From: jeffrey.r.marcell@dom.com [jeffrey.r.marcell@dom.com]
Sent: 2/15/2016 4:55:06 PM
To: Jeffrey C Heffelman (Generation - 3) [/O=DOMINION/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=Jeffre3]
Subject: Fwd: Outfall 010 Bulkhead
Attachments: image007.png; ATT00001.htm; image008.png; ATT00002.htm; image009.png; ATT00003.htm; image010.png; ATT00004.htm; image011.png; ATT00005.htm; image012.png; ATT00006.htm; image013.png; ATT00007.htm; Possum Concrete Spec Section 03100.pdf; ATT00008.htm

FYI

Let's talk with Reuben, Whitey, and Doug tomorrow

Sent from my iPhone

Begin forwarded message:
From: Scott Quinlan <s.quinlan@gaiconsultants.com>
Date: February 15, 2016 at 16:50:54 EST
To: "rwilliams@gloverconstruction.com" <rwilliams@gloverconstruction.com>
Cc: "Michael A Glagola (Generation - 34) (michael.a.glagola@dom.com)" <michael.a.glagola@dom.com>, "Jeffrey R Marcell (Generation - 3)" <jeffrey.r.marcell@dom.com>, 'John Glover' <jglover@gloverconstruction.com>, John Klamut <J.Klamut@gaiconsultants.com>, John DeBarbieri <J.DeBarbieri@gaiconsultants.com>
Subject: Outfall 010 Bulkhead

Rueben:

Options for plugging Outfall 010:

1. <!--[if !supportLists]--><!--[endif]-->Bulkheading options:
    a. <!--[if !supportLists]--><!--[endif]-->Clean end of culvert, install bulkhead, fill culvert above sediment
        i. <!--[if !supportLists]--><!--[endif]-->Catch the toe drainage via sandbags upstream or install pipe to collect flows.
        ii. <!--[if !supportLists]--><!--[endif]-->Collect downstream waters and divert to Pond D.
        iii. <!--[if !supportLists]--><!--[endif]-->Remove downstream pneumatic plug.
        iv. <!--[if !supportLists]--><!--[endif]-->Clean out end of culvert.
        v. <!--[if !supportLists]--><!--[endif]-->Install formwork / plug. Formwork upstream is within pipe and formwork downstream is at outfall pipe. Seal formwork / plug with bentonite waterstop and dewater downstream end of culvert.
        vi. <!--[if !supportLists]--><!--[endif]-->Drill concrete culvert, install steel reinforcement (#4 bar @ 8" o.c.) for cast-in-place concrete, and epoxy annulus.
        vii. <!--[if !supportLists]--><!--[endif]-->Install 3,000 p.s.i fast-setting / curing concrete within formwork and into rebar.
        viii. <!--[if !supportLists]--><!--[endif]-->Cure and then remove formwork.
        ix. <!--[if !supportLists]--><!--[endif]-->Restore disturbed areas
        x. <!--[if !supportLists]--><!--[endif]-->Fill remaining culvert voids with flowable fill or grout.
    b. <!--[if !supportLists]--><!--[endif]-->Clean entire culvert, install bulkhead, fill entire culvert
        i. <!--[if !supportLists]--><!--[endif]-->Same as 1.a except cleanout all debris in pipe first.
        ii. <!--[if !supportLists]--><!--[endif]-->Fill entire culvert with flowable fill or grout.

c. <!--[if !supportLists]--><!--[endif]-->ALTERNATE: Concrete masonry unit / brick and mortar bulkhead & fill pipe opening
    i. <!--[if !supportLists]--><!--[endif]-->Same as Option 1.a. or 1.b but install CMU / brick and mortar bulkhead. Can install some rebar inside CMU's and fill void with concrete for some structural support.
    ii. <!--[if !supportLists]--><!--[endif]-->Fill culvert voids with flowable fill or grout.

2. <!--[if !supportLists]--><!--[endif]-->Grouting culvert only
    a. <!--[if !supportLists]--><!--[endif]-->Install metal plates or plywood on upstream end.
    b. <!--[if !supportLists]--><!--[endif]-->Collect upstream and downstream waters and divert to Pond D.
    c. <!--[if !supportLists]--><!--[endif]-->Remove downstream pneumatic plug.
    d. <!--[if !supportLists]--><!--[endif]-->Clean out end of culvert.
    e. <!--[if !supportLists]--><!--[endif]-->Install downstream metal plate or plywood. Backfill with dirt material to secure in place.
    f. <!--[if !supportLists]--><!--[endif]-->Fill culvert voids with flowable fill or grout.
    g. <!--[if !supportLists]--><!--[endif]-->Remove upstream and downstream metal plates or plywood.
    h. <!--[if !supportLists]--><!--[endif]-->Restore disturbed areas.

Pick an option or describe some variation of the above, and we will prepare sketch with details, as needed. We will follow up this discussion with phone call. A general specification for pipe grouting has been attached for your reference.

Sincerely,

Scott C. Quinlan, PE
Director – Energy Water Resources Engineering and Planning

GAI Consultants
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