Texas Department of Transportation
Book 2 – Technical Provisions

Horseshoe Design-Build Project

Attachment 2-2
Work Breakdown Structure Requirements

The following Work Breakdown Structure (WBS) shall be the basis for organizing all Work under the DBC Documents and shall be used to structure the baseline schedule and other cost control systems, including the Payment Progress Process if applicable.

Table 1 represents the minimum levels of the WBS that all cost and schedule information shall rollup to once the Project Baseline Schedule is fully developed.

The WBS shall conform to level structure as follows:

Table 1: WBS Minimum Requirements

1 Horseshoe Design-Build Project
- **1.1. Project Administration**
  - 1.1.1. Mobilization
    - 1.1.1.1. Developer
    - 1.1.1.2. DB Contractor
  - 1.1.2. Submittals and Permitting
    - 1.1.2.1. (By Governmental Agency)
      - 1.1.2.1.1. (By Specific Permit/Submittal Requirement)
- **1.2. Right-of Way Acquisition**
  - 1.2.1. Acquisition By TxDOT
    - 1.2.1.1. (By Parcel No.)
  - 1.2.2. Acquisition by Developer
    - 1.2.2.1. (By Parcel No.)
- **1.3. Utility Adjustments**
  - 1.3.1. Utility Coordination
    - 1.3.1.1. Administration and Planning
      - 1.3.1.1.1. Site Utility Engineering
      - 1.3.1.1.2. Conceptual Design
    - 1.3.1.2. (By Owner)
      - 1.3.1.2.1. Master Agreements
      - 1.3.1.2.2. Utility Assemblies
  - 1.3.2. Utility Relocations
    - 1.3.2.1. (By Owner)
      - 1.3.2.1.1. (By Line No.)
- **1.4. Design**
  - 1.4.1. General Activities and Field Work
    - 1.4.1.1. Design Mobilization
    - 1.4.1.2. Schematics
    - 1.4.1.3. Survey Work
    - 1.4.1.4. Geotechnical Investigations
    - 1.4.1.5. Additional Field Investigations
  - 1.4.2. Develop Specifications
    - 1.4.2.1. (By Discipline)
  - 1.4.3. Geotechnical Design
    - 1.4.3.1. General
    - 1.4.3.2. Earthwork Geotech
    - 1.4.3.3. Bridge Geotech
    - 1.4.3.4. Culvert Geotech
    - 1.4.3.5. Wall Geotech

1.4. Design (Continued)

- 1.4.4. Pavement Design
  - 1.4.4.1. Data Analysis and Draft Report
  - 1.4.4.2. Final Design and Report
- 1.4.5. Drainage Design
  - 1.4.5.1. Hydrologic and Hydraulic Design
  - 1.4.5.2. Preliminary System Design
  - 1.4.5.3. Detailed Drainage Design
- 1.4.6. Roadway Design
  - 1.4.6.1. Alignments
  - 1.4.6.2. Sections
  - 1.4.6.3. Detailed Design
- 1.4.7. Bridge Design
  - 1.4.7.1. Establish Criteria and Procedures
  - 1.4.7.2. Bridge layouts
  - 1.4.7.3. Substructure Design
  - 1.4.7.4. Superstructure Design
- 1.4.8. Retaining Wall Design
  - 1.4.8.1. Establish Criteria and Procedures
  - 1.4.8.2. Fill Wall Design
  - 1.4.8.3. Cut Wall Design
- 1.4.9. Traffic Management
  - 1.4.9.1. (By Phase)
- 1.4.10. Environmental Design
  - 1.4.10.1. Erosion Control/SWPPP
  - 1.4.10.2. Noise Wall Design
  - 1.4.10.3. Wetland and habitat Mitigation
  - 1.4.10.4. TCEQ Best Management Practices
- 1.4.11. Landscape and Aesthetic Design
  - 1.4.11.1. Landscape Design
  - 1.4.11.2. Aesthetic Design
- 1.4.12. Electrical Design
  - 1.4.12.1. Illumination
  - 1.4.12.2. Traffic Signals
- 1.4.13. ITS & TCS Design
  - 1.4.13.1. Duct Bank System & Power Supply
  - 1.4.13.2. ITS/TCS Equipment & Structures
- 1.4.14. Signage and Marking Design
  - 1.4.14.1. Overhead
  - 1.4.14.2. Small signs and pavement markings
- 1.4.15. Design Packages
  - 1.4.15.1. Package Preparation
  - 1.4.15.2. QA/QC Review
  - 1.4.15.3. Submittal
  - 1.4.15.4. TxDOT/IE Reviews
  - 1.4.15.5. Comment Resolution

1.5. Construction

- 1.5.1. General
  - 1.5.1.1. Mobilization
  - 1.5.1.2. Administration

1.5. Construction (Continued)

- 1.5.1.3. Quality Control
- 1.5.2. By Work Areas – (For example: I-35E, I-30, Mixmaster, Canyon, Calatrava Bridge, etc.)
  - 1.5.2.1. Removals
    - 1.5.2.1.1. Building Removals
    - 1.5.2.1.2. ROW Preparation
    - 1.5.2.1.3. Roadway Removals
    - 1.5.2.1.4. Bridge Removals
  - 1.5.2.2. Earthwork
    - 1.5.2.2.1. Topsoil Stripping and Placing
    - 1.5.2.2.2. Excavation
    - 1.5.2.2.3. Embankment
    - 1.5.2.2.4. Special Geotechnical Measures
  - 1.5.2.3. Landscaping
    - 1.5.2.3.1. Seeding and Sodding
    - 1.5.2.3.2. Fertilizer and Watering
    - 1.5.2.3.3. Special Aesthetic Landscaping (if applicable)
  - 1.5.2.4. Subgrade Treatment and Base
    - 1.5.2.4.1. Lime Treatment
    - 1.5.2.4.2. Flexible Base
  - 1.5.2.5. Pavement
    - 1.5.2.5.1. Asphalt Pavement
    - 1.5.2.5.2. Concrete Pavement
    - 1.5.2.5.3. Curb & Gutter
    - 1.5.2.5.4. Driveways
    - 1.5.2.5.5. Sidewalks and Median Paving
  - 1.5.2.6. Retaining Walls
    - 1.5.2.6.1. (By Wall No.)
  - 1.5.2.7. Bridges
    - 1.5.2.7.1. (By Bridge No.)
  - 1.5.2.8. Drainage
    - 1.5.2.8.1. Culverts
    - 1.5.2.8.2. Storm Sewer
    - 1.5.2.8.3. Riprap
  - 1.5.2.9. Traffic Control and Temporary Work
    - 1.5.2.9.1. Barricades, Signs & Traffic Handling
    - 1.5.2.9.2. Erosion Control
    - 1.5.2.9.3. Detour Construction/Removal
    - 1.5.2.9.4. Portable Traffic Barrier
    - 1.5.2.9.5. Workzone Pavement Marking
    - 1.5.2.9.6. Temporary Bridges
    - 1.5.2.9.7. Temporary Walls/Shoring
    - 1.5.2.9.8. Temporary Drainage
    - 1.5.2.9.9. Temporary Illumination
  - 1.5.2.10. Permanent Barriers
    - 1.5.2.10.1. Permanent Concrete Barriers
    - 1.5.2.10.2. Metal Beam Guard Fence
    - 1.5.2.10.3. Crash Attenuators
  - 1.5.2.11. Signals and Illumination
    - 1.5.2.11.1. Roadway Illumination

1.5.2.11.2. High Mast Illumination

1. 5. Construction (Continued)

1.5.2.11.3. Electrical Services
1.5.2.11.4. Traffic Signals
1.5.2.12. ITS/TCS
1.5.2.12.1. Duct Bank System
1.5.2.12.2. Equipment Foundations
1.5.2.12.3. Support Structures and Equipment
1.5.2.13. Permanent Signing and Marking
1.5.2.13.1. Overhead Sign Structures
1.5.2.13.2. Small Signs
1.5.2.13.3. Pavement Markings
1.5.2.14. Environmental Mitigation
1.5.2.14.1. Noise Walls
1.5.2.14.2. Wetland and Habitat Mitigation
1.5.2.15. Hazardous Materials
1.5.2.15.1. Site Assessments
1.5.2.15.2. Remediation