Transportation Design Manual

December 2019

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Introduction

This manual is provided to give guidance to both City of Dublin Engineering staff and contracted consultants during the development of construction drawings for the city. The City of Dublin reserves the right to deviate from the standards set forth in this document if it is deemed necessary for the subject project.

This manual is not intended to cover all elements needed to perform the design of the proposed improvements. The contracted consultant remains responsible for design and technical details as signified by their signature on the construction drawings.

City of Dublin Engineering staff will periodically review this manual for conformance with industry standards, best practices and the City's desired project outcomes. Suggestions for improvements are welcome and will be reviewed for inclusions in future versions.

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Engineering Manager – Design and Construction

Abbreviations

The following abbreviations are used in this manual:

ADAAG: Americans with Disabilities Act Accessibility Guidelines
BMP: Best management practice
COC: City of Columbus
CPM: Consultant project manger
CPE: Consultant project engineer
ODOT: Ohio Department of Transportation
OMUTCD: Ohio Manual of Uniform Traffic Control Devices
NOI: Notice of Intent
NPDES: National Pollutant Discharge Elimination System
PM: City's Project manager
ROW: Right of way
SWPPP: Stormwater Pollution Prevention Plan

General Guidance

The following specifications and manuals shall be followed as applicable:

- City of Dublin Stormwater Management Design Manual
- City of Dublin Standard Drawings; Standards for Title Sheet, General Notes, Driveway Standards, AutoCAD example, and Electronic Submission Standards will be provided to The Consultant
- City of Columbus 2018 Construction and Material Specifications
- ODOT's 2019 Construction and Material Specifications,
- ODOT's "Location and Design Manual,"
- ODOT's 2011 "Minimum Specifications for Aerial Photography and Mapping,"
- ODOT's Specifications for "Subsurface Investigations,"
- ODOT's Right-of-way plan preparation
- ODOT Traffic Engineering Manual
- Ohio Manual of Uniform Traffic Control Devices 2012
- "Transfer and Conveyance Standards" of the Franklin County/Union County Auditor and the Franklin County/Union County Engineer

Field Survey

All detailed construction design work will be based on field surveying. The PM will determine the appropriate age of information to be used for each project.

The following items are to be followed for field surveys:

- A property owner notification letter must be issued at least one (1) week before field work is started.
    - Consultant will prepare draft letter for the City's use.
    - This letter will be sent to all affected property owners informing them of survey work before the beginning of field work. Consultant will develop the mailing list and ensure that the property address and owner/tax mailing address are the same. If not letters shall be sent to both addresses. Also tenants of any rental homes/buildings are to be included in the mailing list.
    - The City will perform the mailing.
    - The PM will provide a copy of the letter to Dublin City Council prior to the mailing being performed.
- Prior to and during the field survey work and data collection, gather existing utility information from: The Ohio Utilities Protection Service (OUPS), public utilities and City of Dublin, including but not limited to the locations of existing water mains, water taps, sanitary sewers, sanitary sewer taps, and storm sewers.
- Establish benchmarks for vertical control based on existing control monuments in the area. The vertical control datum will be NAVD 1988. Benchmarks will be based on 1988 North American Vertical Datum.
- Coordinate system will be based on Ohio State Plane Coordinate System, South Zone, NAD 83 (1986). Establish a survey baseline for horizontal control. Horizontal datum will be State Plane Coordinates, Ohio South Zone.
    - When providing coordinates in the plans, use standard numbering for format including commas.
- Obtain property corner information by field survey and property research to establish property boundaries for plan preparation. Rights-of-way that are needed for this project will then need to be obtained.
- Property pins will be appropriately reset if necessary after construction.
- Property corners and lines are to be established for necessary ROW or easement acquisition. Staking of property corners and proposed property acquisition may be requested by the PM.
- Existing features must be captured including but not limited to trees, pavement, swales and drainage, public utilities, private utilities, and other landscape items.
- Topographic points must be gathered on a grid of no more than 50 feet. Additional details may be needed at intersections and driveways. A minimum of 75 feet width from existing edge of pavement or proposed roadway centerline must be included.

- In addition to the above, obtain topographic information to supplement mapping: including the collected utility information; roadway centerline; and detailed topographic information. Obtain cross sections and roadway centerline elevations at 25-foot intervals.
- At culverts and bridges, cross sections both faces of the structure and every 25 feet for 100 feet (or bridge span, whichever is greater) up and downstream must be included.
- Location of any jurisdictional boundaries (county line, corporation limit, etc) in the project area.

Roadways

The roadway system is paramount to the vitality of the City of Dublin. The following guidelines are intended to provide consistency in the layout and design of the roadways.

Typical Sections

The City's Standard Drawings are to be followed for roadway sections or as directed by PM.

Baselines

- Identify the location of the baseline of construction on the typical sections if it is not the centerline of the roadway typical section.
- Provide station equations at intersection points.
- Clear notations are needed if the baseline for construction is different than the centerline of the right of way.
- Stationing is to be from south to north and west to east.
- Negative stationing shall not be permitted. Stationing to start with numbering that is appropriate to the project and to be approved by the PM>
- All alignments shall have a different station range.

Profile Grades

- For CIP projects, profile grades are established along the centerline of construction, typically the top of pavement. Grades at reference lines in a roundabout are established at the edge of pavement.
- For a subdivision, profile grade is at the top of curb.
- Minimum grade is 0.50% per code. Preferred minimum is 0.70%.
- Vertical curve minimum length is 75 feet. Preferred length is 3 times the design speed. Shorter lengths to be reviewed and approved by the PM.
- Minimum k value is 15. Other values to be reviewed and approved by the PM.

Intersection Details

- Use top of curb elevations for spot grades for a subdivision. For a CIP project, use edge/top of pavement. Designate the high/low points.
- Show the angle of the intersection at the point of intersection and between the spot elevations.
- Label the radius of each curb based on the edge of pavement. Subdivision is done with f/c.
- Show curb inlet location and structure numbers.
- Provide grading details for ADA ramps, if applicable.
- Do not place ADA ramps in sumps of the curb.
- Curb inlets should not interfere with ADA path through intersection.

Superelevation

- For subdivision streets, no superelevation should be used unless requested by PM.
- For CIP projects, the need for superelevation should be discussed with the PM early in the project. If need exists, use the following for a preliminary layout:
    - The maximum superelevation will be 4%.
    - Use S.E.Method 1 – per ODOT 202-5E, unless project dictates need for different method.
    - Preferred superelevation transition method is the 50 – 50 method.

Pedestrian facilities and ADA Ramps

Pedestrian facilities will be designed in compliance with applicable provisions of ADAAG and the appropriate standard drawings.

The standard drawings will be followed for ADA ramp layout and design. The PM will determine the color and material of the detectable warning. The detectable warning shall be a contrasting color to the adjacent sidewalk (or pedestrian facility).

Infrastructure located at an intersection can be affected by ADA ramps. It is recommended that ADA ramps be located early in the design process to reconcile any conflict.

On curbed streets, the centerline of the ADA ramp shall project towards the opposing curb line, unless approved otherwise by the PM. The detectable warning should be located behind the curb.

On uncurbed streets, the ADA transition panel can be oriented so that the centerline axis of the pedestrian facility is perpendicular or skewed to the edge-of-pavement, whichever provides best alignment. The detectable warning should be behind the paved shoulder.

On alleys and standard private drive approaches, the centerline of the ADA ramp or detectable warning is parallel to the street. Design the accessible crossing of the drive at sidewalk grade to minimize/eliminate any transition from the walk to the drive approach.

For drives serving large commercial areas, or signalized drives (under signal control) that are designed as an intersection on a curbed street, it is preferred that the ramps be oriented the same as for a 'Street Crossings' (see above). If this is not possible due to R/W limitations, then the ramp (or transition) may be oriented as shown on the Driveway-Non Residential and designed with slopes to ensure positive and complete drainage from the ramp with no ponding in the landing located at the curb line.

Detectable warnings are required on public streets, 'alleys' and 'signalized driveways'. Restricted driveways, such as Right-In/Right-Out or private driveways under STOP control require a detectable warning. Private driveways (entrances, not signalized) do not require detectable warnings unless deemed necessary.

Landings (minimum 4' X 4' with 1.56% cross-slope, each way) shall be provided at ramps, intersection of pedestrian facilities. Landing widths will be adjusted based on the type of pedestrian facility (i.e. shared-use path and commercial sidewalks).

Crosswalks should be centered on the ADA ramp as much as possible and allow the 4' x 4' landing pad to be within the crosswalk striping.

Minimum top fence rail height to be 42 inches.

Hand rail height on pedestrian bridges to be 36 inches.

Drainage and Storm Sewers

The City's Stormwater Management Design Manual is to be followed for design of storm management facilities.

The BMP necessity will be discussed during scope development. An erosion and sediment control plan and notes will be included in the construction drawings. This will be a supplement to the SWPPP required during the construction and to be provided by the contractor. The CPM/CPE will file the application, map and fee for the NOI for the project. The PM will file the NOT for the project.

A storm tributary area map will be developed. Drainage and storm sewer calculations will be performed and submitted for review.

Storm sewers should be laid out to minimize pipe, structures and ROW/easement needs.

The minimum grade for roadside ditches is 0.50%, unless otherwise directed by the PM.

Load ratings are to be provided per ODOT standards for any bridge structures.

Grading Plan

The PM will determine the need for a grading plan.

The proposed grading of a project will be shown typically with one-foot contour intervals on its own plan sheet for the entire project.

This could be combined with the landscaping plans as determined by the PM.

Maintenance of Traffic

The City desires to maintain traffic for all movements, if feasible, on roadways during the construction of a project. The consultant will be required to evaluate the feasibility to construct the project under traffic and provide a narrative as to how it could be accomplished. If not feasible to maintain traffic, then an explanation will be provided as to why a full closure in the project area and associated detour is recommended.

The consultant will produce detailed notes and plans for the selected maintenance of traffic plan. Maintenance of traffic will follow the guidelines established by the OMUTCD. Should full closure be determined to be the best plan for the project, the preparation of a maintenance of traffic plan by the consultant to provide a detour plan. The PM will determine if deviations from this are appropriate for the specific project.

Water Lines

The current COC design standards for water line design are to be followed. The City will establish the sizes of any new water lines.

Fire hydrants will be spaced per the requirements of City of Dublin Fire Code Chapter 93.

A meeting early in the design of the project with COC to review the project and preliminary water line needs for the project is required.

Consultant will provide the necessary fees and applications to COC for OEPA review. This can be included on an invoice to be reimbursed by the City.

Sanitary Sewers

The current COC design standards for sanitary sewer design are to be followed. The City will establish the sizes for sanitary sewer lines.

The standard drawings will be followed for additional specifications.

Consultant will provide the necessary fees and applications to the OEPA review. This can be included on an invoice to be reimbursed by the City.

A sanitary tributary area map will be developed. Sanitary sewer calculations will be performed and submitted for review

Street Lighting

The standard drawings will be followed for street lighting design. These will be supplemented with ODOT current specifications

Voltage drop calculations will be performed unless otherwise directed by the PM. Maximum voltage drop to not exceed 5%, preferred maximum voltage drop to not exceed 4%.The PM will approve the light pole locations. Once locations are finalized, the consultant will lay out conduit and pull box details in the plans.

The street lighting controllers will be placed in a location that is coordinated with the power source and appropriate for future maintenance, future expansion and minimal interference with other public or private utilities, and sight distance. Per AEP requirements (if they are the power provider), lighting controller shall include power meter meeting AEP specifications. Other power provider specifications for meters shall be followed.

If a new transformer is required, consultant shall coordinate location of lighting controller with the transformer. This is also to be coordinated the appropriate power company. The PM will approve the location of the lighting controller and transformer.

The design criteria is:

1. Design Criteria
    a. Average = 0.4 fc
    b. Max:Min = 6:1
    c. Avg:Min = 3:1
    d. Crosswalk = 1.1-1.3 fc
2. Standard Light Poles
    a. Approved manufacturers:
        i. Hapco
        ii. Valmont
    b. Or approved equalHeight = 35 ft (unless directed by PM)
    c. T-base = 20 inches
3. Historic District Light Poles
    a. Approved manufacturer
        i. Sternberg
    b. Height
        i. High St and parking lots =11 ft
        ii. Bridge St = 12 ft with
    c. Luminaires -
4. Bridge Park Pedestrian-oriented Light Poles
    a. Approved Manufacturer
        i. Valmont

b. Height = 15'5" on a 1'5" transformer base

5. Bridge Street District Highway Light Poles
    a. Approved Manufacturer
        i. Valmont
    b. Height = 32'7" on a 1'5" transformer base
    c. Upswept arm – 27" sweep with 6" rise
6. Typical street light location/spacing:
    a. Subdivision entrance – at the main entrance on the inbound lane
    b. 2/3 lane roadway – one side (not staggered) spaced approximately 100 feet center to center (dependent on type of fixture used)
    c. 4/5D lane roadway – staggered spacing approximately 100 feet center to center (dependent on type of fixture used)
    d. Roundabout
        i. a light is placed in each quadrant radially
        ii. avoid back lighting the pedestrians in the cross walks
        iii. illuminate beginning of splitter islands

Traffic Signals

All new traffic signals shall be constructed with mast arms with street lighting incorporated. Span wire will only be permitted when directed by the PM. Pole design should be in conformance with ODOT design criteria.

Combination cabinets with backup power are to be used for the signal cabinet. A concrete work pad is to be provided. The doors will have opposite door swings. Inside of cabinets to be painted white. Standard cabinet is Mobotrex Super-P with integrated UPC compartment. PM may direct different cabinet, if there are size constraints for the particular location.

Signal back plates (vented) are to be provided unless otherwise directed by the PMSignal heads to be rigid mounted. Auxillary heads to be used as appropriate and directed by the PM. Signal back plates shall be black mounted around yellow traffic signal head enclosure. The back plate shall not have retro-reflective stripe.

Street name signs are to be illuminated internally or edge-lit (preferred) and rigid mounted.

The PM will determine if pre-emption is to be included in the design.

Traffic signals shall include features to enhance pedestrian access at the intersection. This includes countdown pedestrian signals, accessible pedestrian detection (Polara iNavigator) with detection located per guidelines from ADAAG and OMUTCD.

The power service shall include power meter meeting AEP specifications.

Electrical Conduit/Sleeves

The standard drawings are to the followed for electrical conduit/sleeves.

Signs

The OMUTCD will be followed for sign construction and location.

The use of fluorescent yellow-green in Dublin is reserved for school zone signs only. Use standard highway yellow sheeting for all other yellow signs and yellow portions of multi-colored signs.

Pavement Markings

The OMUTCD will be followed for pavement markings.

The standard lane line and edge line width is 4 inches. The standard channelizing line width is 8 inches. The standard stop bar width is 24 inches. The standard crosswalk bar width is 12 inches.

Standard crosswalks, two bars typically spaced 8-feet apart (nine foot center to center), are used in typical crosswalk applications. See Roundabout section for crosswalks in roundabouts.

Stop lines conform to the OMUTCD 3B.16 and Section 301-5 of the ODOT Traffic Engineering Manual.

Thermoplastic is the preferred pavement marking material. ODOT specification items 644 and 647 are used for line work and preformed thermoplastic, respectively. Specialized markings, such as bicycle symbols are specified as preformed thermoplastic.

Minimize the use of words on pavement.

Private Utilities

All efforts are to be made to minimize private and quasi-private utility relocations the project limits. The consultant shall provide coordination with the private utilities that exist within the limits of the project.

The Consultant will contact all existing utility providers in the area and accurately map horizontal and vertical alignments. Non-destructive testing (number of locations to be determined in scope of services by PM) may be required to locate existing utilities at critical utility crossing locations with proposed underground work if authorized.

The Consultant will document that each utility provider either provides a “No Conflict” letter or their intent to relocate their facilities. The Consultant will make all CAD files available to the utility companies as necessary.

The 60%, 90% and final versions of the construction drawings are to be submitted to the involved private utility companies. Copies of transmittal letters will be submitted to the PM.

Occasionally, the project will include burial of overhead facilities. This will be detailed in the scope of services of the project and should be coordinated with the PM.

Seeding and Landscaping

Landscaping will be included with projects as detailed in the scope of serviced of the project. This work will be coordinated with the City’s Landscape Architect and Forrester. Typically, this will include this installation of street trees.

The level of landscaping will be outlined in the scope of services for the specific project.

Any effected yard areas located on the backside of any pedestrian facilities will restored with – 4 inches of topsoil, and quantities will include seed, fertilizer, straw and watering.

The preferred seed mix is 50% perennial rye and 50% Kentucky Blue.

Roundabouts

Roundabouts should be designed to accommodate a WB-50 design vehicle unless otherwise directed by the PM.

Geometric Guidelines

1. Single lane roundabout
    e. Inscribed circle: 65 foot radius (preferred minimum)
    f. Circulatory roadway:
        i. Width: 19 feet
        ii. Cross slope: 1.56%
    g. Truck apron
        i. Width: 8 feet
        ii. Cross slope: 1.56%
    h. Central island slope: 4.0%
    i. Entry lane width:
        i. Beginning of splitter island: 14 feet
        ii. End of splitter island: 16.5 feet +/-
    j. Entry lane radius: 100 feet
    k. Exit lane width:
        i. Beginning of splitter island: 19 feet +/-
        ii. End of splitter island: 14 feet
    l. Exit lane radius: 300 foot
    m. Minimum splitter island length: 50'
    n. Distance from yield line to crosswalk: 25 feet
7. Double lane roundabout
    a. Inscribed circle: 90 foot radius (preferred minimum)
    b. Circulatory roadway:
        i. Width: 30 feet
        ii. Cross slope: 1.56%
    c. Truck apron
        i. Width: 8 feet
        ii. Cross slope: 1.56%
    d. Central island slope: 4.0%
    e. Entry lane width:
        i. Beginning of splitter island: 24 feet
        ii. End of splitter island: 30 feet +/-
    f. Entry lane radius: 100 feet
    g. Exit lane width:

i. Beginning of splitter island: 19 feet +/-
ii. End of splitter island: 24 feet

h. Exit lane radius: 300 foot
i. Minimum splitter island length: 50 feet
j. Distance from yield line to crosswalk: 25 feet

Signs

Signs will follow the Standard Drawings and the current OMUTCD and NCHRP 672. Use block arrows on lane configuration signs, with a dot to the left of the far left lane movement, indicating the central island.

Pavement Marking

Roundabout pavement markings:

- Use standard block arrows. Fishhooks will not be used unless directed by the PM.
- Crosswalk striping – 12-inch wide, 8-foot long white continental style crosswalks or "piano keys" with 2-foot gap and centered/equally spaced between pavement edges
- Other markings to follow current OMUTCD standards.

Landscaping

Landscaping will be included with roundabout projects. This work will be coordinated with the City's Landscape Architect and Forrester. This will typically include street trees, plant material in the medians and splitter islands and a combination of materials in the island of the roundabout. Height of landscaping and location to be coordinated with sight distance requirements.

The level of landscaping will be outlined in the scope of services for the specific project.

Turn Lanes

The following design guidelines shall be followed when designing a turn lane addition to existing pavement:

- Provide striped 12-foot lanes, unless otherwise directed by the PM.
- Design speed is posted speed plus 5 mph but no less than 35 mph.
- A minimum 125-foot stacking lane is required on residential turn lanes and may be greater if recommended by Traffic Impact Study or the PM.
- Provide a 50 ft. taper transition to the turn lane stacking.
- Provide a 2-foot asphalt berm.
- No gravel berms, piped underdrains or aggregate underdrains are to be used.
- The existing pavement is to be overlaid with 1 1/4 inch of finish asphalt.
- A 3-foot strip is to be milled to a 2 ½ inch depth into the edge of the existing pavement from the edge after the vertical sawcut is made - this area is to be filled with intermediate asphalt.
- Ditches along edges of pavement may be enclosed with pipe only if this will eliminate or reduce the amount of "off-site" easements and/or work agreements needed.
- Tapers and storage lengths are to be determined in accordance with the ODOT L&D Manual and other traffic considerations.
- The widening work is to be split equally on both sides of the existing roadway, unless otherwise directed by the PM.

Shared-Use Paths and Bike Lanes

Shared-use paths are to be included with new collector/arterial streets per the adopted Bikeways plan in the Community Plan. Review the location of any existing paths in the area of the project as typically these will be extended through the project area.

For stand-alone shared-use path projects, apply the current standard drawings as much as is feasible. Minimize re-work of existing driveways, existing private utility relocations and property acquisitions. Landscaping (possibly including stonewalls) may be needed to mitigate impacts to existing vegetation and is to be coordinated with the PM.

Bike lanes are to be included with new collector/arterial streets per the adopted Bicycle Advisor Task Force map. Coordination of these will be needed with the PM.

Color Specifications

The following table of colors are to be used:

Item	General Description	Federal Paint Number	Approved Suppliers
Steel-backed timber guardrail	Wolf Gray		Sherwin-Williams
Pedestrian bridge handrail	Beige		
Pedestrian Steel Railing adjacent to bridge	Semi-Gloss Black		
Typical Mast Arms	Dark Bronze	20040	
Typical Street lights	Dark Bronze	20040	
Inside Pedestrian Concrete Pipe Tunnels	Parchment	5958-27769	
Historic Dublin or bridge Street District – Mast Arms	Black	27038	
Historic Dublin or Bridge Street District – Street Lights	Black	27038	
Fire Hydrants - Public	Vista Green	No. 80-105 (RGB #: 106, 127, 96)	Sherwin Williams (Polane SP Polyurethane Enamel)
Fire Hydrants - Private	Body – White Top/Cap – Vista Green	White: D876967 or 80-1 Vista Green: as above	

Construction Drawing Standards

Plans will generally follow the ODOT format standards unless otherwise directed by the PM.

The project should be designed in 2012 (or later) AutoCAD Civil 3D. The City does not have the Microstation software package. The City desires to be able to reproduce the basemaps (for clarifications and exhibits), general notes, quantities, details, etc. and efficiently update our GIS databases with project information. The deliverable from the consultant must include AutoCAD Civil 3D compatible files. The consultant does not need to provide the design elements and those will remain the responsibility of the design engineer/consultant. The City may request this information from the selected consultant in the future for a specific purpose and the consultant is expected to provide the necessary information to fulfill the request.

The following standards will apply to construction drawings

- Sheet Size: 22 inch by 34 inch
- Scales (English Units)
    - Plan and Profile: 1" = 20' horizontal, 1" = 5' vertical
    - Cross Sections: 1" = 5' horizontal and vertical
    - Details as necessary
- All text should be at a minimum height of 0.10 inches.
- The line weights of the plan views should clearly indicate what is existing (lighter and dashed) and what is proposed (darker and solid).
- Colors can be used to provide clarity with the utility lines using the following convention for all submissions except the final construction drawings:
    - Public water in blue
    - Public storm in orange
    - Public sanitary in green
    - Public/Private electric in red
    - Private gas in magenta
    - Private telecommunications in purple
- Mylar cover sheet submitted for signatures is to be 4 mil double mat Mylar.
- All other final plan sheets are to be submitted electronically in Adobe Acrobat (PDF) format. PDF plan sheets shall be generated by saving to PDF from the CAD software or by printing to PDF format from CAD software. Scanning printed sheets to PDF format is not acceptable.
- AutoCAD files are to be submitted including plot configuration (CTB or STB) and any other custom files (shx, txt, etc.) necessary to properly plot the drawings.

Title Sheets

Title sheets will contain the following items:

- Title of project as directed by the PM.
- The Engineering department's project number

- The traffic volumes
- The speed limits (posted and design) of the roadways involved in the project.
- The OUPS note/logo
- A list of applicable standard drawings.
- The signature and seal of the registered engineer/surveyor responsible for the project.
- Signature space for all applicable jurisdictional approvals. Plan signatures needed will be determined by the PM and may include:
    - Consultant design engineer
    - City of Dublin Director of Engineering/City Engineer~~/Director of Engineering~~
    - COC Water and Sewer departments as necessary
    - ODOT as necessary
    - County Engineer as necessary
- An index of sheets in the plan set
- Any other item as directed by the PM.

General and Sub Summaries

Sub summaries are to be provided in the plans. Indicate which Items are per ODOT specifications. Do not use the Extension column. Quantities are to be grouped into classifications per ODOT standards.

Asphalt shall be listed in tons instead of CY.

General Notes

The current General Notes to be used are included in Appendix A. The PM will work with the CPM/CPE to determine which General Notes are appropriate for the specific project.

General Notes are to be shown on the construction drawings in all capital letters and with a text size of 0.1". Cross references should be provided to notes included in other areas of the plan sets.

Contingency quantities are to be noted in the General Notes and included in the overall quantities for the project. The amount and type of contingency quantities will be determined by the PM.

Construction Drawing Review Submissions

Interactive plan review and project discussions are expected with the PM. The following items are to be submitted to the PM for review at the noted stage of the project:

With all submissions, prior to final:

- Current AutoCAD files
- Updated project schedule
- Printed copies of the identified plan sheets:
    - Two full size
    - Two half size
- PDF files of the submitted plan sheets
- PDF files of the previous round of review comments
- Hard copies of previous mark-up plans.
- Full written disposition of comments

With 30% submission:

- Title sheet
- Typical sections
- Plan and profile sheets
- Scroll plot with existing contours and preliminary grading
- Curb ramp locations
- Preliminary drainage calculations
- Preliminary construction cost estimate

With 60% submission:

- Refined 30% drawings
- General Notes
- Preliminary general summary of quantities
- Maintenance of traffic plan
- Cross sections at 50-foot intervals or to be determined by PM.
- Roundabout pavement details
- Splitter island details
- Intersection details, if applicable
- Curb ramp details
- Driveway details
- Signing and striping plan
- Street lighting plans/details
- Traffic sign design including preliminary plan, notes, details and quantities
- Water line plans
- Erosion and sediment control plan
- Storm water best management practice plans (BMP), storm sewer tributary area maps, storm drainage improvements within the project limits including drainage design table with pipe design, spread, and ten-year hydraulic grade computations, list class of pipe for storm sewers, and
- Miscellaneous details
- Preliminary easement and right of way plans
- Preliminary construction cost estimate

With 90% submission:

- Refined 60% plan set
- Final general summary of quantities
- Final storm drainage and BMP calculations
- Revised traffic signal plans
- Revised easement and right-of-way plans
- Refined construction cost estimate
- Sign and approved legal descriptions and exhibits for any acquisition.

With final submission:

- Signed Mylar cover sheet
- Complete set of construction drawings
    - Two (2) full sized plan sets (bound)
    - Five (5) half-sized plan sets (three hole punched)
    - All project information electronically submitted including: all base AutoCAD files, and cut sheets, calculations, PDFs of plan sheets and any other relevant project information. A copy should be provided on a CD or USB drive.
- Final construction cost estimate in an Excel spreadsheet
- Final bid schedule in format of Dublin's typical bid schedule.

- Supplemental/Technical specifications, if needed.

Right of way

If project requires right of way acquisition, consultant will generate property map, centerline survey and summary sheets. ROW plans may not be required and should be coordinated with the PM

.

Construction Cost Estimates

All construction cost estimates will be performed by the consultant utilizing their best available information. All items to be constructed and or removed with the project will be included with the estimate. The following are to be included:

- Mobilization
- Construction layout stakes
- Project schedule, if determined to be needed by PM
- Proof Survey, if determined to be needed by PM
- SWPPP
- Overall Contingencies:
    - 15% for the 30% and 60% submittal
    - 10% for the 90% and final submittal

Contingency quantities are to be noted in the General Notes and included in the overall quantities for the project. The amount and type of contingency quantities will be determined by the PM. These are to be included in the 60%, 90% and final construction cost estimates.

Construction cost estimates are to be provided in an Excel spreadsheet. The following abbreviations are to be used for Units of Measurements:

Abbreviation	Description
AC	Acres
CF	Cubic Feet
CY	Cubic Yards
DY	Days
EA	Each
GL	Gallons
HR	Hours
LB	Pounds
LF	Linear Feet
LS	Lump Sum
LY	Linear Yards
MI	Miles

Abbreviation	Description
MI	Miles
MO	Months
SF	Square Feet
SM	Square Miles
SY	Square Yards
TN	Ton
VF	Vertical Feet
WK	Weeks
YR	Years