

6. STRUCTURAL REQUIREMENTS

6.1. Dam Intake Diversion Structure

6.1.1. When the dam was constructed provisions were made in Monolith 2 to provide for an irrigation intake. This passage way through the dam can now be used to provide for water from the upstream pool to pass in a pipe through the dam to the downstream area for a proposed fish hatchery water supply on the right bank. An intake opening from the upstream pool, a room for mechanical equipment and an exit through the downstream face of the dam with trashrack and stop log guides at the sides of the upstream opening, were formed when the dam was constructed.

6.1.2. At present the upstream intake is blocked by a 1-foot thick reinforced concrete wall and the downstream passage is closed with an 8-inch thick concrete block wall. A portion of these walls will have to be removed so that a 30-inch diameter metal pipe can pass through them to transport the water.

6.1.3. The existing room in Monolith 2 is available for mechanical equipment and this proposed design calls for a 30-inch gate valve to be installed in the 30-inch diameter metal pipe. The metal pipe invert elevation will be at approximately 920.0 feet. The Chief Joseph normal pool is at elevation 956.0 feet. The room entrance doorway sill is at elevation 930.5 feet. At this elevation, a grating floor will be installed with a metal stairway leading down to a platform from which a person will stand and can turn the wheel to open and close the gate valve (See Figure 1).

6.1.4. A trashrack will have to be designed, fabricated and installed within the existing metal guides. The trashrack will be designed to be 3 feet above the maximum pool. This could be done without a cofferdam.

6.1.5. Stoplogs shall be designed, fabricated and can be installed within the existing stoplog metal guides. The stoplogs can be used as an emergency stoppage of water flow in the pipe and for stoppage of water to inspect, repair and maintain the gate valve and pipe inside the dam.

6.1.6. A fish screen approximately 5-feet high by 4-feet wide will be installed at the inlet between the stoplogs and the entrance of the pipe to prevent small fish from being trapped and injured going through and hitting the interior of the pipe at high velocities.

6.1.7. The 30 inch metal pipe will have an elbow at its exit at the downstream face of the dam and will be trenched in the rock fill and attached to the dam concrete surface with metal straps. The pipe will continue through the rock fill to the right bank lower roadway at elevation 843 feet and then will continue in an 8-feet deep by 11-feet wide trench excavated beneath the roadway. The pipe will be anchored in concrete thrust blocks every 100-feet and at bends or grade changes. The pipe line ends at the Hatchery Head Box Control Structure at approximately elevation 870 feet.

6.2. Relief Tunnel Structure

6.2.1. The existing Relief Tunnel extends from the base of Monolith 1 in a Northwest direction for 1,020 feet. The inside of the tunnel is 8 feet high by 5 feet wide. The ceiling concrete is 3 feet thick, concrete walls 1 foot 8 inches and concrete floor 3 feet thick for the first 180 feet from the sump and then the ceiling, walls and floor are 2 feet, 1 foot 6 inches and 2 feet respectfully for the remainder of the tunnel.

6.2.2. Relief wells exist beneath the relief tunnel and the water from the downstream right bank passes into the relief wells and up into the relief tunnel. The water then travels down the relief tunnel into a sump at one end of the tunnel. An existing 4 foot diameter drain hole in the concrete starts at the sump and exits at the surface base of Monolith 5 with an I.E. of 765.0 into the downstream pool. In order for the Hatchery water to be from the relief tunnel and not from the downstream pool, a flap gate shall be installed at the end of the 4 foot diameter drain hole. When the upstream pool at Wells Dam, the next downstream dam, is high, the flap gate closes to prevent water from Chief Joseph's downstream pool from backing up into the relief tunnel. Back flow from the downstream pool into the relief tunnel is believed to be a transient phenomenon, and the new sump may function satisfactorily without the gate.

6.2.3. A new sump room will be required. Currently the sump is about 10.5 feet long, 4.5 feet wide and 4.5 feet deep (See Figure 2). The new sump room needs to be 18 feet long by 6 feet wide by 7 feet deep. In order to build this room approximately 21 feet of existing tunnel and sump floor slab has to be removed and replaced with a new floor approximately 7 feet deep and 6 feet wide. Also approximately 7 feet of one relief tunnel wall has to be removed and replaced by a new wall which will widen the interior of the room to 6 feet. The ceiling of the existing tunnel would remain but an extension of 1 feet of new ceiling would have to be added on to make the room 6 feet wide by 18 feet long. Approximately 11 feet of the ceiling over the existing sump would be removed and a new raised ceiling constructed to accommodate the pump chamber. A new overflow weir will be added in the sump room between the bottom of the pump intake and the entrance to the 4 foot diameter drain outlet. In order to construct the new sump and pump chamber, a large portion of impervious and random fill would have to be removed and replaced or a shaft would have to be excavated through the fill. The shaft could be made a permanent feature for access to the pump.

U.S. ARMY CORPS OF ENGINEERS OFFICE SYMBOL:

PROJECT: Chief Joseph Dam
Hatchery Water Supply
SUBJECT: Irrigation Intake at Dam
10% Design

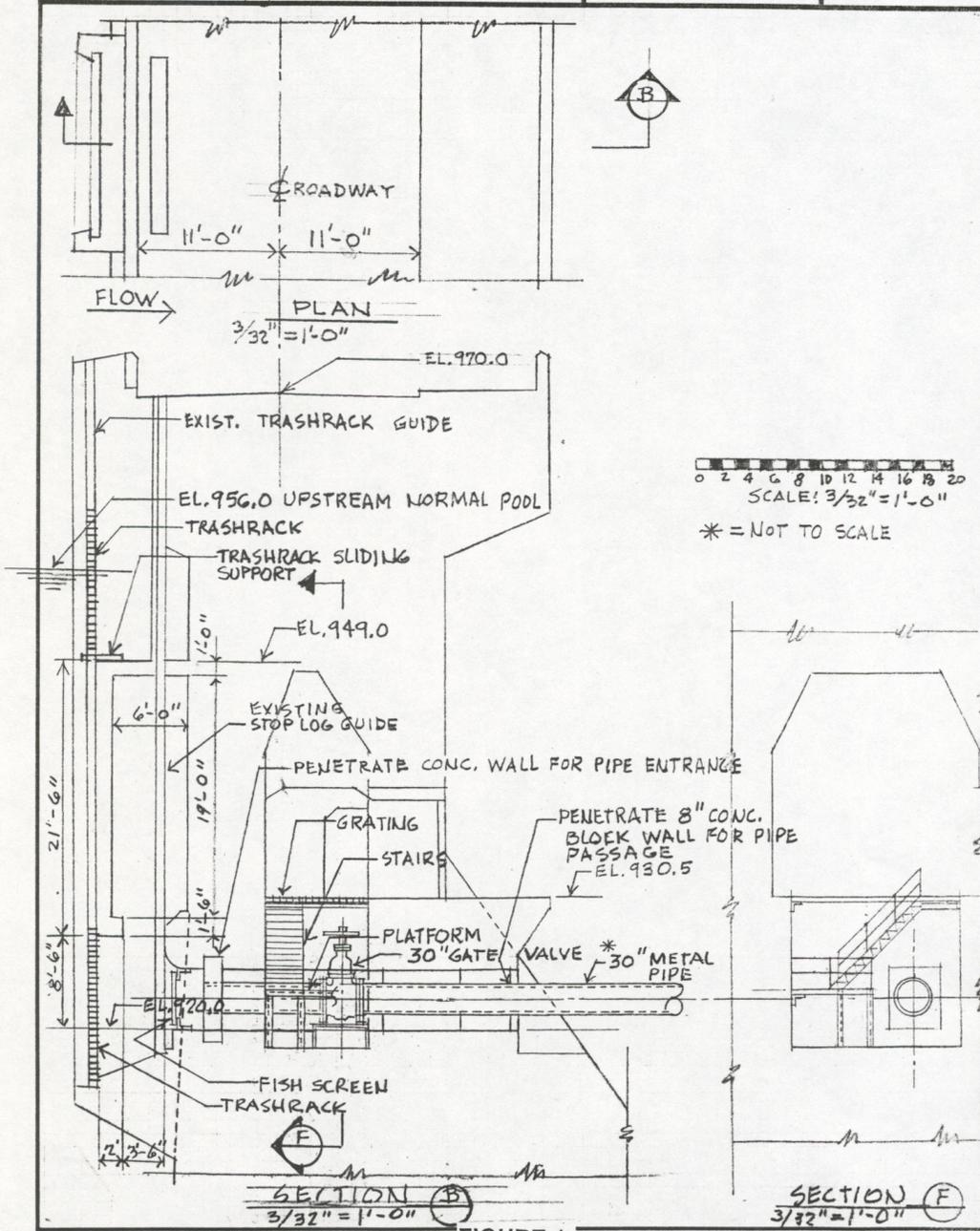
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DATE: FEB. '04

SHT. 1 OF 3

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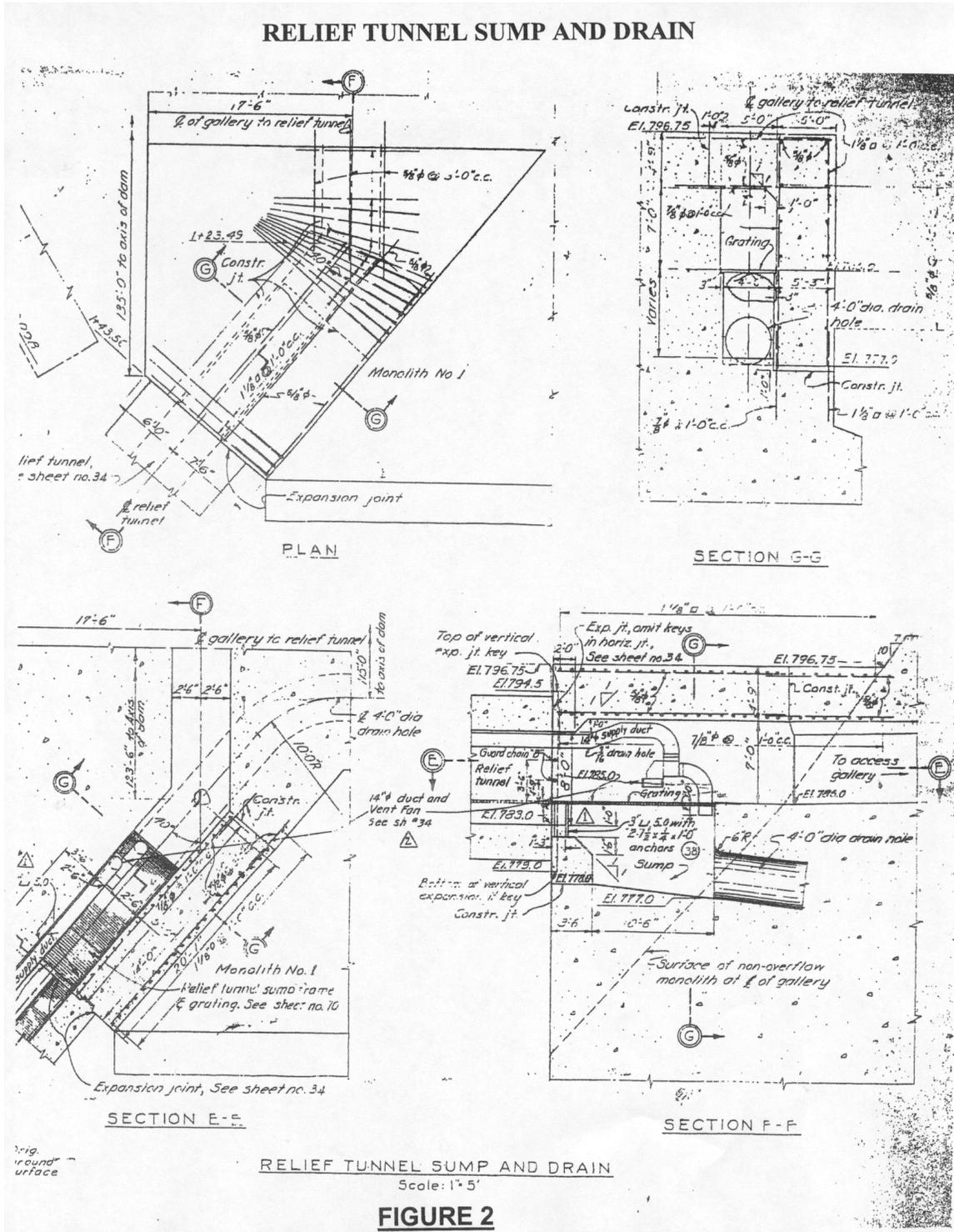
PART:



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FIGURE 1

10 GRID



U.S. ARMY CORPS OF ENGINEERS, SEATTLE DISTRICT

PROJECT: CHIEF JOSEPH DAM	COMPUTED BY: RUSSO	DATE: 19 MAR 04
SUBJECT: HATCHERY WATER SUPPLY STUDY	CHECKED BY: WRIGHT	SHT. OF PART:

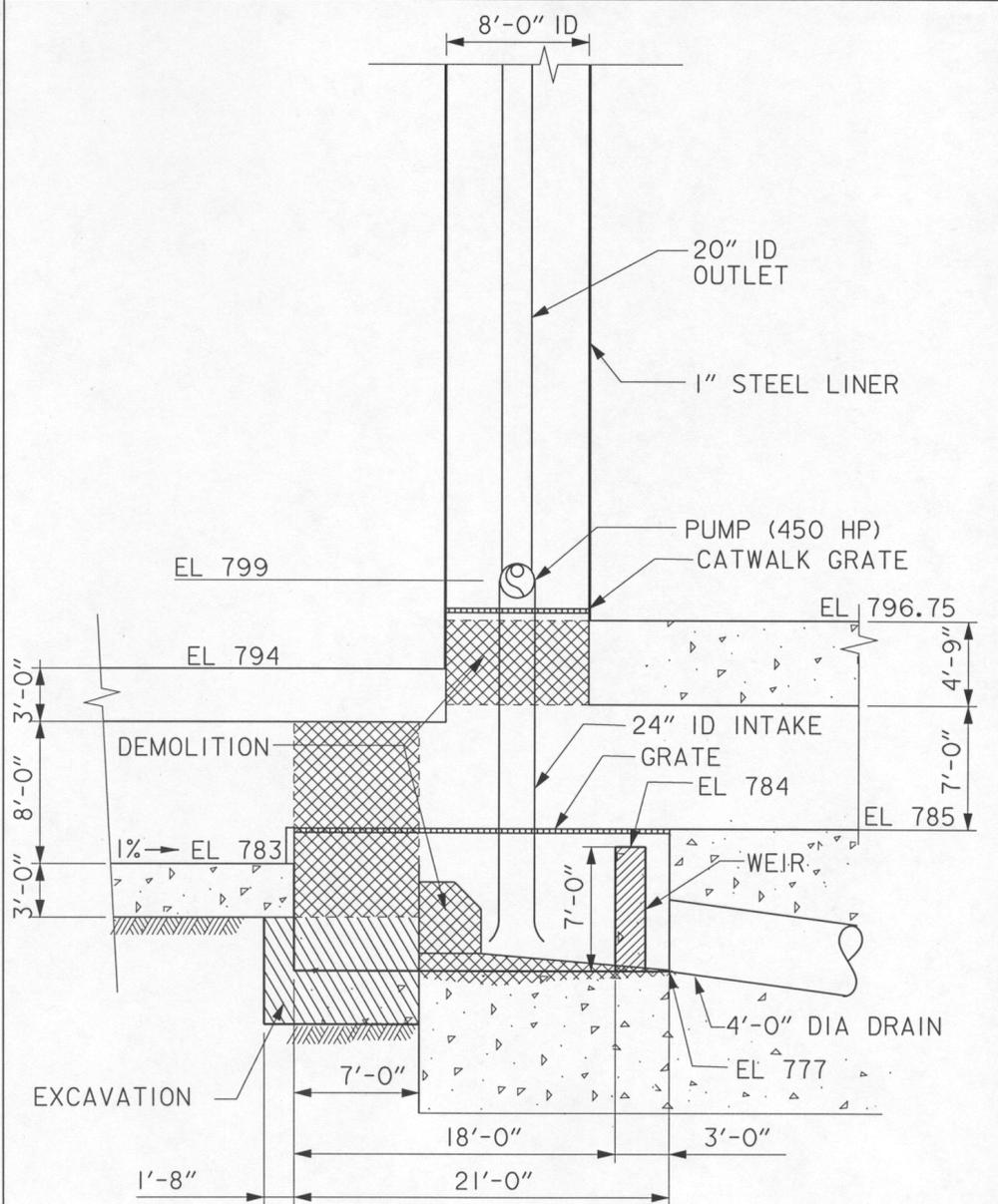


FIGURE 3

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