Requirements for
On-Lot Sewer Facilities
Amador County, California

Installation &
Materials Specifications for
STEF Systems
(Septic Tank Effluent Flow/Gravity)

July 2016
# Installation & Materials Specifications for STEF Systems

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Installation & Materials Specifications for STEF Systems

Section A - Introduction and General Description

A1. General

The septic sewer system represents an economical means of wastewater collection that has been developed to serve in areas where conventional gravity sewers are not feasible. The two types of sewer systems used in Amador County are the STEF (Septic Tank Effluent Flow/Gravity Systems) and STEP System (Septic Tank Effluent Pumped Systems).

This specification deals only with STEF systems. STEF systems are comprised of a septic tank, vault, filter screen, and alarm panel (optional) for level sensors. All materials and their installation shall meet all of the requirements of the Uniform Plumbing Code, National Electrical Code and AWA specifications, whichever is more stringent.

The septic tank alarm panel (optional), vault, filter screen, piping, and all appurtenances from the building to the service connection shall be installed and maintained by the property owner in accordance with the adopted rules and regulations and these specifications. Maintenance shall include periodic pumping of the septic tanks as well as cleaning the effluent filter screen; replacement of any worn or broken parts, which are a part of the septic tank, vault, filter screen, alarm panel (optional), or gravity sewer piping to the collection main. A list of Suppliers with phone numbers and addresses are included in Appendix A for convenience.

A2. Right of Entry

Authorized agents of AWA shall have the right to enter any lot for the purpose of sewer system facilities inspection, which may require maintenance and repair by the owner in accordance with adopted rules and regulations.

A3. Sewer Permit

Each property owner will be required to obtain the required permits from AWA as a condition of the building permit. Each septic tank location will be required to be accessible year-round, by maintenance vehicles for the purpose of inspection by the Water Agency personnel, and maintenance including periodic pumping of septic tanks by the owner. Septic tanks, alarm panel, and sewer clean-out locations shall be reviewed and approved as a part of the permit process.
Section B - Materials and Installation

B1. General Installation Conditions
The installation of all on-lot facilities shall be inspected and approved by AWA prior to connection to the wastewater system. The property owner shall be responsible for the installation and maintenance of all on-lot facilities, including but not limited to the following:

a. Gravity sewer service line to septic tank
b. Concrete septic tank
c. Tank risers and lids
d. PVC Vault and Bio-tube effluent filter
e. Alarm panel (optional)
f. Gravity sewer system lateral to sewer main line connection

B1.01 Special Conditions
The final obligation and responsibility for correcting surface settlement will be that of the property owner. If determined by AWA field inspector that compaction testing is required, the cost of testing shall be paid by the property owner.

The property owner shall be fully responsible for the repair and replacement of all facilities or materials damaged by the installer.

B1.02 Inspections
The property owner shall be responsible for scheduling inspections with AWA for the installation of all on-lot sewer facilities. The following inspections are required:

a. Just prior to and while the septic tanks are being set.
b. Water testing of the septic tanks, pressure testing of all piping, and pump testing.
c. After final grading and clean-up of job site.

To schedule inspections call (209) 223-3018. All inspections by AWA shall be scheduled between 9:00 a.m. and 4:00 p.m. Monday through Friday. Inspections must be scheduled at least two working days prior to the day of inspection.

B1.03 Submittals
The property owner is responsible for submitting two copies of the following information for review and approval by AWA prior to installation:

a. A completed AWA application for installation of on-lot sewer facilities.
b. Site plan showing the location of the structure septic tank, piping, conduit, and alarm panel optional-Figure SS-2A

   1. Spot elevations will be required for the invert of the building and the invert of the inlet to the septic tank. The site plan shall be to scale and preferably on a sheet no larger than eleven inches by seventeen inches (11" x 17").

c. Complete product information on the septic tank, if not supplied from a recommended manufacturer.

d. Product information or certificates of compliance on all piping, valves, and appurtenances, if not supplied by the recommended manufacturer.

e. Specification on imported backfill material.

**B2. Building Sewer**

**B2.01 General**
The building sewer is the line between the building served and the septic tank. Pipe materials and installation of the building sewer shall meet all the requirements of the Uniform Plumbing Code and AWA specifications (whichever is more stringent).

Work under this section shall include furnishing all labor, materials, tools and equipment necessary for the installation and pressure testing of the building sewer line as shown on the plans specified herein.

**B2.02 Materials**
PVC and ABS are acceptable materials for the building sewer and shall be Schedule 40, with Schedule 40 solvent welded fittings or SDR-35 PVC with bell and spigot fittings.

ABS and Schedule 40 PVC fittings shall conform to ASTM D 3311 and be solvent welded. All 90 degree bends shall be long-radius sweeps, “hard” 90 degree fittings are not permitted.

ABS pipe and fittings shall be Schedule 40 and conform to ASTM D 2661. Solvent cement used on ABS shall conform to ASTM D 2235.

Schedule 40 PVC shall conform to ASTM D 1785 or D 2665 (or both). Solvent cement used on PVC shall conform to ASTM D 2564.

SDR-35 PVC pipe and fittings shall conform to ASTM D 3034 and shall be joined using bell and spigot joints conforming to ASTM D 3212 and flexible watertight elastomeric seals conforming to ASTM F 913 or F 477.

All threaded fittings shall be stainless steel.

**B2.03 Building Sewer Cleanout**
Sewer cleanouts shall be installed a maximum of five feet (5’) from the building, be two-way, and spaced every one-hundred feet (100’) as
measured from the initial building cleanout, to the septic tank. Cleanouts are also required following all bends of 22° or greater.

Cleanouts shall be a minimum pipe diameter of three inches (3”) and be SDR-35, schedule 40 PVC or ABS. Details are shown on Figure SS-3.

B2.04 Back Water Valve
Each property owner will be required to provide and maintain a backflow prevention device on the building sewer line, if any floor of the structure is at or below the tank riser rim elevation.

Building sewer line backflow prevention valves shall be PVC or ABS plastic with solvent cement connections. Valve shall be a swing check with removable flapper and self-lubricating hinge. Valve shall be watertight with a ten-foot (10’) water column. The valve shall have a quick-open inspection cover and be installed in a valve access box for ease of inspection. Utility box shall be a minimum twenty-four inches by twelve inches (24” x 12”) with extensions as required and a lid to be installed at grade. Box shall be pre-cast concrete.

B2.05 Pressure Testing
The building sewer line shall be air or water tested for leakage. The internal pressure in the pipe shall be raised to five (5) psig and maintained for five minutes. Any pressure loss over the five-minute period is unacceptable.

B3. Septic Tanks

B3.01 General
This section describes the septic tank as required for all residential services.

All septic tank shall be manufactured and furnished with two access openings eighteen inches (18”) in diameter and of the configuration shown on the standard drawings. Tank shall have a twenty-four inch (24”) diameter by one inch (1”) deep groove (see Standard Detail SS-4) formed in the top of the tank at the access opening for installation of twenty-four inch (24”) diameter riser. Tank shall be installed in strict accordance with the manufacturer’s recommended installation instructions. Modification of completed tanks shall not be permitted unless approved in writing by AWA.

Fiberglass or plastic septic tanks shall NOT be allowed.

B3.02 Septic Tank
a. Septic tank shall be a nominal one-thousand five-hundred (1,500) gallon, two-compartment style septic tank.

b. The tank shall be pre-cast concrete, and shall have the floor and walls of the tank monolithically poured.
c. The tank shall be sealed with a heavy cement-based waterproof coating, Thoroseal or approved equal, on both the inside and outside surfaces.

d. The inlet to the primary septic tank from the building sewer line shall penetrate eighteen inches (18") into the liquid from the inlet flow line.

e. See standard drawing SS-4.

**B3.03 Outlet Risers**

Two outlet risers shall be provided for each tank. Risers shall be at least twelve inches (12") high, shall have a minimum nominal diameter of twenty-four inches (24"). Outlet risers shall be provided for the following locations.

a. **Traffic Rated Areas**

Outlet risers shall be pre-cast concrete as manufactured by Jensen Pre-Cast or approved equal.

Risers shall be installed on the septic tank with a water-tight seal.

A 6"x6" non-shrink concrete ring shall be poured around the joint between the outlet riser and the septic tank, for stabilization of the riser.

Asphaltic sealant shall be used, Ramnek or equal, to provide a watertight seal between the tank, risers and grade rings.

b. **Non-Traffic Areas**

Outlet risers shall be ribbed PVC as manufactured by Orenco Systems, Inc. model RR2424 ribbed PVC riser or approved equal, and shall be factory equipped with the following:

1. Neoprene Grommets: Two grommets, one for the splice box and one for the pump discharge, installed as shown on the drawing.

2. Install riser with Butyl tape and Orenco tank adapter FRTA24, PRTA24, or approved equal. All joints must be watertight.

**B3.04 Lids**

One frame and lid shall be furnished with each riser. Traffic rated lids shall be 24" cast iron frame and cover with gas tight gasket. Non-traffic lids shall be Orenco Systems Model FL24GI4-4BU fiberglass with green aggregate finish, and provided neoprene gasket, stainless steel bolts and wrench or approved equal.

The riser and lid combination shall be able to support a two-thousand five-hundred pound (2,500 lb) wheel load.

**B3.05 Installation**

All septic tank locations are to be a minimum of ten feet (10') from the dwelling or other structures. Septic tank shall be set level and to uniform bearing on a minimum six inches (6") thick layer of bedding material
compacted to 90 percent relative maximum density, over a firm and uniform base.

Unstable or wet foundations shall be stabilized and cared for by over-excavation and backfill with select materials, or other means as required.

Bedding material shall be three-eighths inch (3/8") crushed rock, three-eighths inch (3/8") river run pea gravel, or clean sand (see Detail SS-4 & SS-8). Material shall be clean and free of vegetative matter, clay and other deleterious substances. Backfill for concrete tanks can be select native material with all rocks over three inches (3") removed and free from organic or deleterious material.

The property owner shall be responsible for establishing the tank elevation. Tanks shall be placed at such depth to facilitate a minimum quarter inch (¼") per foot slope of the building sewer.

Soil cover over the top of the tank shall be a minimum of twelve inches (12") deep, with the top six inches (6") being replaced with salvaged topsoil. If the tank is located in a traffic area, then the tank shall have a traffic rated lid and the tank shall be rated for the traffic loading, or it shall be fenced and protected from traffic.

**B3.06 Septic Tank Hydrostatic Testing**

The concrete septic tanks shall be tested with water for leakage. All tests shall be performed in the presence of an AWA inspector.

a. Plug all inlets and outlets.

b. Fill tank with water to full height, including a two-inch (2") depth in the lid.

c. Allow water to stand for twenty-four (24) hours.

d. Any loss of water, or leakage in a twenty-four (24) hour period constitutes failure.

e. Repair and retest all tanks that do not pass hydrostatic test.

**B4. Effluent Systems and Appurtenances**

**B4.01 Check Valves (Figure SS-9)**

Check valves shall be stainless steel 316 ball check valves designed for wastewater effluent pump applications and rated for one hundred fifty (150) PSI.

**B4.02 Ball Valves**

Ball valves shall be stainless steel 316 ball, quarter turn shut-off valves, of true union design, one hundred fifty (150) PSI rating.
**B4.03  P.V.C. Vault and Bio-tube Effluent Filter**

a. Vaults and Effluent Filter Systems shall be Orenco Systems F.T. series with 1/8" filtration or approved equal.

b. Riser and Lids: As specified in Section 3.04 and 3.05

Installation shall be in accordance with these specifications and drawings and in accordance with the manufacturer’s instructions.

**B4.04  Alarm Control Panel (optional)**

The alarm control panel shall be an Orenco System, Inc. Amsenti Series or equal.

**B5.  Sewer Service Lateral**

**B5.01  General**

Work under this section shall include furnishing all labor, materials, tools, and equipment necessary for the installation and pressure testing of the one and a half inch (1 1/2") diameter, Schedule 40, PVC sewer service lateral piping that connects the septic tank to the main sewer line as shown on the plans and specified herein.

**B5.02  Materials**

Lateral pipe and fittings shall be Schedule 40 or 80 PVC conforming to the requirements of PVC1120 per ASTM D 1785 and either D 2466 or D 2467, as appropriate. Fittings shall be solvent weld type. Threaded PVC pipe shall not be permitted. Molded threaded adapter fittings may be used.

**B5.03  Installation**

Trench depths shall provide a minimum cover over the pipe as shown in, see Detail SS-1. A minimum of thirty-six (36") cover is required for pipe installed on public land or within a traveled way. A minimum of twenty-four inches (24") of cover is acceptable on private property where the pipe is installed off the traveled way. In some instances, greater depths shall be required to provide continuous slope to the pipe, avoid obstructions, and utility conflicts, or comply with Title 22 regulations. When crossing water lines, the sewer service lateral shall be at a minimum of twelve inches (12") below the water line. When installed parallel to waterlines, sewer lines shall maintain a ten-foot (10") separation between the water and sewer pipe. The trench bottom shall be smooth and uniform.

Bedding and initial backfill shall extend a minimum of six inches (6") below and at each side together with six inches (6") above pipe as shown on Figure SS-1. Intermediate backfill shall be select native material free of stones, sticks or other deleterious material and having a maximum particle size of three inches (3") or per jurisdictional requirements. Placement shall provide a firm, smooth and uniform bottom for pipe support. Material excavated from the pipe trench that is unsuitable for backfill shall be
removed and disposed of by the Installer, and suitable material imported. Jetting or puddling shall not be allowed.

When in the trench, pipe ends shall be effectively plugged and kept free from debris at all times. Pipe ends shall be open only when installation is actively undertaken.

Two-inch wide detectable tape reading “CAUTION, BURIED SEWER LINE BELOW” as manufactured by CALTICO shall be buried four inches to six inches (4”-6”) above the top of the pipe.

Pipe backfill shall contain proper moisture for compaction and shall be installed as described below and as shown in Figure SS-1.

a. Class “A: Backfill: Within paved areas, backfill materials, pavement removal, disposal, and replacement, installation and compaction shall be per jurisdictional requirements (i.e. Caltrans, County, etc.).

b. Class “B” Backfill: Within graveled areas, backfill shall be compacted native material, if suitable, otherwise imported select backfill. Replacement of surfacing shall be three fourths of an inch (¾”) minus Base Rock, compacted to ninety-five percent (95%) relative maximum density and shall be placed to a minimum compacted thickness of six inches (6”) or the thickness of the removed surfacing, whichever is greater.

c. Class “C” Backfill: Outside of traveled areas, backfill shall be native material if suitable, otherwise imported select backfill and shall be compacted to 85% relative maximum density.

**B5.04 Pressure Testing**

PVC sewer service lateral shall be tested with water for leakage in the presence of an AWA inspector. Test pressure shall be thirty (30) PSI. Test duration shall be one hour. Any pressure loss over the one hour period is unacceptable. Any leakage is unacceptable and must be repaired.
# Appendix A - Recommended Material Suppliers

**Effluent Sewer Equipment:**

<table>
<thead>
<tr>
<th>Supplier</th>
<th>Phone</th>
</tr>
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<tbody>
<tr>
<td>Orenco Systems</td>
<td>(503) 673-0165</td>
</tr>
<tr>
<td>814 Airway Ave</td>
<td></td>
</tr>
<tr>
<td>Sutherlin, OR 97479</td>
<td></td>
</tr>
<tr>
<td>General Wholesale Supply of Auburn</td>
<td>(530) 823-3100</td>
</tr>
<tr>
<td>153 Borland Ave</td>
<td></td>
</tr>
<tr>
<td>Auburn, CA 95603</td>
<td></td>
</tr>
<tr>
<td>Senders Market</td>
<td>(209) 754-1074</td>
</tr>
<tr>
<td>8111 Garibaldi Street</td>
<td></td>
</tr>
<tr>
<td>Mountain Ranch, CA 95246</td>
<td></td>
</tr>
<tr>
<td>Ferguson Pipe Supply</td>
<td>(209) 223-4545</td>
</tr>
<tr>
<td>12690 Kennedy Flat Rd</td>
<td></td>
</tr>
<tr>
<td>Jackson, CA 95642</td>
<td></td>
</tr>
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**Pre-cast Concrete Septic Tanks:**

<table>
<thead>
<tr>
<th>Supplier</th>
<th>Phone</th>
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<tbody>
<tr>
<td>Jensen Precast</td>
<td>(209) 727-0505</td>
</tr>
<tr>
<td>12418 Locke Rd</td>
<td></td>
</tr>
<tr>
<td>Lockeford, CA 95237</td>
<td></td>
</tr>
<tr>
<td>Georgetown Precast</td>
<td>(916) 333-4404</td>
</tr>
<tr>
<td>P.O. Box 65</td>
<td></td>
</tr>
<tr>
<td>2420 Georgia Slide Road</td>
<td></td>
</tr>
<tr>
<td>Georgetown, CA 95634</td>
<td></td>
</tr>
<tr>
<td>K &amp; K Precast</td>
<td>(209) 754-4611</td>
</tr>
<tr>
<td>P.O. Box 702</td>
<td></td>
</tr>
<tr>
<td>806 Poole Station Road</td>
<td></td>
</tr>
<tr>
<td>San Andreas, CA 95249</td>
<td></td>
</tr>
</tbody>
</table>
NOTES:
1. MINE TAILINGS ARE UNACCEPTABLE FOR ANY TRENCH BACKFILLING.
2. GREEN LOCATOR TAPE AT TOP OF SAND TO BE MARKED: CAUTION – SEWER LINE BURIED BELOW”.
3. LOCATING WIRE NOT REQUIRED ON PIPE SECTIONS LINEAR BETWEEN TWO MANHOLES.

PIPE BEDDING: COMPLY WITH A.W.A. STANDARD SPECIFICATION 7.5
INTERMEDIATE BACK FILL: IMPORTED OR NATIVE MATERIAL WITH ALL ROCKS OVER 3” REMOVED AND FREE OF VEGETATIVE MATERIAL.
NOTES:
1. SHALL COMPLY WITH ALL AWA STEP AND WASTEWATER STANDARDS.
2. PLOT PLANS SHALL PROVIDE THE FOLLOWING:
   A. ALL DIMENSIONS FROM STRUCTURES TO TANKS AND PIPING.
   B. SPOT ELEVATIONS FOR BUILDING SEWER INVERT AT STRUCTURE; INLET OF THE TANK.
   C. PUMP TRUCK ACCESS TO TANK,
3. PROVIDE 10' MINIMUM DISTANCE FROM TANK TO ALL STRUCTURES.
NOTES:

1. 12" WIDE BY 8" THICK STEEL REINFORCED CONCRETE COLLAR SHALL BE INSTALLED AROUND CLEANOUT BOX IN ALL TRAFFIC RATED AREAS.

2. CLEANOUTS SHALL BE SPACED EVERY 100' FROM THE INITIAL CLEANOUT AT THE BUILDING TO THE SEPTIC TANK.

3. PIPE MATERIAL SHALL BE SDR-35, SCH. 40 SOLVENT WELDED PVC OR ABS (3" MIN.).

4. CLEANOUTS REQUIRED FOLLOWING ALL BENDS OF 22° OR GREATER.
OSI MODEL FL24G14-4BU FIBERGLASS LID WITH STAINLESS STEEL BOLTS AND NEOPRENE GASKET, OR EQUAL, TYP. SEE NOTE 5.

OSI MODEL RR2424 RIBBED PVC RISER WITH NEOPRENE GROMMETS, OR EQUAL, TYP. SEE NOTE 5.

4" ABOVE GROUND

4" ABS. STANDARD INLET TEE, TYP.

TIGHT LINE FROM DWELLING 3" OR 4" ABS. COUPLE TO EXIST. HOUSE SEWER W/ APPROPRIATE FITTINGS OUTSIDE OF TANK EXCAVATION.

TIGHT LINE, 3" OR 4" ABS. COUPLE TO EXIST. PUMP TANK W/ APPROPRIATE TANK FITTINGS.

LIQUID LEVEL

WORKING DEPTH

SEE NOTE 3

SEE NOTE 4

FILTER

TWO-COMPARTMENT REINFORCED CONCRETE SEPTIC TANK. TANK MUST BE WATER-TIGHT, MONOLITHICALLY CONSTRUCTED AND THOROSEALED INSIDE AND OUT.

NOTES:

1. SHALL COMPLY WITH ALL AWA STEP AND WASTEWATER STANDARDS.

2. BEDDING MATERIAL SHALL BE A MINIMUM 6" THICK USING 3/8" RIVER RUN PEA GRAVEL, 3/8" CRUSHED ROCK OR CLEAN SAND.


4. INSTALL RISER WITH BUTYL TAPE AND ORENCO TANK ADAPTER FRTA24, PRTA24, OR APPROVED EQUAL. ALL JOINTS MUST BE WATER TIGHT.

5. TRAFFIC LIDS AND RISERS REQUIRED FOR ALL TRAFFIC RATED AREAS. SEE FIGURE SS-11.
NOTES:

1. SHALL COMPLY WITH ALL AWA STEP AND WASTEWATER STANDARDS.
2. BEDDING MATERIAL SHALL BE A MINIMUM 6" THICK USING 3/8" RIVER RUN PEAS GRAVEL, 3/8" CRUSHED ROCK OR CLEAN SAND.
4. INSTALL RISER WITH BUTYL TAPE AND ORENGO TANK ADAPTOR FRTA24, PRTE24, OR APPROVED EQUAL. ALL JOINTS MUST BE WATER TIGHT.
5. TRAFFIC LIDS AND RISERS REQUIRED FOR ALL TRAFFIC RATED AREAS. SEE FIGURE SS-11.
NOTES:
1. SERVICE LATERALS SHALL BE SCHEDULE 80 OR RATED 50 PSI GREATER THAN THE MAIN, WHICHEVER IS GREATER.
2. SEWER SERVICE CONNECTION SHALL BE LOCATED AT PROPERTY LINE.
3. BOXES SHALL BE BES C36, CHRISTY B36, CHRISTY FL36 (UNTRAVELED AREAS), OR EQUAL. LID SHALL BE MARKED "SEWER".
4. BRASS & BRONZE ARE NOT ALLOWED IN WASTEWATER APPLICATIONS.
5. SERVICE AND PIPE SHALL NOT BE IN DRIVEWAY OR AREAS WITH VEHICLE TRAFFIC.
6. DUAL SERVICES SHALL NOT BE PERMITTED.
7. LOCATION VARIANCES SHALL BE APPROVED BY AWA ENGINEER.
8. BEDDING & BACK FILL REQUIRED ALONG SERVICE LINE PER STANDARD DETAIL DWG. SS-1.
9. SLOPE BACKFILL AWAY FROM BOX. WHERE THERE IS NO SIDEWALK SET ABOVE GRADE AT PROPERTY LINE.

<table>
<thead>
<tr>
<th>ITEM</th>
<th>DESCRIPTION</th>
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<th>DESCRIPTION</th>
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<tbody>
<tr>
<td>1</td>
<td>SERVICE SADDLE</td>
<td>7</td>
<td>CHRISTY B36-61D STEEL CHECKER PLATE COVER MARKED &quot;SEWER&quot;</td>
</tr>
<tr>
<td>2</td>
<td>SS316 BALL VALVE</td>
<td>8</td>
<td>CHRISTY B36 UTILITY BOX</td>
</tr>
<tr>
<td>3</td>
<td>SS316 CLOSE NIPPLE</td>
<td>9</td>
<td>3/8&quot; RIVER RUN PEA GRAVEL OR 3/4&quot; A.B.</td>
</tr>
<tr>
<td>4</td>
<td>SS316 BALL CHECK VALVE</td>
<td>10</td>
<td>SS316 UNION</td>
</tr>
<tr>
<td>5</td>
<td>LOCATOR WIRE - COATED #10 AWG COPPER WIRE SOFT DRAWN.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>CHRISTY B36X12 EXTENSION, AS NEEDED</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
NOTES:

1. MANHOLE FRAME AND COVER SHALL BE PLACED AT GRADE AND LEVEL WITH EXISTING ROADWAY.
2. ASPHALTIC SEALANT SHALL BE USED, RAMNEK OR EQUAL, TO PROVIDE WATERTIGHT SEAL BETWEEN TANK AND RISER AND GRADE RINGS.
3. 12" WIDE BY 8" THICK STEEL REINFORCED CONCRETE COLLAR INSTALLED AROUND RISERS IN ALL TRAFFIC RATED AREAS.