

DRAFTING STANDARDS

9.00 DRAFTING STANDARDS

Final plans shall conform in appearance, format, accuracy, and quality to the standards used in the Springfield Engineering Division. Additional standards shall apply to the acceptance of electronic and hard copy as-builts requiring the control accuracy of survey ties and GIS map projections. For purposes of readability, reproduction and filing, as-built acceptance standards shall also conform to minimum line weights, fonts, and sheet sizes. Refer to Section 10.00 for electronic drafting and electronic acceptance standards.

9.01 SURVEY AND TOPOGRAPHIC INFORMATION

The engineer shall obtain accurate topographic information in electronic format from a current field survey containing all topography necessary to effectively design the project. The engineer shall process the data collected in the field survey, and verify the accuracy of the information collected prior to using it for design purposes. All topographic surveys shall be based on a control survey as described in section 11.08 of these standards.

Enough survey information shall be collected to adequately show the existing topography, improvements, and the impact it will have on the existing conditions.

The engineer shall verify the alignment, geometry, depth, and inverts of all existing facilities shown on the plans that will be crossed by proposed facilities and shall certify them with a note on the plans. City as-built records are only to be used as an aid to the engineer when field verifying the existing facilities.

9.02 PUBLIC IMPROVEMENT PROJECT PLAN SET REQUIREMENTS

The following plan sheets may be required in a public improvement plan set. In some cases, sheets can be combined or omitted. Refer to the section where each sheet more fully described to determine when it is possible to combine or omit sheets. The public improvement plan set shall include the following plan sheets in the following order:

1. Cover Sheet, see Section 9.03.
2. Plan and Profile View Sheet(s), see Section 9.04.
3. Construction Detail Sheet(s), see Section 9.05.
4. Traffic Plan Sheet(s), see Section 9.06.
5. Traffic Detail Sheet(s), see Section 9.07.
6. Grading Plan Sheet(s), see Section 9.08.
7. Erosion and Sediment Control Plan Sheet(s), see Section 9.09.

9.02.1 Sheet Size / Margins

All public improvement plan sheets shall be prepared electronically and plotted on standard 24" x 36" sheets with a two-inch border (minimum) on the left side one-inch (minimum) borders on all other sides.

Unless otherwise approved or required by the City, all plans shall be drafted and submitted using US Imperial units, with one-foot as the standard measurement of distance/elevation.

9.02.2 Line width

Line width shall not be less than six thousandths (0.006) of an inch.

9.02.3 Line weight

Existing features and facilities shall be shown with thin, dashed and/or gray muted lines. Proposed improvements shall be shown with heavier, solid black lines.

9.02.4 Descriptions and Detail Notes

To the greatest extent possible, descriptions and detail information shown on plan sheets shall not be shown in more than one location. Description and detail notes shall be contained within the match lines of each sheet. Other sheets shall refer to applicable plan sheets for details. For example, curb returns that show up on multiple sheets shall only have one curb return data table and manholes shown on one multiple sheets shall only have information on one sheet and the other(s) shall reference.

9.02.5 Required Information

The following items shall be contained within a title block aligned vertically along the right side of each sheet in the plan set.

- A. Project Title.
- B. Sheet Title.
- C. Designer's Company/Agency Information; including Name, Address, Voice/Fax Telephone Numbers, email address, logo, etc.
- D. Sheet number and total number of sheets; in the format "SHEET X OF Y."
- E. Engineer's Stamp and Signature.
- F. Review Stamp (if applicable); when plans are submitted to the City for review and comment, the plans shall clearly be marked "PRELIMINARY – NOT FOR CONSTRUCTION" over the Engineer's Stamp and Signature.
- G. Date of Drawing.
- H. Revision Block; including area for revision number, description, date, and name.
- I. City Project Number; Orientate horizontally near the bottom right hand corner of the sheet in one-quarter inch minimum letters in the format "City Project Number PXXXXX."
- J. "City Approval" Block (blank area one and one-half inches tall and three inches wide minimum for City approval stamp and signature by the City Engineer).

9.03 COVER SHEET

The purpose of the cover sheet is to provide a quick overall view of the project covering major design features and for orientation to the project area.

A separate cover sheet shall be included in all public improvement project plan sets unless all required information to construct a project can be contained on one plan sheet.

The following items shall be included on the Cover Sheet:

- A. Project Title.
- B. General Construction Notes; see Section 9.03.1.
- C. Sheet Index; including the sheet numbers and titles of all sheets within plan set (unless there is only one).
- D. Symbol Legend; see Section 9.03.2.
- E. Vicinity Map; see Section 9.03.3.
- F. Site Map (including Sheet Index); see Section 9.03.4.
- G. Assessment Plat (if applicable); see Section 9.03.5.

9.03.1 General Construction Notes

The following General Construction Notes shall be included on the cover sheet of the public improvement plan set. If the general construction note in no way applies to the project it may be omitted. Additional notes shall be included as necessary or required.

GENERAL CONSTRUCTION NOTES

- A. ALL MATERIALS AND WORKMANSHIP WITHIN THE PUBLIC RIGHT-OF-WAY OR PUBLIC EASEMENTS SHALL MEET CITY OF SPRINGFIELD DEPARTMENT OF PUBLIC WORKS "STANDARD CONSTRUCTION SPECIFICATIONS, 1994" AS AMENDED IN 1998 (OR CURRENT ADDITION), IN ADDITION TO THESE PLANS.
- B. OREGON LAW REQUIRES THE CONTRACTOR TO FOLLOW RULES ADOPTED BY THE OREGON UTILITY NOTIFICATION CENTER. THOSE RULES ARE SET FORTH IN OAR 952-001-0010 THROUGH OAR 952-001-0100. THE CONTRACTOR MAY OBTAIN COPIES OF THE RULES BY CALLING THE CENTER. NOTE: THE TELEPHONE NUMBER FOR THE OREGON UTILITY NOTIFICATION CENTER IS (800) 332-2344.
- C. LOCATION AND/OR DEPTH OF EXISTING UTILITIES SHOWN ON PLANS ARE APPROXIMATE. IT IS THE CONTRACTOR'S RESPONSIBILITY TO CONTACT ALL UTILITY COMPANIES FOR UNDERGROUND LOCATION OF FACILITIES AT LEAST 48 HOURS PRIOR TO EXCAVATING OR "POTHOLING". THE "ONE-CALL" NUMBER (800) 332-2344
- D. CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATION WITH UTILITY COMPANIES ON THE TIMING OF INSTALLATION OF THEIR FACILITIES.
- E. SPRINGFIELD CODE 10.2.1 REQUIRES NOTIFICATION OF OPEN TRENCHING FOR THE PROJECT TO ALLOW POSSIBLE AT&T CABLE INSTALLATION.
- F. THE CONTRACTOR SHALL PROVIDE ALL TRAFFIC CONTROL DEVICES NECESSARY TO PROTECT AND SAFEGUARD THE PUBLIC AND WORKERS AGAINST INJURY AND PROTECT THE WORK AGAINST DAMAGE. ALL TEMPORARY TRAFFIC CONTROL SIGNING AND DEVICES SHALL BE IN PLACE PRIOR TO BEGINNING WORK. ALL TRAFFIC CONTROL SHALL CONFORM TO THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS (MUTCD), CURRENT EDITION, AS SUPPLEMENTED AND AMENDED BY THE OREGON SUPPLEMENTS. FLAGGING SHALL BE PERFORMED AS SHOWN IN THE OREGON STATE HIGHWAY DIVISION HANDBOOK, "SIGNING AND FLAGGING STANDARDS FOR SHORT-TERM WORK ZONES", CURRENT EDITION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY REQUIRED TRAFFIC CONTROL AS FIELD CONDITIONS WARRANT. THE CONTRACTOR SHALL SUBMIT A TRAFFIC CONTROL PLAN AT THE PRE-CONSTRUCTION CONFERENCE FOR CITY REVIEW AND APPROVAL.
- G. ALL SANITARY AND STORM SEWER CONNECTIONS TO EXISTING CITY OWNED FACILITIES (PIPE, CATCH BASINS, MANHOLES, ETC.) SHALL BE INSPECTED BY THE CONTRACTOR AND THE CITY'S PUBLIC WORKS MAINTENANCE DEPARTMENT PRIOR TO

HOOKING UP TO THEM. CONTACT KEITH MIYATA (726-3615) OR RON SATHER (726-2240) NO LESS THAN 48 HOURS PRIOR TO DESIRED INSPECTION TIME.

- H. BEFORE BACK-FILLING THE END OF A MAINLINE PIPE. NOT ENDING AT A MANHOLE OR A CLEAN OUT, THE CONTRACTOR SHALL PERFORM THE TV INSPECTION AS REQUIRED BY THE STANDARD SPECIFICATIONS AND ALLOW THE CONSULTING ENGINEER TO DETERMINE THE EXACT LOCATION AND ELEVATION OF THE END OF THE PIPE.
- I. WHERE CONNECTING TO AN EXISTING PIPE. THE CONTRACTOR SHALL EXPOSE THE END OF THE EXISTING PIPE AND ALLOW THE ENGINEER TO VERIFY EXACT LOCATION AND ELEVATION, CONDITION, AND POSITIVE FLOW BEFORE LAYING ANY NEW PIPE ON THAT SYSTEM.
- J. THE SEWER GRADE SHALL BE PER THE PLANS SPECIFICATIONS AND WITH THE MINIMUM COVER AS SHOWN ON THE PLANS
- K. THE CONTRACTOR SHALL INTERNALLY TELEVISION INSPECT THE SEWER AFTER ALL BACKFILL AND BEFORE THE FINAL LIFT OF ASPHALT PAVING. THE CONTRACTOR SHALL SUPPLY THE CITY WITH A WRITTEN T.V. REPORT AND VIDEO TAPE FOR CITY APPROVAL AT LEAST 2 WORKING DAYS BEFORE THE PRE-PAVING MEETING.
- L. CONTRACTOR TO SCHEDULE A PRE-PAVING CONFERENCE 24 HOURS PRIOR TO PAVING. CONTACT RON SATHER (726-2240).
- M. ALL JOINTS BETWEEN EXISTING and NEW ASPHALT PAVING SHALL BE SEALED WITH POLYMERIZED ASPHALT AND SANDED TO PREVENT PICK UP.

N. COMPACTION REQUIREMENTS:

<u>LAYER</u>	<u>RATE</u>	<u>TEST</u>
SUBGRADE	95%	T99
CRUSHED ROCK	95%	T180
ASPHALT (LOCAL)	90%	RICE
ASPHALT (COLLECTOR/ARTERIAL)	92%	RICE

O. CONCRETE COMPRESSIVE STRENGTH REQUIREMENTS (PSI):

<u>CONCRETE USE</u>	<u>FIELD</u>	<u>LABORATORY</u>
SIDEWALK/ADA RAMPS	3000	3450
CURBS/GUTTERS	3500	4025
DRIVEWAYS	3500	4025
PAVEMENT	4000	4600

- P. THIS PROJECT SHALL COMPLY WITH THE AMERICAN DISABILITIES ACT REQUIREMENTS SUCH AS INCORPORATION OF DESIGN CRITERIA FOR HANDICAP RAMPS, MAXIMUM PROFILE AND CROSS SECTION SLOPES FOR SIDEWALKS, UPGRADING EXISTING HANDICAP FACILITIES WHERE MAJOR CONSTRUCTION IS OCCURRING, AND BUILDING WARNING FOR OBJECTS IN SIDEWALK SUCH AS CURBING OR LANDSCAPING AROUND MAILBOXES.
- Q. CONTRACTOR IS RESPONSIBLE TO OBTAIN APPLICABLE PERMITS FROM OTHER AGENCIES WITH JURISDICTIONS SUCH AS LANE COUNTY, OREGON DEPARTMENT OF TRANSPORTATION, OREGON DIVISION OF STATE LANDS, THE ARMY CORPS OF ENGINEERS, OR THE DEPARTMENT OF ENVIRONMENTAL QUALITY.
- R. ALL IMPROVEMENTS THAT WILL BE PRIVATELY OWNED AND MAINTAINED WILL BE BOUND BY THE CURRENT REQUIREMENTS OF THE STATE OF OREGON STRUCTURAL SPECIALTY CODE, PLUMBING SPECIALTY CODE, AND/OR CITY OF SPRINGFIELD BUILDING DIVISION REQUIREMENTS. CONTRACTOR IS RESPONSIBLE TO OBTAIN APPLICABLE PERMITS FROM OTHER CITY DEPARTMENT PRIOR TO DOING PRIVATE WORK.

- S. EARTHWORK OUTSIDE THE RIGHT OF WAY AND PUBLIC EASEMENTS IN EXCESS OF 50 CUBIC YARDS REQUIRES A LAND AND DRAINAGE ALTERATION PERMIT (LDAP)
- T. STREET TREES SHALL BE SELECTED FROM THE APPROVED LIST OF STREET TREES IN THE SPRINGFIELD DEVELOPMENT CODE. ONLY STREET TREES WITH A MINIMUM TRUNK CALIPER OF 2 IN. MEASURED 6" ABOVE THE ROOT STEM SHALL BE SELECTED FOR PLANTING.
- U. A PRE-CONSTRUCTION CONFERENCE IS REQUIRED BEFORE START OF CONSTRUCTION. ALL UTILITIES, CONTRACTORS and CITY REPRESENTATIVES SHALL HAVE RECEIVED THE FINAL APPROVED PLANS AT LEAST 5 WORKING DAYS PRIOR TO THE PRE CONSTRUCTION CONFERENCE.
- V. THE ENGINEER AND/OR CITY HAVE THE RIGHT TO REQUIRE ADDITIONAL WORK NOT SHOWN HEREIN BUT NECESSARY FOR THE SUCCESSFUL COMPLETION OF THE PROJECT.
- W. REQUESTS BY THE CONTRACTOR FOR CHANGES SHALL BE APPROVED BY THE ENGINEER AND THE CITY PRIOR TO IMPLEMENTATION.
- X. CONTRACTOR SHALL SUBMIT EVIDENCE OF INSURANCE IN ACCORDANCE WITH THE STANDARD SPECIFICATION TO THE CITY FOR APPROVAL PRIOR TO BEGINNING WORK.
- Y. CONTRACTOR SHALL BE AWARE IF PAVING IS NOT SCHEDULED OR DOES NOT OCCUR PRIOR TO OCTOBER 15TH, WET WEATHER PROVISIONS INCLUDED ADDITIONAL ROCK SUBSTRUCTURE AND GEOTEXTILE FABRIC SHALL USED. REFER TO STANDARD SPECIFICATION SECTION 301.1.01 AND THE TYPICAL CROSS SECTIONS CONTAINED HEREIN FOR DETAILS.

9.03.2 Symbol Legend

The symbol legend shall show, list, and define all symbols and line types shown throughout the plan set. By defining line weights used, the symbol legend shall also detail which improvements are proposed and which are existing.

9.03.3 Vicinity Map

The following information shall be included in the vicinity map:

- A. North Arrow.
- B. Scale.
- C. Street Names.
- D. Project Area Defined.

9.03.4 Site Map (including Sheet Index)

The site map shall include the following (as applicable):

- A. Entire Project Area as defined in the Vicinity Map.
- B. Sheet Numbers and boundaries of plan and profile sheets.
- C. Street Names.
- D. North Arrow.
- E. Scale.
- F. Proposed:
 1. Lot Lines.
 2. Partition/Subdivision Boundaries.

3. Parcel/Lot Numbers.
 4. Right of Way.
 5. Easements.
- G. Existing:
1. Lot Lines.
 2. Partition/Subdivision Boundaries.
 3. Partition/Subdivision Names/Numbers.
 4. Parcel/Lot Numbers.
 5. Tax Lot Numbers.
 6. Right of Way.
 7. Easements.
- H. City Limits Boundary.
- I. Urban Growth Boundary.
- J. Flood Plain Boundary (100-year base flood elevation).

9.03.5 Assessment Plat

For Local Improvement Districts and other projects that will potentially be assessed to adjacent property owners, an assessment boundary labeled “ASSESSMENT PLAT” shall be included in the plan set which clearly shows:

- A. Street name(s).
- B. Street Address Number(s).
- C. Property Owner name(s).
- D. Assessors Tax Map Number(s).
- E. Assessors Tax Lot Number(s).
- F. North Arrow.
- G. Scale.
- H. Dimensions of:
 1. Right of Way width.
 2. Lot Frontage.
- I. Assessment Boundary.

9.04 PLAN AND PROFILE VIEW SHEETS

Complete design showing the street, storm and sanitary sewers, utilities, and other improvements shall all be shown on the plan and profile view sheets. Improvements detailed for construction on separate sheets which may conflict with the other design features (like traffic signal poles or street lights) shall be shown on all plan and profile sheets for reference only.

Plan and profile sheets may be omitted when work is related to traffic items only, i.e. signals or striping. Refer to Section 9.06 and 9.07 for information on traffic sheets.

Plan and profile of each section of improvement shall be on the same sheet, and shall be aligned vertically by stations on the sheet to the greatest extent possible.

9.04.1 Plan View

9.04.1.A Drawing Scale

The following drawing scales shall apply for plan view sheets:

1. An appropriate engineering scale shall be utilized.
2. Horizontal plan and profile scale shall be in ten-foot increments.
3. Street construction project plan view scale shall be 1" = 20'.
4. Sewer construction projects plan view scale shall be between 1" = 20' and 1" = 50' (in ten-foot increments), depending on amount of detail necessary.

9.04.1.B Required Information

The information required to be included in the site map as defined in Section 9.03.4 (excluding sheet numbering index) shall be included in all plan views. In addition the following items shall be included in each plan view:

1. North Arrow.
2. Drawing Scale and Scale Bar (Horizontal).
3. Match lines, see Section 9.04.1.B-1.
4. Right of Way Centerline and Stationing, see Section 9.04.1.B-2.
5. Existing and Proposed Right of Way, Easements, and existing monumentation including dimensions, see Section 9.04.1.B-3.
6. Contour Lines, see Section 9.04.1.B-4.
7. Existing and Proposed Utilities, see Section 9.04.1.B-5.
8. Existing and Proposed Improvements, see Section 9.04.1.B-6.
9. Curb Return Data, see Section 9.04.1.B-7.
10. Centerline Horizontal Curve Data, see Section 9.04.1.B-8.
11. Construction Notes (bubble type), see Section 9.04.1.B-9.
12. Flow Arrows, high and low points (on street projects).

9.04.1.B-1 Match Lines

Match lines shall be used from sheet to sheet. Each match line shall include the centerline station of the break and the adjacent sheet number to reference. Match lines shall be placed in a way to minimize the duplication of information. Specifically note the following:

- A. Whenever possible, match lines shall be placed at an even station numbers (in 50-foot increments); i.e. station 6+00 or station 6+50.
- B. Match lines may be located in the center of an intersection.
- C. Match lines shall not be located in the middle of a curb radius.
- D. Match lines shall not be located at the same station as manholes, curb inlets, or other structures.
- E. Match lines shall be located so that an entire horizontal or vertical curve or curb taper appears on the same sheet. If this is not practical, complete curve information shall be shown on all matching sheets.

9.04.1.B-2 Centerline and Stationing

Bearings, distances, and curve data (see section 9.04.1.B-8) shall be included along all centerlines. Whenever possible, centerline stationing shall:

- A. Be located in the center of the right of way or easement
- B. Be based on an existing survey.
- C. Run either from South to North or from West to East.
- D. Read from left to right on the plan sheet.

When there is no survey available and an arbitrary centerline stationing must be set, stationing shall begin at the centerline of the nearest intersecting street right of way. Negative stationing shall never be used.

Intersecting centerlines shall be labeled with centerline names and Equation Stations, i.e., 7+56 'A' Street = 0+00 8th Street. Equation stations shall be used on all facilities transitioning between two differently stationed alignments.

9.04.1.B-3 Existing and Proposed Right of Way and Easements

The engineer shall be responsible to accurately show all existing and proposed rights of way and easements within the project limits. Then engineer shall retain the services of an Oregon Professional Land Surveyor to determine right of way and easement boundaries. Said right of way and easements shall be accurately shown on the plan view of each sheet including dimension along frontage of improvements. Existing lots shall be identified by tax lot number and address number.

All right of way shall be labeled as "ROW", labeled as existing (EX) or proposed (PR), and accurately dimensioned on the plan view including total width and width from centerline.

All easements shall be labeled with a brief description, labeled as existing (EX) or proposed (PR), and accurately dimensioned on the plan view.

9.04.1.B-4 Contour Lines

The engineer shall develop contour lines based on survey and topographic information. Contour lines shall extend beyond the project area to adequately show the surrounding topography and the impacts the improvement will have on the area.. Contour lines shall be shown at even elevations at one foot intervals (i.e. 495, 496, 497, etc.) and shall be bolder on five at intervals (i.e. 495, 500, 505, etc.). On unusually steep slopes where one foot contour lines would be difficult to read, spacing may be decreased to five feet.

9.04.1.B-5 Existing and Proposed Utilities

The engineer shall gather adequate information from a current field survey, utility records, locates, potholing, etc. to accurately show all existing utilities within and near the project area. Each utility shown on the plan view shall have a description and size (if applicable) contained within the alignment.

9.04.1.B-6 Existing and Proposed Improvements

The engineer shall gather adequate information from a current field survey, utility records; utility locates, as built records, potholing, etc. to accurately show all existing utilities within and near the project area. All existing improvements within the project area that may be impacted by project, or

are important in evaluating the project, shall be shown on the plan view. Plan view shall include adequate topography surrounding the project area for a comprehensive review of the plan.

Existing monumentation shall be shown and noted as to its type. This included, but is not limited to control monuments, street centerline monumentation, property corners, benchmarks, etc.

All improvements shall be shown in plan view in a size, shape, and scale that accurately reflects the improvement as is will be built in the field. If enough information can not be shown on the plan view to construct an improvement, a construction detail shall be included or referred to (see section 9.05).

All proposed improvements shall include a construction note, see Section 9.04.1.B-9, and, if applicable, a station number and offset distance from centerline.

Improvements that are to be moved or relocated as a part of the project shall clearly be shown with the existing and proposed location.

Following are requirements for specific types of improvements on the plan view:

9.04.1.B-6a Sewers

Alignment shall be shown with one solid line down the centerline of the pipe and the type of sewer (Waste Water (WW) or Storm Water (ST)) shall be shown within the alignment.

9.04.1.B-6b Sidewalks

Sidewalk shall be shown on the plans and labeled with width and type (curbside or setback) within the alignment. Sidewalk that will not be built with the project shall be shown on the plans with dashed lines and labeled as “future” with width and type.

9.04.1.B-6c Planter Strips

Planter strips shall be shown on the plans and labeled within the alignment

9.04.1.B-6d Driveways

Curb cuts and driveway approaches shall be shown on the plan set. Driveways behind the sidewalk shall be shown and labeled with material type.

9.04.1.B-6e ADA Ramps

ADA ramps shall be shown on the plans within and surrounding the project area with accurate wing and throat locations and alignments.

9.04.1.B-6f Curb and Gutter

Curb and gutter shall be shown with two lines depicting the back of curb and the gutter flow line/face of curb. If desired, the designer may include the front of gutter bar.

9.04.1.B-6g Pavement

Pavement shall be dimensioned on the plan view. Transitions shall clearly be shown and dimensioned with a length and taper rate.

9.04.1.B-6h Trees

Existing trees shall be shown with type and diameter. Those potentially affected by the construction shall be marked for removal or protection.

Proposed trees shall be shown on the plan view in their approximate planned location.

9.04.1.B-7 Curb Return Data

Each curb return shall be labeled with letters and/or numbers and a corresponding table shall be included on the same sheet. The data table shall include the following information:

- A. Delta angle (in degrees).
- B. Radius (in feet).
- C. Arc Length (in feet).
- D. Beginning (PC) station and offset from centerline.
- E. Cord Length (in feet).
- F. Cord Direction (bearing).
- G. Top of curb elevations corresponding to no less than four places on curb return including a description of each point, i.e. high point, 1/3 delta, etc.

9.04.1.B-8 Horizontal Curve Data

Each horizontal curve shall be labeled with letters and/or numbers and a corresponding table shall be included on the same sheet. PC and PT locations shall be labeled with stationing on the centerline. The data table shall include the following information:

- A. Delta angle (in degrees).
- B. Radius (in feet).
- C. Arc Length (in feet).
- D. Point of curvature (PC) station.
- E. Point of tangency (PT) station.
- F. Cord Length (in feet).
- G. Cord Direction (bearing).

9.04.1.B-9 Construction Notes

Numbered construction notes, also known as “bubble notes,” corresponding to a construction note legend on the same sheet shall be utilized on all plan views. Numbers shall be consistent throughout the plan set, i.e. eight-inch PVC sanitary sewer is always #253, etc.

A construction note legend shall be included on each applicable plan sheet and only the “bubble notes” utilized on that sheet shall be defined in the legend. The “bubble notes” shall appear in numerical order in an easily identified area on the sheet.

Construction notes shall accurately define the work to take place. Construction notes shall include the method used, the size proposed, and reference specific details in the plan set or City standard details.

9.04.2 Profile View

The profile view shall be shown in a grid directly below the corresponding plan view. Grid lines shall be established based on the plan and profile view scales. Under normal circumstances, vertical grid lines shall be placed at 25-foot increments and horizontal grid lines shall be placed at one-foot increments. Grid lines at five-foot elevation increments and 50-foot station increments shall be of a slightly bolder line weight than others. Plan and profile of each section of improvement shall be on the same sheet, and shall be aligned vertically by stations on the sheet to the greatest extent possible.

9.04.2.A Drawing Scale

An appropriate engineering scale shall be utilized. The horizontal scale used on the plan view shall match the horizontal scale used on the profile view. The profile view vertical scale shall be determined based on the following table:

Existing Ground Slope (%)	Vertical Profile Scale
0-10	1 inch = 5 feet*
> 10	1 inch = 10 feet

* For nearly flat existing ground slopes, vertical profile scale may be reduced to one inch = two feet (1' = 2') in order to accurately show required features.

Profile scale shall be based on the overall topography of the project area. Designer shall attempt to use only one profile scale per plan set. Designer shall not vary profile scale on the same plan sheet. If because of grade, a profile must be divided, the break shall be clearly shown on the profile view and the elevations grid lines shall be redefined.

9.04.2.B Required Information

The following items shall be included in each profile view:

1. Drawing Scale and Scale Bar (Horizontal and Vertical).
2. Match lines (if applicable), see Section 9.04.2.B-1.
3. Centerline Stationing, see Section 9.04.2.B-2.
4. Existing Ground Profile, see Section 9.04.2.B-3.
5. Proposed TC or CL Profile, Elevations and Slopes, see Section 9.04.2.B-4.
6. Centerline Grade Break / Vertical Curve Data, see Section 9.04.2.B-5.
7. Existing and Proposed Utilities, see Section 9.04.2.B-6.
8. Existing and Proposed Improvements, see Section 9.04.2.B-7.
9. Backfill requirements, see Section 9.04.2.B-8.

9.04.2.B-1 Match lines

Match lines shall be shown on the profile view at the same location as those shown on the plan view, see Section 9.04.1.B-1. Each match line shall include the centerline station of the break and the adjacent sheet number to reference. Match lines shall also include the TC or CL elevation at the break.

9.04.2.B-2 Centerline Stationing

Centerline stationing on the profile shall match centerline stationing on the plan view, see to Section 9.04.1.B-2. Centerline stationing shall be placed on the bottom of the profile view grid.

Intersecting centerlines shall be labeled with centerline names and Equation Stations, i.e., 7+56 'A' Street = 0+00 8th Street.

9.04.2.B-3 Existing Ground Profile

The engineer shall base existing ground profiles on information collected by the surveyor in the field. Refer to Section 9.01 for details.

Existing ground elevation profiles shall be shown on the profile views in the following locations:

Street alignments: At the centerline and ROW lines (Where ROW width varies, existing ground elevation profiles shall be shown on the profile one foot between proposed sidewalk location.

Sewer alignments: At the centerline of the each pipe alignment.

9.04.2.B-4 Proposed TC or CL Profile, Elevations, and Slopes

The engineer may opt to show the centerline or the top of curb elevations on a project. The choice shall remain consistent throughout the plan set. The slope on each segment shall on the profile view with clear divisions between them. Refer to Section 9.04.2.B-5a for grade break and vertical curve requirements.

A separate profile and/or curve data table shall be provided detailing the top of curb elevations around proposed cul de sac bulbs.

9.04.2.B-5 Centerline Grade Break / Vertical Curve Data

All grade breaks and vertical curve shall clearly be shown on the profile view.

9.04.2.B-5a Grade Breaks

All grade breaks shall include the centerline station, TC or CL elevation, and percent grade change.

9.04.2.B-5b Vertical Curves

Each vertical curve shall be labeled with letters and/or numbers and a corresponding table shall be included on the same sheet. PVI location with stationing and length of vertical curve shall be labeled on the profile. The data table shall include the following information:

1. PC Station / Elevation.
2. PVI Station / Elevation.
3. PT Station / Elevation.
4. High / Low point Station / Elevation.
5. Length.
6. K value (based on AASHTO definition).

9.04.2.B-6 Existing and Proposed Utilities

The engineer shall gather adequate information from a current topographic survey, utility records, locates, potholing, etc. to accurately show all existing utilities within and near the project area.

Utility crossings and potential conflict points shall be shown on the profile view in an accurate location with elevation noted. Each utility shown on the plan view shall have a description and size (if applicable).

9.04.2.B-7 Existing and Proposed Improvements

Proposed improvements shall include a detail note, and, if applicable, a station number and offset distance from centerline.

Following are requirements for specific types of improvements on the profile view:

9.04.2.B-7a Sewers

All structures (manhole, curb inlets, clean outs, etc.) and pipes for proposed and existing sewers shall be accurately depicted (size and elevation) on the profile view.

Sewer structures shall include and be labeled with the following information on the profile:

1. Centerline Station and Offset.
2. Type Inlet, Manhole (Waste Water (WW) or Storm Water (ST)), clean out, etc.
3. Flow line (invert).
 - a. Existing (ex) or Proposed (pr).
 - b. Size.
 - c. Direction.
 - d. Elevation.
4. Top of Curb / Rim.
 - a. Existing (ex) or Proposed (pr).
 - b. Elevation.
 - c. Adjusted elevation (if applicable).

Sewer pipes shall include and be labeled with the following information on the profile:

1. Location (top and flow line inside locations of pipe).
2. Size.
3. Type (Waste Water (WW) or Storm Water (ST)).
4. Length.
5. Slope.
6. Material.
7. HGL, refer to Section XXX for requirement.

9.04.2.B-8 Backfill Requirements

Backfill requirement shall be shown below each pipe near the bottom of the profile. Backfill requirements include the type of material to be used in each area.

9.05 CONSTRUCTION DETAIL SHEETS

City standard drawings shall be referenced in the construction notes on the plan sheet by drawing number. Standard drawings shall not be reproduced as a part of the public improvement plan set.

Construction materials and methods not adequately defined in the City Standard Construction Specifications shall be defined in the specific plan set. If requirements can be met, specific detail drawings may be shown on a plan and profile view sheet(s). On a large plan set, it is preferable to have all specific construction details in a separate section.

9.05.1 Drawing Scale

A drawings scale shall be selected that will accurately convey the information required. Scale shall be in engineering units, and whenever possible should have the same horizontal and vertical scale.

9.05.2 Required Information

The following information shall be included in construction detail drawings as necessary

- A. Scale.
- B. Different views (plan, profile, etc) .
- C. Dimensions.
- D. Construction Materials.
- E. Construction Methods.

9.05.3 Required Details

All street projects shall contain typical street cross sections for the project. Typical street cross sections may either be included on the cover sheet or show on construction detail sheets. Separate cross sections shall be included for each different typical street cross section on the project. Typical cross sections shall be labeled with beginning and ending stationing. The following information is required on a typical street cross section:

- A. Centerline location
- B. Right of way width.
- C. Easements.
 - 1. Width.
 - 2. Location.
 - 3. Description.
- D. Pavement.
 - 1. Width.
 - 2. Depth.
 - 3. Location.
 - 4. Structure.
 - a. Lift / Pour Thickness.
 - b. Type.
 - c. Method.
- E. Standard Aggregate.
 - 1. Depth.
 - 2. Location.
- F. Winter Construction Provisions.

- 1. Addition Aggregate.
- 2. Geotextile Fabric.
- G. Sidewalk.
 - 1. Location (Curbside or Setback).
 - 2. Width.
- H. Planter Strip.
 - 1. Location.
 - 2. Width.
- I. Curb and Gutter.
- J. Maximum Cut/Fill Slope to catch point.
 - 1. Within ROW.
 - 2. Within Easements.

Dimensions on typical street cross sections shall be shown as accurately as possible. When widths vary in a typical cross section area, width shall be labeled on typical cross section as “varies” and include a minimum and maximum dimension.

9.06 TRAFFIC PLAN SHEET(S)

Drafting shall follow the guidelines set forth in the ODOT Traffic Management Section, “Guide for Consultants and Local Governments Preparing Traffic Signal Contract Plans” which includes the ODOT symbol legend. Refer to Section 5.00 for additional requirements and information on when traffic sheets are required and when they may be omitted. In addition, see the following sections for required information.

9.06.1 Drawing Scale

An appropriate engineering scale shall be utilized. Plan view scale shall be selected to clearly show the existing and proposed improvements. Plan scale shall be in ten-foot increments.

9.06.2 Required Information

The information required to be included in the site map as defined in Section 9.03.4 (excluding sheet numbering index) shall be included on all traffic plan sheets. In addition, the following items shall be included in each plan view:

- A. North Arrow.
- B. Drawing Scale and Scale Bar (Horizontal).
- C. Match lines, see Section 9.04.1.B-1..
- D. Right of Way Centerline and Stationing, see Section 9.04.1.B-2 matching the centerline and stationing set up on the plan and profile view sheets.
- E. Existing and Proposed Right of Way and Easements including dimensions, see Section 9.04.1.B-3.
- F. Existing and Proposed Utilities, see Section 9.04.1.B-5 where new underground work is shown on the sheet that may affect the utilities. Existing utilities need not be shown on striping sheets.
- G. Existing and Proposed Improvements, see Section 9.04.1.B-6.
- H. Construction Notes, using ODOT symbol legend, see Section 5.00.

9.07 TRAFFIC DETAIL SHEET(S)

The criteria outlined in Section 9.05, Construction Detail Sheets, Section 9.05.1 Drawing Scale and Section 9.05.2, Required Information all apply to traffic details. Refer to those sections for drafting standards.

9.08 GRADING PLAN SHEET(S)

When major earthwork is a portion of a project, a grading plan may be required for the entire site as a part of the public improvement plan set. Said work may require additional permits to construct. This will always be required when the proposed earthwork may adversely affect existing overland flow.

The information required to be included in the site map as defined in Section 9.03.4 (excluding sheet numbering index) shall be used included on the grading plan.

9.08.1 Drawing Scale

An appropriate engineering scale shall be utilized. Plan view scale shall be selected to clearly show the existing and proposed improvements. Plan scale shall be in ten-foot increments.

9.08.2 Required Information

The following items shall be included in each plan view:

- A. North Arrow.
- B. Drawing Scale and Scale Bar (Horizontal).
- C. Right of Way Centerline and Stationing, see Section 9.04.1.B-2.
- D. Existing and Proposed Right of Way and Easements including dimensions, see Section 9.04.1.B-3.
- E. Existing and Proposed Contour Lines, see Section 9.04.1.B-4.
- F. Existing and Proposed Drainage Ways.
- G. Typical cross Sections (of fill areas, drainage ways, etc.).
- H. Construction methods.
- I. Construction Materials.

9.09 EROSION AND SEDIMENT CONTROL PLAN SHEET(S)

An erosion and sediment control plan shall be included in the plan set whenever the proposed construction may create erosion and or sediment runoff or tracking to a public or private drainage way or property. **Separate erosion sheet(s) shall be included in all public improvement project plan sets unless all required information to construct a project can be contained on one plan sheet.** Refer to Section 8.00 for erosion and sediment control plan design and drafting standards.