

Post Falls, Idaho  
of Pleasant View  
Bridge

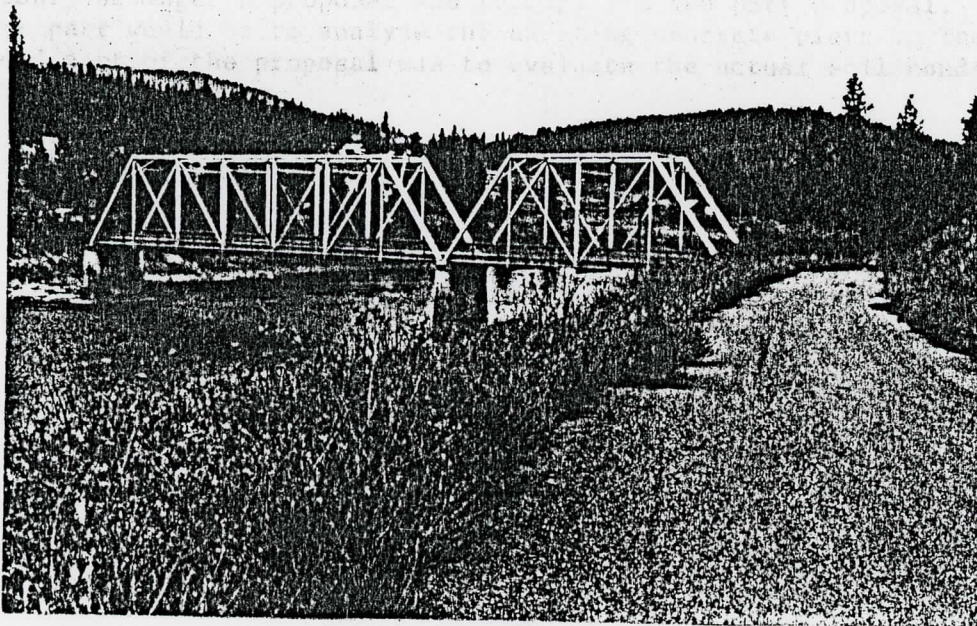
## 1. INTRODUCTION

J-U-B ENGINEERS, Inc. has been requested by the Post Falls Highway District to conduct a feasibility investigation to determine the optimal method of either replacement or remodification of the existing Pleasant View Bridge.

The subject bridge is located on Pleasant View Road where it intersects with the Spokane River (See cover map). The existing bridge is presently out of service due to the removal of the south span for safety reasons.

It should be noted that this study does not include a traffic study. Therefore, it is assumed that the Pleasant View crossing is the most optimal location for the area.

Since the construction cost of the substructure of a bridge is approximately 40 to 50 percent of the total construction cost, this would indicate that the most feasible solution would be to remove the existing superstructure and rebuild the bridge by employing the existing piers. However, in order to determine the above, two factors must be studied. They are the structural capabilities of the existing concrete piers and the existing alignment of Pleasant View Road.



Pleasant View Bridge  
North Approach



A. History

From the information on hand, we have determined that the original bridge was completed in the early 1920's. The original superstructure consisted of timber trusses and decking. During the 1940's, the original timber superstructure was removed and replaced with a steel truss system and timber decking which is now the present state of the bridge. The roadway and bridge are presently on the Federal-Aid System.

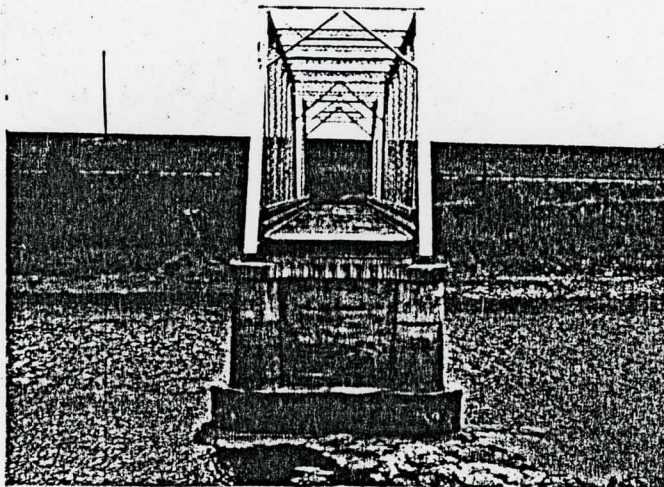
B. Existing Records

No "as-built" drawings exist of the crossing to our knowledge. The only dimensions used in this report are based on field measurements. The existing timber deck is 16-1/2 feet wide from rail to rail. The existing bridge did consist of three spans. The center span is 140 feet in length and the two end spans are 80 feet in length. Therefore, the total length of the existing bridge is 300 feet.

2. EXISTING PIERS

The piers consist of concrete columns with a thin web connecting the columns and supported on a rectangular footing.

Budinger Geotechnical Engineering Consultants were requested by J-U-B ENGINEERS, Inc. to submit a proposal on soil and foundation investigation. Budinger's proposal was primarily a two part proposal. The first part would be to analyze the existing concrete piers. The second part of the proposal was to evaluate the actual soil conditions of the site.



South Pier



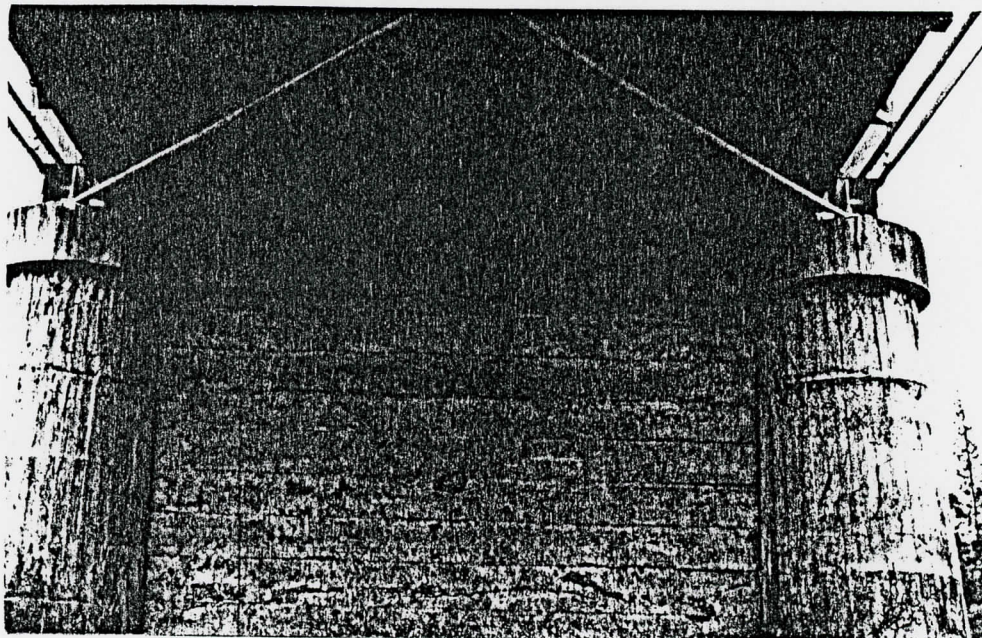
Mr. Roy Bodine, Chairman of the Post Falls Highway District, in a letter dated November 5, 1978, authorized Budinger Geotechnical Engineering Consultants to proceed with the first part of the investigation.

On November 13, 1978, J-U-B ENGINEERS, Inc. received Budinger's evaluation of the existing concrete piers (See Appendix A). The report states that the concrete in the two piers is of high quality with weathering only at the surface. Also, the laboratory tests indicated that the compression strength of the four core samples taken range from 4,810 psi to a maximum of 6,140 psi. The core of the south footing indicated numerous cold joints. These cold joints are probably a result of the relatively small concrete mixing unit during the initial construction of the bridge.

Based on the above lab report and our field investigations, we have concluded that the material in the concrete piers should be considered sound and reasonably equivalent in strength to a new material with the exception of the weathering surface of the piers. It is assumed that all weathered or scaling concrete will be removed to sound concrete if the piers are to be utilized into a new bridge system.

### 3. STRUCTURAL CAPACITY OF PIERS

The structural calculations were performed based on maximum unit stress as stated in the "Manual for Maintenance Inspection of Bridges, 1970", by AASHO, Clause 5.4 (i.e., concrete compression limited to 1,000 psi, etc.). Even though the field test indicated that high maximum stresses can be obtained, we believe that the reduction in maximum stress is justifiable when considering the age of the bridge and the number of possible unknown factors.



North Pier



Since no reinforcing steel was encountered during the concrete coring of the piers, the piers were analyzed as unreinforced concrete pedestals according to "Standard Specifications for Highway Bridges, 1973" by AASHO.

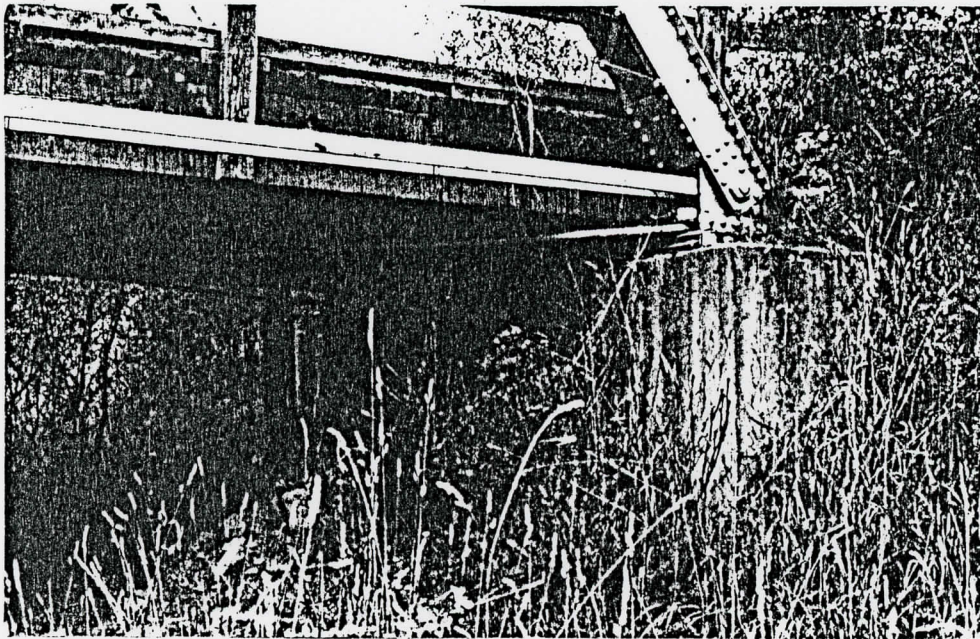
Our structural analysis did indicate that the piers can withstand all forces due to dead load and live load (HS-20) that would be superimposed on them if the existing piers were incorporated into a new bridge scheme. This statement is based on the assumption that the existing bearing strength of the existing footings is greater than the required design load bearing.

#### 4. EXISTING ABUTMENTS

From visual inspections, the abutments appear to be the same configuration as the piers. The only minor difference is that the abutments consist of square concrete columns with a thin web connecting them. Unlike the piers which have circular columns.

Since no records are on hand to confirm the depth and size of the footing of the abutments, we have assumed, for this report, that the abutments cannot be incorporated in a new bridge scheme.

The above assumption would represent the most critical conditions for the feasibility of incorporating the existing piers into a new scheme.



Northeast Abutment



## 5. ALTERNATIVES

As previously stated, the existing piers can be incorporated into a new bridge crossing; however, this does not necessarily indicate that the above would be the most practical method of reconstruction. All alternatives should be investigated before a recommendation is made.

Our study indicated that there are three (3) feasible methods of crossing the Spokane River at Pleasant View Road (See Figure 1). The first alternative would be to remove the existing superstructure (steel trusses and timber decking) and replace them with prestressed concrete beams. If required, the existing north and south abutment would be removed and replaced. The only required modifications to the existing piers would be to remove all scaling and weathering concrete and repair the areas with a epoxy concrete. This alternative is based on a 32 foot wide roadway and bridge length of 300 feet (See Figure 2). The existing alignment of the Pleasant View right of way does not meet Federal or State secondary standards. Therefore, it would be required to relocate the north and south approach roadways. In order to accomplish the relocation of the roadway, additional lands would be required on the north and south banks. In addition, it would appear that rock excavation would be required on the south bank in order to provide an acceptable vertical grade.

In order to avoid the above roadway realignment, a second alternative was investigated. This alternative would require the construction of a 400 foot bridge (See Figure 1). The bridge alignment would cross the river at an angle of approximately 50°, therefore, the 400 foot bridge would eliminate the dogleg of the existing alignment on the north bank. A small area of additional land on the north bank would be required for the above proposal.

A third alternative was also investigated. The proposal was basically the same as the first alternative, that is to construct a bridge at the existing site; however, not incorporating the existing piers. Therefore, this alternative would require the removal of the existing superstructure and substructure and replacement with a new bridge. Like the first alternative, in order to meet Federal secondary standards, a realignment of the existing roadway would be required (See Figure 2).