# STANDARD CONSTRUCTION DETAILS

## AUGUST 2023

### SHEET INDEX

<table>
<thead>
<tr>
<th>SHEET NO.</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>STD-01</td>
<td>COVER AND SHEET INDEX</td>
</tr>
<tr>
<td>STD-02</td>
<td>GENERAL NOTES</td>
</tr>
<tr>
<td>STD-03</td>
<td>GENERAL NOTES</td>
</tr>
<tr>
<td>STD-04</td>
<td>PAVING / MAJOR ARTERIAL</td>
</tr>
<tr>
<td>STD-05</td>
<td>PAVING / MINOR ARTERIAL</td>
</tr>
<tr>
<td>STD-06</td>
<td>PAVING / MAJOR &amp; MINOR COLLECTOR / RESIDENTIAL</td>
</tr>
<tr>
<td>STD-07</td>
<td>PAVING / JOINTS</td>
</tr>
<tr>
<td>STD-08</td>
<td>PAVING / MEDIANS</td>
</tr>
<tr>
<td>STD-09</td>
<td>SIDEWALKS</td>
</tr>
<tr>
<td>STD-10</td>
<td>MISCELLANEOUS PAVING DETAILS</td>
</tr>
<tr>
<td>STD-11</td>
<td>PAVING / DRIVEWAYS</td>
</tr>
<tr>
<td>STD-12</td>
<td>PAVING ALLEY RADIUS</td>
</tr>
<tr>
<td>STD-13</td>
<td>MARKING</td>
</tr>
<tr>
<td>STD-14</td>
<td>STORM SEWER 10 FOOT INLET (SINGLE)</td>
</tr>
<tr>
<td>STD-15</td>
<td>STORM SEWER 14 FOOT AND 20 FOOT INLET (DOUBLE)</td>
</tr>
<tr>
<td>STD-16</td>
<td>STORM SEWER MANHOLE DETAILS</td>
</tr>
<tr>
<td>STD-17</td>
<td>STORM SEWER INLET DETAILS</td>
</tr>
</tbody>
</table>

### SHEET INDEX

<table>
<thead>
<tr>
<th>SHEET NO.</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>STD-18</td>
<td>CHANNELS - CONCRETE</td>
</tr>
<tr>
<td>STD-19</td>
<td>CHANNELS - GABIONS</td>
</tr>
<tr>
<td>STD-20</td>
<td>FLUMES</td>
</tr>
<tr>
<td>STD-21</td>
<td>DETENTION PONDS</td>
</tr>
<tr>
<td>STD-22</td>
<td>WATER</td>
</tr>
<tr>
<td>STD-23</td>
<td>WATER</td>
</tr>
<tr>
<td>STD-24</td>
<td>WATER</td>
</tr>
<tr>
<td>STD-25</td>
<td>WATER - FIRE HYDRANT</td>
</tr>
<tr>
<td>STD-26</td>
<td>SANITARY SEWER - MANHOLES</td>
</tr>
<tr>
<td>STD-27</td>
<td>SANITARY SEWER - DROP MANHOLE</td>
</tr>
<tr>
<td>STD-28</td>
<td>SANITARY SEWER - AERIAL CROSSING</td>
</tr>
<tr>
<td>STD-29</td>
<td>SANITARY SEWER - TRAPS</td>
</tr>
<tr>
<td>STD-30</td>
<td>PIPE EMBEDMENTS</td>
</tr>
<tr>
<td>STD-31</td>
<td>METER VAULT</td>
</tr>
<tr>
<td>STD-32</td>
<td>METER VAULT</td>
</tr>
<tr>
<td>STD-33</td>
<td>TREE PROTECTION</td>
</tr>
<tr>
<td>STD-34</td>
<td>MONUMENTATION</td>
</tr>
<tr>
<td>STD-35</td>
<td>STONE CONSTRUCTION ENTRANCE / EXIT</td>
</tr>
<tr>
<td>STD-36</td>
<td>TEMPORARY DIVERSION</td>
</tr>
<tr>
<td>STD-37</td>
<td>SILT FENCE STONE OVERFLOW STRUCTURE</td>
</tr>
<tr>
<td>STD-38</td>
<td>ROCK CHECK DAM</td>
</tr>
<tr>
<td>STD-39</td>
<td>STONE OUTLET SEDIMENT TRAP</td>
</tr>
<tr>
<td>STD-40</td>
<td>SEDIMENT BASIN</td>
</tr>
<tr>
<td>STD-41</td>
<td>EROSION CONTROL MATING</td>
</tr>
<tr>
<td>STD-42</td>
<td>PIPE INLET PROTECTION</td>
</tr>
<tr>
<td>STD-43</td>
<td>GRASS LINED CHANNELS</td>
</tr>
<tr>
<td>STD-44</td>
<td>OUTLET VELOCITY CONTROL STRUCTURE</td>
</tr>
<tr>
<td>STD-45</td>
<td>CURB INLET PROTECTION</td>
</tr>
<tr>
<td>STD-46</td>
<td>CURB INLET PROTECTION</td>
</tr>
<tr>
<td>STD-47</td>
<td>DROP INLET PROTECTION</td>
</tr>
<tr>
<td>STD-48</td>
<td>EROSION &amp; BMP NOTES</td>
</tr>
<tr>
<td>STD-49</td>
<td>SITE DESCRIPTION - EROSION &amp; SEDIMENT NOTES</td>
</tr>
</tbody>
</table>
GENERAL CONSTRUCTION NOTES

1. All construction, materials and workmanship shall conform to Standard Specifications for Public Works Construction, North Central Texas Council of Governments (NCTCOG Standard Specifications) latest Edition unless otherwise noted.

2. The Contractor shall provide temporary drainage measures during construction.

3. Bracing of utility poles may be acquired by utility companies when trenching or excavation is in close proximity to the poles. The cost of bracing poles will borne by the Contractor. There is no separate pay item for this work. The cost shall be considered incidental work.

4. The locations, elevations and dimensions of existing utilities shown on the plans were obtained from Dig Toss and/or available utility company records and plans and are considered approximate. It shall be the Contractor's responsibility to verify locations, elevations, and dimensions of adjacent and/or conflicting utilities sufficiently in advance of construction in order that adjustments can be made to provide adequate clearance. The Contractor shall preserve and protect public utilities at all times during construction. Any damage to utilities resulting from Contractor's operations shall be noted by the Contractor's engineer. The City shall be notified when proposed facility grades conflict with existing utility grades.

5. The Contractor shall immediately repair or replace any physical damage to private property, including, but not limited to fences, walls, pavement, grass, trees, planters and sprinkler irrigation systems at no cost to the owner. This work shall be subsidiary to the contract, unless otherwise noted, and is not a separate pay item.

6. The Contractor shall cut and plug all irrigation systems located within the easements prior to construction. After construction is complete, the Contractor shall reconnect the systems to the original or better condition, at no cost to the owner. All work shall be completed by an irrigation licensed in the State of Texas. The Contractor shall coordinate with the property owner and the City prior to cutting irrigation systems.

7. The Contractor shall remove surplus material from the project area. This work shall be subsidiary to the contract and is not a separate pay item. Surplus material shall be properly disposed of.

8. The Contractor shall sawcut, remove and dispose of existing pavements, curbs and gutters, intrusions, driveways and sidewalks. Disposal of debris shall be off-side and in a lawful manner.

9. The Contractor shall vegetate all areas disturbed by construction. The Contractor shall provide whatever measures are needed, including temporary irrigation and mulch, to ensure establishment of grass. Unless otherwise noted, pristine lawn areas and pathways in front of pristine lawn areas disturbed by construction shall be replanted with grass and established vegetation twelve to twenty-four months after project completion. The Contractor to ensure water and establish vegetation twelve to a period of 4 weeks minimum or until grass is established as determined by the City. Work shall be completed in accordance with NCTCOG Item 205.1.1.

10. The Contractor shall protect all trees in the project area and temporary easements during construction. No trees shall be removed, unless otherwise noted, or damaged by equipment. The Contractor shall verify the presence of trees and mark them for protection. The Contractor shall protect all trees in the project area and temporary easements during construction. No trees shall be removed, unless otherwise noted, or damaged by equipment. The Contractor shall verify the presence of trees and mark them for protection.

11. The Contractor shall be responsible for taking measures to minimize damage to tree limbs, tree trunk, and tree roots along the route of the project. All such measures shall be considered incidental work. Contractor shall inspect the work site in advance and arrange to have any tree limbs pruned that might be damaged by equipment operations. The City shall be notified at least 24 hours prior to any tree trimming work. Nothing shall be stored over the tree root system within the drip line limits of any tree. The Contractor employ a qualified landscaper for all work required for tree care to ensure utilization of the best agricultural practices and procedures.

12. All fences to remain unless otherwise noted.

13. It will be the responsibility of the contractor to protect all public utilities in the construction of this project. All manholes, cleanouts, valve boxes, fire hydrants, etc. not shown to be abandoned, must be adjusted to finished grade by the contractor. All utility location and grade adjustment are subsidiary except for those included in the pay items.

SIDEWALK REPLACEMENT NOTE

1. Sidewalk removal shall be from joint to joint. Sawcut shall be at existing joint. Connection to existing sidewalk shall be with reflex expansion joint material (recycled rubber or aequal). Full joint replacement required.

2. 18. GENERAL NOTES FOR WATER LINES

1. Fittings shall be ductile iron and shall be cement finish inside and bitumeous coated on the outside. Where connections are made to pipes of dissimilar materials, suitable bond breakers shall be used.

2. All ductile iron fittings shall be mechanical joint or slip joint type CL250.

3. Pipe joints shall be of the push-on type unless otherwise noted.

4. Valves, vault bodies, fire hydrants and manholes boxes shall be located outside of sidewalk areas.

5. All backfilling, embankment and backfilling will be incidental to the unit cost of pipe.

6. Water line sections crossing wastewater mains or laterals shall be a minimum of 18 feet long and shall be centered over the wasterwater main or lateral such that the joints of the water line are equidistant and at least one foot horizontally from the center line of the wastewater main or lateral. Wherever possible, the crossing shall be centered between the joints of the wastewater main or lateral.

7. Water Lines shall be AWWA C900 DR15 pressure class.

8. All trench backfill shall be placed in maximum 30-inch loose lifts and mechanically compacted. Testing shall be in accordance with NCTCOG as a minimum.

9. Work to make connections shall be continuous and shall occur during times of low usage.

10. Valves on lines 12-inch and less shall be gate valves. Gate valves on laterals shall be flanged with slip-on, tee or ring. Gate valves shall conform to AWWA C-508. Butterfly valves shall conform to AWWA C-504.

11. Dewatering of water line trench may be required during construction. Dewatering shall be subsidiary to pipe installation.

12. Contractor to construct water line to grade shown in the plans. All water lines shall have a minimum cover of 4 feet.

13. During water line test construction contractor to dewatering in accordance with TCEQ requirements prior to releasing water overland and into storm-drain systems.

14. Contractor to support all existing utilities as construction of new water line crosses those utilities. No separate pay item. Include in cost of water line.

15. Contractor shall field locate pipelines at connection points prior to ordering or fabricating proposed pipe. Contractor shall verify pipe size, type, elevation and horizontal location. Contractor shall make all necessary adjustments to connect to existing line after approval from the engineer.

16. All new water services shall be AWWA C901, 3/4" minimum IDR (250 psi) HDPE poly pipe with PE4710 as specified in ASTM F716, from the service tap to the curb stop, 3-8inch minimum compression fitting angle stop, and meter box, unless otherwise indicated on the plans. Curb stops will be located within the meter box and facing toward the lot.

17. Bolts and nuts for mechanical joints shall be of a high-strength low-alloy corrosion resistant steel conforming to ASTM A252 (Type 5).

18. Assembly of pipe to be performed as required by pipe manufacturer. Gaskets shall be clean and lubricated. Do not swing or stab the joint. Align the spigot to the bell, insert spigot into bell and contact gasket. The spigot end is marked with insertion mark. Insert pipe to the mark, do not over-insert.

19. Contractor to construct water lines to grade shown in the plans. All water lines shall be tested and disinfectant prior to connections.

20. All crossings of sanitary sewer lines must meet current TCEQ requirements.

21. General Notes for Sanitary Sewer Lines

1. Unless otherwise noted on the plans, all sanitary sewer pipes shall be SDR35 PVC ASTM Designation DS240. Other pipes shall be subject to Approval by the City.

2. All residential sanitary sewer laterals shall include a 4" tee wyd bend, pipe and stopper. Sewer laterals shall be laid on a minimum slope of 1.00% from the main line to the street right-of-way.

3. All sanitary sewer lines and laterals shall be trenched with a pulled mandrel, air pressure test, and television video. The video shall be provided to the City in a electronic format (DVDs format).

4. All sanitary sewer manholes within flood plains or flood plain area require Type "S" manhole lids and shall be properly sealed and "taped per TCEQ requirements. Grade of vertical rise is minimum 1.5 feet above the 100-year water surface.

5. All manholes shall be vacuum tested in accordance to NCTCOG requirements.

6. All manhole covers and clean outs shall be set at finished grade unless otherwise noted. In open spaces, the top of the sanitary sewer manhole shall be installed at a minimum of 12 inches above the surrounding ground.

7. Contractor to construct sewer line to grade shown in the plans.

8. Contractor to support all existing utilities as construction of new sewer line crosses these utilities. No separate pay item. Include in cost of sewer line.

9. Assembly of pipe to be performed as required by pipe manufacturer. Gaskets shall be clean and lubricated. Do not swing or stab the joint. Align the spigot to the bell, insert spigot into bell and contact gasket. The spigot end is marked with insertion mark. Insert pipe to the mark, do not over-insert.

10. Contractor shall field locate pipelines at connection points prior to ordering or fabricating proposed pipe. Contractor shall verify pipe size, type, elevation and horizontal locations. Contractor shall make all necessary adjustments to connect to existing line after approval from the engineer.

11. All crossings of possible water lines must meet current TCEQ requirements.

BACKFILL NOTE

1. All trench backfill shall be placed in maximum 30-inch loose lifts and be mechanically compacted. Density testing shall be in accordance with NCTCOG as a minimum and is directed by the City. The NCTCOG minimum for density testing is once per 300-feet per 1-foot of compacted depth. (NCTCOG Item 504.5.3.2)

GENERAL NOTES FOR TRAFFIC CONTROL

1. The temporary traffic control measures shown on these plans are to be considered a minimum. Additional measures shall be furnished when necessary for traffic safety and to meet the latest Texas MUTCD (TTEC).2.

2. When the normal condition of the roadway is suspended through closure of any portion of the right-of-way, temporary construction work zone traffic control devices shall be installed to effectively guide the motorizing public through the area. Consideration for road user safety, worker safety, and the efficiency of road user flow shall be an integral element of every traffic control zone. All traffic control devices shall be in accordance with the latest Texas MUTCD.

3. The contractor shall be responsible for maintaining all traffic control devices on an around-the-clock basis, whether or not work is active. Any deficiencies shall be corrected by the contractor immediately, regardless of time of day.

4. Lane closures will not be permitted on arterial roads before 9:00 a.m. or after 4:00 p.m. Violations may result in suspension of all work at the job site for a minimum of 48 hours.

5. All temporary traffic control devices shall be removed as soon as practical when they are no longer needed. When work is suspended for short periods of time at the end of the workday, temporary traffic control devices that are no longer appropriate shall be removed or covered. The fines associated with this practice will result in a verbal warning to the contractor foreman. Subsequent violations will result in suspension of all work at the job-site for a minimum of 48 hours.
Erosion Control & Vegetation Notes

1. Every soil disturbing activity shall have an accompanying Erosion Control Plan (ECP), and either Construction Site Notice (CSN) for those activities disturbing more than 1 but less than 5 acres, or Notice of Intent (NOI) for those activities disturbing 5 or more acres including those activities less than 5 acres, but are part of a common plan of development totaling 5 or more acres. A copy of the appropriate CSN or NOI shall be provided to the City.

2. The CSN or NOI shall be posted in a location visible to the public until construction is complete and Notice of Termination (NOT) submitted. The Storm Water Pollution Prevention Plan (SWPPP) shall be readily available for review by Federal, State, or local officials.

3. Soil disturbing activities will occur prior to the SWPPP, ECP, and associated Best Management Practices (BMP) being fully implemented. A copy of the SWPPP shall be provided to the City prior to the start of construction.

4. The contractor shall employ measures as necessary to prevent dirt, mud, debris from being tracked off site.

5. The site shall be reviewed by the operator or his representative weekly, and after any major storm. Adjustments/repairs to the erosion control measures will be made as needed.

6. A completed NOT shall be submitted to the State and a copy of this NOT shall be provided to the City prior to final acceptance.

Tree Protection Notes

1. Unless shown on the plans to be removed, all trees within the construction area shall be protected during construction with temporary fencing or other measures as needed including pruning of limbs and roots.

2. Protective measures shall be taken prior to the start of any work in the area and shall be maintained throughout the duration of the project.

3. Pruning of limbs to provide clearance for construction equipment shall take place before construction begins to prevent damage to trees by tipping and tearing of branches.

4. It is anticipated that in some instances trenches will encroach in the drip line of protected trees. Encroachment in these instances is permitted. Fencing will be installed outside the trench in such a manner as to limit the amount of encroachment while allowing all necessary trench safety measures.

5. Any roots exposed during construction activities shall be pruned flush with the soil. If exposed root areas are not backfilled with soil within two days of initial exposure, they shall be covered with organic material in a manner that reduces the soil temperature and minimizes root loss due to evaporation.

6. No-topsoil treading greater than 4 inches shall be permitted within drip line areas.

Pedestrian Accessibility (Within Public ROW)

1. All newly constructed sidewalks, curb ramps and crosswalks installed shall be considered a pedestrian access route and shall be considered a pedestrian access route and shall conform to the most current "Shall" Guidelines for Public Rights-of-Way created by the United States Access Board. http://www.access-board.gov/paw/pawial.htm

2. Curb Ramps shall conform to the City Standard Construction Details.

3. Detectable warning surfaces shall be warning plates.

4. The contractor shall provide a clear and safe route for pedestrians adjacent to the site for the duration of construction. A temporary pedestrian route shall be provided when any existing sidewalk is closed due to construction activity.

5. Construction materials shall be kept off existing sidewalks and consolidated in areas within the City right-of-way, unless otherwise approved by the City.

Paving Notes

1. All concrete for all streets shall be in accordance with NECTOG Class "C" concrete (3,600 p.s.i. compressive strength @ 28 days) for slip forming, NECTOG Class "F" concrete (4,000 p.s.i. compressive strength @ 28 days) for hand pouring.

2. Reinforcing steel shall be deformed bars No. 3 on 16 inch centers or No. 4 bars on 24 inch centers. Reinforcing shall be in both directions on center. Reinforcing steel shall be in accordance with ASTM A615, 616, & 617.

3. All reinforcing steel shall be tied (100%). Reinforcing shall be set on plastic chairs. Bar laps shall be minimum 50 diameters.

4. Expansion joints shall be spaced every 200 feet and at all intersections. Alleys shall have a minimum of two expansion joints.

5. Swales transverse driveway shall be spaced every 120 feet on paving 8 inches or thicker and every 15 feet for paving thickness less than 8 inches. Swales shall be within 5 to 12 hours after the pour including sealing. Otherwise the section shall be removed and reconstructed, and longitudinal full joint constructed.

6. Subgrade under pavements shall be minimum 6 inches of lime treated subgrade. Only hydraulic lime shall be utilized. Optimum lime shall be used. Optimum lime shall be determined during the excavation by the use of a lime testers test. Lime testers test shall be taken along the excavation at all changes in soil and a minimum of 300 feet. Lime testers shall be completed by an independent laboratory approved by the city.

7. Lime treated subgrade shall be compacted to a density of not less than 95 percent of the maximum density as determined by ASTM D 989. Moisture content shall be within ±4% of optimum. Density test results shall be completed by an independent laboratory approved by the city. All results shall be provided to the city.

8. Lime trimmings are not acceptable for any use.

9. All fill shall be compacted by mechanical methods. Maximum loose fill for comparison shall be 8 inches. All fills shall be tested for density by an independent laboratory approved by the city. Density requirements shall be as shown on the plans for the type of material called for in the plans.

10. All disturbed areas of roadway work shall have grass established immediately. Grass shall meet the requirements of item 3.8, 3.8.1(b), & 3.11 of NECTOG.

11. No vehicles shall be permitted on concrete pavement without approval from the city. The city will make determination based on concrete break report.

Storm Sewer

1. The floor of the excavation for inlet box must provide a firm, level bed for the base section to rest upon.

2. Minimum of 9 inches of 1" diameter (maximum) rocks or gravel shall be used to prepare the building to final grade or in lieu of this, at least 6 inches of 2 inch minimum standardized sand shall be allowed to set by keeping hole pumped dry.

3. After pipe has been laid on proper bedding, backfilling will commence with 3" maximum loose fills mechanically compacted to 90% standard proctor under roadway or 90% standard proctor outside roadway paving. Maximum vase rock in backfill shall not exceed 4 inches in diameter.

4. Precast units must be approved by the city.

5. All concrete shall be in accordance with NECTOG Class "F" (4,200 p.s.i. compressive strength @ 28 days.)

6. Locking device is required on all storm sewer lids.

7. No "Dumping" warning plaque to be installed on all standard and recessed inlets.

8. Concrete cast-in-place inlets shall have a minimum compressive strength of 4,200 p.s.i. @ 28 days.


10. Existing storm sewer pipe and/or manholes shall be located prior to setting of constructing inlet boxes. If adjustment in grade of lateral is required, a revised design by the engineer of record shall be submitted to the city for approval.

11. Reinforced concrete pipe class III minimum or high density polyethylene storm sewer pipe is approved within the city.
MISCELLANEOUS PAVING DETAILS

CITY OF HUTCHINS, TEXAS

DATE: AUGUST 2023

Page 1

Rail Header

Street Header

24" Lay Down Gutter Section

24" Standard Gutter Section

Notes:
- EXPANSION JOINTS IN CURB & GUTTER SHALL BE SPACED AT A MINIMUM DISTANCE OF 40' APART AND AT ALL RADUS POINTS R.C.'s AND H.C.'s.
- EXPANSION JOINTS IN CURB & GUTTER SHALL BE SPACED AT A MINIMUM DISTANCE OF 40' APART.
CITY OF HUTCHINS, TEXAS

STANDARD CONSTRUCTION DETAILS

PAVING ALLEY RADIUS

Date: AUGUST 2023  Sheet: STD-12

ALLEY TURN FOR \( \alpha = 75' - 90' \)

ALLEY TURN FOR \( \alpha > 90' \)

ALLEY TURN FOR \( \alpha = 30' - 75' \)

ALLEY INTERSECTING ALLEY

NOT TO SCALE

SECTION A-A

DETAIL "A"

ALLEY / STREET INTERSECTION
CITY OF HUTCHINS, TEXAS

STORM SEWER MANHOLE DETAILS

PLAN OF COVER

STORM SEWER TYPE A MANHOLE
MAX. PIPE SIZE 12"

STORM SEWER FRAME AND COVER
BASE & PARTS COVER SIP, FRAME KEEP OR EQUAL

STORM SEWER TYPE B MANHOLE
MAX. PIPE SIZE 12"
TYPICAL HDPE SERVICE CONNECTION WITH METER BOX

WATER MAIN LOWERING

NOTE:

1. All steel pipe shall be ductile iron and include fittings and couplings.
2. All steel pipe shall be made to standard size of NPS, and all steel pipe shall include ductile iron and fittings and couplings.
3. All steel pipe shall be made to standard size of NPS, and all steel pipe shall include ductile iron and fittings and couplings.
4. All steel pipe shall be made to standard size of NPS, and all steel pipe shall include ductile iron and fittings and couplings.

TYPICAL CREEK CROSSING

THRU EEP BLOCK

NOTE:

1. All steel pipe shall be ductile iron and include fittings and couplings.
2. All steel pipe shall be made to standard size of NPS, and all steel pipe shall include ductile iron and fittings and couplings.
3. All steel pipe shall be made to standard size of NPS, and all steel pipe shall include ductile iron and fittings and couplings.
4. All steel pipe shall be made to standard size of NPS, and all steel pipe shall include ductile iron and fittings and couplings.
CITY OF HUTCHINS, TEXAS

WATER - FIRE HYDRANT

TYPICAL DFC CONNECTION

1. In general, all fire hydrants shall comply with the American National Standards Institute (ANSI) standards for fire hydrants and auxiliary equipment for fire fighting. For water and fire hydrant installation, all hydrants shall have a minimum of 100 psi opening and a minimum of 2 1/2" diameter connection. All hydrants shall be installed in accordance with the applicable codes and standards. All hydrants shall be approved by the City.

2. Color post shall be a 6" dia. steel pipe. The height of the post above the ground level shall be determined by the City. The post shall be encased in 8" dia. concrete. A 1 1/2" steel pipe shall be inserted into the top of the post and shall extend above the ground level. The post shall be painted black. The post shall be a minimum of 108" above the ground level.

3. Body color shall be white. Stem color shall be black. Cap color shall be red.

4. Fire hydrants shall not be installed in the sidewalk.

5. Fire hydrants shall be on a 5-foot sidewalk and shall be installed on a concrete pad. Fire hydrants shall be installed on the corner of the pad.

6. Fire hydrants shall have a 5-foot sidewalk from the edge of the pad.

7. Fire hydrants shall be installed on a 5-foot sidewalk.

8. The 5-inch main shall be connected to the fire hydrant using a 5-inch main.

TYPICAL FIRE HYDRANT INSTALLATION

1. Fire hydrants shall be installed on a concrete pad. The concrete pad shall be a minimum of 5 feet by 5 feet.

2. Fire hydrants shall be installed on a 5-foot sidewalk.

3. Fire hydrants shall be marked "FIRE HYDRANT" on the side of the pad.

4. Fire hydrants shall be installed on a 5-foot sidewalk.

5. Fire hydrants shall be installed on a 5-foot sidewalk.
TREE PROTECTION PLAN

1. Trees to be protected during construction orange safety fencing (end to end) height shall be installed at the top line of all trees to remain fencing or bearing or performing work within those areas. Other than shown on the plan, will not be allowed. The tree protection shall remain during construction.

2. No attachments or wires of any kind, other than those of a protective nature, shall be attached to any tree.

3. Poles to be installed at 1 foot centers and aluminum wire tree placed on 12 inch centers on each post to support fencing and properly maintained with protective safety caps in place.

4. Fencing to be maintained and repaired as needed during construction.

5. Activity within a fenced tree protection zone, not construction grading, parking equipment, or material storage, or any other activity shall be allowed within the fenced area.

6. Signs shall be installed on the protective fence visible on a sight of the fenced area around the on each side and every 50 feet of varying height. The height of each sign must be a maximum of 25 feet.

7. Critical root zone: The minimum area beneath a tree that must be left undisturbed in order to preserve a sufficient root mass to keep a tree a reasonable chance of survival. The critical root zone is typically represented by a concentric circle centering on the tree stem with a radius equal to one (1) times the number of inches of the main diameter (312 in ft x 1 x diameter inches).

8. Cutting activities near the edge of trees adjacent to a tree protection zone can cause substantial damage to the protected trees. Wherever possible, it is advisable to set minimum treatment distances along the limits of lawn maintenance, as to cut, rather than rear, mowing is required for the protection of mature and mature trees.

9. Soil compaction where compaction might occur due to traffic of materials through the tree protection zone, the area must be molded with a minimum four-inch layer of processed topsoil.
1. Signs in Trost Right-of-Way shall be on all white background.
2. All signs shall have reflective coating (High Intensity Prismatic).
3. All fonts shall be highway series.
4. Street sign blanks shall be aluminum (min. 0.080 thickness).

**POLE NOTES**

1. All poles for street signs shall be aluminum, powder coated black. The poles shall be fluted, outside diameter shall be 4 inches. All poles shall include breakaway kits.
2. All poles shall include 4 cast aluminum powder coated black decorative bands.
3. All poles shall include cast aluminum powder coated black acorn finials.
4. All poles shall be set into ground a minimum of 2 feet and set in 2,000 P.S.I. concrete.
5. All hardware shall be aluminum or stainless steel. Second breaker.
6. All poles, pole bases and pole finial shall be approved by the city.
4. TEMPORARY STONE CONSTRUCTION ENTRANCE/EXIT

A. Description: An aggregate area or pad located where vehicles enter and leave a construction site.

B. Purpose: To provide an area where vehicles can remove mud and sediment from their tires prior to driving on public streets. If used properly, it reduces the requirement to remove sediment from public streets, directs the majority of traffic to a single location, and provides protection for other BMPs on site through traffic control.

C. Applications: Use wherever traffic will be leaving a construction site and moving directly onto a public road or an off-site paved surface. Primary installations include exits from storage areas, staging areas, truck haul routes, and borrow/spoil areas.

D. Limitations: Selection of the stone construction exit/entrance location is critical, since to be effective all traffic must use the area(s) to exit a site. The device is not suitable for use on long, linear projects unless there are designated points for controlled access. Contractors shall clean-up excessive stone from existing paved streets during the construction process.

E. Design Criteria:

1) Minimum Pad Dimensions: Width = 15 feet or total width of vehicle access, whichever is greater.
   Length = 50 feet (Residential lots use 20')
   Depth = 6 inches

2) Grade: Avoid grades steeper than 5% and grade to drain back on to the site or to another BMP to control off-site sedimentation.

3) Location: Locate the construction entrance/exit to limit the amount of sediment that leaves the construction site and to provide for maximum use by vehicles leaving the site. Do not place along curves in the public roadway.

4) Filter Fabric: Shall be used for installations with a construction period of more than 6 months, where heavy truck traffic is anticipated daily, or very weak sub-grade soils are present.

F. Material Specifications:

1) Aggregate: Natural stone or re-cycled concrete meeting the gradation requirements
   - Passing 5-inch Sieve 100%
   - Retained 2-inch Sieve 100%

2) Filter Fabric: NCTCOG Item 201.5.2.1

Maintenance Requirements: Inspections should be made weekly and after rain storm events to ensure that the device is functioning properly. When sediment or mud has clogged the void spaces between the stones or mud is being tracked onto the public roadway the aggregate pad must be washed down or replaced. Runoff from the wash-down operation shall not be allowed to drain directly off site without first flowing through another BMP to control off-site sedimentation. Periodic re-grading or the addition of new stone may be required to maintain the efficiency of the installation.
9. **TEMPORARY DIVERSIONS**

**A. Description:** A ridge, excavated channel, or combination ridge and channel which redirects on-site or off-site runoff to a desired location, during the construction or land disturbing activity.

**B. Purpose:** To protect disturbed ground areas from up-slope runoff and to divert sediment laden on-site runoff to installed BMPs for sediment removal.

**C. Applications:** Typical applications include:
1) Installation above cut or fill slopes to intercept runoff before it flows down a steep slope.
2) Installations to intercept runoff from undisturbed areas to divert the flow around the construction site.
3) Across unprotected slopes, as a slope break, to reduce the slope length.
4) Around the perimeter of the site to prevent sediment laden runoff from leaving the site and to direct the runoff to an appropriate BMP.
5) Within the construction site to divert runoff to the appropriate BMP or to isolate an area from sedimentation damage.

**D. Limitations:** Diversions must not be constructed at a steep grade. They must be sized to be able to convey the flow from the drainage area entering the diversion. The locations of diversions should be carefully planned since they may limit the movement of construction vehicles across the site.

**E. Design Criteria:**
1) Drainage Area - 5 acres or less.
2) Design Capacity - Peak runoff from a 10 year storm.
3) Design Velocity - 6 feet per second or less at design capacity.
4) Side Slopes - 2H:IV or flatter.
5) Freeboard - 0.5 feet between top of ridge and water surface at design flow.

**F. Material Specifications:** Erosion Control Matting - TxDOT approved Specification Item 169, Class 2.

**G. Maintenance Requirements:** Inspect diversions weekly or immediately after rainfall events. Particular attention must be paid to areas where sediment builds up in the channel, areas where vehicles have crossed or caused damage, areas where the ridge begins to erode, and any areas where flow overtops the ridge. Sediment in the channel shall be promptly removed and damaged areas of the ridge shall be stabilized by appropriate methods. Methods of stabilization may include the following or any combination of the following: netting, mulching, temporary seeding, or the flattening of the side slopes. Diversions to be left in place for more than 30 days should be stabilized by establishing temporary ground cover.
6. SILT FENCE

A. Description: A temporary sediment barrier consisting of filter fabric stretched between and attached to metal or wooden posts, with the bottom of the fabric firmly embedded in the soil. At installations draining larger areas the filter fabric will be attached to a hog wire support that is attached to the fence posts.

B. Purpose: To slow the flow of sediment laden water from small disturbed areas to allow sedimentation to occur and to filter out larger sediment particles as the water flows through the filter fabric.

C. Applications: Silt fence is normally used as a perimeter control immediately downstream of small disturbed areas. It can also be used as a flow diversion for very small drainage areas, but does not function as well as a normal diversion channel and is usually much more expensive.

D. Limitations: Do not install silt fences across channels, ditches, streams, pipe outlets, or areas of concentrated water flow. Silt fence locations can limit construction vehicle access so the locations should be well planned to prevent obstructions. Water will pond behind the silt fence, resulting in localized flooding during major rain events.

E. Design Criteria: Place silt fence along perimeter of site where disturbed area sheet runoff must be controlled. Limit the drainage area to 0.25 acres per 100 lineal feet of fence. Provide wire support backing whenever the drainage area exceeds 0.10 acres per 100 lineal feet of fence. Maximum post spacing shall not exceed 8 feet. Stone overflow structures or other outlet device shall be installed at all low points along the fence or every 300 feet if there is no apparent low point.

F. Material Specifications:
1) Filter Fabric: NCTCOG Item 201.5.2.1
2) Stone Overflow: NCTCOG Item 201.5.2.4
3) Wire Support: NCTCOG Item 201.5.2.3
4) Fence Posts: NCTCOG Item 201.5.2.2

Maintenance Requirements: Silt fence should be inspected weekly and after major rain events to ensure that the device is functioning properly. Remove sediment from behind fence when the depth of sediment has built up to one-third the height of the fence above grade. Inspect the base of the fence to ensure that no gaps have developed and re-trench as necessary. Inspect fence posts to ensure that they are properly supporting the fence. Straighten, reset and add posts if necessary. If filter fabric is ripped, damaged or deteriorated, replace it in accordance with the original specifications and details.
7. ROCK CHECK DAMS

A. Description: A small temporary dam made of stone or re-cycled concrete constructed across a swale, ditch, or channel.

B. Purpose: Reduces the velocity of flow and thus the erosion potential of the flowing water. Also provides minimal sediment storage behind the dam.

C. Applications: Rock check dams are used primarily in small to moderately sized open channels that have erosive velocities for design flow conditions. They are typically used in long linear roadway type projects or on short steep sections of drainage channel. These devices are a smaller version of stone outlet sediment traps which are used for larger drainage areas.

D. Limitations: Rock check dams shall not be used in a live stream. The installation of check dams reduces the hydraulic capacity of the channel and localized flooding may result. If not properly installed as detailed or not properly maintained the use of this method can lead to more serious channel erosion problems and channel instability. Method should not be used as a primary erosion control device, but in conjunction with other devices.

E. Design Criteria:

1) Drainage Area: 2.0 acres or less.

2) Linear Spacing: Top of the downstream dam is at the same elevation as the bottom of the upstream dam.

3) Maximum Height: 2 feet at the center of the dam.

4) Stone Size: Well graded from 1½” diameter through the maximum stone diameter. Max. Stone Diameter (inches) = (3 inches/ft.) x (Base Width in feet)

5) Stone Slope: 1.5H:1V or flatter.

F. Material Specifications:

- Aggregate: Natural stone or re-cycled concrete in a mix ratio of 1:1 of 6-inch to 12-inch diameter stone with 2-inch to 4-inch diameter stone.

G. Maintenance Requirements: Rock check dams should be inspected weekly and after all rain events to ensure that the device is functioning properly. Remove sediment from the storage area upstream of the dam when the depth of sediment has built up to one-half of the dam height. Repair damage to the channel in the vicinity of the check dams immediately to prevent additional damage. Replace missing or dislodged rock as needed to maintain the design height and cross section of the check dam.
8. STONE OUTLET SEDIMENT TRAP

A. Description: A ponding area formed by placing an earth and/or stone embankment across a drainage-way or swale. The ponding area may be natural or improved to provide the required storage volume.

B. Purpose: To detain sediment laden runoff long enough to allow the majority of the sediment to settle from the water and to allow diffused runoff from the outlet.

C. Applications: Normally used where the natural topography allows for the construction of the embankment to form the ponding area. Diversions, drainage improvements, and localized grading will allow placement in almost any location that has adequate space for the storage area and will accept the runoff from the disturbed site. The stone outlet sediment trap can be used instead of the standard sediment basin.

D. Limitations: Do not place device in a live stream. Avoid placing in areas planned for future improvements such as pavement or buildings. Inlet channels or pipe should be located as far away from the stone outlet as is practicable to allow for maximum sediment settling time in the basin.

E. Design Criteria:
   1) Drainage Area: 30 acres, maximum.
   2) Storage Volume: 1800 cubic feet per acre of disturbed land draining to the device.
   3) Surface Area of Storage Area: 1% (0.01) of the area draining to the device.
   4) Embankment Height: 6 feet (maximum) to top.
   5) Embankment Slopes: 1.5H:1V or flatter.
   6) Embankment Top Width: 2 feet (minimum)
   7) Stone Outlet Width: 4 feet (minimum)
   8) Outlet Capacity: 10-year design storm, \( C = 0.50 \), Max. \( T_c = 15 \) minutes.
   9) Freeboard @ Design Flow: 6 inches.

F. Material Specifications:
   1) Stone Rip-Rap: Re-cycled concrete 6-inch to 12-inch in diameter
   2) Filter Stone: Passing 1½ Sieve 100%, Retained on ¾” Sieve 100%
   3) Filter Fabric: NCTCOG Item 201.5.2.1

G. Maintenance Requirements: Stone outlet sediment traps should be inspected weekly and after major rain events to ensure that the device is functioning properly. Remove sediment from the storage area when the depth of sediment has built up to one-half the height of the stone outlet. Inspect the downstream base of the stone outlet and the downstream flow channel to ensure that no excessive erosion or gullies have developed and repair as necessary. The sediment storage area should drain within 48 to 72 hours after a rain event. The filter stone on the upstream face of the stone outlet may require cleaning or replacement if standing water remains for longer periods.
9. SEDIMENT BASIN

A. Description: A basin created by building an earth dam across a waterway or low drainage area and/or by excavation. The basin temporarily detains sediment laden runoff and releases it at a reduced rate normally through a perforated corrugated metal riser and barrel assembly.

B. Purpose: To detain the sediment laden runoff long enough to allow the sediment to settle from the stormwater and become trapped in the basin. Prevents sedimentation in off-site streams, lakes and drainageways.

C. Applications: The device is one of the most effective BMPs available for sedimentation control, but due to the area required for storage and the cost of construction it is usually used on larger projects with drainage areas greater than 5 acres. This application works particularly well where larger disturbed areas naturally drain toward one outlet point.

D. Limitations: Limitations on the use of this device include:
1) The drainage area to any one basin shall not exceed 100 acres.
2) Do not locate basin storage area in areas planned for future construction (i.e. buildings, pavements, structures, etc.)
3) If excessive erosion occurs in area draining to the basin, the cleanup, disposal and stabilization of sediment from the basin can become a very costly operation.
4) Access must be provided for heavy equipment to perform cleanout and removal operations.
5) Do not locate in live streams or within 100-year floodplains.

E. Design Criteria:
1) Drainage Area: Less than 100 acres.
2) Storage Volume: 1800 cubic feet per disturbed acre draining to basin.
3) Length/Width Ratio: 2:1
4) Surface Area: 1% of drainage area to basin.
5) Dam Height: 6 feet (Max.)
6) Embankment Slopes: 3H:1V or flatter on downstream face.
   2H:1V or flatter on upstream face.
7) Top of Dam Width: 6 feet (Min.)
8) Riser/Barrel Capacity: Peak runoff from 10-year storm event.
9) Side Channel Overflow Capacity: Peak runoff from 100-year storm event.
10) Basin Dewatering: ½ diameter holes spaced 10" - 12" horizontally and 8" vertically from bottom of riser up to ½ of riser height. Place 1½" filter stone around the outside of the riser to a height 6" above top row of ½" holes.

F. Material Specifications:
1) Riser/Barrel: Corrugated Metal Pipe with Holes Drilled
2) Filter Stone: Passing 1½" Sieve 100%, Retained ¾" Sieve 100%
3) Concrete: 2000 psi Concrete (Min.)
4) Stone Rip-Rap: Natural stone or re-cycled concrete:
   • Passing 5-inch Sieve = 100%
   • Retained on 2-inch Sieve = 100%

G. Maintenance Requirements: Periodically inspect sediment basin to ensure that facility if functioning properly. Clean out sediment and dispose of properly when the sediment storage volume is V2 full. Clean or replace filter stone when stone becomes clogged with sediment or facility will no longer drain properly. Check outlet of spillway barrel and downstream toe of dam to ensure that water is not flowing under the dam or along the outside edge of the spillway pipe. Check downstream channel and overflow channel for erosion and gullies and repair as needed.
10. EROSION CONTROL MATTING

A. Description: A geomembrane or biodegradable fabric placed over disturbed ground areas or immediately downstream of disturbed ground areas.

B. Purpose: To limit the effects of erosive runoff, rainfall impact, and to control minor amounts of sediment runoff.

C. Applications: Matting can be used on any construction-related disturbed land areas, but are particularly effective for erosion control on short steep slopes and channel bottoms or sides. They are also well suited for sheet flow sedimentation control from small drainage areas on flat grades.

D. Limitations: Although matting can be highly effective for erosion control, it may be less cost effective than other BMPs in certain situations. When used for sedimentation control the drainage area must be kept small enough to ensure sheet flow on to the matting at relatively flat grades (i.e. low velocities).

E. Design Criteria:
   1) Matting for Erosion Control and Flexible Channel Liners: Follow the manufacturer's recommendations. All mats shall be pinned in place.
   2) Sedimentation Control: Limit drainage area to 30 feet per linear foot of mat. Max. Slope < three percent (3%).

F. Material Specifications: Products listed in the most recent TxDOT Approved Product List for slope protection and flexible channel liners. Mats are usually installed according to the manufacturer's recommended guidelines. Manufacturer's information will verify acceptable applications for a particular product.

G. Maintenance Requirements: Inspect the erosion control matting installations after all rainfall events to ensure that the facilities are functioning properly and have not been displaced by runoff. Particular attention must be paid to the upstream ends of channel linings and slope protection, as well as the joints between adjacent mats. Repair any damaged areas promptly and replace any displaced matting. Additional staking may be required on steeper slopes and in channel bottoms.
11. PIPE INLET PROTECTION

A. Description: A temporary sediment control barrier made of standard concrete block and filter stone or stone rip-rap and filter stone surrounding the inlet end of a storm drain pipe or inlet pipe headwall.

B. Purpose: To remove sediment from storm runoff before it enters into the storm drain system.

C. Applications: Where existing or proposed storm drain pipes or culverts are to be used prior to final stabilization of the area draining to the pipe inlet. This method is used where the pipe inlet will collect relatively heavy stormwater flows and overflow capability is needed.

D. Limitations: Ponding will occur around the pipe inlet with possible localized flooding as a result. Excavation of a sediment storage area can make final channel stabilization difficult and may create a separate erosion problem if not properly constructed. Do not use Cinder Block Pipe Inlet Protection for pipes larger than 36" in diameter.

E. Design Criteria:
- Volume: 1800 Cubic Feet per Acre of Drainage Area.
- Side Slopes: 1.5H:1V or Flatter.
- Top of Stone and Sediment Storage: ½ of Inlet Pipe Diameter.

F. Material Specifications:
- Concrete Block: ASTM C 139, Concrete Masonry Unit for Construction.
- Wire Fabric: Standard Galvanized Hardware Fabric with ½" by ½" Openings.
- Filter Stone: Passing 1½-inch Sieve 100%, Retained ¾-inch Sieve 100% Stone Rip-Rap: 6-inch Diameter Stone or Crushed Concrete

G. Maintenance Requirements: Pipe inlet protection should be inspected weekly and after major rain events to ensure that the device is functioning properly. Remove sediment from the sediment storage area when the depth of sediment has built up to one-half of the design depth. If de-watering of the storage volume is not occurring, clean or replace the filter stone surrounding the pipe inlet. Clean the stone surface the first few times by raking. Repeated sediment build-up will require filter stone replacement.
12. GRASS LINED CHANNELS

A. Description: A channel with vegetation and possibly temporary or permanent erosion control matting that is constructed to a design cross section and grade for the conveyance of stormwater runoff during long-term or different phases of construction. Channels shall be vegetated within 15-days of reaching final grade.

B. Purpose: To convey concentrated stormwater runoff without erosion, sediment deposition, or flooding.

C. Applications: This practice can be applied where:
   1) Concentrated stormwater runoff must be conveyed on a site.
   2) A vegetative lining can provide sufficient stability for the channel and flow conditions.
   3) Channel grades are generally less than 5%.
   4) Space is available for a relatively large cross section.

D. Limitations: The use of this practice is normally limited to:
   1) Areas where a channel slope of from 1% to 5% can be attained.
   2) Areas where the natural drainage patterns can be maintained by use of the open channels.
   3) Design flow velocities that will be less than 6 feet per second.
   4) Areas graded through existing ground conditions (i.e. not in fill material).

E. Design Criteria:
   1) Capacity: shall convey the runoff from a 100-year storm.
   2) Shape: Trapezoidal, parabolic or V bottom at the discretion of the designer.
   3) Velocity: Less than 6 feet per second at design flow. Erosion control matting may be required to stabilize when design velocity > 6 fps.
   4) Side Slopes: 3H:1V or flatter.
   5) Freeboard: One foot between design flow depth and top of bank.

F. Material Specifications:
   1) Seeding: NCTCOG Item 202.6 (Seeding/Hydromulching)
   2) Sodding: NCTCOG Item 202.5.2 (Solid Sod)
   3) Erosion Control Matting: TxDOT approved Specification Item 169, Class 2.

G. Maintenance Requirements: During the vegetation establishment period inspect channels after every rain event. Check for erosion and sediment buildup and repair as needed. After establishment of vegetation periodically check channel for damage. Particular attention must be given to side slopes, embankments at pipe inlets and outlets, and condition of the vegetative stabilization. Vegetated channels require maintenance for weed control, possible mowing, sediment removal and nil development. Silt shall be kept from entering channels from adjacent disturbed areas.
13. OUTLET VELOCITY CONTROL STRUCTURE

A. Description: A 6" concrete with steel reinforcement structure placed at a pipe outlet, headwall outlet or the outlet end of an armored channel section.

B. Purpose: Used to reduce the outlet flow velocity and dissipate the outlet flow energy to reduce the potential for downstream channel erosion.

C. Applications: Applies to all pipe, headwall or armored channel outlets into vegetated channels where the outlet flow velocity exceeds 4 feet per second.

D. Limitations: Do not use where the downstream channel has a very steep longitudinal slope or where a vertical drop will result at the pipe end or end of the rip-rap pad. Method does not apply well to narrow downstream channels.

E. Material Specifications:
   1) Aggregate: Natural stone or re-cycled concrete in a mix ratio of 1:1 of 6-inch to 12-inch diameter stone with 2-inch to 4-inch diameter stone.
   2) Filter Fabric: NCTCOG Item 201.5.2.1

F. Maintenance Requirements: Inspect periodically and after major rain storm events to ensure that the facility is functioning properly. Repair dislodged or missing stone rip-rap and repair any downstream erosion as soon as possible.
14. **CURB INLET PROTECTION**

A. **Description:** A temporary sediment control barrier made of filter stone and standard concrete block, welded wire fabric, hardware fabric or 2x4 studs surrounding a storm drain inlet.

B. **Purpose:** To remove sediment from storm runoff before it enters into the storm drain system.

C. **Applications:** Where storm drain inlets are to be used prior to final stabilization of the area draining to the structure. This method is used where the inlet will collect relatively heavy flows and overflow capability is needed. This method is also to be used to protect existing curb inlets located in paved areas.

D. **Limitations:** Ponding will occur around the inlet with possible localized flooding as the result. When used at locations that are open to vehicle traffic, this device will encroach into the traveled way. If the curb inlet is not a recessed type inlet a traffic barricade shall be placed at each end of the inlet protection device.

E. **Design Criteria:**
   1) Drainage Area: 2.0 acres or less.
   2) Height: 6” (Maximum).

F. **Material Specifications:**
   1) Concrete Block: ASTM C 139, Concrete Masonry Unit for Construction.
   2) Wire Fabric: Standard galvanized hardware fabric with 1/2 by 1/2’ openings.
   3) Filter Stone: Passing 1½” Sieve = 100%
      Retained ¾” Sieve = 100%
   4) Wire Mesh: Welded wire fabric conforming to NCTCOG Item 201.14.2.5 maximum opening 6” x 6”.

G. **Maintenance Requirements:** Inlet protection should be inspected weekly and after major rain events to ensure that the device is functioning properly. Remove sediment from the storage area when the depth of sediment has built up to one-half of the storage depth. If de-watering of the storage volume is not occurring, clean or replace the filter stone. Clean the filter stone surface the first few times by raking. Repeated sediment build-up will require filter stone replacement.
CURB INLET PROTECTION

INLET SECTION

TYPE A CURB INLET PROTECTION

NOTE:
EXTEND FABRIC, FRAME AND FILTER STONE 12" BEHIND END OF INLET ON BOTH ENDS.

1/2" x 1/2" HARDWARE FABRIC
WIRE MESH 6" x 6" OPENING MAX.

2" GAP BETWEEN TOP OF STONE AND TOP OF OPENING
1 1/2" FILTER STONE

ISOMETRIC PLAN VIEW

INLET SECTION

TYPE B CURB INLET PROTECTION

NOTE:
EXTEND FABRIC, FRAME AND FILTER STONE 12" BEHIND END OF INLET ON BOTH ENDS.

1/2" x 1/2" HARDWARE FABRIC
2" WIRE MESH 6" x 6" OPENING MAX.

2" GAP BETWEEN TOP OF STONE AND TOP OF OPENING
1 1/2" FILTER STONE

ISOMETRIC PLAN VIEW

SECTION A - A

BLOCK AND GRAVEL RECESSED CURB INLET PROTECTION

NOTE:
FILTER STONE PLACED OVER VERTICAL FACE TO PREVENT FILTER STONE FROM GETTING THROUGH.

1/2" x 1/2" HARDWARE FABRIC

CITY OF HUTCHINS, TEXAS

DATE: AUGUST 2023

STANDARD CONSTRUCTION DETAILS

CURB INLET PROTECTION

Sheet STD-47
EXCAVATED DROP INLET PROTECTION

FILTER FABRIC DROP INLET PROTECTION

BLOCK/GRAVEL DROP INLET PROTECTION

NOTE: CONCENTRATED DITCH FLOW COMING FROM ONE OR MORE SIDES TOWARDS THE DROP INLET MAY REQUIRE A STONE OVERFLOW STRUCTURE TO BE CONSTRUCTED ON ONE SIDE OF THE DROP INLET. MSG WIRE SHOULD BE USED TO SUPPORT THE FILTER FABRIC FOR INSTALLATIONS USED MORE THAN 90 DAYS.
I. VEGETATIVE STABILIZATION

This chapter provides standards and specifications for the use of vegetative BMPs for controlling erosion due to land disturbing activities. These methods are primarily for preventing erosion caused by rainfall impact and storm water runoff. The timely use of temporary and permanent ground covers can have a dramatic effect on the amount of erosion that will leave the site of land disturbing activity.

Material specifications listed in this chapter use the latest versions of the North Central Texas Council of Governments, Standard Specifications for Public Works Construction, the Texas Department of Transportation, Standards for the Construction of Highways, Streets and Bridges to the maximum extent possible.

2. TEMPORARY SEEDING
A. Description: The planting of fast growing annual grasses or small grains to provide initial, temporary ground cover for disturbed areas.
B. Purpose: To temporarily stabilize disturbed land areas and earthen BMPs that will not be brought to final grade or have permanent stabilization applied within a period of 90 days.
C. Applications: This practice applies to graded areas, soil areas with sparse vegetation, and soil areas with no vegetation. Specific construction site applications include: 1) Inlets, 2) bare areas, 3) temporary sediment basins, roadway embankments, rough graded areas and soil stockpiles.
D. Limitations: The application of temporary seeded ground cover has the following limitations:
1) Areas must be re-seeded or permanently stabilized within 1 year.
2) High cost for short term uses.
3) Improper attention to materials and application techniques can lead to higher maintenance costs and severe erosion damage.
4) Not applicable to areas used by foot or vehicle traffic.
5) Not applicable to areas with excessive stormwater runoff or high velocity runoff.
6) May require permanent irrigation.
E. MATERIAL SPECIFICATIONS: Comply with requirements of the North Central Texas Council of Governments (NCTCOG), Standard Specifications for Public Works Construction, Item 202.6.1 - Seeding, along with Item 202.4 - Fertilizer.
F. Maintenance Requirements: Repair rills, bare areas, and washouts immediately and re-seed to establish permanent ground cover. Watering, fertilization and soil supplements may be required to initiate the germination process and to maintain permanent ground cover. Protect seeded areas from excessive water runoff and traffic prior to establishing vegetation. May require periodic mowing and weed control.

3. PERMANENT SEEDING
A. Description: Stabilizing disturbed ground areas by establishing perennial vegetative ground cover by seeding.
B. Purpose: To permanently stabilize disturbed areas by establishing a relatively low cost, maintainable ground cover.
C. Applications: Permanent vegetative techniques can and should be applied to almost all construction sites at the completion of the project. Permanent seeding is used on fine-graded areas on which long-lived vegetative ground cover is the most practical and effective method for stabilizing the soil. The method can also be used on rough-graded areas that will not be brought to final grade for more than a year.
D. Limitations: The application of permanent seeded ground cover has the following limitations:
1) Seasonal limits on suitable seeding dates for specific varieties of seed.
2) Improper attention to materials and application techniques can lead to higher maintenance costs and severe erosion damage.
3) Not applicable to areas used by foot and vehicle traffic.
4) Not applicable to areas with excessive stormwater runoff or high velocity runoff.
5) Not applicable to steep slopes. Slopes steeper than 3:1 must use use of equipment for seedbed preparation and mowing.
6) May require permanent irrigation.
E. MATERIAL SPECIFICATIONS: Comply with requirements of the North Central Texas Council of Governments (NCTCOG), Standard Specifications for Public Works Construction, Item 202.6.1 - Seeding, along with Item 202.4 - Fertilizer.
F. Maintenance Requirements: Repair rills, bare areas, and washouts immediately and re-seed to establish permanent ground cover. Watering, fertilization and soil supplements may be required to initiate the germination process and to maintain permanent ground cover. Protect seeded areas from excessive water runoff and traffic prior to establishing vegetation. May require periodic mowing and weed control.

4. REMNANT SODDING
A. Description: Stabilizing bare ground areas by laying a continuous cover of grass sod.
B. Purpose: To provide immediate vegetative stabilization to disturbed land areas and earthen BMPs.
C. Applications: Practice applies to disturbed land areas that require immediate and permanent ground cover or where sodding is the preferred method of establishing grass. Locations that are particularly well suited to stabilization with sod include:
1) Swales, channels and ditches carrying storm water at acceptable velocities.
2) Steeper slopes than can be stabilized by normal seeding.
3) Residential or commercial lawns and golf courses where prompt use and aesthetics are important.
4) Areas around drop inlets after the drainage basin has been stabilized.
D. Limitations: The application of sod ground cover has the following limitations:
1) More costly to install than seeding.
2) More difficult to obtain, transport and store.
3) May require permanent irrigation.
E. MATERIAL SPECIFICATIONS: Comply with requirements of the North Central Texas Council of Governments (NCTCOG), Standard Specifications for Public Works Construction, Item 202.5.1 - Sod, along with Item 202.4 - Fertilizer.
F. Maintenance Requirements: Repair rills and washouts immediately and re-seed to establish permanent ground cover. Watering, fertilization and soil supplements may be required to establish and maintain permanent ground cover. Remove dead sod and replace promptly. May require periodic mowing and weed control. Slopes steeper than 3H:1V will require staking of the sod to hold it in place.

5. OTHER BMPs
Other BMPs shall be included in the design plans.

All inert protection shall meet the requirements of Erosion Control BMPs found in the latest edition of Standard for Construction, North Central Texas Council of Governments (NCTCOG).
## SITE DESCRIPTION

<table>
<thead>
<tr>
<th>PROJECT LIMITS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PROJECT DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>MAJOR SOIL DISTURBANCE ACTIVITIES</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TOTAL EROSION AREA</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.2 D2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TOTAL DESTRUCTION AREA TO BE ERODED</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.2 D2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>WEATHER MORTAR COEFFICIENT</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>EXISTING CONDITION OF SOIL &amp; VEGETATION</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>NAME OF RECEIVING WATERS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>WATER QUALITY</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

## EROSION AND SEDIMENT CONTROLS

### SOR STABILIZATION PRACTICES

<table>
<thead>
<tr>
<th>MEASURES:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>OTHER</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

### STRATEGIC PRACTICES

<table>
<thead>
<tr>
<th>MEASURES:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>OTHER</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

### OTHER EROSION AND SEDIMENT CONTROLS

<table>
<thead>
<tr>
<th>MEASURES:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>OTHER</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

## NARRATIVE - SEQUENCE OF CONSTRUCTION (STORM WATER MANAGEMENT ACTIVITIES)

<table>
<thead>
<tr>
<th>MEASURES:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>OTHER</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

## CIVIL WASTE (EXCLUDING SOIL REQUESTED)

<table>
<thead>
<tr>
<th>MEASURES:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>OTHER</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

## OUI WASTE

<table>
<thead>
<tr>
<th>MEASURES:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>OTHER</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

## DATE: AUGUST 2023

## CITY OF HUTCHINS, TEXAS

## STANDARD CONSTRUCTION DETAILS

## SITE DESCRIPTION - EROSION & SEDIMENT NOTES

<table>
<thead>
<tr>
<th>DATE: AUGUST 2023</th>
</tr>
</thead>
<tbody>
<tr>
<td>STD-58</td>
</tr>
</tbody>
</table>