

DESIGN DRAWINGS &
SPECIFICATIONS

NEW PRIMARY SPILLWAY
AND SEAL OLD MAIN DRAIN

FOR

CHATTOOGA LAKE CLUB

SCDO1637 (C-1)

MOUNTAIN REST, SOUTH CAROLINA



Handwritten signature of Howard R. Leonard, a professional engineer, in blue ink. The signature is written over a red circular professional seal.

Designed By:

PERITUS CIVIL, INC.

GREENVILLE, SOUTH CAROLINA

864-270-5960

BOTTOM COLD TROUT
WATER PUMP. DOWN
TO INTAKE
STRUCTURE.
(DWG. 8)

CHATTOOGA LAKE
NORMAL EL. 1810.03'

10" SIPHON
EXISTING

WATER
EDGE



NEW PRIMARY SPILLWAY
SYSTEM. INTAKE STRUCTURE
(SEE DWG. 4)

WATER
EDGE

Top of 30" Pipe Elev. 1810.03

Elev. 1810.36

Elev. 1810.35

Property Line per P.B. P-48/162 (Not Surveyed)

Shoreline

Elev. 1810.37

Top of Bank

Elev. 1818.52

Elev. 1818.26

Elev. 1818.11

Elev. 1810.35

Elev. 1810.24

Boat Anchor

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IPN 5/8" REBAR

Boiler Ramp

Dry Hydrant

EMERGENCY
SPILLWAY

EL. 1812.5

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Elev. 1818.42

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Elev. 1819.48

Elev. 1819.58

Elev. 1819.68

Elev. 1819.78

Elev. 1819.88

Elev. 1819.98

Elev. 1820.08

Elev. 1820.18

Elev. 1820.28

Elev. 1820.38

Elev. 1820.48

Elev. 1820.58

Elev. 1820.68

Elev. 1820.78

Elev. 1820.88

Elev. 1820.98

Elev. 1821.08

Elev. 1821.18

Elev. 1821.28

Elev. 1821.38

Elev. 1821.48

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Elev. 1821.98

Elev. 1822.08

Elev. 1822.18

Elev. 1822.28

Elev. 1822.38

Elev. 1822.48

Elev. 1822.58

Elev. 1822.68

Elev. 1822.78

Elev. 1822.88

Elev. 1822.98

Elev. 1823.08

Elev. 1823.18

Elev. 1823.28

Elev. 1823.38

Elev. 1823.48

Elev. 1823.58

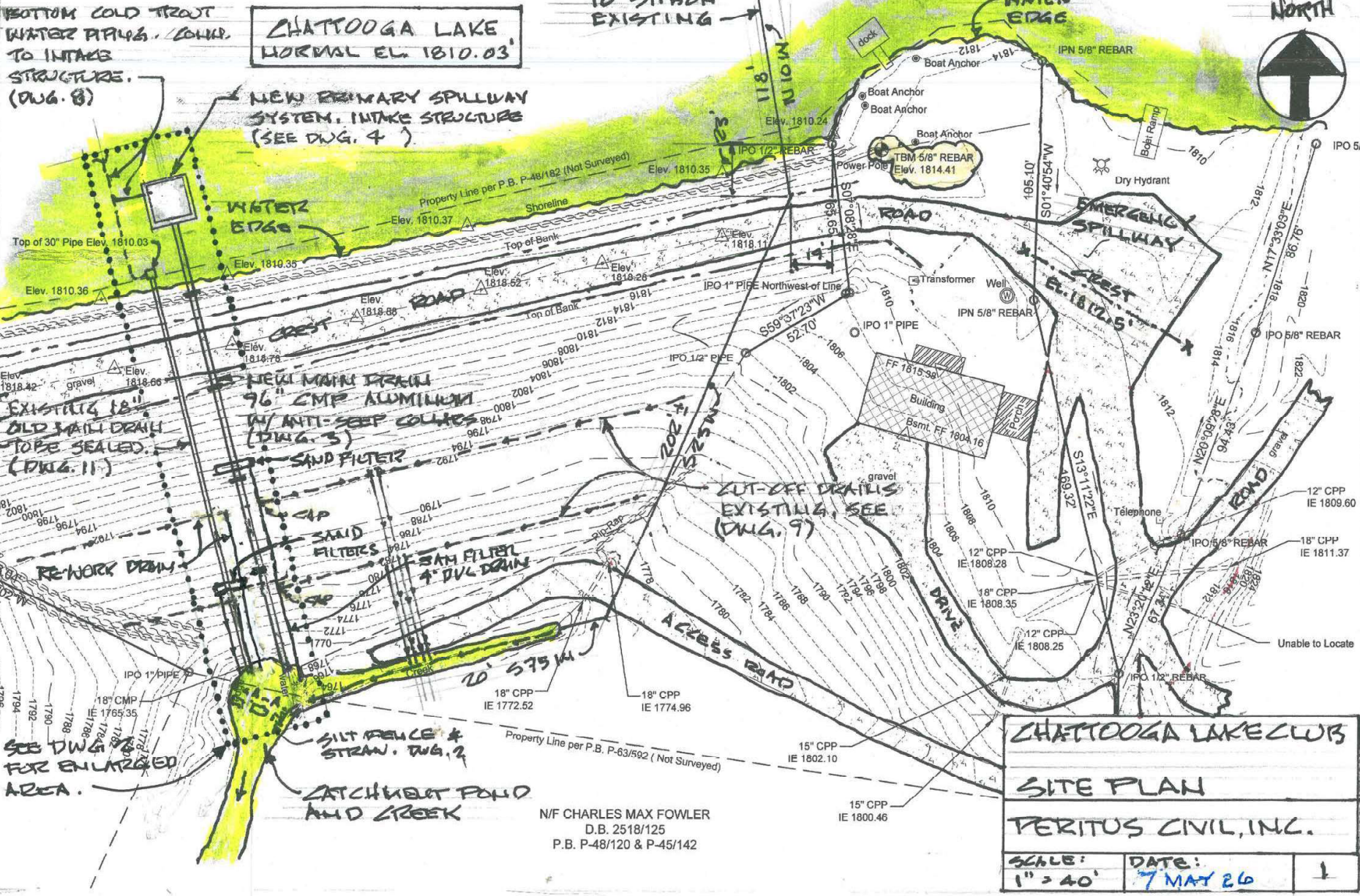
Elev. 1823.68

Elev. 1823.78

Elev. 1823.88

Elev. 1823.98

Elev. 1824.08



CHATTOOGA LAKE CLUB

SITE PLAN

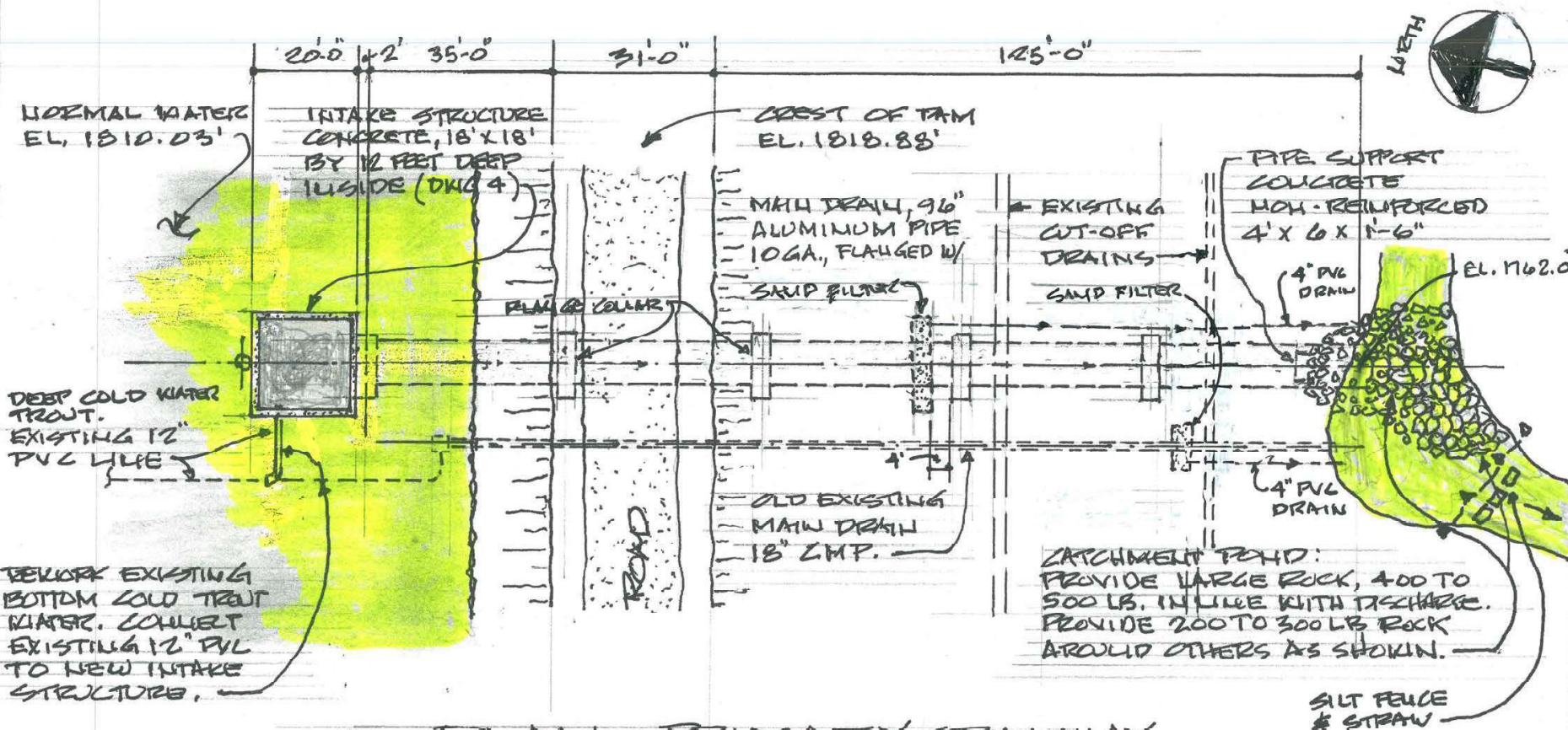
PERITUS CIVIL, INC.

SCALE:
1" = 40'

DATE:
7 MAY 26

1

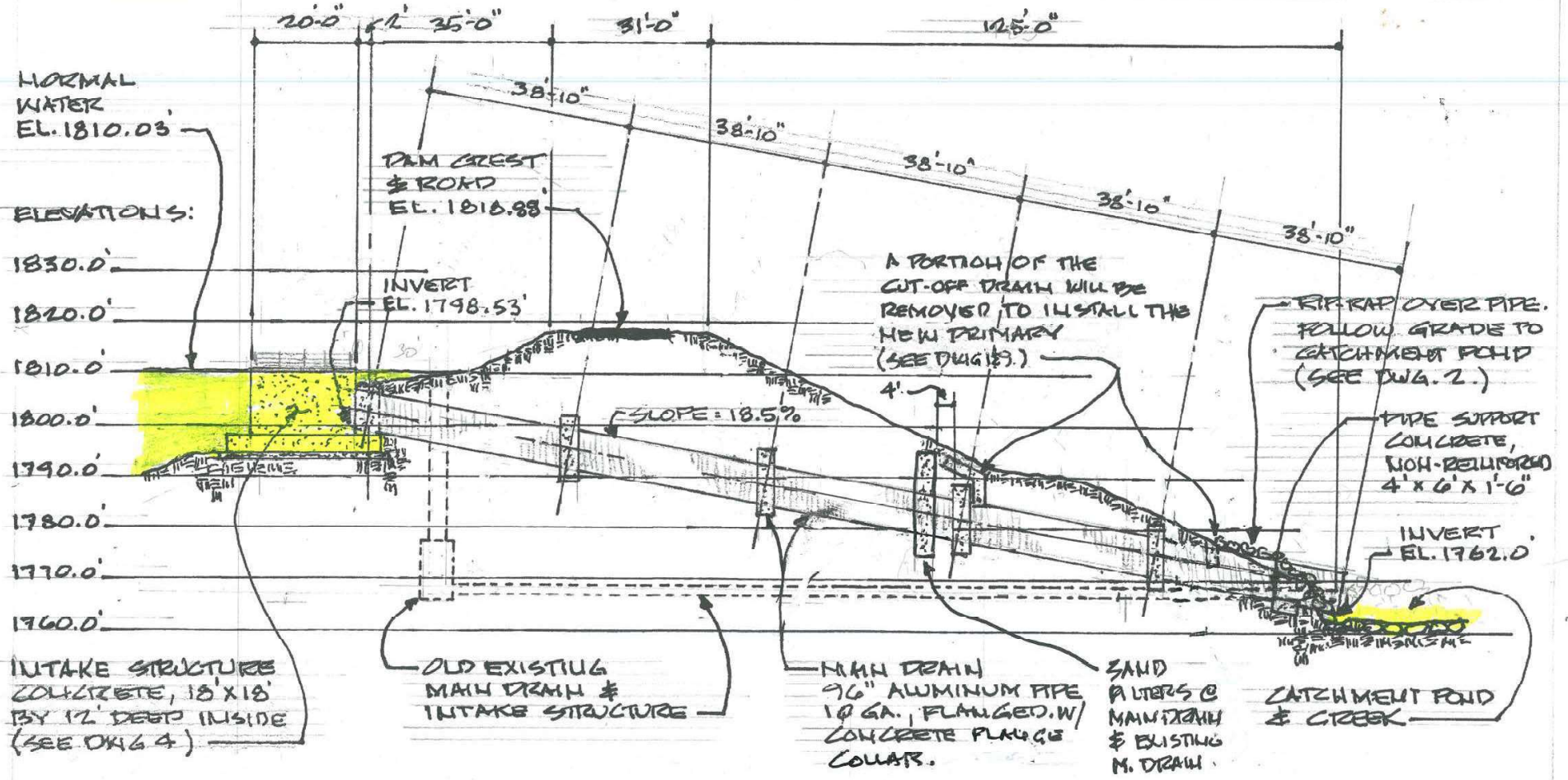
N/F CHARLES MAX FOWLER
D.B. 2518/125
P.B. P-48/120 & P-45/142



PLAN - PRIMARY SPILLWAY

1" = 20'

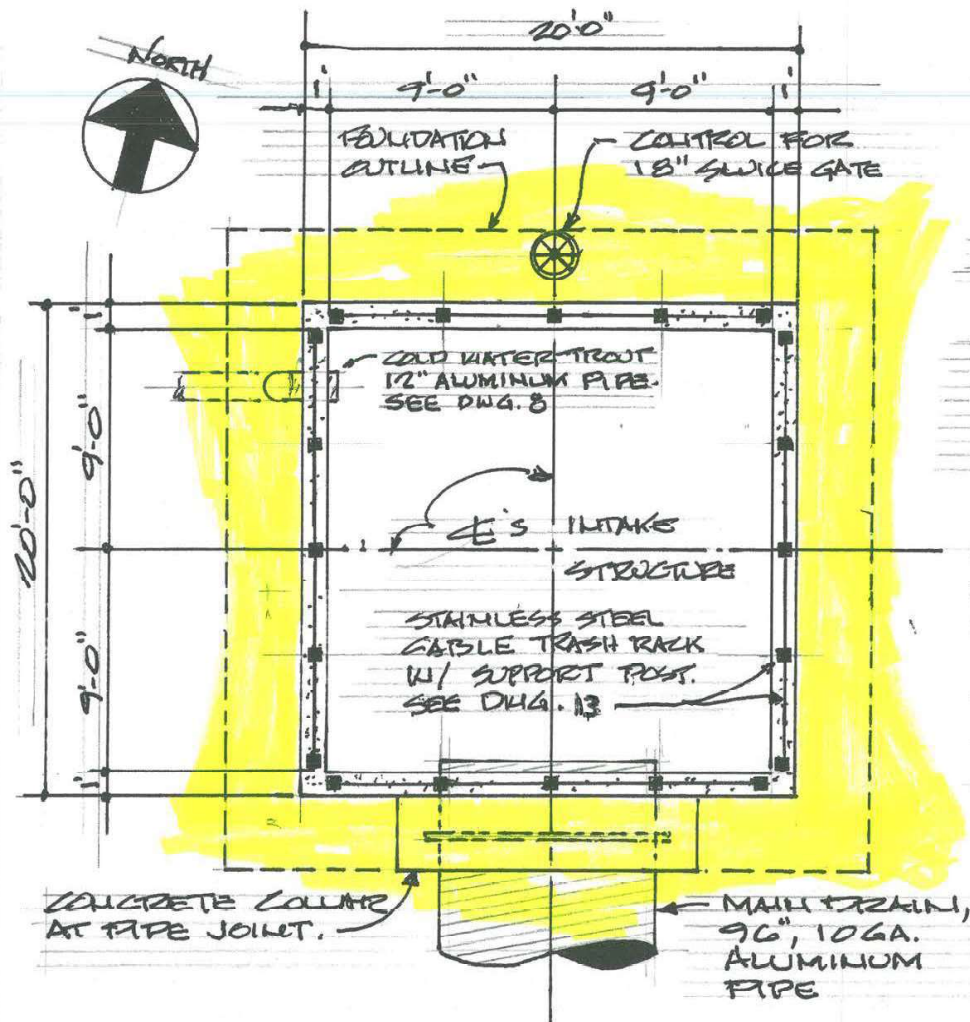
CHATTOOGA LAKE CLUB		
PLAN		
PRIMARY SPILLWAY		
FORITUS CIVIL, INC.		
SCALE: 1" = 20'	DATE 7 MAY 26	2



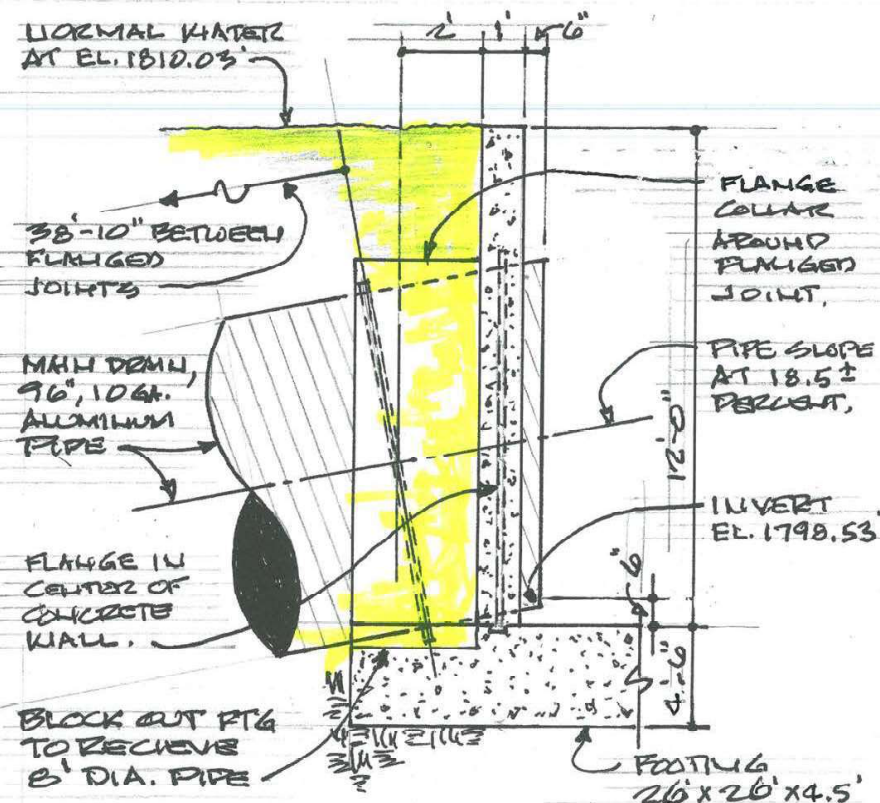
**PRIMARY SPILLWAY
CROSS SECTION PROFILE**

1" = 20'

CHATTOOGA LAKE CLUB PRIMARY SPILLWAY CROSS SECTION PROFILE		
PERITUS CIVIL, INC.		
SCALE: 1" = 20'	DATE: 7 MAY 26	3



INTAKE STRUCTURE PLAN
1" = 5'-0"

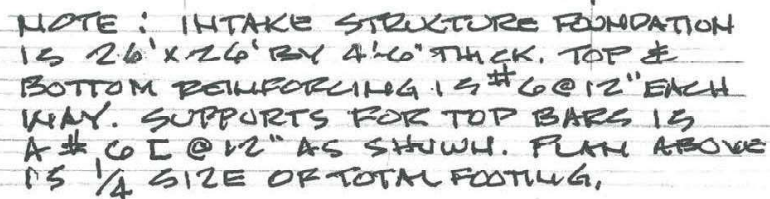
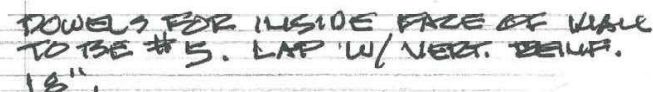


SECTION AT MAIN DRAIN
1" = 3'-0"

CHATTOGA LAKE CLUB
INTAKE STRUCTURE &
SECTION

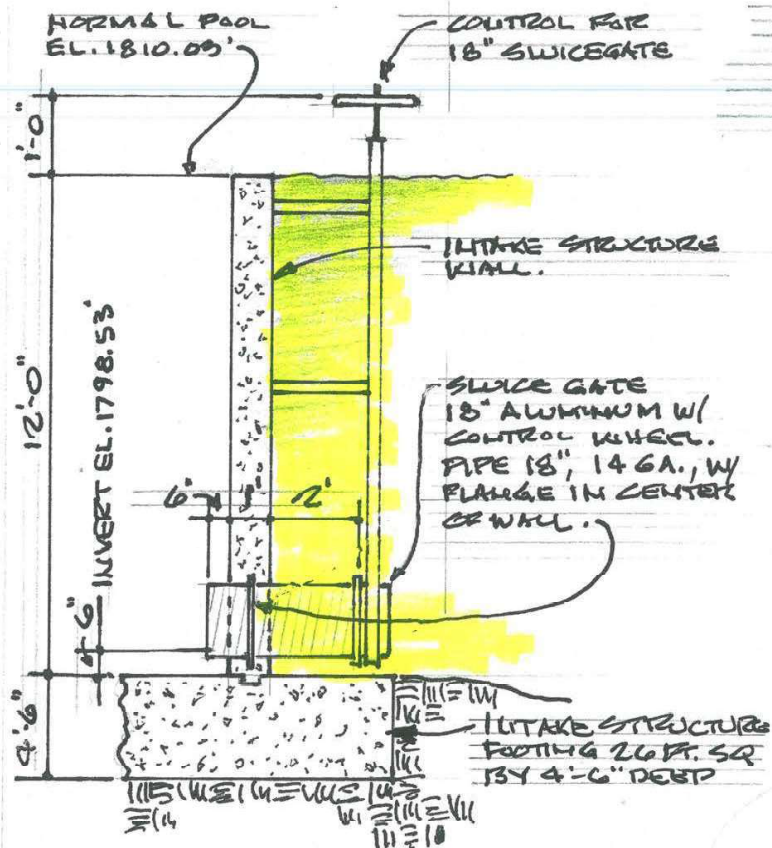
PERITUS CIVIL, INC

SCALE: AS SHOWN	DATE: 7 MAY 20	4
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$$1'' = 4'0''$$


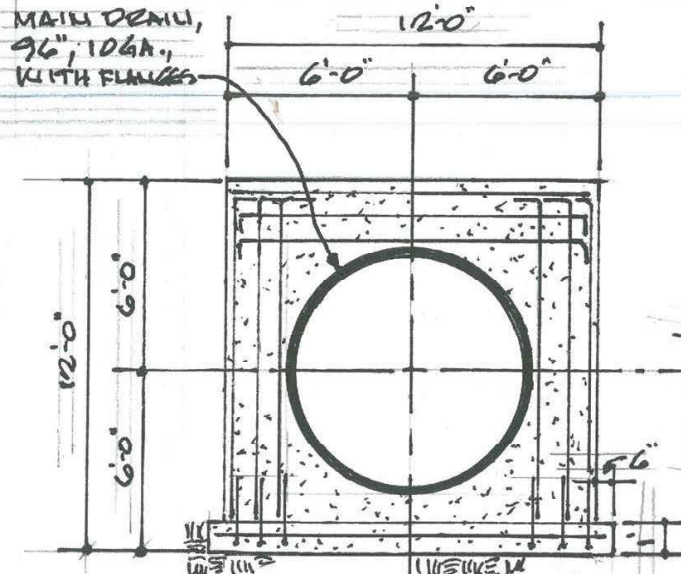
1" = 4'-0"

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SWICE GATE SECTION

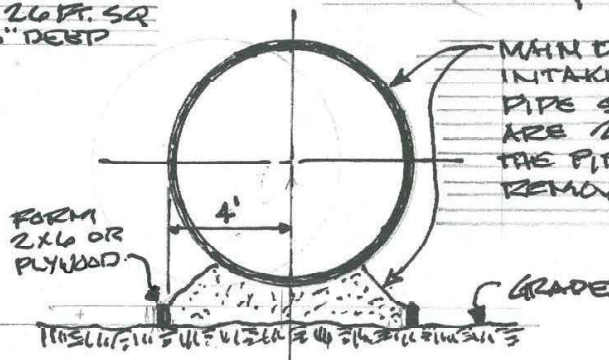
1" = 3'-0"



NOTE: REINFORCING #5 @ 12" EACH FACE. LAP 12". DOWEL LAP 18".

FLANGE COLLAR ELEVATION & SECTION

1" = 4'-0"

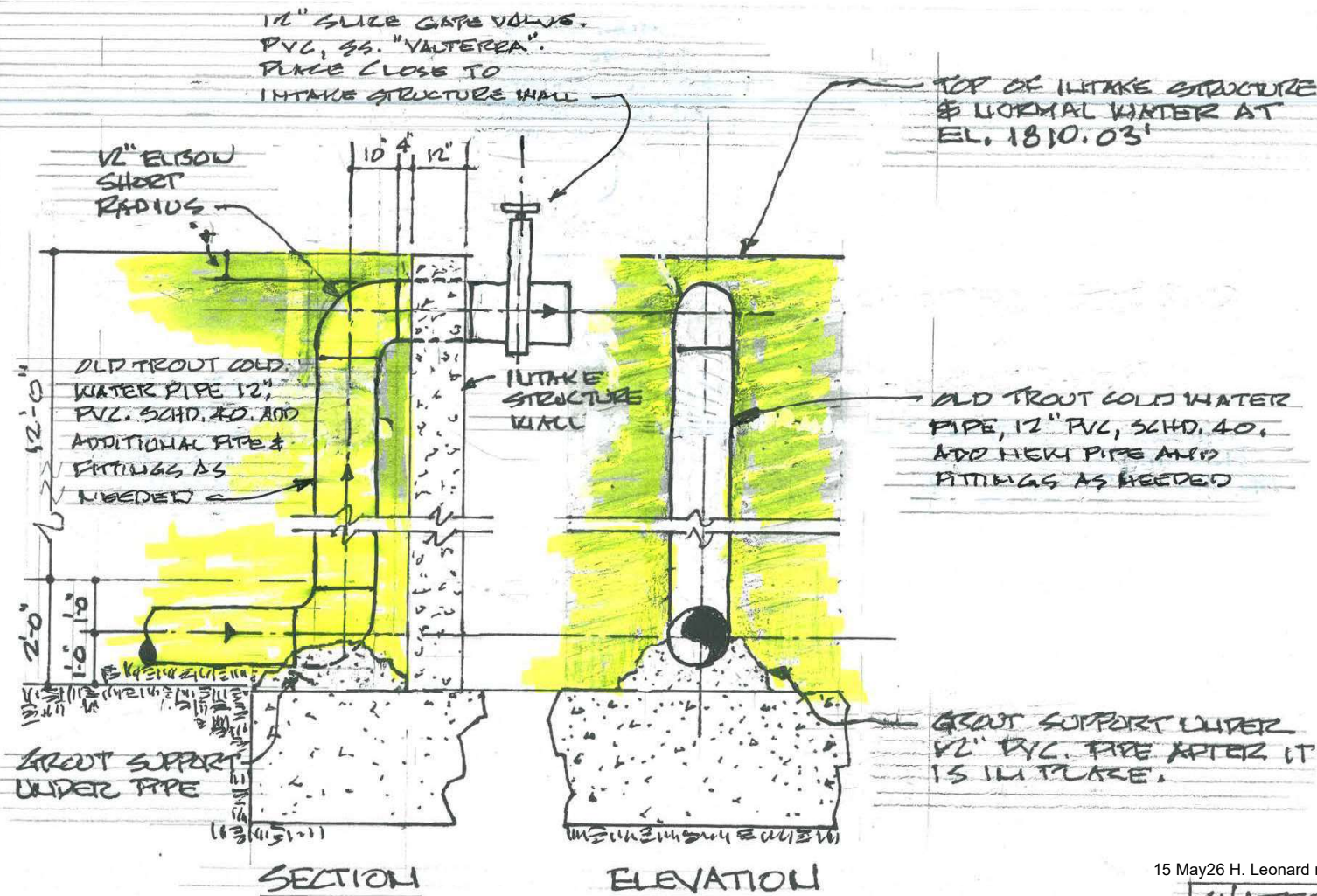


MAIN DRAIN GROUT BEDDING

1" = 4'-0"

CHATTOOGA LAKE CLUB
SWICE GATE, FLANGE COLLAR
& MAIN DRAIN BEDDING
PERITUS CIVIL, LLC.

SCALE: AS NOTED	DATE: 7 MAY 16	6
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COLD TROUT WATER CONNECTION TO INTAKE STRUCTURE

Existing Cut-off Drains and re-work:

1.- Existing Cut-Off Drains are constructed with 4-inch PVC, SCHD, 40, perforated pipe. The trench is lined with filter fabric and has 4 inches of 57 stone under the pipe. After the pipe is laid to proper grade the trench was filled to within 6 inches of grade with 57 stone. Backfill is placed over the stone to finish off the back slope of the dam.

2.- The existing Cut-Off Drains are interrupted where the new Main Drain is located. Cut and remove the existing drains, that are in the way of the Main Drain construction.

3.- After the new Main Drain is in place, re-construct, and extend the cut-off drain to a point near the new Main Drain.

4.- Construct the new Cut-Off Drains as follows. Expose the end of the existing Cut-Off Drain and bulkhead it off with treated 3/4" plywood. Extend new Cut-Off Drain ditch over to near the new Main Drain. Grade ditch to proper slope. Place 4-inches of number 8 stone in bottom of ditch. Lay 4 inch, PVC, SCHD 40, slotted pipe in ditch and connect to existing drain. Slots to be 0.5 MM. Place additional number 8 stone to cover the pipe by 4-inches.

5.- Construct the Sand Filter drain over number 8 stone. Sand Filter material is ASTM C 33. Apply in 8-inch layers and compact with a compactor and water. Continue this process up to the top of the 8-foot Main Drain pipe.

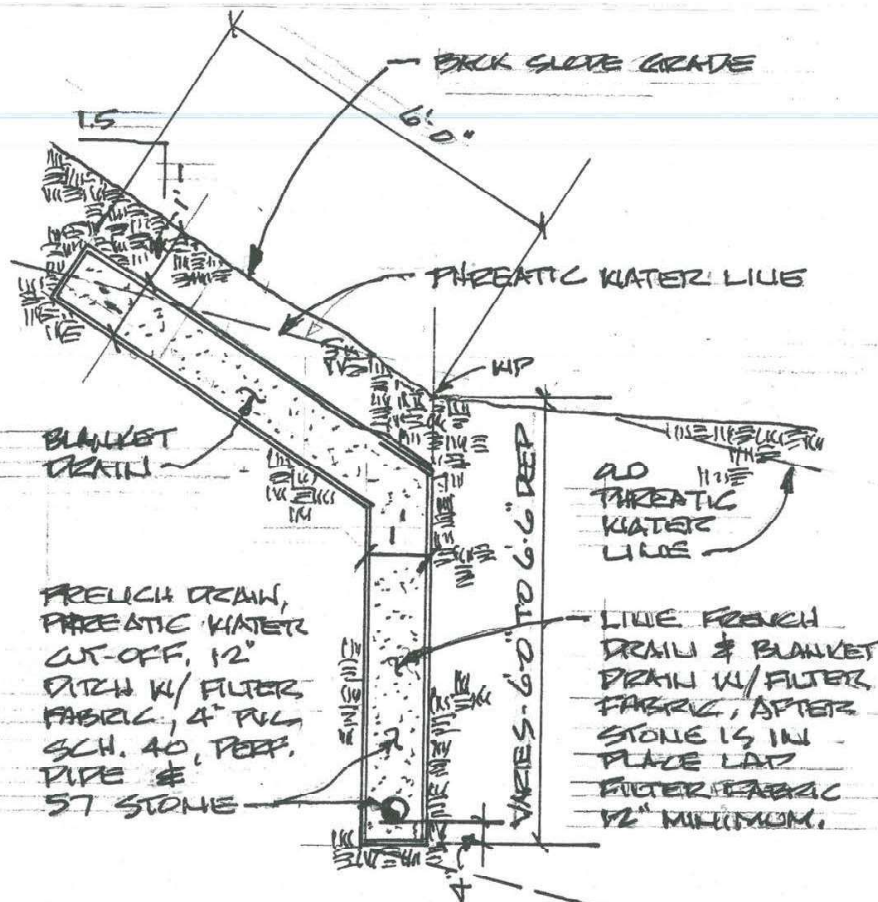
6.- Install drain lines of 4-inch PVC, SCHD 40, to Catchment Pond as shown on the Site plan.

15 May26 H. Leonard note: number 8 stone to be ASTM C 33 #8

CHATTOOGA LAKE CLUB
COLD TROUT WATER
CONNECTION

PERITUS CIVIL, INC.

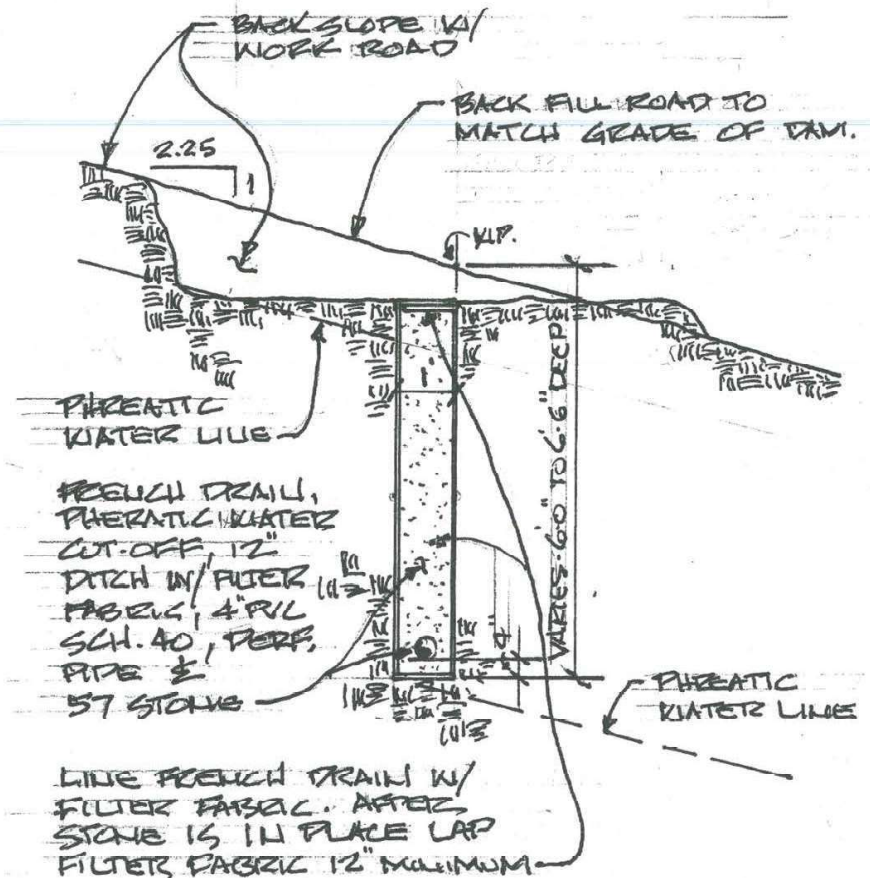
SCALE: 1" = 2'	DATE: 7 MAY 26	8
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NOTE: PROVIDE FLAT WORK AREA FOR EQUIPMENT INTO BACK SLOPE.

SECTION AT UPPER BACK SLOPE AND FLAT BERM

$\frac{1}{2}'' = 1'-0''$



SECTION AT LOWER BACK SLOPE

$\frac{1}{2}'' = 1'-0''$

Notes - Existing Cut-off Drains

The details of Cut-off drains, shows what is existing. As part of the new construction, the drains will be cut to allow for the new Primary Main Drain pipe. These Cut-off drains (2) will be interrupted for about 16 feet in length. See site plan. Once the pipe is in place, the cut-off drains will have to be reworked as detailed. See instructions for the rework on drawing 8.

CHATTODGA LAKE CLUB
SECTIONS OF
EXISTING CUT-OFF DRAINS

PERDUS CIVIL, LLC.

SCALE: $\frac{1}{2}'' = 1'-0''$	DATE 7 MAY 2020	9
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Chattooga Lake Club General Notes:

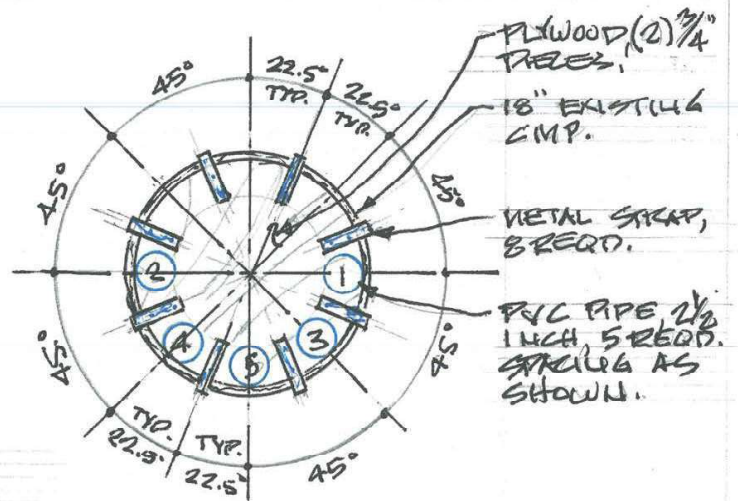
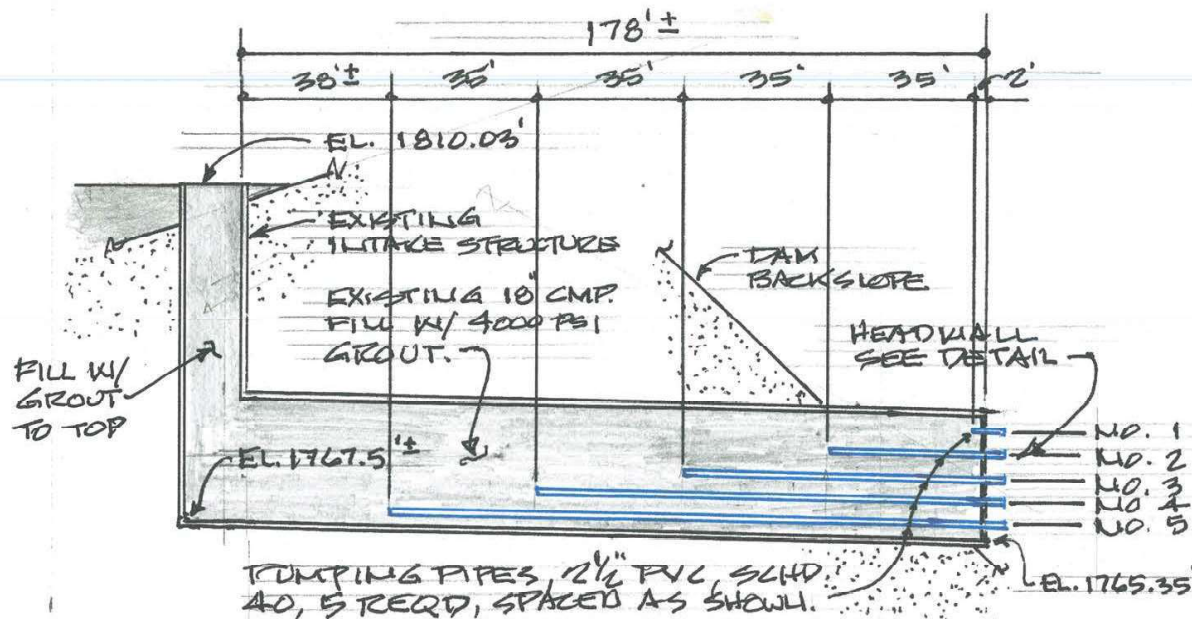
There will be a Pre-construction Conference Meeting, with the contractor selected, to review the bid and project. We will also walk through the design drawings and answer all questions by the contractor.

The contractor will provide the Engineer and Owner with a Bar Chart, listing all starting dates and completion dates of all construction phases of the project such as: "Moving on site", "Lowering of the water", "Clearing grubbing and silt fence", Intake structure foundation, etc. This Chart will be helpful in keeping up with the project.

- 1.- The Engineer will be on site, as needed, to monitor and observe construction to assure the project is constructed according to approved SCDES plans. Discuss with the Engineer any thing that is not clear during construction.
- 2.- There is a TBM (Temporary Bench Mark) at the left abutment, adjacent to a power pole. The location is shown on the site plan. The top of the top of the 5/8-inch rebar is Elevation 1814.41. All new construction will use this elevation the base elevation.
- 3.- Provide barricades as needed at dam and road for traffic control and maintain.
- 4.- Before any grading takes place install silt fence and bales of straw as shown on drawing 2 at the outfall catchment pond.
- 5.- For your information, there is in the crest of the dam, on the lake side, about three feet deep, there is a buried telephone cable about 1 1/4" diameter. At the time of construction verify whether it is active or not.
- 6.- Drop water level in lake to 20 feet below normal or low enough to construct the footing of the new Intake structure footing, two weeks prior to grading on the dam. Should damp to wet dirt be encountered at depths required for construction the lake may have to be lowered again.
- 7.- The project scope of work is to install a Primary Spillway system, including a concrete Intake structure and a 96-inch aluminum, 10 ga., Main Drain. The new system will be 15 feet East of the present system as shown on the site plan.
- 8.-The Primary Spillway Intake structure is poured concrete with an inside measurement of 18 feet by 18 feet by 12 feet deep. Its footing is 26 feet by 26 feet square and is 4'-6" thick. It will have an 18-inch sluice gate for lowering the lake. The Primary Spillway, 96 inch, 10 ga, pipe will be located on the dam side. The top of the structure will have a Stainless-Steel cable Trash Rack with 3-foot-tall aluminum post anchored to the top of the structure, field mounted. Cables are stainless steel, 3/16", at 4 inches center to center.
- 9.- Bottom cold trout water piping will be disconnected from the old Intake structure and installed on the new Intake structure. Use existing PVC pipe to attach to the new intake structure. See detail for connecting 12-inch piping to new Intake structure.
- 10.- A Sand Filter is to be installed just above the second Flange Collar. Another Sand Filter is to be located on the old main drain about 35 feet up from the end of the pipe. See the plans for its location and size.
- 11.- The Primary spillway main drain piping is a 96-inch corrugated aluminum, 10-gauge pipe. Provide length and flanges as shown on the drawings.
- 12.- Layout and construct the foundations of the Flange Collars after setting grade for 96-inch Primary Spillway drain.

- 13.- Once 96-inch Main Drain pipe is in place, and the Flange Collars are complete, provide grout bedding under the pipe, from the Intake structure to the last concrete support at the catchment pond. Use forms as needed to contain the grout horizontally. Grout should come up on the 96-inch pipe a minimum of 8 inches. Grout to be 4,000 psi. See detail shape, width and height of grout.
- 14.- Compaction of material around the 96-inch pipe is critical. Material must be placed around the grout bedding and pipe with ease. A Whacker should be able to reach all areas with ease. A soils Consultant will be hired by the Owner to monitor the compaction of all fill material. Compaction for all fill material will be 95 percent standard proctor.
- 15.- Two cut-off drains, have been already installed on the back slope of the dam. The two drains will have to be interrupted to construct the new Main Drain. Upon the completion of the New Main Drain, the old existing cut-off drains will have to be modified. The upper and lower drain on the West side of the new Main Drain will have to be collected and piped to the catchment pond. The upper and lower drain on the East side will be capped. See instructions in the drawings on how to rebuild the old french drain. An existing old drawing is attached to be used for information only.
- 16.- The sealing of the old main drain should be accomplished while the lake level is at its lowest. To stop all water flow, if needed, can be done in two ways. Plug the intake pipe in the lake or plug the vault at the bottom of the intake structure. The old Main Drain and existing Siphon are the only means for controlling the water level. Once back filling takes place, sealing of the old main drain is a good time to get that done.
- 17.- Construct a Catchment Pond at the outfall of the Main Drain, in the existing pond. Provide large rock, 400-to-500-pound, in-line with the discharge. Provide 200-to-300-pound rock around others as shown to absorb the energy.
- 18.- The old Main Drain is an 18-inch CMP pipe and will be sealed.
- 19.- All concrete will be 4,000 psi in 28 days.
- 20.- All grout will be 4,000 psi in 28 days.
- 21.- Reinforcing to be ASTM A615 grade 60.
- 22.- Following all work, on the dam, the shape of the dam at the work area will match the rest of the dam.
- 23.- Following all work provide grass mat on all disturbed areas.

CHATTOOGA LAKE CLUB		
GENERAL NOTES		
PERTUS CIVIL, INC.		
SCALE:	DATE	
	7 MAY 26	10

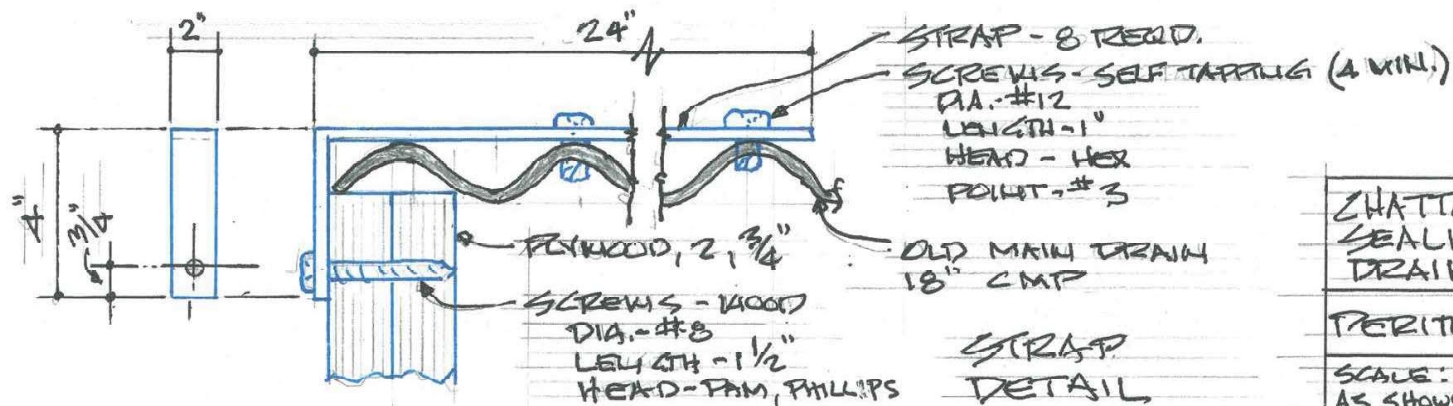


OLD MAIN DRAIN - END CAP

1" = 1'

— ELEVATION —
SEALING OLD MAIN DRAIN W/ GROUT

NO SCALE



STRAP
DETAIL

1" = 3"

ZHATTOOGA LAKE CLUB
SEALING OF MAIN
DRAIN & DETAILS

PERITUS CIVIL, INC.

SCALE:
AS SHOWN

DATE:
7 MAY 26

11

Chattooga Lake Club

Sealing of old Primary Spillway system

The old existing Primary Spillway system (Intake structure and Main drain) will be sealed following the construction of the new Primary spillway and Intake structure.

The Main drain, as shown on our topographic survey, shows the main drain as an 18 in CMP. Contractors have informed us that further into the dam there may be a different type and size pipe. We understand that it is smooth wall. We don't know how the two pipes are connected or where the connection is in relation to the exposed pipe. We also don't know if the two pipes are the same size. The length of the main drain is about 178 feet long plus or minus from the catchment pond to the vault.

The Intake structure is a 30-inch pipe which extends down to the vault chamber. The top of the pipe controls the lake level. The 30-inch pipe extends down to the vault chamber and is attached to the top of the vault concrete. The vault chamber is a reinforced concrete box with a floor of about 2'-7" by 3'-4" and is about 8 feet tall. The vault chamber houses the old original valve. It is built into the concrete wall. The control for the valve is at water level. The valve in the vault is below normal water about 44 feet. The stem has been modified to reach to the surface. The valve can be turned and controlled from the surface at water level.

Before the sealing process the lake needs to be lowered to reduce the pressure at the outfall. The old valve, we think will open, to lower the water. Construction of the main drain will require the lowering of the water in the lake down 20 feet. Less pressure will make it easier to install the plywood disks and anchors at the outfall. It is alright for some water to continue to flow.

Both the Intake Structure and the Main Drain will be filled with pumped 4000 psi grout. The system will be sealed by pumping the grout through 5, 2 1/2" inch PVC pipes. The pipes will be different length as shown on the drawing. The different length pipe will insure no air pockets in the main Drain.

The process is as follows for installing the PVC pipes and the plug.

1.- Cut two 3/4 inch plywood disk to fit tight inside of the old 18-inch pipe. Screw the two pieces together. Plywood is to fit flush with the end of the pipe with as little gap as possible.

2.- Install the five PVC pipes as shown on the drawing. Keep the length and location as shown on the drawing. Install the longest pipe first right down to the 2-foot pipe. Use a soft drink bottle, the two-liter size as a guide. Cut the bottom off and place it on the end

of the long pipe you are pushing into the old main drain. This will keep the pipe moving with no snags.

3.- Drill 5, 3-inch diameter holes in the plywood as shown on the drawing.

4.- Insert PVC pipe through holes in plywood aligning numbers as shown on the drawing. Ends of the 5 pipes are to be threaded to accept the connection at the pumper hose. Project each pipe about 2 feet outside the plywood bulkhead for the ease of making the pump connection. Make sure you keep up with the length and number of each pipe.

5.- Anchor steel straps to plywood disk as shown on the drawing. Straps to be constructed from 1/4 in plate. Strap to be 2 inches wide, or wider, with a 4-inch leg and a 24-inch leg up the pipe. Anchor to metal pipe on the high corrugation with adequate screws. Anchor to plywood disk with adequate screws.

6.- Before anchoring plywood disk to steel pipe re-check pipe length with correct number.

7.- It is estimated that it will take 14 cubic yards, plus or minus of 4000 psi grout to fill the Main Drain. The yardage for the vault and intake structure is a guess at 20 cubic yards.

8.- A special connection must be made to connect the pumper hose to the 2 1/2 inch PVC pipe.

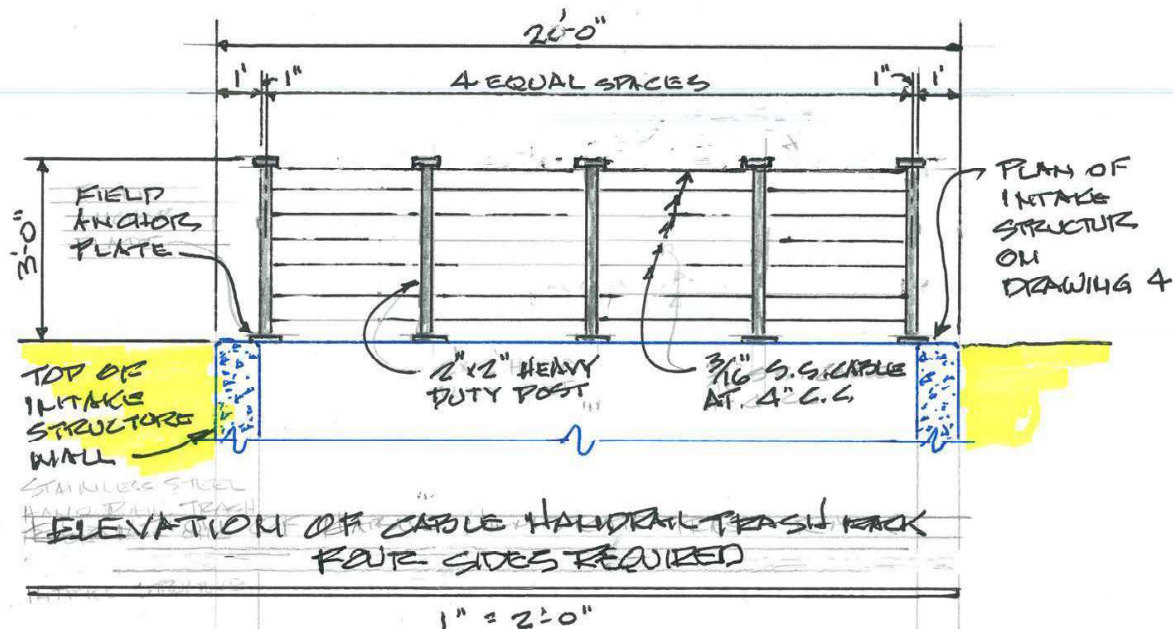
9.- Provide screw on caps for the end of the 2 1/2 inch pipe. When the pumper stops, disconnect the pumper hose and screw on a PVC cap on the pipe you are leaving.

10.- Pumping will began on pipe #1 until pumper chocks down and the hose is to be moved to #2. This process will continue through all 5 pipes. Don't skip any pipes. Start with pipe number 1 and continue through pipe number 5.

11.- Upon the completion of number 5 pipe, concrete trucks can complete the filling of the vault chamber and Intake structure by placing the concrete in the top of the Intake structure.

NOTE:
SKIPPING A PIPE IN
THE PUMPING PROCESS
WILL CREATE AN AIR
POCKET IN THE PIPE.

CHATTOOGA LAKE CLUB SEALING OF OLD PRIMARY SPILLWAY SYSTEM		
PERITUS CIVIL, INC.		
SCALE: NONE	DATE: 7 MAY 26	12



Intake Structure Trash Rack

The Trash Rack for the Intake structure is Post and Cable system, field mounted to the top of the Intake Structure. (See plans for layout) The top of the structure is square and the outside dimension is 20 feet. The wall thickness is 12 inches and is level at El. 1810.03 feet. The Trash Rack system will be field mounted, to the top of the 12-inch exposed concrete wall.

The Trash Rack system, consist of Stainless-Steel post and Stainless-Steel cables. Post to receive a cap.

Post to be 2 inches square, Stainless-Steel and heavy duty to take loads from debris floating in lake. Post for Trash Rack to top-out at 3 feet. Weld post to baseplate. System to withstand a horizontal point load of 400 pounds.

Baseplate for post to be a minimum of 4-inch square by 3/8 inch thick or as needed for the loading. Anchors required

through baseplate is four, 3/8-inch, Stainless-Steel redheads, 6 inches deep into the concrete. Baseplate to have a cover plate of Stainless-Steel to hide anchoring system.

Cables to be 3/16 inch in diameter and Stainless-Steel. Connectors for the Stainless-Steel cable, to be Stainless-Steel and capable of taking the horizontal loading.

Post, around Intake Structure, following installation, are to be vertical and plumb.

CHATTOOGA LAKE CLUB		
TRASH RACK		
PERDUS CIVIL, INC		
SCALE 1" = 2'	DATE 7 MAY 2013	13