

CALDWELL COUNTY TECHNICAL SPECIFICATIONS

GENERAL

All work performed within the R.O.W. or proposed R.O.W. and all products furnished shall comply with requirements which pertain to the various items of work included as Standard Specifications for Construction and Maintenance of Highways, Streets and Bridges of the Texas Department of Transportation, adopted November 1, 2014, and as amended and/or updated unless specifically noted to comply with other specifications.

“Amendment” to Roadway Designs Standards as referenced in the designs shall minimally use the Pavement Design Guideline as referenced in the City of Austin Transportation Manual dated July 12, 2022 (or Current version) Section 14, Appendix B Pavement Design Guidelines, Sections 3, 4, 5 & 6 shall be used for Roadway designs. Whenever a soil investigation indicates that more than 2 feet of expansive subgrade soil with a P. I. of 25 or greater beneath the expected base layer, the design professional shall follow Section 5 of the Pavement Design Guidelines for the roadway design and incorporate a combination of minimally two measures described below in the proposed roadway design.

1. Replace minimally 18 inches of subgrade with an approved material with a P.I. less than 15 and more than four and provide appropriate edge drainage,
2. Use lime, cement, or lime/cement material to stabilize eight to twenty-four inches of subgrade as appropriate to minimize vertical shrink/swell potential and environmental cracking,
3. Reinforcement of the pavement section with TriAx. GeoGrid at the base/subgrade interface.
 - a. Documented TriAx. GeoGrid design/product must be approved by the Road Director, County Engineer or designated representative.
 - b. An acceptable TriAx. GeoGrid design/product must be used in combination with at least one other strategy listed here.
 - c. Other measures as may be approved by the Road Director, County Engineer or designated representative on a case by case basis.
4. Subgrade improvements shall minimally extend 5 feet beyond the back of curb or edge of pavement.
5. Flexible base layer shall extend minimally 4 feet beyond the back of curb or edge of pavement.

All median islands proposed regardless of the subgrade or pavement section shall be curbed and installed with a concrete turn down minimally 4” wide that extends 6” into the subgrade section.

Wherever, in the TxDOT Standard Specifications, reference is made to the State of Texas where related to the rights or actions of the Owner, such reference shall be taken to mean Caldwell County.

All water lines and wastewater line work or installations within the R.O.W. shall minimally comply with the local utility provider’s requirements or shall comply with City of Austin Standard Specifications whichever is more stringent which pertain to the installation of the

utility within the R.O.W. of the County. Wherever, in the City of Austin Standard Specifications, reference is made to the City of Austin as Owner, such reference shall be taken as reference to Caldwell County or the utility provider.

A.01 REFERENCED TXDOT STANDARD SPECIFICATIONS

The following items of the referenced TxDOT Standard Specifications, in their entirety and as listed below, represent the Standard Specifications for Caldwell County. Other Standard Specifications which may be cross-referenced by these specifications shall be considered incorporated into the Standard Specifications. These Standard Specifications take precedence over specifications or plans wherever in conflict therewith.

| <u>TxDOT STD</u> <u>SPEC ITEM</u> | <u>DESCRIPTION</u> |
|--------------------------------------|--|
| 100 | Preparing Right of Way |
| 103 | Disposal of Wells |
| 104 | Removing Concrete |
| 105 | Removing Treated and Untreated Base and Asphalt Pavement |
| 106 | Obliteration Abandoned Road |
| 110 | Excavation |
| 112 | Subgrade Widening |
| 132 | Embankment |
| 160 | Topsoil |
| 164 | Seeding for Erosion Control |
| 166 | Fertilizer |
| 168 | Vegetative Watering |
| 169 | Soil Retention Blankets |
| 210 | Rolling |
| 216 | Proof Rolling |
| 247 | Flexible Base |
| 251 | Reworking Base Courses |
| 260 | Lime Treatment (Road-Mixed) |
| 265 | Fly Ash or Lime-Fly Ash Treatment (Road-Mix) |
| 275 | Cement Treatment (Road-Mix) |
| 300 | Asphalts, Oils, and Emulsions |
| 315 | Fog Seal |
| 316 | Seal Coat |
| 302 | Aggregates for Surface Treatment |
| 310 | Prime Coat |
| 314 | Emulsified Asphalt Treatment |
| 340 | Dense-Graded Hot-Mix Asphalt (Small Quantity) |
| 360 | Concrete Pavement |
| 400 | Excavation and Backfill for Structures |
| 401 | Flowable Backfill |
| 402 | Trench Excavation Protection |
| 420 | Concrete Substructures |

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|-----|--|
| 421 | Hydraulic Cement Concrete |
| 423 | Retaining Walls |
| 432 | Riprap |
| 440 | Reinforcement for Concrete |
| 459 | Gabion Mattress (GALV) (6 IN.) |
| 460 | Corrugated Metal Pipe |
| 462 | Concrete Box Culverts and Drains |
| 464 | Reinforced Concrete Pipe |
| 465 | Junction Boxes, Manholes, and Inlets |
| 466 | Headwalls and Wingwalls |
| 467 | Safety End Treatment |
| 471 | Frames, Grates, and Covers |
| 472 | Remove and Re-Lay Culverts |
| 476 | Jacking, Boring, or Tunneling Pipe or Box |
| 479 | Adjusting Manholes and Inlets |
| 496 | Removing Structures |
| 510 | One-Way Traffic Control |
| 512 | Portable Traffic Barriers |
| 531 | Sidewalks |
| 500 | Mobilization |
| 502 | Barricades, Signs, and Traffic Handling |
| 506 | Temporary Erosion, Sedimentation, and Environmental Controls |
| 508 | Constructing Detours |
| 529 | Concrete Curb, Gutter, and Combined Curb and Gutter |
| 530 | Intersections, Driveways, and Turnouts |
| 540 | Metal Beam Guard Fence |
| 542 | Remove Metal Beam Guard Fence |
| 544 | Guardrail End Treatments |
| 550 | Chain Link Fence |
| 552 | Wire Fence |
| 560 | Mailbox Assemblies |
| 644 | Small Roadside Sign Assemblies |
| 662 | Work Zone Pavement Markings |
| 666 | Reflectorized Pavement Markings |
| 672 | Raised Pavement Markers |
| 677 | Eliminate Existing Pavement Markings and Markers |

A.02 REFERENCED CITY OF AUSTIN STANDARD SPECIFICATIONS

The following items of the referenced City of Austin Standard Specifications, in their entirety and as listed below, represent the Standard Specifications for this project. Other Standard Specifications which may be cross-referenced by these specifications shall be considered incorporated into the Standard Specification for this project by reference. These Standard Specifications take precedence over the plans wherever in conflict therewith.

COA STD

DESCRIPTION

DATE

SPEC ITEM

| | | |
|------|----------------------------------|----------|
| 402S | Controlled Low Strength Material | 11/13/07 |
| 504S | Adjusting Structures | 2/24/10 |
| 510 | Pipe | 12/08/18 |
| 511S | Water Valves | 2/14/22 |
| 824S | Traffic Signs | 02/24/10 |

A.03 SPECIAL PROVISIONS TO TXDOT STANDARD SPECIFICATIONS

Special provisions will govern and take precedence over the TXDOT Standard Specifications enumerated herein wherever in conflict therewith. The following items of the referenced Standard Specifications are hereby amended and incorporated into this Contract and enclosed herein.

| <u>SPECIAL PROVISION ITEM NUMBER</u> | <u>DESCRIPTION</u> |
|--------------------------------------|--------------------|
| SP132-001 | Embankment |

A.03 SPECIAL PROVISIONS TO TXDOT SPECIFICATIONS

SPECIAL PROVISION TO ITEM 132

132-001

EMBANKMENT

Item 132, “Embankment” of the Standard Specifications is amended with respect to the clauses cited below. No other clauses or requirements of this Item are waived or changed.

Article 132.3.4.2., “Density Control.” The first paragraph is voided and replaced by the following:

Compact each layer to the required density using equipment complying with Item 210, “Rolling.” Determine the maximum lift thickness based on the ability of the compacting operation and equipment to meet the required density. Do not exceed layer thickness of 10 in. loose or 8 in. compacted material unless otherwise approved. Maintain a level layer to ensure uniform compaction.

END OF SECTION

SPECIAL PROVISION – CULVERT PIPE

Only reinforced concrete pipe (Class III or better) and corrugated metal pipe (CMP) shall be permitted for culverts. CMP exceeding 48-inches in diameter shall be coated with an asphalt or polymer coating approved by the County Engineer or Unit Road Director.

SPECIAL PROVISION – STORM SEWER PIPE

Only reinforced concrete pipe (Class III or better) shall be permitted for storm sewers within the rights-of-way.

SPECIAL PROVISION – GEOGRID FOR BASE/EMBANKMENT REINFORCEMENT

When called for or specified use TxDOT DMS-6240, Type II, with a Tensile strength of minimally 12,000 lb/ft @2% strain.

INSPECTION OF STORM DRAIN CONDUITS

The following item is a modification of City of Austin Standard Specifications 510. Other Standard Specifications which may be cross-referenced by these specifications shall be considered incorporated into the Standard Specification for this project by reference. These Standard Specifications take precedence over the plans wherever in conflict therewith.

1. Video Inspection of Installed Storm Drain Conduits

Contractor shall provide all labor, equipment, material and supplies and perform all operations required to conduct internal closed-circuit television and video recording of all storm drain conduits. Video recording of each storm drain conduit section shall be conducted after the trench has been backfilled, compacted, proof rolled and prior to placement of permanent pavement repairs or permanent pavement installation. The video recording shall be provided to the Owner, design Engineer and Caldwell County for review. Contractor shall not place permanent pavement repairs or permanent pavement over the storm drain conduit until minimally Owner and design Engineer has reviewed the video and agrees that there are no defects in the storm drain conduit installation shown in the video submitted by the Contractor or shown in any video acquired by the Owner and design Engineer through other means. Placement of permanent pavement repair or permanent pavement reconstruction over the installed storm drain conduit before the Owner and design Engineer acknowledges no defects shall be at the Contractor's risk. Any defects revealed by the video inspection shall be corrected at the Contractor's expense and a new video submitted to the Owner for review prior to acceptance of the conduit.

All video work shall be conducted under the direct full-time supervision of a NASSCO-PACP certified operator.

The conduit inspection camera shall have the capability of panning plus/minus 275 degrees and rotating 360 degrees. The television camera shall be specifically designed and constructed for such

use. The camera shall be operative in 100% humidity conditions. Camera shall have an accurate footage counter that displays on the monitor the exact distance of the camera (to the nearest tenth of a foot) from the centerline of the starting manhole or access point. Camera shall have height adjustment so that the camera lens is always centered within plus/minus 10% of the center axis of the conduit being videoed. Camera shall provide a minimum of 460 lines of horizontal resolution and 400 lines of vertical resolution. Camera shall be equipped with a remote iris to control the illumination range for an acceptable picture. Geometrical distortion of the image shall not exceed one percent (1%). The video image produced by each camera shall be calibrated using a Marconi Resolution Chart No. 1 or equivalent.

Lighting for the camera shall be sufficient to allow a clear picture of the entire periphery of the conduit without loss of contrast, flare out of picture or shadowing. A reflector in front of the camera may be required to enhance lighting in dark or large sized conduit. The video camera shall be capable of showing on the digital display the Owner's name, Project name, Contractor name, date, line size and material, conduit identification, and ongoing footage counter. The camera, television monitor, and other components of the video system shall be capable of producing a picture quality satisfactory to the satisfaction of the Owner. The recording of the internal condition of the storm drain conduit shall be clear, accurate, focused and in color. If the recording fails to meet these requirements, the equipment shall be removed and replaced with equipment that is suitable.

If during video inspection, water is encountered inside the conduit, the conduit shall be dewatered by the Contractor. Video recording conducted while the camera is floating is not acceptable unless approved by the Owner and design Engineer.

If during video inspection, debris is encountered that prohibits a proper inspection of the conduit, the Contractor shall remove the debris before proceeding.

All video shall be documented using a data logger and reporting system that are PACP compliant and which use codes as established by the National Association of Sewer Service Companies (NASSCO)s - Pipeline Assessment and Certification Program (PACP).

Computer printed location records shall be kept by the Contractor and shall clearly show the location and orientation of all points of significance such as joints, conduit connections, connections at manholes and inlets, and defects. Copy of all records shall be supplied to the Owner. Noted defects shall be documented as color digital files and color hard copy print-outs. Photo logs shall accompany each photo submitted.

All proposed method of repair for any defects discovered shall be approved by the Owner and design Engineer and shall inform the County of such proposed methods and locations of repair for any defects discovered.

2. Post-installation video shall not be completed until all work including rework is completed on a section of storm drain conduit. Post-installation video work shall be completed by the Contractor in the presence of the Owner and design Engineer and/or Caldwell. The post-installation video work shall be completed to confirm that the storm drain conduits are free of defects. Provide a color video showing the completed work. Prepare and submit video logs providing location of storm drain conduit along with location of any defects. Manhole and inlet work shall be complete prior to post-installation video work.

Video shall be continuous for each storm drain conduit segment. Do not show a single segment

on more than one CD/DVD, unless specifically allowed by the Owner and design Engineer.

Contractor shall submit to Owner, design Engineer and Caldwell County the following:

- A. National Association of Sewer Service Companies (NASSCO) Pipeline Assessment and Certification Program (PACP) certification of operators who will be performing video work.
 - B. Compact Disc (CD) or Digital Video Disc (DVD) of recording of storm drain conduits (concrete storm water pipe or box culvert).
 - I. The color CD or DVD shall include a digital color key map in a format acceptable to the Owner and design Engineer with each segment of storm drain conduit labeled with the appropriate inspection ID on the map.
 - II. The file folder for each segment of the storm drain conduit shall have a unique name based on the Owner's approved inspection naming convention and shall contain the following:
 - i. Video files
 - ii. Video inspection logs with information coded in accordance with the PACP
 - iii. Photo logs
 - iv. A report summarizing the results of the video inspection
3. Final inspection - Owner and design Engineer must inform the Caldwell County and forward to the County final Post installation video, A., B., I. and II. as reference above along with a written letter of transmittal certified by a professional engineer stating that all identified storm drain infrastructure installation deficiencies for the project have been corrected for the project has been completed.

REQUIRED NOTES FOR DRAINAGE EASEMENTS AND DETENTION PONDS

These notes are to modify as appropriate for plats vs. separate instrument drainage easements.

NO STRUCTURES SHALL BE PERMITTED WITHIN DRAINAGE EASEMENTS EXCEPT FOR PIPE ENDINGS THAT IS OPEN DESIGN TO ALLOW THE FREE FLOW OF WATER. EACH OWNER OF ANY PORTION OF THE PROPERTY OVER WHICH A DRAINAGE EASEMENT IS LOCATED SHALL HAVE THE OBLIGATION AND LIABILITY TO CONTINUOUSLY MAINTAIN THE FACILITIES LOCATED ON THAT OWNER'S PROPERTY IN ACCORDANCE WITH THE REQUIREMENTS OF THE COUNTY AND IN A GOOD AND FUNCTIONING CONDITION, AT THAT OWNERS COST AND EXPENSE. RESPONSIBILITY FOR MAINTAINING IMPROVEMENTS IN THE DRAINAGE EASEMENTS SHOWN HERON IS LOT OWNER [modify as appropriate for plats vs. separate instrument easements]. BLOCKING, FILLING, OBSTRUCTING FLOW, OR ALTERING OF A DRAINAGE EASEMENT IS PROHIBITED WITHOUT EXPRESS APPROVAL OF THE CITY OF SAN MARCOS AND CALDWELL COUNTY. THE COUNTY AND OTHER GOVERNMENTAL AUTHORITIES SHALL HAVE THE RIGHT TO, AND ARE HEREBY GRANTED AN EASEMENT AND RIGHT OF ENTRY TO, INSPECT, MONITOR, AND OTHERWISE ACCESS IN, UPON AND ACROSS ALL DRAINAGE EASEMENTS

DEDICATED BY THIS PLAT [modify for separate instrument easements]. IN THE EVENT OF THE FAILURE OF LOT OWNER [easement owner in the case of an easement] TO MEET ITS OBLIGATIONS UNDER THE PRECEDING PARAGRAPH, THE COUNTY OR OTHER GOVERNMENTAL AUTHORITY SHALL HAVE THE RIGHT TO PERFORM THE OBLIGATIONS OF SUCH OWNER AND THE OWNER DEFAULTING IN SUCH OBLIGATION SHALL BE LIABLE AND OBLIGATED FOR THE COSTS AND EXPENSES INCURRED BY THE COUNTY OR OTHER GOVERNMENTAL AUTHORITY.

CALDWELL COUNTY REQUIREMENTS FOR RIGHT OF WAY CROSSING BY HIGH- & LOW-PRESSURE PIPELINES

This primarily pertains to R.O.W. crossing by Gas, Petroleum lines, High-& Low-Pressure Pipelines, and other Utility Transmission Main Lines not applicable for local Municipal Services.

I. Encasement

1. Underground utility facilities crossing the existing roadway or R.O.W. shall be encased in the interest of, safety, protection of the utility, protection of the roadway, public and for access to the utility facility.
2. Casing shall consist of a steel pipe or other separate structure (if approved by County) around and outside the carrier line. The utility must demonstrate that the casing will be adequate for the expected loads and stresses.
3. The Encasement material shall also be designed to support the load of the roadway and superimposed loads thereon, including that of construction machinery including boring insertion. The strength of the encasement material shall equal or exceed structural requirements for roadway loading, method of installation and satisfactory durability for conditions to which it may be subjected.
4. Encasements shall be installed full width of R.O.W. with end seals unless otherwise approved.
5. The utility provider shall provide an example graphic of a typical section showing encasement lengths and depth of proposed installations.

II. Depth

1. Where placement at depths not less than five (5) feet are impractical or where unusual conditions exist, the County may allow installations at a lesser depth, but will require other means of protection, including encasement or the placement of a reinforced concrete slab.

III. Installation

1. Utility facilities placed beneath any existing roadways shall be installed by boring or tunneling.
2. The County will require encasement of lines installed by boring or jacking.
3. Annular voids greater than one inch between the bore hole and carrier line (or casing, if used) shall be filled with a slurry grout or other flowable fill acceptable to the County to prevent settlement of any part of the roadway or facility over the line or casing.
4. Where circumstances necessitate the excavation of a bore pit or the presence of directional boring equipment closer to the edge of pavement than set forth in paragraph I.4. above, approved protective devices shall be installed for protection of the traveling public. Bore pits shall be located and constructed in such a manner as not to interfere with the roadway, existing structures or traffic operations. If necessary, shoring shall be utilized for the protection of the roadway and must be approved by the County.

5. All traffic control devices, including signs, markings, or barricades used to warn motorists and pedestrians of the construction activity must conform to the TMUTCD.
6. When trenching longitudinally, backfill, low strength concrete or stabilized sand shall be compacted to densities equal to that of the surrounding soil.

IV. Unsuitable conditions. The following conditions are generally unsuitable or undesirable for pipeline crossings and shall be avoided:

1. deep cuts;
2. locations near footings or bridges and retaining walls;
3. crossing intersections at-grade;
4. locations at cross-drains where the flow of water may be obstructed;
5. locations within basins or structures that are drained by pump if the pipeline carries a liquid or liquefied gas; or
6. terrain where minimum depth of cover would be difficult to attain.

V. Pressure pipelines.

1. Depth of cover for crossings, shall be 60 inches minimally outside paved areas and under ditches (original unsilted flowline)
2. Encasement: Pressure gas pipelines crossing the R.O.W. shall be placed in a steel encasement and shall be protected from corrosion by cathodic protective measures and the installed with utility signs and written agreement that the pavement will not be cut for pipeline repairs at any time in the future.
3. Vents: One (1) or more vents shall be provided for each casing. For casings longer than 150 feet, vent shall be provided at both ends. On shorter casings, a vent shall be located at the high end with a marker placed at the low end.

VI. Clearances.

There shall be a minimum of 12 inches vertical and horizontal clearance between a new utility facility and an existing utility facility, unless a greater clearance is required by the County or existing utility provider. However, if an installation of another utility facility or roadway feature cannot take place without disturbing an existing utility facility, the minimum clearance will be 24 inches.

VII. Markers.

Pipeline crosses a roadway, the utility shall place a readily identifiable, durable, and weatherproof marker over the centerline of the pipe at each right-of-way line. All markers shall indicate the name, address, emergency telephone number of the utility, and offset from the right-of-way line if applicable. For gas, petroleum, water, force main or saltwater pipelines, the pipeline product, operating pressure, and depth of pipe below grade shall also be indicated on the markers. At locations where underground utility facilities have been allowed to cross at an angle other than 90 degrees to centerline, the County may require additional markers in the medians and outer separations of the roadway. Under no circumstance shall proposed pipelines cross existing County rights of way at less than 60 degrees to the centerline.

VIII. Design

Unless otherwise required by pipeline owner or operator, all new roadway installations crossing existing Gas, Petroleum lines, High- & Low-Pressure Pipelines, and other Utility Transmission Main Lines (not applicable for local Municipal Services) the following shall minimally apply.

- A. Depth of cover for crossings.
 1. Depth of cover is the depth to the top of the carrier pipe or casing, as applicable. Where materials and other conditions justify, such as on existing lines remaining in place, the County may approve a minimum depth of cover under the pavement structure of 24 inches or one-half (1/2) the diameter of the pipe, whichever is greater. For encased high-pressure pipeline, the minimum depth of cover shall be:
 - a. the greater of 24 inches or one-half (1/2) the diameter of the pipe, under pavement structures.
 - b. 36 inches if the line is outside the pavement structure or under a ditch; or
 - c. 60 inches for unencased sections of encased lines outside the pavement structure.
 2. Where a reinforced concrete slab is used to protect the pipeline, the County may authorize a reduction in the depths specified in this section. For unencased high-pressure pipelines, the minimum depth of cover is as follows:
 - a. 60 inches outside the pavement surface or 24 inches under the pavement structure in paved areas; or
 - b. 48 inches if the line is under a ditch.
- B. Encasement. Casing shall consist of a vented steel pipe.
- C. Unencasement.
 1. Where encasement is not employed, the utility shall show that the welded steel carrier pipe will provide sufficient strength to withstand the internal design pressure and the dead and live loads of the pavement structure and traffic. Additional protective measures must include:
 - a. heavier wall thickness, higher factor of safety in design, or both;
 - b. adequate coating and wrapping;
 - c. cathodic protection; and
 - d. the use of Barlow's formula regarding maximum allowable operating pressure and wall thickness, as specified in 49 CFR §192.105.
 2. Shallow anode bed types exceeding 48 inches in width shall not be permitted in the right of way. All others must have a depth of coverage of at least 36 inches. Deep well anode beds of up to 60 inches in diameter are acceptable. Rectifier and meter loop poles shall be placed at or near the right-of-way line.
 3. The minimum length of the additional protection shall be the same as that required for an encased crossing.
 4. The County may allow existing lines under low-volume roadways to remain in place without encasement or extension of encasement if they are protected by a reinforced concrete slab or equivalent protection or if they

are located at a depth of five (5) feet under the pavement structure and not less than four (4) feet under a roadway ditch.

- D. Vents. Vents shall be installed at both ends of a casing, regardless of length, with a marker on at least one end. Vents shall be placed at the right-of-way line immediately above the pipeline, situated so as not to interfere with highway maintenance or be concealed by vegetation. The owner's name, address, and emergency telephone number shall be shown on each vent marker.
- E. Aboveground appurtenances. Aboveground appurtenances, except vents for gas lines, shall not be permitted within the right-of-way.
- F. Crossing Angle. New roadways shall cross existing pipelines at 90-degrees to the centerline wherever feasible and in no circumstance shall cross at an angle less than 60-degrees to the centerline.

