

DESIGN REVIEW PROCESS AND DESIGN CRITERIA FOR FACILITIES



Approved by Board Resolution No. 11-2018

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CHURCH DITCH WATER AUTHORITY POLICY STATEMENT

The Church Ditch Water Authority (CDWA), which is operated by a Board of Directors, has statutory and other rights to use and maintain the ditch and the right-of-way established for the ditch. The right-of-way includes a reasonable area of land on either side of the ditch necessary for use and maintenance of the ditch. CDWA conveyance systems handle water for irrigation, municipal and industrial use. CDWA conveyance systems also include systems that convey drainage pursuant to an intergovernmental agreement with the City of Arvada, but only in that portion of CDWA facilities specifically identified as drainage conveyance facilities, also known as the Bypass Area.

Development in the region (including, but not limited to, overhead and underground utilities, roads, trails, commuter rail, pipelines, drainage facilities, golf courses, mines and borrow pits, and other urban development), has the potential to impact CDWA water, facilities and methods of operation. CDWA has the right and legal authority to limit activities impacting or potentially impacting its water, facilities, and operations. As such, development that has the potential to affect CDWA water, property and facilities, whether within property or easements owned, controlled, or operated by CDWA or not, must be carefully designed to avoid impacts to CDWA facilities. Specifically,

- CDWA requires the bypass of storm water drainage from new development and bypass from existing development when applicable;
- CDWA maintains, at a minimum, a 50-foot prescriptive easement; and
- Any crossing of the Church Ditch or activity within this easement requires a Board-approved permit from CDWA.

CDWA does not permit trespassing on CDWA property. Access and construction are allowed within CDWA property only after appropriate agreements and permits are executed by the applicant and CDWA.

This document presents a set of minimum standards and guidelines to be followed by persons and entities that propose to design, construct, or operate projects that are located within CDWA property, or on property near CDWA property, when the development has a potential to affect the function, maintenance, capacity, or operation of the Church Ditch. Additional measures may be required by CDWA as determined at the time of review of the initial permit application by CDWA. **A CDWA Board of Directors approved written permit is required before any activity within CDWA prescriptive easement or right-of-way begins.**

These guidelines are in addition to other applicable municipal, county, special district, state or federal guidelines and regulations. In this document, "CDWA" refers to CDWA employees and entities that represent CDWA.

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CHAPTER 1 - GENERAL PROVISIONS

1.1 GOVERNMENTAL REGULATIONS

Various municipal, county, special district, and state and federal regulations control the use and development of land. Under state law and many local regulations, water authorities are designated as “referral agencies.” That is, the local government provides application materials to the water authority and requests comments from the company with regard to whether and how the proposed development affects the ditch company’s interests, and how those potential impacts should be mitigated.

In many jurisdictions, water authorities must approve project plans (as they pertain to the water authority’s interests) before the governmental body will approve a proposed project. Yet even where the local regulations do not explicitly require CDWA approval, the Church Ditch’s interests are protected by state statute or applicable case law. As such, regardless of local government requirements, CDWA approval is required for any proposed development that has the potential to impact Church Ditch property, facilities or operations.

This document provides the procedures typically followed by CDWA in reviewing and approving or disapproving projects that may affect CDWA.

1.2 NO TRESSPASSING

Trespassing onto CDWA property is not allowed. Nothing in this document authorizes entry upon CDWA property or to perform any work thereon without prior express approval by CDWA.

1.3 CDWA REQUIREMENTS

This document provides the standards and procedures that CDWA generally follows when it reviews and approves or disapproves projects that may affect CDWA property, facilities or operations. These standards and procedures are intended to protect the quality, integrity, operation, and efficiency of CDWA property and facilities. All engineering design for construction of structures across or along the ditch shall not interfere with the operation and maintenance of the ditch and shall conform at a minimum, to the following criteria:

1. All crossings and improvements shall be designed to pass a design flow of 125 cubic feet per second (cfs) with 2 feet of freeboard in the ditch.
2. All crossings and other improvements shall be built with a clear span without obstructing the waterway, with a freeboard of 2 feet between the design flow and the bottom most chord of the structure.

3. The top of the foundation footing for structures shall be at least 3 feet deep below the flowline of the ditch.
4. Other design features may be required as dictated by site conditions in conformance with the codes of practice.

These standards are minimum requirements. Additional standards and conditions may be applied to individual projects, depending upon the nature of the project and the level of anticipated impact on or increased risk to CDWA property or facilities.

1.4 NO ADDITIONAL COSTS TO CDWA

CDWA's mission is to efficiently and fairly deliver water to its customers. Activities of third parties, particularly when they are not for the furtherance of the CDWA's mission, shall not have a negative financial or operational impact to the CDWA.

CDWA requires applicants to cover the costs of CDWA reviews. CDWA also requires applicants to ensure that changes to CDWA system that may increase CDWA's costs in the short term (e.g., annual inspections or routine maintenance) or long term (e.g., periodic major maintenance, repairs, or capital replacement) are accompanied by adequate assurances of a reliable funding source or cost reduction measures to completely offset any increased costs to CDWA.

1.5 PROJECTS AND PLANS REQUIRING CDWA REVIEW

1.5.1 ON CDWA PROPERTY OR PRESCRIPTIVE EASEMENT/RIGHT-OF-WAY

CDWA must approve plans and specifications prior to the start of construction of any project or development that directly or indirectly affects the quality of water delivered to CDWA; impacts CDWA property interest, including without limitation easements and rights-of-way; and for all structures being constructed upstream of, on, over or under CDWA property. These projects include, but are not limited to:

1. Overhead and underground utilities such as natural gas, petroleum products, water, sewage and compressed air pressure pipelines; telephone and telecommunication wires and cables; electrical power wires and cables; and sanitary sewers, storm sewers and other gravity-flow or pressure pipelines.
2. Crossings of railroads, streets, roads, highways, equestrian/pedestrian/bicycle paths and similar facilities.
3. Relocation of the Church Ditch or associated CDWA structures.
4. Other projects requiring activity on CDWA property or relocation or modification of CDWA facilities.

1.5.2 OFF CDWA PROPERTY OR PRESCRIPTIVE EASEMENT/RIGHT-OF-WAY

CDWA also must approve plans and specification prior to the start of construction for projects and developments not constructed on CDWA property that directly or indirectly impact the quality of water delivered to CDWA or CDWA facilities or operations. These projects include, but are not limited to:

1. Development or construction that temporarily or permanently changes the land use, flow rate, flow volume, flow pattern or quality of storm water drainage or other discharges into or is tributary to the CDWA system or property. Note that development changes both water quantity and water quality and CDWA does not allow storm water or other water from any developed land to enter its facilities.
2. Development which causes a concentration of people adjacent to CDWA facilities, which facilities in the past have been relatively isolated (e.g., development which could increase trespassing or pressure for public use on or adjacent to CDWA property).
3. Projects that potentially alter groundwater flow paths that could affect the quantity or quality of water in CDWA system.

1.5.3 POLICY STATEMENTS

CDWA policies regarding review of development and activity not on CDWA property are summarized below:

1. CDWA requests that local zoning and subdivision authorities send referral notices to CDWA for any development, construction, or activity that may alter the land use, flow rate, flow volume, flow pattern, or quality of storm water runoff that may reach or leave CDWA property or facilities. CDWA further requests review of plan revisions after the initial referral if the plan revisions affect the original calculations regarding flow rate, volume, pattern, or quality of storm water runoff.
 - i. The development, construction, or activity need not be adjacent to CDWA property for the development to impact CDWA systems.
 - ii. CDWA may request that an applicant provide additional information or a review fee to cover CDWA's costs of performing a technical review of the application. An applicant's failure to provide information or a review fee will result in CDWA objecting to the application.
2. CDWA does not allow storm water or other water from developed land to enter CDWA property or facilities.
 - i. CDWA will not agree to allow any portion of its system to be an integral part of a drainage project or plan, or to otherwise be used for storm water collection, conveyance, retention or detention.

- ii. CDWA requires that Master Drainage Plans prevent storm water from entering CDWA property or facilities, and that the plans prevent or mitigate adverse impacts on such property and facilities as drainage or ditch crossings for flows up to and including the 100-year storm event.
 - iii. As a condition of CDWA approval of any new or modified easement or license agreement, existing discharges into CDWA property or facilities must be eliminated.
3. The Church Ditch bank shall remain undisturbed at all times, except as provided on CDWA-approved construction plans (e.g., the designated construction area of a CDWA-approved crossing).
4. All new development, construction, or grading activity that is either adjacent to or upstream of CDWA property or facilities shall include appropriate temporary Best Management Practices (“BMPs”) for erosion and sediment control protection during construction, and thereafter. Appropriate permanent BMPs shall be installed and perpetually maintained. BMPs shall be designed in general conformance to the most recent edition of the Urban Drainage and Flood Control District criteria.
5. CDWA does not allow the dumping of spoils, trash, debris, lawn clippings, waste, manure, tree limbs, concrete, or any other matter within CDWA property or facilities.
6. CDWA encourages development, construction, or activity that enhances the function of CDWA facilities (e.g., projects that include ditch improvements such as CDWA-approved ditch improvements, trash rack, or hydraulic control structures).
7. CDWA opposes development, construction, or activity adjacent to CDWA property or facilities that may produce polluted groundwater inflows into CDWA property or facilities (e.g., certain types of industrial, mining, or waste-processing activity, or the improper use of pesticides, herbicides, fertilizers, or other chemicals that can pollute groundwater or surface water).
8. CDWA facilities may seep water under abutting and nearby property. Since most CDWA facilities have been in operation for a long period of time, CDWA asserts prescriptive rights to such seepage. CDWA may require applicants to execute a seepage agreement that acknowledges CDWA’s historic right of seepage and releases all past, present, or future claims against CDWA related to seepage. See **Appendix A** for a sample agreement.
9. In a few locations, CDWA facilities may have a long history of overflowing during significant storm events. In those locations, CDWA may have prescriptive rights to overflow onto abutting properties. CDWA may require applicants in those locations to execute a flooding agreement that acknowledges CDWA’s historic right of overflow and releases all past, present, or future claims against CDWA related to flooding.

CHAPTER 2 - CDWA REVIEW PROCESS

2.1 REVIEW AND INSPECTION FEES

As provided in **Section 1.5**, CDWA requires applicants to cover CDWA's cost of application review. CDWA may charge an application fee to set up the file, an administrative fee to cover the cost of processing the application, and a retainer deposit to cover the costs of technical and legal review of project documents (and where necessary, the cost of negotiating and drafting agreements or easements). CDWA also requires payment for inspection fees during construction of improvements that require CDWA inspection.

Applications for CDWA review must include payment of the application fee and any required retainer deposits. The schedule of fees is set by Resolution as adopted by the Board of Directors from time to time. Depending on the specifics of a proposed project, CDWA may also require that a CDWA representative observe construction. The applicant shall pay all associated costs of CDWA's inspections during construction and subsequent final inspection work. The inspection fees are in addition to the engineering and legal fees. Fees for construction inspections will depend on the amount of oversight that is required.

CDWA will use the applicant's deposits to pay its engineering consultants and attorneys for their work on the application, drawing down the retainer on a monthly basis until the work is complete. Since the complexities and the resulting expenses associated with reviewing any individual project are unknown at the time an application is submitted, actual costs may be greater or less than anticipated costs.

If actual costs exceed the retainer, CDWA will require the applicant to provide additional deposits to the retainer during the review process based upon an estimate of the additional anticipated fees. If CDWA requires an additional deposit, it shall be paid within 30 days of invoice. All costs incurred by CDWA must be paid before final approval of an application.

If actual costs are less than the retainer, the amount of the retainer that is not spent during the review and construction inspection process will be returned to the applicant. Application fees and administrative fees are nonrefundable.

In addition to the application fee, administrative fee, retainer deposit, and other payments that may be required for reimbursement of CDWA review costs, a crossing fee shall be paid prior to construction within CDWA property.

The crossing fee for a trenched/open-cut crossing of a ditch is set by Resolution as adopted by the Board of Directors from time to time, and the fee for other types of excavations or crossings within CDWA property may be established by CDWA's General Manager on a case-by-case basis according to the costs CDWA incurs from the excavation or crossing. All crossing fees shall be calculated per line, not per bore.

2.2 SECURITY

CDWA may require an applicant to provide security prior to construction of improvements within CDWA property. The security shall be sufficient to secure completion of the proposed improvements, or removal of partially completed improvements and restoration of the affected CDWA property or facility, as appropriate in CDWA's sole discretion. The security shall also cover the cost of "as-built" drawings if the applicant fails to provide them to CDWA in a timely manner.

In the rare instance in which construction of a ditch crossing is allowed during times when the ditch is carrying water, the applicant or contractor must furnish additional suitable security (letter of credit, bond, or cash deposit) to protect CDWA from potential liability for loss of water, damages to third parties (persons and property) and damages to crops (either directly or from inability to deliver water), and loss of water due to water quality degradation.

Comparable security is required for all bores (trenchless installation techniques) under CDWA property, regardless of whether they are completed when water is present in the ditch.

2.3 APPLICATION REQUIREMENTS

2.3.1 APPLICATION FORM

An application for CDWA review of plans and specifications shall be submitted at the time a review is requested. The application shall be on the form provided by CDWA, a copy of which is included in **Appendix B**. No review shall be undertaken until the application form and required fees and retainer are received by CDWA.

2.3.2 SUBMITTAL FORMAT

An electronic copy of design plans, site plans, grading plans, geotechnical reports, erosion-control plans, revegetation plans, specifications, calculations, drainage studies, survey data and any other relevant data shall be submitted for review. An itemized engineer's estimate of construction costs shall also be submitted prior to approval by CDWA. All submitted information shall be in Adobe Acrobat (.pdf) format. The boundaries of CDWA property must be clearly shown on all applicable drawings.

CDWA is a public entity subject to the Colorado Open Records Act, C.R.S. § 24-72-200.1, *et seq.* It is the applicant's responsibility to notify CDWA if applicant asserts any proprietary, trade secret, or confidential status for materials it submits to CDWA, and it is the applicant's responsibility to clearly mark materials as such. When so marked, CDWA will notify an applicant of a request for disclosure and will initially withhold applicant's alleged proprietary, trade secret, or confidential materials from public disclosure. Disclosure may nonetheless be required pursuant to court order.

2.3.3 CERTIFICATION

All materials submitted for review shall, where applicable, be under seal of a Registered Professional Engineer currently registered in the State of Colorado. All reports shall bear the Professional Engineer's seal on the title page, and the seal shall appear on each drawing of the plans. The certification shall provide that the review by the applicant's Professional Engineer shall be additionally for the benefit of CDWA.

2.3.4 RESUBMITTAL OF REVISIONS

If CDWA requires revisions, any changes on drawings, specifications, or reports shall be clearly identified in the revised drawing, specification, or report. A letter specifically addressing all of CDWA's comments must accompany each resubmittal. Like the original submittal, all resubmittals shall be in Adobe Acrobat (.pdf) format with signed and stamp certification by a Registered Professional Engineer.

2.3.5 AS-BUILT DOCUMENTATION

As-built documentation is required after all projects within 90 days of completion. CDWA will not provide final close-out of any project until as-built information is received by CDWA. As-built information shall include "as-built" drawings and a certificate of completion (see **Section 3.3**).

2.4 APPROVAL OR DISAPPROVAL

Project design shall conform to all applicable laws, statutes, ordinances, rules and regulations, or guidelines imposed by governmental authorities with jurisdiction over the project. However, CDWA will base its approval or disapproval of proposed projects on the Design Criteria set forth herein and other criteria that CDWA may determine should be applied to a particular project in order to serve

the purposes and policies set out in **Chapter 1**.

CDWA's General Manager will issue a written approval or disapproval of plans and specifications for projects only after CDWA's receipt of all material CDWA determines to be necessary for review. **Any revisions made after CDWA approval must be approved in writing by CDWA's General Manager prior to the start of construction.** CDWA retains the right to approve or disapprove any project or modification in its sole discretion.

2.5 CONSTRUCTION AND POST-CONSTRUCTION INSPECTIONS

CDWA representatives shall be provided with safe and unimpeded access to all areas of construction or installation of approved improvements for purposes of project inspection and data collection. This includes, when applicable, horizontal directional drilling ("HDD") operation and all HDD equipment.

Where these design criteria require testing of pipelines or other improvements, the applicant shall give CDWA not less than 48-hours' notification prior to the test, such that a CDWA representative may be present during the test. All written test results shall be promptly provided to CDWA.

CHAPTER 3 - CONTRACTUAL MATTERS

3.1 LIMITATION OF LIABILITY

Under no circumstances do CDWA, its agents, or consultants warrant or guarantee the adequacy of designs reviewed and approved by CDWA, even if CDWA requires modification of a design proposed by an applicant. CDWA's review of project reports, plans and specifications is for the sole benefit of CDWA, and is focused on determining if the proposed project details conform to CDWA design guidelines, which are necessary to reasonably protect CDWA property and facilities from adverse impacts. CDWA's approval of a proposed project does not waive CDWA's right to pursue legal remedies if the project adversely affects CDWA property or facilities.

The applicant is solely responsible for ensuring that its designs conform to applicable laws, statutes, ordinances, rules and regulations, guidelines, and standards of practice. The applicant is solely responsible for the adequacy of its designs, and for any adverse effects the project may have on CDWA or other third parties.

3.2 CONSTRUCTION PERMITTING AND CONFORMANCE

All proposed projects shall be constructed in accordance with approved plans and specifications. CDWA shall also review and approve the proposed project construction schedule. For projects within CDWA property, the construction schedule must be approved in writing by CDWA, typically using a construction permit form. CDWA, at its sole discretion, may limit construction time, particularly in relation to times the Church Ditch runs or could run water.

CDWA employees or agents shall be permitted to inspect the project during construction with such frequency and in such detail as is necessary to determine if the project is being constructed in accordance with approved plans and specifications at the CDWA's sole discretion. If CDWA determines that the project is not being constructed according to the approved plans and specifications, or if CDWA discovers that the approved designs as constructed do not adequately protect CDWA's interests, the applicant will revise, repair, or replace improvements (as CDWA determines appropriate) at the applicant's sole cost and expense.

CDWA reserves the right to stop work and/or utilize securities if, at any point, construction threatens ditch operations or is not being constructed in conformance with approved design plans and specifications.

3.3 CERTIFICATION OF COMPLETION

Upon project completion, the applicant shall furnish CDWA a statement signed and sealed by a Registered Professional Engineer registered in the State of Colorado stating the project was constructed in conformance with approved plans and specifications. Attached to the statement shall

be an electronic set of project plans revised to accurately represent the "As-Built" configuration of the project.

As-builts shall be produced in AutoCAD and shall be submitted to CDWA as an AutoCAD file (version to be determined by CDWA) and Adobe Acrobat (.pdf). Elevation information shall be of the same datum as the submitted permit application.

3.4 PERFORMANCE BOND AND INSURANCE

At least 30 days prior to start of construction, the applicant shall provide to CDWA, unless specifically waived in writing by CDWA, a performance bond, letter of credit or other comparable security to CDWA for the benefit of CDWA. The performance bond shall be in a form acceptable to CDWA and in an amount equal to the greater of estimated cost of the construction of those portions of the work which CDWA determines may have impacts upon CDWA property or facilities or \$1000.

In lieu of providing a performance bond, the applicant may place in escrow funds equal to the greater of engineer's construction cost estimate to cover cost of construction or \$1000. Said funds may be used by CDWA in the event the applicant fails to complete the project in a timely manner or, in case of default by the applicant, to restore CDWA facilities to original condition or to repair erosion control structures. All unused funds will be reimbursed to the applicant upon acceptance of the certificate of completion by CDWA.

At least 30 days prior to the start of construction, the applicant shall provide to CDWA, unless specifically waived by CDWA, a certificate of public liability insurance and a certificate of insurance. CDWA and its agents shall be named as additional insured against property damage to CDWA facilities and limiting CDWA's liability, with endorsements and limitations acceptable to CDWA in the following amounts:

- Personal injury in an amount not less than \$600,000/person and \$1,000,000 per occurrence.
- General property casualty insurance in an amount not less than \$1,000,000.
- Each certificate of insurance shall provide that the policy shall not be cancelable except upon 30 days' written notice to CDWA.

3.5 WARRANTY

In general, ditch crossings and relocations are constructed for the convenience of the applicant. The applicant must warrant ditch conveyance capacity without affecting upstream and downstream hydraulic conditions. The minimum warranty period shall be two years after acceptance by CDWA. During the warranty period, the applicant is responsible for maintenance.

3.6 PROVISION FOR LONG-TERM MAINTENANCE

CDWA may require a covenant running with the benefited land that acceptable maintenance and operation of the project structures and facilities will be performed by the applicant/successor or a CDWA-approved third-party. The specific terms and provisions of any such covenant will be negotiated on a case-by-case basis. Homeowners' associations are not an acceptable entity for such maintenance. Even if long-term maintenance and replacement responsibilities are allocated to CDWA, such responsibilities shall be funded by the applicant/successor such that there is no additional capital or operating cost to CDWA.

3.7 EASEMENT AND LICENSE AGREEMENT

Long-term use or permanent modification of CDWA property by third-parties must be authorized by easement or license agreements, which are typically recorded. No permanent structures above or below ground will be allowed in the right-of-way, and no grading, cut, or fill will be allowed, without approved construction drawings and an appropriate, executed easement or license agreement.

If the application is approved, CDWA shall authorize the applicant's request upon CDWA's License Agreement in the form attached in **Appendix C**. Additional provisions may be added to the standard agreement as warranted in the General Manager's discretion on a case-by-case basis. The License Agreement will be valid for a period of one year from the date of approval unless specified otherwise in the Agreement itself.

CDWA maintains ownership or easements along its ditch and other facilities. CDWA maintains at a minimum 50-foot prescriptive easement: 20 feet from the centerline of the ditch on the uphill side or 15 feet from the top of ditch bank, whichever is greater; and 30 feet from the centerline on the downhill (maintenance road) side or 5 feet from the toe of the ditch berm, whichever is greater. However, not all CDWA's property interests are recorded; and as a matter of Colorado law, CDWA's easements extend to the width that is necessary to maintain its ditches or other facilities using modern equipment. Where any development is proposed adjacent to CDWA facilities, CDWA may require a written easement of adequate width and dimension to accommodate the ditch and maintenance roads as specified in **Section 4.3** below.

CHAPTER 4 - GENERAL DESIGN GUIDELINES

4.1 CONFORMANCE TO GOVERNMENTAL REGULATIONS

Designs shall conform to applicable municipal, county, special district, state and federal rules, statutes, regulations and design criteria in addition to CDWA requirements. The applicant shall be solely responsible for conformance to governmental requirements.

4.2 MAINTAINABILITY

Maintainability of facilities shall be a primary design requirement. Facilities to be maintained by CDWA shall be designed in a manner such that maintenance can be accomplished with relative ease using equipment owned or leased by CDWA or its contractors without the need for special equipment or undue disassembly of the facility. Facilities to be maintained by others shall be designed in a manner such that maintenance can be accomplished with relative ease using standard construction and maintenance equipment.

4.3 ACCESS AND MAINTENANCE ROADS

Continuity of access along the Church Ditch and to CDWA structures and facilities shall be preserved and provided. Access shall be provided to accommodate pickup trucks and maintenance equipment such as backhoes, grade-alls and 10-wheel dump trucks towing a trailer. Access roads shall be adjacent to structures and are required on one side of the ditch to allow inspection from the inspector's vehicle and to allow maintenance and cleaning equipment to reach into the ditches. Access roads are generally required on the "down-slope" side of the ditch. This is the topographically lower side where grading can be accomplished to direct storm water away from the ditch. Usually, this is the east side of the Church Ditch. See **Figure 1** for details. Where required at curves and turn-ins/outs, the minimum outside and inside turning radii shall be of 45 feet and 22.5 feet, respectively (WB-60 design vehicle). Newly constructed access shall consist of 15-foot wide surface graded to drain away from the ditch at a 2% grade with a maximum longitudinal slope of 12 H:1 V. CDWA may require access on both side of the ditch. In no event shall access be limited to less than a 15-foot flat road on at least one side of the ditch.

No modifications that reduce or limit CDWA access to or along its facilities or its ability to stage equipment or materials will be allowed.

4.4 ACCESS AT CROSSINGS

Safe, legal access to the ditch at crossings is imperative. Curb cuts or other means of accessing maintenance roads shall be provided at all crossings. In the event that a proposed crossing is part of improvements that will likely increase traffic volumes (such as a road widening) or reduce direct, straight access through the crossing as judged solely by CDWA, in addition to providing

uninterrupted access across the crossing, a turn-around area may be required. All curb cuts and turn-around features should be sized based on the vehicle requirements established in **Section 4.3**.

4.5 RIGHT-OF-WAY AND SETBACK REQUIREMENTS

CDWA maintains ownership or easements along its ditch and other facilities as set forth in Section 3.7. All easements shall be shown on appropriate drawings submitted for review. Where any development is proposed adjacent to CDWA facilities, the easement must be of adequate size to accommodate the ditch and access road as established in **Section 4.3**. Access roads are required on the down-slope side of the ditch. No permanent structures above or below ground will be allowed in this area and no grading or dumping will be allowed without approved construction drawings and an approved license agreement.

4.6 BRIDGES AND WALKWAYS

Structures that span the ditch shall be designed to provide 2 feet minimum clearance between the water surface at design flow (125 cfs) and the lowest point of the structure above the water surface as shown in **Figure 2**. Bridges and walkways shall not be constructed in a manner to cause siphon flow.

4.7 OVERHEAD PIPELINE CROSSINGS

Overhead pipeline crossings shall meet the same design criteria as for bridges and walkways as presented in **Section 4.6**. Pedestrian guards are required on overhead pipelines.

4.8 TELEPHONE, ELECTRICAL POWER AND OTHER OVERHEAD CROSSINGS

No poles, towers, guy wires or other structures shall be located in the ditch right-of-way. Minimum clearance to the highest ground on the right-of-way under the proposed wires shall be 35 feet as shown in **Figure 3**.

4.9 ATTACHED UTILITY CROSSINGS

Utility crossings that are attached to a bridge structure shall be above the low chord of the bridge. At all times, 2 feet (minimum) of freeboard shall be maintained between the maximum water surface in the ditch and the low chord of the bridge and any attached utility. The maximum size of the attached pipe cannot exceed 8 inches in diameter. Attached utility crossings shall be in accordance with **Figure 2**.

4.10 CONSTRICTION OF FLOW

No piers, abutments, wing walls, footings or fill shall be permitted within the flow section of the ditch. The flow section is the area occupied by water in the ditch at maximum ditch flow. Only single barrels

shall be permitted when the ditch is proposed to be placed in a culvert.

4.11 STORM WATER RUNOFF

CDWA does not allow storm water runoff into its ditch or facilities. All drainage must go over or under CDWA's right-of-way.

4.12 GROUNDWATER INFLOW

CDWA does not allow developments to alter historic groundwater flows into or out of its ditch unless a specific variance is granted.

4.13 FOOTINGS AND FOUNDATIONS

Footings for walls, piers and other foundation elements located within the ditch right-of-way shall be carried to an elevation at least 4 feet below the existing ditch invert.

4.14 PIPED DITCH SECTIONS

This section addresses portions of the ditch proposed for conversion into a conduit. All concrete conduits shall conform to the more stringent of the requirements found in AASHTO Specifications and ACI 350, "Code Requirements for Environmental Engineering for Concrete Structures." All joints must be watertight. Corrugated metal pipe (CMP) is prohibited.

A minimum cover depth over the top of pipe shall be 2 feet unless a thicker cover is required to sufficiently protect the pipe from anticipated loading. Calculations shall be provided to show adequate coverage over the pipe is provided using the maximum design vehicle that will be routed over the pipeline. Pipe bedding and backfill shall be completed in accordance with the pipe manufacturer's requirements. The results of all testing shall be submitted to CDWA. The pipe shall be installed according to the manufacturer's requirements and tolerances.

Shop drawings shall be provided to CDWA prior to installation of pipes for review and approval by CDWA's engineer. See **Section 6.13** for more information.

4.15 EROSION PROTECTION

All sudden changes in channel geometry, channel material (e.g.: concrete to soil), channel flow rates, channel velocities or areas where the potential for erosive scour exists, shall be protected by an appropriate armoring liner. Locations that require armoring shall include, but are not limited to, upstream, between and downstream of bridge abutments, check structures, turnout structures, concrete or other paved liners, small radius curves, and inflow junctions. Approved material includes riprap, grouted riprap and reinforced concrete. Riprap and riprap bedding material and installation shall conform to the current edition of "Urban Drainage and Flood Control District Drainage Criteria

Manual.” If grouted riprap is used, the grout shall be finished flush with the top of the riprap to form a smooth surface. Any riprap that is installed within the portion of the ditch that comes into contact with water in the ditch shall be grouted.

Ditch bends with radii less than or equal to 200 feet shall be lined with grouted riprap. The riprap shall start at the upstream end of the bend and continue past the downstream end of the bend for a minimum distance of twice the top width of the ditch.

4.16 MATERIALS AND STANDARDS

The following requirements shall apply:

- Concrete design shall conform to the more stringent requirements found in AASHTO Specifications or ACI 350 for Hydraulic Structures, latest edition.
- Concrete batching, mixing and placing, and concrete mix design shall be in accordance with Portland Cement Association's "Design and Control of Concrete Mixes," latest edition; concrete 28-day compressive strength shall be not less than 4,500 psi.
- Steel design and construction shall conform to AISC "Manual of Steel Construction," latest edition.
- Wood design and construction shall conform to AITC "Timber Construction Manual," latest edition.
- For items not covered by local building codes, the provisions of the International Building Code (IBC) will govern.

4.17 CUT-OFF COLLARS

For underground utilities installed by trenching or boring through the ditch banks, or within the ditch right-of-way, reinforced concrete cut-off collars shall be provided. The bottom and sides of the collar shall be keyed 6 inches into undisturbed ground. The collars shall project at least 24 inches from the wall of the casing pipe or carrier pipe, if no casing is used. Cutoff collars shall be cast a minimum of 4 feet from the end of the pipe and a minimum of 3 feet from the limits of the flow section. Collars shall be not less than 12 inches thick with reinforcement as shown in **Figure 9**.

For jack boring operations that include the use of bore pits, the concrete cutoff collars along with the bore pits shall be located outside CDWA right-of-way. Concrete cutoff collars shall be installed on the ditch side of the bore pits.

4.18 WASTE DISPOSAL SEPTIC SYSTEM

All on-site waste disposal facilities including septic systems shall be located a minimum of 100 feet from CDWA facilities.

4.19 PLANS

4.19.1 GENERAL

All plans submitted for review by CDWA shall include the following:

- A vicinity map to locate the proposed project;
- Plan and elevation drawings depicting CDWA property, easements and rights-of-way;
- Design plans for ditch crossings must include a current field survey of the ditch that calls out the bottom of the ditch (not the water surface as shown on aerial surveys), the elevation of the ditch invert, and the elevation of the lowest point of CDWA property outside the limits of the ditch itself;
- The hydraulic grade line for 125 cfs must be shown on any plans to span over the ditch.
- If the plans include a ditch crossing using a pipe or box culvert, calculations shall be submitted to CDWA to address the sizing of the proposed pipe or box culvert.

4.19.2 Trenched Ditch Crossing Plans

Design plans for trenched crossings shall depict the limits of disturbance. No excavation outside the indicated limits shall be allowed unless approved in advance, in writing, by the CDWA. **Figure 4** and **Figure 5** include standard details for Cased Trenched Crossing under CDWA Conduit and Cased Trenched Crossings under Open Ditch, respectively. **Figure 6** includes a standard detail for an Uncased Trenched Crossing under Open Ditch. See **Chapter 5** for more information on trenched crossings.

4.19.3 Trenchless Ditch Crossing Plans

Plans for trenchless crossings under the ditch shall detail the following:

- Layout of CDWA right-of-way lines and surveyed profile of ditch bottom and anticipated ditch water level.
- Identification of entry and exit bore pits and their location relative to ditch centerline.
- Specifications for carrier pipe and casings, if used.

- Proposed trenchless alignment and profile in relation to surveyed ground surface and ditch bottom.
- All utility crossings, both underground and overhead, parallel underground utilities, pole lines, and other facilities.
- Plans shall be stamped by a Professional Engineer licensed in the State of Colorado.

4.19.4 General Note Requirements

All plans should include the following CDWA general notes. These notes may be modified with CDWA's approval as appropriate for the type of project:

CHURCH DITCH WATER AUTHORITY (CDWA) NOTES

1. DEFINITIONS
 - A. FACILITY OWNER - CDWA
 - B. PROPERTY OWNER - **(TO BE COMPLETED)**
 - C. CONTRACTOR - **(TO BE COMPLETED)**
 - D. ENGINEER - **(TO BE COMPLETED)**
2. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE "DESIGN CRITERIA FOR FACILITIES OF THE CHURCH DITCH WATER AUTHORITY," LATEST EDITION, EXCEPT AS SPECIFICALLY MODIFIED BY THESE PROJECT DRAWINGS.
3. CONTRACTOR SHALL DEFEND, INDEMNIFY AND HOLD CDWA HARMLESS FROM ANY AND ALL LIABILITY, REAL AND ALLEGED, IN CONNECTION WITH THE PERFORMANCE OF WORK ON THIS PROJECT TO THE MAXIMUM EXTENT PERMITTED BY LAW.
4. CDWA AND ITS AGENTS OR CONSULTANTS DO NOT WARRANT OR GUARANTEE THE ADEQUACY OF DESIGNS REVIEWED AND APPROVED BY CDWA. CDWA'S REVIEW OF PROJECT REPORTS, PLANS, AND SPECIFICATIONS IS FOR THE SOLE BENEFIT OF CDWA TO DETERMINE IF PROJECT DETAILS CONFORM TO CDWA DESIGN GUIDELINES, WHICH ARE NECESSARY TO REASONABLY ASSURE THAT PROJECTS DO NOT ADVERSELY AFFECT THE FACILITIES OR OPERATIONS OF CDWA.
5. CONTRACTOR SHALL SCHEDULE A PRE-CONSTRUCTION MEETING WITH CDWA REPRESENTATIVES AND **(FILL IN LOCAL GOVERNING MUNICIPALITY OR COUNTY GOVERNMENT)** AT LEAST 72 HOURS PRIOR TO START OF CONSTRUCTION. THOSE IN ATTENDANCE SHALL INCLUDE OWNER'S REPRESENTATIVE, ENGINEER, CONTRACTOR, AND OTHER AFFECTED AGENCIES. CONSTRUCTION PLANS AND SCHEDULE WILL BE DISTRIBUTED AT THE PRE-CONSTRUCTION MEETING.
6. TECHNICAL APPROVAL BY CDWA OF THE DESIGN OF THE IMPROVEMENTS SPECIFIED HEREIN SHALL NOT CONSTITUTE AUTHORIZATION TO BEGIN WORK. AN EASEMENT OR LICENSE AGREEMENT, APPROVED TEMPORARY ACCESS AND CONSTRUCTION PERMIT (INCLUDING SCHEDULE THAT INCLUDES THE DAY, MONTH, AND YEAR WHEN WORK IS ALLOWED), AND WRITTEN NOTICE TO PROCEED FROM CDWA'S GENERAL MANAGER ARE ALSO REQUIRED PRIOR TO COMMENCING CONSTRUCTION ACTIVITIES. FOLLOWING THE APPROVAL OF THE DESIGN PLANS AND EASEMENT OR LICENSE AGREEMENT, AND

PRIOR TO THE PRE-CONSTRUCTION MEETING, IT WILL BE THE RESPONSIBILITY OF THE CONTRACTOR TO SUBMIT A CONSTRUCTION SCHEDULE TO CDWA FOR REVIEW AND APPROVAL. CDWA'S APPROVAL OF THE CONSTRUCTION SCHEDULE IS IN CDWA'S SOLE DISCRETION, AND CDWA MAY REFUSE TO APPROVE A SCHEDULE IF CDWA DETERMINES IT MAY IMPACT THE DITCH'S OPERATIONS OR CDWA'S ABILITY TO MAINTAIN OR ACCESS ITS FACILITIES.

7. CONTRACTOR SHALL RESTRICT CONSTRUCTION ACTIVITY TO AREAS DEFINED AS PERMANENT AND/OR TEMPORARY CONSTRUCTION EASEMENTS, UNLESS OTHERWISE AUTHORIZED BY CDWA AND PROPERTY OWNER.
8. CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING CONTINUOUS ACCESS FOR CDWA PERSONNEL AND EQUIPMENT ALONG THE LENGTH OF THE EXISTING DITCH AND PRESCRIPTIVE EASEMENT THROUGHOUT THE COURSE OF THE PROJECT.
9. ALL MATERIALS AND WORKMANSHIP SHALL BE SUBJECT TO INSPECTION BY CDWA. CDWA RESERVES THE RIGHT TO ACCEPT OR REJECT ANY SUCH MATERIALS AND WORKMANSHIP THAT DO NOT CONFORM TO STANDARDS AND SPECIFICATIONS. CONTRACTOR SHALL PROVIDE SHOP DRAWINGS TO CDWA FOR ENGINEERING REVIEW AND APPROVAL PRIOR TO INSTALLATION OF MATERIALS OR FACILITIES FOR WHICH SHOP DRAWINGS ARE CREATED.
10. CONTRACTOR SHALL VERIFY ACCURACY BETWEEN WORK SET FORTH ON THESE PLANS AND WORK REQUIRED IN THE FIELD. ANY DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER AND CDWA REPRESENTATIVE PRIOR TO START OF CONSTRUCTION.
11. IT IS THE ENGINEER'S RESPONSIBILITY TO RESOLVE CONSTRUCTION PROBLEMS WITH CDWA DUE TO CHANGED CONDITIONS ENCOUNTERED BY CONTRACTOR DURING THE PROGRESS OF ANY PORTION OF THE PROPOSED WORK. IF, IN THE SOLE OPINION OF CDWA, PROPOSED ALTERATIONS TO THE APPROVED CONSTRUCTION PLANS INVOLVES SIGNIFICANT CHANGES TO THE CHARACTER OF THE WORK, OR TO FUTURE CONTIGUOUS PUBLIC OR PRIVATE IMPROVEMENTS, THE ENGINEER SHALL BE RESPONSIBLE FOR SUBMITTING REVISED PLANS TO CDWA FOR REVIEW AND APPROVAL, PRIOR TO ANY FURTHER CONSTRUCTION RELATED TO THAT PORTION OF THE WORK.
12. GROUNDWATER ENCOUNTED DURING CONSTRUCTION SHALL NOT BE RELEASED TO THE DITCH OR OTHER FACILITIES WITHOUT WRITTEN APPROVAL FROM THE CDWA GENERAL MANAGER.
13. ALL CONCRETE USED FOR THE PROJECT SHALL CONFORM TO ACI 350. THE CONTRACTOR SHALL SUPPLY CDWA WITH SHOP DRAWINGS AND SPECIFICATIONS FOR ALL PRE-FABRICATED CONCRETE STRUCTURES TO ENSURE CONFORMANCE TO ACI 350.
14. WHERE THE EXISTING SIDES OR BOTTOM OF THE DITCH ARE DISTURBED AND ARE TO BE REPLACED, THE TOP TWO FEET OF BACKFILL MATERIAL SHALL BE CLAY CONTAINING AT LEAST 40 PERCENT BY DRY WEIGHT PASSING THE #200 SIEVE (FINES) AND A PLASTICITY INDEX OF 15 OR GREATER. AS AN ALTERNATIVE, THE EXISTING MATERIAL CAN BE MIXED WITH TWO PERCENT POWDERED DRY BENTONITE (BY DRY WEIGHT) PROVIDED THE EXISTING SOILS CONTAIN AT LEAST 25 PERCENT FINES. THE MATERIALS UPON COMPACTION SHALL HAVE A PERMEABILITY LESS THAN OR EQUAL TO 1×10^{-6} CM/SEC AS DETERMINED BY ASTM D 5084.

15. THE CHANNEL CLAY LINING SHALL BE COMPACTED TO 90% OF THE MODIFIED PROCTOR (ASTM D1557) AND WITHIN -2% TO +2% OF THE OPTIMUM MOISTURE CONTENT. FILL SHALL BE PLACED IN THIN LIFTS WITH MAXIMUM LOOSE LIFT THICKNESS OF 12 INCHES. PLACEMENT ON DITCH SLOPES MAY REQUIRE OVERBUILDING AND CUTTING BACK TO OBTAIN THE REQUIRED COMPACTION.
16. ALL PROPOSED MATERIAL TYPES TO BE USED AS BEDDING, CLAY LINING AND BACKFILL SHALL BE SUBMITTED TO CDWA FOR APPROVAL PRIOR TO PLACEMENT.
17. MATERIALS GRAIN SIZE ANALYSIS (ASTM D422), ATTERBERG LIMITS (ASTM D4318), AND MOISTURE-DENSITY RELATIONSHIP TESTS (ASTM D1557) SHALL BE COMPLETED, AS A MINIMUM, ON EACH SOIL TYPE OR AT A RATE OF 300 CY OF MATERIAL PLACED, WHICHEVER IS GREATER.
18. COMPACTION OF BEDDING, CLAY LINING AND ALL TYPES OF BACKFILL SHALL BE TESTED AT A RATE OF AT LEAST FOUR TESTS PER 1,000 SQUARE FEET OF FILL MATERIAL PER LIFT. THIS FREQUENCY MAY BE ALTERED BY THE ENGINEER OR CDWA REPRESENTATIVE DEPENDING ON THE PROJECT, THE METHODS BY WHICH THE CONTRACTOR IS USING TO OBTAIN COMPACTION, OR IF CDWA DETERMINES CIRCUMSTANCES WARRANT ADDITIONAL TESTING. THE TESTING SHALL BE AT VARIOUS DEPTHS AND LOCATIONS. THE ENGINEER OR CDWA'S REPRESENTATIVE RESERVES THE RIGHT TO REQUEST ADDITIONAL TESTS AND DETERMINE THE LOCATION OF TESTING. THE TESTING MAY BE COMPLETED EITHER BY SAND CONE DENSITY TEST (ASTM D1556) OR BY THE NUCLEAR GAUGE (ASTM D6938) METHODS. TEST RESULTS SHALL BE SUBMITTED TO CDWA'S REPRESENTATIVE WITHIN 24 HOURS OF THE TEST OR ON THE NEXT WORKING DAY.
19. ON STEEP SIDE SLOPES, FILL MATERIALS, WHETHER CLAY LINING OR SUBGRADE SOILS, MAY BE REQUIRED TO BE PLACED IN HORIZONTAL LIFTS ALONG THE SLOPE TO ACHIEVE THE REQUIRED COMPACTION. THIS METHOD WILL CREATE AN OVERBUILT SECTION THAT WILL BE CUT BACK TO FORM THE DESIGN SLOPE.
20. CONTRACTOR SHALL MAINTAIN SILT FENCE AND OTHER EROSION AND SEDIMENT CONTROL BMPs ON A DAILY BASIS, AND SHALL PREVENT DEBRIS FROM ENTERING INTO THE DITCH. THE CONTRACTOR WILL BE RESPONSIBLE FOR DAILY CLEANING OF DEBRIS THAT ENTERS THE DITCH, IF BMPs FAIL. CONTRACTOR SHALL FULLY COMPLY WITH EROSION CONTROL REQUIREMENTS OF THE APPROPRIATE COUNTY OR MUNICIPALITY MS4.
21. CONTRACTOR IS RESPONSIBLE FOR REPAIR AND REVEGETATION OF ANY AREAS IMPACTED BY CONSTRUCTION ACTIVITIES, WHETHER ON THE CONSTRUCTION SITE ITSELF OR ANY LAND WITHIN CDWA AUTHORITY, TO EXISTING PRIOR TO CONSTRUCTION OR BETTER.
22. UNLESS ANOTHER SPECIFIC MAINTENANCE AGREEMENT IS IN PLACE, CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROPER FUNCTIONING OF FACILITY IMPROVEMENTS FOR A MINIMUM OF TWO YEARS FROM THE DATE OF SUBSTANTIAL COMPLETION OR FINAL ACCEPTANCE OF THE IMPROVEMENTS BY CDWA, WHICHEVER IS LATER. ANY FAILURE DURING THIS PERIOD OF GUARANTEE SHALL BE REMEDIATED BY CONTRACTOR TO THE SATISFACTION OF CDWA AT CONTRACTOR'S EXPENSE.
23. AS-BUILT DOCUMENTS ARE TO BE SUPPLIED TO CDWA PRIOR TO SUBSTANTIAL COMPLETION OR FINAL ACCEPTANCE OF THE IMPROVEMENTS. RECORD DOCUMENTS SHALL BE SUBMITTED ELECTRONICALLY IN BOTH PDF AND AUTOCAD FORMAT PRIOR TO

CDWA ACCEPTANCE. AS-BUILT DRAWINGS SHALL BE SIGNED AND STAMPED BY A COLORADO-REGISTERED PROFESSIONAL ENGINEER.

4.19.5 CDWA APPROVAL BLOCK

The standard CDWA approval block shall be attached to the cover page of all plans:

<p>CDWA APPROVAL BLOCK</p> <p>The signature of the General Manager of the Church Ditch Water Authority (CDWA) is for the purposes of acknowledging acceptance of the design of the Permitted Structures only. The signature shall not in any way change the rights and obligations of either party with respect to the [TITLE OF EASEMENT OR LICENSE AGREEMENT] to which these designs are attached. The CDWA is expressly relying upon the design standards and performance standards set forth in these drawings as presented by [NAME OF APPLICANT], and [NAME OF APPLICANT] shall be solely responsible that, as constructed, the Permitted Structures shall perform as specified herein.</p> <hr/> <p>General Manager, Church Ditch Water Authority</p>

4.19.6 CDWA CONTACT INFORMATION

The Church Ditch Water Authority shall be added to the agency contact list on the first page of the drawings as follows:

Church Ditch Water Authority (CDWA)
Nathan McCoy
General Manager
14025 West 82nd Avenue
Arvada, Colorado 80005
(303) 423-6010

CHAPTER 5 - UNDERGROUND CROSSINGS

5.1 GENERAL

All utility lines and pipelines that are proposed to cross under CDWA property or facilities (including but not limited to telephone, coaxial cable, fiber optic lines, electric power lines, storm drains, water mains and laterals, sewer mains and laterals, graywater pipelines, natural gas pipelines, oil pipelines, etc.) shall adhere to the guidelines in this chapter and all other CDWA standards, as appropriate to the method of installation. All underground crossings shall be installed perpendicular to the ditch. **NO UNDERGROUND UTILITY LINES OR PIPELINES WILL BE ALLOWED WITHIN CDWA RIGHT-OF-WAY IN CONFIGURATIONS THAT ARE PARALLEL TO THE DITCH.** All piped crossings of the ditch shall be identified by marker posts located outside the CDWA right-of-way on both sides of the ditch.

5.2 TRENCHED INSTALLATIONS

5.2.1 GENERAL

Trenching through ditch banks is acceptable provided that the installation can be completed in a manner that protects the long-term integrity of CDWA's facilities. Trenching through ditch banks will not be permitted without written approval from CDWA's General Manager. Except in the most unusual circumstances, trenching is generally only allowed during periods when the ditch is turned off (typically November 1 to March 31). At the sole discretion of CDWA, jacking or tunneling of casing may be completed during irrigation season if the Contractor furnishes suitable security to protect CDWA from potential liability for loss of water, damages to third party persons and property, damages to crops (either directly or from inability to deliver water), and loss of water due to water quality degradation. An explicit agreement allowing work during the flow season is required for this condition.

A specific construction schedule shall be approved in writing by CDWA as provided in **Section 3.2** prior to the commencement of any work.

For trenched installations, the top of the pipeline, conduit, casing pipe, or line (depending upon the type of crossing) shall be not less than 5 feet below the ditch invert, nor less than 3 feet below the lowest point of the CDWA property outside the limits of the ditch itself.

Following a trenched installation, the banks and bottom of the ditch shall be restored to the pre-construction condition for a minimum distance of 10 feet up- and downstream of the crossing. Concrete-lined sections shall be replaced with a reinforced concrete lining designed in accordance with ACI 350, "Code Requirements for Environmental Engineering for Concrete Structures." Eighteen-inch deep cut-off walls shall be installed at the upstream and downstream tie-ins. Earth-lined sections of the ditch will be reconstructed using low-permeability clay material placed and

compacted to a depth of 2 feet or they may be concrete lined. See **Section 4.19.4** (Notes 14 through 19) for details. Backfill shall not be placed in standing water. Snow, ice, frozen earth or organic material shall not be incorporated into fill.

Abandoned boreholes, pipelines, casings or conduits shall be cleaned and filled completely with a concrete grout.

5.2.2 CASED TRENCHED DITCH CROSSINGS

Underground utilities or pipelines are to be carried in 12-gauge welded steel casing pipe for the full width of the CDWA right-of-way. Minimum specifications for casing pipe are set out below in **Table 5.2.2**.

TABLE 5.2.2. SPECIFICATIONS FOR CASING PIPE		
Pipe Diameter	Material	Wall Thickness
12-inch or smaller	Steel	3/16- inch wall
Over 12-inch and less than 24-inch	Steel	1/4-inch wall
24-inch to less than 60-inch	Steel	3/8-inch wall
60-inch and larger diameter	Special design by a Professional Engineer registered in the State of Colorado	

Except with respect to telephone, coaxial cable, fiber optic, and electric power lines:

- The casing shall be liquid-tight, and the casing sealed to the carrier pipe at each end of the casing.
- The carrier pipe shall be separated from the casing pipe using insulated casing spacers properly dimensioned and spaced to safely accommodate the utility or pipeline and prevent shorting of the carrier pipe’s cathodic protection system. Where applicable, the carrier pipe shall include restrained joints for the entire length within the casing pipe.
- Casing pipe should be a minimum of 6 inches larger in diameter than carrier pipe in order to provide a minimum of 3 inches of clearance around the carrier pipe. Carrier pipe shall be centered inside the casing pipe.
- Casing pipe shall be suitably protected from failure due to corrosion for a minimum design life of 50 years.
- When the carrier pipe is conveying volatile gas or volatile liquid, a 2-inch diameter (minimum) vent shall be provided for the casing at each end of the casing. Vents shall not be located within CDWA right-of-way.
- Reinforced concrete cutoff collars shall be installed for all underground utilities installed by trenching through the ditch banks and for installations of bored or jacked crossings with casing pipe at both right-of-way lines. See **Section 4.17**, **Section 5.3**, and **Figures 4, 5, 6, 8 and 9**.

Marker posts shall be installed at each edge of the right-of-way. Additional measures should be included to assist CDWA maintenance personnel in locating the pipe in the field. This includes as-built survey information (such as surveyed coordinates and distance/depth of top of pipe from marker post or edge of right-of-way) and may include tracer wire. If used, tracer wire shall be placed in the trench above the casing pipe and concrete collars throughout CDWA's easement or deeded land.

5.2.3 PIPED DITCH, STORM SEWER, OR OTHER DRAINAGE CROSSINGS

All proposed piped ditch, storm sewer, or other drainage crossings shall extend the full width of the ditch right-of-way. The outside top of the proposed pipe shall be not less than 5 feet below the ditch invert, nor less than 3 feet below the lowest point of the CDWA right-of-way outside the limits of the ditch itself.

If the clearances specified herein cannot be achieved, CDWA may consider designs that include encasing the crossing in flowable fill material or structural concrete on a case-by-case basis. All storm sewer and drainage pipe joints shall be liquid-tight for the entire length within CDWA right-of-way.

For underground utilities installed by trenching through the ditch banks, or within the ditch right-of-way, reinforced concrete cut-off collars shall be provided at both right-of-way lines.

5.2.4 UNCASED TRENCHED DITCH/DITCH CROSSINGS

CDWA may consider uncased trenched crossings on a case-by-case basis. For an uncased crossing to be considered, the applicant must provide a substantial justification as to why an uncased pipeline is more appropriate than a cased pipeline. CDWA may require additional design safeguards to approve uncased crossings.

For underground utilities installed by trenching through the ditch banks or within the ditch right-of-way, reinforced concrete cut-off collars shall be provided at both right-of-way lines.

5.3 CUT-OFF WALLS

Except with respect to telephone, coaxial cable, fiber optic, and electric power lines or pipes installed using horizontal directional drilling (HDD) techniques, cutoff walls shall be installed at both right-of-way.

Cut-off walls shall be constructed of Portland Cement concrete with a 28-day compressive strength of 4,500 psi. Cut-off walls shall be constructed in accordance with **Section 4.17** and **Figures 4, 5, 6, 8** and **9**.

5.4 TRENCHLESS INSTALLATION

This section includes minimum requirements for trenchless methods used to install pipelines and piped utilities within CDWA property. CDWA may change these minimum design criteria or apply alternative criteria as it determines appropriate, in its sole discretion, in any given application.

5.4.1 GENERAL

All details of the trenchless design shall be submitted as part of the permit application. All trenchless installations passing beneath CDWA ditches are subject to the following general requirements:

- Mitigation for potential seepage from the Church Ditch to bore pits shall be addressed by the applicant as part of the design process.
- Internal annular space shall be filled with grout. Pumping equipment shall be sized to inject grout at a velocity and pressure to completely fill the annular space.
- The design of the new pipeline shall not be within 10 feet of any existing utility or facility within the CDWA property.
- Minimum vertical clear distance between the largest reamed diameter and ditch bottom must be maintained for the entire width of the ditch.
- Silt fencing shall be installed between the entry pit and CDWA property to prevent flow of drilling fluid into CDWA property.
- All pipe joints within CDWA property shall be radiographic or ultrasonic tested, CDWA shall be provided with results.
- A pressure test shall be performed on the pipeline after installation. The hydrostatic testing shall be conducted at 125% of the maximum operating pressure for a minimum of 8 hours. CDWA shall be invited to the test with at least 48-hours notification.

5.4.2 HORIZONTAL DIRECTIONAL DRILLING (HDD) INSTALLATIONS

Underground pipeline utilities installed by horizontal direction drilling methods with or without a casing pipe measuring 24 inches or less in diameter shall be installed as shown in the standard details. See **Section 4.19.3** and **Figure 7**. For HDD crossings with pipe sizes larger than 24 inches, CDWA may require additional design safeguards.

HDD crossings shall have a minimum vertical clearance of 20 feet beneath the ditch and 10 feet beneath the lowest point of the CDWA right-of-way outside the limits of the ditch itself.

HDD drilling fluid flow rates, volumes and pressures shall be monitored during drilling. If there is any indication of loss of circulation or borehole integrity, drilling activities shall cease and CDWA shall be notified.

5.4.3 BORED OR JACKED INSTALLATIONS

Bored or jacked crossing with casing pipe shall be made in accordance with **Figure 8** and shall meet the specifications for encasement pipe. The minimum vertical clearance beneath top of the casing pipe and the ditch or CDWA property shall be 5 feet.

The casing shall be designed to withstand the maximum anticipated jacking force with a factor of safety of 2 or greater. The casing shall have a minimum yield strength of 35,000 pounds per square inch (psi). Steel carrier pipe shall not be installed via auger boring or jacking, but shall be slip-lined into a steel casing.

For casing pipe with an outside diameter greater than 48 inches, an assessment will be required to determine the estimated settlement and required minimum vertical separation beneath the ditch bottom and top of pipe. Furthermore, the external annular space shall be filled with grout. Pumping equipment shall be sized to inject grout at a velocity and pressure to completely fill the annular space.

The boring/source target pit shall be located between 15 feet minimum and 50 feet maximum from the top of ditch bank unless otherwise agreed to by Church Ditch Water Authority.

The invert (bottom) of the ditch above an uncased crossing shall be concrete lined. Concrete lining shall extend a minimum of 10 feet on both sides of the crossing. It shall consist of a 6-inch thick reinforced concrete section and include 18-inch cutoff walls on the upstream and downstream tie-ins. The lining shall be constructed 1 foot below the ditch invert to prevent the accumulation of debris.

CHAPTER 6 – DITCH RELOCATIONS

6.1 GENERAL

Relocation of the ditch will be considered on a case-by-case basis. No work on the relocation of a ditch section shall commence until final approval is given and all appropriate documentation is executed.

The hydraulic conditions immediately upstream, immediately downstream, and within the relocated section shall be generally unchanged from the hydraulic conditions existing before relocation, and the relocated ditch section as well as areas upstream and downstream of the proposed relocated section must have the capacity for its maximum design flow of 125 cubic feet per second (cfs) plus 2 feet of freeboard. Hydraulic analysis of existing and proposed conditions are required in support of any relocation request. Analyses must include the location to be relocated and areas upstream and downstream of the relocation that may either control hydraulics or be impacted by backwater conditions.

Relocated ditch rights-of-way shall include a minimum 15-foot wide maintenance access road on the down-slope side of the ditch (see **Figure 1**). Other right-of-way may be required by CDWA to allow for appropriate maintenance, repair, or replacement of the new CDWA facilities.

6.2 SUMMARY OF PROCESS

No ditch relocation shall occur prior to the execution of a relocation agreement in a form and with terms, conditions, and specifications acceptable to CDWA. All ditch relocation work shall be in accordance with the terms, conditions, and specifications of such agreement. In general, the process proceeds as outlined below.

Before executing a relocation agreement CDWA will review and approve the construction plans, specifications, and drawings for the relocated ditch section and improvements and appurtenances to be constructed and installed within the proposed new location for the ditch. The plans, specifications, and drawings will be attached to the agreement.

Within a fixed period of time after execution of the relocation agreement, the applicant must provide CDWA with a survey and title commitment for the new right-of-way, and a title commitment for a seepage easement that binds the applicant's property from a title insurance company selected by CDWA. If CDWA objects to any matters of survey or title, the applicant must resolve the issues to CDWA's satisfaction. The relocation agreement will not be executed unless CDWA approves the title commitment in writing.

The applicant then provides performance security and obtains a construction permit from CDWA (for

work within the existing CDWA property) and all required permits from the local government with jurisdiction, the State of Colorado, and agencies of the federal government, as applicable (collectively, the “Permitting Agencies”). After providing the security and securing appropriate permits, the applicant constructs the relocated ditch improvements within the new right-of-way.

The relocated ditch improvements are connected to the existing ditch for testing only after:

- CDWA inspects the relocated ditch improvements;
- The applicant makes such repairs or corrections as required by CDWA; and
- The applicant obtains any final inspections as may be required by Permitting Agencies.

Upon completion of all required corrections and repairs and CDWA’s satisfaction with the condition of the relocated ditch improvements, CDWA will accept the relocated ditch improvements. Thereafter, the applicant executes and delivers to CDWA an agreement for the new right-of-way (“CDWA Easement”) along with an owner’s policy of title insurance in conformity with the approved title commitment. CDWA will execute and deliver to the applicant a quitclaim deed for the portion of the existing ditch right-of-way that traverses the applicant’s property (less any associated groundwater or mineral rights). The applicant will pay CDWA the purchase price for the existing CDWA property that is established in the relocation agreement. Upon completion, CDWA commences use of the relocated ditch improvements.

6.3 CONTROL OF CDWA PROPERTY

The existing right-of-way shall remain in CDWA’s ownership and the ditch shall not be filled-in until such time as:

1. The relocated ditch section is operated and shown to function to the satisfaction of CDWA; and
2. The new right-of-way is conveyed in fee simple to CDWA subject only to easements and reservations acceptable to CDWA.

At least 20 days prior to relocating any section of ditch or right-of-way, CDWA shall be provided at no cost a commitment for title insurance. No relocation shall commence until CDWA has provided the applicant with written acceptance of the quality of title to be received. Upon closing, CDWA shall be provided a policy of title insurance in conformity with the approved commitment.

The new right-of-way shall include a minimum 15-foot wide maintenance access road along the down-slope side of the ditch or such other right-of-way as shall be required by CDWA.

6.4 DESIGN FLOWS AND VELOCITY

The design flow for the Church Ditch shall be the normal design flow of 125 cfs. All new or relocated ditch sections must be adequate to convey the design flow plus 2 feet of freeboard to render them compatible with CDWA's long-range plans for upgrading its system. Design velocities shall be sufficient to ensure the ditch is self-cleaning at 50% of normal design flow. The design must include adequate erosion protection for higher velocities or changes in direction of flow. Extreme changes to direction of flow may not be allowed.

6.5 LINING

Lining will be required for all ditch relocations. Lining specifics will be determined on a case-by-case basis by CDWA.

6.6 DROP STRUCTURES AND ENERGY DISSIPATORS

Drop structures and energy dissipaters shall be designed and built in accordance with applicable U.S. Bureau of Reclamation guidelines as required. Impact stilling basins or similar semi-closed structures will not be permitted because of the difficulty to clean and maintain. Stilling basins shall not be located under bridges, overhead pipelines, walkways or other structures that will interfere with access and maintenance.

6.7 GRAVITY FLOW

Gravity flow operation of the ditch shall be maintained. Gravity flow to existing turnouts must be preserved. The Church Ditch shall not be put into a siphon.

6.8 INITIAL OPERATION

New or relocated ditch sections shall be constructed in their entirety while separated from the existing ditch by a suitable bypass or other acceptable method approved by CDWA in writing. The new ditch section may be placed in service at such times and in such manner as CDWA agrees to in writing. See **Section 6.2** and **6.3**.

6.9 SEEPAGE

In areas to be lined where the ditch "makes water" (i.e., groundwater seeps into the ditch and becomes surface flow), a suitable underdrain system shall be provided to collect seepage water under the lining and convey the collected water into the ditch or to other discharge points as CDWA may specify.

In areas where the existing ditch seeps water under abutting property, CDWA may require a seepage

easement agreement (see **Appendix A**) and release of past, present, and future claims for damages due to seepage.

6.10 TURNOUTS AND FLUMES

Relocated sections of ditch shall be designed to preserve the ability to divert water to all affected water users. All relocated turnouts shall be designed to include a Parshall flume to measure flow. Flumes shall be constructed to operate without submergence and shall have an adequate stilling area upstream of the flume to assure proper operation and accurate measurement. Turnout and flume sizes will be specified by CDWA. All new flumes shall include a side stilling well with a locking recorder box.

6.11 CHECK STRUCTURES

Check structures may be required as part of channel realignment associated with turnouts or other requirements for checking the water. Overshot gates or other approved structures shall be installed at all locations where a check structure is required.

6.12 SPILL STRUCTURES

Where spill structures are incorporated into the design, the applicant shall provide flowage easements acceptable to CDWA to convey ditch overflow water and any required maintenance.

6.13 PIPED DITCH SECTIONS

Piping of the ditch may be considered by CDWA on a case-by-case basis. In order for piping to be considered, all existing deliveries must be maintained, and the pipe must be determined by CDWA to not impact operations or maintenance.

Trash racks may be required on the upstream and downstream end of all piped sections. Adequate room to clean trash racks and pile material taken from the rack must be provided. In general, this will necessitate a 20-foot x 20-foot pad graded away from the ditch. A flow by-pass with the capacity equal to the design flow must be provided at the upstream end of the piped section to allow water delivery in the event the trash rack becomes plugged.

The type and size of the proposed pipe shall be clearly noted on the drawings. Corrugated metal pipe (CMP) is prohibited. If the pipe consists of concrete, it must conform to the more stringent of the requirements found in AASHTO Specifications and ACI 350, "Code Requirements for Environmental Engineering for Concrete Structures." All joints must be watertight. Should the plans call for a prefabricated conduit (pipe, box, arch, etc.), without specific details, the shop drawings shall be submitted to CDWA or its representative before manufacturing of the structure for approval and to insure conformance to AASTO and ACI 350.

A minimum soil cover of 2 feet shall be maintained unless CDWA determines that calculations show a thicker cover is required. Calculations shall be performed and submitted to CDWA to prove the height of cover over the pipe is adequate. Specifications for installation and backfill of the piped section shall be provided to CDWA for review.

6.14 WARRANTY

In general, ditch relocations will be for the convenience of the applicant. The applicant must warrant ditch conveyance capacity without affecting upstream and downstream hydraulic conditions. The applicant must also warrant related facilities including grass and vegetation for a period of 2 years after acceptance by CDWA. During the warranty period, the applicant is responsible for maintenance. In specific cases, CDWA may require perpetual maintenance and repair by the applicant.

6.15 ENVIRONMENTAL REQUIREMENTS

Per U.S. Army Corps of Engineers (USACE) guidelines, projects that impact the ditch are potentially subject to proper permits and procedures for wetlands disturbance. The contractor will be required to coordinate directly with USACE. The applicant must, however, first contact CDWA and allow CDWA to review and approve any correspondence with USACE prior to submission.

CHAPTER 7 – MIXED-USE OF RIGHT-OF-WAY

7.1 GENERAL

CDWA will consider on a case-by-case basis whether CDWA right-of-way will remain private or if mixed-use will be allowed. Equestrian use of the Church Ditch and maintenance or access roads shall not be permitted.

7.2 FENCING

CDWA will generally approve fencing that blocks public access to CDWA property, provided that:

- CDWA approves the design and location of the fence and gates;
- The fencing does not interfere with CDWA service access to, or maintenance of, CDWA facilities;
- Gates are operable by CDWA at all times; and
- Gates and fences allow CDWA to access and maintain its facilities in a safe manner.

7.3 BIKE/PEDESTRIAN PATHS/GOLF CART PATHS

Bike and pedestrian paths shall be designed to serve as maintenance roads and to withstand loads imposed by heavy maintenance equipment standing on or crossing the paths. Where designed to serve as maintenance roads, the paths shall be a minimum of 15 feet wide and shall be designed to withstand turning, loading and operation of heavy maintenance equipment. CDWA disclaims all liability for damage to paths due to normal operation of maintenance equipment. Suitable gates and removable barriers shall be provided to prevent the use of maintenance roads and bike/pedestrian paths by unauthorized motor vehicles. All related paths shall be subject to a mixed-use agreement with CDWA.

7.4 MAINTENANCE ROADS

Bike/pedestrian paths designed to also function as maintenance roads shall be continuous and unobstructed. They shall be a minimum of 15 feet in width with suitable gates and removable barriers to prevent unauthorized use. The road shall be sloped to drain away from the ditch.

7.5 RIGHT-OF-WAY MARKERS

Permanent, easily identifiable markers shall be placed at the right-of-way lines at intervals of not less than 200 feet and at all corners or change of alignment. Markers shall be installed at no less than 100-foot intervals on curves. CDWA must approve marker design in advance of installation.

7.6 MAINTENANCE

The person or entity requesting mixed use shall be responsible in perpetuity for the maintenance of the mixed-use right-of-way. Maintenance shall include, without limitation, the following:

1. Preventing accumulation of rubbish and debris;
2. Keeping vegetation mowed and in reasonably neat appearance;
3. Preventing accumulation of vegetation in the flow area of the ditch; and
4. Keeping fencing and removable barriers and maintenance roads in serviceable condition and in good repair.

CDWA remains responsible for removal of accumulations of silt, sand or earth in the ditch and repairs to the ditch bank unless such damage is in any way a result of the mixed-use. Additional costs incurred by CDWA as a result of the mixed use, such as removal of soil and sand or other debris from the right-of-way, shall be borne by the party requesting mixed-use. Alternatively, with CDWA permission, actual removal and cleaning may be performed by the mixed use party at its expense. CDWA shall not be liable for damage to structures or improvements within CDWA right-of-way incurred as part of CDWA's normal maintenance or operational activities.

7.7 INDEMNIFICATION

The applicant as part of its use of CDWA property assumes all risks of such use, indemnifies and holds harmless CDWA, its directors, officers, agents, contractors, subcontractors, invitees, licensees, and employees from all claims and demands, including reasonable attorney's fees and cost of defense, arising from such use, and releases all claims against CDWA for such use. Continuing public liability insurance may be required.

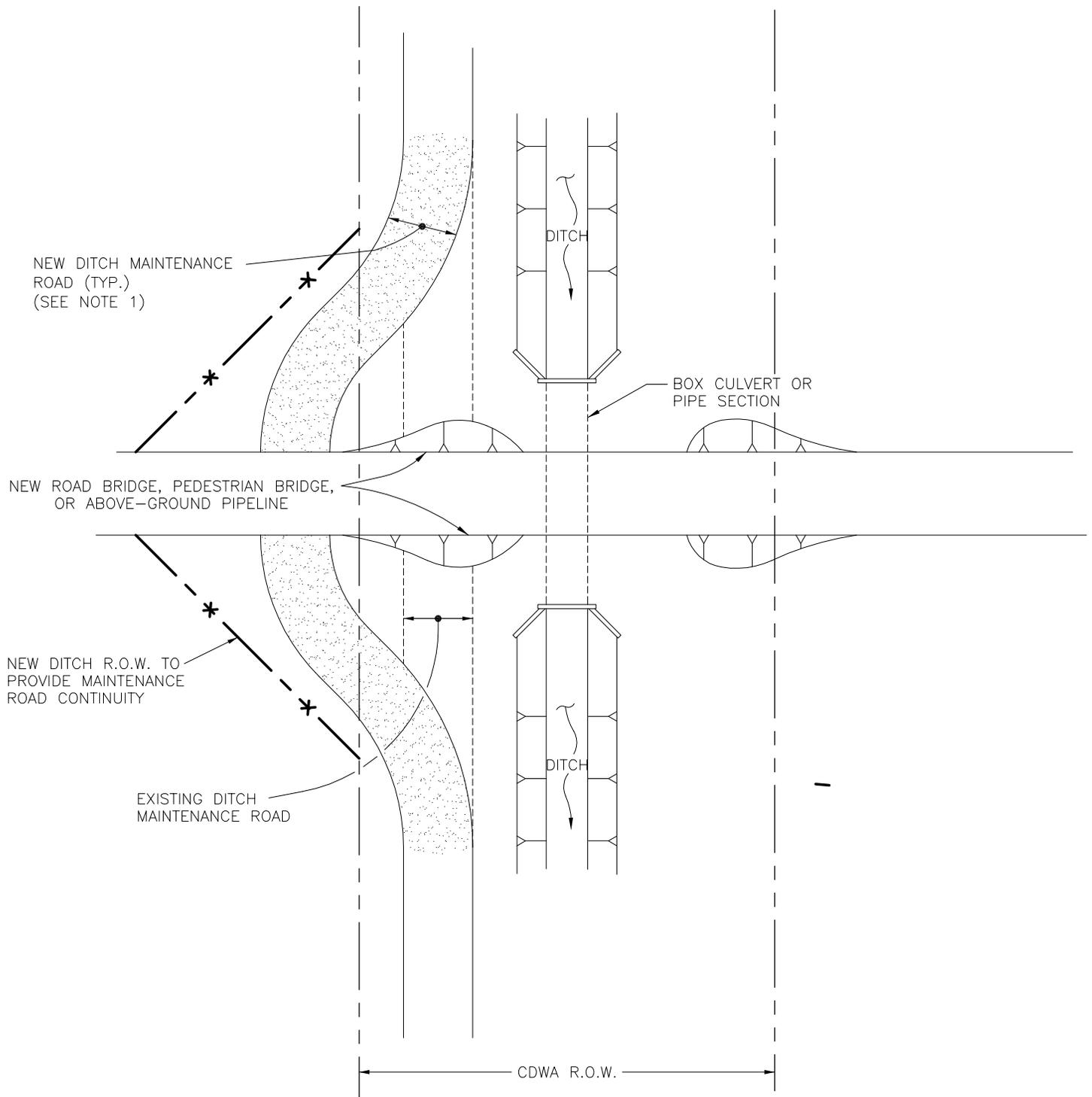
7.8 VEGETATION AND LANDSCAPING

No trees, shrubs, vine-like or aquatic plants shall be permitted within the limits of the CDWA right-of-way. Only grass (not irrigated) will be permitted. Where existing vegetation is disturbed, new grass shall be established. Any contracts for seeding of grass shall have a "guaranteed stand" clause.

7.9 CONTINUING OBLIGATIONS

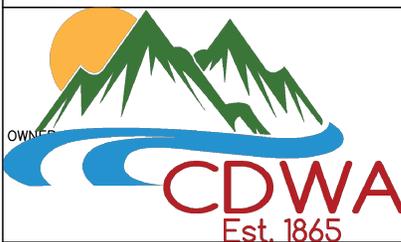
In the case of any mixed-use of right-of-way, CDWA is under no obligation to maintain the flows in or the use of the ditch. CDWA retains its right to discontinue use of the ditch, to relocate the ditch or to sell the right-of-way without approval from, consultation with or obligation to the co-user.

FIGURES



NOTES:

1. NEW DITCH MAINTENANCE ROAD TO BE 15-FOOT WIDE ON DOWN-SLOPE SIDE (GENERALLY EAST BANK OR RIGHT BANK WHEN FACING DOWNSTREAM). CROSS SLOPE WILL DRAIN AWAY FROM DITCH AT 2% (MAX). LONGITUDINAL SLOPE NOT TO EXCEED 12H : 1V.



**STANDARD CDWA
DESIGN DETAILS**

DATE: AUGUST 2018

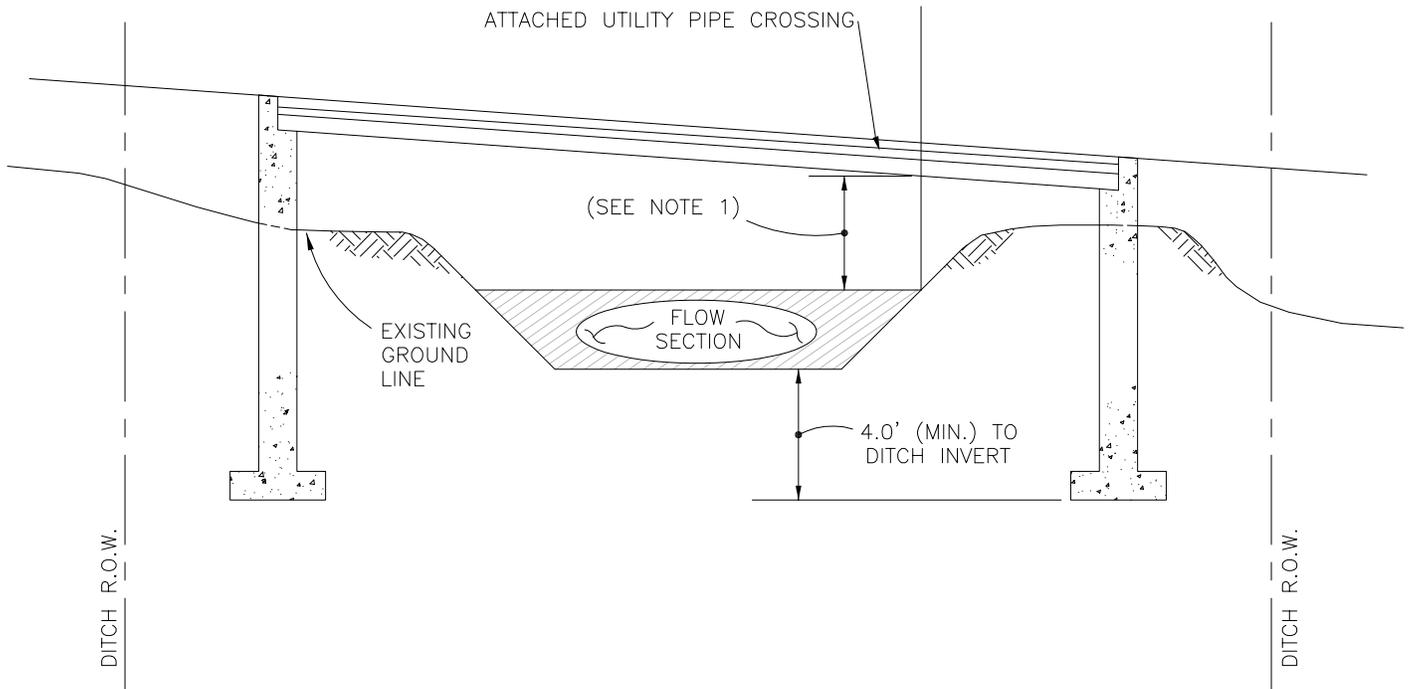
**CANAL MAINTENANCE
ROAD**



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FIGURE

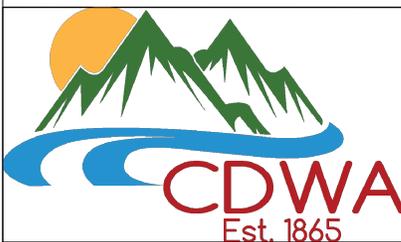
01



NOTES:

1. 2.0 FT. (MIN.) FREEBOARD CLEARANCE REQUIRED ABOVE MAXIMUM WATER SURFACE ELEVATION TO LOW CHORD OF BRIDGE ON STRUCTURE ABOVE FLOW SECTION.
2. ATTACHED UTILITY CROSSINGS TO BE ABOVE LOW CHORD OF BRIDGE.
3. ATTACHED UTILITY PIPE CROSSINGS NOT TO EXCEED 8-INCH PIPE DIAMETER.
4. ATTACHED CROSSINGS TO BE AFFIXED TO DOWNSTREAM SIDE OF BRIDGE ON TOP OF STEEL GIRDERS.

MINIMUM CASING REQUIREMENTS FOR PIPE SIZES UP TO AND INCLUDING 8-INCH PIPE: 1/4-INCH WALL STEEL PIPE



**STANDARD CDWA
DESIGN DETAILS**

DATE: AUGUST 2018

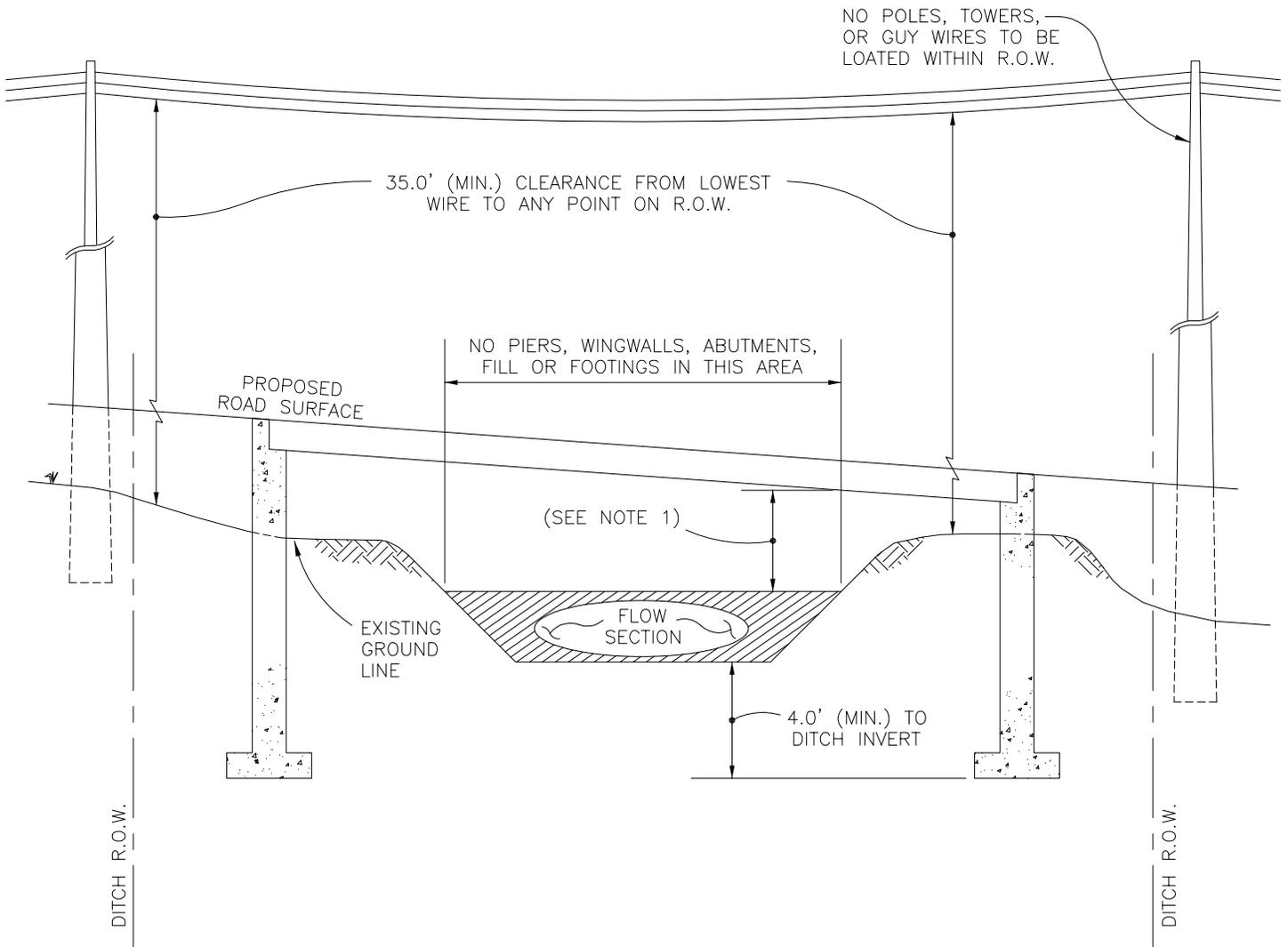
**BRIDGE AND ATTACHED
UTILITY CROSSING**



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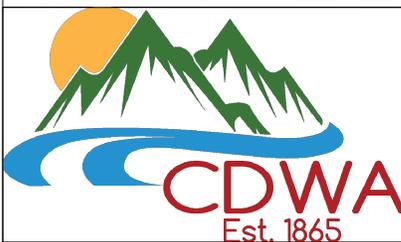
FIGURE

02



NOTES:

1. 2.0 FT (MIN) FREEBOARD CLEARANCE REQUIRED ABOVE MAXIMUM WATER SURFACE ELEVATION TO ANY POINT ON STRUCTURE ABOVE FLOW SECTION.



**STANDARD CDWA
DESIGN DETAILS**

DATE: AUGUST 2018

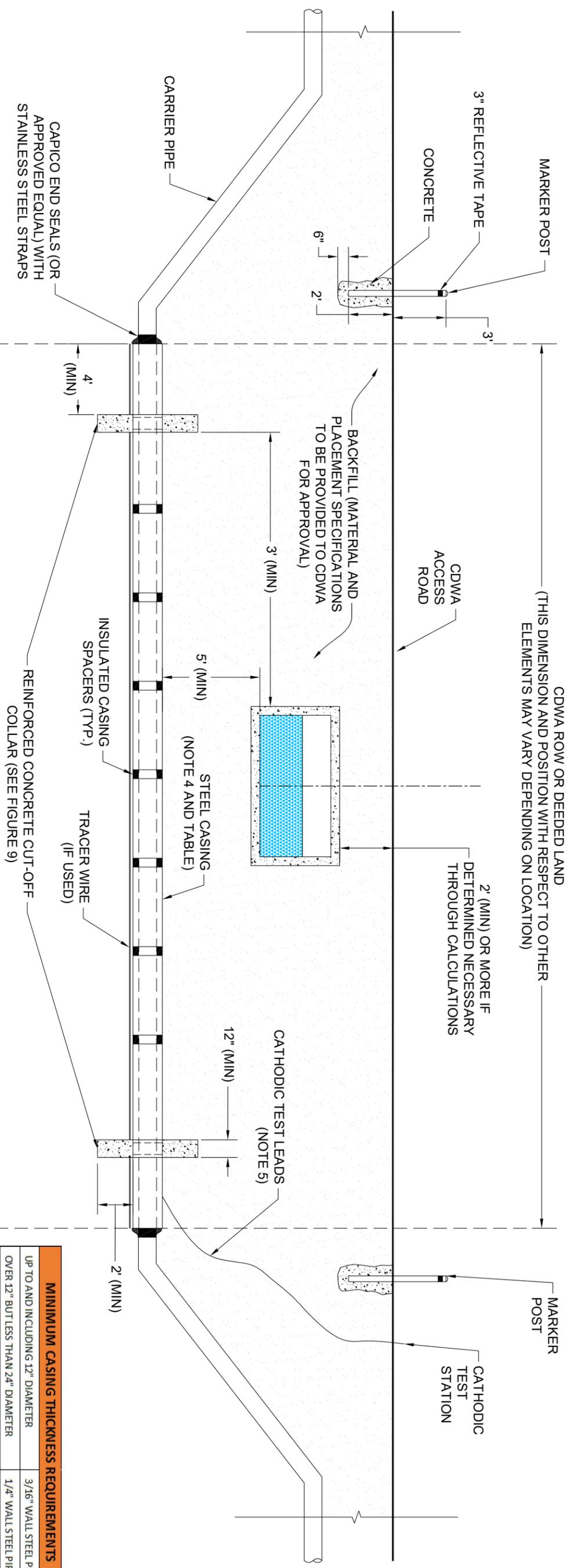
**OVERHEAD CANAL
CROSSING**

FIGURE

03



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MINIMUM CASING THICKNESS REQUIREMENTS		
UP TO AND INCLUDING 12" DIAMETER		3/16" WALL STEEL PIPE
OVER 12" BUT LESS THAN 24" DIAMETER		1/4" WALL STEEL PIPE
24" DIAMETER BUT LESS THAN 60" DIAMETER		3/8" WALL STEEL PIPE
60" DIAMETER OR GREATER:		SPECIAL DESIGN

NOTES:

1. IT IS THE DEVELOPERS RESPONSIBILITY TO OBTAIN CDWA ROW OR DEEDED LAND.
2. IT IS THE DEVELOPERS RESPONSIBILITY TO PROVIDE A SURVEY OF THE DITCH AT THE PROPOSED CROSSING. THE DESIGN PLANS SHALL INCLUDE DITCH TOP AND BOTTOM ELEVATIONS (NOT THE WATER SURFACE AS SHOWN ON MOST AERIAL SURVEYS). THE SURVEY INFORMATION SHALL BE PROVIDED TO CDWA.
3. CARRIER PIPE TO BE SEPARATED FROM THE CASING PIPE USING INSULATED CASING SPACERS PROPERLY DIMENSIONED AND SPACED TO SAFELY ACCOMMODATE THE UTILITY AND PREVENT SHORTING OF THE PIPES CATHODIC PROTECTION SYSTEM.
4. CASING PIPE TO BE A MINIMUM OF 6" LARGER IN DIAMETER THAN CARRIER PIPE TO ALLOW A MINIMUM 3" CLEARANCE AROUND PIPE.
5. CASING TO BE SUITABLY PROTECTED FROM FAILURE DUE TO CORROSION FOR A MINIMUM DESIGN LIFE OF 50 YEARS.
6. WHEN THE CARRIER PIPE IS CONVEYING VOLATILE GAS OR VOLATILE LIQUID A 2-INCH DIAMETER (MINIMUM) VENT SHALL BE PROVIDED FOR THE CASING AT EACH END OF THE CASING. VENTS SHALL NOT BE LOCATED WITHIN THE CDWA ROW.
7. CONSTRUCTION MATERIALS TESTING REQUIREMENTS SHALL BE PROVIDED TO CDWA FOR APPROVAL.
8. A PRESSURE TEST SHALL BE PERFORMED ON THE PIPELINE AFTER INSTALLATION. THE HYDROSTATIC TESTING SHALL BE CONDUCTED AT 125% OF THE MAXIMUM OPERATING PRESSURE FOR A MINIMUM OF 8 HOURS. CDWA SHALL BE INVITED TO THE TEST WITH AT LEAST 48-HOURS NOTIFICATION.
9. ALL PIPE JOINTS WITHIN CDWA PROPERTY SHALL BE RADIOGRAPHIC OR ULTRASONIC TESTED. CDWA SHALL BE PROVIDED WITH RESULTS.



CHURCH DITCH WATER AUTHORITY

DATE: AUGUST 2018



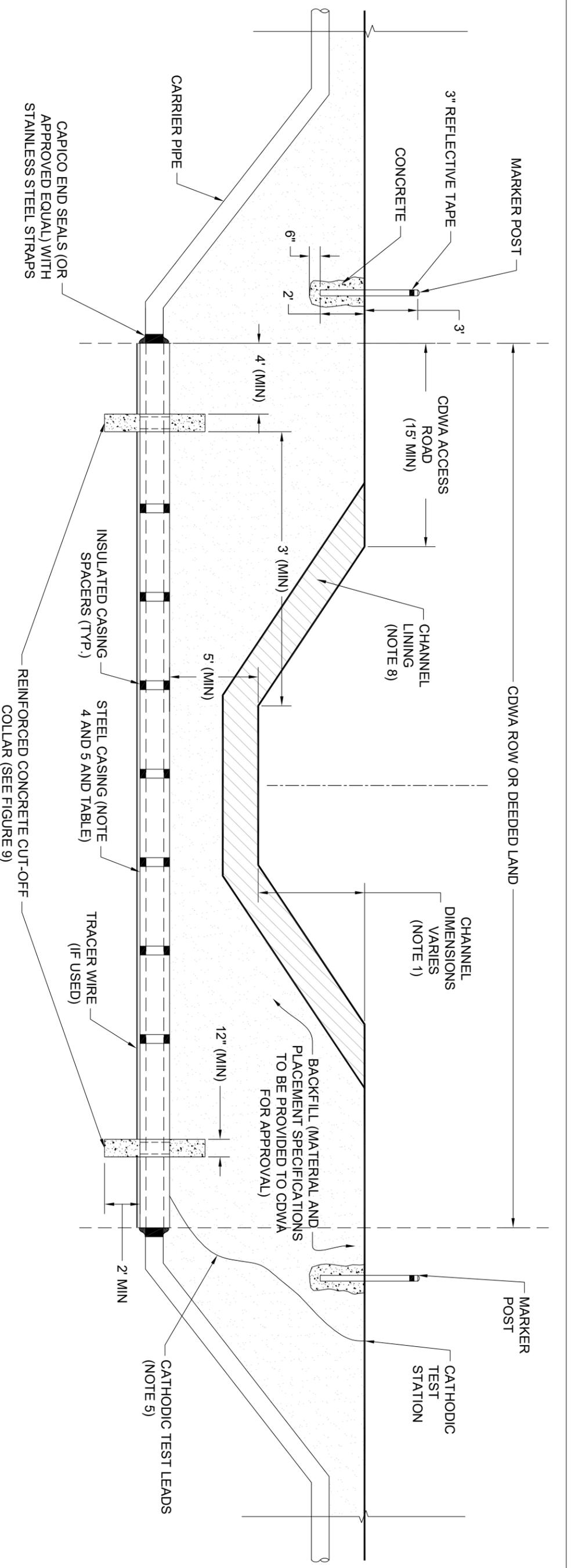
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STANDARD CDWA DESIGN DETAILS

CASED UTILITY TRENCHED CROSSING WITH CANAL CONDUIT

FIGURE

04



NOTES:

1. IT IS THE DEVELOPERS RESPONSIBILITY TO OBTAIN CDWA ROW OR DEEDED LAND.
2. IT IS THE DEVELOPERS RESPONSIBILITY TO PROVIDE A SURVEY OF THE DITCH AT THE PROPOSED CROSSING. THE DESIGN PLANS SHALL INCLUDE DITCH TOP AND BOTTOM ELEVATIONS (NOT THE WATER SURFACE AS SHOWN ON MOST AERIAL SURVEYS). THE SURVEY INFORMATION SHALL BE PROVIDED TO CDWA.
3. CARRIER PIPE TO BE SEPARATED FROM THE CASING PIPE USING INSULATED CASING SPACERS PROPERLY DIMENSIONED AND SPACED TO SAFELY ACCOMMODATE THE UTILITY AND PREVENT SHORTING OF THE PIPE'S CATHODIC PROTECTION SYSTEM.
4. CASING PIPE TO BE A MINIMUM OF 6" LARGER IN DIAMETER THAN CARRIER PIPE TO ALLOW A MINIMUM 3" CLEARANCE AROUND PIPE.
5. CASING TO BE SUITABLY PROTECTED FROM FAILURE DUE

6. TO CORROSION FOR A MINIMUM DESIGN LIFE OF 50 YEARS.
7. WHEN THE CARRIER PIPE IS CONVEYING VOLATILE GAS OR VOLATILE LIQUID A 2-INCH DIAMETER (MINIMUM) VENT SHALL BE PROVIDED FOR THE CASING AT EACH END OF THE CASING. VENTS SHALL NOT BE LOCATED WITHIN THE CDWA ROW.
8. CANAL LINER TO BE 2.0 FT. (MIN.) THICK CLAY SOIL OR 2% BENTONITE BLENDED WITH NATIVE SOIL. IF THE NATIVE SOIL/BENTONITE MIXTURE IS TO BE USED, THE NATIVE SOILS SHALL CONTAIN A MINIMUM OF 25% MINUS #200 PARTICLE SIZE.
9. ALL FILL MATERIAL SHALL BE COMPACTED TO 90% MODIFIED PROCTOR DENSITY AND WITHIN 2% OPTIMUM MOISTURE CONTENT (ASTM D1557).
10. CONSTRUCTION MATERIALS TESTING REQUIREMENTS SHALL BE PROVIDED TO CDWA FOR APPROVAL.

11. A PRESSURE TEST SHALL BE PERFORMED ON THE PIPELINE AFTER INSTALLATION. THE HYDROSTATIC TESTING SHALL BE CONDUCTED AT 125% OF THE MAXIMUM OPERATING PRESSURE FOR A MINIMUM OF 8 HOURS. CDWA SHALL BE INVITED TO THE TEST AND GIVEN 48-HOURS NOTIFICATION PRIOR TO THE TEST.
12. ALL PIPE JOINTS WITHIN CDWA PROPERTY SHALL BE RADIOGRAPHIC OR ULTRASONIC TESTED, CDWA SHALL BE PROVIDED WITH RESULTS.

MINIMUM CASING THICKNESS REQUIREMENTS

UP TO AND INCLUDING 12" DIAMETER	3/16" WALL STEEL PIPE
OVER 12" BUT LESS THAN 24" DIAMETER	1/4" WALL STEEL PIPE
24" DIAMETER BUT LESS THAN 60" DIAMETER	3/8" WALL STEEL PIPE
60" DIAMETER OR GREATER:	SPECIAL DESIGN



STANDARD CDWA DESIGN DETAILS

DATE: AUGUST 2018

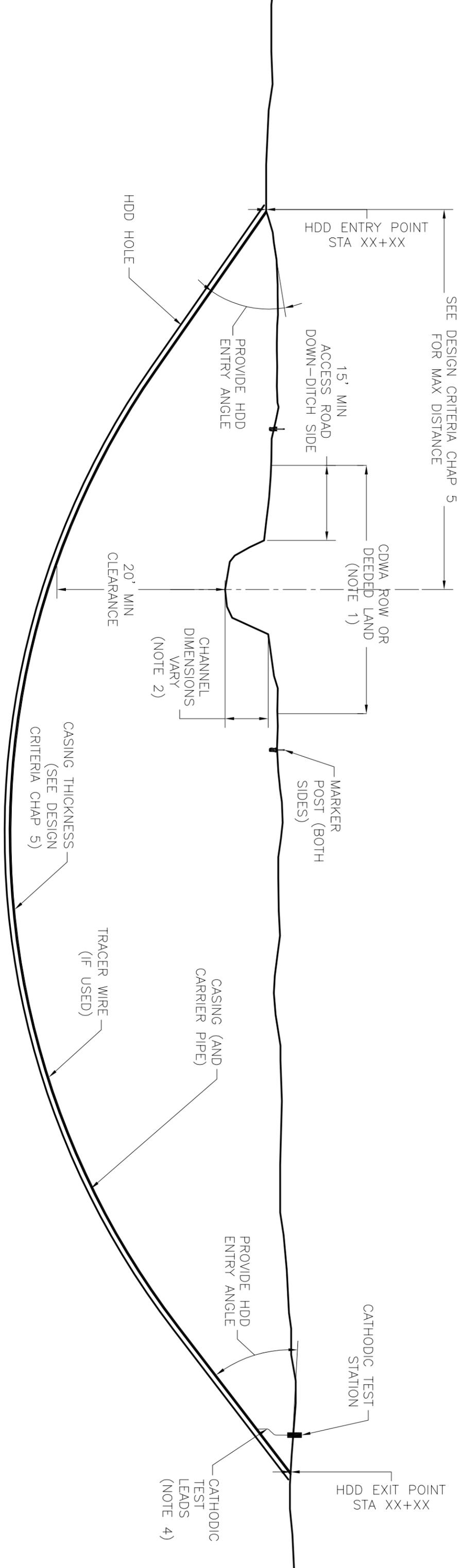


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CASED TRENCHED CROSSINGS WITH OPEN DITCH

FIGURE

05



SEE DESIGN CRITERIA CHAP 5 FOR MAX DISTANCE

HDD ENTRY POINT STA XX+XX

15' MIN ACCESS ROAD DOWN-DITCH SIDE

CDWA ROW OR DEEDED LAND (NOTE 1)

CHANNEL DIMENSIONS VARY (NOTE 2)

CASING THICKNESS (SEE DESIGN CRITERIA CHAP 5)

MARKER POST (BOTH SIDES)

CASING (AND CARRIER PIPE)

TRACER WIRE (IF USED)

CATHODIC TEST STATION

HDD EXIT POINT STA XX+XX

CATHODIC TEST LEADS (NOTE 4)

PROVIDE HDD ENTRY ANGLE

NOTES:

1. IT IS THE DEVELOPERS RESPONSIBILITY TO OBTAIN CDWA ROW OR DEEDED LAND WIDTH AND CHANNEL DIMENSIONS.
2. DESIGN PLANS NEED TO INCLUDE A SURVEY OF THE DITCH INCLUDING AN ELEVATION OF THE BOTTOM AND TOP OF THE DITCH (NOT WATER SURFACE AS SHOWN ON MOST AERIAL SURVEYS). THE SURVEY INFORMATION SHALL BE PROVIDED TO CDWA.
3. SPECIFICATIONS FOR THE PIPE SHALL BE INCLUDED IN THE APPLICATION.
4. PIPE TO BE SUITABLY PROTECTED FROM FAILURE DUE TO CORROSION FOR A MINIMUM DESIGN LIFE OF 50 YEARS.
5. WHEN THE CARRIER PIPE IS CONVEYING VOLATILE GAS OR VOLATILE LIQUID, A 2-INCH DIAMETER (MINIMUM) VENT SHALL BE PROVIDED FOR THE CASING AT EACH END OF THE CASING. VENTS SHALL NOT BE LOCATED WITHIN CDWA'S ROW.
6. A PRESSURE TEST SHALL BE PERFORMED ON THE PIPELINE AFTER INSTALLATION. THE HYDROSTATIC TESTING SHALL BE CONDUCTED AT 125% OF THE MAXIMUM OPERATING PRESSURE FOR A MINIMUM OF 8 HOURS. CDWA SHALL BE INVITED TO THE TEST WITH AT LEAST 48-HOURS NOTIFICATION.
7. ALL PIPE JOINTS WITHIN CDWA PROPERTY SHALL BE RADIOGRAPHIC OR ULTRASONIC TESTED, CDWA SHALL BE PROVIDED WITH RESULTS.



CHURCH DITCH WATER AUTHORITY

DATE: AUGUST 2018

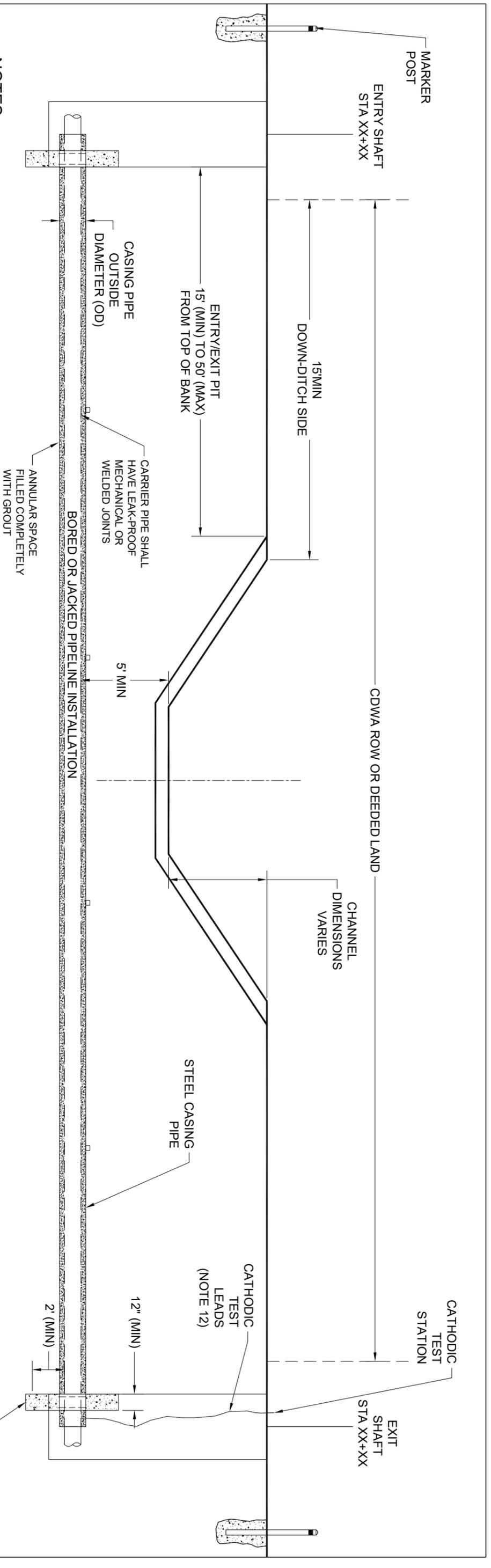


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STANDARD CDWA DESIGN DETAILS

STANDARD HORIZONTAL DIRECTION DRILLING (HDD) INSTALLATION

FIGURE
07



NOTES:

1. IT IS THE DEVELOPERS RESPONSIBILITY TO OBTAIN CDWA ROW OR DEEDED LAND.
2. IT IS THE DEVELOPERS RESPONSIBILITY TO PROVIDE A SURVEY OF THE DITCH AT THE PROPOSED CROSSING. THE DESIGN PLANS SHALL INCLUDE DITCH TOP AND BOTTOM ELEVATIONS (NOT THE WATER SURFACE AS SHOWN ON MOST AERIAL SURVEYS). THE SURVEY INFORMATION SHALL BE PROVIDED TO CDWA.
3. SPECIFICATIONS FOR BOTH THE CARRIER AND CASING PIPE SHALL BE INCLUDED IN THE APPLICATION.
4. FOR CASING OUTSIDE DIAMETERS GREATER THAN 48 INCHES, SPECIAL DESIGN CRITERIA MAY APPLY (SEE DESIGN CRITERIA SECTION 5.4.3)
5. THE CASING SHALL BE DESIGNED TO WITHSTAND THE MAXIMUM ANTICIPATED JACKING FORCE WITH A FACTOR OF SAFETY OF 2 OR GREATER.
6. THE CASING SHALL HAVE A MINIMUM YIELD STRENGTH OF 35 KSI.
7. STEEL CARRIER PIPE SHALL NOT BE INSTALLED VIA AUGER BORING OR JACKING, BUT SHALL BE SLIP-LINED INTO A STEEL CASING.
8. THE INVERT (BOTTOM) OF THE DITCH ABOVE THE UNCASSED CROSSING SHALL BE CONCRETE LINED. CONCRETE LINING SHALL EXTEND A MINIMUM OF TEN FEET ON BOTH SIDES OF THE CROSSING. CONSIST OF A SIX INCH THICK REINFORCED CONCRETE SECTION AND INCLUDE 18 INCH CUTOFF WALL ON THE UPSTREAM AND DOWNSTREAM END. THE LINING SHALL BE CONSTRUCTED ONE FOOT BELOW THE DITCH INVERT TO PREVENT ACCUMULATION OF DEBRIS.
9. FOR INTERNAL ANNULAR SPACE GROUTING, PUMPING EQUIPMENT SHALL BE SIZED TO INJECT GROUT AT A VELOCITY AND PRESSURE TO COMPLETELY FILL THE INTERNAL ANNULAR SPACE.
10. A PRESSURE TEST SHALL BE PERFORMED ON THE PIPELINE AFTER INSTALLATION. THE HYDROSTATIC TESTING SHALL BE CONDUCTED AT 125% OF THE MAXIMUM OPERATING PRESSURE FOR A MINIMUM OF 8 HOURS. CDWA SHALL BE INVITED TO THE TEST WITH AT LEAST 48-HOURS NOTIFICATION.
11. ALL PIPE JOINTS WITHIN CDWA PROPERTY SHALL BE RADIOGRAPHIC OR ULTRASONIC TESTED, CDWA SHALL BE PROVIDED WITH RESULTS.
12. PIPE TO BE SUITABLY PROTECTED FROM FAILURE DUE TO CORROSION FOR A MINIMUM DESIGN LIFE OF 50 YEARS.



CHURCH DITCH WATER AUTHORITY

DATE: AUGUST 2018



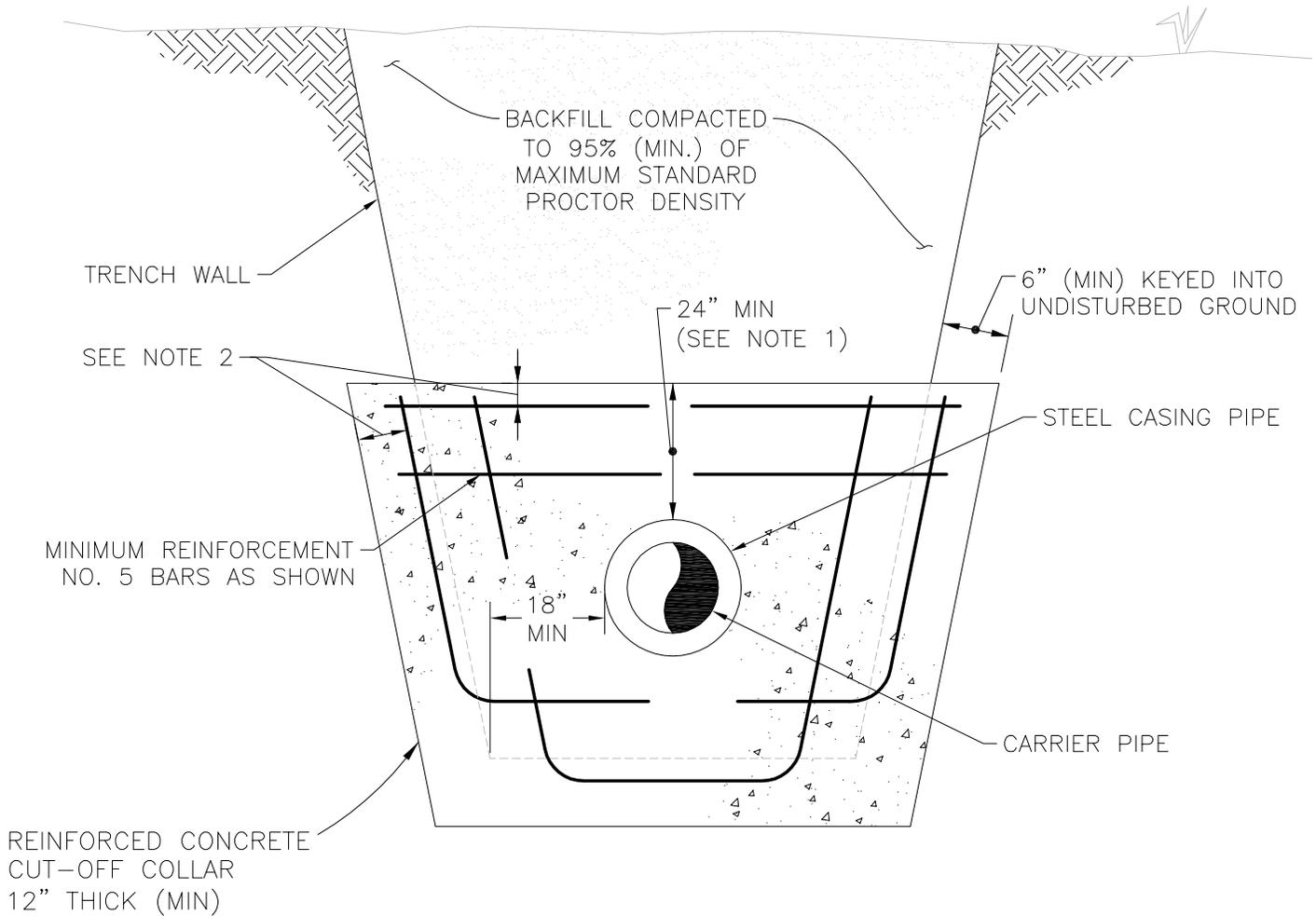
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STANDARD CDWA DESIGN DETAILS

STANDARD BORED OR JACKED CROSSING

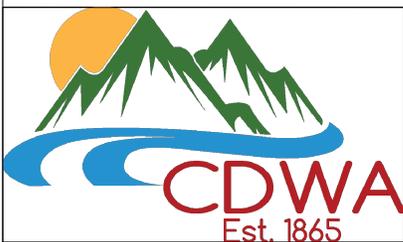
08

FIGURE



NOTES:

1. GREATER DISTANCE MAY BE REQUIRED IN CERTAIN CASES.
2. BAR REINFORCEMENT TO BE 4 INCHES CLEAR TO PIPE OR EDGE OF CONCRETE.



**STANDARD CDWA
DESIGN DETAILS**

DATE: AUGUST 2018

**CONCRETE
CUTOFF COLLAR**

FIGURE

09



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APPENDICES

APPENDIX A

CHURCH DITCH WATER AUTHORITY
SEEPAGE EASEMENT AGREEMENT

SEEPAGE EASEMENT AGREEMENT

THIS SEEPAGE EASEMENT AGREEMENT (the "Agreement") is made and entered into this day of _____, 20__, by and between _____, the owner of real property legally described as _____, _____ (hereinafter referred to as "Grantor"), and the Church Ditch Water Authority, whose address is 14025 West 82nd Avenue, Arvada Colorado 80005 (hereinafter referred to as "Grantee").

WITNESSETH:

FOR AND IN CONSIDERATION of the sum of ten dollars (\$10.00) to Grantor in hand paid by Grantee, receipt of which is hereby acknowledged, and in consideration of the mutual covenants contained herein, Grantor hereby grants, bargains and sells to Grantee, its successors and assigns, a seepage easement across Grantor's property, more particularly described in **Exhibit A** (the "Property"), attached hereto and incorporated herein by this reference, for the purpose of continuing the historic seepage appurtenant to Grantee's ditch, commonly referred to as the Church Ditch; use of said easement shall be at Grantee's cost and expense, and at no cost or expense of Grantor.

THE GRANTOR HEREBY ACKNOWLEDGES the historic presence of Grantee's Ditch and the Ditch's seepage rights and easement, acknowledges Grantee's ownership of prescriptive rights therein, and executes this Agreement for the purpose of documenting, recording, and clarifying the scope and boundaries of Grantee's easement.

IT IS FURTHER MUTUALLY COVENANTED AND AGREED by and between Grantor and Grantee as follows:

1. Grantor specifically retains the right to the undisturbed use and occupancy of the property more particularly described in **Exhibit A**, insofar as such use and occupancy is consistent with and does not impair any grant or agreement contained herein. However, Grantor specifically grants Grantee an easement to seep water from the Church Ditch on, over and through the Property, and Grantor specifically waives, releases and disclaims any right to claim damage caused by the seepage of water arising from Grantee's ownership, operation and maintenance of the Church Ditch.

2. Grantee agrees that following any construction, maintenance, or other activity by it or its agent which involves disturbance of the surface of the ground, Grantee shall restore the surface and its landscaping substantially to the grade and condition it was in immediately prior to the disturbance.

3. Grantor warrants that it has full right, title and lawful authority to grant the easement herein, and to make and enforce the promises herein, subject to existing easements, restrictions, and rights-of-way of record.

4. The word "Grantor" as used herein, whenever the context requires or permits, shall include the heirs, personal representatives, beneficiaries, successors, grantees, and assigns of each of the owners of the land through which the easement runs or the respective owners from time to time of portions thereof. The burdens and benefits of this Agreement shall be deemed covenants running with said easement and said land. Notwithstanding any contrary provision in this Agreement, however, any obligation under this Agreement which is to be performed by the owner of any land which is burdened by this Agreement shall be enforceable only against the then owner of such land, and not against any such owner's predecessors in interest.

5. The terms and provisions of this Agreement, except as qualified above, shall be binding upon and shall inure to the benefit of the respective heirs, personal representatives, beneficiaries, successors, grantees and assigns of the parties hereto.

IN WITNESS WHEREOF, the parties have executed the within Agreement as of the day and year first above written.

RECORD OWNER

STATE OF COLORADO)
) ss.
COUNTY OF _____)

The within and foregoing instrument was acknowledged before me in the said County and State on this __ day of _____, 20____, by _____.

My commission expires:

(S E A L)

Notary Public

CHURCH DITCH WATER AUTHORITY

ATTEST:

APPENDIX B

APPLICATION FOR LICENSE

APPLICATION FOR LICENSE

WHEREAS, the Church Ditch Water Authority is the operator of an irrigation canal known as Church Ditch in Jefferson County, State of Colorado, hereinafter referred to as "CDWA", and;

WHEREAS, CDWA is willing to investigate the proposed encroachments, crossings, changes, alterations, or revisions to the location, alignment, cross-section or flow capabilities of Church Ditch.

NOW, THEREFORE, for and in consideration of the covenants and agreements of the parties hereinafter set forth and contained, the parties agree as follows:

FIRST: Applicant hereby does make an application to CDWA for a license for _____ to be located at _____ in the manner shown on the attached sheets. There are _____ sheets, which by this reference are made a part of this application.

SECOND: By written acceptance of this application, CDWA agrees that it will cause a review of the request to be made in such manner as it shall, in its sole discretion, deem appropriate.

THIRD: CDWA approval of the request shall only be made by a separate license in writing and only upon receipt of the license fee established by the CDWA Board of Directors.

FOURTH: If the request is approved by the CDWA, then the parties each will enter into an agreement designated "License Agreement".

FIFTH: No approval or requirement of the CDWA shall be considered to be a statement as to the adequacy or suitability of any proposed structure or any plan, specification or part thereof for any intended use by Applicant, nor shall such approval or requirement provided by CDWA to the Applicant limit or absolve the responsibility of Applicant to maintain or repair Church Ditch.

SIXTH: CDWA expressly reserves the right not to approve any request that in its sole judgment and determination might interfere with the ditch or with the flow of water in Church Ditch, impede maintenance work, or cause additional expenses in maintenance or operation or in any way be adverse to the interests of CDWA or condition approval upon additional requirements as the CDWA may give at its sole discretion.

SEVENTH: Each application must be accompanied by a payment of one thousand dollars (\$1,000.00) to CDWA. This shall be deemed a minimum initial payment to cover preliminary expenses, such as legal work, engineering analysis, time and transportation cost for CDWA's review of the application. Such initial payment will not be refunded even though the request is denied. If the request presented is substantial in nature and so involved as to necessitate CDWA incurring expense in excess of the initial deposit, the matter will not be cleared and receive final approval until an additional deposit is made in such amount as is reasonably calculated to cover the legal, engineering and other costs to CDWA in investigating the matter fully. If the actual cost to the CDWA is less than this estimate, the difference will be refunded (less the \$1,000.00 minimum).

EIGHTH: No permission, right-of-way, easement, license or other interests are granted by this application, but the sole intent and purpose of this application is to permit CDWA to investigate the request by the Applicant.

DATED this _____ day of _____, 20__.

Applicant

ATTEST:

ACCEPTED for review purposes only this _____ day of _____, 20__.

CHURCH DITCH WATER AUTHORITY

By _____

APPENDIX C

CHURCH DITCH WATER AUTHORITY
RIGHT-OF-WAY EASEMENT AND LICENSE AGREEMENT

CHURCH DITCH WATER AUTHORITY
LICENSE AGREEMENT

THIS LICENSE AGREEMENT (the "Agreement") is made and entered into this ____ day of _____ 20__, by and between the CHURCH DITCH WATER AUTHORITY, a political subdivision of the State of Colorado (the "AUTHORITY"), _____, individuals (collectively, the "LICENSEE"), each a "Party" and collectively, the "Parties."

WITNESSETH:

WHEREAS, the AUTHORITY is the operator of that certain irrigation canal commonly known as the Church Ditch in Jefferson County, Colorado (the "Church Ditch");

WHEREAS, LICENSEE owns fee simple title to certain real property located in Jefferson County, Colorado that is adjacent to the Church Ditch, commonly known as [street address] (the "Property");

WHEREAS, LICENSEE desires to construct and maintain certain facilities that require the grant of certain access rights from the AUTHORITY to enable the LICENSEE to cross the Church Ditch, as generally depicted on the drawings attached hereto as **Exhibit A** and incorporated herein by this reference (the "Property Access Crossing"). Exhibit A consists of ____ sheets; and

WHEREAS, the AUTHORITY is willing to grant such access rights in the form of a license subject to certain covenants.

NOW, THEREFORE, in consideration of the foregoing promises and covenants set forth below, the receipt and sufficiency of which are mutually acknowledged, the parties hereto agree as follows:

1. Grant of License. For the sum of One Thousand Five Hundred Dollars (\$1500.00) paid to the AUTHORITY (the "License Fee"), and other good and valuable consideration, the AUTHORITY hereby grants to LICENSEE a license over, across, under and through the portions of the Church Ditch as depicted on Exhibit A to accommodate (i) LICENSEE's and its agents' construction and maintenance activities in the Property Access Crossing area and (ii) LICENSEE's and its guests' and agents' vehicular and pedestrian access to and from the Property (collectively, the "License").

2. Term. The License herein granted to LICENSEE shall continue for so long and only so long as LICENSEE, its successors and assigns, shall faithfully and promptly comply with the provisions herein.

3. Performance Deposit. In addition to the License Fee set forth above, LICENSEE shall provide a performance deposit in the amount of _____ (\$ _____) (the "Performance Deposit"), prior to beginning of construction of any crossing over the Church Ditch.

4. Pre-Construction.

a. The LICENSEE shall hold a pre-construction meeting on the job site with the AUTHORITY Manager of Ditch Maintenance (the "Manager") or designee(s) for the Church Ditch crossing or encroachment. The LICENSEE's agent(s), contractor and an official of the appropriate city or county (if construction is within a public right-of-way) shall also attend.

b. No construction of the ditch crossing shall be made without LICENSEE first providing five (5) business days' notice to the AUTHORITY and obtaining the consent and approval thereof of the Manager, which approval shall not be unreasonably withheld or delayed. The LICENSEE and its agent(s) shall provide for inspection of the Church Ditch crossing by the AUTHORITY and said inspection shall be completed within two (2) business days of the request for inspection by the LICENSEE. Failure by the LICENSEE or its agent(s) to provide an opportunity for inspection by the AUTHORITY may result, in the commercially reasonable discretion of the AUTHORITY, in the uncovering, at the sole cost of the LICENSEE, of any such construction so that the inspection can be made.

c. The LICENSEE or its agent(s) shall perform material or soil compaction testing as required by the Church Ditch Design Review Process and Design Criteria for Facilities, approved by Board Resolution No. 11-2018 (the "Design Manual"), or as directed by the Manager. A copy of test results shall be provided to the AUTHORITY. Should any portion of the work fail said testing, the LICENSEE shall immediately cause the affected item(s) to be removed, redone, and retested until test results confirm such work is in compliance with the Design Manual.

5. Construction Activity.

a. The effectiveness of the License granted pursuant to this Agreement, with respect to construction activities to occur within the Property Access Crossing area, is conditioned upon the AUTHORITY'S issuance of a "Notice to Proceed," following the AUTHORITY'S review and approval of the construction plans, specifications, and the construction calendar, such issuance not to be unreasonably withheld or delayed.

b. No work shall be performed in the Property Access Crossing area between April 1 and November 1 of any year without express prior written approval of the AUTHORITY, such approval not to be unreasonably withheld or delayed.

c. LICENSEE agrees to pay as liquidated damages, and not as a penalty, the sum of One Hundred Dollars (\$100.00) for each calendar day delay in completing construction work after the completion dated specified in the Notice to Proceed, excluding any approved extensions of time because of unavoidable delay ("Liquidated Damages"). The amount of liquidated damages is based on the determination by the AUTHORITY that the cost for running decreed water in the Church Ditch is a minimum of the amount set forth above, and LICENSEE agrees the amount is reasonable under the circumstances. The AUTHORITY may deduct Liquidated Damages from the Performance Deposit (as defined below).

6. Deficiency. If any failure to comply with construction plans, specifications, crossing agreement requirements, the Design Manual, or in the event that LICENSEE's construction activity in or over the Church Ditch creates a condition rendering the Church Ditch incapable of safely carrying water, or other deficiency, is noted by the AUTHORITY, it shall give LICENSEE written notice of said deficiency.

a. Corrective Action. LICENSEE shall initiate corrective actions within three (3) business days after receipt of the written notice, which corrective actions must be completed to the commercially reasonable satisfaction of AUTHORITY. If after

the three (3) days from receipt of the written notice no corrective action has been initiated, the AUTHORITY may undertake and complete the corrective action on its own. All direct and reasonable costs incurred by the AUTHORITY in making the corrective actions shall be reimbursed by LICENSEE within ten (10) days from receipt of a billing invoice from the AUTHORITY. If LICENSEE fails to remit timely payment to the AUTHORITY for the AUTHORITY'S corrective actions, the AUTHORITY may deduct from the Performance Deposit all such direct and reasonable costs.

- b. Certificate of Completion. Upon completion of the construction work in the Property Access Crossing area, LICENSEE shall contact the AUTHORITY for final inspection and shall furnish the AUTHORITY an "Affidavit of Installation of Ditch Crossing" in substantially the form attached hereto as **Exhibit B** (the "Affidavit"), signed and sealed by a Professional Engineer registered in the State of Colorado. The Affidavit shall state that the project on the Licensed Property was constructed in conformance with approved plans and specifications. Attached to the Affidavit shall be a set of project plans revised to accurately represent the "As-Built" configuration of the project. Upon acceptance of the as-built drawings and Affidavit, the AUTHORITY shall issue the Certificate of Completion. The AUTHORITY shall not be unreasonable in inspecting the construction or the execution of the Certificate of Completion. Once the Certificate of Completion has been issued, the warranty period shall begin on the License.

7. Construction Warranty. LICENSEE warrants all work for a minimum period of two (2) year following Certificate of Completion executed by the AUTHORITY. Thirty (30) days prior to expiration of the warranty period, the AUTHORITY shall submit a list of warranty repairs, if any, to LICENSEE, which repairs shall be made by LICENSEE to the satisfaction of the AUTHORITY within (30) days from the date notice under this provision is received by LICENSEE. After such construction and, where applicable, warranty repairs are completed, the AUTHORITY shall issue a written acceptance of work, which acceptance shall not be unreasonably withheld. The AUTHORITY reserves the right to bring to the attention of LICENSEE any deficiencies in the work prior to the period stated herein.

8. Release of Performance Deposit. Upon completion, inspection by the AUTHORITY and expiration of the two year warranty period for the final License issued pursuant to this Agreement, the AUTHORITY shall immediately return the Performance Deposit to LICENSEE. The AUTHORITY shall not be unreasonable in inspecting the construction, initiating the warranty period, or releasing the performance deposit.

9. Scope of AUTHORITY. It is understood that this instrument shall grant to LICENSEE only such rights as the AUTHORITY has the power to grant.

10. Non-Interference with Church Ditch Operations. In exercising the rights granted by this License, LICENSEE shall act in such manner as not to damage the Church Ditch or the embankments and/or the right-of-way thereof and so as not to interfere with or affect the flow of water in Church Ditch and/or laterals therefrom. LICENSEE agrees that it will at all times maintain its licensed facilities and repair all breaks, leaks and damages therein and thereto at its

own expense. If, by reason of any break, leak or damage in and to the licensed facilities injury occurs to the properties of the AUTHORITY, then LICENSEE will reimburse the AUTHORITY for all work necessary to repair and replace such property of the AUTHORITY to the same condition as the property was in prior to such break, leak, or damage in and to the said licensed facilities, and will pay any and all monetary damages resulting from such break, leak or damage sustained or incurred by the AUTHORITY or its water users or to any one not a party to this Agreement, including water lost. LICENSEE further agrees that if at any time the LICENSEE or LICENSEE's act or acts causes any washing, settling or other change or damage in the Church Ditch embankments, the roads thereon, or any part of the ditch right-of-way, or any loss of water or of ditch capacity, it will, upon notification from the AUTHORITY, LICENSEE will reimburse the AUTHORITY for all necessary repairs.

11. Indemnification. To the extent permitted by law, Licensee agrees to indemnify and save harmless the AUTHORITY, its owners, successors, assigns, officers, directors, employees, agents, attorneys, engineers, and stockholders on account of any damage or loss sustained by them or any of them or to anyone not a party to this Agreement arising by reason of laying, construction, operation, maintenance or removal of said licensed facilities by Licensee or Licensee's agents. Licensee further agrees, to the extent permitted by law, to indemnify, protect, and save and hold the AUTHORITY, its owners, successors, assigns, officers, directors, employees, agents, attorneys, and engineers from any claims, causes of action, demands or injuries arising, either directly or indirectly, out of the operation or maintenance of the Church Ditch and laterals thereunder or resulting from any other act of the Licensee.

12. Alterations. Licensee agrees that before any future alteration of said licensed facilities, it will notify the AUTHORITY of the proposed alteration and submit appropriate License amendment documentation to the AUTHORITY for such alteration. If in the future, the AUTHORITY should determine in its commercially reasonable discretion that it is necessary to repair, restore, enlarge, deepen or otherwise change or relocate said Church Ditch or laterals thereunder or to construct any other canal, ditch or waterway on the Church Ditch right-of-way or to do any other thing incident to the operation of Church Ditch or laterals, then Licensee agrees to allow the AUTHORITY to temporarily remove Licensee's licensed facilities and reconstruct the same so as to comply with such plans and specifications the AUTHORITY may prescribe as being necessary to permit the proper maintenance and operation of the ditch, the costs of such relocation and/or reconstruction to be allocated equitably by agreement between the Parties.

13. Immunity. The parties understand and agree that the AUTHORITY is relying on and does not waive or intend to waive the monetary limitations or any other rights, immunities, and protections provided by the Colorado Governmental Immunity Act, C.R.S. § 24-10-101, *et seq.*, as from time to time amended, or otherwise available by law to the AUTHORITY.

14. Binding Effect. It is mutually understood and agreed that this agreement and all the terms and conditions hereof shall extend to and be binding upon the parties hereto, their successors, designees and assigns.

15. Board Approval. This Agreement is expressly contingent upon the approval by the Church Ditch Water Authority Board of Directors of all of the terms set forth herein. In the event

this Agreement is not approved in its entirety by the Board, neither Party shall be bound to the terms of this Agreement.

16. Effective Date. The Effective Date of this Agreement shall be the date the resolution approving this Agreement is adopted by the Church Ditch Water Authority Board of Directors.

EXECUTED in duplicate the day and year first hereinabove written.

**CHURCH DITCH WATER
AUTHORITY:**

By: _____
Tamara Moon, President

ATTEST:

Nathan McCoy, General Manager

LICENSEE:

STATE OF COLORADO)

COUNTY OF) ss.
)

Subscribed, sworn to and acknowledged before me this ____ day of _____
20__ by _____ and _____.

My Commission Expires: _____.

(SEAL)

Notary Public

EXHIBIT A

Depiction of Property Access Crossing

[Sheets Attached]

EXHIBIT B

Form of

AFFIDAVIT OF INSTALLATION OF DITCH CROSSING

This is to acknowledge that I, _____, am a Professional Engineer licensed by the State of Colorado (License # _____) and that to the best of my knowledge, installation of ditch crossing structures and appurtenances located at _____ and maintained by _____ meets the design criteria given to me by the Church Ditch Water Authority and other applicable codes of practice.

Dated this _____ day of _____, 20__.

By: _____
Professional Engineer

SEAL

Subscribed and sworn to before me this ____ day of _____, 20__ .

Notary Public
My commission expires: _____