APPENDICES

APPENDIX 1

CONSTRUCTION GUIDELINES AND REQUIREMENTS

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CITY OF OCEANSIDE

WATER UTILTIES DEPARTMENT

WATER, SEWER, AND RECYCLED WATER DESIGN & CONSTRUCTION MANUAL

A. PRE-CONSTRUCTION REQUIREMENTS

Hours of Operation	8:00 AM to 5:00 PM, Monday-Friday; Including equipment warm-up. Hours are superseded by terms of traffic control/encroachment permit when working in the right of way.
Saturday Operations	Requires filing a permit by 2:30 PM on the proceeding Thursday.
Developers Representative or Superintendent	To be on site full time.
Mass Grading Daily Reports	City copies of daily reports to be kept on site in a 2-inch notebook, which is to be turned into the City with Mass Grading Soils Report.
Soil Engineer	To be present during all grading, excavation and backfilling operations.
Field Changes	All changes in approved plans, soil reports and specifications must be submitted to the City for review and approval prior to implementation in the field.
Construction Water	By permit only. Protect hoses in street. Needs to be metered and meter must be protected by a RPP backflow assembly at all times. Requirements for Water Lines: Filling the Line, Chlorination and Dechlorination, Water Quality Testing, Notifications, Shutdowns, Tie-ins. Requirements for Sewer Lines: Protecting Existing Lines,

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	Testing, Videotaping, Notifications, and Tie-ins. Also: SDRWQCB compliance.
Clear and Grub	Maintain dust control. Provide haul routes for removal (refer to #9). No grading within 100 feet of stockpiles.
Dust Control	Required during construction at all times.
Haul Routes	Permit required from Traffic Engineer. Provide map of hauling, beginning and ending dates and maximum number of trucks to be used. Street cleaning is required (refer to #12).
Traffic Control Plan	Permit required from Traffic Engineer prior to implementing any traffic control.
Import and Export	Permit required from Traffic Engineer.
Debris in Streets	Forbidden by vehicle code. Stop Notice will be issued for non-compliance.
Cleanup	Bonding will be required.
Protection of Adjoining	Developer's responsibility (read the section). No grading on adjacent properties until an approved Permission to Grade letter is on file in the Engineering Department.
Notice to Inspectors	<u>24-Hour notice is required for all inspections.</u> For Public works telephone (760) 435-5081 to leave a message. For all water and sewer inspection requests, call (760) 435-5800. (NOTE: Special notifications are required per this Manual and may be greater than the 24-hour notice.
Canyon Clean Out	24-Hour notice is required for inspection; and written approval by the Soils Engineer or Geologist (not

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	a Technician) is required prior to inspection. Can be issued as a field memorandum.
Keyways and Benches	Same action item as described in #15.
Sub-Drains	Same action item as described in #15. Method of construction approved by City Engineering Department prior to installation. Materials certification approved (refer to #18). Location surveyed as "As-Built" plans.
Materials Certification	A letter of certification from a Material Testing facility stating compliance with specifications and test results for all road base, permeable materials, etc., shall be on file at the City prior to placement in the field.
Embankment/Fill Slope Testing	Minimum of 25% Sandcone. Minimum of 90% Compaction. 20% of density test shall be taken within 3 feet of final slope and 1 test within the outer 12 inches of the final slope, for every 5,000 square feet of slope area.
Fills of 10 Feet Plus (+) Or	Same action item as described in #15.
Slope Shaping & Debris/Silt/Fencing	Overfill and cut back Slopes Debris/Silt Fences at slope toe are required on slopes above all traveled roadways.
Cover Critical Items in the Soil Report	Soils Engineer, City Geotechnical Consultant settlement monumentation for surcharge areas).
Erosion Control	See Ordinance #82-43 and Ordinance #92-15.
Emergency Telephone Numbers	Answering machines or services are <u>not acceptable</u>.

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Building Permits requirements	(A) Final Soils Report by Soil Engineer; (B) Pad Certification by Civil Engineer; (C) Construction Phasing Plan by Developer; (D) Permanent Fire Protection in and approved.
Interim Soils Report	Approved prior to beginning underground construction.
Slopes	Must be planted within 45 days of completion of grading.
All Items on Approved Plans and "As-Built" Plans	All items shown on the approved plans must be completed and "As-Built" plans approved prior to requesting bond release.
Structural Section Recommendations	Structural section Recommendations shall be submitted to the City Engineer for approval.
Drainage Devices, Slope Planting and Certifications	All drainage devices, slope planting and certifications must be complete and approved prior to Release for Occupancy (refer to Release for Occupancy Check List for additional requirements).
See AB73 Highlights for Underground	Included in the City of Oceanside Engineers Design and Processing Manual.

S I G N A T U R E S	**DATES**
Owner: _____	_____
Contractor: _____	_____
Engineer of Work: _____	_____
Engineer: _____	_____
City Inspector: _____	_____

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B. BEDDING AND BACKFILL TESTING SPECIFICATIONS

Testing and quality control of Neutral Backfill Material and Native Backfill Material has become more of an issue due to availability. Wherever there is a question of the suitability of the backfill material, a correction notice requesting testing of the material for conformance to the following requirements shall be written.

Where "Neutral" material is specified for reducing corrosion to ferrous metal appurtenances, the following specifications, as a minimum, shall be met:

Sand Equivalent	30 Minimum
PH	6.5 – 8.5
Resistivity	2,000 – 50,000 ohm-cm
Sulfate (optional)	1500 PPM or less

Where "Sand" is specified, a sieve analysis shall be required if material gradation is questioned regarding excessive fines or oversize material. The minimum requirements for "Sand" shall be that the material has 100% passing the 3/8-inch sieve, 90% - 100% passing No. 4 sieve and 0% to 5% passing the 200 sieve.

Where "Native" material is specified as an option for backfill material, a sieve analysis and sand equivalent shall be required. The material shall be a minimum SE of 30 and the sieve analysis shall conform to the disintegrated granite gradation from the Greenbook Section 200-2.7

Sieve Size	Percent Passing
1 inch	90 - 100
No. 4	50 - 100
No. 30	25 - 55
No. 200	5 - 18

Before placement of material requiring certification, a qualified laboratory will test and the results will be submitted to the City of Oceanside for approval. If approved, continuous or random testing for conformance will be required.

C. TRENCH BACKFILL TESTING REQUIREMENTS

The following are the minimum compaction testing requirements for all developments. Additional tests may be required at the discretion of the Water Utilities inspector.

1. Test sewer main between each manhole or every 200 feet, whichever is less (–2 foot intervals below F.G.).

2. Test every fifth sewer lateral run (-2 foot intervals below F.G.).

3. Test structural backfill around all sewer manholes (-2 foot intervals below F.G.).

4. Test water main every 200 feet (pipe bedding material along side of pipe or 1 foot above top of water main; and, trench backfill at –2 foot intervals below F.G.).

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5. Test every fifth water service run (-2 feet below F.G.).

6. Test dry utility main trench at 300-foot intervals (-2 feet below F.G.).

7. Test every fifth dry utility service run (-2 feet below F.G.).

8. Test storm drain backfill between each structure or at 200-foot intervals along side of pipe and at an elevation of –2 to –4.5 feet below F.G. when pipe is placed in a trench where top of culvert is 3 feet or more below ground level.

9. Test structure backfill around all drainage structures (1 test per structure –2 to –5 feet below F.G.).

10. Embankment test within proposed street right-of-way shall be taken in each fill every 3 feet in vertical elevation and at 250 feet intervals along fill.

11. Sub-grade and base compaction tests to be taken at the rate of test per block, or every 300 feet.

12. Formal results of all tests taken, including failures shall be forwarded to the City Engineer within ten days after the tests are taken. All failures shall require area re-compaction and re-testing as required by the City Engineer.

13. All tests for underground utilities as described in the Water, Sewer, and Reclaimed Water Design & Construction Manual, shall be formally submitted to the City Engineer prior to the construction of curbs, gutters, base or paving.

14. The City Engineer will request design and control testing of Portland cement concrete and asphalt concrete as necessary during construction of the project.

D. SEWER AND WATER TESTING REQUIREMENTS

Testing of water and sewer systems shall not be performed until all utilities, including dry utilities, are installed. Prior to final acceptance by the City, all water and sewer utilities shall be tested. When mains are located within roadways, sub-grade shall be established.

E. TELEVISING SEWER MAINS

1. No sewer line will be connected to the City's sewer system prior to the City's final written acceptance of the line.

2. After completion of all cleaning, testing, and mandrel passing, all sewer mains shall be inspected by closed circuit DVD television at the Contractor's expense prior to final acceptance.

3. The videotaping will take place after completion of trench backfill and finish grading but prior to the placement of pavement or permanent trench resurfacing to determine the existence and extent of any obstructions, structural deficiencies, sags, or foreign material.

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4. The Contractor shall submit written notification to the City of Oceanside 10 working days in advance of the anticipated date of the videotaping.

5. All video documentation will be performed in the presence of the Water Utilities inspector.

6. The video, which will include a verbal description, and a written manuscript of the videotape, will be submitted to the Water Utilities Director for review and approval prior to final acceptance. The minimum information that is required for both the verbal and written documentation is the report number; date of the TV inspection; line location; upstream and downstream manhole numbers; size, type, and joint length of pipe; lateral locations; direction of flow; and, description and location any problem areas or defects. The City of Oceanside will have 10 working days to review each individual video. At the end of the city's review, a written report will be given to the contractor. The City's report will indicate whether the line is acceptable or any deficiencies or sags were discovered.

7. A calibrated device with ¼-inch markings will be mounted in front of the camera in a fashion that will be least obstructive to the forward view of the pipe.

8. The Contractor will follow the directions of the Water Utilities inspector in isolating the particular section of sewer main to be televised. The line to be videotaped will be isolated between manholes; and, the televising will proceed from the upstream manhole to the downstream manhole. On slopes greater than 1.6 percent (1.6%), the Contractor will cause a 5-gallon per minute continuous, metered flow of water to travel through the pipe during the videotaping. On slopes less than 1.6 percent (1.6%) the contractor will supply sufficient water to cause drainage within the isolated section prior to televising the line. The Contractor will remove all standing water in the downstream manhole by pump(s), "Vactor" truck, or other approved means. The removal and discharge of the water will comply with all applicable regulations (See #11 below).

9. Sags, or standing water in the pipe, shall meet the following criteria:

Pipe Slope	Complies with Specification	Does not Comply with Specification and Reconstruction is Required
2.0% or less	3/8" or less	greater than 3/8"
Greater than 2.0%	½" or less	greater than ½"

10. Due to unacceptably high operation and maintenance costs and poor system reliability, pipelines with sag depths exceeding those listed for "Reconstruction is Required" will be rejected. Reconstruction of the entire length of the sag plus 20 feet on each side of the sag will be required. Damaged pipe must be removed and not reused.

11. All water discharge from videotape operation shall comply with all requirements of the California Regional Water Quality Control Board—San Diego Region (SDRWQCB) regulations.

F. ADMINISTRATIVE PROCEDURE (WU-107) FOR WATER SAMPLING

1. PURPOSE

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This administrative procedure identifies and clarifies the respective roles in scheduling and implementing water samplings.

2. PROCEDURE

Water samplings will be handled according to the following:

A. At least two working days prior to taking water samples an on-site meeting to review the new lines and sample locations will be conducted. Upon completion of the pressure test and disinfection process, the Water Utilities inspector will contact the Water Distribution Supervisor in the Distribution Division to schedule a sample date and time.

B. A Water Utilities Department employee will take the water samples and deliver them to the Department's Laboratory.

C. All test sites will be accessible with free means of ingress and egress for the person taking the sample(s).

D. Testing shall comply with AWWA Standard C651.

E. The Water Utilities inspector will be notified by the Water Utilities Department approximately 24 hours after the general physical (GP) test results, and approximately 24 hours after each Bacteriological result (BT) and heterotrophic plate count (HPC) test results.

F. New line samples will not be taken on Monday, Friday or on a Tuesday that follows a Monday holiday. High chlorination samples may be taken during hours of operation.

G. In order to meet required water quality standards, it is imperative that authorized Water Utilities Department personnel only operate all existing water system valves.

G. WATER SYSTEM TESTING REQUIREMENTS

3. METERING AND PROTECTION

A. All water used for testing and flushing shall be metered; and, the meter shall be protected by a Reduced Pressure Backflow Prevention (RP) Assembly that will be tested and certified by a Tester on the City's current approved list located on the City's website.

B. The City of Oceanside shall provide the meter upon receipt of a completed application and deposit. The Contractor/Developer shall provide the backflow prevention assembly and all necessary fittings, hoses, valves, etc. for testing and flushing of the new waterline(s).

C. Whenever possible, a permanent source (fire hydrant, blow-off, riser, etc.) with meter, backflow preventer, pipe(s), and hose(s) shall be connected to the temporary blow-off riser of the new waterline throughout the entire process. This will help minimize potential contamination by reconnecting the supply hose/line on multiple occasions.

D. The Contractor/Developer shall be billed for all water used at the prevailing rate.

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E. The Contractor/Developer shall protect all pipes and/or hoses from vehicle traffic and damage.

4. PIPELINE HYDROSTATIC TESTING

a. The City will not test water system until all utilities, including dry utilities, are installed.

b. Testing against valves is not authorized. Tapped end caps (temporary blow-offs) with a minimum 2-inch riser for filling the line, or releasing air, and with an appropriate size concrete thrust block will be installed to test against.

c. Pipe Manufacturer's recommendations for filling and testing shall be followed.

d. The Hydrostatic Test will be observed and verified by the Water Utilities Inspector. Arrange for the testing through the Water Utilities Department at (760) 435-5800.

e. All water systems will be pre-tested to insure they will pass a 2-hour test prior to calling for the Water Utilities Inspector.

f. The Developer or Contractor shall furnish all materials including water, pumps, meters, equipment, bracing, connections, labor and expense required for testing of water mains. The Contractor shall be responsible for the results of any failure under test, which are attributable to defective material and/or workmanship furnished by him/her or to his/her negligence or improper conduct of the test.

g. Each water main shall be hydrostatically tested by the Contractor in the presence of the Water Utilities Inspector after all pipes and appurtenances have been installed; all anchors, thrust blocks and encasement have been placed and have attained sufficient strength; and, the required select and/or other specified backfill has been compacted and certified by the Soils Engineer.

h. The pipeline shall be tested as directed by the Water Utilities inspector. The entire pipeline shall successfully meet the requirements specified herein before any portion will be accepted. The test shall be made by placing end caps at the ends of the pipe and filling the pipeline with water in such a manner as to prevent air pockets. After the line has been completely filled, it shall be allowed to stand under pressure to permit escape of air pockets and to examine valves and connections for leaks.

i. The test pump and gauge shall be connected to the water main at a location other than the highest point in the line, in order to allow release of air from the high point. Means shall be provided for accurately measuring the quantity of water pumped into the pipe during or immediately after the test period in order to maintain or restore the initial test pressure. All pipe, fittings, valves, hydrants, services and appurtenance shall be subjected to the Hydrostatic Test and irrespective of the measured quantity of leakage; all detectable leaks shall be repaired by the Contractor unless otherwise specified herein.

j. The hydrostatic pressure shall be made by pumping the pipeline to a pressure (PSI) of 1.25 times the pipe class (i.e., Class 150 x 1.25 = 187.5 PSI) measured at the highest point on the pipeline. The highest pressure of the section of pipe is

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measured at the lowest invert elevation of pipe in the test section. Test pressure shall be maintained for a minimum of 2 hours not allowing pressure to drop below 1.5 times the pipe class (i.e., Class 150 x 1.5 = 225 PSI). At the end of the testing period, pipeline pressure will be pumped to 1.5 times the pipe class before measuring the leakage. Leakage shall be the amount of water pumped into the pipeline to maintain the minimum pressure (1.5 times the pipe class) during the entire testing period. Allowable loss for the 2 hour test shall be computed as follows:

For PVC Pipe:

$$Q = \frac{L\,D\sqrt{P}}{148{,}000}$$

Where: Q = Quantity of makeup water, in gallons per hour
L = Length of pipe section being tested, in feet
D = Nominal diameter of the Pipe, in inches
P = Average test pressure during the leakage test, PSIG

For DIP:

$$L = \frac{S\,D\sqrt{P}}{148{,}000}$$

Where: L = Allowable leakage, in gallons per hour
S = Length of pipe tested, in feet
D = Nominal diameter of the Pipe, in inches
P = Average test pressure during the leakage test, in pounds per square inch (gauge)

k. The water main shall be tested in sections of convenient lengths as determined by the range of elevations within the test section which will result in test pressures within the limits hereinafter specified.

l. If there is more than 100 feet difference in elevation, the system shall be split and tested separately, maintaining an absolute minimum of 1.5 times the pipe class at the lowest elevation providing that a minimum of 1.25 times the pipe class (i.e., Class 150 X 1.25 = 187.5 PSI) at the highest point is maintained throughout the test period.

m. All water mains shall be tested for the length of time and at the pressure specified. Any detectable leak shall be repaired. After all leaks have been repaired, the test shall be repeated until the section tested has met the above requirements.

5. CHLORINATION/DISINFECTION

a. Preliminary flushing: Before chlorination, the main shall be filled to eliminate air pockets and shall be flushed to remove debris and particulates. The flushing velocity in the main shall not be less than 2.5 ft./sec. (0.76 m/sec).

NOTES:

1. Flushing is no substitute for preventative measures during construction.

2. All water discharge from flushing, testing, and dewatering shall comply with all requirements of the California Regional Water Quality Control Board-San Diego

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Region (SDRWQCB) regulations and the Statewide National Pollutant Discharge Elimination Permit (NPDES)

b. All new waterlines will be disinfected by the continuous feed method with a minimum of 25 parts per million (25ppm) of chlorine, up to a maximum of 100ppm.

c. The chlorinated lines(s) shall set static for a 24-hour period, after which time there must be a minimum of 10ppm residual at all points of the lines (s). After the high chlorine test passes, chlorinated water should be removed from pipe immediately.

d. If the 10ppm residual throughout is not met, steps a, b, and c above will be repeated until it is achieved.

e. Once the 10ppm residual test has been satisfactorily completed, all piping and appurtenances (mainlines, branches, service lines, A/V's, etc.) shall be flushed within 24-48 hours to remove the high chlorine concentration from the new waterlines.

f. Water quality test shall be performed within 10 working days from the completion of the disinfection process (see Bacteriological, Heterotrophic Plate Count, and General Physical Tests).

6. DECHLORINATION AND DISPOSAL OF WATER

g. The testing water must be dechlorinated.

h. Contact the Water Utilities inspector prior to flushing any line.

i. A suitable means shall be provided for disposal and dechlorination of test, disinfection, and flushing water so that no damage results to facilities or waterways.

j. The means for dechlorination shall be subject to the approval of the City of Oceanside, local governing authorities, regulatory agencies, National Pollutant Discharge Elimination System (NPDES) requirements and American Water Works Association (AWWA) C651.

k. The Contractor/Developer shall be responsible for any damage caused by its water disposal operation.

7. COSTS

l. The costs for City crews, on all water quality samples, including related laboratory work, shall be billed to the Contractor/Developer at the prevailing rate.

8. BACTERIOLOGICAL (BT) TEST

m. Before collecting samples, each new waterline shall contain a chlorine residual that is comparative to the source water residual and shall appear free of obvious turbidity, odors, color, etc.

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n. Prior to collecting samples, each sample point shall be above grade, pressurized with its own valve, and made ready with proper fittings so as to minimize spraying and provide a representative sample.

o. All samples shall be collected by a City of Oceanside Water Utilities Department employee and shall be delivered to the City of Oceanside State Certified Laboratory under the chain of custody criteria for analysis.

p. The Distribution Operator shall determine each sample location, which at minimum will include each end of the pipe run and each branch off the main line as described in AWWA C651.

q. Each sample location shall be analyzed for E-Coli and total coliform bacteria. In all results, each constituent must be absent.

r. After final flushing and before the new water main is connected to the distribution system, **TWO** consecutive sets of acceptable samples, taken at least 24 hours apart, shall be collected from the new main.

If the initial disinfection fails to produce satisfactory bacteriological results or if other water quality is affected, the new main maybe reflushed and shall be resampled. If check samples also fail to produce acceptable results, the main shall be rechlorinated by the continuous feed method until satisfactory results are obtained-that being two consecutive sets of acceptable samples taken 24 hours apart.

9. HETEROTROPHIC PLATE COUNT (HPC) TEST

s. May be required at any time in conjunction with the BT test.

t. HPC test when required shall have a Plate Count of <500 CFU/ml.

u. HPC test may be required after a first BT test failure if the Contractor/Developer wants to proceed with the test when it appears there is no chlorine residual, or when there is marginal clarity, odors, etc. in the water.

v. Lines that have HPC test with a Plate Count >500 CFU/ml may be flushed and re-sampled twice to achieve the <500 CFU/ml before being required to re-chlorinate and disinfect the line.

10. GENERAL PHYSICAL (GP) TEST

w. GP test shall be required in addition to the BT and HPC tests.

x. GP test shall be performed to ensure removal of turbidity (particulates) and ensure aesthetic criteria.

y. GP test shall include Total Chlorine Residual, Turbidity, Color, Odor, and pH.

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z. The first GP samples shall be collected with the first BT test samples.

aa. If the first GP sample fails any of the criteria, the line may be flushed and re-sampled until each sample meets each of the criteria.

bb. For a GP resample, the line may be flushing up to the time of resample collection unless a BT resample is also scheduled requiring the 4-hour static condition.

cc. Odor detection in new waterline(s) typically comes from the lack of properly and completely flushing the pipe o-ring gasket lubricant from the line(s). Therefore, the odor criteria shall be 1 TON, or no greater than any odor detected in the source water when properly flushed.

11. APPROVAL FOR NEW WATERLINE TIE-IN (CONNECTION)

dd. After all water quality tests have been satisfactorily completed and passed, approval shall be given from the Water Distribution Division to the Water Utilities inspector to proceed with the tie-in process.

ee. The Contractor/Developer shall have 10 working days from the date of approval to complete the tie-in process or they may be subject to a flushing and testing schedule to be established by the Water Distribution Supervisor until the tie-in is complete.

ff. Tie-in connections equal to, or less than, one pipe length ($\leq$ 18 feet) may be sprayed or swabbed with a 5% chlorine solution under the direction of the Water Utilities inspector.

gg. Tie-in connections greater that one pipe length (> 18 feet) shall be evaluated and approved on a case-by-case basis by the Water Distribution Supervisor.

hh. At no time shall any new waterline(s), piping, etc. be tied into, connected, joined, etc. to any part of the existing City of Oceanside water system without first completing all testing requirements and meeting all of the conditions of the Administrative Procedure (WU-106) for Water Line Shutdowns.

H. ADMINISTRATIVE PROCEDURE (WU-106) FOR WATER LINE SHUTDOWNS

12. PURPOSE

This administrative procedure identifies and clarifies the respective roles in scheduling and implementing water shutdowns.

13. PROCEDURE

A. Written notice ten (10) working days prior to a shutdown shall be submitted to the Water Distribution and Water Maintenance Supervisors after all testing has been satisfactorily completed with all pertinent information regarding the water shutdown. On special occasions the written notice may be submitted less than 10 days if it is deemed feasible by the Water Utilities Department and all previous conditions have been met. This advance notice will allow the Department to inform the City Council, City Manager, and

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other City Departments that may be receiving telephone calls. Multi-media information sources such as radio, newspaper, reverse 911, and social media sites etc. may be used to notify affected areas of the City. In addition, this notice allows staff to verify which valves will be closed and what customers may be out of water.

B. At the time the shutdown is scheduled, verification will be made that all valves are uncovered and accessible, and all bacteriological and general physical testing have been completed and passed.

C. Upon verification of the shutdown schedule, a field meeting will be scheduled for the day before that shutdown is to occur. The meeting will be on-site and will be attended by both the Water Utilities Department Field Representative and the Water Utilities inspector to ensure all material is onsite, all valves have been exercised, and all affected customers have been notified.

D. All customers will be given at least a 48-hour personal notice of the impending shutdown. The notice shall include all pertinent information, such as why water is being shutdown; the date and time of the shutdown; and, when the customer may expect resumption of their water service.

E. On the day of the scheduled shutdown, the same Water Utilities Department Field Representative and the same Water Utilities inspector will meet and complete final field verification. Both individuals must identity any field problems prior to any scheduled changes.

F. Water service outages will not be allowed until every other option has been eliminated and those same shutdowns will be scheduled in such a manner as to minimize the amount of customers that may be out of water.

G. All water shutdowns will be scheduled for a Tuesday, Wednesday, or Thursday. If another day other than those above is requested they may be evaluated on a case by case basis.

H. Flushing of waterlines and BT and GP tests must be satisfactorily completed prior to scheduling the water shutdown.

I. All material required for a waterline tie-in will be on the job site and verified by the Water Utilities Inspector prior to submitting the written notice for the water shutdown.

I. FINAL FLUSHING AFTER NEW WATERLINE TIE-IN (CONNECTION)

1. Immediately after completion of a new waterline tie-in, flushing of the tie-in point shall be conducted under the direction of Water Utilities personnel.

2. The flushing point shall be metered and the Contractor/Developer shall provide all fittings, hoses, etc. necessary for the final flushing operation.

3. The Contractor shall supply all personnel required to complete flushing. The Contractor's personnel will install all necessary protection devices required for protection of existing improvements and storm drain systems that are adjacent to, or downstream of, the project; and, will install all necessary erosion prevention devices required.

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4. Only the City of Oceanside personnel will actuate all line valves.

   Final flushing shall continue until the water is free of apparent turbidity, odor, color, etc.

   3. All water discharge from flushing, testing, and dewatering shall comply with all requirements of the California Regional Water Quality Control Board—San Diego Region (SDRWQCB) regulations and the Statewide National Pollutant Discharge Elimination Permit (NPDES)

J. WALK THROUGH

1. After all water and sewer improvements are made, the Contractor/Developer shall make their own preliminary inspection to ensure compliance with all Design Criteria and Construction Requirements.

2. After all compliance items have been corrected under the preliminary inspection, the Contractor/Developer shall contact the Water Utilities inspector and schedule a final walk through.

3. Each component of the new water and sewer system shall meet all Design Criteria and Construction Requirements to the satisfaction of the Water Utilities inspector.

K. AS BUILT DRAWINGS

1. After the final walk through has been completed, and before the project “final” is granted, two sets of as-builts shall be made and delivered to the Water Utilities Department for the Operations/Distribution and Maintenance Division. See CAD STANDARDS section for submittal requirements

L. FINAL/ONE YEAR START DATE/BOND RELEASE

1. Upon delivery of the as-builts and approval of the Water Utilities Department, a project may receive a “final” status and commence the one year period prior to “request for bond release.”

2. After successful completion of the one-year period, the Contractor/Developer shall apply for the release of bonds.

M. SAN DIEGO REGIONAL WATER QUALITY CONTROL BOARD REGULATIONS

1. All water discharge from flushing, testing, and dewatering shall comply with all requirements of the California Water Quality Control Board-San Diego Region (SDRWQCB) regulations and the Statewide National Pollutant Discharge Elimination Permit (NPDES).

APPENDIX 2

CAD STANDARDS AND REQUIREMENTS FOR THE DIGITAL SUBMITTAL OF MAPS AND IMPROVEMENTS PLANS

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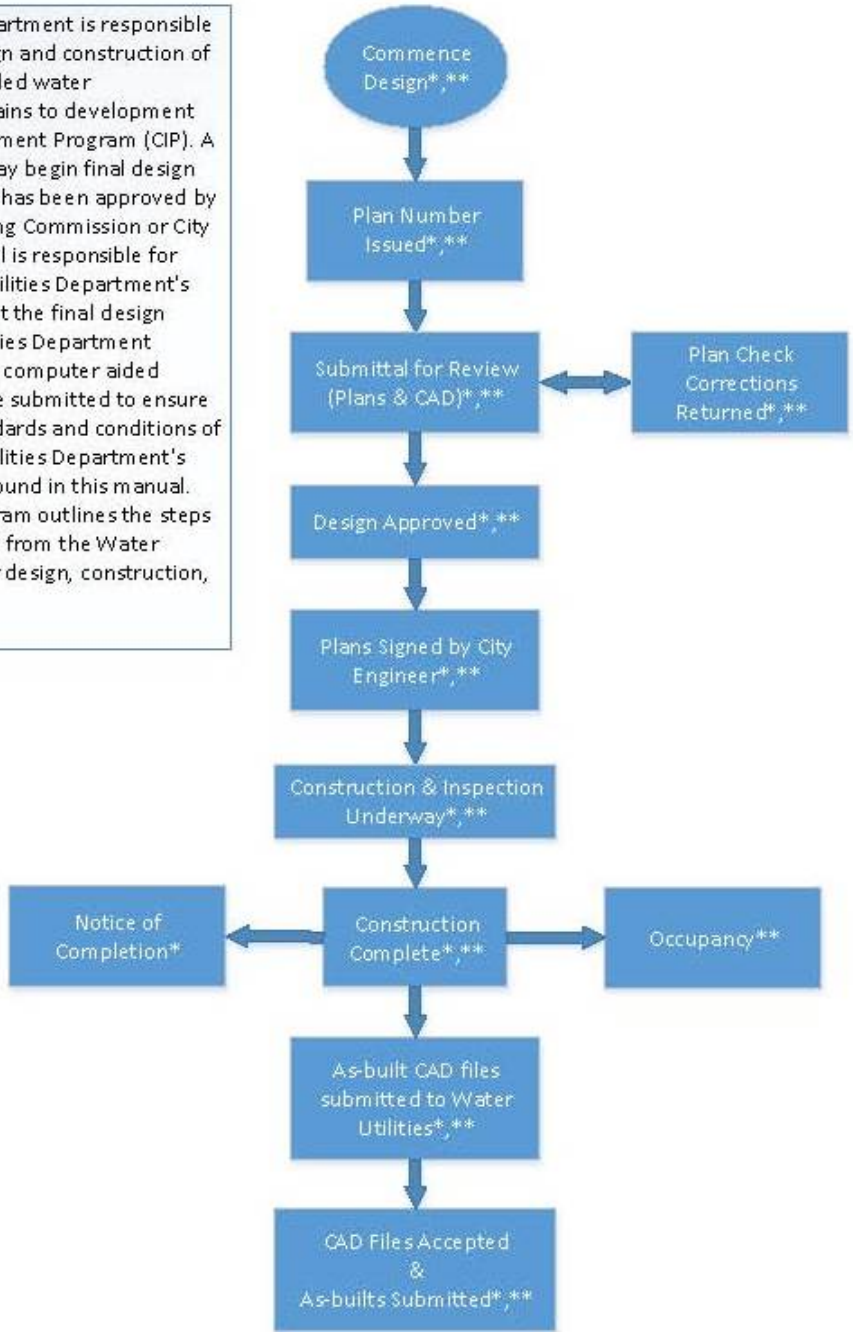
Work Flow CIP*/Development Project Flow Diagram**

The Water Utilities Department is responsible for overseeing the design and construction of water, sewer, and recycled water infrastructure as it pertains to development and it's Capital Improvement Program (CIP). A development project may begin final design for construction once it has been approved by the City Planner, Planning Commission or City Council. The City Council is responsible for approving the Water Utilities Department's CIP projects. Throughout the final design process the Water Utilities Department requires both plans and computer aided drafting (CAD) files to be submitted to ensure conformance with standards and conditions of approval. The Water Utilities Department's CAD standards can be found in this manual. The following flow diagram outlines the steps necessary gain approval from the Water Utilities Department for design, construction, and project closeout.



APPENDIX 2 – CAD STANDARDS AND REQUIREMENTS FOR THE DIGITAL SUBMITTAL OF MAPS AND IMPROVEMENTS PLANS

CITY OF OCEANSIDE

WATER UTILTIES DEPARTMENT

WATER, SEWER, AND RECYCLED WATER DESIGN & CONSTRUCTION MANUAL

A. INTRODUCTION

The Water Utilities Department, City of Oceanside, maintains a Geographic Information System (GIS) for use by many departments for a variety of public-service uses. To improve the efficiency of data collection and use in city operations, the City of Oceanside requires the submission of digital copies along with the required number of hardcopies for the submittal of Capital Improvement Project (CIP) and development Plans. These requirements do not affect in any way existing requirements of other departments regarding map/plan processing.

Exceptions from these requirements may be made with the express permission of the Principal Water Engineer, Water Utilities Department.

For further information or clarification of this specification, contact:

City of Oceanside
300 N. Coast Highway
Oceanside CA 92054
(760) 435-5800 (Water Utilities Department)
(760) 435-4373 (Development Services Department, Engineering Division)

B. SUBMITTAL PROCEDURE

The AutoCAD file or GIS shapefile should match the Mylar plans that are being submitted for final approval and City Engineer‘s signature. The digital files may be saved on CD, DVD, USB or any other type of device and be submitted with the Mylar drawings.

If there are significant changes between the approved and the as-built plans, a new digital file will be required at the time of as-built Mylar submittal.

C. FORMAT REQUIREMENTS

Always check with the city for the latest version of programs that are used by the City.

The format for digital submission of specified plans and maps shall be one of the following:

AutoCAD .dwg/.dxf or Microstation .dgn
Esri shapefile
Esri file geodatabase

D. BASIS OF BEARINGS AND COORDINATE REFERENCE

The basis of bearings and all coordinates of data submitted to the City must be in reference to the State Plane Coordinate System (NAD 83) California Zone 6 - the vertical datum in NAVD88, and both measurements in US Survey Feet based on ties to the City of Oceanside Survey Control Network monuments as published on Record of Survey Map No. 21787, filed

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in the office of the San Diego County Recorder on August 21, 2014. Esri's equivalent systems are:

- NAD 1983 StatePlane California VI FIPS 0406 (US Feet)
  -or-
  NAD_1983_StatePlane_California_VI_FIPS_0406_Feet, WKID: 2230

- NAVD 1988 (US survey feet)
  -or-
  NAVD_1988_Foot_US, WKID: 105703

E. DATA LAYERING REQUIREMENTS

Plans will consist of:

- File(s) of the entire plan submittal area, no submittal of individual cut sheets

- Layers and symbol descriptions (digital file)

F. SUBMISSION REQUIREMENTS

1. The model space of the submitted drawings should contain the entire project (showing project boundary, lot lines, rights-of-way, improvements, etc.), and it should not be divided into sheets (used for plotting purposes.) Keep proposed and existing, public or private elements and the associated text and notes in separate layers.

2. Units will be decimal units.

3. Scale will be 1:1

4. Layer names should match that of the City standard layers shown on tables in the **City Standard AutoCAD Layers** section.

5. Lines should be POLYLINES when they are more than one segment.

6. Maps will be oriented to geographic north.

7. No call outs, text, page boundaries, or map primitives of any kind is required. They should be kept in separate layers.

8. Annotation layers will be used to provide attribute data on each object where text is requested. Text insertion points are to be middle justified. Where text relates to an area, the text insertion point must lie within enclosed area boundary.

9. Blocks will not be permitted as a valid data element for point feature symbology.

10. Any extensions outside of the usual CAD software must be turned off.

APPENDIX 2 – CAD STANDARDS AND REQUIREMENTS FOR THE DIGITAL SUBMITTAL OF MAPS AND IMPROVEMENTS PLANS

DWG Layer	Object Description	CAD Line Type
Ex_PARCEL Prop_PARCEL	Existing & Proposed lot/parcel line	Line
LOT	Lot Numbers	Anno
SUB_BOUND	Subdivision Boundary	Line
SUBDIV	Subdivision name	Anno
ADR	Address number	Anno
BOUND	Parcel boundary label	Anno
CITY_BOUNDARY	City Boundary	Line
DIM	Dimensions	Anno
CENTERLINE	Public or Private Street Center Line	Line
ST_Name	Street Name	Anno
STDIM	Street Dimension (Width)	Anno
Ex_ROW Prop_ROW Pvt_ROW	Public or Private Street Right-of-way	Line
EASE_WAT	Water Easements	Polygon
EASE_SEW	Sewer Easement	Polygon
EASE_DRAIN	Storm Sewer and Drainage Easement	Polygon
EASE_UTIL	Public Utility Easement	Polygon
EASE_MISC	Miscellaneous Easements	Polygon
EASE_STM	Storm or drainage easement	Polygon
EP	Edge of Pavement	Line
Median	Any raised median, planter area in the ROW	Polygon
B_CURB	Back of Curb	Line
Walk	Side walk , Walk way	Polygon
BLDG_FTP	Building Footprint	Polygon
RAILROAD	Railroad	Line
RESERVOIR	Reservoir	Polygon
HYDRO_LINE	River, Creeks	Line

APPENDIX 2 – CAD STANDARDS AND REQUIREMENTS FOR THE DIGITAL SUBMITTAL OF MAPS AND IMPROVEMENTS PLANS

Cont1	1 foot contour lines	Line
Cont2	2 foot contour lines	Line
Cont5	5 foot contour lines	Line
Cont10	10 foot contour lines	Line
Fence	Fence line	Line
City_Mon_Text	City Survey monument description	Text
City_Mon	City Survey Monument	Point
City_Bench	City benchmark	Point
City_Bench_Text	City benchmark description	Text
GPS_Point	City GPS control point	
GPS_Text	City GPS control point description	
SD_GPS_Point	San Diego County GPS control point	Point
SD_GPS_Text	SD County GPS control point description	Text

11. No externally referenced data is permitted. All data referenced is to be included in the file submitted.

12. The submittal should be complete and City should not need additional programs or activity to view drawings and extract data.

13. Submit the digital files on a CD, DVD, USB or other storage device labeled with Date, Company Name, Project Name, Address, Project File No, Plan Number, … (or in the BOX account provided by City of Oceanside).

G. EXPLANATORY DATA:

All digital data will require an **accompanying metadata text file**. The file will be in ASCII file (.txt extension) format using the same naming convention as the digital data file being submitted. This file will contain the following information:

Project Name:
File Name:
Date data was created:
Contact Name:
Contact Phone:

Contact Email:
Control point order accuracy:
Vertical and horizontal datum referenced:
Data accuracy:

APPENDIX 2 – CAD STANDARDS AND REQUIREMENTS FOR THE DIGITAL SUBMITTAL OF MAPS AND IMPROVEMENTS PLANS

H. DATA LAYER REQUIREMENTS

Each CAD layer or GIS entity should be defined by one of the following prefixes (when applicable) followed by city standard layer name. Use underscore to separate prefix.

Ex= Existing Anno=Annotation Rem = exiting to be removed Fut = Future

Prop= Proposed Pvt= Private Aban = abandon in place

CAD drawings should have separate layer for each object type. Even if the City groups objects together in GIS, the CAD file should separate them in different layers such as separate layers for blow offs, check valves regulators, etc. Objects may not be grouped together other than listed below.

NOTE: You may contact Water Utilities, GIS Division to request for a copy of the blank City Standard geodatabase and metadata to set up your project.

I. CITY STANDARD AUTOCAD LAYERS

LANDBASE:

DRY UTILITIES:

DWG Layer	Object Description	CAD Line Type
Electric	Electric lines	Line
Cable	Cable TV line	Line
Gas	Gas pipe line	Line
Tel	Telephone lines	Line
Fiber	Fiber optic line	Line
UPole	Utility Poles	Point
LPole	Light Pole	Point
Traffic_Signal	Traffic Signal	Point

STORM:

DWG Layer	Object Description	CAD Line Type
BMP_Point	All BMP features that can be shown as points. Media & sand filter, separators, others	Point
BMP_Line	Infiltration trench, vegetated/bioretention swale, others	Line
BMP_Poly	Basins, wetland, permeable concrete, others	Line
STM_Cleanout	Storm manhole/cleanout	Point

APPENDIX 2 – CAD STANDARDS AND REQUIREMENTS FOR THE DIGITAL SUBMITTAL OF MAPS AND IMPROVEMENTS PLANS

STM_Drain	Storm Drain line includes; Circular pipes, box or pipe culverts, open channel, brow ditch, under drain, cross gutter, swales, others	Line
STM_Inlet	Catch Basin, Curb inlet, Brooks box, headwalls, others	Point
STM_Outlet	Headwall, Headwall with energy dissipater, riprap, curb outlet, others	Point
STM_Poly	Detention/retention basin, pond, others	Line
STM_Text	Storm related text	Anno
Cap	Cap – Used to plug end of pipe. (Feature is GIS storm drain subtype)	Point
Plug	Plug _-Used to plug end of pipe (Feature is GIS storm drain subtype)	Point
Lug	Lug - Connection point of one pipe to another without any structure like catch basin or manhole (Feature is GIS storm drain subtype)	Point
Junc	Junction-A structure used to merge or distribute flow (Feature is GIS storm drain subtype)	Point
Gbreak	Grade Break - Point of slope change in the pipe (Feature is GIS storm drain subtype)	Point
Tran	Transition - A structure connecting two different pipe/culvert/drain/etc. sizes (Feature is GIS storm drain subtype)	Point
Levee	Boundary/outline of a levee	Polygon
Weir	A portion of a levee	Polygon
Basin	Detention/retention basin or pond	Polygon
Culvert	Center line of culvert (Feature is GIS storm drain subtype)	Line
Channel	Center line of Channel (Feature is GIS storm drain subtype)	Polyline
Creek/Ditch	Center line of creek or ditch (Feature is GIS storm drain subtype)	Polyline
Watershed	Major or minor watershed areas	Polyline

NOTE:

APPENDIX 2 – CAD STANDARDS AND REQUIREMENTS FOR THE DIGITAL SUBMITTAL OF MAPS AND IMPROVEMENTS PLANS

1. Storm drain lines (particularly larger size pipes) are usually drawn with double lines in CAD drawings depicting the diameter of the pipe. Digital submittal to the City must have centerline of the pipes, channels, culverts, etc. drawn as a single line connecting center points of features (nodes) such as manholes, catch basins, etc. This line can be saved in a separate layer to accommodate transition in to GIS.

2. Storm drains, channels, culvers, creeks, etc. need to be digitized with proper directionality: Lines must be drawn from the uphill node to the downhill node or flipped after the lines have been digitized.

3. All tangents between storm drain manholes, inlets, outlets, clean outs need to be drawn with a single polyline. Lines must not continue for more than one tangent.

4. All tangents must be snapped at endpoints intersecting at the exact center of the cleanouts, inlets, and outlets. No gaps should exist between tangents.

5. Cleanouts need to be symbolized consistently exactly on the tangent endpoints.

6. Storm manholes, cleanouts, inlets, outlets, culverts, and appurtenances or any other item requiring elevations must be annotated on a separate annotation defined layer. The annotation should be comprehensive to each item.

FLOOD HAZARD AREA:

DWG Layer	Object Description	CAD Line Type
Fld_haz_ar	Flood hazard area boundary	Polygon
Floodway	Floodway boundary	Polyline
BFE	Base Flood Elevation (BFE) line	Line
FL_Zone_Revised	Flood zone boundary revised per LOMR	Polygon
Not_removed	Property not removed from flood zone	Polygon
Property_Out	Property removed from flood zone	Polygon
Structure_Out	Structures removed from flood zone	Polygon

PLNNING AND LAND USE:

DWG Layer	Object Description	CAD Line Type
Landuse	Boundaries of different land use areas	Polygon
Zoning	Boundaries of different zoning areas	Polygon
Redev_Area	Boundary of the downtown redevelopment area	Polygon
Master_Plan	Boundaries of areas designated as Master	Polygon

APPENDIX 2 – CAD STANDARDS AND REQUIREMENTS FOR THE DIGITAL SUBMITTAL OF MAPS AND IMPROVEMENTS PLANS

	Plan	
Specific_Plan	Boundaries of areas designated as Specific Plan	Polygon
Coastal	Coastal Zone area boundary	Polygon

SEWER:

DWG Layer	Object Description	CAD Line Type
Sew_Main	Sewer main line	Line
Sew_Forcemain	Sewer force main	Line
Sew_Lateral	Sewer lateral	Line
Manhole	Sewer manhole	Point
Sew_Encase	Sewer encasement	Line
Sew_Text	Sewer text	Anno
Lift_Sta	Sewer lift station	Point
Sew_AirVac	Sewer air vacuum	Point
Sew_RelValve	Sewer release valve	Point
Sew_FMLVavle	Sewer force main line valve (plug or gate valve)	Point

NOTE:

1. Sewer Lines and Sewer Taps need to be digitized with proper directionality: Lines must be drawn from the uphill node to the downhill node or flipped after the lines have been digitized.
2. All tangents between sewer manholes need to be drawn with a single polyline. Lines must not continue for more than one tangent.
3. All tangents must be snapped at endpoints intersecting at the exact center of the manhole. No gaps should exist between tangents.
4. Manholes need to be symbolized consistently exactly on the tangent endpoints.
5. Sewer tap locations must be snapped to the sewer tangent and accurately placed. Placement should be based on direct survey of the tap where it connects to the sewer tangent, or based on the televising report.
6. Sewer manholes, cleanouts, appurtenances or any other item requiring elevations must be annotated on a separate annotation defined layer. The annotation should be comprehensive to each item.

WATER:

DWG Layer	Object Description	CAD Line Type

APPENDIX 2 – CAD STANDARDS AND REQUIREMENTS FOR THE DIGITAL SUBMITTAL OF MAPS AND IMPROVEMENTS PLANS

Wat_Main	Water main line	Line
Wat_Service	Water service line	Line
FH	Fire Hydrant	Point
Wat_Valve	Water in-line valve (gate or butterfly valve)	Point
Wat_Meter	Water meter	Point
Air_Vent	Water line air vent	Point
Check_Valve	Water line check valve	Point
Relief_Valve	Pressure relief valve	Point
Blow_Off	Blow off valve	Point
Fitting	Water line fitting	Point
Regulator	Pressure regulator	Point
Hydro_Sta	Hydro-electric station	Point
Pump_Sta	Pump station (building or fence)	Polygon
Wat_Pump	Water pump	Point
Reservoir	Reservoir	Polygon
RP_Backflow	Reduced pressure principal assembly	Point
DCDA_Backflow	Double check detector assembly	Point
Pres_Red	Pressure reducing station	Point
Wat_Encase	Water line encasement	Polygon
Wat_Text	Water text	Anno

NOTE:

1. Water lines must be digitized with all straight-line pipes consisting of only two end points. Straight-line pipes will begin and end at the following features (nodes): hydrants, valves, meters, pumps, tees, crosses, and valves. Polylines should be used wherever a water line contains elbows or bends (i.e., when the line does make a straight run from node to node). Do not spline.
2. Curves may be digitized with enough vertices to capture the curve geometry, but they must be single, continuous lines. Curves or arcs may also be used to designate curved pipe.
3. Hydrants must be shown in their true, surveyed location, and must be connected to the water main via a valved fire hydrant line.
4. All water lines must be continuous, with pipe endpoints snapped to each other at endpoints (nodes).
5. End-of-line caps must be drawn to differentiate end-of-lines from lines that extend beyond the extent of the drawing. Caps should be drawn for lines that are to be

APPENDIX 2 – CAD STANDARDS AND REQUIREMENTS FOR THE DIGITAL SUBMITTAL OF MAPS AND IMPROVEMENTS PLANS

permanently capped when the project is complete, not for lines that are temporarily capped pending inspection.

RECYCLED WATER:

DWG Layer	Object Description	CAD Line Type
RW_Main	Recycled water main line	Line
RW_Valve	Recycled water in-line valve (gate or butterfly valve)	Point
RW_Meter	Recycled water meter	Point
RW_Air_Vent	Recycled water line air vent	Point
RW_Check_Valve	Recycled water line check valve	Point
RW_Relief_Valve	Recycled pressure relief valve	Point
RW_Blow_Off	Recycled blow off valve	Point
RW_Fitting	Recycled water line fitting	Point
RW_Regulator	Pressure regulator	Point
RW_Pump_Sta	Recycled pump station (building or fence)	Polygon
RW_Pump	Recycled water pump	Point
RW_Pres_Red	Recycled pressure reducing station	Point
RW_Encase	Recycled water line encasement	Polygon
RW_Text	Recycled water text	Anno

NOTE:

See the requirements for WATER.

J. REVIEW OF DIGITAL DATA

All digital data will be reviewed for the following criteria:

1. Correct layering.
2. No duplicate linear or point elements.
3. Closure of the geometry of all logical areas.
4. Verification that digital and hardcopy maps are consistent.
5. Correct geographical position (i.e., correct coordinate values for final submissions).

The submitting party will be responsible for correcting any errors and delivering the new correct digital file prior to approval by the City of Oceanside.

APPENDIX 2 – CAD STANDARDS AND REQUIREMENTS FOR THE DIGITAL SUBMITTAL OF MAPS AND IMPROVEMENTS PLANS

K. DIGITAL FILE DRAWING REQUIREMENTS

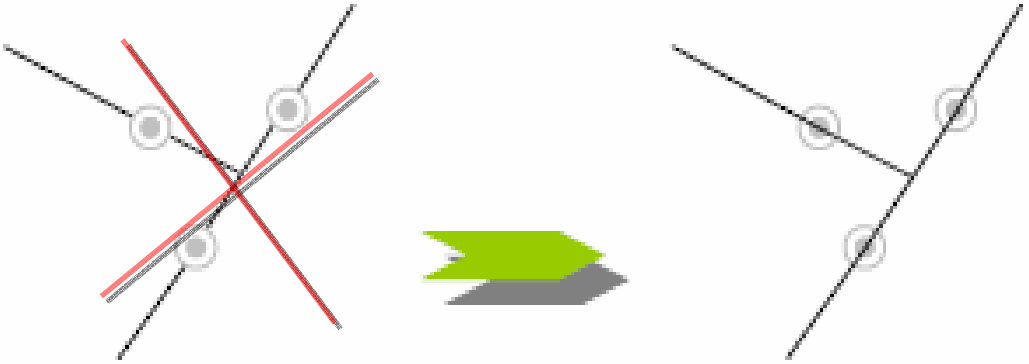
1. No drawing information should be placed on layer “0”.

2. All digital line work must be geometrically correct, topologically clean without slivers, dangles, undershoots or inappropriate breaks. Polygon features drawn as polylines must properly close without gaps.

3. Each layer for water, sewer, and storm drain shall clearly indicate the pipe size and/or the type and material of appurtenance.

4. Point objects should all have an insert point in their own layer and in the center.

5. All linear features, such as water main and sewer line, should be connected on their nodes, mainly on the center of point features, like valves and manholes, which are represented by such feature insert points. In other words, point objects should be placed first and then linear objects should be drawn by snapping to the insertion point (center) of existing point objects.



6. Polygons should be drawn as lines and form a closed polygon. Lines must not be overshot, undershot or have gaps in the intersection points.

7. Valve, hydrant, check valve, fitting, regulator, relief valve and blow-off should be connected to water main.

8. Meter and air vent should be connected to water service.

9. Manhole and lift station should be connected to sewer line.

10. Inlet, outlet, cleanout should be connected.

11. Plug, cap, lug, junctions, grade break, transition structures must connect to storm drain.

12. Right-of-way and parcel should be connected to each other to insure that all parcel polygons are closed.

13. There should be no gap or overlap between parcels and/or right-of-way.

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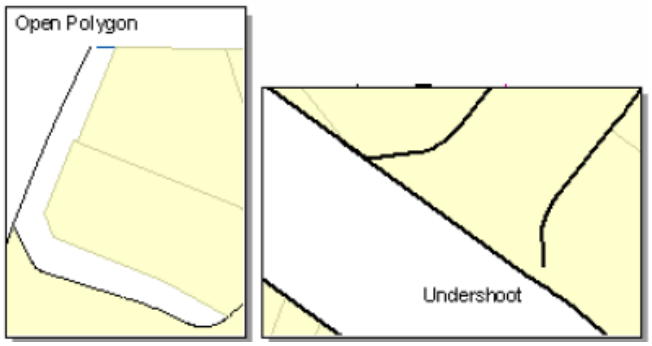
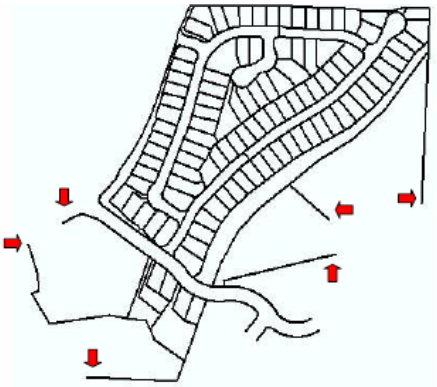


14. Some private streets are parcels. Therefore, line segments in the private streets should be maintained in order to make the polygons inside the streets as parcels:

15. There should not be any lot/parcel line with free endpoint(s); otherwise, they will be deleted in the time of loading into GIS.



16. The boundaries for easements of all types should be closed to create distinct polygons.

17. Boundaries of each easement should not overlap another easement, whether fully or partially.

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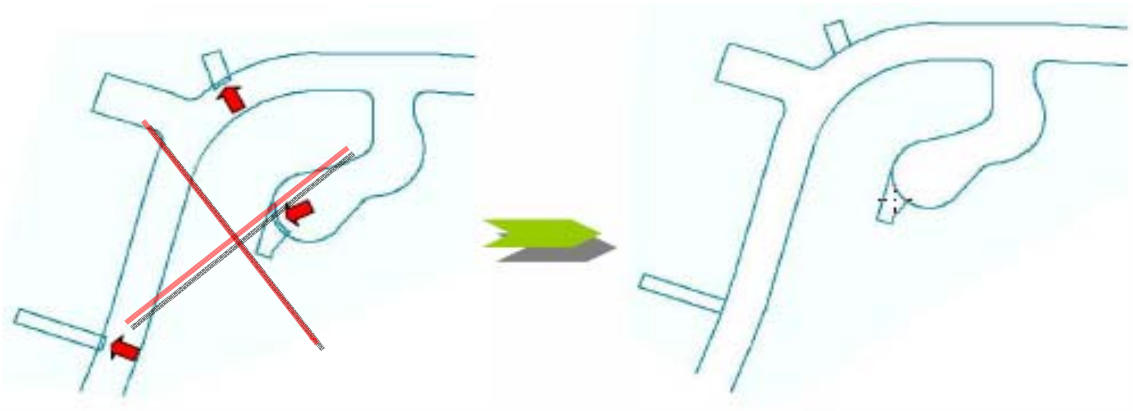

18. All connection lines to the fire hydrants should be in the same layer as Water Main.

L. CITY OF OCEANSIDE DISCLAIMER - DIGITAL OR HARD COPY PLAN DATA

A statement of understanding between the City of Oceanside (City) and any and all subsequent users of information obtained therefrom:

THE PLANS AND SUPPORTING INFORMATION IS FURNISHED BY THE CITY, AND IS ACCEPTED / USED BY THE RECIPIENT WITH THE UNDERSTANDING THAT THE CITY MAKES NO WARRANTIES, EXPRESS OR IMPLIED, CONCERNING THE ACCURACY, COMPLETENESS, RELIABILITY, OR SUITABILITY OF SAID PLANS OR ANY SUPPORTING DATA, AND FURTHER UNDERSTANDS THAT ALL USERS ARE ACTING AT THEIR OWN RISK. THE CITY SHALL BE UNDER NO LIABILITY WHATSOEVER RESULTING FROM ANY USE OF THIS INFORMATION. THIS INFORMATION SHOULD NOT BE RELIED UPON AS THE SOLE BASIS FOR EXISTING WATER, SEWER, AND/OR STORM DRAIN LOCATIONS. THE ENGINEER SHALL CHECK AND VERIFY ALL DIMENSIONS AND LOCATIONS OF EXISTING UTILITIES.

THE INFORMATION DELINEATED HEREON WAS COMPILED FROM AVAILABLE RECORD DATA; NO LIABILITY IS ASSUMED FOR ACCURACY. THIS INCLUDES ALL PRINTS, EMAILS AND DOCUMENTS PROVIDED BY THE CITY OF OCEANSIDE.

If you have any questions or comments, please contact Water Utilities Department at (760) 435-5800 or by email: waterstaff@ci.oceanside.ca.us