



COASTAL WATER AUTHORITY

EASEMENT & RIGHT-OF-WAY ENCROACHMENT

GENERAL REQUIREMENTS

REVISED March 2022

(SUPERSEDES AUGUST 2015 REVISION)

Issued by:

Coastal Water Authority
1801 Main Street, Suite 800
Houston, Texas 77002



Contents

1.0	BACKGROUND	1
1.1	CWA SYSTEM IMPORTANCE	1
1.2	PURPOSE OF REQUIREMENTS.....	1
1.3	DEFINITIONS.....	2
2.0	APPLICATION PROCESS.....	4
2.1	APPLICATION SUBMISSION.....	4
2.2	FEES.....	5
2.3	APPLICATION REVIEW.....	6
3.0	ENCROACHMENT REQUIREMENTS.....	8
3.1	DESIGN DRAWINGS	8
3.2	PROJECT DESIGN	10
3.3	UNDERGROUND UTILITIES	11
3.4	ABOVEGROUND FACILITIES	14
3.5	ROADWAYS	15
3.6	RAILROADS.....	16
3.7	CWA CANAL CROSSINGS.....	16
4.0	ENCROACHMENT CONDITIONS	23
4.1	GENERAL CONDITIONS	23
4.2	INDEMNIFICATION.....	24
4.3	INSURANCE REQUIREMENTS	25
4.4	ACCESS REQUIREMENTS	27
4.5	CONSTRUCTION REQUIREMENTS	28
4.6	MAINTENANCE	29
4.7	ABANDONMENT.....	30
5.0	MISCELLANEOUS REQUESTS.....	31
5.1	SPECIAL ENCROACHMENTS.....	31
5.2	PROJECT INTERRUPTION.....	31

Appendices

- A. EASEMENT & RIGHT-OF-WAY ENCROACHMENT APPLICATION
- B. RIGHT OF ENTRY FORM
- C. TYPICAL DETAILS



1.0 BACKGROUND

1.1 CWA SYSTEM IMPORTANCE

The Coastal Water Authority's (CWA) principal objective is to deliver raw water to municipal, industrial and agricultural entities throughout Liberty, Chambers, and Harris County, Texas. Therefore, CWA must be able to construct, operate, maintain, and repair or replace the various water distribution facilities throughout the CWA system. Inappropriate activities in proximity to CWA facilities can be costly, damaging, and threaten public health and safety. These easement and right-of-way encroachment requirements apply to all CWA rights-of-way and easements and serve as the primary means to monitor all existing or proposed construction and operations/maintenance of improvements, while facilitating the maximum protection of the CWA system and its users.

The purpose of these requirements is to enhance CWA conveyance and distribution facilities' security, protect the integrity of existing facilities and accommodate future facility improvements and operational needs. CWA canals and distribution system perform an integral function, providing fresh water to the City of Houston (COH) and surrounding communities. Continued uninterrupted operation is a vital governmental function for the well-being of citizens in the served communities.

1.2 PURPOSE OF REQUIREMENTS

These revised/updated requirements supersede all previous editions and revisions. The requirements identify the rules and guidelines that must be satisfied to encroach upon or cross a CWA right-of-way or easement as well as the procedures to obtain authorization for such activities. These requirements contain the following sections:

- Application Process
- Encroachment Requirements
- Encroachment Conditions
- Changes to Easements or Encroachments

CWA rights-of-way and/or easements are identified as "CWA Corridors" in this document. Each section addresses the most common procedures and requirements related to the specific section. These requirements may not be all-inclusive depending on specific situations and circumstances. Each *Easement and Right-of-way Encroachment Application* will be considered on an individual basis and additional information and/or precautions may be required. All *Easement or Consent to Encroach Application* reviews will focus on the protection of CWA facilities and the ability for CWA to construct, operate, maintain, repair or replace CWA facilities. These guidelines are available on the CWA Crossing Application website (<https://cwacrossing.org/>). The Applicant is responsible for becoming and remaining informed of the General Requirements. **FAILURE TO OBTAIN AN EASEMENT OR CONSENT TO ENCROACH MAY RESULT IN THE REMOVAL OF INSTALLED FACILITIES.**

NOTE: THIS DOCUMENT PROVIDES MINIMUM REQUIREMENTS. THE GENERAL REQUIREMENTS MAY BE AMENDED FROM TIME TO TIME. CWA RESERVES THE RIGHT TO INCREASE THE STATED REQUIREMENTS BASED ON PROJECT SPECIFIC CIRCUMSTANCES TO PROTECT CWA FACILITIES.



General Encroachment Requirements

The General Requirements delegate to the Executive Director approval authority for certain easements and encroachments. The General Requirements do not limit or restrict the CWA Board's exercise of any powers, duties, or jurisdiction conferred by law. The CWA Board may vote to amend or otherwise alter the General Requirements from time to time.

The references to parts, sections, and other headings in the General Requirements are for reference purposes only and will not affect the meaning or interpretation of the rules. If any one or more of the General Requirements is for any reason held to be invalid or unenforceable in any respect, the other General Requirements shall remain valid and be construed as if the invalid or unenforceable requirement was not included in the General Requirements.

1.3 DEFINITIONS

Applicant: Any person or entity that seeks or obtains an easement or consent to encroach through submission of an application referenced in these General Requirements.

Application: CWA's *Easement and Right-of-way Encroachment Application* and all related, applicable submittals described in the Encroachment Requirements and Encroachment Conditions. The application is available on the CWA Crossing Application website (<https://cwacrossing.org/>) and attached as *Appendix A*

Boring or Direction Drilling Pit: Limited excavations to facilitate underground pipe installation without open cutting a trench the entire pipe installation length.

Cathodic Protection: A technique to control the corrosion of a metal surface by making it work as a cathode of an electrochemical cell and achieved by placing another more easily corroded metal to act as the anode of the electrochemical cell in contact with the metal to be protected.

Crossing Angle: The intersection angle between the existing CWA facility and the proposed improvement.

CWA As-Built Drawings: Record drawings that depict CWA water distribution and conveyance systems as documented at construction completion.

CWA Board of Directors: The governing body of the Coastal Water Authority.

CWA General Engineering Consultant or CWA GEC: CWA's general engineering consultant (GEC) acts as the CWA engineer and provides various engineer support including reviews of proposed encroachments to CWA facilities.

CWA Corridor: CWA property rights-of-way or easements.

CWA Facilities: Any property, easements, rights-of-way, building, and water distribution and conveyance facilities, including waterlines, or equipment owned or controlled by CWA.

Depth of Cover: The distance between natural ground and the buried facility after installation.

Design Drawings: Documents that show proposed construction activity that are signed and sealed by a licensed Texas professional engineer.

Directional Drilling: Directional boring, commonly called horizontal directional drilling or HDD, is a steerable trenchless method of installing underground pipes, conduits and cables in a shallow arc along a prescribed bore path by using a surface launched drilling rig, with minimal impact on the surrounding area.



General Encroachment Requirements

Executive Director: CWA's executive director as duly appointed by the board, from time to time.

Dry Bore Process: Bore is accomplished with drilling tools only; no fluids are used to flush or facilitate the bore.

Encroachment: Any activity on, across, under, or within a CWA property, easement or right-of-way or adjacent to and having potential adverse impacts on CWA property, easements or rights-of-way. These activities include without limitation utility crossings and any activity pursuant to an easement or consent to encroach granted by CWA.

Minimum Separation Distance: The required distance between existing CWA facilities and the proposed facility.

Potholing: The process of digging a test hole to expose underground utilities to identify the horizontal and vertical location of these facilities.

Project: Any proposed or approved encroachment to alter, improve, or install property in a CWA Corridor.

Project area: The entire area where CWA authorizes the Applicant access to carry out a project

Utility Crossing: Any utility installation on or within a CWA property, easement or right-of-way.



2.0 APPLICATION PROCESS

Submit all applications to encroach and/or cross any CWA Corridor paid online at the CWA Crossing Application Website (<https://cwacrossing.org/>) or to the following address:

Executive Director
Coastal Water Authority
1801 Main Street, Suite 800
Houston, Texas 77002
Attn: Easement or Consent to Encroach Application

Application documents and requirements are described below.

2.1 APPLICATION SUBMISSION

A. Initial Application Requirements

All Applicants seeking approval for a project or encroachment within CWA's property right-of-way or easement must complete and submit the following:

1. Application (see the CWA Crossing Application Website (<https://cwacrossing.org/>) or Appendix A) signed by the Applicant or the Applicant's authorized representative;
2. A general physical description and address of the encroachment location;
3. Applicable fees can be paid online at the CWA Crossing Application Website (<https://cwacrossing.org/>) or delivered to the address above as a corporate check or cashier's check (§ 2.2);
4. A certificate of insurance that meets the Insurance Requirements (§ 4.3);
5. Submittals including calculations, specifications, and design drawings showing plan views, profiles, and sections of the proposed project within the CWA Corridor that meet the Design Requirements; and
6. A Certificate of Account Status, issued by the Texas Comptroller of Public Accounts, or if an Applicant was formed in another state a comparable document from the state of formation, no more than 30 days prior to date of this application. CWA may require statements and/or instruments of financial assurance of individual Applicants at the discretion of CWA's Executive Director.

B. Application Requirements

To facilitate the application process, the Applicant must satisfy the following requirements, as applicable:

1. Obtain CWA GEC approval of all application drawings and other documents applicable under the General Requirements;
2. Pay all outstanding fees and complete all tasks related to CWA facility relocation(s), as the CWA GEC deems prudent and reasonable;
3. Obtain and provide to CWA a title report for the CWA Corridor affected by the proposed project;



General Encroachment Requirements

4. Secure any additional rights from all third parties owning an interest in the CWA Corridor affected by the proposed project;
5. Notify all owners of other pipelines, communication lines or other third-party facilities located within the CWA Corridor of CWA's grant of the application;
6. Provide written confirmation that Federal, State and local permitting and environmental requirements are fully addressed; and
7. For easement requests, the Applicant must obtain an appraisal from a Texas licensed appraiser that holds a MAI, SRPA or SRA member of the Appraisal Institute designation establishing the value of the requested easement.

C. Multiple Encroachments

If the proposed project contains multiple CWA property encroachments, each encroachment requires a separate Easement and Right-of-way Encroachment Application and plan and profile drawing for each encroachment location. If the proposed project contains multiple installations at a single CWA encroachment site to be installed at the same time, a single Easement or Consent to Encroach application and plan and profile drawing may be acceptable as determined by CWA on a case-by-case basis.

D. Applicant Resources

The following resources are available to Applicants:

- CWA Easement or Right-of way Encroachment Requirements and forms at the CWA Crossing Application Website (<https://cwacrossing.org/>)
- Appropriate CWA as-built drawings from CWA's GEC via email
- Preliminary review and guidance meeting with CWA's Field Staff or GEC

2.2 FEES

A. Administrative Fee

There is a non-refundable \$5,000 administrative fee for each pipeline, utility, road, railroad, or other facility crossing a CWA Corridor. The fee must be submitted with the initial application and does not cover costs associated with the grant of an easement, special encroachment consideration, or review requiring specialized knowledge or consideration for which additional fees may be charged.

B. Easement Fee

CWA may charge Applicants requesting an easement a fee based on the appraisal submitted by the Applicant along with other factors identified by CWA in an invoice. This fee is in addition to the Administrative Fee described above.

C. Special Encroachment Fee

Special encroachments will be evaluated on a case-by-case basis and the review fee will be based on actual cost reimbursement. The initial charge is a non-refundable \$5,000 administrative fee to review an application for a special encroachment.



General Encroachment Requirements

D. Payment Method

All fees must either be paid online at the CWA Crossing Application Website (<https://cwacrossing.org/>) or by corporate or cashier's "positive pay" check made payable to Coastal Water Authority and submitted with the application. Any fees assessed after the initial submittal must be paid within 30 days. **BANK DRAFTS ARE NOT ACCEPTABLE.**

2.3 APPLICATION REVIEW

A. Initial Review

CWA staff and the GEC will consider the following:

1. Application completeness;
2. Easement and Right-of-way Encroachment General Requirements compliance;
3. Impact on CWA's Facilities; and
4. Additional requirements necessary to protect CWA's Facilities.

B. Initial Response

CWA will provide the Applicant a list of discrepancies, if any, that must be addressed before approval. If no discrepancies, the process will proceed to the next step.

C. Subsequent Reviews

The application submittal will be reviewed, and discrepancies noted until the application is considered complete, meeting the CWA Easement and Right-of-way Encroachment General Requirements.

D. Consent to Encroach or Easement

Except in instances where there are special circumstances, after the application is complete, the proposed easement or right-of-way encroachment document(s) will be processed.

E. Special Circumstances

Applications with special circumstances may require additional processing that can include review and approval of the Executive Director, CWA Board's Operations and Maintenance Oversight Committee (O&M Committee), and the CWA Board. Once an application with special circumstance is considered complete, the application will be processed as follows:

1. Executive Director Review: CWA staff will submit completed application to the Executive Director for review.
2. Executive Director Determination: The Executive Director, with O&M Committee input as needed, will issue one of the following determinations:
 - a. Proposed encroachment poses no significant risk or manageable risk to CWA Facilities and approves the application;
 - b. Proposed encroachment poses a significant risk to CWA Facilities and denies application approval; or
 - c. Refer the application back to CWA staff requesting additional information or project modifications before a final approval or denial can be issued.



General Encroachment Requirements

3. O&M Committee Review: The O&M Committee may review any application that may present any significant risk to CWA Facilities and provide a recommendation that the Executive Director (1) approve the application; (2) deny application approval; or (3) refer the application to the CWA Board.
4. CWA Board Review: The CWA Board will review any application upon a request from the Executive Director, or after O&M Committee Review, or upon a request from the Applicant.
5. Final Determination: An application determination is final under these General Requirements when (1) the application is approved by the Executive Director or CWA Board; (2) the Applicant withdraws the application; or (3) the CWA Board or Executive Director denies application approval.



3.0 ENCROACHMENT REQUIREMENTS

3.1 DESIGN DRAWINGS

Submittals that accompany an *Easement and Right-of-way Encroachment Application* must include calculations, specifications, and detailed construction drawings showing plan views, profiles, and sections of proposed work within the CWA Corridor that meet the applicable criteria provided in these guidelines and include the crossing location general physical description and address.

A. Drawing Format

Applicant shall submit at least one legible 8½-inch x 11-inch copy of documents in a format acceptable to CWA's GEC. Portable document format (PDF) is the generally acceptable file format, but CWA's GEC may require files in a different format. Drawings must clearly show the proposed limits of construction.

B. Legal Department Drawing Requirements

The Applicant may be required to submit a metes and bounds description of the property and all relevant drawings must contain the following minimum requirements (use of a centerline survey may be accepted on a case-by-case basis):

1. North arrow & scale;
2. County name;
3. Survey name & abstract number;
4. Point of beginning and termination (with State Plane Coordinates if available);
5. CWA Corridor boundaries;
6. Tie to closest CWA property corner;
7. Tie to centerline of closest CWA above ground and underground facility or pipeline (showing distance and structure number) and offset or parallel distance from CWA easement or fee strip line;
8. Type and size of crossing (outer pipe diameter, width of road and ditch crossings, or area for surface sites);
9. Stationing along the proposed project;
10. Bearing and distance of crossing or longitudinal occupation;
11. If CWA will issue an easement, the easement boundaries must be shown on the drawings and easement metes and bounds description included with the submittal;
12. Locative reference – tie to a street;
13. CWA tract reference & adjoiner information, including CWA right-of-way width;
14. Reference to recorded instrument granting CWA property rights that will be affected by Applicant's request;
15. Basis of bearings (and coordinates if used);
16. Reference to CWA as-built drawing(s);
17. Registered professional land surveyor's certification, seal, signature & printed name with registration number;



General Encroachment Requirements

18. Total area or distance, separated by fee & easement, within CWA right-of-way;
19. Name address and phone number of registered professional land surveyor or firm that prepared the survey;
20. Ties to existing pipelines every 500 feet or at a change in direction and position;
21. Swales, ditches, ponds, rivers, and/or canals locations in the right-of-way; and
22. A profile of the facility if it crosses any underground facilities of CWA or others.

C. Utility Crossing Drawing Requirements

Utility crossing construction drawings will include plan and profile sheets for the proposed crossing or encroachment. Utility easements or encroachments in the immediate vicinity will also be shown. Crossings shall be perpendicular to the CWA pipelines or facilities. The Applicant shall provide the following information on the construction drawings:

1. Required crossing information:
 - a. Utility size
 - b. Location
 - c. Type of material transported
 - d. Maximum operating pressure
 - e. Pipe type
 - f. Joint type
 - g. Wall thickness
 - h. Maximum test pressure
 - i. Description of test procedures
2. Required standard notes:
 - a. Vehicular crossing access shall be provided to CWA at all times across any and all such facilities or improvements.
 - b. No equipment or vehicle shall be operated over CWA lines that would produce a surface loading exceeding AASHTO HS-20.
 - c. No spoil or materials shall be placed over CWA waterlines.
 - d. No ditches are permitted on CWA's rights-of-way or easements.
 - e. All excavations shall be backfilled to original ground level with suitable fill materials as approved by CWA. Backfill shall be placed in 6-inch maximum loose lifts and compacted to a minimum density equal to the surrounding natural soil.
 - f. Pipeline or casing installation under existing CWA facilities shall be accomplished using the dry boring process, or an approved directional drilling process, that must be a minimum depth of 5 feet below CWA pipelines and 20 feet below CWA canals both for the entire width of the right-of-way. All boring activities shall be accomplished in one simultaneous and continuous operation. If steel casing is used, it shall be coated and isolated from the



General Encroachment Requirements

- carrier pipe. Plastic casing pipe can be used if appropriate. All casing materials and the installation method must be approved prior to construction.
- g. Dewatering operations, if required, shall be conducted as to direct water away from the CWA right-of-way or easement.
 - h. Marker signs showing pipeline depths shall be installed on casing vents or treated timber posts if casing vents are not provided.
 - i. Schedule a pre-construction conference with CWA representatives, CWA's GEC, the Pipeline Owner's representatives and Construction Inspectors at least 48 hours prior to commencing any work on or adjacent to CWA's right-of-way or easement.
 - j. Assign a qualified inspector to be on-site at all times during the performance of construction operations directed at crossing CWA's rights-of-way or easements. The inspector shall order the cessation or work when so requested by CWA's field representative.
 - k. Notify CWA's representative (*Name, Phone number, email – CWA to provide project specific information upon request or with initial review comments*) a minimum of 48 hours in advance when working in, over or adjacent to the CWA rights-of-way or easements. No work shall be done on CWA's right-of-way or easement in the absence of CWA's representatives unless authorized by the representative.
3. Specify protective coatings and corrosion control measures; method of handling pipeline expansion and contraction; location of nearest shutoff valve on each side of the crossing; and code(s) used for design.

3.2 PROJECT DESIGN

A. Longitudinal Encroachments

Longitudinal encroachments are not permitted.

B. Crossing Angle

All facilities or improvements will be installed as near a 90-degree angle to the longitudinal boundaries of CWA's Corridor as is reasonably practical for the proposed type of facility or improvement. Crossings at angles other than 90-degrees may be permitted and will be reviewed and approved on a case-by-case basis. If the facility is installed in an existing pipeline corridor, the proposed facility will be installed parallel to the existing pipeline crossing.

C. Minimum Separation Distance from Wastewater Facilities

Proposed wastewater treatment plant units, wastewater pumping/lift stations or land implementing surface irrigation with treated wastewater effluent must be located a minimum of 150 horizontal feet from the property, easement, or right-of-way boundary of any CWA or COH open canal that conveys raw water supplies for public drinking water [TAC Tile 30, Part I, Chapter 309, Subchapter B, §309.13].



General Encroachment Requirements

D. Surface Static Loads and Materials Storage

1. Material and Equipment Storage Not Permitted

Storage and/or placement of construction equipment and materials are not permitted within the CWA Corridor. Spoil or other materials will NOT be placed over CWA pipeline or on canal embankments. Any exceptions to this requirement will be on a case-by-case basis and are subject to CWA review and approval.

2. Authorized Loading

With written CWA permission, loads may be placed outside of the area subtended by two planes extending upward at an angle of 45 degrees above the horizontal from the center of the buried pipeline to intersection with the natural ground line.

3. Notification of Equipment Loads

The type and weight of construction equipment crossing CWA pipelines, roads, bridges and proposed crossing locations will be submitted for CWA review and approval. No vehicle with a net surface loading that exceeds the equivalent of standard HS-20 loading, as defined by American Association of State Highway and Transportation Officials (AASHTO), will be placed or operated on CWA's Corridor.

E. Excavation and Backfill Requirements

Excavations will be backfilled to original ground level with suitable fill materials as approved by CWA. Backfill will be placed in 6-inch maximum loose lifts and compacted to 95 percent of maximum density at optimum moisture content, plus or minus 3 percent as specified by ASTM D6988, or latest edition

F. Markers

1. Casing Vents

Markers indicating pipeline depths will be installed on casing vents.

2. Boundary Markers

Signposts that extend five feet above grade will plainly and permanently mark the location where the proposed facilities enter and exit CWA Corridors. Signposts will contain the name of owner/operator, pipeline contents, utility identification and an emergency contact phone number. Drawings will indicate the location of the signposts.

G. Ditches and Berms

The Applicant may not place any ditches or berms in CWA's Corridor.

3.3 UNDERGROUND UTILITIES

A. Potholing

Potholing may be required for CWA pipeline crossings at the crossing location as determined by CWA and at the Applicant's expense. All potholing activities must be observed and monitored by a CWA representative.



General Encroachment Requirements

B. Crossings Above CWA Buried Waterlines

1. Minimum Cover

The minimum ground cover between finished grade or natural grade (whichever is lower) and the top of the crossing facility will not be less than three feet, with the preferred cover being four feet. All proposed modifications/exceptions to existing cover over CWA pipelines will be subject to case-by-case review and must be approved by CWA. Requests for temporary or permanent placement of excavated materials within the CWA Corridor will be subject to CWA review and must be approved by CWA. A grading plan that shows the top of CWA pipeline elevation will be submitted for review.

2. Constant Depth

All crossing utilities will be installed at a constant depth across the CWA Corridor.

3. Casing Above Buried Water Line

Underground lines, pipelines, conduits or cables installed above CWA's buried water lines will be installed in a new casing extending the full width of CWA's Corridor. If steel, the casing will be coated, wrapped and electronically isolated from the carrier pipe. Casing vents will be located adjacent to but outside of CWA's Corridors. Pipe and casing will be capable of spanning a 40-foot wide open-trench.

4. Minimum Casing Clearance

An 18-inch minimum vertical clearance is required between the bottom of casing for underground lines, pipelines, conduits or cables and the top of the highest CWA facility for the full width of CWA's Corridor.

5. No Crossing at Vertical Curve or Bend

Crossing lines will not pass directly over a vertical curve or bend in a CWA line.

6. Excavation and Backfill

Excavation for underground facilities will be backfilled as specified in *Section 3.2E Excavation and Backfill Requirements*.

7. Cathodic Protection

All proposed underground metal lines, pipelines or conduits will be cathodically isolated. A test station, including test wires connected to each structure, will be installed at each crossing and verified by CWA inspection. Each test station will be monitored annually. Joint interference testing will be conducted annually, and the results submitted to CWA. If cathodic protection interference is found, the facility owner(s) will resolve any such interference.

8. Casing Installation

If a casing is utilized for a crossing above CWA buried, utilize casing design requirements in Subsection C.2.c below.

C. Crossings Below CWA Buried Waterlines:

1. Minimum Vertical Clearance

Underground lines, pipelines, conduits or cables installed below CWA's facilities will maintain a minimum vertical clearance between the top of casing or facility and



General Encroachment Requirements

the bottom of the lowest of CWA's facilities. Vertical clearances are specified below. Additional clearance may be required to accommodate future plans for larger CWA facilities, as determined by CWA.

- a. 3'- 0" minimum, if cased
- b. 5'- 0" minimum, if uncased (uncased lines may be permitted only on a case-by-case basis with approval by CWA, see requirements in *Section 3.7D Uncased Pipeline Crossings*).

2. Pipeline and Casing Installation

Pipelines and casings under existing CWA lines will be installed using one of the following trenchless boring methods:

- Dry boring
- Micro-tunneling
- Directional drilling
- Other methods approved by CWA prior to construction

The following items are required for pipeline and casing installation:

- a. Directional drilling may be used provided a minimum clearance of 5 feet below CWA pipelines is maintained for the entire width of the CWA Corridor.
- b. When directional drilling is used, a hydraulic fracturing and inadvertent returns analysis report and a trenchless boring monitoring plan, which includes continuous annular pressure monitoring, is required prior to the proposed utility crossing approval. Boring and casing, or boring and installation of carrier pipe, will be accomplished in one simultaneous and continuous operation.
- c. Casing design requirements
 1. Provide casing designed by Contractor's Professional Engineer for appropriate loading conditions and deflection criteria, including but not limited to: overburden and lateral earth pressures; handling and installation stresses; loads imposed by tunnel shield or tunnel boring machine thrust jacks; subsurface soil and water loads; grouting; and other conditions of service. Assume responsibility for design of casing to carry construction loads in combination with overburden, earth and hydrostatic loads.
 2. At railroad crossings conform to Cooper E-80 locomotive loading distributions in accordance with AREMA specifications for culverts. In design, account for additive loadings due to multiple tracks. Provide casing for railroad crossings as specified or as shown on Drawings.
 3. For truck loading use HS-20 vehicle loading distributions in accordance with AASHTO.
- d. Steel casing, if used to facilitate boring, will be coated and electrically isolated from the carrier pipe.
 1. Provide steel pipe casing designed and manufactured in conformance with AWWA C200 and AWWA M11 except as modified herein. Steel to be minimum of ASTM A106, ASTM A36, ASTM A1011 Grade 36, ASTM A53 Grade B, ASTM A135 Grade B, or ASTM A139 Grade B.



General Encroachment Requirements

2. Provide casing pipe with wall thickness of no less than listed in table below.
3. Provide complete penetration groove welds for all field joints of casing pipe.

MINIMUM DIAMETER CASING PIPE			
Corresponding Casing Pipe Size (in.)	Minimum Wall		Approximate Weight per LF Uncoated (lb.)
	O.D. (in.)	Thickness (in.)	
8	8.625	0.219	19.64
10	10.75	0.219	24.60
12	12.75	0.219	29.28
16	16.00	0.219	36.86
18	18.00	0.25	47.39
20	20.00	0.250	52.73
24	24.00	0.250	63.41

- e. Any void between the borehole and casing after installation is complete will be filled with an approved material.

3. Boring Pits

All boring equipment pits will not be closer to the centerline of the CWA pipe than the intersection of a 1.5H:1V sloped line from the top centerline of the CWA facility to the bottom of the proposed excavation. Pits must be shored to provide continual lateral support to CWA facilities. Dewatering operations, if required, will be conducted to direct water away from the CWA Corridor.

3.4 ABOVEGROUND FACILITIES

A. Overhead Clearance

Railway and pipe bridge clearances over CWA Corridors will be no less than 30 feet. This clearance must be maintained between the lowest point on any such facility and the surface. Overhead electrical conductors, communication lines, etc. will follow the table below. Large electrical transmission lines that cross any CWA Corridor will provide and maintain the following clearances between the lowest point on any such facility and natural ground (or top of canal embankment):

- Up to 12 kV: minimum clearance is 30 feet
- 12 kV up to 35kV: minimum clearance is 50 feet
- 35 kV up to 95kV: minimum clearance is 60 feet
- 95 kV up to 200kV: minimum clearance is 90 feet
- Greater than 200kV: to be determined on case-by-case basis

B. Overhead Crossing Requirements

1. Poles or towers cannot be located within CWA Corridor. Overhead electrical and communication line supports will be located outside of CWA's Corridor.
2. Proposed overhead crossings will be free-span design or attached to existing or new structures.



General Encroachment Requirements

3. Proposed overhead crossings will cross perpendicularly to the centerline of the CWA conveyance facility.
4. Marker warning signs will be provided that indicate the clearance and power line voltage. These signs will face oncoming traffic and state:

"DANGER HIGH VOLTAGE OVERHEAD"

C. Post, Pole and Support Structure Installation

Posts, poles, support structure, etc., will be installed a minimum of 20 feet from the edge of CWA facilities to maintain the required minimum clearance.

3.5 ROADWAYS

A. Temporary Roadways

Temporary roadways may be approved on a case-by-case basis. All temporary roadways must be removed at project completion before the installed facilities receive final CWA approval.

B. Parking Areas/Driveways

CWA does not allow permanent parking areas within CWA rights-of-way or easements. Requests for driveways within CWA rights-of-way or easements may be considered on a case-by-case basis. Any approved driveway may be removed for CWA facility maintenance or repair. Reinstallation of the approved driveway will be completed by the driveway owner at the owner's expense.

C. Flexible Pavement

CWA prefers that all streets, roads, and approved driveways installed on CWA rights-of-way or easements are asphalt or other flexible pavement.

D. Depth of Cover

Provide and maintain a minimum of 5 feet of earthen cover from the top of cased CWA pipe to the roadway base. Additional depth above CWA's underground facilities may be required by CWA for project specific circumstances. Required cover above uncased CWA pipe will be reviewed and identified on a case-by-case basis.

E. Lime Stabilization

Stabilize subgrade with lime to a minimum depth of 6 inches for the width of roadway and shoulders.

F. Base Material

Flexible pavement will be underlain with compacted, stabilized, flexible base material not less than 8 inches thick.

G. Concrete Pavement

If concrete pavement is specified and approved, it will be not less than 6 inches thick. The pavement will be reinforced using reinforcing steel in accordance with standard State of Texas Department of Highways and Public Transportation specifications. If permanent concrete pavement is specified, a geotechnical investigation must be completed, and a report issued that includes a concrete pavement design for the site-specific conditions, including expansion joints.



General Encroachment Requirements

H. Surface Loading Limits

No vehicle will be placed or operated on CWA Corridors that has the net effect of producing a surface load that exceeds standard HS-20 loading as defined by AASHTO.

3.6 RAILROADS

A. Depth of Cover

Provide and maintain a minimum of 10 feet of earthen cover, or additional depth above CWA's underground facilities as identified by CWA's GEC. In lieu of the required cover, provide an alternate means to protect CWA facilities that must be approved by CWA's GEC.

B. Lime Stabilization

Stabilize subgrade with lime to a minimum depth of 6 inches.

C. Cement Sand Under Ballast

Provide a minimum 10 inches of cement-stabilized sand fill with 5 percent by weight of Portland cement under ballast.

D. Ballast

Provide a minimum of 6 inches of crushed rock ballast below rail ties.

E. Surface Loading

Do not place or operate any railroad vehicle on CWA's Corridor that produces a loading on the CWA pipeline exceeding the design load capacity of the CWA pipeline. Additional works may be required by CWA to prevent overloading the CWA pipeline.

F. Grade Crossing

Provide and maintain a heavy-duty plank grade crossing suitable for CWA vehicle access at locations designated by CWA.

3.7 CWA CANAL CROSSINGS

A. Canals Covered by these Requirements

- CWA Main Canal
- CWA Cedar Point Lateral
- CWA Lateral Canals
- CWA Luce Bayou Interbasin Transfer Canal

The CWA canal system conveys raw water for industrial and public potable water consumption. All canal crossings must meet state and federal requirements for crossing a water body used for public potable water consumption.

B. Minimum Ground Cover

The minimum distance between the canal bottom and top of casing/pipe must not be less than 20 feet across the full width of the canal and canal embankments as determined by CWA. Casings outside the embankment limits, but within the CWA right-of-way, must be a minimum of 5 feet below the lowest elevation point within CWA's ROW.



General Encroachment Requirements

C. Pipeline Crossing Requirements

It is the CWA's preference that all pipeline crossings below all canals or laterals must be placed within an approved casing pipe for the full width of the CWA Corridor, unless a variance is granted as set forth in *Section 3.7D, Uncased Pipeline Crossings*. Casing vents will be located adjacent to but outside of CWA's Corridors. Follow guidelines and instructions for markers as set forth in *Section 3.2F, Markers*.

D. Uncased Pipeline Crossings

Uncased pipeline crossings may be allowed on a case-by-case basis. The pipeline must be designed for a reduced risk of failure in the entire portion within CWA's ROW. An uncased crossing must meet the following minimum requirements.

- Pipelines carrying hazardous materials regulated by 49 CFR Parts 192 and 195 shall be designed with a design factor of 0.50 of the specified minimum yield strength of steel Grades X60 or less based on the maximum allowable operating pressure for the pipeline. Steel Grades higher than X60 are not allowed.
- Material contingency and emergency response plans must be approved by CWA prior to issuance of CWA authorization.
- To minimize the amount of any material entering the canal, CWA may require the installation of a block (gate) valve and/or a check valve on each side of the canal adjacent to and outside CWA ROW boundary.
- Protective coating systems and corrosion control measures for metallic pipelines shall be used. Coating systems shall be bonded dielectric coatings appropriate for the proposed installation method with adequate coating thickness for abrasion resistance.
- All other applicable requirements outlined in *Section 3.7, CWA Canal Crossings* also apply.
- Potable waterline shall be designed with an additional 50 percent working pressure factor.
- All storm sewer crossing must be designed and constructed with pressure flow pipe not typical gravity flow drainage pipe.

The following items are required for uncased pipeline installations:

- a. If directional drilling is used, a minimum clearance of 20 feet below the CWA canal is required for the entire width of the CWA Corridor.
- b. If directional drilling is used, a hydraulic fracturing and inadvertent returns analysis report and a trenchless boring monitoring plan, which includes continuous annular pressure monitoring, is to be required prior to the proposed utility crossing approval. Boring and casing, or boring and installation of carrier pipe, will be accomplished in one simultaneous and continuous operation.
- c. Any void between the borehole and the pipeline casing after the installation is complete will be filled with an approved material.
- d. Protective coating systems and corrosion control measures for metallic pipelines shall be submitted to CWA for review prior to the proposed utility crossing approval. Submitted coating system information, at a minimum, shall include



General Encroachment Requirements

coating type, surface preparation, thickness of coating to be applied, and application information.

E. Pipeline Installation

Pipeline and casing installation under canals will be installed using one of the following:

- Dry boring
 - Micro-tunneling
 - Directional drilling
 - Other methods approved by CWA prior to construction
1. Boring installations will be accomplished in one simultaneous and continuous operation. Boring pits on each side of the canal will not be closer to the canal centerline than the intersection of a 1.5H:1V sloped line from the outside top of the canal levee to the bottom of the proposed pipeline.
 2. Boring pits will be constructed so that lateral support to CWA property is provided continuously. If the top of the boring pit is more than 18-inches below the canal water surface elevation, an earthen berm shall be constructed that completely encloses the boring pit to a minimum elevation of 18-inches above the canal water surface elevation.
 3. Dewatering operations, if required, will be conducted to direct water away from the CWA Corridor. Open trench methods may be utilized at lateral canal crossings, provided the flow of water is not interrupted.

F. Horizontal Directional Drilling

1. Horizontal directional drilling for casings 36 inches and smaller under an open canal must maintain a minimum clearance of 20 feet between the casing and the bottom of the canal lining. Casings larger than 36 inches will be considered on a case-by-case basis and may require additional clearance from the bottom of the canal lining.
2. If directional drilling is used, a hydraulic fracturing and inadvertent returns analysis report and a trenchless boring monitoring plan, which includes continuous annular pressure monitoring, is required prior to the proposed utility crossing approval. Boring and casing, or boring and installation of carrier pipe, will be accomplished in one simultaneous and continuous operation.
3. Steel casing, if used to facilitate boring, will be coated and electrically isolated from the carrier pipe.
4. Any void between the borehole and the casing after the installation is complete will be filled with an approved material.

G. Abandoned Pipeline, Casing and Vent Removal

Pipelines, casings and vents located outside of the canal embankment limits that are to be abandoned during replacement will be excavated and removed from within the canal corridor at the time of replacement. The portion of abandoned pipelines and casings within canal embankment limits will be filled with grout and left in place, provided the casing does not present an obstruction to canal operation and maintenance. The grout will be a sand-cement mixture with a minimum content of 1½ sacks of cement per cubic



General Encroachment Requirements

yard of grout. Such excavation within the CWA Corridor will be backfilled and compacted in accordance with the requirements of the following *Section 3.8G, Pipeline Installation or Relocation Backfill*.

H. Pipeline Installation or Relocation Backfill

Excavations for pipeline installations or relocations will be backfilled to the higher of natural ground or original elevation with suitable fill material as approved by CWA. Fill will be placed and compacted per the requirements of *Section 3.2.E*. Compaction testing may be performed by an independent testing laboratory under the supervision of the engineer to assure compliance.

I. Cathodic Protection

All proposed underground metal lines, pipelines or conduits will be cathodically isolated. A test station, including test wires connected to each structure, will be installed at each crossing and verified by CWA inspection. Each test station will be monitored annually. Joint interference testing will be conducted annually, and the results submitted to CWA. If cathodic protection interference is found, the facility owner(s) will resolve any such interference.

G. Canal Bridge and Above Grade Roadway Crossings

A licensed professional engineer in the State of Texas who has demonstrated five plus years in bridge design experience must design all bridges over CWA canals. The preliminary design and proposed location will be reviewed and approved by CWA before initiating final design. Bridges must not interfere with canal hydraulic capacity; modeling may be required to confirm that hydraulic restrictions are minimal and identify the backwater effect on the canal embankments. Bridge designs shall comply with the following:

1. Exhibit 1 in Appendix C illustrates the minimum requirements for a roadway bridge structure that crosses a CWA canal and provides general guidelines for the information to be included with the crossing application.
2. CWA reserves the right to reject the location of any bridge and may suggest another suitable location.
3. Vertical elevations shall be tied to the vertical datum as identified on CWA record drawings.
4. New bridge crossings (vehicular, pedestrian and utility) should be perpendicular (between 70° and 90°) to the centerline of the canal and at locations approved by CWA.
5. New bridges shall not restrict the full capacity of the canal. Modifications to existing bridges will only be allowed if it is hydraulically proven that the modification will not restrict the full capacity of the canal.
6. Bridge structures must not interfere with canal hydraulic capacity; a HEC RAS analysis is required for bridges where there is any change in cross section of the canal, or where there is a pier or other obstruction in the canal. This analysis shall be used to confirm hydraulic restrictions and identify backwater effect on canal embankments.



General Encroachment Requirements

7. When the bank-to-bank canal width is 45 feet or less, a clear span structure must be used. If the bank-to-bank canal width is over 45 feet, a pier may be allowed.
8. There must be at least 30 feet of clearance between top of bank and the bottom of the superstructure or bottom of deck slab, whichever is lowest, to allow for maintenance equipment to pass under the bridge and maintenance activities.
9. Horizontal clearances:
 - a. A minimum of 20 feet shall be maintained from the edge of a bridge to the nearest edge of an existing radial canal gate structure.
 - b. A minimum of 10 feet shall be maintained from edge of CWA canal access/maintenance roadway to nearest bridge column/pier.
10. Surface drainage from the bridge shall not be allowed to enter the canal. Drainage shall be carried beyond the CWA canal right -of-way in a manner that will not cause erosion within CWA right-of -way.
11. The licensee will be responsible for changes to CWA's existing right-of-way; bridge O&M access roads; existing fencing, gates and signs; and the addition of new fencing, O&M gates, signs, etc.
12. If the bridge design stops during the review process, and no activity occurs for 18 months, CWA may require that the review process be restarted from the beginning.

The following shall be included in bridge crossing submittals to CWA:

1. The bridge designer shall submit one set of final signed and sealed bridge drawings. The drawings will either be approved, or comments will be provided. If comments are provided, corrections shall be made to the drawings and resubmitted until the drawings are approved by CWA.
2. If required, the bridge designer shall submit a HEC RAS analysis. This submittal shall include:
 - a. Electronic copies of the data files
 - b. Short findings report quantifying anticipated water surface elevation differences
 - c. Profile and cross section plots of both existing and proposed conditions
 - d. Specific data necessary to support report conclusions
3. Construction scheduling and phasing information shall be submitted with the final review documents.

H. Canal Roadway Crossing with Culvert(s)

The preliminary canal roadway crossing with culvert design and proposed location will be reviewed and approved by CWA before initiating final design. Culverts must not interfere with canal hydraulic capacity; modeling may be required to confirm that hydraulic restrictions are minimal and identify the backwater effect on the canal embankments. Canal roadway crossing with culvert designs shall comply with the following:

1. Exhibit 2 in Appendix C illustrates the minimum requirements for a culvert-supported roadway that crosses a CWA canal and provides general guidelines for the information to be included with the crossing application.



General Encroachment Requirements

2. CWA reserves the right to reject the location of any road crossing and may suggest another suitable location.
3. Vertical elevations shall be tied to the vertical datum as identified on CWA record drawings.
4. New road crossings (vehicular, pedestrian and utility) should be perpendicular (between 70° and 90°) to the centerline of the canal and at locations approved by CWA.
5. Canal access/maintenance roads should intersect proposed roads at right angles for proper visibility. This may require the applicant to acquire additional right-of-way for use if the existing canal right-of-way is not sufficient. Landscaping, fencing, walls or any other objects shall not restrict the safe sight distance necessary for safe transition of vehicles from the canal access roadway.
6. If roadway design includes a median, then a permanent all-weather access crossing surface in the median shall be provided for CWA maintenance equipment vehicles. On divided roadways having a concrete curb median, a 15-foot-wide (minimum) opening is required through the median and shall be aligned with the concrete aprons to allow CWA maintenance vehicles to cross the public road.
7. New culverts shall not restrict the full capacity of the canal. Modifications to existing culverts will only be allowed if it is hydraulically proven that the modification will not restrict the full capacity of the canal. A capacity analysis is required for roadway culverts where there is any change in cross section of the canal. This analysis shall be used to identify hydraulic restrictions and backwater effect on canal embankments.
8. A minimum 20-foot horizontal clearance shall be maintained from the roadway edge to the nearest edge of an existing canal gate or check structure.
9. Roadway surface drainage shall not be allowed to enter the canal. Drainage shall be conveyed beyond the CWA right-of-way in a manner that will not cause erosion within CWA right-of-way.
10. Include rip rap or slope paving with concrete headwall and wingwalls, as needed, to prevent erosion.
11. Where fencing is proposed within CWA right-of-way limits:
 - a. Handrails on retaining or wing walls shall be removable to facilitate canal maintenance.
 - b. A minimum 16-foot wide gate (TXDOT barrier gate or approved equal) should be provided for CWA access at roadway.
12. The licensee will be responsible for changes to CWA's existing right-of-way; O&M access roads; existing fencing, gates and signs; and the addition of new fencing, O&M gates, signs, etc.
13. If the roadway design stops during the review process, and no activity occurs for 18 months, CWA may require that the review process be restarted from the beginning.



General Encroachment Requirements

The following shall be included in canal roadway crossings with culverts submittals to CWA:

1. If required, the bridge designer shall submit a HEC RAS analysis. This submittal shall include:
 - a. Electronic copies of the data files
 - b. Short findings report quantifying anticipated water surface elevation differences
 - c. Profile and cross section plots of both existing and proposed conditions
 - d. Specific data necessary to support report conclusions
2. Construction scheduling and phasing information shall be submitted with the final review documents.

I. Pipe Racks Over Canals

Pipe racks over canals must provide sufficient clearance and access for CWA maintenance and improvement activities. Each crossing will be reviewed on a case-by-case basis. The pipe rack design must address each of the following items:

1. Vertical Clearance: Minimum 30 feet above the canal top of bank
2. Horizontal Clearance/Support Location: Pipe rack supports must be located outside the CWA easement or property line, but no closer than 30 feet from edge of bank.
3. Support Impacts: Crossing entity must provide sufficient evidence, including calculations, geotechnical reports, etc., that the pipe rack supports will have no adverse effects on the canal embankments.
4. Leak Protection: Crossing entity must identify specific design features or precautions to be implemented to prevent pipeline leakage into the CWA canal.

J. Electrical Crossings Over Canals

See Subsection 3.4 Aboveground Utilities



4.0 ENCROACHMENT CONDITIONS

Any easement or encroachment granted by CWA is issued subject to the following conditions, reservations, and requirements.

4.1 GENERAL CONDITIONS

A. Reservation of Surface and Subsurface

CWA reserves for itself and its successors and assigns the right to use of the surface and subsurface of the project area for any and all purposes that do not interfere with and are not inconsistent with rights granted by CWA. Subject to the foregoing, CWA's right to use the project area shall include, without limitation, CWA's right to: (i) maintain its existing facilities located within the project area and to install, place and maintain future facilities within or below the surface of the project area; and (ii) cross over the project area by foot or with wheel and track vehicles to the extent necessary to efficiently prosecute the work described in item (i) provided that CWA notify Applicant in advance of any action CWA will undertake in the area covered by this Consent except for emergency situations.

B. Right of Removal

CWA may remove project facilities to install a new pipeline, perform maintenance on existing pipeline(s), or remove an Applicant's project facilities not authorized by an easement or encroachment. CWA shall not be responsible to pay any costs incurred by Applicant to replace the project facilities removed as a result of CWA's actions.

C. Confirm Regulatory Compliance

The Applicant will provide written confirmation that Federal, State and local environmental requirements are fully addressed prior to the issuance of an Easement or Consent to Encroach. Throughout construction activities, all environmental requirements must be complied with and any issues resolved. Provisions will be made and enforced to prevent contamination of groundwater, surface water, or canal water during construction.

D. CWA Facilities Protection

The Applicant will protect in place CWA facilities and appurtenances, such as existing blow-offs, air valves, vents, manholes and cathodic protection test stations, prior to and during construction. Upon request, CWA personnel familiar with CWA facilities, such as valves, manholes, or cathodic protection systems, will be made available to identify the locations of such facilities.

E. Avoid Project Conflicts

The Applicant will construct and maintain any project facilities within the CWA Corridor to avoid conflict with CWA's existing or future facilities. Additional requirements beyond these guidelines may be imposed if CWA's concludes additional safeguards are necessary to protect CWA's existing or future facilities.



General Encroachment Requirements

F. Assumption of Risk

The Applicant assumes all risks associated with the project within CWA property rights-of-way or easements including, but not limited to, worker injuries, damage to CWA facilities, damage to contiguous utility lines, damages or injuries from improper installation and/or maintenance of facilities as shown in the approved design documents.

G. Project Adjustment

The Applicant or owner of any project facility constructed in a CWA Corridor that causes interference with the use of such corridor will be notified by CWA in writing and will remove, lower, adjust or relocate any such facility at the owner's expense.

H. Repair/Adjustment Cost Responsibility

The Applicant or owner of any facility constructed in a CWA Corridor shall be fully responsible for reimbursement to CWA for all cost associated with any damage to CWA facilities during construction, removal and/or replacement of the facility. In the event CWA must excavate within CWA's Corridor for future maintenance or installation of new pipelines and/or related appurtenances and this affects the Applicant or owner's constructed facility, the Applicant or owner is responsible for all associated constructed facility repair or reinstallation.

I. Venue

Venue for any dispute between the Applicant and CWA relating to an easement or right-of-way encroachment is Harris County, Texas.

J. Applicable Laws

Any dispute between the Applicant and CWA relating to an easement or encroachment is subject to the laws of the State of Texas, the laws of the federal government of the United States, and all rules and regulations of any regulatory body or officer having jurisdiction.

4.2 INDEMNIFICATION

THE PROJECT OWNER AGREES TO AND DOES HEREBY, INDEMNIFY AND DEFEND CWA AND ITS OFFICERS, DIRECTORS, AGENTS, SERVANTS, REPRESENTATIVES, EMPLOYEES, ENGINEERS AND ATTORNEYS (COLLECTIVELY REFERRED TO HEREIN AS THE "INDEMNIFIED PARTIES") FROM AND AGAINST ANY AND ALL SUITS, DEMANDS, OR CLAIMS AND ALL COSTS, LOSSES SETTLEMENTS (VOLUNTARY OR OTHERWISE), LIABILITIES, EXPENSES AND JUDGMENTS INCURRED IN CONNECTION THEREWITH, INCLUDING ATTORNEY'S FEES AND COURT COSTS; WHETHER ARISING IN EQUITY, AT COMMON LAW OR BY STATUTE (INCLUDING THE TEXAS DECEPTIVE TRADE PRACTICE ACT OR OTHER SIMILAR STATUTES), OR UNDER THE LAW OF CONTRACTS, TORTS (INCLUDING WITHOUT LIMITATIONS NEGLIGENCE OR STRICT LIABILITY WITHOUT REGARD TO FAULT) INCLUDING WITHOUT



LIMITATION ALL CLAIMS, DEMANDS AND SUITS FOR DAMAGES OR INJURIES, INCLUDING DEATH TO ANY AND ALL PERSONS OR PROPERTY, WHETHER REAL OR ASSERTED, BASED UPON, IN CONNECTION WITH, RESULTING FROM OR ARISING OUT ANY ACTION OR OMISSION WHETHER NEGLIGENT OR OTHERWISE ON THE PART OF THE PROJECT OWNER OR ITS AGENTS, SERVANTS, REPRESENTATIVES, EMPLOYEES AND SUBCONTRACTORS. SUCH INDEMNIFICATION WILL INCLUDE WORKERS' COMPENSATION CLAIMS OF OR BY ANYONE WHOMSOEVER IN ANY WAY BASED UPON, IN CONNECTION WITH, RESULTING FROM OR ARISING OUT OF THE PROJECT OWNER'S WORK, AND OPERATIONS IN CONNECTIONS HEREWITH INCLUDING OPERATIONS OF SUBCONTRACTORS ENGAGED BY PROJECT OWNER, IF ANY.

PROJECT OWNER'S CONTRACTUAL OBLIGATIONS OF INDEMNIFICATION WILL EXTEND TO AND COVER CLAIMS, DEMANDS AND CAUSES OF ACTION ALLEGING ACTS OF NEGLIGENCE, FAULT OR OTHER ACT OR OMISSION BY OR ON THE PART OF THE INDEMNIFIED PARTIES. HOWEVER, IN THE EVENT THAT ONE OR MORE OF THE INDEMNIFIED PARTIES ARE ADJUDICATED AT FAULT WITH RESPECT TO DAMAGE OR INJURY SUSTAINED BY A CLAIMANT, PROJECT OWNER WILL INDEMNIFY THE INDEMNIFIED PARTIES ONLY FOR THAT PORTION OF THE DAMAGE OR INJURY ADJUDICATED TO HAVE BEEN CAUSED BY PROJECT OWNER AND/OR ITS AGENTS, SERVANTS, REPRESENTATIVES, EMPLOYEES AND SUBCONTRACTORS.

4.3 INSURANCE REQUIREMENTS

A. Required Insurance Periods

For all periods of time the Applicant and subcontractors are working within CWA Corridors, the Applicant and Applicant's contractors and subcontractors must provide insurance, at no cost to CWA, meeting the requirements described in this section.

B. Insurance Requirements

Field activities will not be permitted without proof of insurance on a Texas Department of Insurance (TDI) approved certificate of insurance form (certificate). The certificate must be valid for as long as the consent or easement exists. The Applicant shall obtain endorsement to cover Insurance Requirements not covered by the terms of the Applicant's underlying insurance policy or contract. The certificate shall reference all endorsements applicable to the policy or contract. All policies, except Workers' Compensation coverage, shall name CWA as an additional insured. The Applicant's policy must include a waiver of subrogation in favor of CWA.

C. Insurer Requirements

The Applicant shall obtain coverage from (1) an insurer with a Certificate of Authority from the Texas Department of Insurance to issue policies in Texas or (2) a non-admitted



General Encroachment Requirements

insurer eligible to issue policies in Texas with a current Best’s rating of at least B+ and a Best’s financial size category of class VI or better.

D. Policies and Minimum Limits of Liability

The Applicant shall provide, at no cost to CWA, minimum coverage described below during period that the Applicant performs or authorizes work within CWA’s rights-of-way or easements:

Policies and Minimum Limits of Liability

<u>Kinds of Insurance</u>	<u>Limits of Liability</u>
(A) Workers Compensation; Texas Operations	Statutory
(B) Employer’s Liability	<ul style="list-style-type: none"> • Accident \$1,000,000 Each Accident • Disease \$1,000,000 Each Employee • Disease \$1,000,000 Policy Limit
(C) Commercial General Liability including, but not limited to: <ol style="list-style-type: none"> 1. premises/operations 2. independent contractors’ protective 3. products and completed operations 4. personal injury liability with employment exclusion deleted 5. contractual 6. owned, non-owned and hired motor vehicles 	<ul style="list-style-type: none"> • \$2,000,000 General Aggregate • \$2,000,000 Products/Completed Operations Aggregate • \$1,000,000 Each Occurrence • \$1,000,000 Personal and Advertising Injury • \$500,000 Fire Damage Liability
(D) Business Automobile Liability including All Owned, Hired and Non-owned Automobiles	\$1,000,000 Combined Single Limit Per Occurrence
(E) Umbrella Liability: Such insurance shall be excess over and be no less broad than all coverages described above and shall include a drop-down provision for exhaustion of underlying limits. This policy shall have the same inception and expiration date as the commercial general liability insurance required above.	<ul style="list-style-type: none"> • \$5,000,000 Per Occurrence • \$5,000,000 Aggregate Bodily Injury and Property Damage
(F) Builder’s Risk: An all risk policy form covering, without limitation, perils of fire and extended coverage and physical loss or damage, including theft, earthquake, hurricane, flood, windstorm, tornado, vandalism, malicious mischief, collapse, false work, testing and start-up, temporary buildings and debris removal and covering reasonable compensation for CWA’s and Engineer’s services and reasonable expenses of CWA and Engineer which are required as a result of such loss.	The initial Contract Price and any subsequent modifications thereto for the entire Work and materials stored at the site, stored offsite or being shipped to the site, on a replacement cost basis without voluntary deductibles



General Encroachment Requirements

E. Material or Lack of Coverage

The Applicant will provide CWA with 30 days written notice if any of the Applicant's policies or endorsements are cancelled, materially changed, or non-renewed. If CWA staff determines that Applicant's coverage does not meet the requirements of this section, at the sole discretion of the CWA Executive Director, CWA may (1) purchase the required insurance and invoice Applicant for the full cost; or (2) suspend the Applicant's encroachment or easement approval until CWA staff determines the Applicant's coverage meets the requirements of this section.

4.4 ACCESS REQUIREMENTS

A. Access Notice

The Applicant will notify CWA staff a minimum of 48 hours prior to any activity in or adjacent to CWA facilities, property, rights-of-way, or easements. Except for approved access for installation and routine maintenance, Applicant must obtain CWA's consent before entering CWA's Corridor. A copy of the right of entry form can be found on the CWA Crossing Application Website (<https://cwacrossing.org/>) and is included as Appendix B.

B. Installation Access

The Applicant's right of access for installation will expire 180 calendar days from the date CWA approves the application, unless otherwise noted or extended. If the Applicant does not begin project installation within the approved time frame, the right of access expires, and the Applicant must submit a new application in accordance with CWA's then current policy.

C. Routine Maintenance Access

Routine maintenance activities accomplished remotely without any access or invasive activities to CWA Corridors require a 48-hour advance CWA notification, but do not require a new application CWA's prior consent. The Applicant must obtain a special encroachment for routine maintenance that includes invasive activities. The CWA GEC will reasonably determine what constitutes routine maintenance and when CWA's prior consent is required.

D. Emergency Maintenance Access

All emergency maintenance access requires advanced or simultaneous CWA Representative notification at (281) 424-2312 or the name and phone number provided in writing by CWA staff. If CWA determines this access is a new activity, an encroachment application and associated fee will be required. Updated as-built drawings are required if the emergency maintenance activity alters the pre-access location of the installed facilities.

E. Open Access

CWA's ongoing operations and maintenance activities will not be disrupted due to any Applicant activities. Maintenance access and roads along open canals must be kept accessible and available for CWA use at all times.



General Encroachment Requirements

F. Vehicle Access

Vehicular access across all facilities or improvements will be provided to CWA personnel at all times.

4.5 CONSTRUCTION REQUIREMENTS

A. Pre-construction Conference

CWA staff, CWA's GEC, the Applicant's agent and construction inspectors must schedule and attend a pre-construction conference before any work commences on CWA's Corridor. A minimum 48-hour pre-construction meeting advance notice is required.

B. Construction Work Plan

The Applicant may be required to submit procedures, excavation plans, schedules and the type and weight of the construction equipment to be used when working within or crossing the CWA Corridor. No equipment with a net surface loading that exceeds the equivalent of standard HS-20 loading, as defined by American Association of State Highway and Transportation Officials (AASHTO) will be permitted. When crossing under a CWA facility, the installation means and methods will be specified and followed during the construction phase. Means and methods revisions must be submitted to CWA prior to the start of any construction near the CWA facility.

C. Advanced Notification

ADVANCE NOTIFICATION OF TWO WORKING DAYS IS REQUIRED PRIOR TO STARTING ACTIVITIES WITHIN COASTAL WATER AUTHORITY CORRIDOR. Contact the CWA Representative at (281) 424-2312 or the name and phone number provided on approval documents. ALL WORK COMPLETED WITHIN CWA RIGHTS-OF-WAY, EASEMENTS, OR PROPERTY MUST BE MONITORED AND INSPECTED BY CWA PERSONNEL.

D. Site Inspections

Prior to construction, the condition of CWA's roads, fences, and adjacent land areas will be jointly inspected and documented by the Applicant or the Applicant's agent and CWA staff. Upon completion of the proposed construction activities, a final inspection will be conducted. The Applicant is responsible for all costs associated with returning the site features to pre-construction conditions or better.

E. Applicant's Inspector

The Applicant will assign a qualified inspector to be on site during construction operations within CWA's Corridors. The inspector will order the cessation of the work when so requested by CWA's field representative.

F. Required Communication

The Applicant will keep CWA staff advised at all times when working adjacent to or within CWA's Corridor. No work will be done on CWA's Corridor without CWA's representatives present, unless authorized by a CWA representative.



General Encroachment Requirements

G. Safety

The Applicant will be responsible for creating, implementing, and following a safety program to perform the work, maintain a safe work place, and comply with the Applicant's standard of care and all applicable laws bearing upon safety and any standards of care, laws, or regulations applicable to the Applicant's agents, contractors, and subcontractors. These parties will perform work in a safe and reasonable manner and seek to avoid injury, loss or damage to persons or property by taking reasonable steps to protect: (a) employees and other persons at the project site, and (b) all property and structures located at the project site affected by the work or adjacent areas.

H. Security

If permanent fencing is removed, the area must be secured with temporary fencing or a guard when workers are not present. Permanent fencing must be reinstalled to existing or better condition when construction is complete.

I. Site Restoration

The Applicant must remove all equipment and materials from CWA property and return property to "as before or better" condition (to be verified and approved by CWA's representative) before the expiration of the Applicant's right of access for installation or special encroachment. If the Applicant fails to comply, CWA will take appropriate action to return property to "as before" condition and the Applicant will reimburse CWA for all associated expenses or forfeit its encroachment or easement.

J. Record Drawings

The Project Owner will provide CWA with record drawings showing location, horizontal coordinate values, and elevations within 60 days of project completion. These drawing must include plan and profile information, use Texas State Plane Coordinate NAD 27 grid and scale factor at both ends of the casing. Vertical elevations for end of the casing will be tied to the vertical datum as identified on CWA record drawings.

4.6 MAINTENANCE

A. Maintenance Plan

All improvements, modifications, or facilities installed within CWA Corridors must be maintained in reasonable operating condition per typical industry standards.

B. Maintenance Responsibility

The Applicant will be solely responsible and liable for operation and maintenance of all project features. CWA is not responsible for any failure associated with the constructed work by submitted drawing and specification approval, or the observation during project construction by CWA personnel.



4.7 ABANDONMENT

A. Installed Facilities

Prior to abandoning any existing facilities within CWA Corridors, submit a facility abandonment request that completely describes all abandonment activities for CWA review and approval.

B. Abandonment

Prior to abandoning any ongoing facility installation within CWA Corridors, Applicant must submit a project abandonment request that describes how any partially installed facilities will be removed, the site will be returned to preconstruction condition, and how CWA facilities will be protected during the abandonment activities for CWA review and approval.



5.0 MISCELLANEOUS REQUESTS

5.1 SPECIAL ENCROACHMENTS

A. Purposes

The Applicant may apply for a special encroachment to obtain:

1. Transfer an encroachment or easement
2. Minor amendments to existing easements or encroachments
3. Waivers to certain requirements subject to approval under the waiver process described below
4. Items that the Executive Director determines are not standard

B. Application Submission

The Applicant will submit an application meeting the initial application requirements provided in § 2.1(A). The submittal will include a statement describing the purpose and justification of the special encroachment. The Applicant must submit a separate statement for each special encroachment the Applicant seeks.

C. Waiver Process

The Applicant has no right or claim to any waiver. CWA may grant waivers on a case-by-case basis if CWA determines that (1) granting the waiver creates no significant risk of harm to CWA facilities; and (2) the Applicant will take all reasonable and prudent steps to minimize any identifiable risk to CWA facilities. CWA may require the Applicant to provide additional financial assurances, insurance coverages, and enhanced design requirements prior to granting any waiver.

D. Special Encroachment Review

CWA will review the application for a special encroachment as outlined in §2.3 of the General Requirements.

5.2 PROJECT INTERRUPTION

A. Suspension

CWA staff may suspend any Applicant's work pursuant to any easement or right-of-way encroachment upon obtaining credible evidence that the Applicant has failed to comply with the applicable easement or consent to encroachment requirements issued by CWA. The Executive Director shall review suspensions within 48 hours. If the Executive Director determines that the Applicant's encroachment may present a continuing significant risk to CWA facilities, the Executive Director will issue a waiver with specified requirements or uphold the suspension and (1) request that the Board hold a public hearing to terminate the easement or encroachment; or (2) require the Applicant submit a request for special encroachment.

B. Termination

CWA may terminate any easement or right-of-way encroachment the CWA Board determines creates a continuing, significant risk to CWA facilities after providing the Applicant (1) notice of at least 48 hours and (2) a hearing before the O&M Committee.

ATTACHMENT A

Coastal Water Authority

Easement or Right-of-way Encroachment
Application

Easement or Right-of-way Encroachment Application

Coastal Water Authority
1801 Main Street, Suite 800
Houston, TX 77002-8120
Attn: Operations Manager

Phone: (713) 658-9020
<http://www.coastalwaterauthority.org/>

REQUESTOR INFORMATION: *(Print or Type Only)*

Date _____

Individual Name	Company Name	Phone Number	
Address	City	State	Zip Code

Email Address	Site Location/Key Map (attach)
---------------	--------------------------------

LEGAL NAME OF FACILITY OWNER REQUESTING PERMISSION TO ENCROACH:

Company Name	If pipeline, product(s) to be transported		
Address	City	State	Zip Code

Authorized Representative: Name & Title

State requesting company is incorporated

SUBMITTAL REQUIREMENTS

All requestor's must agree to comply with "**CWA Easement or Right-of-way Encroachment General Requirements – Revised March 2022**" and as amended periodically. If CWA facility relocation is required due to this request, the relocation(s) cost(s) will be borne by the requesting party and must be paid before the request is granted. The following documents will be issued per CWA property rights:

- Fee ownership: an easement will be prepared and executed by CWA
- An easement: a Consent to Encroach will be issued

It is the requestor's responsibility to secure additional needed rights from parties where CWA's rights are limited or less than a fee simple ownership. The requestor must notify owners of other pipelines, communication lines or other third party facilities located within CWA's grant to requestor.

FEE

The easement or consent to encroach fee is defined in the CWA Easement or Right-of-way Encroachment General Requirements – Revised March 2022. **A \$5,000.00 NON-REFUNDABLE ADMINISTRATIVE FEE MUST ACCOMPANY THE REQUEST SUBMITTAL.**

INDEMNIFICATION

BY SIGNING THIS APPLICATION, THE FACILITY OWNER REQUESTING PERMISSION TO ENCROACH IS LEGALLY BOUND BY THE INDEMNIFICATION AGREEMENT IN THE CWA EASEMENT OR RIGHT-OF-WAY ENCROACHMENT GENERAL REQUIREMENTS (March 2022).

REQUESTS SUBMITTED WITHOUT THE REQUIRED APPLICATION FEE OR THAT DO NOT CONTAIN THE SPECIFIED INFORMATION, WILL NOT BE APPROVED. Deficiencies will be identified and a revised package can be resubmitted.

The undersigned authorizes CWA to contact the Surveying firm that prepared the attachments and **certifies that the information provided is accurate and acknowledges that incomplete information may delay processing or invalidate this application.**

By: _____
Printed Name

Signature: _____

Title: _____



(revised March 2022)

ATTACHMENT B
Coastal Water Authority
Right of Entry Form

RIGHT OF ENTRY

THIS RIGHT OF ENTRY (this "Agreement@) is entered into effective as of the date (the "Effective Date") of signature by Grantor (as hereinafter defined) by and between **COASTAL WATER AUTHORITY**, a conservation and reclamation district created pursuant to the Constitution and laws of the State of Texas, whose address for purposes hereof is 1801 Main Street, Suite 800, Houston, Texas, 77002, Attn: Executive Director, and _____, whose address is _____, Houston, TX _____, Attn: _____ ("Grantee").

RECITALS

Grantor is the owner of that certain tract of real property as shown on the legal description and/or drawing attached to this Agreement as **Exhibit "A"** (the "Property").

Grantee has requested Grantor's permission for access over and across the Property for the purpose of

_____.

Grantor has agreed to allow Grantee such access according to the terms of this Agreement.

AGREEMENT

NOW, for and in consideration of the above recitals and the mutual agreements contain in this Agreement, the parties agree as follows:

1. Agreement for Access. Grantee its employees, agents and equipment service contractors will have the right of ingress and egress to the Property over and cross the Property for the purpose recited above, during regular working hours.

2. Term. The License granted under this Agreement shall have a term commencing on the Effective Date as shown following Grantor's signature below and extending until _____ calendar days thereafter.

3. Consideration. Grantee agrees to pay Grantor as follows: _____ . Payment shall be due and payable on or before the effective date of this Agreement.

4. General Provisions.

4.1. Grantee agrees to conduct all operations in a careful, diligent and workmanlike manner, and in strict compliance with all laws, regulations, and orders of duly constituted authorities and industry guidelines.

4.2. Survey stakes or markers of any kind shall not be placed inside the CWA right of way.

4.3. Access is limited to light duty vehicles, PU trucks and ATV's unless otherwise specified.

4.4. Access during wet weather conditions is prohibited.

4.5. CWA gates will be kept locked at all times during and after specified activities.

4.6. Grantee or its contractor(s) and subcontractors shall give 24 hours prior notice of its entry onto the Property by contacting Grantor. Hours of access shall be limited to Monday thru Friday from 7:30 am to 3:30 pm.

4.7. Grantee agrees to compensate Grantor for all damages over and above normal wear and tear which may have occurred as a result of Grantee's entry and operations on the Property. Grantee, at its sole cost and expense, will repair all road damages, ruts, fence damages and damages to the vegetation resulting from its entry and operations on the Property.

5. INDEMNIFICATION AND RELEASE OF GRANTOR.

GRANTEE, FOR ITSELF AND ITS SUCCESSORS AND ASSIGNS, BY THIS AGREEMENT DOES RELEASE AND DISCHARGE THE GRANTOR AND AGREES THAT IT WILL PROTECT, DEFEND, INDEMNIFY AND HOLD HARMLESS THE GRANTOR, ITS PREDECESSORS, SUCCESSORS, ASSIGNS, LEGAL REPRESENTATIVES AND ITS FORMER, PRESENT AND FUTURE AGENTS, EMPLOYEES AND OFFICERS FROM ANY AND ALL LIABILITIES, CLAIMS, LOSSES, DAMAGES OR INJURIES TO PERSONS OR PROPERTY, COSTS OR EXPENSES (COLLECTIVELY, "CLAIMS") ARISING OUT OF OR IN CONNECTION WITH THIS AGREEMENT OR GRANTEE'S ENTRY ONTO OR USE OF THE PROPETRY, EXCLUDING ONLY CLAIMS CAUSED BY THE SOLE GROSS NEGLIGENCE OF GRANTOR.

6. Insurance. With no intent to limit Grantee's liability under the indemnification provisions set forth above, Grantee shall provide and maintain in full force and effect during the Term of this Agreement and all extensions and amendments thereto, at least the following insurance:

- (a) Worker's Compensation at statutory limits;
- (b) Employer's Liability, including bodily injury by accident and by disease, for \$1,000,000 combined single limit per occurrence and a twelve (12)-month aggregate policy limit of \$1,000,000;
- (c) Commercial General Liability Coverage, including third party liability from under an insured contract, products and completed operations, personal injury, bodily injury, operations hazard, pollution, explosion, collapse and underground hazards for \$2,000,000 per occurrence and a twelve (12) month aggregate policy limit of \$4,000,000;
- (d) Automobile Liability Insurance (for automobiles used by Grantee in the course of its performance under this Agreement, including employer's non-ownership and hired auto coverage) for \$1,000,000 combined single limit per occurrence; and

The insurance coverages required above may be represented in one (1) or more certificates of insurance, which shall be provided to the Grantor at the address set forth above.

The issuer of any policy must have a certificate of authority to transact insurance business in the State of Texas issued by the Texas Board of Insurance and a rating of at least B+ and a financial size of Class VI or better in the most current edition of Best's Insurance Reports. Each issuer must be responsible and reputable and must have financial capability consistent with the risks covered.

Each policy, except those for Worker's Compensation and Employer's Liability, must name the Grantor and its agents, officers, directors, officials, legal representatives, employees and assigns as additional insured parties with respect to the original policy and all renewals or replacements during the Term of this Agreement.

Grantee shall assume and bear any claims or losses falling under or within any deductible amounts under any insurance policy responsive to the requirements of this Agreement and waives any claim it may ever have for the same against the Grantor, its officers, agents or employees.

All such policies and certificates shall contain an agreement that the insurer shall notify the Grantor in writing not less than thirty (30) days before any material change, reduction in coverage or cancellation of any policy.

Each policy must contain an endorsement to the effect that the issuer waives any claim or right in the nature of subrogation to recover against the Grantor, its officers, agents or employees.

Each policy must contain an endorsement that such policy is primary insurance to any other insurance available to the Grantor as an additional insured with respect to claims arising hereunder and that the insurance applies separately to each insured.

Grantee shall be entitled to purchase and maintain the insurance required under this Agreement under so-called blanket policies, provided the coverage thereunder is at least at the levels contained herein and is otherwise adequate in keeping with prudent underwriting standards.

Grantee shall require all third-party contractors and subcontractors that are to perform work under this Agreement to maintain in full force and effect during the term of this Agreement and all extensions and amendments thereto insurance in the amount and type that is customary for conducting any activities on the Property for Grantee.

7. Governing Law. This Agreement shall be governed by, and construed in accordance with, the laws of the State of Texas. Venue for any litigation relating to this Agreement is Harris County, Texas

8. Severability. If any provision of this Agreement is determined to be illegal or unenforceable for any reason, the remaining provisions hereof shall not be affected thereby.

The parties have executed this Agreement, in multiple counterparts, each of which is deemed to be an original, to become effective on the date of signature on behalf of Grantor.

GRANTOR
COASTAL WATER AUTHORITY

By: _____

Name: _____

Title: _____

Effective Date: _____

GRANTEE

Company: _____

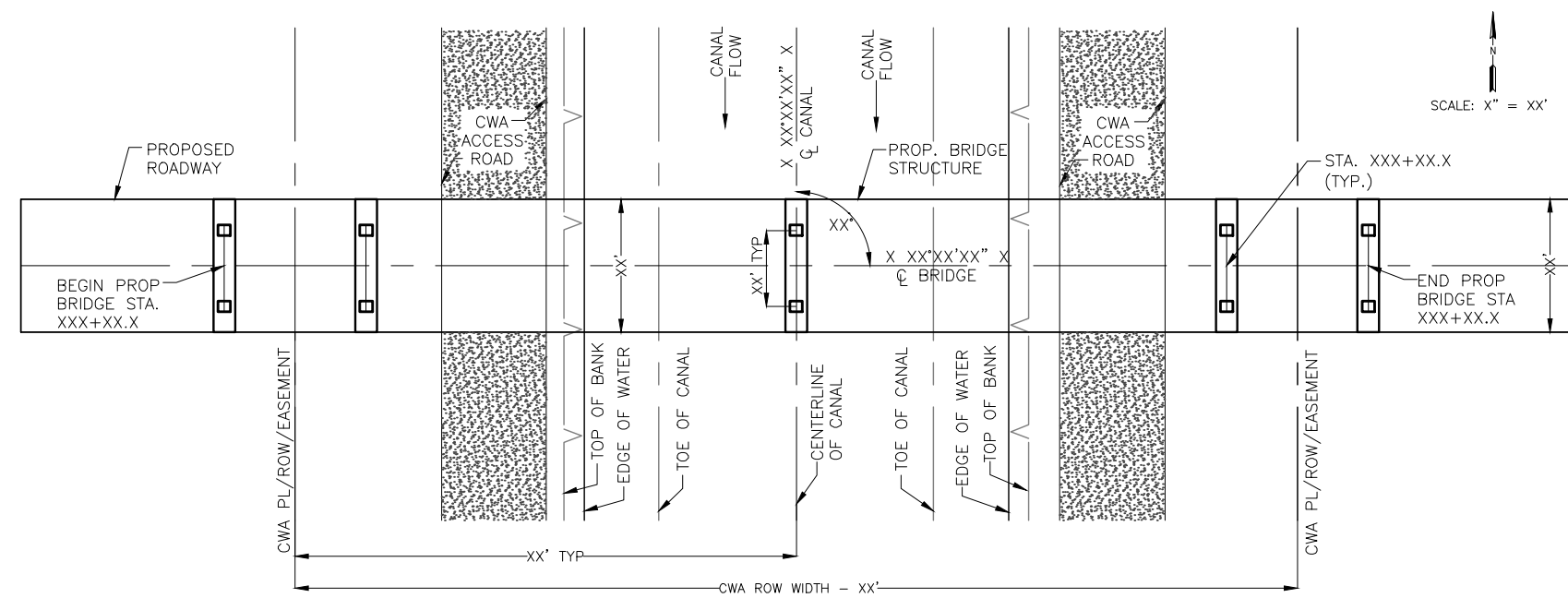
By: _____

Name: _____

Title: _____

ATTACHMENT C
Coastal Water Authority
Typical Details

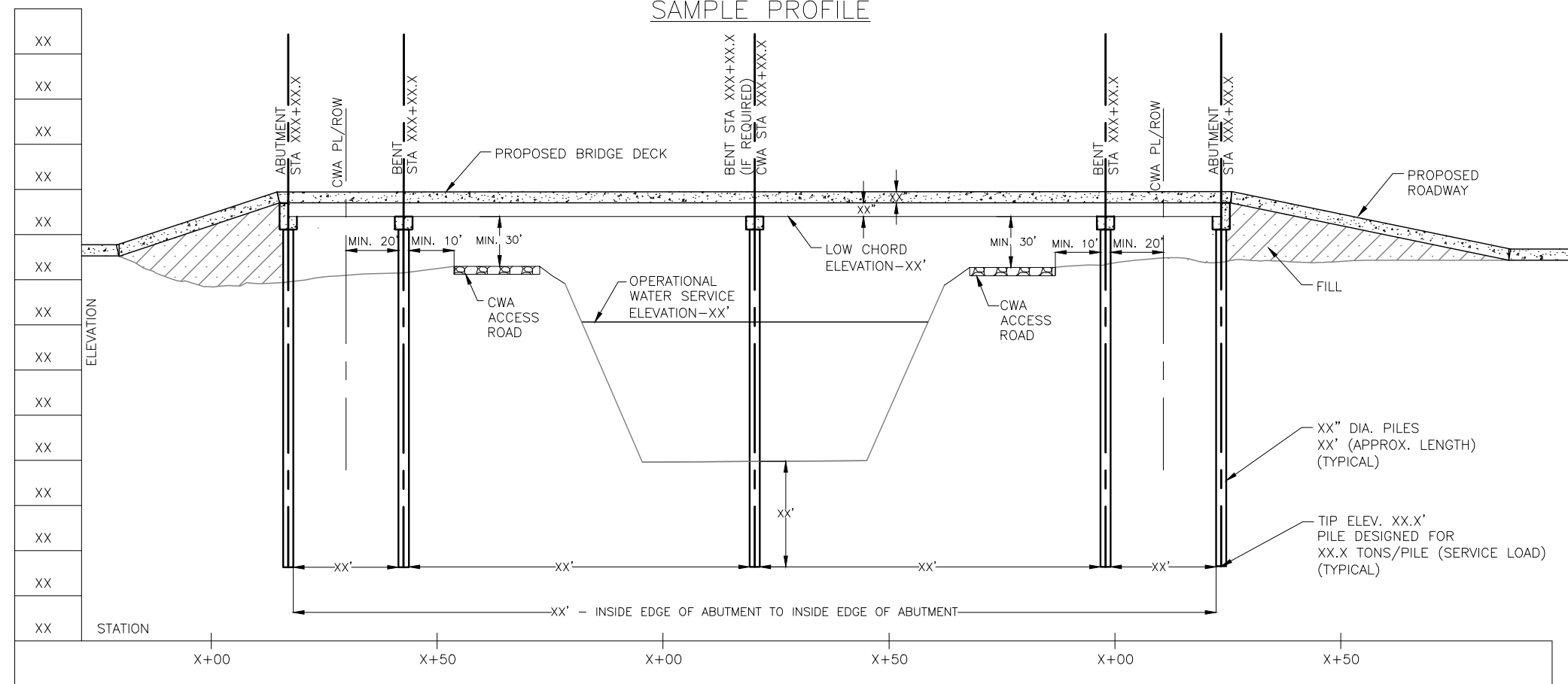
SAMPLE PLAN



GENERAL NOTES:

1. THIS DETAIL ILLUSTRATES THE MINIMUM REQUIREMENTS FOR A ROADWAY BRIDGE STRUCTURE THAT CROSSES A CWA CANAL AND PROVIDES GENERAL GUIDELINES FOR INFORMATION TO BE INCLUDED WITH THE CROSSING APPLICATION.
2. FOR ADDITIONAL MINIMUM REQUIREMENTS SEE TYPICAL BRIDGE NOTES FOR CANAL CROSSINGS SHEET.

SAMPLE PROFILE



DESIGN ENGINEER TO IDENTIFY THE FOLLOWING:

1. SUPERSTRUCTURE, ABUTMENTS, RAILINGS, EMBANKMENTS, AND DRAINAGE, INCLUDING DETAILS AND SECTIONS.
2. TYPE OF MATERIALS (CONCRETE, STEEL, ETC.) USED FOR DIFFERENT MEMBERS.
3. DESIGN LOADINGS AND DETAILS OF BRIDGE PILES/COLUMNS, IF ANY, ON BOTH SIDE OF CANAL.
4. THE ELEVATION OF THE BOTTOM OF THE SUPERSTRUCTURE AND THE CLEARANCE BETWEEN THE HIGH WATER LEVEL, TOPE OF BANK, AND CANAL ACCESS/MAINTENANCE ROWADWAY.
5. DESIGN STANDARDS ON WHICH THE BRIDGE IS BASED (TXDOT, AASHTO, ETC.)

CONSTRUCTION NOTES (INCLUDE ON DRAWINGS):

1. AT NO TIME WILL ANY OBSTRUCTION TO THE FLOW OF THE CANAL BE ALLOWED. THIS INCLUDES DECK SUPPORT TIMBERS, AND ANY SOIL OR RUBBLE THAT MAY ENTER THE CANAL. IF MATERIAL DOES ENTER THE CANAL, THE CONTRACTOR SHALL REMOVE IT AT HIS EXPENSE IMMEDIATELY. IF THE CONTRACTOR DOES NOT REMOVE THE MATERIAL WHEN NOTIFIED, CWA MAY REMOVE THE DEBRIS AT THE LICENSEE'S EXPENSE.
2. THE CONTRACTOR IS RESPONSIBLE FOR HANDLING STORM FLOWS, RETURN FLOWS AND OTHER NUISANCE WATER IN CANALS.
3. NO EXCAVATION WILL BE PERMITTED ACROSS THE FULL WIDTH OF THE CANAL BANK AND MAINTENANCE ROAD, WHICH WOULD, AT BANK-TO-BANK FLOW, CREATE A CONDUIT FOR FLOW OUT OF THE CANAL, OR ACROSS MAINTENANCE ROADS.
4. ALL APPROVED EXCAVATIONS SHALL BE BACKFILLED TO ORIGINAL GROUND LEVEL WITH SUITABLE FILL MATERIALS APPROVED BY CWA. BACKFILL SHALL BE PLACED IN 9-INCH MAXIMUM LOOSE LIFTS AND COMPACTED TO A MINIMUM DENSITY EQUAL TO THE SURROUNDING CANAL EMBANKMENT.
5. ELEVATIONS OF THE PROPOSED BRIDGE FLOOR AND LOWEST ELEVATION OF BRIDGE SUPERSTRUCTURE SHALL BE VERIFIED BY CWA PRIOR TO PLACING CONCRETE.
6. NO CONCRETE SHALL BE PLACED WITHOUT PRIOR APPROVAL OF CWA.
7. ADD APPLICABLE NOTES FROM CWA EASEMENT AND RIGHT-OF-WAY ENCROACHMENT GENERAL REQUIREMENTS SECTION 3.1.C.2.

**COASTAL WATER
AUTHORITY**



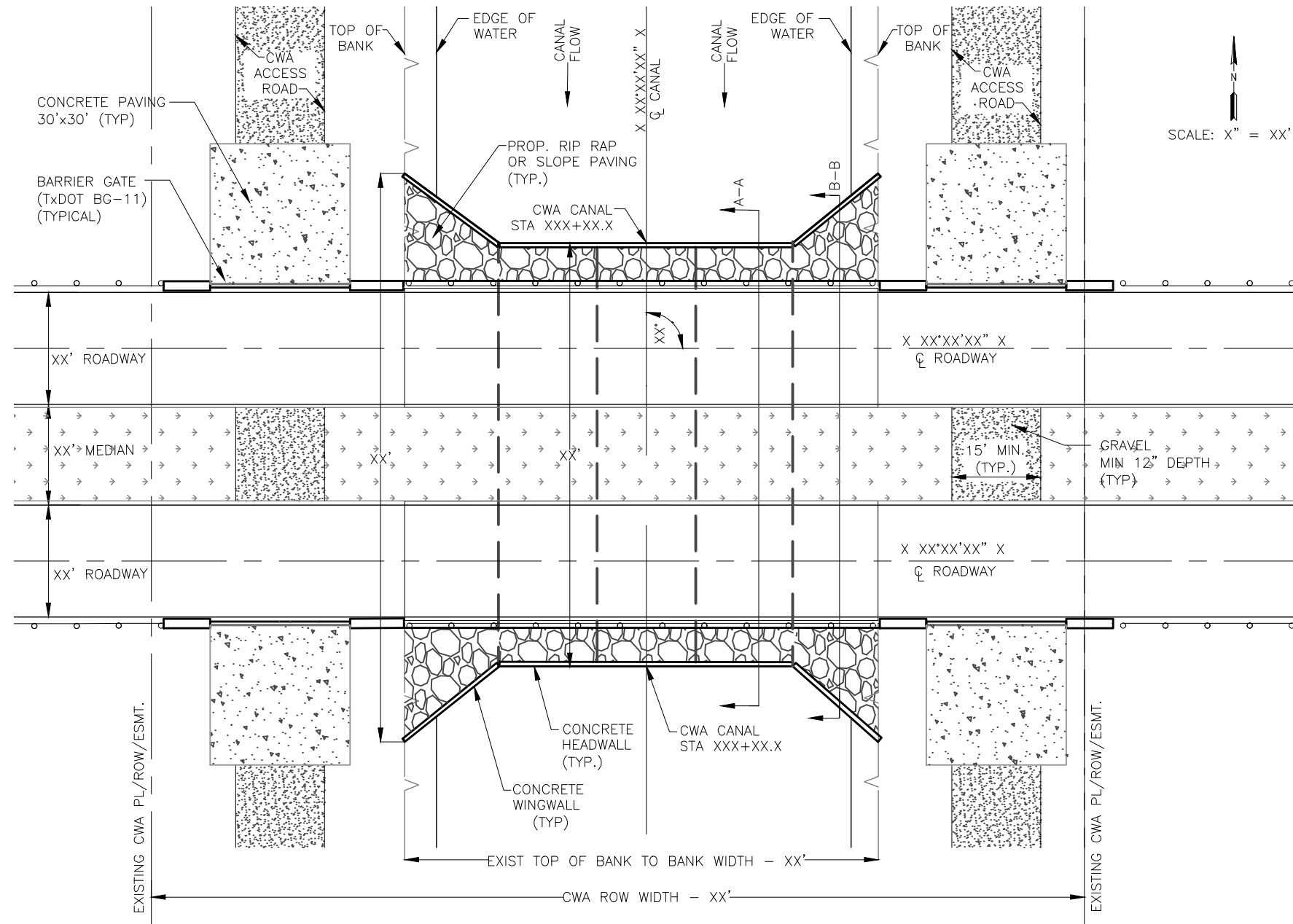
LAN **Lockwood, Andrews
& Newnam, Inc.**
A LEO A DALY COMPANY
2925 Briarpark Drive
Houston, Texas 77042-3720
Tel 713-266-6900 Fax 713-266-7596

Title: **Typical Bridge Notes
For Canal Crossings**

Exhibit: **1A**

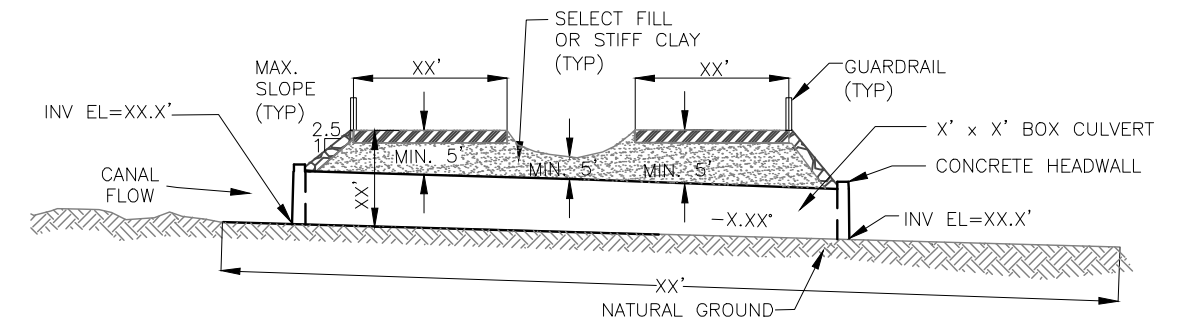
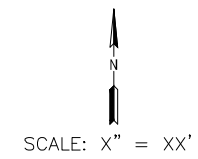
Job No. 120-11004-000
Date October 2014

SAMPLE PLAN

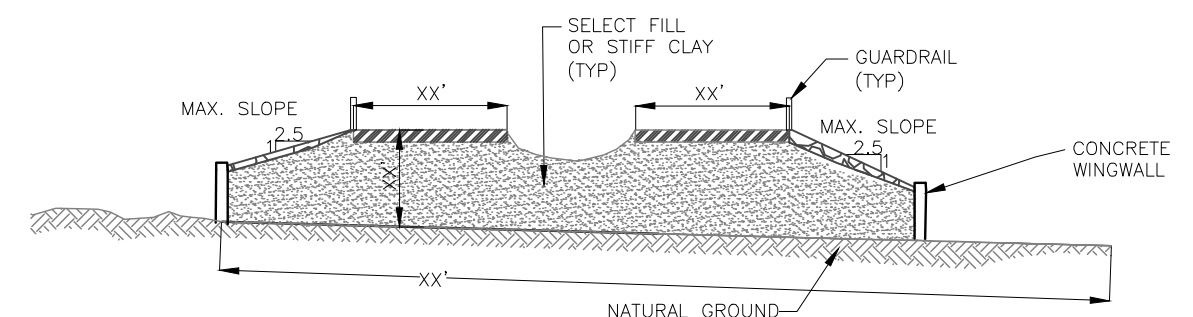


GENERAL NOTES:

1. THIS DETAIL ILLUSTRATES THE MINIMUM REQUIREMENTS FOR A ROADWAY THAT CROSSES A CWA CANAL BY CULVERT AND PROVIDES GENERAL GUIDELINES FOR THE INFORMATION TO BE INCLUDED WITH THE CROSSING APPLICATION.
2. FOR ADDITIONAL MINIMUM REQUIREMENTS SEE TYPICAL CULVERT DETAIL NOTES FOR CANAL CROSSINGS

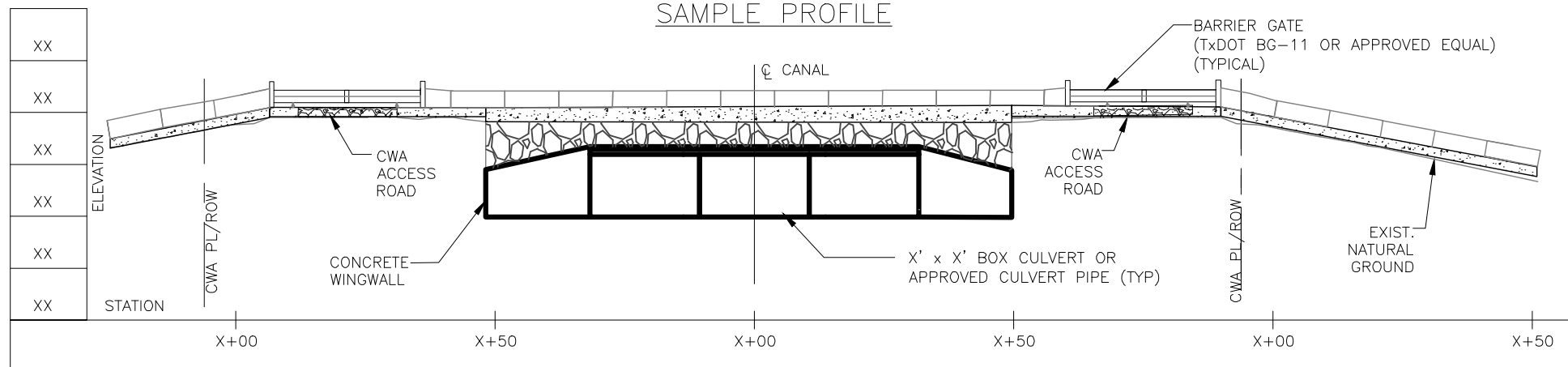


SAMPLE CROSS-SECTION A-A



SAMPLE CROSS-SECTION B-B

SAMPLE PROFILE



DESIGN ENGINEER TO IDENTIFY THE FOLLOWING:

1. CULVERT DESIGN MATERIALS, EMBANKMENTS, AND DRAINAGE, INCLUDING DETAILS AND SECTIONS.
2. CULVERT SPECIFICATIONS INCLUDING BUT NOT LIMITED TO INVERT, CHANNEL SLOPE, CULVERT LENGTH, DISTANCE BETWEEN HEADWALLS, ETC.
3. DESIGN LOADINGS AND DETAILS OF CULVERTS, IF ANY, ON BOTH SIDES OF CANAL.

CONSTRUCTION NOTES (INCLUDE ON DRAWINGS):

1. AT NO TIME WILL ANY OBSTRUCTION THAT LIMITS THE REQUIRED FLOW CAPACITY OF THE CANAL BE ALLOWED. THIS INCLUDES ANY SOIL OR RUBBLE THAT MAY ENTER THE CANAL. IF MATERIAL DOES ENTER THE CANAL, THE CONTRACTOR SHALL REMOVE IT AT HIS EXPENSE IMMEDIATELY. IF THE CONTRACTOR DOES NOT REMOVE THE MATERIAL WHEN NOTIFIED, CWA MAY REMOVE THE DEBRIS AT THE LICENSEE'S EXPENSE.
2. THE CONTRACTOR IS RESPONSIBLE FOR HANDLING STORM FLOWS, RETURN FLOWS AND OTHER NUISANCE WATER IN CANALS.
3. NO EXCAVATION WILL BE PERMITTED ACROSS THE FULL WIDTH OF THE CANAL BANK AND MAINTENANCE ROAD, WHICH WOULD, AT BANK-TO-BANK FLOW, CREATE A CONDUIT FOR FLOW OUT OF THE CANAL, OR ACROSS MAINTENANCE ROADS.
4. ALL APPROVED EXCAVATIONS SHALL BE BACKFILLED TO ORIGINAL GROUND LEVEL WITH SUITABLE FILL MATERIALS APPROVED BY CWA. BACKFILL SHALL BE PLACED IN 9-INCH MAXIMUM LOOSE LIFTS AND COMPACTED TO A MINIMUM DENSITY EQUAL TO THE SURROUNDING CANAL EMBANKMENT.
5. NOTHING SHALL BE INSTALLED THAT WILL IMPEDE THE FLOW INTO AND OUT OF THE CULVERT, SUCH AS SEDIMENT-CATCHING WALLS.
6. NO CONCRETE SHALL BE PLACED WITHOUT PRIOR APPROVAL OF CWA.
7. NO LANDSCAPING OR OTHER CHANGES IN GROUND SURFACES WITHIN CWA CANAL/LATERAL RIGHT-OF-WAY SHOULD BE MADE WITHOUT ADVANCE WRITTEN PERMISSION THROUGH THE APPLICATION PROCESS.
8. ADD APPLICABLE NOTES FROM CWA EASEMENT AND RIGHT-OF-WAY ENCROACHMENT GENERAL REQUIREMENTS SECTION 3.1.C.2.

**COASTAL WATER
AUTHORITY**



LAN **Lockwood, Andrews
& Newnam, Inc.**
A LEO A DALY COMPANY
2925 Briarpark Drive
Houston, Texas 77042-3720
Tel 713-266-6900 Fax 713-266-7596

Title: Typical Culvert Detail Notes For Canal Crossings	
Exhibit: 2A	Job No. 120-11004-000 Date October 2014