

# ODOT

## Design-Build Manual and Instructions for completing the Scope of Services form

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### ***Introduction to Design-Build***

This manual has been designed to help **ODOT** personnel in preparing the Scope of Services for Design-Build projects.

A clear project definition will help minimize change orders. A complete “Red Flag” summary and Preliminary Engineering will help determine scope issues. The type and amount of environmental resources (streams, wetlands, cultural resources, threatened and endangered species, etc.) impacted by a project can significantly affect project costs, schedule, and mitigation requirements.

Please follow these guidelines when writing the Scope of Services:

- Conduct a field review prior to writing the scope.
- Items such as fatigue analysis and corrosion protection system need to be evaluated up-front by the district, so that the required repairs can be defined in the scope.
- The Subsurface Exploration for the scoped work should be performed before writing the scope. This will allow the information to be given as part of the scope.
- Avoid using phrases such as: as directed by the engineer...; if recommended by the Department, typical work comments, the district preference is.....these are not contract rules and will invite negotiation and the lessening of quality during construction.
- Avoid using words such as: Rehabilitation of...; Reuse existing....; Repair .... If needed then set parameters so that all bids are even and work can be enforced during construction.
- When ODOT design and specification requirements allow more than one option, but the District has a preference, you **must** specify the preferred option in the scope.
- Avoid procedural directions in the construction process unless absolutely necessary.
- Remember that the Design-Build Team is only responsible for what is called for in the Scope of Services and the remainder of the Conceptual Documents. As a general rule, district preferences, plan notes and special provisions must be specifically listed or called for in the bid documents so that all Contractors can bid on them and the District can enforce them during construction.

### ***Design-Build project selection considerations***

- Projects which due to physical conditions demand an expedited schedule and can be completed earlier using design-build.
- Projects that require minimal Right-of-Way acquisition and utility relocation.
- Projects which qualify for an environmental Categorical Exclusion.
- Projects that do not have complicated geotechnical problems (e.g., slide repairs, rock cuts, mine remediation).
- Projects that can have a clearly defined Scope of Services and design basis.
- Ideally, projects should be scheduled for sale between August and September so the Design-Build Team can work on the design during the winter.
- Projects that have room for innovation in the design and/or construction effort.
- Projects that require expertise that is not available in-house.
- Projects that have limited railroad involvement.

### ***Design-Build Scope criteria***

The Design-Build scope of services documents must meet the following criteria:

- MS WORD
- 12 pt. font in Times New Roman
- 1" margins all around
- NO permanent tabs set
- Do NOT indent text
- Maps in .tif format only

### ***Design-Build As-Built Plan Requirements***

The District must forward one copy of the **final as-built plans** (submitted by the Design-Build Team as required in the Scope of Services) to the **Office of Reproduction** manager in Central Office.

These files **MUST BE** in **.TIF** format and can be either transferred directly to **Reproduction's** server or can be provided on CD.

If you have any technical questions regarding drawing / document submissions, please call the **Office of Reproduction** manager at 614-466-0024.

### ***Instructions for completing the Design-Build Scope Form***

#### **1. PROJECT IDENTIFICATION**

##### **1.1 Design Designation**

For each location, fill in the blanks according to **Location and Design Manual, Volume 3**, Section 1302.3.

##### **1.2 Existing Plans**

List existing plans available at the district and the name and number of a contact person.

##### **1A. Prima Facie Speed Limit**

The Prima Facie Speed Limit note (**Location and Design Manual, Volume 3**, Section 1302) is required for all projects when the speed limit is reduced in the construction zone. This must be used with the Work Zone Speed Limit sign note found in the **Traffic Engineering Manual (TEM)**.

The Prima Facie Speed Limit note is required for all projects when penalties are increased in the construction zone. This must be used with the Work Zone Increased Penalties sign note found in the **TEM**.

The Prima Facie Speed Limit note **must be signed** by the district deputy director before the final scope package is sent to Central Office.

For more information on these notes please refer to the **Traffic Engineering Manual**.

If speed reduction and increased penalties are not required, please state 'not applicable' in this section.

##### **1B. Railroad Coordination**

If railroad coordination is not required, please state 'not applicable' in this section.

**The involved railroad/railway should be contacted to determine their maximum review time for technical review and approval of projects that affect their rail lines.**

Necessary agreements with the railroads include “Preliminary Engineering Agreements” and Standard Railroad Construction Agreements.” These agreements are issued and executed by the State Rail Coordinator in Central Office. For projects with rail involvement, the State Rail Coordinator must be notified early in project project/scope development.

The applicable railroad’s Special Provisions for construction are to be included in the scope package. These Special Provisions may be obtained from the State Rail Coordinator.

### **1C. Airway/Highway Clearance**

Airway/Highway Clearance analysis should be provided according to **Location and Design Manual, Volume 3**. If airway/highway clearance is not required, please state ‘not applicable’ in this section.

### **2. PRE-BID MEETING**

Fill in the blanks.

### **3. ADDENDA**

Nothing required.

### **4. PREQUALIFICATION**

Nothing required.

### **5. CONTRACTOR’S CONSULTANT**

Fill in the pre-qualification(s) required for the Contractor’s Consultant and Sub-consultants.

### **6. SCOPE OF WORK**

Fill in the blanks.

Project description: add a brief narrative description of the work, as required in the **Location and Design Manual, Volume 3**.

Completion date: list completion dates (*if there are any interim completion dates, list them in the appropriate sections that follow*).

Warranties: list all applicable supplemental specification numbers and titles for warranted items.

## **7. FIELD OFFICE**

Specify type of field office according to **Location and Design Manual, Volume 3**, Section 1307.

## **8. GENERAL PROVISIONS FOR THE WORK**

**8.4** Fill in the blanks

**8.6** The District must determine whether a “formal” or “informal” partnering process will be used for the project. Formal partnering is typically used for projects that are more complex and/or have many stakeholders.

**8.7** Fill in the blanks

## **9. HAZARDOUS MATERIALS**

District must provide all bidders with any information relating to the presence of material and substances at the site which could create hazardous conditions. The type of contaminated material present, quantity of the contaminated materials, location, parties responsible for testing and handling requirements, and payment method should all be listed in this section.

If there is **no known hazardous material** present at the site, please include the following statement in this section:

At this time, the Department is not aware of, nor is in possession of, any information relating to the present of hazardous material at the site.

In case of asbestos material, list the SFN and bridge number of all affected structures and use one of the following three options:

### **OPTION 1:**

Asbestos inspection has been conducted by a certified asbestos hazard evaluation specialist on \_\_\_\_\_. The inspection determined that no asbestos is present on the following structures. See attachment \_\_\_\_\_ for inspection results.

### **OPTION 2:**

Asbestos inspection has been conducted by a certified asbestos hazard evaluation specialist on: \_\_\_\_\_. See attachment \_\_\_\_\_ for inspection results.

Asbestos containing materials were encountered. All suspect materials shall be removed

and properly disposed of by a certified Asbestos Removal DBT in accordance with Ohio Administrative Code (OAC) 3745-20. An individual trained in the provisions of NESHAPS (40 CFR Part 61, subpart M) will be on site during the Demolition or Renovation of any structure with Asbestos Containing Materials (ACM) and evidence that the required training has been accomplished by this person will be available during normal business hours.

All associated costs of asbestos materials to be removed and properly disposed of, will be paid under 'Third party billing' provisions of ODOT change order policy 510-010(P) Appendix E.

### **OPTION 3:**

The DBT shall conduct asbestos inspections of all bridges subject to renovation or demolition as per Chapter 3745-20 of the Ohio Administrative Code (OAC) "Asbestos Emission Control from Renovation/Demolition and Waster Disposal Operation" May 29, 1990 utilizing a certified Ohio Asbestos Hazard Evaluation Specialist. Should suspect Asbestos Containing Materials (ACM) be encountered; perform bulk sampling and analysis. Prepare a letter report (1-2 pages) including a brief discussion of the inspection of and sampling methodology, mapping indicating the bridge location and sampling locations, and analytical test results.

For all options, at least 10 working days before operations begin, the DBT shall complete an Ohio Environmental Protection Agency (OEPA) 'Notification of Demolition and Renovation' form and submit this to the local air pollution control division, if delegated, or OEPA.

The DBT shall provide a copy of the completed form to ODOT. Payment for all fees, labor and material needed to inspect the bridges and submit OEPA notification shall be included in the appropriate Structure Remove Lump Sum bid item.

Should asbestos containing materials be encountered, all suspect materials shall be removed and properly disposed of by a certified Asbestos Removal DBT in accordance with OAC 3745-20. An individual trained in the provisions of NESHAPS (40 CFR Part 61, subpart M) will be on site during the Demolition or Renovation of any structure with ACM and evidence that the required training has been accomplished by this person will be available during normal business hours.

All associated costs of asbestos materials to be removed and properly disposed of, will be paid under ‘Third party billing’ provisions of ODOT change order policy 510-010(P) Appendix E.

### **10. ENVIRONMENTAL**

District should make sure that all necessary permit applications have been submitted, approved and available for review if requested by the bidders. **In general**, NEPA approval is required prior to award of the design-build contract.

The scope preparer should determine a project impact area for the design build project. This area will be sized to accommodate a “worst case scenario” from an environmental perspective. It will include all anticipated work areas (including temporary work areas). Assume that all environmental resources within the project impact area will be negatively impacted.

A waterway permit determination will be completed by ODOT prior to scope approval.

Should the project meet the requirements of the US Army Corps of Engineers (USACE) Nationwide Permit Program, the State of Ohio Department of Transportation Regional General Permit, of a Category 1 or 2 Isolated Wetland Permit The Office of Environmental Services/ Waterway Permits Unit (OES/WPU) will process the permit and provide the Special Condition Package to the Project Manager and the District Environmental Coordinator for inclusion in the Scope of Services Form.

Should the project require an Individual 404 Permit, a 401 Water Quality Certification, or a Category 3 Isolated Wetland Permit the DBT will be scoped to prepare the permit applications subject to OES/WPU review, comment and approval. The permit application(s) shall be developed in compliance with latest version of the ODOT Waterway Permit Manual. Any required compensatory mitigation for impacts to streams, wetlands, or endangered species will be defined by the OES/WPU at the time of the permit determination.

The OES/WPU will coordinate and submit all complete permit applications, including the mitigation plans to the USACE and Ohio EPA.

List all permits and their approval dates in this section of the scope.

### **11. RIGHT OF WAY**

If minimum right of way is needed for the project, **in most cases it will** be acquired by ODOT. Please delete the current wording in Section 11 of the scope and replace it with the following:



*The purchase of additional right of way will be necessary to accommodate the construction of this project. All necessary rights of way for the construction of the project will be acquired by ODOT. Any Relocation Assistance Program study, if required, will be performed by ODOT.*

*The right of way will be cleared and available for occupancy by the DBT no later than \_\_\_\_\_.*

*Right of way plans and legal descriptions will be prepared by the DBT. The DBT will be pre-qualified in Right of Way Plan Development by ODOT.*

*The Submission of R/W Plans will be made by the DBT as required in Section 18, Plans Submittals and Review Requirements, of this document no later than:*

Contact the Office of Production if Right of Way will be acquired by the DBT.

### RIGHT OF WAY PLANS

The right of way plans will be prepared in accordance with ODOT's **Real Estate Policies and Procedures Manual** and other specifications and manuals, as applicable, and will include the following:

- 1.1 Legend Sheet
- 1.2 Centerline Plat
- 1.3 Property Map
- 1.4 Summary of Additional Right of Way
- 1.5 Right of Way Detail Sheets
- 1.6 Legal Descriptions
- 1.7 Special Plats (Railroad, Government, etc.) as required

Approximate Number of Affected Ownerships: \_\_\_\_\_

[The approximate number of affected ownerships shown hereon is estimated. The actual number of affected ownerships may vary depending on the work being performed, the final determination of property lines or any property splits. The total number of parcels (permanent and temporary) may vary from the number of affected ownerships.]

The Right of Way Cost Estimate will be provided by ODOT.

42 Year Title Searches and Title Reports will be performed by an ODOT pre-approved Title Agent as contracted by the DBT prior to the Preliminary **Right of Way** Plan Review Submission. Continuation of Title Reports will be performed by an ODOT pre-approved Title Agent as contracted by the DBT prior to the Submission of R/W **Tracings**.

### **Title Report**

The DBT will be responsible for submitting a Title Report and Title Chain for any acquisition in accordance with the **Real Estate Policies and Procedures Manual** which will identify ownership, liens, or other interests in the property to be acquired. A report shall be prepared for each property. Said Title Report will cover a period of ownership of not less than 42 years. Title Reports will be submitted to the District Real Estate Administrator no later than the Preliminary **Right of Way** Plan Review Submission.

### **Continuation of Title Report**

The DBT will be responsible for submitting a Continuation of Title Report and if applicable, a Title Chain, for any acquisition in accordance with the **Real Estate Policies and Procedures Manual** which will identify ownership, liens, or other interests in the property to be acquired. A report shall be prepared for each property. Said Continuation of Title Report will cover the period of time from the completion of the original title report to no more than fifteen (15) working days immediately prior to the Submission of R/W Plans. Continuation of Title Reports will be submitted to the District Real Estate Administrator no later than the Submission of R/W **Tracings**.

Existing and proposed right of way lines will be located by the DBT based on requirements specified in Chapter 4733-37 of the Ohio Revised Administrative Code (Board Rules) governed by regulations outlined in Chapter 4733, Ohio Revised Code (Regulation Laws) and in accordance with any special requirements of the County(s) in which the project is located. It is the responsibility of the DBT to research right of way information from all available sources including but not limited to ODOT records, County road records, Commissioners' Journals and records of other County offices to the extent necessary to provide an accurate basis for the establishment of the right of way.

The DBT will establish an accurate centerline of right of way as legal descriptions are tied to said centerline.

The DBT will set monuments on all property line intersections, breaks and corners on the proposed permanent right of way lines. The District Real Estate Administrator will notify the DBT when these monuments/hubs are to be set, by letter, when the right of way acquisition is complete. The DBT will certify, by letter, to the District that the work was completed.

The DBT will stake and flag the proposed right of way in the field prior to the start of construction and will maintain said stakes through the duration of the project. Staking and flagging of the proposed right of way to facilitate appraisal and negotiation will be done by the DBT upon request by ODOT.

The DBT will identify and show all right of way encroachments on the right of way plans at the **Preliminary Right of Way** Review Submission. ODOT's District Office will be responsible for clearing all encroachments on Federal-aid projects in accordance with standard encroachment removal procedures.

The type of title to right of way (standard highway easement or warranty deed) designated for the roadway portion of a project will depend on the nature of the project itself. Once project development has progressed to the point where a determination of type of title and amount of right of way can be made, the DBT shall promptly provide pertinent information developed to date, as deemed necessary by the District Real Estate Administrator, for the latter to make an informed decision in this matter.

The DBT will utilize property ownership data for right of way plan development based on a search of County records conducted no more than six (6) months prior to the **Preliminary Right of Way** Review Submission. The DBT will submit copies of each property owner's record deed transferring title to that owner to the District Real Estate Office with the **Preliminary Right of Way** Review Submission. In cases where partial title interest is conveyed, copies of any supplemental documents required to delineate property lines and title will also be submitted. A report, if needed, identifying any title defects encountered for the affected parcels will be included with the deed copies. This submittal will also include all applicable tax maps.

In addition, no more than fifteen (15) working days prior to the Submission of R/W **Tracings**, the property ownership data will be checked and verified. Copies of deeds for any new ownership transactions that impact the project will be submitted to the District Real Estate Administrator. An in-depth field review of the project will also be conducted within the same fifteen (15)

working day period to assure that no topographic features, structures and/or utilities have been changed or omitted. The right of way plan and descriptions will be revised to accurately reflect the above information. The actual dates that the ownership data and topography were checked and verified will be shown on the plans and in the submittal letter with the Submission of Right of Way **Tracings**.

The DBT will determine specifications regarding individual County requirements pertaining to the preparation of legal descriptions, plats and any other required documents. All legal descriptions will be prepared in accordance with standards of the County(s) involved and will be pre-approved by the County(s) where permitted. Prior to the Submission of **Preliminary** R/W Plans, the DBT will submit the legal descriptions to the appropriate County, with a copy to the District Real Estate Administrator, for pre-approval. The DBT will then verify the County's response at the Submission of R/W Plans. The DBT will assure mathematical closure of each right of way parcel and provide the District Real Estate Administrator with a computer printout demonstrating this fact. The DBT will be responsible for revision/correction of any instruments deemed unacceptable for transfer by the County Recorder's Office.

The DBT will submit legal descriptions in electronic format using ODOT's current **RX forms as specified in the Real Estate Policies and Procedures Manual** or as directed by the District Office.

During the acquisition phase, all revisions to the construction plans, right of way plans and/or legal descriptions deemed necessary by ODOT will be performed by the DBT, as directed, in such a manner as to facilitate the timely acquisition of right of way.

ODOT's District Office will be responsible for preparing the Certificate of Rights of Way to the FHWA.

## **12. UTILITIES**

**12.1** List all underground and overhead utilities, similar to a Utility note.

**12.3** If Subsurface Utility Engineering is needed specify what level type is required: A, B, C or D.

If Subsurface Utility Engineering is not needed, please state 'not applicable'.

### **13. DESIGN AND CONSTRUCTION REQUIREMENTS: MAINTENANCE OF TRAFFIC (MOT)**

**13.2** Fill in the blanks

**13.3** This section should include any district preferences, traditional plan notes, special provisions, and all work descriptions and requirements to be enforced during construction.

**Note:** The District Work Zone Traffic Manager (DWZTM) or the Maintenance of Traffic Exception Committee (MOTEC) shall be consulted as needed. Also, refer to Policy no. 516-003(p) titled “Traffic Management in Work Zones for Interstate and Other Freeways” effective 7/18/00.

**The following is a checklist of items that should be considered when writing this section:**

#### **Traffic Management**

- a. Capacity Analysis - lanes required, length of queues anticipated.
- b. Exceptions to Permitted Lane Closure Maps/Schedules may be permitted. Exceptions must be requested through the Multi-Lane Coordinator for a waiver or modification of the lane closure restrictions at the site.
- c. Time restrictions - peak hours - seasonal peaks – special events (sports, fairs, etc.),
- d. Limits to work areas:
  - i. project work limit,
  - ii. MOT work limits.
  - iii. number of lanes
  - iv. revise signal timing (see 16.4 Traffic Signals)
- e. Capacity of detours:
  - i. traffic volume,
  - ii. vehicle type.
- f. Work vehicle access and proper parking:
  - i. acceleration or deceleration lanes needed,
  - ii. worker parking,
  - iii. deliveries.
- g. Bicycle and pedestrian traffic:
  - i. will they be maintained - on and/or off road,
  - ii. special provisions e.g. covered walkways.
- h. Warning sign locations - detours, long queues, intersecting roads:
  - i. adequate space for advance warning,

- ii. adequate lateral clearance for placement,
  - iii. effect on permanent signs -spacing - covering etc.,
  - iv. use of Portable Changeable Message Signs (PCMS).
- i. Railroad crossings and train frequency,
- j. Nighttime delineation and illumination,
- k. Signals, turning lanes, bus stops:
  - i. effect on signal operation,
  - ii. will turning lanes be closed,
  - iii. bus stops relocated.
- l. Intelligent Transportation System (ITS) deployment for work zones.
- m. Entrance ramps (location, volume, impact on mainline)

### Construction Requirements

- a. Phasing of work,
- b. Ramps that may be closed,
- c. Night work restrictions,
- d. Holidays and weekends lane closures,
- e. Lane closures for bridge steel erection,
- f. Maximum length of work area or lane closure,
- g. Width restrictions
- h. Number of work areas,
- i. Duration of work,
- j. Special conditions such as drop-offs, sign bridge installations, etc.,
- k. Curing time - or any other factor that affects how long the work will take,
- l. Special contract provisions needed,
- m. Incentives and disincentives,
- n. Short duration closures anticipated,
- o. Temporary drainage,
- p. Lights for night work,
- q. Temporary roadway lighting,

Pavement marking requirements for 2 season projects.

### Operational Performance

- a. Speed management - regulatory or warning,
- b. Law Enforcement Officers (LEO):
  - i. number of LEOs,

- ii. when to utilize,
  - iii. pull off areas for violators.
- c. Start-up procedures and phase changes,
- d. Temporary Barrier installation:
  - i. Can portable barrier be stored in the median over the winter shutdown?
  - ii. Geometry of temporary roadways,
  - iii. Is there going to be a drop off in the construction zone?
  - iv. If so then attach the Drop off in Construction Zone plan insert sheet.

### Constructability

- a. Structural capacity of bridges, shoulders, and pavement,
- b. Can project be completed in one construction season/winter work or shut down?
- c. Will strategy allow the DBT to finish project in acceptable time?
- d. Status of existing traffic control devices - signals, signs, railroad crossings, etc,
- e. Wintertime restrictions - snow removal, etc,
- f. Can temporary barrier be stored in the median during winter shutdown?
- g. How many breaks in the barrier will be permitted for construction access?
- h. Will impact attenuators be required? If so, temporary or permanent?
- i. Is the DBT required to provide a detail of construction ingress/egress area?

### Emergency Planning

- a. Incident management plans,
- b. Emergency medical assistance (EMS),
- c. Accidents, breakdowns, tow trucks,
- d. Snow removal,
- e. Emergency closures,
- f. Utility interruptions,
- g. State police,
- h. Local law enforcement.

### Coordination

- a. Local officials - police, fire, hospitals, schools, environmental agencies, utilities, toll facilities, ferries, railroads, airports,
- b. Public awareness - media, motorist service agencies, local businesses, motor carriers, use of PCMS,
- c. Special events,

- d. Intra-agency coordination - maintenance crews, permits section, adjacent projects,
- e. Transit.

### **14. DESIGN AND CONSTRUCTION REQUIREMENTS: LOCATION & DESIGN**

#### **14.1 Survey**

Make sure all items listed are provided. If items do not apply or cannot be provided, please cross them out of the scope.

If Digital Terrain Model (.tin) is required, then specify that DBT is to provide a GEOPAK Digital Terrain Model (.tin file) based on the surveyed points, and that point usages and break line determination must be from the ODOT standard Survey Manager Database (.smd file).

If Coordinate Geometry Database (.gpk) is required, then specify that DBT is to Provide GEOPAK Coordinate Geometry Database (.gpk file) and that this file should contain all alignment, right of way and property line data.

Each of the following sections should include any district preferences, traditional plan notes, special provisions, and all work descriptions and requirements to be enforced during construction.

#### **14.2 Vertical and Horizontal Alignment**

- a. Address mainline, side roads and ramps
- b. Are horizontal alignment and vertical profile existing, new or a combination of both?
- c. At what interval will cross sections be required? (usually 50' and any abrupt changes.)
- d. Identify and correct all deficiencies in horizontal and vertical alignment?
- e. Correct superelevation deficiencies?
- f. Correct only at specified locations?
- g. Increase sight distance at intersections to SSD or ISD?
- h. Increase vertical clearances at structures?

#### **14.3 Pavement**

- a. Address mainline, side roads and ramps
- b. Soil Stabilization needs to be determined by the DBT?
- c. Initial soil exploration data shall be provided by the Department. The DBT will



- analyze the subgrade according to **Geotechnical Bulletin 1 (GB1)**: Plan Subgrades. Collection of additional soils information shall be the responsibility of the DBT and considered incidental to the design effort.
- d. Pavement buildup to be specified by DBT?
  - e. If by DBT, based on what CBR.
  - f. Shoulder buildup if different than minimum required by standard?
  - g. Pavement, paved shoulder and graded shoulder widths if other than required by standard?
  - h. Curb and gutter?
  - i. Curb only?
  - j. Full depth/partial depth pavement repairs?
  - k. Resurfacing thickness?
  - l. Warranty pavement?
  - m. Concrete or asphalt required?
  - n. Rumble strips required?
  - o. Free draining base required?
  - p. Location of underdrains?

### 14.4 Roadway

- a. **Perform capacity analysis?**
- b. Address mainline, side roads and ramps.
- c. Number of lanes?
- d. Number of turn lanes?
- e. Type of grading (e.g., safety, clear zone, standard)?
- f. District preferences for mailbox support replacement?
- g. Replace all guardrail?
- h. Specify approach slab width.

### 14.5 Drainage

- a. Address mainline, side roads and ramps
- b. Retain existing system?
- c. Specify clean out or repairs needed.
- d. New open or closed drainage system?
- e. Raise catch basins, inlets and manholes to accommodate resurfacing or feather pavement?
- f. Catch basins or sodded flumes for bridge drainage?

- g. County Engineer flow line approvals?
- h. FEMA approvals?
- i. COE/EPA approvals?
- j. Additional right of way required at culverts?
- k. Can existing drainage conduits be reused as long as there is not a conflict with new construction?
- l. Will new headwalls be required for existing drainage conduits?
- m. Is there any intent to address possible drainage problems outside the toe of the embankment?
- n. If new underdrain runs are required, are there any ROW restraints for ditches? Would a closed system be required for outlets? Note: indicate that additional ROW acquisition is not allowed.
- o. Post-construction storm water Best Management Practices (BMP) according to **Location and Design Manual, Volume 2.**

### **14.6 Design Exceptions**

- a. Are there any known design exceptions at this time? If so, list them.

### **14.7 Interchange Justification/Modification Study**

- a. Does an IMS/IJS need to be completed for this project? If so, provide a reference to the approved document.

### **14.8 Landscaping**

- a. What is the extent of landscaping?
- b. Are the plantings provided by the ODOT Tree Legacy Program?

### **14.9 Fencing**

- a. What is the need for fencing?

### **14.10 Additional Description of Required Work:**

- a. This section should include any additional provisions needed.

## **15. DESIGN AND CONSTRUCTION REQUIREMENTS: STRUCTURES**

**15.1** Make sure all items listed are provided. If the items listed do not apply, please remove them from the scope.

**15.2** Fill in the blanks for all structures on the project.

**15.3** Fill in the blanks for each structure.

**Additional Description of Required Work and special provisions** section should include any district preferences, traditional plan notes, special provisions, and all work description and requirements to be enforced during construction.

**15.4** Noise Barrier - fill in the project specific requirements for each sub-section:

- a. General Noise Barrier Requirements:
- b. Noise Barrier Panels and Posts: Initial soil exploration data shall be provided by the Department. Collection of additional soils information shall be the responsibility of the DBT and considered incidental to the design effort.
- c. Noise Barrier Bearing Pad and Block Riser:
- d. Noise Barrier Foundations:
- e. Specific Barrier Descriptions:
- f. Other Noise Barrier Requirements:

If needed, add sections (i.e. 15.5, 15.6, etc.)

**The following is a check list of items that should be considered when writing the structure requirements sections:**

### **HYDRAULICS**

- a. ODOT shall determine if a flood hazard evaluation is necessary.
- b. Be aware that a decrease in the waterway opening must be carefully considered. In a designated Flood Insurance Area, generally a decrease in the waterway opening is not acceptable.

### **HORIZONTAL AND VERTICAL CONTROLS**

- a. Will lane additions to the outside affect the existing structures, including clearances?
- b. Will lane additions to the inside affect the existing structures, including clearances?
- c. Are the clearances (vertical and horizontal) adequate? If not, state the clearance that is desired (minimum or preferred).
- d. Bridge roadway width should be stated if a width greater than the minimum required is desired.

### GENERAL

- a. Aesthetics - state any requirements in scope.
- b. Protective Coating requirements, if any? Paint, Galvanized, shop metallized, etc. (Include, if not in manual, any special notes, etc.)

### REHABILITATED STRUCTURES

#### Superstructure

- a. Do the existing beams meet loading criteria [as given in the **Bridge Design Manual (BDM)**]?
- b. Merlin Dash or comparable analysis (with composite action) should be completed prior to writing the scope.
- c. If the beams need the load carrying capacity increased beyond being made composite (i.e. moment plates, etc.) replacement is preferred.
- d. Do the existing steel beams meet the AASHTO fatigue criteria?
- e. If not, specify fatigue retro-fit or new beams. Analysis should be done prior to scope.
- f. Are hinges utilized? If so, consider removing.
- g. If the beams are to be replaced, should any replacement superstructure type be ruled out?
- h. Is the deck to be retained or replaced?
- i. If the deck is to be retained, is an overlay necessary? If so, specify type.
- j. Eliminate the longitudinal joint? See the **BDM**, section 405.1

#### Abutments

- a. Are the abutments to be salvaged or replaced? Refer to the **BDM**, section 403.
- b. If the abutments are replaced, define type acceptable if there are any limitations.
- c. If the abutments are to be salvaged, what is the load carrying capacity?
- d. If the footings are to be retained and are supported on piles, are the pile logs available?
- e. If their condition is good, stub and integral type abutments should be considered acceptable if the dead loads are increased by 20% or less due to the new superstructure (live + dead loads) and the bearing locations are not changed.
- f. Foundations should be considered acceptable if the increase in load is less than given in the following list for appropriate type
- g. Friction piles of Drilled Shafts - 15%
- h. Piles bearing on rock - 30%

- i. Drilled shafts with rock sockets - no limit
- j. Backwall - retained or replaced? If replaced, should there be any restrictions as to type?
- k. Abutments founded on spread footings not on bedrock are not permitted, unless they are founded below the stream thalweg.

### Piers

- a. Are the piers to be retained or replaced? Refer to the **Bridge Design Manual**, Section 403.
- b. For piers that are functioning properly and are in good shape, the requirements to meet code requirements can be waived if the superstructure loads are not increased by more than 15% and the new beam lines are placed in the same bearing location (except wall type) as the existing beam lines. This should be analyzed for each structure, prior to scope.
- c. Piers on spread footings, not on bedrock, in a stream shall be replaced.
- d. If the footings are to be retained and are supported on piles, are the pile logs available?

## NEW STRUCTURE

### Superstructure

- a. Should any structure types be ruled out?
  - i. Note: A588 weathering steel is now permitted on any structure.
  - ii. Box beams - can the superstructure be non-composite or is composite required.
- b. Is a specific size (length) structure desired?
  - i. If so, give the minimum acceptable length (begin - end stations)
- c. Are utilities to be banned from the structure? If so, no utilities shall be placed on the bridge. The **BDM** suggests to keep utilities off.

### Substructure

- a. Should any substructure type be ruled out?
  - i. Example - No capped pile piers for overpass structures.
- b. Any need to limit the abutment type?
- c. The **BDM** does not limit the use of spread footings except when in streams.
- d. **Location and Design Manual, Volume 2**, Section 1008 provides limitations on the use of spread footings for arch or flat slab topped culverts.

## **16. DESIGN AND CONSTRUCTION REQUIREMENTS: TRAFFIC CONTROL**

### **16.1 PAVEMENT MARKINGS AND DELINEATORS**

This section should include any district preferences, traditional plan notes, special provisions, and all work descriptions and requirements to be enforced during construction.

**The following is a check list of items that should be considered by the district and added on to this section:**

#### **Pavement Markings**

- a. Specify the type of pavement markings required for concrete or asphalt surface from Table 397-1 Material Selection for Pavement Marking and Expected Life in Years in the **Traffic Engineering Manual**, including township, county and state route crossroads.
  - i. 642 Traffic Paint
  - ii. 643 Polyester
  - iii. 644 Thermoplastic
  - iv. 645 Preformed Pavement Marking
  - v. 646 Epoxy Pavement Marking
  - vi. 647 Heat-Fused Preformed Pavement Marking
- b. Specify the extent of the marking for township, county and state route crossroads.
  - i. Edge line,
  - ii. Lane line,
  - iii. Center line,
  - iv. Channelizing line,
  - v. Stop line,
  - vi. Crosswalk line,
  - vii. Transverse line,
  - viii. Handicap symbol marking,
  - ix. Railroad symbol marking,
  - x. School symbol marking,
  - xi. Parking lot stall marking,
  - xii. Lane arrow (see range of spacing distances on TC-71.10),

- xiii. Word on pavement (see range of spacing distances on TC-71.10),
- xiv. Dotted line.

### **Raised Pavement Markers**

- a. Provide all the locations for raised pavement marker items to the DBT.
  - i. Raised pavement marker
  - ii. Raised pavement marker casting, installation only
  - iii. Raised pavement marker, installation only
  - iv. Prismatic reflectors.

### **Delineators**

- a. If the district has a preference , then specify type of delineator needed:
  - i. Delineator, Type \_\_\_\_\_, post mounted
  - ii. Delineator, Type \_\_\_\_\_, bracket mounted
  - iii. Temporary Delineator, Type \_\_\_\_\_
  - iv. Delineator Removed for (storage or disposal)
  - v. Reflector, Type \_\_\_\_\_

### **Barrier Reflectors**

- a. If the district has a preference , then specify type of Barrier Reflectors needed
  - i. Barrier Reflector, Type \_\_\_\_\_

### **Object Markers**

- a. Provide all locations of object marker items to the DBT
  - i. Sign, Flat Sheet, Type G, H or J

## **16.2 SIGNING**

This section should include any district preferences, traditional plan notes, special provisions, and all work descriptions and requirements to be enforced during construction.

**The following is a check list of items that should be considered by the district and added on to this section.**

**Signs - The suitability of the existing signing should be evaluated.**

- a. Are all of the existing signs adequate?
- b. Are the existing signs in conformance with the OMUTCD?

- c. Are there nonstandard signs used that should be replaced with standard signs?
- d. Are larger signs needed?
- e. Should additional signs be installed?
- f. Should existing unnecessary signs be permanently removed?
- g. Are there optional sign treatments that should be considered?
- h. Are there signs in less than optimal locations that can be relocated to improve effectiveness? This would include signs located in vertical or horizontal curves, or obscured by overpasses or other structures.
- i. Are there signs that should be supplemented with hazard identification beacons?

**Sign Supports - The suitability of the existing supports should be evaluated.**

- a. Are the existing supports adequate for the sign area?
- b. Are the existing supports in the proper locations?
- c. Are the existing supports in good structural condition?
- d. Do the existing supports in exposed locations meet current breakaway criteria?
- e. Are the existing nonbreakaway supports adequately protected by guardrail or barrier?

**Flat Sheet Signs**

- a. Typically, all flat sheet signs on a project should be upgraded, even if some have not reached the end of their useful life.
- b. It should be made clear to the DBT that ODOT maintains the STOP signs on the intersecting non-state roads.
- c. The road name signs on conventional state highways are usually maintained by the local jurisdiction. ODOT can decide to install road name signs (including advance signs) if desired. This can be selectively done on an intersection by intersection basis.
- d. Optional signs that are to be included should be sufficiently described. This includes destination signs, cross road and side road intersection warning signs, other warning signs, generator signs, and recreational and cultural interest area signs.
- e. If supplemental left side mounted signs are to be used at any locations, the District should specify where.
- f. If oversized signs are to be used at any locations, the District should specify where.
- g. If some signs will be provided by ODOT for DBT installation, such as Ohio Byway signs, this needs to be clearly indicated.
- h. Specify the minimum mounting height and lateral offset if different from the OMUTCD and Standard Construction Drawing requirements. If a maximum mounting height is desired, this needs to be specified as well.



- i. If some flat sheet signs will be mounted overhead, this needs to be specified.
- j. Typically, removed flat sheet signs should be disposed of by the DBT.

### Extrusheet Signs

- a. Typically, all extrusheet signs on a project should be upgraded, even if some have not reached the end of their useful life.
- b. Optional signs that are to be included should be sufficiently described. This includes additional advance guide signs, generator signs, and recreational and cultural interest area signs.
- c. Specify the minimum mounting height and lateral offset if different from the OMUTCD and Standard Construction Drawing requirements.
- d. Specify where extrusheet signs will be mounted overhead.
- e. Specify that wide, narrow signs, such as destination signs on conventional highways, be made of extrusheet.
- f. For freeway and expressway mainline designable guide signs, the element sizes (level of signing) should be indicated if it may be unclear to the DBT what level would be required, or if the District desires to use a higher level than required by the OMUTCD and TEM.
- g. If some signs will be provided by ODOT for DBT installation, such as state line signs, this needs to be clearly indicated.
- h. For freeway and expressway guide signing, the District should scrutinize the current signing, and decide if different signing strategies should be employed. This includes the increased use of sign spreading, interchange sequence signs, and diagrammatic signs (OMUTCD Sections 2E-10, 2E-37 and 2E-19, respectively).
- i. For freeway and expressway guide signing, unnecessary pull-thru signs should be eliminated. (See OMUTCD Section 2E-11.)
- j. Freeway and expressway entrance ramp approach signing that is located beyond the right-of-way and is not on a rural state route or state route extension in a municipality is not the responsibility of ODOT. If this signing will be included, it should be clearly indicated. (Consent of the local jurisdiction may be required.)
- k. TODS and logo signs are installed and maintained by Ohio Logos, Inc., under contract with and in locations approved by ODOT. Under the terms of the contract, Ohio Logos can be required to temporarily remove or relocate the signs during construction. They can also be required to permanently remove or relocate the signs.
- l. Typically, removed extrusheet signs should be disposed of by the Contractor.

### Ground Mounted Post Supports

- a. Typically, all ground mounted post supports should be upgraded. All post supports in exposed locations not meeting current crash testing requirements (e.g. back-to-back u-channel posts) must be replaced.
- b. For No. 2 and No. 3 posts, direct driven u-channel, direct driven square post, and square post in anchor base are considered as equivalents on SCD TC-41.20. If the District prefers one support system, this needs to be described. (Even if square post is specified for flat sheet signs, the District may want to consider allowing u-channel for small extrusheet signs to simplify sign attachment to support.)
- c. If the District wants a breakaway connection used, this needs to be described in detail.
- d. Typically, removed ground mounted post supports should be disposed of by the DBT.

### Ground Mounted Beam Supports

- a. Will the existing supports be reused? Galvanized steel structural beam sign supports can oftentimes be reused if they are in good condition, in the correct location, and the replacement sign is of a comparable size.
- b. For structural beam supports, the slip base and alternate connection as shown on SCD TC-41.10 are considered as equivalents. The slip base connection will usually be supplied due to its lower cost. If the District wants to require the exclusive use of the alternate connection, this needs to be specified.
- c. Structural beam sign supports subject to multidirectional impacts at intersections should use the alternate connection on sizes larger than S4 x 7.7.
- d. If the District wants to use a different support system, such as the laminated veneer wooden beams, this needs to be described in detail.
- e. Typically, removed ground mounted beam supports should be disposed of by the DBT.

### Overhead Supports

- a. Due to the high cost of overhead supports, the District will need to determine in advance which overhead supports will be reused in place, relocated, or replaced, and where new overhead supports will be installed.
- b. Overhead sign supports should be inspected by the District to determine their condition and structural adequacy.
- c. The steel portions of existing structures that will be reused can be recoated using the standard four-step process developed for this purpose. This process can also be applied to new structures.

- d. Specify the required vertical clearance of overhead signs. OMUTCD Section 2A-18 defines this as seventeen feet, except when other structures use a lesser clearance. In this case, the vertical clearance does not need to be greater than one foot higher than the minimum design clearance of other structures. However, whenever possible, a seventeen foot clearance is recommended.
- e. Consideration should be given to revising median end frame foundations that are encased in barrier wall assemblies to the top of the concrete barrier (SCD TC-21.40). The barrier wall assembly can result in increased maintenance as this design will tend to accumulate debris that will need to be periodically removed to avoid vegetation growth.
- f. If end frames and poles located in the clear zone do not meet current requirements for shielding (guardrail or barrier), a determination will need to be made regarding appropriate remedial measures.
- g. The use of aesthetic treatments should be considered in accordance with ODOT policy.
- h. Sign attachment assemblies, which include the z-bar, u-bolts, clamps and miscellaneous hardware, can be reused if they are in good condition and the replacement sign is the same size as the existing sign. If not, these should be replaced.
- i. **Sign lighting components should be removed and disposed of by the contractor.**
- j. Typically, removed overhead supports and sign lighting components should be disposed of by the DBT.

### 16.3 LIGHTING

This section should include any district preferences, traditional plan notes, special provisions, and all work descriptions and requirements to be enforced during construction.

In addition to highway lighting, will the project requirements include items for river navigation lighting or airway clearance?

**The following is a check list of items that should be considered by the district and added on to this section.**

**What is the amount of highway lighting to be installed on the project?**

- a. No lighting, Briefly explain why no lighting is required,
- b. Partial interchange,

- c. Complete interchange,
- d. Continuous,
- e. Safety rest area,
- f. Rest area,
- g. Weigh station.

### **What is the type of lighting equipment to be installed?**

- a. Conventional,
- b. Off highway,
- c. Low mast,
- d. High mast,
- e. Underpass,
- f. Post top,
- g. Decorative.

### **What type of light source is to be used (e.g. high pressure sodium, induction, light emitting diode or metal halide)?**

### **Owner preferences**

- a. Brands and model of luminaries,
- b. Brands of lowering devices,
- c. Type of pullboxes,
- d. Wiring methods,
- e. Maximum wire sizes,
- f. Metered electric,
- g. Type of conduit.

### **Equipment details**

- a. Mounting heights,
- b. Power supply locations,
- c. System voltages.

### **Are aesthetic devices required?**

### **Is light trespass into surrounding areas a concern?**

- a. Public meetings and input,
- b. Cut-off luminaires,
- c. Low mast or conventional instead of high mast.

### **If lighting is existing:**

- a. If existing lighting is not to be disturbed, specifically state this requirement.
- b. Can any equipment, poles, foundations, pull boxes, conduit crossovers, etc. be reused and to what extent?
- c. Does existing lighting need to be maintained?
- d. Disposition of existing equipment?
- e. Are as-built plans available to the bidders?
- f. Is existing equipment returned to ODOT? Which items? Delivered to ODOT yard or stored on project?

### **Jurisdictional boundaries**

- a. Provide jurisdictional boundaries and note that luminaires in different jurisdictions are to be separate physical plant and have separate power services.
- b. Determine if township and county road underpasses are to be lit (local agencies willing to pay power cost)?

### **Engineering**

- a. Define what information will be given to the bidders concerning preliminary pole location and circuit design.
- b. Define the extent of the lighting plan to be developed and requirements for District approval.
- c. If the Consultant is to determine the pole locations, add the following note to the Design Requirements: "Lighting fixtures of various manufactures are not exactly identical in their respective outputs. The designer shall include supporting calculations to allow the reviewer to determine that the proposed design will function within the required design parameters as stated herein no matter which of the currently specified brands of equipment is installed."
- d. Provide list of luminaires for consideration in design.

### 16.4 TRAFFIC SIGNALS

This section should include any district preferences, traditional plan notes, special provisions, and all work descriptions and requirements to be enforced during construction.

**The following is a check list of items that should be considered by the district and added on to this section.**

#### Signal Analysis

- a. Is the consultant responsible for signal warrant analysis or will ODOT state where signalized intersections are located? If the consultant does the analysis, which warrants are to be met?
- b. Is the consultant responsible for signal phasing and timing analysis? For how many time periods?
- c. Is the consultant responsible for signal coordination timings and time-space diagrams?
- d. If the consultant does any analysis, who provides the traffic counts? Will the consultant have to get TTS certification?
- e. If a central monitor station is to be provided, what are the minimum equipment requirements for personal and laptop computers? List locations where central monitor stations will be provided.
- f. Will emergency vehicle preemption or railroad preemption be required? List locations. New railroad preemption may require agreements and force account work by the railroad company.
- g. If the consultant determines that protected left turns are needed, does the District have a preference for lead versus lag, or protected only versus protected/permitted?
- h. Will signal(s) be interconnected? Where? How?
- i. Is the signal part of an Intelligent Transportation System as defined in the Traffic Engineering Manual? Is CFR 940 documentation required?

#### Reconstructed Signal Intersections

- a. List the existing signalized locations, including flasher locations.
- b. Will signal(s) be interconnected? Where? How?
- c. The extent to which the existing signal operation is maintained must be specified. Can phasing and timing be changed, or turns prohibited?
- d. Can any equipment be reused? Specify items.

- e. Can existing foundations or supports be reused? Specify where.
- f. Is existing equipment returned to ODOT? Which items? Delivered to ODOT yard or stored on project site?
- g. Are existing loops to be reused? If pavement surface is to be milled, how will consultant estimate which loops will survive?
- h. Is the existing controller capable of being upgraded?
- i. Can the existing underground conduit system and pull boxes be reused? If reused, does it have to be cleaned?

### Supports

- a. Use mast arms or span wires?
- b. Are simple spans allowed or is a pole required in each quadrant?
- c. Can the alternate wire wrap shown on TC-84.20 be used or are pole clamps required?
- d. Are supports aesthetically painted?

### Pedestrian

- a. Are pedestrian push-buttons required? Across mainline? Across all approaches?
- b. Are pedestrian signal heads required? Where?
- c. If push-buttons are used, access must be provided to reach them. Is a paved area by the push-button provided? Curb ramps?

### Control Equipment

- a. Can multiple intersections be run from one controller? Which locations?
- b. What type of controller/cabinet (TS-1/TS-2, 170/2070/332/336)? Minimum phase capability?
- c. Ground or pole mounted?
- d. Cabinet finish? Unpainted or aesthetically painted?
- e. Software provided by project or by ODOT?
- f. Is a “guarantee and warranty” period to be specified? How long? Does the warranty on the design/build project suffice?
- g. Will “prepare to stop when flashing” (PTSWF) operation be used? Specify where and the distance in advance of the intersection.
- h. Is a concrete work pad required?
- i. Is a proprietary item required for system compatibility?

### Signal Interconnection

- a. Which signals are to be interconnected?

- b. Master controller required? Where?
- c. What type of interconnect? Radio, twisted pair, fiber optic.
- d. Interconnect to be overhead or underground?
- e. Telephone drop and modem required? Where?
- f. Telephone account to be maintained by DBT until final acceptance?

### **Vehicle Detection (Add note?)**

- a. What type of detection? Video, loops, magnetometers, microwave.
- b. Location of detection?
  - i. Samples or guidelines available?
  - ii. Dilemma zone (single or double loop installation)?
  - iii. Second vehicle detection?
- c. Typical loop size for different loop applications?
- d. System detectors and location?
- e. Each loop with its own lead-in cable and detector channel?
- f. All lead-in cable in conduit or is direct burial allowed?
- g. Rack or shelf mounted, one/two/four channel, delay/extension features?
- h. Emergency vehicle preemption?

### **Miscellaneous Equipment**

- a. Vehicle signal heads (Add note?)
  - i. Aluminum or polycarbonate body?
  - ii. Glass or polycarbonate lenses?
  - iii. Tri-stud wire entrance fitting?
  - iv. Rigid mounted, if on mast arms?
  - v. Incandescent or LED signal lamps?
- b. Pedestrian signal heads (Add note?)
  - i. Type? A2 or D2. Countdown?
  - ii. Aluminum or polycarbonate?
  - iii. Bracket arm or 2-piece clamshell mount?
  - iv. Incandescent or LED?
- c. Disconnect switch or electric meter required?
- d. Conduit
  - i. PVC (725.05) or steel (725.04)?
  - ii. Will conduit run across pavement be trenched, jacked or either?
  - iii. Is there a minimum diameter size to be used for runs that have only 1 or 2



cables in them: such as interconnect, lead-in or power cable runs?

e. Cable and Wire

- i. Minimum wire size and number of conductors for signal cable?
- ii. Interconnect cable size?
- iii. Wiring for future left turn signal heads?

### **17. PROJECT SCHEDULE REQUIREMENTS**

The current edition of Proposal Note 107, including updates released on or before the prebid meeting date, shall be met or exceeded.

### **18. PLAN SUBMITTALS AND REVIEW REQUIREMENTS**

Fill in the blanks for all sections and make sure all items listed are needed. If items do not apply please cross them out and state 'not applicable'.

Submittals to Central Office shall be made according to the Project Development Process Manual, Appendix B. If it is apparent that the time needed for a Central Office review of a submission will exceed 14 days, the submission should be identified in the scope with an adjusted review time. The adjusted review time shall be shown in the Progress Schedule. If possible, all Central Office review comments should be resolved prior to letting the project.

### **19. BUILDABLE UNITS**

Description of buildable units provided.

### **20. INDEX OF ATTACHMENTS**

Attach copies of project map, environmental documents, railroad agreements, survey notes, etc. as needed.