

STEAMBOAT CANAL AND IRRIGATION COMPANY
Encroachment Application & Instruction Packet
Revised September 25, 2018

This packet is intended to assist Applicants in working with Steamboat Canal and Irrigation Company (SCIC). All entities or persons proposing projects within the SCIC easement, or affecting SCIC facilities, must obtain an encroachment agreement from SCIC prior to performing work.

The Steamboat Canal and Irrigation Company (SCIC, "Irrigation Company") operates and maintains the Steamboat Irrigation Canal that run along the Sierra Nevada foothills. The canal starts at the California Nevada State Line and terminates in South Reno.

Portions of the canal are maintained during winter months for storm drainage by the City of Reno, and Washoe County depending on location. SCIC prepares the canal for irrigation season and maintains the canal during the irrigation season.

The SCIC easements date back to the late 1800's and are generally 45 feet (30 feet from centerline on the roadway side; 15 feet from CL on non-road side) but may be up to 100 feet (50 feet from centerline) on various canal sections. In addition there are prescriptive easements of varying widths for underground seepage which change generally depending on soil conditions and topography.

Modifications to the canal, or projects that may affect the canal require an encroachment application and agreement. An encroachment agreement is a conditional license, with contractual rights and responsibilities for the licensee. It is not an easement or other real property interest. An encroachment agreement, or other agreement, must be signed before the any site work including site preparation within the SCIC easement begins.

Construction projects out of the SCIC easement that increase runoff into the canal must obtain an encroachment agreement but are generally not permitted. Flooding and serious legal consequences may result from unauthorized storm water discharge into the canal.

Dyer Engineering Consultants, Inc, (DEC, "Company Engineer") is the engineer for SCIC. McDonald Carano (MC) is the legal representation for SCIC. DEC, MC, and SCIC are not responsible for design or construction of encroaching project facilities. SCIC and DEC review project designs and applications briefly, for the purposes of protecting the operation and maintenance of the SCIC canals only. SCIC duties regarding an encroachment are only to its shareholders. The person or entity constructing an encroaching project, and their project engineers and contractors, maintain all responsibility for design and construction. No review or approval waives or modifies any encroachment agreement terms or gives SCIC, DEC, or MC any responsibility for design or construction, to workers on site, or the public. It is the responsibility of the Applicant to provide SCIC, DEC, and MC with accurate information, so a reasonable determination can be made regarding the projects compliance with SCIC Standard, and assurance that the proposed project will not adversely affect SCIC facilities.

The project review process can be expedited by insuring the first submittal meets SCIC standards, following careful review of the checklist that is provided in this packet. Which consists of:

- 1.0 The Permitting Process
- 2.0 Project Kick off Meeting Request Form

- 3.0 Encroachment Application Form
- 4.0 SCIC Standards

1.0 THE PERMITTING PROCESS

The following is an outline of the typical permitting process for an encroachment application.

- **Step 1 – Project Kick off Meeting**

- The Project Kick off meeting is required for most encroachment applications. The Kick off meeting has been found to save considerable time and effort for all parties involved.
- Applicant will submit the required Project kick-off meeting form and fee which will cover the costs of the SCIC's representatives. The fee must be received in order to schedule the meeting.
- SCIC and applicant will have a kickoff meeting at which the applicant will present the concepts for the proposed encroachment.
- SCIC will give guidance as applicable to aid the applicant in encroachment permitting process.

- **Step 2 – Encroachment Application Submission**

- SCIC receives the application, application fees, and construction documents.
- SCIC and DEC will perform a review of the drawings and in certain cases, a meeting will be held with DEC, SCIC, and the Applicant to discuss the project. A redline comment letter will be sent to the Applicant with a checklist of items that must be addressed prior to acceptance. The reviews will repeat as explained above until all items from the checklist have been addressed and plans are to SCIC standards.
- An encroachment agreement will be prepared between the Applicant and SCIC. SCIC's Attorney will provide the finalized encroachment agreement pursuant to the payment of all application fees. Applicant will deliver three original copies of the agreement to the Attorney.
- Once the agreement has been executed by all parties, permission has been granted to the Applicant to begin the construction phase of the project in accordance with the agreement.

- **Step 3 - Construction Inspection**

- The Applicant is required to notify SCIC and DEC at least 24 hours before beginning construction on SCIC facilities.
- DEC and SCIC may perform limited field inspection to verify that the construction appears to be in accordance with the accepted design drawings and the encroachment agreement. It is the responsibility of the Applicant to perform adequate construction review to ensure the facilities are constructed to SCIC standards, and in accordance to their design drawings attached to the encroachment agreement.
- After construction is complete, the Applicant is required to schedule a final walkthrough that will be attended by DEC and SCIC to identify any final items that need to be

completed before construction is accepted. A punch list will be prepared and sent to the Applicant listing items required.

- The Applicant must submit record drawings and testing data for the completed project.

Notes:

Costs incurred by the SCIC above the application fee will be billed to the applicant at the cost plus a 10% administration fee. This includes but is not limited to; attorney fees during negotiations, and engineering fees during design review and construction inspection.

This checklist is updated periodically, so downloading the most recent version of the packet for each new application is recommended. Any questions regarding the application process can be directed to Jeff Weigel at DEC at 775-852-1440.

2.0 PROJECT KICK OFF MEETING REQUEST FORM

STEAMBOAT CANAL AND IRRIGATION COMPANY

A kick off meeting is required for encroachment applications in accordance with the following table:

Select	Project Type	Application Fee	Kick off Meeting
	Development or Subdivision	\$9,500	\$1,000
	Bridge or Box Culvert	\$8,500	\$1,000
	Excavation of Canal	\$7,500	\$1,000
	Large Bore (24 inches or larger Dia.)	\$6,500	\$500
	Turnout/Headgate/Dump	\$5,500	\$500
	Small Boring or Directional Drilling	\$4,000	\$500
	Overhead Crossing	\$4,000	Optional (\$500)
	Retaining walls	\$3,000	Optional (\$500)
	Temporary Access Permit	\$1,000	Optional (\$500)
	Other* (list):	TBD*	\$1,000

*Projects not fitting the listed categories will require a kick off meeting, after which an appropriate application fee will be determined.

1. Applicant: _____

Mailing Address: _____

Contact Person: _____

Telephone Number: _____

Email: _____

2. Contact Person: _____

Mailing Address: _____

Telephone Number: _____

Email: _____

3. Engineering Company: _____

Mailing Address: _____

Telephone Number: _____

Contact Person: _____

Email: _____

4. Brief Description of Proposed Construction:

Proposed Construction Start Date: _____

Proposed Construction End Date: _____

(Generally construction during the irrigation season, April 15 to October 15, is not allowed)

Project Location: _____

5. Attach applicable information

Addition data will be helpful in the kick off meeting.

List Attachments:

By submitting this kick off meeting form and fee the applicant agrees to pay for preliminary meeting costs incurred above the initial kick off meeting fee at the SCIC consultants typical billing

rates, plus a 10% administration fee. This includes but is not limited to; attorney fees during negotiations, and engineering fees during design review and construction inspection.

Applicant agrees that the fees are none refundable, and that by submitting the fees there is no guarantee of encroachment approval.

Signed by (print name): _____

Title: _____

Signature: _____

Date: _____

Please make all checks payable to: **Steamboat Canal and Irrigation Company.**

6. Deliver or send Kick off meeting request form and fees to

Dyer Engineering Consultants, Inc.
9160 Double Diamond Pkwy. Ste. A
Reno, NV 89521

7. The project kick off meeting will likely be held at the Dyer Engineering Reno Office (see section 6 for address) or at the proposed project site depending on the information contained in this application.
8. DEC will contact the listed contact person to set up the meeting date and time once the project kickoff form and fee are received.

3.0 STEAMBOAT CANAL AND IRRIGATION COMPANY

Application for Encroachment Agreement Encroachment Agreement to Construct Within or Cross Canal Easement

1. Applicant for Encroachment Agreement (Applicant): _____

Mailing

Address: _____

Contact Person: _____

Telephone Number: _____

Email: _____

2. Contact Person: _____

Mailing Address: _____

Telephone Number: _____

Email: _____

3. Engineering Company: _____

Mailing Address: _____

Telephone Number: _____

Contact Person: _____

Email: _____

4. Brief Description of Proposed Construction:

Proposed Construction Start Date: _____

Proposed Construction End Date: _____

Project Location: _____

5. Attach two (2) (11x17 minimum size) copies of plans/design drawings for the proposed construction. Plans shall be drawn to SCIC standards. A Standards Checklist has been prepared to assist engineers in designing to SCIC standards.
6. Application fees are listed below. For initial submittal, the fee below will begin the review process.

Select	Project Type	Application Fee*
	Development or Subdivision	\$9,500
	Bridge or Box Culvert	\$8,500
	Excavation of Canal	\$7,500
	Large Bore (24 inches or larger Dia.)	\$6,500
	Turnout/Headgate/Dump	\$5,500
	Small Boring or Directional Drilling	\$4,000
	Overhead Crossing	\$4,000
	Retaining walls	\$3,000
	Temporary Access Permit	\$1,000
	Other* (list):	List Fee:

* Costs incurred by the SCIC above the application fees will be billed to the applicant at the cost plus a 10% administration fee. This includes but is not limited to; attorney fees during negotiations, and engineering fees during design review and construction inspection.

Application fees will be used by SCIC for purposes of administration, coordination, engineer review, preparation of agreements, review during construction, legal guidance, and any other expenses incurred related to this application.

Please make all checks payable to: **Steamboat Canal and Irrigation Company.**

7. Deliver or send application, plans, and application fee to:

Dyer Engineering Consultants, Inc.
9160 Double Diamond Pkwy. Ste. A
Reno, NV 89521

8. Bonding

- The SCIC bonding requirements are as follows: Bonding will be 110% of the total cost of irrigation facilities. Upon completion of construction, approval by SCIC, and successful delivery of water through the system, a portion of the bond equal to 100% of the total cost of irrigation facilities will be released. One year after the project has been accepted and approved by SCIC, and pending no problems with the facilities as determined by SCIC, the remaining portion of the bond equal to 10% of the total cost of irrigation facilities will be released. All bond releases are subject to approval by SCIC.
- Easements for SCIC must be recorded with the Washoe County Recorder.
- Starting construction without prior written approval in the form of an Encroachment Agreement from SCIC may result in an additional fee assessment of \$5,000. This fee may be taken from the bond if the Applicant does not pay within 30 days upon receipt of a written invoice.
- If costs incurred by SCIC are greater than the application fee, the Applicant will be responsible to reimburse SCIC for the remainder of the expenses. These additional costs may be taken from the bond if the Applicant does not pay within 30 days upon receipt of a written invoice. If costs incurred by SCIC are less than the application fee, a partial refund may be given back to Applicant, upon receipt by SCIC of written request by Applicant at up to 15 days after the final bond is released.
- The review process will not begin until the application fee is paid.
- This application is valid for 6 months from the date it is submitted. The Encroachment Agreement must be signed within this 6-month period. Once the Encroachment Agreement is signed, the Applicant has one year to complete work on irrigation facilities.
- This application cannot be sold to other parties. If the Applicant chooses to sell the property associated with this application, the application must be resubmitted.

9. Insurance

- SCIC's encroachment agreement will require that SCIC be named as a Certificate Holder and an additional insured for the commercial general liability, commercial

auto liability. The amount of such liability insurance shall be not less than \$5,000,000 combined single limit.

- Licensee shall provide, and shall require its contractors to provide, worker's compensation and employer's liability insurance coverage for no less than \$1,000,000 for any individuals who will be using the License Area in the manner authorized under the final agreement.

NOTES:

1. Starting construction without prior written approval from SCIC may result in the irrigation company assessing an additional fee of \$5,000.
2. If application costs exceed the fees paid, the Applicant will be responsible to reimburse SCIC within 30 days upon receipt of an invoice.
3. The review process will not begin until the application fee is paid.
4. This application is valid for 6 months from the date it is submitted. The encroachment agreement must be signed within this 6-month period. Once the encroachment agreement is signed, the Applicant has 12 months to complete work of irrigation company facilities. A new application and fee must be submitted if these time frames are not met.
5. Other permits (i.e. City, County, etc.) are the responsibility of the Applicant.

SCIC and its engineering and legal consultants will have no responsibility for design or construction of the facilities related to this application.

I have read, understand, and agree to the terms of this application.

Signed by (print name): _____

Title: _____

Signature: _____

Date: _____

4.0 STEAMBOAT CANAL AND IRRIGATION COMPANY (SCIC) STANDARDS CHECKLIST

This checklist is intended to assist engineers in designing projects to SCIC standards. All projects seeking acceptance by SCIC must be designed to these standards. When used correctly, this checklist will expedite the review and encroachment agreement process. Not all items on this checklist will be applicable to every project.

Neither SCIC nor Dyer Engineering Consultants (DEC) will have responsibility for design, construction, or maintenance of the Applicant's facilities. It is the responsibility of the Applicant and its engineer to design the project to meet SCIC standards at a minimum. No approval or acquiescence by SCIC or DEC will operate as a waiver or modification of SCIC standards.

In most instances, the Applicant will install, operate, maintain, inspect, repair, and replace the facilities that are constructed through the application process with no interruption of SCIC delivery of water or operation, maintenance, repair or replacement of SCIC facilities. SCIC only takes responsibility for routine cleaning of facilities like culverts, etc. that may be required for the delivery of water.

Note: This checklist is updated when standards are amended. SCIC reserves the right to make exceptions to the standards or impose other requirements, depending on the Applicant's project.

GENERAL INFORMATION AND REQUIREMENTS

- ☐ Submit an "Application for Encroachment Agreement" and all application fees.
- ☐ SCIC maintains its irrigation facilities by driving a bull dozer in the canal and a track hoe on the maintenance road, and in some instances burning prior to each irrigation season and as needed. This should be considered while designing your project. SCIC only accepts concrete structures to be installed in its easement so they will not be damaged during maintenance.
- ☐ No landscaping or other changes in ground surfaces within SCIC pipeline and canal/lateral ROW should be made without advance written permission of SCIC through the application process. Landscaping changes may (1) limit, prevent, or hamper O&M access; (2) increase the costs of operations and maintenance of the facility; (3) impact facility reliability; or (4) create a public nuisance or liability issue.
- ☐ Pipes, conduits, or other similar facilities are not allowed to be installed over the canal channel. Irrigation boxes, trees, or other facilities are not allowed to be installed in SCIC easements. Turnouts, overhead power lines, etc. can be exceptions.
- ☐ All drawings must be stamped, signed, and dated by a licensed professional engineer. This can be completed after the project meets SCIC standards and is ready for the encroachment agreement.
- ☐ Before submitting drawings to DEC for review, please verify that all notes, references, and labels are correct and accurate.
- ☐ SCIC cannot verify the locations of underground facilities. Underground Service Alert (USA) North 811 or 1-800-642-2444 shall be called before digging.

ALL SUBMITTALS SHALL:

- ☐ Show the plan and profile view of the proposed facilities.

- Show all existing facilities in and around the project (i.e. canal O&M road, turnouts, pipes, box culverts, pipe outlets, etc.).
- Provide the location map, and if applicable, the plat map.
- Show the SCIC canal easement on the drawings.
- Applicant is responsible for checking surrounding property and labeling SCIC easement. If the land is owned, the actual ownership boundaries should be shown.
- Have a copy of this checklist completed by the Applicant or the Applicant's engineer.
- Provide a proposed date for start and completion of construction. The start date should reflect adequate time to complete the application process and secure an encroachment agreement.

Notes to include on plans:

- Notification must be given at least 72 hours prior to the beginning of construction work and re-notification of re-commencement of work following any cessation of work for more than 4 (four) standard working days
 - Contact information: Jeff Weagel, Dyer Engineering Consultants, 775-852-1440
- Any changes in design drawings after the encroachment agreement has been executed must be reviewed and accepted by Dyer Engineering Consultants and Steamboat Canal and Irrigation Company prior to construction.
- Work cannot interfere with delivery of water. Construction within canal corridors that will impact the canal or Operation & Maintenance Road (O&M road) must be completed between October 15 and April 1 (this may vary depending on water year).
- All construction within the canal corridor must be completed to Steamboat Canal and Irrigation Company standards.
- If disturbed, the canal O&M road must be returned to pre-construction state or better, following construction. The O&M road must be available for use by canal personnel between April 1 and October 15 each year (this may vary depending on water year).
- Stormwater and Groundwater runoff enters the canal during storm events or at other unexpected times. It is the responsibility of the Contractor to protect the work site.

BORING

For the purpose of this application packet, boring refers to the installation of a casing under the canal without excavating the canal itself. Also see the "Directional Drilling/Boring" section.

- All facilities (utilities, pipes, etc.) installed under the canal (even under box culverts) must be encased in a steel casing, designed for at least H-20 and required construction equipment loading. Calculations are required.
- In locations where steel casing pipe is used, soil tests for resistivity shall be completed by the Applicant and at the Applicant's expense. Test results shall be submitted to Dyer Engineering Consultants. Soils with a soil resistivity (ohm cm) of 2,500 or less shall have cathodic protection with a 25-year life or have cellular concrete placed in the annular space between the carrier pipe and casing pipe.

- ❑ Casings must have a minimum of 2 feet between the top of the casing and the bottom of the box culvert or concrete-lined canal, and a minimum of 4 feet between the top of the casing and the earthen canal bottom.
- ❑ The casing shall extend at least to the greater of (a) 5' beyond the outside edge of each canal embankment or (b) 15' beyond the outside edge of each canal bottom edge.
- ❑ Bore pits must be located outside of channel embankments.
- ❑ Bore pit compaction shall be 92-percent Modified Proctor density.
- ❑ Trench plugs are to be placed at each end of the casing.
- ❑ Trench plugs shall extend 12 inches radially from casing pipes, and shall have a thickness of 24 inches.
- ❑ Trench plugs shall be a mixture of 10-percent bentonite and 90-percent clay.
- ❑ The carrier pipe must have steel-banded skids or equivalent pipe cradling system.
- ❑ Waterline pipes inside the casings shall have restraining joints.
- ❑ Adequate thrust blocks are required on all bends for DIP, PVC or PIP waterlines.

Notes to include on plans:

- Contractor to notify Jeff Weagel of Dyer Engineering Consultants 72 hours prior to trench plugs installation. Verification of trench plug completion must be performed by Dyer Engineering Consultants before backfilling. Jeff can be reached at 775-852-1440.

DIRECTIONAL DRILLING/BORING

For the purpose of this application packet, directional drilling refers to the installation of a smaller casing for a utility (usually under 6 inches in diameter) installed by directional drilling.

- ❑ Label the conduit material and thickness. Verification that the conduit specifications are sufficient is the responsibility of the Applicant.
- ❑ Conduit shall have a minimum of 2 feet between the top of the conduit and the bottom of a box culvert or concrete-lined canal, and 4 feet between the top of the conduit and the earthen canal bottom.
- ❑ The conduit shall extend at least to the greater of (a) 5' beyond the outside edge of each canal embankment or (b) 15' beyond the outside edge of each canal bottom edge..
- ❑ Bore pits must be located outside of channel embankments.
- ❑ Fill bore pits with a mixture of native material and 10-percent bentonite powder to create a seal that will prevent water from following the new conduit.
- ❑ Bore pit compaction shall be 92-percent Modified Proctor Density.

OCCUPYING EXISTING BLANK CONDUIT/CASING

This section is used when an existing blank conduit is in place under the canal and the Applicant wishes to occupy the conduit. It is common for conduits to be installed at the same time as a box culvert; however, the placement of these conduits does not give permission for the utility to be installed in the conduit. An application, drawings, and fee need to be submitted and an encroachment agreement signed before the

conduit is occupied. Drawings from the original conduit placement can be used if the Applicant can provide them.

- ☐ Show the plan and profile view of the existing blank conduit.
- ☐ Specify the existing conduit material and thickness.
- ☐ Show or note the details of the utility to be installed in the blank conduit.
- ☐ Show where and how the conduit will be accessed to install the utility.
- ☐ Show the canal corridor.

OPEN CUT OF CANAL CHANNEL

- ☐ Open cuts through the ditch may require a concrete liner at the SCIC's discretion.
- ☐ All facilities (utilities, pipes, etc.) installed under the canal must be encased in a steel casing, rated for H-20 loadings. Calculations are required.
- ☐ In locations where steel casing pipe is used, soil tests for resistivity shall be done and submitted to Dyer Engineering Consultants. Soils with a soil resistivity (ohm cm) of 2,500 or less shall have cathodic protection with a 25-year life or have cellular concrete placed in the annular space between the carrier pipe and casing pipe.
- ☐ Casings must have a minimum of 2 feet between the top of the casing and the bottom of the box culvert or concrete-lined canal, and 4 feet between the top of the casing and the earthen canal bottom.
- ☐ Unless specifically approved by SCIC casings shall extend outside the canal easement
- ☐ Trench plugs are to be placed at each end of the casing.
- ☐ Trench plugs are to extend the width of trench, 12 inches above and below casing pipes, and with a thickness of 24 inches.
- ☐ Trench plugs shall be a mixture of 10-percent bentonite and 90-percent clay.
- ☐ The carrier pipe must have adequate steel-banded skids.
- ☐ Waterline pipes inside the casings shall have restraining joints.
- ☐ Adequate thrust blocks are required on all bends for DIP, PVC or PIP waterlines.
- ☐ Bedding material must be shown, as appropriate for the design.

Notes to include on plans (earthen canal):

- ☐ The canal floor and embankment material removed for excavation shall be replaced with a 12-inch minimum thickness of 10-6 cm/sec permeability clay material, in 6-inch maximum lifts.
- ☐ All replaced materials shall be compacted to 96-percent Modified Proctor Density.
- ☐ Canal embankment shall be shaped to match the existing canal prism.
- ☐ Compaction test results must be submitted to Dyer Engineering Consultants. All failed material shall be removed and compacted to specifications. Testing must be performed by a licensed soils laboratory.
- ☐ Open-cut trenches shall be cut at a minimum of 2 horizontal to 1 vertical so that backfill can be properly compacted.
- ☐ Contractor to notify Jeff Weagel of Dyer Engineering Consultants 72 hours prior to trench plugs installation. Verification of trench plug completion must be performed by Dyer Engineering Consultants before backfilling. Jeff can be reached at 775-852-1440.

Notes to include on plans (concrete-lined canal):

- ❑ The existing concrete section must be sawcut to give a clean edge for the replacement section.
- ❑ The trench through the canal may be cut as little as ¼ horizontal to 1 vertical to minimize the amount of concrete liner that needs to be removed. It is the responsibility of the Applicant to verify that compaction will not be affected.
- ❑ Embankment material shall be compacted to a minimum of 92-percent Modified Proctor Density. Native material may be used.
- ❑ Compaction test results must be submitted to Dyer Engineering Consultants. All failed material shall be removed and compacted to specifications. Testing must be performed by a licensed soils laboratory.
- ❑ Canal embankment shall be shaped to match the existing canal prism.
- ❑ Rebar shall be a minimum of #4 bar at 12 inches on center. Rebar shall tie into existing concrete with epoxy.
- ❑ Contractor to notify Jeff Weagel of Dyer Engineering Consultants 72 hours prior to trench plugs installation. Verification of trench plug completion must be performed by Dyer Engineering Consultants before backfilling. Jeff can be reached at 775-852-1440.

BOX AND PIPE CULVERTS

- ❑ If extending an existing box culvert, SCIC recommends that the Applicant perform a reasonable inspection of the existing culvert to make a determination of whether it should be replaced instead of extended.
- ❑ Applicant is responsible to verify that culvert design will not negatively impact the hydraulics of the canal, including other existing structures in the area.
- ❑ A plan view is required of the culvert showing the centerline of the canal, the top of banks, and the SCIC corridor boundaries.
- ❑ Show the elevation and location of the top of the banks, bottom of the banks, and the canal prism, as well as new structures including box culvert and wing walls.
- ❑ Trench detail is required showing bedding, backfill material, and compaction requirements.
- ❑ The dimensions and type of culvert must be labeled.
- ❑ Label the culvert with loading information and rebar details. Loading shall be determined by the Applicant.
- ❑ All concrete used in the construction shall have a minimum compressive strength of 4,000 psi, and be specified by a professional engineer.
- ❑ The culvert wing walls should flare at a 45-degree angle then a 90-degree angle into the canal banks, a minimum of 2 feet perpendicular to the canal banks. Placement of the wing walls cannot interfere with the O&M road. The top of the wing walls shall be a minimum of 12 inches above the high-water mark in the canal.
- ❑ Wing walls shall be tied into the canal banks in a manner that provides a smooth transition from the canal into the culvert, and back out of the culvert on the outlet side.
- ❑ If using a pre-cast wing wall/end section, the wing walls, apron, and cutoff wall must be one piece.
- ❑ If cast-in-place concrete is placed next to pre-cast, Waterstop RX or an approved equivalent shall be placed to prevent seepage between the surfaces.
- ❑ PVC water stop, or equivalent, is required in all joints of cast-in-place concrete.
- ❑ If extending an existing box culvert, Waterstop RX, Swellstop, or an approved equivalent, shall be placed between the old culvert and the new culvert to prevent seepage. Mastic is not acceptable.

- ❑ A concrete apron shall be between the wing walls.
- ❑ Concrete cut-off walls are required on the inlet and outlet, a minimum of 2 feet below the bottom of the concrete slab (apron). These cutoffs are required to extend into the banks to the ends of the wing walls.
- ❑ The structure must be able to handle the maximum flow capacity of the canal. The Applicant is responsible for verifying maximum flows in the specific canal reach and designing appropriately. The culvert shall not cause water to backup upstream of the proposed facility.
- ❑ Detail should show rip rap, appropriately designed to protect the banks and structure:
- ❑ Rip rap sized for velocities.
- ❑ Appropriate length and location for rip rap. Rip rap not generally required on inlet.
- ❑ Rip rap shall be placed up to the high-water mark in the canal.
- ❑ Top of rip rap to be level with top of concrete apron.
- ❑ State on the plans the backfill material and methods for filling and compacting around the box and wing walls. Backfill around the box culvert shall meet manufacturer's specifications for compaction and materials, or a minimum of 92-percent Modified Proctor Density.
- ❑ Place a minimum of 24 inches of clay material behind wing walls, compacted to a minimum of 96-percent Modified Proctor Density.
- ❑ All other backfill material around head walls and in open canal channel to be compacted to a minimum of 96-percent Modified Proctor Density.
- ❑ A 6-foot chain-link fence or 4-foot parapet wall is required on all box culverts that carry pedestrian traffic. Exceptions may occur where local ordinances note otherwise, and upon approval by SCIC and DEC.
- ❑ Access to canal O&M road shall be installed with curb cuts at drive approaches and thickened concrete at sidewalks.
- ❑ Casings under the culvert must be shown on the plan and profile view
- ❑ Identify existing conduits and utilities under the canal.
- ❑ Identify each new conduit being placed under the canal.
- ❑ If the conduit owner/occupier is known, label as such.
- ❑ If the conduit is to remain empty, label as such.
- ❑ Notes to include on plans:
- ❑ Canal floor and embankment material removed for excavation (between apron and undisturbed canal) shall be replaced with a 12-inch minimum thickness of 10-6 cm/sec permeability clay material in 6-inch maximum lifts.
- ❑ Compaction around the box culverts to meet manufacturer requirements or a minimum of 92-percent Modified Proctor Density.
- ❑ All other replaced materials shall be compacted to 96-percent Modified Proctor Density.
- ❑ Canal embankment shall be shaped to match the existing canal prism.
- ❑ Compaction test results shall be submitted to Dyer Engineering Consultants. All failed material shall be removed and compacted to specifications. Testing shall be performed by a licensed soils lab.
- ❑ Open-cut trenches shall be cut at a maximum of 2 horizontal to 1 vertical so that backfill can be properly compacted.

- ❑ Conduits shown on these drawings do not give permission for the conduit to be occupied by an entity other than the original Applicant. Each entity crossing the canal must apply for, and receive an agreement from the canal company.
- ❑ Signs must be placed at each entrance to the canal O&M road that state:
- ❑ No Trespassing. Warning: Canal Maintenance Road, Authorized Personnel Only. No Swimming or Tubing.

DUMP/SPILLWAY/TURNOUT

The turnout structure being proposed shall at all times be subject to rights reserved by SCIC to reasonably use, operate, maintain, inspect, repair, replace and improve the canal. The turnout structure to be built by the Applicant pursuant to the Agreement shall be the sole responsibility of the Applicant for purposes of ongoing maintenance and repair, but the canal shall continue to be used exclusively by SCIC for its ongoing delivery of water to its shareholders. Any future repairs, excavation, removal or other work on the weir/turnout structure shall be subject to advanced review and approval by SCIC engineers.

- ❑ Submit an “Application for Encroachment Agreement” and “Application for Weir/Turnout.”

Turnout Gate & Headwall

- ❑ Provide specifications for the turnout gate. A water-tight Waterman gate, or equivalent, is required.
- ❑ Canal banks shall be tied into the wing walls in a manner that provides a smooth transition around the headwall.
- ❑ The headwall should be placed in a manner so that the structure does not extend into the canal or the O&M road.
- ❑ The inlet structure shall be placed on undisturbed soils.
- ❑ The bottom of the pipe opening should be a minimum of 2 inches off the bottom of the canal floor.
- ❑ Rebar details are required on the submitted drawings. The rebar design must be appropriate for the proposed site and conditions.

Pipe from Turnout

- ❑ Open-cut trenches shall be cut at a minimum of 2 horizontal to 1 vertical so that the backfill can be properly compacted.
- ❑ Bedding material must be shown, as appropriate for the design.
- ❑ Specify the pipe size and class, professional engineer to ensure H20 load compliance.
- ❑ A trench plug is required behind the headwall. Trench plug to be placed in location shown for width of trench, 12 inches above and below the pipe, and a thickness of 24 inches.
- ❑ Trench plugs shall be a 10-percent bentonite and 90-percent clay mixture.

OVERHEAD CROSSING

- ❑ Provide a cross section showing the elevation of the overhead crossing and the elevation of the canal invert and banks.
- ❑ Show the location of power poles and any permanent structures in relation to the canal and toe of the canal embankment. Structures shall not be located closer than 20 feet from the canal bank and shall not interfere with the O&M road.

- Overhead electrical and communication lines should cross perpendicular (between 70 and 90 degrees) to the centerline of the SCIC Canal.
- Overhead wires across the SCIC easement shall be at least 32 feet above all ground levels in the right of way. For electrical powerlines of 69 kilovolts (kV) or higher voltage, the minimum clearance should be 40 feet plus 0.25 inch per kV of line-to-line voltage above 450 kV. In any case, the minimum clearance is to be that determined to be needed with an ambient temperature of 120 degrees Fahrenheit.
- A marker warning sign shall be provided on the O&M road that shows the clearance and electrical line voltage. The warning sign shall face both ways and state, "DANGER, HIGH VOLTAGE OVERHEAD."