



Guadalupe-Blanco River Authority

CIP Design Deliverable Guidelines

Effective 12/08/2025

Table of Contents

Acronyms	2
Intent	3
Governing Standards	3
General Description	4
PER/EFR Phase	4
30% Phase	7
60% Phase	7
90% Phase	8
100% and IFB Phase	8
IFC Phase	9
Design Review Meetings.....	9
Project Manual.....	9
Pipeline Project Submittal Requirements.....	10
Pump Station, Lift Station, and Delivery Point Project Submittal Requirements	15
Treatment Facility Project Submittal Requirements	27
Appendix A.....	39
OPCC Classification	39
SUE Classification	40

Acronyms

Acronym	Term	Information
CIP	Capital Improvement Project	GBRA construction project for new or existing infrastructure
EFR	Engineering Feasibility Report	Prepared in accordance with TWDB guidance and submitted with application for funding
EOR	Engineer of Record	Responsible person for the design and construction administration of the Project component identified by their seal and signature
EPA	Environmental Protection Agency	
I&C	Instrumentation and Control	
IFB	Issued for Bid	Set of construction contract documents signed and sealed by the engineer(s) of record suitable for bidding purposes
IFC	Issued for Construction	Set of construction contract documents signed and sealed by engineer(s) of record for construction
GBRA	Guadalupe-Blanco River Authority	
LS	Lift Station	
OPCC	Opinion of Probable Construction Cost	Cost estimating classification system by AACE International – reference Appendix A
P&ID	Process and Instrumentation Diagram	
PER	Preliminary Engineering Report	Also known as Basis of Design Report or Engineering Feasibility Report as applicable per scope
PM	Project Manager	GBRA engineering staff member assigned as project manager to the project
PS	Pump Station	
SCADA	Supervisory Control and Data Acquisition	
SUE	Subsurface Utility Engineering	Engineering practice that involves managing risks associated with mapping existing subsurface utilities at appropriate quality levels, utility design and coordination, utility relocation design, utility condition assessment, and communication of utility data – reference Appendix A for the quality level classifications
SWPPP	Stormwater Pollution Prevention Plan	A site-specific document developed to identify potential sources of stormwater pollution at a construction site to be developed by GBRA's consultant engineer in accordance with EPA & TCEQ guidelines
TCEQ	Texas Commission on Environmental Quality	
TWDB	Texas Water Development Board	
WTP	Water Treatment Plant	
WWTP	Wastewater Treatment Plant	
WRF	Water Reclamation Facility	

Intent

The intent of this document is to provide GBRA's consulting engineer (Engineer) with a list of submittal requirements for the design phases of a CIP (Project). These requirements are not an exhaustive list and should not be used as a replacement of the Project's scope of work and/or contract. These guidelines are only applicable to low-bid or competitive sealed proposal projects. Design-build (DB) and construction manager-at-risk projects (CMAR) will have case-by-case guidelines provided in the project's agreement. The GBRA review process will not begin until all milestone submittal requirements are submitted. During the design process, it will be the Engineer's responsibility to coordinate with the GBRA PM to request any necessary GBRA information to conform with these design guidelines or standards. The GBRA PM may reject any incomplete submittal package without review.

Governing Standards

At a minimum, the Project's design documents should be in conformance with the following latest editions of industry standards and/or practices:

- Latest GBRA Standards and Design Guidelines, including (when applicable):
 - Developer's Resource Guide
 - Standards and Design Guidelines for Wastewater Treatment Plants and Lift Stations
 - Standards and Design Guidelines for Customer Water Delivery Points
 - Standards and Design Guidelines for Developer Utilities
- American Concrete Institute (ACI)
- American Institute of Steel Construction (AISC)
- American National Standards Institute (ANSI)
- American Society for Testing and Materials (ASTM)
- American Water Works Association (AWWA)
- Environmental Protection Agency (EPA)
- Hydraulic Institute Standards (HIS)
- International Building Code (IBC)
- Institute of Electrical and Electronics Engineers (IEEE)
- Illuminating Engineering Society (IES)
- National Electrical Code (NEC)
- National Electrical Manufacturers Association (NEMA)
- National Sanitation Foundation International (NSF)
- Occupational Safety and Health Administration (OSHA)
- Texas Commission on Environmental Quality (TCEQ)
- Texas Water Development Board (TWDB)
- Texas Department of Transportation (TxDOT)

General Description

Projects will generally consist of the following chronological design phases: PER, 30%, 60%, 90%, 100%, IFB, and IFC. Additional project requirements are detailed in project-type specific tables listed below. GBRA may choose to combine the PER and 30% design phase for certain projects. A 100% design deliverable will be required to address any comments provided on the 90% set. All comments must be addressed prior to issuing IFB. For projects funded by the TWDB, the EFR may be the PER deliverable, however, it will be at the direction of the GBRA PM and Project's scope of work to combine the PER and EFR or develop two (2) separate documents.

The general expectations for each Project phase are as follows:

PER/EFR Phase

The PER/EFR forms the conceptual basis of the Project and should describe the Project's scope of work, basis of design and operation, options analysis, and Engineer's recommendation. All comments must be addressed prior to sealing the PER. The sealed PER shall identify design selections and any pending decisions.

At a minimum, the following details must be included in the PER/EFR:

- A. Project Description, including:
 - i. general description of existing system with maps to locate existing facilities and service area;
 - ii. description of the proposed scope of work & Project needs within the planning area;
 - iii. description of the project goals, objectives, and drivers;
 - iv. maps and drawings to locate and describe the project area to be served, including, but not limited to geographic boundaries, terrain characteristics, and drainage area;
 - v. current, design, and projected population to be served with the justification of planning horizon;
 - vi. identify and discuss any existing operational issues; and
 - vii. description of the proposed Project design and construction schedule and phasing.
- B. Project Specific Requirements, including:
 - i. a description of the proposed infrastructure, including considerations for future potential expansion(s);
 - ii. proposed site plan with maps to describe the locations and layout of proposed facilities indicating floodplain, easements, buffer zones, and crossings;
 - iii. a description of the anticipated operations and maintenance costs of the proposed infrastructure;
 - iv. list of required regulatory and/or construction permits with an active permit log maintained by the Engineer listing the permit name/holder, required application information, submission deadline, application costs, and status;
 - v. list of wet and dry utility coordination needs with an active coordination log maintained by the Engineer listing the utility owner, process fluid, coordination needs, and if any, proposed adjustments;

- vi. a description of the Project's recommended procurement method, including potential recommendations of early equipment procurement, multiple bid packages, or alternative delivery methods; and
 - vii. if applicable, a description of recommended temporary or bypass system(s) to maintain continuous operations during construction.
- C. Design Alternatives Analysis, including:
- i. identifying design alternatives with Engineer's recommendation and justification, e.g., a scoring matrix with alternative routes, alternative site layouts, mechanical equipment options, and/or treatment process;
 - ii. recommendations for potential materials of construction and/or manufacturers;
 - iii. a cost and effectiveness analysis;
 - iv. environmental and cultural impact analysis; and
 - v. if applicable, potential phasing and/or value engineering considerations.
- D. For Potable Water Projects:
- i. maximum and minimum water demand determination, including maximum daily, average annual, and peak hour demands; and
 - ii. description of water source(s), with quantity and quality of water availability, including a discussion of the adequacy of supply and/or potential fluctuations in water quality during drought conditions.
- E. For Wastewater Projects:
- i. average daily flow and two-hour peak flow determination
 - ii. description of the quantity and quality of existing and/or proposed wastewater influent sources and expected characteristics changes during the Project's operating life;
 - iii. if applicable, considerations for odor generation during the Project's operating life;
 - iv. if applicable, an inflow and infiltration analysis, including quantification of existing and anticipated I&I volumes during the operating life of the infrastructure; and
 - v. if applicable, an analysis of industrial and other non-domestic waste sources.
- F. For Pipeline Projects:
- i. routing analysis, including identification of easement acquisition needs and flood hazards;
 - ii. if applicable, pipe size diameter options analysis based on capacity and desired quality requirements;
 - iii. if applicable, a desktop geology assessment to identify potential benefits or issues for alignment identification;
 - iv. if applicable, hydraulic and transient analyses, including coordination with potential associated pump station project(s); and
 - v. if applicable, cathodic protection analysis, including potential geotechnical analysis.
- G. For Pump Station Projects:
- i. preliminary design data, including a process flow diagram, pumping capacities, water storage capacities, and anticipated system operations during normal and emergency conditions;
 - ii. if applicable, identification and considerations for noise abatement;
 - iii. if applicable, identification of potential hazardous materials or chemicals requiring unique actions during construction, including conducting an asbestos survey;

- iv. if applicable, hydraulic and transient analyses, including coordination with potential associated pipeline project(s); and
- v. if applicable, cathodic protection analysis, including potential geotechnical analysis.

H. For Treatment Projects:

- i. map of the proposed infrastructure with present and future housing developments, industrial sites, prevailing winds, highways, and/or public thoroughfares such as parks, schools, recreational areas, shopping centers, etc.;
- ii. identifying the receiving stream, canal, major water source, and/or effluent disposal areas;
- iii. design data such as nutrient loading, treated flow/effluent quality, detention times, surface loadings, chemical consumption, non-potable water demands, weir loading, and process fluid calculations;
- iv. estimated waste production such as sludge or residuals production, including quantity, quality, dewatering methods, transportation, and end-use purpose;
- v. if applicable, identification and considerations for noise abatement;
- vi. if applicable, identification of potential hazardous materials or chemicals requiring unique actions during construction, including conducting an asbestos survey.

For projects seeking TWDB funding, Engineer shall provide an EFR in accordance with the guidance documents TWDB-0555 and TWDB-0556 for drinking water and wastewater projects as applicable.

Other TWDB requirements in the EFR include:

- Project Budget Form (TWDB-1201)
- Environmental Data Form (TWDB-0800 State Programs)
- Federal Environmental Review Form (TWDB-0801 Federal Programs)
- United States Iron and Steel Guidance (TWDB-1105 State Funded)
- American Iron and Steel Guidance (TWDB-1106 Federally Funded)
- Use of Alternative Delivery Methods Guidance (TWDB-0570) (if applicable)

The following Project deliverables are anticipated during this phase. Deviations to this list of deliverables must be approved by the GBRA PM prior to the end of this design phase or explicitly listed in the Project's scope of work.

- PER Phase Deliverables:
 - Draft PER
 - Signed and Sealed PER
 - AACE Class 5 OPCC
 - Comment Response Log
 - Action Item & Decisions Made Tracker, Risk Register, and Permit Log
 - Meeting materials, including but not limited to meeting agenda, minutes, and workshop presentation(s)
 - Project Schedule

30% Phase

The 30% design should illustrate and locate all major design elements and provide enough detail for the reviewer to identify any major issues, including conflicts, that might alter the Project's design. The following Project deliverables are anticipated during this phase. Deviations to this list of deliverables must be approved by the GBRA PM prior to the end of this design phase and be explicitly listed in the scope of work.

- 30% Design Phase Deliverables:
 - 30% Design Drawings
 - Table of Contents for the Project Manual
 - AACE Class 4 OPCC
 - Comment Response Log
 - Action Item & Decisions Made Tracker, Risk Register, and Permit Log
 - Meeting materials, including but not limited to meeting agenda, minutes, and workshop presentation(s)
 - Updated Project Schedule

60% Phase

The 60% submittal should include a complete set of plans, technical specifications, and any updated calculations. The 60% Design submittal should be sufficiently comprehensive of all Project components that the Project cost estimates should not fluctuate more than -15% to + 15% from the 60% Design to Issued for Bid (IFB) unless for extenuating factors outside of the Engineer's control such as changes in market costs, changes in scope of work, or factors agreed upon by the PM. The 60% submittal will be rejected if there is unmodified content copied from another project or standard. The following Project deliverables are anticipated during this phase. Deviations to this list of deliverables must be approved by the GBRA PM prior to the end of this design phase and be explicitly listed in the scope of work.

- 60% Design Phase Deliverables:
 - 60% Design Drawings
 - 60% Project Manual
 - AACE Class 3 OPCC
 - Comment Response Log
 - Action Item & Decisions Made Tracker, Risk Register, and Permit Log
 - Meeting materials, including but not limited to meeting agenda, minutes, and workshop presentation(s)
 - Updated Project Schedule

90% Phase

The 90% submittal should be the Engineer's complete set of documents. Any previously unresolved coordination efforts with others (engineering disciplines, permitting, external utility providers, equipment manufacturers and vendors, etc.) should be resolved and incorporated into the 90% submittal. The following Project deliverables are anticipated during this phase. Deviations to this list of deliverables must be approved by the GBRA PM prior to the end of this design phase and explicitly listed in the scope of work.

- 90% Design Phase Deliverables:
 - 90% Design Drawings
 - 90% Project Manual
 - AACE Class 2 OPCC
 - Comment Response Log
 - Action Item & Decisions Made Tracker, Risk Register, and Permit Log
 - Meeting materials, including but not limited to meeting agenda, minutes, and workshop presentation(s)
 - Updated Project Schedule

100% and IFB Phase

A 100% design deliverable will be required to address any comments provided on the 90% set. Once GBRA confirms resolution of all comments in a 100% deliverable set, Engineer can deliver the IFB contract documents. The following Project deliverables are anticipated during this phase. Deviations to this list of deliverables must be approved by the GBRA PM prior to the end of this design phase and explicitly listed in the scope of work.

- 100%/IFB Design Phase Deliverables:
 - 100% Design Drawings (if applicable)
 - 100% Project Manual (if applicable)
 - Comment Response Log (if applicable)
 - Issued for Bid Drawings
 - Issued for Bid Project Manual
 - AACE Class 2 OPCC
 - Action Item & Decisions Made Tracker, Risk Register, and Permit Log
 - Meeting materials, including but not limited to meeting agenda, minutes, and workshop presentation(s)
 - Updated Project Schedule

Sealed IFB contract documents to be delivered to PM once all comments have been addressed. The IFB contract documents are to be utilized for bidding purposes.

IFC Phase

Engineer to incorporate all addenda from the bid to produce conformed, sealed IFC contract documents and deliver to the PM prior to the preconstruction meeting with the contractor. The following Project deliverables are anticipated during this phase. Deviations to this list of deliverables must be approved by the GBRA PM prior to the end of this design phase and explicitly listed in the scope of work.

- IFC Phase Deliverable(s):
 - IFC Drawings (including hard copies)
 - IFC Project Manual (including hard copies)
 - Action Item & Decisions Made Tracker, Risk Register, and Permit Log
 - Meeting materials, including but not limited to meeting agenda, minutes, and workshop presentation(s)

Design Review Meetings

At the end of each Design Phase, Engineer shall conduct a Design Review workshop to elicit feedback from GBRA staff and make necessary decisions to proceed with the design. Consultant engineer shall be responsible for recording and documenting design decisions through design review meeting minutes, including, but not limited to, an Action Item & Decisions Made Tracker, Risk Register, Permit Log, and Comment Response Log.

Project Manual

The Project Manual will consist of the construction contract documents (Division 00), project-specific general requirements (Division 01), and technical specifications. The GBRA PM will provide initial and updated Division 00 documents as described above. At a minimum, the following Division 00 documents will be provided by the GBRA PM:

- Requests for Proposals
- Instructions to Bidders
- Supplementary Instructions to Bidders
- Qualifications Statement
- Bid Form
- Bid Bond
- Insurance Requirements
- Agreement between Owner and Contractor
- Performance Bond
- Payment Bond
- Certificate of Interested Parties
- Conflict of Interest Questionnaire
- General & Supplementary Conditions

Pipeline Project Submittal Requirements

Pipeline Project Component	DESIGN PHASE (%)				
	PER	30%	60%	90%	IFB
GENERAL					
Obtain and review GBRA Construction Standards & Details	X				
Obtain and review GBRA IT/SCADA Parameters (Communication Type and Location)	X				
Obtain and review GBRA CAD/GIS Standards, including fonts, legends, format preferences, etc.	X				
Design and Construction Schedule Submittal	X	X	X	X	X
AACE Class 5 OPCC including costs for land acquisition, permitting, and utility coordination	X				
AACE Class 4 OPCC including unit costs for major materials and equipment		X			
AACE Class 3 OPCC including vendor quotes for major equipment (>5% of Total Project Cost)			X		
AACE Class 2 OPCC including updated vendor quotes for major equipment (>5% of Total Project Cost)				X	X
Identify if continuous operations are required with the PM and identify potential bypass system(s)	X				
Develop a preliminary bypass plan, including identifying areas for staging bypass equipment (if applicable)			X		
Finalize the bypass plan (if applicable)				X	
Coordinate on allowable staging areas with PM and if plans are necessary			X		
Finalize construction staging areas, including allowable Right of Entry (if applicable)				X	
Conduct contractor outreach to identify interested parties & identify potential procurement challenges that may occur during advertisement		X	X	X	

Pipeline Project Component	DESIGN PHASE (%)				
	PER	30%	60%	90%	IFB
Conduct Project Identification Meeting with local regulatory agencies & utilities to identify key design and construction requirements and required permits. Potential agencies include but are not limited to: <ul style="list-style-type: none"> - U.S Army Corps of Engineers - Texas Department of Transportation - Railroad Commission - Federal Aviation Administration - Texas Parks and Wildlife - Local City/County/Municipality - Local Water/Wastewater/Electric/Gas/Communication Utilities - Texas Historical Commission - Texas Commission on Environmental Quality - Funding Agency (TWDB, EPA, BOR, etc....) 		X			
Preliminary equipment selection list, including manufacturer and model names, with justification for any potentially sole-sourced equipment		X			
Update local regulatory agencies & utilities with design progress and expected timeline of submissions			X		
Final equipment selection list, including any approved sole-source documentation			X		
Finalize permitting with local regulatory agencies & utilities				X	
PROJECT MANUAL					
Table of Contents, including a complete list of the Project's anticipated Div 00 and 01 and technical specifications		X			
GBRA PM to provide draft Div 00 specifications, including insurance and bond requirements			X		
Draft Specifications, including any Div 00 and 01 and technical specifications that are necessary for Project construction, with all non-related Project notes and details removed and replaced with Project-specific details			X		
Final Specifications (Ready for Permit Review)				X	
Signed and Sealed Specifications					X
CIVIL					
Desktop survey to establish project boundaries and routing analysis. Alignment maps with parcel boundaries, existing easements or utilities on aerial background. Hydraulic analysis for recommended routes. At a minimum, publicly available aerial graphics may be used.	X				

Pipeline Project Component	DESIGN PHASE (%)				
	PER	30%	60%	90%	IFB
Field Survey to establish the following minimum details: - Site grading, drainage features, above-grade structure locations and dimensions, overhead and underground utilities, special site conditions, and/or site constraints		X			
Review historical data, including Closed Circuit Televising (CCTV), video reports, record drawings, and block maps if available	X				
SUE Level D and C	X				
SUE Level B and A (coordinate crossings with other utilities)		X			
Develop initial utility conflict matrix (if applicable)	X				
Identification of proposed surge control system (if applicable)	X				
Identify if a Tree Preservation Plan is required for the Project	X				
Identify whether any unique features are recommended, e.g., fiber optic cables, drain valves, pigging stations, inspection ports, etc.	X				
Identify recommended pipeline scour prevention improvements, e.g., cofferdams, riprap, mats, etc.	X				
Preliminary scour prevention details (if applicable)		X			
Final scour prevention details (if applicable)			X		
Identify any required non-conventional trenching or excavation methods, e.g., rock saw, tunneling, etc.	X				
Finalize non-conventional trenching or excavation details (if applicable)			X		
Final Geotechnical Report		X			
Standard notes and details		X			
Existing site conditions plan with locations of existing infrastructure, contours, and drainage features		X			
Demolition plan (if applicable)		X			
Preliminary site grading and drainage plan		X			
Overall pipeline plan view		X			

Pipeline Project Component	DESIGN PHASE (%)				
	PER	30%	60%	90%	IFB
Preliminary site plan with locations of existing and proposed easements, piping, valves, meters, access roads, fencing, vaults, and/or associated improvements		X			
Preliminary stormwater pollution prevention and erosion control plan, including compliance with regulatory requirements		X			
Final site grading and drainage plan, including plan and profiles of roadway or drainage structures with final onsite vertical and horizontal control points identified (minimum two (2) within eyesight)			X		
Updated stormwater pollution prevention and erosion control plan, including adjustments for design updates			X		
Preliminary utility plan and profile sheets identifying the proposed improvements with existing utilities clearly identified in locations where conflicts could exist			X		
Draft traffic control plan and measures and begin coordination with regulatory entity			X		
Final surge analysis, including number and/or size of proposed surge control system and coordination with GBRA & others on associated system improvements that may impact the surge analysis, e.g., pump station improvements (if applicable)			X		
Finalize utility conflict matrix and confirm all conflicts are addressed with the proposed Project			X		
Finalize Tree Preservation Plan and identify if any mitigation measures are required (if applicable)			X		
Final utility plan and profile sheets identifying the proposed improvements with existing utilities clearly identified in locations where conflicts could exist (Ready for Permit Review)				X	
Final stormwater pollution prevention and erosion control plan (Ready for Permit Review)				X	
Finalize traffic control plan and measures and confirm regulatory approval of plan (Ready for Permit Review)				X	
Signed and Sealed Drawings					X
Design Calculations, including but not limited to:					
Drainage calcs and hydrologic analysis (if applicable)			X		
Earthwork calcs of cut and fill volumes with applicable cross sections			X		
Pressure, demand, and capacity analysis for sizing and material proposed in the utility system improvements			X		
Hydraulic calcs including surge analysis			X		

Pipeline Project Component	DESIGN PHASE (%)				
	PER	30%	60%	90%	IFB
STRUCTURAL					
Equipment Foundations and Cross-Sections		X			
Aboveground pipe support locations and details			X		
Preliminary structural plan and section layouts with overall dimensions and connection details			X		
Conduct a cross-discipline coordination meeting to confirm compatibility of equipment			X	X	
Final structural plan and section layouts with dimensions, tolerances, detail references, general and keyed notes and confirmed compatibility with other disciplines (Ready for Permit Review)				X	
Signed and Sealed Drawings					X
CATHODIC PROTECTION (IF APPLICABLE)					
Identify whether cathodic protection is recommended for the proposed Project, including evidence-based justification, e.g., geotechnical report, historical maintenance data, etc.	X				
Identify proposed cathodic protection system, e.g., impressed current or galvanic anodes	X				
For impressed current systems, identify power availability and reliability		X			
Identify proposed locations of cathodic protection infrastructure, e.g., rectifiers, anode stations, etc.		X			
Develop detailed design drawings, including locations of insulating flange kits and associated cathodic protection system equipment			X		
Final design drawings (Ready for Permit Review)				X	
Signed and Sealed drawings					X

Pump Station, Lift Station, and Delivery Point Project Submittal Requirements

PS/LS/DP Project Components	DESIGN PHASE (%)				
	PER	30%	60%	90%	IFB
GENERAL					
Obtain and review GBRA Construction Standards & Details	X				
Obtain and review GBRA IT/SCADA Parameters (Communication Type and Location)	X				
Obtain and review GBRA CAD/GIS Standards, including fonts, legends, format preferences, etc.	X				
Design and Construction Schedule Submittal	X	X	X	X	X
AACE Class 5 OPCC including costs for land acquisition, permitting, and utility coordination	X				
AACE Class 4 OPCC including unit costs for major materials and equipment		X			
AACE Class 3 OPCC including vendor quotes for major equipment (>5% of Total Project Cost)			X		
AACE Class 2 OPCC including updated vendor quotes for major equipment (>5% of Total Project Cost)				X	X
Conceptual Construction Sequencing Plan, including identifying key shutdown periods (if applicable)	X				
Preliminary Construction Sequencing Plan, including phasing (if applicable)		X			
Final Construction Sequencing Plan			X		
Identify whether any future expansion(s) are anticipated and discuss recommended features to improve constructability of future expansion(s) (if applicable)	X				
Preliminary future layout sheet(s) (if applicable)		X			
Finalize future layout sheet(s) (if applicable)			X		
Identify if continuous operations are required with the PM and identify potential bypass system(s)	X				
Develop a preliminary bypass plan, including identifying areas for staging bypass equipment (if applicable)			X		
Finalize the bypass plan (if applicable)				X	

PS/LS/DP Project Components	DESIGN PHASE (%)				
	PER	30%	60%	90%	IFB
Coordinate on allowable staging areas with PM and if plans are necessary			X		
Finalize construction staging areas, including allowable Right of Entry (if applicable)				X	
Conduct contractor outreach to identify interested parties & identify potential procurement challenges that may occur during advertisement		X	X	X	
Conduct Project Identification Meeting with local regulatory agencies & utilities to identify key design and construction requirements and required permits. Potential agencies include but are not limited to: <ul style="list-style-type: none"> - U.S Army Corps of Engineers - Texas Department of Transportation - Railroad Commission - Federal Aviation Administration - Texas Parks and Wildlife - Local City/County/Municipality - Local Water/Wastewater/Electric/Gas/Communication Utilities - Texas Historical Commission - Texas Commission on Environmental Quality - Funding Agency (TWDB, EPA, BOR, etc....) 		X			
Update local regulatory agencies & utilities with design progress and expected timeline of submissions			X		
Finalize permitting with local regulatory agencies & utilities				X	
Identify anticipated long-lead items for materials and equipment with description of proposed mitigation strategies to minimize risk of project schedule impacts	X				
Preliminary equipment selection list, including manufacturer and model names, with justification for any potentially sole-sourced equipment		X			
Final equipment selection list, including any approved sole-source documentation			X		
PROJECT MANUAL (SPECIFICATIONS)					
Table of contents, including a complete list of the Project's anticipated Div 00 and 01 and technical specifications		X			
GBRA PM to provide draft Div 00 specifications, including insurance and bond requirements			X		
Draft specifications, including any Div 00 and 01 and technical specifications that are necessary for Project construction, with all non-related Project notes and details removed and replaced with Project-specific details.			X		
Final specifications (Ready for Permit Review)				X	

PS/LS/DP Project Components	DESIGN PHASE (%)				
	PER	30%	60%	90%	IFB
Signed and Sealed specifications					X
CIVIL					
Desktop survey to establish project boundaries and approximate locations of existing and proposed infrastructure. At a minimum, publicly available aerial graphics may be used.	X				
Field Survey to establish the following minimum details: Site grading, drainage features, above-grade structure locations and dimensions, overhead and underground utilities, special site conditions, and/or site constraints		X			
SUE Level D and C	X				
SUE Level B and A (coordinate crossings with other utilities)		X			
Draft Hazardous Materials & Asbestos Survey (if applicable)	X				
Final Hazardous Materials & Asbestos Survey (if applicable)		X			
Identify if a Tree Preservation Plan is required for the Project	X				
Identify site security requirements, e.g., fencing, security cameras, etc.	X				
Identify whether any landscaping requirements are required for the site, e.g., seeding, trees, etc.	X				
Final Geotechnical Report		X			
Standard notes and details		X			
Existing site conditions plan with locations of existing infrastructure, existing contours, and drainage features		X			
Demolition plan (if applicable)		X			
Preliminary site grading and drainage plan		X			
Preliminary stormwater pollution prevention and erosion control plan, including compliance with regulatory requirements		X			
Preliminary site plan with locations of existing and proposed easements, piping, valves, pumps, storage tanks, meters, access roads, fencing, vaults, and/or associated improvements		X			

PS/LS/DP Project Components	DESIGN PHASE (%)				
	PER	30%	60%	90%	IFB
Final site grading and drainage plan, including plan and profiles of roadway or drainage structures with final onsite vertical and horizontal control points identified (minimum two (2) within eyesight)			X		
Draft traffic control plan and measures and begin coordination with regulatory entity			X		
Updated stormwater pollution prevention and erosion control plan, including adjustments for design updates			X		
Preliminary utility plan and profile sheets identifying the proposed improvements with existing utilities clearly identified in locations where conflicts could exist			X		
Finalize Tree Preservation Plan and identify if any mitigation measures are required (if applicable)			X		
Finalize landscaping design sheets (if applicable)			X		
Conduct a cross-discipline coordination meeting to confirm compatibility of equipment			X	X	
Finalize traffic control plan and measures and confirm regulatory approval of plan (Ready for Permit Review)				X	
Final stormwater pollution prevention and erosion control plan (Ready for Permit Review)				X	
Final utility plan and profile sheets identifying the proposed improvements with existing utilities clearly identified in locations where conflicts could exist (Ready for Permit Review)				X	
Signed and Sealed drawings					X
Design Calculations, including but not limited to:					
Drainage calcs and hydrologic analysis			X		
Earthwork calcs of cut and fill volumes with applicable cross sections			X		
Pavement design calculations			X		
Road design calcs including horizontal and vertical alignment, curve data, super elevation, minimum sight distances, and pavement thickness			X		
PROCESS/MECHANICAL					
Identify existing, proposed, and future minimum, maximum, and average pumping rates	X				
Identify existing, proposed, and future system head conditions	X				

PS/LS/DP Project Components	DESIGN PHASE (%)				
	PER	30%	60%	90%	IFB
Identification of proposed surge control system (if applicable)	X				
Identify key features for major process areas such as proposed equipment maintenance accessibility, cranes, canopies, safety features, etc.	X				
Preliminary surge analysis, including number and/or size of proposed surge control system (if applicable)		X			
Standard notes and details		X			
Preliminary mechanical plan and section layouts of proposed equipment, including pipes, pumps, valves, and instrumentation		X			
Final surge analysis, including number and/or size of proposed surge control system and coordination with GBRA & others on associated system improvements that may impact the surge analysis, e.g., pipeline improvements (if applicable)			X		
Project-specific details, e.g., pipe penetrations, supports, hangers, trench, valves, instruments, vaults, joints, etc.			X		
Detailed mechanical plan and section layouts of proposed equipment, including dimensional information and Project-specific construction notes			X		
Conduct a Process/Mechanical Workshop for approval of key mechanical equipment and features, including acceptable manufacturer, equipment warranties, list of spare parts, operator training, etc.			X		
Conduct a cross-discipline coordination meeting to confirm compatibility of equipment			X	X	
Final mechanical plan and section layouts of proposed equipment (Ready for Permit Review)				X	
Signed and Sealed drawings					X
Design Calculations, including but not limited to:					
System Curve considering minimum and maximum demands	X				
Recommendation of number and size of pumps based on steady-state hydraulic modeling of pipeline operating at minimum and maximum demands	X				
List of pump manufacturers meeting requirements (flow, TDH, NPSH _r , rpm, etc)	X				
Sizing calculations for hydraulic structures, e.g., wet well, intake structure, reservoir, etc.	X				

PS/LS/DP Project Components	DESIGN PHASE (%)				
	PER	30%	60%	90%	IFB
Tank overflow and vent calculations	X				
Calculation of available net positive suction head		X			
Consideration of pump operation/cycling		X			
Consideration of POR and BEP		X			
Consideration of pump and hydraulic structure accessibility & maintenance		X			
Compliance confirmation with applicable Hydraulic Institute standards			X		
STRUCTURAL					
Identification of proposed structures, including building function, material, design methodology, performance category, hazard category, acceptance criteria, and ancillary features.	X				
Equipment and building foundation plans and cross-sections			X		
Aboveground pipe support locations and details			X		
Preliminary structural plan and section layouts with overall dimensions and connection details			X		
Secondary component details such as footings, beams, and columns			X		
Conduct a cross-discipline coordination meeting to confirm compatibility of equipment			X	X	
Final structural plan and section layouts with dimensions, tolerances, detail references, general and keyed notes and compatibility with other disciplines (Ready for Permit Review)				X	
Beam, column, and footing schedules				X	
Foundation & anchor details				X	
Reinforcement and connection details, including bolt and weld sizes				X	
Signed and Sealed drawings					X
ARCHITECTURAL					

PS/LS/DP Project Components	DESIGN PHASE (%)				
	PER	30%	60%	90%	IFB
Description of proposed structures and associated architectural features, such as materials, insulation rating, and/or external façade	X				
Identify any code requirements and required features of buildings & structures per local and state ordinances	X				
Preliminary architectural symbols and legend		X			
Establish Design Criteria, including Life Safety Analysis, IBC Code, and NFPA 101 Occupancy Type		X			
Identify required locking mechanisms for building security		X			
Preliminary plan layouts and exterior elevations			X		
Conduct a cross-discipline coordination meeting to confirm compatibility of equipment			X	X	
Final layouts and exterior elevations, including wall sections and required ADA details (Ready for Permit Review)				X	
All plans, elevations, sections, details, interior elevations, and schedules completed, authorized, and ready to issue for approval				X	
HVAC					
Preliminary mechanical symbols and legend		X			
Preliminary equipment schedule, including a schedule of major equipment with operating parameters		X			
Preliminary HVAC floor plans showing major equipment, duct runs, and VAVs/heating coils			X		
Preliminary HVAC roof plans showing office layout and equipment room, major equipment, penetrations, and pipe/duct runs			X		
Preliminary airflow diagrams including major equipment, supply & return diffusers, transfer grills, dampers, VAV/ reheat coils, airflow rates, and facility/room pressurization requirements			X		
Preliminary P&IDs including major system equipment, control devices, control wiring & logic, and sequence of operation (if applicable)			X		
Conduct a cross-discipline coordination meeting to confirm compatibility of equipment			X	X	
Final HVAC floor and roof plans (Ready for Permit Review)				X	

PS/LS/DP Project Components	DESIGN PHASE (%)				
	PER	30%	60%	90%	IFB
Final airflow diagrams and P&IDs (Ready for Permit Review)				X	
Signed and Sealed drawings					X
PLUMBING					
Preliminary plumbing symbols and legend		X			
Preliminary plumbing diagrams including riser diagrams for the potable water system, sanitary waste/vent system, roof drainage, and make-up water system. Major equipment, fixtures, and piping included on the riser diagrams		X			
Preliminary heating water P&ID (if applicable)		X			
Preliminary chilled water P&ID (if applicable)		X			
Preliminary plumbing floor plans including office layout, restrooms, equipment rooms, major equipment locations, fixture locations, and distribution and vent piping			X		
Preliminary Process Piping Plans including all major equipment, pipe runs, pipe sizes, and water flow rates			X		
Preliminary Plumbing Details include major equipment requirements and specialties, e.g. backflow preventer installation assemblies, PRV piping details, floor drain details, and cleanout details			X		
Conduct a cross-discipline coordination meeting to confirm compatibility of equipment			X	X	
Final plumbing diagrams, P&IDs, floor plans, process piping plan and sections, and details (Ready for Permit Review)				X	
Signed and Sealed drawings					X
FIRE PROTECTION (if applicable)					
Description of location, size, number of stories, construction, and occupancy of buildings and identification of locations to be provided with fire protection and fire alarm systems	X				
Identify any code requirements and required features of buildings & structures per local and state ordinances	X				
Building plan showing building layout, fire areas, fire walls, locations of FACP, pull stations, and horn/strobe units			X		

PS/LS/DP Project Components	DESIGN PHASE (%)				
	PER	30%	60%	90%	IFB
Preliminary site plan showing size, type and location of underground water mains and location of hydrants, sprinkler system lead-ins, and sectional valves			X		
Preliminary layouts showing all areas to be within a sprinkler radius, including features of construction and HVAC that could present obstructions of which the sprinkler contractor must be aware of, and rating of emergency lights			X		
Conduct a cross-discipline coordination meeting to confirm compatibility of equipment			X	X	
Final fire protection drawings and layouts (Ready for Permit Review)				X	
Signed and Sealed drawings					X
ELECTRICAL					
Conduct Utility Power Coordination Meeting	X				
Identification of proposed motor starting methods for major equipment	X				
Applicable standard electrical details and notes		X			
Preliminary site plan, including electrical and communication connection points and routing to project and onsite duct bank routing		X			
Preliminary one-line diagram indicating service and distribution system arrangement		X			
Preliminary power plans, including major electrical equipment locations		X			
Preliminary communication plans, including room locations and preliminary cable tray routing		X			
Conduct an Electrical and IT/SCADA/I&C Design Workshop (to identify network switch classifications)			X		
Detailed site plan, including power supply plan, site lighting, and duct bank routing			X		
One-line diagram further developed to show all component sizes			X		
Detailed power plans, including locations of receptacles, mechanical equipment, user equipment, and complete branch circuiting			X		
Detailed enlarged electrical room plans, including indication of NEC required working spaces			X		
Detailed lighting plans, including complete branch circuiting and lighting controls			X		

PS/LS/DP Project Components	DESIGN PHASE (%)				
	PER	30%	60%	90%	IFB
Detailed luminaire schedule, including complete descriptions and catalog numbers of all luminaires			X		
Detailed communication plans, including receptacles, grounding, equipment racks, outlet locations and final cable tray routing			X		
Preliminary lightning protection system performance specification, including locations of air terminals, main conductors, down conductors, and grounding counterpoise (if applicable)			X		
Preliminary grounding diagram, including main grounding electrode, main electrode ground bar, supplemental ground bars, and bonding locations for piping and structural steel			X		
Preliminary communication protocol and system riser diagram			X		
Preliminary motor control diagram for each typical motor control configuration			X		
Preliminary security system riser diagram			X		
Preliminary panel schedules created for each panel not detailed on the one-line, including load descriptions and values			X		
Preliminary Power System Study ¹ , including confirming power availability with local power utility			X		
Harmonic study (if applicable)			X		
Conduct a cross-discipline coordination meeting to confirm compatibility of equipment			X	X	
Final site plan, one-line diagrams, lighting plans, and electrical room plans, including confirmed compatibility with other disciplines (Ready for Permit Review)				X	
Final lightning protection system performance specification, grounding diagrams, communication system riser diagrams, motor control diagrams, security system riser diagrams, panel schedules, and equipment ID tags, including confirmed compatibility with other disciplines (Ready for Permit Review)				X	
Signed and Sealed drawings					X
Design Calculations, including but not limited to:					
Conceptual electrical load summary to estimate major equipment capacities, including generator sizing	X				
Preliminary electrical load study to determine wiring, conduit, and associated equipment capacities			X		

PS/LS/DP Project Components	DESIGN PHASE (%)				
	PER	30%	60%	90%	IFB
Final generator capacity calculations and equipment selected				X	
Final load study, including circuits sized and distribution components selected				X	
Final voltage drop calculations				X	
Final exterior lighting calculations based on IES standards or GBRA-approved standards				X	
Final wiring sized and components selected				X	
Final confirmation of all electrical calcs with latest design updates, including cross-discipline coordinated				X	
INSTRUMENTATION AND CONTROLS					
Conceptual control narrative	X				
Preliminary Control System Network Block Diagram for each process area		X			
Preliminary process and control narratives and Sequence of Operations for each system		X			
Preliminary I/O list			X		
Preliminary P&ID drawing for each system, include major process equipment & instrumentation (Panel IDs are not required)			X		
Preliminary instrument list			X		
Preliminary control schematics			X		
Final Control System Network Block Diagram including SCADA servers, HMIs, PLCs, local control panels, and communication including firewalls, switches, DMZ and inter-area communications.			X		
Final process control narratives and sequence of operations for each system, including complete descriptions of permissives, interlocks, system alarms, emergency callout alarms, and PID loops				X	
Conduct a cross-discipline coordination meeting to confirm compatibility of equipment			X	X	
Final P&IDs, instrument point list, instrument list, control panel schematics, and control power feeds, including confirmed compatibility with other disciplines (Ready for Permit Review)				X	

PS/LS/DP Project Components	DESIGN PHASE (%)				
	PER	30%	60%	90%	IFB
Signed and Sealed drawings					X
Design Calculations, including but not limited to:					
Preliminary device sizing calculations			X		
Completed calculations for all engineered instrumentation devices				X	
Preliminary Path or Communication Study		X			
Final Path or Communication Study			X		
Cathodic Protection (If applicable)					
Identify whether cathodic protection is recommended for the proposed Project, including evidence-based justification, e.g., geotechnical report, historical maintenance data, etc.	X				
Identify proposed cathodic protection system, e.g., impressed current or galvanic anodes	X				
For impressed current systems, identify power availability and reliability		X			
Identify proposed locations of cathodic protection infrastructure, e.g., rectifiers, anode stations, etc.		X			
Develop detailed design drawings, including locations of insulating flange kits and associated cathodic protection system equipment			X		
Final design drawings (Ready for Permit Review)				X	
Signed and Sealed drawings					X

¹Design Engineer is responsible for confirming electrical load and electrical availability for required Work. Contractor to perform coordination study which is dependent on specific equipment procured.

Treatment Facility Project Submittal Requirements

Treatment Facility Project Components	DESIGN PHASE (%)				
	PER	30%	60%	90%	IFB
GENERAL					
Obtain and review GBRA Construction Standards & Details	X				
Obtain and review GBRA IT/SCADA Parameters (Communication Type and Location)	X				
Obtain and review GBRA CAD/GIS Standards, including fonts, legends, format preferences, etc.	X				
Design and Construction Schedule Submittal	X	X	X	X	X
AACE Class 5 OPCC including costs for land acquisition, permitting, and utility coordination	X				
AACE Class 4 OPCC including unit costs for major materials and equipment		X			
AACE Class 3 OPCC including vendor quotes for major equipment (>5% of Total Project Cost)			X		
AACE Class 2 OPCC including updated vendor quotes for major equipment (>5% of Total Project Cost)				X	X
Identify if any TPDES/TLAP permit updates/applications are necessary for the proposed Project	X				
Submit any TPDES/TLAP permit applications		X			
TPDES/TLAP permit issued for proposed Project					X
Conceptual Construction Sequencing Plan, including identifying key shutdown periods if necessary	X				
Preliminary Construction Sequencing Plan, including phasing if necessary		X			
Final Construction Sequencing Plan			X		
Identify whether any future expansion(s) are anticipated and discuss recommended features to improve constructability of future expansion(s) (if applicable)	X				
Preliminary future layout sheet(s) (if applicable)		X			
Finalize future layout sheet(s) (if applicable)			X		

Treatment Facility Project Components	DESIGN PHASE (%)				
	PER	30%	60%	90%	IFB
Identify if continuous operations are required with the PM and identify potential bypass system(s)	X				
Develop a preliminary bypass plan, including identifying areas for staging bypass equipment (if applicable)			X		
Finalize the bypass plan (if applicable)				X	
Coordinate on allowable staging areas with PM and if plans are necessary			X		
Finalize construction staging areas, including allowable Right of Entry (if applicable)				X	
Conduct contractor outreach to identify interested parties & identify potential procurement challenges that may occur during advertisement		X	X	X	
Conduct Project Identification Meeting with local regulatory agencies & utilities to identify key design and construction requirements and required permits. Potential agencies include but are not limited to: <ul style="list-style-type: none"> - U.S Army Corps of Engineers - Texas Department of Transportation - Railroad Commission - Federal Aviation Administration - Texas Parks and Wildlife - Local City/County/Municipality - Local Water/Wastewater/Electric/Gas/Communication Utilities - Texas Historical Commission - Texas Commission on Environmental Quality - Funding Agency (TWDB, EPA, BOR, etc....) 		X			
Update local regulatory agencies & utilities with design progress and expected timeline of submissions			X		
Finalize permitting with local regulatory agencies & utilities				X	
Identify anticipated long-lead items for materials and equipment with description of proposed mitigation strategies to minimize risk of project schedule impacts	X				
Preliminary equipment selection list, including manufacturer and model names, with justification for any potentially sole-sourced equipment		X			
Final equipment selection list, including any approved sole-source documentation			X		

Treatment Facility Project Components	DESIGN PHASE (%)				
	PER	30%	60%	90%	IFB
PROJECT MANUAL (SPECIFICATIONS)					
Table of contents, including a complete list of the Project's anticipated Div 00 and 01 and technical specifications		X			
GBRA PM to provide draft Div 00 specifications, including insurance and bond requirements			X		
Draft specifications, including any Div 00 and 01 and technical specifications that are necessary for Project construction, with all non-related Project notes and details removed and replaced with Project-specific details			X		
Final specifications (Ready for Permit Review)				X	
Signed and Sealed specifications					X
CIVIL					
Desktop survey to establish project boundaries and approximate locations of existing and proposed infrastructure. At a minimum, publicly available aerial graphics may be used.	X				
Field Survey to establish the following minimum details: Site grading, drainage features, above-grade structure locations and dimensions, overhead and underground utilities, special site conditions, and/or site constraints		X			
SUE Level D and C	X				
SUE Level B and A (coordinate crossings with other utilities)		X			
Draft Hazardous Materials & Asbestos Survey (if applicable)	X				
Final Hazardous Materials & Asbestos Survey (if applicable)		X			
Identify site security requirements, e.g., fencing, security cameras, etc.	X				
Identify whether any landscaping requirements are required for the site, e.g., seeding, trees, etc.	X				
Final Geotechnical Report		X			
Standard notes and details		X			
Existing site conditions plan with locations of existing infrastructure, existing contours, and drainage features		X			

Treatment Facility Project Components	DESIGN PHASE (%)				
	PER	30%	60%	90%	IFB
Demolition plan (if applicable)		X			
Preliminary site grading and drainage plan		X			
Identify if traffic control measures are necessary for construction, including equipment delivery		X			
Preliminary stormwater pollution prevention and erosion control plan, including compliance with regulatory requirements		X			
Preliminary site plan with locations of existing and proposed easements, piping, valves, pumps, storage tanks, meters, access roads, fencing, vaults, and/or associated improvements		X			
Final site grading and drainage plan, including plan and profiles of roadway or drainage structures with final onsite vertical and horizontal control points identified (minimum two (2) within eyesight)			X		
Draft traffic control plan and measures and begin coordination with regulatory entity			X		
Updated stormwater pollution prevention and erosion control plan, including adjustments for design updates			X		
Preliminary utility plan and profile sheets identifying the proposed improvements with existing utilities clearly identified in locations where conflicts could exist			X		
Finalize landscaping design sheets (if applicable)			X		
Final utility plan and profile sheets identifying the proposed improvements with existing utilities clearly identified in locations where conflicts could exist (Ready for Permit Review)				X	
Finalize traffic control plan and measures and confirm regulatory approval of plan (Ready for Permit Review)				X	
Final stormwater pollution prevention and erosion control plan (Ready for Permit Review)				X	
Conduct a cross-discipline coordination meeting to confirm compatibility of equipment			X	X	
Signed and Sealed drawings					X
Design Calculations, including but not limited to:					
Drainage calcs and hydrologic analysis			X		
Earthwork calcs of cut and fill volumes with applicable cross sections			X		

Treatment Facility Project Components	DESIGN PHASE (%)				
	PER	30%	60%	90%	IFB
Pavement design calculations			X		
Road design calcs including horizontal and vertical alignment, curve data, super elevation, minimum sight distances, and pavement thickness			X		
PROCESS/MECHANICAL					
Establish existing, proposed, and future minimum, maximum, and average flow rates	X				
Establish existing, proposed, and future process flow diagram for liquids and solids process streams	X				
Establish existing, proposed, and future biosolids or residuals production and identify proposed solids handling equipment and system	X				
Identify key features for major process areas such as proposed equipment maintenance accessibility, cranes, canopies, safety features, etc.	X				
Identify if any odor control measures are necessary for the proposed Project based on estimated H ₂ S generation and/or historic evidence	X				
Evaluate existing hydraulic profile to identify potential hydraulic bottlenecks (if applicable)	X				
Establish existing, proposed, and future hydraulic profiles, including liquids and solids process streams		X			
Standard notes and details		X			
Preliminary mechanical plan and section layouts of proposed equipment, including pipes, pumps, valves, and instrumentation		X			
Project-specific details, e.g., pipe penetrations, supports, hangers, trench, valves, instruments, vaults, joints, etc.			X		
Detailed mechanical plan and section layouts of proposed equipment, including dimensional information and Project-specific construction notes			X		
Conduct a Process Mechanical Workshop for approval of key mechanical equipment and features, including acceptable manufacturer, equipment warranties, list of spare parts, operator training, etc.			X		
Conduct a cross-discipline coordination meeting to confirm compatibility of equipment			X	X	
Final mechanical plan and section layouts of proposed equipment (Ready for Permit Review)				X	

Treatment Facility Project Components	DESIGN PHASE (%)				
	PER	30%	60%	90%	IFB
Signed and Sealed drawings					X
Design Calculations, including but not limited to:					
Hydraulic profile considering minimum and maximum flow rates	X				
Recommendation of number and size of treatment basins and equipment based on process modeling operating at minimum and maximum demands	X				
Aeration and return flow calculations for proposed biological treatment processes, including under varying nutrient loading and flow conditions	X				
Chemical feed calculations, including sizing of chemical storage and feed pumps	X				
Solids production calculations, including sizing of sludge storage, thickening, and dewatering processes	X				
Sizing calculations for hydraulic structures, e.g., wet well, intake structure, reservoir, etc.	X				
Consideration of equipment and hydraulic structure accessibility & maintenance		X			
Compliance confirmation with applicable AWWA, WEF, and TCEQ standards			X		
STRUCTURAL					
Identification of proposed structures, including building function, material, design methodology, performance category, hazard category, acceptance criteria, and ancillary features.	X				
Equipment and building foundation plans and cross-sections			X		
Aboveground pipe support locations and details			X		
Preliminary structural plan and section layouts with overall dimensions and connection details			X		
Secondary component details such as footings, beams, and columns			X		
Conduct a cross-discipline coordination meeting to confirm compatibility of equipment			X	X	
Final structural plan and section layouts with dimensions, tolerances, detail references, general and keyed notes and compatibility with other disciplines (Ready for Permit Review)				X	

Treatment Facility Project Components	DESIGN PHASE (%)				
	PER	30%	60%	90%	IFB
Beam, column, and footing schedules				X	
Foundation & anchor details				X	
Reinforcement and connection details, including bolt and weld sizes				X	
Signed and Sealed drawings					X
ARCHITECTURAL					
Description of proposed structures and associated architectural features, such as materials, insulation rating, and/or external façade	X				
Identify any code requirements and required features of buildings & structures per local and state ordinances	X				
Preliminary architectural symbols and legend		X			
Establish Design Criteria, including Life Safety Analysis, IBC Code, and NFPA 101 Occupancy Type		X			
Identify required locking mechanisms for building security		X			
Preliminary plan layouts and exterior elevations			X		
Conduct a cross-discipline coordination meeting to confirm compatibility of equipment			X	X	
Final layouts and exterior elevations, including wall sections and required ADA details (Ready for Permit Review)				X	
All plans, elevations, sections, details, interior elevations, and schedules completed, authorized, and ready to issue for approval				X	
HVAC					
Preliminary mechanical symbols and legend		X			
Preliminary equipment schedule, including a schedule of major equipment with operating parameters		X			
Preliminary HVAC floor plans showing major equipment, duct runs, and VAVs/heating coils			X		

Treatment Facility Project Components	DESIGN PHASE (%)				
	PER	30%	60%	90%	IFB
Preliminary HVAC roof plans showing office layout and equipment room, major equipment, penetrations, and pipe/duct runs			X		
Preliminary airflow diagrams including major equipment, supply & return diffusers, transfer grills, dampers, VAV/reheat coils, airflow rates, and facility/room pressurization requirements			X		
Preliminary P&IDs including major system equipment, control devices, control wiring & logic, and sequence of operation (if applicable)			X		
Conduct a cross-discipline coordination meeting to confirm compatibility of equipment			X	X	
Final HVAC floor and roof plans (Ready for Permit Review)				X	
Final airflow diagrams and P&IDs (Ready for Permit Review)				X	
Signed and Sealed drawings					X
PLUMBING					
Preliminary plumbing symbols and legend		X			
Preliminary plumbing diagrams including riser diagrams for the potable water system, sanitary waste/vent system, roof drainage, and make-up water system. Major equipment, fixtures, and piping included on the riser diagrams		X			
Preliminary heating water P&ID (if applicable)		X			
Preliminary chilled water P&ID (if applicable)		X			
Incorporate estimated flows in the process flow diagram		X			
Preliminary plumbing floor plans including office layout, restrooms, equipment rooms, major equipment locations, fixture locations, and distribution and vent piping			X		
Preliminary process piping plans including all major equipment, pipe runs, pipe sizes, and water flow rates			X		
Preliminary plumbing details include major equipment requirements and specialties, e.g. backflow preventer installation assemblies, PRV piping details, floor drain details, and cleanout details			X		
Conduct a cross-discipline coordination meeting to confirm compatibility of equipment			X	X	

Treatment Facility Project Components	DESIGN PHASE (%)				
	PER	30%	60%	90%	IFB
Final plumbing diagrams, P&IDs, floor plans, process piping plan and sections, and details (Ready for Permit Review)				X	
Signed and Sealed drawings					X
FIRE PROTECTION (if applicable)					
Description of location, size, number of stories, construction, and occupancy of buildings and identification of locations to be provided with fire protection and fire alarm systems	X				
Identify any code requirements and required features of buildings & structures per local and state ordinances	X				
Building plan showing building layout, fire areas, fire walls, locations of FACP, pull stations, and horn/strobe units			X		
Preliminary site plan showing size, type and location of underground water mains and location of hydrants, sprinkler system lead-ins, and sectional valves			X		
Preliminary layouts showing all areas to be within a sprinkler radius, including features of construction and HVAC that could present obstructions that the sprinkler contractor must be aware of, and rating of emergency lights			X		
Conduct a cross-discipline coordination meeting to confirm compatibility of equipment			X	X	
Final fire protection drawings and layouts (Ready for Permit Review)				X	
Signed and Sealed drawings					X
ELECTRICAL					
Conduct Utility Power Coordination Meeting	X				
Identification of proposed motor starting methods for major equipment	X				
Applicable standard electrical details and notes		X			
Preliminary site plan, including electrical and communication connection points and routing to project and onsite duct bank routing		X			
Preliminary one-line diagram indicating service and distribution system arrangement		X			

Treatment Facility Project Components	DESIGN PHASE (%)				
	PER	30%	60%	90%	IFB
Preliminary power plans, including major electrical equipment locations		X			
Preliminary communication plans, including room locations and preliminary cable tray routing		X			
Conduct an Electrical and IT/SCADA/I&C Design Workshop			X		
Preliminary Power System Study ¹ , including confirming power availability with local power utility			X		
Detailed site plan, including power supply plan, site lighting, and duct bank routing			X		
One-line diagram further developed to show all component sizes			X		
Detailed power plans, including locations of receptacles, mechanical equipment, user equipment, and complete branch circuiting			X		
Detailed enlarged electrical room plans, including indication of NEC required working spaces			X		
Detailed lighting plans, including complete branch circuiting and lighting controls			X		
Detailed luminaire schedule, including complete descriptions and catalog numbers of all luminaires			X		
Detailed communication plans, including receptacles, grounding, equipment racks, outlet locations and final cable tray routing			X		
Preliminary lightning protection system performance specification, including locations of air terminals, main conductors, down conductors, and grounding counterpoise (if applicable)			X		
Preliminary grounding diagram, including main grounding electrode, main electrode ground bar, supplemental ground bars, and bonding locations for piping and structural steel			X		
Preliminary communication protocol and system riser diagram			X		
Preliminary motor control diagram for each typical motor control configuration			X		
Preliminary security system riser diagram			X		
Preliminary panel schedules created for each panel not detailed on the one-line, including load descriptions and values			X		

Treatment Facility Project Components	DESIGN PHASE (%)				
	PER	30%	60%	90%	IFB
Harmonic study (if applicable)			X		
Conduct a cross-discipline coordination meeting to confirm compatibility of equipment			X	X	
Final site plan, one-line diagrams, lighting performance specification, and electrical room plans, including confirmed compatibility with other disciplines (Ready for Permit Review)				X	
Final lightning protection system performance specification, grounding diagrams, communication system riser diagrams, motor control diagrams, security system riser diagrams, panel schedules, and equipment ID tags, including confirmed compatibility with other disciplines (Ready for Permit Review)				X	
Signed and Sealed drawings					X
Design Calculations, including but not limited to:					
Conceptual electrical load summary to estimate major equipment capacities, including generator sizing	X				
Preliminary electrical load study to determine wiring, conduit, and associated equipment capacities			X		
Final generator capacity calculations and equipment selected				X	
Final load study, including circuits sized and distribution components selected				X	
Final voltage drop calculations				X	
Final exterior lighting calculations based on IES standards or GBRA-approved standards				X	
Final wiring sized and components selected				X	
Final confirmation of all electrical calcs with latest design updates, including cross-discipline coordinated				X	
INSTRUMENTATION AND CONTROLS					
Conceptual control narrative	X				
Preliminary Control System Network Block Diagram for each process area		X			

Treatment Facility Project Components	DESIGN PHASE (%)				
	PER	30%	60%	90%	IFB
Preliminary process and control narratives and Sequence of Operations for each system		X			
Preliminary I/O list			X		
Preliminary P&ID drawing for each system, include major process equipment & instrumentation (Panel IDs are not required)			X		
Preliminary instrument list			X		
Preliminary control schematics			X		
Final Control System Network Block Diagram for each process area including SCADA servers, HMIs, PLCs, local control panels, and plant-wide communication including firewalls, switches, DMZ, and inter-area communications.			X		
Final process control narratives and sequence of operations for each system, including complete descriptions of permissives, interlocks, system alarms, emergency callout alarms and PID loops				X	
Conduct a cross-discipline coordination meeting to confirm compatibility of equipment			X	X	
Final P&IDs, instrument point list, instrument list, control panel schematics, and control power feeds, including confirmed compatibility with other disciplines (Ready for Permit Review)				X	
Signed and Sealed drawings					X
Design Calculations, including but not limited to:					
Preliminary device sizing calculations			X		
Completed calculations for all engineered instrumentation devices				X	
Preliminary Path or Communication Study (Internet/Ethernet service)		X			
Final Path or Communication Study (Internet/Ethernet service)			X		

¹Design Engineer is responsible for confirming electrical load and electrical availability for required Work. Contractor to perform coordination study which is dependent on specific equipment procured.

Appendix A

OPCC Classification

	<i>Primary Characteristic</i>	<i>Secondary Characteristic</i>	<i>Secondary Characteristic</i>	<i>Secondary Characteristic</i>
ESTIMATE CLASS	% COMPLETE	TYPE	METHODOLOGY	ACCURACY RANGE
Class 5	0% to 2%	Concept	Capacity Factored, Parametric Models, Judgment, or Analogy	L: -20% to -50% H: +30% to +100%
Class 4	2% to 15%	Feasibility	Equipment Factored or Parametric Models	L: -15% to -30% H: +20% to +50%
Class 3	10% to 40%	Budget/Funding	Semi-Detailed Unit Costs with Assembly Level Line Items	L: -10% to -20% H: +10% to +30%
Class 2	30% to 75%	Control	Detailed Unit Cost with Forced Detailed Take-Off	L: -5% to -15% H: +5% to +20%
Class 1	65% to 100%	Bid	Detailed Unit Cost with Detailed Take-Off	L: -3% to -10% H: +3% to +15%

https://web.aacei.org/docs/default-source/toc/toc_18r-97.pdf?sfvrsn=4

SUE Classification

Utility Quality Level	Definition
D	Information derived from existing records or oral recollections.
C	Information obtained by surveying and plotting visible above-ground utility features and by using professional judgment in correlating this information to quality level D information.
B	Information obtained through the application of appropriate surface geophysical methods ¹ to determine the existence and approximate horizontal position of subsurface utilities. Quality level B data should be reproducible by surface geophysics at any point of their depiction. This information is surveyed to applicable tolerances defined by the project and reduced onto plan documents.
A	Precise horizontal and vertical location of utilities obtained by the actual exposure (or verification of previously exposed and surveyed utilities) and subsequent measurement of subsurface utilities, usually at a specific point. Minimally intrusive excavation ² equipment is typically used to minimize the potential for utility damage. A precise horizontal and vertical location, as well as other utility attributes, is shown on plan documents. Accuracy is typically set to 15-mm vertical and to applicable horizontal survey and mapping accuracy as defined or expected by the project owner.

1. Surface geophysical method - Any of a number of methods designed to utilize and interpret ambient or applied energy fields for the purpose of identifying properties of, and structure within, the earth. Such methods typically include variants of electromagnetic, magnetic, elastic wave, gravitational, and chemical energies.
2. Minimally intrusive excavation method - A method of excavation that minimizes the potential for damage to the structure being uncovered. Factors such as utility material and condition may influence specific techniques. Typical techniques for utility exposures include air-entrainment/vacuum-extraction systems, water-jet/vacuum-extraction systems, and careful hand tool usage

<https://www.dot.ga.gov/PartnerSmart/utilities/Documents/ASCE%2038-02.pdf>

Reference *Standard Guideline for Investigating and Documenting Existing Utilities, ASCE/UESI/CI 38-22* for survey accuracies associated with each utility quality level.