GENERAL
1. THE SPECIFICATIONS ARE MINIMUM REQUIREMENTS. THE PIPELINES SHALL BE DESIGNED AND CONSTRUCTED SO THAT CALTRAM
OPERATIONS, MAINTENANCE, AND THE PUBLIC ARE NOT HAMPERED, INTERRUPTED, OR SAFETY COMPROMISED.
2. ANY REPLACEMENT OR MODIFICATIONS TO THE EXISTING PIPE (CARRIER OR CASINO) SHALL BE CONSIDERED AS A NEW
INSTALLATION SUBJECT TO THESE SPECIFICATIONS.
3. ALL DESIGN SHALL BE SIGNED AND SEAL BY A CIVIL ENGINEER LICENSED IN THE STATE OF CALIFORNIA.
4. PIPELINES SHALL CROSS TRACKS AT RIGHT ANGLES IF NOT POSSIBLE, AT MAXIMUM 45 DEGREES. THE PIPELINES SHALL
NOT BE PLACED ABOVE CLEATS, NOT UNDER RAIL BRIDGES, OR LESS THAN 100 FEET IN ANY PORTION OF ANY RAIL BRIDGE,
CULVERTS, BUILDING, OR OTHER IMPORTANT STRUCTURE.
5. CROSSING PIPELINES SHALL NOT BE LOCATED WITHIN 15 FEET OF THE LIMITS OF A TURNOUT. THE LIMIT OF A TURNOUT IS 25 FEET FROM THE
SUCH POINTS.
6. LONGITUDINAL PIPELINES SHALL BE LOCATED AS FAR AS PRACTICAL FROM ANY TRACKS OR OTHER IMPORTANT STRUCTURES.
7. LONGITUDINAL PIPELINES SHALL NOT BE LOCATED WITHIN 400 FEET OF ANY TUNNEL OR ANY OTHER STRUCTURE.
8. THE DEPTH OF THE PIPELINES (CARRIER AND CASINO PIPE) SHALL BE SUCH TO WITHSTAND RAILROAD OPERATING CONDITIONS AND SHALL
ALLOW FOR FUTURE INSTALLATIONS (E.G., CONDUIT PIPES, STRUCTURES, ETC.) BY CALTRAM.
(DEPOTS IN AREAS WHERE ARE FOR FLAMMABLE OR HAZARDOUS SUBSTANCES):
A. 6 FT MINIMUM FROM THE TOP OF THE TIE (6 FT MINIMUM)
B. 4 FT MINIMUM FROM THE BOTTOM OF THE TRACK (4 FT MINIMUM)
C. 4 FT MINIMUM FROM THE LOWEST GROUND LEVEL (4 FT MINIMUM).
10. BOTH CARRIER AND CASINO PIPELINES SHALL BE INSTALLED WITH SUITABLE BACK fill SO THAT THE PIPE ARE NOT IN TENSION.
11. SECTIONS TO INCREASE THE LENGTH OF PIPELINE OR DUCT BANK SHALL BE INSTALLED AND MAINTAINED BY OWNER OF THE TRACK.
THE SECTIONS SHALL HAVE INSURANCE, WIND-PROOFING, AND BE ON BOTH SIDES OF THE TRACKS OVER THE CENTERLINE OF THE
UNITS WITH THE FOLLOWING SPECIFICATIONS:
A. NAME AND ADDRESS OF OWNER
B. CONTACTS AND ADDRESS OF LINING
C. PIPE SCHEDULE D TO THE SURFACE
D. PIPE EXTENDED BELOW THE SURFACE
12. MARKING TAPE SHALL BE PLACED WITHIN 2 FEET FROM GROUND SURFACE FOR OPEN CUT INSTALLATION.

CASINOS:
1. CASINO REQUIREMENTS APPLY TO PIPELINES THAT CARRY LIQUID OR GASEOUS SUBSTANCES AS FOLLOWS:
A. ALL GAS, PETROLEUM PRODUCTS OR OTHER FLAMMABLE, VAPORIZING, OR HAZARDOUS SUBSTANCES UNDER PRESSURE
B. LIQUEFIED NITROGEN OR ANY NON-FLAMMABLE OR HAZARDOUS SUBSTANCE WHICH MIGHT PASS THROUGH THE LOOP OR IN THE HOOP OR CONSTRUCTION OR WITHDRAWAL OR FILLING OF THE CALTRAM CORRIDOR.
2. CASINO PIPE SHALL BE INSTALLED TO PREVENT THE FORMATION OF STANDING WATER UNDER THE TRACKS, AND SHALL NOT BE
PLACED NEAR THE WATER OR ANY OTHER LOCATION WHERE THE WATER COULD DAMAGE OR MAY CAUSE DAMAGE TO THE RAIL OR IN THE HOOP OR CONSTRUCTION OR WITHDRAWAL OR FILLING OF THE CALTRAM CORRIDOR.
3. CASINO PIPE SHALL BE LOCATED SUCH THAT IT IS AT LEAST 12 INCHES CLEARANCE TO THE TOPOGRAPHIC DRAINAGE OF THE
SIDEWALKS OF THE CASINO, JOINTS OR COUPLINGS.
4. BOTH ENDS OF THE PIPELINES SHALL BE METERED AGAINST THE ENTRANCE TO FOREIGN MATERIAL, AND THE USA "METER" TO PASS THROUGH THE LOOP OR IN THE HOOP OR CONSTRUCTION OR WITHDRAWAL OR FILLING OF THE CALTRAM CORRIDOR.
5. CASINO PIPE AND JOINTS SHALL BE IF OF LEAK PROOF CONSTRUCTION, CAPABLE OF WITHSTANDING RAILROAD LOADING (CUTTER 1-4-3).
6. CASINO PIPE SHALL HAVE A MAXIMUM VEHICULAR STRENGTH OF 20,000 PSI WHEN CALTRAM IS WITHOUT PROTECTIVE COATING, AND NOT
CATEGORIZED PROTECTED. THE WALL THICKNESS SHOWN IN TABLE 1-3-1 (AREMA, PART 1) SHALL BE INCREASED TO THE NEAREST STANDARD SIZE WHICH IS A MINIMUM OF 1.5X GREATER THAN THE THICKNESS SHOWN EXCEPT FOR DIAMETERS LESS
THAN 12.
7. CASINO SHALL COVER THE ENTIRE WIDTH OF THE CALTRAM CORRIDOR.

VENTING:
1. CASINO PIPE SHALL BE PROPERLY VENTED. VENT PIPES SHALL BE MINIMUM 2 INCHES IN DIAMETER AND SHALL BE INSTALLED
NEAR THE END OF THE CASINO.
2. VENT PIPE SHALL BE VERTICAL AND SHALL EXTEND NOT LESS THAN 6 FEET ABOVE GROUND SURFACE. TOP OF VENT PIPE SHALL
BE FITTED WITH COUNTERSUNK ELBOW PROPERLY SLOPED ON A SLOPE VALUE.
3. VENTS IN LOCATIONS SUBJECT TO INCREASED WATER shall BE EXTENDED ABOVE MAXIMUM ELEVATION OF INCREASED WATER AND SHALT BE
SUPPORTED AND PROTECTED.

MANHOLE:
1. MANHOLE ARE NOT ALLOWED WITHIN CALTRAM CORRIDOR, EXCEPT FOR LONGITUDINAL PIPELINES WHERE MANHOLE SHALL BE
REPLACED WITH CONCRETE PLINTH WITH TOP OF GROUND.

REHABILITATION:
1. THE OWNER OF ALL CROSSING OR LONGITUDINAL PIPELINES PROPOSED FOR REHABILITATION SHALL NOTIFY CALTRAM, IN WRITING,
OF THE INTENTION TO REHABILITATE.
2. AS DIRECTED BY CALTRAM, REHABILITATION PIPELINES SHALL BE IF OF LEAK PROOF OR COMPLETELY FILLED WITH CONCRETE BLASTED, COMPACTED, SAND, OR OTHER MATERIALS, AS APPROVED BY CALTRAM.
3. REHABILITATED PIPELINES SHALL BE REPLACED TO A MINIMUM DEPTH OF 8 FEET BELOW PAVING GRADING AND COMPLETELY FILLED
WITH CONCRETE BLASTED, COMPACTED, SAND, OR OTHER MATERIALS, AS APPROVED BY CALTRAM.

NOTES:
1. AREMA: AMERICAN RAILWAY ENGINEERING AND MAINTENANCE-OF-WAY ASSOCIATION
2. FEED WATER OR ELECTRICAL INSTALLATIONS MAY USE PVC OR HOPE PIPE SCHEDULE 80, AS A CONDUIT.
CARRIER PIPE

1. CLASS 50 PIPE SHALL BE USED FOR STORM WATER OR OTHER USES THAT COULD CAUSE CORROSION, WHERE THE OPERATING PRESSURE IS UNDER 40 PSI.

2. DUCTILE IRON PIPE IN A CASING IS ACCEPTABLE AS FOLLOWS:
   a. CLASS 50 FOR DIAMETERS OF 4" THRU 10".
   b. CLASS 54 FOR DIAMETERS OF 12" THRU 18".
   c. CLASS 56 FOR DIAMETERS OF 20" THRU 24".

3. PLASTIC PIPE SHALL BE IN A CASING. THE PLASTIC PIPE SHALL BE PVC OR HIGH DENSITY Polyvinyl Chloride (PVC) AND VENOM SCHEDULE 80, WHERE THE OPERATING PRESSURE IS UNDER 20 PSI.

CASING PIPE

1. CASING PIPE MAY BE CHANGED FOR NON-PRESSURE GRADES OTHER AND STORM SEWER CROSSINGS UNDER TRACKS WHERE THE PIPE IS NOT IN CAPEABLE OF WITHSTANDING RAILROAD CROSSING.

2. NON-METAL CASING AND CASING PIPE SHALL BE FILL IN WITH CLEAN SAND IN ALL PRESSURE ABOVE 20 PSI INSTALLATIONS. CASING MAY BE FILL IN OTHERS AS SHOWN.

NOTES:

1. ACCEPTABLE EMERGENCY SHUT-FLOW VALVE MAY BE REQUIRED BY THE FEDERAL AND LOCAL AUTHORITIES. IF INSTALLED, THE VALVE SHALL BE LOCATED OUTSIDE OF CALTRAIN RIGHT-OF-WAY.

2. SEE SN-B002 FOR GENERAL REQUIREMENTS.

3. SHOWN NOT SHOWN FOR CLARITY.
CARRIER PIPES:
The following requirements are in accordance with AREMA, PART 1.
1. PIPELINE CARRYING OIL, LIQUID PETROLEUM GAS, NATURAL OR MANUFACTURED GAS AND OTHER FLAMMABLE LIQUIDS SHALL COMPLY WITH THE REQUIREMENTS OF ANSI B31.8 AND ANSI B31.4 AND OTHER APPLICABLE CODES, EXCEPT THAT THE MAXIMUM ALLOWABLE STRESS FOR DESIGN OF STEEL PIPE SHALL NOT EXCEED THE SPECIFIED MINIMUM YIELD STRENGTH, WHICH IS DETERMINED BY A PERCENTAGE OF THE MOON SQUARE DUE TO INTERNAL PRESSURE AS LAXED BELOW.

1. STEEL LINED PIPE UNDER TRACKS THAT IS PROTECTED WITH A STEEL COATING. THE FOLLOWING PERCENTAGES APPLY TO MOON STRESS:
   A. 10% FOR INSTALLATION ON OR NEAR TIES
   B. 10 FOR INSTALLATION ON OR NEAR TIES, PETROLEUM, GAS AND OTHER FLAMMABLE LIQUIDS WITH LOW FLAMMABILITY
   C. 10% FOR INSTALLATION ON GAS PIPELINES

2. STEEL PIPE WITHIN THE CARRIER UNDER SECONDARY OR INDUSTRY TRACKS. THE FOLLOWING PERCENTAGES APPLY TO THE SUM OF THE MOON STRESS DUE TO THE MAXIMUM ALLOWABLE INTERNAL PRESSURE AND THE PLACED RING STRESS DUE TO EXTERNAL LOADING:
   A. 10% FOR INSTALLATION ON OR NEAR TIES
   B. 10 FOR INSTALLATION ON OR NEAR TIES, PETROLEUM, GAS AND OTHER FLAMMABLE LIQUIDS WITH LOW FLAMMABILITY
   C. 10% FOR INSTALLATION ON GAS PIPELINES

3. STEEL PIPE LAY CONDITIONAL ON CARRIER ROW WITHOUT THE PROTECTION OF A COATING. THE FOLLOWING PERCENTAGES APPLY TO MOON STRESS:
   A. 10% FOR INSTALLATION ON OR NEAR TIES
   B. 10 FOR INSTALLATION ON OR NEAR TIES, PETROLEUM, GAS AND OTHER FLAMMABLE LIQUIDS WITH LOW FLAMMABILITY
   C. 10% FOR INSTALLATION ON GAS PIPELINES

4. ALL JOINTS OR COUPLINGS SHALL BE HELD
   B. GAS LINE SHALL BE ALLOWED CARBON STEEL WITH A FACTORY-APPLIED CORROSION PROTECTION COATING.

CASING PIPE:
1. CASING PIPE AND JOINTS SHALL BE HELD, CAPABLE OF WITHSTANDING RAILROAD LOADING (CODE E-80)
2. CASING PIPE MAY BE SHIPPED FOR GAS PIPELINES

NOTES:
1. SALTISH VALUES MAY BE REQUIRED BY THE FEDERAL, STATE OR LOCAL AUTHORITIES. IF INSTALLATION THE VALUES SHALL BE LOCATED OUTSIDE OF CARRIER ROW.
2. SEE 06-0200 FOR GENERAL REQUIREMENTS.