

## Project Delivery Quality Assurance “Lite” Reviews

A “Lite” review for Quality Assurance is designed to occur sometime during a six-month window following bid letting. Projects will be selected for review based on the criteria shown in the section titled *Project Selection Filter & Criteria*. This type of review is intended to comprise about a two-hour timeframe per discipline or specialty area and is focused on the elements that are considered to represent the overall quality of the work. These review elements will be listed by deliverable within its discipline or specialty area. The required documents will also be specified.

### Environmental Discipline

#### Biology

##### Documents required for review

- Area of impact known
- Scoping report (this could also be the Bio portion of the Baseline report)
- The Affects Analysis, determination, format and level of detail in the BA(s)
- Terms and Conditions in the BO(s) are in the 00290 specs
- The fish salvage report if salvage was done within 6 months of let
- Monitoring during construction to ensure BO is enforced

#### Cultural Resources

##### Documents required for review

- Qualifications of the people doing the work (must meet the Secretary of Interior Standards for Cultural Resources)
- Scoping report (this could also be the Cultural Resources portion of the Baseline report)
- Format and reasonableness for all Requests for Determination of Eligibility
- Format and reasonableness for all Section 106 Findings of Effect
- All Section 106 Memoranda of Agreement (MOAs), outlining proposed mitigation efforts for properties being adversely effected by the project
- All Section 4(f) evaluations
- All Programmatic Agreement memos for properties inventoried which were not considered eligible for the NRHP
- Format and reasonableness for all ORS 358.653 documentation
- Appropriate level of effort for Cultural Resources Technical Reports (for NEPA Class 1 and 3 only)

## **Archaeology**

### Documents required for review:

- Phase 1 survey reports and site identification documentation
- Format and reasonableness for all Section 106 documentation
- Phase 2 and 3 testing and recovery plans and documentation
- Review of Tribal coordination efforts and communications

## **Roadside Development Program**

### Baseline Reports / Project Prospectus

- Applicable references to any Federal, State or Local guidelines, codes or requirements

### EA/EIS

- Do the products address baseline/project prospectus data
- Does the analysis of alternatives address purpose and need
- Do the products follow standard outline format
- Identify erroneous data

### Visual Resources Technical Reports

- Do the reports follow established criteria for visual analysis, i.e. FHWA, USFS
- Do the reports coordinate baseline/project prospectus data
- Erroneous data identified

### PS&E

- Do the products appear to follow ODOT Contract Plans Development Guidelines
- Do the products follow current ODOT Standard Specifications
- Do the products address ODOT Highway Directives for maintenance

## **Region Environmental Coordinators**

### Prospectus Part 3

### Input Parts I and Part II of Prospectus for Part 3

- Complete (each section or NA)
- Recommended NEPA classification
- Classification document should encompass info from Part 3 checklist

### Baseline Report

- Format
- Input: delineation of area of potential impact (API), done in concurrence with Project Team
- Compliance with applicable guidelines
- Overall quality of writing and graphics and photos
- For Class 2 Project REC oversees, Class 1, 3 Overseen by EPM
- Output: design that avoids minimizes and mitigates impact.

### **Environmental: Air Quality**

Items to Review for: Clarity, technical adequacy, appropriate level of analysis, preparer qualifications, regulatory sufficiency.

### Prospectus Part 1 & 3: Environmental Worksheet /Air Quality

- Information is complete and accurate; tasks identified; project description represents project at bid-let

### Baseline Report: Air Quality

- Information is complete and accurate; tasks identified; project description represents project at bid-let

### Air Quality Technical Report or Memoranda

- Project description
- Analysis Methodology
- Traffic data
- Modeling parameters
- Modeling results
- Regulatory requirements
- Statement of Conformity with Air Quality State Implementation Plan (SIP)

Transportation Conformity Determination (Environmental Class '2' projects requiring a project level conformity determination, without supporting air quality analysis)

Project description  
Traffic data  
Regulatory requirements  
Statement of Conformity with Air Quality State Implementation Plan (SIP)

#### Project Final Design

- Scope and design unchanged from project identified in AQ Technical Report / Transportation Conformity Determination.

#### Indirect Source Construction Permit (Lane County, only)

- Supporting documentation

#### Joint Permit Application

- **Successful use of ACOE 404/DSL Permit and Slopes III**
- Was application submitted 'complete' (as judged by DSL and Corps permit reviewers)?
  - No. of iterations till acceptable completion
  - Reasons for incompleteness
- Was application in conformance with DSL and Corps regulations and policies?
  - Project purpose accurate and appropriate
  - Alternative designs and locations (if applicable) effectively presented and described
  - Selected alternative effectively justified
  - Impact minimization
    - Sufficiency
    - Description to the point and appropriate
  - ESA issues clearly and succinctly described
  - If mitigation required, was original concept proposed acceptable to DSL and Corps? If not, why?
- Level of analysis and documentation appropriate to project scope and degree of resource impacts
  - Were any permit components unnecessarily submitted for review and concurrence?
- Maps and drawings legible and clearly depicted
- Application process steps effectively followed
  - If applicable, was wetland delineation report submitted prior to General Authorization submittal
  - Permit fees submitted with application
  - Local planning review and signature submitted with application
- Natural resources of site clearly, succinctly described
- Compensatory mitigation commensurate with the proposed impacts
- Compensatory mitigation concepts technically sound and likely to succeed
- **Permit conditions included in 00290 specs.**

## **National Environmental Policy Act**

### Environmental Impact Statement/Environmental Assessment

- Purpose and Need - review to confirm compliance with various guidance such as TA 6640.8A and CETAS guidance, as well as for P&N clarity.
- Skim P&N, alternative descriptions, and resource impacts chapter to determine most sensitive resources. Give these resources (the most sensitive ones identified) a full reading - including Affected Environment, Environmental Consequences, and Conservation Measures/Mitigation.
- Read all Comments and Agency Responses and comment where necessary.
- Confirm entire format of NEPA document with TA 6640.8A guidance.
- If there is a Section 4(f) and/or 6(f) Evaluation, read it entirely and comment as appropriate.
- Look for the correct use of verb tense, such as "would" rather than "will..."
- Check to see that compliance with SAC Rule 731-015-0075 is documented

## **Geo-Environmental Discipline**

### **GeoTechnical/Engineering Geology**

#### Geotechnical Foundation Report and Engineering Geology Report

- Was the appropriate exploration performed for the project? Were there enough borings, deep enough, located properly? (Refer to AASHTO manual on Subsurface Exploration).

#### Plans and Specs

- Rock blasting and excavation- Are quantities for controlled blast holes included? Are overburden slopes and slope breaks shown in plans and/or in specs?
- Rock blasting- Are Special Provisions for Blast Consultant and noise/vibration monitoring included? (not required in all cases)
- Scaling- Is scaling area and approximate quantity shown on plan sheets? Is hourly work item and estimate of hours included in Special Provisions?
- Rockfall Catchment Areas- Are ditch widths and depths shown on the plan sheets?
- Rockfall Catchment Areas- Do ditch configurations conform to Highway Design Manual guidelines?
- Slope Protection Mesh- Is the area, quantity, and typical section shown in the plan sheets? Are Standard Drawings included in plans?
- Slope Protection Mesh- Are up-to-date specs used? Are specs and drawings included for PVC coated mesh? Are anchor spacings shown?
- Rock Bolts and Dowels- Are location, quantity, and typical details shown in the plans? Are areas shown as spot bolt or pattern bolt areas with spacing? Are design loads and lengths shown? Do

- specs have quantity, type, and testing requirements included?
- Slope Protection Fences- Are location, quantity and typical section shown on plan sheets? Are Special Provisions included for high capacity fences?
- Rockfall MSE, Gabion and Block walls- are details, location, and bid item quantities shown in plan sheets? Are Gabion Standard Drawings included? Do specs include quantities, backfill material and approved manufacturers?
- Rockfall berms- Are heights, slopes, location and quantity shown on the plan sheets?
- Rockslope drainage- Are drain location, typical section and quantity shown in the plans? Are special provisions included?
- Shotcrete- Is location, area, quantity and typical details shown in plan sheets. Do specs include quantity?
- Temporary rockfall measures- (not required in all cases) Do the plans show locations, area, approximate quantity, typical details of temporary measures such as temp walls, barriers, aggregate cushions, fences, netting, etc.?
- Did this review identify any CRITICAL problems that will impact construction or ODOT's liability?
- Are the title blocks correct? (Project Name, Bridge Number, Sheet Number, etc.)
- Are the sheets stamped by the Engineer, Geologist, or both?
- Are the standard notes and legend present? (SPT Symbol, Groundwater, Reference to logs, etc.)
- Are the sheets titled "Geotechnical Data"?
- Are all of the explorations shown on the plan view(s) with the standard symbols?
- Are the structures investigated outlined in plan view? Scarps and cracks for slides?
- If ground contours used, are they labeled with the interval defined?
- Critical map features – North Arrow, Scale
- Project stationing?
- Labeled cross-section or profile lines(A-A') or labeled according to station and offset?
- Graphical columns shown on the cross-section/profile consistent with project boring logs?
- Are the borings on the drawings the same scaled length as the logs?
- Geologic unit thickness consistent with borings?
- Legend on each page describing every geologic unit for that page's drawing?
- Sample depths shown with appropriate symbol and label (SPT square, N-value, etc)?
- Table for each hole showing core run, RQD, recovery, hardness?
- Core runs shown with brackets?
- Lines connecting units across the graphic logs?
- Piezometric surface delineated with a line and the standard symbol?

- Subsurface drawings projected onto the existing ground line with the proposed alignment profile also shown?
- Do the drawing scales provide the best balance between readability and clarity vs. content?
- Are the profiles and cross sections taken appropriately? (i.e. along the centerline of a structure, perpendicular to the alignment, along the axis of a slide, is it situated to best display the pertinent features of the subsurface)
- Unit descriptions in the legend consistent with the project boring logs? Appropriate syntax?

## **Hazardous Materials**

### Prospectus Part 3

- Was the HazMat portion of Part 3 of the prospectus completed?
- Did scoping provide an appropriate estimate for HazMat assessment and construction costs?
- Based on the proposed project activities (excavation, demolition, property acquisition), was a HazMat Corridor Study required?

### Hazardous Materials Corridor Study

- If required, was a HazMat Corridor Study completed?
- Does the Corridor Study include all of the required elements (database review, site visit & historical research)
- Was a copy of the Corridor Study sent to ROW, PL & Designer prior to “Right-of-Way Map & Descriptions”?
- If recommended, were draft special provisions attached to the report?

### Additional Research

- If additional research was recommended, was it conducted?

### Level 2 PSI Scope of Work

- Were DEQ records reviewed prior to conducting Level 2 PSI work?
- Was a scope of work prepared prior to conducting Level 2 PSI work?

### Level 2 Preliminary Site Investigation

- If recommended, was a Level 2 PSI completed?
- Was a copy of the Level 2 PSI sent to ROW, PL & Designer prior to “Approved Design (30%)”?
- If recommended, were draft special provisions attached to the report?

### Special Provisions

- Did any of the HazMat reports recommend special provisions?
- Were the recommended special provisions included in the contract?

#### Right-of-Way Files

- If recommended, did ROW follow recommendations for acquisition of contaminated property (or any equally effective measures)?

#### Cleanup Reports/Tank Closure Reports

- If recommended, were pre-construction activities completed?
- Were required reports filed with DEQ?

### **Noise**

#### Prospectus

- Was the noise section in the Worksheet portion of the Prospectus completed?

#### Noise Study Report

- Was a noise study report required and completed?
- Is the Project Leaders aware of special requirements related to noise issues?

#### Plans and Specs

- Were the recommended noise mitigation measures included in the plans?
- Are the required noise mitigation measures similar to those shown in the Noise Study Report?
- Are there contract special Provisions necessary regarding unique or special noise issues?
- Are the cost estimates for mitigation reasonably close to the costs in the Noise Study Report?
- Is

### **Material Sources**

#### Material Source/Disposal Site Report or Narrative

- Was a material source or disposal site narrative or report prepared?

#### Plans and Specs

- Was a Prospective and/or Mandatory Material Source offered in the

contract?

- Does the location(s) of the source(s) and/or disposal site(s) show up on the plans cover sheet?
- Do the material source(s) and/or disposal site(s) show up in the contract plan sheets?
- Do the material source(s) and/or disposal site(s) show up in the index of sheets?
- Do the plan sheets for material source(s) and/or disposal site(s) show up in the contract plan sheets?
- Are the material source specification contained in the special provisions?
- Are the disposal site specifications contained in the special provisions?
- Are the specifications for the materials sources (Sec. 160.40) or disposal sites (Sec. 330.41[a-5]) in the correct section of the specifications?
- Do the specifications match the plans?
- Do the plans and specifications appear to meet the project needs?
- Are the plans and specifications clear and easy to understand?
- Do the locations of any exploration holes show on the plan sheets?
- Are property or permit boundaries clearly shown on the plan sheets?
- Are appropriate safety measures clearly shown in the plans and covered in the specifications?

## **Bridge Design Discipline**

### Documents required for review

- Bridge Contract Plans
  - Review General Notes
    - Appropriate loading
    - Permit load included
    - LRFD code used
    - Appropriate seismic loading
    - Acceleration coefficient and soil profile listed
    - HPC used for cast-in-place decks
  - Complete "Checklist for Final Design"
  - Non-standard details
    - Should Bridge Design Manual be updated?
  - New or unusual details
    - Should Bridge Design Manual be updated?
  - Plans legible and easy to read
- Contract Special Provisions
  - Project specific special provisions
    - Would boiler plate specifications have been adequate?
    - Should Bridge Design Manual be updated?
    - Are specifications written in imperative mood?

## **Hydraulics Engineering Discipline**

### Documents required for review

- Qualifications of the people doing the work
- Scoping report
- Hydraulics Report
  - Hydrology
  - Backwater Calculation
  - FEMA Regulations
  - "No-Rise" Certification
  - Fish Passage
  - Outfall Protection
  - Scour Calculation
  - Abutment/Bank Protection Stability Calculation
  - Temporary Water Management
  - Trenchless Installation / Rehabilitation Alternatives
- Plans and Details
  - Backwater Table
  - Abutment Protection
  - Fish Passage Improvements
  - Outfall Protection
  - Toe Trench
  - Abutment/Bank Protection Section Depth
  - Temporary Water Management
- Specifications
  - Fish Removal Sequence
  - Trenchless Installation/Rehabilitation

## **Stormwater Engineering Discipline**

### Documents required for review:

- Qualifications of the people doing the work
- Scoping report
- Concept Report (only on large projects)
  - Outfall Locations
  - Water Quality Treatment Considered?
  - Detention Considered?
  - Trenchless Rehab / Install Alternatives
  - UIC's Regs
  - FEMA Regs
- Final Stormwater Report
  - Hydrology
  - Outfall Protection
  - Water Quality
  - Detention
  - Minimum Velocity
  - HGL / EGL
  - Erosive Velocity
  - Inlet Efficiency
  - Downstream Impacts
- Plans and Details
  - Maintenance Access
  - Outfall Protection
  - Split Flow Device Detail
  - Flow Control Device Detail
  - WQ Swale Details
- Specifications
  - Proprietary Water Quality Structures
- Operation and Maintenance Manual

## **Right of Way Discipline**

### **R/W Engineering**

- Hard copy Right of Way Drawing(s) shows properties actually acquired.
- Review Right of Way Acquisition Map for substantial compliance to standards.
  - Centerline properly tied.
  - Files and Property ownership information correctly shown.
  - All acquisition parcels shown and correctly identified for property rights acquired.
- Legal Descriptions (Exhibit A) free of ambiguities and based on centerline stationing for partial takings.
- Project Design and Location Survey CAD files (electronic) in

- proper format are properly archived.
- Federal Government easement plats/exhibits and/or railroad encroachment exhibits, if any, are substantially completed in compliance with standards.
- Access control rights to be acquired are shown correctly on the r/w acquisition map and noted in the legal description addendum.

### **Right of Way Authorization**

- Verify Oregon Transportation Commission resolution to condemn.
- Verify Authorization to Proceed prior to appraisal activity.

## **Real Property Appraisals & Appraisal Reviews**

- Type of appraisal report complies with appraisal assignment and/or contract.
- 15-Day Inspection notice provided to property owner.
- Date of Description used in appraisal same as description used in final conveyance document.
- Appraisals were officially reviewed to establish just compensation.
- Appraisal Review contained appropriate breakdown of just compensation and the determination of any uneconomic remnant.

## **Relocation**

- Verify Replacement Housing and Rent Studies performed according to the Right of Way Manual & approved by Right of Way HQ.
- Verify Benefit Claims were officially reviewed and approved by Right of Way HQ.
- Review the Relocation Benefit Summary provided to property owner with the Offer-Benefit Letter for compliance to the Uniform Act and federal regulations.

## **Railroad /Utility Review and Oversight**

- Utility work added to ODOT contract – check agreement.
- Utility reimbursement identified – check agreements.
- Utility relocation schedules identified - check Certification of Reimbursement Rights.
- Railroad reimbursement identified - check for submittal of timing letter.
- Railroad right of way identified - check C&M agreement and conveyance document.

## **Final Report Closing Packages**

- Final Report packet contains all necessary file documentation.
- Signed Deeds or Easements contain correct language, descriptions and access control language.
- Offer Benefit Letter correct and made in writing to all legal & equitable owners.
- Acquisition Summary Statement contains all notices (30-day or 30/90-day) and offer matches Reviewed Determination of Just Compensation.
- All items on the Office Title Report were addressed.
- Justification of any settlement over Just Compensation is properly documented and approved.
- Most recent Exhibit A, Right of Way Description, is correct and matches the Right of Way map.

## **Recommendation for Condemnation Packages**

- Packet contains all necessary file documentation.
- Grantor given at least 40 days to consider offer and reasonable time allowed for negotiations.
- Offer Benefit Letter correct. Acquisition Summary Statement contains all notices (30-day or 30/90-day) and offer matches Reviewed Determination of Just Compensation.
- Title report received.
- All items on the Office Title Report were addressed.
- All parties having an interest in the property named in the complaint.
- Access language on RC form.
- Project possession time frame preserved.
- Most recent Exhibit A, Right of Way Description, is correct and matches the Right of Way map.

## **Right of Way Certification**

- Exceptions to certification (holdouts) properly identified and contained in the plans and specifications.
- Certification signed and submitted prior to bid advertisement.

## **Pavement Design**

This checklist is for Technical Services QA-Lite reviews. It is not intended to be a detailed review of every calculation and item included within the design report, plans, and project specifications. The checklist is to provide the reviewer with information regarding the elements that should be accounted for in the design report, project plans, and specifications.

## **Pavement Design Report**

- Project location and scope
- Used approved design procedure
- Proper field work completed and meets requirements of ODOT Pavement Design Guide
- Traffic Analysis
  - Appropriate ESAL calculations (proper time periods & conversion factors)
- Design Life
  - Appropriate for type of work and materials (Rehab vs. New work vs. Bridge approach)
- Design inputs documented and reasonable
- Pavement Design Sections
  - New work design sections reasonable (includes surfacing stabilization)
- Pavement Design Sections
  - Rehabilitation appropriate and meets objectives of

- project
- Pavement Design Sections
  - Provision made for joint between existing pavement and new widening
- Pavement Design Sections
  - Structural capacity of shoulder to carry traffic addressed where required
- Life Cycle Cost Analysis completed – if required
- Materials Selection
  - Meet requirements of ODOT Pavement Design Guide
- Required Specifications
  - All required specifications identified
- Required Specifications
  - Report includes any required changes to special provisions
- Report includes all required deliverables per ODOT Pavement Design Guide
  - See Deliverable Checklist – ODOT Pavement Design Guide, Appendix G

## **Project Plans**

- Typical sections match pavement design report
- Plans include appropriate standard drawings and details

## **Project Specifications**

- Appropriate Pavement specifications and special provisions included
- Work can be accomplished with current traffic staging and timelines
- Bid Items

## **Quality Assurance “Lite” for Illumination Plans:**

### 1. Scope and Warrant

Review project narrative for proper scoping for illumination

- Clear statement of the necessity of lighting
- Proper coverage on roadway/bridge section(s)
- Appropriate estimate

To determine whether lighting is to be provided on a project, investigation of accident history, Traffic data, ADT levels and availability of funds are necessary. (Utilize engineering judgment on local conditions and roadway characteristics)

## 2. Illumination and Electrical Design

- 1) Permanent Illumination - Lighting levels to be checked with lighting calculation submittals/reports.
  - Average illuminance level
  - Minimum and maximum points
  - Uniformity ratios
- 2) Electrical Installation method to be verified with NEC (National Electrical Code) and ODOT Standards.
  - Conduit size and appropriate route
  - Wire type and size
  - Voltage drop calculation

## 3. Illumination Material

- 1) Roadway Luminaire selection
  - Use ODOT standard luminaires – Special type needs review and approval
  - Wattage
- 2) Poles and Foundations
  - Proper Mounting Height and Arm length of poles
  - Use ODOT Traffic Standard Drawings and Specifications.

## 1. Pole placement

- Follow Roadside Design Guide and ODOT's standard practice
- Clear Zone requirement

## 5. Utility Coordination

- Type of service
- Voltage and Phase type

## 6. Agreement – Inter-government agreement set-up for electrical system

- Ownership
- Maintenance
- Financial responsibility for electrical consumption

## 7. Drafting check

- 1) Font type and size
- 2) Centerline and stationing
- 3) Line styles and weights
- 4) Layout and Title block
- 5) Conduit and wire symbols

## 9. Documentation

- ‘As Constructed’ Drawings
- Illumination material submittals and approval

## **Quality Assurance “Lite” for Traffic Signal Plans:**

*OAR 734 -020-0400 through 0500 requires the approval of all traffic signals on the State Highway System by the State Traffic Engineer. This includes the location and final design of all new and modifications to all intersections. This office will therefore review and approve all traffic signal plans.*

### Administrative requirements:

- Adherence to ODOT Traffic Manual
- Adherence to ODOT Traffic Signal Policy and Guidelines
- Adherence to MUTCD, with Oregon Supplements
- Adherence to NEC
- Adherence to ADA
- Adherence to ODOT Traffic Design Manual

### Traffic Engineering requirements:

#### Verify:

- State Traffic Engineer approval letter requirements have been addressed in the plans
- Each plan is stamped and signed by a PE, registered in Oregon, who is knowledgeable in the Traffic Engineering discipline
- Authorization for use of alternative equipment (design exceptions)
- Adherence to chosen design standards – ODOT and/or local agency (the MUTCD being the minimum requirement)
- Project solution is in accord with inter-agency agreement
- Equipment is appropriate for intended use, and standard equipment is called for where possible
- Plan information matches special provisions
- Controller cabinet located correctly
- Plan shows signal, illumination and ped pedestal pole locations
- Traffic and pedestrian signal head locations and overhead signs meet MUTCD and ODOT requirements for vertical, horizontal and lateral positioning
- Traffic signal head locations meet MUTCD and ODOT requirements for correct size, number and head configuration, with at least one signal head for each direction dimensioned to a lane stripe
- Normal Phase Rotation Diagram is correct

- Pole Entrance Chart is correct
- Loop Wiring Diagram is correct
- Railroad Matrix is correct
- Vehicle and/or ped detection equipment is located correctly
- Signal poles and mast arms are correct size and type
- All equipment is located within right-of-way or easements
- Equipment placement will be clearly visible and understandable to users
- The plan does not give illegible, extraneous or confusing information

Once the plans are approved:

- Assign TMS Drawing Numbers.
- For plans developed outside ODOT Tech Services- Sign dated “Reviewed” stamp or signature in sign-off box, and issue letter of approval to appropriate personnel, along with copies of the approved plans. File copies of drawings in the Traffic Design Section files.

## Quality Assurance “Lite” for Signing Plans:

Signing plans must adhere to the current MUTCD with Oregon Supplements, the ODOT Sign Policy and Guidelines, and the ODOT Traffic Sign Design Manual, with regard to content and format. Listed below are critical items to be checked.

### 1. PLANS

- Verify that signing plans follow the intent identified in the project prospectus with regard to the extent of sign replacement (complete vs. limited).
- A sign inventory is required to establish location, content, and condition of existing signs.
- Multiple plan sheets should be provided. Standard Signing Plan format includes Signing Plan sheets, Sign Detail sheets and Sign and Post Data Table sheets. If project signing is limited to a very small number of signs, the data may be incorporated into other project plan sheets.
- Verify that, at a minimum, all non-compliant signs are being replaced. Non-compliant signs include:
  - Signs that are no longer retroreflective. ( A good indication of this are signs listed in fair/poor condition on the sign inventory, or with faded appearance in photos.)
  - Signs that are the wrong color.
  - Signs with substandard legend sizes/fonts. Generally speaking, minimums for primary legends include: **Freeway/Expressway** – E(modified) font, 10

2/3" upper case with 8" lower case. Refer to MUTCD Tables 2E-1 and 2E-2 for sizes which vary with classification of interchange.

**Conventional highways** – 6" type C font.

- Verify that all non-compliant sign supports are being removed. Specifically, Pipe Supports are not allowed on the state highway system.
- Verify that signing plans include sign installation/removal/relocation as necessary in areas where the highway is being realigned, widened, or where lane configuration is changing (see striping plans). Verify that striping plans are consistent with signing plans.
- Verify that speed (limit) signs are placed according to the relevant Speed Zone Order. This includes SCHOOL SPEED 20 signs.
- Verify that SCHOOL SPEED 20 sign riders conform to new legislation effective July 1, 2004. **All** SCHOOL SPEED 20 signs on highways adjacent to school grounds within speed zones of 30 mph and less must include an AT ALL TIMES rider. See the Traffic Section website for other requirements ----  
[www.odot.state.or.us/traffic](http://www.odot.state.or.us/traffic).
- Verify that signs are standard sizes (3" increments for plywood and sheet aluminum, and 6" increments for extruded aluminum).
- Verify that sign substrate shown on plans is appropriate for the sign size. (Plywood signs generally should not exceed 8' wide x 4' high, and sheet aluminum generally should not exceed 4' in width.)
- Verify adequate sign spacing and placement. This requires that existing signing be shown on the plans.
- Verify that appropriate Standard Drawing numbers are listed in the title block on the first Signing Plan sheet.
- Verify that the plans are stamped by a Professional Engineer, registered in Oregon.

## 2. SPECIFICATIONS

- Ensure that applicable Special Provisions are included. Possible relevant sections include 160, 440, 530, 840, 902, 905, 910, 920, 930, 937, 940, 941, 945, 2530, 2560, and 2910.
- If concrete footings are included in the project, verify that steel and concrete quantities are included in Special Provisions Sections 920 and 930.
- Verify that listed Bid Items match materials listed in Sign and Post Data Table.

## 3. CONSTRUCTION SUPPORT

- Verify that Shop Drawings have been provided for each sign and support.
  - Sign Shop Drawings
  - Steel Support Drawings (based on field surveyed cross-section of site)

## Quality Assurance Short Review for Traffic Structures

### Purpose:

Specify the required documentation to make sure that all required documents are included in a project.

### Required Items Checklist:

- Prospectus
- Existing Project Plans and Structure Drawings
- Bridge Log for the appropriate Section of Highway
- Original Manufacturer's working drawings of the structure or field data
- Existing Loading on Structures
- Proposed New Loading
- Designers Final Plan Sheets
- Certified CALC Book – Includes analysis and design code
- Survey performed at each new structure location – Cross Sections
- Soils Investigation and Geotechnical Report at each new structure location
- Roadway Clear Zone Issues – Break away or not
- Structure Numbers, Structure Work Numbers, and Drawing Numbers
- Cost Estimate sheet
- Special Provisions Final
- Manufacture Working Drawings – Shop Drawings
- Construction Support Correspondence. Design in CALC book.
- Review all contract change orders for Traffic Structures
- Structures updated or added to the bridge log

- All drawings submitted for filing

### **Erosion Control QA (Light)**

#### **Process**

- Who is the project owner
- Erosion control (EC) shown on plans
- If not, should it have been
- Project work flow
  - EC in prospectus & schedule
  - EC work in logical order
  - Any unique problems
  - Unique problems resolved
- Design & plan review - QC
  - Was QC done before bidding
  - By who
  - Is a copy available
  - Did maintenance review
  - Review comments dealt with
- Project review – QA
  - Who performs QA
  - QA form forwarded to who

#### **Documentation**

- Is there project documentation directly affecting EC
  - Documentation noted
  - Documentation included
  - None included or noted
- Type of documentation
  - Roadway Design narrative
  - Staging narrative
  - EC Design narrative
  - Biological Opinion (BO)
  - Env. Document Type:
    - EA / FONSII / EIS
- Permits other than NPDES
- Misc. documentation

#### **Design & Site Issues**

- Extreme topography, problem soils
  - Example - long, steep slopes
- Design adequate for impacts
  - BMPs complete
  - Design is cost effective
  - Design is constructable
  - EC incl. const. detours
  - Const. access maintained
  - Sensitive areas dealt with

- EC design adequate to comply with NPDES permit (See *ODOT Hydraulics Manual, Vol. 2*)

### **Contract Documents**

- Erosion control plans
  - Plans clear & complete
  - Include all details & notes
  - Ground disturbance shown (toe of slopes, ditches, water quality features, et cetera)
  - Waterways, wetlands, other sensitive areas identified
  - "No Work" areas protected
  - Construction detours & potential staging areas shown
  - Plans conflict with landscaping, mitigation, or other work
- Specifications & Estimate
  - ODOT specifications used
  - Bid items complete & agree with Special Provisions
  - Unique work supported with adequate specs. & bid items
  - Estimate available, dollars adequate

### **Construction**

- Contractor's ESCP
  - Adequate ESCP Plan done, ESCM identified
  - Maintenance schedule shown
- Has construction begun
- Who is managing construction
- Any special EC instructions to Const. Project Manager
- Any issues unresolved
- EC designer assisting construction
- Monitoring begun, ODOT form used
- Any NPDES permit violations occur

### Abbreviations:

QA - Quality Assurance

QC – Quality control

EA – Environmental Assessment

FONSI – Finding of No Significant Impact

EIS – Environmental Impact Statement

ESCP – Erosion & Sediment Control Plan

ESCM – Erosion & Sediment Control Manager

## Roadway Quality Assurance “Lite” Review Checklist

### Prospectus

- Compare design elements below to what was prescribed in Prospectus.

### Designer Narrative

- Scope of project
- Design standards used
- Design criteria
  - Design speed
  - ADT
  - Functional classification
  - Freight route (Design Vehicle)
- List of any assumptions
- Design Exceptions

### Roadside Design

- Clear zone
- Appurtenances

### Cross-sections

- Lane/median/shoulder
- Rock Slopes & Ditches

### Geometry

- Horizontal Elements
  - Max curvature
  - standard spirals & superelevation
  - Intersections – ADA requirements, sight distance, turn lane width & storage
  - R/R Clearance
- Profiles
  - Max grades
  - Min K value
  - Bridge Clearance
- Staging – Cross-sections, Alignments, Tapers, Vertical Clearance

### General

- Drainage - Pipe data sheet included in plans
- Signal Plans included
- Signing Plans included
- Construction Note composition

### Specs

- Table of contents
  - Check each technical section for standard Bid Items to match
  - Check that each standard Bid Item has specs that match
  - Compare with document assembly to ensure all appropriate sections included
- Look for something out of the ordinary
  - Unique Bid Items and unique specs to go with them

## Traffic Control QA "Lite"

- ☀ Lane Restrictions/Road Closures
- ☀ Advance Signing
- ☀ Adequate Delineation (Channelization & Pavement Markings)
- ☀ Bicycle, Pedestrian Accommodations
- ☀ ADA Requirements
- ☀ Truck Accommodation (radii, horizontal & vertical dimensions)
- ☀ Abrupt Edges/Drop-Offs/Excavations
- ☀ Taper Lengths
- ☀ Accesses (Businesses & Private)
- ☀ Correct Use of Concrete Barrier & End Treatments
- ☀ Pay Items Listed in Specials match those on TCP Sheets
- ☀ Unit Price Contract vs. "Lump Sum"
- ☀ Standard Drawing List
- ☀ Design of Median Crossovers
- ☀ Reasonable Room for Construction Personnel & Equipment
- ☀ Typical Sections
- ☀ Detour Plan, if Applicable, Properly Signed, Logical
- ☀ Logical, Constructible Staging Plan:
  - Excessive "Magic Happening"
  - Excessive "Construct Under Traffic"
  - Work that Depends on Subsequent Work
  - Bridge Construction - Drives other Construction
- ☀ Working on Both Sides of Hwy. Concurrently
- ☀ End Panel Construction & Staging
- ☀ Temporary Signals (for Staged Construction)
- ☀ 24-Hour Flagging vs. Temporary Signals
- ☀ Signalized Intersection Work
  - Flagging in Multi-Lane Intersections
- ☀ Transverse Excavations