CAJUN INDUSTRIES, LLC

Document Type:	Standard Operating Procedure (SOP)	**Document #:**		☒ N/A	
Document Title:	COFFERDAMS – Planning, Design, and Construction Guidance				
Owner:	Corporate Safety	**Effective Date:**	11/14/2022	**Revision #:**	0

PURPOSE:
To provide a consistent, cross-discipline process to ensure personnel safety and risk mitigation are considered throughout the sequence of planning, design, and construction for cofferdams.

PROCESS:

I. ESTIMATE STAGE

REQUIRED DOCUMENTS:

- *ATTACHMENT 1 – Cofferdam Preliminary Design Checklist*

Bid Solicitation - [*BU15 is typically responsible for providing the cofferdam design and sheet pile installation.]*

i. Assess available information. Information desired includes (Estimator to verify):
   1. Geotechnical Report
   2. Specifications / Drawings
   3. Location of cofferdam in reference to the site plan and available geotechnical report SPTs/CPTS
   4. Excavation depths and requirements

      Note: A request for information should be submitted if the above information is not provided.

ii. Preliminary Design ***[Subcontracted to Cajun Engineering Solutions or a 3rd party design engineer]***
   1. Use above inputs to develop initial design.
      a. Items for Cajun to verify/ask at bid stage (Complete Attachment 1)
      b. Existing site conditions (elevations, proximity to existing geotechnical data)
      c. Dewatering requirements and assumptions including groundwater design basis
      d. Surcharge requirements, assumptions, limitations
      e. Waler and strut feasibility
      f. Is the available geotechnical information sufficient to complete design?
      g. Should the engineer consider an excavation tolerance (e.g. extra 1+' OR allowing more for stacking walers)?
      h. Has the engineer allowed time in bid for meetings/discussions?

iii. All assumptions and limitations shall be stated in the bid clarifications.

II. POST AWARD PRE-CONSTRUCTION STAGE

REQUIRED DOCUMENTS:

- *ATTACHMENT 2 – Cofferdam Submittal Checklist*

a. Cajun must NOT opt out of Builder's Risk coverage for cofferdam projects.

b. Review the Preliminary Design – [*Typically performed by BU15].*

i. Review the project's basis for bid design and compare with most current client-provided drawings and requirements
   1. Compare the Preliminary Design Checklist to the current requirements

c. Pre-submittal discussion with owner/client

i. Conduct a design and constructability review meeting
   1. Led by DF PM - Attendees include EOR, deep foundations CM, civil CM (party excavating)
   2. Agenda topics shall include, at a minimum, the items included in the Preliminary Design Checklist. Additional topics may include:
      a. Needs to include excavation and waler installation ground elevation requirements
      b. Drawings should include maximum cut depths (Hold Points) for each stage of the excavation
      c. Accommodations for known obstructions or utilities

ii. IFA design is completed and drawings are prepared

iii. Preliminary submittals

1. DF to review to ensure IFA drawings capture all relevant design and constructability points (Complete ***Attachment 2***)

d. Final Design (IFC)

i. Incorporate comments from returned submittal (if any) into final design

ii. Conference with client (if applicable) to clarify final design and construction requirements

iii. Finalize IFC design/drawings

iv. Ensure final design includes:

1. Excavation Phases, including step-by-step procedures identified on the drawings
2. Include depths with tolerances (maximum cut depths)

v. Submit drawings for final IFC approval, with example Turnover Checklist included

vi. Only upon receipt of approval, proceed with material procurement

e. Procure Material per IFCs – [*Typically done by BU15]*

i. Review waler fabrication needs (e.g. prefabrication vs. loose material desired, coped corners needed for constructability, custom corners desired?)

f. Pre-construction – *[By BU15 AND Cajun BU's excavating cofferdams]*

i. Internal Pre-construction meetings *(both DF and other Cajun BU meetings)*

1. Attendees should include, at a minimum, Estimator, PM, CM, BU Manager of Safety and Site Manager.
2. Final submittals/design, IFC drawing, and sheet pile shop drawing requirements are discussed. Information is transferred to field team (safety, superintendents, APMs, surveyors, QC).
3. In the case of joint Cajun BU projects when Cajun is installing, excavating, and constructing within the cofferdam, a joint kickoff meeting should be held.
4. Site specific plans are developed (Execution plan, JHA, Etc.).
5. Discuss material lead times and delivery schedule.

III. CONSTRUCTION STAGE

REQUIRED DOCUMENTS:

- *ATTACHMENT 3 – Cofferdam Installation Checklist*
- *ATTACHMENT 4 – Cofferdam Notice of Acceptance*
- *ATTACHMENT 5 – Cofferdam Excavation & Bracing Checklist*

a. Installation of Sheet Piles – *[BU15]*

i. Onsite Pre-Installation Meeting with BU15 PM, Superintendent, and Foreman to review detailed sheet pile installation material, equipment, and sequencing (to be completed after onsite BU15 pre-installation meeting).

1. ***Attachment 3*** should begin at the pre-installation meeting and used by the superintendent/foreman throughout the cofferdam installation. Completed attachment shall be submitted to the Project Manager fully signed upon completion of each cofferdam structure.

ii. Post-installation, Project Manager must ensure all documents are complete and archived in the job folder. This includes all QC documents, including as-builts, RFI's, pictures, and sheet pile delivery receipt records.

b. Turnover – [*By BU15 to an External Client OR another Cajun BU]*

i. ***Attachment 4*** - Cofferdam Notice of Acceptance (to be completed when transferring custody of cofferdam to an EXTERNAL CLIENT or other Cajun Business Unit after Cajun's work on the cofferdam is complete)

1. Cajun's Project Manager (typically BU15) shall ensure Cofferdam Turnover Document is completed by the Cajun field supervisor and signed by the external client

ii. ***Attachment 5*** - Cofferdam Excavation & Bracing Checklist (to be completed by Cajun's field quality control personnel when excavation and structural bracing is required to be performed in stages)

1. Document is owned by the Cajun entity performing the cofferdam excavation and bracing. It is maintained in the field by the superintendent/foreman supervising the excavation activity.

iii. Responsibility for access, safety, and integrity of the cofferdam is held by the party excavating and constructing within the cofferdam during that phase of the work.

c. Excavate and install sub-surface walers/tie-backs – [*By BU01, 02, 04 or external client; BU15 occasionally installs/extracts walers/struts*

i. Ensure design drawings, Cofferdam Construction Sequence Checklist, and any relevant constructability documents are in the possession of superintendent/foremen excavating the cofferdam and installing any structural members

ii. When should Cajun contact the Engineer of Record?

1. Change in conditions (non-typical weather events, excessive groundwater seepage, underground obstruction encountered, etc.)

2. Modification or variance to the IFC cofferdam design or constructability plan, including phased excavation depths or extents
3. Any noted sheet pile deflection
4. Structural deficiencies (e.g. weld cracking)
5. Any needed deviation in fit-up or welding procedure from provided structural connection details, e.g. welding vs. bolting walers, spacer plate additions

d. Reverse the sequence to backfill and remove the system (walers and temporary sheets) - By BU01, 02, 04 or external client; DF sometimes installs/extracts cofferdam reinforcement, i.e. walers/struts

PAY OFF:
A consistently-utilized process for cofferdams that ensures we achieve Cajun's vision to put the health and safety of our employees above all else.

Approvals		
Title	***Signature***	***Date***
Vice President	*Chris Normand*	01/01/2023

Revision History				
Rev #	***Date***	***Reason for Changes***	***Originator***	***Effective Date***
1	01/16/2024	Added Attach. 3 – Reordered Attachments	Chris Normand	01/22/2024

Note: SOP Requirement
Work must be performed in accordance with the information in this SOP. If it is determined that work cannot be done as required in the SOP or that it presents additional risk, you must obtain authorization for variance from the Business Unit Sr. Construction Manager and Business Unit Manager of Safety.