

# Benjamin Drainage District

## Application Packet

Guide for Application, Review, and Approval Process with  
Benjamin Drainage District  
For Encroachment upon Easements

## Benjamin Drainage District General Instructions

This packet is intended to assist Applicants in working with Benjamin Drainage District (BDD). All Applicants are required to obtain permission from BDD to do work affecting BDD facilities. BDD facilities include: land drain lines, drainage ditches, and some storm drains.

Any desired development that will affect BDD facilities must go through the Application, Review, and Approval Process. This includes any time that work is done within BDD easements. Franson Civil Engineers (Franson Civil) is the engineering firm for BDD. Franson Civil will review all plans that affect BDD facilities. This review process is in-depth and may be lengthy depending on the quality of the plans submitted for review. The following is a guideline for the Application, Review, and Approval Process affecting BDD facilities:

- The Applicant meets with Benjamin Drainage District representative. The Applicant contacts Franson Civil to receive the application packet.
- The Applicant uses the guidelines in the application packet to design the affected facilities to BDD standards and will coordinate with Franson Civil on ditch capacities and site-specific design elements.
- The development drawings should then be prepared for BDD review.
- Franson Civil receives the **application, application fees, and drawings**. The application and fees have to be submitted to Franson Civil before the final drawings are submitted to BDD. Otherwise, no review of the drawings will be completed by BDD and no review comments will be returned. This will delay the approval of the development.
- Franson Civil will **review** the drawings, including the plat map. A meeting will be held with Franson Civil, BDD, and the Applicant (if desired) to discuss the development. Review comments will be sent to the Applicant with a checklist of items that must be addressed prior to approval (generally 2-3 weeks for each review). Subsequent reviews will take place with coordination directly between Franson Civil/BDD and the Applicant. The review cycle will repeat as explained above until all items from the checklist have been addressed and plans are to BDD standards. This typically takes 2-3 reviews. **If the standards in the packet are strictly adhered to, and the improvements to the facilities are well designed, the time involved in this review process can be greatly reduced.**
- **Bonding** is required by BDD. When the drawings are acceptable, the Applicant will provide a cost estimate to Franson Civil for the construction of BDD facilities so the bonding amount can be determined. Once the bonding amount has been determined, reviewed, and accepted by BDD, the Applicant will be notified of the amount. Once the bonding amount is set, the Applicant should have their bank prepare the bond.
- **Easements** for BDD facilities must be recorded with the Utah County Recorder. Easements shall be shown on the Plat Map for the subdivision. A signed statement from the landowner stating that the easement will be recorded must be submitted if the easement has not been recorded at this point in the process. Proof of record for the irrigation easements or the

Benjamin Drainage District  
General Instructions

signed statement must be submitted to Franson Civil before the Encroachment Agreement will be prepared.

- An **Encroachment Agreement** will be prepared between the Applicant and BDD once all of the above-mentioned items have been completed. An electronic copy of the agreement will be sent out for signature, or, if preferred, three hard copies of the agreement will be mailed to or arranged for pick up by the Applicant. If the Applicant wishes to request changes to the agreement, these changes will have to be discussed and approved by the BDD Chairman and Board.
- Once the Encroachment Agreement has been signed by the Applicant and BDD, permission has been granted to the Applicant to begin the construction phase in accordance with the agreement(s).
- The Applicant is required to notify BDD and Franson Civil at least 24 hours in advance of beginning construction on irrigation facilities, as outlined in the agreement.
- A representative from BDD will make occasional site visits for construction review of the facilities to ensure they are completed in accordance with the agreement.
- After construction is complete, a **final walkthrough** will be done by Franson Civil and BDD to identify any final items that need to be completed before work is accepted by BDD. A **punch list** will be prepared and sent to the Applicant listing items required, as applicable.
- Recording of easement(s) through the Utah County Recorder's Office should be completed (if not already done so) once construction is complete. If construction changes altered where BDD facilities were installed and the easement was already recorded, an updated easement document will need to be recorded prior to acceptance by BDD.
- When all these items are complete, BDD will send a **letter of acceptance** to the Applicant stating the modifications to the drainage district facilities are complete.

Enclosed in this packet are:

- Large Subdivisions and General Encroachment Application
- Small Subdivisions Application
- City or Utility Crossings Application (Bore, Overhead, Etc.)
- Development Design Checklist (to assist the Applicant's engineer in designing plans to BDD standards)

## BENJAMIN DRAINAGE DISTRICT

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### LARGE SUBDIVISIONS AND GENERAL ENCROACHMENT

Application for Agreement to Encroach and Construct within  
Benjamin Drainage District (BDD) Right-of-Way or Easement  
(for developments greater than 2.5 acres)

1. Applicant for Encroachment Agreement (Applicant): \_\_\_\_\_  
Mailing Address: \_\_\_\_\_  
Contact Person: \_\_\_\_\_  
Telephone Number: \_\_\_\_\_  
Email: \_\_\_\_\_
2. Legal Name of Owner for Agreement: \_\_\_\_\_  
Owner Mailing Address: \_\_\_\_\_  
Signatory Name: \_\_\_\_\_  
Telephone Number: \_\_\_\_\_  
Email: \_\_\_\_\_
3. Contact Person (if different than #2): \_\_\_\_\_  
Mailing Address: \_\_\_\_\_  
Telephone Number: \_\_\_\_\_  
Email: \_\_\_\_\_
4. Engineering Company: \_\_\_\_\_  
Mailing Address: \_\_\_\_\_  
Telephone Number: \_\_\_\_\_  
Contact Person: \_\_\_\_\_  
Email: \_\_\_\_\_
5. Brief Description of Proposed Construction and Encroachment on BDD Facilities (include location and subdivision name, if applicable): \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
6. Proposed start date: \_\_\_\_\_ Proposed completion date: \_\_\_\_\_
7. Attach two (2) 11x17 copies of plans/design drawings for the proposed construction. Also, email a digital plan set to Franson Civil Engineers (see #9). Plans shall be drawn to BDD standards. A Design Checklist has been prepared to assist engineers in designing to BDD standards.
8. Attach a check for \$9,000 for the application and review fee. The application fee will be used by BDD for purposes of administration, coordination, engineer review, preparation of agreements, construction review, legal guidance, and any other expenses it incurs related to this application. If fees incurred by BDD are greater than the application fee, the Applicant will be responsible to reimburse BDD for the remainder of the expenses.

Please make all checks payable to: **Benjamin Drainage District**

9. Send application, plans, and application fee by mail or email to:

Franson Civil Engineers  
Attn: Canal Reviews  
1276 South 820 East, Suite 100  
American Fork, UT 84003  
Telephone: (801) 756-0309  
Email: encroachment@fransoncivil.com

10. The following persons are available for consultation:

Anthony Canto	(801) 655-3234	BDD Chairman
Glen Tanner	(801) 852-8602	BDD Board Member
Patricia Ayaa	(801) 756-0309	Franson Civil Engineers

**NOTES:**

1. The review process will not begin until the application fee is paid.
2. The BDD bonding requirements are as follows: Bonding will equal the total cost of irrigation and drainage facilities. Eighty percent of the bond will be released upon completion of construction, approval by BDD, and successful delivery of water through the system for a full irrigation season. Twenty percent of the bond will be released two years after the project has been accepted and approved by BDD, pending no problems with the facilities. All bond releases are subject to approval by BDD.
3. Easements for BDD must be recorded with the Utah County Recorder. The recorded document, or a signed statement stating the easement will be recorded, must be provided to Franson Civil prior to the encroachment agreement being released for signatures.
4. Starting construction without prior written approval in the form of an encroachment agreement from BDD may result in an additional fee assessment of \$10,000. This fee may be taken from the bond if the Applicant does not pay within 30 days upon receipt of a written invoice.
5. If review costs exceed the fees paid with this application, additional costs will be the responsibility of the Applicant. Additional costs may be taken from the bond if the Applicant does not pay within 30 days upon receipt of a written invoice.
6. This application is valid for six months from the date it is submitted. The encroachment agreement must be signed within this six-month period. Once the encroachment agreement is signed, the Applicant has one year to complete work on irrigation and drainage facilities.
7. This application cannot be sold to other parties. If the Applicant chooses to sell the property associated with this application, the application is voided, and the new owner is required to begin the application process again.

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

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Signature of Applicant

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Printed

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Date

## BENJAMIN DRAINAGE DISTRICT

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### SMALL SUBDIVISIONS

Application for Agreement to Encroach and Construct within  
Benjamin Drainage District (BDD) Right-of-Way or Easement  
(for developments 2.49 acres or smaller)

1. Applicant for Encroachment Agreement (Applicant): \_\_\_\_\_  
\_\_\_\_\_  
Mailing Address: \_\_\_\_\_  
Contact Person: \_\_\_\_\_  
Telephone Number: \_\_\_\_\_  
Email: \_\_\_\_\_
2. Legal Name of Owner for Agreement: \_\_\_\_\_  
Owner Mailing Address: \_\_\_\_\_  
Signatory Name: \_\_\_\_\_  
Telephone Number: \_\_\_\_\_  
Email: \_\_\_\_\_
3. Contact Person (if different than #2): \_\_\_\_\_  
Mailing Address: \_\_\_\_\_  
Telephone Number: \_\_\_\_\_  
Email: \_\_\_\_\_
4. Engineering Company: \_\_\_\_\_  
Mailing Address: \_\_\_\_\_  
Telephone Number: \_\_\_\_\_  
Contact Person: \_\_\_\_\_  
Email: \_\_\_\_\_
5. Brief Description of Proposed Construction and Encroachment on BDD Facilities (include location and subdivision name, if applicable): \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
6. Proposed start date: \_\_\_\_\_ Proposed completion date: \_\_\_\_\_
7. Attach two (2) 11x17 copies of plans/design drawings for the proposed construction. Also, email a digital plan set to Franson Civil Engineers (see #9). Plans shall be drawn to BDD standards. A Design Checklist has been prepared to assist engineers in designing to BDD standards.
8. Attach a check for \$6,500 for the application and review fee. The application fee will be used by BDD for purposes of administration, coordination, engineer review, preparation of agreements, construction review, legal guidance, and any other expenses it incurs related to this application. If fees incurred by BDD are greater than the application fee, the Applicant will be responsible to reimburse BDD for the remainder of the expenses.

Please make all checks payable to: **Benjamin Drainage District**

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10. The following persons are available for consultation:

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**NOTES:**

1. The review process will not begin until the application fee is paid.
2. The BDD bonding requirements are as follows: Bonding will equal the total cost of irrigation and drainage facilities. Eighty percent of the bond will be released upon completion of construction, approval by BDD, and successful delivery of water through the system for a full irrigation season. Twenty percent of the bond will be released two years after the project has been accepted and approved by BDD, pending no problems with the facilities. All bond releases are subject to approval by BDD.
3. Easements for BDD must be recorded with the Utah County Recorder. The recorded document, or a signed statement stating the easement will be recorded, must be provided to Franson Civil prior to the encroachment agreement being released for signatures.
4. Starting construction without prior written approval in the form of an encroachment agreement from BDD may result in an additional fee assessment of \$10,000. This fee may be taken from the bond if the Applicant does not pay within 30 days upon receipt of a written invoice.
5. If review costs exceed the fees paid with this application, additional costs will be the responsibility of the Applicant. Additional costs may be taken from the bond if the Applicant does not pay within 30 days upon receipt of a written invoice.
6. This application is valid for six months from the date it is submitted. The encroachment agreement must be signed within this six-month period. Once the encroachment agreement is signed, the Applicant has one year to complete work on irrigation and drainage facilities.
7. This application cannot be sold to other parties. If the Applicant chooses to sell the property associated with this application, the application is voided and the new owner is required to begin the application process again.

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

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Signature of Applicant

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Printed

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Date

## BENJAMIN DRAINAGE DISTRICT

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### CITY OR UTILITY CROSSINGS (BORE, OVERHEAD, ETC.) – APPLICATION TYPE 3

Application for Agreement to Encroach and Construct within  
Benjamin Drainage District (BDD) Right-of-Way or Easement

1. Applicant for Encroachment Agreement (Applicant): \_\_\_\_\_  
\_\_\_\_\_  
Mailing Address: \_\_\_\_\_  
Contact Person: \_\_\_\_\_  
Telephone Number: \_\_\_\_\_  
Email: \_\_\_\_\_
2. Legal Name of Owner for Agreement: \_\_\_\_\_  
Owner Mailing Address: \_\_\_\_\_  
Signatory Name: \_\_\_\_\_  
Telephone Number: \_\_\_\_\_  
Email: \_\_\_\_\_
3. Contact Person (if different than #2): \_\_\_\_\_  
Mailing Address: \_\_\_\_\_  
Telephone Number: \_\_\_\_\_  
Email: \_\_\_\_\_
4. Engineering Company: \_\_\_\_\_  
Mailing Address: \_\_\_\_\_  
Telephone Number: \_\_\_\_\_  
Contact Person: \_\_\_\_\_  
Email: \_\_\_\_\_
5. Brief Description of Proposed Construction and Encroachment on BDD Facilities (include location and subdivision name, if applicable): \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
6. Proposed start date: \_\_\_\_\_ Proposed completion date: \_\_\_\_\_
7. Attach two (2) 11x17 copies of plans/design drawings for the proposed construction. Also, email a digital plan set to Franson Civil Engineers (See #9). Plans shall be drawn to BDD standards. A Design Checklist has been prepared to assist engineers in designing to BDD standards.
8. Attach a check for \$5,000 for the application and review fee. The application fee will be used by BDD for purposes of administration, coordination, engineer review, preparation of agreements, construction review, legal guidance, and any other expenses it incurs related to this application. If fees incurred by BDD are greater than the application fee, the Applicant will be responsible to reimburse BDD for the remainder of the expenses.  
  
Please make all checks payable to: **Benjamin Drainage District**



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10. The following persons are available for consultation:

Anthony Canto	(801) 655-3234	BDD Chairman
Glen Tanner	(801) 852-8602	BDD Board Member
Patricia Ayaa	(801) 756-0309	Franson Civil Engineers

**NOTES:**

1. The review process will not begin until the application fee is paid.
2. Starting construction without prior written approval in the form of an Encroachment Agreement from BDD may result in an additional fee assessment of \$10,000 and a project cease and desist letter. This fee may be taken from the bond if the Applicant does not pay within 30 days upon receipt of a written invoice.
3. If costs incurred by BDD are greater than the application fee, the Applicant will be responsible to reimburse BDD 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.
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. If the Encroachment Agreement is not signed within this period, the Applicant may be required to submit a new application. Once the Encroachment Agreement is signed, the Applicant has one year to complete work on irrigation facilities.
5. This application cannot be sold to other parties. If the Applicant chooses to sell the property associated with this application, the application is voided and the new owner is required to begin the application process again.

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

\_\_\_\_\_  
Signature of Applicant

\_\_\_\_\_  
Printed

\_\_\_\_\_  
Date

## **BENJAMIN DRAINAGE DISTRICT DEVELOPMENT DESIGN CHECKLIST**

This checklist is intended to assist engineers in designing projects to Benjamin Drainage District (BDD) standards. All projects seeking acceptance by BDD 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 BDD nor Franson Civil Engineers (Franson Civil) will have responsibility for design or construction of Applicant's facilities. It is the responsibility of the Applicant and their engineer to design the project to BDD standards. No approval or acquiescence by BDD or Franson Civil will operate as a waiver or modification of BDD standards.

BDD Standard Drawings (Standard Drawings) are available for reference and are to be used as design examples. Standard Drawings, being design examples, do not represent an actual site-specific design and are not to be directly included in the drawings. Final development drawings must be designed and prepared by a licensed Professional Engineer.

The Applicant will install the facilities that are constructed through the application process with no interruption of BDD operations.

Note: This checklist is updated when standards are amended. Checking for the latest version of this checklist at [www.fransoncivil.com/canal-applications](http://www.fransoncivil.com/canal-applications) will ensure the most up-to-date information. BDD reserves the right to make exceptions to the standards or impose other requirements, depending on the Applicant's project.

### **GENERAL**

- ☐ Appropriate application must be filled out and all application fees submitted.
- ☐ All drawings must be stamped, signed, and dated by a licensed Professional Engineer, which can be completed after all drawing reviews by BDD and Franson Civil.
- ☐ Show all existing drainage ditches and drain lines affected by development, including storm drain discharge locations. The exact location of drain lines is not always known. Potholing is required to locate the drains before the design is started.
- ☐ If any BDD facilities are located during construction that are not identified on the drawings, Applicant shall work with BDD through drawing reviews and then shall perform what work is required to cause the BDD facilities to remain functional for use by BDD. All work shall be to BDD standards. All costs are the responsibility of the Applicant.
- ☐ Show new location of all ditches and drain lines. All open channel ditches must be piped.
- ☐ All storm drainage must route through an orifice and oil/water separator before discharging into the BDD open drains.
- ☐ Submit Plat Map; all BDD facilities must have recorded easements (see Easements section).

- ☐ Before submitting drawings to Franson Civil, verify all notes, references, labels, and streets are clearly labeled.
- ☐ Bonding is required on all BDD facility improvements. After drawings have been deemed acceptable by Franson Civil, please submit a detailed cost estimate of construction (materials and labor) of BDD facilities. Once this has been checked, the bond amount will be set.

**ADD THE FOLLOWING NOTES TO DRAWINGS UNDER HEADING “BENJAMIN DRAINAGE DISTRICT NOTES”**

- ☐ Contractor must notify Franson Civil Engineers at least 24 hours before construction on Benjamin Drainage District facilities. Call Kyle DeVaney, P.E., with Franson Civil Engineers at 801-756-0309. Failure to do so may result in a \$10,000 fine.
- ☐ Benjamin Drainage District contact during construction: Anthony Canto, Chairman, 801-655-3234.
- ☐ All construction must be done to Benjamin Drainage District Standards.
- ☐ It is the responsibility of the contractor to protect the work site. Any damage to the canal corridor caused by construction activities will be the responsibility of the contractor and Applicant.
- ☐ All backfill materials shall be compacted to a minimum of 95% standard Proctor density.
- ☐ Applicant is required to perform compaction testing at the Applicant’s cost. If requested, compaction test results shall be submitted to Franson Civil Engineers. All failed material shall be removed and compacted to specifications. Testing must be performed by a licensed soils lab.
- ☐ Prior to backfilling of pipes, the contractor must notify Kyle DeVaney, P.E., of Franson Civil Engineers so a GPS survey of the location and elevation of the installed pipelines can be performed.
- ☐ All concrete used in construction shall have a minimum compressive strength of 4,000 psi. The concrete mix shall include between 5% and 7% air entrainment.
- ☐ Apply Waterstop RX, Swellstop, or an approved equivalent to all concrete cold joints.
- ☐ PVC water stop, or equivalent, is required in all joints of cast-in-place concrete to prevent seepage between the surfaces.
- ☐ Fences disturbed during construction activities must be replaced and returned to pre-construction conditions, or better.
- ☐ If any BDD facilities are located during construction that are not identified on the drawings, Applicant shall work with BDD through drawing reviews and then shall perform what work is required to cause the BDD facilities to remain functional for use by BDD. All work shall be to BDD standards. All costs are the responsibility of the Applicant.
- ☐ Neither BDD nor Franson Civil can verify the locations of underground facilities. Blue Stakes should always be called before digging (1-800-662-4111).

## **DRAIN LINES (Underground Land Drains)**

- ☐ All existing drain lines shall be potholed at the development boundaries and shown on the plans. Label each location where the drain lines were potholed. Also, show the approximate location of existing drain lines by viewing the BDD map. A map in the area of your subdivision can be found here: [BDD Public \(arcgis.com\)](https://arcgis.com/public/BDD) and on the Franson Civil website: <https://fransoncivil.com/canal-applications/>.
- ☐ All existing land drains on the developed property, and under roads to be improved around the property, are required to be improved to current standards. Show proposed drain line locations. The new drain line shall connect with the existing drain line on adjacent properties.
- ☐ Pipe size should match the existing size of the underground land drain lines, but shall have a minimum diameter of 8 inches.
- ☐ Pipe should be ADS N-12 with manufactured perforations.
- ☐ A trench detail of the proposed land drain is required.
- ☐ The soil is predominantly clay in the BDD service area. Backfill the perforated pipe with at least 1 foot of 1-inch crushed clean gravel around the pipe.
- ☐ Submit a soils report and add a note to the drawings specifying the installation of a geotextile fabric of the Mirafi 140 N series or equivalent as indicated below. Any equivalent geotextile fabric must be approved by the BDD engineer prior to approval of the drawings.
  - For native soil material with less than 20% fines: Wrap the geotextile fabric around the backfilled 1-inch clean crushed gravel material.
  - For native soil material with 20% fines or greater: Cover only the top of the backfilled 1-inch clean crushed gravel material with the geotextile fabric across the entire width of the trench.
- ☐ Metallic warning tape (labeled “Caution: Buried Drain Line Below”) must be installed a minimum of 1 foot above the pipe. In some circumstances, a locating wire may be required.
- ☐ Manhole and cleanout box lids must be marked as “DRAIN” only. Sewer, Water, Storm Drain, etc. are not acceptable.
- ☐ Drain line cleanout boxes are required every 500 feet, minimum, and at all alignment changes. Boxes are also required on each side of road crossings.
- ☐ Pipes entering and exiting a cleanout box or manhole must be sealed and grouted.
- ☐ Pipes entering and exiting a cleanout box or manhole must be secured in place with a concrete collar.
- ☐ If a utility is being installed within 10 feet of an existing clay drain pipe, the clay pipe should be replaced with ADS N12 perforated pipe as trenching activities may weaken the clay pipe and lead to breakage of the pipe.
- ☐ An easement for all drain lines must be recorded (see Easements section).

### **Notes to add to plans under the header “Benjamin Drainage District Notes”**

- ☐ Clay cutoffs are required every 250 feet on sewer and other lines that are deeper than drain lines to prevent water from following the pipe trench. Clay cutoffs must be 2 feet long, keyed into the trench walls 1 foot, surrounding the pipe, and as high as the drain lines.
- ☐ Pipes or other utilities running parallel to the drain lines in a shared easement shall be placed a minimum of 5 feet horizontally distanced from the drain lines.
- ☐ Pipes crossing perpendicularly over or under the drain lines shall have a minimum 1-foot vertical clearance.
- ☐ Pipes entering and exiting a cleanout box or manhole must be sealed and grouted.
- ☐ Pipes entering and exiting a cleanout box or manhole must be secured in place with a concrete collar.

### **STORMWATER AND DETENTION BASIN**

- ☐ Stormwater can be discharged in BDD’s open drains when approved by the BDD Board, but shall not be discharged into BDD’s land drain pipes.
- ☐ Detention basins must be above the top of the high water mark in the open drain to prevent backflow into the detention basin. Show elevations of the detention basin.
- ☐ Orifice plate must be galvanized steel or aluminum and sized correctly. The acceptable flow rate into BDD facilities is 0.1 cfs per acre of land. State the acreage of the development.
- ☐ Trash rack or grate is required on outlet of pond.

### **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 Boring/Drilling and Microtrenching” section to see if your project qualifies for that section.*

- ☐ All facilities (utilities, pipes, etc.) installed under the canal (even under box culverts) must be encased in a continuous welded steel, fused HDPE solid wall, or fused PVC casing.
- ☐ Minimum thickness for steel casing can be found on the standard drawings. Minimum HDPE casing thickness shall be DR 32.5. PVC casing shall have a minimum pressure rating of 50 psi. Verification that the minimum thickness is sufficient is the responsibility of the Applicant.
- ☐ Casings under the canal must be shown on the plan and profile view.
- ☐ 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 Franson Civil. 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. In areas with sand or cobbles, this distance may need to be increased. The actual safe depth is to be determined by the Applicant's engineer.
- ☐ The casing shall extend outside the canal corridor.
- ☐ Bore pits must be located outside the canal corridor.
- ☐ The carrier pipe shall have adequate casing spacers.
- ☐ 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.
- ☐ See the "Canal Boring Plan and Section" in the BDD Standard Drawing Set for additional requirements.

**Notes to add to plans under the header "Benjamin Drainage District Notes"**

- ☐ Bore pits must be placed completely outside the canal right-of-way.
- ☐ Fill bore pits with a mixture of native material and 10% bentonite powder to create a seal that will prevent water from following the new conduit.
- ☐ Bore pit compaction shall be a minimum of 95% standard Proctor density.
- ☐ 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 10% bentonite and 90% clay mixture. At least 40% of the backfill material must pass a No. 200 U.S. standard sieve prior to adding bentonite powder. The backfill material shall then be amended by adding and thoroughly mixing commercial bentonite powder with the backfill material at a ratio of one-part bentonite to nine parts backfill material. Impermeable flowable fill is an acceptable alternative.
- ☐ Contractor to notify Kyle DeVaney of Franson Civil Engineers when trench plugs are installed. Verification of trench plug completion must be performed by Franson Civil Engineers before backfilling. Kyle can be reached at 801-756-0309.
- ☐ Water line pipe inside the casing shall have restraining joints.
- ☐ Thrust blocks are required on all bends for DIP, PVC, or PIP water lines.

## **DIRECTIONAL BORING/DRILLING AND MICROTRENCHING**

*For the purpose of this application packet, directional drilling refers to the installation of a smaller casing for a utility (usually under six inches in diameter) installed by directional drilling. Microtrenching involves the excavation of narrow shallow trenches, typically 1 to 2 inches wide and up to 12-16 inches deep into existing roadways and sidewalks to install fiber optic cables and other utilities.*

- ☐ Label the conduit material and thickness. Verification that the conduit specifications are sufficient is the responsibility of the Applicant.
- ☐ Conduit must have a minimum of two feet between the top of the conduit and the bottom of a box culvert or concrete-lined canal, and four feet between the top of the conduit and the earthen canal bottom. In areas with sand or cobbles, this distance may need to be increased. The actual safe depth is to be determined by the Applicant's engineer.
- ☐ For directional bore or microtrench above the box or pipe culvert, there should be a minimum of 1 foot between the bottom of the conduit and the top of the box or pipe culvert.
- ☐ The conduit shall extend outside the canal corridor.
- ☐ Bore pits must be located outside the canal corridor.
- ☐ Fill bore pits with a mixture of native material and 10% bentonite powder to create a seal that will prevent water from following the new conduit.
- ☐ Bore pit compaction shall be a minimum of 95% standard Proctor density.
- ☐ See the "Directional Drilling and Microtrenching Details" in the BDD Standard Drawing Set for additional requirements.

### **Notes to add to plans under the header "Benjamin Drainage District Notes"**

- ☐ Work cannot interfere with delivery of water. Installation activities can take place at any time provided BDD's access to operation, maintenance, and replacement of its facilities is not impacted.
- ☐ Bore pits must be placed completely outside the canal right-of-way.
- ☐ Fill bore pits with a mixture of native material and 10% bentonite powder to create a seal that will prevent water from following the new conduit.
- ☐ Bore pits shall be compacted to a minimum of 95% standard Proctor Density.

## **EASEMENTS**

- ☐ Easements are required to be recorded with the Utah County Recorder for all BDD facilities:
  - Plat Maps are best to have these easements recorded.
  - If the plat has already been recorded, the owner can grant the easement with a legal description and have this recorded.
  - Proof of the record must be submitted to Franson Civil.

- ☐ Easements are 20 feet wide minimum, centered over the pipe. Any changes in the easement width will need to be reviewed by BDD. Easements should be in the name of the Benjamin Drainage District.
- ☐ If Applicant does not provide proper easements in a timely manner, BDD may use the bond for any costs associated with procuring the easements necessary for their facilities.
- ☐ Note to be added to the Plat Map: “No trees, shrubs, telephone boxes, or power boxes are allowed in Benjamin Drainage District easements.”