

## SEWER NOTES

1. THE SEWER SYSTEM SHOWN ON THESE PLANS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE REQUIREMENTS OF THE CITY OF NATIONAL CITY.
2. SEWER LATERALS SHALL BE SPACED SO THERE IS ONLY ONE CONNECTION IN ANY ONE PIPE LENGTH.
3. OPEN ENDS OF ALL SEWER MAINS AND LATERALS SHALL BE PROVIDED WITH PVC CLEANOUTS, AND "S-2" MANHOLES. THE CLEANOUTS SHALL BE PROVIDED TWO FEET IN FROM THE PROPERTY LINE.
4. A METALLIC IDENTIFICATION TAPE SHALL BE INSTALLED ABOVE THE SEWER LATERAL BETWEEN THE SUBGRADE AND THE STRUCTURAL SECTION OF THE SURFACE IMPROVEMENTS FROM THE SEWER MAIN TO THE CLEANOUT 12" TO 14" BELOW FINISH GRADE.
5. WHERE LATERALS AND MAINS RUN UNDER DRIVEWAYS, PARKING AREAS, STREETS OR OTHER TRAFFICED AREAS WITH A DEPTH OF LESS THEN THREE FEET OF COVER TO TOP OF PIPE THEY SHALL BE CONCRETE ENCASED PER SDRSD S-7.
6. SEWER LATER "AS BUILT" LOCATIONS SHALL BE SHOWN ON THESE PLANS.
7. ALL SEWER MAIN AND LATERALS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE CURRENT NATIONAL CITY SEWER AND STREET STANDARDS AND SAID STANDARDS SHALL GOVERN ALL SEWER TRENCH BACKFILL AND RESURFACING.
8. A SEWER LATERAL CURB MARK "\$" SHALL BE INSTALLED OR REINSTALLED WHENEVER CURBS WITH SEWER LATERAL CURB MARKS ARE RECONSTRUCTED, OR WHENEVER A SEWER LATERAL IS REPLACED OR INSTALLEED. THE INTERSECTING SLASH ON THE "S" MARK SHALL SHOW THE ALIGNMENT OF THE SEWER LATERAL TO THE SEWER MAIN.
9. THE NATIONAL CITY PUBLICS WORK DEPARTMENT SHALLBE NOTIFIED FOR ANY REQUIRED WET TAPCONNECTION AND INSPECTION. CONTRACTOR SHALL PERFORM THE TRENCHING, SHORING, AND INSTALLATION OF TRAFFIC CONTROL DEVICES, INCUDING INSTALLATION OF THE SEWER LATERAL(S).
10. INSTALLATION OF 8" MAIN AS INDICATED ON THE PROJECT PLANS, AND COMPLETE RESTORATION OF THE SITE TO THE CONDITIONS EXISTING PRIOR TO THE WORK SHALL COMPY WITH SECTION 306 OF THE STANDARD SPECIFICATION FOR PUBLIC WORKS CONSTRUCTION (THE "GREENBOOK").

11. **PIPE AND JOINT MATERIALS** SEWER MAIN PIPE AND SEWER SERVICE LATERALS SHALL BE VITRIFIED CLAY EXTRA STRENGTH (VCES) AND/OR P.V.C. S.D.R. 35. APPROVED P.V.C. JOINT MATERIAL SHALL BE NEOPRENE, POLYURETHANE OR SYNTHETIC RUBBER WITH EQUAL OR GREATER RESISTANCE TO SOLVENCY, CHEMICAL OR BIOLOGICAL ATTACK. APPROVED VCES MATERIALS ARE: TYPE "G" JOINT FOR SOCKET AND SPIGOT PIPE AND TYPE "D" JOINT PLAIN-END PIPE. THE CIRCULAR SLEEVE OF THE TYPE "D" JOINT SHALL BE NEOPRENE, POLYURETHANE OR SYNTHETIC RUBBER.
  
12. **SEWAGE FLOW CONTROL** WHERE WORK IS TO BE PERFORMED ON AN EXISTING SEWER MAIN, SEWER SERVICE SHALL BE MAINTAINED TO ALL PROPERTIES OR OTHER ARRANGEMENTS SHALL BE MADE WITH THE APPROVAL OF THE CITY ENGINEER.
  
13. **BEDDING, BACKFILL AND TRENCH RESURFACING** BEDDING, BACKFILL AND TRENCH RESURFACING SHALL COMPLY WITH THE STANDARD SPECIFICATION FOR PUBLIC WORKS CONSTRUCTION (THE "GREENBOOK"), AND CITY OF NATIONAL CITY STANDARD DRAWING 113-S-B, OR AS INDICATED ON THE PROJECT PLANS. ONLY LIGHT TAMPING EQUIPMENT SHALL BE USED WITHIN THREE FEET OF ANY PIPES OR UNDERGROUND APPURTENANCES.
  
14. CONTRACTOR TO PERFORM FIELD INVESTIGATION AND T.V. TESTING TO LOCATE ANY EXISTING LATERALS ON THE SEWER MAIN(S) TO BE ABANDONED, OTHER THAN THOSE SHOWN ON THE SEWER PLAN. IF SUCH OTHER LATERALS ARE FOUND, THEY SHALL BE PROPERLY TIED INTO SEWER.
  
15. EACH PROPERTY SHALL HAVE A SEPARATE LATERAL. WHERE MORE THAN ONE BUILDING IS TO BE CONSTRUCTED ON THE SAME LOT IF THE LOT IS A DIVISIBLE LOT A SEPARATE LATERAL FOR EACH BUILDING SHALL BE INSTALLED. THE MINIMUM SIZE FOR ALL NEW LATERALS IS 6".
  
16. THE NEW SEWER MAIN SHALL BE VIDEO TAPED. TELEVISIONING THE SEWER MAIN SHALL FOLLOW THE REGIONAL SUPPLEMENT AMENDMENTS SECTION 306-1.4.8 PROVISIONS.

#### **INSTALLATION OF SEWER MANHOLES**

17. INSTALLATION OF THE MANHOLE BASE, PRE-CAST SECTIONS, FRAME AND COVER SHALL CONFORM TO SECTION 306-6 OF THE "GREENBOOK" AND THE SAN DIEGO REGIONAL STANDARD DRAWING NO. S-2, AS MODIFIED HEREIN.

18. WHERE A MANHOLE IS TO BE CONSTRUCTED ON UNSTABLE NATIVE MATERIAL A STABLE BASE SHALL FIRST BE CONSTRUCTED WITH ADDITIONAL BEDDING MATERIAL, AS SPECIFIED IN SECTION 306-1.2.1 OF THE "GREENBOOK" TO THE DIMENSIONS SPECIFIED IN WRITING BY THE ENGINEER.
19. **EPOXY MORTAR** EPOXY MORTAR SHALL BE USED AT THE RISER JOINTS ON ALL MANHOLES TO CREATE WATERTIGHT JOINT TO RESIST INFILTRATION.
20. THE MORTAR SHALL BE MIXED IN ACCORDANCE TO THE MANUFACTURERS SPECIFICATIONS BUT SHALL NOT EXCEED FIVE (5) PARTS SAND AND ONE (1) PART EPOXY.
21. 490 EPOXY PUTTY OR 498 UNDERWATER EPOXY PUTTY, MANUFACTURED BY ENGARD COATINGS OF HUNTINGTON BEACH, CA., OR SIKADUR 31 HI-MOD GEL OR SIKADUR 32 HI-MOD MANUFACTURED BY SIKA CORPORATION, LOS ANGELES, CA., OR APPROVED EQUAL, ARE ACCEPTABLE EPOXIES.
22. THE CONCRETE OR OTHER SURFACES THAT ARE TO ADHERE TO THE EPOXY MORTAR ARE TO BE FREE FROM DUST, LOOSE AGGREGATE, OIL, GREASE OR OTHER CONTAMINANTS.
23. **P.V.C. LINER** ALL MANHOLES SHALL BE PROTECTED BY AN APPROVED LINING AND COATING TO PREVENT DETERIORATION OF THE INTERIOR CONCRETE SURFACE BY CORROSIVE SEWER GASES.
24. NEW PRE-CAST MANHOLE RISERS SHALL BE LINED WITH WHITE POLYVINYL CHLORIDE SHEETS MEETING THE REQUIREMENTS OF SECTION 210-2 OF THE "GREENBOOK". RISER JOINTS SHALL BE WITH JOINT STRIPS OF THE SAME MATERIAL AS THE LINER, REFER TO SECTION 210-2.4.3 OF THE "GREENBOOK" FOR MATERIAL SIZES. LINERS SHALL BE ATTACHED TO THE CONCRETE WALL WITH EMBEDDED LOCKING EXTENSIONS DURING THE FABRICATION PROCESS.
25. ALL INSTALLED LINER MEMBRANES SHALL BE FREE FROM POROSITY AND SHALL BE SPARK-TESTED BY THE CONTRACTOR IN THE PRESENCE OF THE CITY FIELD ENGINEERING INSPECTOR.
26. **POLYURETHANE COATING** ALL BASES AND EXPOSED CONCRETE MORTAR SURFACES SHALL BE PROTECTED WITH A POLYURETHANE COATING. THE MANUFACTURER SHALL SUBMIT COMPLETE SPECIFICATIONS, APPLICATION PROCEDURES AND REFERENCES FOR REVIEW AND APPROVAL.

27. THE COATING MUST BE CONTINUOUS, WITHOUT SEAMS, FREE FROM ANY DEFECTS, HOLES OR SURFACE IRREGULARITIES. IT MUST BE COMPLETELY BONDED TO THE MANHOLE STRUCTURE. THE COATING THICKNESS SHALL BE A MINIMUM OF 100 MILS AT ALL PLACES FOR NEW CONCRETE AND 125 MILS FOR EXISTING OR REPAIRED CONCRETE. THE CONTRACTOR SHALL FURNISH THE CITY ENGINEER WITH A MINIMUM OF TWO (2) PLUGS PER MANHOLE TO PERMIT VERIFICATION OF THE APPLIED THICKNESS.
28. **MATERIAL** THE MATERIAL SHALL BE ONE HUNDRED PERCENT (100%) SOLID, NON-SOLVENTED, ELASTOMERIC URETHANE WITH A MINIMUM SHORE "D" HARDNESS OF 55. THE MATERIAL MUST BE ABLE TO PASS FLEXIBILITY AS PRESCRIBED BY ASTM D1737, USING CYLINDER MANDREL OF 0.5 INCH.
29. THE COATING MATERIAL SHALL BE APPLIED TO A DRY SURFACE. RELATIVE HUMIDITY SHALL BE LESS THAN EIGHTY PERCENT (80%). THE SURFACE TEMPERATURE OF THE SUBSTRATE SHALL BE FIVE DEGREES FAHRENHEIT (5° F) OR MORE, GREATER THAN THE DEW POINT. SURFACE AND AMBIENT TEMPERATURE SHALL BE BETWEEN NINETY DEGREES FAHRENHEIT (90° F) AND ONE HUNDRED TEN DEGREES FAHRENHEIT (110° F).
30. THE SURFACE TEMPERATURES, AMBIENT TEMPERATURE, RELATIVE HUMIDITY AND DEW POINT SHALL BE MEASURED PRIOR TO THE START OF WORK AT FOUR (4) HOUR INTERVALS THEREAFTER.
31. RELATIVE HUMIDITY SHALL BE MEASURED PER ASTM 337. THE CONTRACTOR SHALL PROVIDE AND OPERATE THE NECESSARY MEASURING EQUIPMENT TO MAINTAIN THE REQUIRED CONDITIONS.
32. THE COATING MATERIAL SHALL BE RESISTANT TO THE FOLLOWING:
- A. OXIDIZING AGENTS
  - B. SULFURIC, PHOSPHORIC, NITRIC, CHROMIC, OLEIC, AND STEARIC ACIDS
  - C. SODIUM AND CALCIUM HYDROXIDES
  - D. FERRIC SULFATE
  - E. PETROLEUM OILS AND GREASES, VEGETABLE AND ANIMAL OILS, FATS, GREASES AND SOAPS.
33. THE COMPLETED COATING MEMBRANE SHALL BE IMPERMEABLE TO SEWER GASES AND LIQUIDS AND NON-CONDUCTIVE TO BACTERIAL OR FUNGUS GROWTH.
34. ALL INSTALLED COATING MEMBRANES SHALL BE FREE FROM POROSITY AND SHALL BE SPARK-TESTED BY THE CONTRACTOR IN THE PRESENCE OF THE CITY FIELD ENGINEERING INSPECTOR.

35. THE COATING SHALL HAVE GOOD IMPACT RESISTANCE.
36. THE COATING SHALL BE CAPABLE OF REPAIR AT ANY TIME DURING THE LIFE OF THE MEMBRANE
37. THE COLOR OF THE COATING SHALL BE CREAM.
38. **INSTALLATION OF THE POLYURETHANE COATING MEMBRANE** ONLY WORKERS TRAINED BY AND QUALIFIED AS INSTALLERS BY THE MANUFACTURER SHALL BE USED ON THE WORK.
39. COATING MEMBRANE COVERAGE SHALL NOT BE LESS THAN THE MINIMUM INDICATED IN THESE SPECIFICATIONS.
40. SURFACE PREPARATION OF THE CONCRETE SHALL BE BY ABRASIVE BLASTING OR ACID ETCHING.
41. THE COATING MEMBRANE SHALL BE APPLIED IN ONE CONTINUOUS COAT UTILIZING PLURAL COMPONENT AIRLESS SPRAY EQUIPMENT.
42. THE COATING MEMBRANE SHALL BE APPLIED TO ALL INTERIOR CONCRETE SURFACES EXCEPT FOR A NINETY-DEGREE (90°) ARC IN THE BOTTOM OF THE MANHOLE CHANNEL.
43. **WARRANTY** THE INSTALLED PROTECTIVE COATING SHALL BE WARRANTED BY THE CONTRACTOR TO BE FREE OF DEFECTS IN MATERIALS OR WORKMANSHIP FOR A PERIOD OF TWO (2) YEARS AFTER ACCEPTANCE. SHOULD THE COATING SHOW DEFECTS DURING THIS PERIOD, INCLUDING BUT NOT LIMITED TO BLISTERING, PEELING, CORROSION OR EROSION THE ENGINEER SHALL IMMEDIATELY NOTIFY THE CONTRACTOR. THE CONTRACTOR/APPLICATOR SHALL MAKE REPAIRS, ON A SCHEDULE AGREED TO BY THE CITY.
44. **CLEAN-UP, RESTORATION** ALL EXCESS DIRT, MATERIALS AND CONSTRUCTION DEBRIS SHALL BE REMOVED FROM THE SITE AND DISPOSED OF PROPERLY. THE EXISTING PAVED SURFACES SHALL BE RESURFACED IN CONFORMANCE WITH SECTION 306-1.5 OF THE "GREENBOOK".