



City of Tulsa Engineering Services Transportation Design Checklist

Project Number: _____ Project Name: _____

City of Tulsa Project Manager: _____

Consultant Reviewer: _____ Phone: _____ Date: _____

Professional Engineer: _____ Phone: _____ Date: _____

- | | | |
|--------------------------|-----------------------|-----------------------------------|
| <input type="checkbox"/> | Conceptual Report | Construction Budget: _____ |
| <input type="checkbox"/> | Preliminary Submittal | |
| <input type="checkbox"/> | Final Submittal | Construction Cost Estimate: _____ |
| <input type="checkbox"/> | Pre-Mylar Submittal | |
| <input type="checkbox"/> | Mylar Submittal | |

The purpose of this checklist is to offer comments on plan design for construction of paving projects within public right-of-way. Source of paving and related construction in the public right-of-way design policy are the current City of Tulsa Specifications and Details, 2009 Edition of the "Standard Specifications for Highway Construction" published by the Oklahoma Department of Transportation (ODOT), AASHTO, MUTCD and ADA.

This checklist serves to minimize redline comments on the check prints and to maintain consistency among plan reviewers on plans for paving and related construction in the public right-of-way. Plan approval and certain grading/right-of-way clearances depend on compliance with the comments made on the check prints and this checklist. The engineer of record shall satisfy themselves of the completeness and accuracy of the design.

A completed checklist must be attached to the design plans when submitted for review. The following Certification Statement must be signed by the Engineer of record certifying that all applicable requirements on this checklist have been met.

CERTIFICATION

I CERTIFY THAT THE REFERENCED PLANS COMPLY WITH ALL APPLICABLE CITY ORDINANCES AND STANDARDS, INCLUDING FEDERAL, STATE AND COUNTY REQUIREMENTS AND REGULATIONS. IN ADDITION, I CERTIFY THAT THIS CHECKLIST HAS BEEN COMPLETED ENSURING ALL ITEMS LISTED ARE PROPERLY ADDRESSED. I UNDERSTAND THAT IF I FAIL TO ADDRESS ALL APPLICABLE ITEMS IN THIS CHECKLIST, THE PLANS MAY BE IMMEDIATELY RETURNED TO ME WITHOUT ANY FORMAL REVIEW BEING PERFORMED.

Engineer's Name: _____

Engineer's Signature: _____ Date: _____

Please complete and return this checklist and the check prints with each submittal. Discussion of redline comments on plans or this checklist should be directed to the plan reviewer listed above.

Engineer of record (**ENG**) must fill out all boxes in the first column as either (Addressed) or **N/A** (Not Applicable).

Civil QA/QC plan reviewer (**RVW**) shall check the second column as (Required) when requirements have been properly addressed.

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Drawings Required per Submittal	Conceptual Report Submittal¹	Preliminary Submittal²	Final Submittal²	Pre-Mylar Submittal³	Mylar Submittal⁴
Title Sheet		X	X	X	X
Typical Sections	X	X	X	X	X
Summary of Roadway Pay Items and Notes		X	X	X	X
Summary of Traffic Pay Items and Notes		X	X	X	X
Summary of Bridge Pay Items and Notes			X	X	X
Supplementary Summary Sheets			X	X	X
Geometric Data	X	X	X	X	X
Survey Control Sheets	X	X	X	X	X
Section Corners/Lines	X	X	X	X	X
ROW Identification of needs	X	X	X	X	X
Property Lines/Right-of-Way/Easements		X	X	X	X
Certified Property Reports and Legal for ROW			X	X	X
Topographic Survey Sheets	X	X	X	X	X
Drainage Area Map	X	X	X	X	X
Drainage Summaries		X	X	X	X
Storm Water Management Plan			X	X	X
Plan & Profile Sheets	X	X	X	X	X
Intersection Details			X	X	X
Drainage Details		X	X	X	X
Demolition Plan			X	X	X
Joint Layout Plan			X	X	X
Construction Sequence/Traffic Control Plan		X	X	X	X
Signing & Striping			X	X	X
Cross-Sections		X	X	X	X
City of Tulsa Details		X	X	X	X
ODOT Details			X	X	X
Specifications + Bid Packet (8.5x11)				X	X
Specifications + Contract packet (8.5x11)					
Cost Estimate	X	X	X	X	X

Quantities:

1Five (5) 8-1/2"x11"/Half-sized sets + PDF+ Departmental Checklists+ Cost Estimate

2Twenty-three black and white (23) Half-sized sets + Seven Color (7) Half-sized sets + PDF (Black/White & Color) + Departmental Checklists + Cost Estimate

3 Pre-Mylar- Three (3) Full-sized sets &Five (5) Half-sized sets + PDF+ Departmental Checklists + Cost Estimate

4Signed Sealed Mylar (Engineer/City)+ Departmental Checklists + Cost Estimate

Bid Items Seven (7) Full-Sized sets + PDF, Forty-five (45) Half-sized sets + PDF

NOTE: Project CAD files to be provided to OWNER upon request.

Right of Way

Acquisition Document for Right of Way due prior to Final Design Submittal.

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GENERAL PLAN SET REQUIREMENTS (EXCLUDING CROSS SECTIONS)

<u>ENG</u>	<u>RVW</u>	<u>N/A</u>	
_____	_____	_____	A current City of Tulsa Standard Title Block shall be located in the lower right hand corner of each sheet.
_____	_____	_____	North shall be oriented to the top or right side of all sheets. North Arrow and graphical scale shall be located in the top right hand corner of each sheet.
_____	_____	_____	Plans shall be transparent reproducible Mylar. A standard sheet shall be 34" wide by 22" high having a margin of 1+ 1/2" along the left border and 1/2" along the top, bottom and right border.
_____	_____	_____	Freehand lettering shall be no smaller than the No. 4 setting on the Ames lettering guide (0.12" minimum height). Mechanical lettering shall be at least comparable to the 100 Leroy guide (0.10" minimum height) except mechanical lettering on plats or records reproduced in the plans may be comparable to the 80 Leroy guide (0.08" minimum height). Typing shall be at least 0.10". These lettering sizes are minimum. Sizes greater than these are desirable and suggested.
_____	_____	_____	All sheets shall have the Oklahoma Professional Engineer/Land Surveyor seal and original signature prior to Issue For Bid submittal (Mylar).
_____	_____	_____	Designers, technicians, surveyors, dates shall be filled in Title block, as well as Atlas pages.
_____	_____	_____	All drafting shall be in accordance with City of Tulsa Engineering Drafting Guidelines for Outside Consultants.
_____	_____	_____	Cover for underground utilities shall meet current City of Tulsa minimums. For utility relocations, show the specific utility affected and the utility owner responsible (i.e. Telco Box to be relocated by Cox).
_____	_____	_____	Consultant to provide current plan submittal in PDF Format.

COVER SHEET REQUIREMENTS

<u>ENG</u>	<u>RVW</u>	<u>N/A</u>	
_____	_____	_____	Complete description and location of project.
_____	_____	_____	Correct project #, TMUA#, MS #, contract, zone, and phase numbers.
_____	_____	_____	Correct account numbers.
_____	_____	_____	Location map with blow up view of project location.
_____	_____	_____	North arrow (shown to the top or right of page).
_____	_____	_____	Legend of symbols on left side of cover page.
_____	_____	_____	Note Stating: Current City of Tulsa Standard Specifications and Standard Details govern. All other construction and materials shall be in accordance with the Oklahoma Department of Transportation 2009 Oklahoma Standard Specifications for Highway Construction.

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- _____ _____ _____ Name, address, phone number and fax number, CA number, and expiration date of consultant.
- _____ _____ _____ Design Data, Design Speed, Flex EASLs, Rigid EASLs, ADT current, ADT future, etc.(arterials).
- _____ _____ _____ Sheet index located in upper right hand corner. Sheets are to be in the following order:
1. Cover Sheet
 2. Pay Items and Construction Notes
 3. Typical Sections
 4. Right-of-Way
 5. Survey Data
 6. Drainage Areas and H&H information
 7. Storm Sewer Inlet and Pipe Design Table
 8. Storm Sewer Summary Table
 9. Storm Water Management Plan
 10. Roadway Location Key Map (Rehab only)
 11. Repair Location Plan (Rehab only)
 12. Paving Schedule Map (Rehab only)
 13. Street Construction/Reconstruction Plan and Profile
 14. Waterline Location Map (Rehab only)
 15. Waterline Plan and Profile
 16. Sanitary Sewer Location Map (Rehab only)
 17. Sanitary Sewer Plan and Profile
 18. Striping and Signs and Signals
 19. Construction and Structural Details
 20. Arterial Construction Phasing
 21. Cross-Sections
- _____ _____ _____ City of Tulsa and ODOT standards listed on right side of page. Non-Arterial Projects shall at the least list the ODOT Traffic Control Standards.
- _____ _____ _____ Call Okie shield with phone number.
- _____ _____ _____ 2 Permanent ADS benchmark location with description and note of referenced datum to include City of Tulsa permanent benchmark reference as well as other permanent benchmarks. Verified with the City of Tulsa Survey Department.
- _____ _____ _____ Project, contract, zone, and phase number listed in margin on right side of the page.
- _____ _____ _____ Signed and sealed by engineer (mylars).
- _____ _____ _____ Advertisement date line under City Engineer's name. Date to be filled in later by City of Tulsa Staff
- _____ _____ _____ Cover Sheet shall be transparent reproducible Mylar. A standard sheet shall be 34" wide by 22" high having a margin of 1+1/2" along the left border and 1/2" along the top, bottom, and right border.
- _____ _____ _____ Utility Contacts
- AT&T – Al Nichols 596-4237
 - Cox Comm. - Brandon Wade 286-4716
 - ONG – Jonathon Meadows 831-8215
 - AEP/PSO – Adam Fields 250-6257
 - City of Tulsa Utility Coordinator – Chris Kovac 596-9649
 - MTTA- Eric Smith- 918-830-0024

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Provide Railroad information, including Owner and Owner’s contact representative and phone number.

Provide Lane Miles of reconstruction/rehabilitation.

PAY ITEM AND CONSTRUCTION NOTES SHEET REQUIREMENTS

ENG RVW N/A

Verify that pay items, units and quantity shown on sheet match current Transportation Standard Notes and Pay Items and are correctly shown on engineers cost estimate. For current copy contact Transportation Design at 918-596-9636.

Include appropriate pay items for Railroad Crossings and associated activities. Including but not limited to the following as directed by the Railroad Owner: “Insurance for Work in Railroad ROW” paid by LS, “Railroad Flagman” typically paid as an Allowance amount, and “Coordination with Railroad” paid as LS.

The current version of the pay items, pay notes and general construction notes version date will be shown next to the heading on the corresponding plan sheets.

Verify current cost estimate is within the Project Budget.

Summary of pay quantities table shall list Item No., Spec No., Pay Item/Description, Pay item note No., Units, Total quantity.

Summary table breakout all pay items per Street or per sheet

Do Not Use Lump Sum; Pay as Each (EXCEPTION-Removal of Structures and Obstructions & SWPPP Documentation and Management).

Cap Owner Allowance at either 1% of the engineers estimate or \$25,000 whichever is smaller.

Pay item for ALL pipe sizes that may be encountered, disturbed or required to tie into all new inlets or located within the project.

Pay item for Type S5 Asphalt, for all projects that involve the milling and/or paving of existing asphalt, to be used as a leveling course. Plans need to state that leveling course will be used as directed by the field Engineer.

Pay item for a Field Office {Construction Time of (at least) 240 days will require a Field Office}. Quantity Each.

Verify that pay item notes correspond to at least one pay item in quantity summary table.

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TYPICAL SECTION REQUIREMENTS

<u>ENG</u>	<u>RVW</u>	<u>N/A</u>	
_____	_____	_____	Detail full width street section to include width of pavement from centerline. Include all ROW treatments.
_____	_____	_____	Edge of pavement typical showing fill slope and limits of sod.
_____	_____	_____	Details of curbs or combined curb and gutter, valley gutters, and joints.
_____	_____	_____	Detail of sidewalks, sidewalks each side of drives, sidewalks thru drives.
_____	_____	_____	Thickness of all layers existing and proposed.
_____	_____	_____	Type, width and depth of milling. Detail Butt Joints and transitions.
_____	_____	_____	All locations in plans where section applies called out under each typical section by station.
_____	_____	_____	Proposed surface cross slopes with arrows toward lower side (residential: 3/8" per foot, arterial: 1/4" per foot inside lanes and 3/8" per foot outside lanes).
_____	_____	_____	Verify that typical calls out Fabric Reinforcement and/or Separator Fabric, there are minimum of 2' overlaps of the material shown at seams and a 2' wrap around the longitudinal sides of the aggregate material.
_____	_____	_____	Add the following Note to all Mill/Patch/Overlay Projects: 1" Superpave Type S5 leveling course shall be used at the discretion of the field engineer prior to placing the fabric reinforcement and may be omitted in its entirety.
_____	_____	_____	Any and all notes pertinent to work.
_____	_____	_____	Utilize ODOT Safety Edge on asphalt sections without curb and gutter.
_____	_____	_____	Verify PG 76-28 OK or PG 70-28 OK on arterial streets. (See ODOT suggested guidelines for asphalt pavement.) Lifts shall be within ODOT lift thickness ranges.
_____	_____	_____	Verify PG 64-22 OK on non-arterial streets.

RIGHT OF WAY AND SURVEY DATA SHEET REQUIREMENTS

<u>ENG</u>	<u>RVW</u>	<u>N/A</u>	
_____	_____	_____	Map of area showing areas included in project.
_____	_____	_____	Surveyor's Certificate.
_____	_____	_____	Label CRL with bearings and distances.
_____	_____	_____	Key reference points showing northings, eastings, and elevations.
_____	_____	_____	Control Points/Benchmarks referenced with both coordinates and stationing along CRL.
_____	_____	_____	Description of monument types i.e.: metal caps, pk nails, chiseled crosses, iron pins, etc.

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<u> </u>	<u> </u>	<u> </u>	Established vertical and horizontal datum used for survey; Tie to COT/ADS Permanent Benchmark as verified by COT Survey Department.
<u> </u>	<u> </u>	<u> </u>	Survey Limits should run past Right-of-Way to include as much data as possible to ensure proper tie in locations and elevations (example porch to porch or driveway limits). Finished floor elevations are required.
<u> </u>	<u> </u>	<u> </u>	Provide proposed map showing ROW acquisition areas (Fee Simple, Permanent easements, Construction Easements). Include Parcel Table with property and tract details and descriptions.
<u> </u>	<u> </u>	<u> </u>	Show limits of Railroad Right of Way, book and page information, and Owners information, including contact name and number.
<u> </u>	<u> </u>	<u> </u>	Include any ROW negotiation items (special construction or agreements made as part of the ROW negotiation). Verify with COT ROW Group.
<u> </u>	<u> </u>	<u> </u>	Show all existing ROW and Existing Easements within work area.
<u> </u>	<u> </u>	<u> </u>	Horizontal control shall have bearings, length and control. Northing and Easting coordinates shall be provided at all control points.
<u> </u>	<u> </u>	<u> </u>	Horizontal Curve information shall have PC, PT, length, Δ (RT or LT), Tangent, Radius and other requirements.
<u> </u>	<u> </u>	<u> </u>	Include Table with Address, Lot, Block, and Names for parcels requiring a Right of Entry. This table shall coordinate with the plan sheets.
<u> </u>	<u> </u>	<u> </u>	Current ROW Checklist

ROADWAY LOCATION/KEY MAP SHEET REQUIREMENTS

<u>ENG</u>	<u>RVW</u>	<u>N/A</u>	
<u> </u>	<u> </u>	<u> </u>	Overview map (Key Map) of streets.
<u> </u>	<u> </u>	<u> </u>	Streets show bold boundary lines with sheet numbers.
<u> </u>	<u> </u>	<u> </u>	Boring locations shown and numbered.
<u> </u>	<u> </u>	<u> </u>	Legend showing type of work

REHABILITATION PLAN/RECONSTRUCTION/WIDENING PLAN AND PROFILE SHEET REQUIREMENTS

<u>ENG</u>	<u>RVW</u>	<u>N/A</u>	
<u> </u>	<u> </u>	<u> </u>	Layouts of individual streets or areas showing street, driveway, sidewalk and storm repairs.
<u> </u>	<u> </u>	<u> </u>	Include vertical Bench Mark and Horizontal Control on each sheet that will not be disturbed during construction.
<u> </u>	<u> </u>	<u> </u>	Show profile grades, existing and proposed, at minimum 50' intervals, 20' intervals preferred.

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- _____ Existing paving type and limits (shown on street).
- _____ Show Addition name, addresses, block number, lot number, street name and Right-of-Way widths on plan sheet. Include property owner information in table and drawing's.
- _____ Match lines (if necessary) with sheet references.
- _____ Driveway Schedule to include left and right with stationing on either side of drive, radius, material, length, width, existing slope, proposed slope (<10%).
- _____ Driveways: Unique pattern to distinguish between existing structures and types of work to be conducted. Verify pay items for special surfaces.
- _____ Sidewalks: Unique pattern to distinguish between existing structures and types of work to be conducted to include size and thickness.
- _____ Curbs: Unique pattern to distinguish between existing structures and types of work to be conducted. Show curb penetrations for side drains.
- _____ Add concrete bus pads behind the sidewalk at the Bus Stop locations (Allows a waiting area for pedestrians). If there is only a sign or bench at the location ideally we want to add a 10'x10' concrete pad.
- _____ Curb ramps with truncated dome panels, called out with type of each. Verify landing areas and orientation. Directional orientation preferred. Document any locations that do not fully meet current practices.
- _____ ADA table shall be added to plan set showing: ADA transition plan ID and location.
- _____ Ensure concrete pavement to remain concrete, APC shall be replaced with PCC, Asphalt will remain, except for Arterial projects.
- _____ Patching (pattern and give size and S.F.), use legend no. for type. (Is the patching area large enough to obtain adequate compaction, Min 5' x 5') (Note: Pay Quantity is measured by CY.)
Check for excessive patching length. (PLAN AND PROFILE REQUIRED FOR ALL STREET PROJECTS.) Vertical curve design and controls are required for patch lengths over 100 feet.
- _____ Identify patching type (APC, PCC or AC) and provide quantities for each patch. (CY) Concrete patch areas require joint layouts and dimensions.
- _____ Structures to be adjusted to grade (public manholes to include new frame and lid, private manholes, inlets, valves, or meters).
- _____ Culvert pipe (show pipe size and type), proposed F/L each end with adequate clearance to driveway surface. (Minimum 18" unless noted)
- _____ Show paving width from back of curb to back of curb. All sheets and changes in width.
- _____ Show existing and proposed ditching limits and drainage structures including Top of Grate and Flow Line (In/Out with direction) elevations.

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_____ _____ _____
Special structures shall be drawn to scale unless noted otherwise. Sufficient detail dimensions and related notes shall be provided for all structures.

_____ _____ _____
Show project limits. Call out Stations and offsets with coordinates as needed.

_____ _____ _____
Verify storm sewers penetrate the walls of junction boxes instead of any of the corners.

_____ _____ _____
Verify that inlets with an access manhole is used instead of an inlet with a separate manhole

_____ _____ _____
Drainage structure summary, with logical ID system. Refer to Storm Water checklist.

_____ _____ _____
Inlets, pipes, and structures must be analyzed and sized for local area drainage.

_____ _____ _____
All Structures (manholes, boxes, inlets, headwalls, etc.) shall be numbered and labeled both in plan and in profile and referenced to the storm water structure schedule (Drainage Summary Table)

_____ _____ _____
Design speed shall be 25 mph on all residential streets and 30 mph on all collector streets. Arterial design speed shall be as determined between 35 and 50 mph.

_____ _____ _____
The minimum centerline radius on street alignment shall be 200' and/or meet AASHTO Minimum Radii and Superelevation for Low-Speed Urban Streets. Superelevation on residential streets should be avoided whenever possible and shall be reviewed on a case by case basis.

_____ _____ _____
The minimum radius on returns at residential intersections shall be 25'. At intersections of a residential and arterial street, the minimum radius on returns shall be 30'. The minimum radius on the returns for arterial streets shall be 40'. Where there is a heavy truck turning movement, compound curb returns should be evaluated for a WB-67. Design exception may be required.

_____ _____ _____
The maximum grade of a residential street when intersecting an arterial shall be 2% for a minimum of 100' from the curb line of the arterial. No vertical curve shall begin any closer than 50' from the curb line of the arterial.

_____ _____ _____
At intersections, the design philosophy shall be to provide a "table top" design. The crown from side streets into arterials shall transition to meet the through gutter line. Smooth transitions with vertical curves. No Grade Breaks.

_____ _____ _____
Vertical curves in profile shall give the CRL elevation at the PC, PI, PT and high/low point at a minimum of 50' intervals. Vertical Curves not meeting AASHTO minimum lengths must be documented and approved.

_____ _____ _____
Sag vertical curves shall be designed according to the AASHTO Specifications using the criteria of headlight sight distance and drainage control. Crest vertical curves shall be designed according to the current AASHTO specifications using the criteria of safe stopping sight distance. Vertical curves shall be the minimum length available for the two grades entering into a sump area as defined by the AASHTO publication titles, "A POLICY ON DESIGN OF URBAN HIGHWAYS AND ARTERIAL STREETS".

_____ _____ _____
Vertical curves shall have a minimum length of 50' for residential streets and 3x design speed for arterial streets

_____ _____ _____
Vertical Curves shall be symmetrical, no asymmetrical curves shall be used

_____ _____ _____
Scale 1" = 20' (no smaller) and show scale horizontal.

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- _____ _____ _____ Scale 1" = 5' (no smaller) and show scale vertical.
- _____ _____ _____ Follow current City of Tulsa Design Standards.
- _____ _____ _____ Sight distance at intersections shall meet design standards of AASHTO.
- _____ _____ _____ Show all utilities in plan and profile. Include Cautionary notes as applicable.
_____ _____ _____ Driveways shall be replaced to 1st joint, not to ROW. If sidewalk is replaced, the driveway would be replaced to the back of sidewalk.
- _____ _____ _____ All reconstructed and rehab streets must have a CRL with stationing established from left to right.
_____ _____ _____ Provide N/E at all PI's.
- _____ _____ _____ Engineer shall pothole City owned utilities, as necessary, to verify location and depth if conflict is possible.
- _____ _____ _____ All structures subject to vehicular traffic shall be designed for HS-20-44 loading.
- _____ _____ _____ All bridges shall meet the requirements in the latest edition of the Standard Specifications for Highway Bridges prepared by AASHTO.
- _____ _____ _____ Design longitudinal profile of minimum 0.75% standard. Provide a design exception and document efforts for grades not meeting the City Standards.
- _____ _____ _____ Provide Control Point/Bench Mark locations that won't be disturbed by proposed construction on each sheet. All project surveys must be tied to a COT/ADS Permanent Benchmark.
- _____ _____ _____ Bench Mark or Control Point must have a northing, easting, and elevation and description.
- _____ _____ _____ Determine if additional right-of-way, utility easements, etc. will be needed.
- _____ _____ _____ Provide intersection detail for each location at least 150' in each direction. Show curb and gutter elevations, CL elevations, cross-slope transitions, drainage paths, joint layout for concrete intersections, tie-in to existing, etc.
- _____ _____ _____ Utility Caution Note shown where needed.
- _____ _____ _____ Requirements for Pedestrian and Vehicle Safety are addressed (ADA) (PROWAG).
- _____ _____ _____ Consultant to provide list of addresses where damage to Adjacent Fences, Walls, Trees etc. is expected. City/Consultant to make contact with Property Owners as needed once list is provided.
- _____ _____ _____ Verify that there is structure and utility clearance on both ends for bore pits.
- _____ _____ _____ Existing structures and utilities are to be shown with a thin, solid weight line and proposed with a heavy weight line.
- _____ _____ _____ All utility manholes should be out of the wheel path whenever possible.

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STORM WATER SHEET REQUIREMENTS

<u>ENG</u>	<u>RVW</u>	<u>N/A</u>	
_____	_____	_____	Location map of proposed work.
_____	_____	_____	Highlight (box) around street or area referencing sheet number.
_____	_____	_____	Attach Storm water Design checklist.
_____	_____	_____	Northing and Eastings are to be provided for all manholes and inlets.
_____	_____	_____	Fence installations around storm water channels and drainage areas shall have pedestrian gate access for maintenance personnel. All fence designs shall be reviewed with Storm water Maintenance staff (Bryan/Roy) for locations and size.

WATERLINE LOCATION MAP SHEET REQUIREMENTS

<u>ENG</u>	<u>RVW</u>	<u>N/A</u>	
_____	_____	_____	Show project number (TMUA) on all associated sheets
_____	_____	_____	Location map of proposed work.
_____	_____	_____	Waterline shall use the same Centerline stationing that the roadway uses with offsets provided.
_____	_____	_____	Highlight (box) around street or area referencing sheet number.
_____	_____	_____	Attach Water Design checklist.

SANITARY SEWER SHEET REQUIREMENTS

<u>ENG</u>	<u>RVW</u>	<u>N/A</u>	
_____	_____	_____	Show project number (MS) on all associated sheets.
_____	_____	_____	Location map of proposed work.
_____	_____	_____	Highlight (box) around street or area referencing sheet number.
_____	_____	_____	Attach Wastewater Design checklist.

TRAFFIC OPERATIONS REQUIREMENTS

<u>ENG</u>	<u>RVW</u>	<u>N/A</u>	
_____	_____	_____	Include a Sign Schedule.
_____	_____	_____	Include COT Standards 608 A & B and Specification 625 on the cover page.
_____	_____	_____	All COT signs and poles provided are new, undamaged and meet the requirements of COT Specification 608 Traffic Signs. Verify replacement of old signs with current MUTCD requirements.
_____	_____	_____	All traffic materials removed shall be handled per COT Specification 625 Removal of

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_____ _____ _____
Traffic Items.

For Existing signs that are to be reset the following note should be added to the General Construction Notes: Check Construction Notes to see if notes mention cleaning and resetting signs. If they do ask them to replace the note with: "The contractor shall be responsible for the replacement of all existing Neighborhood, MTTA etc. traffic signs and markings removed or damaged as part of this project."

_____ _____ _____
Make sure that there are sign quantities for all signs and sign posts listed.
2" sign posts are the sleeves that go in the ground.
1 3/4" signs are the actual posts.
1 1/2" signs are the street sign posts.

_____ _____ _____
All signs should be replaced with same type sign unless change in sign type is approved by traffic engineering. Use MUTCD requirements. Ex: Don't replace yields with stop signs.

_____ _____ _____
Bus Stop signs, Alert Neighbors, Neighborhood Association signs, ODOT signs, Non-City of Tulsa signs, etc. should all be listed so that they can be reset after construction. These signs do not need to be replaced.

_____ _____ _____
Sign summaries should be detailed enough to know what kind of sign it is and where it is located. Dimensions are preferred too. A sign shop should be able to make every sign based on the sheet: "S 73rd E Ave 9100". All arterial intersection signs should have block numbers and the block numbers should be the same on each side of an arterial. It should be double checked that they are the correct block number for that arterial.

_____ _____ _____
Ave., Pl., St., and Ct. get confused. E and W can get mixed up too. Verify street names mirror the original sign.

_____ _____ _____
Verify Signs that are double sided have the sign on the reverse side included. Ex: One-way or signs posted on the back of other signs.

_____ _____ _____
Check to make sure all signs are valid MUTCD signs. Designs should match existing. (Speed limits' not mirroring what is out there, etc.)

_____ _____ _____
Check to see that Object Markers, One-Ways, Right or Left Turn Only signs, Arrow Plaques) should be listed as the correct design (ie. OM3-R or OM3-L, etc.).

_____ _____ _____
Check to make sure that No Parking signs fit our current standard. Verify with Traffic for standard if unfamiliar.

_____ _____ _____
Replace Right Turn or Left Turn Must Turn Signs with R3-5R or R3-5L signs.

_____ _____ _____
"3-Way" or "4-Way" plaques on Stop Signs should be replaced with R1-3P "All Way Plaques"

_____ _____ _____
Street signs where the street curves and the street name changes are easy to forget so it should be checked that these are in the summary.

_____ _____ _____
There should only be one set of street signs at each residential street corner. Arterials should have one set of street signs on each side of the arterial.

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Replace Private street signs with black street signs and not red per MUTCD.

Street signs are double sided so look for sign area quantities equal to or greater than 3 SF on residential streets and greater than or equal to 4 SF on arterial streets.

Verify current Traffic Operations pay items and details.

Verify existing Traffic Facilities are shown on the plans (loop detectors, traffic conduit, etc.).

PERMITS REQUIREMENTS

ENG RVW N/A

Railroad Right of Way Permits, Crossing Permits, etc. as needed for the project. Include Owners information and contact.

Water Shed Permit needed for Final routing to development services.

CONSTRUCTION AND STRUCTURAL DETAIL SHEET REQUIREMENTS

ENG RVW N/A

Show pavement joint pattern layout (PCC): (Do not exceed $L = W \times 1.25$). Panels should be relatively square.

Call out type of pavement joint (PCC) and include details of all project joint types.

Show elevations at all intersection C/L's, curb and gutter returns, joints and inlets to verify positive drainage in all directions. Reference "Intersection Details" and prepare detail for each intersection within the project.

Show all special design structures (walls, special inlets). Structural design of all special elements must be provided. "Design by Manufacturer" is not permitted.

Detail of ADA required tactile domes.

All chain-link fences are to have a top rail and the bottom tension wire. The posts need to be set in concrete. Note some of this is different than the ODOT specs.

Maximum joint spacing in feet is two times the slab thickness in inches, in both the transverse and longitudinal directions (Ex: 6" thick = 12' Max Panel). Panel should never be greater than 15feet in either direction, regardless of slab thickness. Note that this is the maximum joint spacing, but smaller panels can be used. Panels should be relatively square.

Include appropriate Railroad details to show precast concrete panels and smooth transitions. Include ADA crossing and sidewalk details.

Curbs should be 8" for arterials and 6" height for residential and non-arterials.

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CONSTRUCTION PHASING SHEET REQUIREMENTS

<u>ENG</u>	<u>RVW</u>	<u>N/A</u>	
_____	_____	_____	Non-Arterial and Residential projects need to define the required phases based on project content and access for construction equipment and materials.
_____	_____	_____	Construction Phasing signage and layout per current MUTCD manual is required for all Projects Arterial/ Non Arterial & Residential.
_____	_____	_____	Include specification that each phase must be completed before beginning the next phase.
_____	_____	_____	Complete roadway closures are to be avoided whenever possible. If required closures need to be as short as possible, defined in the required phasing, and have liquidated damages tied to the allowed closure duration.
_____	_____	_____	Verify all phases of the construction will have positive drainage.
_____	_____	_____	Verify project can be constructed as phased and continuous access is provided.
_____	_____	_____	Verify all required Railroad permits have been acquired.
_____	_____	_____	Verify traffic control quantities adequate for all phases of construction.
_____	_____	_____	Verify quantity of construction signs and lights are checked
_____	_____	_____	Arterial Project shall have temporary striping and flex tabs.
_____	_____	_____	Project Sign (COT STD 102) pay item required on all projects.
_____	_____	_____	Construction traffic signs over 16 S.F. shall be included
_____	_____	_____	Barrels – recommendation that non-arterials should have at least 30 barrels per construction day. Arterials - project length and speed limit determine the max spacing between barrels (up to 50' max)
_____	_____	_____	Changeable message sign(s) for all Arterial Street Projects.

CROSS SECTION SHEET REQUIREMENTS

<u>ENG</u>	<u>RVW</u>	<u>N/A</u>	
_____	_____	_____	All cross-sections for street Right-of-Ways shall be drawn to scale showing existing ground and proposed construction.
_____	_____	_____	Show cross-sections every 50' and at all driveway C/L's, side streets, Rights of Way and other sections as needed to clearly convey the design intent.
_____	_____	_____	Provide driveway grades, centerline and curb elevations. Show cross slopes on all surfaces, ditch flow lines and other details.

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_____ Show Storm Sewer and other utilities (sanitary, water, gas, underground electric, etc.).

_____ Cut/fill quantities shown in cross-sections.

_____ Each section shall be stationed clearly.

_____ The beginning and ending points of a project shall be stationed and cross sections for both the
_____ stations shall be drawn and labeled Begin Project and End Project.

_____ Scale for cross-sections shall be not less than:
1" = 5' horizontal 1" = 5' vertical