

EMWD GUIDELINES FOR SEWER SYSTEM PLANS

Submittal Requirements

EMWD will require the documents identified below to start the plan check process (reference form NBD-063 Documents Required for Plan Check):

- An Approved Design Conditions (DC) with all attachments with an approval date of two years or less from date of plan check submittal.
- Sewer Improvement Plans (2 sets)
- Street Improvements Plans (1 set)
- Storm Drain Plans (1 set)
- Grading Plans (1 set)
- Approved Tentative Tract Map (1 set), if applicable
- Parcel or Tract Map (1 set)
- Current Conditions of Approval (1 set)
- Cover letter signed with plan check list by registered civil engineer
- Plan Check Deposit
- Community Facilities District (CFD) Letter

This plan checklist is a general guide to assist Consulting Engineers in the design and drafting of water plans. Contact our Engineering Department concerning any exceptions; in order to prevent unnecessary plan revisions. Please note that if water, sewer, and recycled water are required, these are to be delineated on one set of 24" x 36" drawings.

- A. **Title or Cover Sheet** (For CAD examples and details access CAD Toolbox [HERE](#))
1. Index map that shows all sewer system facilities and any water system, if any. Do not show storm drain facilities as part of the index map. Index map can be shown on sheet 2 if it will not fit on title sheet.
 - a. Piping system; size and type. (See paragraph B.1.g, page 3).
 - b. Manholes, temporary cleanouts, end plugs and backwater valves.
 - c. Existing sewer must be shown dashed with corresponding EMWD drawing number.
 - d. Sewer dashed and labeled "proposed per Tract No. _____"
If planned or constructed by other projects but not yet accepted by EMWD.
 - e. Sheet number references to plan-profile drawings.

- f. Laterals schematically showing approximate location on lot frontage and to which sewer line it is connected.
- g. Potholing – EMWD strongly recommends the potholing of existing utilities during the design phase to avoid costly and time-consuming changes during construction. In addition, potholing will identify conflicts that will result in shutdowns of existing EMWD facilities. These possible shutdowns can be coordinated during the plan check process with EMWD Operations and Maintenance staff.

If potholing is not conducted during design, the engineer of record will be required to assess the risk of unplanned shutdowns of existing EMWD facilities due to unforeseen conflicts.

- 2. (Do not show storm drain facilities as part of the index map).
- 3. General Notes and Requirements – County/City required notes only. (Do not include notes that conflict with EMWD required notes).
- 4. Estimate of Quantities; items such as pipe, pipe laterals, manholes and cleanouts (on sheet with index map).
- 5. Notifications – See attached page 13.
- 6. EMWD Sewer Notes – See attached pages 14.
- 7. EMWD Sewer Force Main Notes – See attached page 19.
- 8. Sewer Certification (tracts & parcel maps) – See attached page 20.
- 9. Time Limitation – See attached page 20.
- 10. Engineer’s Declaration of Responsible Charge – See attached page 21.
- 11. Typical Lot
- 12. Sewer Legend – See Toolbox (on sheet with index map).
- 13. EMWD Approval Block/Title Block
- 14. Minimum letter heights 0.08” (all sheets).
- 15. List of Implementing Facilities (on sheet with index map).

16. Project Vicinity Map (on sheet with index map).

17. Manholes, cleanout, etc. should be at a large enough scale so as to be clear and obvious.

B. Plan and Profile

1. Gravity Sewer

2. Plan and Profile Drawing

a. Stationing shall correspond with street centerline.

b. Pipe Size – Diameter in inches.

c. M.H. Location – 6' north or east of the centerline of street.

d. Sewer Pipe Depth – Minimum 7.5' cover over the top of pipe, drawn to scale in profile.

e. Pipe slopes and F.L. (flow line) elevations at all manholes to be shown in profile. Minimum slopes are as follows: Laterals: 4" & 6" - .0200; Main Lines: 8" - .0040, 10" - .0032, 12" - .0024, 15" - .0016, 18" - .0014, 21" - .0012, 24" - .0010 for minimum accepted velocities of 2 f.p.s. at design flow depths of ½ full of 12" and less diameter, and ¾ full for 15" and larger diameter. Maximum slopes are as follows: 8" - .1200, 10" - .0850, 12" - .0660, 15" - .0500, 18" - .0370, 21" – .0300, 24" - .0250.

Slopes shall be shown in decimal form, not as a percentage. The recommended velocity at design flow is 3 fps. Sewer lines of different sizes connecting to the same manhole shall match soffits (top of pipes) at the center of the manhole. Upsizing sewer size to obtain a flatter slope will not be allowed.

f. Storm drain shall be shown in plan and profile, dashed, and labeled.

g. Pipe Type

i. Sewer shall be EMWD approved PVC or VCP pipe.

ii. VCP is required when:

- Serving industrial development.
- On curved alignments (12" and above).
- Sizes larger than 15" (unless otherwise approved by the District)

- When pipe type is not dictated by above requirements, no pipe type shall be indicated on plan or profile.
- iii. When VCP is required, it shall be indicated on plan and profile.
 - iv. Where existing grade goes cut to fill, use short joints 2.5' max., 10' each side for VCP pipe. Use flex couplings for plastic pipe. Note to be labeled on profile if applicable.
 - v. Where casings are used and the annular space is filled with grout per EMWD specifications, use VCP pipe or PVC C-900 or C-905 as required.
- h. Special bedding for gravity sewer pipe: Refer to standard drawings SB-157, SB-158 and SB-159 for specific type of bedding.
 - i. 10' horizontal clearance required between water and sewer mains (edge to edge; 8' horizontal clearance required between edge of sewer main and curb face). Sewer pipeline crossing under water pipelines must have 1' of vertical clearance between top of sewer main and bottom of water pipe. Water main shall not have any joints within 8-feet of the outside of the sewer pipe crossing, in both directions. Otherwise, special conditions will be required per Division of Drinking Water (DDW) requirements. Give crossing elevations (top of sewer, bottom of water). When there is no alternative except for sewer to go over water, special conditions will be required per DDW requirements.
 - j. Scale & North Arrow:
All sheets to have same scale: Horizontal @ 1" = 40' to have Vertical @ 1" = 4'; exceptions must have EMWD approval prior to submission of plans for review. Vertical scale 1"= 8' is not acceptable. North arrow pointing down is not acceptable.

3. Force Main

- a. Stationing shall correspond with street centerline.
- b. Pipe size – Diameter in inches.
- c. Pipe type- PVC C-900, DR18 (Color-Green)

- d. Pipe Depth – Minimum 4’ cover over the top of pipe, drawn to scale in profile view. To avoid existing, proposed, or future potable water laterals and services crossing under force main, the force main shall be installed 12-inches deeper than potable water laterals and pipelines.
 - e. Pipe location – 7’ off the curb face in the street on the north or east side of the street. If there is an existing or proposed recycled water pipeline on this location, the proposed force main shall be relocated towards the center of the street with a minimum of 4-foot clearance to the recycled water pipeline, or as otherwise approved by EMWD.
 - f. Pipe slopes and C.G. (center grade) elevations, and stationing at all grade breaks to be shown in profile view in decimal format (ex. S=0.0010). Show top and bottom of pipe in profile view for sizes 16” and larger.
 - g. Show restrained joint limits on PVC pipe by dimensions and stations in profile view at appropriate design locations.
 - h. Minimum 10’ horizontal clearance required between water and sewer force mains (outside pipe to outside pipe).
 - i. Sewer force main crossings under water pipelines must have 1’ of vertical clearance between bottom of water and top of sewer force main. No joints shall be allowed within 10’ of the outside water pipe on either side of the crossing.
 - j. When there is no alternative except for sewer force main to go over water, special conditions will be required by DDW.
 - k. Manholes at the discharge point for sewer force mains shall be protected from corrosion. Existing manholes shall be lined as approved by the District and shown in Section “Y” of the notes. New manholes shall be polymer concrete (Armorock) or approved equal.
4. Sewage Air Valves:
- a. High points in sewer force mains shall be avoided.
 - b. To avoid high points and sewage air valves in the force main, start with a deep force main at the sewage lift station.

- c. If unavoidable, sewage air valves are required at high points in the force main wherever pipe grade changes from an “uphill” to a “downhill” slope. Show a sewage air valve symbol in plan view. Station sewage air valve in plan and profile views with standard drawing number; sewage air valve sizes shall be calculated for all sewer force mains. When a sewage air valve is required, a combination sewage air release and vacuum valve shall be used. Additional vacuum valves may be required based on the sewage lift station’s surge analysis.
- d. Air valves shall be stainless steel combination sewage air and vacuum valves as specified in EMWD Standard Detailed Provision Section 11210.
- e. Air valve discharge lines shall be plumbed to the nearest gravity sewer.
- f. Air valves may require odor control measures, as required by EMWD.

5. Fittings

- a. Call out all fittings in plan view; specify size, type, and stationing.
- b. Fittings for vertical grade breaks to be called out in profile view.
- c. Ductile iron fittings shall be Class 250 and shall be cement mortar lined as specified in EMWD Standard Detailed Provision Section 11210.
- d. Ductile iron fittings shall be provided with an exterior asphaltic coating and polyethylene encasement as specified in EMWD Standard Detailed Provision Section 11210.

6. Restrained System

- a. When required, anchorage shall be provided by means of restraint fittings for plastic (PVC) pipe or ductile iron pipe. The use of concrete anchorage in lieu of restrained joints will not be allowed.
- b. Utility Crossings – Show caution note designating type, size and stationing of the utility line wherever it crosses the force main. In note, also include top or bottom elevation of utility line and water main at minimum vertical crossing point. Where a minimum crossing separation is obtained, label on profile view between utilities “CDF per EMWD specs”.

- C. **Scale and North Arrow:**
All sheets to have same scale: Horizontal @ 1" = 40' to have Vertical @ 1" = 4'; exceptions must have EMWD approval prior to submission of plan for review. Vertical scale 1" = 8' is not acceptable. North Arrow pointing down or left is not acceptable.
- D. **Manholes**
The manholes shall be stationed, numbered and shown in the plan and profile. Terminus manholes are required at permanent ends of sewer mains. Number manholes starting with No. 1.
- E. **Shallow Manholes**
Required for all manholes of depths less than 5' from finished street grade to sewer pipe shelf.
- F. **Manhole Spacing**
The maximum distance between manholes on tangent sections is 500'. Manholes are required at beginning and end of curves.
- G. **Horizontal Curves**
The minimum radius is 144' for VCP (4" to 12", 6' length), 200' for 8" PVC and 250' for 10" PVC. For radius equal to or greater than 500', maximum manhole spacing is 450'; for radius less than 500', maximum manhole spacing is 150'. Reverse curves and/or combination curve/tangent are not allowed between manholes.
- H. **Mainline Cleanouts**
The use of a temporary cleanout is permitted in lieu of a manhole at the end of a sewer main with a length of 150' or less and is to be extended in the future. Cleanout or stub shall extend 10' or the depth (whichever is greater) past the tract boundary. Temporary end of a sewer line that exceeds 150' will require a manhole.
- I. **Private Lateral Cleanouts**
Private sewer cleanouts shall be placed on each private sewer lateral just inside of the property line or edge of easement per SB-52.
- J. **Utility Crossings**
Show a caution note designating type, size and stationing of the utility line wherever it crosses a sewer main or lateral. In note, also include top or bottom edge elevation of utility line and sewer main/lateral at minimum vertical crossing point. Where a minimum crossing separation is obtained, label on profile between utilities "C.D.F. per EMWD specs."

K. **Sewer Laterals**

Show all sewer laterals on the plan and on the index map. Locate laterals to miss driveways. Design lateral grades, per SB-177, to accommodate water system construction. Maximum number of laterals into terminus manhole not to exceed four. The maximum length of laterals shall be 55 feet from lateral cleanouts (see sub-paragraph I) to centerline of manhole or pipeline connection.

4-inch and 6-inch sewer laterals shall be private with private sewer cleanouts. Sewer laterals, 8 inches and larger, shall be owned and maintained by EMWD, with an on-site EMWD manhole at the property line or inside the property with an EMWD easement.

For the installation of new sewer laterals to existing sewer pipelines, use Tap-N-Tee connection systems. Tap-N-Tee connections can only be used for existing sewer pipelines of the following materials: PVC C-900, VCP, HDPE, Spirolite. Do not use Tap-N-Tee connections when using PVC SDR 35. EMWD to determine the use of Tap-N-Tee connection systems on other pipe materials.

L. **Backwater Valves**

Section 710.1 of the Uniform Plumbing Code states that "...Fixtures which have flood level rims located below the elevation of the next upstream manhole cover...shall be protected...by installing an approved type backwater valve." EMWD will require lots with pad elevation below the elevation of the next upstream manhole cover to have a backwater valve. Show the backwater valve symbol on each protected lot in the plan view and on index map.

M. **Pad Elevations**

Show the pad elevation of each lot on plan view. Any revisions to the grading plans should be reflected on the sewer plans.

N. **Easements**

Sewers to be located in easements will not be allowed except upon approval by the Development Services Department. Provide easement description and plats where required, with widths typically twice the depth; rounded up to the nearest 10' increment; 20' minimum. Show and label easements on the index map and plan view of improvement plans. Provide ingress and egress to all manholes or a 72 foot diameter turn around if egress is not provided. Sewers are to be in the center of the easement unless otherwise directed. For commercial and industrial projects, easement must be recorded before approval of plans. For residential projects easement documents must be submitted before approval of plans.

1. Easements within residential lots shall not be double-walled or double-fenced.
2. Easements that contain manholes will require an access road within the easement, or alternate access/egress easement(s) to reach said appurtenances. Driveways and gates will be required to access and secure the easements, as necessary. Manhole covers within easements shall be bolted-down.
3. For residential developments, the preference by EMWD is to hold easements within lettered lots, which are maintained by an HOA, land agency, or other maintaining entity.
4. The preferred surfaces for access roads within easements shall be the following: Class II Aggregate Base and Gravel. Other surface materials may be used upon EMWD approval.
5. The following improvements are not allowed within proposed EMWD easements: trees, shrubs, irrigation pipelines, ribbon gutters, curb, reinforced and non-reinforced concrete pavement, stamped concrete, pavers, grouted and non-grouted river rock, rip-rap, water basins, and other structural improvements.
6. Encroachment into existing EMWD easements may only be allowed upon review and acceptance of the proposed improvements through an EMWD encroachment license.
7. Easements shall not straddle properties longitudinally, encompass longitudinal slopes or water quality basins, contain structures, and have restricted access.
8. For temporary easements, existing facilities shall be either removed or abandoned as required by EMWD, prior to the quit claim of said easements. The developer shall make a cash deposit prior to the installation of facilities within temporary easements to ensure their removal or abandonment. Once facilities have been removed or abandoned, the cash deposit shall be returned to the developer. If the developer does not remove or abandon said facilities, EMWD shall use the cash deposit to conduct the work.

O. **Access Roads**

1. A means of access and egress to sewer facilities shall be provided. When a separate point of egress is not provided, the project proponent shall provide a cul-de-sac with a radius of 38 feet, or a hammer head design to allow for a vector truck to make a three-point turn. The project engineer shall provide a truck-turning wheel design to prove the design will be adequate (use a bus wheel template).
2. Surface Material - EMWD will consider the following materials for the access road:
 - a. Class II Base (95% Relative Compaction) – 8-inches in depth minimum (or as required by Geotechnical Report to support a fully loaded vector truck). Use HS-20 vehicle to determine Class II Base section. Manholes with access road shall include an AC pavement pad per standard drawing SA-47.
 - b. 2-inch Angular Gravel – 8-inches in depth. Manholes with access road shall include an AC pavement pad per standard drawing SB-181.
 - c. Asphalt Concrete Pavement with Class II Base (95% Relative Compaction) – 6-inches over 8-inches (or as required by Geotechnical Report to support a fully loaded vector truck). Use HS-20 vehicle to determine AC pavement with Class II Base section.
3. Driveways - A means of entry to access roads from public right-of-way will be required. EMWD will consider the following:
 - a. Driveway – Install 16-foot wide commercial driveway per the local land agency’s standards.
 - b. Rolled Curb – Install 16-foot wide section of rolled curb per the local agency’s standards. Increase the depth of the sidewalk to 8-inches, and upgrade the base to account for the additional load.
 - c. Access/Egress Easements – If direct entry or exit from public right-of-way cannot be provided to access road, developer shall allow entry or exit through its property by means of an access/egress easement.
4. Gates - A means of limiting access to access roads shall be provided. Acceptable means of limiting access are: Pipe gates, chain link fence gates, and wrought iron gates. EMWD’s construction and safety inspector shall provide the locks to be used on these gates.

5. Horizontal Curves - Horizontal curves within access roads shall not have a radius of less than 50-feet.
6. Vertical Curves - Vertical angle points shall not be allowed in access roads. Vertical curves shall be introduced to avoid ground clearance "bottoming out" conditions. (Vector truck is 25 feet long from the center of the back hub to the center of the front hub. Lowest point on the unit is 11 inches from the ground).
7. Drainage Crossings
 - a. EMWD will consider the following for access roads drainage crossings:
 - b. Grouted rounded river rock 6-inches in diameter or smaller.
 - c. AC pavement.
 - d. Subsurface structures as approved by EMWD.
8. Maximum permissible slopes shall be 12 percent on surfaces other than AC pavement.

P. **Abandonment of Existing Sewer Facilities**

1. Abandonment of Sewer Laterals – Cut sewer lateral at wye and remove 12-inches of pipe (minimum). Install plug at wye. Remove on-site clean out, if any. Install concrete end plugs on both ends of sewer lateral and fill with grout per EMWD Standard Detailed Provision Section 03604 or Cellcrete.
2. Abandonment of Sewer Manholes – Remove and dispose of top 6 feet of manhole. Install concrete plugs on sewer inlets and outlet. Fill manholes with sand SE30 or better, or fill with grout per EMWD Standard Detailed Provision Section 03604 or Cellcrete.
3. Abandonment of Sewer Pipeline/Sewer Force Main – Install concrete end plugs and fill with grout per EMWD Standard Detailed Provision Section 03604 or Cellcrete.
4. Remove and dispose of excess materials in accordance to local, state, and federal regulations.

Q. **District Financial Participation**

1. For projects that require District financial participation, the project proponent shall obtain a minimum of three bids to determine the District's cost. EMWD staff will provide the developer with instructions and necessary documents on how to bid the work starting at the design conditions. Please refer to the Policy Highlights of Facility Oversizing and Reimbursement Form in the Development Services process section within EMWD's web site.
2. The developer shall provide the plan checker with copies of all the bids. The information will be used to prepare the standard facilities agreement between the District and the developer.

R. **Index to Commonly Used Sewer Standard Drawings**

Click [here](#) to access the EMWD Standard Drawings.

Manholes

SB-8	Locking Type Manhole Cover & Frame
SB-30	Reinforced Precast Shallow Manhole
SB-53	Precast Reinforced Concrete, 48" & 60" ID Manhole
SB-54	Precast Reinforced Concrete, 60" & 72" ID Flat Top
SB-58	Terminus Manhole
SB-61	Manhole Cover and Frame Standard & Watertight Manholes
SB-73	Precast Reinforced Concrete 36" ID Sampling Manhole
SB-179	48" and 60" Diameter Manhole Installation for HDPE Sewer Main
SB-181	Paving Detail Around Manholes

Pipeline

SB-49	Pipe Casing (Sewer Main)
SB-157	Pipe Zone Bedding for Sewer Pipe
SB-158	Trench Backfill for Sewer Pipe
SB-159	Classification of Pipe Zone Bedding for Sewer Pipe
SB-182	Connecting Dissimilar Sewer Pipes
SB-184	Sewer Concrete Anchor

Service

SB-52	Sewer Cleanout (mainline & on-site)
SB-52A	Sewer Tree Laterals & Cleanouts
SB-176	Sewer Lateral Connections
SB-177	Sewer Laterals
SB-180	Sewer Chimney Lateral
SB-63	Sewer Connection at Concrete Encasement
SB-70	Grease Interceptor with 24" Sampling Box
SB-75	Sand / Oil Interceptor with 24" Sampling Box

Miscellaneous

SB-183	Existing Sewer Manhole Median Installation
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S. Notifications

1. Engineering shall include the following notes:
At least 48 hours prior to commencing construction, contractor shall notify:
Eastern Municipal Water District, Field Engineering Department,
(951) 928-3777, ext. 4372

2. Permit Agency (Engineering to select agency).

Riverside County Road Department
(951) 955-6885

City of Hemet
(951) 765-2360

City of San Jacinto
(951) 654-7337

City of Moreno Valley
(951) 413-3350

City of Temecula
(951) 694-6400

City of Perris
(951) 943-5003

City of Murrieta
(951) 698-1040

3. Underground Service Alert (USA)
1- (800) 227-2600 or 811
4. All other affected agencies that are not members of USA. (Engineer to provide names and phone numbers of agencies).

T. **Plotting of Mylars**

Mylars to be plotted mirrored on HP Matte Film (51642B) 5 mil.

U. **EMWD Sewer Notes**

Use only those notes and standards determined appropriate by EMWD.

V. **Detailed Requirements:**

(List on title sheet of construction plans. **List only those notes that are applicable to the project.**)

1. Sewer system construction and materials shall be in accordance with EMWD's standards and specifications.
2. Gravity sewer profile elevations are to flow line (conduit invert). Force Main profile elevations are to centigrade (C.G.).
3. Contractor has the option to install PVC or VCP sewers, except where specifically designated on plans per EMWD standards and specifications. PVC pipe shall be colored green as manufactured.
4. Manholes shall be constructed in accordance with standard drawings SB-53, SB-58 and SB-61, as applicable. Sewer mains may be laid through the manholes and used as a form for the invert.
5. Manholes of depths less than five feet from finish street grade to sewer pipe shelf are to be constructed in accordance with standard drawing SB-30.

6. All sewer service laterals, 6-inch in diameter and smaller, shall be PRIVATE and shall have a PRIVATE on-site cleanout in accordance with standard drawings SB-52. In addition, for PRIVATE lower sewer service laterals serving industrial and/or commercial developments, the requirements for sampling and/or pretreatment facilities shall be determined by contacting EMWD's Source Control Division at (951) 928-3777, ext. 6209.
7. Mainline cleanouts, where called for on the plans, shall be constructed in accordance with standard drawing SB-52.
8. Prior to construction of sewer, contractor shall expose existing sewer and verify its existing elevation and location. Where connecting to existing manholes and inlet stub of proper size exists, no alterations shall be made to existing manhole base or stub except as specifically authorized by EMWD.
9. All sewer inlets at the manhole shall be such that its crown shall be level with the crown of the outlet pipe, at their projections to the manhole centerline.
10. Reconstruction of existing manholes shall be scheduled at the convenience of EMWD and shall be completed within five working days following its commencement.
11. PRIVATE lower sewer service laterals shall be constructed in accordance with SB-177. Locations of wyes and PRIVATE lower sewer service laterals, where not shown on the plans, are to be determined in the field prior to construction to miss driveways. All PRIVATE lower sewer service laterals are to be 4" in diameter unless otherwise shown on plans. Connections of new PRIVATE lower sewer service laterals to existing sewer are to be per standard drawing SB-176.
12. The contractor is advised that the work on this project may involve working in a confined air space. Contractor shall be responsible for "confined air space" Article 108, Title 8, California Administrative Code.
13. Backwater valves shall be installed per Section 710.1 of the Uniform Plumbing Code.
14. All pipe zone bedding & trench backfill are to be per standard drawing SB-157, SB-158 and SB-159.

- W. **Add for Pedestrian Safety:**
Where pedestrians will be walking on manhole covers, all manhole covers shall be GMI Composite Cover Attributes – 2600 Series (Titus Industrial Group, Inc., Phone No. 541-389-1975 or 541-948-4458, or approved equal.
- X. **Add for Odor Control:**
Manholes with new force main discharge shall be fitted with a manhole odor eliminator system (MOE™). This is a cover filter system designed to remove odors from vented manholes.
- Y. **Add for Manhole Lining (Corrosion Protection):**
As noted per plans, manholes shall be coated in the interior (shaft, channel, and shelves) with a 100% solid epoxy polymer. Minimum total dry thickness of coating system shall be 125 mils.
1. Saureisen SewerGard Glaze No. 210GL. Surface preparation including Saureisen Underlayment No. F-120 or No. 209 Filler Compound, abrasive blasting, mixing application, and curing shall be as recommended by manufacturer.
 2. Raven 400 lining system. Surface preparation, abrasive blasting, mixing application, and curing shall be as recommended by manufacturer. Minimum total dry thickness of coating system shall be 125 mils.
- Z. **Add for Groundwater Waterproofing:**
Where groundwater is encountered, all VCP pipe shall be treated for absorption resistance per EMWD’s specifications. In addition, manholes shall be coated in the exterior with Barricoat-R (Carlisle Coatings & Waterproofing); Phone No. 800-527-7092, or with Mel-Rol-LM (W.R. Meadows); Phone No. 541-389-1975, or approved equal. Where groundwater infiltration persists, use Sauresein Instaplug F-180, Hydroactive Polyurethane Grout F-370, and Sewerseal F-170.
- AA. **Add for Proposed Sewers Joining Existing Manholes:**
Requirements to remove existing sewer manhole stub and join with new sewer. Remove existing sewer stub, install Sika Hydrophilic Leakmaster WaterStop, and seal opening with SikaTop 122 PLUS mortar. Join new sewer by coring manhole base (core sized to accommodate water stops). Install Sika Hydrotite Waterstops both on the pipe and the outside diameter of the cutout. Fill the annulus space with non-shrink grout per EMWD standard detail provision section 03300. Coat outer affected surface areas of manhole with Carlisle “Barricoat-R” Phone No. 800-527-7092 or W.R. Meadows “Mel-Rol-LM” Phone No. 800-342-5976. Rechannel manhole bottom.

BB. Add for Temporary Sewer Bypass Systems:

1. Temporary Sewer Bypass System – Where sewer conveyance facilities must be removed from service to allow modifications and connections to existing facilities, which will require bypass of sewage flows. Conveyance of sewage shall not be interrupted by project construction. The Contractor shall be responsible for necessary bypassing of the existing gravity sewers.
 - a. Contractor shall have adequate bypass facilities, including pumping units (duty and backup), electric generators (if electric motor driven pumps are provided), suction and discharge piping, valves, and repair fittings to convey sewage without leakage.
 - b. Contractor shall locate bypass facilities out of the traveled way. If discharge piping is located in areas subjected to traffic, Contractor shall install discharge piping below ground with sufficient cover to protect the discharge piping in place.
 - c. A minimum of 15 calendar days prior to installing any bypass system and prior to beginning any sewer connections work, Contractor shall submit to EMWD the following for approval:
 - i. Proposed schedule, including installation of bypass system, bypass system testing, sewer construction, and bypass system removal.
 - ii. A detailed written plan for bypassing the existing gravity sewer. Plan shall include layout drawing of temporary equipment and piping, manufacturer's data for major system components (data shall provide equipment performance capabilities and power requirements), backup pumping and power equipment, and method of operation and control. Plan shall also include a system head curve for bypass pump and temporary piping, along with supporting data and calculations.
2. Temporary bypass pumping equipment shall be suitable to pump raw sewage, and shall be capable of running dry. Pumping equipment may be engine driven or electric motor driven. Electric motor driven pumping units shall be provided with portable electric power generators. Portable electric power generators shall be sized to start and continuously operate connected pumping units. Contractor shall provide backup pumping equipment sized to pump 100% of the specified sewage flow. Backup pump(s) shall be installed and connected to temporary piping system.

Backup pump(s) shall automatically start and operate upon failure of duty pump(s). Backup pumping units that are electric motor driven shall be provided with a backup portable electric power generator.

3. Temporary bypass pumping equipment and backup pumping equipment shall be sized to handle peak flow. Contractor shall assign competent personnel to operate the bypass pumping equipment during all bypass operations (24 hours per day). Reliable operation of bypass facilities for a minimum of 24 hours shall be demonstrated prior to removal of the existing gravity sewers from service (refer hereafter as “functional test”). During the 24-hour functional test, the emergency back-up system shall be activated a minimum of two (2) cycles to check the reliability, including capacity and controls. The Contractor shall be solely responsible for operation of the bypass facilities until such time as the new sewers are in operation and said sewers are acceptable to the District.
4. Contractor shall be responsible for and pay all costs for any sewage spills which result from his construction activities, including subsequent cleanup, fines, and damage due to backup into dwellings and/or businesses.

CC. **Add for Steel Casings with Blown Sand:**

(Blown sand shall only be used in steel casings with a length of 100 linear feet or less)

1. Use air-blown sand to fill the annular space between the casing and the carrier pipe unless otherwise required by the agency having jurisdiction over the road or railroad crossing.
2. Furnish the necessary sand, air compressor, hoses, pressure gauges, valves, and fittings for the filling operation.
3. Air blown sand shall conform with the following gradation requirements:

<u>Sieve Size</u>	<u>% Passing</u>
No. 4	100
No. 8	90-100
No. 16	70-90
No. 30	30-70
No. 50	0-30
No. 100	0-5
No. 200	0

4. Certification that the sand meets this requirement shall be provided. Sand shall be free of lumps when put into the hopper. Sand shall be of a consistency to flow unimpeded and completely fill all voids.
5. Place a bulkhead for retaining the sand in the annular space between the casing and the carrier pipe at each end of the jacked casing. At the start of the sand fill operation, extend the sand discharge pipe from the placing equipment, through the inside of the casing, and to the bulkhead at the remote end of the casing. The method used to place the sand shall be such to ensure complete filling of the annular space. During placement, position the sand discharge pipe so that its discharge end shall be kept well buried in the sand at all times after the sand has been built up over the crown of the pipe at the remote end of the section being filled. Install a riser pipe suitable for a vent in the casing adjacent to the bulkhead at the near end of the casing. Plug the vent pipe with grout upon completion of sand filling.
6. Job site air quality management will adhere to Cal OSHA regulations and EMWD's Respirable Crystalline Silica: Exposure Control Plan.

DD. **Add for Sewage Force Mains:**

1. EMWD Sewer Force Main Notes - Use only those notes and standards determined appropriate by EMWD.
2. Detailed Requirements - List on title sheet of construction plans. **List only those notes that are applicable to the project.**
3. Force main profile elevations are to center grade (C.G.).
4. The design of force mains shall maintain a positive slope towards the discharge (avoiding high points). If there is an extraordinary need for a high point due to unavoidable constraints, then a high point with a sewage valve can be introduced. Sewage air valves shall be per EMWD's Approved material List. If available, sewage air valves shall be designed to discharge to existing/proposed sewer manholes.
5. Install locator wire over sewer force main per EMWD STD. B-656.
6. Install non-metallic identification tape 12-inches above the sewer force main. Identify sewer force main laterals with identification tape that visibly extends to the above grade appurtenance. Secure identification tape every 10 feet to the top of the pipe.

7. Joint restrainers shall be used on all mainline (sewer force main) pipe joints within specified limits and all joints on water appurtenance laterals off mainline, per EMWD STD. B-663. A joint restrain device shall be used on all mainline pipe joints within specified limits per STD. DWG. B-663.
8. Force main shall be Type C-900, DR18 Green, except where noted, otherwise pipe shall conform to AWWA specification. Force main shall be C-900, DR 18 pipe unless otherwise approved by the District. Pipe shall conform to AWWA specifications.
9. Fittings for PVC pipe shall be ductile gray iron. Fittings shall be flanged, bolted mechanical joints, or push on joints, and shall be cement mortar lined and tar (seal) coated per EMWD Standards and Specifications.
10. The contractor is advised that the work on this project may involve working in a confined air space. Contractor shall be responsible for "confined air space" Article 108, Title 8, California Administrative Code.
11. Manholes within 4000 feet of the force main discharge shall be Sauereisen coated. The manhole at the force main discharge shall be a polymer concrete manhole.
12. List other specific requirements as appropriate.

EE. **Sewer Certification**

I certify that the design of the sewer system is in accordance with the Eastern Municipal Water District's Sewer System Master Plan, and the District has programmed adequate capacity to treat wastes from the proposed tract.

EASTERN MUNICIPAL WATER DISTRICT

By: _____
Principal Engineer of Development Services Date:

FF. **Time Limitation**

The time limit on drawing approval shall be six (6) months from the date on the certification. If construction has not commenced within stated time, EMWD requires drawings to be reviewed by the Developer/Design Engineer and resubmitted to EMWD for possible changes in Master Planned sizing and changes in specifications and standards.

GG. **Engineer's Declaration of Responsible Charge**

I hereby declare that I am the engineer of work for this project, that I have exercised responsible charge over design of this project as defined in Section 6703 of the Business and Professions Code, and that the design is consistent with current standards.

I understand that the check of project drawings and specifications by Eastern Municipal Water District is confined to a review only and does not relieve me, as Engineer of Work, of my responsibilities for project design.

Name	P.E.#	Date
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