

# **GBIC**

## **GILA BASIN IRRIGATION COMMISSION**

November 1, 2010

Chairman  
Interstate Stream Commission  
407 Galisteo Street  
Bataan Memorial Building  
Santa Fe, NM 87504-5102

Subject: Gila Basin Irrigation Commission  
Project Funding Request for FY 2011

The Gila Basin Irrigation Commission (GBIC) appreciates the opportunity to present a project to the Interstate Stream Commission (ISC) for funding consideration. The funding request is for one component of the GBIC's Plan to utilize water allowed under the Arizona Water Settlement Act (AWSA) in southwest New Mexico.

### **1.0 BACKGROUND**

The GBIC is made up of surface and ground water irrigators in the Gila River Basin and includes numerous ex-officio members who represent livestock producers, domestic well owners, realtors, habitat interests, landowners along the Gila River, and other parties who are affected or concerned about current and future availability of water in or from the Gila River.

The AWSA authorizes 14,000 acre-feet of water from the Gila and San Francisco River Basins and funding of \$128,000,000 for a project (or projects) to put the water to beneficial use in New Mexico. Application to the Secretary of Interior for use of the water must be made no later than 2014. If application is not made, New Mexico forfeits its right to the water to Arizona.

The GBIC maintains that this water is needed to meet present and future needs. GBIC is confident that a significant portion, if not all of the water available under the AWSA, could be used to restore water rights lost in the 1964 adjudication, improve and diversify agricultural production, improve habitat in and along the river, and increase recreational opportunities, provided an adequate and dependable supply of water is available throughout the year. The water could also be used to expand limits on domestic wells for gardens, yards, and other outside use, as well as provide stock pond water for livestock producers.

GBIC has created a Plan to identify needs, uses, and implementation options for water available under the AWSA. The Plan was developed by seeking input from GBIC members as well as ex-officio members, as described in the first paragraph of this section, over a period exceeding one year. Components of the Plan were then discussed in an open forum. Components were evaluated by assigning a weighted ranking to each component using twelve different criteria. The sum of the rankings for each criterion were added to reach a final score. Top ranking components, based on score, were selected in the broad categories of diversion, conveyance, and storage resulting in the Project. Because diversion is necessary to accomplish all categories, GBIC is focusing their attention in this funding request to diversion structures related to existing acequias. GBIC is confident that these structures will be part of any project that is built and thus, funding these

diversion structures will move any project considered for AWSA water in the Gila Valley forward. Additionally, the diversion structures enhance the existing infrastructure and, therefore, provide a net benefit beyond their role in the proposed Project.

## **2.0 PROJECT GOALS**

By making water available under the AWSA to the Gila Valley, the overall Project as proposed by the GBIC will meet several immediate needs:

- Restoration of irrigated land lost as a result of the 1964 adjudication process. Several historic fields have not been irrigated in recent history because water has not been available. Water made available through this Project would bring some of these fields back into production.
- Reduction of the irrigation water shortage. Currently, irrigated land in the basin is water short, meaning that the supply does not cover the potential demand. This results in a limited cropping structure and does not allow all the potential beneficial uses of existing land.
- Growth of rural and urban/suburban areas. No new water rights appropriations are allowed in the Gila Basin. Thus, prospective homeowners or municipalities are forced to purchase existing water rights in order to have adequate supplies for personal use. The Project could allow new water rights to be distributed to homeowners and municipal entities for future growth.
- Ecologic enhancement. The Gila Valley has been under irrigation since the late 1800s. When irrigable land was removed from production in the 1960s for transfer to other entities or lost to the appropriation process, the reduced return flow to the river resulted in loss of habitat that was supported through historical irrigation practices. The additional irrigation water made available through this Project will increase the amount of return flow to the river, thus enhancing the aquatic and riparian habitat along the Gila River corridor.

In 2010, ISC contracted with AMEC Earth and Environmental (AMEC) to perform a demand study for southwest New Mexico in relation to the AWSA. AMEC presented their findings in a draft presentation to the AWSA Stakeholders Group on June 16, 2010. AMEC predicts that additional water will be needed for irrigation, domestic wells, and municipal use by the year 2050. The projected need may even exceed that available from AWSA.

As with any project of this magnitude, GBIC anticipates a balance of benefits and challenges. The overall Project will provide multiple benefits in addition to the immediate economic enhancement of agriculture (e.g., crop diversification, consistent water source, expanded economic base). Some of the additional benefits considered in the design of the Project and selection of components includes:

- Enhancing riparian corridor
- Restoring Gila River flow regime to a more natural flow pattern (currently, the river is completely dammed during irrigation season, with no flow in the channel downstream until return flows accrete)
- Extending the irrigation season
- Maintaining the Gila River geomorphic processes

- Maintaining/enhancing threatened and endangered species habitat
- Developing infrastructure that will support multiple future uses.

Thus, immediate benefits to the existing infrastructure and area agriculture can be realized by initiating the chosen diversion component of the Project. Additionally, starting the diversion component will demonstrate some of the benefits that will be realized from implementing the overall Project.

The main challenges associated with the Project include:

- Opposition to agriculture, municipal, and domestic growth
- Technical issues related to component placement, construction, and operation.

GBIC implemented a design process that entails community outreach and involvement, followed by the beginnings of a selection process for Project components that incorporated technical, legal, environmental, and economic considerations to address the challenges. We recognize that the process of education, community outreach, and dialogue is an ongoing process and will be required throughout project implementation. This process of outreach and dialogue is GBIC's most effective tool to manage the challenges faced on the Project.

### **3.0 PROJECT DESCRIPTION**

GBIC proposes the replacement of earthen diversions with two permanent concrete diversion structures. One diversion would be located at or upstream of the Upper Gila and Fort West Ditch diversions. The second diversion would be located where it can provide water to the Gila Farm Ditch. The diversions would be non-storage structures (not dams) that would cross the main channel of the Gila River and the over-bank zone, to contain future channel migration. In addition, modifications will be considered (based on field investigations) in the final design of the structure in order to mitigate potential impacts.

Water diverted during times of adequate flow would be conveyed by unlined ditches to beneficial uses downstream. The existing Upper Gila and Fort West Ditches would likely distribute water from the northern diversion, while the Gila Farm Ditch would receive water from the southern diversion (Figure 1). Within the overall Project, these ditches may be repaired or enhanced to accommodate flow as needed and/or new conveyance structures constructed in order to transport sufficient flow to use locations.

The overall Project also contains storage components of aquifer storage and "on-farm" surface storage. Aquifer storage involves the placement of diverted water into the unsaturated portion of the Gila River alluvium by a variety of possible means, including ditch and pond seepage, infiltration galleries, and injection wells (conceptually shown in Figure 1). Due to the length and depth of the alluvium, it may be feasible to store a significant volume of water this way. This storage can be recovered by wells and river return flows. The other storage component, "on-farm" storage, refers to the use of small-scale reservoirs to store diverted water on property owners' land. These may be in the form of stock ponds, small reservoirs, and even wetlands.

In order to qualify for AWSA funding, the GBIC recognizes that all project components discussed above (diversion, conveyance, storage, and beneficial use) need to be a part of the combined project. However, diversion is required first before the other components can be implemented. Therefore, this funding request is specifically intended to focus on the diversion component details and costs, which are presented in the following section. Details and funding requests for the other components will be proposed in the future.

## **4.0 PROJECT DEVELOPMENT**

While the overall Project involves three components: diversion, conveyance, and storage, this funding request focuses on the development of the diversion component of the overall Project. It will utilize the already-completed conceptual design of the diversion structures to develop a final design and construction bid package.

While several types of diversion structures were considered (from infiltration galleries to a large dam and reservoir) in the criteria evaluation, permanent low-head concrete diversion structures (non-ponding) scored significantly higher than any other type of diversion structure. Thus, a conceptual design of the proposed diversion structure has been developed, and includes a low-head structure, with the ability to divert flood-plain / over-bank water without storing water. Figure 2 shows a preliminary conceptual design to use as a base for continued refinement during the process of developing a final engineering design. The conceptual design was developed based upon preliminary hydrologic and hydraulic analyses of the Gila River Basin and the Upper Gila and Fort West Ditches. A topographic survey of the Upper Gila and Fort West Ditches was included in this preliminary effort.

To address the feasibility of the conceptual design, several field investigations are necessary to address the stability and determine design details of the diversion structures. Suitable locations for the diversion structures must be identified and detailed surveys of both the proposed diversion locations and the Gila Farm Ditch will be needed to refine the design specification for the diversion structures. Geotechnical studies including laboratory analysis and testing of earthen materials will address the stability of the diversion structure within the native site soils. Additional hydrologic and hydraulic studies will be necessary to address the stability of the structure within the floodplain and to ensure no channel instability will be caused upstream or downstream of the diversion. A biological and cultural assessment will be performed to identify potential impacts from the construction activities and to guide final design. Field investigation results will be used in the development of final designs and cost estimates.

The design of the diversion structures and associated best management practices (sediment controls, etc.) will be refined based on information gathered in the field investigations. The final design will include all engineering drawings and specifications required for project completion. Construction drawings will include detailed grading plans, facility profiles, cross-sections, construction details, storm water and sediment control details, construction notes, and survey control information. Construction specifications will include technical requirements for construction (materials specifications, compaction, tolerances, etc.) as well as regulatory compliance requirements during construction (environmental controls, temporary sediment control, sanitation, etc.), quality control requirements, and quality assurance requirements. A bid package of construction drawings and

specifications for the diversion structures will be assembled and provided to the selected construction contractor.

## **4.1 Preliminary Cost Estimate**

A preliminary cost estimate for the diversion structures for the Upper Gila and Fort West Ditches and Gila Farm Ditch has been divided into two phases: 1) engineering and field investigations and 2) construction of diversion structures.

The first phase includes all tasks discussed above, which are all related to development of the final designs of the diversion structures. This phase will include a plan for all permitting activities; however, the cost of governmental permitting has not been included in the estimated costs. The estimated cost for the engineering and field investigation phase is approximately \$471,000.

The second phase includes the actual on-the-ground construction of the diversion structures. The estimated cost for the construction of the diversion structures is approximately \$2.80 million. This cost is a rough estimate only, as actual construction costs depend upon the field investigations and final design.

## **4.2 Funding Request**

The GBIC respectfully requests funding to complete the diversion component of our overall Project in the amount of \$3.27 million. If fully funded, the results would include the construction of one diversion structure on the Upper Gila and the Fort West Ditches and a second diversion structure on Gila Farm Ditch, with the benefits of enhanced irrigated land, extended irrigation season, potential crop diversification, and enhanced aquatic and riparian environment.

Regardless, the diversion structure will benefit the community even if completed independent of the other components

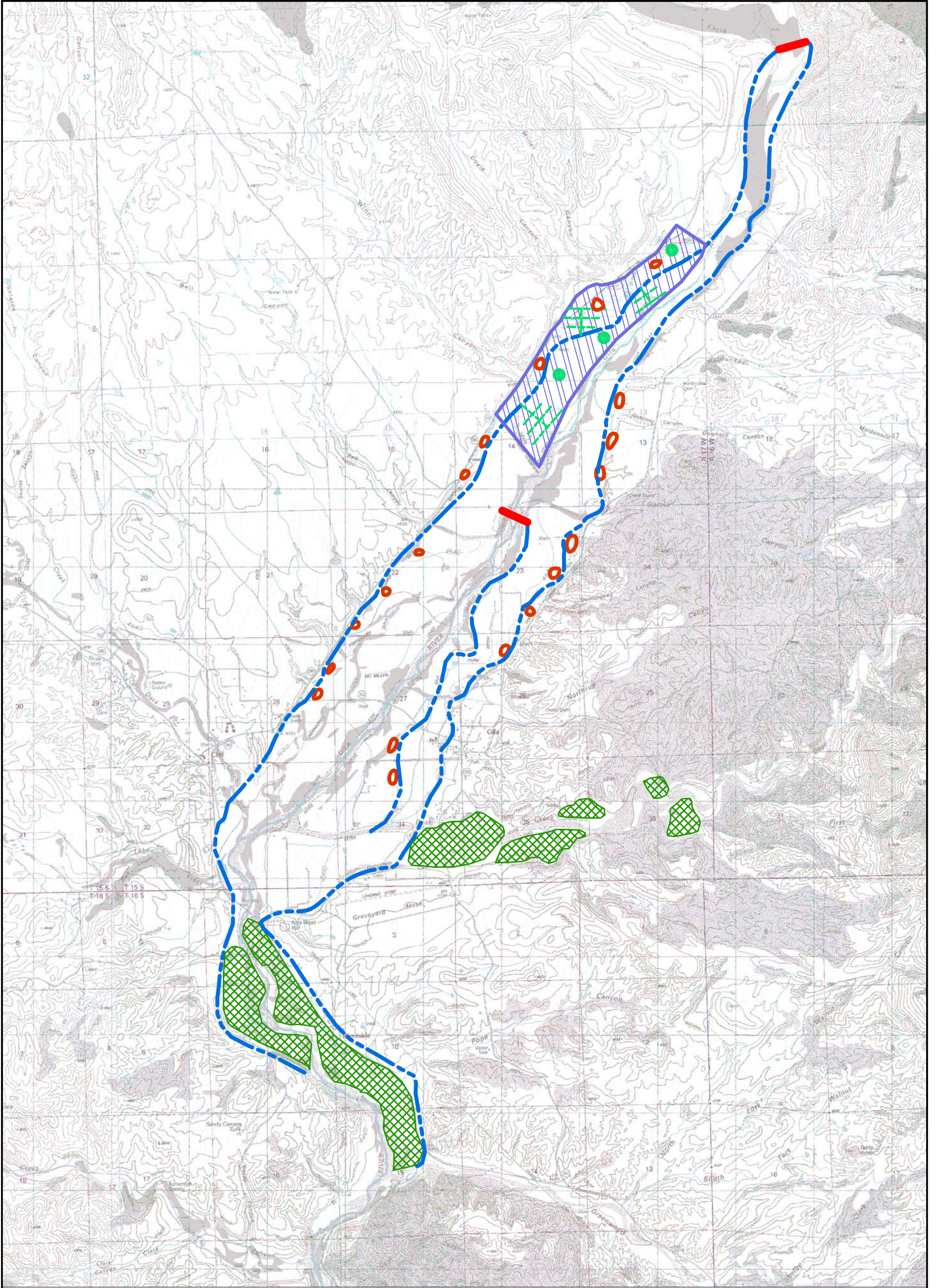
If you have questions or concerns with this request, please feel free to contact me at your earliest convenience. If you would like more information regarding the process we have initiated to develop a project to encumber the water available under the AWSA, we would be happy to discuss. Thank you for your consideration.

Sincerely,

***Gila Basin Irrigation Commission***

Topper Thorpe  
Chairman

THT:dal  
Enclosure  
cc:



**LEGEND**

- DIRECT DIVERSION
- INFILTRATION GALLERIES
- DITCH
- INJECTION / PUMPING WELLS
- AQUIFER STORAGE
- ON-FARM STORAGE
- RECLAIMED FARMS

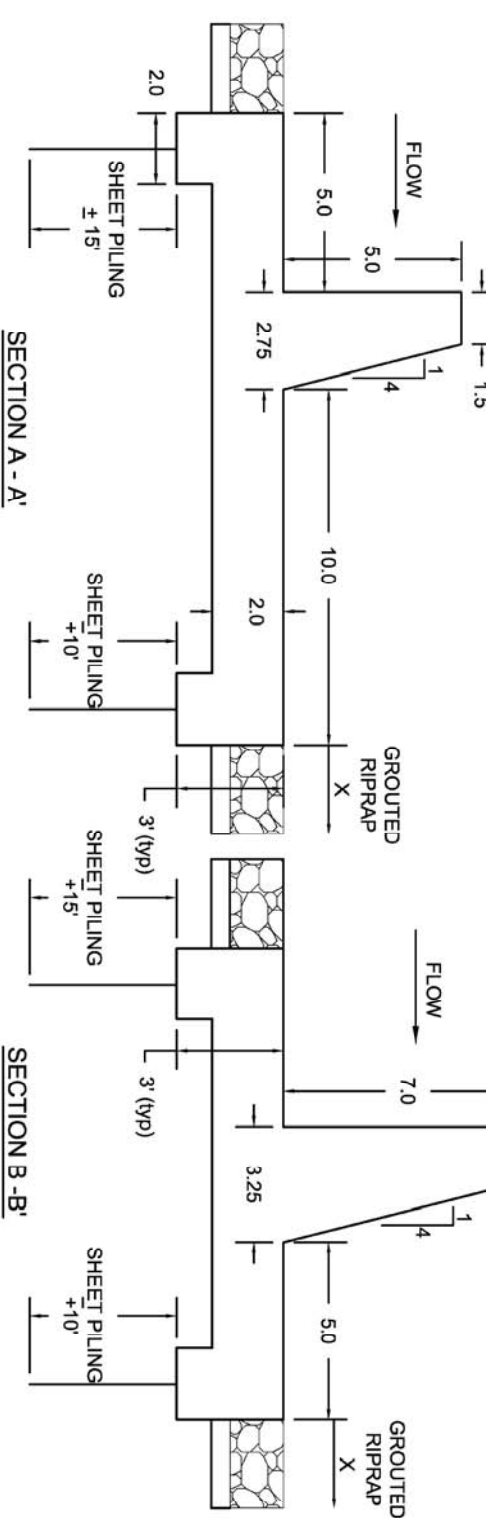
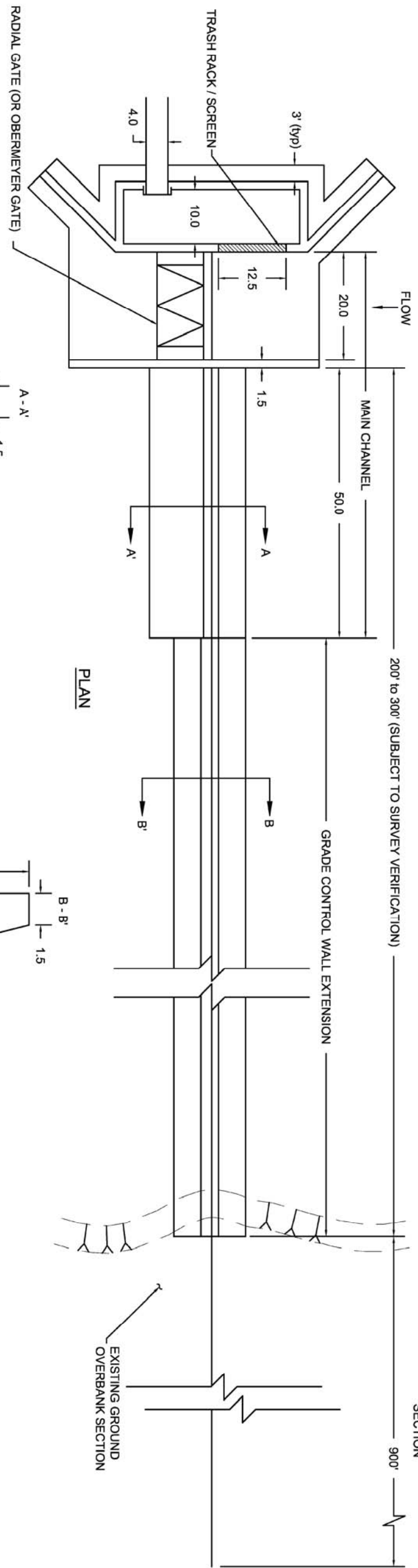
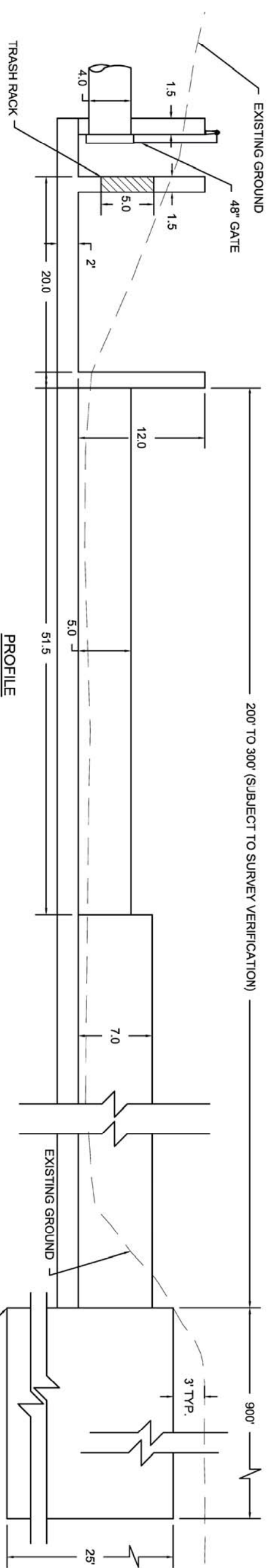
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PROJECT: 219601	TASK: 1
PREPARED BY: <b>TELESTO</b> <small>SOLUTIONS INCORPORATED</small>	

**FIGURE 1**  
**CONCEPTUAL PROJECT COMPONENTS**

PREPARED FOR:  
**G B I C**  
 GILA BASIN IRRIGATION COMMISSION



**NOTE:**  
1. ALL DIMENSIONS TO BE CONFIRMED WITH SITE SURVEY.

**NOT TO SCALE**

**IMAGE BY OTHERS**

PROJECT: 219601 TASK: 1

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SOLUTIONS INCORPORATED

PREPARED FOR: **G I L A**  
GILA BASIN IRRIGATION COMMISSION

**FIGURE 2**  
**PRELIMINARY**  
**CONCEPTUAL DESIGN**