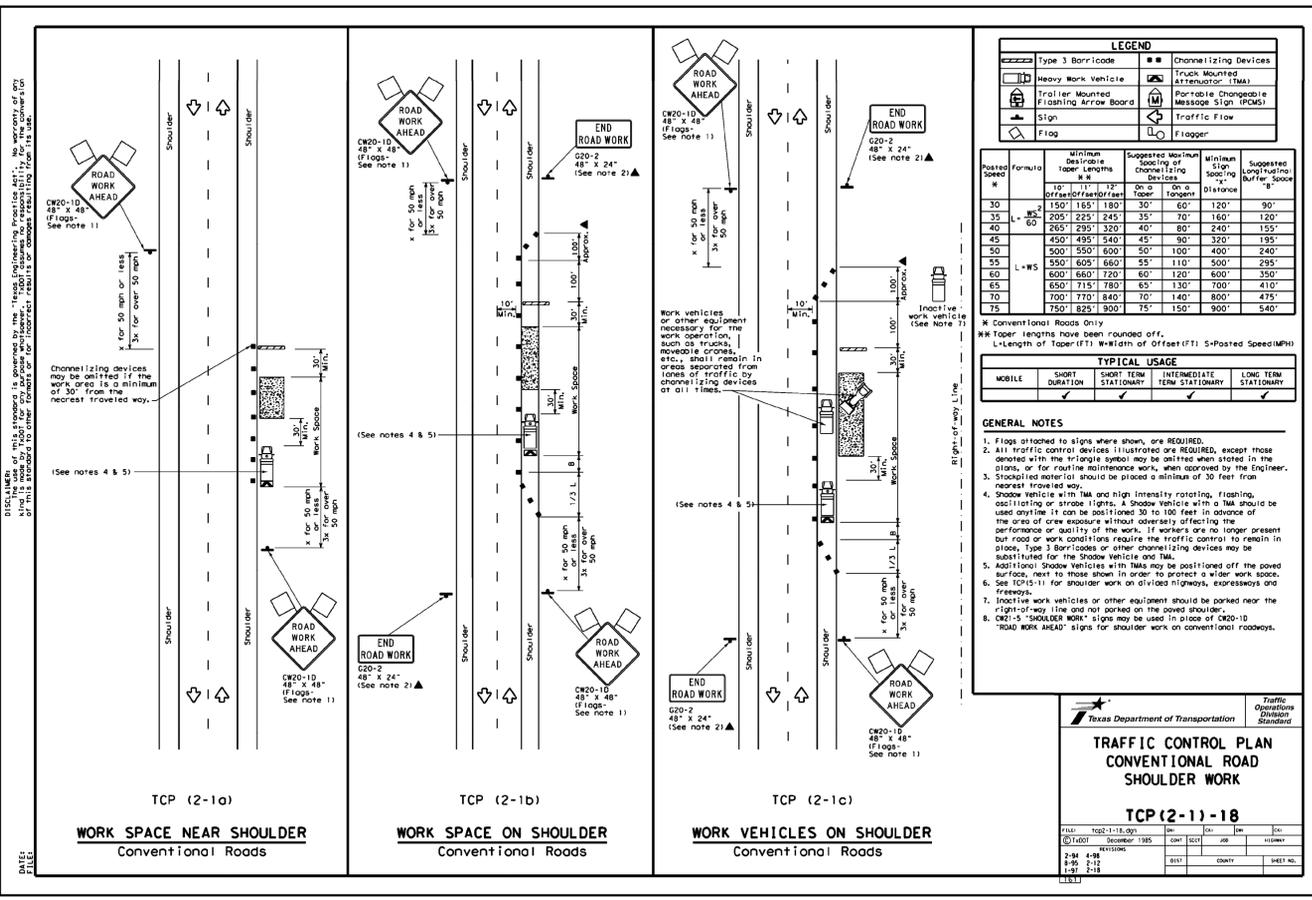
DRAWN BY: BP

DESIGNED BY: BP

REVIEWED BY: ESP

HMT PROJECT NO.: 337.078

SHEET C5.6



QUANTITY SUMMARY - TRAFFIC SIGNAL INSTALLATION				
TxDOT Item No.	TxDOT Desc. Code	Description	Unit	FM 1101 AT KROESCHE LN
416	7043	DRILL SHAFT (TRF SIG POLE) (30 IN)	LF	11
416	7044	DRILL SHAFT (TRF SIG POLE) (36 IN)	LF	26
500	7001	MOBILIZATION	LS	1
502	7001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO	3
618	7030	CONDT (PVC) (SCHD 40) (2")	LF	30
618	7036	CONDT (PVC) (SCHD 40) (3")	LF	40
618	7040	CONDT (PVC) (SCHD 40) (4")	LF	135
618	7041	CONDT (PVC) (SCHD 40) (4") (BORE)	LF	240
618	7054	CONDT (PVC) (SCHD 80) (2")	LF	165
620	7004	ELEC CONDUCTOR (NO. 12) INSULATED	LF	270
620	7008	ELEC CONDUCTOR (NO. 8) INSULATED	LF	1,110
620	7009	ELEC CONDUCTOR (NO. 6) BARE	LF	610
620	7010	ELEC CONDUCTOR (NO. 6) INSULATED	LF	390
624	7008	GROUND BOX TY D (162922) W/APRON	EA	5
628	7190	ELEC SRV TY D 120/240 070 (NS) SS (E) PS (U)	EA	1
636	7001	ALUMINUM SIGNS (TY A)	SF	49.5
680	7002	INSTALL HWY TRAF SIG (ISOLATED)	EA	1
682	7001	VEH SIG SEC (12") LED (GRN)	EA	4
682	7002	VEH SIG SEC (12") LED (GRN ARW)	EA	3
682	7003	VEH SIG SEC (12") LED (YEL)	EA	4
682	7004	VEH SIG SEC (12") LED (YEL ARW)	EA	4
682	7005	VEH SIG SEC (12") LED (RED)	EA	6
682	7006	VEH SIG SEC (12") LED (RED ARW)	EA	1
682	7042	BACKPLATE W/REF BRDR (3 SEC) (VENT) ALUM	EA	6
682	7043	BACKPLATE W/REF BRDR (4 SEC) (VENT) ALUM	EA	1
684	7031	TRF SIG CBL (TY A) (14 AWG) (5 CONDR)	LF	226
684	7033	TRF SIG CBL (TY A) (14 AWG) (7 CONDR)	LF	900
686	7035	INS TRF SIG PL AM(S) 1 ARM (32') LUM	EA	1
686	7039	INS TRF SIG PL AM(S) 1 ARM (36') LUM	EA	2
6007	7001	BBU SYSTEM (EXTERNAL BATT CABINET)	EA	1
6017	7001	VDS PROSR SYS	EA	1
6017	7007	HVDS W/FXD LNS	EA	3
6017	7009	VDS CNTRL SOFTWARE	EA	1
6017	7012	VDS CABLING	LF	625



Digitally signed by
 James A. Robertson
 Date: 2025.11.11
 11:06:05-06'00'

JAMES A. ROBERTSON, P.E.
 LEE ENGINEERING, L.L.C. - REGISTRATION NO. - F-450



FM 1101 AT
 KROESCHE LN

TRAFFIC SIGNAL
 QUANTITY SUMMARY

STATE	CITY	COUNTY	HIGHWAY NO.	SHEET NO.
TEXAS	NEW BRAUNFELS	COMAL	FM 1101	TS-1

The CONTRACTOR shall notify the City of New Braunfels Public Works Department, at (830) 221-4030 and Jeb Smith, P.E. with TxDOT at (830)609-0707 at least one week prior to starting work on this project.

The CONTRACTOR will only be allowed to work on this project during daylight hours (8 AM to 5 PM Monday - Friday).

The CONTRACTOR shall clean up and remove from work area all loose material resulting from the contract operations each day before work is suspended.

Any obstructions to existing drainage due to the CONTRACTOR's operations will be removed by the CONTRACTOR as required by the City at the CONTRACTOR's entire expense.

THE TRAFFIC SIGNAL INSTALLATION CONSISTS OF THE FOLLOWING PRINCIPAL ITEMS:

1. Furnishing and installing a ground mounted controller cabinet assembly with an APC Battery Back-Up unit.
2. Furnishing and installing signal poles, pedestal poles, signal heads, and signal cable.
3. Furnishing and installing an Accessible Pedestrian Signal (APS) system, conduit and ground boxes.
4. Furnishing and installing radar detection system (Presence and Advance) including cable.
5. The CONTRACTOR shall also furnish and install all other items not listed above which are needed to provide the complete traffic signal installation as called for in the plans and specifications.
6. Unless directed by the City of New Braunfels, the signal shall be placed in full operation between 9:00 A.M. - 12:00 P.M. (noon) on Tuesday, Wednesday, or Thursday only.

SIGNAL TECHNICIAN

A signal technician from the City of New Braunfels and TxDOT shall be present when the signals are placed in operation. The Contractor shall notify the City of New Braunfels Public Works Department at (830) 221-4030 and Jeb Smith, P.E. with TxDOT at (830) 609-0707 at least 48 hours in advance of the turn on.

TEST PERIOD FOR SIGNALS

Once the permanent signals have been installed and placed in operation, they shall operate continuously for a minimum of 30 calendar days in a satisfactory manner. Equipment failures during these 30 days will cause the test period to start over.

The signal will be inspected by City of New Braunfels Traffic Signal Department and TxDOT and all punch list items will be addressed prior to acceptance of the signal by the City. The signal shall not be placed in flash until it is 100% complete and all punch list items have been addressed and reinspected by the City. Point of contact for inspection is Chris Nowak (830) 221-4049 and Jeb Smith, P.E. (830) 609-0707.

PHASES OF SIGNAL OPERATION

The signal installation shall be wired to operate in accordance with phase diagrams in these plans. Time intervals shall be adjusted and set as directed by the City of New Braunfels.

EXISTING UTILITIES

The exact location of the underground utilities is not certain. The CONTRACTOR shall contact the City of New Braunfels and utility companies with utilities in the area for exact location prior to drilling for foundations and any other work that might interfere with or damage present utilities. Known utilities include city water and sewer lines, and AT&T/SBC telephone lines. Location of some of these utilities can be determined by calling 1-800-DIG-TESS (344-8377). No additional payment will be made for relocation of any foundations due to utilities.

Texas State Law, Article 1436C, makes unlawful the operation of equipment or machines within 10 feet of any overhead electrical line unless danger against contact with high voltage lines has been effectively guarded against pursuant to the provisions of the article. When construction operations requires working near an overhead electrical line, the CONTRACTOR shall contact the owner/operator of the overhead electrical line to make adequate arrangements and to take necessary safety precautions to ensure that all laws, electrical line owner/operator requirements and standard industry safety practices are met.

ITEM 416 - POLE FOUNDATIONS

No pedestal poles shall be placed on the foundations prior to seven (7) days following placement of concrete.

The dimensions shown on the plans for location of signal foundations, conduit, and other items may be varied to meet local conditions, subject to approval by the City.

The CONTRACTOR shall notify Garry Ford, P.E. of the City of New Braunfels at (830) 221-4645 and Jeb Smith, P.E. at (860) 609-0707 at least 48 hours before placing concrete. Cylinders will be made for testing by a third party.

ITEM 416 - POLE FOUNDATIONS, CONT.

All exposed pedestal pole foundations shall receive a Class C finish as per TxDOT item 427.

Pedestal pole foundations will be paid for once regardless of extra work caused by obstructions.

Concrete removal required for installation of drilled shafts will be subsidiary to TxDOT Item 416.

ITEM 618 - CONDUIT

Use materials from prequalified material producers list as shown on the Texas Department of Transportation (TxDOT) - Construction Division's (CST) materials producers list. Category is "Roadway Illumination and Electrical Supplies."

Underground conduit for cable shall be PVC. All couplings and connections shall be tight and waterproof.

The location of conduits and ground boxes are diagrammatic only and may be shifted to accommodate field conditions as directed.

Secure permission and approval from the proper authority prior to cutting into or removing any sidewalks or curbs for installation of this item. Sidewalks and curbs shall be restored to their preconstruction condition at no expense to the City.

A continuous bare copper wire no. 6 or larger shall be installed in every PVC conduit throughout the electrical system in accordance with the electrical detail sheets, and the latest edition of the National Electrical Code.

PVC trenched conduit shall be heavywall schedule and PVC bored conduit shall be heavywall schedule 40, unless otherwise approved by the Engineer.

All conduit elbows and rigid metal extensions required to be installed on PVC conduit systems will not be paid for separately, but will be considered subsidiary to TxDOT Specification 618.

Conduit to be placed under existing pavement shall be by an approved boring method and placed at a minimum depth of 3 feet below the pavement surface. Do not place boring pits closer than 2 feet from the edge of pavement unless directed. Do not use water jetting. Do not exceed 18 inches in the vertical and horizontal tolerances as measured from the intended target point.

Do not use a pneumatically driven device for punching holes beneath the pavement (commonly known as a "missile").

Furnish and install a non-metallic mule tape in conduit runs in excess of 50 feet. Also furnish and install non-metallic mule tape in conduit installed for future use and cap using standard weather-tight conduit caps as approved. Furnish Garvin #PT-1250-3K, ComStar PUL 1250P3K, Ideal Part No. 31-315 or equal as approved by the Engineer. This work will not be paid for directly, but is subsidiary to this item.

Use a colored cleaner-primer on all PVC to PVC joints before application of PVC cement.

Seal all conduit ends with a permanently soft, non-toxic duct seal. Use a duct seal that does not adversely affect other plastic materials or corrode metals.

2" Schedule 80 PVC will be used at the power pole to supply electricity to underground services.



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FM 1101 AT
KROESCHE LN

TRAFFIC SIGNAL GENERAL
NOTES (1 OF 3)

STATE	CITY	COUNTY	HIGHWAY NO.	SHEET NO.
TEXAS	NEW BRAUNFELS	COMAL	FM 1101	TS-2

ITEM 620 - ELECTRICAL CONDUCTORS

The equipment grounding conductor shall be identified by a continuous green colored jacket insulation or bare wire. Grounded conductors (Neutral) shall be identified by a continuous white colored jacket. Ungrounded conductors (Hot) in a 120/240v or 240/480v system shall be identified by each pole or leg. For 240-volt branch circuit fed from 120/240 source and 480-volt branch circuit fed from 240/480 source, ensure one leg is identified by a continuous black colored jacket and the other leg by a continuous red colored jacket.

Grounding conductors that share the same conduit, ground box, or structure shall be bonded together at every accessible point in accordance with the NEC.

ITEM 624 - GROUND BOXES

Slack conductors required by Standard Sheet ED(3)-14 will be subsidiary to Item 624.

Concrete removal required for installation of ground boxes will be subsidiary to Item 624.

ITEM 628 - ELECTRICAL SERVICE

Contact the appropriate utility company during the first three weeks of the project lead-time period to allow adequate time for any necessary utility adjustments, transformer installation, etc.

Label the service enclosures indicating service address as well as all required information as shown on the Electrical Detail (ED) standard sheets. Labeling shall be silk screening or other acceptable method. This work will not be paid for directly, but is subsidiary to this item.

A Licensed Master Electrician shall be required for the installation of electrical services.

When concrete for service foundations is required, use Class A in accordance with Item 421, "Hydraulic Cement Concrete", except consider the concrete subsidiary to Item 628 for payment purposes. When reinforcing steel for service foundations is required, it will be in accordance with Item 440, "Reinforcing Steel", except consider the steel subsidiary to Item 628 for payment purposes.

Use only white insulated wire for neutral wire.

Once the signal installation has been formally accepted by the City, the billing for the electrical service power usage will be transferred to the City of New Braunfels.

ITEM 656 - FOUNDATIONS FOR TRAFFIC CONTROL DEVICES

Form a 3/4 inch chamfer on the top edge of each signal pole foundation.

Probe for utilities and underground structures prior to drilling for foundations at the direction of the City. Foundations shall be paid for once regardless of extra work caused by obstructions.

TRAFFIC SIGNAL CONTROLLER AND CABINET ASSEMBLY

CONTRACTOR shall furnish and install a Econolite Cobalt ATC traffic signal controller assembly (TS2 Type 2) with a NEMA TS2 Type 2 controller cabinet assembly or approved equal.

The controller cabinet shall have a 16 position NEMA backpanel wired for 8 phase, 4 pedestrian, and 4 overlaps. The controller cabinet shall include an EDI MMU16-LEip malfunction management unit.

Install the signal controller cabinet in an orientation as directed.

ITEM 682 - SIGNAL HEADS

Unless otherwise shown in the plans, all signal heads shall be mounted vertically.

All signal heads shall be covered with burlap or other approved material from the time of installation until the signal is placed in operation.

LED indications shall be used and furnished and installed by the CONTRACTOR.

ITEM 682 - SIGNAL HEADS - CONTINUED

All signal heads shall be EAGLE Black Polycarbonate signal heads. Provide backplates, louvers, and the inside of the visors with a flat black finish. Provide aluminum back plates with a 2" HIP border for all traffic signal heads.

Mount signal heads level and plumb and aim as directed. All signal heads shall be aligned with the center of the lane they control.

ITEM 684 - CABLE

The CONTRACTOR shall furnish and install stranded 14 AWG Type A signal cables for LED signal heads.

Identify each cable as shown on the plans (cable 1, etc.) with permanent marking labels (Panduit Type PLM standard single marker tie, Thomas & Betts Type 548M, or equal) at each ground box and controller.

Extra cable length (3 feet of slack) shall be included in each run to provide adequate slack, as determined by the City, at each ground box or foundation.

No splices shall be allowed in any cable.

Provide 12 circuit Buchanan Type 112SN, Kulka Type 985-GP-12 CU, or equal terminal strips in the signal pole access compartment. Provide additional terminal strips of 8 circuits each when more than 12 circuits are required. The conductors for the Line and Load side of the terminal strip shall be identified with a plastic label with two straps per tag. The line side shall have each signal head, PED head, and push button identified on the tag.

Mark pole shafts and mast arms with the identification numbers from the plans to facilitate field-assembly.

Provide nuts on top and bottom (double nuts) of the base plate as shown on the plans.

Set anchor bolts for mast arm signal poles so that two are in tension and two are in compression. Obtain approval of anchor bolt placement before placing concrete.



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FM 1101 AT
KROESCHE LN

TRAFFIC SIGNAL GENERAL
NOTES (2 OF 3)

STATE	CITY	COUNTY	HIGHWAY NO.	SHEET NO.
TEXAS	NEW BRAUNFELS	COMAL	FM 1101	TS-3

ITEM 686 - POLE ASSEMBLIES

Provide a minimum vertical clearance of 19.0 feet from the roadway to the lowest point of the signal head or mast arm. Place signal heads 40 feet minimum and 180 feet maximum from the stop line. If the nearest signal is more than 180 feet from the stop line, place a supplemental near-side signal head. Determine the field measurements and elevations from the actual field location of the poles, considering all above and below ground utilities and existing roadway elevations.

Provide vibration dampers for mast arms 28 feet to 48 feet in length. Install as shown on MA-DPD-20.

Prior to ordering equipment, the Contractor shall submit proposed signal pole and mast arm details to the City for approval.

Prior to ordering equipment, the Contractor shall provide detailed submittals for all traffic signal equipment to the City Traffic Signal Department for approval. Contact the City Traffic Signal Department at 830-221-4049.

Contact the City Traffic Signal Department at 830-221-4049 for a copy of the New Braunfels Traffic Signal Standards and approved equipment list before ordering traffic signal materials.

LUMINAIRE HEAD & MAST ARMS

Luminaire mast arms shall be positioned directly above and in line with the associated mast arm unless otherwise instructed.

ITEM 6007 - BATTERY BACK-UP SYSTEM FOR SIGNAL CABINETS

CONTRACTOR shall furnish and install an APC Battery Back-Up Unit at this intersection. The BBU will be installed with the controller on the concrete pad paid for under Item 680. If a larger pad is needed to accommodate the BBU, the additional labor and material will be subsidiary to this item.

ITEM 6017 - HYBRID VEHICLE DETECTION SYSTEM

CONTRACTOR shall furnish and install notraffic Hybrid Vehicle Detection System (HVDS). The system shall include 3 sensor assembly, 1 processor system, 1 control software, and cabling. Payment for furnishing and installing the system shall be in accordance with TxDOT Special Specification 6017.

ITEM 636 - SIGNS

All new signs shall be furnished and installed by the CONTRACTOR. Payment for the signs shall be according to item 636.

CONTRACTOR shall verify information on the signs and the background color of the street name blades with the City prior to fabrication.

The contractor shall be responsible for determining and resolving any conflicts overhead utilities prior to drilling pole shafts.

All poles and luminaires must have a 10' radius clearance from all power lines and overhead utilities.

CONTRACTOR'S RESPONSIBILITY FOR THE WORK

The CONTRACTOR shall be responsible for all installations until accepted by the City as required by the general provisions and requirements. Should "knock downs" occur, the CONTRACTOR shall be responsible for all labor to reinstall said equipment at no additional cost to the City or TxDOT. If new equipment is required, as determined by the City or TxDOT, the CONTRACTOR shall provide replacement equipment at no additional cost to the City or TxDOT.

HANDLING OF TRAFFIC

Roads and streets shall be kept open to traffic at all times. The CONTRACTOR shall, unless otherwise directed by the City or TxDOT, arrange the work in the roadway so as to close only one lane of a roadway at a time. All construction operations shall be conducted to provide the least possible interference to traffic as provided in the specifications and/or as directed by the City or TxDOT.

The CONTRACTOR shall arrange the installation of signals, poles, and conduit so as to permit the continuous movement of the traffic in both directions at all times. A pre-construction conference including City and TxDOT staff shall outline intersection construction phases.

A Traffic Control Plan (TCP) for this project shall be as detailed on Standard Sheets WZ (BTS-1)-13 and WZ (BTS-2)-13. All construction signs shall be mounted on fixed supports (4" x 4" wood posts) unless otherwise directed by the City or TxDOT.

ITEMS SUBSIDIARY TO ITEM 680

FURNISH & INSTALL TRAFFIC SIGNAL CONTROLLER CABINET ASSEMBLY - 1 EA

FURNISH & INSTALL 250W EQUIVALENT LED LUMINAIRE - 3 EA

FURNISH & INSTALL TxDOT APPROVED CONCRETE BASE FOR TRAFFIC SIGNAL CONTROLLER - 1 EA



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FM 1101 AT
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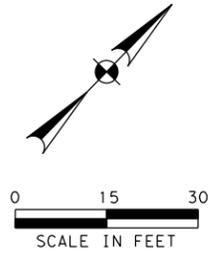
TRAFFIC SIGNAL GENERAL
NOTES (3 OF 3)

STATE	CITY	COUNTY	HIGHWAY NO.	SHEET NO.
TEXAS	NEW BRAUNFELS	COMAL	FM 1101	TS-4

NOTES:

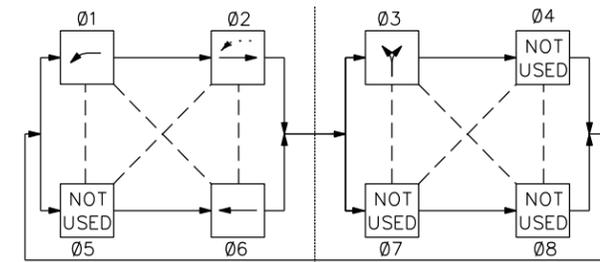
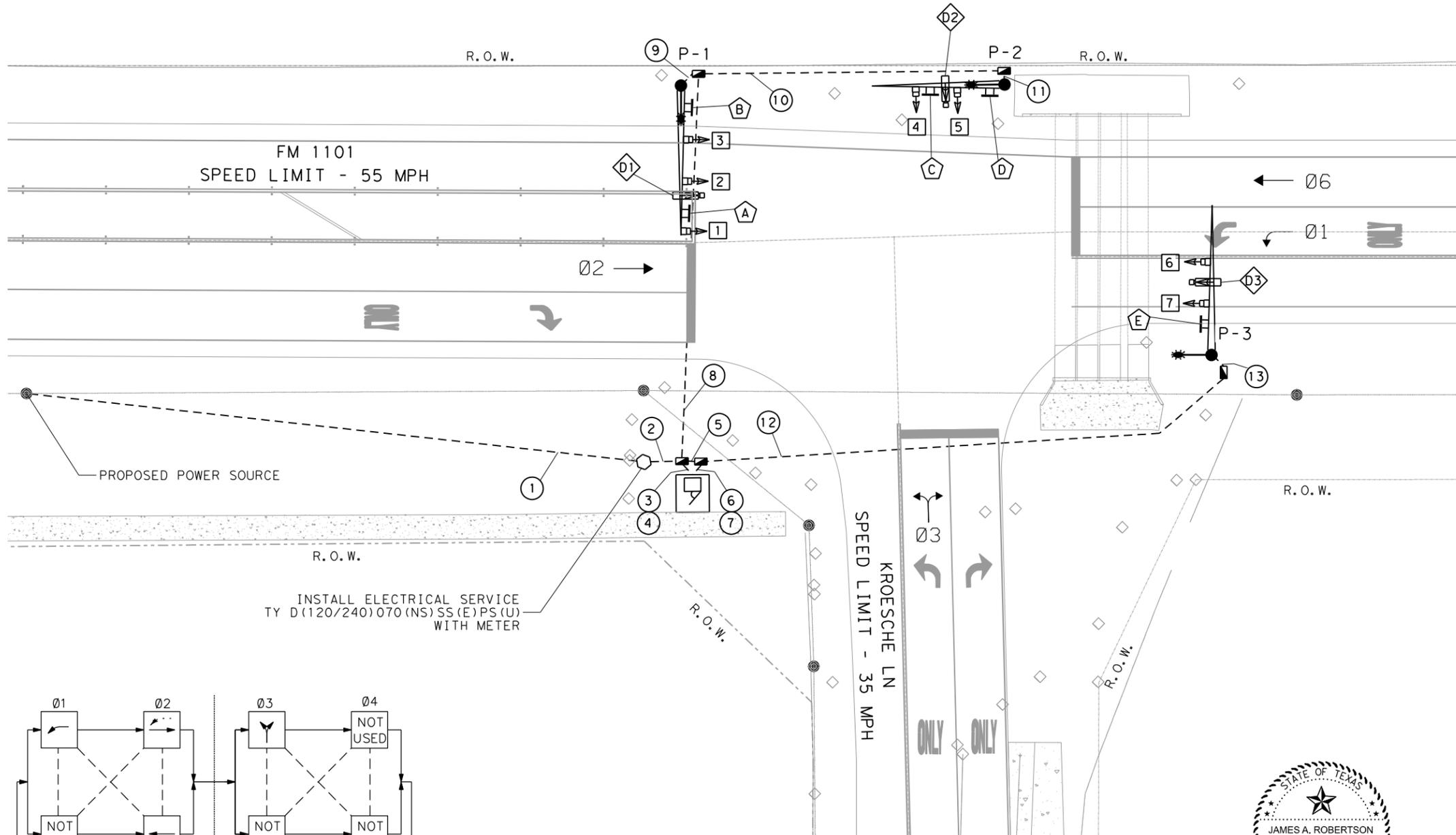
1. ALL CITY STANDARD EQUIPMENT/SPECIFIED EQUIPMENT MUST BE SUBMITTED TO THE CITY FOR APPROVAL. CONTRACTOR SHALL CONTACT CHRIS NOWAK AT (830) 221-4049 FOR INSTRUCTIONS.

2. PER THE LATEST EDITION OF THE TXDOT ROADWAY DESIGN MANUAL, ALL EQUIPMENT MOUNTED ON THE MAST ARM ASSEMBLY SHALL BE A MINIMUM OF 19' ABOVE THE PAVEMENT.



LEGEND OF SYMBOLS

-  TRAFFIC SIGNAL POLE ASSEMBLY
-  VEHICLE SIGNAL HEAD
-  SIGNAL HEAD NUMBERS
-  POLE NUMBERS
-  GROUND MOUNTED CONTROLLER CABINET ASSEMBLY
-  MAST ARM MOUNTED SIGN
-  NEW SIGN IDENTIFICATION
-  CONDUIT RUN & NUMBER
-  LUMINAIRE
-  TYPE D GROUND BOX W/APRON
-  PRESENCE & ADVANCE DETECTOR
-  DETECTOR IDENTIFICATION
-  PEDESTAL ELECTRICAL SERVICE
-  R.O.W. RIGHT OF WAY LINES
-  PHASE NUMBERS



Ø1 is a leading protected left turn followed by a permissive left turn.
 PHASE SEQUENCE



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FM 1101 AT KROESCHE LN

PROPOSED SIGNAL LAYOUT

STATE	CITY	COUNTY	HIGHWAY NO.	SHEET NO.
TEXAS	NEW BRAUNFELS	COMAL	FM 1101	TS-5

CONDUIT RUNS AND CABLE CHART

RUN NO.	CONDUIT STATUS	CONDUIT PERCENT FILL	ITEM 618 CONDUIT SIZE/TYPE (FEET)					CABLE STATUS	ITEM 620 ELECTRICAL CONDUCTORS (FEET)								ITEM 684 TRAFFIC SIGNAL CABLES				ITEM 6017		TOTAL LENGTH OF RUN (FEET)	RUN NO.
			2" PVC - Trenched (SCHD 80)	2" PVC - Trenched (SCHD 40)	3" PVC - Trenched (SCHD 40)	4" PVC - Trenched (SCHD 40)	4" PVC - Bored (SCHD 40)		NO. 6 XHHW POWER WIRE	NO. 6 BARE WIRE		NO. 8 XHHW WIRE (LUM.)		NO. 12 XHHW WIRE		TY A 5 CNDR. CABLE (#14 AWG)		TY A 7 CNDR. CABLE (#14 AWG)		VDS CABLING				
										1.939	2.067	3.068	4.026	3.826	0.271	0.143	0.233	0.160	0.426	0.463	0.896			
DIAM. (IN.)	---	---	LF	LF	LF	LF	LF	QTY	LF	QTY	LF	QTY	LF	QTY	LF	QTY	LF	QTY	LF					
1	I	4%	165					I	2	330	1	165									165	1		
2	I	6%		15				I	2	30	1	15	2	30							15	2		
3	I	4%		15				I	2	30	1	15									15	3		
4	I	15%				15		I			1	15					4	60	2	30	15	4		
5	I	3%			10			I			1	10	4	40							10	5		
6	I	1%				15		I			1	15					1	15			15	6		
7	I	5%				15		I			1	15							1	15	15	7		
8	I	18%					100	I			1	100	2	200			4	400	2	200	100	8		
9	I	16%			10			I			1	10	4	40			2	20	1	10	10	9		
10	I	8%				90		I			1	90	2	180			2	180	1	90	90	10		
11	I	14%			10			I			1	10	2	20			2	20	1	10	10	11		
12	I	9%					140	I			1	140	4	560			1	140	1	140	140	12		
13	I	13%			10			I			1	10	4	40			1	10	1	10	10	13		
SUBTOTAL	---	---	165	30	40	135	240	---	390	610	1,110	0	0	0	845	505					SUBTOTAL			
WIRE INSIDE POLE																								
P-1								P					90	76	55	47					VARIES	P-1		
P-2								P					90	74		35					VARIES	P-2		
P-3								P					90	76		38					VARIES	P-3		
SUBTOTAL	---	---							0	0	0	270	226	55	120						SUBTOTAL			
TOTAL	---	---	165	30	40	135	240		390	610	1,110	270	226	900	625						TOTAL			

CONDUIT / CABLE STATUS: E=EXISTING; I:INSTALL; A=ABANDON; AC=AERIAL CABLE; R=REMOVE AND SALVAGE; P=INSTALL WIRE INSIDE STEEL POLE

CONDUIT RUN #1 INCLUDES A 10' RISER ON THE POLE.



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FM 1101 AT
KROESCHE LN

PROPOSED SIGNAL TABLES
(1 OF 4)

STATE	CITY	COUNTY	HIGHWAY NO.	SHEET NO.
TEXAS	NEW BRAUNFELS	COMAL	FM 1101	TS-6

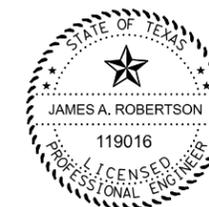
CABLE TERMINATION CHART

	CONDUCTOR COLOR	CABLE 1 FROM P-1 TO CNTRL 7 CNDR	CABLE 2 FROM P-1 TO CNTRL 7 CNDR	CABLE 3 FROM P-2 TO CNTRL 7 CNDR	CABLE 4 FROM P-2 TO CNTRL 7 CNDR	CABLE 5 FROM P-3 TO CNTRL 7 CNDR
1	BLACK	SH 1 PH 1 YA LT	SH 2, 3 PH 6 Y	SH 4 PH 3 YA LT	SH 5 PH 3 YA RT	SH 6, 7 PH 2 Y
2	WHITE	SIG COMMON				
3	RED	SH 1 PH 1 RA LT	SH 2, 3 PH 6 R	SH 4 PH 3 R	SH 5 PH 3 R	SH 6, 7 PH 2 R
4	GREEN	SH 1 PH 1 GA LT	SH 2, 3 PH 6 G	SH 4 PH 3 GA LT	SH 5 PH 3 GA RT	SH 6, 7 PH 2 G
5	ORANGE	SH 1 OLA FYA LT	SPARE	SPARE	SPARE	SPARE
6	BLUE	SPARE	SPARE	SPARE	SPARE	SPARE
7	WHITE/BLACK	SPARE	SPARE	SPARE	SPARE	SPARE

R = RED BALL; Y = YELLOW BALL; G = GREEN BALL; RA = RED ARROW; YA = YELLOW ARROW; GA = GREEN ARROW
 FYA = FLASHING YELLOW ARROW; RT = RIGHT TURN; LT = LEFT TURN; DW = DON'T WALK; W = WALK

NOTES:

1. THE INTENTION OF THIS PLAN SET IS TO CREATE A FULLY OPERATIONAL TRAFFIC SIGNAL. ANY ITEMS NEEDED TO MAKE THIS POSSIBLE THAT ARE NOT LISTED WITHIN THE PLANS SHALL BE SUBSIDIARY TO ITEM 680.
2. CONTRACTOR SHALL POTHOLE SIGNAL POLE FOUNDATION LOCATIONS NEAR UNDERGROUND UTILITIES PRIOR TO INSTALLING POLE FOUNDATIONS.
3. CONTRACTOR SHALL CONNECT FIELD WIRING TO CONTROLLER.
4. SIGNAL HEADS SHALL HAVE A MINIMUM OF 19.0 FEET CLEARANCE ABOVE ROADWAY SURFACE.
5. INFORMATION SHOWN ON THESE DRAWINGS CONCERNING SIGNAL EQUIPMENT, PAVEMENT MARKINGS, SIGNING, RIGHT-OF-WAY, AND UTILITIES IS NOT GUARANTEED TO BE ACCURATE OR ALL-INCLUSIVE. BEFORE CONSTRUCTION, CONTRACTOR SHALL DETERMINE THE TYPE AND LOCATION OF EXISTING UTILITIES TO AVOID DAMAGE THERETO.
6. CONTRACTOR SHALL CONTACT THE CITY OF NEW BRAUNFELS PUBLIC WORKS DEPARTMENT AT 830-221-4030 AND TXDOT AT 830-609-0707 AT LEAST ONE WEEK IN ADVANCE TO COORDINATE WORK.
7. THE LOCATIONS OF PROPOSED SIGNAL EQUIPMENT IS DIAGRAMMATIC ONLY AND MAY BE SHIFTED BY THE ENGINEER TO ACCOMMODATE FIELD CONDITIONS.
8. CONTRACTOR SHALL COORDINATE WITH NEW BRAUNFELS UTILITY TO ARRANGE ELECTRICAL SERVICE. CONTACT MICHAEL NAJERA AT 830-608-8957 REGARDING ELECTRICAL POWER SOURCE AND PEDESTAL SERVICE.
9. ALL SIGNAL POLES SHALL HAVE A GALVANIZED STEEL FINISH.
10. ALL SIGNAL HEADS SHALL BE BLACK POLYCARBONATE WITH BLACK ALUMINUM VISORS AND BACKPLATES. BACKPLATES SHALL BE VENTED AND INCLUDE A 2" FLOURESCENT YELLOW RETROREFLECTIVE BORDER.



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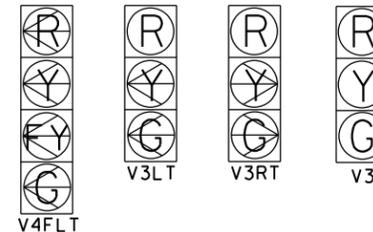


FM 1101 AT
 KROESCHE LN

PROPOSED SIGNAL TABLES
 (2 OF 4)

STATE	CITY	COUNTY	HIGHWAY NO.	SHEET NO.
TEXAS	NEW BRAUNFELS	COMAL	FM 1101	TS-7

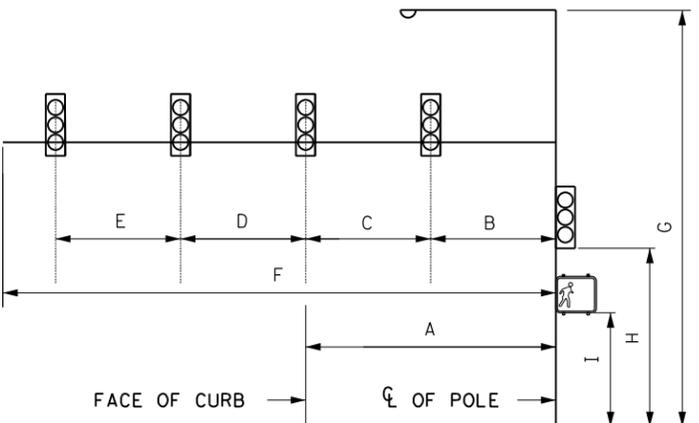
ITEM 682 - SIGNAL HEADS									
SIGNAL HEAD NO.	SIGNAL HEAD TYPE	12" SIGNAL INDICATION		VEHICLE SIGNAL SECTIONS					
		BACKPLATE		RED BALL	YELLOW BALL	GREEN BALL	RED ARROW	YELLOW ARROW	GREEN ARROW
		3 SEC (EA)	4 SEC (EA)						
2, 3, 6, 7	V3	4		4	4	4			
5	V3RT	1		1				1	1
4	V3LT	1		1				1	1
1	V4FLT		1				1	2	1
	TOTAL	6	1	6	4	4	1	4	3



ALL SIGNAL HEADS SHALL INCLUDE ALUMINUM BACKPLATES WITH A 2" HIP BORDER.

SIGNAL HEAD AND POLE PLACEMENT (FEET)												ITEM 416 - DRILLED SHAFTS (FEET)		
POLE NUMBER	DISTANCE FROM CURBLINE/PAVEMENT EXTENSIONS	A	B	C	D	E	F	G	H	I	NO. OF HEADS ON MAST ARM/POLE	LUM-A	TYPE 30-A	TYPE 36-A
P-1	34.5S, 9.5W	9.5	13	10	12	---	36	30	---	---	3 / 0	1	---	13
P-2	3N, 12.5W	---	12	10	---	---	32	30	---	---	2 / 1	1	11	---
P-3	51N, 7.5E	7.5	12.5	10	---	---	36	30	---	---	2 / 0	1	---	13
	TOTAL												11	26

P-1: 34.5S, 9.5W - 34.5' SOUTH OF PROPOSED KROESCHE LN PAVEMENT EDGE EXTENSION, 9.5' WEST OF PROPOSED FM 1101 PAVEMENT EDGE.
P-2: 3N, 12.5W - 3' NORTH OF PROPOSED KROESCHE LN PAVEMENT EDGE EXTENSION, 12.5' WEST OF PROPOSED FM 1101 PAVEMENT EDGE.
P-3: 51N, 7.5E - 51' NORTH OF PROPOSED KROESCHE LN PAVEMENT EDGE EXTENSION, 7.5' EAST OF PROPOSED FM 1101 PAVEMENT EDGE.



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FM 1101 AT
KROESCHE LN

PROPOSED SIGNAL TABLES
(3 OF 4)

STATE	CITY	COUNTY	HIGHWAY NO.	SHEET NO.
TEXAS	NEW BRAUNFELS	COMAL	FM 1101	TS-8

ITEM 636 - SIGN SUMMARY

ID	TYPE	LEGEND	EXIST	REM	REL	REP	INST	HARDWARE & SUPPORT	LOCATION	SIGN QTY
A	R10-17T	LEFT TURN YIELD ON FLASHING YELLOW ARROW					1	1	MAST ARM P-1	10.5 SF
B	D3-1G	KROESCHE LN					1	1	MAST ARM P-1	11.25 SF
C	R3-8LR	LANE CONFIGURATION SIGN					1	1	MAST ARM P-2	9 SF
D	D3-1G	FM 1101					1	1	MAST ARM P-2	7.5 SF
E	D3-1G	KROESCHE LN					1	1	MAST ARM P-3	11.25 SF

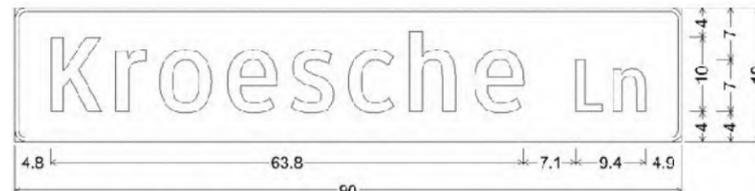
EXIST = EXISTING, REM = REMOVE, REL = RELOCATE, REP = REPLACE, INST = INSTALL

ITEM 624 - GROUND BOX SUMMARY	
TYPE	EACH
TYPE D W/APRON	5



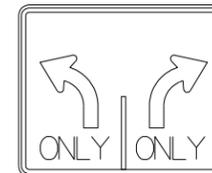
TMUTCD SIGN R10-17T
36"X42"

SIGN A



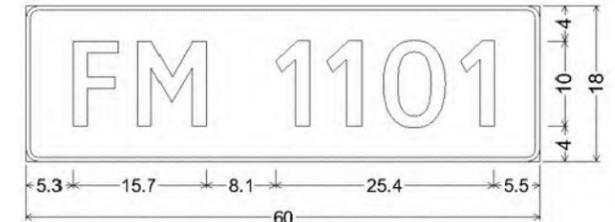
1.5" Radius, 0.5" Border, White on Green;
"Kroesche", ClearviewHwy-3-W; "Ln", ClearviewHwy-3-W;

SIGN B, E



TMUTCD SIGN R3-8LR
36"X36"

SIGN C



1.5" Radius, 0.5" Border, White on Green;
"FM 1101", ClearviewHwy-3-W;

SIGN D

ITEM 628 - ELECTRICAL SERVICE DATA

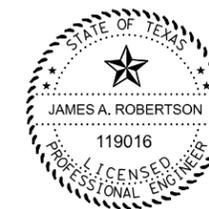
ELECTRIC SERVICE NO.	ELECTRICAL SERVICE DESCRIPTION	SERVICE CONDUIT SIZE (PVC)	SERVICE CONDUCTORS NO./SIZE	SAFETY SWITCH AMPS	MAIN CIRCUIT BREAKER POLE/AMP	TWO-POLE CONTACTOR AMPS	PANELBD. / LOADCENTER AMP RATING	CIRCUIT NO.	BRANCH CIRCUIT BREAKER POLE/AMPS	BRANCH CIRCUIT AMPS	KVA LOAD
	SEE ED(5) & (6)-14										
1	ELEC SRV TY D (120/240) 070 (NS)SS(E)PS(U)	2"	3/#6	N/A	2P/70	30	100	T. S. LIGHT	1P/50 2P/15	40 3	6.2

ITEM 6017 - DETECTION INFORMATION

DETECTION IDENTIFICATION	STATUS	PHASES	LOCATION
D1	I	PH 1 & PH 6 PRESENCE	P-1 MAST ARM
		PH 6 ADVANCE	
D2	I	PH 3 PRESENCE	P-2 MAST ARM

D3	I	PH 2 PRESENCE	P-3 MAST ARM
		PH 2 ADVANCE	

I = INSTALL; E = EXISTING



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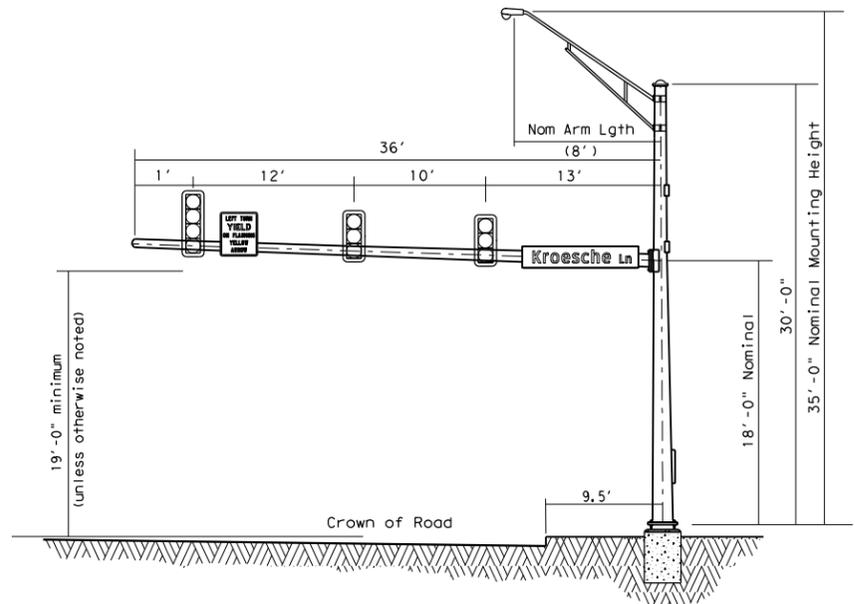
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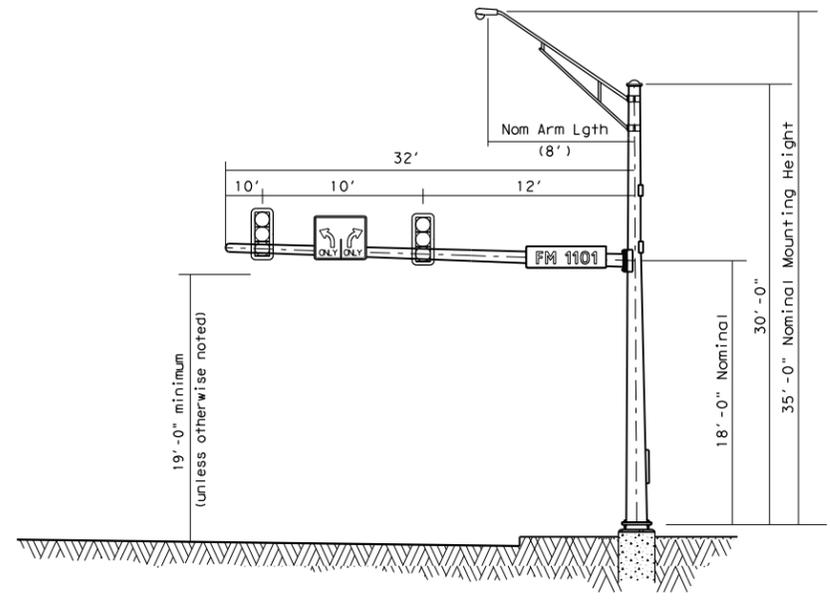
FM 1101 AT
KROESCHE LN

PROPOSED SIGNAL TABLES
(4 OF 4)

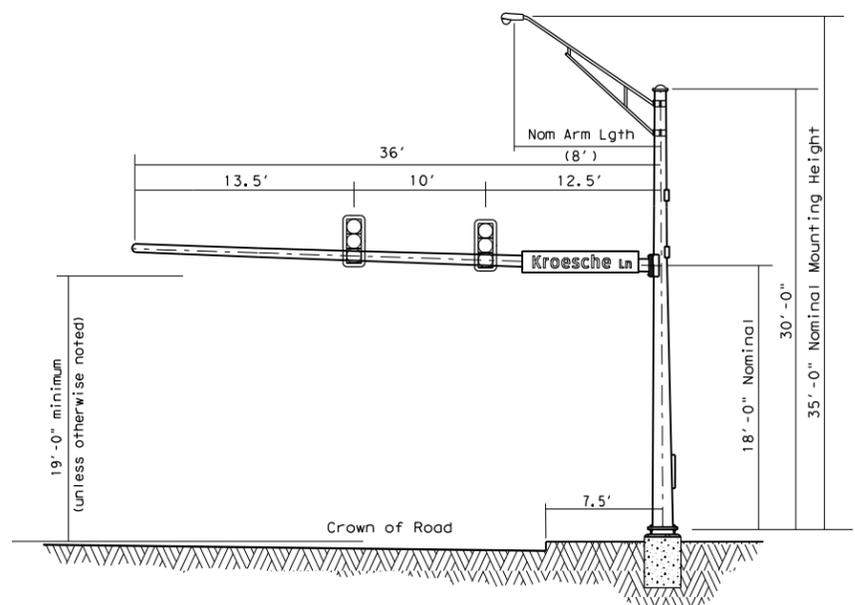
STATE	CITY	COUNTY	HIGHWAY NO.	SHEET NO.
TEXAS	NEW BRAUNFELS	COMAL	FM 1101	TS-9



POLE "1" ELEVATION



POLE "2" ELEVATION



POLE "3" ELEVATION



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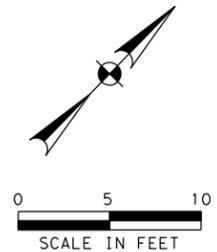
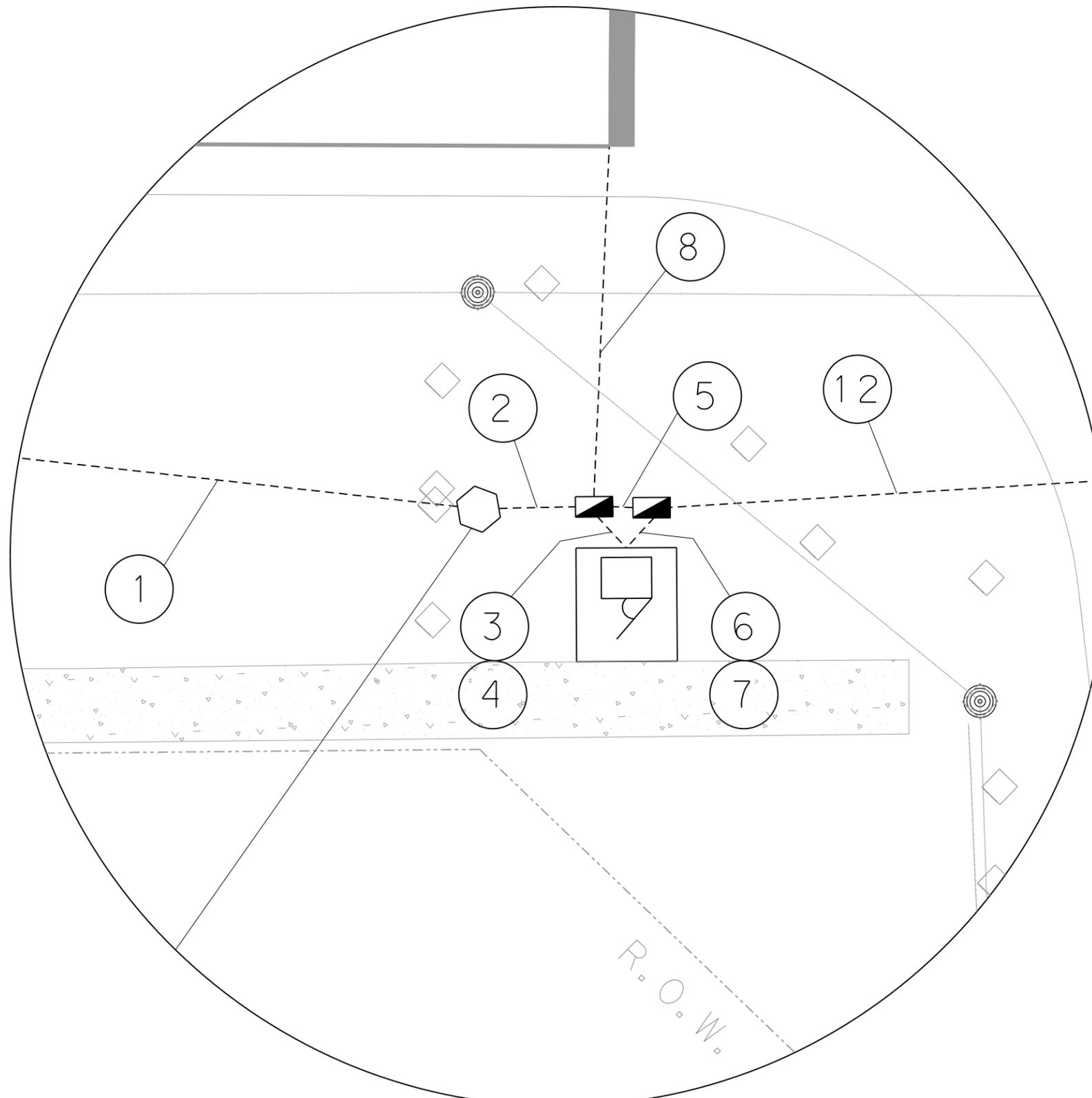
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FM 1101 AT
 KROESCHE LN

PROPOSED SIGNAL
 POLE ELEVATIONS

STATE	CITY	COUNTY	HIGHWAY NO.	SHEET NO.
TEXAS	NEW BRAUNFELS	COMAL	FM 1101	TS-10



LEGEND OF SYMBOLS

-  TRAFFIC SIGNAL POLE ASSEMBLY
-  VEHICLE SIGNAL HEAD
-  SIGNAL HEAD NUMBERS
-  POLE NUMBERS
-  GROUND MOUNTED CONTROLLER CABINET ASSEMBLY
-  MAST ARM MOUNTED SIGN
-  NEW SIGN IDENTIFICATION
-  CONDUIT RUN & NUMBER
-  LUMINAIRE
-  TYPE D GROUND BOX W/APRON
-  PRESENCE & ADVANCE DETECTOR
-  DETECTOR IDENTIFICATION
-  PEDESTAL ELECTRICAL SERVICE
-  R.O.W. RIGHT OF WAY LINES
-  Ø2 PHASE NUMBERS



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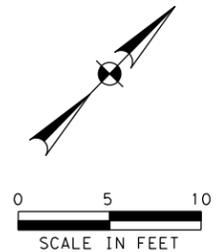
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FM 1101 AT
 KROESCHE LN

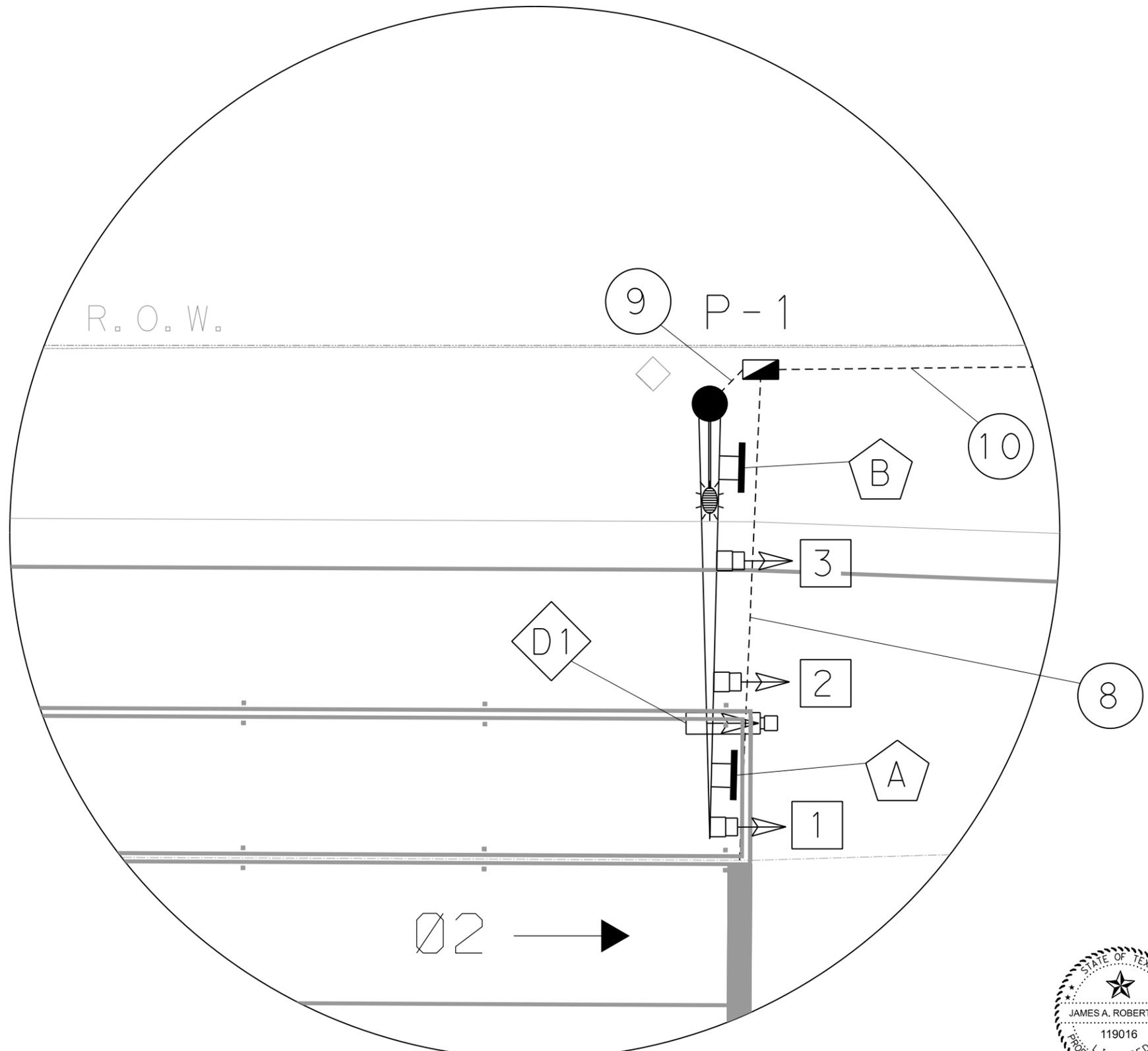
SOUTHEAST CORNER LAYOUT

STATE	CITY	COUNTY	HIGHWAY NO.	SHEET NO.
TEXAS	NEW BRAUNFELS	COMAL	FM 1101	TS-11



LEGEND OF SYMBOLS

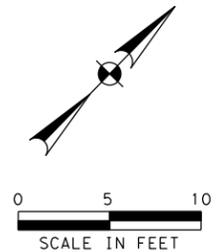
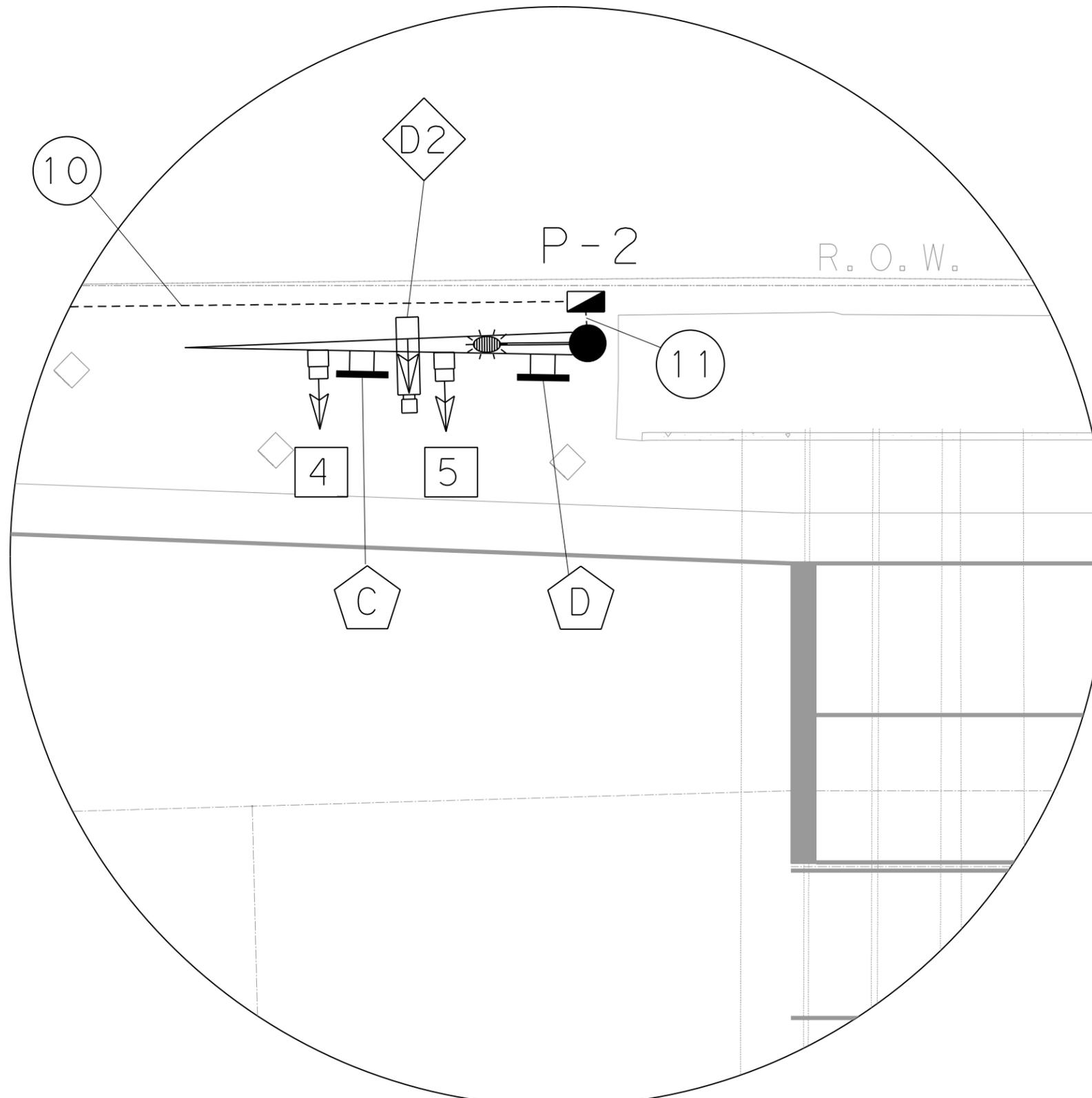
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-  VEHICLE SIGNAL HEAD
-  SIGNAL HEAD NUMBERS
-  POLE NUMBERS
-  GROUND MOUNTED CONTROLLER CABINET ASSEMBLY
-  MAST ARM MOUNTED SIGN
-  NEW SIGN IDENTIFICATION
-  CONDUIT RUN & NUMBER
-  LUMINAIRE
-  TYPE D GROUND BOX W/APRON
-  PRESENCE & ADVANCE DETECTOR
-  DETECTOR IDENTIFICATION
-  PEDESTAL ELECTRICAL SERVICE
-  R.O.W. RIGHT OF WAY LINES
-  PHASE NUMBERS



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FM 1101 AT KROESCHE LN				
SOUTHWEST CORNER LAYOUT				
STATE	CITY	COUNTY	HIGHWAY NO.	SHEET NO.
TEXAS	NEW BRAUNFELS	COMAL	FM 1101	TS-12



LEGEND OF SYMBOLS

-  TRAFFIC SIGNAL POLE ASSEMBLY
-  VEHICLE SIGNAL HEAD
-  SIGNAL HEAD NUMBERS
-  POLE NUMBERS
-  GROUND MOUNTED CONTROLLER CABINET ASSEMBLY
-  MAST ARM MOUNTED SIGN
-  NEW SIGN IDENTIFICATION
-  CONDUIT RUN & NUMBER
-  LUMINAIRE
-  TYPE D GROUND BOX W/APRON
-  PRESENCE & ADVANCE DETECTOR
-  DETECTOR IDENTIFICATION
-  PEDESTAL ELECTRICAL SERVICE
-  R.O.W. RIGHT OF WAY LINES
-  PHASE NUMBERS



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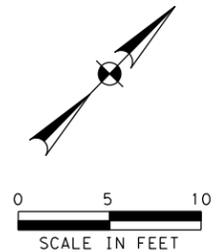
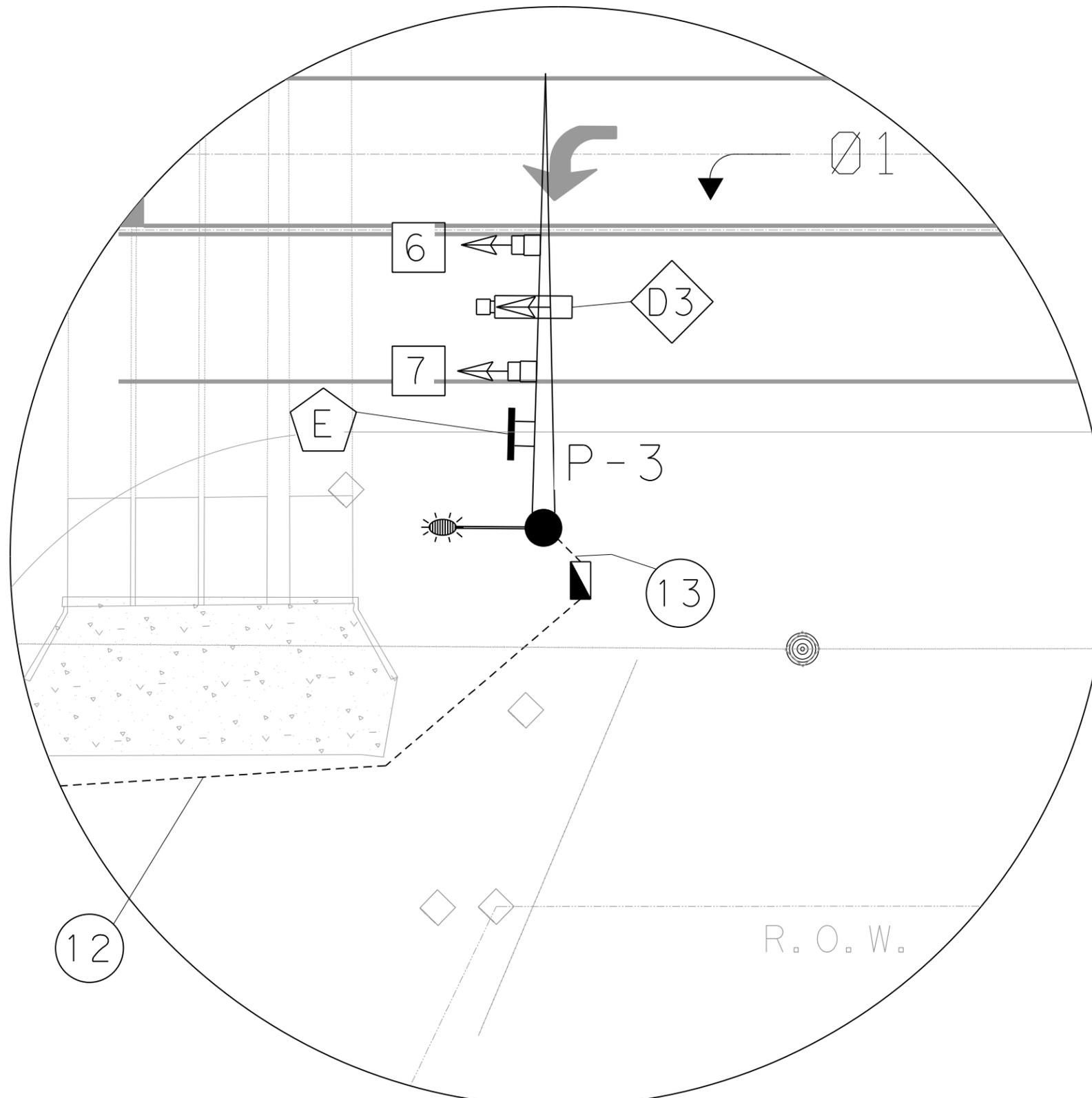
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FM 1101 AT
KROESCHE LN

NORTHWEST CORNER LAYOUT

STATE	CITY	COUNTY	HIGHWAY NO.	SHEET NO.
TEXAS	NEW BRAUNFELS	COMAL	FM 1101	TS-13



LEGEND OF SYMBOLS

- TRAFFIC SIGNAL POLE ASSEMBLY
- VEHICLE SIGNAL HEAD
- SIGNAL HEAD NUMBERS
- POLE NUMBERS
- GROUND MOUNTED CONTROLLER CABINET ASSEMBLY
- MAST ARM MOUNTED SIGN
- NEW SIGN IDENTIFICATION
- CONDUIT RUN & NUMBER
- LUMINAIRE
- TYPE D GROUND BOX W/APRON
- PRESENCE & ADVANCE DETECTOR
- DETECTOR IDENTIFICATION
- PEDESTAL ELECTRICAL SERVICE
- R.O.W. RIGHT OF WAY LINES
- PHASE NUMBERS



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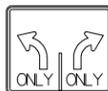
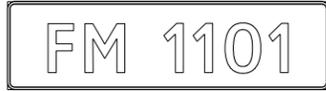
FM 1101 AT
KROESCHE LN

NORTHEAST CORNER LAYOUT

STATE	CITY	COUNTY	HIGHWAY NO.	SHEET NO.
TEXAS	NEW BRAUNFELS	COMAL	FM 1101	TS-14

SUMMARY OF SMALL SIGNS

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PLAN SHEET NO.	SIGN NO.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	SM RD SGN ASSM TY XXXXX (X) XX (X-XXXX)				BRIDGE MOUNT CLEARANCE SIGNS (See Note 2)
							POST TYPE	POSTS	ANCHOR TYPE	MOUNTING DESIGNATION	
							FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sch 80	1 or 2	UA=Universal Conc UB=Universal Bolt SA=Slipbase-Conc SB=Slipbase-Bolt WS=Wedge Steel WP=Wedge Plastic	PREFABRICATED P = "Plain" T = "T" U = "U"	
			FM 1011 AT KROESCHE LN								
TS-5	A	R10-17T		36"X42"	X				MOUNT ON MAST ARM P-1		
TS-5	B	D3-1G		90"X18"	X				MOUNT ON MAST ARM P-1		
	E	D3-1G		90"X18"	X				MOUNT ON MAST ARM P-3		
TS-5	C	R3-8LR		36"X36"	X				MOUNT ON MAST ARM P-2		
TS-5	D	D3-1G		60"X18"	X				MOUNT ON MAST ARM P-2		

ALUMINUM SIGN BLANKS THICKNESS	
Square Feet	Minimum Thickness
Less than 7.5	0.080"
7.5 to 15	0.100"
Greater than 15	0.125"

The Standard Highway Sign Designs for Texas (SHSD) can be found at the following website.
<http://www.txdot.gov/>

- NOTE:**
- Sign supports shall be located as shown on the plans, except that the Engineer may shift the sign supports, within design guidelines, where necessary to secure a more desirable location or to avoid conflict with utilities. Unless otherwise shown on the plans, the Contractor shall stake and the Engineer will verify all sign support locations.
 - For installation of bridge mount clearance signs, see Bridge Mounted Clearance Sign Assembly (BMCS) Standard Sheet.
 - For Sign Support Descriptive Codes, see Sign Mounting Details Small Roadside Signs General Notes & Details SMD (GEN).



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SUMMARY OF SMALL SIGNS

SOSS

FILE: slums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT May 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS				FM 1011
4-16	DIST	COUNTY	SHEET NO.	
8-16	SAT	COMAL	TS-15	

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DATE: FILE:

FOUNDATION DESIGN TABLE

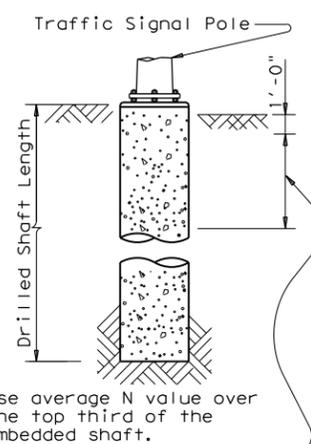
FDN TYPE	DRILLED SHAFT DIA	REINFORCING STEEL		EMBEDDED DRILLED SHAFT LENGTH-ft (4), (5), (6)			ANCHOR BOLT DESIGN (1)			FOUNDATION DESIGN LOAD (2)		TYPICAL APPLICATION	
		VERT BARS	SPIRAL & PITCH	TEXAS CONE PENETROMETER N blows/ft			ANCHOR BOLT DIA	Fy (ksi)	BOLT CIR DIA	ANCHOR TYPE	MOMENT K-ft		SHEAR Kips
				10	15	40							
24-A	24"	4- #5	#2 at 12"	5.7	5.3	4.5	3/4"	36	12 3/4"	1	10	1	Pedestal pole, pedestal mounted controller.
30-A	30"	8- #9	#3 at 6"	11.3	10.3	8.0	1 1/2"	55	17"	2	87	3	Mast arm assembly. (see Selection Table)
36-A	36"	10- #9	#3 at 6"	13.2	12.0	9.4	1 3/4"	55	19"	2	131	5	Mast arm assembly. (see Selection Table) 30' strain pole with or without luminaire.
36-B	36"	12- #9	#3 at 6"	15.2	13.6	10.4	2"	55	21"	2	190	7	Mast arm assembly. (see Selection Table) Strain pole taller than 30' & strain pole with mast arm
42-A	42"	14- #9	#3 at 6"	17.4	15.6	11.9	2 1/4"	55	23"	2	271	9	Mast arm assembly. (see Selection Table)

NOTES:

- Anchor bolt design develops the foundation capacity given under Foundation Design Loads.
- Foundation Design Loads are the allowable moments and shears at the base of the structure.
- Foundations may be listed separately or grouped according to similarity of location and type. Quantities are for the Contractor's information only.
- Field Penetrometer readings at a depth of approximately 3 to 5 feet may be used to adjust shaft lengths.
- If rock is encountered, the Drilled Shaft shall extend a minimum of two diameters into solid rock.
- Decimal lengths in Design Table are to allow interpolation for other penetrometer values. Round to nearest foot for entry into Summary Table.

FOUNDATION SELECTION TABLE FOR STANDARD MAST ARM PLUS ILSN SUPPORT ASSEMBLIES (ft)

WIND SPEED	MAX SINGLE ARM LENGTH	FDN 30-A	FDN 36-A	FDN 36-B	FDN 42-A
		80 MPH DESIGN	32'	48'	
80 MPH DESIGN	MAXIMUM DOUBLE ARM LENGTH COMBINATIONS	24' X 24'			
		28' X 28'			
		32' X 28'	32' X 32'		
			36' X 36'		
			40' X 36'		
100 MPH DESIGN	MAXIMUM DOUBLE ARM LENGTH COMBINATIONS	44' X 28'	44' X 36'		
			32' X 32'		
			36' X 36'		
			40' X 24'	40' X 36'	
			44' X 36'		

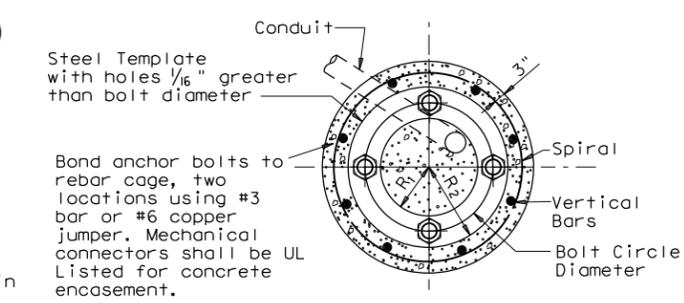


Use average N value over the top third of the embedded shaft. Ignore the top 1' of soil.

ANCHOR BOLT & TEMPLATE SIZES

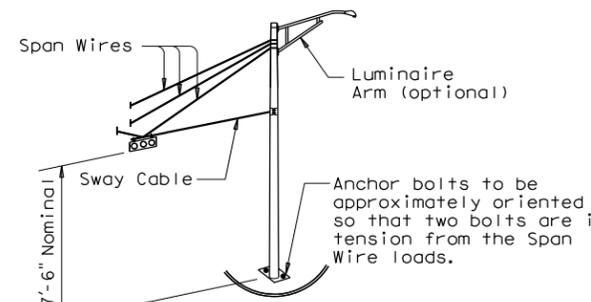
BOLT DIA IN.	BOLT LENGTH	TOP THREAD	BOTTOM THREAD	BOLT CIRCLE	R2	R1
3/4"	1'-6"	3"	—	12 3/4"	7 1/8"	5 5/8"
1 1/2"	3'-4"	6"	4"	17"	10"	7"
1 3/4"	3'-10"	7"	4 1/2"	19"	11 1/4"	7 3/4"
2"	4'-3"	8"	5"	21"	12 1/2"	8 1/2"
2 1/4"	4'-9"	9"	5 1/2"	23"	13 3/4"	9 1/4"

Min dimensions given, longer bolts are acceptable.

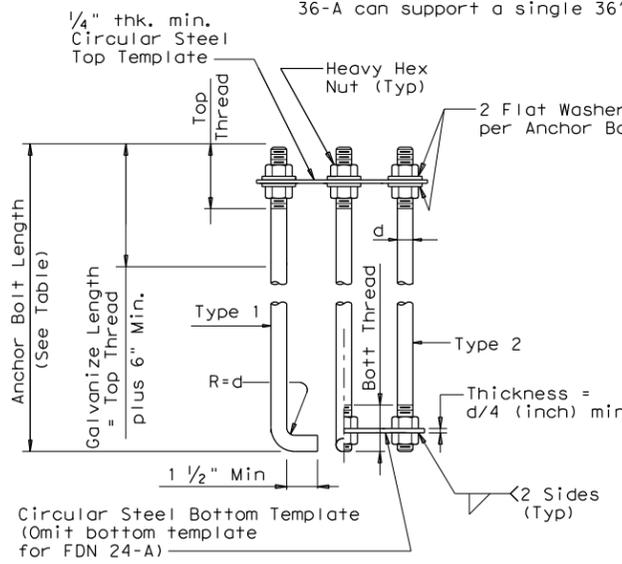


Bond anchor bolts to rebar cage, two locations using #3 bar or #6 copper jumper. Mechanical connectors shall be UL Listed for concrete encasement.

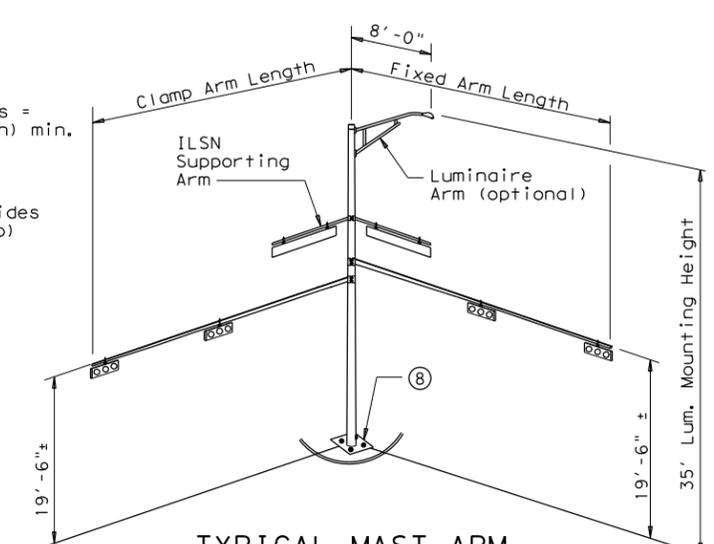
- EXAMPLE:**
- For 80mph design wind speed, foundation 30-A can support up to a 32' arm with another arm up to 28'
 - For 100mph design wind speed, foundation 36-A can support a single 36' mast arm.



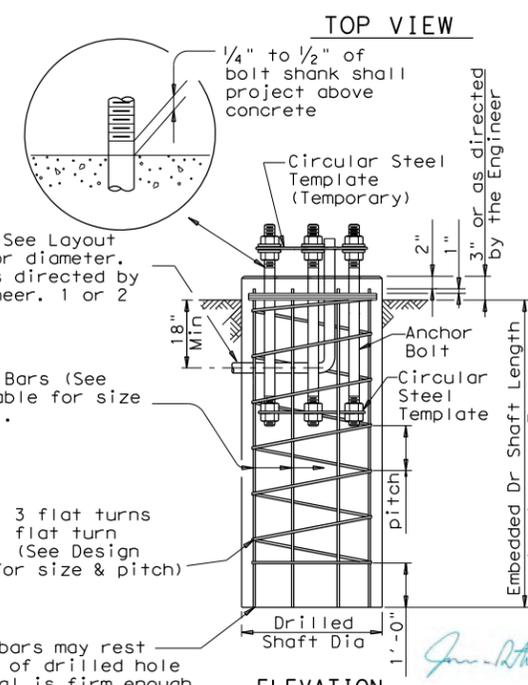
TYPICAL STRAIN POLE ASSEMBLY



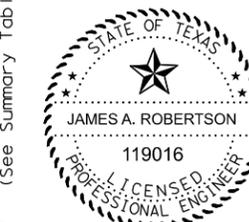
HOOKED ANCHOR (TYPE 1) NUT ANCHOR (TYPE 2) ANCHOR BOLT ASSEMBLY



TYPICAL MAST ARM ASSEMBLY



FOUNDATION DETAILS



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LEE ENGINEERING, L.L.C.
REGISTRATION NO. F-450

FOUNDATION SUMMARY TABLE (3)

LOCATION IDENTIFICATION	AVG. N BLOW /ft.	FDN TYPE	NO. EA	DRILLED SHAFT LENGTH (6) (FEET)				
				24-A	30-A	36-A	36-B	42-A
FM 1101 AT KROESCHE LN								
P-1	10	36-A	1			13		
P-2	10	30-A	1		11			
P-3	10	36-A	1			13		
TOTAL DRILLED SHAFT LENGTHS					11	26		

THIS TABLE WAS COMPLETED UNDER MY RESPONSIBLE SUPERVISION.

GENERAL NOTES:

- Design conforms to 1994 AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals and interim revisions thereto.
- Reinforcing steel shall conform to Item 440, "Reinforcing Steel".
- Concrete shall be Class "C".
- Threads for anchor bolts and nuts shall be rolled or cut threads of 8UN series up to 2" in diameter or UNC series for all sizes. Bolts and nuts shall have Class 2A and 2B fit tolerances. Galvanized nuts shall be tapped after galvanizing.
- Anchor bolts that are larger than 1" in diameter shall conform to "alloy steel" or "medium-strength mild steel" per Item 449, "Anchor Bolts". Anchor bolts that are 1" in diameter or less shall conform to ASTM A36. Galvanize a minimum of the top end thread length plus 6" for all anchor bolts unless otherwise noted. Exposed washers and exposed nuts shall be galvanized. All galvanizing shall be in accordance with Item 445, "Galvanizing".
- Templates and embedded nuts need not be galvanized. Lubricate and tighten anchor bolts when erecting the structure in accordance with Item 449, "Anchor Bolts".



TRAFFIC SIGNAL POLE FOUNDATION

TS-FD-12

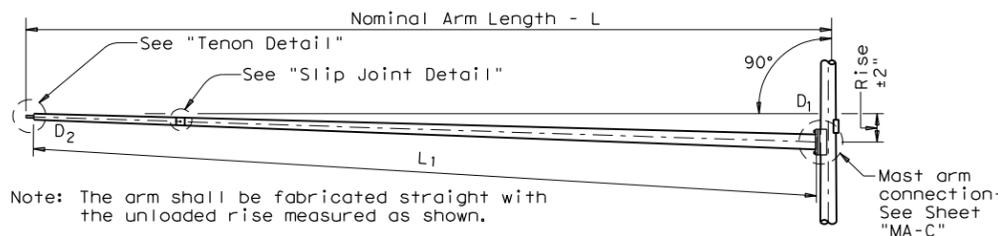
© TxDOT August 1995	DN: MS	CK: JSY	DW: MAO/MMF	CK: JSY/TEB
5-96 11-99 1-12	REVISIONS	CONT	SECT	JOB
				HIGHWAY
				FM 1011
		DIST	COUNTY	SHEET NO.
		SAT	COMAL	TS-16

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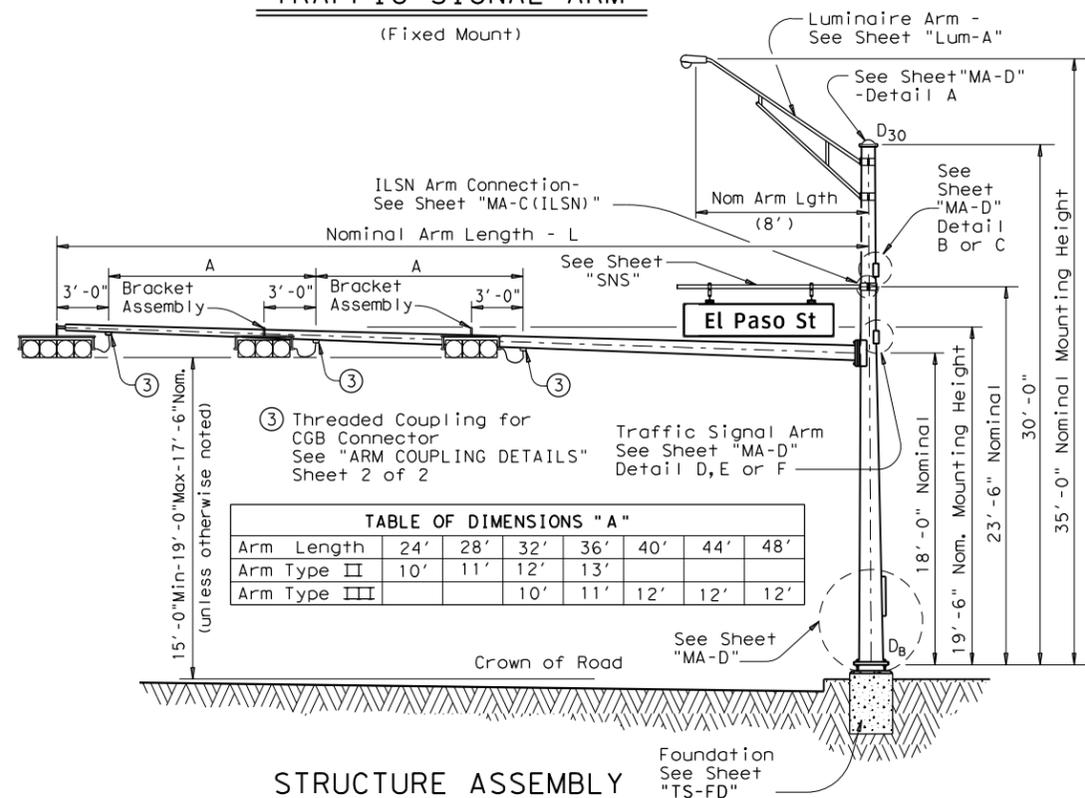
Arm Length	ROUND POLES					POLYGONAL POLES					Foundation Type
	D _B	D ₁₉	D ₂₄	D ₃₀	① thk	D _B	D ₁₉	D ₂₄	D ₃₀	① thk	
20	10.5	7.8	7.1	6.3	.179	11.5	8.5	7.7	6.8	.179	30-A
24	11.0	8.3	7.6	6.8	.179	12.0	9.0	8.2	7.3	.179	30-A
28	11.5	8.8	8.1	7.3	.179	12.5	9.5	8.7	7.8	.179	30-A
32	12.5	9.8	9.1	8.3	.179	12.0	9.0	8.2	7.3	.239	30-A
36	12.0	9.3	8.6	7.8	.239	12.5	9.5	8.7	7.8	.239	36-A
40	12.0	9.3	8.6	7.8	.239	13.5	10.5	9.7	8.8	.239	36-A
44	12.5	9.8	9.1	8.3	.239	14.0	11.0	10.2	9.3	.239	36-A
48	13.0	10.3	9.6	8.8	.239	15.0	12.0	11.2	10.3	.239	36-A

Arm Length	ROUND ARMS					POLYGONAL ARMS				
	L ₁	D ₁	D ₂	① thk	Rise	L ₁	D ₁	② D ₂	① thk	Rise
20	19.1	6.5	3.8	.179	1'-9"	19.1	7.0	3.5	.179	1'-8"
24	23.1	7.5	4.3	.179	1'-10"	23.1	7.5	3.5	.179	1'-9"
28	27.1	8.0	4.2	.179	1'-11"	27.1	8.0	3.5	.179	1'-10"
32	31.0	9.0	4.7	.179	2'-1"	31.0	9.0	3.5	.179	2'-0"
36	35.0	9.5	4.6	.179	2'-4"	35.0	10.0	3.5	.179	2'-1"
40	39.0	9.5	4.1	.239	2'-8"	39.0	9.5	3.5	.239	2'-3"
44	43.0	10.0	4.1	.239	2'-11"	43.0	10.0	3.5	.239	2'-6"
48	47.0	10.5	4.1	.239	3'-4"	47.0	11.0	3.5	.239	2'-9"

- D_B = Pole Base O.D.
- D₁₉ = Pole Top O.D. with no Luminaire and no ILSN
- D₂₄ = Pole Top O.D. with ILSN w/out Luminaire
- D₃₀ = Pole Top O.D. with Luminaire
- D₁ = Arm Base O.D.
- D₂ = Arm End O.D.
- L₁ = Shaft Length
- L = Nominal Arm Length
- ① Thickness shown are minimums, thicker materials may be used.
- ② D₂ may be increased by up to 1" for polygonal arms.



TRAFFIC SIGNAL ARM
(Fixed Mount)



STRUCTURE ASSEMBLY

SHIPPING PARTS LIST

Ship each pole with the following attached: enlarged hand hole, pole cap, fixed-arm connection bolts and washers and any additional hardware listed in the table.

Nominal Arm Length	30' Poles With Luminaire		24' Poles With ILSN		19' Poles With No Luminaire and No ILSN	
	Designation	Quantity	Designation	Quantity	Designation	Quantity
ft	20L-80		20S-80		20-80	
24	24L-80		24S-80		24-80	
28	28L-80		28S-80		28-80	
32	32L-80	1	32S-80		32-80	
36	36L-80	2	36S-80		36-80	
40	40L-80		40S-80		40-80	
44	44L-80		44S-80		44-80	
48	48L-80		48S-80		48-80	

Traffic Signal Arms (1 per Pole) Ship each arm with the listed equipment attached

Nominal Arm Length	Type I Arm (1 Signal)		Type II Arm (2 Signals)		Type III Arm (3 Signals)	
	Designation	Quantity	Designation	Quantity	Designation	Quantity
ft	20I-80		20II-80		20III-80	
24	24I-80		24II-80		24III-80	
28	28I-80		28II-80		28III-80	
32			32II-80	1	32III-80	
36			36II-80	1	36III-80	1
40			40II-80		40III-80	
44			44II-80		44III-80	
48					48III-80	

Luminaire Arms (1 per 30' pole)

Nominal Arm Length	Quantity
8' Arm	3

ILSN Arm (Max. 2 per pole) Ship with clamps, bolts and washers

Nominal Arm Length	Quantity
7' Arm	
9' Arm	

Anchor Bolt Assemblies (1 per pole)

Anchor Bolt Diameter	Anchor Bolt Length	Quantity
1 1/2"	3'-4"	1
1 3/4"	3'-10"	2

Each anchor bolt assembly consists of the following: Top and Bottom templates, 4 anchor bolts, 8 nuts, 8 flat washers, and 4 nut anchor devices (Type 2) per Standard Drawing "TS-FD".

Templates may be removed for shipment.



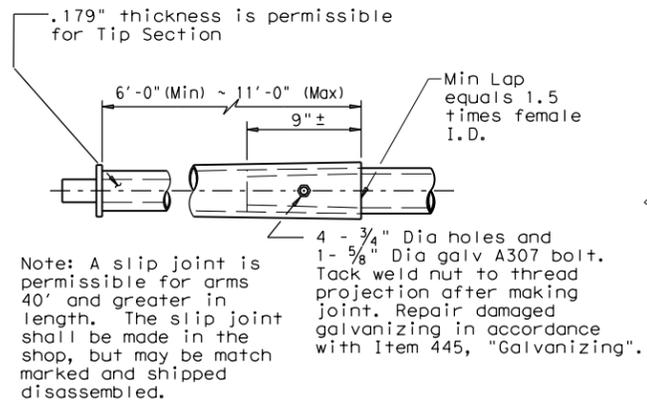
Digitally signed by James A. Robertson
Date: 2025.11.11 11:58:16-06'00'

JAMES A. ROBERTSON, P.E.
LEE ENGINEERING, L.L.C. - REGISTRATION NO. F-450

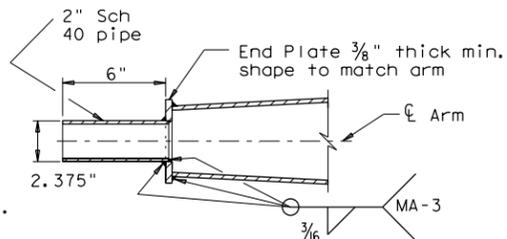
Texas Department of Transportation
Traffic Operations Division
TRAFFIC SIGNAL SUPPORT STRUCTURES
SINGLE MAST ARM ASSEMBLY
(80 MPH WIND ZONE)
SMA-80(1)-12

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REVISIONS	CONT	SECT	JOB	HIGHWAY
5-96				FM 1101
11-99				
1-12				
	DIST	COUNTY		SHEET NO.
	SAT	COMAL		TS-17

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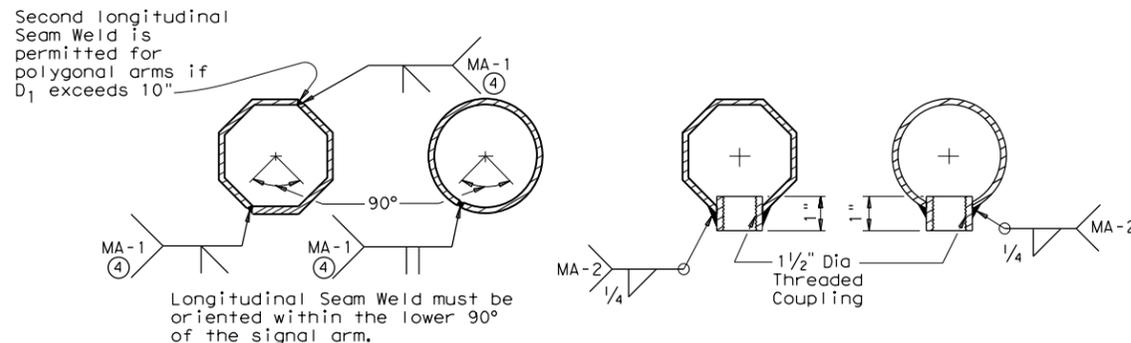
SLIP JOINT DETAIL



TENON DETAIL

Stainless steel bands (or Cables) and cast bracket as in "Astro-Brac", "Sky Bracket" or "Easy Bracket" with 1 1/2" Dia Threaded Coupling.

BRACKET ASSEMBLY



ARM WELD DETAIL

ARM COUPLING DETAILS

④ 60% Min. penetration
100% penetration within
6" of circumferential
base welds.

VIBRATION WARNING

Mast Arms of SMA and DMA structures and clamp-on Arms of LMA structures of approximately 40 ft or longer are subject to harmonic vertical vibrations in light wind conditions due to the aeroelastic characteristics of a few of the myriads of possible combinations of the following: signal numbers, weights and positions; existence/solidity of backplates; presence of additional attachments to the arm, such as signs and cameras; arm-wind orientation; and arm-pole stiffness.

Such vibrations may cause fatigue damage to the structure and may lead to galloping in moderate wind conditions which may further damage the structure and alarm the public. Tests have indicated that when wind is blowing toward the back side of signal heads having un-vented backplates attached the probability of unacceptable harmonic vibration and/or galloping is rather high.

If backplates are not required for improved visibility they should not be applied to the signal heads or, if they must be applied, they should be vented as a first and inexpensive measure to mitigate vibrations.

The traffic signal mast arms shall be visually inspected in 5 to 20 mph wind conditions after installation of signal heads and any attachments, including any required backplates. If vertical movements with a total excursion (maximum upward excursion to maximum downward excursion) of more than approximately 8" are observed at the arm tip, a damping plate shall be fitted to the arm. See "Damping Plate Mounting Details" on standard sheet, MA-DP-10.

This visual inspection shall be repeated after each modification of the structure that could affect its aeroelastic response. Excessive vibrations shall not be allowed to continue for more than two days.

GENERAL NOTES:

Design conforms to 1994 AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals and Interim Specifications thereto. Design Wind Speed equals 80 mph plus a 1.3 gust factor.

Poles are designed to support one 8'-0" luminaire arm, one 9'-0" internally lighted street name sign and one traffic signal arm with a length as tabulated. The specified luminaire load applied at the end of the luminaire arm equals 60 lbs vertical dead load plus the horizontal wind load on an effective projected area of 1.6 sq ft. The specified internally lighted street name sign load applied 4.5 ft from the centerline of the pole equals 85 lbs vertical dead load plus horizontal wind load on an effective projected area of 11.5 sq ft. The specified signal load applied at the end of the traffic signal arm equals 180 lbs vertical dead load plus the horizontal wind load on an effective projected area of 32.4 sq ft (actual area times drag coefficient).

See Standard Sheet "MA-D" for pole details, "MA-C" for traffic signal arm connection details, "MA-C (ILSN)" for internally lighted street name sign arm connection details, "LUM-A" for luminaire arm and connection details, "SNS" for internally lighted street name sign details, and "TS-FD" for anchor bolt and foundation details. See "MA-C" for material specifications.

Fabrication shall be in accordance with Item 686, "Traffic Signal Pole Assemblies (Steel)" and with the details, dimensions, and weld procedures shown herein. Weld references call for preapproved weld procedures which the Fabricator must obtain prior to fabrication. Materials, fabrication tolerances, and shipping practices shall meet the requirements of this sheet and Item 686, "Traffic Signal Pole Assemblies (Steel)".

Unless otherwise noted, all parts shall be galvanized in accordance with Item 445, "Galvanizing", after fabrication.

Deviation from the details and dimensions shown herein require submission of shop drawings in accordance with Item 441, "Steel Structures". Alternate designs are not acceptable.



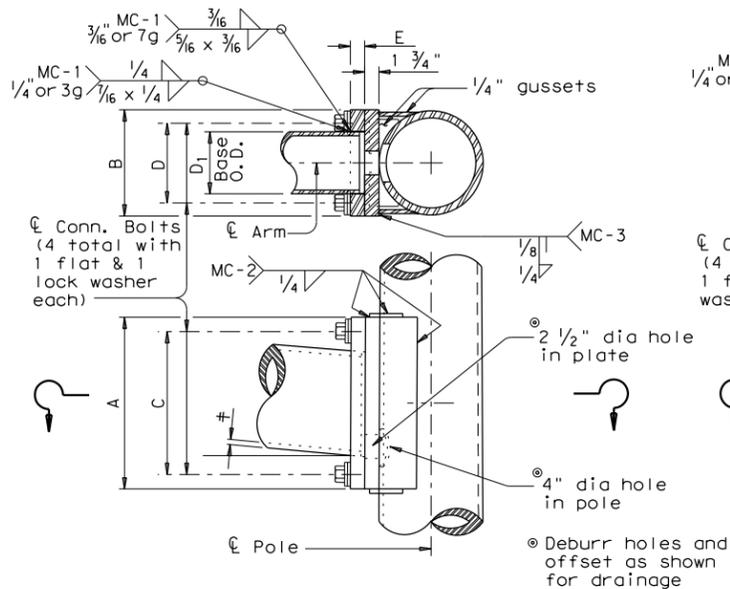
**TRAFFIC SIGNAL
SUPPORT STRUCTURES
SINGLE MAST ARM ASSEMBLY
(80 MPH WIND ZONE)**

SMA-80(2)-12

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				FM 1101	
	DIST	COUNTY		SHEET NO.	
		SAT	COMAL		TS-18

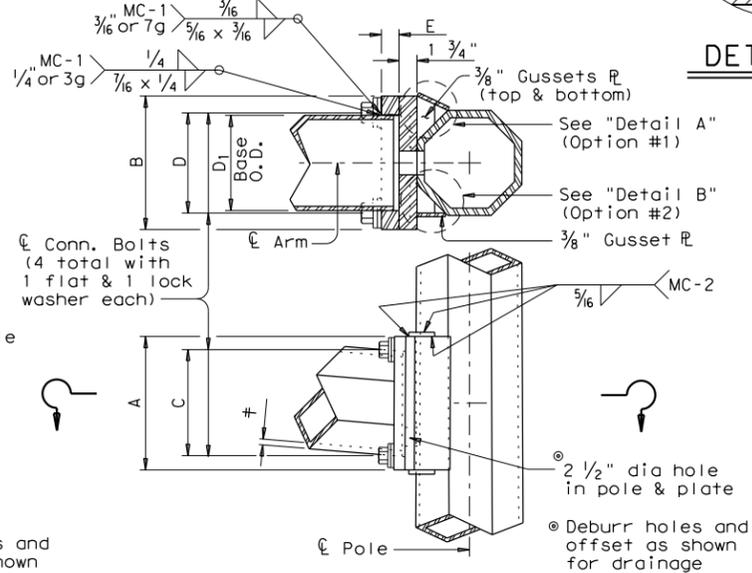
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ARM SIZE		A	B	C	D	E	CONN BOLT DIA
D ₁	∅	in.	in.	in.	in.	in.	in.
6.5	.179	12	9	9	6	1 3/4	1
7.5	.179	13	9	10	6	1 3/4	1
8.0	.179	14	10	11	7	2	1 1/4
9.0	.179	16	11	13	8	2	1 1/4
9.5	.179	17	12	14	9	2	1 1/4
9.5	.239	18	12	15	9	2	1 1/4
10.0	.239	18	12	15	9	2	1 1/4
10.5	.239	18	13	15	10	3	1 1/2
11.0	.239	18	13	15	10	3	1 1/2

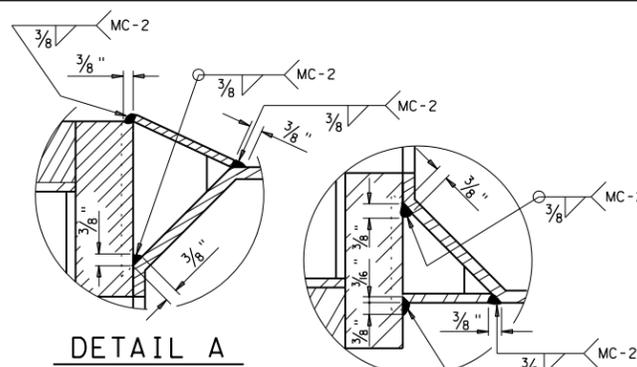


FIXED MOUNT DETAIL 1

ARM SIZE		A	B	C	D	E	CONN BOLT DIA
D ₁	∅	in.	in.	in.	in.	in.	in.
7.0	.179	11	11	8	8	1 3/4	1 1/4
7.5	.179	11	11	8	8	1 3/4	1 1/4
8.0	.179	11	11	8	8	2	1 1/4
9.0	.179	13	13	10	10	2	1 1/4
10.0	.179	13	13	10	10	2	1 1/4
9.5	.239	13	13	10	10	2	1 1/4
10.0	.239	14	14	11	11	2	1 1/2
11.0	.239	14	14	11	11	3	1 1/2
11.5	.239	14	14	11	11	3	1 1/2

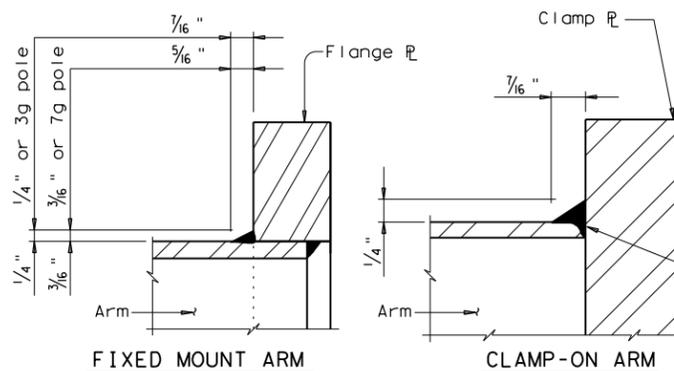


FIXED MOUNT DETAIL 2



DETAIL A

DETAIL B



FIXED MOUNT ARM

CLAMP-ON ARM

ARM BASE WELD DETAILS

MATERIALS	
Round Shafts or Polygonal Shafts ^①	ASTM A595 Gr.A, A588, A1008 HSLAS Gr.50 Class 2, A1011 HSLAS Gr.50 Class 2, A572 Gr.50 or A1011 SS Gr.50 ^②
Plates ^①	ASTM A36, A588, or A572 Gr.50
Connection Bolts	ASTM A325 or A449, except where noted
Pin Bolts	ASTM A325
Pipe ^①	ASTM A53 Gr.B, A501, A1008 HSLAS-F Gr.50, A1011 HSLAS-F Gr.50
Misc. Hardware	Galvanized steel or stainless steel or as noted

- ① ASTM A572, A1008 HSLAS, A1011 HSLAS, A1008 HSLAS-F, A1011 HSLAS-F or A1011 SS may have higher yield strengths but shall not have less elongation than the grade indicated.
- ② ASTM A1011 SS Gr.50 material shall also have a minimum elongation of 18 percent in 8 inches or 23 percent in 2 inches. Material thickness in excess of those stipulated under A1011 SS will be acceptable providing the material meets all other A1011 SS requirements and the requirements of this item.

GENERAL NOTES:

Clamp-on details are used for the second arm on dual mast arm assemblies. A Maximum 1 1/2" wide vertical slotted hole shall be cut in the front clamp plate to facilitate drainage during galvanizing. The slot shall be centered behind the arm and shall be no longer than the arm diameter minus 1"

Fixed mount details are used for single mast arm assemblies and for the first arm on dual mast arm assemblies.

Where duplicate parts occur on a detail, welds shown for one part shall apply to all similar parts on the detail.

Pin bolts are required to prevent rotation of clamp-on arms under design wind forces.

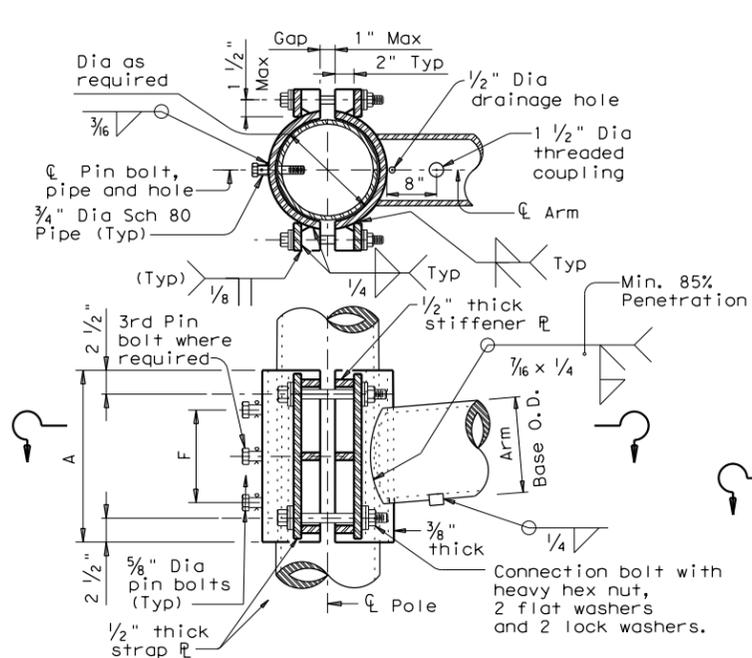
NOTE:

Pin bolts shall be A325 with threads excluded from the shear plane. Pin bolt and 3/4" dia pipe shall have 3/16" dia holes for a 1/8" dia galvanized cotter pin. Back clamp plate shall be furnished with a 3/4" dia hole for each pin bolt. An 1/16" dia hole for the pole after arm orientations have been approved by the Engineer.

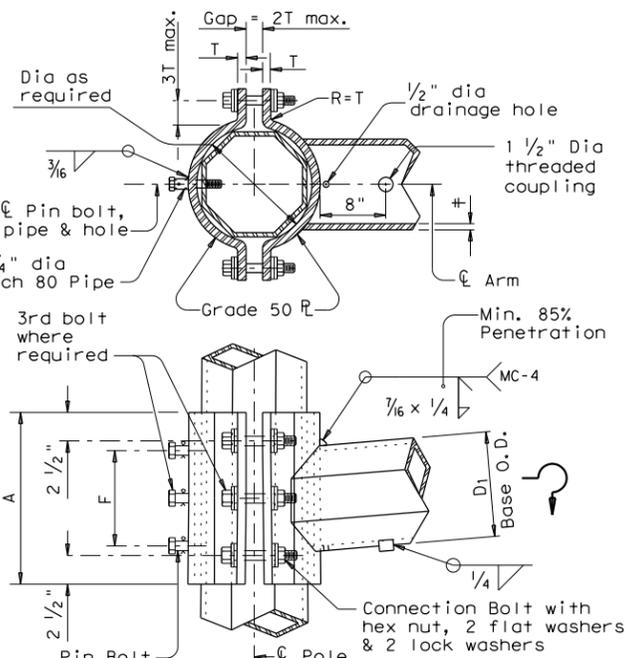
ARM SIZE		A	F	CONN. BOLTS	PIN BOLTS
D ₁	∅	in.	in.	No. Dia	No. Dia
6.5	.179	12	6	4 1	2 5/8
7.5	.179	14	8	4 1	2 5/8
8.0	.179	14	8	4 1	2 5/8
9.0	.179	16	10	4 1	2 5/8
9.5	.179	18	12	4 1 1/4	3 5/8
9.5	.239	18	12	4 1 1/4	3 5/8
10.0	.239	18	12	4 1 1/4	3 5/8

ARM SIZE		A	F	T	CONN. BOLTS	PIN BOLTS
D ₁	∅	in.	in.	in.	No. Dia	No. Dia
7.0	.179	12	6	3/4	4 3/4	2 5/8
7.5	.179	14	8	3/4	4 3/4	2 5/8
8.0	.179	14	8	3/4	4 3/4	2 5/8
9.0	.179	16	10	7/8	4 1	2 5/8
10.0	.179	18	10	7/8	4 1	2 5/8
9.5	.239	18	10	1	6 1	3 5/8
10.0	.239	18	10	1	6 1	3 5/8

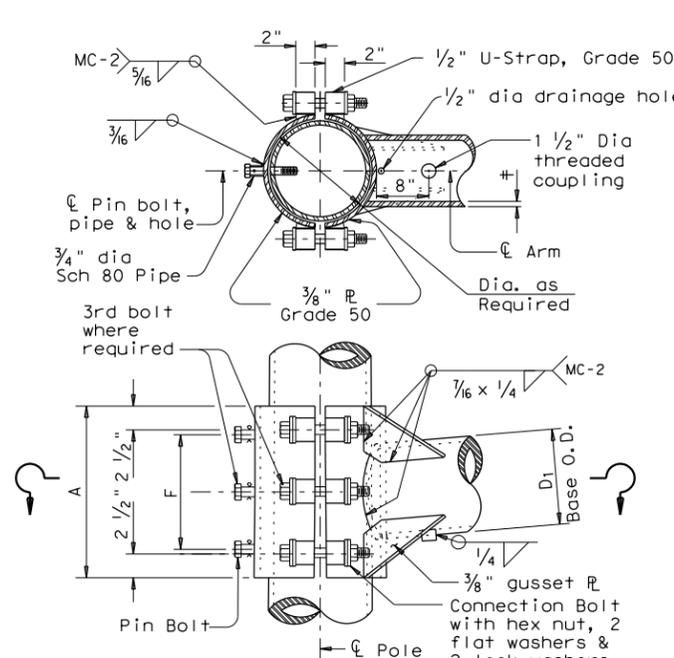
ARM SIZE		A	F	CONN. BOLTS	PIN BOLTS
D ₁	∅	in.	in.	No. Dia	No. Dia
6.5	.179	12	6	4 1	2 5/8
7.5	.179	14	8	4 1	2 5/8
8.0	.179	14	8	4 1	2 5/8
9.0	.179	16	10	4 1	2 5/8
9.5	.179	18	12	6 1	3 5/8
9.5	.239	18	12	6 1	3 5/8
10.0	.239	18	12	6 1	3 5/8



CLAMP-ON DETAIL 1



CLAMP-ON DETAIL 2



CLAMP-ON DETAIL 3

Texas Department of Transportation
Traffic Operations Division

**STANDARD ASSEMBLY
FOR TRAFFIC SIGNAL
SUPPORT STRUCTURES**

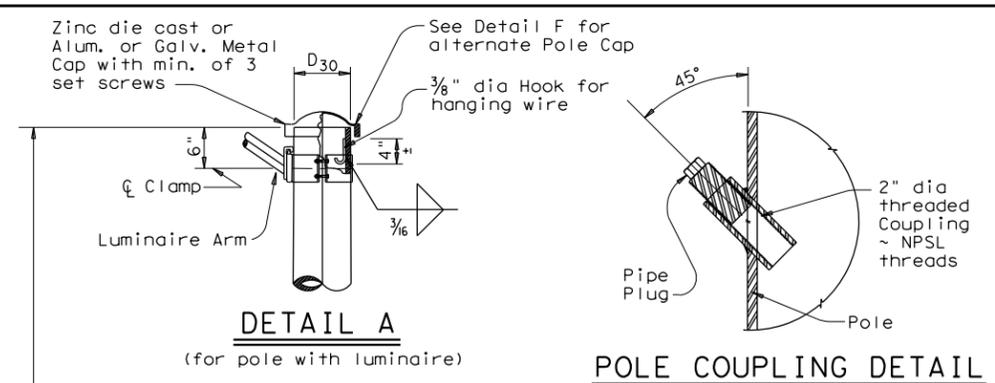
MAST ARM CONNECTIONS

MA-C-12

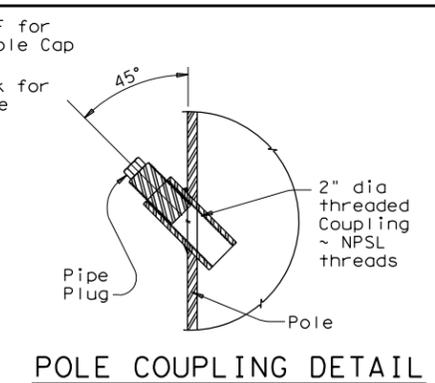
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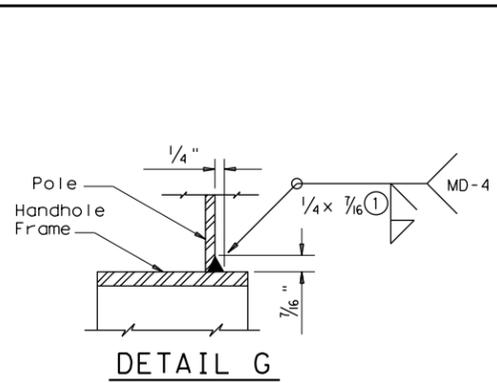
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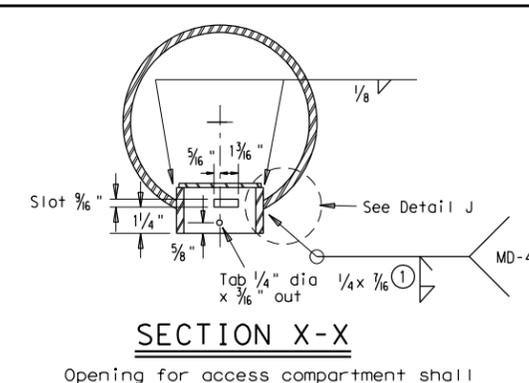
DETAIL A
(for pole with luminaire)



POLE COUPLING DETAIL

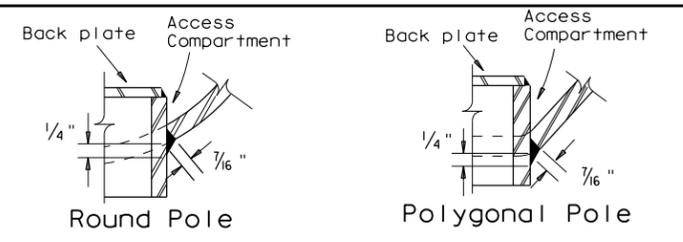


DETAIL G

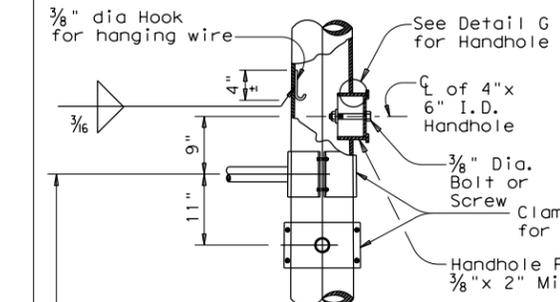


SECTION X-X

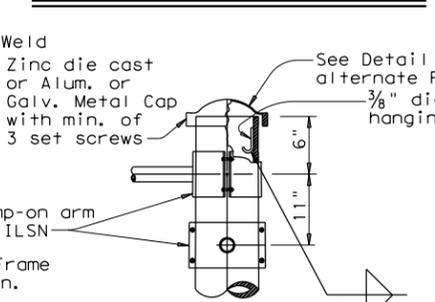
Opening for access compartment shall be no more than 1/16 inch wider than the access compartment itself.



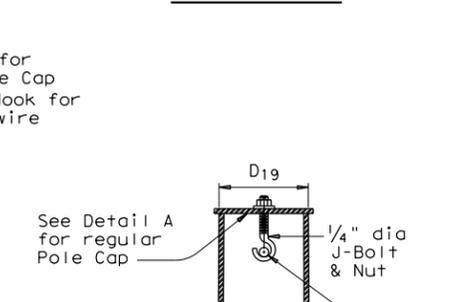
DETAIL J



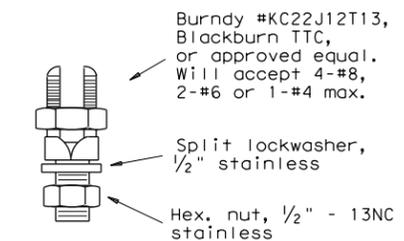
DETAIL B
(If ILSN applied)



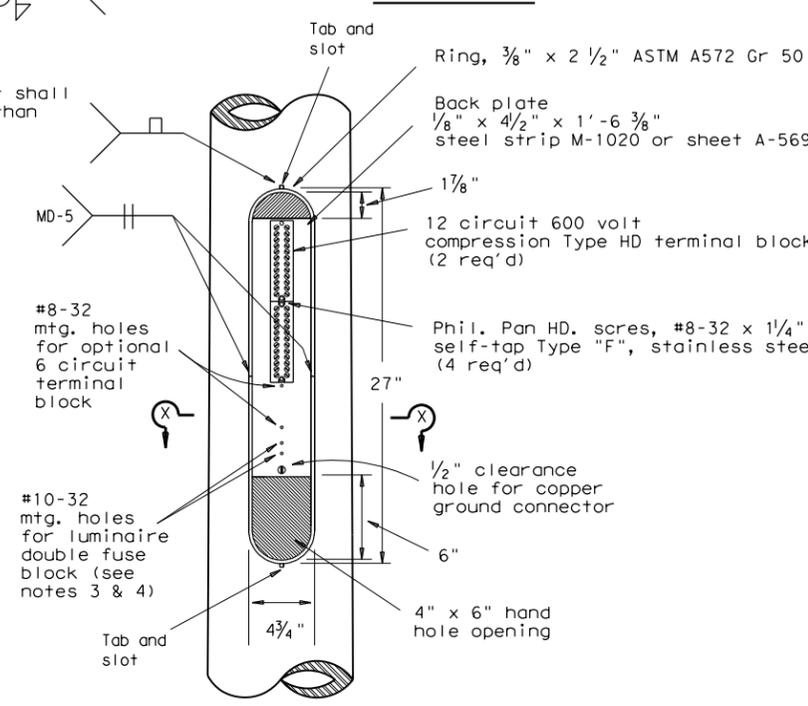
DETAIL C



SECTION Y-Y



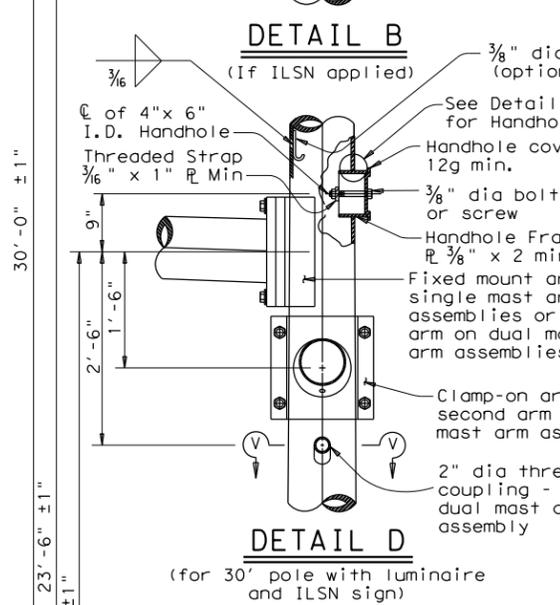
COPPER GROUND CONNECTOR



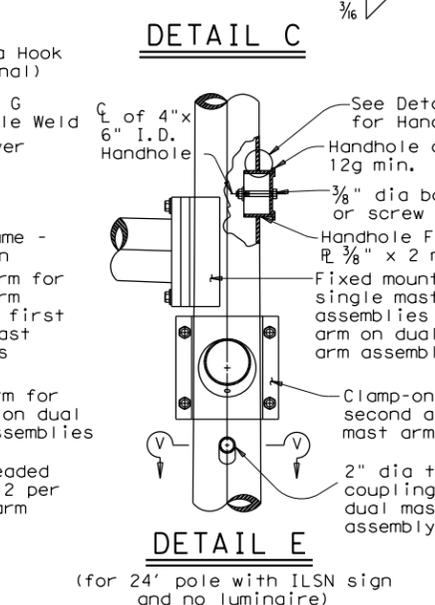
ACCESS COMPARTMENT

NOTES:

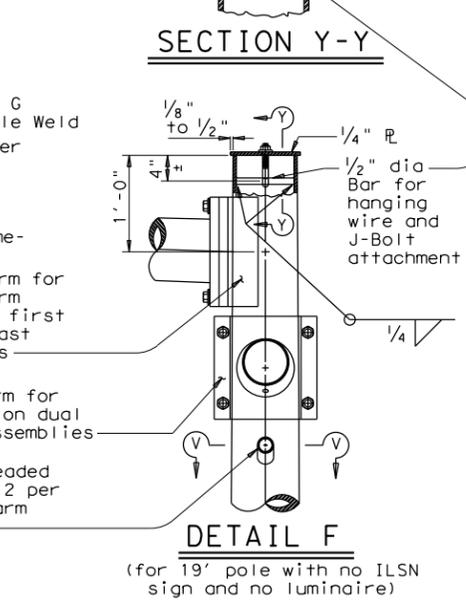
- The cover shall be one piece formed from ABS plastic, shall be a pearl gray color, and shall be suitable for exposure to harsh sunlight and extreme weather. Cover shall latch with two screw latches and shall fit tightly to the enclosure ring to create a rainproof seal. Latch screws shall be 1/4-20 stainless flat socket head screws with tamper proof feature.
- The pole manufacturer shall provide with each pole a separate kit consisting of: one cover with two latching assemblies, two terminal strips (Marathon #985GP12CU or approved equal), four #8-32 x 1 1/4 self tapping type "F" stainless steel pan head screws, and one ground connector (Blackburn TTC, Burndy KC22J12T13, or IlSCO SSS-5). The traffic signal contractor shall install the kit items in the field.
- The screw hole spacing on the enclosure back plate shall be for two Marathon #985GP12 terminal strips, one Marathon #985GP06CU terminal strip, and one Bussmann #BM6032B fuse block.
- Install one Bussmann #BM6032B, Littelfuse #L60030M-2C, or Ferraz-Shawmut #30352 fuse block for poles where luminaires are to be installed.



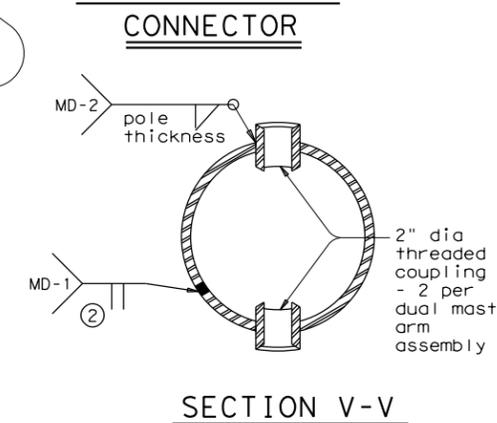
DETAIL D
(for 30' pole with luminaire and ILSN sign)



DETAIL E
(for 24' pole with ILSN sign and no luminaire)

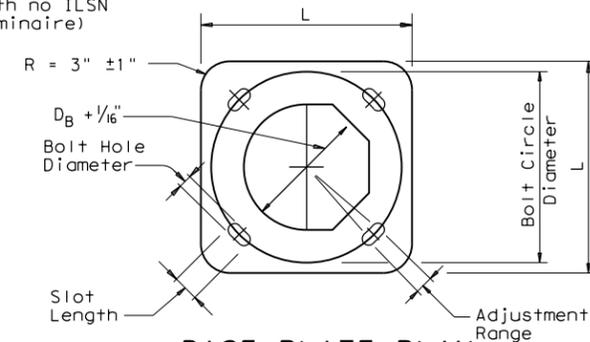


DETAIL F
(for 19' pole with no ILSN sign and no luminaire)



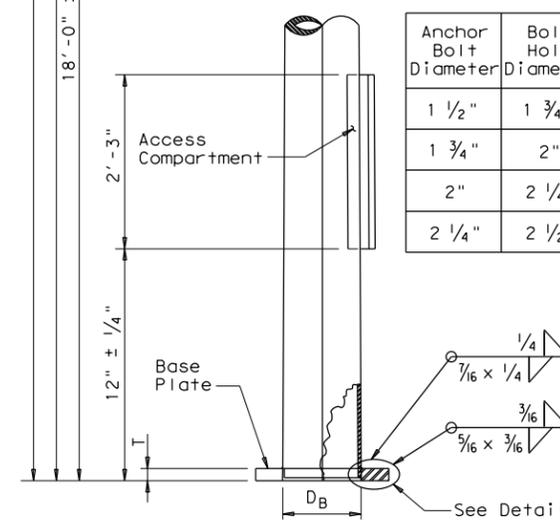
SECTION V-V

Anchor Bolt Diameter	Bolt Hole Diameter	Slot Length	Bolt Circle Diameter	Base R Dim. L x T	Adjust. Range
1 1/2"	1 3/4"	3 1/2"	17"	18" x 1 1/2"	13.4°
1 3/4"	2"	4"	19"	20" x 1 3/4"	13.5°
2"	2 1/4"	4 1/2"	21"	22" x 2"	13.6°
2 1/4"	2 1/2"	5"	23"	24" x 2 1/4"	13.7°

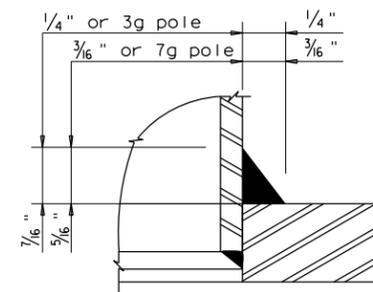


BASE PLATE PLAN

- ① 85% Min. penetration
- ② 60% Min. penetration
100% penetration within 6" of circumferential base welds.



POLE ELEVATION



DETAIL H

Texas Department of Transportation
Traffic Operations Division

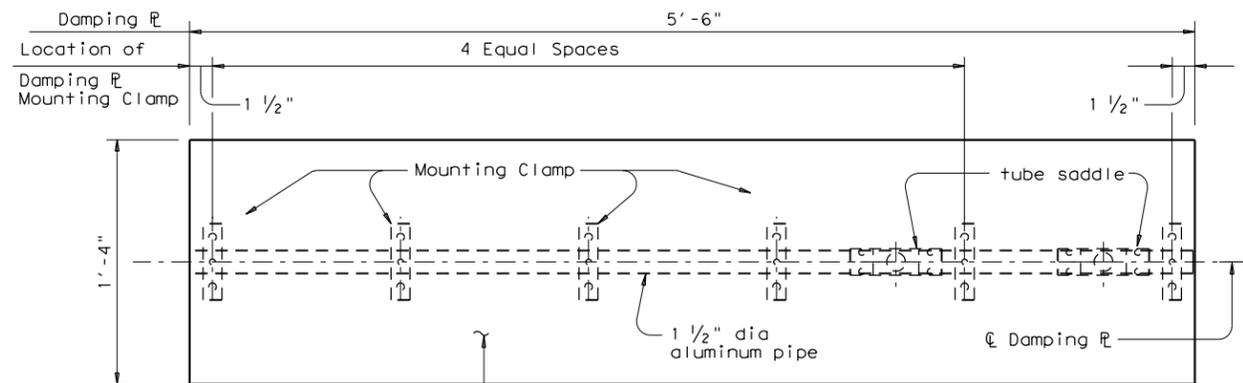
TRAFFIC SIGNAL SUPPORT STRUCTURES MAST ARM POLE DETAILS

MA-D-12

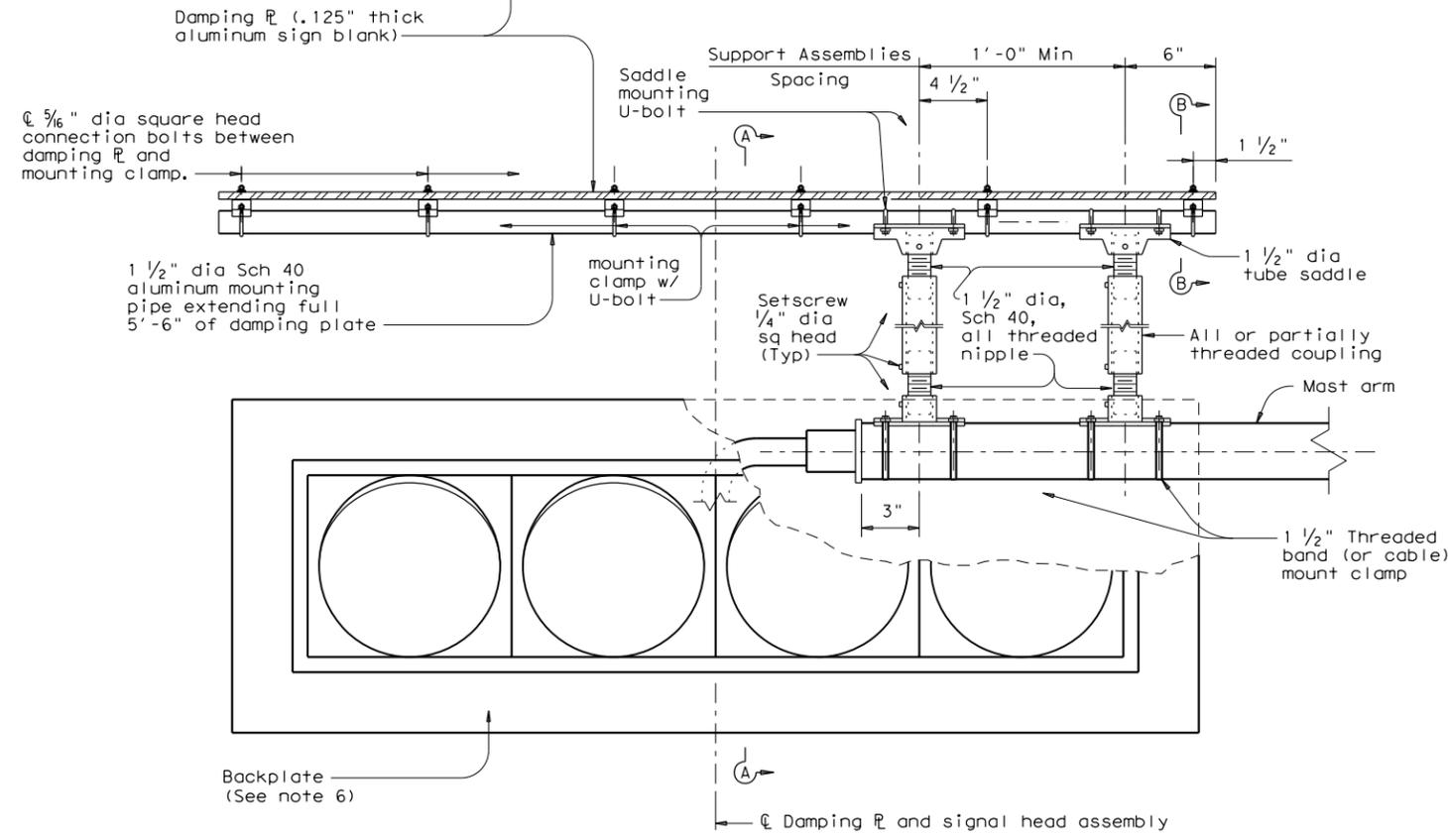
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			COUNTY	SHEET NO.
			COMAL	TS-20

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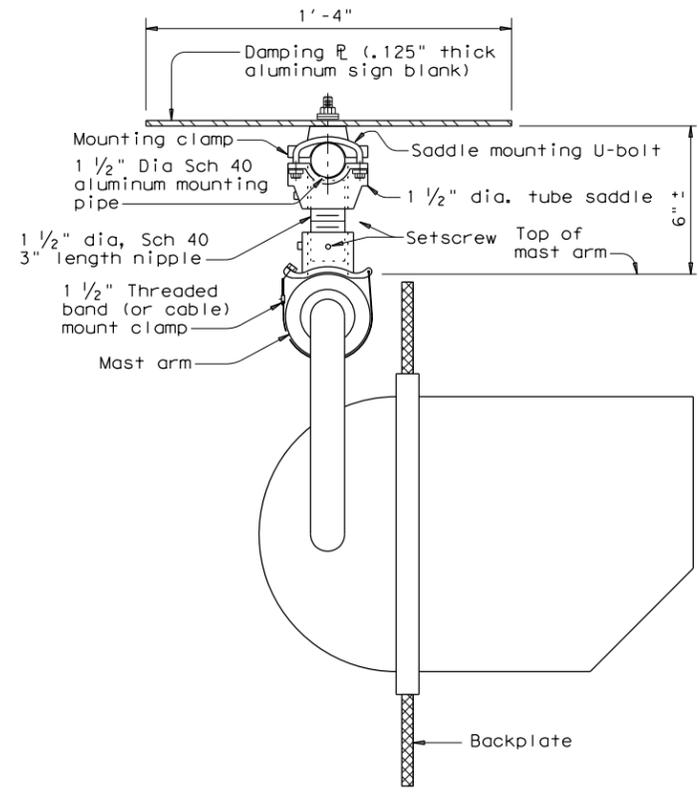


PLAN

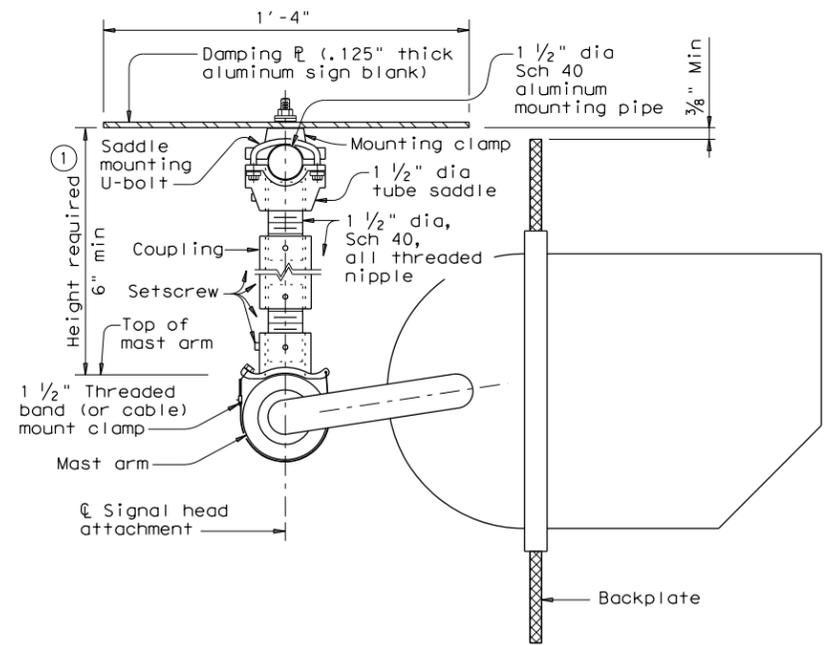


ELEVATION

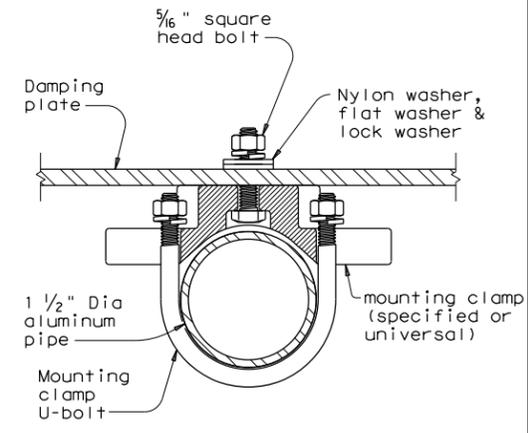
DAMPING PLATE MOUNTING DETAILS
(Showing alternate placement of signal head)



SECTION A-A
(Showing standard placement of signal head)
(Mounting clamp U-bolt is not shown for clarity)



SECTION A-A
(Showing alternate placement of signal head)
(Mounting clamp U-bolt is not shown for clarity)



SECTION B-B
(Showing damping plate attachment)

GENERAL NOTES:

- In accordance with the findings of TxDOT sponsored research, the installation of a damping plate in accordance with the details shown here at the end of signal mast arms of SMA and DMA standard structures reduces excessive harmonic vertical vibration, and thus fatigue damage. Any deviation from these details may reduce the effectiveness of this damping device.
- Aluminum sign blank for damping plate will conform to Departmental Material Specifications DMS-7110. Materials for mast arm mounting clamp and tube saddle will be aluminum castings or aluminum alloys as in accordance with manufacturers' stipulations. Mounting pipe, pipe nipple and coupling will be aluminum alloy 6061-T6 or 6063-T6. Damping plate mounting clamp and u-bolt assemblies will conform to Standard sheet SMD(GEN). U-bolts for saddle mounting will have a minimum yield strength of 36 ksi.
- Damping plate will be mounted horizontally. Position centerline of damping plate to align with centerline of mast arm or horizontal signal head assembly. Vertical clearance between signal head (with or without backing plate) and bottom of damping plate will be maintained as shown. The attachments shown here are examples only, other supporting details which meet both alignment and vertical clearance requirements are also acceptable.
- Unless stipulated by the manufacturers, all steel parts will be galvanized finish in accordance with Standard Specification Item 445, "Galvanizing".
- Contractor will verify applicable field dimensions before the installation.
- Backplates are optional for traffic signals. When backplates are used, Backplates will have a 2-inch fluorescent yellow AASHTO Type BFL or CFL retroreflective border conforming to TxDOT DMS-8300 "Sign Face Materials." See Sheet TS-BP-20 for backplate details.

① Recommended supporting assemblies to achieve required height for horizontal section heads

Height required	One nipple each length	Two nipples each length plus One coupling each length	
6"-6 3/4"	3"	-	-
7"-8 1/2"	4"	-	-
9"-10 1/2"	6"	-	-
11"-15 1/2"	-	4"	5"
16"-24"	-	6"	10"

Texas Department of Transportation Traffic Safety Division Standard

MAST ARM DAMPING PLATE DETAILS

MA-DPD-20

FILE: ma-dpd-20.dgn DWN: TxDOT CK: TxDOT DW: TxDOT CK: TxDOT

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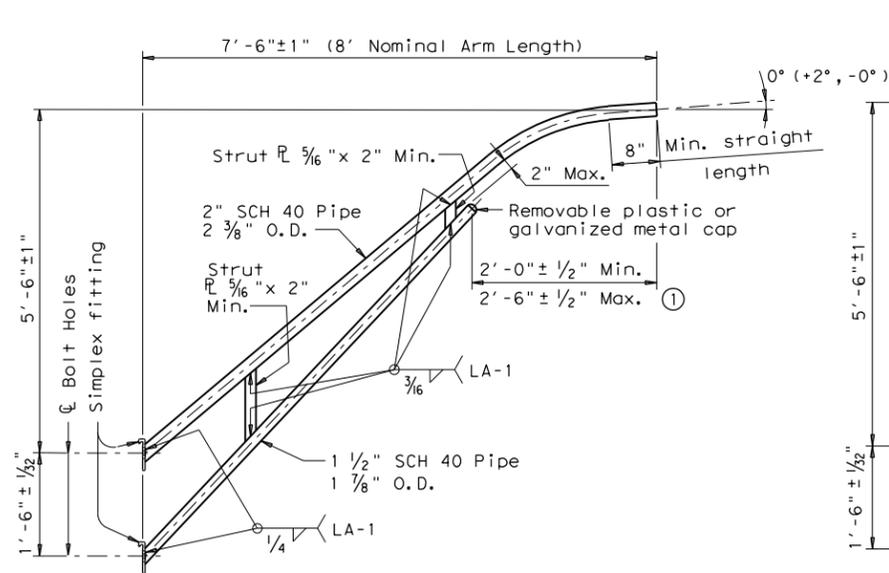
4-20 REVISIONS FM 1101

6-20 DIST COUNTY SHEET NO.

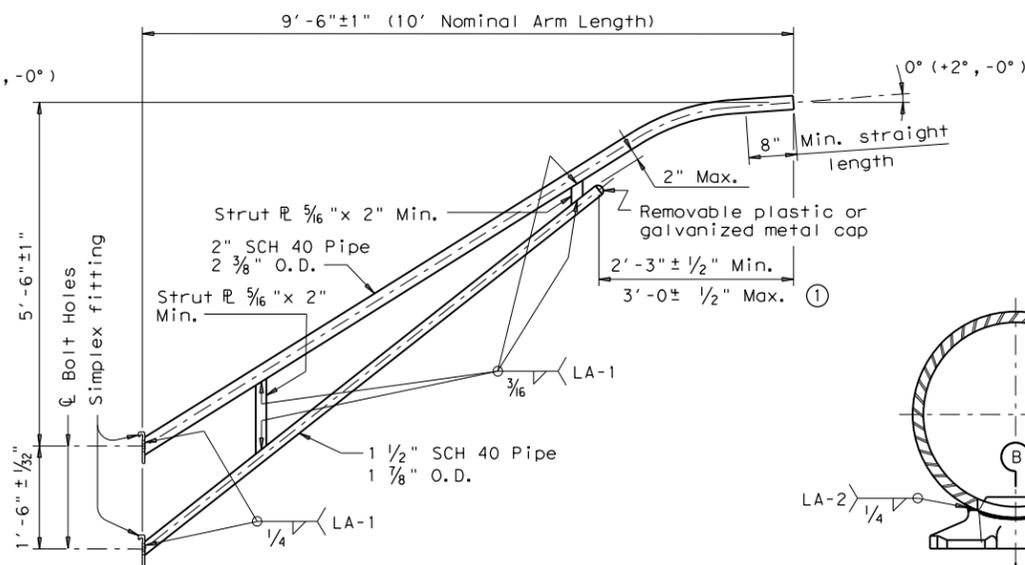
SAT COMAL TS-21

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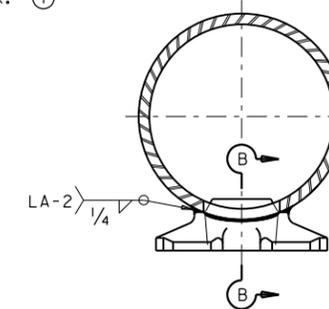
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8-FOOT LUMINAIRE ARM



10-FOOT LUMINAIRE ARM



DIRECT ATTACHMENT DETAIL

MATERIALS	
Pole or Arm Simplex	ASTM A27 Gr. 65-35 or A148 Gr. 80-50, A576 Gr. 1021 (3), or A36 (Arm only)
Arm Pipes	ASTM A53 Gr. B, A501, A1008 HSLAS-F Gr. 50 (4), or A1011 HSLAS-F Gr. 50 (4)
Arm Strut Plates (2)	ASTM A36, A572 Gr. 50 (4), or A588
Misc.	ASTM designations as noted

- Dimensional limits are given to show acceptable variation in design. All of a Fabricator's production of a particular arm length shall have the same dimensions within specified tolerances.
- Any of the materials listed for plates may be used where the drawings do not specify a particular ASTM designation.
- A576 must be suitable for forging and also meet minimum tensile strength of 65 ksi, minimum yield of 35 ksi, and elongation in 2 inches of 22 percent.
- ASTM A572, A1008 HSLAS-F, and A1011 HSLAS-F may have higher yield strengths but shall not have less elongation than the grade indicated.

GENERAL NOTES:

Design conforms to 1994 AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals and Interim Revisions thereto. Design Wind Speed equals 90 mph plus a 1.3 gust factor. Arms are designed to support a 60 lb. luminaire having an effective projected area (actual area times drag coefficient) of 1.6 sq. ft.

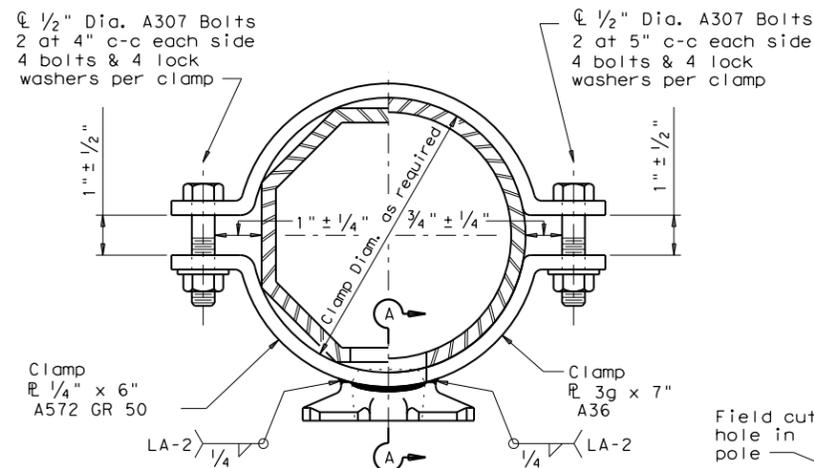
Materials and fabrication shall be in accordance with Item 686, "Traffic Signal Pole Assemblies (Steel)" and with the details, dimensions, and weld procedures shown herein. Weld references call for preapproved weld procedures which the Fabricator must obtain prior to fabrication. In the absence of specified Fabricator tolerances, dimensions shall be within the tolerances generally obtainable in normal fabrication practice.

Unless otherwise noted, all parts shall be galvanized after fabrication in accordance with Item 445, "Galvanizing".

Deviation from the details and dimensions shown herein require submission of shop drawings in accordance with Item 441, "Steel Structures". Alternate designs are not acceptable.

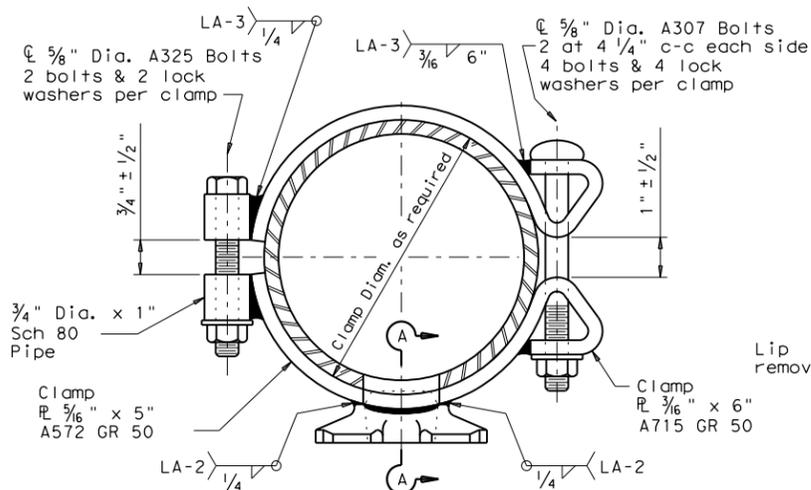
Each pole simplex fitting shall be supplied with 2 ASTM A325 bolts and 2 lock washers of the size specified. The bolts and lock washers shall be secured to the pole with the other hardware items called for in the plans. When clamp attachment is specified, the Fabricator shall ship the clamp assembly securely attached to the pole at the location shown on the plans.

If clamp assemblies are ordered without poles, the Fabricator shall ship one upper and one lower clamp assembly together in a single package, including all nuts and washers required for the clamps and simplex fittings.



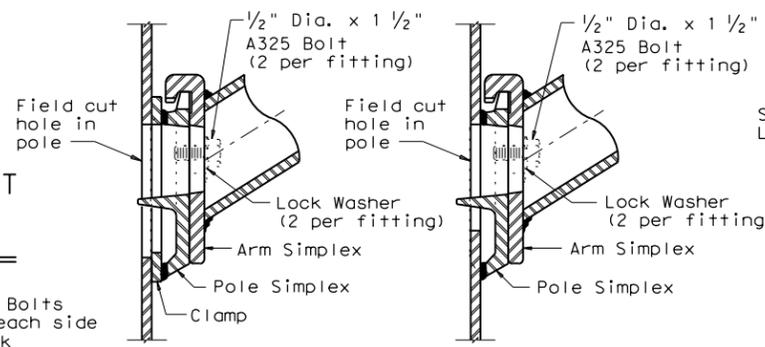
CLAMP ATTACHMENT DETAIL NO. 1 (HALF SECTION)

CLAMP ATTACHMENT DETAIL NO. 2 (HALF SECTION)



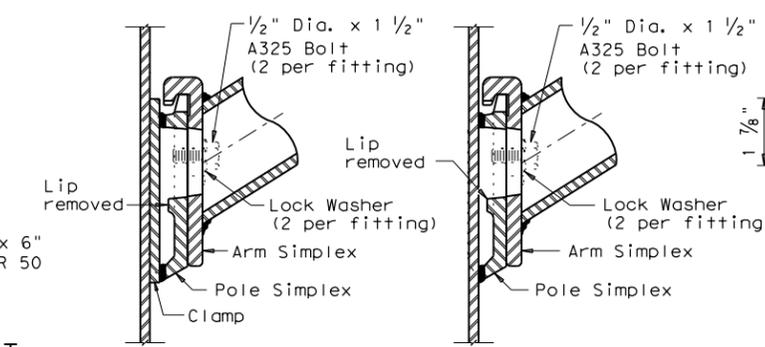
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CLAMP ATTACHMENT DETAIL NO. 4 (HALF SECTION)



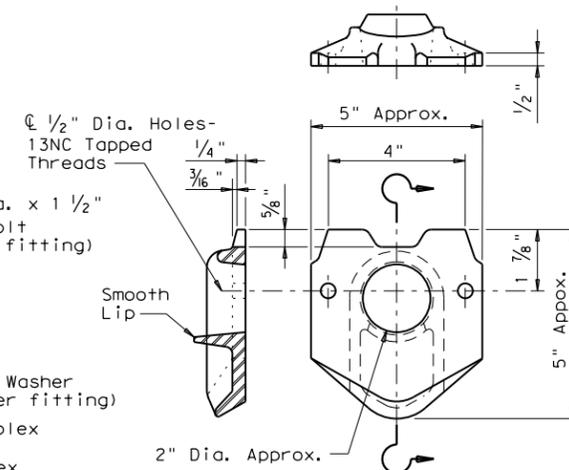
UPPER SIMPLEX FITTING

UPPER SIMPLEX FITTING

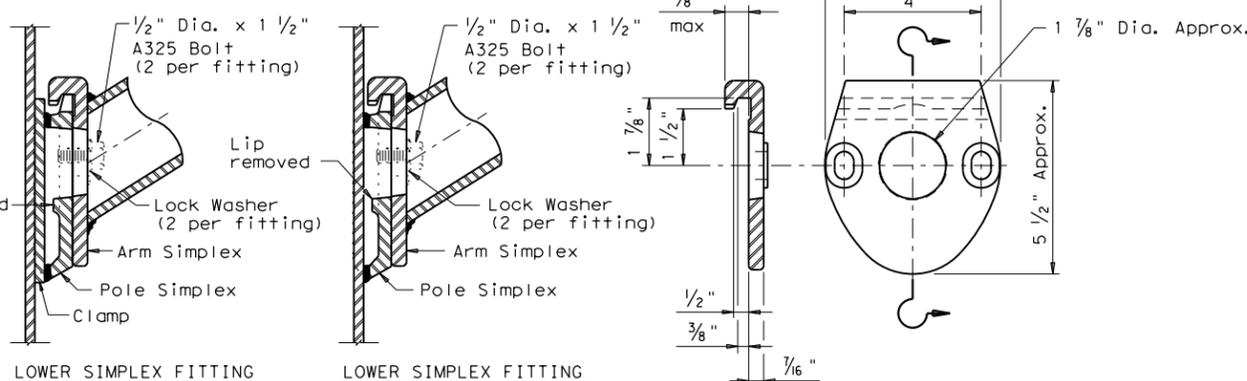


LOWER SIMPLEX FITTING

LOWER SIMPLEX FITTING



POLE SIMPLEX DETAIL



SECTION A-A

SECTION B-B

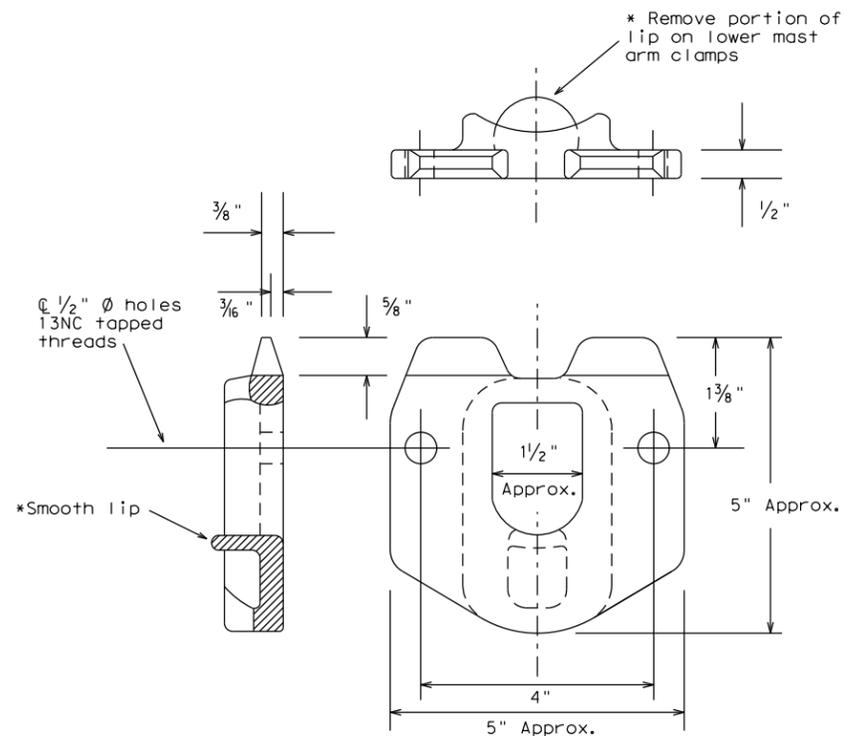
ARM SIMPLEX DETAIL

Texas Department of Transportation
Traffic Operations Division
STANDARD ASSEMBLY DRAWINGS FOR LUMINAIRE SUPPORT STRUCTURES
ARM DETAILS
LUM-A-12

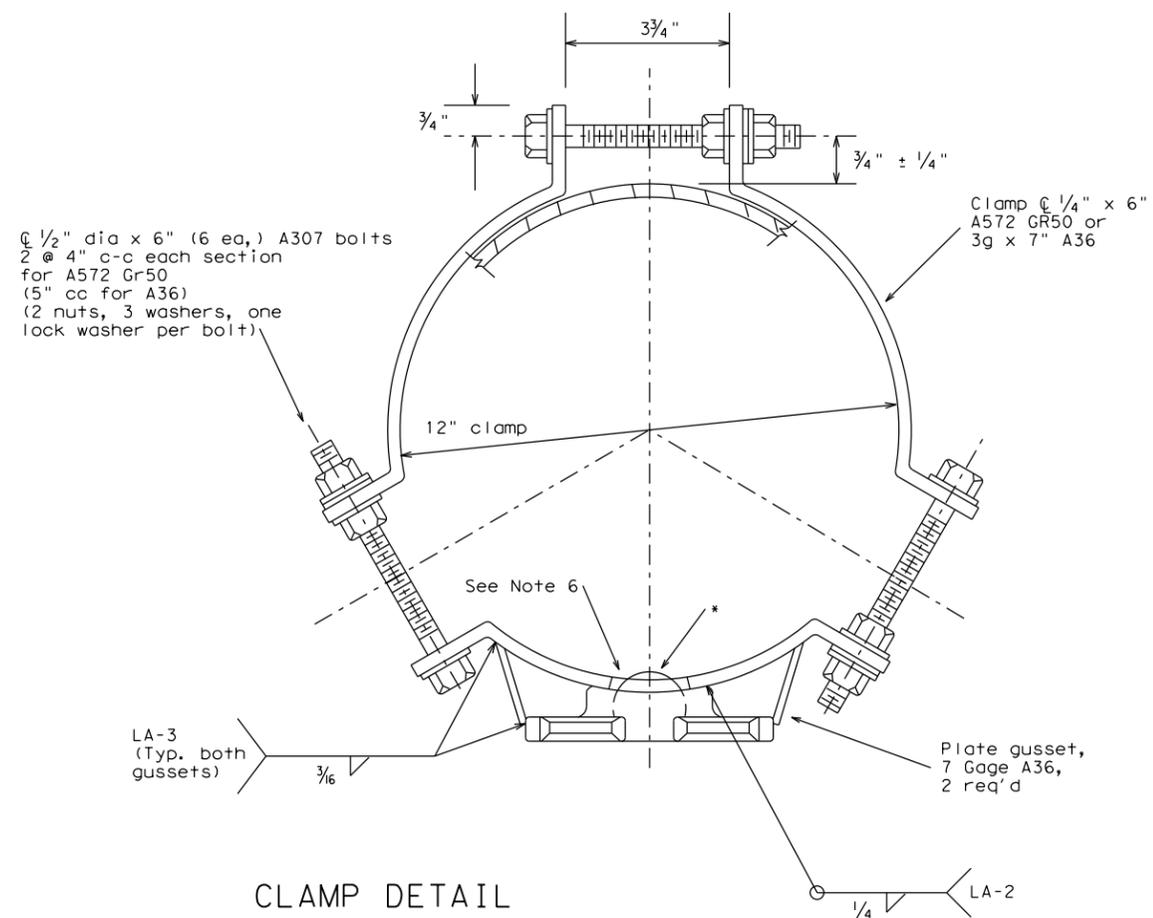
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5-96	CON	SECT	JOB	HIGHWAY
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1-12	DIST	COUNTY		SHEET NO.
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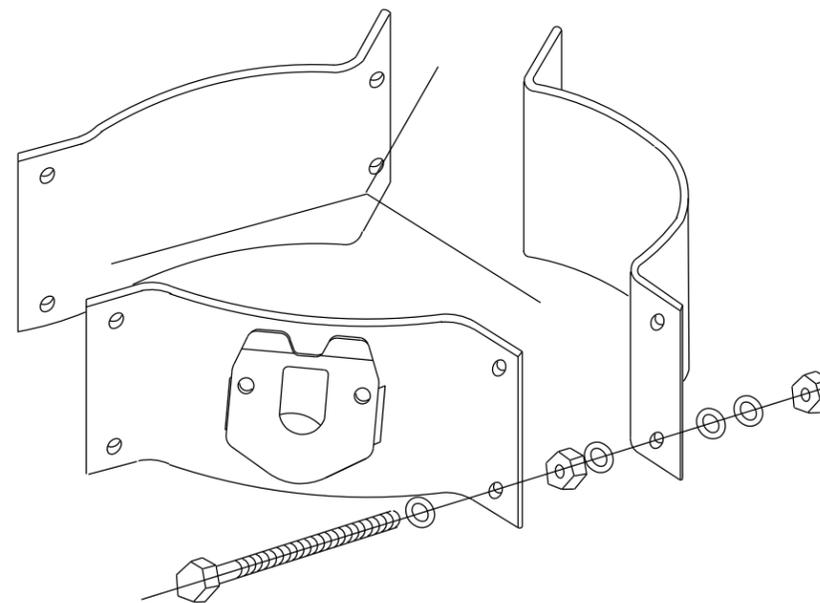
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POLE SIMPLEX DETAILS



CLAMP DETAIL



PROJECTION

For 8.9 - 12 inch diameter Signal Poles
(Two req'd for each mast arm)

OTHER MATERIALS:

1. Pole simplex shall be ASTM A27 GR65-35 or A148 GR80-50 or A576 GR1021. ASTM A576 must be suitable for forging and also meet minimum tensile of 65ksi, minimum yield of 35ksi, and a minimum elongation of 22 percent in 2 inches.
2. Welded tabs and backplates shall be ASTM A-36 steel or better.
3. Nylon insert locknuts shall conform to ASTM A563.

GENERAL NOTES:

1. Materials and fabrication shall be in accordance with Standard Sheet "MA-C" and with the details, dimensions, and weld procedures shown herein. Weld references call for preapproved weld procedures which the Fabricator must obtain prior to fabrication. In the absence of specified fabrication tolerances, dimensions shall be within the tolerances generally obtainable in normal fabrication practice.
2. All parts shall be galvanized after fabrication in accordance with Item 445, "Galvanizing". The throat of the Simplex shall be made free of all rough or sharp edges resulting from the galvanizing process.
3. Each simplex fitting shall be supplied with 2 ASTM A325 bolts, 1/2 in. X 1 1/2 in. and 2 lock washers. The bolts and lock washers shall be secured to the clamp with the other hardware items. The Fabricator shall ship clamp assembly together in a single package, including all bolts, nuts, and washers required for the clamp and simplex fitting.
4. Design conforms to 1994 AASHTO "Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals" and interim revisions thereto. Design Wind Speed equals 80 mph plus a 1.3 gust factor. Clamps are designed to support a 60 lb. luminaire having an effective projected area (actual area times drag coefficient) of 1.6 sq. ft., 12 ft. maximum arm length.
5. Each assembly shall consist of one upper piece simplex fitting having a smooth lip and one lower piece simplex fitting with the lip removed.
6. Approximately 2 in. diameter hole in upper mast arm clamp.

Texas Department of Transportation
Traffic Operations Division

CLAMP ON
FITTING ASSEMBLY FOR
LUMINAIRE MAST ARM

CFA-12

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GENERAL NOTES FOR ALL ELECTRICAL WORK

1. The location of all conduits, junction boxes, ground boxes, and electrical services is diagrammatic and may be shifted to accommodate field conditions.
2. Provide new and unused materials. Ensure that all materials and installations comply with the applicable articles of the National Electrical Code (NEC), TxDOT standards and specifications, National Electrical Manufacturers Association (NEMA), and are listed by Underwriters Laboratories (UL) or a Nationally Recognized Testing Lab (NRTL). NRTLs such as Canadian Standard Association (CSA), Intertek Testing Services NA Inc., or FM Approvals LLC can be considered equivalent to UL. Where reference is made to NEMA listed devices, International Electrotechnical Commission (IEC) listed devices will not be considered an acceptable equal to a NEMA listed device. Acceptable devices may have both a NEMA and IEC listing. Faulty fabrication or poor workmanship in any material, equipment, or installation is justification for rejection. Replace or reinstall rejected material or equipment at no additional cost to the Department.
3. Miscellaneous nuts, bolts and hardware, except for high strength bolts, may be stainless steel when plans specify galvanized, provided the bolt size is 1/2 in. or less in diameter.
4. Provide the following test equipment as required by the Engineer to confirm compliance with the contract and the NEC: voltmeter, ammeter, megohm meter (1000 volt DC), ground resistance tester, torque wrenches, and torque screwdrivers. Ensure all equipment has been properly calibrated within the last year. Provide calibration certification to the Engineer upon request. Operate test equipment during inspection as requested by the Engineer.
5. Install grounding as shown on the plans and in accordance with the NEC. Ensure all metallic conduits; metal poles; luminaires; and metal enclosures are bonded to the equipment grounding conductor. Provide stranded bare copper or green insulated grounding conductors. Ground rods, connectors, and bonding jumpers are subsidiary to the various bid items.
6. When required by the Engineer, notify the Department in writing of materials from the Material Producers List (MPL) intended for use on each project. Prequalified materials are listed on the MPL on TxDOT's website under "Roadway Illumination and Electrical Supplies." No substitutions will be allowed for materials on this list.

CONDUIT

A. MATERIALS

1. Provide conduit, junction boxes, fittings, and hardware as per TxDOT Departmental Material Specification (DMS) 11030 "Conduit" and Item 618 "Conduit" of TxDOT's "Standard Specifications For Construction And Maintenance Of Highways, Streets, And Bridges," latest edition. Provide conduits listed under Item 618 on the MPL under "Roadway Illumination and Electrical Supplies." Provide conduit types according to the descriptive code or as shown on the plans. Do not substitute other types of conduits for those shown. Provide liquidtight flexible metal conduit (LFMC) when flexible conduit is called for on galvanized steel rigid metallic conduit (RMC) systems. Provide liquidtight flexible nonmetallic conduit (LFNC) when flexible conduit is called for on polyvinyl chloride (PVC) systems.
2. Provide galvanized steel RMC for all exposed conduits, unless otherwise shown on the plans. Properly bond all metal conduits.
3. Unless otherwise shown on the plans, provide junction boxes with a minimum size as shown in the following table, which applies to the greatest number of conductors entering the box through one conduit with no more than four conduits per box. When a mixture of conductor sizes is present, count the conductors as if all are of the larger size. For situations not applicable to the table, size junction boxes in accordance with NEC.

AWG	3 CONDUCTORS	5 CONDUCTORS	7 CONDUCTORS
#1	10" x 10" x 4"	12" x 12" x 4"	16" x 16" x 4"
#2	8" x 8" x 4"	10" x 10" x 4"	12" x 12" x 4"
#4	8" x 8" x 4"	10" x 10" x 4"	10" x 10" x 4"
#6	8" x 8" x 4"	8" x 8" x 4"	10" x 10" x 4"
#8	8" x 8" x 4"	8" x 8" x 4"	8" x 8" x 4"

4. Junction boxes with an internal volume of less than 100 cu. in. and supported by entering raceways must have threaded entries or hubs identified for the intended purpose and supported by connection of two or more rigid metal conduits. Secure conduit within 3 ft. of the enclosure or within 18 in. of the enclosure if all conduit entries are on the same side. Mechanically secure all junction boxes with an internal volume greater than 100 cu. inches.
5. Provide hot dipped galvanized cast iron or sand cast aluminum outlet boxes for junction boxes containing only 10 AWG or 12 AWG conductors. Do not use die cast aluminum boxes. Size outlet boxes according to the NEC.
6. Do not use intermediate metal conduit (IMC) or electrical metallic tubing (EMT) unless specifically required by the plan sheets. When EMT is called for, provide junction boxes made from galvanized steel sheeting, listed and approved for outdoor use, unless otherwise noted on the plans. Size all galvanized steel junction boxes in accordance with the NEC. Provide junction boxes for IMC conduit systems that meet the same requirements for junction boxes used with RMC systems.
7. Provide PVC junction boxes intended for outdoor use on PVC conduit systems, unless otherwise noted on the plans.

8. Provide PVC elbows in PVC conduit systems, unless otherwise shown on the plans. Use only a flat, high tensile strength polyester fiber pull tape for pulling conductors through the PVC conduit system. When galvanized steel RMC elbows are specifically called for in the plans and any portion of the RMC elbow is buried less than 18 in., ground the RMC elbow by means of a grounding bushing on a rigid metal extension. Grounding of the rigid metal elbow is not required if the entire RMC elbow is encased in a minimum of 2 in. of concrete. PVC extensions are allowed on these concrete encased rigid metal elbows. RMC or PVC elbows are subsidiary to various bid items.
9. When required, provide High-Density Polyethylene (HDPE) conduit with factory installed internal conductors according to Item 622 "Duct Cable." At the Contractor's request and with approval by the Engineer, substitute HDPE conduit with no conductors for bored schedule 40 or schedule 80 PVC conduit bid under Item 618. Ensure bored HDPE substituted for PVC is schedule 40 and of the same size PVC called for in the plans. Ensure the substituted HDPE meets the requirements of Item 622, except that the conduit is supplied without factory-installed conductors. Make the transition of the HDPE conduit to PVC (or RMC elbow when required) at the bore pit. Provide conduit of the size and schedule as shown on the plans. Do not extend substituted conduit into ground boxes or foundations. Provide PVC or galvanized steel RMC elbows as called for at all ground boxes and foundations.
10. Use two-hole straps when supporting 2 in. and larger conduits. On electrical service poles, properly sized stainless steel or hot dipped galvanized one-hole standoff straps are allowed on the service riser conduit.

B. CONSTRUCTION METHODS

1. Provide and install expansion joint conduit fittings on all structure-mounted conduits at the structure's expansion joints to allow for movement of the conduit. In addition, provide and install expansion joint fittings on all continuous runs of galvanized steel RMC conduit externally exposed on structures such as bridges at maximum intervals of 150 ft. When requested by the project Engineer, supply manufacturer's specification sheet for expansion joint conduit fittings. Repair or replace expansion joint fittings that do not allow for movement at no additional cost to the Department. Provide the method of determining the amount of expansion to the Engineer upon request. Do not use LFMC or LFNC as a substitute for the required expansion conduit fittings.
2. Space all conduit supports at maximum intervals of 5 ft. Install conduit spacers when attaching metal conduit to surface of concrete structures. See "Conduit Mounting Options" on ED(2). Install conduit support within 3 ft. of all enclosures and conduit terminations.
3. Do not attach conduit supports directly to pre-stressed concrete beams except as shown specifically in the plans or as approved by the Engineer.
4. Unless otherwise shown on the plans, jack or bore conduit placed beneath existing roadways, driveways, sidewalks, or after the base or surfacing operation has begun. Backfill and compact the bore pits below the conduit per Item 476 "Jacking, Boring, or Tunneling Pipe or Box" prior to installing conduit or duct cable to prevent bending of the connections.
5. When placing conduit in the sub-grade of new roadways, backfill all trenches with excavated material unless otherwise noted on the plans. When placing conduit in the sub-base of new roadways, backfill all trenches with cement-stabilized base as per requirements of Items 110 "Excavation", 400 "Excavation and Backfill for Structures", 401 "Flowable Backfill", 402 "Trench Excavation Protection", and 403 "Temporary Special Shoring."
6. Provide and place warning tape approximately 10 in. above all trenched conduit as per Item 618.
7. During construction, temporarily cap or plug open ends of all conduit and raceways immediately after installation to prevent entry of dirt, debris and animals. Temporary caps constructed of durable duct tape are allowed. Tightly fix the tape to the conduit opening. Clean out the conduit and prove it clear in accordance with Item 618 prior to installing any conductors.
8. Ensure conduit entry into the top of any enclosure is waterproof by installing conduit sealing hubs or using boxes with threaded bosses. This includes surface mounted safety switches, meter cans, service enclosures, auxiliary enclosures and junction boxes. Grounding bushings on water tight sealing hubs are not required.
9. Fit the ends of all PVC conduit terminations with bushings or bell end fittings. Provide and install a grounding type bushing on all metal conduit terminations.
10. Install a bonding jumper from each grounding bushing to the nearest ground rod, grounding lug, or equipment grounding conductor. Ensure all bonding jumpers are the same size as the equipment grounding conductor. Bonding of conduit used as a casing under roadways for duct cable is not required, if the duct extends the full length through the casing.
11. At all electrical services, install a 6 AWG solid copper grounding electrode conductor.
12. Place conduits entering ground boxes so that the conduit openings are between 3 in. and 6 in. from the bottom of the box. See the ground box detail on sheet ED(4).
13. Seal ends of all conduits with duct seal, expandable foam, or by other methods approved by the Engineer. Seal conduit immediately after completion of conductor installation and pull tests. Do not use duct tape as a permanent conduit sealant. Do not use silicone caulk as a conduit sealant.
14. File smooth the cut ends of all mounting strut and conduit. Before installing, paint the field cut ends of all mounting strut and RMC (threaded or non-threaded) with zinc rich paint (94% or more zinc content) to alleviate overspray. Use zinc rich paint to touch up galvanized material as allowed under Item 445 "Galvanizing." Do not paint non-galvanized material with a zinc rich paint as an alternative for materials required to be galvanized.

					
<p>ELECTRICAL DETAILS CONDUITS & NOTES</p> <p>ED(1) - 14</p>					
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REVISIONS		FM 1101			
	DIST	COUNTY		SHEET NO.	
	SAT	COMAL		TS-24	

ELECTRICAL CONDUCTORS

A. MATERIAL INFORMATION

1. Provide Type XHHW insulated conductors in accordance with Departmental Material Specification (DMS) 11040 "Conductors" and Item 620 "Electrical Conductors." Provide conductors as listed on the Material Producers List (MPL) on the Department web site under "Roadway Illumination and Electrical Supplies" Item 620. Color code insulated conductors in conformance with the NEC. Identify grounded (neutral) conductors with white insulation. Identify grounding conductors (ground wires) with green insulation or bare conductors. Identify ungrounded (hot) conductors with any color insulation except green, white, or gray. Keep color scheme consistent throughout the wiring system. Identify conductors 6 American Wire Gauge (AWG) and smaller by continuous color jacket. Identify electrical conductors 4 AWG and larger by continuous color jacket or by colored tape. When identifying conductors with colored tape, mark at least 6 in. of the conductor's insulation with half laps of tape.
2. Provide a solid copper 6 AWG grounding electrode conductor to bond the electrical service equipment to the concrete encased grounding electrode or the ground rod at the service location. Connect the grounding electrode conductor to the ground rod with a UL listed connector in accordance with DMS 11040. Connect the grounding electrode conductor to the concrete encased grounding electrode as shown in the plans.
3. Where two or more circuits are present in one conduit or enclosure, permanently identify the conductors of each branch circuit by attaching a non-metallic tag around both circuit conductors at each accessible location. Provide tags with two straps, large enough to indicate circuit number, letter, or other identification as shown in the plans. Print circuit identification on the tag with a permanent marker.
4. Use listed compression or screw type pressure connectors, terminal blocks, or split bolt connectors for splicing as specified in DMS 11040. Use hot melt adhesive tape to fill the gap and seal the ends of heat shrink tubing. Provide UL listed gel-filled insulating splice covers. Splicing materials, insulating materials, breakaway disconnects, splice covers, and fuse holders are subsidiary to various bid items.

B. CONSTRUCTION METHODS

1. Use only a flat, high tensile strength polyester fiber pull tape for pulling conductors through the conduit system. After installing conductors in conduit, perform conductor pull test. If a conductor cannot be freely pulled, make any needed alterations or repairs at no additional cost to the department. Perform insulation resistance tests in accordance with Item 620. Coordinate with the Engineer to witness the tests.
2. Leave 2 ft. minimum, 3 ft. maximum length for each conductor up to the splice in ground boxes. Leave 3 ft. minimum, 4 ft. maximum length of conductor in ground boxes when pulled through with no splice. Leave 1 ft. minimum, 1.5 ft. maximum length of conductor at enclosures, weatherheads and pole bases.
3. Make splices only in junction boxes, ground boxes, pole bases, or electrical enclosures and use only listed compression or screw type pressure connectors, terminal blocks, or split bolt connectors. Insulate splices with heavy wall heat shrink tubing or gel-filled insulating splice covers to provide a watertight splice. Overlap conductor insulation with heat shrink tubing a minimum of 2 in. past both sides of the splice. Where heat shrink tubing may not shrink sufficiently to provide a watertight seal around the individual conductors, prior to heating the tubing, increase the diameter of the conductor insulation using hot melt adhesive tape to provide a watertight seal between the individual conductors and the heat shrink tubing. Ensure the tape extends past the heat shrink tubing. Use hot melt adhesive tape to fill the gap and seal the ends of heat shrink tubing. Heat shrink tubing that appears to have been burned, or overheated, is considered defective and must be replaced.
4. Size and install gel-filled insulating splice covers according to manufacturer's specifications when used in place of heat shrink tubing.
5. Wire nuts with factory applied waterproof sealant may be used for 8 AWG or smaller conductors in above ground junction boxes, but not in pole bases or ground boxes. Install wire nuts in an upright position to prevent the accumulation of water.
6. Support conductors in illumination poles with a J-hook at the top of the pole.
7. When terminating conductors, remove the insulation and jacketing material without nicking the individual strands of the conductor. Conductors with nicked individual conductor strands or removed strands will be considered damaged.
8. Replace conductors and cables that are damaged beyond repair or that fail an insulation resistance test at no additional cost to the department.
9. Do not repair damaged conductors with duct tape, electrical tape, or wire nuts. Use only approved splicing methods.
10. Do not terminate more than one conductor under a single connector, unless the connector is rated for multiple conductors. Do not exceed the pressure connector's listing for maximum number and size of conductors allowed.
11. Install breakaway connectors on conductors bid under Item 620 whenever those conductors pass through a breakaway support device. Follow manufacturer's instructions when terminating conductors to breakaway connectors. Properly torque threaded connections. Proper terminations are critical to the safe operation of breakaway devices. Trim waterproofing boots on breakaway connectors to fit snugly around the conductor to ensure waterproof connection. Only one conductor may enter a single opening in a boot. Provide waterproof boots with the correct number of openings. Leave unused openings factory sealed. Use prequalified breakaway connectors as shown on the MPL.

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12. Provide and install a separate stranded equipment grounding conductor (EGC) in all conduits that contain circuit wiring of 50 volts or more. Unless shown elsewhere, size the EGC to be the same size as the largest current carrying conductor contained in the conduit. Ensure all EGCs are bonded together at every accessible location. For traffic signal installations, provide a minimum size 8 AWG EGC. The EGC is paid for under Item 620.

C. TEMPORARY WIRING

1. Install temporary conductors and electrical equipment in accordance with the NEC article "Temporary Installations" and Department standard sheets.
2. Provide a ground fault circuit interrupter (GFCI) for power outlets for portable electrical equipment, power tools, ice machines, ice storage bins and refrigerators located outdoors at grade. GFCI may be any one of the following: molded cord and plug set, receptacle, or circuit breaker type.
3. Use listed wire nuts with factory applied sealant for temporary wiring where approved.
4. Enclose conductor splices within a listed enclosure or ground box, or ensure the splices are more than 10 ft. above grade vertically and more than 5 ft. horizontally from any metal structure. Where installing temporary conductors in areas subject to vehicle traffic or mobile construction equipment, ensure the vertical clearance to ground is at least 18 ft. when measured at the lowest point. Ground messenger wires that support power conductors in conformance with the NEC.
5. Protect and when necessary repair any existing electrical conduits uncovered during the construction process in a timely manner and in conformance with the NEC.

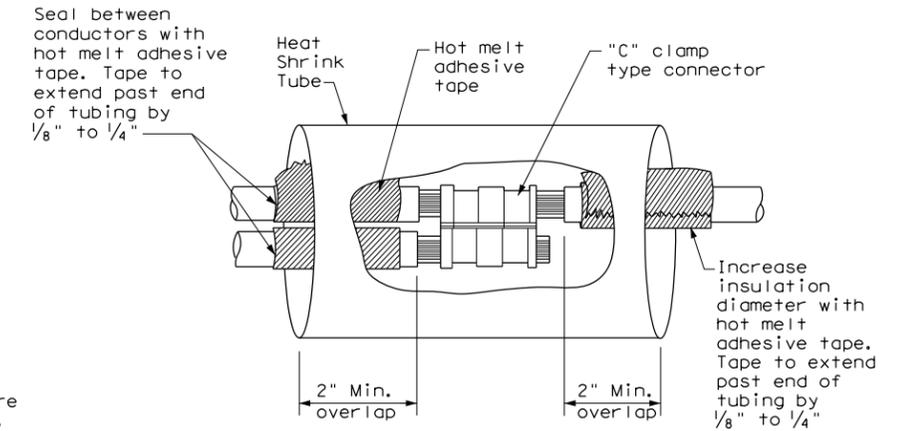
GROUND RODS & GROUNDING ELECTRODES

A. MATERIAL INFORMATION

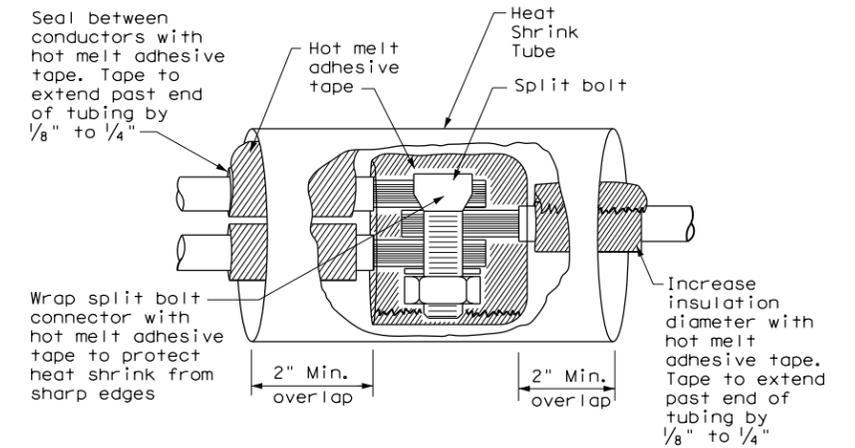
1. Provide and install a grounding electrode at electrical services. Provide ground rods according to DMS 11040 and the plans. Larger diameter or longer length rods may be called for in some specific locations, see the individual plans sheets. Concrete encased grounding electrodes may be called for in specific locations including electrical service, see individual plan sheets.

B. CONSTRUCTION METHODS

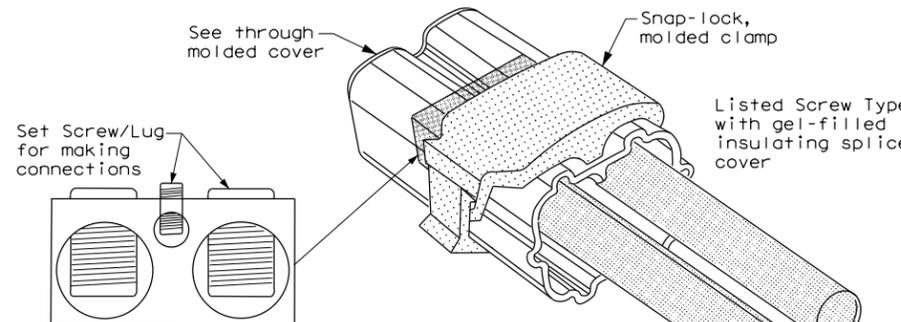
1. Furnish auxiliary ground rods for lightning protection and install in soil, concrete, or both, as called for in the plans. For ground rods installed in concrete, ensure the connection of the conductor to the ground rod is readily accessible for inspection or repairs. For ground rods installed in soil, ensure that the upper end is between 2 to 4 in. below finished grade.
2. Do not place ground rods in the same drilled hole as a timber pole.
3. Install ground rods so the imprinted part number is at the upper end of the rod.
4. Remove all non-conductive coatings such as concrete splatter from the rod at the clamp location.
5. Route all conductors as short and straight as possible for connection to lightning protection ground rods. When a bend is required, ensure a minimum radius bend of four inches for these conductors.
6. Unless otherwise called for in the plans, protect grounding electrode conductors with non-metallic conduit. When protecting grounding electrode conductors with metal conduit, provide and install a grounding type bushing and properly sized bonding jumper on each end of the metal conduit.
7. Written authorization is required before installing a ground rod in a horizontal trench for rocky soil or a solid rock bottom.



**SPLICE OPTION 1
Compression Type**



**SPLICE OPTION 2
Split Bolt Type**

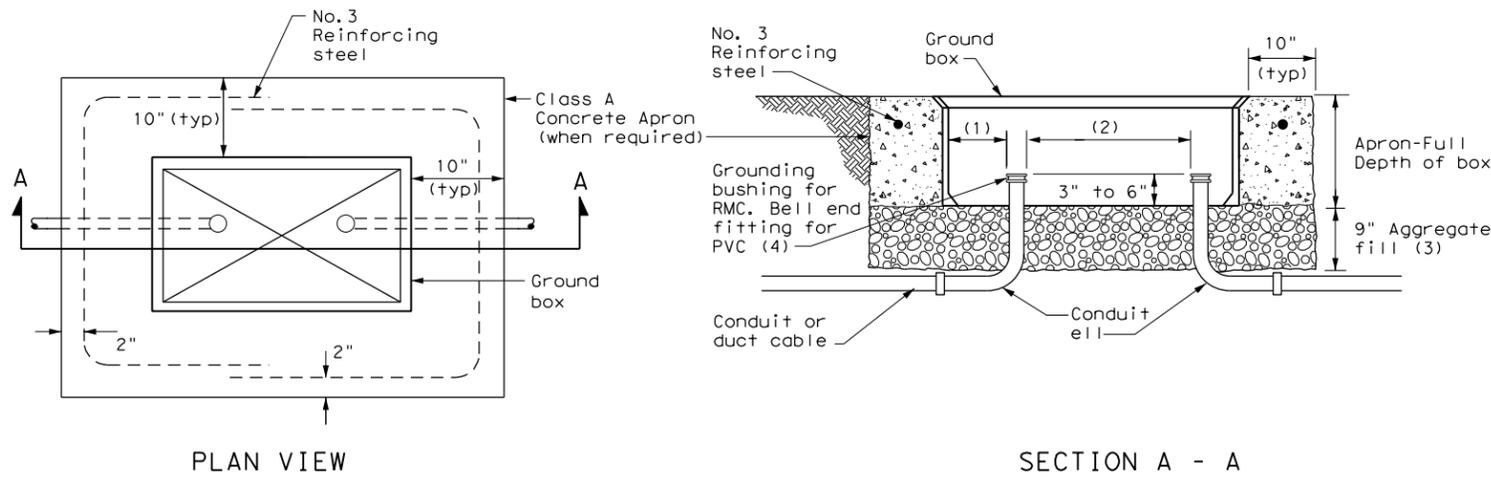


**SPLICE OPTION 3
Listed Screw Type**

		Traffic Operations Division Standard	
<h2 style="margin: 0;">ELECTRICAL DETAILS CONDUCTORS</h2>			
<h3 style="margin: 0;">ED(3) - 14</h3>			
FILE#	ed3-14.dgn	DN#	TxDOT
©TxDOT	October 2014	CK#	TxDOT
REVISIONS		DW#	TxDOT
CONT	SECT	JOB	HIGHWAY
		FM 1101	
DIST	COUNTY	SHEET NO.	
SAT	COMAL	TS-25	

DATE: FILE:

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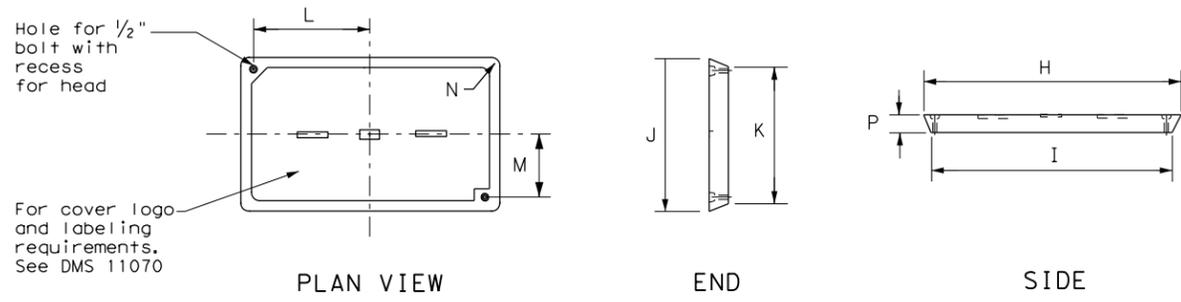


APRON FOR GROUND BOX

- (1) Uniformly space ends of conduits within the ground box. Position ends of conduits so that ground box walls do not interfere with the installation of grounding bushings or bell end fittings.
- (2) Maintain sufficient space between conduits to allow for proper installation of bushings.
- (3) Place aggregate under the box, not in the box. Aggregate should not encroach on the interior volume of the box.
- (4) Install a grounding bushing on the upper end of all RMC terminating in a ground box. Ground RMC elbow when any part of the elbow is less than 18 in. below the bottom of the ground box. Install a PVC bushing or bell end fitting on the upper end of all PVC conduits terminating in a ground box.

GROUND BOX DIMENSIONS	
TYPE	OUTSIDE DIMENSIONS (INCHES) (Width x Length X Depth)
A	12 X 23 X 11
B	12 X 23 X 22
C	16 X 29 X 11
D	16 X 29 X 22
E	12 X 23 X 17

GROUND BOX COVER DIMENSIONS								
TYPE	DIMENSIONS (INCHES)							
	H	I	J	K	L	M	N	P
A, B & E	23 1/4	23	13 3/4	13 1/2	9 7/8	5 1/8	1 3/8	2
C & D	30 1/2	30 1/4	17 1/2	17 1/4	13 1/4	6 3/4	1 3/8	2



GROUND BOX COVER

GROUND BOXES

A. MATERIALS

1. Provide polymer concrete ground boxes measuring 16x30x24 in. (WxLxD) or smaller in accordance with Departmental Material Specification (DMS) 11070 "Ground Boxes" and Item 624 "Ground Boxes."
2. Provide Type A, B, C, D, and E ground boxes as shown in the plans, and as listed on the Material Producers List (MPL) on the Department web site under "Roadway Illumination and Electrical Supplies," Item 624.
3. Ensure ground box cover is correctly labeled in accordance with DMS 11070.
4. Provide larger ground boxes in accordance with Item 624 and as shown in the plans.

B. CONSTRUCTION METHODS

1. Remove all gravel and dirt from conduit. Cap all conduits prior to placing aggregate and setting ground box. Provide Grade 3 or 4 coarse aggregate as shown on Table 2 of Item 302 "Aggregates for Surface Treatments." Ensure aggregate bed is in place and at least 9 inches deep, prior to setting the ground box. Install ground box on top of aggregate.
2. Cast ground box aprons in place. Reinforcing steel may be field bent. Ensure the depth of concrete for the apron extends from finished grade to the top of the aggregate bed under the box. Ground box aprons, including concrete and reinforcing steel, are subsidiary to ground boxes when called for by descriptive code.
3. Keep bolt holes in the box clear of dirt. Bolt covers down when not working in ground boxes.
4. Install all conduits and ells in a neat and workmanlike manner. Uniformly space conduits so grounding bushings and bell end fittings can easily be installed.
5. Temporarily seal all conduits in the ground box until conductors are installed.
6. Permanently seal conduits immediately after the completion of conductor installation and pull tests. Permanently seal the ends of all conduits with duct seal, expandable foam, or other method as approved. Do not use duct tape as a permanent conduit sealant. Do not use silicone caulk as a sealant.
7. When a ground rod is present in a ground box, bond all equipment grounding conductors together and to the ground rod with listed connectors.
8. When a type B or D ground box is stacked to meet volume requirements, it is allowable to cut an appropriately sized hole for conduit entry in the side wall at least 18 inches below grade.
9. If an existing ground box in the contract has a metal cover, bond the cover to the equipment grounding conductor with a 3 ft. long stranded bonding jumper the same size as the grounding conductor. The bonding jumper is subsidiary to various bid items. Verify existing ground boxes with metal covers are shown on the plans, with notes fully describing the work required.
10. If other ground boxes with metal covers are within the project limits but are not part of the contract, the Engineer may direct the Contractor to bond the metal covers, identifying the specific boxes in writing. This work will be paid for separately.
11. Bond metal ground box covers to the grounding conductor with a tank ground type lug.

				Traffic Operations Division Standard	
ELECTRICAL DETAILS GROUND BOXES					
ED(4) - 14					
FILE:	ed4-14.dgn	DN:	TxDOT	CK:	TxDOT
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REVISIONS					
DIST:	COUNTY:		SHEET NO.:		
SAT:	COMAL		TS-26		

DATE:
FILE:

ELECTRICAL SERVICES NOTES

- Provide new materials. Ensure installation and materials comply with the applicable provisions of the National Electrical Code (NEC) and National Electrical Manufacturers Association (NEMA) standards. Ensure material is Underwriters Laboratories (UL) listed. Provide and install electrical service conduits, conductors, disconnects, contactors, circuit breaker panels, and branch circuit breakers as shown on the Electrical Service Data chart in the plans. Faulty fabrication or poor workmanship in material, equipment, or installation is justification for rejection. Where manufacturers provide warranties and guarantees as a customary trade practice, furnish these to the State.
- Provide electrical services in accordance with Electrical Details standard sheets, Departmental Material Specification (DMS) 11080 "Electrical Services," DMS 11081 "Electrical Services-Type A," DMS 11082 "Electrical Services-Type C," DMS 11083 "Electrical Services-Type D," DMS 11084 "Electrical Services-Type T," DMS 11085 "Electrical Services-Pedestal (PS)", and Item 628 "Electrical Services" of the Standard Specifications. Provide electrical service types A, C, and D, as listed on the Material Producers List (MPL) on the Department web site under "Roadway Illumination and Electrical Supplies," Item 628. Provide other service types as detailed on the plans.
- Provide all work, materials, services, and any incidentals needed to install a complete electrical service as specified in the plans.
- Coordinate with the Engineer and the utility provider for metering and compliance with utility requirements. Primary line extensions, connection charges, meter charges, and other charges by the utility company to provide power to the location are paid for in accordance with Item 628. Get approval for the costs associated with these charges prior to engaging the utility company to do the work. Consult with the utility provider to determine costs and requirements, and coordinate the work as approved.
- The enclosure manufacturer will provide Master Lock Type 2 with brass tumblers keyed #2195 for all custom electrical enclosures. Installing Contractor is to provide Master Lock #2195 Type 2 with brass tumblers for "off the shelf" enclosures. Master Lock #2195 keys and locks become property of the State. Unless otherwise approved, do not energize electrical service equipment until locks are installed.
- Enclosures with external disconnects that de-energize all equipment inside the enclosure do not need a dead front trim. Protect incoming line terminations from incidental contact as required by the NEC.
- When galvanized is specified for nuts, screws, bolts or miscellaneous hardware, stainless steel may be used.
- Provide wiring and electrical components rated for 75°C. Provide red, black, and white colored XHHW service entrance conductors of minimum size 6 American Wire Gauge (AWG). Identify size 6 AWG conductors by continuous color jacket. Identify electrical conductors sized 4 AWG and larger by continuous color jacket or by colored tape. Mark at least 6 inches of the conductor's insulation with half laps of colored tape, when identifying conductors. Ensure each service entrance conductor exits through a separately bushed non-metallic opening in the weatherhead. The lengths of the conductors outside the weatherhead are to be 12 inches minimum, 18 inches maximum, or as required by utility.
- All electrical service conduit and conductors attached to the electrical service including the riser or the elbow below ground are subsidiary to the electrical service. For an underground utility feed, all service conduit and conductors after the elbow, including service conduit and conductors for the utility pole riser when furnished by the Contractor, will be paid for separately.
- Provide rigid metal conduit (RMC) for all conduits on service, except for the 1/2 in. PVC conduit containing the electrical service grounding electrode conductor. Size the service entrance conduit as shown in the plans. Ensure conduit for branch circuit entry to enclosure is the same size as that shown on the layout sheets for branch circuit conduit. Extend all rigid metal conduits a minimum of 6 inches underground and then couple to the type and schedule of the conduit shown on the layout for that particular branch circuit. Install a grounding bushing on the RMC where it terminates in the service enclosure.
- Use of liquidtight flexible metal conduit (LFMC) is allowed between the meter and service enclosure when they are mounted 90 to 180 degrees to each other. Size the LFMC the same size as service entrance conduit. LFMC must not exceed 3 feet in length. Strap LFMC within 1 foot of each end. LFMC less than 12 inches in length need not be strapped. Each end of LFMC must have a grounding bushing or be terminated with a grounding fitting. The LFMC must contain a grounded (neutral) conductor. Ensure any bend in LFMC never exceeds 180 degrees. A pull test is required on all installed conductors, with at least six inches of free conductor movement demonstrated to the satisfaction of the Engineer.
- Ensure all mounting hardware and installation details of services conform to utility company specifications.
- For all electrical service enclosures listed under Item 628 on the MPL, the UL 508 enclosure manufacturers will prepare and submit a schematic drawing unique to each service. Before shipment to the job site, place the applicable laminated schematic drawings and the laminated plan sheet showing the electrical service data chart used to build the enclosure in the enclosure's data pocket. The installing contractor will copy and laminate the actual project plan sheets detailing all equipment and branch circuits supplied by that service. The laminated plan sheets are to be placed in the service enclosure's document pocket. Reduce 11 in. x 17 in. plan sheets to 8 1/2 in. x 11 in. before laminating. If the installation differs from the plan sheets, the installing contractor is to redline plan sheets before laminating.
- When providing an "Off The Shelf" Type D or Type T service, provide laminated plan sheets detailing equipment and branch circuits supplied by that service. Reduce 11 in. x 17 in. plan sheets to 8 1/2 in. x 11 in. before laminating. Deliver these drawings before completion of the work to the Engineer, instead of placing in enclosure that has no door pocket.
- Do not install conduit in the back wall of a service enclosure where it would penetrate the equipment mounting panel inside the enclosure. Provide grounding bushings on all metal conduits, and terminate bonding jumpers to grounding bus. Grounding bushings are not required when the end of the metal conduit is fitted with a conduit sealing hub or threaded boss, such as a meter base hub.

SERVICE ASSEMBLY ENCLOSURE

- Provide threaded hub for all conduit entries into the top of enclosure.
- Type galvanized steel (GS) enclosures may be used for Type C panelboards and for Type D and T services that do not use an enclosure mounted photocell or lighting contactor. Provide GS enclosures in accordance with DMS 11080, 11082, 11083, and 11084.
- Provide aluminum (AL) and stainless steel (SS) enclosures for Types A, C, and D in accordance with DMS 11080, 11081, 11082, 11083, and 11084. Do not paint stainless steel.
- Provide pedestal service (PS) enclosures in accordance with ED(9) and DMS 11080 and 11085. Do not provide GS pedestal services. If GS is shown in the PS descriptive code, provide an AL enclosure.

MAIN DISCONNECT & BRANCH CIRCUIT BREAKERS

- Field drill flange-mounted remote operator handle if needed, to ensure handle is lockable in both the "On" and "Off" positions.
- When the utility company provides a transformer larger than 50 KVA, verify that the available fault current is less than the circuit breaker's ampere interrupting capacity (AIC) rating and provide documentation from the electric utility provider to the Engineer.

PHOTOELECTRIC CONTROL

- Provide photocell as listed on the MPL. Move, adjust, or shield the photocell from stray or ambient night time light to ensure proper operation. Mount photocell facing north when practical. Mount top of pole photocells as shown on Top Mounted Photocell Detail.

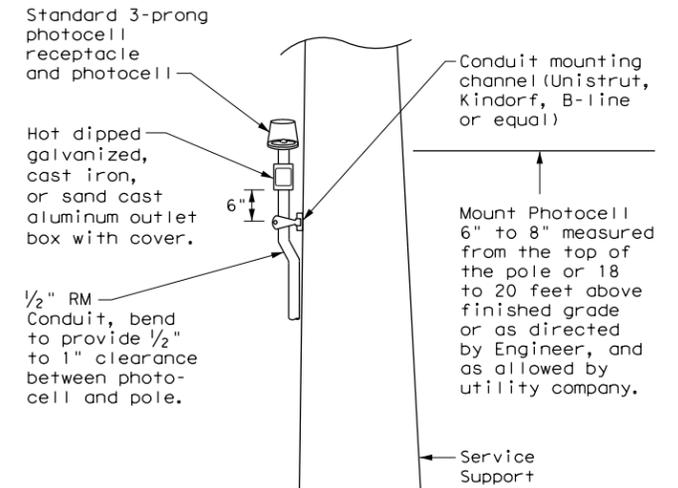
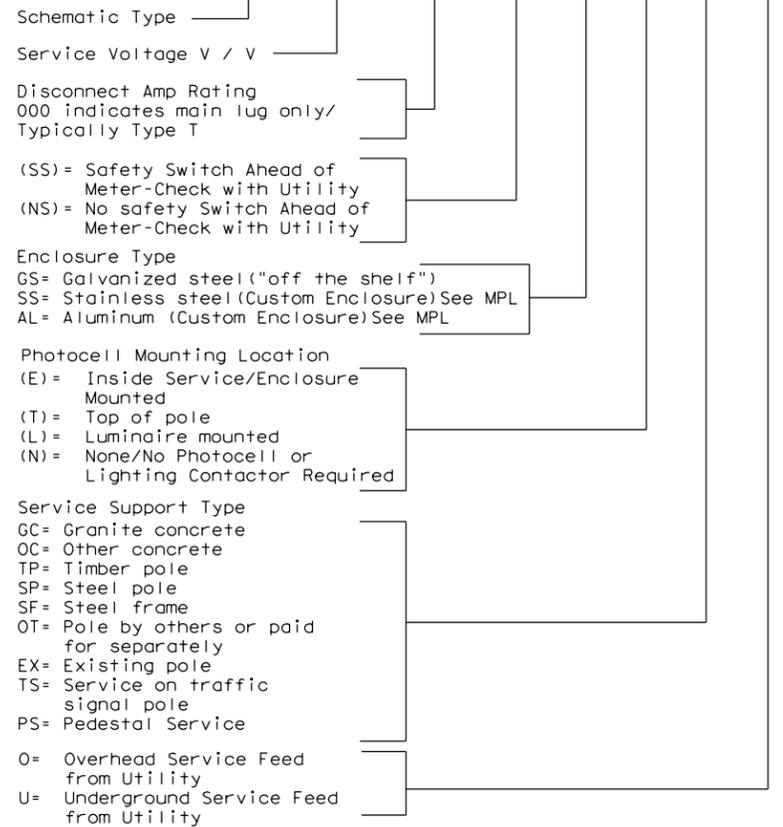
* ELECTRICAL SERVICE DATA												
Elec. Service ID	Plan Sheet Number	Electrical Service Description	Service Conduit **Size	Service Conductors No./Size	Safety Switch Amps	Main Ckt. Bkr. Pole/Amps	Two-Pole Contractor Amps	Panelbd/ Loadcenter Amp Rating	Branch Circuit ID	Branch Ckt. Bkr. Pole/Amps	Branch Circuit Amps	KVA Load
SB 183	289	ELC SRV TY A 240/480 100(SS)AL(E)SF(U)	2"	3/#2	100	2P/100	100	N/A	Lighting NB	2P/40	26	28.1
									Lighting SB	2P/40	25	
									Underpass	1P/20	15	
NB Access	30	ELC SRV TY D 120/240 060(NS)SS(E)TS(O)	1 1/4"	3/#6	N/A	2P/60		100	Sig. Controller	1P/30	23	5.3
							30		Luminaires	2P/20	9	
									CCTV	1P/20	3	
2nd & Main	58	ELC SRV TY T 120/240 000(NS)GS(N)SP(O)	1 1/4"	3/#6	N/A	N/A	N/A	70	Flashing Beacon 1	1P/20	4	1.0
									Flashing Beacon 2	1P/20	4	

* Example only, not for construction. All new electrical services must have electrical service data chart specific to that service as shown in the plans.

** Verify service conduit size with utility. Size may change due to utility meter requirements. Ensure conduit size meets the National Electrical Code.

EXPLANATION OF ELECTRICAL SERVICE DESCRIPTIVE CODE

ELEC SERV TY X XXX/XXX XXX (XX) XX (X) XX (X)



TOP MOUNTED PHOTOCELL

Install conduit strap maximum 3 feet from box. 5 foot maximum spacing between straps supporting conduit.

Texas Department of Transportation Traffic Operations Division Standard

ELECTRICAL DETAILS SERVICE NOTES & DATA

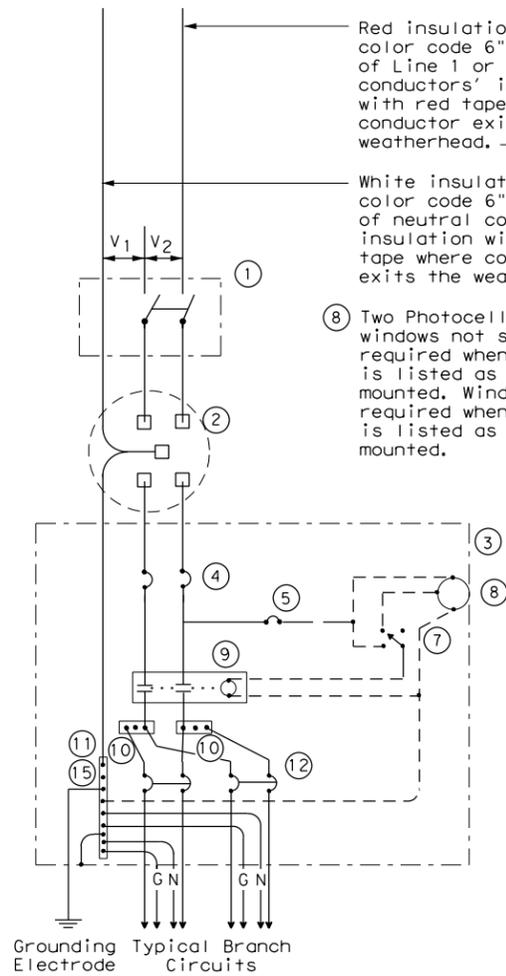
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FILE: ed5-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT October 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS				
DIST	COUNTY		SHEET NO.	
SAT	COMAL		TS-27	

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**SCHEMATIC TYPE A
THREE WIRE**

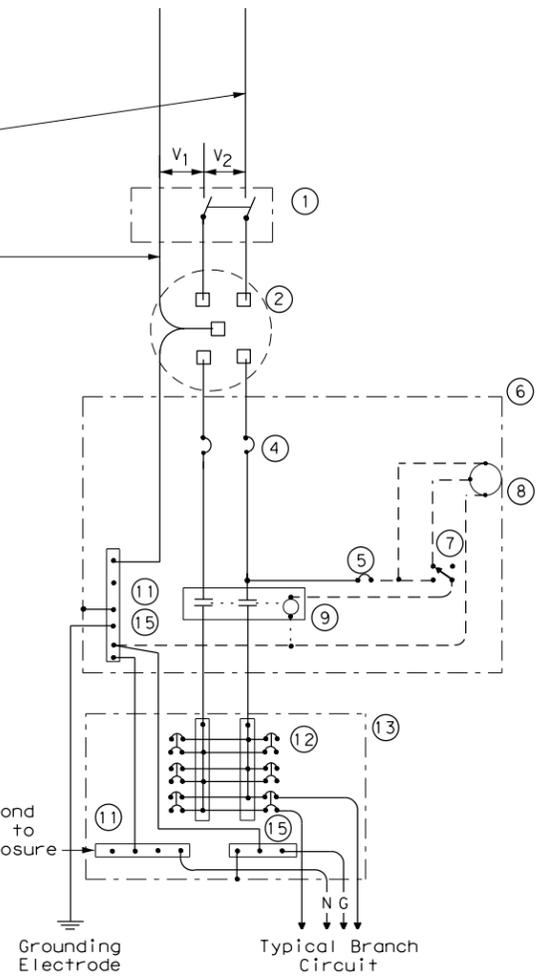
Red insulation or color code 6" length of Line 1 or Line 2 conductors' insulation with red tape where conductor exits the weatherhead.

White insulation or color code 6" length of neutral conductors' insulation with white tape where conductor exits the weatherhead.

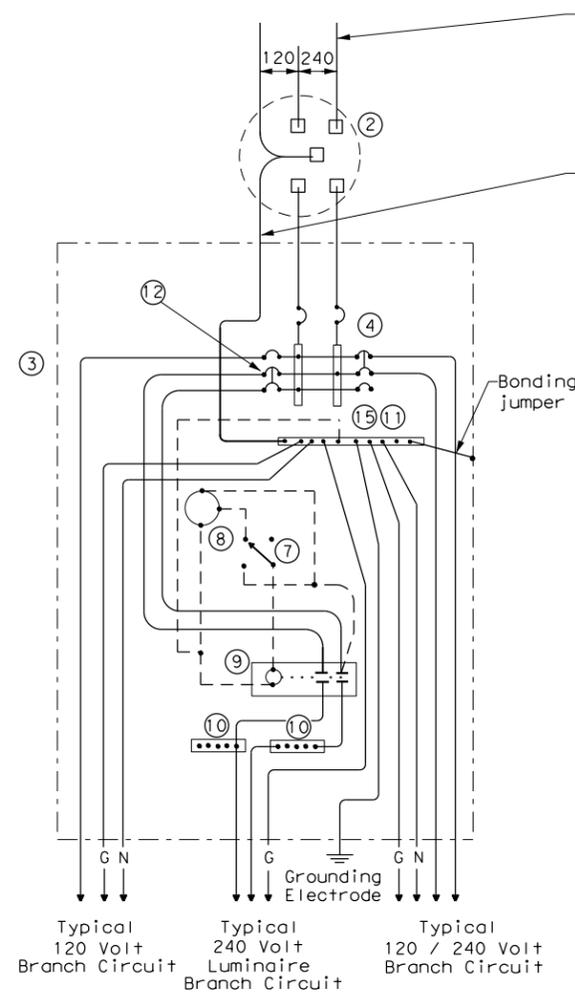
8 Two Photocell viewing windows not shown but required when photocell is listed as enclosure mounted. Windows not required when photocell is listed as pole top mounted.

Do not bond this bus to the enclosure

WIRING LEGEND	
————	Power Wiring
-----	Control Wiring
—N—	Neutral Conductor
—G—	Equipment grounding conductor-always required



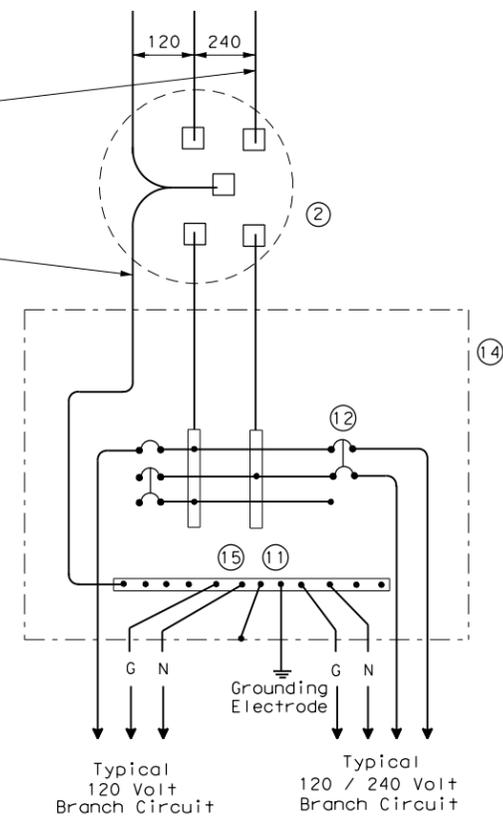
**SCHEMATIC TYPE C
THREE WIRE**



**SCHEMATIC TYPE D - CUSTOM
120/240 VOLTS - THREE WIRE**

Red insulation or color code 6" length of Line 1 or Line 2 conductors' insulation with red tape where conductor exits the weatherhead.

White insulation or color code 6" length of neutral conductors' insulation with white tape where conductor exits the weatherhead.



**SCHEMATIC TYPE T
120/240 VOLTS - THREE WIRE**
Galvanized steel-"Buy Off The Shelf" only. When required install photocell top of the pole or on luminaire only, no lighting contractor will be installed.

SCHEMATIC LEGEND	
1	Safety Switch (when required)
2	Meter (when required-verify with electric utility provider)
3	Service Assembly Enclosure
4	Main Disconnect Breaker (See Electrical Service Data)
5	Circuit Breaker, 15 Amp (Control Circuit)
6	Auxiliary Enclosure
7	Control Station ("H-O-A" Switch)
8	Photo Electric Control (enclosure-mounted shown)
9	Lighting Contactor
10	Power Distribution Terminal Blocks
11	Neutral Bus
12	Branch Circuit Breaker (See Electrical Service Data)
13	Separate Circuit Breaker Panelboard
14	Load Center
15	Ground Bus

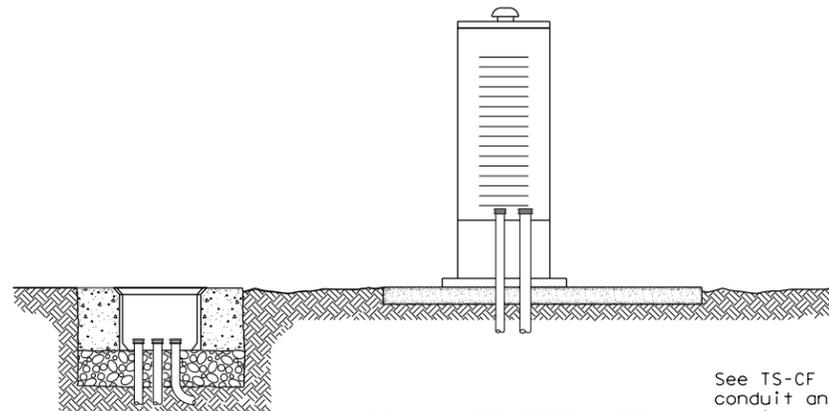
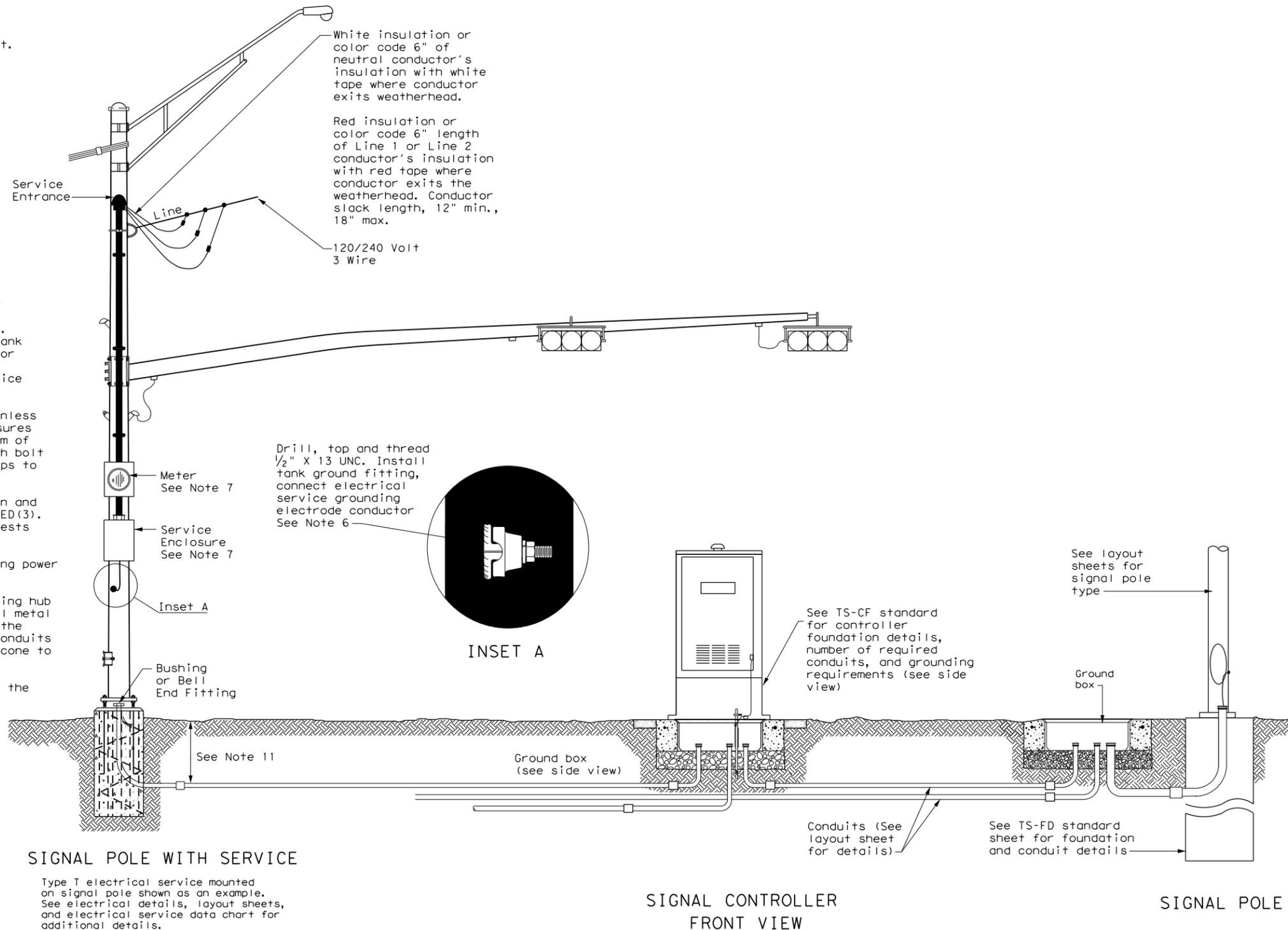
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ELECTRICAL DETAILS SERVICE ENCLOSURE AND NOTES					
ED(6) - 14					
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DIST:	COUNTY:	SAT:	COMAL:	SHEET NO.:	TS-28

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TRAFFIC SIGNAL NOTES

1. Do not pass luminaire conductors through the signal controller cabinet.
2. Include an equipment grounding conductor in all conduits throughout the electrical system. Bond all exposed metal parts to the grounding conductor.
3. Provide roadway luminaires, when required, in accordance with the material and construction sections of Item 610, "Roadway Illumination Assemblies," except for performance testing of luminaires. Test installed roadway luminaires for proper operation as a part of the associated traffic signal system test.
4. If internally illuminated street name signs are approved for use, ground the fixture to the pole with a 12 AWG green XHHW conductor.
5. Bond anchor bolts to rebar cage in two locations using #3 bars or 6 AWG stranded copper conductors. Use listed mechanical connectors rated for embedment in concrete. See TxDOT standard TS-FD for further details.
6. Drill and tap signal poles for 1/2 in. X 13 UNC tank ground fitting. Provide and install tank ground fitting 4 in. to 6 in. directly below electrical service enclosure. Provide properly sized hole through the bottom of the enclosure for the service grounding electrode conductor. Connect the electrical service grounding electrode conductor to the tank ground fitting. Ensure electrical service grounding electrode conductor is as short and straight as possible from the enclosure to the tank ground fitting. See Inset A detail for further information. Size service entrance conduit and branch circuit conduit as shown in the plans.
7. Mount electrical service enclosure and meter to signal pole with stainless steel bands. Ensure bands are a minimum width of 3/4 in. Secure enclosures to bands using two-bolt brackets. Install brackets near top and bottom of each enclosure. Install properly sized stainless steel washers on each bolt in the enclosure. Band or drill and tap properly sized stand-off straps to signal pole for attaching conduit.
8. Conduct pull tests and insulation resistance tests on all illumination and power conductors as required in Item 620 "Electrical Conductors" and ED(3). To prevent electronics damage, do not conduct insulation resistance tests on traffic signal cables after termination.
9. Lock all enclosures and bolt down all ground box covers before applying power to the signal installation.
10. Terminate conduits entering the top of enclosures with a conduit-sealing hub or threaded boss such as meter hub. Install a grounding bushing on all metal conduits not connected to conduit-sealing hub or threaded boss. Bond the grounding bushing to the ground bus with a bonding jumper. Seal all conduits entering enclosures with duct seal or expanding foam. Do not use silicone to seal conduit ends.
11. For all conduits, ensure the burial depth is a minimum of 18". Ensure the minimum burial depth for conduit placed under a roadway is 24".



SIGNAL CONTROLLER SIDE VIEW

See TS-CF standard for conduit and grounding requirements. See layout sheets for ground box locations and any additional conduits that are required.

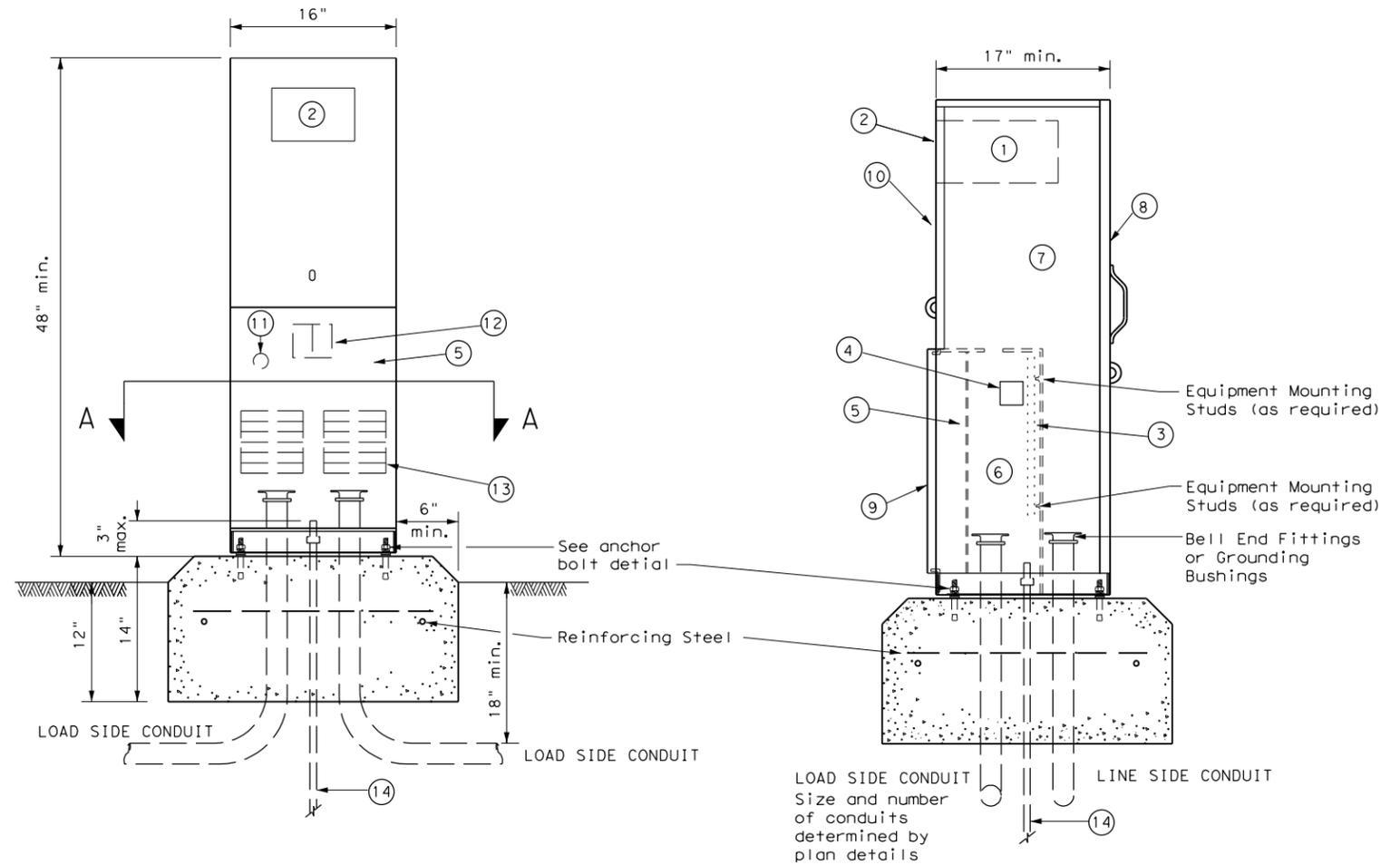
		Texas Department of Transportation		Traffic Operations Division Standard	
ELECTRICAL DETAILS TYPICAL TRAFFIC SIGNAL SYSTEM DETAILS					
ED(8) - 14					
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		FM 1101			
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PEDESTAL SERVICE NOTES

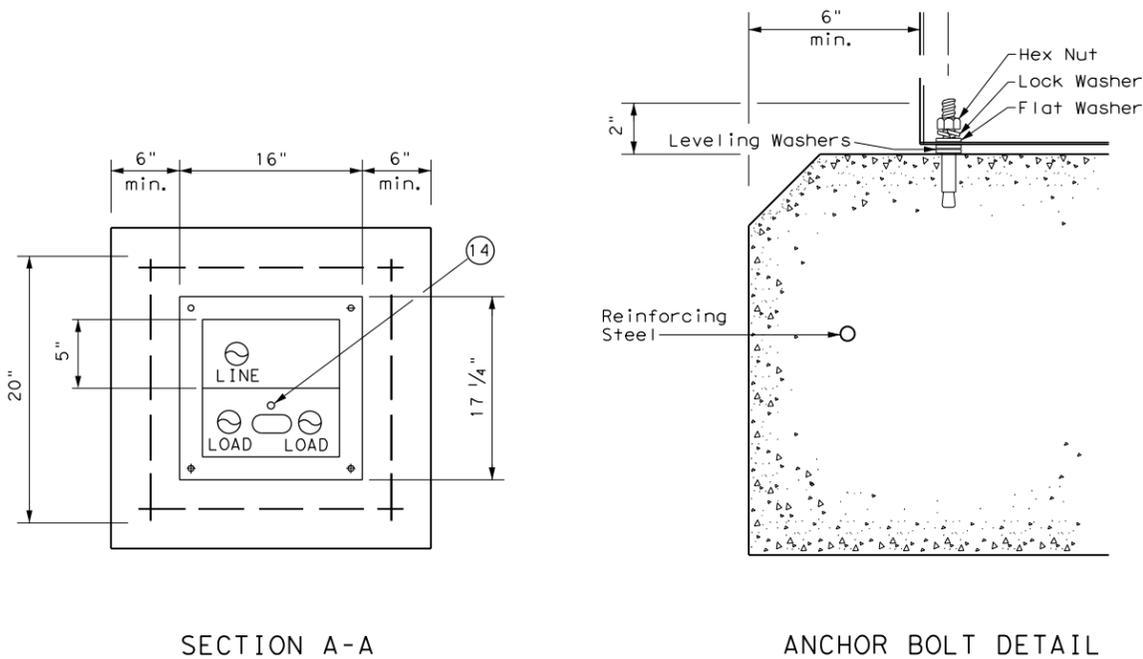
1. Manufacture pedestal electrical services in accordance with Departmental Material Specifications (DMS)11080 "Electrical Services", 11085 "Electrical Services-Pedestal (PS)" and Item 628 "Electrical Services." Provide pedestal electrical services as listed on the Material Producers List (MPL) on the Department's web site under "Roadway Illumination and Electrical Supplies," Item 628. Ensure all mounting hardware and installation details of services meet utility company specifications. Contact the local utility company for approval of pedestal details prior to installing the electrical pedestal service. Submit any changes required by the utility company prior to manufacturing the pedestal enclosure.
2. When a meter socket is required, provide a socket with a minimum 100 amp rating that complies with local utility requirements.
3. Provide Class A or C concrete for pedestal service foundations in accordance with Item 420, "Concrete Substructures," except that concrete will not be paid for directly but is considered subsidiary to Item 628.
4. Provide #4 reinforcing steel for foundations in accordance with Item 440, "Reinforcement for Concrete."
5. Install 1/2 in. X 2 1/6 in. minimum length concrete single expansion type anchors for mounting pedestal enclosure to foundation. Anchor location to match mounting holes in each corner of enclosure. Secure each of the four corners of the pedestal enclosure to the anchors in the foundation with a 1/2 in. galvanized or stainless steel machine thread bolt, a properly sized locknut and a flat washer.
6. Finish top of concrete foundation in a neat and workmanlike manner. If leveling washers are used, ensure no more than 1/8 in. gap at any corner. Do not exceed a maximum dip or rise in the foundation of 1/8 in. per foot. When properly installed, ensure the top of the service enclosure is level front to back and side to side within 1/4 in. Repair rocking or movement of the service enclosure at no additional cost to the department.
7. Do not use liquidtight flexible metal conduit (LFMC) on pedestal type services.
8. Ensure all elbows in the foundation are sized as per utility provider's conduit requirements for underground conduit and feeders. PVC extensions may be installed provided the ends of the rigid metal conduits are more than 2 in. below the top of the concrete foundation. Where extension conduits are metal, grounding bushings must be installed with a bonding jumper properly terminated.



FRONT VIEW

SIDE VIEW

TYPE C shown, TYPE A similar except that TYPE A shall have individual circuit breakers (CB) mounted on an equipment mounting panel. CB Handles shall protrude through hinged deadfront trim.



SECTION A-A

ANCHOR BOLT DETAIL

LEGEND

1	Meter Socket, (when required)
2	Meter Socket Window, (when required)
3	Equipment Mounting Panel
4	Photo Electric Control Window, (When required)
5	Hinged Deadfront Trim
6	Load Side Conduit Trim
7	Line Side Conduit Area
8	Utility Access Door, with handle
9	Pedestal Door
10	Hinged Meter Access
11	Control Station (H-O-A Switch)
12	Main Disconnect
13	Branch Circuit Breakers
14	Copper Clad Ground Rod - 5/8" X 10'



**ELECTRICAL DETAILS
ELECTRICAL SERVICE SUPPORT
PEDESTAL SERVICE TYPE PS**

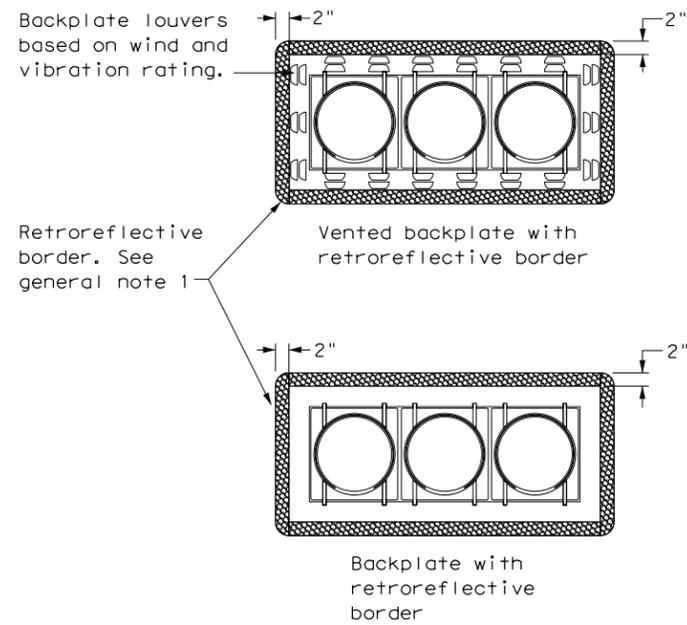
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REVISIONS		DIST	COUNTY	SHEET NO.					
		SAT	COMAL	TS-30					

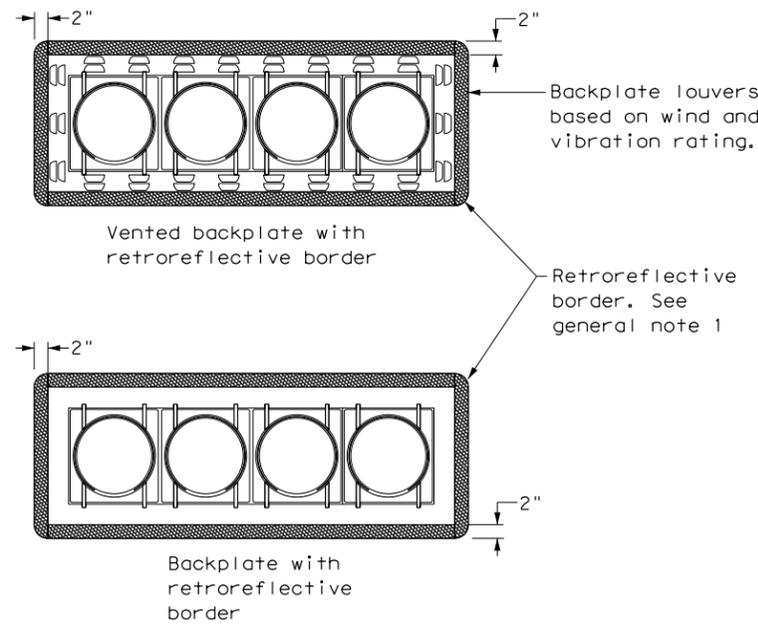
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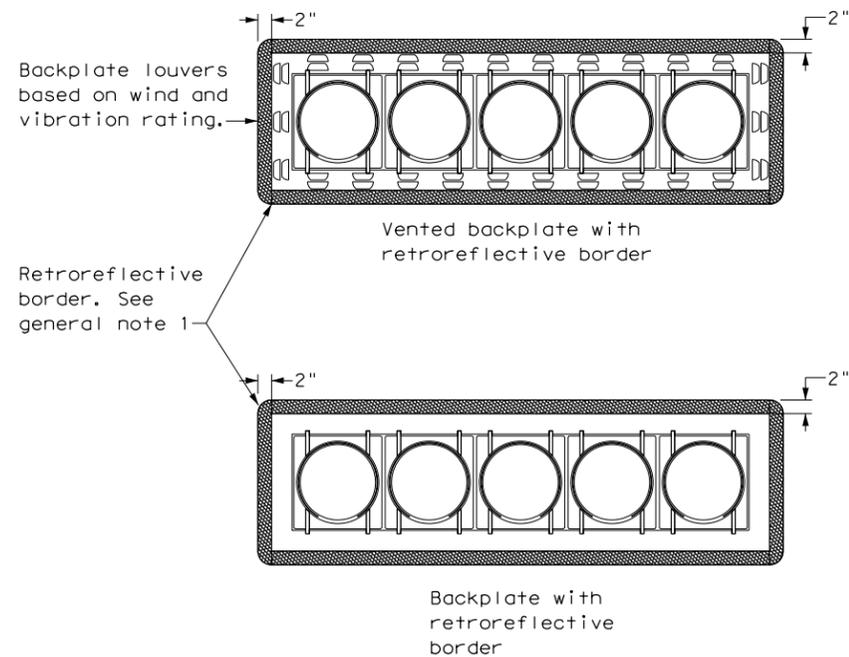
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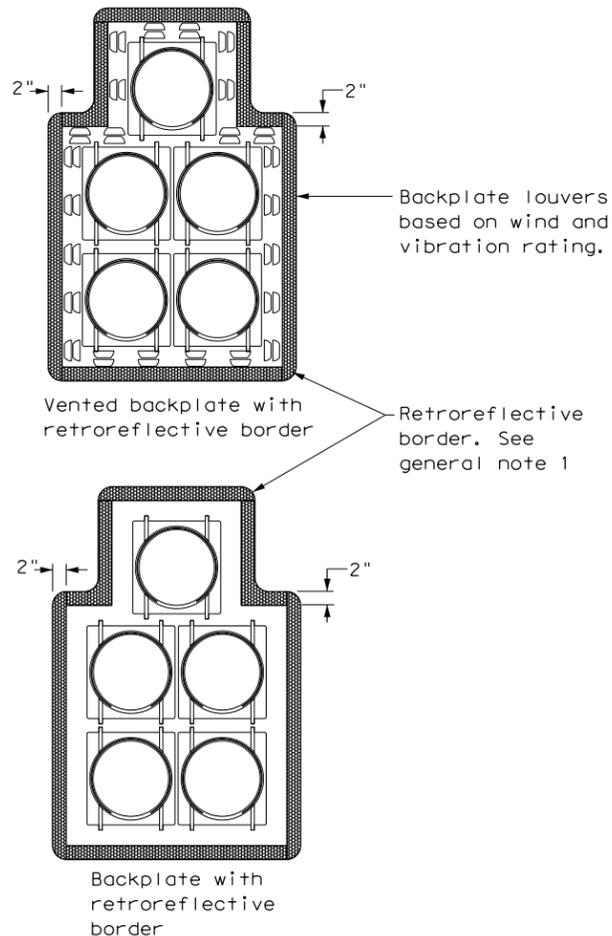
THREE-SECTION HEAD
HORIZONTAL OR VERTICAL



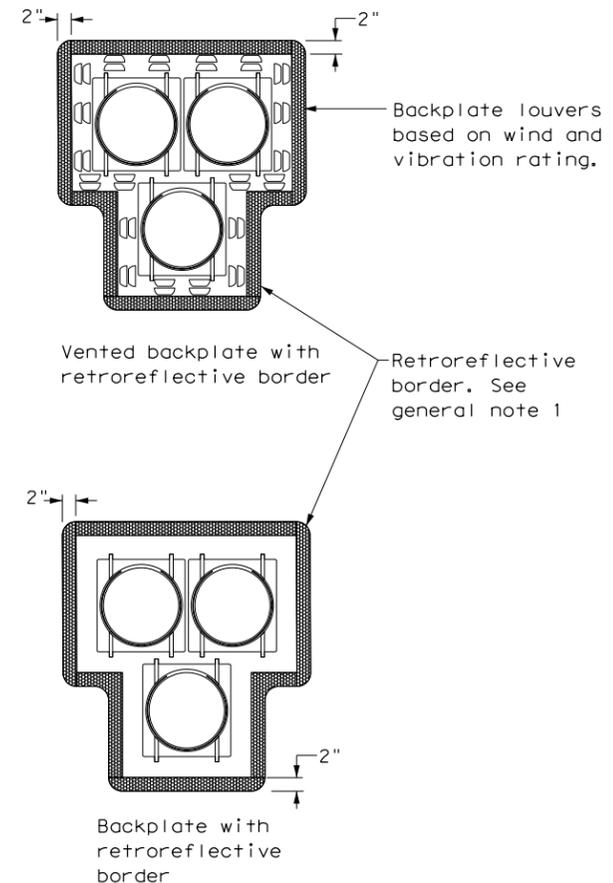
FOUR-SECTION HEAD
HORIZONTAL OR VERTICAL



FIVE-SECTION HEAD
HORIZONTAL OR VERTICAL



FIVE-SECTION HEAD
CLUSTER

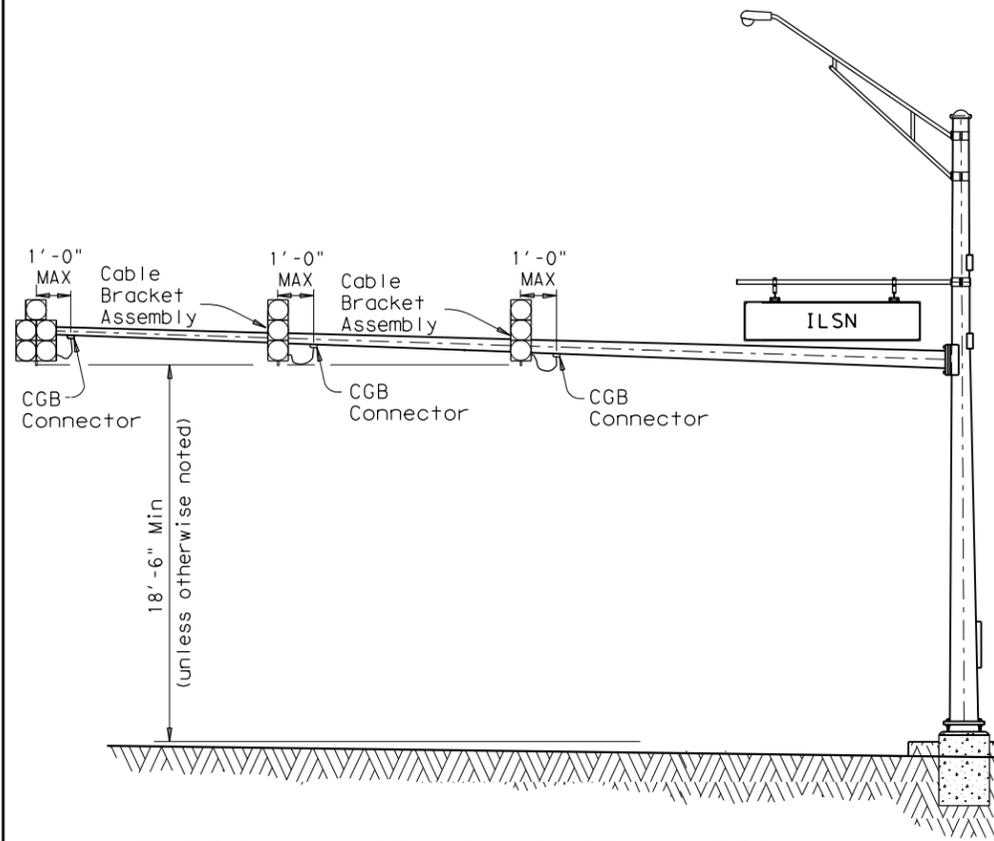


PEDESTRIAN HYBRID
BEACON

GENERAL NOTES:

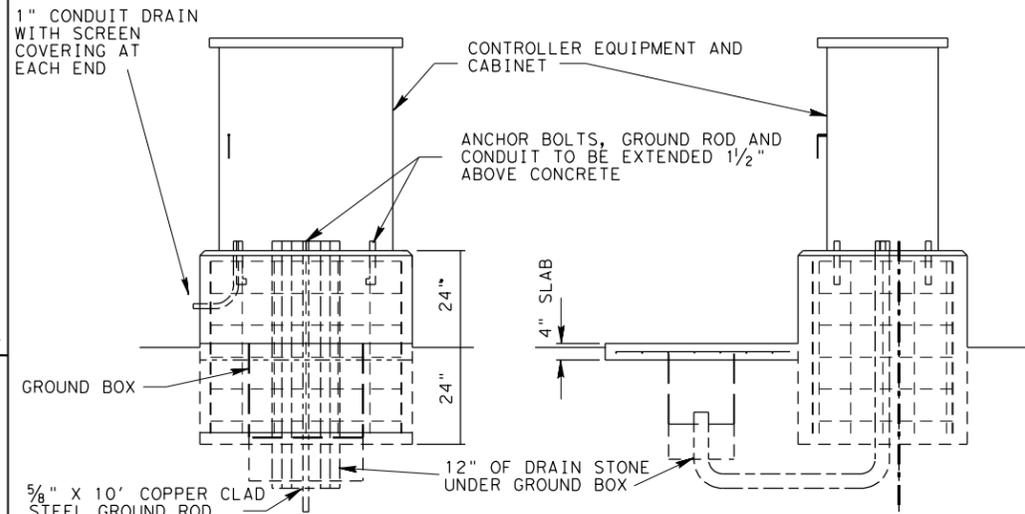
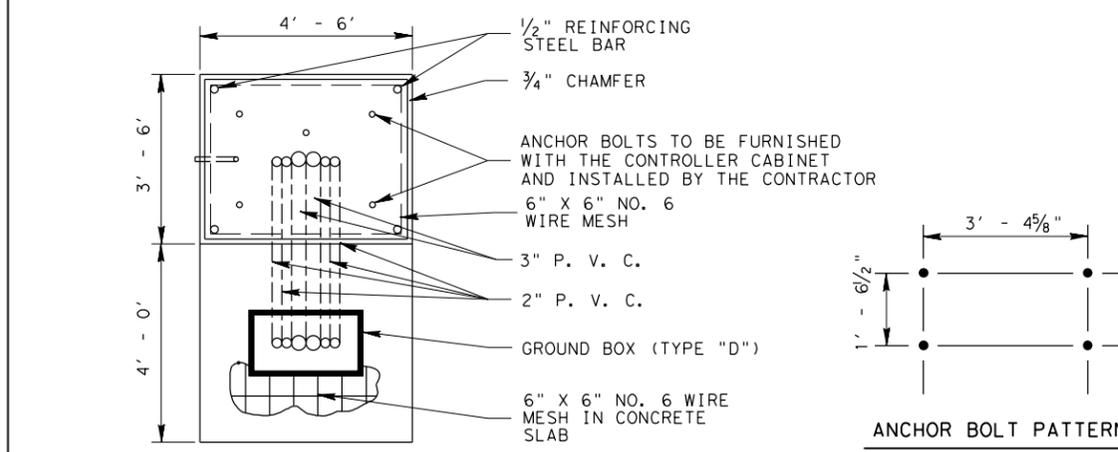
1. Backplates are optional for traffic signals and pedestrian hybrid beacons. When backplates are used, a 2-inch wide fluorescent yellow AASHTO Type B_{FL} or C_{FL} retroreflective border conforming to TxDOT DMS-8300 is required. Place on all approaches when used.
2. Signal head and backplate compatibility must be verified by the contractor prior to installation.
3. When using backplates on signal heads, venting is preferred to reduce cyclic vibration stress.
4. When a vented backplate is used, the retroreflective border must not be placed over the louvers.
5. This standard sheet applies to all signal heads with backplates, including but not limited to:
 - Pole mounted
 - Overhead mounted
 - Span wire mounted
 - Mast arm mounted
 - Vertical signal heads
 - Horizontal signal heads
 - Clustered signal heads
 - Pedestrian hybrid beacons

				Texas Department of Transportation		Traffic Safety Division Standard	
TRAFFIC SIGNAL HEAD WITH BACKPLATE TS-BP-20							
FILE: ts-bp-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT			
© TxDOT June 2020	CONT	SECT	JOB	HIGHWAY			
REVISIONS				FM 1101			
	DIST	COUNTY		SHEET NO.			
	SAT	COMAL		TS-31			



TYPICAL MAST ARM INSTALLATION

BACKPLATES ARE NOT SHOWN FOR CLARITY



CONTROLLER MOUNT NOTES :

ALL WIRING TERMINATING IN THE CONTROLLER SHALL BE LABELED IN A MANNER THAT CAN BE IDENTIFIED WHEN THE CONTROLLER IS INSTALLED THE CONTRACTOR SHALL CONNECT THE FIELD WIRING TO THE CONTROLLER

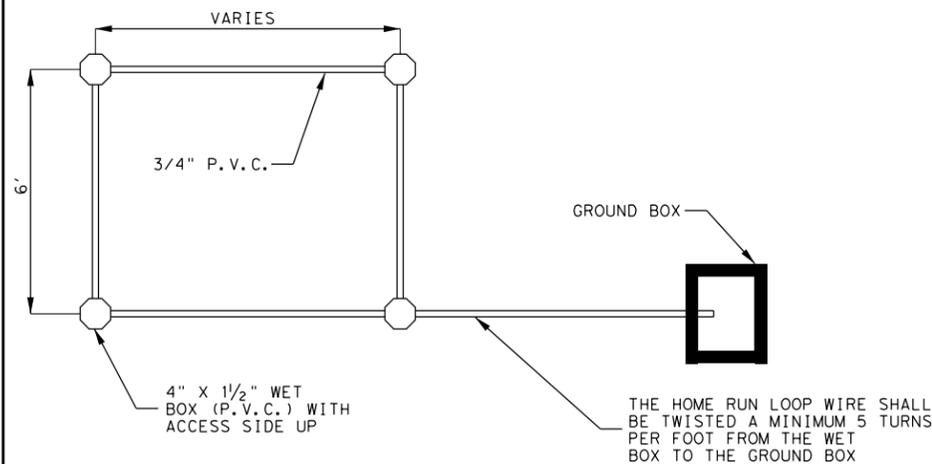
ONE 2" PVC SHALL REMAIN EMPTY FOR FUTURE USE

CONCRETE SHALL BE TESTED AS MISCELLANEOUS CONCRETE

ALL MATERIALS SHOWN AND LABOR TO INSTALL THE CONTROLLER FOUNDATION SHALL BE CONSIDERED SUBSIDIARY TO PERTINENT ITEMS

CONTROLLER FOUNDATION SHALL BE AS SHOWN ON THE PLANS, UNLESS OTHERWISE DIRECTED BY THE ENGINEER.

TYPICAL CONTROLLER MOUNT DETAILS



CONDUIT ENCASED LOOPS

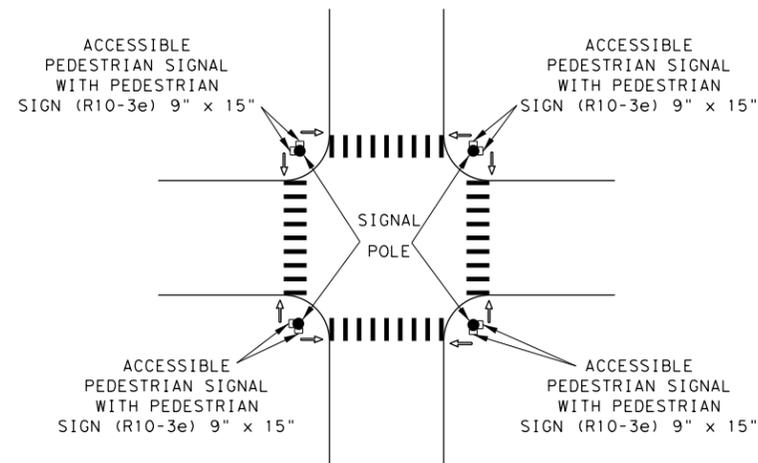
NOTES:

SHALL INSTALL CONDUIT ENCASED LOOPS AT THE LOCATIONS SHOWN ON THE PLANS USING 3/4" DIAMETER PVC SCHEDULE 40 OR AT NO ADDITIONAL COST 1" DIAMETER PVC SCHEDULE 80.

LOOP LOCATIONS MAY BE STAGGERED SLIGHTLY (6") TO ACCOMMODATE HOME RUN PLACEMENT.

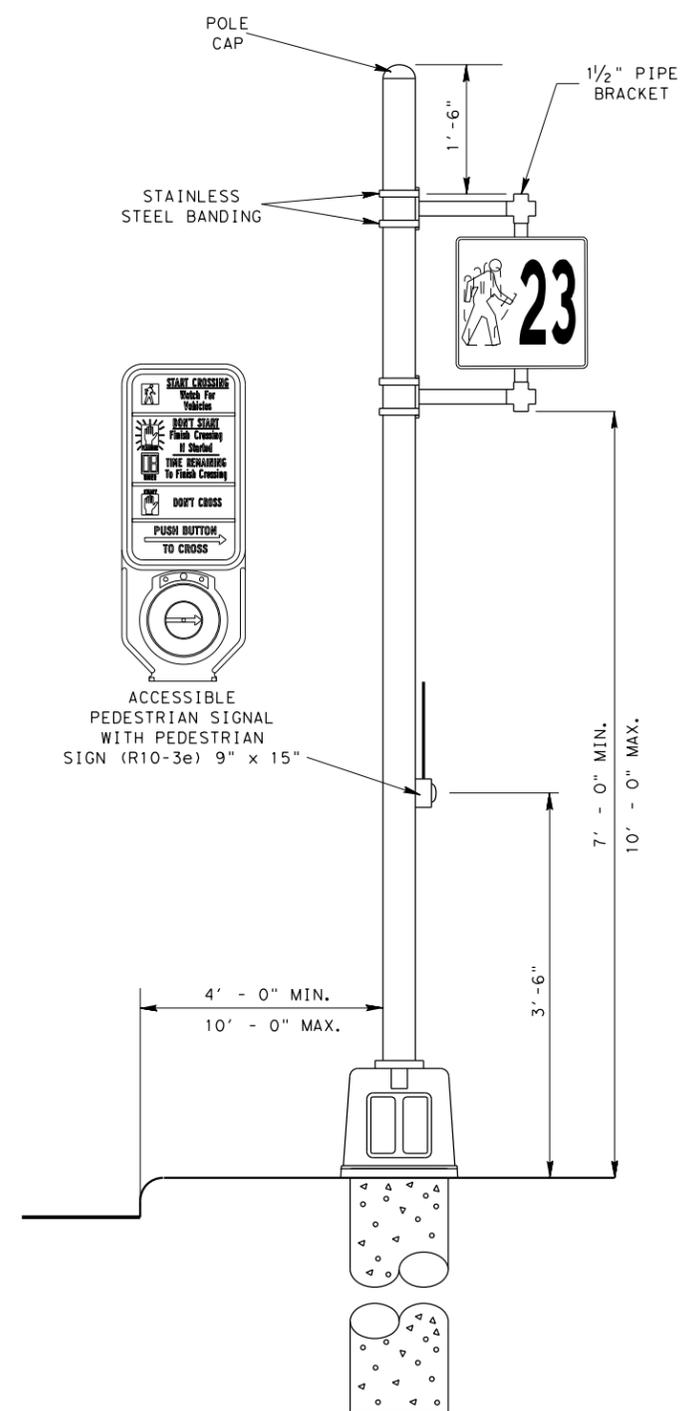
INDIVIDUAL HOME RUN CONDUITS SHALL BE EXTENDED TO THE GROUND BOX SHOWN ON THE PLANS FOR EACH LOOP INSTALLED.

THE NUMBER OF LOOP WIRE TURNS SHALL BE AS SHOWN ON THE TYPICAL LOOP DETECTOR DETAILS.



TYPICAL PED PUSH BUTTON LOCATION

THE ENGINEER SHALL VERIFY ALL PEDESTRIAN SIGNAL AND PEDESTRIAN PUSH BUTTON LOCATIONS PRIOR TO INSTALLATION.



TYPICAL PEDESTAL POLE ASSEMBLY

ACC:

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48
49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64

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San Antonio District Standard

MISCELLANEOUS TRAFFIC SIGNAL DETAILS

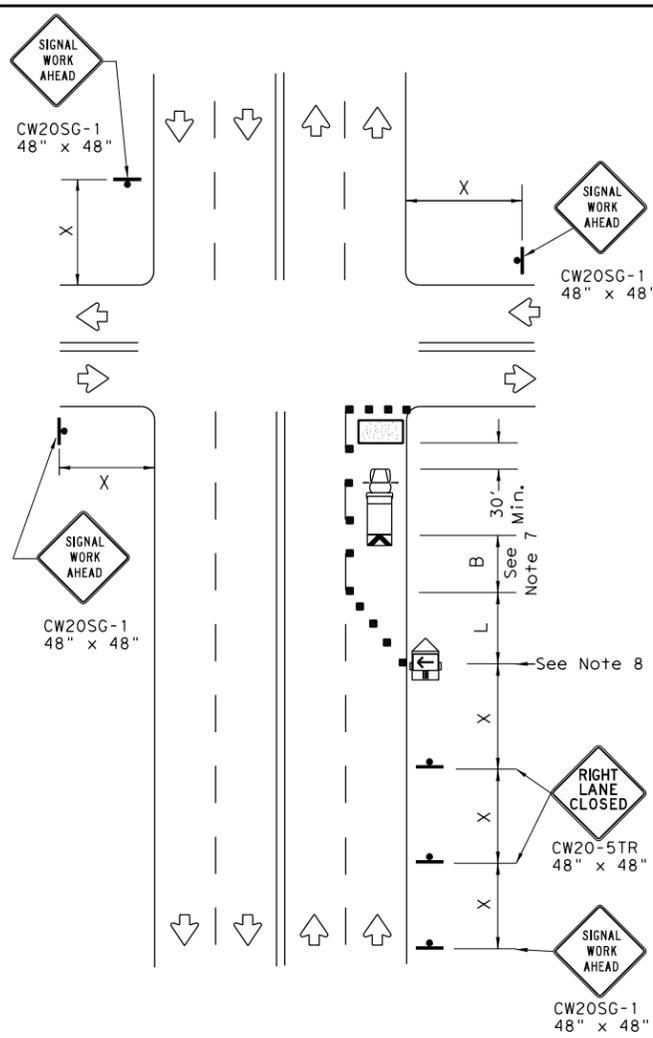
SCALE: NS

MTS-18

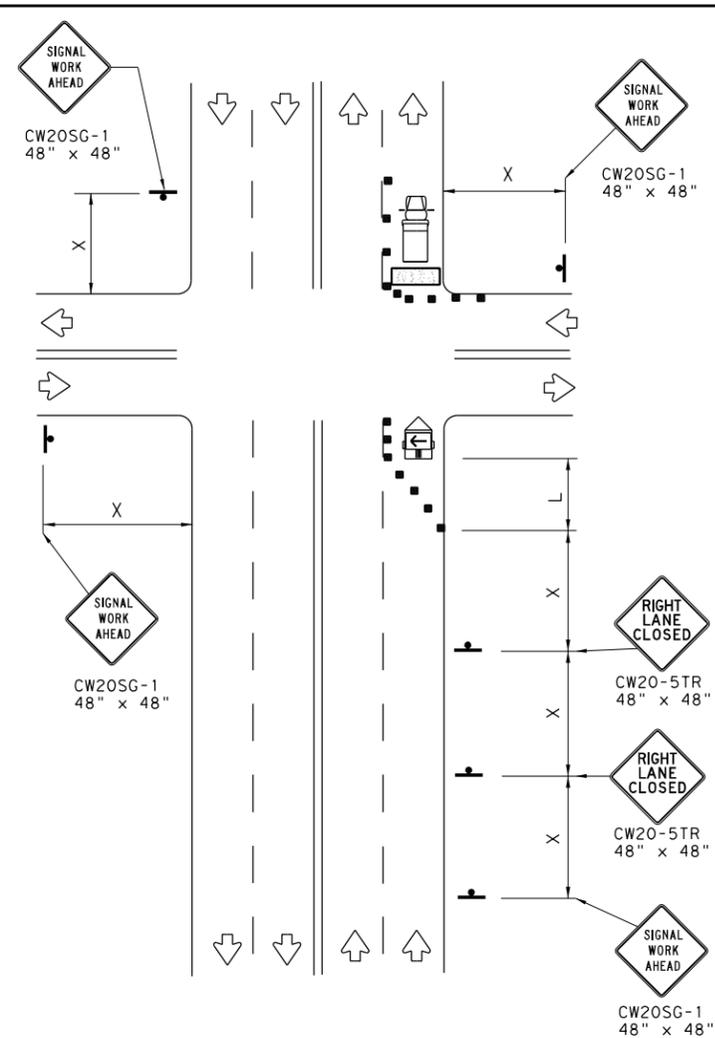
REVISIONS	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
FEB 2006	6	SEE TITLE SHEET	TS-32
OCT 2007	STATE	DIST.	COUNTY
MAR 2017	TEXAS	SAT	COMAL
MAY 2018	CONT.	SECT.	JOB
			HIGHWAY NO.
			FM 1101

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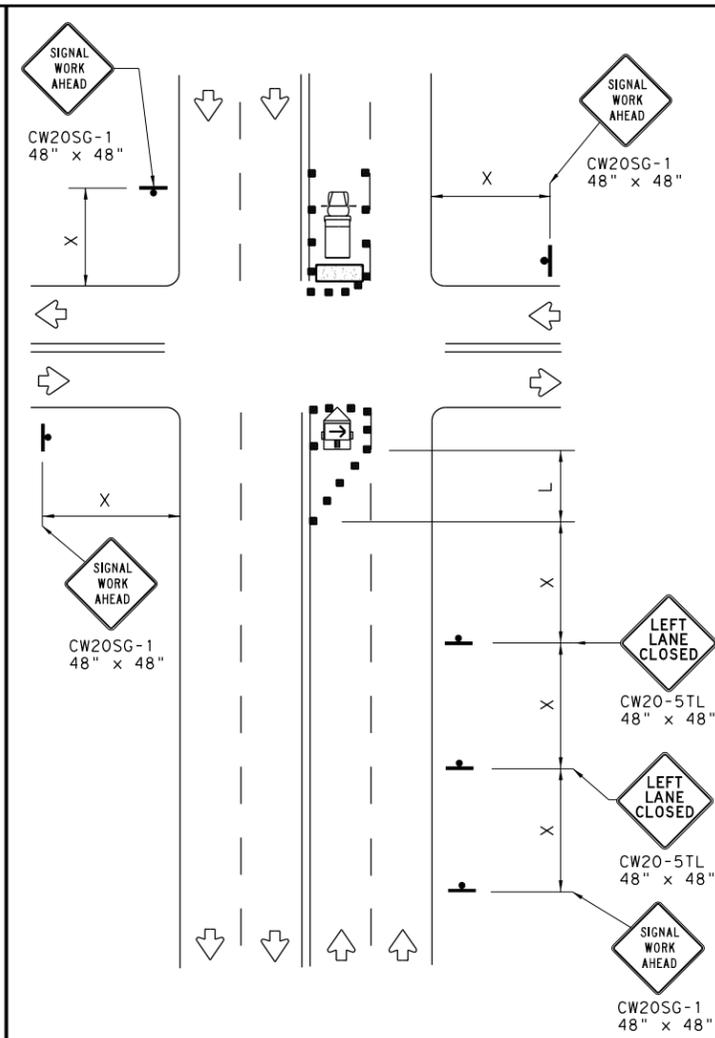
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NEAR SIDE LANE CLOSURE
SHORT DURATION OR SHORT TERM STATIONARY



FAR SIDE RIGHT LANE CLOSURE
SHORT DURATION OR SHORT TERM STATIONARY



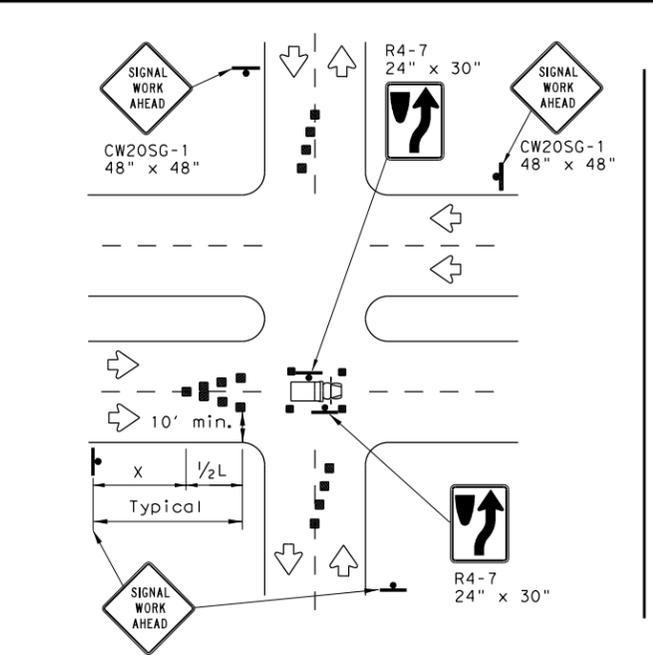
FAR SIDE LEFT LANE CLOSURE
SHORT DURATION OR SHORT TERM STATIONARY

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

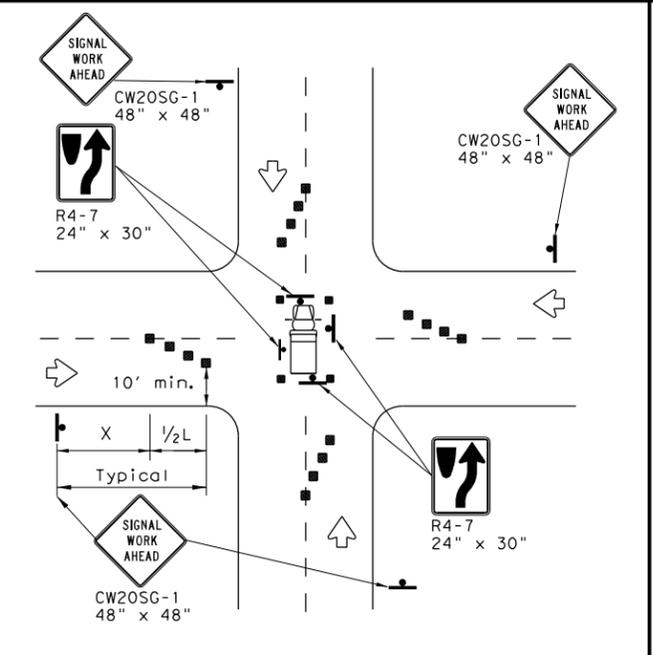
Posted Speed *	Formula	Minimum Desirable Taper Lengths **			Suggested Maximum Spacing of Channelizing Devices		Minimum Sign Spacing "X" Distance	Suggested Longitudinal Buffer Space "B"
		10' Offset	11' Offset	12' Offset	On a Taper	On a Tangent		
30	$L = \frac{WS^2}{60}$	150'	165'	180'	30'	60'	120'	90'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

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

WORKERS IN BUCKET TRUCKS SHALL NOT WORK ABOVE OPEN LANES OF TRAFFIC.



OPERATIONS IN THE INTERSECTION
SHORT DURATION



GENERAL NOTES

- The minimum size channelizing device is the 28" cone. 42" Two-piece cones, drums, vertical panels or barricades will be required when the device must be left unattended at night.
- Obstructions or hazards at the work area shall be clearly marked and delineated at all times.
- Flaggers and Flagger Symbol (CW20-7) signs may be required according to field conditions.
- Vehicles parked in roadway shall be equipped with at least two high intensity rotating, flashing, oscillating or strobe type lights.
- High level warning devices (flag trees) may be used at corners of the vehicle.
- When work operations are performed on existing signals, the signals may be placed in flashing red mode when approved by the engineer. If existing signals do not have power, All-Way Stop (R1-1 and R1-3P) signs may be implemented when approved by the engineer.
- For Short-Term Stationary work the buffer space "B" from the above table should be used if field conditions permit. For Short Duration (less than 1 hour) any buffer space provided will enhance the safety of the setup.
- The arrow board at this location may be omitted for Short Duration work if the work vehicle has an arrow board in operation. As an option, the arrow board may be placed at the end of the taper in the closed lane if space is not available at the beginning of the taper.
- Signs and devices for the NEAR SIDE LANE CLOSURE may be altered for a left lane closure by using a LEFT LANE CLOSED (CW20-5TL) and adding channelizing devices on the centerline to protect the work space from opposing traffic.



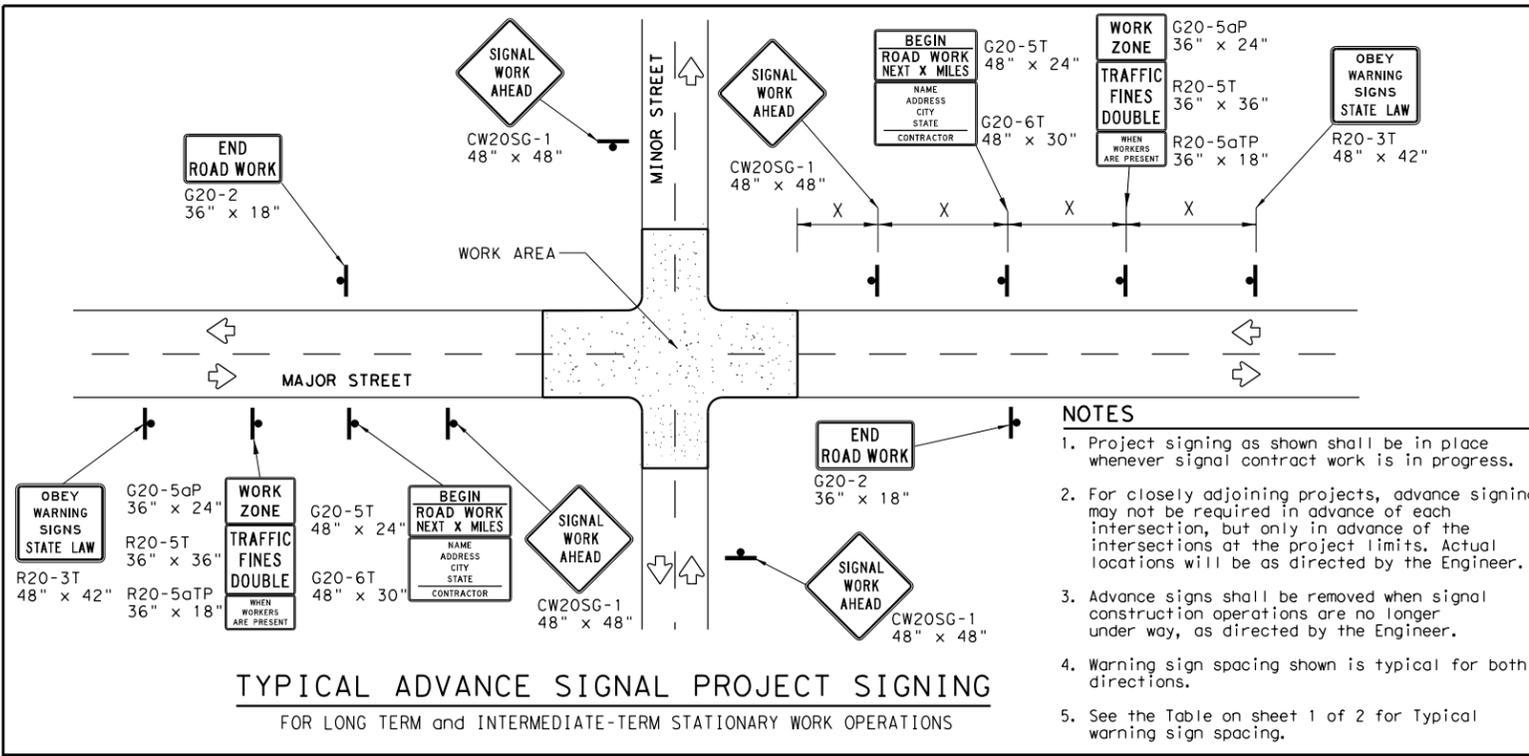
TRAFFIC SIGNAL WORK TYPICAL DETAILS

WZ(BTS-1)-13

FILE: wzbts-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT April 1992	CONT	SECT	JOB	HIGHWAY
REVISIONS	FM 1101			
2-98 10-99 7-13	DIST	COUNTY	SHEET NO.	
4-98 3-03	SAT	COMAL	TS-33	

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DATE: FILE:



TYPICAL ADVANCE SIGNAL PROJECT SIGNING
FOR LONG TERM and INTERMEDIATE-TERM STATIONARY WORK OPERATIONS

- NOTES**
1. Project signing as shown shall be in place whenever signal contract work is in progress.
 2. For closely adjoining projects, advance signing may not be required in advance of each intersection, but only in advance of the intersections at the project limits. Actual locations will be as directed by the Engineer.
 3. Advance signs shall be removed when signal construction operations are no longer under way, as directed by the Engineer.
 4. Warning sign spacing shown is typical for both directions.
 5. See the Table on sheet 1 of 2 for Typical warning sign spacing.

GENERAL NOTES FOR WORK ZONE SIGNS

1. Signs shall be installed and maintained in a straight and plumb condition.
2. Wooden sign posts shall be painted white.
3. Barricades shall NOT be used as sign supports.
4. Nails shall NOT be used to attach signs to any support.
5. All signs shall be installed in accordance with the plans or as directed by the Engineer.
6. The Contractor shall furnish the sign design shown in the plans or in the "Standard Highway Sign Designs for Texas" (SHSD).
7. The Contractor shall furnish sign supports and substrates listed in the "Compliant Work Zone Traffic Control Device List" (CWZTCD), installed as per the manufacturer's recommendations.
8. Temporary signs that have damaged or cracked substrates and/or damaged or marred reflective sheeting shall be replaced as directed by the Engineer.
9. Identification markings may be shown only on the back of the sign substrate. The maximum height of letters and/or company logos used for identification shall be 1".
10. Damaged wood posts shall be replaced. Splicing wood posts will not be allowed.

DURATION OF WORK

1. Work zone durations are defined in Part 6, Section 60.02 of the Texas Manual on Uniform Traffic Control Devices (TMUTCD).

SIGN MOUNTING HEIGHT

1. Sign height of Long-term/Intermediate-term warning signs shall be as shown on Figure 6F-1 of the TMUTCD.
2. Sign height of Short-term/Short Duration warning signs shall be as shown on Figure 6F-2 of the TMUTCD.
3. Regulatory signs shall be mounted at least 7 feet, but not more than 9 feet, above the paved surface regardless of work duration.

REMOVING OR COVERING

1. When sign messages may be confusing or do not apply, the signs shall be removed or completely covered, unless otherwise approved by the Engineer.
2. When signs are covered, the material used shall be opaque, such as heavy mil black plastic, or other materials which will cover the entire sign face and maintain their opaque properties under automobile headlights at night without damaging the sign sheeting. Burlap, or heavy materials such as plywood or aluminum shall not be used to cover signs.
3. Duct tape or other adhesive material shall NOT be affixed to a sign face.
4. Signs and anchor stubs shall be removed and holes backfilled upon completion of the work.

REFLECTIVE SHEETING

1. All signs shall be retroreflective and constructed of sheeting meeting the requirements of the DMS and color usage table shown on this sheet.

SIGN SUPPORT WEIGHTS

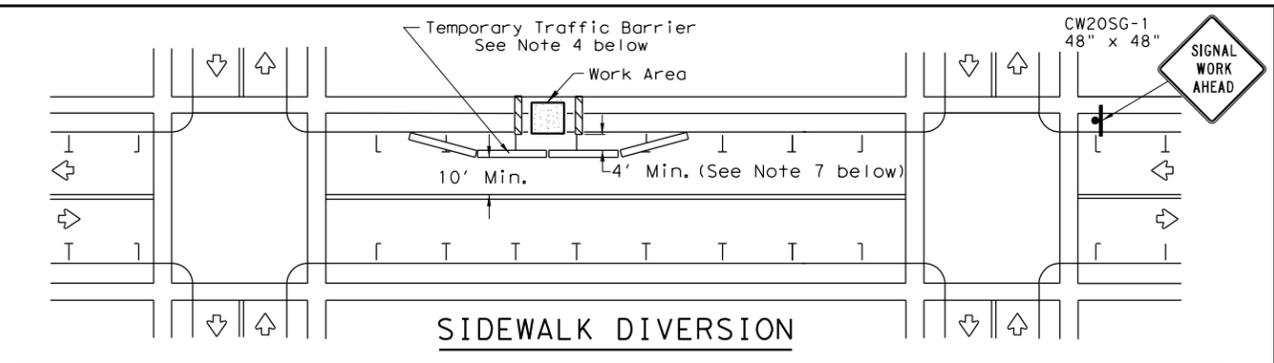
1. Weights used to keep signs from turning over should be sandbags filled with dry, cohesionless material.
2. The sandbags will be tied shut to keep the sand from spilling and to maintain a constant weight.
3. Rock, concrete, iron, steel or other solid objects will not be permitted for use as sign support weights.
4. Sandbags should weigh a minimum of 35 lbs and a maximum of 50 lbs.
5. Sandbags shall be made of a durable material that tears upon vehicular impact. Rubber, such as tire inner tubes, shall not be used.
6. Rubber ballasts designed for channelizing devices should not be used for ballast on portable sign supports. Sign supports designed and manufactured with rubber bases may be used when shown on the CWZTCD list.
7. Sandbags shall only be placed along or laid over the base supports of the traffic control device and shall not be suspended above ground level or hung with rope, wire, chains or other fasteners. Sandbags shall be placed along the length of the skids to weigh down the sign support.
8. Sandbags shall NOT be placed under the skid and shall not be used to level sign supports placed on slopes.

LEGEND	
	Sign
	Channelizing Devices
	Type 3 Barricade

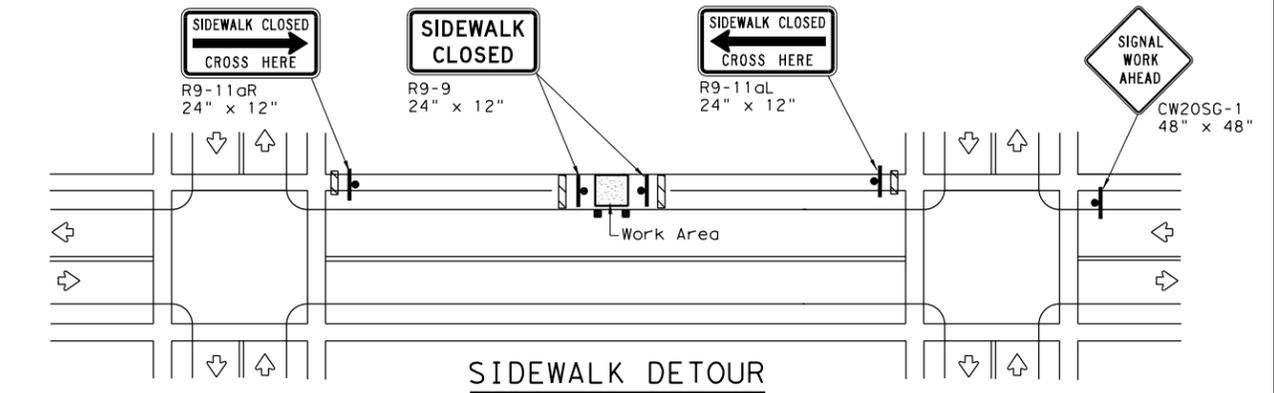
DEPARTMENTAL MATERIAL SPECIFICATIONS	
SIGN FACE MATERIALS	DMS-8300
FLEXIBLE ROLL-UP REFLECTIVE SIGNS	DMS-8310

COLOR	USAGE	SHEETING MATERIAL
ORANGE	BACKGROUND	TYPE B _{FL} OR TYPE C _{FL} SHEETING
WHITE	BACKGROUND	TYPE A SHEETING
BLACK	LEGEND & BORDERS	ACRYLIC NON-REFLECTIVE SHEETING

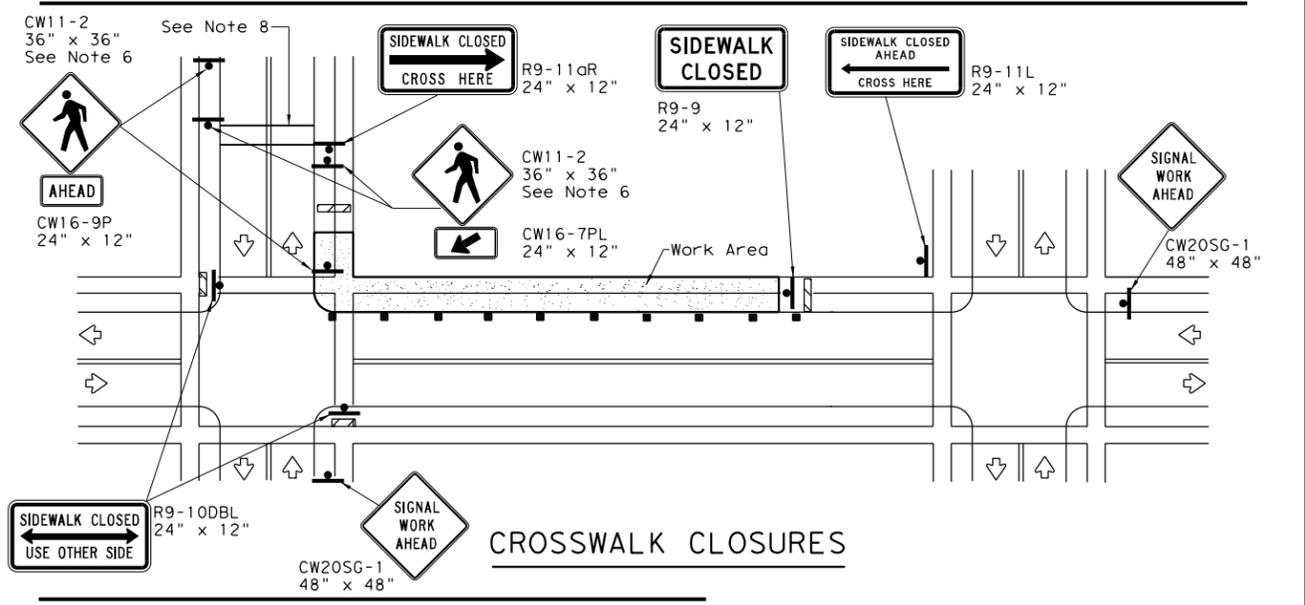
Only pre-qualified products shall be used. A copy of the "Compliant Work Zone Traffic Control Devices List" (CWZTCD) describes pre-qualified products and their sources and may be found at the following web address:
http://www.txdot.gov/txdot_library/publications/construction.htm



SIDEWALK DIVERSION



SIDEWALK DETOUR



CROSSWALK CLOSURES

PEDESTRIAN CONTROL

1. Holes, trenches or other hazards shall be adequately protected by covering, delineating or surrounding the hazard with orange plastic pedestrian fencing or longitudinal channelizing devices, or as directed by the Engineer.
2. "CROSSWALK CLOSURES" as detailed above will require the Engineer's approval prior to installation.
3. R9 series signs shown may be placed on supports detailed on the BC standards or CWZTCD list, or when fabricated from approved lightweight plastic substrates, they may be mounted on top of a plastic drum at or near the location shown.
4. For speeds less than 45 mph longitudinal channelizing devices may be used instead of traffic barriers when approved by the Engineer. Attenuation of blunt ends and installation of water filled devices shall be as per BC(9) and manufacturer's recommendations.
5. Location of devices are for general guidance. Actual device spacing and location must be field adjusted to meet actual conditions.
6. Where pedestrians with visual disabilities normally use the closed sidewalk Detectable Pedestrian Barricades should be used instead of the Type 3 Barricades shown.
7. The width of existing sidewalk should be maintained if practical.
8. Pavement markings for mid-block crosswalks shall be paid for under the appropriate bid items.
9. When crosswalks or other pedestrian facilities are closed or relocated, temporary facilities shall be detectable and shall include accessibility features consistent with the features present in the existing pedestrian facility.

SHEET 2 OF 2



TRAFFIC SIGNAL WORK BARRICADES AND SIGNS

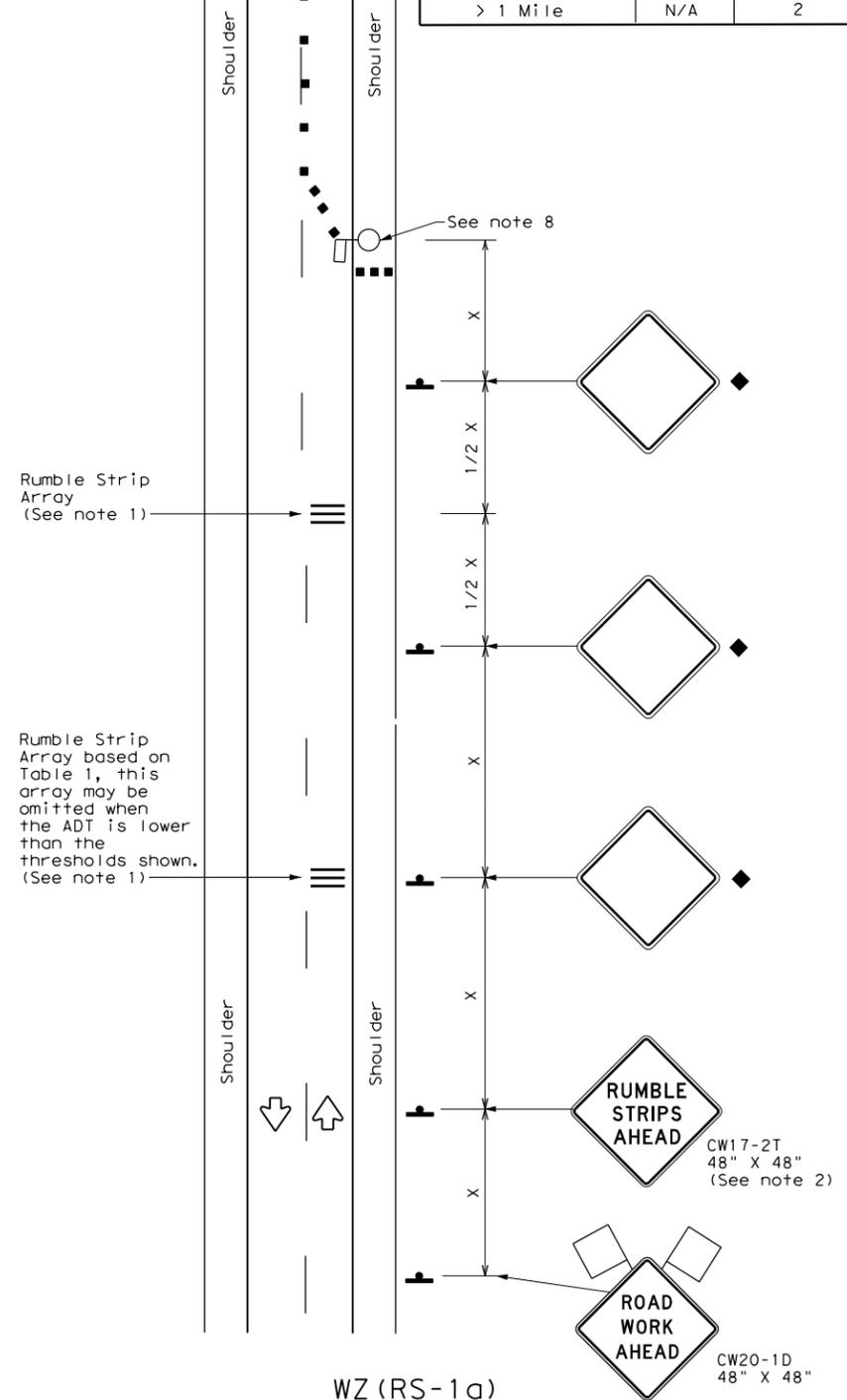
WZ(BTS-2)-13

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REVISIONS	FM 1101			
2-98 10-99 7-13	DIST	COUNTY	SHEET NO.	
4-98 3-03	SAT	COMAL	TS-34	

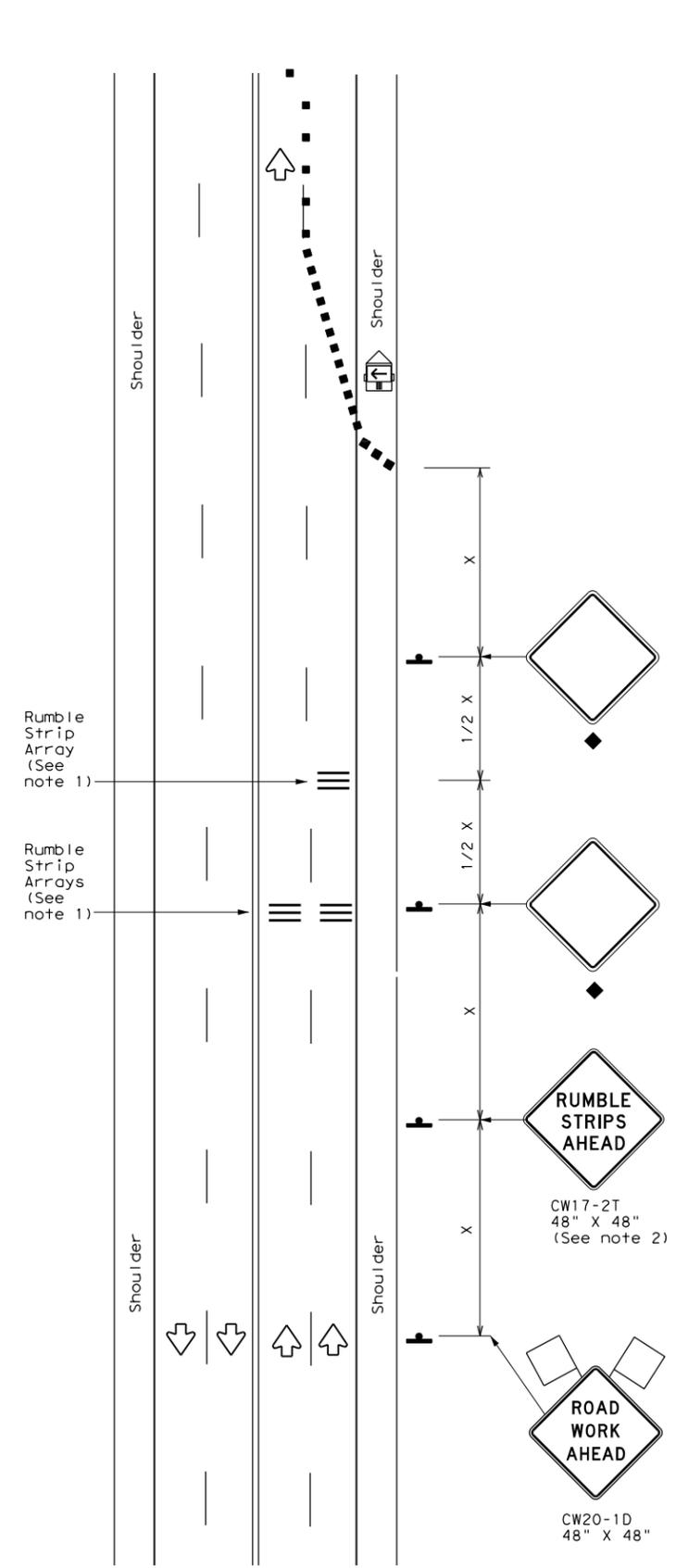
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Warning sign and rumble strip sequence in opposite direction is same as below

Flagger to Flagger (Length of Work Area)	ADT	# of Rumble Strip Arrays
1/8 Mile	< 4,500	1
	≥ 4,500	2
1/4 Mile	< 3,500	1
	≥ 3,500	2
1/2 Mile	< 2,600	1
	≥ 2,600	2
1 Mile	< 1,600	1
	≥ 1,600	2
> 1 Mile	N/A	2



WZ (RS-1a)
75 mph or Less
RUMBLE STRIPS ON ONE-LANE
TWO-WAY APPLICATION



WZ (RS-1b)
75 mph or Less
RUMBLE STRIPS FOR LANE CLOSURE
ON CONVENTIONAL ROADWAY

GENERAL NOTES

- Each Rumble Strip Array should consist of three rumble strips spaced center to center at the spacing shown in Table 2, placed transverse across the lane at locations shown.
- The CW17-2T "RUMBLE STRIPS AHEAD" sign should be located after the CW20-1D "ROAD WORK AHEAD" sign and spaced as shown. If traffic is observed to be queuing, or is expected to queue beyond the Rumble Strips, the CW17-2T sign and the first Rumble Strip Array may be located upstream of the CW20-1D sign as necessary to provide needed warning.
- Temporary Rumble Strips will be considered subsidiary to Item 502, and shall be a product listed on the Compliant Work Zone Traffic Control Devices.
- Removal of the Temporary Rumble Strips should be accomplished before removing the advance warning signs.
- Temporary Rumble Strips should not be used on horizontal curves, loose gravel, soft or bleeding asphalt, heavily rutted pavements or unpaved surfaces.
- Temporary Rumble Strips shall be installed and maintained as per manufacturer's recommendations.
- This standard sheet shall be used in conjunction with other appropriate TCP standard, TMUTCD typical application or project specific detail for the project.
- The one-lane two-way application may utilize a flagger, an AFAD or a portable traffic signal.
- Temporary Rumble Strips may be used on freeways or expressways based on engineering judgment.

Speed	Approximate distance between strips in an Array
≤ 40 MPH	10'
> 40 MPH & ≤ 55 MPH	15'
> 55 MPH	20'

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

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

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

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

◆ Signs are for illustrative purposes only. Signs required may vary depending on the TCP, TMUTCD Typical Application, or project specific details for the project.

Texas Department of Transportation
 Traffic Operations Division Standard

TEMPORARY RUMBLE STRIPS

WZ (RS) - 16

FILE: wzrs16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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REVISIONS				
2-14				
4-16	DIST	COUNTY	SHEET NO.	
	SAT	COMAL	TS-35	

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