

Plan Review Documents

A.1 CAD STANDARDS

- A.1.1. Provide one set of AutoCAD (Version 2000 or higher) files for the as-built Civil drawings on an electronic file format acceptable to the District. Provide Xref files as required. Provide a list of the file names linking the drawing files to the sheet number. A hard copy description of the drawing configuration including paper space layout, layer assignments, and special plotting instructions is requested. A printed description included in the actual drawing file is recommended.
- A.1.2. As-Built drawings shall conform to the following:
1. Use CD IBM compatible or equal.
 2. Use AutoCAD version 2000 or higher *.dwg file format.
 3. The files saved to disk should be printable when opened and be the same file used to plot the Mylar as-built.
 4. Use compressed file(s) only if the decompression program is included.
 5. As-built plans are to conform to the layering standards included on the following page. If additional layering is needed use these general layers as prefixes (Ex. EASE-UTIL, EASE-SS).
 6. All entity colors are to be by layer. If different colors are needed for line width and plotting purposes, a suffix of that colors name or number may be added to the appropriate layer name.
 7. Where proposed and existing features are shown in the same drawing the prefix "P" shall be used for proposed and prefix "X" for existing in layering names, (ex. P-ROW for proposed right-of-way, X-ROW for existing right-of-way.)
 8. Feature annotation shall be attached to each respective layer unless otherwise noted.
 9. Use standard fonts, shapes and line types. If nonstandard files are used supply electronic font, shape or line type file on disk. SOFTDESK files are acceptable. Fonts sizes used to label features should be consistent.
 10. All manholes, catch basins, fire hydrants, valves, meters, etc. are to be inserted as blocks. All blocks are to be created on layer 0.
 11. All drawings are to be seamless, drawn in model space.
 12. Drawings are not to be rotated off of world coordinate bases but may be "viewed" in model space to accommodate desired plot rotation.
 13. Plan views shall show north predominantly to the top or left of sheet.

14. All drawings are to be plotted by view in paper space at a scale of 1:1. Views are to be named "PLOT" (Ex. PLOT1, PLOT2, etc.)
15. Drawings are to be delivered purged of all unused layers, blocks, line types, and styles.
16. The primary features should appear bolder and stand out against the background features in both the plan and profile views, i.e. sanitary lines and appurtenances on sanitary sheets.
17. Preferred CAD Layering – Sanitary Sewer

SANITARY SEWER CAD LAYERING		
	Existing Sanitary Sewer	Proposed Sanitary Sewer
	(green layer color)	(red layer color)
Sanitary Sewer	E-SS	P-SS
Sanitary Sewer Manhole	E-SSMH	P-SSMH
Sanitary Sewer Text	E-TXT	P-TXT
Lot lines	E-Lot	P-Lot

18. Preferred CAD Layering – Storm Drainage

STORM DRAINAGE CAD LAYERING			
	Existing Storm Drainage	Proposed Storm Drainage	
	(blue layer color)	(magenta layer color)	
Storm Drainage	E-SD	P-SD	
Storm Drainage Manhole	E-SDMH	P-SDMH	
Storm Drainage Detention Facilities	E-SDDF	P-SDDF	
Storm Drainage Water Quality Facilities	E-SDWQ	E-SDWQ	

19. Miscellaneous Layering (layer name and description)

TB	Title block, company logo, scale, north arrow	EG	Edge of gravel
TBTXT	Title block text	RR	Railroad tracks, structures, etc.
BORDER	Title block border	PWR	Power lines, power poles, streetlights, etc.
EDGE	Edge of paper	GAS	Gas lines, gas valves, meters, etc.
		TEL	Telephone lines, closures, etc.
SS	Sanitary sewer pipes	TV	Television cable lines, closures, etc.
SSMH	Sanitary sewer manholes	TXT	General text (street names, tax lot numbers, etc.)
SSTXT	Sanitary sewer annotation		
SSLAT	Sanitary sewer service laterals	CONT5	Contour lines are to be on a "CONT" layer with their
		CONT1	interval number as a suffix (Ex. 5' contours)
SD	Storm drain pipe		on the layer CONT5)
SDMH	Storm system manholes	CONTXT	Contour text labels
SDTXT	Storm system annotation		
SDDF	Storm detention facilities and structures	CL	Centerlines
SDWQ	Storm system water quality facilities	STA	Stationing and stationing text
		GRID	Profile grids
WL	Waterlines (valves, meters, vaults, etc.)	GRIDTXT	Profile grid text
		XGRD	Existing ground/grade
ROW	Rights-of-way and easements	PGRD	Proposed ground/grade
LOT	Boundary lines of parcels		
		CONC	Detailed concrete
VEG	Trees, shrubs, vegetation	PIPE	Detailed pipe
BLDG	Buildings and structures	ROCK	Detailed rock
FEN	Fences	EARTH	Detailed earth/ground
WALL	Retaining and other walls	HATCH	Hatch patterns in details
EP	Edge of pavement		

A.2 Sanitary Sewer Notes

A.2.1. General construction notes are required to be included on the construction plans and can be found on the District website or provided upon request. These notes are required and the design professional may include other applicable notes they deem necessary.

SANITARY SEWER:

ALL WORK AND MATERIALS SHALL CONFORM WITH THE CONSTRUCTION STANDARDS AND SPECIFICATIONS OF CLACKAMAS COUNTY SERVICE DISTRICT #1 (CCSD#1).

THE CONTRACTOR IS REQUIRED TO ATTEND A PRE-CONSTRUCTION CONFERENCE AT THE DISTRICT'S OFFICES PRIOR TO BEGINNING WORK ON THE SANITARY SEWER. THE OWNER OR CONTRACTOR IS ALSO REQUIRED TO PROVIDE THE DISTRICT A WARRANTY BOND FOR THE NEW SANITARY SEWER MAINS AND SERVICE CONNECTIONS AT THE COMPLETION OF CONSTRUCTION.

THE ENGINEER IS REQUIRED TO HAVE AN INSPECTOR ON SITE AT ALL TIMES DURING CONSTRUCTION OF THE SANITARY SEWER, THE CONTRACTOR, SHALL GIVE THE ENGINEER AT LEAST 24 HOURS NOTICE PRIOR TO BEGINNING WORK AT THE START OF CONSTRUCTION OR AFTER AN INTERVAL OF NOT WORKING ON THE SANITARY SEWER.

MATERIALS:

POLYVINYL CHLORIDE PIPE (PVC) SHALL CONFORM TO THE REQUIREMENTS OF ASTM D-3034, SDR 35, AND JOINT TYPE SHALL BE ELASTOMERIC GASKET CONFORMING TO ASTM D-3212.

CONCRETE SEWER PIPE (CSP) TO CONFORM TO THE REQUIREMENTS OF ASTM C-14, CLASS 3 NON-REINFORCED CONCRETE PIPE WITH ELASTOMERIC GASKETS.

MANHOLES TO BE PRECAST CONCRETE SECTIONS WITH MINIMUM INSIDE DIAMETER OF 48-INCHES, CONFORMING TO THE REQUIREMENTS OF ASTM C-478, EXCEPT AS NOTED ON THE PLANS. POURED IN PLACE MANHOLES MAY BE SUBSTITUTED.

INSTALLATION:

POLYVINYL CHLORIDE PIPE (PVC) SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS. PVC SEWER PIPE SHALL BE CONNECTED TO CONCRETE MANHOLES BY MEANS OF AN APPROVED COUPLING WITH AN ELASTOMERIC GASKET, AN APPROVED WATERSTOP OR FLEXIBLE SLEEVE. USE OF PORTLAND CEMENT GROUT FOR CONNECTION OF PVC SEWER PIPE TO MANHOLES WILL NOT BE PERMITTED.

AFTER THE CONTRACTOR HAS BACKFILLED THE PIPE ZONE OF THE TRENCH AS REQUIRED, HE SHALL THEN BACKFILL THE BALANCE OF THE TRENCH, WITH THE TYPE OF BACKFILL SPECIFIED, IN ONE FOOT (1') LAYERS, MECHANICALLY COMPACTING EACH LAYER TO 95% OF MAXIMUM DENSITY IN ROADWAYS AND 85% TO 90% IN ALL OTHER AREAS. MAXIMUM RELATIVE DENSITY SHALL BE DETERMINED PER AASHTO T-180. IN PLACE, DENSITY SHALL BE DETERMINED PER AASHTO T-191, T-205 OR T-238. ANY SUBSEQUENT SETTLEMENT OF THE TRENCH

OR DITCH DURING THE GUARANTEE PERIOD SHALL BE CONSIDERED TO BE THE RESULT OF IMPROPER COMPACTION AND SHALL BE PROMPTLY CORRECTED BY THE CONTRACTOR AT NO EXPENSE TO THE DISTRICT OR THE OWNER.

SANITARY SEWER PIPE AND APPURTENANCES SHALL BE TESTED FOR LEAKAGE IN ACCORDANCE WITH CCSD#1 STANDARDS. LEAKAGE TESTS INCLUDE AN AIR TEST OF THE SEWER MAINS AND SERVICE CONNECTIONS AND A WATER EXFILTRATION TEST OR VACUUM TEST OF THE MANHOLES. ANY PORTION OF THE SEWER WHICH FAILS TO PASS THESE TESTS SHALL BE EXCAVATED, REPAIRED OR REALIGNED, AND RETESTED. IN ADDITION TO HYDROSTATIC OR AIR TESTING, SANITARY SEWERS CONSTRUCTED OF PVC SEWER PIPE SHALL BE DEFLECTION TESTED NO LESS THAN 30-DAYS AFTER THE TRENCH BACKFILL AND COMPACTION HAS BEEN COMPLETED. THE TEST SHALL BE CONDUCTED BY PULLING AN APPROVED SOLID POINTED MANDREL 95% OF THE INSIDE DIAMETER THROUGH THE PIPELINE ON A MANHOLE TO MANHOLE BASIS.

UNLESS OTHERWISE SPECIFIED ON THE PLANS OR DIRECTED BY THE ENGINEER, EACH SERVICE CONNECTION SHALL BE LAID IN A SEPARATE TRENCH ON A STRAIGHT LINE AND GRADIENT FROM THE TEE TO THE END OF THE SERVICE CONNECTION. AT THE PROPERTY LINE THE SERVICE CONNECTION SHALL BE AT LEAST 6 FEET BELOW THE GRADE OF THE STREET CENTER LINE. NO SERVICE CONNECTION SHALL BE LAID ON A SLOPE OF LESS THAN TWO PERCENT, UNLESS OTHERWISE DIRECTED BY THE ENGINEER OR SHOWN ON THE PLANS. THE ENGINEER WILL PROVIDE A CUT STAKE AT THE TERMINAL POINT OF EACH SERVICE CONNECTION. UNLESS OTHERWISE DIRECTED BY THE ENGINEER, THE CONTRACTOR WILL USE A GRADING LINE TO LAY THE PIPE AND THE SERVICE CONNECTION SHALL BE INSTALLED WITH THE SAME ACCURACY AS THE MAIN SEWER. EACH SERVICE CONNECTION SHALL BE PLUGGED WITH A RUBBER RING PLUG. A 2 X 4 MARKER PAINTED GREEN SHALL BE PLACED AT THE END OF EACH SERVICE CONNECTION, AND SHALL EXTEND FROM THE END OF THE PIPE TO A POINT ONE FOOT (1') ABOVE THE SURFACE OF THE GROUND. A DETECTABLE GREEN MAGNETIC TAPE ("THORDURATEC SAFETY GREEN SANITARY SEWER RIBBON OR EQUAL") WITH THE WORD "SEWER" AT REGULAR INTERVALS SHALL BE PLACED ALONG THE SERVICE CONNECTION FROM THE MAINLINE TEE TO THE GROUND SURFACE.

IN EASEMENT AREAS ALL MANHOLES SHALL HAVE TAMPER-PROOF LIDS PER CCSD#1 SPECIFICATIONS, OR APPROVED EQUAL. CAUTION: NOT ALL TAMPER-PROOF LIDS MEET CCSD#1 SPECIFICATIONS. THE FRAME AND COVER SHALL BE SIX INCHES (6") ABOVE FINISH GRADE.

THE CONTRACTOR SHALL AT ALL TIMES PROVIDE AND MAINTAIN AMPLE MEANS AND DEVICES TO REMOVE AND DISPOSE OF ALL WATER ENTERING THE TRENCH EXCAVATION DURING THE PROCESS OF LAYING THE PIPE. WATER AND DEBRIS SHALL NOT ENTER INTO THE DISTRICT'S SEWER SYSTEM. WATER AND DEBRIS SHALL BE DISPOSED OF IN AN APPROVED MANNER.

VERTICAL DATUM: BASED ON CCSD#1 SANITARY MANHOLE ____ STA
____. ____ (NORTH, SOUTH, EAST, WEST) INVERT ELEVATION = ____.

A.3 Sanitary Sewer Notes

A.3.1. Below is the acceptable format showing the sanitary sewer manhole callouts. The District will determine the type and format of all callouts on the final as-built drawings.

- a) Street stationing and other related information is allowed on the construction plans; however, this must be removed on the accepted as-built plans.
- b) Reference Balloons - In general reference balloons are not allowed. If stormwater reference balloons are used on construction drawings then the reference will be removed on the final asbuilt drawings.

PLAN AND PROFILE MANHOLE CALLOUTS FOR CCSD#1 AS-BUILT DRAWINGS

PROFILE VIEW CALLOUTS

MH HV20-1
STA 3+49.40
RIM 486.50
IE IN (N) 478.60
IE OUT 478.40

IF A LATERAL BEGINS IN THE MANHOLE MODIFY LINE 2
AS BELOW AND ADD LINES 3 AND 6.

MH HV20-1
STA 3+49.40 =
0+00 LAT HV20.1
RIM 486.50
IE IN (N) 478.60
IE IN (E) 478.60
IE OUT 478.40

PLAN VIEW CALLOUT

MH HV20-1
STA 3+49.40