

MEMORANDUM FOR: CESPK-ODL (ATTN Kim Leonard)

SUBJECT: Draft Checklists for Conditional Determination Reports: Bridges, Horizontal Directional Drilling (HDD), Pressurized Pipes, and General Categories.

1. Reference: No references used.
2. Purpose: The checklists presented below are to provide guidance to 408 requesters by providing information needed by the Levee Safety Section to perform a complete review. The 408 Section plans to incorporate our checklists into their main Completion Determination Report documents.
3. Checklists. The information provided in the “General” checklist (Section 3a.) should be included in all 408 requests. Information provided in the “Bridges”, “Horizontal Directional Drilling”, and “Pressurized Pipes” checklists (Sections 3b., 3c., and 3d., respectively) should be provided if the proposed project improvements are related to bridges, horizontal directional drilling, and/or pressurized pipes, respectively.
  - a. General
    - 1) Project Description.
    - 2) Location Map.
    - 3) Project location coordinates.
    - 4) General plan showing project improvements (e.g. plan view).
    - 5) Detailed drawings of proposed improvements. Include a plan view and detailed typical cross sections of the entire levee embankment with landside/waterside toes and maintenance easements.
    - 6) Elevation Datum (NGVD 29 or NAVD 88).
    - 7) USACE Authorized water surface elevation (Elevations must be shown in NGVD 29 or NAVD 88).
    - 8) Logs of explorations used for project design or to support the proposed project (e.g. borings, cone penetration tests (CPT), trenches, geophysical, etc.).
    - 9) Embankment Material placement and compaction requirements. Embankment material excavated as part of the proposed project must be placed in 4- to 6-inch loose lifts and compacted to greater than or equal to 95% of the maximum density at moisture contents

between -2 and +3 percent of optimum obtained from ASTM D698 (*USACE preferred method*); *Alternate Method*: Compact to greater than or equal to 90% of the maximum density at moisture contents between -1 and +4 percent of optimum obtained from ASTM D1557.

- 10) Existing excavated material may be used as backfill. If import fill is required then the plasticity index must be between 8 and 25%, the liquid limit less than 50%, the minimum fines content less than 20%, and with 100% of the soil passing the 3 inch sieve. All fill material must be free of construction debris and deleterious materials.
- 11) An under seepage and slope stability analyses must be submitted to support proposed project work that will alter the geometry of an existing levee. Representative cross sections for both existing and proposed final grades must be developed for model runs using site specific subsurface soil profiles.

b. Bridges

- 1) Cross section/s at existing and new bridge alignments, showing project elements that intersect the levee prism and adjacent channel.
  - i. Include detailed typical cross-sections of the entire levee embankment showing location of landside/waterside toes, maintenance easements, proposed foundations, wing walls, retaining walls, roadway approaches/pavement, utility lines, and other relevant structural features.
- 2) Existing and final topographic contours map.
- 3) Information related to the proposed abutment and/or pier foundations. Include the following, if applicable:
  - i. Pile Data Table, to include: pile type and size, cut-off elevation, and design tip elevation.
  - ii. Casing type, size, and design tip elevation.
  - iii. If cast-in-drilled-hole (CIDH) piles will be used with casing, provide details related to grouting of annulus.
  - iv. Shallow footing type and size, and bottom of footing elevation.

4) Submit the following plan sheets:

- i. Foundation Plan. Provide scaled drawings in plan and profile views showing location and depth of proposed foundation improvements for bridge and abutment supports (e.g. spread footing shallow foundation, pile-bent deep foundations, etc.).
- ii. Abutment Detail/s. Provide scaled drawings in plan and profile views showing location and depth of proposed abutments as related to the existing flood risk management structure.
- iii. Pile Detail/s. Provide scaled drawings in plan and profile views showing pile locations, pile data table, and pile design parameters.
- iv. Utility Plan. Provide scaled drawings in plan and profile views showing all utilities (existing/proposed/relocations) within the limits of work.
- v. Demolition Plan. Provide a Demolition Plan with drawings in plan and profile views detailing existing structures, structure removal process, equipment and materials used, and site restoration.
- vi. For efficiency, please indicate drawing plan sheets with pertinent information.

c. Horizontal Directional Drilling

- 1) Provide scaled drawings in plan and profile views showing the proposed drilling path and location of the proposed horizontal directional drilling (HDD) pipeline. The proposed HDD pipeline design must contain the following features:
  - i. The proposed HDD pipeline **MUST** be installed at least 50 feet below the levee landside toe and the creek/river thalweg as measured from the top of the pipeline.
  - ii. The proposed HDD pipeline entry/exit points must be spaced at least 300 feet from the landside embankment toe(s).

- iii. The annulus at the proposed HDD pipeline entrance and exit **MUST** be sealed with cementitious material to at least 10 vertical feet from the surface.
- 2) Provide a Frac-Out Plan that details the procedures for addressing inadvertent drilling fluid returns, identifying a frac-out and potential for frac-out, response to the incident, clean up, notification, and documentation. If hydraulic fracturing of the flood risk management structure occurs, the requester must submit a Corrective Action Plan.
- 3) Correction Action Plan:
  - i. If distress is observed during the HDD pipeline operation, such as cracking, displacement, settlement, and/or sloughing, the flood risk management structure must be repaired, and the lines and grades restored to the existing geometric configuration. Remediation may include complete excavation and removal of the affected foundation and embankment or other appurtenant features of the flood control levee.
- 4) Pipe details, such as material type, size and purpose.
- 5) Provide a Hydraulic Fracturing Analysis Report with supporting subsurface explorations. The report must include soil parameters, earth pressure and borehole fluid pressure calculations at incremental depths along the drill path, assumptions made in calculations, method used for calculations, and computed factor of safety to support analyses.

d. Pressurized Pipes

- 1) Provide scaled drawings in plan and profile views of the entire levee embankment showing landside/waterside toes and maintenance easements. The drawings must display the USACE Authorized water surface elevation and must show the existing and proposed pipeline alignments.
  - i. The invert elevation of replacement pipe **MUST** be above the USACE Authorized water surface elevation.
  - ii. The replacement pipe **MUST** include a siphon breaker and a positive closure device located at the waterside hinge point.

- 2) Replacement pipe details, such as material type, size and purpose.
  - i. Pipe material **MUST** be either concrete, ductile iron or welded coated steel.
- 3) Backfill details.
  - i. Compact the trench subgrade prior to placement of the pipe in the trench using a wheel roller or suitable hand-operated compactors (for minimum compaction criteria, see General). Place new pipe in trench supported on cradles to permit free flow of a controlled low strength material (CLSM) under the pipe and haunches, and backfill with CLSM in the pipe bedding zone and around the pipe haunches in one lift. The backfill operation may be paused to avoid pipe flotation. After the CLSM has adequately set, place a second lift of CLSM to a level one foot above the top of the pipe. After the second lift of CLSM has adequately set, Final Trench Backfill may proceed. Minimum pipe cover is 2 feet above the top of pipe.
- 4) Will the existing pipe be abandoned in place? If yes, please provide:
  - i. Existing conditions of the pipe within the levee prism and at pipe outlets.
    1. Include a report documenting the video inspection report.
    2. To be abandoned in place, the existing pipe **MUST** be intact throughout the entire embankment zone. Existing pipes that contain corroded or collapsed sections **CAN NOT** be abandoned in place and **MUST** be removed.
  - ii. Mix design and grouting procedures that will be used to ensure the pipe is properly grouted with no voids.
- 5) State if a waterside outlet structure will be constructed. If so, include scaled detailed plan and profile drawings. Flap gates are required on all outlet structures.
- 6) Detailed drawing of the pipe connections.

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- 7) Details related to additional utility improvements to support the proposed project (e.g. electrical connectivity and conduits through the embankment).
4. Conditions. The above checklists are considered a working document. The checklists may be altered by Levee Safety Section in the future based on USACE personnel and public feedback.
5. The point of contact for this memorandum is Glen A Johnson at (916) 557-7637 or Johnathan J Wright at (916) 557-7219.



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