

IGWA's FOURTH MITIGATION PLAN 60% MAGIC SPRINGS PROJECT REPORT

Prepared for

**THE IDAHO GROUND WATER APPROPRIATORS, INC.
NORTH SNAKE GROUND WATER DISTRICT
MAGIC VALLEY GROUND WATER DISTRICT
SOUTHWEST IRRIGATION DISTRICT**

Prepared by

**SPF Water Engineering, LLC
300 East Mallard Drive, Suite 350
Boise, Idaho 83706
(208) 383-4140**

September 26, 2014

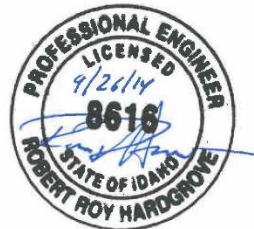


Table of Contents

1. Magic Springs Project Summary	1
2. Water Rights	1
3. Water Quality	3
4. January 19, 2014 Delivery – 0.5 cfs	4
4.1. Temporary Pumping Facilities	4
4.2. Temporary Piping Facilities.....	4
5. Project Design – 10 cfs	7
5.1. Pipeline Alignment.....	7
5.1.1. Highway District Approval.....	7
5.2. ABC Flume Diversion	9
5.2.1. Diversion Description.....	9
5.2.2. Gravity Pipeline	11
5.2.3. Pump Station Design.....	11
5.2.4. Power Availability	12
5.2.5. Pipeline Design.....	12
5.3. I&J Raceway Diversion.....	13
5.3.1. Diversion Description.....	13
5.3.2. Gravity Pipeline	14
5.3.3. Pump Station Design.....	15
5.3.4. Power Availability	15
5.3.5. Pipeline Design.....	16
5.4. Delivery to Rangen	16
6. Project Schedule	17
7. Project Cost Estimate	18
7.1. Capital Construction Cost Estimate	18
7.2. Annual System Operational Costs	19

List of Figures

Figure 1. Water Rights Points of Diversion	2
Figure 2. 0.5 CFS Pipeline Alignment.....	6
Figure 3. Pipeline Alignment.....	8
Figure 4. Potential diversion locations at Magic Springs.....	10
Figure 5. Aqua Life Project Schedule	17

List of Tables

Table 1. Magic Springs Water Rights	2
Table 2. Water Quality Field Data.....	3
Table 3. Temperature Readings	3
Table 4. Preliminary Opinion of Probable Cost – ABC.....	18
Table 5. Preliminary Opinion of Probable Cost – I&J.....	19
Table 6. Component Inventory and Capital Replacement Analysis – ABC	20
Table 7. Component Inventory and Capital Replacement Analysis – I&J.....	20
Table 8. Annual Operating Costs – ABC	21
Table 9. Annual Operating Costs – I&J.....	21

Appendices

- Appendix A: 60% Design Drawing Set
- Appendix B: Application for Transfer of Water Right
- Appendix C: AMEC Temperature Analysis (Not Received Yet)
- Appendix D: Hagerman Highway District Approval (Not Received Yet)

1. MAGIC SPRINGS PROJECT SUMMARY

The Idaho Ground Water Appropriators, Inc. (IGWA) is reviewing legal and technical options related to water management stemming from the Rangen, Inc. (Rangen) Water Call. IGWA has requested through its water rights legal counsel that SPF Water Engineering, LLC (SPF) provide a 60% design to deliver 9.1 cfs of direct flow to Rangen from the Magic Springs facility owned and operated by SeaPac of Idaho, Inc. (SeaPac).

SPF was hired to design the infrastructure required to implement IGWA's Fourth Mitigation Plan, which includes the direct delivery of water from Magic Springs to Rangen, referred to as the Magic Springs Project (Project). The Project proposes construction of a pumping station and pipeline from SeaPac's Magic Springs property to the Rangen property approximately 1.6 to 1.9 miles away, depending upon the final diversion point. To date, the engineering required to construct the Project is 60% complete. Current engineering drawings are included as Appendix A. This report summarizes the work SPF has completed regarding the Project.

2. WATER RIGHTS

SeaPac owns two water rights for fish propagation at Magic Springs. Water right 36-7072 authorizes the diversion of 148.2 cfs for fish propagation purposes from Thousand Springs with a priority date of September 5, 1969. Water right 36-8356 authorizes the diversion of 45.0 cfs for fish propagation from springs with a priority date of May 9, 1988. Rights 36-7072 and 36-8356 combined shall not exceed a total diversion rate of 148.2 cfs. Water right information is summarized in Table 1. The Project will be designed to deliver a maximum flow of 10.0 cfs of spring water associated with water right 36-7072 to Rangen.

The points of diversion associated with water rights 36-7072 and 36-8356 are displayed in Figure 1. These locations were obtained from Idaho Department of Water Resources' (IDWR) water rights records and may not reflect the actual diversion location.

IGWA submitted an Application for Transfer of Water Right on September 10, 2014, to IDWR to add Rangen as a new place of use for up to 10 cfs from water right 36-7072. Approval of this transfer will allow water from Magic Springs to be used for fish propagation and mitigation at Rangen. A copy of the transfer application is included as Appendix B, less some of the attachments. The Project will utilize one of the three authorized points of diversion for water right 36-7072.

A letter of intent (LOI) established between IGWA and SeaPac states that SeaPac will lease or sell up to 10 cfs of "first use" water from its Magic Springs water rights (36-7072 and 36-8356) to IGWA. The LOI is included as Attachment 1b within the Application for Transfer of Water Right included as Appendix B.

3. WATER QUALITY

SPF performed a limited water quality field analysis on September 9, 2014 at both Magic Springs and Rangen. This analysis focused on pH, electrical conductivity, specific conductance, and dissolved oxygen. The results are shown in Table 2. In general, the Magic Springs water had a pH and dissolved oxygen concentrations similar to that found at Rangen. The electrical conductivity and specific conductance had slightly (~5%) higher readings than the water at Rangen.

Rangen Field Water Quality		pH Meter	Conductivity Meter		DO Meter	
Location	Date/Time	pH	EC (µS)	SC (µS)	DO (mg/L)	% Saturation
Upstream Farmers Box	9/9/2014 13:13	7.90	262.9	324.6	8.3	94
Upstream Rangen Box	9/9/2014 13:21	8.11	262.4	324.1	8.8	99
Upstream Bridge Diversion	9/9/2014 13:33	8.34	267.7	328.8	8.8	99
Magic Springs Field Water Quality		pH Meter	Conductivity Meter		DO Meter	
Location	Date/Time	pH	EC (µS)	SC (µS)	DO (mg/L)	% Saturation
Upper Flume DS Bridge	9/9/2014 11:50	8.09	277.9	342.1	8.9	99
Raceway Diversion at Head of Raceway	9/9/2014 12:00	8.09	273.5	334.9	9.0	101

Table 2. Water Quality Field Data

SPF also took temperature readings on September 9, 2014. Three different instruments were calibrated with a mercury thermometer and a correction factor by dividing the thermometer reading by the instrument reading. Field measurements of temperature and the corrected temperatures are shown in Table 3. The temperature readings at Magic Springs were very similar to the readings at Rangen.

Rangen Field Water Quality		pH Meter ⁴		Conductivity Meter ⁵		DO Meter ⁵	
Location	Date/Time	Temp (°C)	Corr Temp (°C) ¹	Temp (°C)	Corr Temp (°C) ²	Temp (°C)	Corr Temp (°C) ³
Upstream Farmers Box	9/9/2014 13:13	15.1	15.5	15.1	15.4	15.8	16.0
Upstream Rangen Box	9/9/2014 13:21	14.9	15.3	15.0	15.3	15.3	15.5
Upstream Bridge Diversion	9/9/2014 13:33	15.2	15.6	15.3	15.6	15.6	15.8
Magic Springs Field Water Quality		pH Meter ⁴		Conductivity Meter ⁵		DO Meter ⁵	
Location	Date/Time	Temp (°C)	Corr Temp (°C) ¹	Temp (°C)	Corr Temp (°C) ²	Temp (°C)	Corr Temp (°C) ³
Upper Flume DS Bridge	9/9/2014 11:50	15.1	15.5	15.2	15.5	15.2	15.4
Raceway Diversion at Head of Raceway	9/9/2014 12:00	15.3	15.7	15.4	15.7	15.5	15.7
1 - Calibrated against mercury thermometer using tap water, correction factor =				1.0238			
2 - Calibrated against mercury thermometer using tap water, correction factor =				1.0193			
3 - Calibrated against mercury thermometer using tap water, correction factor =				1.0147			
4 - Temperature accuracy of 0.5°C							
5 - Temperature accuracy of 0.2°C							

Table 3. Temperature Readings

An analysis to determine how much the water temperature may increase after 10 cubic feet per second (cfs) is pumped and piped from Magic Springs to Rangen is being performed by Emily LoDolce, P.E. (AMEC). This temperature analysis will address the two proposed diversion locations. The analysis was not completed when this report was published and will be made available when it is completed.

SPF does not see any critical water quality or temperature disparities between the two facilities' water sources. SeaPac of Idaho is successfully raising trout at their Magic Springs facility. The Project assumes that water from Magic Springs will be suitable for raising trout at Rangen.

4. JANUARY 19, 2014 DELIVERY – 0.5 CFS

The Order Approving IGWA's Second Mitigation Plan states IGWA must provide water to Rangen by January 19, 2015, the date when the Morris exchange water mitigation expires. If IGWA fails to satisfy this obligation, users of consumptive ground water rights junior to August 12, 1973 will be curtailed. To mitigate for commercial, industrial, and municipal groundwater users directly affected by the Order, IGWA proposes the delivery of 0.5 cfs of direct flow from Magic Springs to Rangen, prior to the January 19, 2015 deadline. Full build out of the permanent pump station and pipeline is not scheduled to occur prior to the January 19, 2015 deadline. Because of this, a temporary pump and pipeline system will need to be constructed to deliver the 0.5 cfs to Rangen.

4.1. Temporary Pumping Facilities

To deliver 0.5 cfs to Rangen, a temporary end-suction pump will be constructed to pull water directly from the upstream end of the I&J raceway at the Magic Springs facility. The pump will be designed with a manual priming pump and foot valve on the suction line. The pump will be sized for a TDH of 200 feet and a flow of 225 gpm (0.5 cfs) and will require a nominal 20-hp motor. Pump monitoring during the day will be completed by the general contractor selected for the pump installation. SeaPac staff who live on-site at the Magic Springs facility will be available during non-working hours for pump monitoring.

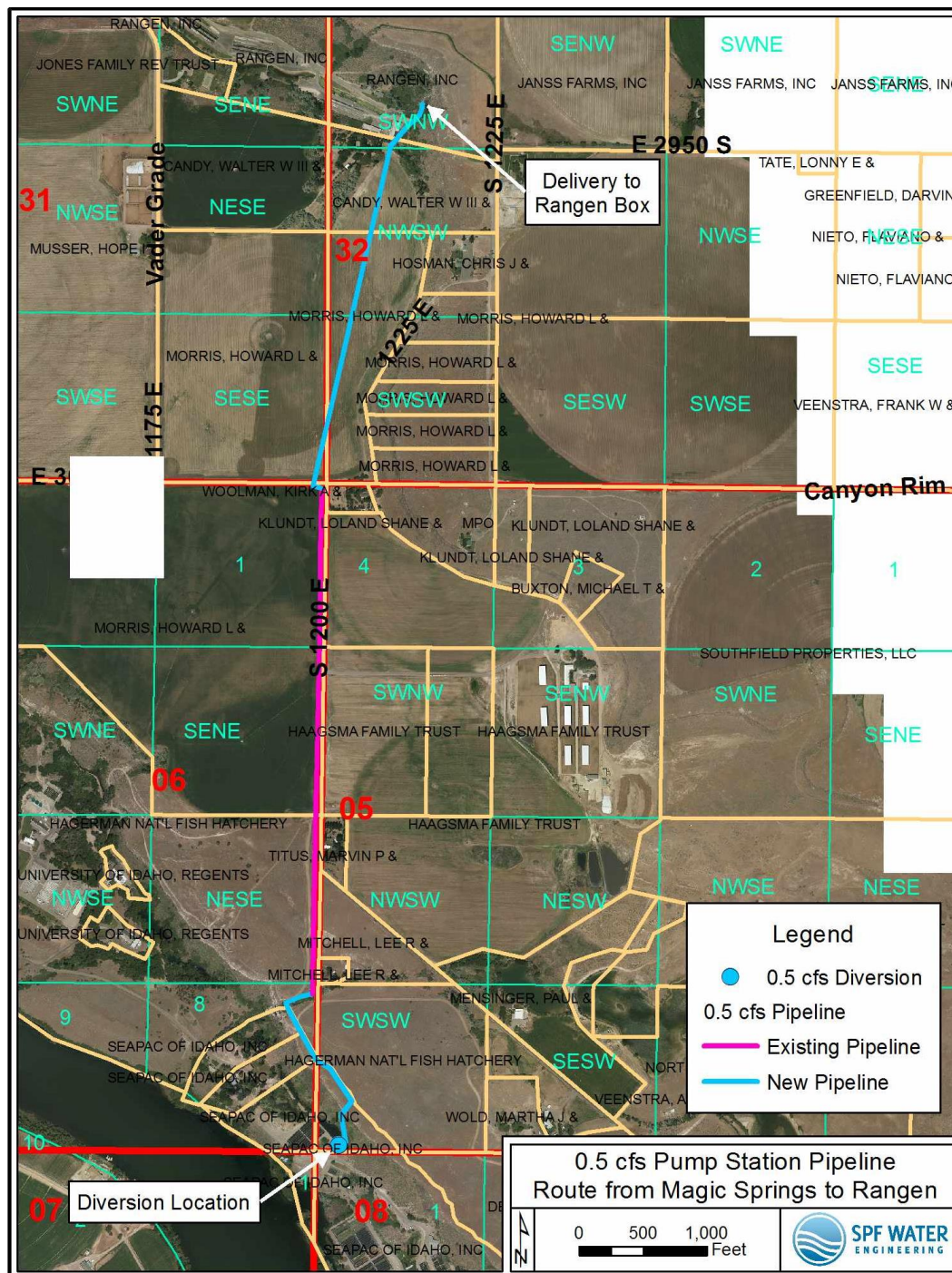
4.2. Temporary Piping Facilities

The proposed temporary pipeline alignment will parallel the permanent pipeline alignment. Six-inch, SDR 9 HDPE pipe will be placed on top of the ground from the pump to the top of the rim. The pipe will be hung from the rim and will be restrained across the talus slope with sand bags. Once on top of the rim, the pipe will transition to SDR 17 HDPE and will run on top of the ground north to the Mitchell Property. From the south end of the Mitchell property north to E 3000 S, existing pipe infrastructure owned by Butch Morris will be utilized. New pipe will be buried under E 3000 S. From the north side of the road to the Rangen property, SDR 17 HDPE pipe will be placed on top of the ground through dormant fields owned by Mr. Morris and Mr. Candy. The HDPE pipe will then follow the existing above grade piping up the talus slope and discharge into the existing Rangen Box. The described alignment is shown in Figure 2.

Mr. Morris has stated additional portions of his buried piping network have the potential to be used, resulting in a reduction of the amount of new above grade pipe re-

quired for the temporary pipeline project. Further investigation will be needed to confirm existing pipeline locations and materials. Along with additional existing buried infrastructure, the use of idle above ground 6-inch aluminum irrigation pipe will also be investigated and could be used in lieu of HDPE in many of the areas where new piping is required.

When full build out of the permanent pump station and pipeline has occurred and the permanent piping is successfully delivering water to Rangen, the temporary piping facilities will be removed.



5. PROJECT DESIGN – 10 CFS

5.1. Pipeline Alignment

IGWA has requested SPF design a 10-cfs pumping and pipeline system to reliably deliver 9.1 cfs from Magic Springs to the Rangen facility. The alignment shown in Figure 3 was developed based on topography, construction feasibility, Hagerman Highway District (HHD) input, and acquirable access to private property. Elevations for the alignments were developed by in-field topographical survey on both ends of the alignments by Quadrant Consulting, Inc. (Quadrant) and an aerial survey and mapping for the length of the alignments by 3Di GeoTerra Mapping Group.

Two potential points of diversion for the project exist below the rim at Magic Springs. The pipeline alignments for both diversion points eventually intersect on top of the rim within SeaPac property. From that point to Rangen, the alignment for both points of diversion is the same. The alignments range from 1.6 to 1.9 miles long.

From the Magic Springs points of diversion, the alignments travel from their respective pumping location above grade, across the talus slope, and up the canyon rim. Once on top of the rim, the pipeline transitions from above grade steel to buried HDPE and parallels the rim on SeaPac property until it intersects with North Side Canal Company (NSCC) property. Within NSCC property, the alignment crosses and then parallels the NSCC 7-D waste ditch until turning north on Lee Mitchell's property. Once across the Mitchell property, the pipeline will travel down HHD's S 1200 E right-of-way for approximately 450 feet to property owned by Butch Morris. The pipeline then parallels S 1200 E on Morris property, crosses E 3000 S, and continues north across Morris property. The pipeline crosses a short section of Walter Candy property prior to entering property owned by Rangen.

5.1.1. Highway District Approval

SPF has presented two different alignments to the HHD superintendent, Rich Regnier. SPF requested that HHD grant preliminary approval for both alignments. The preferred alignment, described above, runs within HHD's S 1200 E right-of-way for approximately 450 feet and has one road crossing at E 3000 S. The alternate alignment, as shown in Figure 3, includes an additional two road crossings of S 1200 E. The HHD is holding a meeting on September 26, 2014 to discuss the two alignments and to consider approval. This report was published prior to HHD's meeting, so it has been assumed both alternatives will be approved. If the IDWR approves the Fourth Mitigation Plan and the Project moves forward, the pipeline contractor will be required to obtain permits from the HHD for the selected alignment and pay any associated fees required at the time of construction.

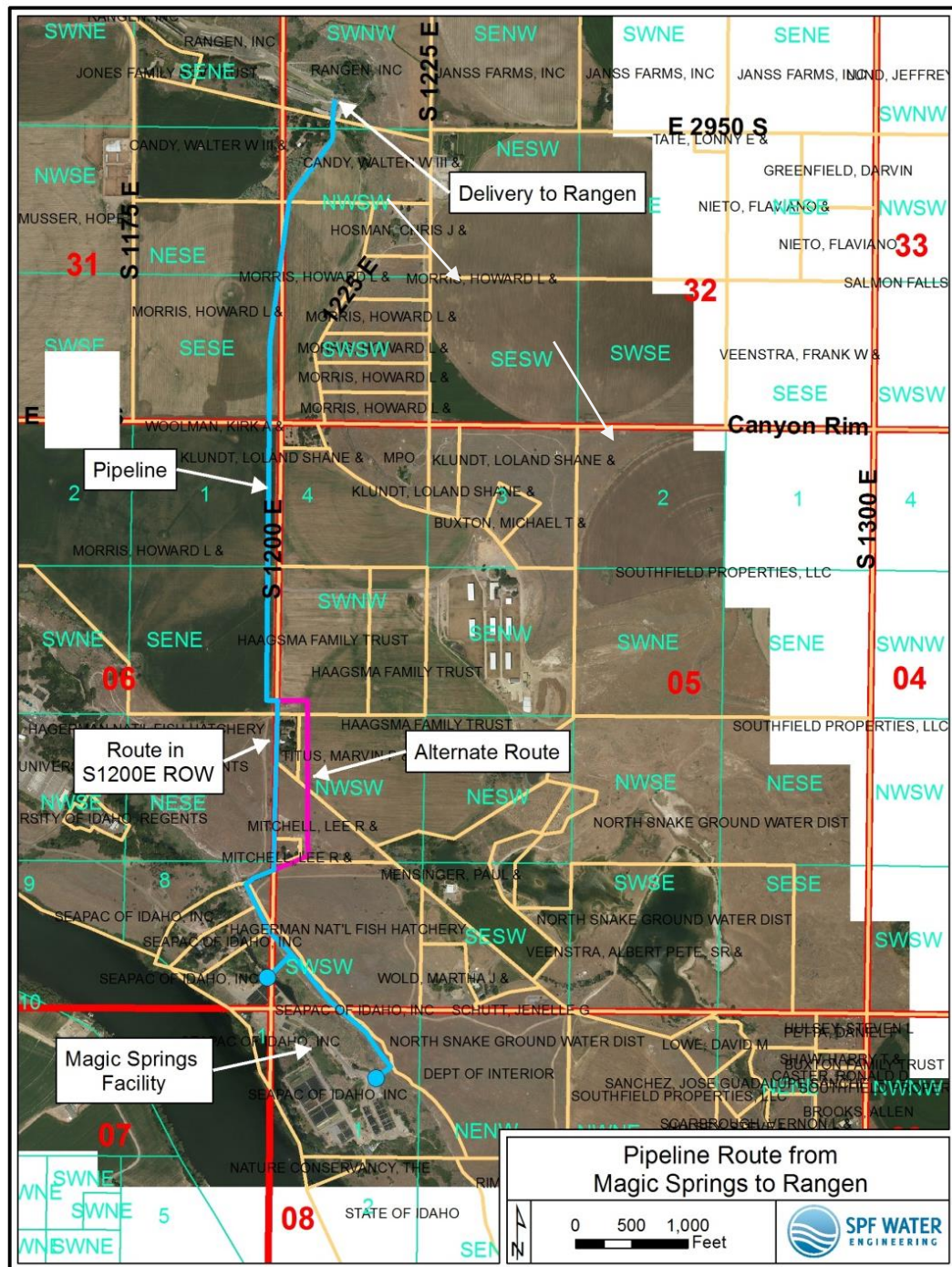


Figure 3. Pipeline Alignment

5.2. ABC Flume Diversion

5.2.1. Diversion Description

There are two potential diversion locations at Magic Springs for delivery of up to 10 cfs of water to Rangen. One location is referred to as the ABC flume diversion. The other location is referred to as the I&J raceway diversion, which is discussed in Section 5.3. The ABC flume diversion will connect to an existing concrete flume that carries ABC spring water to raceways. The water surface elevation at this location is approximately 3,020 feet, 37 feet higher than the I&J raceway diversion. This diversion location is an existing point of diversion under SeaPac's water right 36-7072. According to IDWR records, the ABC flume typically carries 21 cfs in the summer and 24 cfs in the winter and has a defined seasonal variation. A photograph of the proposed diversion location is provided as Photo 1. The proposed diversion location is shown in Figure 4.

The proposed diversion point from the ABC flume is a short distance from where the water emanates from the talus slope. Therefore water diverted at this location should have water quality representative of the spring at its source. Because the proposed diversion is connecting to an existing concrete flume in an area with no wetland vegetation, a new spring collection structure and associated permitting is not required.

The LOI, between IGWA and SeaPac, states that SeaPac will grant a permanent easement to IGWA to access, design, construct, operate and maintain the water intake and collection facilities, pump station, pipeline, and other facilities as necessary to divert and deliver the 10 cfs to Rangen.



Photo 1. ABC flume diversion location

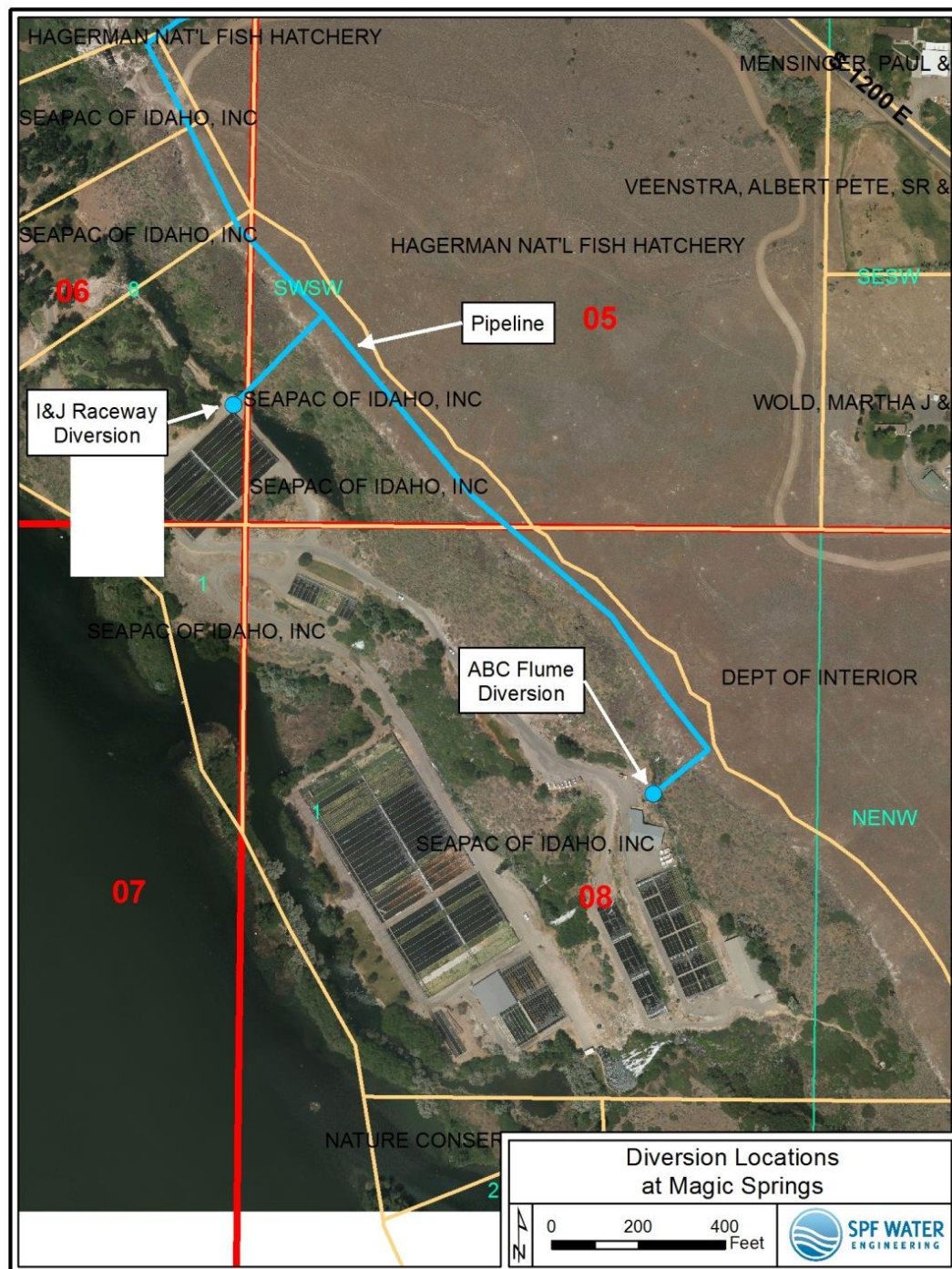


Figure 4. Potential diversion locations at Magic Springs

5.2.2. Gravity Pipeline

A 24-inch diameter gravity pipeline, constructed of welded steel pipe, will carry water from the flume to the pump station. This pipeline will be installed above-grade, and will connect to the flume via a new concrete collection box. The gravity pipeline will be approximately 120 feet long. A head gate will be installed on the upstream end of the gravity line to isolate the feed to the pump station for maintenance. The pipeline and diversion structure details can be found in the design drawings included as Appendix A.

The water surface elevation at the flume is 3,020 feet and can be further increased through the use of downstream check boards if necessary. Accounting for head loss through the pipeline, the calculated head at the suction side of the pump station is 3,016 feet.

5.2.3. Pump Station Design

The 60% design set contemplates utilizing a skid-mounted packaged pump station; including pumps, mechanical piping, valves, flow meter, variable frequency drives (VFDs), and associated controls, generator, and enclosure. The pump station is proposed north of the Magic Springs office as indicated on the design drawings, at a ground elevation of approximately 2,994 feet. The proposed location avoids Magic Springs infrastructure and will not interfere with operations.

The pump station will include three short-set line-shaft turbine pumps. Two of the pumps will be duty pumps and one will be on standby to ensure that two pumps can operate at all times should one be taken out of service for maintenance. The pumps will be placed in individual 24-inch diameter pump cans. The depth of the cans is anticipated to be approximately 7 feet below existing ground surface. The pump cans will be fed from the 24-inch diameter gravity line from the ABC flume. The pump cans will be designed to be watertight under static pressure conditions from the flume.

To deliver 10 cfs from the ABC flume to Rangen, the pump station will need to generate approximately 200 feet of total dynamic head (TDH). The TDH calculation assumes:

- 480 feet (120 feet for the gravity line and 360 feet for the pressure line) of 24-inch Schedule 20 steel pipe (23.25-inch I.D.)
- 9,440 feet of 24-inch HDPE pipe (IPS, SDR 17, 21.01-inch I.D.)
- A pumping water elevation of 3,016 feet at the pump station
- A maximum pipeline elevation of 3,165 feet
- A butterfly valve throttled to maintain backpressure of approximately 25 feet over the maximum elevation of the pipeline
- Connection to Rangen's existing 14-inch buried steel pipe between the hatch house and the small raceway
 - Assumed design flow of 4 cfs (1,800 gpm) to Rangen's small raceway

- Assumed design flow of 6 cfs (2,700 gpm) to the Rangen box

With a TDH of 200 feet and a delivery rate of 10 cfs (4,488 gpm), total brake horsepower (hp) required is 268 hp, or 134 hp per pump with two pumps running. The pumps will require nominal 150-hp motors. All three 150-hp pumps will be controlled by VFDs and paced off flow to maintain any operator-adjustable flow rate up to 10 cfs. System operation will be controlled by a programmable logic controller with remote monitoring and auto-restart capabilities.

The packaged pump station will include an isolation and check valve on each pump, a mainline butterfly valve, pressure relief, combination air valve, and a flow meter. A generator is proposed to provide emergency power. The pump station will be enclosed for protection from weather and to provide sound attenuation. The insulated enclosure will be heated and ventilated.

The pump station will be designed to deliver a maximum flow of 10 cfs at 200 feet of TDH. Because the pump station is using two VFD-controlled pumps paced off of flow, it can be programmed to deliver the phased in lower direct flows identified by IDWR in the Rangen curtailment order. These flows were determined to be:

- 1st Year: 3.4 cfs (1,525 gpm)
- 2nd Year: 5.2 cfs (2,335 gpm)
- 3rd Year: 6.0 cfs (2,695 gpm)
- 4th year: 6.6 cfs (2,965 gpm)
- 5th year: 9.1 cfs (4,085 gpm)

The pump station will be designed to be a reliable, year-round facility. It includes a redundant pump, remote monitoring and alarming capabilities, auto-restart, and a proposed standby power generator and auto-transfer switch. The pump station VFDs will be controlled by discharge rate, allowing them to automatically adjust their speed to deliver a constant flow to Rangen without the need for manual adjustments. The pump station enclosure will be lockable and durable. All these items will make the pump station dependable, biologically and physically secure, and will minimize down-time due to maintenance and power outages.

5.2.4. Power Availability

Three-phase power is available at Magic Springs to power the ABC pump station. Idaho Power has confirmed they can supply the pump station with the necessary electrical service. At this time, there are no known issues related to power availability that will prevent the pump station from operating and delivering 10 cfs to Rangen.

5.2.5. Pipeline Design

With the ABC flume diversion location, the pipeline to Rangen is approximately 1.9 miles long. The 60% design anticipates using approximately 120 feet of welded steel

pipe for the gravity line from the flume to the pump station and 360 feet of welded steel pipe (Schedule 20) to reach the top of the rim, installed above-grade. Once on top of the rim, the pipeline will consist of approximately 9,440 feet of HDPE pipe, SDR 17 (125 psi). HDPE is a very durable and low-friction pipe. It has a better friction coefficient than PVC, which minimizes head loss due to friction and is less susceptible to any build-up on the interior surface of the pipe.

The working pressure at the pump station is anticipated to be approximately 95 psi. The Schedule 20 steel pipe specified in the 60% design documents downstream of the pump station has a pressure rating exceeding 500 psi. The specified pipe is designed to accommodate the pressure surges, or water hammer, that may occur due to pressure transients in the system resulting from power outages or rapid valve closures.

The HDPE pipe will be connected using a butt-fusion welding machine. The pipe comes in 50-foot lengths which will result in approximately 200 butt-fused joints. The interior welds will be de-beaded to keep the interior a continuous smooth surface. This type of HDPE installation results in a fully restrained and leak-free pipeline. The pipeline has an approximate 60-foot bending radius, which eliminates the need for fittings on vertical and horizontal bends of 45 degrees or less.

A minimum of 3 feet of cover is required for the pipeline installation. In many places the bury depth is greater than this to maintain straight grades in the pipe. The grading of the pipe is necessary to minimize the number of high points and low points in the alignment. Over the 1.9 miles, the design has limited the high points and low points to approximately seven each. Combination air valves will be installed at the high points and pipeline drains will be installed at the low points. Additional combination air valves may be installed along the alignment in the final design. Combination air valves will release air during pipeline filling, let air enter the pipe when it is being drained, and release small amounts of accumulated air when the pipe is under pressure. These valves help protect the pipe during filling and draining events and minimize the amount of air in the line, which reduces the friction losses in the pipeline. In areas that are safe from vehicles or farm equipment, the air valves are placed directly over the pipe with access via a manhole. Where the pipeline is in a road or a farmed field, the air valve is remotely located in a vault and fed with a small diameter lateral line.

5.3. I&J Raceway Diversion

5.3.1. Diversion Description

The other potential diversion location at Magic Springs for delivery of up to 10 cfs of water to Rangen is referred to as the I&J raceway diversion. The I&J raceway diversion will divert water from the manifold at the head of the I&J raceway, eliminating the need to construct new spring collection infrastructure. As a result, permitting associated with potential impacts to wetlands and wildlife is avoided. The water surface elevation at this diversion point is approximately 2,983 feet. This diversion location is an

existing point of diversion under SeaPac's water right 36-7072. The I&J raceway flows approximately 34 cfs according to SeaPac. A photograph of the proposed diversion location is provided as Photo 2. The proposed diversion location is shown in Figure 4.

The proposed diversion point from the I&J raceway is directly adjacent to the spring water source pond and is prior to any commercial use within the raceway. The water diverted at this location should have water quality representative of the spring at its source.

The LOI, between IGWA and SeaPac, states that SeaPac will grant a permanent easement to IGWA to access, design, construct, operate and maintain the water intake and collection facilities, pump station, pipeline, and other facilities as necessary to divert and deliver the 10 cfs to Rangen.



Photo 2. I&J raceway diversion location

5.3.2. Gravity Pipeline

A 24-inch diameter buried gravity pipeline, constructed of ductile iron pipe, will carry water from the I&J raceway to the pump station. The gravity pipeline will be approximately 45 feet long. A head gate will be installed on the upstream end of the gravity line to isolate the feed to the pump station for maintenance. The pipeline and diversion structure details can be found in the design drawings included as Appendix A.

The water surface elevation at the raceway is at 2,983 feet. Accounting for head loss through the pipeline, the calculated head at the pump station is 2,982 feet.

5.3.3. Pump Station Design

The pump station design for the I&J raceway diversion is similar to that for the ABC flume diversion. A skid-mounted packaged pump station is anticipated including pumps, mechanical piping, valves, flow meter, variable frequency drives (VFDs), and associated controls, generator, and enclosure. The pump station is proposed north of the I&J raceway as shown on the design drawings, at a ground elevation of approximately 2,986 feet. The proposed location avoids Magic Springs infrastructure and will not interfere with operations.

The pump station will include three short-set line-shaft turbine pumps: two duty pumps and one standby. The pumps will be placed in individual 24-inch diameter pump cans. The depth of the cans is anticipated to be about 12 feet below existing ground surface. The pump cans would be fed from the 24-inch diameter gravity line from the I&J raceway.

To deliver 10 cfs from the I&J raceway to Rangen, the pump station will have to generate approximately 220 feet of total dynamic head (TDH). The TDH calculation assumes:

- 365 feet of 24-inch Schedule 20 steel pipe (23.25-inch I.D.)
- 7,980 feet of 24-inch HDPE pipe (IPS, SDR 17, 21.01-inch I.D.)
- A pumping water elevation of 2,982 feet at the pump station
- A maximum pipeline elevation of 3,149 feet
- A butterfly valve throttled to maintain backpressure of approximately 25 feet over the maximum elevation of the pipeline
- Connection to Rangen's existing 14-inch buried steel pipe between the hatch house and the small raceway
 - Assumed design flow of 4 cfs (1,800 gpm) to Rangen's small raceway
 - Assumed design flow of 6 cfs (2,700 gpm) to the Rangen box

With a TDH of 220 feet and a delivery rate of 10 cfs (4,488 gpm), total brake horsepower (hp) required is 295 hp, or 148 hp per pump with two pumps running. The pumps will require nominal 200-hp motors, with all three controlled by VFDs and paced off flow to maintain any operator-adjustable flow rate up to 10 cfs. System operation will be controlled by a programmable logic controller with remote monitoring and auto-restart capabilities. Other features of the packaged pump station are similar to the ABC flume pump station. The pump station will be designed to be a reliable and secure facility. It includes a redundant pump, remote monitoring and alarming capabilities, auto-restart, and a proposed standby power generator and auto-transfer switch.

5.3.4. Power Availability

Three-phase power is available at Magic Springs to power the I&J pump station. Idaho Power has confirmed they can supply the pump station with the necessary electri-

cal service. At this time, there are no known issues related to power availability that will prevent the pump station from operating and delivering 10 cfs to Rangen.

5.3.5. Pipeline Design

With the I&J raceway diversion location, the pipeline to Rangen is approximately 1.6 miles long. The pipeline will include approximately 365 feet of above-grade steel pipe (Schedule 20) to reach the top of the rim, and then approximately 7,980 feet of HDPE pipe, SDR 17 (125 psi) to Rangen. The HDPE pipe will be connected using a butt-fusion welding machine, with the interior welds de-beaded to keep the interior a continuous smooth surface. This type of HDPE installation results in a fully restrained and leak-free pipeline.

The working pressure at the pump station is anticipated to be approximately 93 psi. The Schedule 20 steel pipe specified in the 60% design documents downstream of the pump station has a pressure rating exceeding 500 psi. The specified pipe is designed to accommodate the pressure surges, or water hammer, that may occur due to pressure transients in the system resulting from power outages or rapid valve closures.

A minimum of 3 feet of cover will be provided for the pipe. Over the 1.6 miles, the design has limited the high points and low points to approximately 5 each. Combination air valves will be installed at the high points and pipeline drains will be installed at the low points.

5.4. Delivery to Rangen

The pipeline from Magic Springs will connect to the existing 14-inch pipeline between the hatch house and the small raceway. Redundant butterfly valves will be provided immediately upstream of the tie-in point to maintain a minimum upstream pressure in the pipeline under all static and operating conditions. Throttling the butterfly valve will ensure a full pipeline upstream of the valve and that enough pumping head is developed to transport water over the mainline high-point without creating a vacuum condition. Only one of the throttling valves will be utilized at a time, with the other valve closed. Should the active valve need to be replaced, the other valve could be used to maintain delivery of water to Rangen. Isolation valves will be installed on either side of each of the butterfly valves to allow for maintenance and/or replacement. The butterfly valves will be housed in a buried vault on Rangen property.

Directly downstream of the valve vault, the new pipeline will connect by tee to the existing 14-inch buried steel pipeline that exists between the hatch house and the small raceway. A 14-inch butterfly valve will be installed on the small raceway leg of the tee to allow control of flow to the small raceway. There is an existing 14-inch valve located in a vault near the hatch house that could be used to control flow from or to the Rangen Box. In addition, there is an existing valve and lateral that can be used to direct flow from the 14-inch pipeline to the hatch house.

The existing 14-inch pipeline transports water from the Rangen Box to the small raceways. The pipe from Magic Springs will tie-in to this 14-inch pipe, allowing flows to be directly delivered to the small raceways through the 14-inch pipe, or to the large raceways in two ways: (1) after water flows through the small raceways via an existing 18-inch diameter pipeline and (2) through the Bridge Diversion in Billingsley Creek which can receive water spilled from the Rangen Box. The 60% design assumes 4 cfs will be delivered to the small raceways and 6 cfs will be delivered to the Rangen Box. However, if the small raceways can take additional flow, a larger portion of the 10 cfs can be sent that direction. The distribution of water between the small raceways and the Rangen Box will be adjusted by opening or closing a 14-inch butterfly valve that will be installed on the small raceway leg of the tee.

6. PROJECT SCHEDULE

If the Magic Springs Project is constructed, the target date to deliver 0.5 cfs to Rangen is January 19, 2015 and the target date to deliver up to 9.1 cfs to Rangen is April 1, 2015. The hearing for the 4th Mitigation Plan is scheduled for October 8-9. It is assumed the IDWR Director will render a favorable decision within two weeks. The proposed schedule in Figure 5 identifies the major tasks and their timeframes required to meet the target dates.

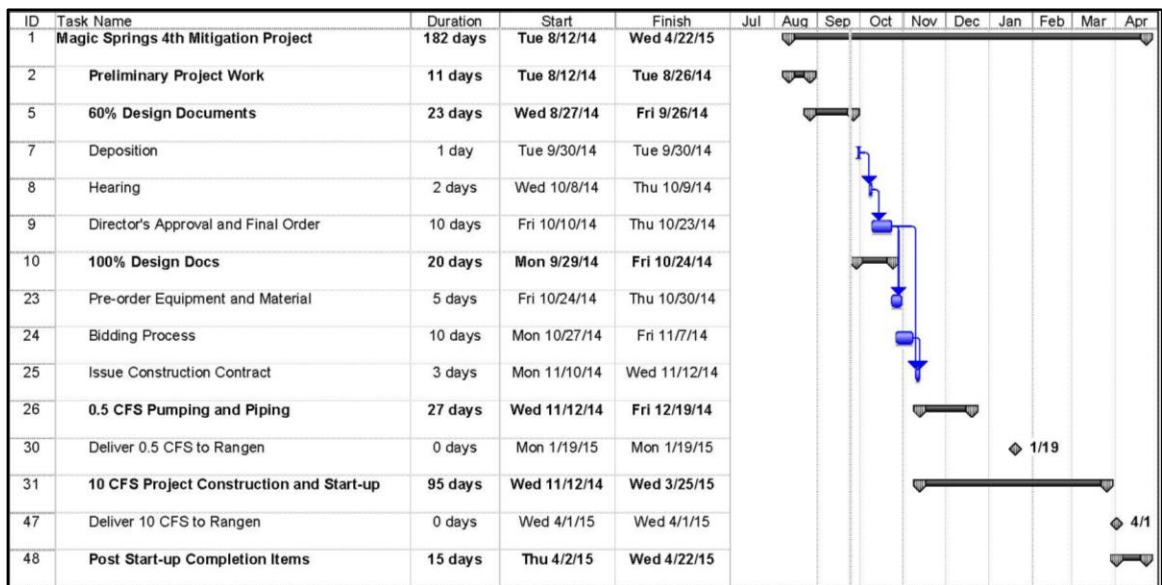


Figure 5. Aqua Life Project Schedule

7. PROJECT COST ESTIMATE

7.1. Capital Construction Cost Estimate

The Preliminary Opinion of Probable Cost developed for the 60% design is based on direct vendor material pricing, contractor installation input, and historical information SPF had available. Pipe, fitting, and valve material costs were based on direct vendor pricing obtained in April 2014. Pipeline installation costs of the project were developed based on information from reputable contractors. The 60% design contemplates a skid-mounted packaged pump station, including pumps, mechanical piping, valves, flow meter, variable frequency drives (VFDs) and associated controls, generator, and enclosure. Costs for this packaged pump station were obtained from a packaged pump station vendor in September 2014.

The estimate assumes Idaho Power does not need to upgrade their distribution facilities. The estimate also includes a construction contingency and engineering and construction services to finalize the design and support the construction effort.

Table 4 and Table 5 summarize the Preliminary Opinion of Probable Costs for the 60% design of the Magic Springs Project.

 OPINION OF PROBABLE COST MAGIC SPRINGS PROJECT -- ABC SOURCE SUMMARY OF COSTS		
PROJECT : 4th Mitigation Plan -- Magic Springs ABC Source		ESTIMATE CLASS : 4
SPF JOB # : 535.0150		DATE : 9/25/2014
LOCATION : Hagerman, Idaho		BY : RRH
		REVIEWED : JT
NO.	DESCRIPTION	ESTIMATED COSTS
1	PIPELINE AND APPURTENANCES	\$ 1,352,313
2	PUMPING AND MECHANICAL	\$ 394,268
3	ELECTRICAL AND CONTROLS	\$ 118,062
4	MOBILIZATION, FEES, CONTINGENCY, ENGINEERING	\$ 484,807
ESTIMATED DESIGN AND CONSTRUCTION COST		\$ 2,349,000
<i>This estimate of probable cost reflects our professional opinion of accurate costs at this time based on current conditions at the project location. This estimate is subject to change through the project planning and design process. Actual construction cost will depend on the cost of labor, materials, equipment, and services provided by others, contractor's methods of determining prices, competitive bidding and market conditions.</i>		

Table 4. Preliminary Opinion of Probable Cost – ABC

 OPINION OF PROBABLE COST MAGIC SPRINGS PROJECT -- I&J SOURCE SUMMARY OF COSTS		
PROJECT : 4th Mitigation Plan -- Magic Springs I&J Source		ESTIMATE CLASS : 4
SPF JOB # : 535.0150		DATE : 9/25/2014
LOCATION : Hagerman, Idaho		BY : RRH
		REVIEWED : JT
NO.	DESCRIPTION	ESTIMATED COSTS
1	PIPELINE AND APPURTENANCES	\$ 1,100,098
2	PUMPING AND MECHANICAL	\$ 423,268
3	ELECTRICAL AND CONTROLS	\$ 151,720
4	MOBILIZATION, FEES, CONTINGENCY, ENGINEERING	\$ 452,273
ESTIMATED DESIGN AND CONSTRUCTION COST		\$ 2,127,000
<i>This estimate of probable cost reflects our professional opinion of accurate costs at this time based on current conditions at the project location. This estimate is subject to change through the project planning and design process. Actual construction cost will depend on the cost of labor, materials, equipment, and services provided by others, contractor's methods of determining prices, competitive bidding and market conditions.</i>		

Table 5. Preliminary Opinion of Probable Cost – I&J

7.2. Annual System Operational Costs

If the Magic Springs Project is constructed there will be on-going operational and maintenance costs associated with the new system. A capital reserve fund is recommended to help with replacement costs of the equipment. Table 6 and Table 7 show an analysis of a Component Inventory and Capital Replacement Fund. This produces an annual dollar amount that should be included in the overall annual budget for this system.

On-going operational costs include electricity, operational labor, and preventative maintenance. These costs are summarized in Table 8 and Table 9. Water quality testing may be required but is not included in this estimate. The most significant annual cost will be the electrical. Currently a \$0.06/kW-Hr cost is being used for the Idaho Power costs.

Equipment Description	Initial Cost	Expected Life	Replacement Year	Replacement Cost @ 3%	Annual Cost @ 6%
Pipeline	\$ 545,931	50	2065	\$ 2,393,310	\$ 8,243
(3) Turbine Pumps/Motors, 150 hp	\$ 177,894	15	2030	\$ 277,153	\$ 11,907
(3) Variable Frequency Drives, 150-hp	\$ 48,000	15	2030	\$ 74,782	\$ 3,213
PLC, HMI	\$ 15,000	15	2030	\$ 23,370	\$ 1,004
Flow Meter	\$ 7,200	12	2027	\$ 10,265	\$ 609
Mechanical Piping and Valves	\$ 20,000	25	2040	\$ 41,876	\$ 763
Pump Station Enclosure	\$ 30,300	25	2040	\$ 63,441	\$ 1,156
Pump Cans	\$ 28,143	25	2040	\$ 58,925	\$ 1,074
Air Vacs	\$ 19,250	25	2040	\$ 40,305	\$ 735
Drains	\$ 10,500	25	2040	\$ 21,985	\$ 401
Pressure Control Valve, Iso Valves	\$ 18,200	10	2025	\$ 24,459	\$ 1,856
Mainline Valves	\$ 42,800	25	2040	\$ 89,614	\$ 1,633
Collection Box	\$ 12,000	50	2065	\$ 52,607	\$ 181
Generator	\$ 93,062	25	2040	\$ 194,851	\$ 3,551
Total Annualized Payment for Capital Reserve Fund	\$1,068,280			\$ 3,366,944	\$ 36,327
Assumptions:					
1) Inflation Rate = 3.0 %					
2) Interest Rate = 6.0 %					
3) All equipment costs and life expectancies are estimated.					

Table 6. Component Inventory and Capital Replacement Analysis – ABC

Equipment Description	Initial Cost	Expected Life	Replacement Year	Replacement Cost @ 3%	Annual Cost @ 6%
Pipeline	\$ 459,660	50	2065	\$ 2,015,106	\$ 6,941
(3) Turbine Pumps/Motors, 200 hp	\$ 190,623	15	2030	\$ 296,984	\$ 12,759
(3) Variable Frequency Drives, 200-hp	\$ 61,500	15	2030	\$ 95,815	\$ 4,116
PLC, HMI	\$ 15,000	15	2030	\$ 23,370	\$ 1,004
Flow Meter	\$ 7,200	12	2027	\$ 10,265	\$ 609
Mechanical Piping and Valves	\$ 20,000	25	2040	\$ 41,876	\$ 763
Pump Station Enclosure	\$ 30,300	25	2040	\$ 63,441	\$ 1,156
Pump Cans	\$ 42,000	25	2040	\$ 87,939	\$ 1,603
Air Vacs	\$ 13,750	25	2040	\$ 28,789	\$ 525
Drains	\$ 7,000	25	2040	\$ 14,656	\$ 267
Pressure Control Valve, Iso Valves	\$ 18,200	10	2025	\$ 24,459	\$ 1,856
Mainline Valves	\$ 58,700	25	2040	\$ 122,905	\$ 2,240
Generator	\$ 121,720	25	2040	\$ 254,855	\$ 4,645
Total Annualized Payment for Capital Reserve Fund	\$1,045,653			\$ 3,080,461	\$ 38,484
Assumptions:					
1) Inflation Rate = 3.0 %					
2) Interest Rate = 6.0 %					
3) All equipment costs and life expectancies are estimated.					

Table 7. Component Inventory and Capital Replacement Analysis – I&J

Item	Annual Cost
2 - 150 HP Electrical Costs (\$0.06/kW-h)	\$109,789
Weekly Inspections (\$200/week)	\$10,400
Miscellaneous Maintenance	\$5,000
Remote Monitoring	\$2,450
Capital Reserve Fund	\$36,327
TOTAL	\$163,966

Table 8. Annual Operating Costs – ABC

Item	Annual Cost
2 - 200 HP Electrical Costs (\$0.06/kW-h)	\$120,058
Weekly Inspections (\$200/week)	\$10,400
Miscellaneous Maintenance	\$5,000
Remote Monitoring	\$2,450
Capital Reserve Fund	\$38,484
TOTAL	\$176,392

Table 9. Annual Operating Costs – I&J

APPENDIX A: 60% DESIGN DRAWING SET

MAGIC SPRINGS PROJECT PUMP STATION AND PIPELINE

HAGERMAN, IDAHO

2014

PROJECT TEAM

OWNER

NORTH SNAKE AND MAGIC VALLEY GROUND WATER DISTRICTS
AND SOUTHWEST IRRIGATION DISTRICT
LYNN CARLQUIST
152 E MAIN ST
JEROME, ID 83338
(208) 324-8995

CIVIL ENGINEER

SPF WATER ENGINEERING
ATTN: ROBERT HARDGROVE, PE
300 E MALLARD DR, SUITE 350
BOISE, ID 83706
PHONE: (208) 383-4140
EMAIL: bhardgrove@spfwater.com

SURVEYOR

QUADRANT CONSULTING, INC
ATTN: PETE LOUNSBURY
1904 W OVERLAND RD
BOISE, ID 83705
PHONE: (208) 342-0091
EMAIL: pete@quadrant.cc

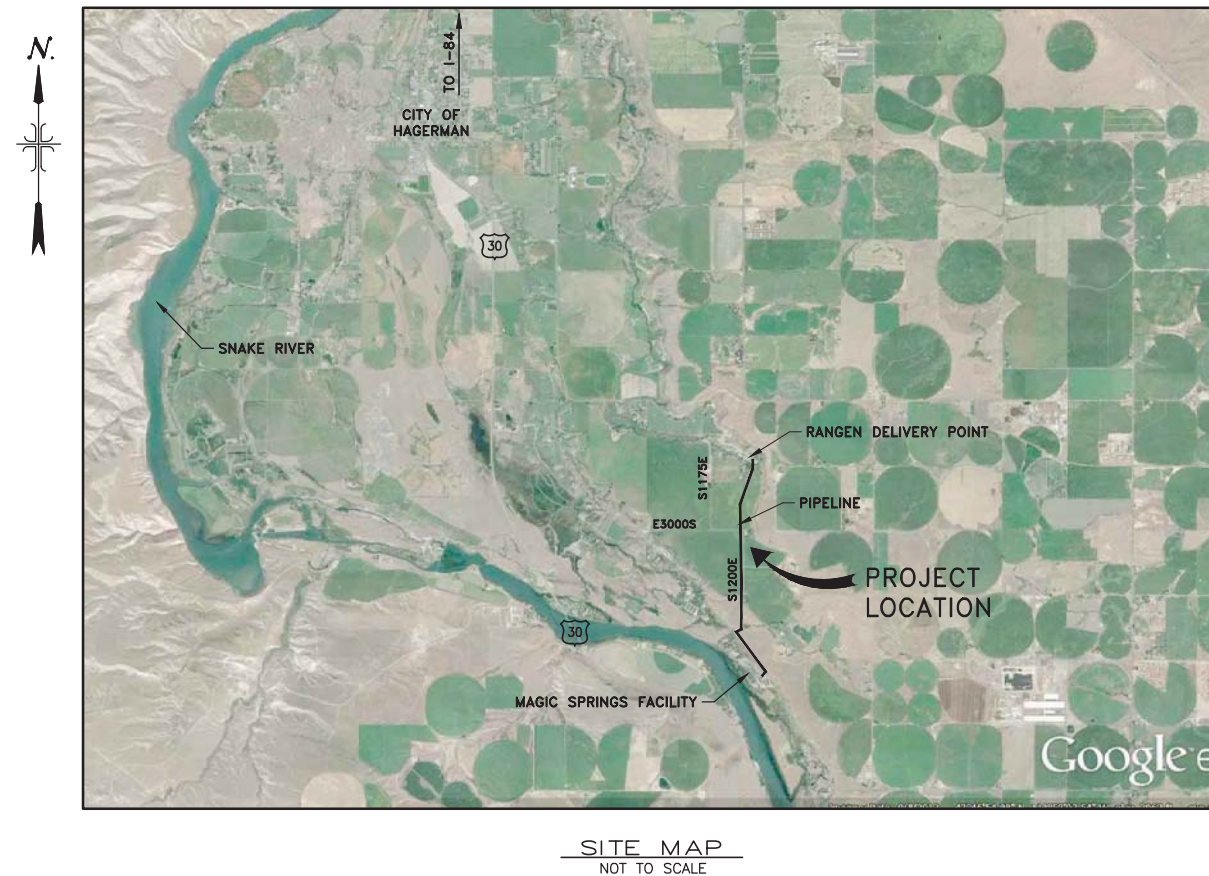
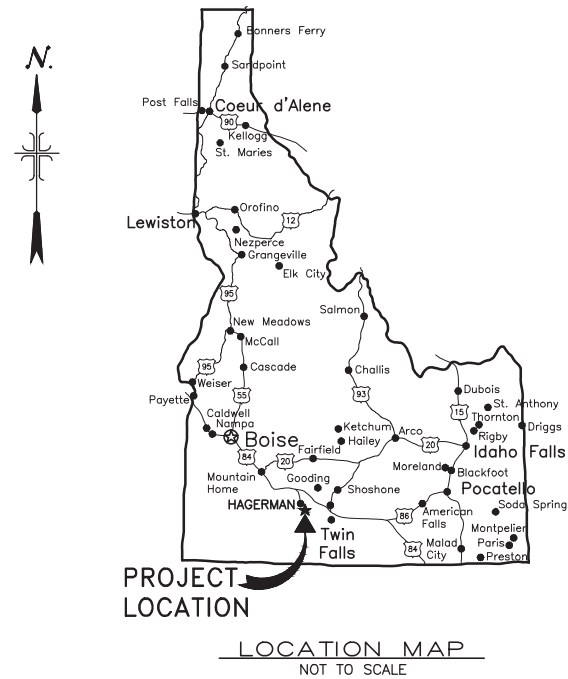
3Di GEOTERRA MAPPING GROUP
ATTN: SCOTT WILSON
9543 W EMERALD ST, STE 203
BOISE, ID 83704
PHONE: (208) 336-2430
EMAIL: swilson@3DiMapping.com

GEOTECHNICAL ENGINEER

STRATA CORPORATION
ATTN: DANIEL GADO, PE
8653 W. HACKAMORE DRIVE
BOISE, ID 83709
PHONE: (208) 376-8200
EMAIL: dang@stratageotech.com

STRUCTURAL ENGINEER

LOCHSA ENGINEERING
ATTN: RILEY MAHAFFEY, PE
201 N. MAPLE GROVE ROAD SUITE 100
BOISE, ID 83704
PHONE: (208) 342-7168
EMAIL: riley@lochsaidaho.com



SHEET INDEX

G-001	COVER SHEET
G-002	DESIGN CRITERIA
G-003	GENERAL NOTES
G-004	ABC PUMP PROCESS FLOW DIAGRAM
G-004A	I&J PUMP PROCESS FLOW DIAGRAM
G-005	ABC PUMP HYDRAULIC PROFILE
G-005A	I&J PUMP HYDRAULIC PROFILE
G-006	PLAN AND PROFILE SHEET KEY MAP
C-101	ABC PIPELINE PLAN & PROFILE STA. 0+00 TO ABC PUMP
C-102	ABC PIPELINE PLAN & PROFILE ABC PUMP TO STA. 5+00
C-103	ABC PIPELINE PLAN & PROFILE STA. 5+00 TO 13+50
C-104	ABC PIPELINE PLAN & PROFILE STA. 13+50 TO 22+00
C-101A	I&J PIPELINE PLAN & PROFILE STA. 15+49 TO I&J PUMP
C-102A	I&J PIPELINE PLAN & PROFILE I&J PUMP TO STA. 22+00
C-105	PIPELINE PLAN & PROFILE STA. 22+00 TO 30+00
C-106	PIPELINE PLAN & PROFILE STA. 30+00 TO 38+00
C-107	PIPELINE PLAN & PROFILE STA. 38+00 TO 46+00
C-108	PIPELINE PLAN & PROFILE STA. 46+00 TO 54+00
C-109	PIPELINE PLAN & PROFILE STA. 54+00 TO 62+00
C-110	PIPELINE PLAN & PROFILE STA. 62+00 TO 70+00
C-111	PIPELINE PLAN & PROFILE STA. 70+00 TO 78+00
C-112	PIPELINE PLAN & PROFILE STA. 78+00 TO 86+00
C-113	PIPELINE PLAN & PROFILE STA. 86+00 TO 94+00
C-114	PIPELINE PLAN & PROFILE STA. 94+00 TO 98+67
M-101	ABC FLUME PUMP STATION PLAN
M-201	ABC FLUME PUMP STATION SECTION
M-101A	I&J RACEWAY PUMP STATION PLAN
M-201A	I&J RACEWAY PUMP STATION SECTION
M-501	DETAILS
M-502	DETAILS
S0.01	STRUCTURAL COVER SHEET
S0.02	STRUCTURAL DESIGN NOTES
S0.03	STRUCTURAL DESIGN NOTES
S0.04	STRUCTURAL DESIGN NOTES
S0.05	STRUCTURAL DESIGN NOTES
S1.01ABC	FOUNDATION PLAN
S1.01IJ	FOUNDATION PLAN
S6.01	DETAILS

MAGIC SPRINGS PROJECT
PUMP STATION AND PIPELINE

COVER SHEET

PRELIMINARY
DRAFT NOT FOR
CONSTRUCTION

REVISIONS		
ITEM	DESCRIPTION	DATE
A	60% DESIGN SUBMITTAL	9/26/14

VERIFY SCALE  BAR MEASURES ONE-INCH ON FULL SIZE DRAWING.	
PROJECT:	535.0150
DESIGNED:	JWT
DRAWN:	PZC
CHECKED:	RRH

G-001

4TH MITIGATION PLAN
MAGIC SPRINGS PROJECT
DESIGN CRITERIA AND ASSUMPTIONS

ABC PUMP STATION AND PIPELINE

PUMPING DATA

- SOURCE WATER: FLUME UPSTREAM OF ABC RACEWAYS, MAGIC SPRINGS FACILITY
- MINIMUM REQUIRED DIRECT FLOW TO RANGEN:
 - 1ST YEAR: 3.4 CFS (1,525 GPM)
 - 2ND YEAR: 5.2 CFS (2,335 GPM)
 - 3RD YEAR: 6.0 CFS (2,695 GPM)
 - 4TH YEAR: 9.1 CFS (4,085 GPM)
- CONTINUOUS DESIGN FLOW TO RANGEN: 10 CFS (4,500 GPM)
 - ASSUMED DESIGN FLOW TO SMALL RACEWAY: 4 CFS (1,800 GPM)
 - ASSUMED DESIGN FLOW TO RANGEN BOX: 6 CFS (2,700 GPM)
- DESIGN TOTAL DYNAMIC HEAD: 200 FEET
 - HEAD TO THROTTLING VALVE SET POINT: 158 FEET
 - HEAD DOWNSTREAM OF THROTTLINE VALVE: 102 FEET
 - ASSUMED LOW WATER ELEVATION IN FLUME: 3020 FEET
- ACTUAL HORSEPOWER REQUIRED TO DELIVER 10 CFS AT 200 FEET TDH: 268 HP
- NOMINAL HORSEPOWER REQUIRED TO DELIVER 10 CFS AT 200 FEET TDH: 300 HP
- PUMP STATION WILL INCLUDE THREE (3) 150-HP PUMPS: TWO (2) DUTY PUMPS AND ONE (1) STANDBY PUMP
- ALL THREE (3) PUMPS WILL BE CONTROLLED BY VARIABLE FREQUENCY DRIVES (VFDS) AND PACED OFF OF FLOW
- THREE-PHASE POWER WILL BE DELIVERED FROM THE EXISTING IPCO DISTRIBUTION LINE ON THE MAGIC SPRINGS PROPERTY. A TRANSFORMER WILL BE INSTALLED ADJACENT TO THE PUMP STATION. IPCO HAS CONFIRMED THEY CAN PROVIDE THE ELECTRICAL SERVICE TO THE PUMP STATION.
- THE PUMP STATION WILL BE PROVIDED WITH A HEATED AND VENTILATED INSULATED ENCLOSURE FOR YEAR-ROUND OPERATION AND SOUND ATTENUATION.
- STANDBY POWER GENERATION WILL BE UTILIZED FOR SYSTEM RELIABILITY.

PIPELINE

- 24-INCH SCHEDULE 20 WELDED STEEL AND 24-INCH IPS HDPE, DR17 (21.01-INCH I.D.; 125 PSI) PE4710 WITH FUSED JOINTS.
~~RANGEN TIE-IN~~
- POINT OF DELIVERY: RANGEN, INC.'S BURIED 14-INCH STEEL PIPELINE
 - 14-INCH PIPELINE STARTS AT THE RANGEN BOX AND TERMINATES AT THE SMALL RACEWAYS
 - TIE INTO 14-INCH PIPELINE BETWEEN THE HATCHERY HOUSE AND THE SMALL RACEWAYS
- FLOW WILL BE DELIVERED THROUGH THE 14-INCH PIPELINE TO BOTH THE SMALL AND LARGE RACEWAYS
 - DIRECTLY TO THE SMALL RACEWAYS THROUGH THE 14-INCH PIPELINE
 - INDIRECTLY TO THE LARGE RACEWAYS
 - TO LARGE RACEWAYS AFTER IT FLOWS THROUGH THE SMALL RACEWAYS
 - FLOW NOT TAKEN THROUGH THE SMALL RACEWAYS WILL BE DELIVERED TO THE RANGEN BOX THROUGH THE 14-INCH PIPELINE, SPILLED INTO BILLINGSLEY CREEK AND DIVERTED TO THE LARGE RACEWAYS AT THE BRIDGE DIVERSION

PUMP SCHEDULE:

Pump Name	Type	Controls	Design Flow (gpm)	Design TDH (ft)	Pump Model, Or Approved Equal	Number of Stages	Pump HP
Duty Pump 1	Canned Lineshaft Turbine	VFD	2250	200	Goulds 14RHMC	3	150
Duty Pump 2	Canned Lineshaft Turbine	VFD	2250	200	Goulds 14RHMC	3	150
Duty Pump 3	Canned Lineshaft Turbine	VFD	2250	200	Goulds 14RHMC	3	150

I&J PUMP STATION AND PIPELINE

PUMPING DATA

- SOURCE WATER: I&J RACEWAY MANIFOLD, MAGIC SPRINGS FACILITY
- MINIMUM REQUIRED DIRECT FLOW TO RANGEN:
 - 1ST YEAR: 3.4 CFS (1,525 GPM)
 - 2ND YEAR: 5.2 CFS (2,335 GPM)
 - 3RD YEAR: 6.0 CFS (2,695 GPM)
 - 4TH YEAR: 9.1 CFS (4,085 GPM)
- CONTINUOUS DESIGN FLOW TO RANGEN: 10 CFS (4,500 GPM)
 - ASSUMED DESIGN FLOW TO SMALL RACEWAY: 4 CFS (1,800 GPM)
 - ASSUMED DESIGN FLOW TO RANGEN BOX: 6 CFS (2,700 GPM)
- DESIGN TOTAL DYNAMIC HEAD: 220 FEET
 - HEAD TO THROTTLING VALVE SET POINT: 181 FEET
 - HEAD DOWNSTREAM OF THROTTLING VALVE: 90 FEET
 - ASSUMED LOW WATER ELEVATION IN RACEWAY MANIFOLD: 2983 FEET
- ACTUAL HORSEPOWER REQUIRED TO DELIVER 10 CFS AT 220 FEET TDH: 295 HP
- NOMINAL HORSEPOWER REQUIRED TO DELIVER 10 CFS AT 220 FEET TDH: 400 HP
- PUMP STATION WILL INCLUDE THREE (3) 200-HP PUMPS: TWO (2) DUTY PUMPS AND ONE (1) STANDBY PUMP
- ALL THREE (3) PUMPS WILL BE CONTROLLED BY VARIABLE FREQUENCY DRIVES (VFDS) AND PACED OFF OF FLOW
- THREE-PHASE POWER WILL BE DELIVERED FROM THE EXISTING IPCO DISTRIBUTION LINE ON THE MAGIC SPRINGS PROPERTY. A TRANSFORMER WILL BE INSTALLED ADJACENT TO THE PUMP STATION. IPCO HAS CONFIRMED THEY CAN PROVIDE THE ELECTRICAL SERVICE TO THE PUMP STATION.
- THE PUMP STATION WILL BE PROVIDED WITH A HEATED AND VENTILATED INSULATED ENCLOSURE FOR YEAR-ROUND OPERATION AND SOUND ATTENUATION.
- STANDBY POWER GENERATION WILL BE UTILIZED FOR SYSTEM RELIABILITY.

PIPELINE

- 24-INCH SCHEDULE 20 WELDED STEEL AND 24-INCH IPS HDPE, DR17 (21.01-INCH I.D.; 125 PSI) PE4710 WITH FUSED JOINTS.
~~RANGEN TIE-IN~~
- POINT OF DELIVERY: RANGEN, INC.'S BURIED 14-INCH STEEL PIPELINE
 - 14-INCH PIPELINE STARTS AT THE RANGEN BOX AND TERMINATES AT THE SMALL RACEWAYS
 - TIE INTO 14-INCH PIPELINE BETWEEN THE HATCHERY HOUSE AND THE SMALL RACEWAYS
- FLOW WILL BE DELIVERED THROUGH THE 14-INCH PIPELINE TO BOTH THE SMALL AND LARGE RACEWAYS
 - DIRECTLY TO THE SMALL RACEWAYS THROUGH THE 14-INCH PIPELINE
 - INDIRECTLY TO THE LARGE RACEWAYS
 - TO LARGE RACEWAYS AFTER IT FLOWS THROUGH THE SMALL RACEWAYS
 - FLOW NOT TAKEN THROUGH THE SMALL RACEWAYS WILL BE DELIVERED TO THE RANGEN BOX THROUGH THE 14-INCH PIPELINE, SPILLED INTO BILLINGSLEY CREEK AND DIVERTED TO THE LARGE RACEWAYS AT THE BRIDGE DIVERSION

PUMP SCHEDULE:

Pump Name	Type	Controls	Design Flow (gpm)	Design TDH (ft)	Pump Model, Or Approved Equal	Number of Stages	Pump HP
Duty Pump 1	Canned Lineshaft Turbine	VFD	2250	220	Goulds 14RJHC	3	200
Duty Pump 2	Canned Lineshaft Turbine	VFD	2250	220	Goulds 14RJHC	3	200
Duty Pump 3	Canned Lineshaft Turbine	VFD	2250	220	Goulds 14RJHC	3	200



SPF WATER
ENGINEERING

300 East Mallard Drive, Suite 350
Boise, Idaho 83706
Tel (208) 383-4140 Fax (208) 383-4156

MAGIC SPRINGS PROJECT
PUMP STATION AND PIPELINE

DESIGN CRITERIA

PRELIMINARY
DRAFT NOT FOR
CONSTRUCTION

REVISIONS		DATE					
ITEM	DESCRIPTION						
A	60% DESIGN SUBMITTAL	9/26/14					

VERIFY SCALE	
BAR MEASURES ONE-INCH ON FULL SIZE DRAWING.	
PROJECT:	535.0150
DESIGNED:	JWT
DRAWN:	PZC
CHECKED:	RRH

G-002

Path: Y:\PROJECTS\535.0150\SHE File: 5350150 G-003 Plot date: Sep 26, 2014-10:52:07am CAD User: PCooper.
Xref File: 5350150 xr tb |

GENERAL NOTES:

- CONSTRUCTION SHALL BE PER THE LATEST VERSION OF THE ISPMC OR PROJECT PLANS/SPECIFICATIONS, WHICHEVER IS MORE STRINGENT.
- CONTRACTOR SHALL FURNISH AND INSTALL EVERYTHING REQUIRED TO PROVIDE COMPLETE AND OPERABLE FACILITIES AS SHOWN HEREIN. IF THERE IS AN OMISSION ON THE PLANS, SUCH OMISSION SHALL NOT BE CONSTRUED TO MEAN THAT THE CONTRACTOR IS NOT REQUIRED TO FURNISH OR PROVIDE EVERYTHING THAT IS NECESSARY TO PROVIDE COMPLETE AND OPERABLE FACILITIES.
- ANY CHANGES TO THE DESIGN AS SHOWN IN THESE CONSTRUCTION DRAWINGS MUST BE REVIEWED AND APPROVED BY THE ENGINEER BEFORE CHANGES ARE MADE. THIS INCLUDES CHANGES REQUESTED BY THE OWNER'S REPRESENTATIVE AND SUBCONTRACTORS.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL EXISTING MONUMENTS, OTHER SURVEY MARKERS, STREET SIGNS, UTILITIES, IRRIGATION LINES, PAVEMENT, TREES, FENCES, AND ANY OTHER IMPORTANT OBJECTS ON OR ADJACENT TO THE JOB SITE AS DETERMINED BY THE OWNER'S REPRESENTATIVE OR ENGINEER.
- CONTRACTOR SHALL CONTACT IDAHO DIG LINE (208) 342-1585 TO MARK AND IDENTIFY UNDERGROUND UTILITIES PRIOR TO EXCAVATION.
- CONTRACTOR SHALL LEGALLY DISPOSE OF ALL EXCESS MATERIAL.
- ALL "OR EQUAL" ITEMS ARE SUBJECT TO REVIEW AND APPROVAL OF THE ENGINEER.
- CONTRACTOR SHALL PROVIDE, MAINTAIN, AND BE RESPONSIBLE FOR ALL EROSION AND SEDIMENT CONTROL STRUCTURES AND PRACTICES AND MEET THE REQUIREMENTS OF ANY AGENCY HAVING JURISDICTION.
- CONTRACTOR TO OBTAIN AND PAY ALL COSTS FOR ALL APPLICABLE PERMITS, INCLUDING BUT NOT LIMITED TO A PERMIT FROM THE HAGERMAN HIGHWAY DISTRICT FOR ALL ROADWAY INSTALLATIONS AND OTHER APPURTENANCES INSTALLED WITHIN THE ROW.
- UPON THE COMPLETION OF WORK, THE CONTRACTOR SHALL SUBMIT A SET OF "RED-LINED" RECORD DRAWINGS TO THE ENGINEER.
- CONTRACTOR SHALL NOTIFY AND COORDINATE WITH THE OWNER'S REPRESENTATIVE PRIOR TO, DURING, AND AT THE COMPLETION OF CONSTRUCTION ACTIVITY.
- IF WITHIN ONE (1) YEAR FROM THE DATE OF COMPLETION, THE PUMPING SYSTEM, PIPELINE, AND ALL APPURTENANCES OR ANY PART THEREOF INSTALLED AS NEW SHALL PROVE TO BE DEFECTIVE IN INSTALLATION, MATERIAL, OR WORKMANSHIP THE CONTRACTOR SHALL WARRANT REPLACEMENT OR REPAIR TO THE SATISFACTION OF THE OWNER'S REPRESENTATIVE AT NO EXPENSE TO THE OWNER.
- THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN AS AN APPROXIMATE LOCATION ONLY. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK. THE CONTRACTOR AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THEIR FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES. CONTRACTOR SHALL CONTACT PROPERTY OWNERS TO GAIN INFORMATION ON PRIVATE UTILITIES.
- CONTRACTOR TO NOTIFY AND COORDINATE WITH PRIVATE PROPERTY OWNERS PRIOR TO BLOCKING AND DETOURING DRIVEWAYS AND PROPERTY ACCESS POINTS.
- ALL CONTRACTORS WORKING WITHIN THE PROJECT BOUNDARIES ARE RESPONSIBLE FOR COMPLIANCE WITH ALL APPLICABLE SAFETY LAWS OF ANY JURISDICTIONAL BODY.
- CONTRACTOR SHALL PROVIDE, MAINTAIN, AND BE RESPONSIBLE FOR TRAFFIC CONTROL PERSONNEL AND DEVICES PER HAGERMAN HIGHWAY DISTRICT REQUIREMENTS.
- IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO DEWATER ALL EXCAVATIONS DURING CONSTRUCTION. GROUNDWATER SHALL BE KEPT BELOW THE BOTTOM OF EXCAVATIONS DURING INSTALLATION AND TESTING OF ALL UTILITIES AND STRUCTURES. PRIOR TO DISCHARGING TO WATERS OF THE STATE OF IDAHO, THE CONTRACTOR SHALL OBTAIN A SHORT TERM ACTIVITY EXEMPTION FROM THE IDAHO DEPARTMENT OF ENVIRONMENTAL QUALITY.
- CONSTRUCTION STAKING SHALL BE DONE USING THE CONTROL DATA CREATED AND SET IN THE FIELD BY QUADRANT CONSULTING, INC. ALL LINES AND GRADES ON THE DESIGN SHEETS WERE BASED ON THE TOPOGRAPHICAL SURVEY COMPLETED BY 3Di GEOTERRA MAPPING GROUP ON JUNE 12, 2014.
- CONTRACTOR TO COORDINATE WITH IDAHO POWER ON INSTALLING NEW ELECTRICAL SERVICE TO PUMP STATION SITE. THE OWNER WILL PAY ALL IDAHO POWER FEES. CONTRACTOR SHALL PROVIDE AND INSTALL METER CAN NEAR PUMP STATION TRANSFORMER PROVIDED BY IDAHO POWER.

PIPELINE CONSTRUCTION NOTES:

- THE CONTRACTOR WILL BE RESPONSIBLE FOR ALL COSTS ASSOCIATED WITH THE REQUIRED PIPELINE TESTING. ALL TESTING SHALL BE IN ACCORDANCE WITH SECTION 401 OF ISPMC. PIPELINE SHALL BE TESTED TO 150 PSI AT THE PUMP STATION. CONTRACTOR TO NOTIFY THE ENGINEER 48 HOURS PRIOR TO CONDUCTING TESTING. THE ENGINEER OR DESIGNATED REPRESENTATIVE WILL BE PRESENT FOR THE TESTING.
- CONTRACTOR TO USE AND PLACE NATIVE BEDDING AND MATERIAL 6 INCHES OVER PIPE. NATIVE MATERIAL SHALL CONTAIN NO ROCK, ORGANIC MATTER, OR MATERIALS LARGER THAN 2"Ø, PER DETAIL 3/M-501.
- CONTRACTOR TO USE NATIVE TRENCH BACKFILL MATERIAL ABOVE THE BEDDING ZONE FREE FROM CINDERS, ASHES, REFUSE, ORGANIC, AND FROZEN MATERIAL, ROCKS, 8" OR LARGER, OR OTHER UNSUITABLE MATERIALS. BACKFILL AND COMPACTION PRACTICES SHALL BE TYPE C PER SECTION 306 OF THE ISPMC PER DETAIL 3/M-501.
- PIPELINE SHALL HAVE A MINIMUM BURY DEPTH OF 3 FEET.
- INSTALL PIPE WITH UNIFORM SLOPES AND STRAIGHT ALIGNMENTS, AVOID LOCALIZED HIGH AND LOW POINTS (TYP).
- POLYETHYLENE ENCASE ALL BURIED DUCTILE IRON AND STEEL PIPING, JOINTS, BOLTS AND RESTRAINING DEVICES.
- PIPELINE MATERIAL SHALL BE 24-INCH IPS, DR 17 HDPE, PE4710, 24-INCH SCH 20 WELDED STEEL, AND VARIOUS SIZES OF DUCTILE IRON.
- COMBINATION AIR VALVES SHALL BE INSTALLED PER DRAWINGS, APCO MODEL 145C OR EQUAL. INSTALL VALVES IN 4"Ø MANHOLE PER DETAIL 1/M-501 (LOCAL) OR 2/M-501 (REMOTE).
- BURIED VALVES TO BE HENRY PRATT GROUNDHOG CLASS 150B FOR BURIED SERVICE RUBBER SEATED BUTTERFLY VALVES WITH CAST IRON VALVE BOX.
- INSTALL BELOW GRADE THRUST BLOCKS PER DETAIL 5 ON SHEET M-501 FOR ALL PIPE FITTINGS AND ACCESSORIES.
- VALVE BOXES AND LIDS SHALL BE PER ISPMC STANDARD DETAIL SD-406. CONCRETE COLLAR REQUIRED.
- FOR ASPHALT ROAD INSTALLATIONS, CUT AND SURFACE REPAIR PER HAGERMAN HIGHWAY DISTRICT REQUIREMENTS, REFER TO DETAIL 3/M-501.
- CONTRACTOR SHALL VERIFY EXISTING LOCATIONS, ELEVATIONS, AND MATERIAL TYPES OF ALL UTILITIES AND FEATURES WHERE PROPOSED IMPROVEMENTS CONNECT. NOTIFY ENGINEER IMMEDIATELY OF ANY DISCREPANCIES.

EROSION AND SEDIMENT CONTROL (ESC) NOTES:

- CONTRACTOR SHALL PROVIDE, MAINTAIN, AND BE RESPONSIBLE FOR ALL ESC STRUCTURES, PRACTICES, AND PLANS TO MEET ALL LOCAL, STATE, AND FEDERAL REQUIREMENTS FOR WATER QUALITY AND EROSION AND SEDIMENT CONTROL. THE FOLLOWING ARE SUGGESTIONS, BUT ALTERNATE BMPS AND PRACTICES MAY BE APPROPRIATE AND SHOULD BE NOTED ON THE CONTRACTOR'S ESC PLAN.
- CONTRACTOR SHALL UTILIZE ESC BEST MANAGEMENT PRACTICES (BMPS) PER THE IDAHO DEPARTMENT OF ENVIRONMENTAL QUALITY CATALOG OF STORMWATER BMPS FOR IDAHO CITIES AND COUNTIES IN CONJUNCTION WITH ANY LOCAL AMENDMENTS OR REQUIREMENTS.
- CONTRACTOR TO PRESERVE EXISTING VEGETATION AND MINIMIZE THE AREAS DISTURBED BY CONSTRUCTION ACTIVITY.
- ANY DEWATERING ACTIVITIES SHOULD MEET ALL APPLICABLE REQUIREMENTS AND DEWATERING FLOWS SHALL NOT BE DISCHARGED INTO RECEIVING WATERS WITHOUT THE CONTRACTOR OBTAINING THE APPROPRIATE APPROVALS AND PERMITS.
- SWEEPING OF PAVED ROADS SHALL BE CONDUCTED AS NECESSARY TO KEEP PAVED SURFACES CLEAN.
- CONTRACTOR SHALL PROVIDE INLET PROTECTION TO ALL CULVERTS, INLETS, CANALS, AND SUB-SURFACE DRAINS.



SPF WATER
ENGINEERING

300 East Mallard Drive, Suite 350
Boise, Idaho 83706
Tel (208) 383-4140 Fax (208) 383-4156

MAGIC SPRINGS PROJECT
PUMP STATION AND PIPELINE

GENERAL NOTES

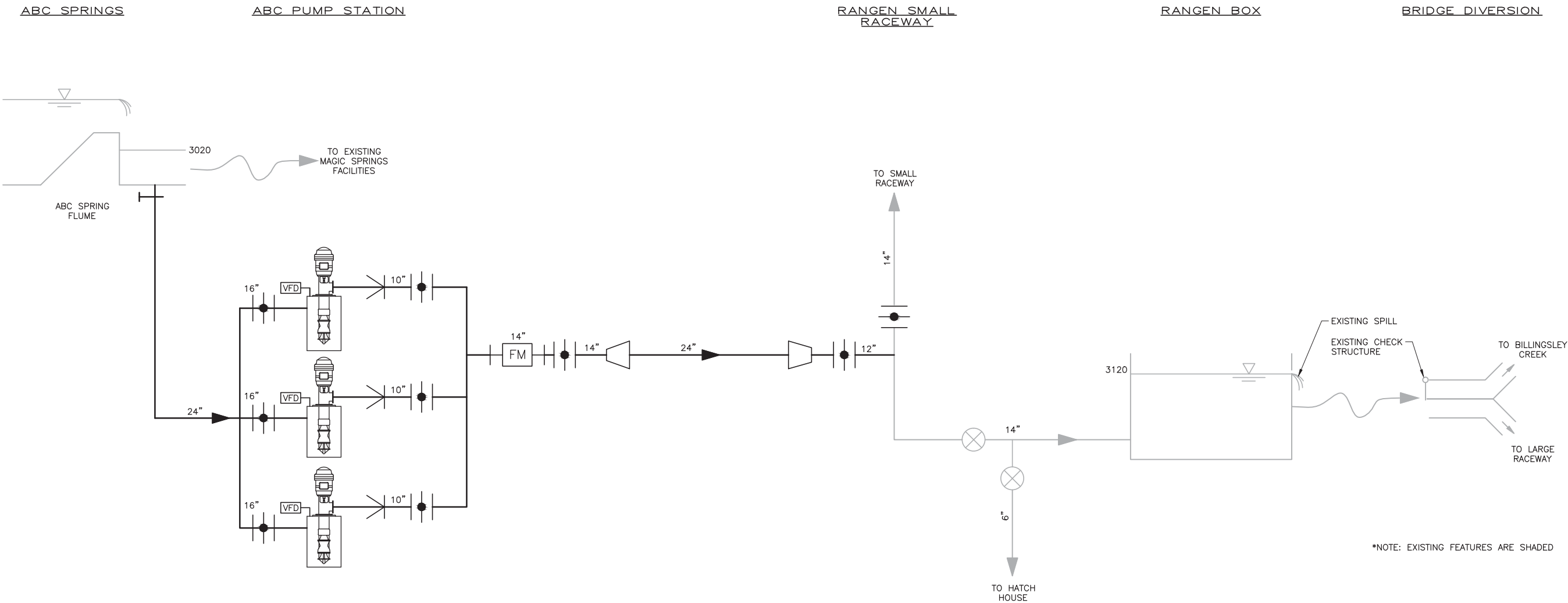
PRELIMINARY
DRAFT NOT FOR
CONSTRUCTION

REVISIONS		DATE
ITEM	DESCRIPTION	
A	60% DESIGN SUBMITTAL	9/26/14

VERIFY SCALE	
0 1/2 1	
BAR MEASURES ONE-INCH ON FULL SIZE DRAWING.	
PROJECT:	535.0150
DESIGNED:	JWT
DRAWN:	PZC
CHECKED:	RRH

G-003

Path: Y:\PROJECTS\535.0150\SHE Filename: 5350150 G-004 Plot date: Sep 26, 2014-10:52:12am CAD User: PCooper.
Xref Filename: | 5350150 xr tb |



PROCESS FLOW DIAGRAM
NOT TO SCALE

- LEGEND:
- BUTTERFLY VALVE
 - PIPELINE
 - OPEN CHANNEL FLOW
 - HEAD GATE
 - FLOW METER
 - REDUCER
 - CHECK VALVE
 - VARIABLE FREQUENCY DRIVE
 - PRESSURE SUSTAINING VALVE
 - DIVERSION
 - LINESHAFT TURBINE PUMP, 150-HP

ITEM	REVISIONS		DATE
	DESCRIPTION	SUBMITTAL	
A	60% DESIGN		9/26/14

VERIFY SCALE	
BAR MEASURES ONE-INCH ON FULL SIZE DRAWING.	
PROJECT:	535.0150
DESIGNED:	JWT
DRAWN:	PZC
CHECKED:	RRH

Path: Y:\PROJECTS\535.0150\SHE Filename: 5350150 G-004A Plot date: Sep 26, 2014--10:52:17am CAD User: PCooper.
Xref Filename: J 5350150 xr to I

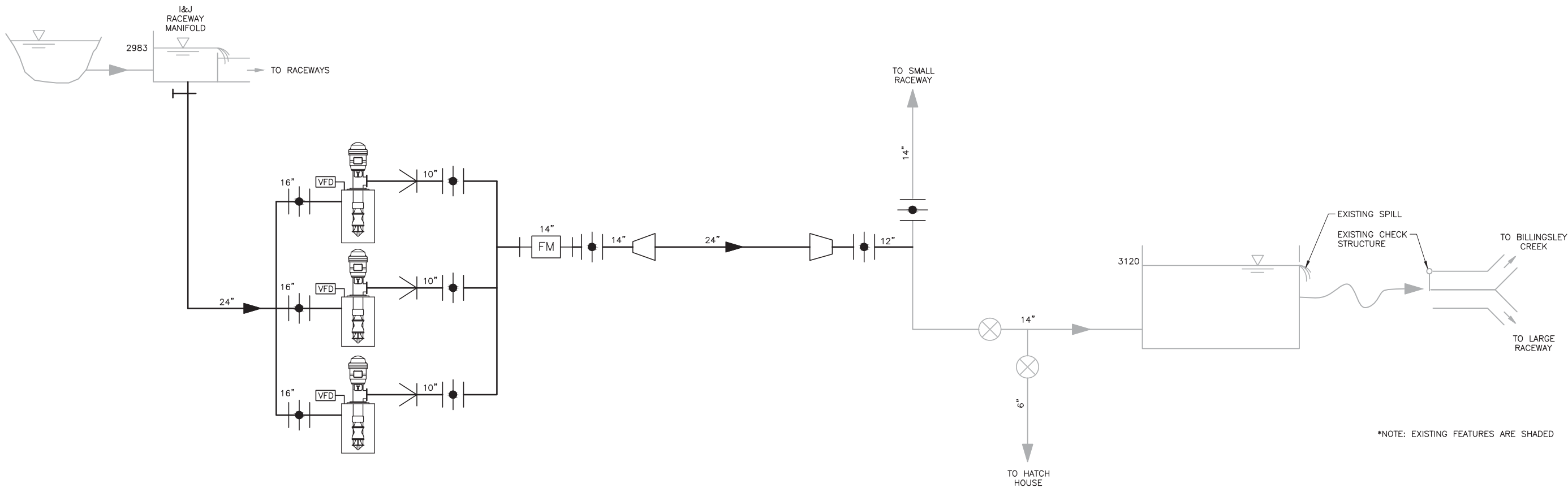
I&J SPRINGS

I&J PUMP STATION

RANGEN SMALL
RACEWAY

RANGEN BOX

BRIDGE DIVERSION



PROCESS FLOW DIAGRAM
NOT TO SCALE

LEGEND:

- BUTTERFLY VALVE
- PIPELINE
- OPEN CHANNEL FLOW
- HEAD GATE
- FLOW METER
- REDUCER
- CHECK VALVE
- VARIABLE FREQUENCY DRIVE
- PRESSURE SUSTAINING VALVE
- DIVERSION
- LINESHAFT TURBINE PUMP, 200-HP

MAGIC SPRINGS PROJECT
PUMP STATION AND PIPELINE

I&J PUMP PROCESS FLOW DIAGRAM

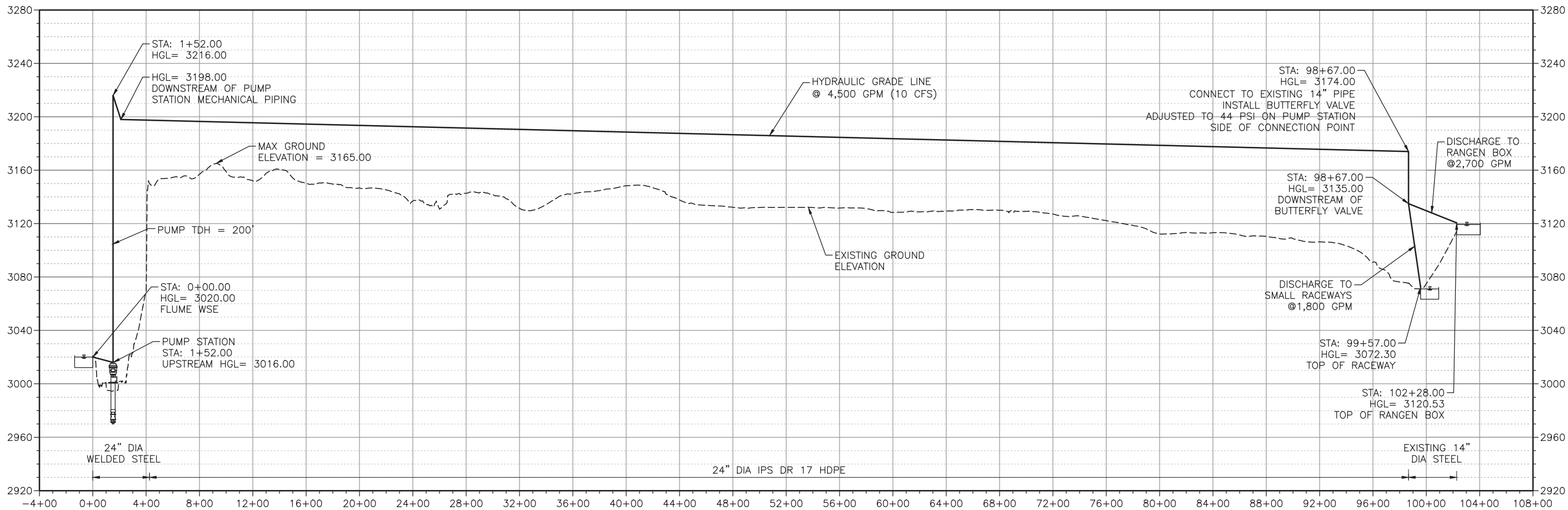
PRELIMINARY
DRAFT NOT FOR
CONSTRUCTION

ITEM	REVISIONS		DATE
	DESCRIPTION	SUBMITTAL	
A	60% DESIGN		9/26/14

VERIFY SCALE	
0 1/2 1	
BAR MEASURES ONE-INCH ON FULL SIZE DRAWING.	
PROJECT:	535.0150
DESIGNED:	JWT
DRAWN:	PZC
CHECKED:	RRH

G-004A

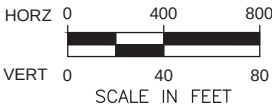
Path: Y:\PROJECTS\535.0150\5HE Filename: 5350150 G-005 Plot date: Sep 26, 2014-10:53:38am CAD User: PCooper.
Xref Filename: | 5350150 xr tb | 5350150-XR-BASE | 5350150-XR-3DI AERIAL 5' BIG BOUNDARY |



ABC PUMP STATION
HYDRAULIC PROFILE

DESIGN CRITERIA

1. TOTAL DELIVERY TO RANGEN= 10 CFS (4,500 GPM)
2. TOTAL DELIVERY TO SMALL RACEWAY= 4 CFS (1,800 GPM)
3. TOTAL DELIVERY TO RANGEN BOX= 6 CFS (2,700 GPM)



MAGIC SPRINGS PROJECT
PUMP STATION AND PIPELINE

ABC PUMP HYDRAULIC PROFILE

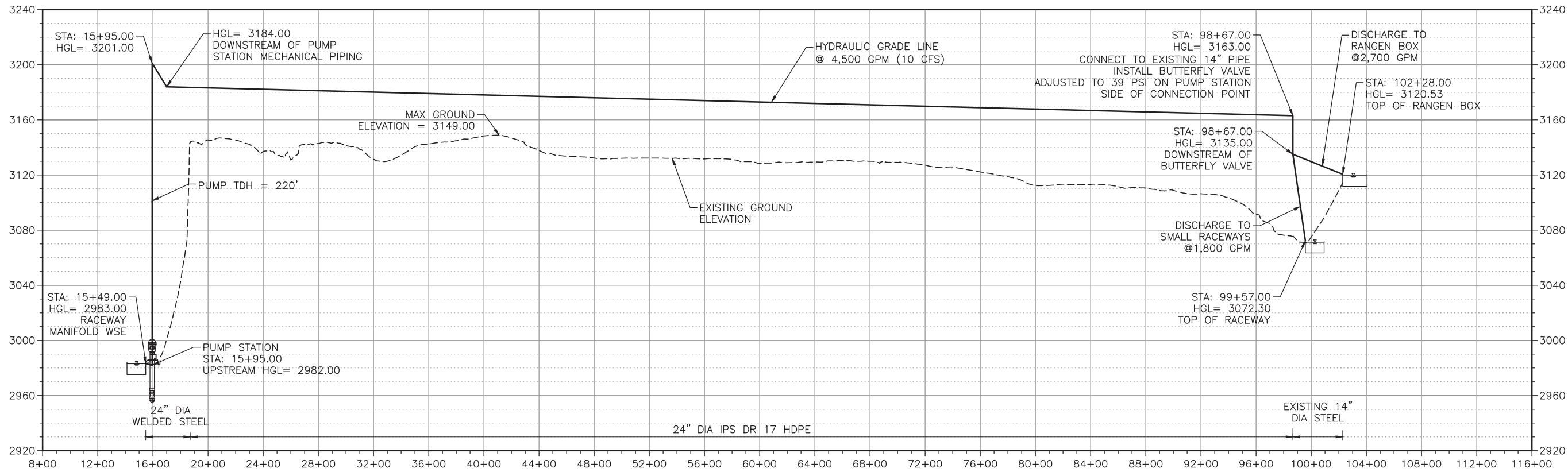
PRELIMINARY
DRAFT NOT FOR
CONSTRUCTION

ITEM	REVISIONS	DESCRIPTION	DATE
			9/26/14
A	60%	DESIGN SUBMITTAL	

VERIFY SCALE	
0 1/2 1	
BAR MEASURES ONE-INCH ON FULL SIZE DRAWING.	
PROJECT:	535.0150
DESIGNED:	JWT
DRAWN:	PZC
CHECKED:	RRH

G-005

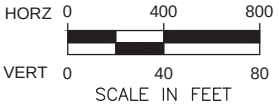
Path: Y:\PROJECTS\535.0150\5HE Filename: 5350150 G-005A Plot date: Sep 26, 2014-10:54:38am CAD User: PCooper.
Xref Filename: | 5350150 xr tb | 5350150-XR-BASE | 5350150-XR-3DI AERIAL 5' BIG BOUNDARY |



I&J PUMP STATION
HYDRAULIC PROFILE

DESIGN CRITERIA

1. TOTAL DELIVERY TO RANGEN= 10 CFS (4,500 GPM)
2. TOTAL DELIVERY TO SMALL RACEWAY= 4 CFS (1,800 GPM)
3. TOTAL DELIVERY TO RANGEN BOX= 6 CFS (2,700 GPM)



MAGIC SPRINGS PROJECT
PUMP STATION AND PIPELINE

I&J PUMP HYDRAULIC PROFILE

PRELIMINARY
DRAFT NOT FOR
CONSTRUCTION

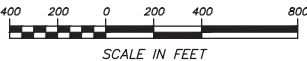
REVISIONS		DATE
ITEM	DESCRIPTION	
A	60% DESIGN SUBMITTAL	9/26/14

VERIFY SCALE 0 1/2 1 BAR MEASURES ONE-INCH ON FULL SIZE DRAWING.	
PROJECT:	535.0150
DESIGNED:	JWT
DRAWN:	PZC
CHECKED:	RRH

G-005A

Path: Y:\PROJECTS\535.0150\5HE Filename: 5350150 G-006 Plot date: Sep 26, 2014-10:55:12am CAD User: PCooper.

Xref Filename: | 5350150 xr tb | 5350150-XR-BASE | 5350150-XR-3DI AERIAL 5' BIG BOUNDARY |

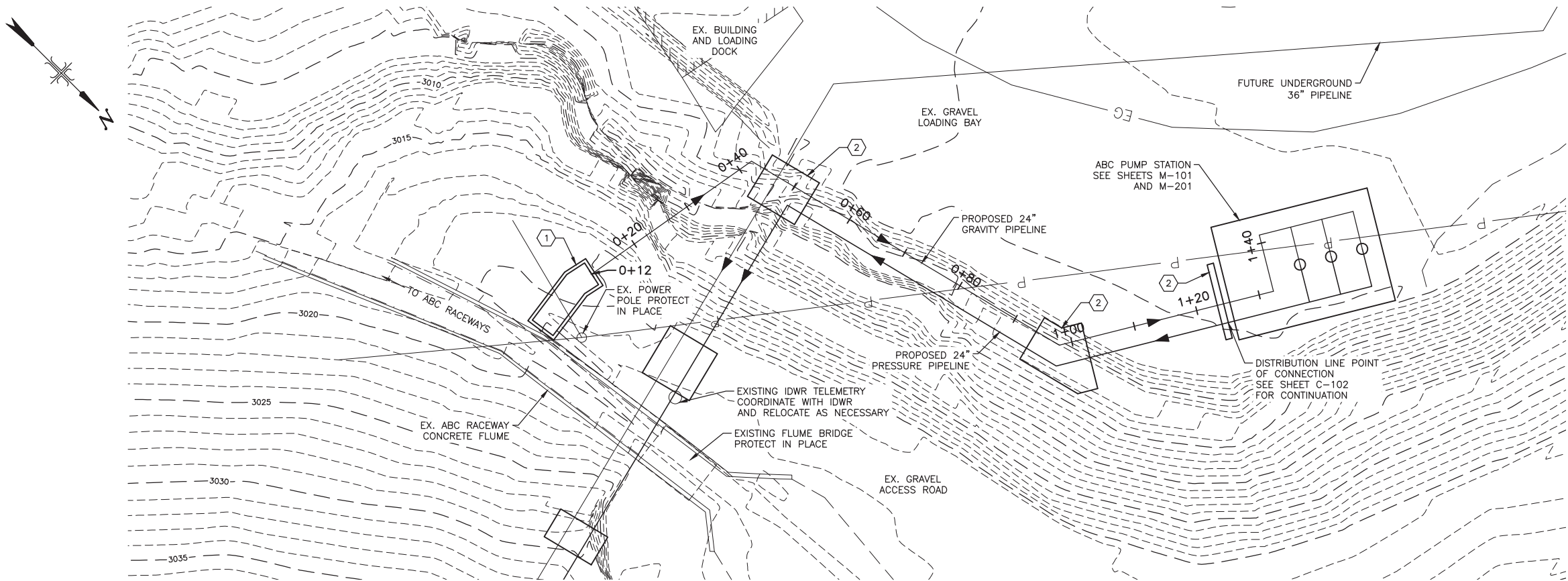


REVISIONS		
ITEM	DESCRIPTION	DATE
A	60% DESIGN SUBMITTAL	9/26/14

VERIFY SCALE	
BAR MEASURES ONE-INCH ON FULL SIZE DRAWING.	
PROJECT:	535.0150
DESIGNED:	JWT
DRAWN:	PZC
CHECKED:	RRH

MAGIC SPRINGS PROJECT
PUMP STATION AND PIPELINE
PLAN AND PROFILE SHEET KEY MAP

Path: Y:\PROJECTS\535.0150\5HE Filename: 5350150 C-101 Plot date: Sep 26, 2014-10:55:50am CAD User: PCooper.
Xref Filename: | 5350150-XR-3Di AERIAL 5' | 5350150-XR-BASE | 5350150-XR-SURVEY |



CONSTRUCTION KEYNOTES

1. INSTALL ABC FLUME DIVERSION STRUCTURE. SEE DETAIL 6/M-501.
2. INSTALL ABOVE GRADE THRUST BLOCK PER STRUCTURAL PLANS.



SPF WATER
ENGINEERING

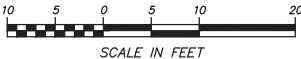
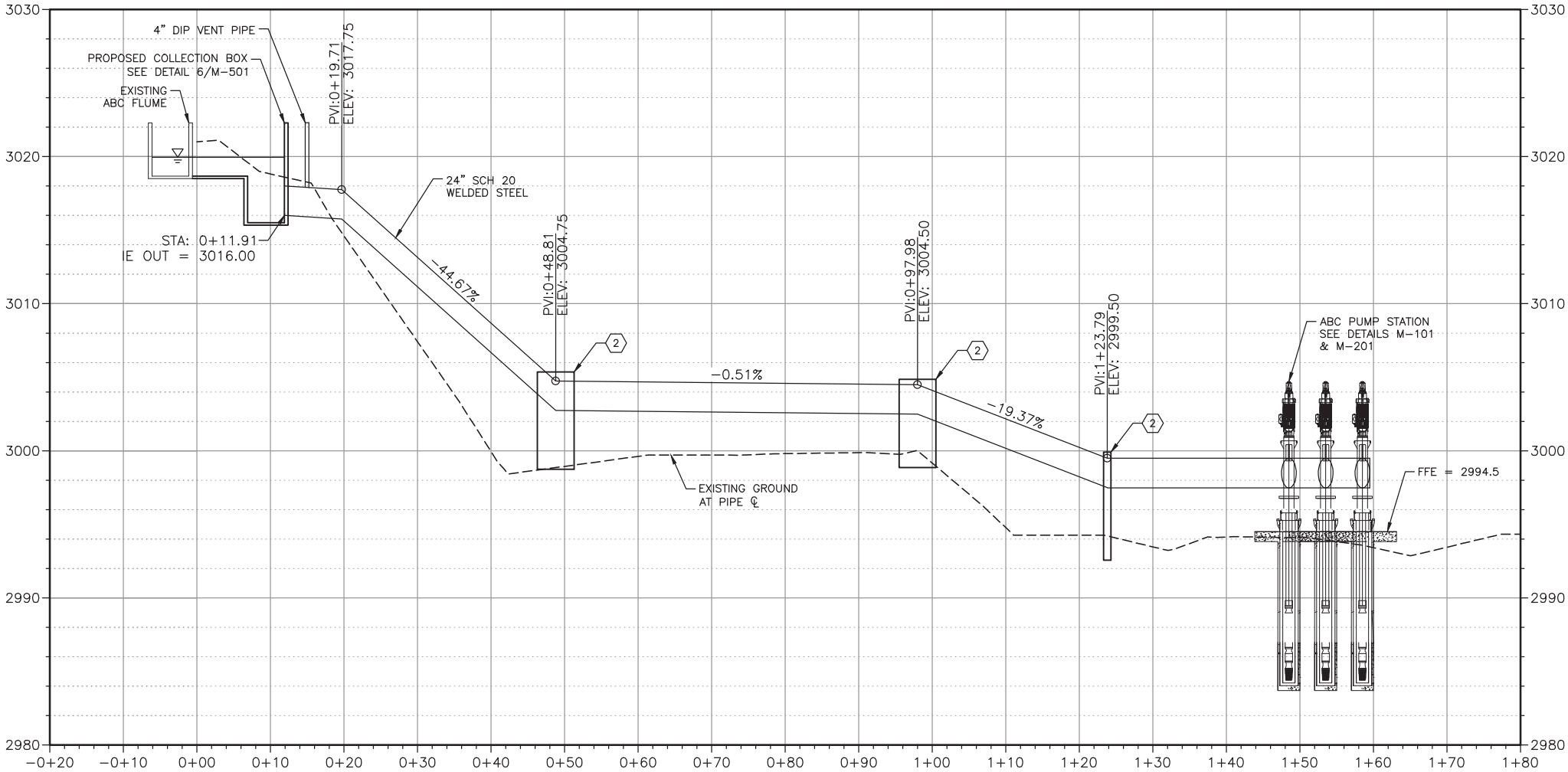
300 East Mallard Drive, Suite 350
Boise, Idaho 83706
Tel (208) 383-4140 Fax (208) 383-4156

MAGIC SPRINGS PROJECT

PUMP STATION AND PIPELINE

ABC PIPELINE PLAN & PROFILE STA. 0+00 TO ABC PUMP

PRELIMINARY
DRAFT NOT FOR
CONSTRUCTION

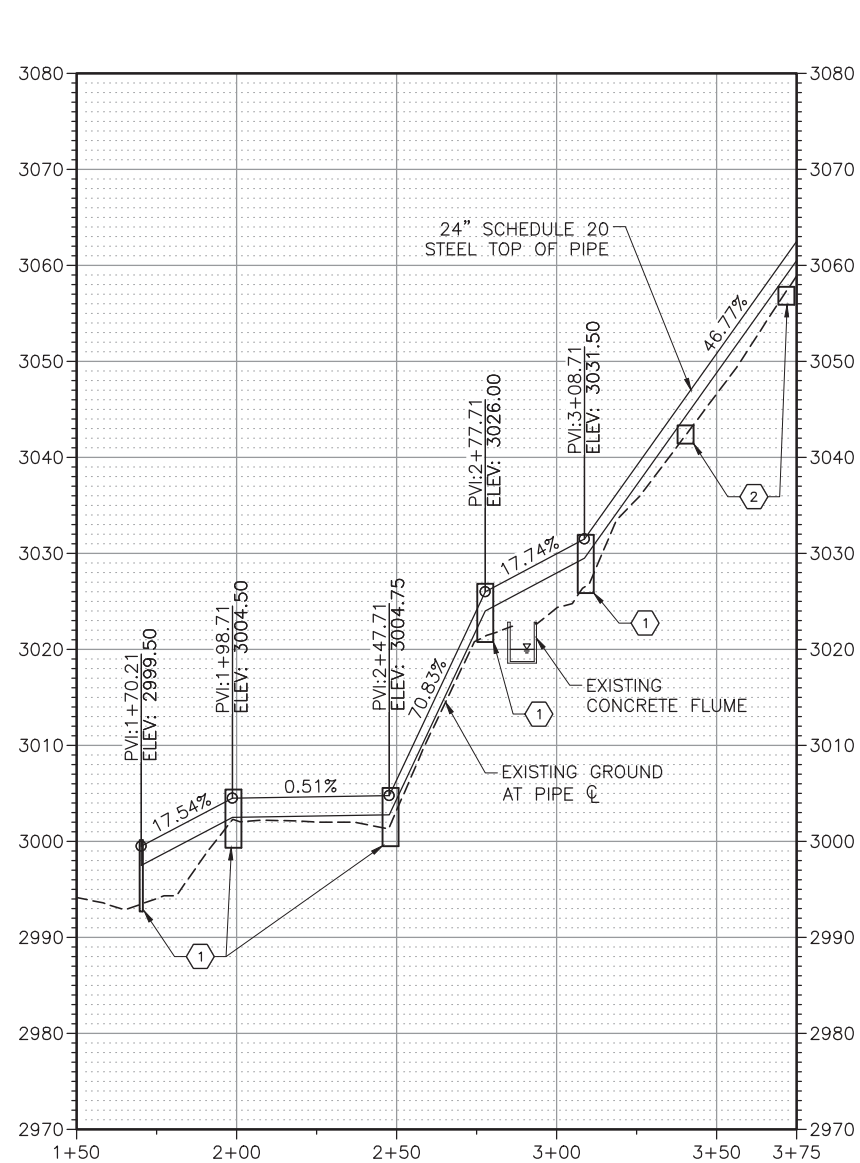
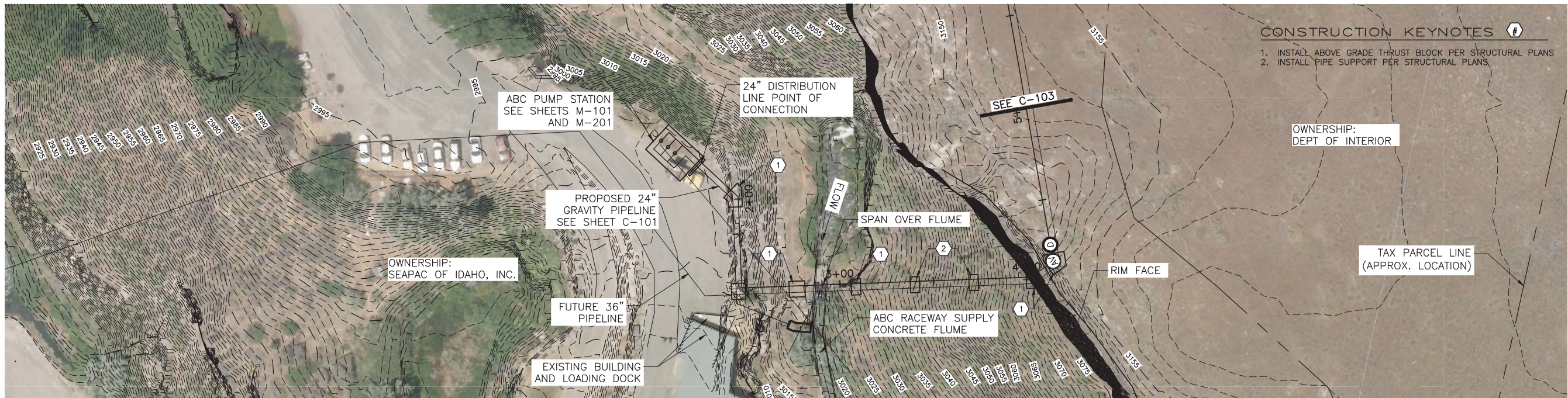


ABC GRAVITY PIPELINE PROFILE
-0+20 TO 1+80

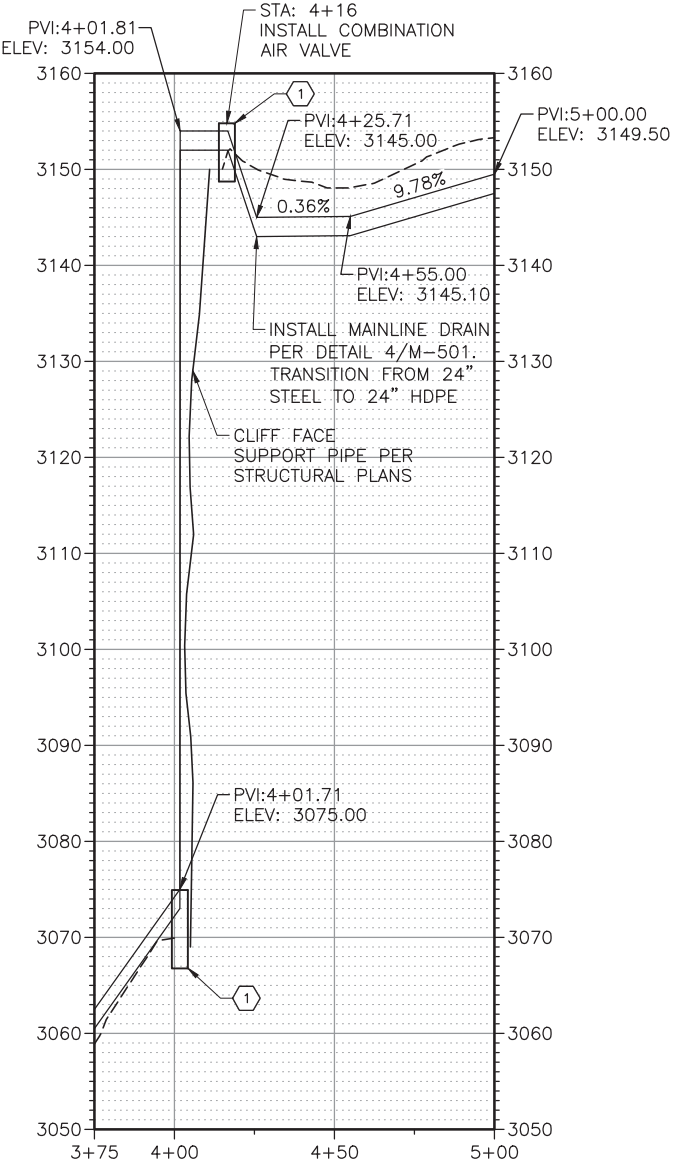
REVISIONS		DATE
ITEM	DESCRIPTION	
A	60% DESIGN SUBMITTAL	9/26/14

VERIFY SCALE	
	
BAR MEASURES ONE-INCH ON FULL SIZE DRAWING.	
PROJECT:	535.0150
DESIGNED:	JWT
DRAWN:	PZC
CHECKED:	RRH

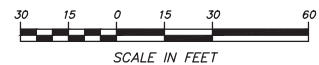
Path: Y:\PROJECTS\535.0150\5HE Filename: 5350150 C-102 Plot date: Sep 26, 2014-10:56:35am CAD User: PCooper.
Xref Filename: | 5350150-XR-3Di AERIAL 5' | 5350150-XR-SURVEY | 5350150-XR-BASE |



ABC 10 CFS PROFILE
1+50 TO 3+75



ABC 10 CFS PROFILE
3+75 TO 5+00



MAGIC SPRINGS PROJECT
PUMP STATION AND PIPELINE

ABC PIPELINE PLAN & PROFILE ABC PUMP TO STA. 5+00

PRELIMINARY
DRAFT NOT FOR
CONSTRUCTION

ITEM	REVISIONS	DESCRIPTION	DATE
A	60%	DESIGN SUBMITTAL	9/26/14

VERIFY SCALE	
0 1/2 1	
BAR MEASURES ONE-INCH ON FULL SIZE DRAWING.	
PROJECT:	535.0150
DESIGNED:	JWT
DRAWN:	PZC
CHECKED:	RRH

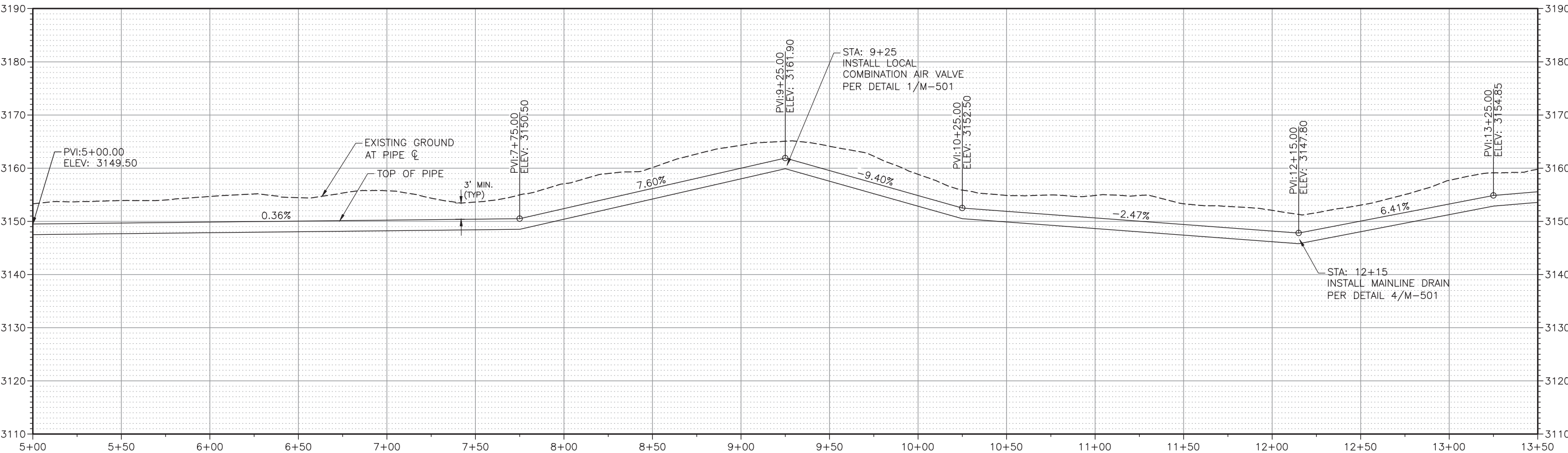
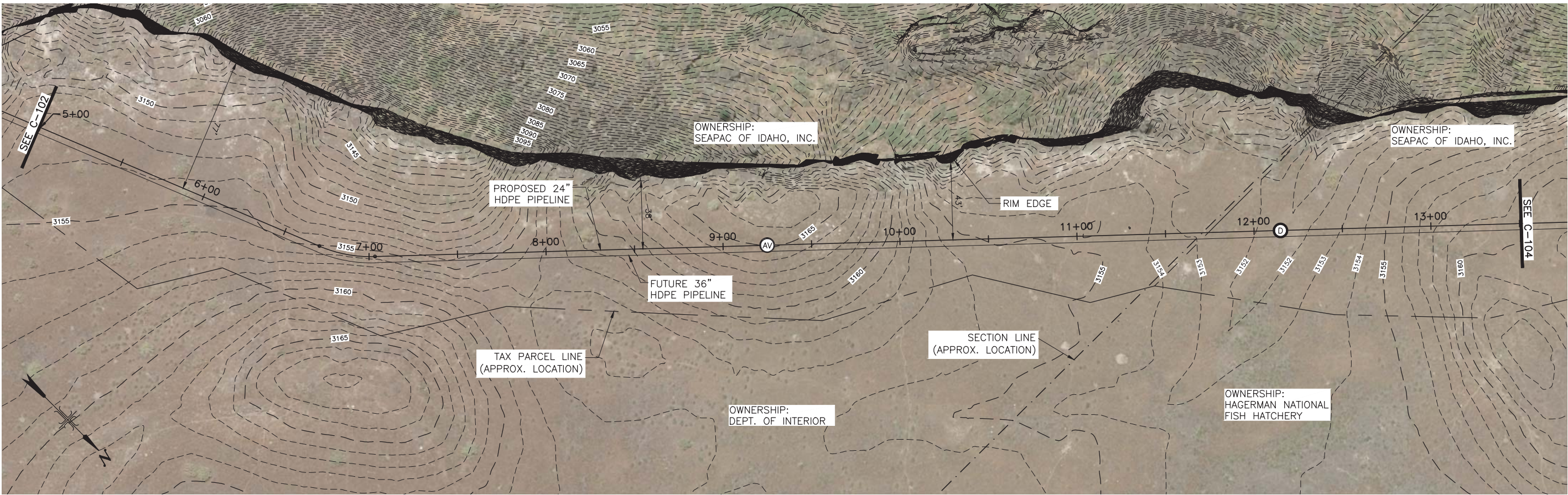
C-102



SPF WATER
ENGINEERING

300 East Mallard Drive, Suite 350
Boise, Idaho 83706
Tel (208) 383-4140 Fax (208) 383-4156

Path: Y:\PROJECTS\535.0150\5HE Filename: 5350150 C-103 Plot date: Sep 26, 2014-10:57:22am CAD User: PCooper.
Xref Filename: | 5350150-XR-3Di AERIAL 5' | 5350150-XR-BASE | 5350150-XR-SURVEY |



ABC 10 CFS PROFILE
5+00 TO 13+50

MAGIC SPRINGS PROJECT
PUMP STATION AND PIPELINE

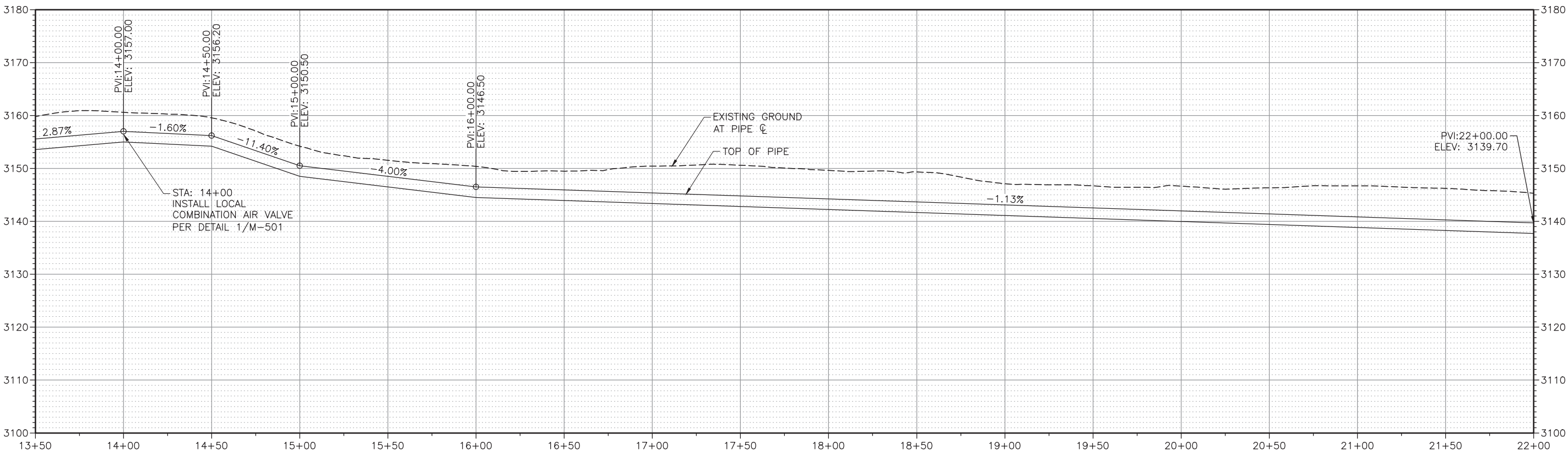
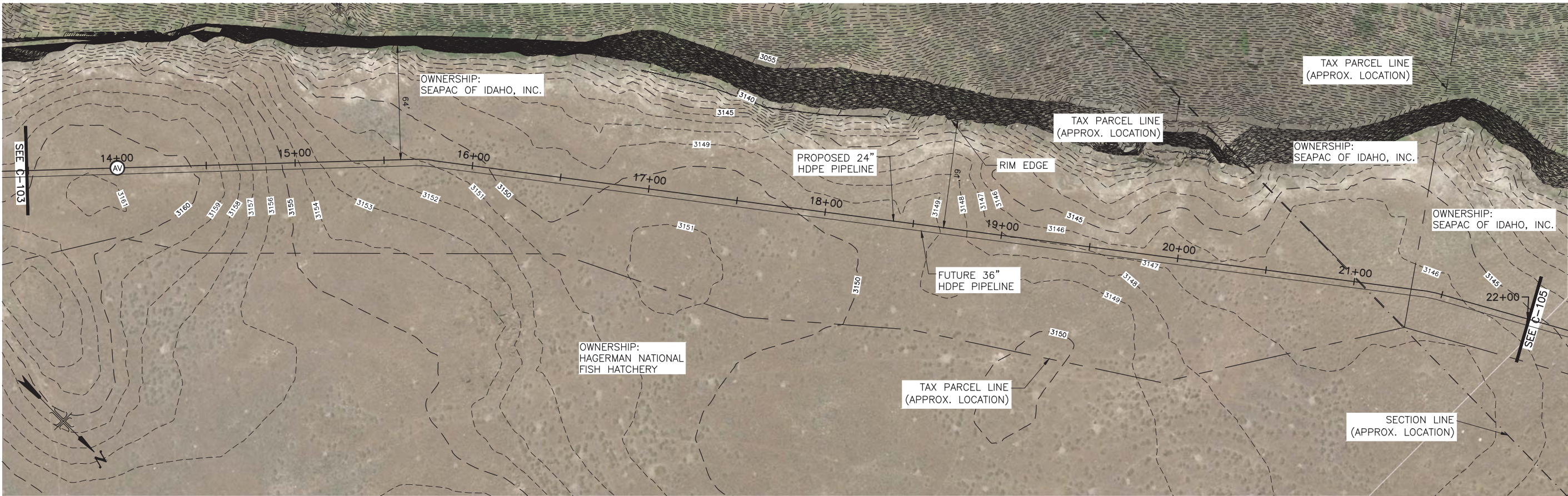
ABC PIPELINE PLAN & PROFILE STA. 5+00 TO 13+50

PRELIMINARY
DRAFT NOT FOR
CONSTRUCTION

ITEM	REVISIONS	DESCRIPTION	DATE
			DATE
A	60%	DESIGN SUBMITTAL	9/26/14

VERIFY SCALE	
BAR MEASURES ONE-INCH ON FULL SIZE DRAWING.	
PROJECT:	535.0150
DESIGNED:	JWT
DRAWN:	PZC
CHECKED:	RRH

Path: Y:\PROJECTS\535.0150\5HE Filename: 5350150 C-104 Plot date: Sep 26, 2014-10:58:05am CAD User: PCooper.
Xref Filename: | 5350150-XR-3D1 AERIAL 5' | 5350150-XR-BASE | 5350150-XR-SURVEY |



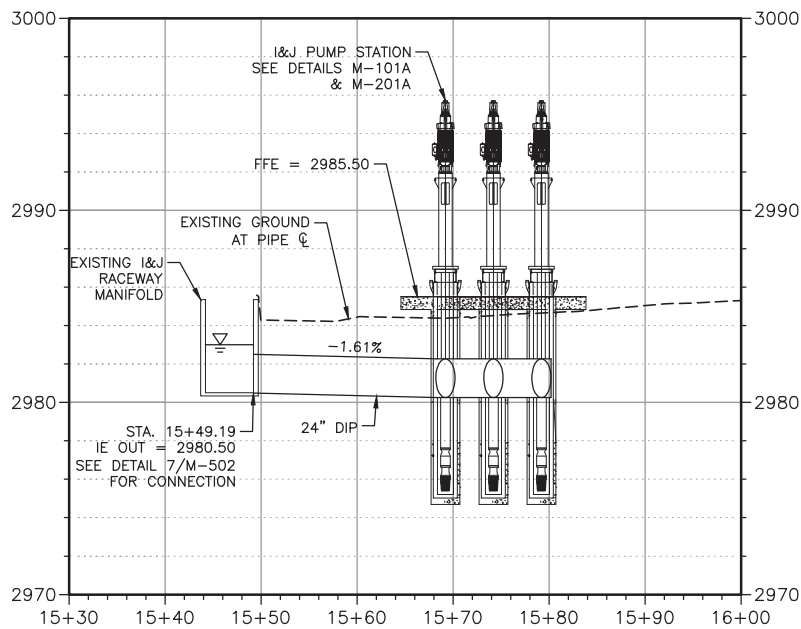
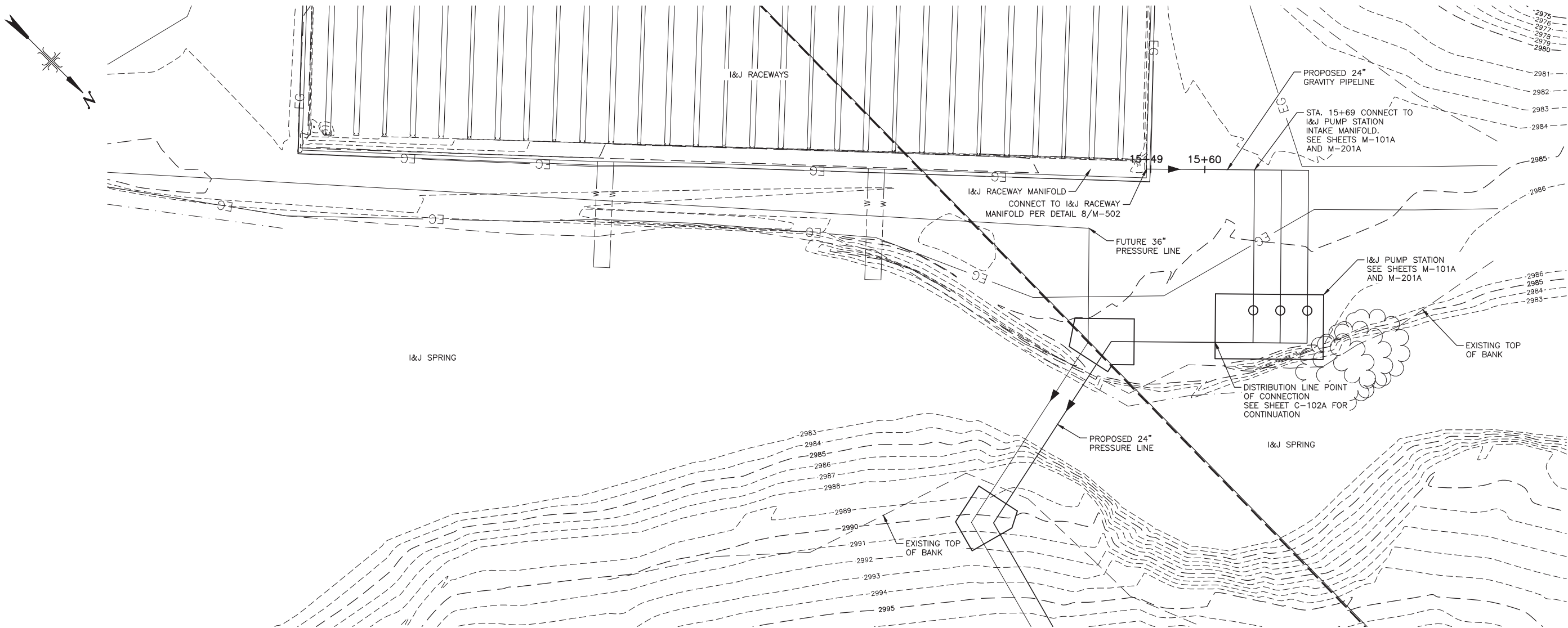
ABC 10 CFS PROFILE
13+50 TO 22+00

PRELIMINARY
DRAFT NOT FOR
CONSTRUCTION

REVISIONS		DATE
ITEM	DESCRIPTION	
A	60% DESIGN SUBMITTAL	9/26/14

VERIFY SCALE	
0 1/2 1	
BAR MEASURES ONE-INCH ON FULL SIZE DRAWING.	
PROJECT:	535.0150
DESIGNED:	JWT
DRAWN:	PZC
CHECKED:	RRH

Path: Y:\PROJECTS\535.0150\5HE Filename: 5350150 C-101A Plot date: Sep 26, 2014-10:58:46am CAD User: PCooper.
Xref Filename: | 5350150-XR-3Di AERIAL 5' | 5350150-XR-BASE | 5350150-XR-SURVEY |



I&J GRAVITY PIPELINE PROFILE
15+30 TO 16+00

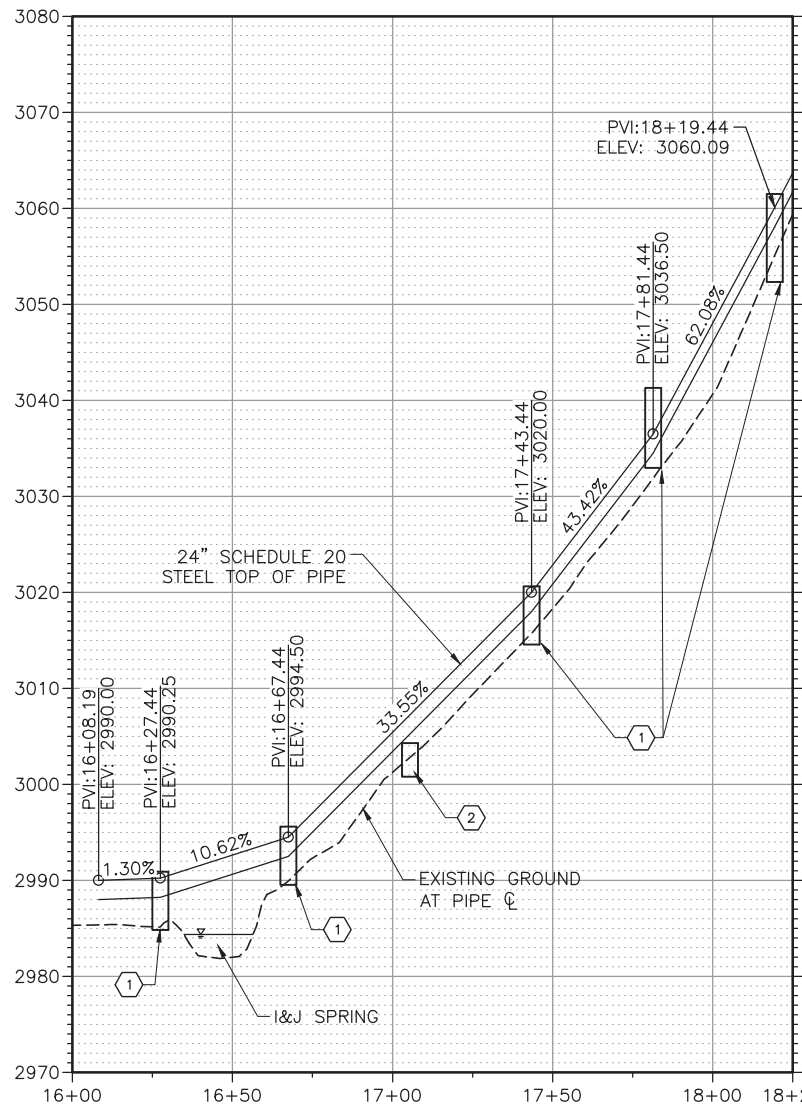
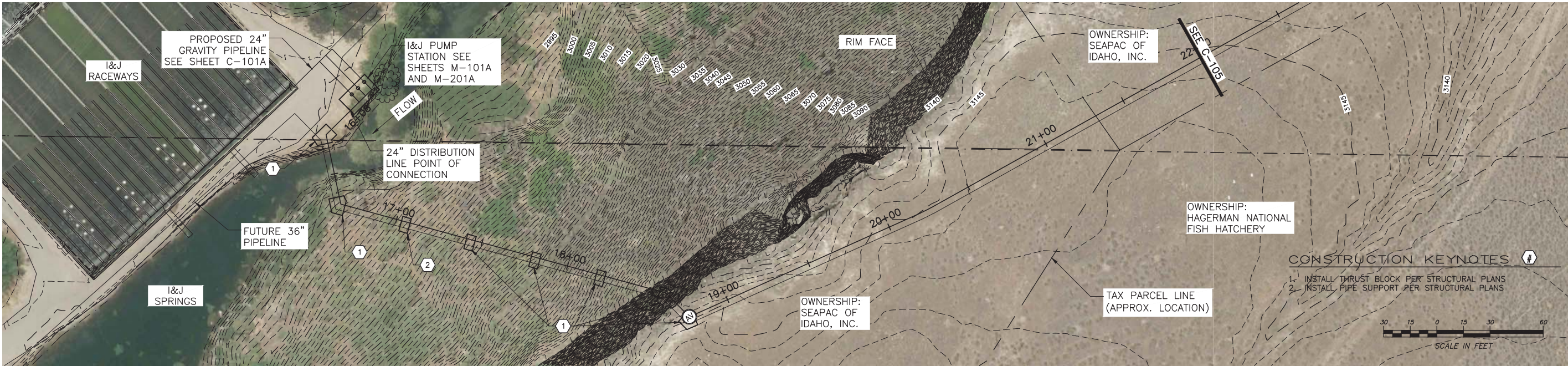
MAGIC SPRINGS PROJECT
PUMP STATION AND PIPELINE
I&J PIPELINE PLAN & PROFILE STA. 15+49 TO I&J PUMP

PRELIMINARY
DRAFT NOT FOR
CONSTRUCTION

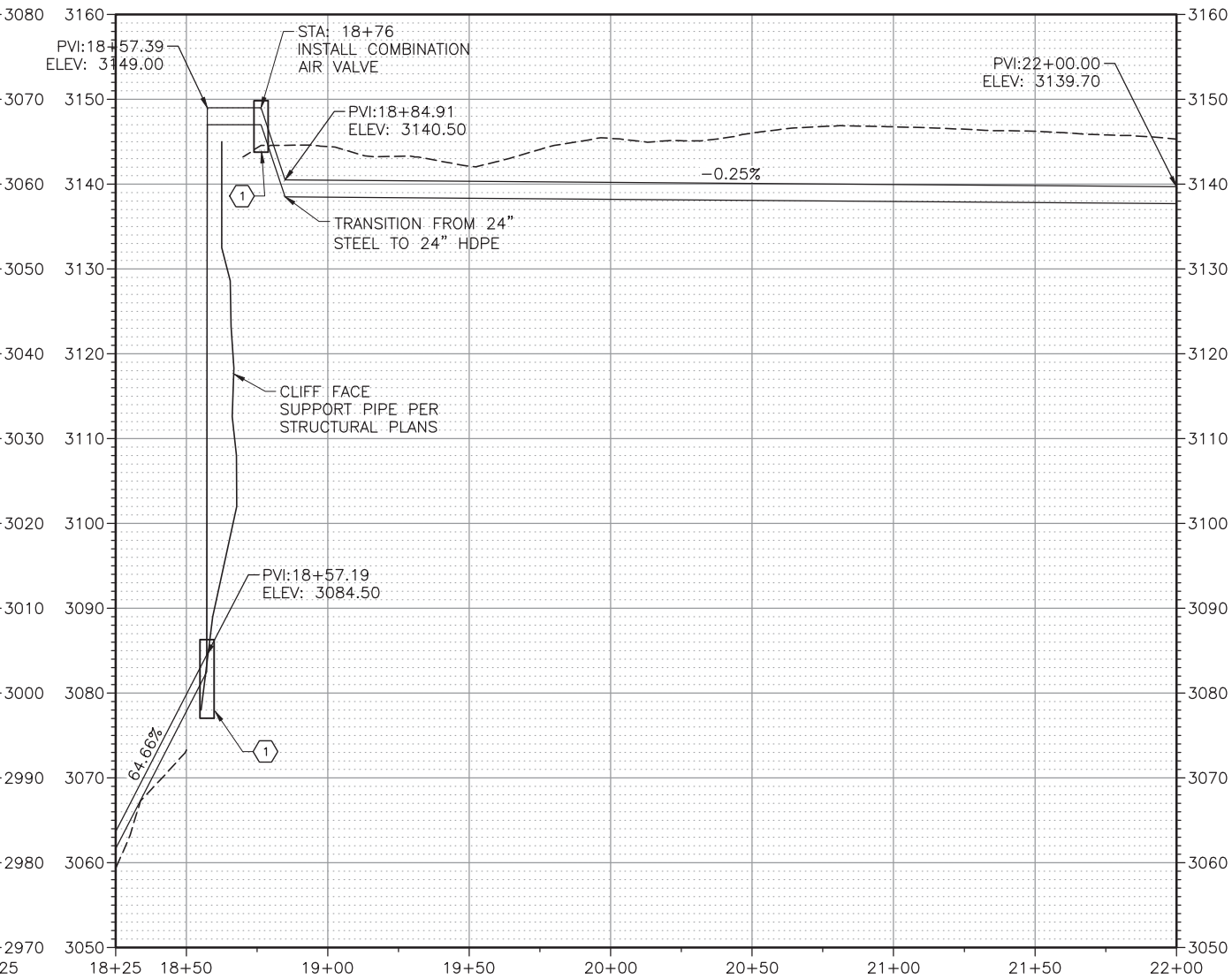
REVISIONS		DATE
ITEM	DESCRIPTION	
A	60% DESIGN SUBMITAL	9/26/14

VERIFY SCALE 0 1/2 1 BAR MEASURES ONE-INCH ON FULL SIZE DRAWING.	
PROJECT:	535.0150
DESIGNED:	JWT
DRAWN:	PZC
CHECKED:	RRH

Path: Y:\PROJECTS\535.0150\5HE Filename: 5350150 C-102A Plot date: Sep 26, 2014-10:59:29am CAD User: PCooper.
Xref Filename: | 5350150-XR-3Di AERIAL 5' | 5350150-XR-BASE | 5350150-XR-SURVEY |



I&J PROFILE
16+00 TO 18+25



I&J PROFILE
18+25 TO 22+00

MAGIC SPRINGS PROJECT
PUMP STATION AND PIPELINE

I&J PIPELINE PLAN & PROFILE I&J PUMP TO STA. 22+00

PRELIMINARY
DRAFT NOT FOR
CONSTRUCTION

ITEM	REVISIONS DESCRIPTION	DATE
A	60% DESIGN SUBMITTAL	9/26/14

VERIFY SCALE 0 1/2 1 BAR MEASURES ONE-INCH ON FULL SIZE DRAWING.	
PROJECT:	535.0150
DESIGNED:	JWT
DRAWN:	PZC
CHECKED:	RRH

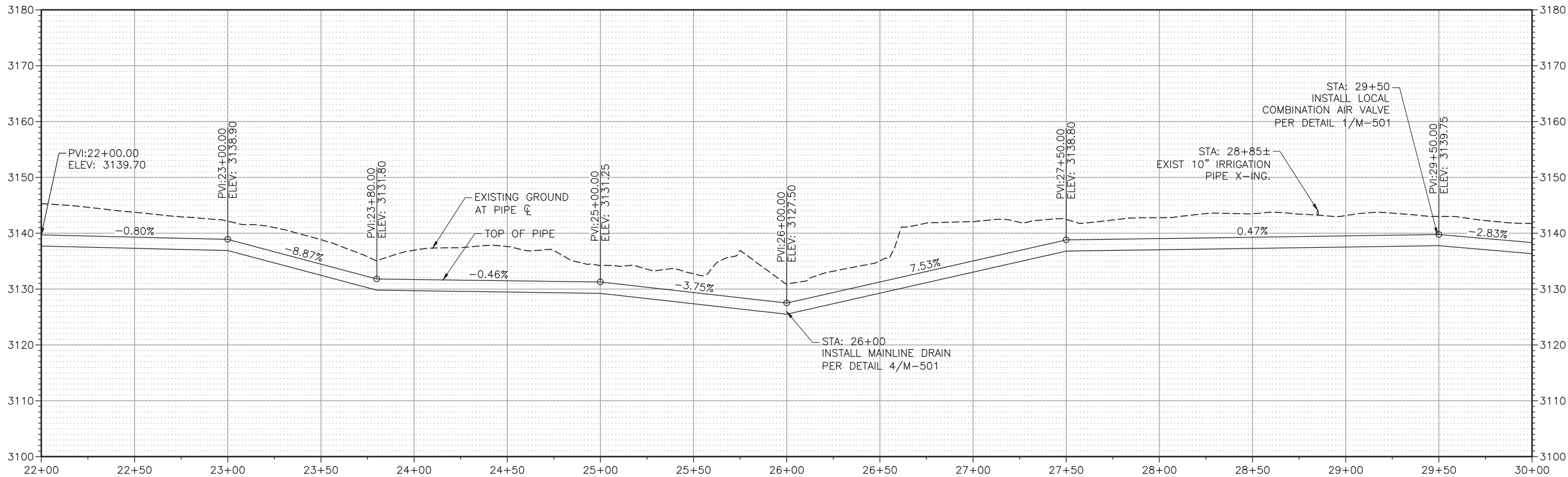
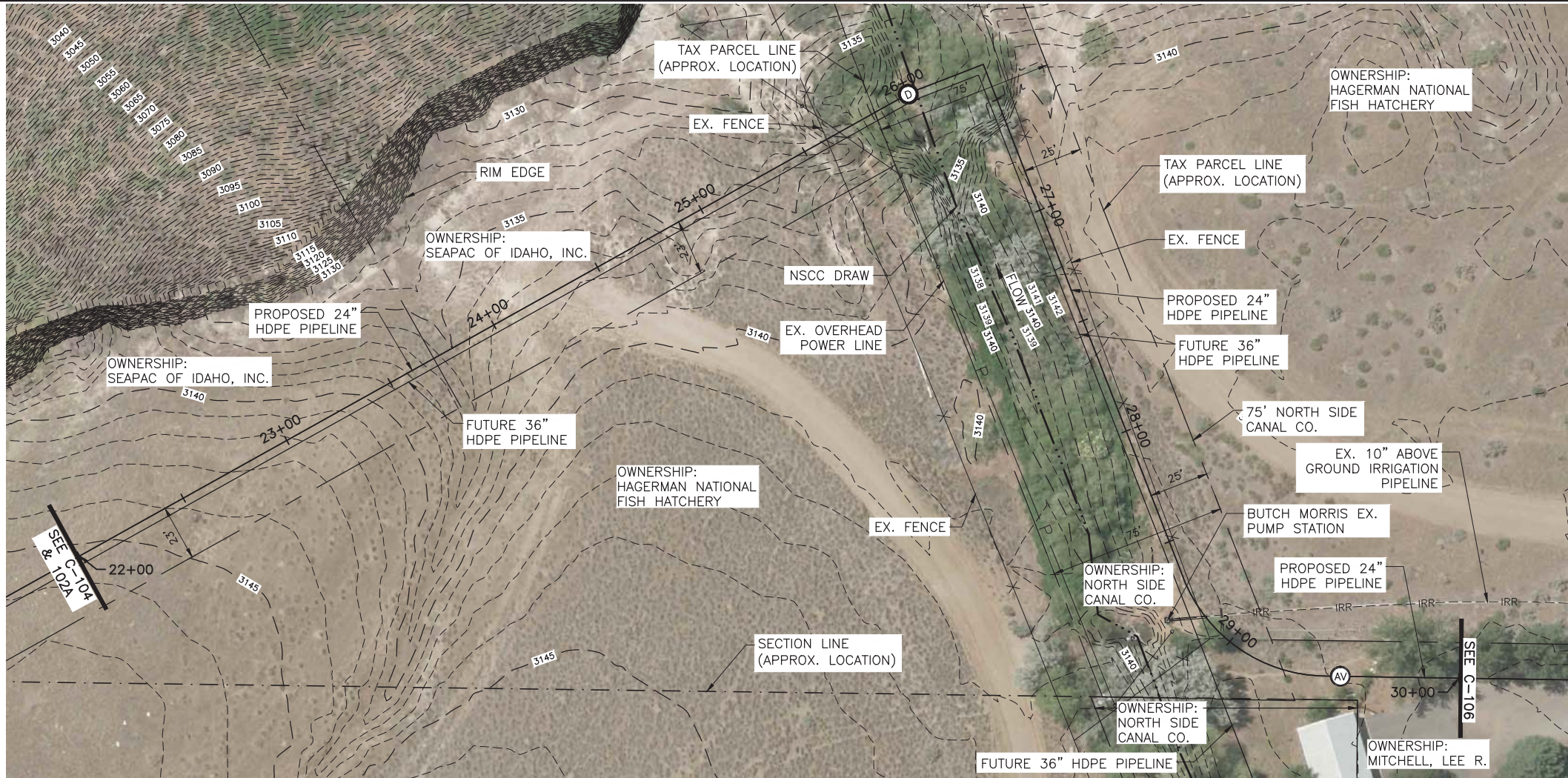
C-102A



SPF WATER
ENGINEERING

300 East Mallard Drive, Suite 350
Boise, Idaho 83706
Tel (208) 383-4140 Fax (208) 383-4156

Path: Y:\PROJECTS\535.0150\5HE Filename: 5350150 C-105 Plot date: Sep 26, 2014-11:00:18am CAD User: PCooper.
Xref Filename: | 5350150-XR-3D1 AERIAL 5' | 5350150-XR-BASE | 5350150-XR-SURVEY |



24" PIPELINE PROFILE
22+00 TO 30+00



SPF WATER
ENGINEERING

300 East Mallard Drive, Suite 350
Boise, Idaho 83706
Tel (208) 383-4140 Fax (208) 383-4156

MAGIC SPRINGS PROJECT
PUMP STATION AND PIPELINE

PIPELINE PLAN & PROFILE STA. 22+00 TO 30+00

PRELIMINARY
DRAFT NOT FOR
CONSTRUCTION

ITEM	REVISIONS	DESCRIPTION	DATE
A	60%	DESIGN SUBMITTAL	9/26/14

VERIFY SCALE



BAR MEASURES ONE-INCH ON FULL SIZE DRAWING.

PROJECT:

535.0150

DESIGNED:

JWT

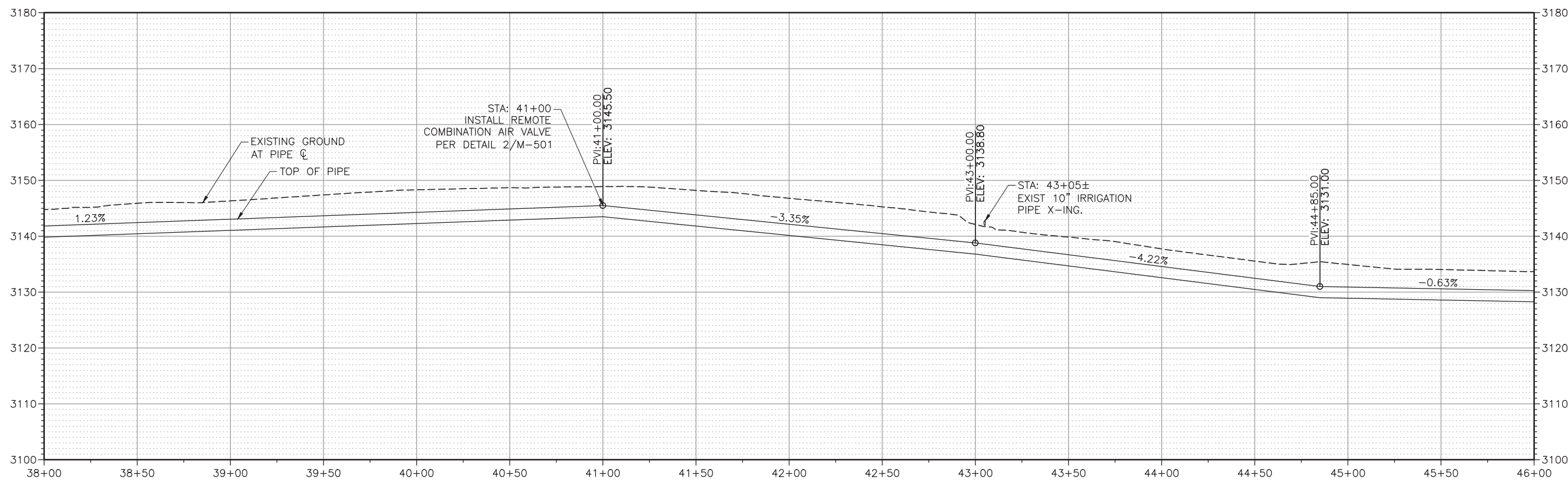
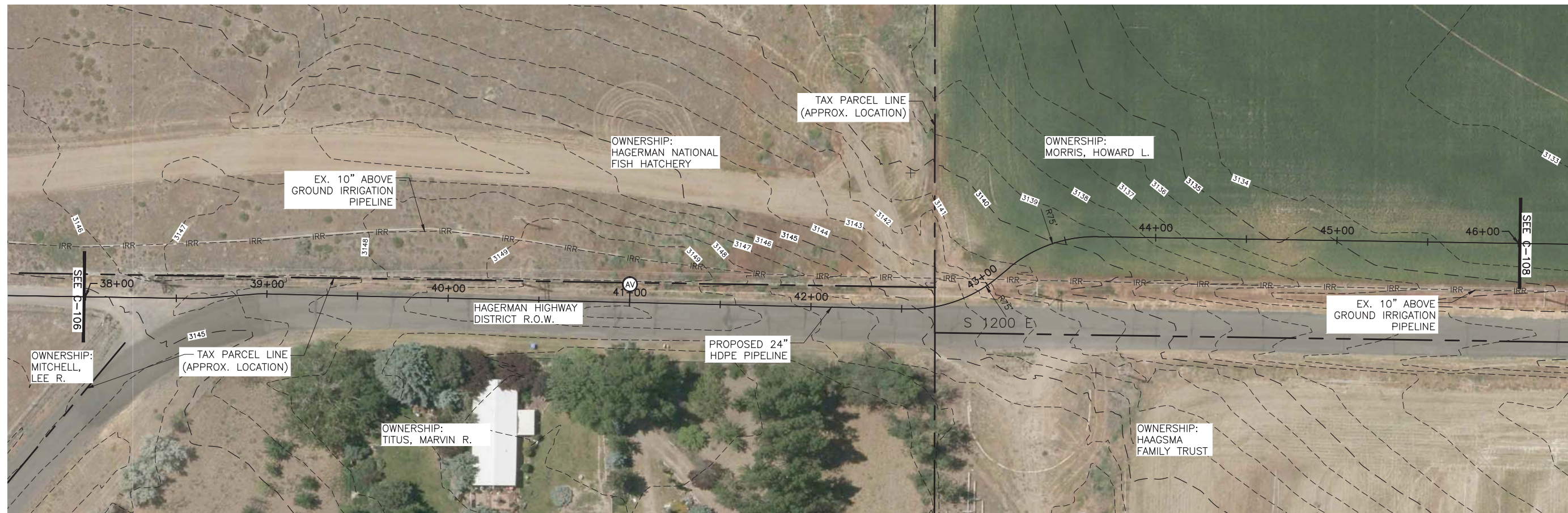
DRAWN:

PZC

CHECKED:

RRH

C-105



 **SPF WATER**
ENGINEERING

300 East Mallard Drive, Suite 350
Boise, Idaho 83706
Tel (208) 383-4140 Fax (208) 383-4156

MAGIC SPRINGS PROJECT
PUMP STATION AND PIPELINE

PIPELINE PLAN & PROFILE STA. 38+00 TO 46+00

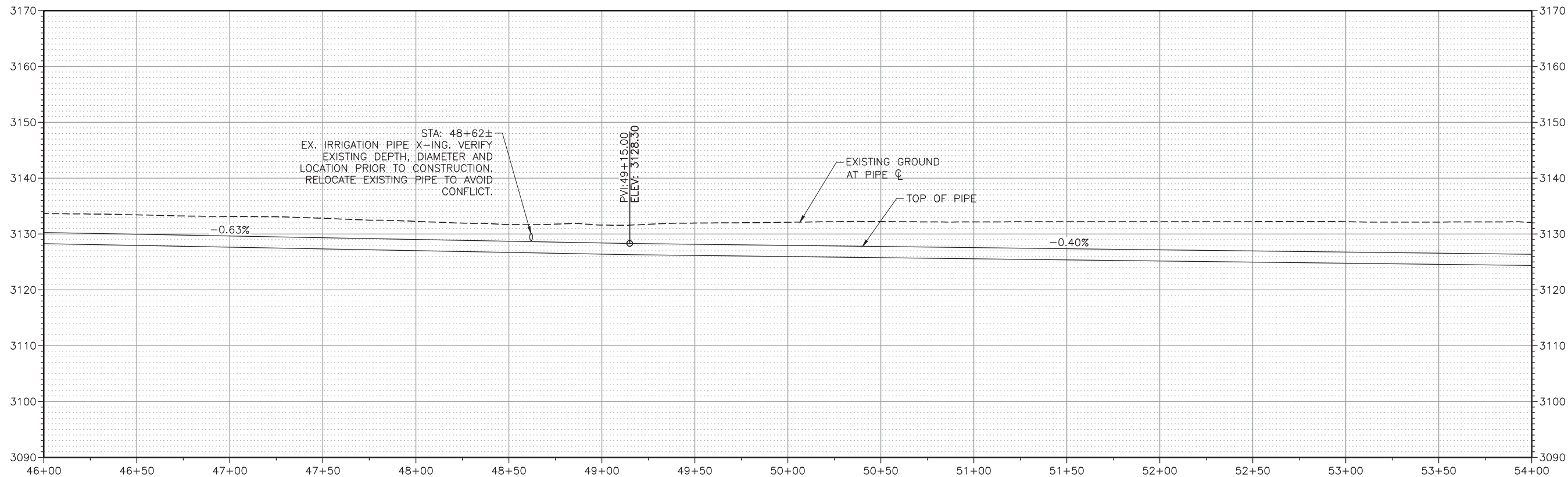
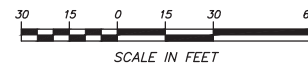
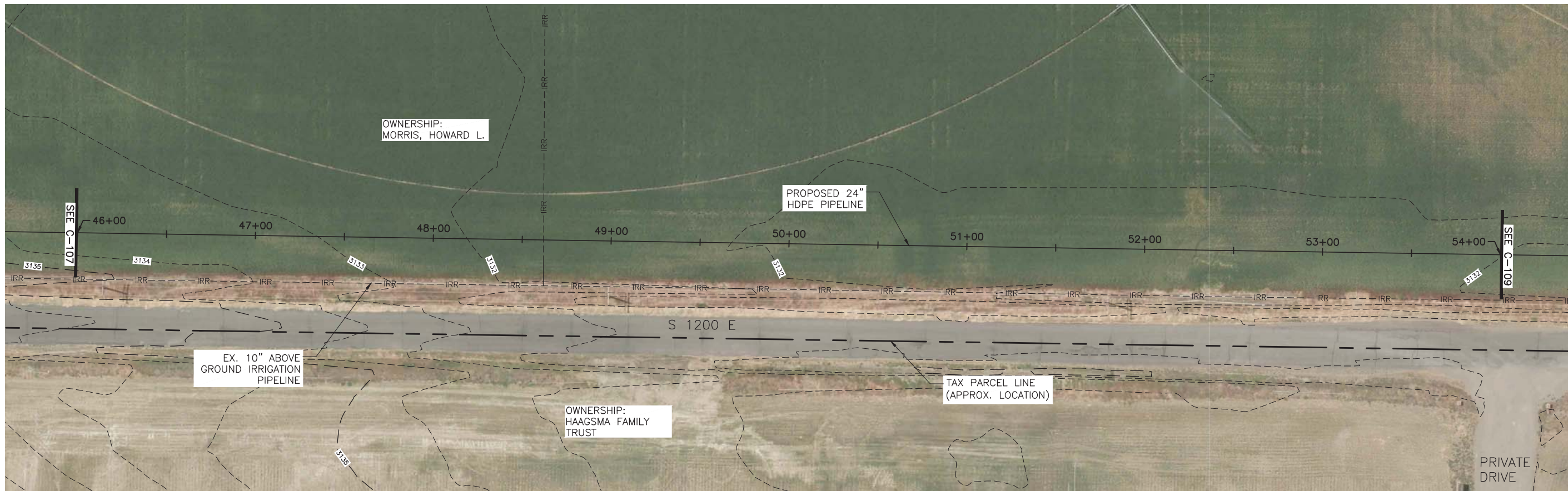
PRELIMINARY
DRAFT NOT FOR
CONSTRUCTION

ITEM	REVISIONS		DATE
	DESCRIPTION		
A	60% DESIGN SUBMITTAL		9/26/14



PROJECT:	535.0150
DESIGNED:	JWT
DRAWN:	PZC
CHECKED:	RRH

Path: Y:\PROJECTS\535.0150\5HE Filename: 5350150 C-108 Plot date: Sep 26, 2014-11:02:34am CAD User: PCooper.
Xref Filename: | 5350150-XR-3Di AERIAL 5' | 5350150-XR-BASE | 5350150-XR-SURVEY |



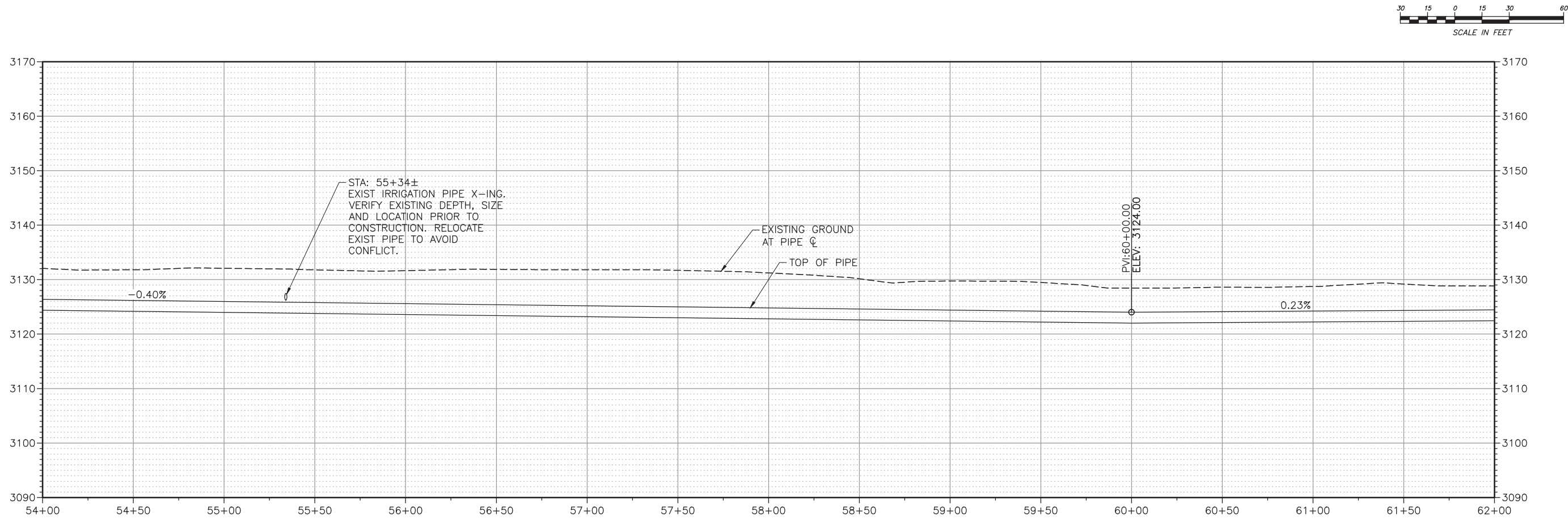
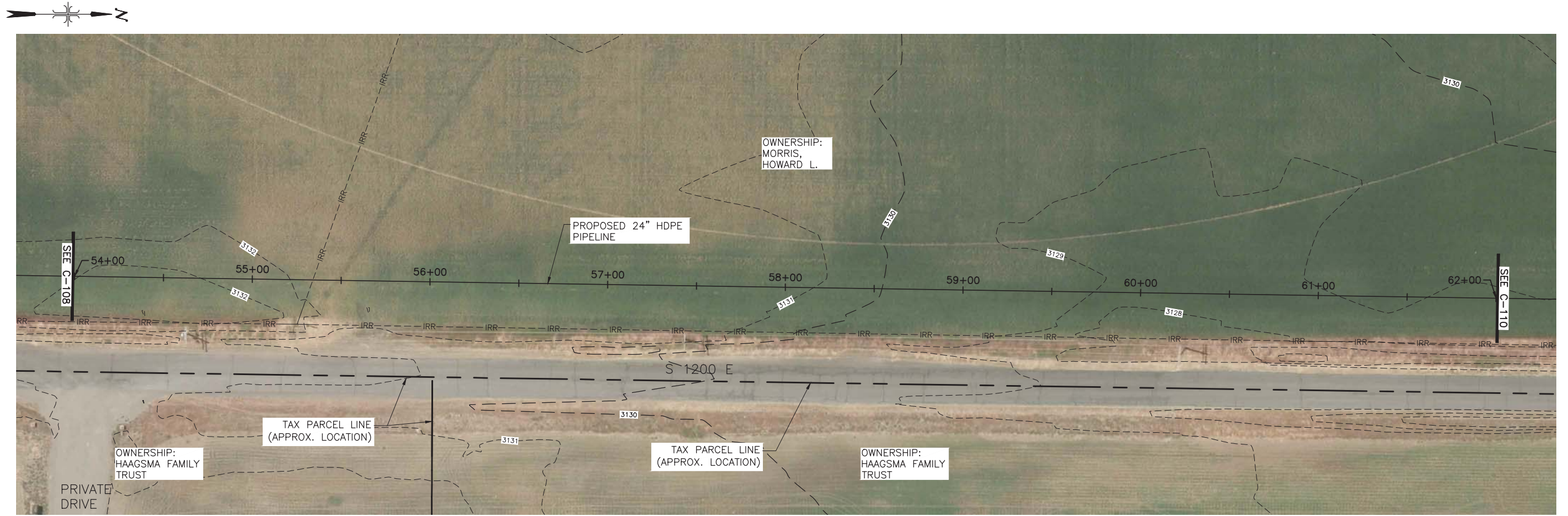
24" PIPELINE PROFILE
46+00 TO 54+00

PRELIMINARY
DRAFT NOT FOR
CONSTRUCTION

ITEM	REVISIONS DESCRIPTION	DATE	
		DATE	DESCRIPTION
A	60% DESIGN SUBMITTAL	9/26/14	

VERIFY SCALE 0 1/2 1 BAR MEASURES ONE-INCH ON FULL SIZE DRAWING.	
PROJECT:	535.0150
DESIGNED:	JWT
DRAWN:	PZC
CHECKED:	RRH

Path: Y:\PROJECTS\535.0150\SHE Filename: 5350150 C-109 Plot date: Sep 26, 2014-11:03:19am CAD User: PCooper.
Xref Filename: | 5350150-XR-30i AERIAL 5' | 5350150-XR-BASE | 5350150-XR-SURVEY |



24" PIPELINE PROFILE
54+00 TO 62+00



SPF WATER

ENGINEERING

300 East Mallard Drive, Suite 350
Boise, Idaho 83706
Tel (208) 383-4140 Fax (208) 383-4156

MAGIC SPRINGS PROJECT

PUMP STATION AND PIPELINE

PIPELINE PLAN & PROFILE STA. 54+00 TO 62+00

PRELIMINARY
DRAFT NOT FOR
CONSTRUCTION

REVISIONS		DATE
ITEM	DESCRIPTION	
A	60% DESIGN SUBMITTAL	9/26/14

VERIFY SCALE

BAR MEASURES ONE-INCH
ON FULL SIZE DRAWING.

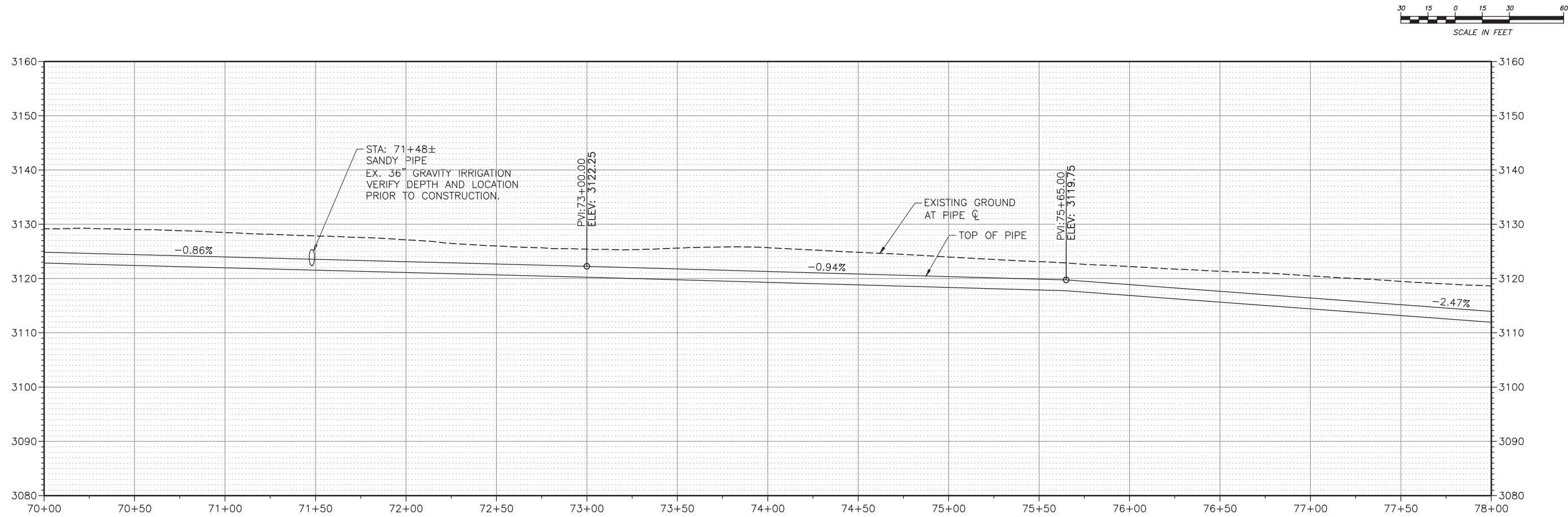
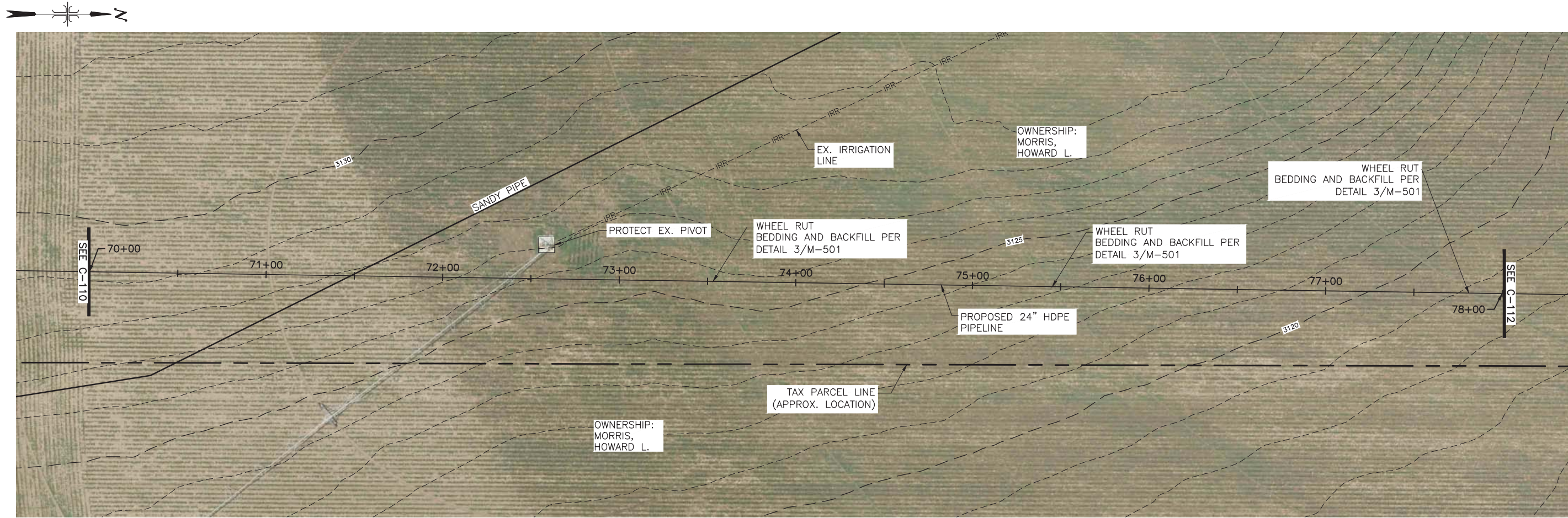
PROJECT: 535.0150

DESIGNED: JWT

DRAWN: PZC

CHECKED: RRH

Path: Y:\PROJECTS\535.0150\5HE Filename: 5350150 C-111 Plot date: Sep 26, 2014--11:04:47am CAD User: PCooper.
Xref Filename: | 5350150--XR--3Di AERIAL 5' | 5350150 xr tb | 5350150--XR--BASE | 5350150--XR--SURVEY |



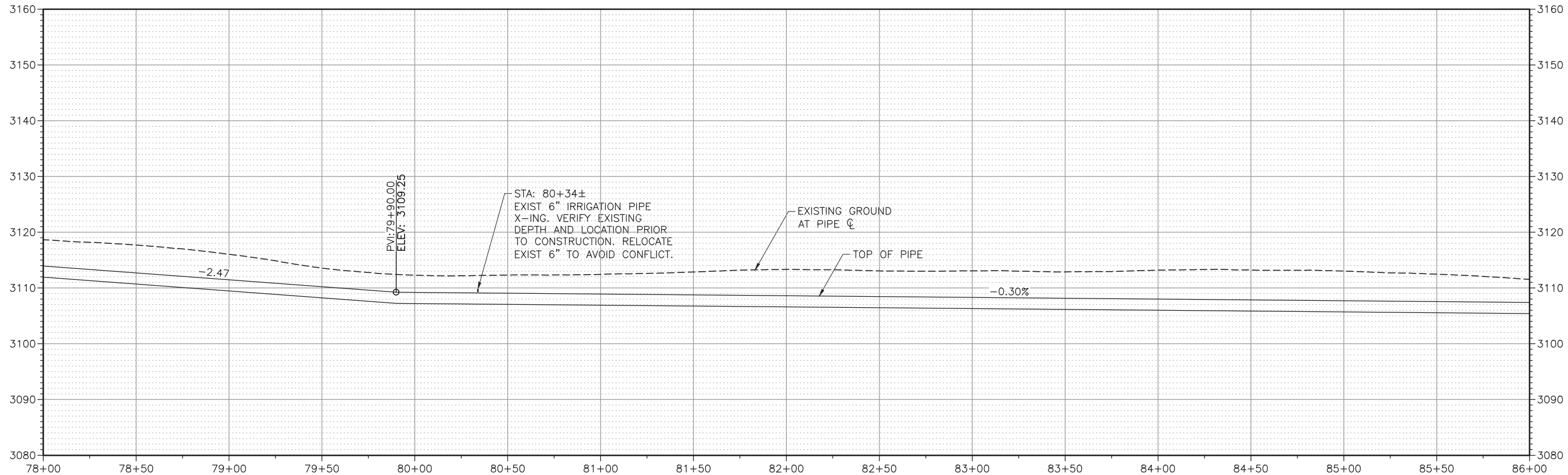
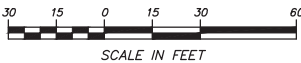
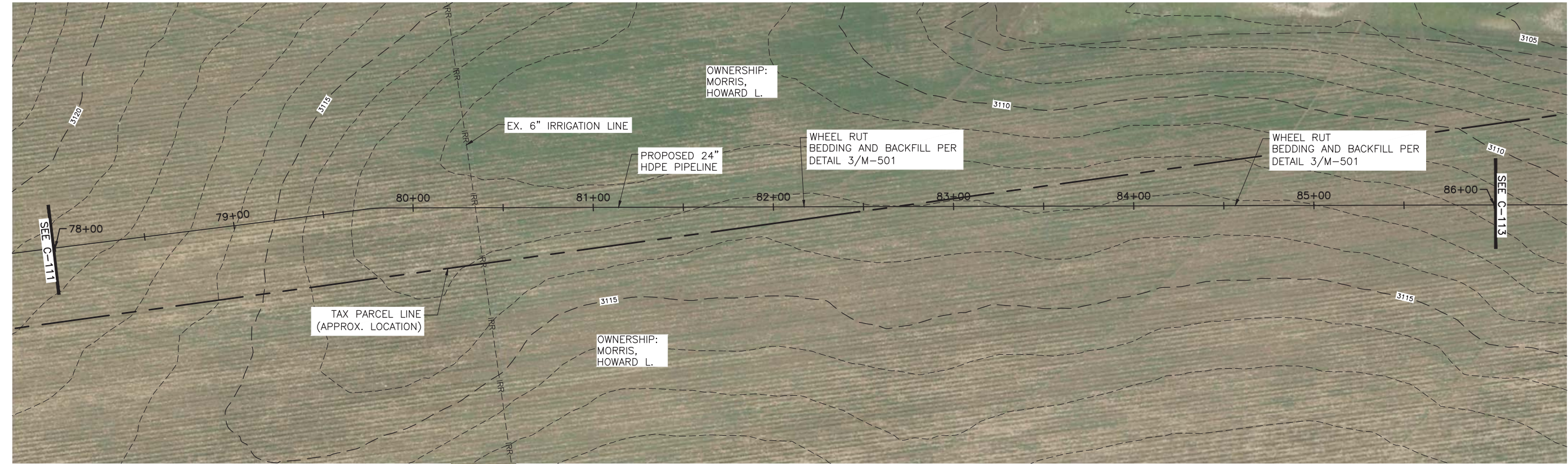
24" PIPELINE PROFILE
70+00 TO 78+00

PRELIMINARY
DRAFT NOT FOR
CONSTRUCTION

REVISIONS		DATE
ITEM	DESCRIPTION	
A	60% DESIGN SUBMITTAL	9/26/14

VERIFY SCALE	
0	1/2 1
BAR MEASURES ONE-INCH ON FULL SIZE DRAWING.	
PROJECT:	535.0150
DESIGNED:	JWT
DRAWN:	PZC
CHECKED:	RRH

Path: Y:\PROJECTS\535.0150\5HE Filename: 5350150 C-112 Plot date: Sep 26, 2014--11:05:33am CAD User: PCooper.
Xref Filename: | 5350150--XR--3Di AERIAL 5' | 5350150--XR--BASE | 5350150--XR--SURVEY |



24" PIPELINE PROFILE
78+00 TO 86+00



SPF WATER
ENGINEERING

300 East Mallard Drive, Suite 350
Boise, Idaho 83706
Tel (208) 383-4140 Fax (208) 383-4156

MAGIC SPRINGS PROJECT

PUMP STATION AND PIPELINE

PIPELINE PLAN & PROFILE STA. 78+00 TO 86+00

**PRELIMINARY
DRAFT NOT FOR
CONSTRUCTION**

ITEM	REVISIONS DESCRIPTION	DATE
A	60% DESIGN SUBMITTAL	9/26/14

VERIFY SCALE

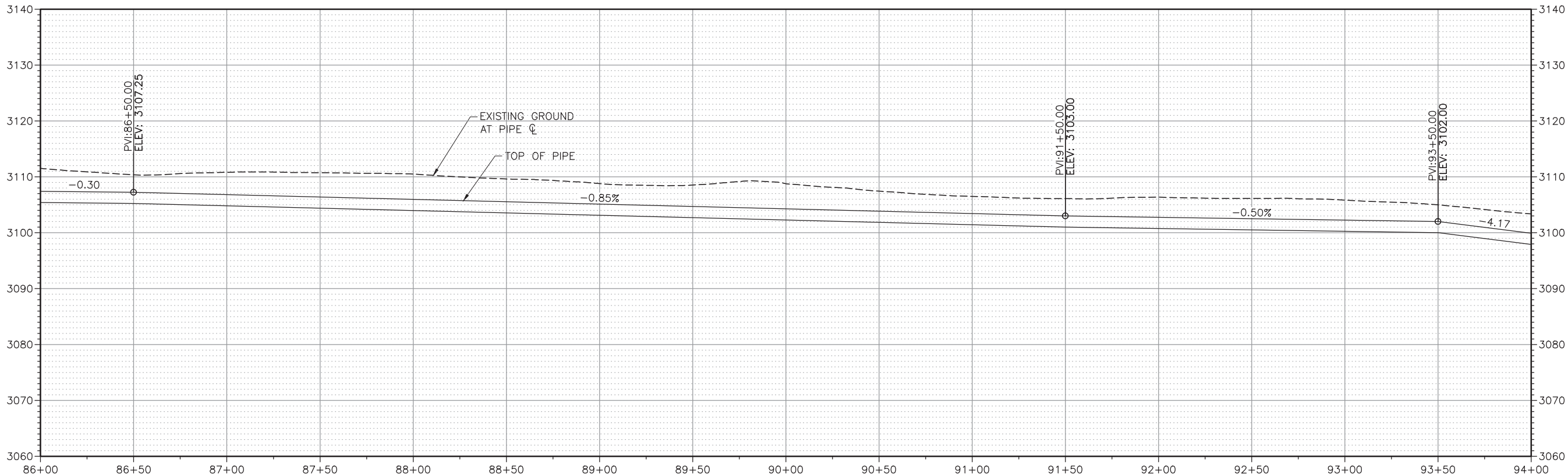
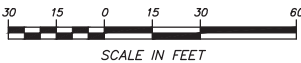
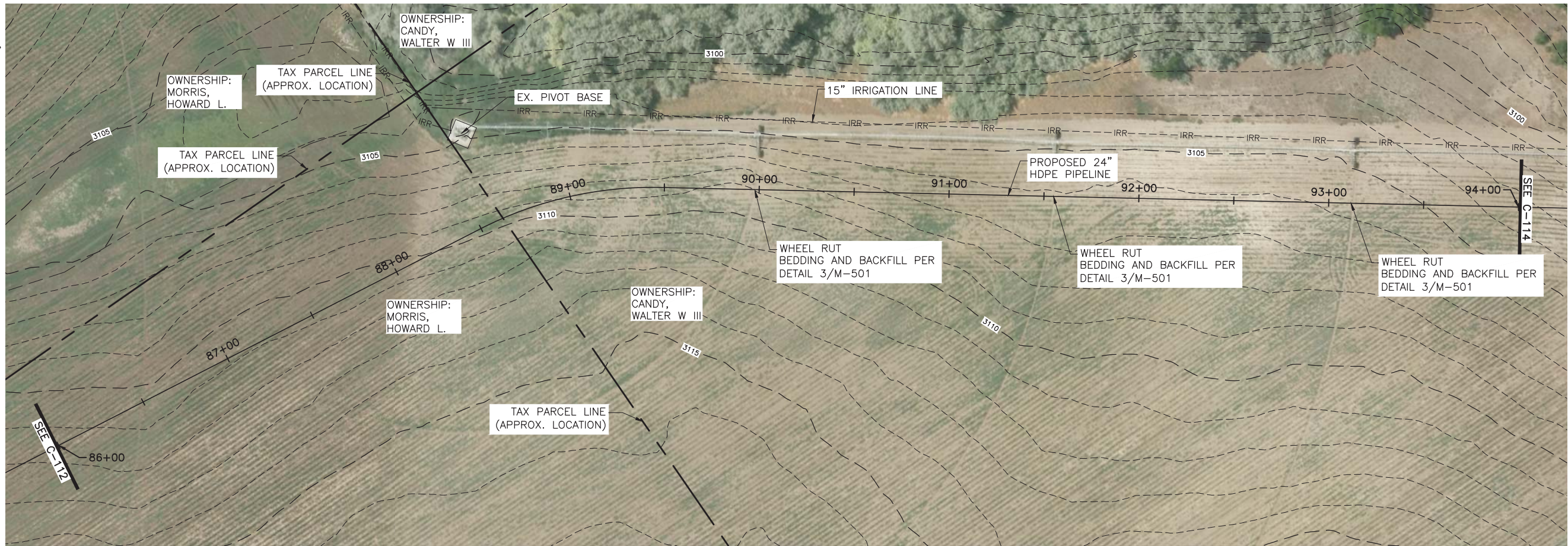
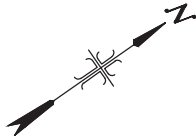


BAR MEASURES ONE-INCH ON FULL SIZE DRAWING.

PROJECT:	535.0150
DESIGNED:	JWT
DRAWN:	PZC
CHECKED:	RRH

C-112

Path: Y:\PROJECTS\535.0150\5HE Filename: 5350150 C-113 Plot date: Sep 26, 2014--11:06:24am CAD User: PCooper.
Xref Filename: | 5350150--XR--3Di AERIAL 5' | 5350150--XR--BASE | 5350150--XR--SURVEY |



24" PIPELINE PROFILE
86+00 TO 94+00



SPF WATER
ENGINEERING

300 East Mallard Drive, Suite 350
Boise, Idaho 83706
Tel (208) 383-4140 Fax (208) 383-4156

MAGIC SPRINGS PROJECT
PUMP STATION AND PIPELINE

PIPELINE PLAN & PROFILE STA. 86+00 TO 94+00

PRELIMINARY
DRAFT NOT FOR
CONSTRUCTION

REVISIONS	DATE	DESCRIPTION
ITEM	DATE	DESCRIPTION
A	9/26/14	60% DESIGN SUBMITTAL

VERIFY SCALE



BAR MEASURES ONE-INCH ON FULL SIZE DRAWING.

PROJECT:

535.0150

DESIGNED:

JWT

DRAWN:

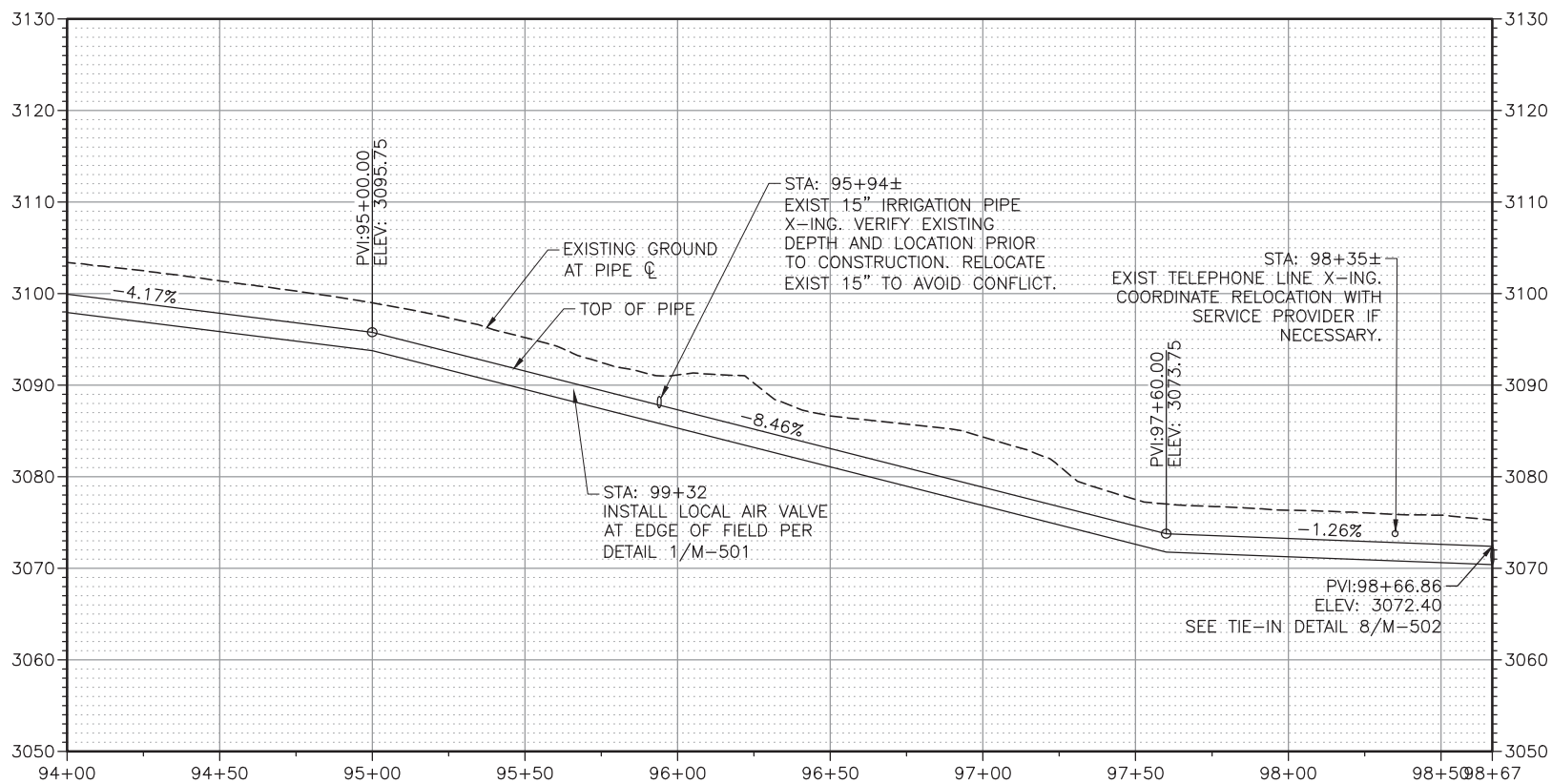
PZC

CHECKED:

RRH

C-113

Path: Y:\PROJECTS\535.0150\5HE Filename: 5350150 C-114 Plot date: Sep 26, 2014--11:07:05am CAD User: PCooper.
Xref Filename: | 5350150--XR-3Di AERIAL 5' | 5350150--XR-BASE | 5350150--XR-SURVEY |



24" PIPELINE PROFILE
94+00 TO 98+67

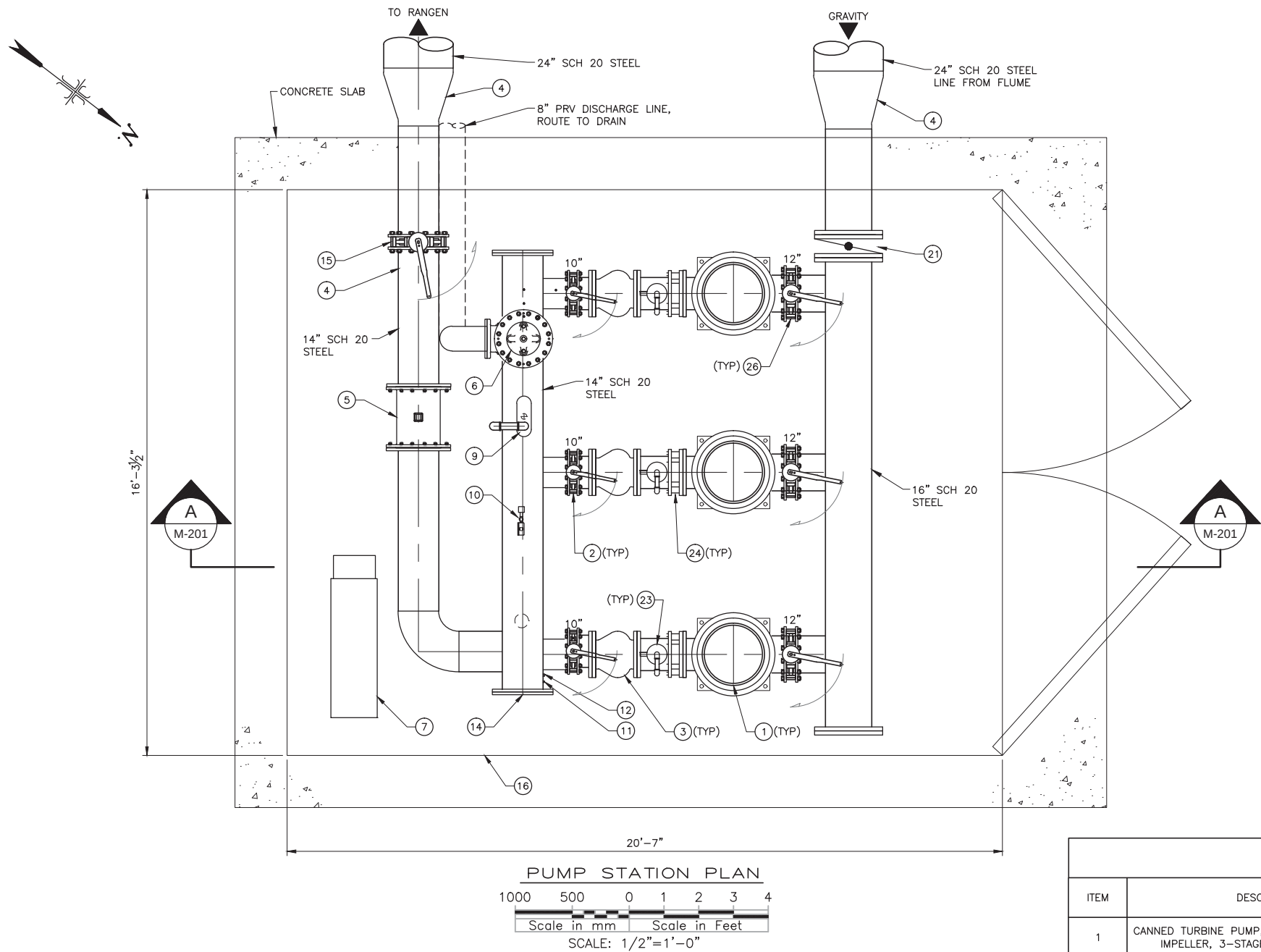
MAGIC SPRINGS PROJECT
PUMP STATION AND PIPELINE
PIPELINE PLAN & PROFILE STA. 94+00 TO 98+67

PRELIMINARY
DRAFT NOT FOR
CONSTRUCTION

REVISIONS		DATE
ITEM	DESCRIPTION	
A	60% DESIGN SUBMITTAL	9/26/14

VERIFY SCALE	
BAR MEASURES ONE-INCH ON FULL SIZE DRAWING.	
PROJECT:	535.0150
DESIGNED:	JWT
DRAWN:	PZC
CHECKED:	RRH

Path: Y:\PROJECTS\535.0150\SHE Filename: 5350150 M-101 Plot date: Sep 26, 2014-11:07:23am CAD User: PCooper.
Xref Filename: | 5350150 xr mech | 5350150 xr tb |



EQUIPMENT SCHEDULE							
ITEM	DESCRIPTION	SIZE	QTY	ITEM	DESCRIPTION	SIZE	QTY
1	CANNED TURBINE PUMP, GOULDS 14 RHMC, 9.19" IMPELLER, 3-STAGE, 150 HP; 24"Ø CAN		3	14	BLIND FLANGE	14"	2
2	BUTTERFLY VALVE	10"	3	15	FL BUTTERFLY VALVE	14"	1
3	GLOBE STYLE SILENT CHECK VALVE	10"	3	16	PUMP STATION ENCLOSURE W/ HEATER AND VENTILATION		1
4	REDUCER	VARIES	2	17	COLUMN PIPE	10"	3
5	MAGNETIC FLOW METER	14"	1	18	STAINLESS STEEL LINESHAFT	1.5"	3
6	HIGH PRESSURE RELIEF VALVE	8"	1	19	WET WELL LEVEL SENSOR		1
7	PUMP CONTROL PANEL		1	20	MANIFOLD DRAIN VALVE	4"	1
8	POWDER COATED SKID		2	21	BUTTERFLY VALVE	16"	1
9	COMBINATION AIR VALVE W/ ISOLATION VALVE	2"	1	22	PUMP CAN	24"	3
10	PRESSURE TRANSMITTER AND PRESSURE GAUGE W/ ISOLATION VALVE	1/4"	1	23	AIR/VACUUM VALVE W/ ISOLATION VALVE	1"	3
11	HIGH PRESSURE CUT-OFF SWITCH	1/2"	1	24	FLEXIBLE COUPLING ADAPTER, RESTRAINED W/ ALL-THREAD ROD	10"	3
12	HALF COUPLER (MISC)	3/4"	1	25	PRESSURE GAUGE W/ ISOLATION VALVE	1/4"	3
13	NOT USED	-	-	26	FL BUTTERFLY VALVE	12"	3

SPF WATER
ENGINEERING

300 East Mallard Drive, Suite 350
Boise, Idaho 83706
Tel (208) 383-4140 Fax (208) 383-4156

MAGIC SPRINGS PROJECT
PUMP STATION AND PIPELINE

ABC FLUME PUMP STATION PLAN

PRELIMINARY
DRAFT NOT FOR
CONSTRUCTION

REVISIONS	DATE	DESCRIPTION	60% DESIGN SUBMITTAL
ITEM	A		

VERIFY SCALE
0 1/2 1
BAR MEASURES ONE-INCH
ON FULL SIZE DRAWING.

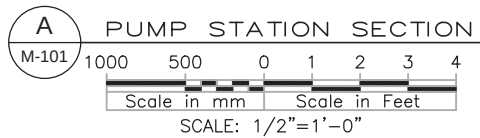
PROJECT: 535.0150

DESIGNED: JWT

DRAWN: PZC

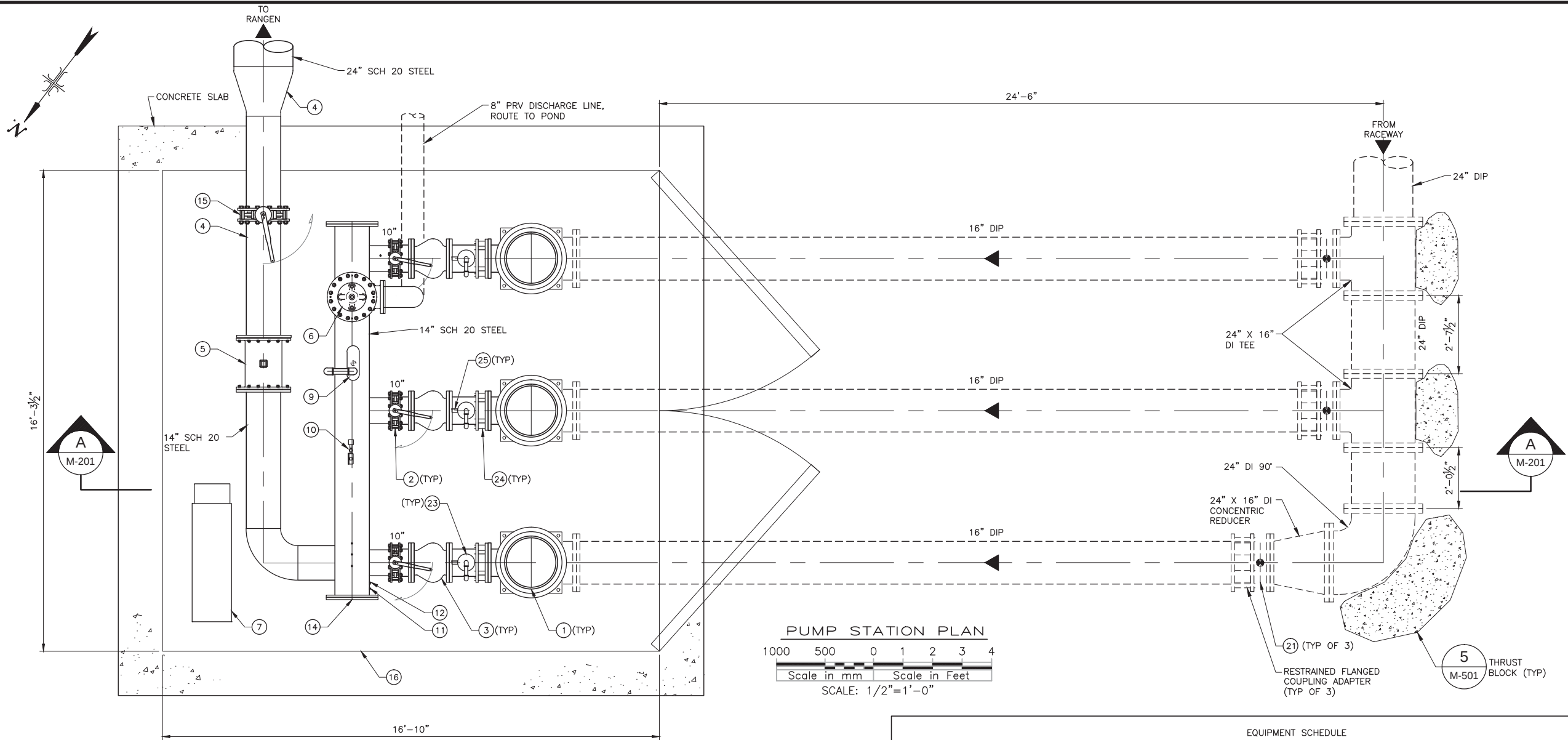
CHECKED: RRH

M-101



EQUIPMENT SCHEDULE							
ITEM	DESCRIPTION	SIZE	QTY	ITEM	DESCRIPTION	SIZE	QTY
1	CANNED TURBINE PUMP, GOULDS 14 RHMC, 9.19" IMPELLER, 3-STAGE, 150 HP; 24"Ø CAN		3	14	BLIND FLANGE	14"	2
2	BUTTERFLY VALVE	10"	3	15	FL BUTTERFLY VALVE	14"	1
3	GLOBE STYLE SILENT CHECK VALVE	10"	3	16	PUMP STATION ENCLOSURE W/ HEATER AND VENTILATION		1
4	REDUCER	VARIES	2	17	COLUMN PIPE	10"	3
5	MAGNETIC FLOW METER	14"	1	18	STAINLESS STEEL LINESHAFT	1.5"	3
6	HIGH PRESSURE RELIEF VALVE	8"	1	19	WET WELL LEVEL SENSOR		1
7	PUMP CONTROL PANEL		1	20	MANIFOLD DRAIN VALVE	4"	1
8	POWDER COATED SKID		2	21	BUTTERFLY VALVE	16"	1
9	COMBINATION AIR VALVE W/ ISOLATION VALVE	2"	1	22	PUMP CAN	24"	3
10	PRESSURE TRANSMITTER AND PRESSURE GAUGE W/ ISOLATION VALVE	1/4"	1	23	AIR/VACUUM VALVE W/ ISOLATION VALVE	1"	3
11	HIGH PRESSURE CUT-OFF SWITCH	1/2"	1	24	FLEXIBLE COUPLING ADAPTER, RESTRAINED W/ ALL-THREAD ROD	10"	3
12	HALF COUPLER (MISC)	3/4"	1	25	PRESSURE GAUGE W/ ISOLATION VALVE	1/4"	3
13	NOT USED	—	—	26	FL BUTTERFLY VALVE	12"	3

Path: Y:\PROJECTS\535.0150\SHE Filename: 5350150 M-101A Plot date: Sep 26, 2014--11:07:58am CAD User: PCooper.
Xref Filename: J 5350150 XR-MECH J 5350150 xr tb |



PUMP STATION PLAN
1000 500 0 1 2 3 4
Scale in mm Scale in Feet
SCALE: 1/2"=1'-0"

NOTES:

1. ALL BURIED DI PIPING SHALL BE FLANGED OR MECHANICALLY RESTRAINED.
2. DI FLANGED FITTINGS SHALL COMPLY WITH ANSI/AWWA C110 STANDARD. DI SPOOLS SHALL HAVE ANSI/AWWA C115 FLANGES.
3. STEEL PIPE MAY BE USED IN PLACE OF DIP WITH APPROVAL FROM ENGINEER.
4. POLYETHYLENE ENCASE ALL BURIED DIP.

EQUIPMENT SCHEDULE

ITEM	DESCRIPTION	SIZE	QTY	ITEM	DESCRIPTION	SIZE	QTY
1	CANNED TURBINE PUMP, GOULDS 14 RJHC, 9.19" IMPELLER, 3-STAGE, 200 HP; 24"Ø CAN		3	14	BLIND FLANGE	14"	2
2	BUTTERFLY VALVE	10"	3	15	FL BUTTERFLY VALVE	14"	1
3	GLOBE STYLE SILENT CHECK VALVE	10"	3	16	PUMP STATION ENCLOSURE W/ HEATER AND VENTILATION		1
4	REDUCER	14"X24"	1	17	COLUMN PIPE	10"	3
5	MAGNETIC FLOW METER	14"	1	18	STAINLESS STEEL LINESHAFT	1.5"	3
6	HIGH PRESSURE RELIEF VALVE	8"	1	19	WET WELL LEVEL SENSOR		1
7	PUMP CONTROL PANEL		1	20	MANIFOLD DRAIN VALVE	4"	1
8	POWDER COATED SKID		2	21	BUTTERFLY VALVE W/ VALVE BOX	16"	3
9	COMBINATION AIR VALVE W/ ISOLATION VALVE	2"	1	22	PUMP CAN	24"	3
10	PRESSURE TRANSMITTER AND PRESSURE GAUGE W/ ISOLATION VALVE	1/4"	1	23	AIR/VACUUM VALVE W/ ISOLATION VALVE	1"	3
11	HIGH PRESSURE CUT-OFF SWITCH	1/2"	1	24	FLEXIBLE COUPLING ADAPTER, RESTRAINED W/ ALL-THREAD ROD	10"	3
12	HALF COUPLER (MISC)	3/4"	1	25	PRESSURE GAUGE W/ ISOLATION VALVE	1/4"	3
13	NOT USED	-	-				

MAGIC SPRINGS PROJECT
PUMP STATION AND PIPELINE

I&J RACEWAY PUMP STATION PLAN

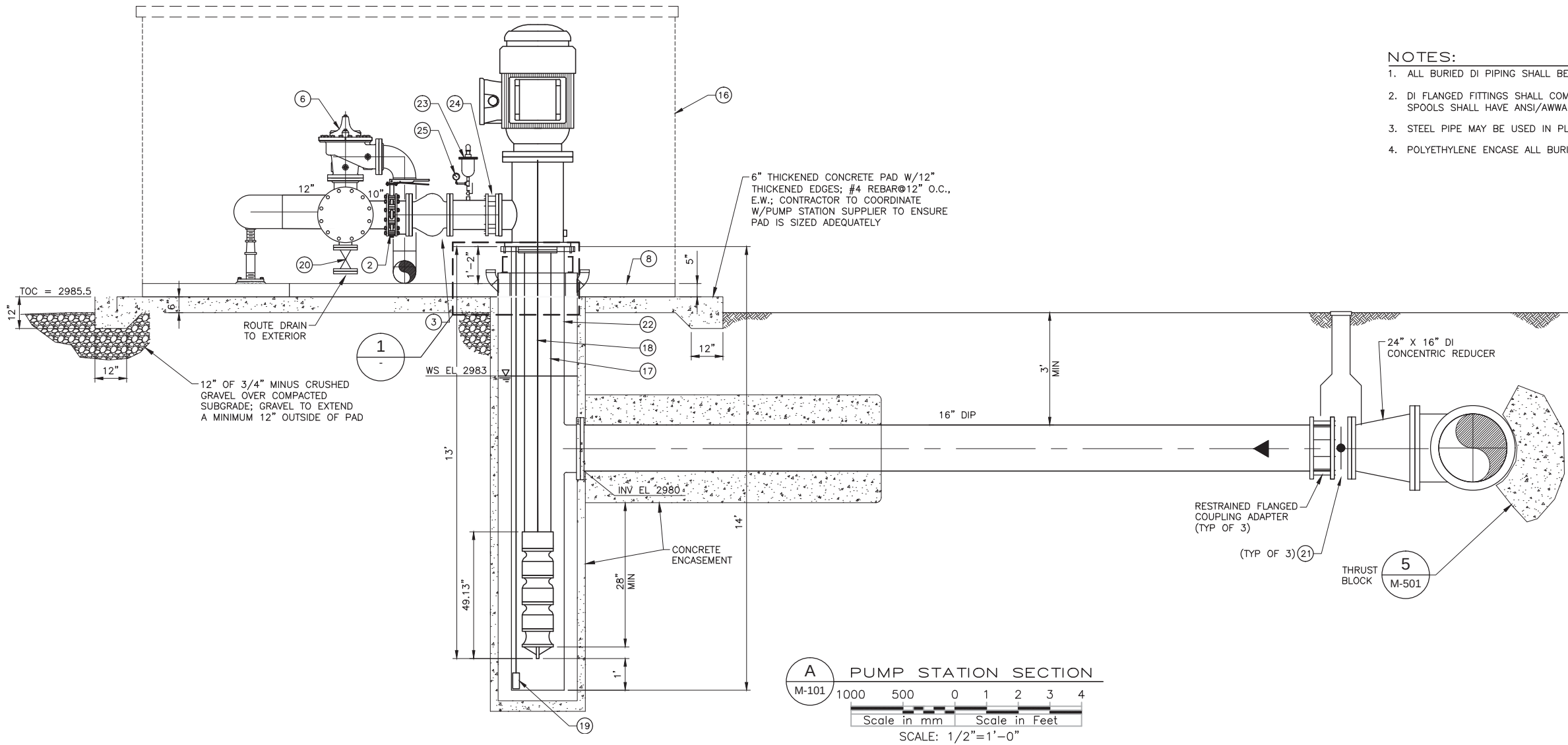
PRELIMINARY
DRAFT NOT FOR
CONSTRUCTION

REVISIONS	DATE	DESCRIPTION	60% DESIGN SUBMITTAL
ITEM	A		

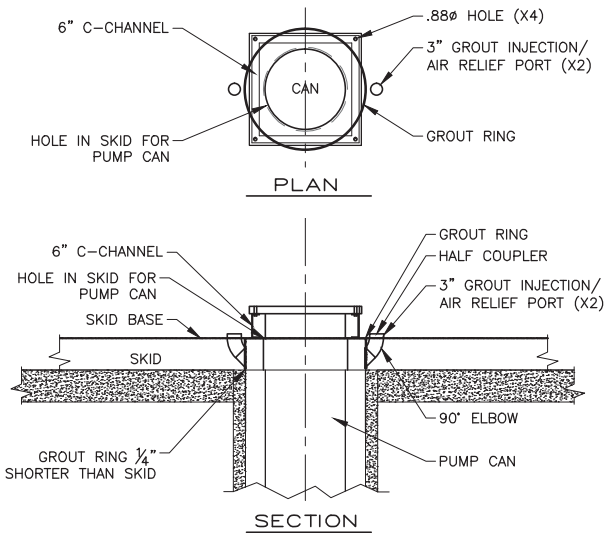
VERIFY SCALE
0 1/2 1
BAR MEASURES ONE-INCH ON FULL SIZE DRAWING.
PROJECT: 535.0150
DESIGNED: JWT
DRAWN: PZC
CHECKED: RRH

M-101A

Path: Y:\PROJECTS\535.0150\535.0150 SHE Filename: 5350150 M-201A Plot date: Sep 26, 2014--11:08:16am CAD User: PCooper.
Xref Filename: | 5350150 xr mech | 5350150 xr tb |



- NOTES:
1. ALL BURIED DI PIPING SHALL BE MECHANICALLY RESTRAINED.
 2. DI FLANGED FITTINGS SHALL COMPLY WITH ANSI/AWWA C110 STANDARD. DI SPOOLS SHALL HAVE ANSI/AWWA C115 FLANGES.
 3. STEEL PIPE MAY BE USED IN PLACE OF DIP WITH APPROVAL FROM ENGINEER.
 4. POLYETHYLENE ENCASE ALL BURIED DIP.

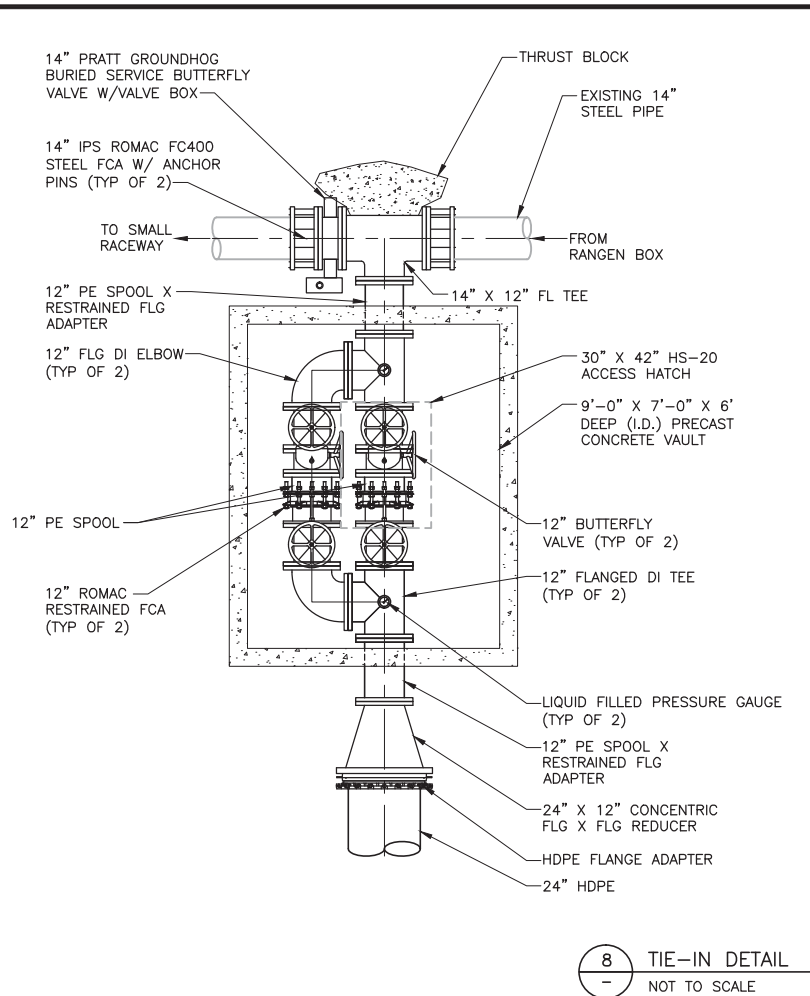
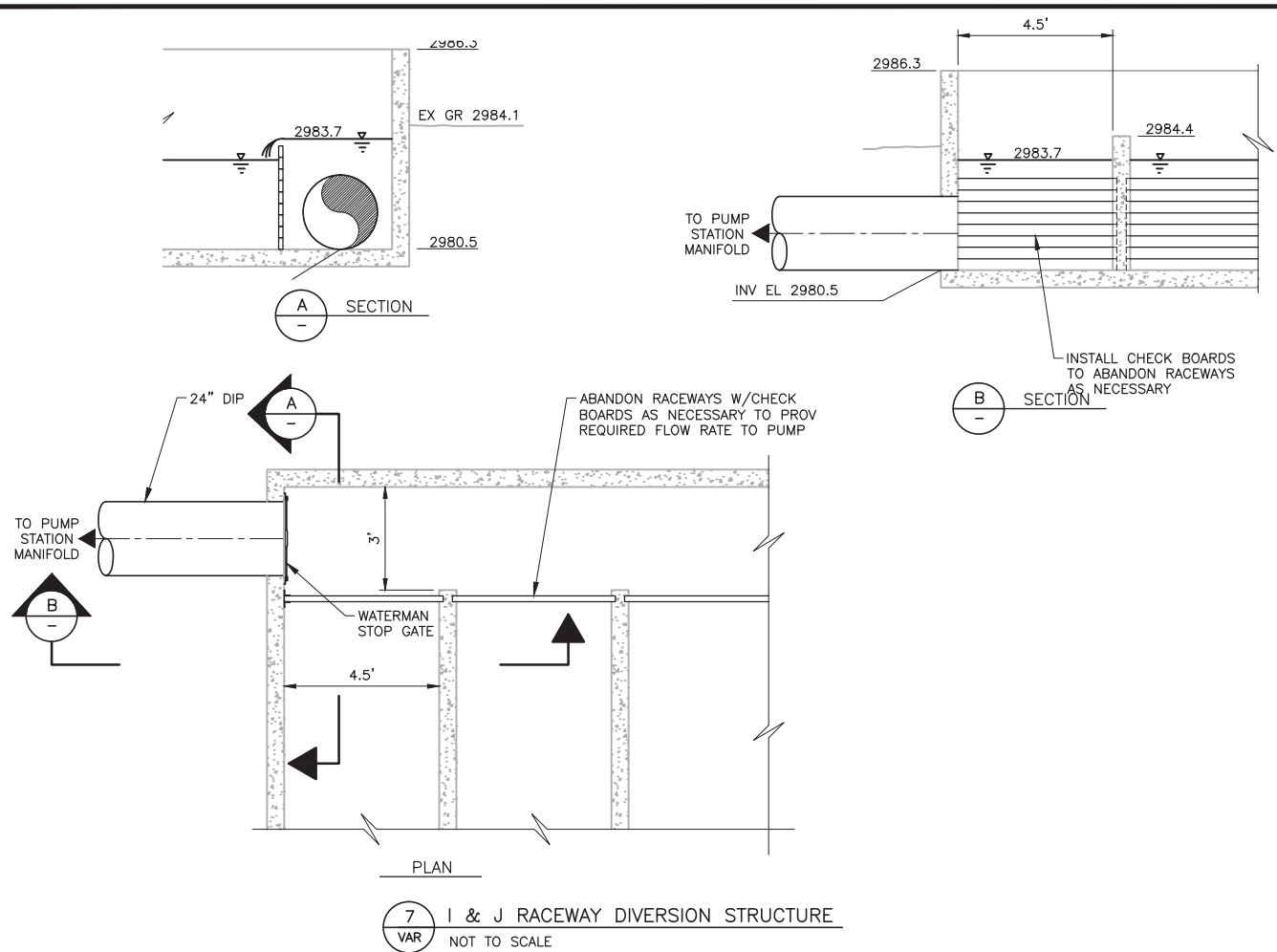


1 PUMP SUPPORT DETAIL

EQUIPMENT SCHEDULE							
ITEM	DESCRIPTION	SIZE	QTY	ITEM	DESCRIPTION	SIZE	QTY
1	CANNED TURBINE PUMP, GOULDS 14 RJHC, 9.19" IMPELLER, 3-STAGE, 200 HP; 24"Ø CAN		3	14	BLIND FLANGE	14"	2
2	BUTTERFLY VALVE	10"	3	15	FL BUTTERFLY VALVE	14"	1
3	GLOBE STYLE SILENT CHECK VALVE	10"	3	16	PUMP STATION ENCLOSURE W/ HEATER AND VENTILATION		1
4	REDUCER	14"X24"	1	17	COLUMN PIPE	10"	3
5	MAGNETIC FLOW METER	14"	1	18	STAINLESS STEEL LINESHAFT	1.5"	3
6	HIGH PRESSURE RELIEF VALVE	8"	1	19	WET WELL LEVEL SENSOR		1
7	PUMP CONTROL PANEL		1	20	MANIFOLD DRAIN VALVE	4"	1
8	POWDER COATED SKID		2	21	BUTTERFLY VALVE W/ VALVE BOX	16"	3
9	COMBINATION AIR VALVE W/ ISOLATION VALVE	2"	1	22	PUMP CAN	24"	3
10	PRESSURE TRANSMITTER AND PRESSURE GAUGE W/ ISOLATION VALVE	1/4"	1	23	AIR/VACUUM VALVE W/ ISOLATION VALVE	1"	3
11	HIGH PRESSURE CUT-OFF SWITCH	1/2"	1	24	FLEXIBLE COUPLING ADAPTER, RESTRAINED W/ ALL-THREAD ROD	10"	3
12	HALF COUPLER (MISC)	3/4"	1	25	PRESSURE GAUGE W/ ISOLATION VALVE	1/4"	3
13	NOT USED	-	-				

REVISIONS	DATE	DESCRIPTION
ITEM	DATE	DESCRIPTION
A	9/26/14	60% DESIGN SUBMITTAL

Path: Y:\PROJECTS\535.0150\SHE Filename: 5350150 M-502 Plot date: Sep 26, 2014--11:09:01am CAD User: PCooper.
Xref Filename: J 5350150 DETAILS J 5350150 xr tb J



NOTES:

1. NEED TO VERIFY LOCATION, DEPTH, SIZE, MATERIAL, AND CONDITION OF EXISTING PIPELINE. DEPTH MAY IMPACT DEPTH OF PRECAST CONCRETE VAULT.
2. PRE-FABRICATE ASSEMBLY BEFORE CUTTING INTO EXISTING PIPE.
3. PRESSURE SETPOINT SHALL BE EASILY ADJUSTABLE IN THE FIELD. DESIGN SETPOINT SHALL BE 36 PSI. CONTRACTOR SHALL ADJUST SETPOINT IN FIELD AS NECESSARY TO ACHIEVE DESIRED OPERATING CONDITIONS.
4. PRESSURE GAUGES SHALL BE INSTALLED UPSTREAM AND DOWNSTREAM OF VALVE ASSEMBLY. PRESSURE GAUGES SHALL BE STAINLESS STEEL, OIL-FILLED, 2.5 INCHES IN DIAMETER, AND SHALL HAVE A PRESSURE RANGE OF 0 TO 100 PSI. ISOLATION VALVES SHALL BE PROVIDED FOR EACH OF THE GAUGES.
5. ALL JOINTS NEED TO BE MECHANICALLY RESTRAINED, PLUS CONCRETE THRUST BLOCK BEHIND TEE.
6. MECHANICAL PIPING INSIDE VAULT SHALL BE CONSTRUCTED SO THE BUTTERFLY VALVE CAN BE REMOVED WHILE WATER IS FLOWING IN THE BY-PASS LINE.
7. MECHANICAL PIPING INSIDE VAULT SHALL BE PROPERLY SUPPORTED WITH AND WITHOUT THE BUTTERFLY VALVE IN PLACE.
8. ALL VAULT PENETRATIONS SHALL BE SEALED.
9. VAULT SHALL BE SET ON 1-FOOT OF BEDDING CHIPS.
10. VAULT SHALL HAVE AN ACCESS HATCH CENTERED OVER THE VALVE ASSEMBLY AND A FLOOR DRAIN.
11. VAULT WALLS AND LID SHALL BE INSULATED TO PREVENT FREEZING.

MAGIC SPRINGS PROJECT
PUMP STATION AND PIPELINE

DETAILS

PRELIMINARY
DRAFT NOT FOR
CONSTRUCTION

REVISIONS		DATE
ITEM	DESCRIPTION	DATE
A	60% DESIGN SUBMITTAL	9/26/14

VERIFY SCALE	
0	1/2 1
BAR MEASURES ONE-INCH ON FULL SIZE DRAWING.	
PROJECT:	535.0150
DESIGNED:	JWT
DRAWN:	PZC
CHECKED:	RRH

M-502

STRUCTURAL COVER SHEET
MAGIC SPRINGS PROJECT
Enter address under Manage tab in Project info



201 N. Maple Grove Ste 100
Boise, Idaho 83704
Phone (208) 342-7168
Fax (208) 342-3079

Boise, ID
Las Vegas, NV
Dubai, UAE
Ho Chi Minh City, Vietnam

Sheet List

DWG #	DRAWING TITLE	ORIGINAL SUBMITTAL	REV. #	REV.
S0.01	STRUCTURAL COVER SHEET	01/27/14		
S0.02	STRUCTURAL DESIGN NOTES	01/28/14		
S0.03	STRUCTURAL DESIGN NOTES	01/28/14		
S0.04	STRUCTURAL DESIGN NOTES	01/28/14		
S0.05	STRUCTURAL DESIGN NOTES	01/28/14		
S1.01ABC	FOUNDATION PLAN	01/28/14		
S1.01IJ	FOUNDATION PLAN	09/25/14		
S6.01	DETAILS	01/29/14		

Abbreviations

A.B. ACI ADD. AFF. AGGR. AIA AISC AISI ALT. AL. ANSI APA APPROX. ARCH. ASPH. ASSY. ASTM AVG. AWS	Anchor Bolt American Concrete Institute Addition Above Finish Floor Aggregate American Institute of Architects American Institute of Steel Construction American Iron and Steel Institute Alternate Aluminum American National Standards Institute American Plywood Association Approximate Architect or Architectural Asphalt Assembly American Society for Testing and Materials Average American Welding Society	L. L.G. L.H.E. L.L.B. LLH LLV LONG. LVL L.W. M. MATL. MAX. M.B. MECH. MED. MET. MEZZ. MIN. MIN. MISC. MIX. MK. MULT. N NF NO. or # NOM. NTS NS OC OD OPP. ORIG. O.S.B. OVS OWSJ P.C. PCF PEN. PERM. PERP. P. P.P. PROJ. PSF PSI P.T P.T. QTR. RAD. or R. REF. REINF. REQD. REV. RUL. R.O. S S SCHED. S.F. SHT. SHTG. SIM. SK. SPECS. SQ. S.S. SSLT STD. STIR. STK. STRUCT. SYM. T AND G T AND B TAN. THK. THRU TJI TO TOC or TO CONC. TOF or TO FTG. TOL TOM or TO MASONRY TOS or TO STL. TOW or TO WALL TRANSV. TYP. UN UNO VERT. V.I.F. VOL. W W WD. W.P. WT. X-HVY X-STR YD. ZL	Angle Light Gauge Low Hydrogen Electrode Long Leg Back To Back Long Leg Horizontal Long Leg Vertical Longitudinal Laminated Veneer Lumber Light Weight Material Maximum Machine Bolt Mechanical Medium Metal Mezzanine Minimum Minute Miscellaneous Mixture Mark Multiple North Near Face Number Nominal Not to Scale Near Side On Center Outside Diameter Opposite Original Oriented Strand Board Oversized Open Web Steel Joist Piece Pounds Per Cubic Foot Penetration Permanent Perpendicular Pile Partial Pen. Project Pounds Per Square Foot Pounds Per Square Inch Post Tension, Post Tensioned Pressure Treated Quarter Reference Reinforce, Reinforced, Reinforcement or Reinforcing Required Revise or Revision Room Rough Opening South I Beam Schedule Strut Force Sheet Sheathing Similar Sketch Specifications Square Stainless Steel Short Slotted Holes Transverse to Direction of Load Standard Stump Stock Structural Symmetrical Tongue and Groove Top and Bottom Tangent Thick Through Trus Joist MacMillan I Joist Top Of Top of Concrete Top of Footing Tolerance Top of Masonry Top of Steel Top of Wall Transverse Typical Unless Noted Unless Noted Otherwise Vertical Verify in the Field Volume West Wide Flange Wood Work Point Weight Extra Heavy Extra Strong Yard Double Angle
--	---	---	--

Symbol Legend

	Slope Direction (down)	<u>Symbols for Concrete per ACI</u>
	Span Direction	AT Spacing - Center to Center
	Miscellaneous Elevation	Direction in Which Bars Extend
	Floor or Steel Elevation	Limits of Area Covered By Bars or Post Tension
	Rigid Connection	Welding symbols per AWS
	Masonry (CMU) Wall	<u>Symbols for Structural Steel per AISC</u>
	Concrete Wall	H Brace Frame
	Earth	Brace Down
	New Construction	Change (Step) in Elevation
	Existing Construction	Slip Critical Connection
	Section Cut	Number of Bolts per Row
	Elevation Reference	Number of Rows
	Seismic Force Resisting System	Revision Cloud and Number
		Number of Nelson Studs required
		W12x19 [10] c=3/4" AISC beam designation
		Depth of steel joist
		Uniform live load (PLF)
		Uniform total load (PLF)
		Series of steel joist

SPF WATER
ENGINEERING

MAGIC SPRINGS PROJECT

STRUCTURAL COVER SHEET

PROFESSIONAL ENGINEER
PRELIMINARY NOT FOR CONSTRUCTION
This document is preliminary in nature and is not a final, signed and sealed document
EXP. 05/31/16

REV.	DATE	DESCRIPTION	SUBMITTAL
A	01/23/14	60% DESIGN	

VERIFY SCALE	0 1/2 1
BAR MEASURES ONE-INCH ON FULL SIZE	
PROJECT:	144168.00
DESIGNED:	RM / NH
DRAWN:	GT / JG
CHECKED:	###

S0.01

General

1.

All design and construction shall conform to the 2009 International Building Code and local jurisdictional amendments per state, county, city, etc.
2.

References to ASTM and other standards shall refer to the latest edition designated by IBC Chapter 35. Refer to the specifications for information in addition to that covered by these structural notes and drawings. The following standards were used for design.

Building Code Requirements for Structural Concrete	ACI 318-08
Seismic Provisions For Structural Steel Buildings	AISC 341-05
Specifications For Structural Steel Buildings	AISC 360-05
North American Specifications For The Design Of Cold-formed Steel Structural Members	AISI S100-07
Minimum Design Loads For Buildings And Other Structures	ASCE 7-05
National Design Specifications For Wood Construction	NDS-05
Building Code Requirements For Masonry Structures	TMS 402-08

All specifications and codes noted shall be the latest approved editions and revisions by the governmental agency having jurisdiction over this project.
3.

The Contractor shall verify all dimensions prior to starting construction. The Architect shall be notified of any discrepancies or inconsistencies.
4.

Summary of Work: Project consists of new construction as shown on these Contract Documents used in coordination with the Architectural and other discipline's documents. See also note 7.
5.

Warranty: The EOR has used the degree of care and skill ordinarily exercised under similar circumstances by members of the profession in this locale and no other warranty, either expressed or implied, is made in connection with rendering professional services.
6.

Structure noted in the drawings as existing shall be field verified by the contractor and any discrepancies noted shall be reported to the Architect/Structural Engineer.
7.

Construction documents include but are not limited to: drawings, plan notes, typical details, general notes, custom details, specifications, etc. In addition to those prepared by other disciplines.
8.

Do not scale the drawings for dimensions not shown.
9.

Notes and details on the drawings shall take precedence over general notes, typical details, and the project specifications.
10.

Typical details and schedules indicated may not be specifically referenced on the drawings. The contractor is responsible to determine where each typical detail or schedule applies. If locations are found where no typical detail, typical schedule, or specific detail applies, notify the Architect/Structural Engineer. - Drawings indicate general and typical details of construction. Typical details and general notes shall apply even if not specifically denoted on plans, UNO. Where conditions are not specifically indicated similar details of construction shall be used, subject to review and approval by the Architect and the Structural Engineer of Record.
11.

The contract Structural drawings and specifications represent the finished structure. They do not indicate the method of construction. Contractor to provide construction means, methods, techniques, sequences and procedures is required. Contractor to provide adequate excavation procedures, shoring, bracing and erection procedures complying with national, state and local safety ordinances. The Contractor shall provide all measures necessary to protect the structure during construction. Such measures shall include, but not be limited to: bracing and shoring for loads due to hydrostatic, earth, wind or seismic forces, construction equipment, temporary loading, etc.
12.

Observation visits (site visits) by representatives of Architect/Structural Engineer do not include inspection of construction means and methods. Site visits during construction are not continuous nor detailed inspection services which are to be performed by others. Observations are performed solely for the purpose of determining if the Contractor understands design intent shown in the contract drawings. Observations do not guarantee Contractor's performance and are not to be construed as supervision or verification of construction.
13.

Notify the Structural Engineer prior to constructing or fabricating, when drawings by others show openings, pockets, etc., not shown on the structural drawings, but which are located in the structural members.
14.

Products that require a report on code compliance shall have an ICC-ES or IAPMO report evaluated for the above listed governing building code. Where required by the governing jurisdiction, a submittal as an alternate material and method is required for all reports evaluated to an earlier edition of the IBC. Reports evaluated to codes other than the above listed code are not permitted, unless allowed by the governing jurisdiction.
15.

Contractor shall investigate the site during clearing and earth work operations for filled excavations or buried structures such as cesspools, cisterns, foundations, utilities, etc. If any such structures are found, the Structural Engineer shall be notified immediately.
16.

Construction materials shall be spread out when placed on framed floors or roofs. The construction material load shall not exceed the design live load per square foot. Provide adequate shoring and/or bracing where structure has not attained design strength.
17.

See the architectural drawings for the following:
Size and location of door and window openings, size and location of interior and exterior non-bearing partitions, size and location of concrete curbs, floor drains, slopes, depressed areas, changes in level, chamfers, grooves, inserts, size and location of floor and roof openings, floor and roof finishes, stair framing and details, dimensions not shown on the structural drawings, ceiling assemblies, exterior wall assemblies, etc.

18.

See mechanical, plumbing, and electrical drawings for the following:
Pipes, sleeves, hangers, trenches, wall, floor, and/or roof openings, duct penetration, electrical conduit runs, boxes, outlets in walls and slabs, concrete inserts for electrical, mechanical or plumbing fixtures, size and location of machine or equipment bases, anchor bolts for mounts, etc., except as shown or noted. See also note 13.
19.

For mechanical and electrical equipment anchorage that is to be designed by others, see IBC section 1613 and ASCE 7 chapter 13. Use isolators, fasteners and bracing approved by ICC-ES or approved third party capable of transmitting code required lateral loads. Secure suspended equipment with lateral bracing.
20.

For piping and ductwork bracing to be designed by others, see the latest edition of "Guidelines for Seismic Restraints of Mechanical Systems" by the Sheet Metal and Air Conditioning Contractors National Association.
21.

SHOP DRAWINGS:

A.

Shop drawings and material submittals shall be submitted to the Architect and Structural Engineer of Record prior to any fabrication or construction. Electronic submittals shall be made where possible. Any submittals containing hard copies shall include one reproducible and one copy; reproducible will be marked and returned. Additional copies of reviewed shop drawings are the responsibility of the general contractor. No modifications or substitution of drawings and specifications will be accepted via shop drawing review. Contractor shall review and stamp shop drawings prior to submission to the Architect/Structural Engineer. Contractor shall review for completeness and compliance with contract documents including addendums, clarifications, etc. See also note 7.

B.

Submit shop drawings to the Architect/Structural Engineer as indicated or specified for review prior to fabrication. Review will be for general conformance with design intent conveyed in contract documents.

C.

When an engineer is required to sign and stamp shop drawings and calculations, ensure seal indicates engineer as registered in state where project site occurs.

D.

Shop drawings are not a part of contract documents, therefore, Architect's/Structural Engineer's review does not constitute an authorization to deviate from terms and conditions of the contract. See also note 7.

E.

Shop drawings will be rejected for incompleteness, lack of coordination with other portions of contract documents, lack of calculations (if required), or where modifications or substitutions are indicated without prior review per paragraph A above. Resubmittals shall be clouded and dated for all changes to the submittal. Only clouded portions of resubmittal will be reviewed and Structural Engineer of Record's review stamp applies to only these areas.

F.

Submit shop drawings and calculations to governing code authority when specifically indicated or requested.

G.

Maintain a copy of all shop drawings accepted by the Architect/Structural Engineer at site during construction period.

H.

Structural Engineer requires 10 working days after receipt of shop drawings and calculations for processing.

I.

As a minimum submit shop drawing submittals shall include the following items plus, additional items listed in the project specifications for structural review, but not be limited to:

a.

Construction sequence description

b.

Contractor Quality Control testing procedures when required in specifications

c.

Concrete mix designs

d.

Concrete construction joint plans

e.

Concrete reinforcing bar shop drawings and placing plans

f.

Reinforcing bar mill certificates shall be available upon request

g.

Post-tensioning reinforcing and stressing sequence plan

h.

Studrails

i.

Concrete accessories material specification, size and location

j.

Precast concrete members shown on structural documents

k.

Non-shrink grout material specifications and manufacturer's installation recommendations

l.

Masonry materials and mix designs

m.

Masonry reinforcing bar shop drawings and placing plans.

n.

Fabrication shop AISC Certification or statement of equivalent testing and inspection procedures.

o.

Structural steel mill certificates shall be available upon request

p.

Structural steel shop and erection drawings

q.

Welding Procedure Specifications and certifications

r.

Metal deck material submittal

s.

Metal deck and accessories layout

t.

Open web steel joist layout, accessories, and calculations

u.

Shear stud layout

v.

Cold-formed steel shown on structural drawings

w.

Glued laminated members (certificates shall be on site and be available upon request)

x.

Engineered wood beams (certificates shall be on site and be available upon request)

y.

Pre-engineered wood trusses layout and calculations.

z.

Hold down systems layout and calculations.

aa.

Elevator supports and layout

bb.

Rock anchor system layout and calculations.

cc.

LEED material submittals

dd.

Tilt-up panel erection procedures including pick points, bracing, additional reinforcing, etc.
22.

DEFERRED STRUCTURAL COMPONENTS:

A.

Components referred to as Deferred Structural Components shall comply with these notes. These elements have not been permitted under the base building application. The contractor will be required to submit the component system documents to the building official for approval. The documents shall be stamped and signed by an engineer licensed by the state where the project is located. The deferred structural components shall not be installed until the design and submittal documents have been approved by the building official.

B.

Prior to building department submittal, the deferred structural components submittals shall receive cursory review by Structural Engineer of Record for loads imposed on primary structure and general conformance with design concept of the project and general compliance with the information given in the Structural Contract Documents. Review of submittals does not constitute approval or acceptance of unauthorized deviation from Contract Documents.

C.

Submittals of contractor-designed components shall include the designing professional engineer's stamp and signature, as noted above. The submittal shall be approved by the component vendor prior to review by the Structural Engineer of Record.

D.

The designing professional is responsible for code conformance and all necessary connections not specifically called out on architectural or structural contract documents.

E.

Submittals shall include details of connections to primary structure that indicate magnitude and direction of all loads imposed at point of connection.

F.

Design criteria shall be provided with submittal and calculations shall be made available upon request.

G.

Refer to other discipline's contract documents for additional deferred components that may require structural design and details. Connections of these elements shall not induce torsion on structural members.

H.

Deferred Structural Components shall be manufactured, delivered, handled, stored, and field erected in conformance with instructions prepared by the component vendor.

I.

The following list includes the items that are defined as Deferred Structural Components. Additional items may be included in the project specifications.

J.

Deferred structural components:

a.

Exterior wall system support

b.

Light-gage metal stud systems

c.

Post-tensioning systems

d.

Metal or pre-cast stairs and landings

e.

Fall restraint systems

f.

Handrails, guards, grab bars, and wall mounted shower seats

g.

Marquees and canopies unless detailed on Contract Documents

h.

Precast panels

i.

Precast structural members

j.

Open web steel joist

k.

Open web wood joists

l.

Plywood web joists

m.

Structural Insulated Panel product data, erection and shop drawings

n.

Continuous Rod Holddown Systems

o.

Pre-manufactured wood trusses

p.

Pre-manufactured metal buildings

q.

Metal Grating and/or stair treads

23.

PREFABRICATED METAL BUILDINGS:

Metal building framing, including rigid frames, rafter beams, columns, purlins, girt's, lateral bracing and metal roofing and siding shall be designed by the manufacturer for the structure dead load and the live and lateral loads indicated on these drawings. All design shall be completed in accordance with the building code listed on these drawings and sealed by an engineer licensed in the appropriate state per the appropriate discipline. Provide structural members as required by design and consistent with locations shown on these drawings. Modifications of building configuration will be permitted only with written approval of the Architect and Engineer. Submit design calculations and framing / erection plan for Engineer review prior to fabrication. As a minimum, the submittal shall include foundation reactions, anchor bolt placement and sizes, column bearing area requirements, member sizes and spacing, and all connection details. Building manufacturer shall be responsible for redesign if the maximum reactions or required pier and footing sizes exceed those stated on these drawings. Snow drifts from adjacent buildings shall be accounted for per the appropriate ASCE-7 design standard. Refer to shop drawing notes regarding submittal, substitutions and additional requirements.

Reinforcing Steel (for Concrete & Masonry)

1.

All reinforcing steel shall be detailed and placed in accordance with the 'Building Code Requirements for Reinforced Concrete' (ACI 318) and the 'Manual of Standard Practice for Reinforced Concrete Construction' by CRSI and WCRSI as modified by the project drawings and specifications.

2.

Deformed reinforcing bars shall conform to the requirements of ASTM A615 grade 60 and ASTM A706 grade 60 for deformed yieldable bars.

3.

Welding of reinforcing is permitted only where shown on the drawings or when approved by the structural engineer. Welding of reinforcing bars shall be with low hydrogen electrodes in accordance with the 'Recommended Practices for Welding Reinforcing Steel, Etc.', American Welding Society, AWS D1.4 and IBC table 1704.4.1 all reinforcing to be welded shall conform to ASTM A706 grade 60 u.n.o.

4.

All reinforcing bar bends shall be made cold.

5.

Lap splices made at locations other than those specifically indicated on the drawings shall require approval by engineer prior to any fabrication or construction activities.

6.

Reinforcing dowels between footings and walls or columns shall be the same number, size, spacing and grade as the specified vertical reinforcing, u.n.o.

7.

All reinforcing bars shall be marked so their identification can be made when the final in-place inspection occurs.

8.

Welded wire fabric shall conform to ASTM A185.

9.

Minimum lap of welded wire fabric shall be 6 inches or one full mesh and one half, whichever is greater.

10.

Submit shop drawings to structural engineer: Placing drawings that detail fabrications, bending, and placement. Include bar sizes, lengths, material, grade, bar schedules, stirrup spacing, bent bar diagrams, bar arrangement, splices and laps, mechanical connections, tie spacing, hoop spacing, and supports for concrete reinforcement.

11.

In addition to all the reinforcing included on the drawings the contractor shall provide for an allowance of 7% of reinforcing bars to be finished, fabricated and placed during the progression as may be directed by the structural engineer. In the event that the allowance is not completely exhausted, the contractor should be prepared to issue a credit to the owner for the remaining portion of the allowance.

SPF WATER
ENGINEERING

300 East Mallard Drive, Suite 350
Boise, Idaho 83706
Tel (208) 383-4140 Fax (208) 383-4156

MAGIC SPRINGS PROJECT

STRUCTURAL DESIGN NOTES

PROFESSIONAL ENGINEER
PRELIMINARY NOT FOR CONSTRUCTION
(This document is) preliminary in nature and is not a final, signed and sealed document
EXP. 05/31/16

REV.	DESCRIPTION	DATE	REVISIONS			
			1	2	3	4
A	60% DESIGN SUBMITTAL	9/23/14				

VERIFY SCALE

0 1/2 1

BAR MEASURES ONE-INCH ON FULL SIZE

PROJECT: 144168.00

DESIGNED: RM / NH

DRAWN: GT / JG

CHECKED: ###

S0.02

FULL SIZE = 22x34 HALF SIZE = 11x17

SNOW LOADS:	
Ground Snow Load	Pg = xxx psf
Importance Factor	I = xxx
Exposure Factor	Ce = xxx
Flat Roof Snow Load	Pf = xxx psf
Thermal Factor	Ct = xxx
Snow Drifts	As indicated on drawings.

Wind Base Shear:			
Wind X (East-West)	X kips	Wind Y (North-South)	X kips

Soil Factor Coefficients:	
Fa = x.xxx g	Fv = x.xxx g

Seismic Design Criteria:	
Seismic Response Coefficient:	CS = x.xxx
Seismic Design Category	-
Analysis Procedure	-
Structural System	-
Response Modification Factor	-

Seismic X (East-West)	X kips	Seismic Y (North-South)	X kips
-----------------------	--------	-------------------------	--------

Building Location	xx.xxxxxx, -xxx.xxxxxx
Mean Building Height	xxx feet

North/South Direction	$\rho = x.x$
East/West Direction	$\rho = x.x$

Roof Live Load	20 psf (reducible)
Roof Live Load (Tenant Accessible)	60 psf (reducible)
Roof Live Load (Public Accessible)	100 psf (non-reducible)

Uninhabitable Attics w/out Storage	10 psf
Uninhabitable Attics w/ Storage	20 psf

Multi-family Live Loads:	
Roof Live Load (Tenant Accessible)	60 psf (reducible)
Roof Live Load (Public Accessible)	100 psf
Stair, Corridor, Lobby (at First Floor) & other public rooms	100 psf
Stair, Corridor, Lobby (All other floors)	80 psf
Residential Floor	40 psf
Residential Deck	40 psf
Residential Balconies	60 psf

Parking Floor	40 psf
Concentrated Load	3000 lbs

Lobbies and First Floor Corridor	100 psf
Offices	50 psf
Corridors above the First Floor	80 psf
Concentrated Load (All Conditions)	2000 lbs
Partition Loading	20 psf

Retail First Floor	100 psf
Retail Upper Floors	75 psf
Wholesale All Floors	125 psf
Concentrated Load (All Conditions)	1000 lbs

Classrooms	40 psf
Corridors (Above First Floor)	80 psf
First Floor Corridors	100 psf
Concentrated Loads (All Conditions)	1000 lbs
Gymnasium, Main Floor and Balconies	100 psf

Reading Rooms	60 psf
Stack Rooms	150 psf
Concentrated Loads (All Conditions)	1000 lbs

Light Storage	125 psf
Heavy Storage	250 psf

Marquees	75 psf
Guardrails/Balcony Rails	50 plf or 200lbs.
Mechanical Equipment	Weights Furnished by Manufacturer

1. Special Inspector shall be hired by the owner to perform the following special inspections per IBC Section 1704. The type and frequency of special inspection, structural testing and subsequent reporting conforming to the requirements of IBC sections 1705 shall be submitted by the inspection and testing agencies to the architect/structural engineer for approval.
2. Testing Laboratory: Retained by owner and satisfactory to Architect/Structural Engineer and governing code authority to perform required tests and inspections of this contract and applicable code.
3. Material Certification: Submit laboratory test reports certifying materials are of identifiable tested stock to owner, testing laboratory, Architect/Structural Engineer and, upon request, to governing code authority. If laboratory test reports cannot be made available, testing laboratory will perform tests as directed by Architect/Structural Engineer. Contractor shall pay testing laboratory for costs related to tests and inspections of unidentifiable materials or materials furnished without laboratory test reports, materials found deficient after initial tests and inspections, or materials replacing deficient materials.
4. The following inspections are required and shall be performed per the building code or as requested by the engineer of record. See the following for material specific requirements in cases where the requirements listed in the applicable codes and these requirements are redundant the more stringent criteria shall apply:
 - A. Inspection of fabricators per 1704.5
 - B. Steel construction per 1705.2, Table 1705.2.2, AISC 360-10: Chapter N and the following:
 - a. Shop welding unless performed on premises of an approved fabricator as defined in IBC Section 1704.2.
 - b. Field welding including shear studs (when permitted)
 - c. Field welding of metal deck per appropriate ICC evaluation report. (Periodic inspection permitted per IBC section 1704.3-2.2.2).
 - d. Welded guardrail
 - e. Light gauge steel headers shall not be spliced
 - f. Inspection of built-up light gauge steel members
 - g. High strength bolting
 - C. Concrete construction and post-tension construction per 1705.3, Table 1705.3 and the following:
 - a. Testing laboratory will review concrete mix design data and will perform the following concrete tests at frequency indicated in ACI 318-Section 5.6
 - b. Slump tests in compliance with ASTM C143.
 - c. Prepare four test cylinders for compressive strength testing in compliance with ASTM C39, ACI 318 and ACI 318- Section 5.6 and field cure. Test one cylinder at 7 days, two cylinders at 28 days and retain remaining cylinder for tests until completion of project. Determine concrete compressive strength at 28 days based on average of two cylinders tested. Additional cylinders may be required depending on weather conditions, see structural engineer and concrete general notes.
 - d. Entrained air content in compliance with ASTM C231 for air entrained concrete
 - e. Bolts, embedded plates and post-installed mechanical anchors (expansion and/or) installed in concrete.
 - f. Special ductile moment-resisting concrete frame.
 - g. Reinforcing, pre-stressing and post-tensioning steel and mechanical reinforcing bar splices: During placement and/or during stressing.
 - h. P-T cables in garages that are driven over
 - i. Shotcrete
 - D. Stud rail installation
 - E. Precast concrete erection
 - F. Masonry construction per 1705.4 and MSJC code TMS 402/ ACI 530/ ASCE 5. Structures classified as brick category IV shall comply with TMS 402/ ACI 530/ ASCE 5 level B quality assurance.
 - G. Wood Construction: Per 1705.5 including but not limited to:
 - a. High load diaphragms per 1705.5.1
 - b. Periodic special inspection for nailing, bolting anchoring and other fastening components including wood shear walls, wood diaphragms, drag struts, braces, shear panels and holdowns) where fastened spacing of the sheathing is 4" oc. or less.
 - H. Soils per 1705.6, Table 1705.6 and the following:
 - a. Excavations and backfills
 - b. Foundation placement
 - c. Piles (auger-cast, helical or driven), piers, and caisson inspections shall be made by the Geotechnical Inspector per IBC 1705.7, 8, and 9 and Tables 1705.7 and 8
 - I. Sprayed fire-resistant materials per 1705.13 and .14 (see architectural specifications)
 - J. Exterior Insulation & Finish System (EIFS) per 1705.15 (see architectural specifications)
 - K. Special cases per 1707.1:
 - a. Epoxy and grout set bolts and reinforcing bars. Ten percent of drilled-in, epoxy, or grout set anchors shall be proof tested to 2 times allowable tension. Notify Architect/Structural Engineer of any failures so additional testing of adjacent anchors can be directed.
 - b. Other:
 - L. Smoke control per 1705.17: See mechanical specifications for requirements.
 - M. Special Inspections for Wind Requirements per 1705.10 and 1704.4 for exposure B, 120mph or greater, exposure C, or D, 110mph or greater.

- SPF WATER**
ENGINEERING
- 300 East Mallard Drive, Suite 350
Boise, Idaho 83706
Tel (208) 383-4140 Fax (208) 383-4156

STRUCTURAL DESIGN NOTES

REVISIONS		
REV.	DESCRIPTION	DATE
A	60% DESIGN SUBMITTAL	9/23/14

VERIFY SCALE

BAR MEASURES
ONE-INCH ON FULL SIZE

DRAWING

PROJECT:	144168.00
DESIGNED:	RM / NH
DRAWN:	GT / JG
CHECKED:	###

S0.03

Foundation

- ENGINEER TO EDIT

Company: -

Report No. -

Dated: -

Copies are available for review at the Architect's office and contractor shall have a copy at the jobsite.

ENGINEER TO EDIT

Soil Bearing Capacity -

Frost Depth XX"

Equivalent Fluid Pressure Unconstrained -

Equivalent Fluid Pressure Constrained -

Passive Pressure -

Friction Coefficient -

Retaining Wall Surcharge -

Pile, drilled piers, or driven piles are designed based on the following:

Pier Dia.	Downward	Upward	Lateral	Head Fixity
36"	-	-	-	-
48"	-	-	-	-
60"	-	-	-	-
72"	-	-	-	-
48"	-	-	-	-

A1/3 increase is allowed for seismic or wind loading where asterisk (*) is indicated.

ENGINEER TO EDIT

The foundation system is designed based on recommendations of chapter 18 of the IBC and have been designed for the following:

Soil Bearing Capacity -

Frost Depth XX"

Equivalent Fluid Pressure Unconstrained -

Equivalent Fluid Pressure Constrained -

Passive Pressure -

Friction Coefficient -

Retaining Wall Surcharge -

ENGINEER TO EDIT

It is recommended that the contractor shall retain the services of a geotechnical engineer to perform necessary testing and inspections for quality control to ensure that the recommendations of chapter 18 of the IBC and presumptive soil loads noted above are complied with and achievable. If the recommendations of chapter 18 of the IBC and the presumptive soil loads noted above are not achievable, all work shall stop and the architect and structural engineer shall be notified immediately.

ENGINEER TO EDIT

The contractor shall provide for proper dewatering of excavations from surface water, ground water, seepage, etc.

Drainage systems, including foundation, roof and surface drains, shall be installed as directed by the Geotechnical Report and IBC Section 1805.

Vapor retarder placed below slab on grade shall conform to ASTM E 1643 and ASTM E 745. Coordinate placement with Geotech and/or Architectural drawings.

The Contractor shall provide for the installation and design of all cribbing, sheathing and shoring required to safely and adequately retain the earth banks and support any existing structures in accordance with all national, state and local safety ordinances.

All abandoned utilities, footings, etc., that interfere with the new construction shall be removed. Notify the Structural Engineer should any foundations for existing structures be encountered that are not shown on the structural drawings.

Footings shall be placed and estimated according to depths shown on the drawings. Excavations for footings shall be approved by the Geotechnical Engineer prior to placing the concrete and reinforcing. The Contractor shall notify the Geotechnical Engineer when the excavations are ready for inspection. The Geotechnical Engineer shall submit a letter of compliance to the Owner. Should soil encountered at these depths not be approved by the Geotechnical Engineer, modified footing elevations or footing designs may be subject to additional engineering fees.

All excavations shall be properly backfilled. Footing backfill and utility trench backfill within the building perimeter shall be mechanically compacted in layers, to the approval of the Geotechnical Engineer. See Geotechnical report for requirements. Flooding will not be permitted.

The Contractor shall not backfill behind retaining walls before the concrete or masonry walls have reached full design strength. The Contractor shall brace or protect all building and pit walls below grade from lateral loads until attaching floors are completely in place and have reached full design strength. The Contractor shall provide for the design, any required permits and the installation of such bracing and protection.

Sub-base below, slabs on grade shall be supported on natural grade or structural fill as directed in the Geotechnical report or by a geotchnical engineer. Sub-grade will be compacted per the recommendations of the geotechnical engineer and no sub-grade rutting will be allowed at time of concrete placement under slabs on grade.

Unless otherwise noted, footings shall be centered below columns or walls.

ENGINEER TO EDIT

The design of the foundation system is based on the Geotechnical report (and any addenda) prepared by the following company:

ENGINEER TO EDIT

The foundation system is designed based on the following:

ENGINEER TO EDIT

The foundation system is designed based on recommendations of chapter 18 of the IBC and have been designed for the following:

ENGINEER TO EDIT

It is recommended that the contractor shall retain the services of a geotechnical engineer to perform necessary testing and inspections for quality control to ensure that the recommendations of chapter 18 of the IBC and presumptive soil loads noted above are complied with and achievable. If the recommendations of chapter 18 of the IBC and the presumptive soil loads noted above are not achievable, all work shall stop and the architect and structural engineer shall be notified immediately.

ENGINEER TO EDIT

The contractor shall provide for proper dewatering of excavations from surface water, ground water, seepage, etc.

Drainage systems, including foundation, roof and surface drains, shall be installed as directed by the Geotechnical Report and IBC Section 1805.

Vapor retarder placed below slab on grade shall conform to ASTM E 1643 and ASTM E 745. Coordinate placement with Geotech and/or Architectural drawings.

The Contractor shall provide for the installation and design of all cribbing, sheathing and shoring required to safely and adequately retain the earth banks and support any existing structures in accordance with all national, state and local safety ordinances.

All abandoned utilities, footings, etc., that interfere with the new construction shall be removed. Notify the Structural Engineer should any foundations for existing structures be encountered that are not shown on the structural drawings.

Footings shall be placed and estimated according to depths shown on the drawings. Excavations for footings shall be approved by the Geotechnical Engineer prior to placing the concrete and reinforcing. The Contractor shall notify the Geotechnical Engineer when the excavations are ready for inspection. The Geotechnical Engineer shall submit a letter of compliance to the Owner. Should soil encountered at these depths not be approved by the Geotechnical Engineer, modified footing elevations or footing designs may be subject to additional engineering fees.

All excavations shall be properly backfilled. Footing backfill and utility trench backfill within the building perimeter shall be mechanically compacted in layers, to the approval of the Geotechnical Engineer. See Geotechnical report for requirements. Flooding will not be permitted.

The Contractor shall not backfill behind retaining walls before the concrete or masonry walls have reached full design strength. The Contractor shall brace or protect all building and pit walls below grade from lateral loads until attaching floors are completely in place and have reached full design strength. The Contractor shall provide for the design, any required permits and the installation of such bracing and protection.

Sub-base below, slabs on grade shall be supported on natural grade or structural fill as directed in the Geotechnical report or by a geotchnical engineer. Sub-grade will be compacted per the recommendations of the geotechnical engineer and no sub-grade rutting will be allowed at time of concrete placement under slabs on grade.

Unless otherwise noted, footings shall be centered below columns or walls.
- ENGINEER TO EDIT

NEW UTILITIES:

Contractor to determine the location of all new below grade utilities and coordinate placement with new footings per typical details for foundations at or adjacent to excavations and utilities.

ENGINEER TO EDIT

RETAINING WALLS:

A. Grade on either side of concrete walls shall not vary by more than 4", UNO. Slope of backfill shall not exceed 12H to 1V, UNO. Backfill behind all retaining walls with free draining, granular fill installed per the Geotechnical Report. Provide for subsurface drainage. Design pressures used for the design of retaining walls are based on drained conditions.

B. Retaining walls are to be designed for active and passive soil pressure per note 2.

C. Provide temporary shoring for tops of walls if backfill is placed prior to the supporting structure being constructed. Supporting structure is the floor framing and sheathing completely installed and attached to perpendicular walls.

ENGINEER TO EDIT

PILES AND PIERS:

A. Pile or pier lengths indicated on drawings are estimated; actual length shall be determined in field by a Geotechnical Inspector. For bidding purposes, the contractor shall provide an add/deduct value per foot of pile/pier length. This value shall be applied to variations in actual lengths as compared to estimated lengths.

B. The contractor shall determine the location of all adjacent underground utilities prior to drilling or driving operations. Hole drilling shall be performed without loss of ground and without endangering previously installed piles. Refer to the Geotechnical Report for recommended drilling or driving procedure. Alternate piles shall be placed and completed so that at least 24 hours are allowed for the concrete to set prior to drilling adjacent piers.

C. Pile or pier types other than those indicated on the drawings may be submitted as a Substitution. Optional piles must be supported on the same soil strata as the piles shown on the drawings. If the configuration of the piles is different from the contract documents, the modification to the pile caps must also be designed by the contractor and submitted with the Substitution. A 2-week minimum time allowance must be made for the engineer to review all optional pile and pile-cap design. Any design changes to the original drawings will be subject to additional engineering fees for design/review time.

D. Pile driving shall be done under the supervision of a qualified individual.

E. Damaged piles shall not be used.

F. A pile driving log with relevant information shall be kept.

G. Piles shall be creosote treated timber piles inches in diameter with an inch diameter (minimum) tip.

ENGINEER TO EDIT

CONCRETE PIERS:

Design bearing pressure per note 2 and in accordance with Geotechnical report. Geotechnical Inspector shall confirm that the bottoms of the piers are located on proper bearing material. Shafts shall be excavated to dimensions shown on drawing. Tolerance for out-of-plumb is +/-2" of the pile length. Reinforcing cages shall be placed and piers filled with concrete as soon as possible after shafts have been excavated and inspected. Pier excavations shall be clean and free of water before placing concrete. Use casings as needed. See Geotechnical Report for additional construction considerations. Adjacent shafts (within ten pier diameters, min. or as directed by geo-tech report uno.) shall not be excavated until concrete has set up for 72 hours minimum.

ENGINEER TO EDIT

STEEL PILING:

All piles shall be steel conforming to ASTM A36 with size as noted on the drawings. Design load on each pile equals as shown. Piles shall be driven to refusal within the bearing strata. Pile driving shall be monitored by a Geotechnical Inspector. The driving criteria may be modified to suit the site conditions encountered when approved by the Geotechnical Inspector.

ENGINEER TO EDIT

PIN PILES:

A. Pin piles are to be XXX" diameter Schedule 40 pipe (X-Strong pipe for 2" diameter) and develop XXX tons bearing capacity. Piles to be zinc-plated (galvanized) by the hot-dipped galvanic method (or pre-approved equivalent). Any surface where the coating has been removed or damaged must be brushed and re-coated in clean, dry field conditions with an approved zinc-based anti-corrosion coating.

B. Pin piles shall be driven to refusal in bearing strata. For 2" pin piles, refusal shall be defined as less than 1" penetration in 60 seconds during continuous driving with a 90 lb jackhammer under the full effort of the operator. For 3" and larger pin piles, refusal shall be defined as less than 1" penetration in 3 cycles of driving with an 850-pound pneumatic hammer mounted on a backhoe. The maximum pile eccentricity shall be 4" unless otherwise noted as 'battered' on the plans for lateral resistance. A minimum of 3% of the piles shall receive an ASTM Standard D-1143 Quick Load Test.

C. Battered piles shall be battered 1:3 at 6" piles and 1:4 at 4" piles. Battered piles shall have welded splices that develop the full tension capacity of the pipe. Battered piles shall have caps with headed studs or other positive means to anchor the pile into the concrete pile cap for a tension force equal to the design capacity of the pile. Pile placement shall be within a 2" tolerance at the top of the pile.

ENGINEER TO EDIT

ROCK ANCHORS:

A. Rock anchors as shown on drawings shall be a resin cartridge set dowel system such as DYWIDAG THREADBAR or approved equal. Bore hole for anchor in alignment shown on details. Inspect hole and insert resin cartridge. Insert bar in strict accordance with manufacturer's written instructions. Rock anchors shall be tested after installation to develop a tension capacity as noted on the drawings. Submit system description, installation methods and capacities to engineer prior to start of installation.

Concrete

ENGINEER TO EDIT

All aspects of work pertaining to the concrete construction shall be in accordance with ACI 318, 'Building Code Requirements for Structural Concrete' and the latest edition of 'Specifications for Structural Concrete for Buildings', ACI 301, with modifications as noted on the project drawings and/or specifications. ACI 318, section 5.12 for cold weather placement and ACI 318, section 5.13 for hot weather placement.

ENGINEER TO EDIT

Concrete mix designs shall be submitted to the Structural Engineer for review. All mix designs shall be designed by a qualified testing laboratory and shall be sealed by an engineer licensed in the appropriate state per the appropriate discipline. Base design mix on field experience or trial mixtures as stipulated in IBC Section 1905.3

ENGINEER TO EDIT

Portland cement shall conform to ASTM C150 Type I or II concrete minimum, coordinate additional requirements with note 5.

ENGINEER TO EDIT

All concrete shall be ready mix concrete and shall be mixed and delivered in accordance with ATSM C94 or ATSM C685

ENGINEER TO EDIT

Concrete mix designs shall meet the following minimum exposure requirements per ACI 318 chapter 4.

Severity	Class	ACI Requirements
Freezing and Thawing		
Not Applicable	F0	-
Moderate	F1	ACI 318 Table 4.3.1 and 4.4.1
Severe	F2	ACI 318 Table 4.3.1 and 4.4.1
Very Severe	F3	ACI 318 Table 4.3.1, 4.4.1, and 4.4.2
Sulfate		
Not Applicable	S0	-
Moderate	S1	ACI 318 Table 4.3.1
Severe	S2	ACI 318 Table 4.3.1
Very Severe	S3	ACI 318 Table 4.3.1
Permability		
Not Applicable	P0	-
Required	P1	ACI 318 Table 4.3.1
Corosion Protection of Reinforcing		
Not Applicable	C0	-
Moderate	C1	ACI 318 Table 4.3.1
Severe	C2	ACI 318 Table 4.3.1

ENGINEER TO EDIT

Maintain concrete above 50 degrees Fahrenheit and in a moist condition for a minimum of 7 days after placement unless otherwise accepted by Architect/Structural Engineer. If average temperature at the site is below 50°, 2 additional testing cylinders to be provided and field cured. For structural components that are used prior to design strength.

ENGINEER TO EDIT

Any curing compounds used on concrete that is to receive a resilient tile finish shall be approved by the Finish Applicator before use.

ENGINEER TO EDIT

Fly ash may be used in concrete mixes. The fly ash shall conform to ASTM C618 Class F. The loss of ignition shall be limited to 2%. The addition rate for fly ash shall be limited to 20% of the cement weight. The contractor shall submit all certificates showing the fly ash is in accordance with the above criteria.

ENGINEER TO EDIT

Do not use concrete or grout containing chlorides.

ENGINEER TO EDIT

AGGREGATE:

A. Hard rock concrete - aggregate shall conform to all requirements and tests of ASTM C33 and project specifications. Exceptions may be used only with approval of the Structural Engineer. Provide concrete mix design with proven shrinkage characteristics of less than **0.0005** inches/inch.

B. Lightweight concrete - aggregate shall be in accordance with ASTM C330 and project specifications. Lightweight concrete mix designs shall be tested prior to approval, for shrinkage in accordance with ASTM C157. Shrinkage shall not exceed 0.00035 inches / inch.

ENGINEER TO EDIT

At concrete slabs to be exposed, shrinkage limit shall be reduced to 0.00035 inches/inch uno.

ENGINEER TO EDIT

Structural concrete 28-day strengths & types are as follows:

Location of Concrete	Strength, psi	Type	Exposure Categories
Lean Mix	4000	Hard Rock	F0, S0, P0, C0,
Footings	3000	Hard Rock	F0, S0, P0, C0,
Slab on Grade (Interior)	3000	Hard Rock	F0, S0, P0, C0,
Slab on Grade (Exterior)	3000	Hard Rock	F0, S0, P0, C0,
Columns	4000	Hard Rock	F0, S0, P0, C0,
Grade Beams	4000	Hard Rock	F0, S0, P0, C0,
Peir Caps	4000	Hard Rock	F0, S0, P0, C0,
Stem Walls	4500	Hard Rock	F1, S0, P0, C0,
Slab on Metal Deck	3500	Hard Rock	F0, S0, P0, C0,
Framed Slabs	4000	Hard Rock	F0, S0, P0, C0,
Roof Slab on Metal Deck	3500	Light Weight	F0, S0, P0, C0,
Tilt-Up Wall	5000	Hard Rock	F0, S0, P0, C0,
Basement Walls	4500	Hard Rock	F1, S0, P0, C0,

ENGINEER TO EDIT

The modulus of elasticity of concrete, shall be tested in accordance with ASTM C469 for framed concrete slabs and beams and shall be at least the value given by the equations in section 8.5.1 of ACI 318 for the specified concrete 28-day strength.

ENGINEER TO EDIT

Dry pack or grout under base plates, sill plates, etc., see specifications. Strength requirements are as required for concrete. Minimum grout strength shall be fc= 7,000 psi.

ENGINEER TO EDIT

Concrete forms shall be laid out and constructed to provide the specified cambers indicated on the structural drawings.

ENGINEER TO EDIT

Submit shop drawings to Architect/Structural Engineer indicating locations of concrete joints for review prior to placing concrete. Place joints at locations to minimize effects of shrinkage as well as being placed at points of low stress. Locations shown on plans are a minimum. Additional locations may be approved by engineer. Shop drawings shall be developed by referencing all construction documents including, but not limited to: Architectural, Mechanical, Civil, and Electrical.

ENGINEER TO EDIT

Concrete placement shall be in accordance with ACI standard 304 and project specifications. Provide keys in construction joints unless detailed otherwise. Thoroughly clean, remove laitance and thoroughly wet and remove standing water in construction joints before placing new concrete. At vertical joints, slush with a coat of neat cement before placing new concrete.

ENGINEER TO EDIT

Roughen concrete surface to a full amplitude of 1/4 inch where masonry walls intersect concrete or where new concrete interfaces with existing concrete.

ENGINEER TO EDIT

If columns and walls are placed with a floor, two hours must elapse between end of column or wall placement and beginning of the floor placement.

ENGINEER TO EDIT

Clear coverage of concrete over reinforcing bars shall be as follows:

Location of Concrete	Minimum Concrete Cover
Concrete cast against and permanently exposed to earth:	3"
Concrete exposed to earth or weather:	
#6 through #18 bar	2"
#5 bar and smaller	1 1/2"
Concrete not exposed to weather or in contact with ground, UNO:	
Slabs, walls, and joists:	
#14 and #18bar	1 1/2"
#11 bar and smaller	3/4"
Beams and Columns:	
Primary reinforcing, ties, stirrups, spirals.	1 1/2"
Slab on grade:	2" clear from top
Precast concrete (Manufactured under plant controled conditions):	See IBC section 1907.7.3
Prestressed concrete coverage:	See IBC section 1907.7.2

ENGINEER TO EDIT

Prior to concrete placement, all reinforcing bars, anchor bolts and other concrete inserts shall be well secured in position utilizing wire ties or approved alternative.

ENGINEER TO EDIT

Mechanical pipes or electrical conduit shall not pass through concrete columns or beams unless specifically detailed.

ENGINEER TO EDIT

Unless otherwise indicated in the mechanical, electrical drawings or project specifications, mechanical pipes and electrical conduits which pass through slab on grade, concrete on steel deck, framed concrete floors and walls do not require sleeves. If sleeves are required, the sleeves shall be installed prior to placing concrete. Do not cut any reinforcing which may interfere with sleeve placement. Provide concrete clear cover per note 13 for adjacent to sleeves reinforcing. Coring openings in concrete is not permitted. Notify the Structural Engineer in advance of conditions not shown on the structural drawings.

ENGINEER TO EDIT

With the exception of slabs on grade and concrete on steel deck, the outside diameter of mechanical pipes and/or embedded electrical conduits (other than those passing through) shall not exceed 1/3 of the slab thickness and shall be centered between the top and bottom reinforcing, unless specifically detailed otherwise. Concentrations of mechanical pipes and/or electrical conduits shall be avoided except where detailed openings are provided. Conduit and pipe shall be spaced at 3" or 3 diameters on center, whichever is larger.

ENGINEER TO EDIT

For slabs on grade and concrete on steel deck no pipes or conduits shall be placed within the indicated concrete slab thickness and shall be located below the slab unless specifically detailed otherwise.

ENGINEER TO EDIT

The projecting corners of columns, beams, walls, etc., shall be finished with a 3/4 inch chamfer, unless otherwise noted on architectural drawings or specifications.

ENGINEER TO EDIT

Shoring and re-shoring of elevated slabs shall be designed and approved by engineer.

ENGINEER TO EDIT

Contractor to coordinate with architect and manufacturer's requirements. The following table may be used as a guide:

Composite flatness, FF	Composite levelness, I	Typical applications
20	15	Noncritical: mechanical rooms, nonpaved surfaces to have thick-set tile, parking slabs
25	20	Carpeted areas of commercial office buildings, lightly-trafficked office/industrial buildings
35	25	Thin set flooring or warehouse floor with moderate or heavy traffic
45	35	Warehouse with air-curtain doors, pallet use, ice, or other heavy loads
>50	>50	Movie or television studios

ENGINEER TO EDIT

MAGIC SPRINGS PROJECT

ENGINEER TO EDIT

STRUCTURAL DESIGN NOTES

ENGINEER TO EDIT

PRELIMINARY NOT FOR CONSTRUCTION (This document is) preliminary in nature and is not a final, signed and sealed document

ENGINEER TO EDIT

DATE: 9/23/14

ENGINEER TO EDIT

REV. A

ENGINEER TO EDIT

DESCRIPTION: 60% DESIGN SUBMITTAL

ENGINEER TO EDIT

VERIFY SCALE: 0 1/2 1 BAR MEASURES ONE-INCH ON FULL SIZE

ENGINEER TO EDIT

PROJECT: 144168.00

ENGINEER TO EDIT

DESIGNED: RM / NH

ENGINEER TO EDIT

DRAWN: GT / JG

ENGINEER TO EDIT

CHECKED: ###

ENGINEER TO EDIT

S0.04

FULL SIZE = 22x34 HALF SIZE = 11x17

Structural Steel

1.

Submit shop drawings to structural engineer indicating fabrication of structural steel components. Include details of cuts, connections, splices, camber, holes and other pertinent data. Include embedment drawings. Indicate welds by standard AWS symbols, distinguishing between shop and field welds, and show size, length and type of each weld. Indicate type, size and length of bolts distinguish between shop and field bolts. Identify retensioned and slip-critical high strength bolted connections.
2.

Designing, detailing, fabrication, and erection of structural steel shall be in accordance with the American Institute of Steel Construction (latest edition and supplements). See general notes for additional information.
3.

In addition to the steel included on the drawings, the contractor shall provide a 5% allowance of steel to be finished, fabricated and installed during the progression as may be directed by the structural engineer. In the event the allowance is not completely exhausted, the contractor should be prepared to issue a credit to the owner for the remaining portion of the allowance.
4.

Structural steel not exposed to weather shall be left unpainted unless noted otherwise in the architectural drawings and/or specifications.
5.

MATERIALS:

A.

Structural Steel Shapes Shall Conform to the following:
Structural steel "W" shapes shall comply to ASTM Standard A992.

B.

Angles, plates "M" and "S" shapes, channels and bars shall comply to ASTM Standard A36, unless noted otherwise.

C.

Steel pipe shall comply to ASTM Standard A53 grade B (Fy = 35 ksi).

D.

Rectangular and square Hollow Structural Sections (HSS) shall comply to ASTM Standard A500 grade B (Fy = 46 ksi).

E.

Round Hollow Structural Sections (HSS) shall comply to ASTM Standard A500 grade B (Fy = 42 ksi).

F.

Raise - Pattern floor plates shall comply to ASTM A786.

G.

Steel grating by the manufacturer, supplier, or contractor designed for loads and deflections as required by the adopted code and as indicated, unless noted otherwise. As a minimum, grating is to be designed for a 300# point load and a maximum deflection of L/360 or 1/4". Submit style and layout for approval.
6.

WELDING:

A.

All welding shall comply to the American Welding Society Standard (AWS D1.1 and AWS D1.8). All welded joints shall be detailed as indicated by the prequalified joint details in the Structural Welding Code.

B.

Weld lengths called for on plans are the net effective length required. Weld size shall be AISC minimum unless a larger size is noted. All welds shall use minimum E70XX electrodes.

C.

Welding tests and inspections, see specifications.

D.

Filler material covered in ANSI/AWS D1.1 TABLE 3.1.
7.

BOLTING:

A.

Anchor bolts shall conform to ASTM F1554, grade 36 unless noted otherwise.

B.

Bolts shall conform to ASTM A325-N TYPE 1 less than 1 1/2" dia. uno., see also note 'G' below.

C.

Weather or Corrosion Resistance bolts are required to conform to A325-N Type 3.

D.

Nuts shall conform to ASTM A563.

E.

Washers shall conform to ASTM F436. Washers used in load transfer on subject to direct tension shall conform to ASTM F844.

F.

Threaded rods shall comply to ASTM A36 uno.

G.

Except as subsequently noted, high strength bolts need not be tightened beyond the snug-tight condition, as defined in section 8.(c) of the specifications for structural joints using ASTM A325 or A490 Bolts. For connections subject to direct tension, connections for braced frames, and other connections shown or noted on the plans as SC (slip critical) or fully tensioned, bolts shall be tightened by one of the methods described in section (d) and to the minimum tension specified in section 8.(d), Table 4.

H.

Bolt holes in steel shall be 1/16 inch larger than nominal side of bolt used, except anchor bolt holes which may be 1/8" larger or as noted on drawings.
8.

ANCHOR STUDS, SHEAR STUDS, AND DEFORMED ANCHORS:

A.

Shall be manufactured by Nelson Stud Welding Co. or equal.

B.

Headed studs (shear and anchor) shall be made of material conforming to ASTM A108.

C.

Deformed anchors shall be made of material conforming to ASTM A496.

D.

Studs and anchors shall be welded according to manufacturer's recommendations. Manual arc (stick) welding of headed studs and/or deformed anchors is not allowed: Paragraphs 7.5.5 to 7.5.5.6 of AWS D1.1, are deleted.

9.

STEEL DECK:

A.

Deck shall be cold rolled steel factory primer painted uno., and conforming to ASTM A 1008 grade 33 minimum (minimum yield of 38ksi), with the profile, depth, and uncoated thickness as indicated on the drawings. All metal accessories are to have the same gauge as the decking, uno.

B.

Minimum bearing of steel deck on supports shall be 2 inches. All 3" deep steel deck shall have minimum bearing of 3". Sheets shall be attached to all supporting steel members as indicated on drawings and in accordance with manufacturer's recommendations.

C.

Minimum deck connection shall be 7-1/2" puddle welds per sheet and 3/16" button punch or welds at 12" oc. uno.

D.

See architectural, mechanical, electrical, etc., for sizes and locations of deck openings and for deck openings smaller than 12" not shown on the structural drawings. See typical details for framing requirements at deck openings. Openings larger than 12" shall not be placed in deck unless specifically shown on the structural drawings.

E.

~~DO NOT~~ hang loads from metal deck. Provide engineered structural system to hang all loads from steel joists or beams. This includes but is not limited to metal stud soffit or ceiling framing, mechanical or plumbing equipment, etc.

F.

Steel deck manufacturers shall submit shop drawings for approval.

G.

Steel deck units with concrete fill shall be continuous over three or more spans. If steel deck units with concrete fill span less than 3 spans, the deck units shall be shored, u.n.o. steel roof deck units shall be continuous over two or more spans, u.n.o.

H.

All exterior exposed or high moisture area decks are to be galvanized. Galvanized deck to be zinc coated steel per ATSM A653, grade 33 minimum (minimum yield of 38 ksi) and ASTM A653, G60 with the profile, depth and uncoated thickness as indicated on the drawings. All metal accessories are to have the same gauge as the decking, uno. Upon completion of erection, all welds on galvanized steel deck areas shall be de-slagged, cleaned and touched-up with a zinc rich primer.
10.

OPEN WEB STEEL JOISTS

A.

Steel joists and joist girders shall conform to SJI CJ-1.0, SJI K-1.1, SJI LH/DLH-1.1 & SJI JG-1.1 published by the Steel Joint Institute (SJI) and as adopted by the International Building Code Section 2206.

B.

Steel joist fabricator shall submit shop drawings and calculations sealed by an engineer licensed in the appropriate state per the appropriate discipline for EOR records prior to project closeout.

C.

Steel joist fabricator shall design and provide joist bridging as required by current SJI and AISC recommendations. As a minimum contractor is responsible for end bay bridging for wind uplift. All joists 40 feet and longer must have a row of bolted bridging in place prior to slackening of hoisting lines.

D.

Steel joist fabricator shall design joist and joist girder bearings to resist a horizontal force acting parallel to the joist. The force shall be the greater of: The seismic force, Fp=0.8 SDS Wp (per ASCE 7-05 section 12.14.7.5), or 5% of total Dead Load + Live Load (per ASCE 7-05 section 12.14.7.1).

E.

Top chords of joists shall be designed for the seismic or wind Axial collector forces (tension or compression) shown on plan. SF = Strut Force. Strut forces shown on plans do not include overstrength or load factors.

F.

Steel joist shall be designed using the following minimum load criteria (All loads shown are UNFACTORED and ~~do not~~ include overstrength factor):

Dead Load	XXX psf Top Chord
Dead Load	XXX psf Bottom Chord
Live Loads	XXX psf Top Chord (Non-Reducible)
Uplift	XXX psf Top Chord (Non- Reducible)
Wp (To be used Seismic Axial Force)	XXXXX#

G.

Refer to the framing plans for any additional concentrated or uniform load design requirements (Mechanical units, wind/seismic, screen walls platforms, etc.).

H.

Contractor shall field install a web member on joists from point of load to nearest panel point on opposite chord when concentrated loads are not applied directly at panel points. See typical details for additional information.

I.

Joist bearings are shown flat in the details. Adjust for slope as required. Provide continuous 14 gage L- shaped strip if supporting steel members are not flat with respect to decking.

J.

All OSHA requirements and standards for Open Web/Bar Joists shall be followed. Such requirements would include but not be limited to; bolted erection connections, bottom chord stability plates, bridging, etc.

K.

The maximum Open Web Joist live load deflection shall be 1/360 of the span length.

L.

~~DO NOT~~ camber or provide reduced camber for joists parallel to bearing walls, flat beams, etc. where the drawings show the supported deck directly attaching to both the joists and other bearing elements.

Dead Load	XXX psf Top Chord
Dead Load	XXX psf Bottom Chord
Live Loads	XXX psf Top Chord (Non-Reducible)
Uplift	XXX psf Top Chord (Non- Reducible)
Wp (To be used Seismic Axial Force)	XXXXX#

11.

FIREPROOFING:

A.

The application of the fireproofing to the steel members and steel deck is the responsibility of the contractor. The contractor must enforce the requirements of the manufacturer and not impose any additional loads, including construction live loads, during the application and curing of the fireproofing.

B.

Structural framing members have been designed to accommodate a maximum of XXX plf of fire proofing per member. Contact engineer if proposed fireproofing system exceeds this value.

C.

Structural floor system has been designed to accommodate a maximum of XXX psf of fire proofing. Contact engineer if proposed fireproofing system exceeds this value.

D.

For fireproofing requirements, specifications and thickness, refer to the Architectural drawings.

E.

Do not prime paint or galvanize steel or decking where fireproofing is to be applied.
12.

ARCHITECTURALLY EXPOSED STRUCTURAL STEEL

A.

Architecturally exposed structural steel (AESS) shall be fabricated in accordance with the requirements of AISC Section 10.

B.

All welded joints shall ground smooth UNO.

C.

See Architectural drawings for additional requirements if no requirements are shown provide mockup for review prior to commencing fabrication.

ENGINEER TO EDIT

FULL SIZE = 22x34 HALF SIZE = 11x17

SPF WATER
ENGINEERING

300 East Mallard Drive, Suite 350
Boise, Idaho 83706
Tel (208) 383-4140 Fax (208) 383-4156

MAGIC SPRINGS PROJECT

STRUCTURAL DESIGN NOTES

PROFESSIONAL ENGINEER

PRELIMINARY NOT FOR CONSTRUCTION
| This document is |
preliminary in nature and is not a final, signed and sealed document
EXP. 05/31/16

REV.	DESCRIPTION	DATE	
		DATE	SUBMITTAL
A	60% DESIGN SUBMITTAL	9/23/14	

VERIFY SCALE

PROJECT: 144168.00

DESIGNED: RM / NH

DRAWN: GT / JG

CHECKED: ###

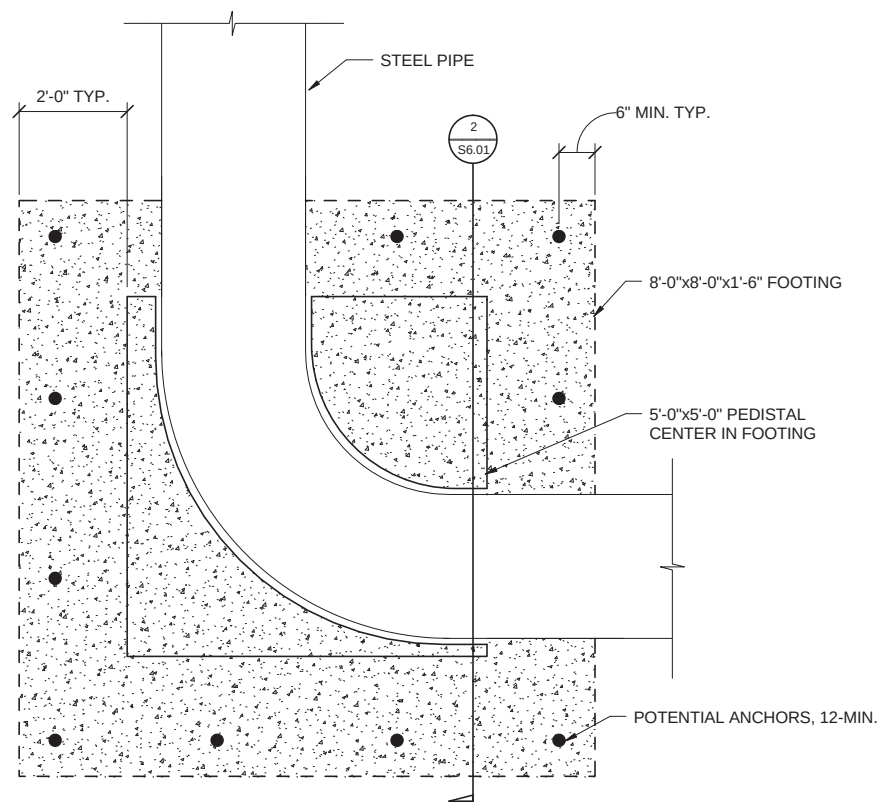
S0.05



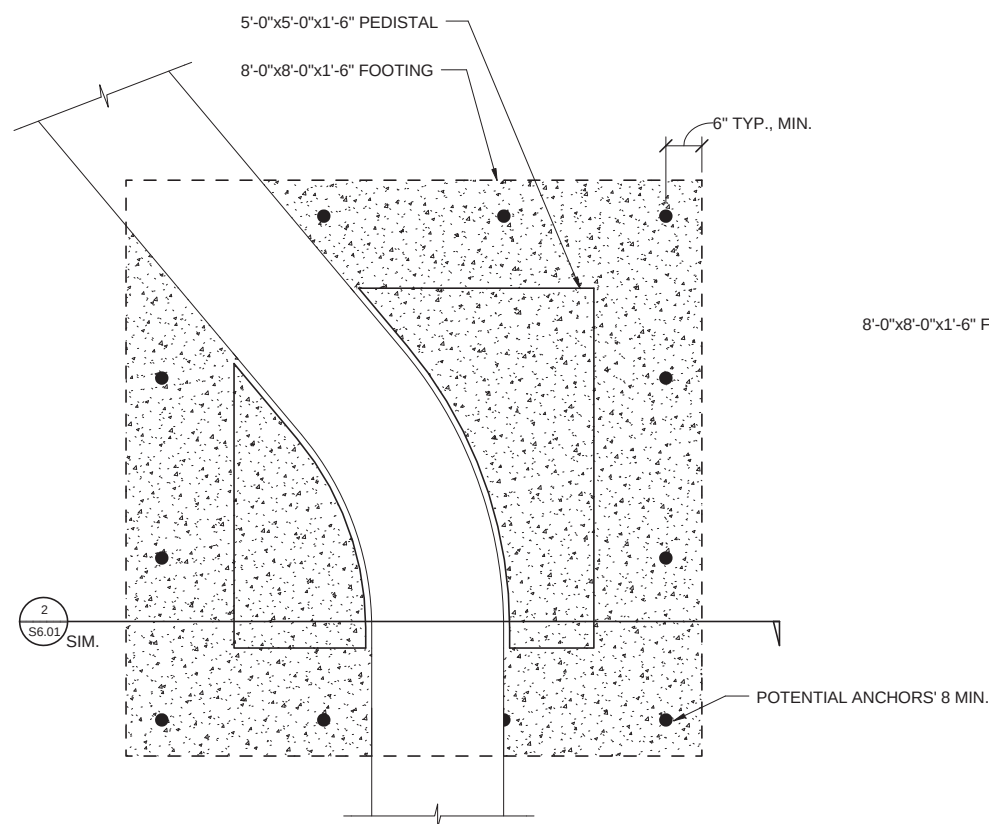
PLAN NOTES

- Plan Notes:
- For structural design notes, see sheet S001 thru S007.
 - Backgrounds are shown for reference only. The dimensions shown apply to structural elements only. For dimensions not shown, see architect of record submittal.
 - Contractor shall field verify existing structural conditions. If any discrepancies are found, contractor shall contact the Architect and Structural Engineer before performing alteration work.
 - Contractor to verify existing slab construction for attachments specified in these drawings. Notify Architect/Engineer of findings.

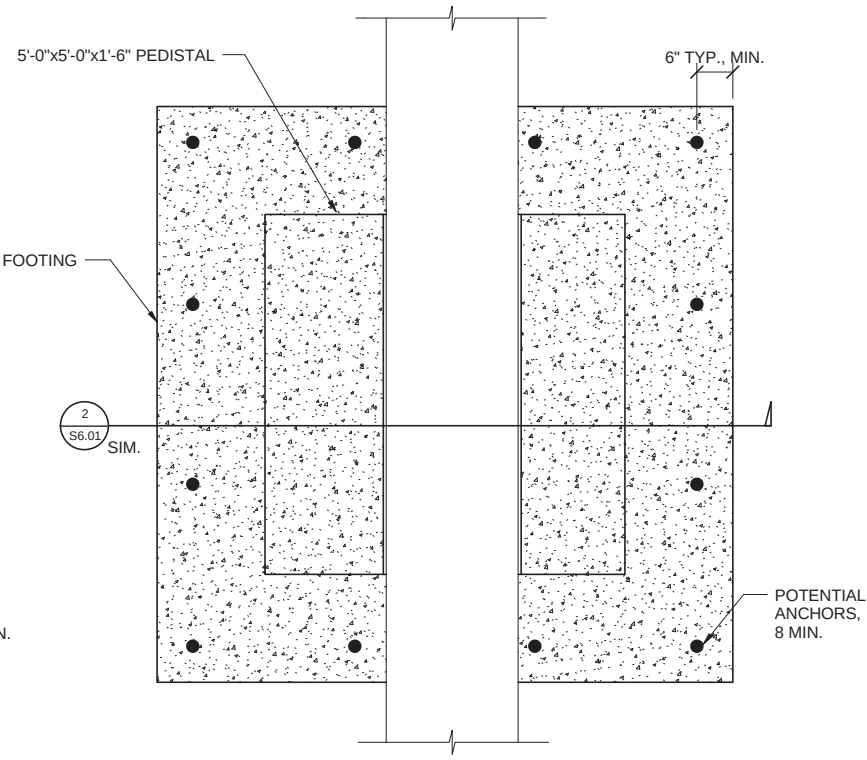
1 FOUNDATION PLAN
1/2" = 1'-0"



90° THRUST BLOCK-PLAN VIEW
3/4" = 1'-0"



45° THRUST BLOCK-PLAN VIEW
NO SCALE



TYPICAL THRUST BLOCK-PLAN VIEW
NO SCALE

MAGIC SPRINGS PROJECT
FOUNDATION PLAN

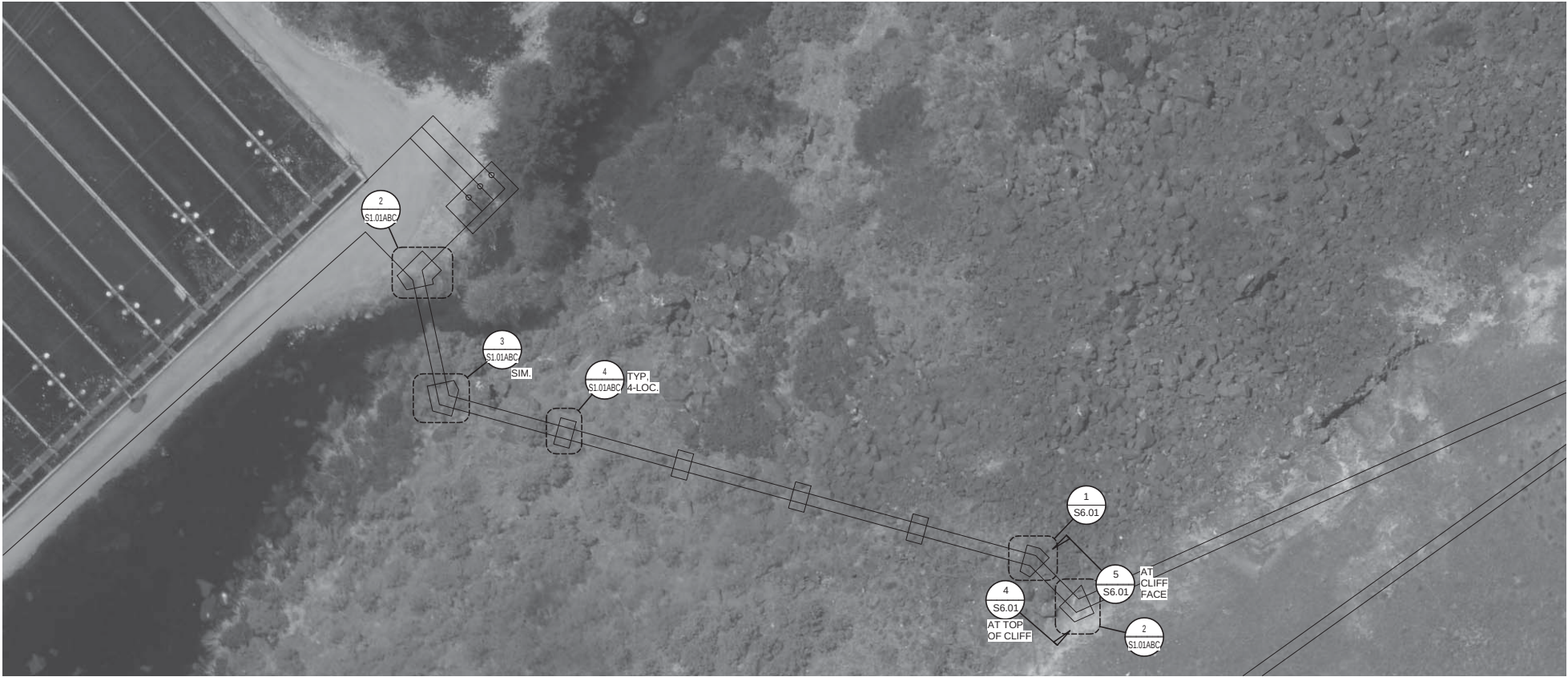
PROFESSIONAL ENGINEER
PRELIMINARY NOT FOR CONSTRUCTION
This document is preliminary in nature and is not a final, signed and sealed document
EXP. 05/31/16

REV.	DESCRIPTION	DATE
A	60% DESIGN SUBMITTAL	9/23/14

PROJECT:	144168.00
DESIGNED:	RM / NH
DRAWN:	GT / JG
CHECKED:	###

S1.01ABC

1 FOUNDATION PLAN
1/2" = 1'-0"



PLAN NOTES

- Plan Notes:
- For structural design notes, see sheet S001 thru S00?.
 - Backgrounds are shown for reference only. The dimensions shown apply to structural elements only. For dimensions not shown, see architect of record submittal.
 - Contractor shall field verify existing structural conditions. If any discrepancies are found, contractor shall contact the Architect and Structural Engineer before performing alteration work.
 - Contractor to verify existing slab construction for attachments specified in these drawings. Notify Architect/Engineer of findings.

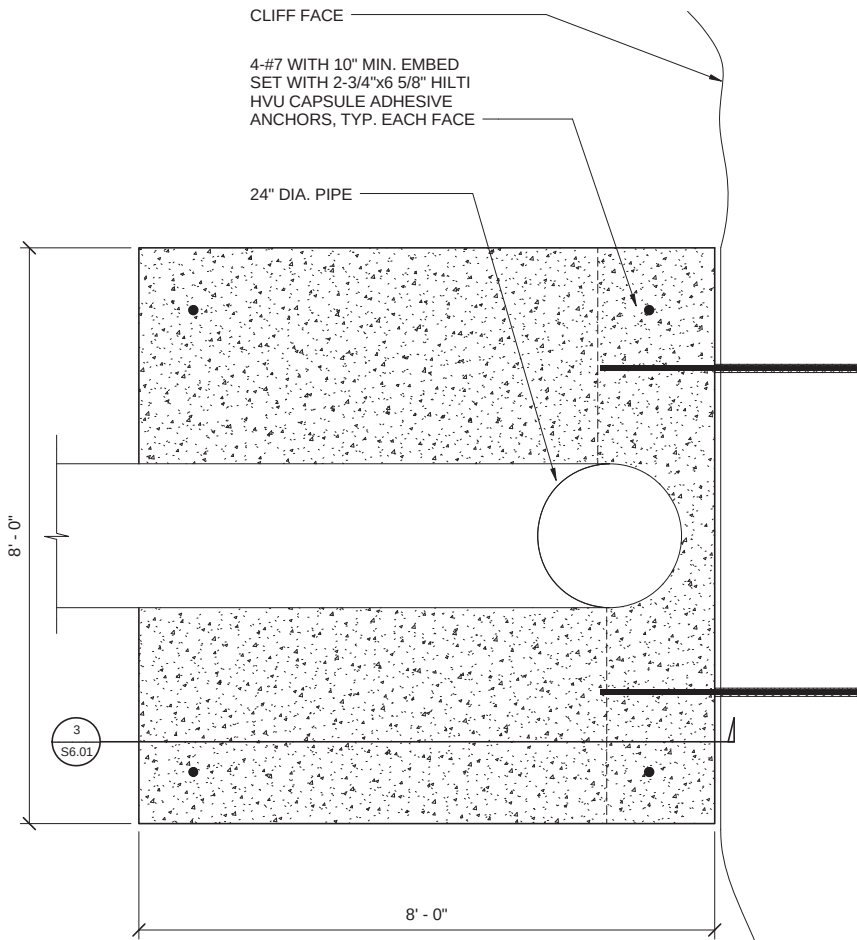
MAGIC SPRINGS PROJECT
FOUNDATION PLAN

PROFESSIONAL ENGINEER
PRELIMINARY NOT FOR CONSTRUCTION
This document is preliminary in nature and is not a final, signed and sealed document
EXP. 05/31/16

REVISIONS		DATE
REV.	DESCRIPTION	
A	60% DESIGN SUBMITTAL	9/23/14

VERIFY SCALE	
BAR MEASURES ONE-INCH ON FULL SIZE	
PROJECT:	144168.00
DESIGNED:	RM / NH
DRAWN:	GT / JG
CHECKED:	###

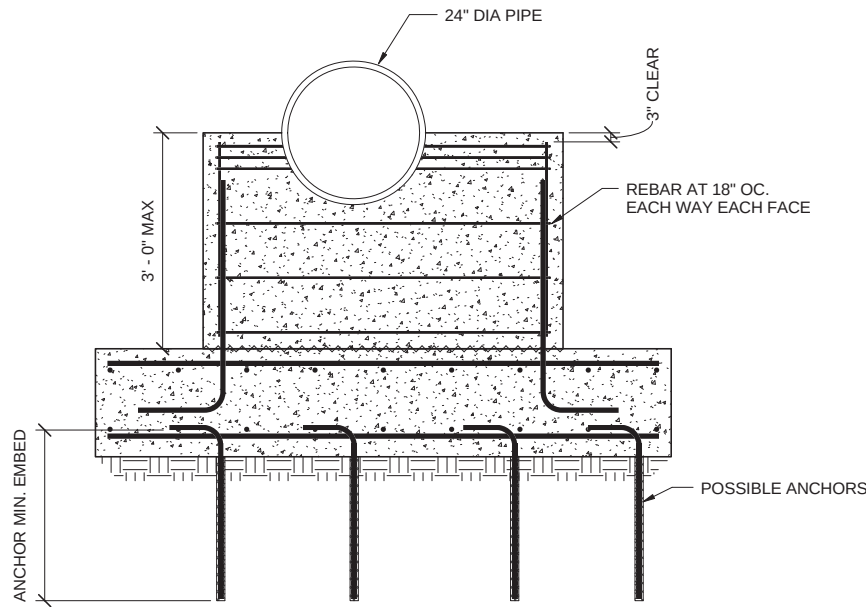
S1.01IJ



THRUST BLOCK AT CLIFF BOTTOM

3/4" = 1'-0"

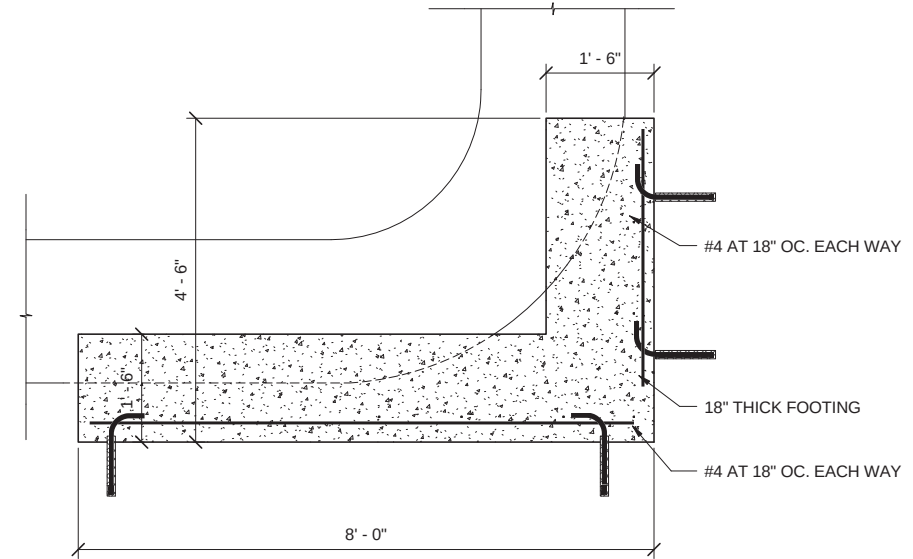
1



THRUST BLOCK SECTION

3/4" = 1'-0"

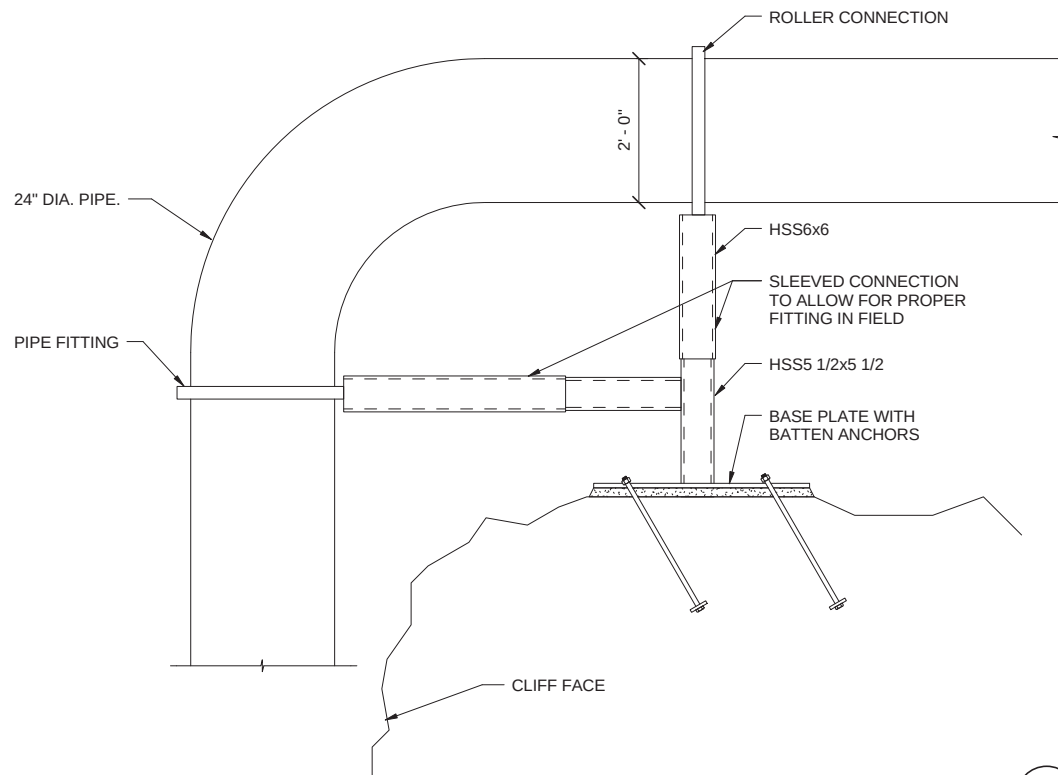
2



CLIFF BOTTOM THRUST BLOCK SECTION

3/4" = 1'-0"

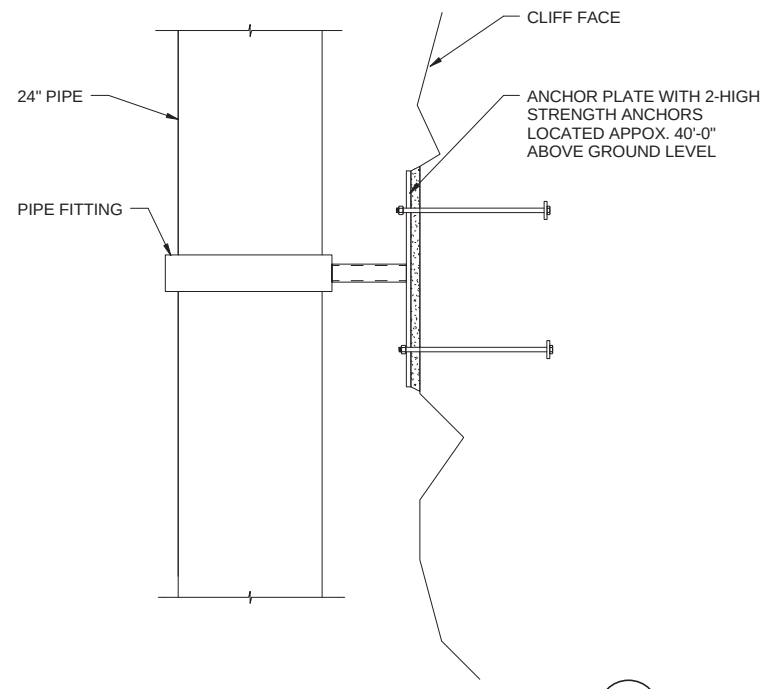
3



STEEL SUPPORT AT CLIFF TOP

3/4" = 1'-0"

4



PIPE SUPPORT AT CLIFF FACE

NO SCALE

5

TYPICAL DETAIL NOTES

Typical Detail Notes:

- For structural design notes, see sheet S001 thru S007.
- Architectural backgrounds are shown for reference only. The dimensions shown apply to structural elements only. For dimensions not shown, see architect of record submittal.
- Contractor shall field verify existing structural conditions. If any discrepancies are found, contractor shall contact the Architect and Structural Engineer before performing alteration work.
- For all top of footing, top of slab, and slab on grade construction, see foundation plan. Details not shown on this sheet, see all "S5" series drawings.

MAGIC SPRINGS PROJECT

DETAILS

PROFESSIONAL ENGINEER
PRELIMINARY NOT FOR CONSTRUCTION
This document is preliminary in nature and is not a final, signed and sealed document
EXP. 05/31/16

REV.	DESCRIPTION	DATE
A	60% DESIGN SUBMITTAL	9/23/14

PROJECT:	144168.00
DESIGNED:	RM / NH
DRAWN:	GT / JG
CHECKED:	###

S6.01

SPF WATER
ENGINEERING



300 East Mallard Drive, Suite 350
Boise, Idaho 83706
Tel (208) 383-4140 Fax (208) 383-4156

APPENDIX B: APPLICATION FOR TRANSFER OF WATER RIGHT

STATE OF IDAHO
DEPARTMENT OF WATER RESOURCES

Transfer No. _____

MINIMUM REQUIREMENTS CHECKLIST

TO BE SUBMITTED WITH APPLICATION FOR TRANSFER

An application for transfer must be prepared in accordance with the minimum requirements listed below to be acceptable for processing by the Department. Incomplete applications will be returned. The instructions, fee schedule, Part 2A reports and additional Part 2B forms are available from any Department office or on the Department's website at www.idwr.idaho.gov.

Name of Applicant(s) IGWA for North Snake GWD, Magic Valley GWD, Southwest ID

Check whether each item below is *attached* (Yes) or *not applicable* (N/A) for the proposed transfer.

Yes N/A * Means the item is always required and must be included with the application.

- ☒ * Completed Application for Transfer of Water Right form, Part 1.
- ☒ * Signature of applicant(s) or applicant's authorized representative on Application for Transfer Part 1. Include evidence of authority labeled Attachment #3 (see below) if signed by representative.
- ☒ * Application for Transfer Part 2A. Attach a Part 2A report describing each water right in the transfer as currently recorded.
- ☒ ☐ Complete and attach an Application for Transfer Part 2B for each water right for which only a portion is proposed to be changed through this transfer application.
- ☒ * Application for Transfer Part 3A is always required (see Attachment #7a below); Parts 3B and 3C must be completed for transfer applications proposing to change the nature of use of the water right(s) or proposing changes to supplemental right(s).
- ☒ * Correct fee submitted with transfer application form. (Fee schedule is on website and instructions for application for transfer.)

Attachments to Application - Label each attachment with the corresponding number shown below as Attachment #1-9.

- ☐ ☒ #1 If the applicant is a business, partnership, organization, or association, and not currently registered in the State of Idaho as a business entity, attach documentation identifying officers authorized to sign or act on behalf of right holder. (See Part 1.)
- ☒ ☐ #2a Water Right ownership documentation if Dept. records do not show the applicant as the current water right owner. **
- ☐ ☒ #2b If the ownership of the water right will change as a result of the proposed transfer to a new place of use, attach documentation showing land and water right ownership at the new place of use. Include documentation for all affected land and owner(s).**
** Additional fee(s) required for water right ownership changes; see fee schedule.
- ☒ ☐ #3 Documentation of authority to make the change if the applicant is not the water right owner.
- ☒ ☐ #4 Power of Attorney or documentation providing authority to sign or act on the applicant's behalf. (See Part 1.)
- ☐ ☒ #5 If the transfer application proposes to change the point of diversion for a water right affecting the Eastern Snake Plain Aquifer (ESPA), attach the results of an ESPA analysis and a detailed mitigation plan to offset any depletions to hydraulically connected reaches of the Snake River. ESPA transfer spreadsheet and model grid labeled cells are available on the Department's website at www.idwr.idaho.gov/WaterManagement/WaterRights/WaterRightTransfers/resources.htm.
- ☐ ☒ #6 Notarized statement of agreement or a statement on official letterhead signed by an authorized representative from each lien holder or other entity with financial interest in the water right(s) or land affected by the proposed transfer. (See Part 1.5.c.)
- ☒ * #7a Attach a map identifying the proposed point(s) of diversion, place(s) of use, and water diversion and distribution system details as described on the application. Include legal description labels. If only a portion of the right is proposed to be changed, identify the current location of the part of the existing right(s) proposed to be changed. (See Part 3A.)
- ☐ ☒ #7b If the transfer application proposes to change the place or purpose of use of an irrigation right attach a Geographic Information System (GIS) shape file, or an aerial photo or other image clearly delineating the location and extent of existing acres and changes to the place of use.
- ☐ ☒ #8a If the transfer application proposes to change the nature of use or period of use for one or more rights, provide documentation describing the extent of historic beneficial use for the water rights proposed to be transferred and document how enlargement will be avoided. (See Part 3B.) Additional fee required for proposed changes to nature of use; see fee schedule.
- ☐ ☒ #8b If the transfer application proposes to change the place of use of a supplemental irrigation right, provide documentation regarding the historic use of the supplemental right(s) and availability or reliability of the primary right(s) being supplemented, both before and after the proposed change. (See Part 3C.)
- ☒ ☐ #9 Other. Please describe: IGWA's Fourth Mitigation Plan and Exhibits

STATE OF IDAHO
DEPARTMENT OF WATER RESOURCES

APPLICATION FOR TRANSFER OF WATER RIGHT PART 1

Name of Applicant(s) IGWA for North Snake GWD, Magic Valley GWD, Southwest ID Phone 208-232-6101

Mailing address See attached mailing list for each applicant Email rcb@racinelaw.net
tjb@racinelaw.net

- ☐ If applicant is not an individual and not registered to do business in the State of Idaho, attach documentation identifying officers authorized to sign or act on behalf of the applicant. Label it **Attachment #1**.
- ☒ Attach water right ownership documentation if Department records do not show the transfer applicant as the current water right owner. Label it **Attachment #2a**.
- ☒ If the ownership of the water right will change as a result of the proposed transfer to a new place of use, attach documentation showing land and water right ownership at the new place of use. Include documentation for all affected land and owner(s). Label it **Attachment #2b**.
- ☒ Attach documentation of authority to make the proposed change if the applicant is not the water right owner. Label it **Attachment #3**.

Provide contact information below if a consultant, attorney, or any other person is representing the applicant in this transfer process.

☐ No Representative

Name of Representative Randall C. Budge, T.J. Budge Phone 208-2332-6101

Mailing address PO Box 1391, Pocatello, ID 83204 Email rcb@racinelaw.net;tjb@racinela

- ☐ Send all correspondence for this application to the representative and not to the applicant.
OR
- ☒ Send original correspondence to the applicant and copies to the representative.
- ☐ The representative may submit information for the applicant but is not authorized to sign for the applicant.
OR
- ☒ The representative is authorized to sign for the applicant. Attach a Power of Attorney or other documentation providing authority to sign for the applicant and label it **Attachment #4**.

I hereby assert that no one will be injured by the proposed changes and that the proposed changes do not constitute an enlargement in use of the original right(s). The information contained in this application is true to the best of my knowledge. I understand that any willful misrepresentations made in this application may result in rejection of the application or cancellation of an approval.


Signature of Applicant or Authorized Representative

Randall C. Budge/T.J. Budge
Print Name and Title if applicable

September 10, 2014
Date

Signature of Applicant or Authorized Representative

Print Name and Title if applicable

Date

A. PURPOSE OF TRANSFER

- ☐ Change point of diversion
☐ Change nature of use

☐ Add diversion point(s)
☐ Change period of use

☒ Change place of use
☐ Other _____
- Describe your proposal in narrative form, including a detailed description of non-irrigation uses to justify amounts transferred (i.e. number of stock, etc.), and provide additional explanation of any other items on the application. Attach additional pages if necessary and label it **Part 1A.2**.

See narrative Attachment 1 - Part 1A.2.

STATE OF IDAHO
DEPARTMENT OF WATER RESOURCES

APPLICATION FOR TRANSFER OF WATER RIGHT

PART 1 Continued

B. DESCRIPTION OF RIGHTS AFTER THE REQUESTED CHANGES. IF THE RIGHTS ARE BEING SPLIT, DESCRIBE PORTIONS TO BE CHANGED AS THEY WOULD APPEAR AFTER THE REQUESTED CHANGES.

1.	Right Number	Amount (cfs/ac-ft)	Nature of Use	Period of Use	Source & Tributary
All or Part ☐ ☒	36-7072	10 cfs total	Fish Propagation / Mitig	1/1 to 12/31	Thousand Springs/Snake R
☐ ☐				to	
☐ ☐				to	
☐ ☐				to	
☐ ☐				to	
☐ ☐				to	
☐ ☐				to	
☐ ☐				to	
☐ ☐				to	

Total authorized under rights 10 cfs and/or _____ acre-feet.

2. Total amount of water proposed to be transferred or changed 10 cubic feet per second and/or _____ acre-feet per annum.

3. Point(s) of Diversion:

- ☒ No changes to point(s) of diversion are proposed - the following chart is therefore not completed. (Proceed to #4.)
- ☐ Attach Eastern Snake Plain Aquifer analysis if this transfer proposes to change a point of diversion affecting the ESPA.
Label it **Attachment #5**.

New ?	Lot	¼	¼	¼	Sec	Twp	Rge	County	Source	Local name or tag #

4. Place of use: (If irrigation, identify with number of acres irrigated per ¼ ¼ tract.)

- ☐ No changes to place of use are proposed - the following chart is therefore not completed. (Proceed to #5.)

Twp	Rge	Sec	NE ¼				NW ¼				SW ¼				SE ¼				Acre Totals
			NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	
7S	14E	31			H	H													
		32							H										
Total Acres (for irrigation use)																			

STATE OF IDAHO
DEPARTMENT OF WATER RESOURCES

APPLICATION FOR TRANSFER OF WATER RIGHT
PART 1 Continued

5. General Information:

- a. Describe the complete diversion system, including how you will accommodate a measuring device and lockable controlling works should they be required now or in the future:

The Districts will pump and pipe water from Magic Springs facility to the Rangen hatchery. Detailed plans and specifications include pumps, motors, measuring device and controlling works per engineering submitted in Fourth Mitigation Plan, CM-MP-2014-006.

- b. Who owns the property at the point(s) of diversion? SeaPac of Idaho, Inc.

If other than the applicant, describe the arrangement enabling the applicant to access the property for the diversion system:
Letter of Intent between Applicants and SeaPac of Idaho, Inc., copy attached.

- c. Are the lands from which you propose to transfer the water right subject to any liens, deeds of trust, mortgages, or contracts?

If yes, ☐ Attach a notarized statement from the holder of the lien, deed of trust, mortgage or contract agreeing to the proposed changes on official letterhead signed by an authorized representative. Label it **Attachment #6**. List the name of the entity and type of lien: N/A

It is the applicant's responsibility to provide notice to lien holder, trustee, mortgagor, or contract holder of the proposed changes that may impact or change the value of the water rights or affected real property. Any misrepresentation of legal encumbrance on this application may result in rejection of the application or cancellation of an approval.

- d. Describe the effect on the land now irrigated if the place or purpose of use is changed pursuant to this transfer:
N/A

- e. Describe the use of any other water right(s) for the same purpose or land, or the same diversion system as right(s) proposed to be transferred at both the existing and proposed point(s) of diversion and place(s) use:

Rangen has (5) decreed water right nos. 36-00134B, 36-135A, 36-15501, 36-02551, 36-07694 diverted from the Martin-Curren Tunnel tributary to Billingsley Creek for fish propagation, irrigation and domestic uses.

- f. To your knowledge, has/is any portion of the water right(s) proposed to be changed:

Yes No

- ☐ ☒ undergone a period of five or more consecutive years of non-use,
☐ ☒ currently leased to the Water Supply Bank,
☐ ☒ currently used in a mitigation plan limiting the use of water under the right, or
☐ ☒ currently enrolled in a Federal set-aside program limiting the use of water under the rights?

If yes, describe:

STATE OF IDAHO
DEPARTMENT OF WATER RESOURCES

APPLICATION FOR TRANSFER OF WATER RIGHT PART 2

A. DESCRIPTION OF RIGHT(S) AS RECORDED

For each water right listed in Part 1B.1 of the application, attach a **Part 2A** report obtained from any Department office or from the Department's website @ www.idwr.idaho.gov, Water Right Transfers, Step 1. Insert Part 2A reports into the application following Part 1.

B. IF ONLY A PORTION OF THE RIGHT IS PROPOSED TO BE CHANGED, DESCRIBE THE PORTION BEING CHANGED AS IT APPEARS BEFORE THE REQUESTED CHANGES

- ☒ Complete and attach one copy of Part 2B for each right for which only a portion is proposed to be changed. If the entire right is proposed to be changed, Part 2B is not applicable. Additional copies of the **Part 2B** form can be obtained from any Department office or from the Department's website @ www.idwr.idaho.gov, Water Right Transfers, Step 3, or Water Right Forms, Changes in Use. Insert completed Part 2B forms into the application following Part 2A of the same water right.

Right Number: 36-7072

1. amount 10 CFS total (cfs/ac-ft) for Fish Propagation purposes from 1/1 to 12/31
 amount _____ (cfs/ac-ft) for _____ purposes from _____ to _____
 amount _____ (cfs/ac-ft) for _____ purposes from _____ to _____
 amount _____ (cfs/ac-ft) for _____ purposes from _____ to _____
 amount _____ (cfs/ac-ft) for _____ purposes from _____ to _____
 amount _____ (cfs/ac-ft) for _____ purposes from _____ to _____
 amount _____ (cfs/ac-ft) for _____ purposes from _____ to _____
 amount _____ (cfs/ac-ft) for _____ purposes from _____ to _____
2. Lands irrigated or place of use: (If irrigation, identify with number of acres irrigated per 1/4 1/4 tract.)

Twp	Rge	Sec	NE 1/4				NW 1/4				SW 1/4				SE 1/4				Acre Totals
			NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	
8S	14E	5											H						N/A
8S	14E	6																H	
8S	14E	8						H											
Total Acres (for irrigation use)																			N/A

STATE OF IDAHO
DEPARTMENT OF WATER RESOURCES

APPLICATION FOR TRANSFER OF WATER RIGHT PART 3

A. PLAT MAP (See Part 3A of Instructions for application for transfer for complete requirements.)

- ☒ Attach a map of the diversion, measurement, control, and distribution system. Label it **Attachment #7a**.
- ☐ If the transfer application proposes to change the place or purpose of use of an irrigation right attach a Geographic Information System (GIS) shape file, or an aerial photo or other image clearly delineating the location and extent of existing acres and changes to the place of use. Label it **Attachment #7b**. If the place of use currently consists of a permissible place of use, then the attachment is not required if the application contains a clear statement that the boundaries for the place of use are not proposed to be changed by the transfer and the total number of irrigated acres within the place of use before and after the transfer is clearly stated.

B. CHANGES IN NATURE OF USE (Water Balance)

- ☐ If you propose to change the nature of use or period of use of all or part of the rights(s) listed in this application, attach documentation describing the extent of historic beneficial use of the portion of the right(s) proposed to be changed. Also attach documentation showing that the portion of the right(s) to be changed will not be enlarged in rate, volume, or consumptive use through the proposed change. Label it **Attachment #8a**.

C. PLACE OF USE CHANGES TO SUPPLEMENTAL IRRIGATION RIGHTS

- ☐ If you propose to change the place of use of a supplemental irrigation right, answer below and attach supporting documentation. Label it **Attachment #8b**.

Describe how the supplemental water rights have been used historically in conjunction with other water rights at the existing place of use. Describe the time during the irrigation season that the supplemental rights have been used. Include information about the availability or reliability of the primary right(s) being supplemented, both before and after the change. If the applicant is proposing to change a supplemental irrigation right to a primary right, provide the information required on Part 3B above:

N/A

FOR DEPARTMENT USE ONLY

Transfer contains _____ pages and _____ attachments.

Received by _____ Date _____ Preliminary check by _____ Date _____

Fee paid _____ Date _____ Received by _____ Receipt # _____

Add'l fee paid _____ Date _____ Received by _____ Receipt # _____

Attachment 1

Mailing List and Special Powers of Attorney

ATTACHMENT 1

APPLICANT'S ADDRESSES AND CONTACT INFORMATION

Idaho Ground Water Appropriators, Inc. (IGWA)

c/o Randall C. Budge
P.O. Box 1391
Pocatello, Idaho 83204
rcb@racinelaw.net
tjb@racinelaw.net

North Snake Ground Water District

Lyn Carlquist, Chairman
c/o Joyce Moreno, Secretary
152 E Main St
Jerome, ID 83338
nsgwd@safelink.net
carlquil@yahoo.com

Magic Valley Ground Water District

Dean Stevenson, Chairman
c/o Emily Haynes, Secretary
PO Box 430
Paul, ID 83347
desteve@pmt.org
mvgwd@hotmail.com

Southwest Irrigation District

c/o William Parsons, Attorney
137 W 13th St
Burley, Idaho 83318
wparsons@pmt.org
csearle@pmt.org

SPECIAL POWER OF ATTORNEY FOR WATER RIGHTS

The undersigned hereby appoints the law firm of RACINE OLSON NYE BUDGE & BAILEY, CHARTERED, 201 E. Center Street, Post Office Box 1391, Pocatello, Idaho 83204, my/our true and lawful attorney for the purpose of dealing with the Idaho Department of Water Resources relative to the management and transaction of water rights, and to allow them to receive all information, opinions, and records regarding water rights, and to sign and submit applications and other filings on my/our behalf.

DATED this 5th day of May, 2014.

NORTH SNAKE GROUND WATER DISTRICT

By: _____

Name: Lynn Carlquist

Title: Chairman

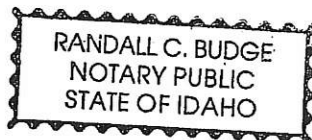
STATE OF IDAHO)

County of Bannock)

SS

On this 3rd day of May, 2014, before me, the undersigned, a Notary Public in and for said State, personally appeared Lynn Carlquist, known or identified to me to be the Chairman of the company that executed the instrument or the person who executed the instrument on behalf of said company, and acknowledged to me that such company executed the same.

IN WITNESS WHEREOF, I have hereunto set my hand and seal the day and year first above written.



Randall C. Budge

NOTARY PUBLIC FOR IDAHO

Residing at: Pocatello, Id.

Commission expires: 10/21/16

SPECIAL POWER OF ATTORNEY FOR WATER RIGHTS

The undersigned hereby appoints the law firm of RACINE OLSON NYE BUDGE & BAILEY, CHARTERED, 201 E. Center Street, Post Office Box 1391, Pocatello, Idaho 83204, my/our true and lawful attorney for the purpose of dealing with the Idaho Department of Water Resources relative to the management and transaction of water rights, and to allow them to receive all information, opinions, and records regarding water rights, and to sign and submit applications and other filings on my/our behalf.

DATED this 2nd day of May, 2014.

MAGIC VALLEY GROUND WATER DISTRICT

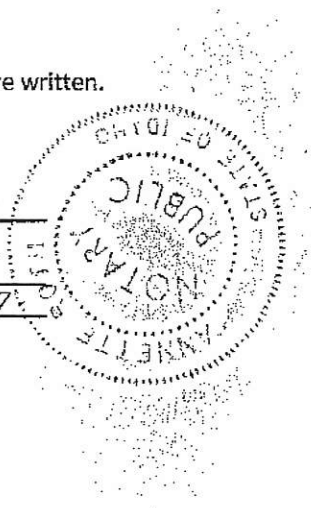
By: [Signature]
Name: Dean Stevenson
Title: Chairman

STATE OF IDAHO)
)
County of Minidoka)
)

On this 2nd day of May, 2014, before me, the undersigned, a Notary Public in and for said State, personally appeared Dean Stevenson, known or identified to me to be the Chairman of the company that executed the instrument or the person who executed the instrument on behalf of said company, and acknowledged to me that such company executed the same.

IN WITNESS WHEREOF, I have hereunto set my hand and seal the day and year first above written.

[Signature]
NOTARY PUBLIC FOR IDAHO
Residing at: Rupert, Id
Commission expires: 8-4-2017



SPECIAL POWER OF ATTORNEY FOR WATER RIGHTS

The undersigned hereby appoints the law firm of RACINE OLSON NYE BUDGE & BAILEY, CHARTERED, 201 E. Center Street, Post Office Box 1391, Pocatello, Idaho 83204, my/our true and lawful attorney for the purpose of dealing with the Idaho Department of Water Resources relative to the management and transaction of water rights, and to allow them to receive all information, opinions, and records regarding water rights, and to sign and submit applications and other filings on my/our behalf.

DATED this 5 day of May, 2014.

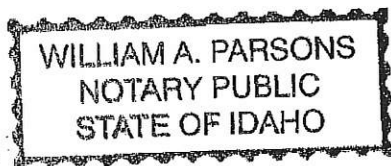
SOUTHWEST IRRIGATION DISTRICT

By: Randy Brown
Name: Randy Brown
Title: Chairman

STATE OF IDAHO)
County of Carson)
:SS

On this 5 day of May, 2014, before me, the undersigned, a Notary Public in and for said State, personally appeared Randy Brown, known or identified to me to be the Chairman of the company that executed the instrument or the person who executed the instrument on behalf of said company, and acknowledged to me that such company executed the same.

IN WITNESS WHEREOF, I have hereunto set my hand and seal the day and year first above written.



William A. Parsons
NOTARY PUBLIC FOR IDAHO
Residing at: Boise
Commission expires: 7/28/2016

SPECIAL POWER OF ATTORNEY FOR WATER RIGHTS

The undersigned hereby appoints the law firm of RACINE OLSON NYE BUDGE & BAILEY, CHARTERED, 201 E. Center Street, Post Office Box 1391, Pocatello, Idaho 83204, my/our true and lawful attorney for the purpose of dealing with the Idaho Department of Water Resources relative to the management and transaction of water rights, and to allow them to receive all information, opinions, and records regarding water rights, and to sign and submit applications and other filings on my/our behalf.

DATED this 2nd day of May, 2014.

IDAHO GROUND WATER APPROPRIATORS, INC.
(IGWA) acting for and on behalf of its Ground
Water District members

By: [Signature]
Name: Tim Deeg
Title: President

STATE OF IDAHO)
County of Bannock)
:ss

On this 2nd day of May, 2014, before me, the undersigned, a Notary Public in and for said State, personally appeared Tim Deeg, known or identified to me to be the President of the company that executed the instrument or the person who executed the instrument on behalf of said company, and acknowledged to me that such company executed the same.

IN WITNESS WHEREOF, I have hereunto set my hand and seal the day and year first above written.



[Signature]
NOTARY PUBLIC FOR IDAHO
Residing at: Pocatello, ID
Commission expires: 10/05/2015

Attachment 1A.2.

Purpose of Transfer

ATTACHMENT

PART 1A.2. – Purpose of Transfer – Magic Springs Project

The purpose of the Transfer Application is to change the place of use for up to 10 CFS of water under Water Right No. 7072 (Attachment Part 2 A) from SeaPac of Idaho, Inc (“SeaPac”) to the head of Billingsley Creek/Curren Ditch and/or the Rangen Facility for fish propagation and mitigation pursuant to the District’s Fourth Mitigation Plan (“Plan”) pending in Case No. CM-MP-2014-006 (Attachment #7a).

The Plan provides for the use of up to 10 CFS of spring water discharged from the ESPA at Magic Springs to be pumped via buried pipeline approximately 2.5 miles to Rangen’s place of use near the head of Billingsley Creek. This water is currently used for fish production year round and would be delivered to Rangen for fish production and mitigation year round. The Plan includes the design and construction of an intake, pump station with pumps, motors and related equipment including necessary redundancy to continuously pump up to a maximum of 10.0 CFS water from Magic Springs to Rangen.

A copy of the Letter of Intent with SeaPac is Attachment #1b. Attachments #7a are aerial maps depicting the location of SeaPac, the pipeline and the new points of diversion and place of use.

The transfer and delivery would occur on an “as needed” basis to meet the mitigation obligation to Rangen, which is phased in over five years up to a maximum of 9.1 CFS. The maximum 9.1 CFS obligation to Rangen may be reduced by future orders of the Director or Courts, by other mitigation credits and/or other mitigation plans to Rangen. These credits and other direct deliveries may vary over time and may include such things as credits for CREP, conversions and recharge as well as other direct water deliveries to Rangen under other mitigation plans. Based on known credits at this time, it is estimated that approximately 10.0 CFS is the maximum amount of water that would be delivered from the Magic Springs facility to Rangen in the future. The transfer is requested for up to a maximum of 10 CFS which substantially exceeds the present and most likely exceeds all future mitigation obligations to Rangen to provide excess that might be needed for mitigation in the future at Rangen.

The transferred water right may be acquired by IGWA from SeaPac, pursuant to the Letter of Intent.

The approval of the transfer requested is contingent upon:

- A. IGWA and/or the Districts securing an Order from IDWR approving the Fourth Mitigation Plan providing for the delivery of 10 CFS from SeaPac’s Magic Springs water rights to satisfy the mitigation obligation to Rangen;
- B. IGWA and/or the Districts proceeding to construct the Magic Springs project and implement the Fourth Mitigation Plan.

- C. The existence of a continuing mitigation obligation to Rangen that is not satisfied by other means.

This Transfer Application supports the Plan and is an integral part of the *Thousand Springs Water Supply Settlement Framework* proposed by the State of Idaho, Attachment 5.

Attachment 1b.

Letter of Intent

LETTER OF INTENT

USE OF WATER FROM SEAPAC OF IDAHO, INC'S MAGIC SPRINGS FACILITY, CONSTRUCTION OF PUMP STATION AND PIPELINE IN EXCHANGE FOR WATER FROM THE AQUA LIFE FACILITY

This Letter of Intent ("LOI") is entered into by and between Idaho Ground Water Appropriators, Inc. ("IGWA"), acting for and on behalf of North Snake Ground Water District, Magic Valley Ground Water District and Southwest Irrigation District (collectively "Districts"), and SeaPac of Idaho, Inc. ("SeaPac").

RECITALS

A. In response to Rangen, Inc.'s ("Rangen") water delivery call, the Idaho Department of Water Resources ("IDWR") determined in its January 29, 2014 order that holders of ground water rights junior to July 13, 1962 must provide 9.1 cfs of direct flow to Rangen. Other delivery calls are pending or may be filed by other Hagerman Valley water right holders seeking to curtail junior ground water users.

B. IGWA represents ground water districts whose members consist of irrigators, municipalities, and commercial and industrial entities with ground water rights. Many of the ground water districts' member's water rights are junior to Rangen and certain other water rights in the Thousand Springs reach of the Hagerman Valley and are subject to curtailment unless a mitigation plan is approved providing replacement water.

C. IGWA and SeaPac support the concepts and implementation of the State of Idaho's *Thousand Springs Water Supply Settlement Framework* designed to provide recharge and other means to stabilize the aquifer, to improve water supplies in the Hagerman Valley and to resolve conflicts between junior and senior water right holders.

D. The Idaho Water Resource Board ("IWRB") owns and operates the Aqua Life Aquaculture Facility Hatchery ("Aqua Life") and has entered into a Letter of Intent with IGWA to make available to IGWA by lease or purchase up to ten (10) cfs of its Aqua Life water rights from adjacent springs as needed to meet the mitigation obligation to Rangen and others in the Hagerman valley. IGWA has entered into negotiations with IWRB seeking to lease and acquire ownership of all of Aqua Life.

E. SeaPac currently has a short-term lease of Aqua Life from IWRB and desires to continue its Aqua Life operations by securing ownership and/or a long-term lease.

F. IGWA desires to secure water from SeaPac's Magic Springs to provide a supply of water for mitigation purposes to Rangen and to other senior rights in the Hagerman Valley.

G. IGWA and SeaPac desire to enter into this Letter of Intent ("LOI") to set forth their intent to commence negotiation of a final agreement providing for the exchange of Magic Springs water for Aqua Life water consistent with the terms set forth below.

TERMS

The Agreement shall have the following terms and conditions:

1. SeaPac will lease or sell to IGWA up to ten (10) cfs of first use water from its Magic Springs water right nos. 36-7072 and 36-8356 and also will provide access to allow IGWA to utilize all discharge water from its Magic Springs facilities as needed to provide mitigation to other water right holders in the Hagerman valley.

2. In exchange for water from Magic Springs, IGWA will secure ownership or control of Aqua Life water right nos. 36-1044, 36-2734, 36-15476, 36-2414, and 36-2338 by long-term lease or purchase from IWRB and make them available to SeaPac.

3. IGWA will pay all costs to design, construct, operate and maintain the water collection and intake system, pump station, pipeline and other facilities necessary to deliver up to 10 cfs of first use water together with discharge water from Magic Springs to the head of Billingsley Creek directly up gradient from the Rangen hatchery and/or other locations in the Hagerman valley for mitigation purposes. IGWA will ensure that the diversion and delivery facilities to be constructed will not interfere with the use of SeaPac's remaining water rights at Magic Springs.

4. IGWA shall be responsible to secure from IDWR approval of such mitigation plans, transfer applications and other permits as may be required to change the point of diversion and place of use to accomplish the delivery of Magic Springs water for mitigation purposes. SeaPac hereby grants consent to IGWA to file and process such mitigation plans, transfer applications based on this LOI, with the approvals made subject to this LOI and the contemplated final Agreement between the parties.

5. SeaPac will grant IGWA permanent easements at Magic to design, construct, operate and maintain the water intake and collection facilities, pump station, pipeline and other facilities as necessary for the delivery of water to other locations for mitigation purposes.

6. IWRB will cooperate with IGWA and provide all necessary documents to conduct such investigation as it shall deem appropriate.

7. The Agreement will be contingent upon: (a) IGWA securing an order from IDWR approving mitigation plans providing for the delivery SeaPac's Magic Springs water rights to satisfy the mitigation obligations to Rangen and/or others in the Hagerman valley; (b) IGWA

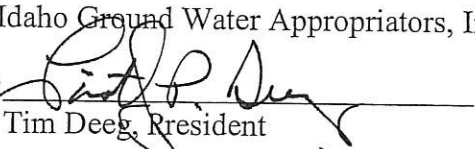
securing an order from IDWR approving the transfer of the point of diversion and place of use (as necessary) from SeaPac to Rangen and other locations for mitigation; (c) IGWA proceeding to construct and implement the pump and pipeline facilities pursuant to an approved mitigation plan; and IGWA securing ownership or control by long-term lease of Aqua Life and providing it to SeaPac.

8. This LOI may be executed in counterparts, each of which shall be deemed to be an original, but all of which, taken together, shall constitute but one and the same agreement. Delivery of an executed counterpart of this LOI via facsimile transmission shall be as effective as delivery of an original signed copy. Thereafter, the parties shall exchange executed originals of this LOI.

9. This LOI is intended as a general expression of the terms and conditions, under which the parties are willing to proceed to prepare, negotiate and if acceptable to all parties in their respective sole discretion, execute a final Agreement. Neither this LOI nor the execution hereof as provided below, shall be binding on any party until the formal Agreement is executed by all parties.

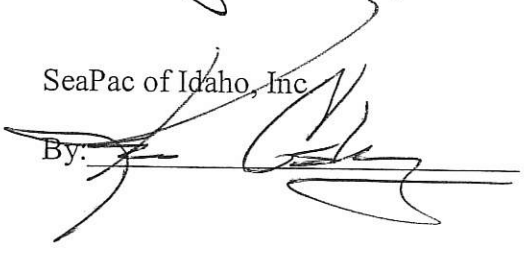
10. Upon execution of this LOI SeaPac will provide access to IGWA to begin engineering work, IGWA will proceed to file and process with IDWR mitigation plans and transfer applications as contemplated and the parties will proceed to negotiate a final Agreement incorporating the terms and conditions as outlined above.

Idaho Ground Water Appropriators, Inc.

By: 

Tim Deeg, Resident

SeaPac of Idaho, Inc

By: 

APPENDIX C: AMEC TEMPERATURE ANALYSIS (TO BE ADDED)

**APPENDIX D: HAGERMAN HIGHWAY DISTRICT APPROVAL
(TO BE ADDED)**
