



CITY OF MESA ENGINEERING DEPARTMENT

ROADWAY SUBMITTAL GUIDELINES

December 2015



ALIGNMENT STUDY (15% Submittal)

The intent of the alignment study is to show roadway alignment alternatives on recent aerial photographs so staff can evaluate impacts of new roadway improvements on existing and future improvements. The alignment study will show preliminary utility relocation and right-of-way needs, along with potential impacts to adjacent businesses and residences. The alignment study will be used to present a preferred alignment to City Council Committees or other City Council-designated Committees, and to the public at open house meetings. Items to be included in the Alignment Study, at a minimum, are as follows:

1. Roadway alignment alternatives plotted on recent 20 scale aerial photographs showing:
 - a. Curb and gutter
 - b. Sidewalk
 - c. Raised or flushed median
 - d. Driveways
 - e. Centerline alignment
 - f. Existing right-of-way
 - g. Proposed right-of-way
 - h. Existing utilities
 - i. Dimensions to curb and gutter, existing and proposed right-of-way, etc.
 - j. Property lines
 - k. Parcel numbers and addresses
 - l. Business names
 - m. Number of traffic lanes including bike lanes
 - n. Street names (Including E/W/N/S and Street/Avenue/Drive)
 - o. North arrow
 - p. Striping (proposed)
 - q. Overhead to undergrounding conversion limits obtained by the right of way manager
 - r. Existing and proposed City utility and non-City utility facilities
2. Initial construction quantities and cost estimate for each alternative alignment.
3. Initial right-of-way quantities and cost estimate for each alternative alignment.
4. A discussion of the pros and cons for each alternative alignment.
5. Recommendation of a preferred alignment.

CONCEPTUAL DESIGN (30% Submittal)

The intent of the 30% submittal is to provide preliminary horizontal geometry and vertical profile of the preferred roadway alternative on 20 scale base sheets. All sheets should be prepared on the City of Mesa approved base sheets. Preliminary horizontal alignments of new City utilities and existing non-City (private utilities) and City utilities should be shown. This includes proposed overhead to underground joint trench alignments or any joint trenches, if applicable. This submittal will be used by the outside utility companies to verify their existing utility locations and help identify their initial utility installation and/or relocation needs. This submittal should show all existing features that could influence the proposed roadway alignment and pavement grades. Items to be included in the 30% submittal are as follows:



1. Cover sheet in standard City of Mesa layout showing:
 - a. Project title and project number
 - b. Vicinity map
 - c. Sheet index
2. 20 scale plan and profile sheets generated from a new topographic survey and from as-built drawings showing all existing above ground and underground improvements:
 - a. Standard City of Mesa title block
 - b. North arrow
 - c. Existing horizontal control (monumentation)
 - d. Existing vertical control (City of Mesa datum or benchmark)
 - e. Existing profiles
 - f. Stationing
 - g. Horizontal and vertical scales
 - h. Street names
 - i. New curb, gutter, sidewalk, medians and driveways with horizontal geometry
 - j. Existing and proposed right-of-way and easements with dimensions
 - k. Property lines
 - l. Adjacent parcel numbers, business names, and addresses
 - m. Existing utilities showing ownership, type, size, and materials with horizontal geometry (Such as, COM – I RGRCP, SRP – I RGRCP, SRP – OH12kV, SRP – OH69kV, SRP – UG12kV, Cox – fiber, CL – coax)
 - n. Preliminary alignment of proposed utilities (storm drain, water, sewer, gas, communications, and joint trenches, if applicable.)
 - o. Graphic layout of proposed pavement marking
 - p. Preliminary bridge layout (general plan)
 - q. Preliminary wall layout
 - r. The topographic survey field notes and benchmark level loop should be compiled in booklet form for use by the City Project Engineer.
3. A list of all properties, listed by parcel number and street address, with right-of-way impacts identified.

PRELIMINARY DESIGN (60% Submittal)

The intent of the 60% submittal is to provide final horizontal geometry and vertical profile of the roadway and utility improvements. Preliminary street light, traffic signal, signing and pavement marking, and landscape plans along with a construction cost estimate should be included in this submittal. This submittal will be used by the outside utility companies to help finalize new utility locations, and determine pothole and right-of-way needs. The previous 30% review comments with responses should be returned to the City with the new submittal. Items to be included in the 60% submittal are as follows:

1. Cover sheet in standard City of Mesa layout showing:
 - a. Project title and project number
 - b. Vicinity map
 - c. Sheet index
 - d. Sheet index map
 - e. General notes (may go on separate sheet)
 - f. Legend and abbreviations (may go on separate sheet)
 - g. Approval blocks



2. New and existing City owned utilities shall be shown on **all** plan sheets such as:

- Storm drain (main, laterals, manholes and catch basins)
- Sanitary sewer (main, manholes and services)
- Waterline (main, services, meters, valves, and fire hydrants)
- Gas line (main, services and valves)
- Communications (duct banks, vaults, manholes and pull boxes)
- Electrical (duct banks, vaults, manholes and pull boxes)

New and existing outside utilities shall be shown on **all** plan sheets such as:

- Salt River Project Irrigation and Electric
- CenturyLink
- Cox Communications
- RWCD
- AT&T
- Southwest Gas
- Zayo Fiber Solutions
- TCA
- Others

3. Horizontal and vertical control plan:

- a. Existing monumentation
- b. Horizontal control points (stations and offsets)
- c. Monument line
- d. Construction centerline
- e. Street names
- f. Bench marks (City of Mesa datum)
- g. Scale
- h. Curve data
- i. North arrow

4. Typical roadway sections and detail sheet:

- a. Typical section showing exist and new curb & gutter, sidewalk, median, and pavement
- b. Cross slopes
- c. Face of curb and right-of-way dimensions
- d. Grading needs at back of sidewalk and driveway vs. existing elevations (may be outside the right-of-way)
- e. Typical pavement cross-section
- f. Scale
- g. Other miscellaneous details as required

5. Paving plan and profile sheets:

- a. Roadway horizontal geometry with stationing, offset dimensions, and curve data
- b. Monument line and monumentation
- c. Construction centerline
- d. New and existing right-of-way and easements with horizontal geometry
- e. Horizontal and vertical scales, North arrow, benchmark and match lines



- f. Construction notes clearly describing new improvements along with limits of new installations and removals
 - g. New and existing improvements such as:
 - Curb and gutter
 - Sidewalk and ramps
 - Medians
 - Driveways (show existing grades at back of new driveway)
 - Utilities (overhead and underground)
 - Street lights, conduit and pull boxes
 - Traffic signals, conduit and pull boxes
 - Bus pullouts and shelters
 - Storm drains and catch basins
 - Walls and fences
 - h. Roadway profiles:
 - Stationing
 - Grades
 - Top of curb and flow line elevations. Show driveways and sidewalk ramps
 - Vertical Curve Data
 - Pavement elevations
 - Underground utilities and pipes
6. Utility plan and profile sheets:
- a. Utility horizontal geometry with stationing and offset dimensions
 - b. Monument line and monumentation
 - c. Construction centerline
 - d. Scale and north arrow
 - e. New and existing right-of-way and easements with horizontal geometry
 - f. Complete construction notes and design
 - g. New and existing City owned utilities such as:
 - Storm drain (main, laterals, manholes and catch basins)
 - Sanitary sewer (main, manholes and services)
 - Waterline (main, services, meters, valves, and fire hydrants)
 - Gas line (main, services and valves)
 - Communications (duct banks, vaults, manholes and pull boxes)
 - Electrical (duct banks, vaults, manholes and pull boxes)
 - h. New and existing outside utilities such as:
 - Salt River Project Irrigation and Electric
 - CenturyLink
 - Cox Communications
 - TCA
 - RWCD
 - AT&T
 - Southwest Gas
 - Others
7. Storm drains pipe profiles:
- a. Storm drain main line (show manholes, connecting pipes and pavement profile)
 - b. Lateral connector pipes (show manholes, catch basins, main line and pavement x-sect)



- c. Monument line and construction centerline
 - d. Horizontal and vertical scales
 - e. Existing adjacent or crossing utilities and conflicts
8. Street light plans:
- a. Plan view showing curb and gutter, sidewalk, median, utilities and right-of-way
 - b. Layout showing pole, conduit and pull box locations
 - c. Pole spacing with stationing and offset dimensions & street light number
 - d. Lighting control cabinet locations
 - e. Electric point-of-service
 - f. Lighting circuits identified
 - g. Lighting analysis
 - h. Voltage drop calculations
 - i. Evaluate overhead and underground utility conflicts
 - j. Street light general notes
 - k. Construction notes
9. Traffic signal plans:
- a. Plan view showing curb and gutter, sidewalk, median, utilities and right-of-way
 - b. Layout showing pole, conduit, pull box, loop detector & control cabinet locations
 - c. Pole type, foundation, mast arms, and signal heads
 - d. Electric point-of-service
 - e. Phasing movement diagrams
 - f. Illuminated street name sign layout
 - g. Fiber optic signal interconnection
 - h. Conduit, conductor and pull box schedules
 - i. Lighting analysis for intersections
 - j. Evaluate overhead and underground utility conflicts
 - k. General notes
 - l. Construction notes
10. Signing and Pavement Marking plans:
- a. Plan view showing curb and gutter, sidewalk, median and driveways
 - b. Pavement markings and signage:
 - Horizontal layout of pavement markings w/ type, size and location shown
 - Lane width dimensions
 - Crosswalk markings
 - Symbols (bicycle lane, left turn arrows, etc.) located on plan
 - Details for symbols, legends, and etc.
 - Signage type, size and locations
 - Sign summary table
11. Landscape plans:
- a. Plan view showing curb and gutter, sidewalk, median, driveways, utilities, street lights, street signs, right-of-way and new landscaping layout
 - b. Plant material legend noting symbols, plant name, quantity and size
 - c. Typical plant palette with plant spacing



- d. Planting and groundcover details (use City of Mesa Standard Landscape and Irrigation Details)
- e. Curbing or header layout and locations
- f. Paver layout and locations
- g. Construction notes
- h. General notes

12. Landscape irrigation plans:

- a. Plan view showing curb and gutter, sidewalk, median, driveways, utilities, street lights, street signs, right-of-way and new landscape irrigation system
- b. Irrigation legend with symbols and material requirements
- c. Controller, meter and backflow prevention device locations
- d. Valve key showing valve type, controller station, size and flow
- e. Electric point-of-service for controllers
- f. Construction notes
- g. General notes

13. Structures plans:

- a. Bridge general plan and profile
- b. Deck, pier, girder and abutment details
- c. Deflection diagram
- d. Foundation data
- e. Typical wall cross sections and details
- f. Wall layout

14. Salt River Project (SRP) irrigation plans:

- a. Include SRP permit for work on or near their facilities in the project specifications
- b. Attach irrigation improvement plans prepared by SRP in the project plans

15. Specifications:

- a. Prepare preliminary Technical Provisions

16. Pothole plans and summary list:

- a. Prepare pothole plan sheets designating existing utility type, size, station, ownership, northing, easting, and offset location for each pothole
- b. Prepare pothole summary list on the City's standard pothole form Exhibit A
- c. The consultant shall provide pothole location in a GIS compatible format using the following coordinate system: State Plane Projection – Arizona Central (FIPS 0202), North American Datum 1983 HARN (NAD 83 HARN), Linear unit: Feet (Int'l). Digital copies of City of Mesa land base data can be provided by the City for location and reporting use in the above coordinate system to the selected potholing contractor.

The potholing contractor shall provide a Testhole Data Summary Report, summarizing the information on the Testhole Data Report, in the same format as the enclosed example. These reports shall be electronically submitted as a spreadsheet, or similar agreed upon format, and include fields containing the following information:



1. City project number
2. Date of pothole
3. Testhole number
4. Street name
5. Station & Offset
6. Northing & Easting
7. Facility Owner Name
8. Type of cover
9. Ground elevation
10. Top of pipe
11. Bottom of pipe
12. Material type of utility found
13. Outside diameter of utility found
14. Depth of cover
15. Anticipated utility

All reports for utility location and pothole shall be sealed by a Registered Land Surveyor or Professional Civil Engineer properly licensed in the State of Arizona. As noted above, the Testhole Data and the Testhole Data Summary Report shall be prepared in the same format as the enclosed examples. Report not in accordance with the requirements specified shall be rejected (Exhibit B).

Each pothole shall be numbered. The first pothole shall begin with the number one and each ensuing pothole shall be numbered in chronological order. Each utility within the same trench shall be assigned their own number. Furthermore, the numerical order shall be maintained for each potholing phase. For example, if the last pothole in the first phase ends at 40. The first pothole in the second phase must begin at 41.

The consultant will provide an itemized spreadsheet listing the outside utility companies' potholes, pothole number, and pothole cost. This will allow the City to seek pothole reimbursement from our utility partners (Exhibit C).

17. Right-of-way maps and legal descriptions:

- a. Right-of-way strip map
 - 100 scale plan view map of entire project
 - Existing and new right-of-way and easements with dimensioning
 - Parcel numbers, property lines and addresses
 - Monument lines
 - Street names
 - North Arrow
- b. Prepare written legal descriptions and 8½" x 11" exhibits of all new right-of-way and easements for each individual parcel.

FINAL DESIGN (90% Submittal)

The 90% submittal should include final plans and specifications for the City's and outside utility company's final comprehensive review. If the project includes new water and/or sewer facilities, the 90% submittal should also be sent to the Maricopa County Environmental Services Department (MCESD) for review and approval. The 90% submittal should incorporate all the City's previous comments and concerns. An updated construction cost estimate should be provided. The plans should show final outside utility designs and final right-of-way needs. The previous 60% review comments with appropriate responses should be returned to the City with new submittal. Items to be included in the 90% submittal are, at a minimum, as follows:



1. Final plans:
 - a. Complete Cover sheet
 - b. Horizontal and vertical control plan
 - c. Typical roadway section and detail sheet(s)
 - d. Paving plan and profile sheets
 - e. Utility plan and profile sheets with pothole elevations shown
 - f. Storm drain pipe profiles with pothole elevations shown
 - g. Street light plans
 - h. Traffic signal plans
 - i. Signing and Pavement Marking plans
 - j. Landscape and Irrigation plans
 - k. Bridge plans
 - l. Wall plans
 - m. Flood irrigation plans
 - n. Non-City utility relocation plans
2. Final specifications:
 - a. City of Mesa standard front end documents tailored per project needs
 - Bid Schedule
 - Technical Provisions - by Consultant
By City with consultant review and input
 - Private utility (or Non-City Utility) conflict matrix
 - Pothole Authorization Form, pothole results, and associated summary sheets
3. Right-of-way maps and legal descriptions:
 - a. May need to adjust strip maps, legal descriptions and exhibits based upon revised utility and project needs as a result of the 90% submittal. The revisions need to be kept to a minimum since the real estate acquisition process may already be underway.

BID DOCUMENTS (100% Submittal)

The 100% submittal should include final plans, specifications and construction cost estimate ready for bid advertisement. The City's Project Manager should only need to do a cursory review to confirm all previous review comments were adequately addressed. The 100% submittal should include the following items:

1. Final plans on 3-mil to 5-mil mylar with original seal and signature
2. Final specifications with original seal and signature
3. Electronic files of final plans in AutoCAD 2013
4. Electronic file of specifications in Word
5. Electronic file of bid schedule and construction cost estimate