Denise Ball
Administrative Secreta

CITY of THE DALLES
313 COURT STREET
THE DALLES, OREGON 97058

(541) 296-5481

AGENDA
CITY OF THE DALLES HISTORIC LANDMARKS COMMISSION

CITY HALL COUNCIL CHAMBERS
313 COURT SREET
THE DALLES, OREGON 97058
CONDUCTED IN A HANDICAP ACCESSIBLE MEETING ROOM

WEDNESDAY, FEBRUARY 28TH, 2001
4:00 P.M.

I. **Call to order**

II. **Roll call**

III. **Approval of minutes** – October 25th, 2000 and November 1st, 2000

IV. **Approval of agenda**

V. **Public comment: The public is invited to comment on any topic that does not appear on the agenda.**

VI. **Public Hearing (Quasi-Judicial)**

HLC #57-01, 6th Street Bridge

VII. **Presentation by The Dalles Mural Society** on possible new murals.

VIII. **Next meeting date:** March 28, 2001 – 4:00 p.m.

IX. **Adjournment**

CITY of THE DALLES
313 COURT STREET
THE DALLES, OREGON 97058

(541) 296-5481

HISTORIC LANDMARK COMMISSION MINUTES

WEDNESDAY, OCTOBER 25, 2000
CITY HALL COUNCIL CHAMBERS
313 COURT STREET
THE DALLES, OREGON 97058
Conducted in a handicap accessible room

CALL TO ORDER

The meeting was called to order at 4:00 p.m. by Chair Eric Gleason.

ROLL CALL

Roll call was held by Administrative Secretary Pat Carter. Members present: Bob McNary, Eric Gleason, Pat May. Absent members: John Lambert, Francine Havercroft. Staff members present: Bob Paul, Senior Planner; Pat Carter, Administrative Secretary. Dorothy Davison was present, representing the City Council.

APPROVAL OF MINUTES

Bob Paul had a correction to the minutes of July 26, 2000. On page 2 of 3, sentence 2, the word Voight was corrected to *Vogt.*

May moved to approve the minutes as amended. McNary seconded. The motion was passed unanimously; Havercroft and Lambert absent.

APPROVAL OF AGENDA

Paul requested the addition of an item to VII. Presentation by Bob Paul. Item B would be added *Other Business.*

McNary moved to accept the agenda as amended. May seconded. The motion was passed unanimously; Havercroft and Lambert absent.

PUBLIC COMMENT

None

PUBLIC HEARING (Quasi-Judicial)

HLC #56-00, Sprint Communications: The application was to install an ADA accessible ramp on the eastern side of the building, replacing steps now in place. Chair Gleason read the rules for a quasi-judicial hearing. No Commissioners declared any ex-parte contact or conflict of interest.

Paul reviewed the staff report and said that staff was recommending approval with conditions. The condition was *removal and installation of accessible ramp should be completed in a workmanlike manner and no destruction of exterior brickwork should be left in a damaged state.*

Gleason questioned the condition, saying he would like to have more pictures of the area where the ramp would be installed.

McNary moved to meet again at 4:00 p.m. on Wednesday, November 1, 2000. May seconded. The motion was passed unanimously; Havercroft and Lambert absent. This meeting would be considered a continuation of the October 25th meeting, with the only agenda item being the Sprint application. Staff would provide additional information at that meeting.

Downtown Streetscape Phase II: Paul presented the Commission with information regarding the project. He explained that the Planning Director was able to approve minor alterations to property in the Historic Downtown District and that this project was considered to be in that category.

Gleason questioned if old man hole covers, sidewalk stamps, etc., would be kept intact. Paul said that there were no provisions to keep them.

Gleason suggested that documentation be made of any historic artifacts that may be unearthed. He also requested that any artifacts be surrendered to the City. Staff will make this recommendation to the City.

Pioneer Cemetery: Paul presented the Commissioners with copies of a letter to the editor that was written by Earline Wasser. She said she was part of a group that wanted to clean up the cemetery. He continued that the City Public Works Department will loan a lawnmower and other equipment to help in the cleanup process. A dumpster has also been contributed. Paul also advised the group that the City Manager had designated the care of the cemetery to the Historic Landmarks Commission.

Paul encouraged the support of the Commission with this project and any other volunteer effort to improve historical properties. This support could range from labor to helping to raise funds for projects.

Design Guidance Ordinance: Paul reported that the present ordinance was ineffective and should be rewritten. He presented a draft model that had been recommended to him.

Preservation Books: Paul presented a catalog of preservation books that he had received. He asked that the Commission review the catalog to determine if there were any books they were interested in purchasing for the HLC library.

NEXT MEETING DATE

A special meeting will to held on Wednesday, November 1, 2000, to complete review of the application submitted by Sprint Communications.

The next regularly scheduled meeting was set for November 22; however, objections were voiced concerning this date being the day before Thanksgiving. An alternate date was not determined.

ADJOURNMENT

The meeting was adjourned at 4:53 p.m.

Submitted by Patricia Carter, Administrative Secretary

Eric Gleason, Chair

CITY of THE DALLES
313 COURT STREET
THE DALLES, OREGON 97058
(541) 296-5481

HISTORIC LANDMARK COMMISSION MINUTES

WEDNESDAY, NOVEMBER 1, 2000
CITY HALL COUNCIL CHAMBERS
313 COURT STREET
THE DALLES, OREGON 97058
Conducted in a handicap accessible room
-SPECIAL MEETING-

CALL TO ORDER

The meeting was called to order at 4:05 p.m. by Chair Eric Gleason.

ROLL CALL

Roll call was conducted by Chair Gleason. Members present: Bob McNary, Eric Gleason, Pat May. Absent members: John Lambert, Francine Havercroft. Staff members present: Bob Paul, Senior Planner; Pat Carter, Administrative Secretary.

CONTINUATION HEARING TO APPROVE APPLICATION #HLC 56-00, SPRINT COMMUNICATIONS to add an ADA accessible ramp to their building at 203 E. 4th Street. Senior Planner Paul read the changes he had made in the Condition of Approval suggested on the Staff Report. Condition to be: *Removal of exterior architectural features and installation / re-installation of accessible ramp and ladder should be completed in a workmanlike manner. All care should be used to not damage the existing brickwork. If any damage occurs incidental or otherwise to the structure, repairs must be undertaken to restore to original. To verify compliance with this condition, photos should be sent to the Historic Landmark Commission showing both the area before removal and after installation of the accessible ramp tp provide a photographic record of compliance with this condition and the application as submitted and approved.*

The Staff Report portion of the hearing was then closed.

Proponent Testimony: Paul said that the architect representing the applicant could not be present but had no problem complying with the condition of approval.

Opponent Testimony: None

Public testimony was then closed.

Commission Deliberation: Gleason said he didn't think the applicant could have done a more sensitive job in putting in a handicap ramp.

McNary moved to approve Resolution #HLC 56-00. May seconded. The motion carried unanimously; Lambert and Havercroft absent.

OTHER BUSINESS

Paul said that the 6th Street Bridge plans were nearing completion and construction should begin in the spring to restore the bridge to its original condition. He advised the Commissioners that a representative would appear before an HLC meeting in either January or February, 2001, to advise them of the schematics.

NEXT MEETING DATE

The regular scheduled meeting date of November 22, 2000, was changed to November 29, 2000, because of the Thanksgiving holiday.

ADJOURNMENT

The meeting was adjourned at 4:18 p.m.

Submitted by Pat Carter, Administrative Secretary

Eric Gleason, Chair

CITY of THE DALLES
313 COURT STREET
THE DALLES, OREGON 97058

(541) 296-5481

STAFF REPORT
HISTORIC LANDMARK REVIEW #57-01
Dan Durow, Urban Renewal Agency

TO: The Dalles Historic Landmarks Commission

FROM: Bob Paul, Senior Planner

HEARING DATE: February 28, 2001

ISSUE: 6th Street Bridge Reconstruction

SYNOPSIS:

APPLICANT	Dan Durow, Urban Renewal Agency
PROPERTY OWNER	City of The Dalles
LOCATION	6th Street and Mill Creek
ZONING	Residential High/Medium Density/ General Commercial Zone
EXISTING USE	Pedestrian and Vehicular Bridge
SURROUNDING USE	Commercial to the West and Residential to the East
HISTORIC STATUS	City of The Dalles Trevitt National Historic District, Secondary Contributing Resource.

NOTIFICATION: Published advertisement in local newspaper; notification to property owners within 100 feet, SHPO.

RECOMMENDATION: Approval, with conditions.

BACKGROUND: C.B. McCullough designed the 6th Street Bridge. The original design showed concrete arched openings more in keeping with the basalt arches on 4th Street Grade. The bridge was constructed in 1920. The original plan was modified to the current concrete balusters that exist today. It is believed this modification was made for safety reasons.

McGee Engineering was contracted to complete a technical evaluation report of the structure and reconstruct the historic bridge. An emphasis was placed on restoration of the current bridge without modification. However, the technical evaluation report concluded serious vehicular and pedestrian safety issues with duplication of the existing bridge. The current design does not appear to provide adequate protection for an automobile impact to the railing. Additionally, the spacing between the balusters is too wide per current code.

Recommendations from McGee Engineering focused on improving safety of the bridge while maintaining a distinctive historic appearance. Their report detailed the current bridge and suggested three other construction styles that may be used. The CIP Arch Bridgerail has an apparent gothic architecture. A precast Tee Arch Bridgerail similar to the Ross Island Bridge in Portland was also suggested as an option. Both of these two options maintain McCullough's intent of keeping visibility through the decorative railing.

A third alternative is to install railings similar to the railings used on numerous Historic Highway 30 Bridges. This design is a solid concrete wall with an arched recess painted gray. This design would promote consistency along highway 30.

At the writing of this staff report, a separate possibility was being researched by the City Engineer. This is the possible option of providing a nine-inch high curb between the cartway and the walkway. A curb of this size may be considered adequate for most of the vehicular safety concerns. If this is allowable, the current bridge design could be utilized with only minor modification. The reconstruction would decrease the spacing between the balusters. The design of the railing and balusters would remain the same.

ANALYSIS: The HLC is responsible for conducting hearings dealing with design issues on historic properties and the Design Guidelines will serve as a tool to help them make these decisions. The purpose of the HLC, the Historic Ordinance and the Design Guidelines are to:

- *Protect historic and cultural resources from destruction, inappropriate alteration, and incompatible adjacent development;*
- *Stabilize and improve property values in historic districts and citywide;*
- *Enhance the city's attractiveness to visitors and residents, and stimulate business, industry and tourism;*
- *Educate The Dalles' citizens and visitors concerning the city's heritage;*
- *Preserve the historic housing stock of The Dalles;*
- *Comply with The Dalles comprehensive Plan.*

ORDINANCE 1194—AN ORDINANCE RELATING TO HISTORIC RESOURCES WITHIN THE CITY OF THE DALLES

Section 7, Subsection A. Review Criteria:

"Secretary's Standards. Commission decisions shall be based on the Secretary of the Interior's Guidelines for the Treatment of Historic Properties." The following are pertinent standards from the "Guide".

- *The historic character of a property shall be retained and preserved. The removal of historic materials or alterations to features and spaces that characterize a property shall be avoided.*

FINDING-1: The historic nature of this bridge is documented in the Trevitt's Addition National Register documentation. Due to safety concerns, some modification to the existing structure will be necessary. With the 9-inch curbing it may be possible to reconstruct this bridge very close to the originally constructed style.

- *Each property shall be recognized as a physical record of its time, place, and use. Changes that create a false sense of historical development, such as adding conjectural features or architectural elements from other buildings, shall not be undertaken.*

FINDING-2: Utilizing either of the two alternate historic styles would not be in keeping with this criterion.

- *New additions, exterior alterations, or related new construction shall not destroy historic materials that characterize the property. The new work shall be differentiated from the old and shall be compatible with the massing, size, scale, and architectural features to protect the historic integrity of the property and its environment.*

FINDING-3: This structure has been in continuous operation for over eighty years. The engineering report demonstrates that the historic materials must be removed and reconstructed for safety. However, a possible condition of approval requiring an interpretive sign speaking to the original design, original construction style, and new construction would serve to preserve the history of this bridge.

CONCLUSIONS: This bridge requires substantial reconstruction. At issue is the style that should be utilized for the final construction plans. Increasing the safety of the crossing while maintaining (as close as possible) the original designers intent is the optimal solution. Utilizing either the CIP Arch or the Tee Arch architectural styles, although historic, are not totally in keeping with McCullough's original intent. Utilizing the solid wall similar to other Historic Highway 30 bridges eliminates the character of the existing bridge. Increasing the curb height and reconstructing the balusters with decreased spacing is the preferable option.

Recommended Conditions of Approval:

1. Installation of interpretive signage adjacent to the bridge documenting the history of the bridge including the original design, constructed design, and current design complete with architectural detail shall be provided at the applicant's expense.

McGee Engineering

3933 Sitka Place, Corvallis, OR 97330
Fax: (541)758-6585 Phone: (541)757-9833
brudgeman6@juno.com

January 4, 2001

Paul Wolf
Civil Construction Company, Inc
1840 W. 16th Street
The Dalles, OR, 97058

RE: Rail Details at W. 6th Street Bridge.

We have performed a field inspection of the West 6th Street Bridge and are in the process of preparing a technical evaluation report and recommendations. It has become increasingly evident that preparation of the bridge rail recommendations should involve some input from the City.

The present bridge rail is comprised of concrete posts and rail with concrete "urn-style" balusters (the balusters are roughly shaped like ornate bowling pins). The concrete posts are spaced to match the span lengths, resulting in spacing of 28'-28'-40'-28'. The balusters are spaced at about 14". It was understood that our efforts were to be directed toward restoration of this existing detail. The original plans do not show these urn-style balusters, but show tee-section balusters which act together to form arched openings, referred to as an arch-style baluster. Apparently, last-minute revisions occurred which resulted in the change to the urn-style balusters to alleviate concerns over opening size (child safety).

Concerns arose as we disassembled some of the existing urn-style balusters and observed their anchorage mechanism. These balusters are not structurally integrated into the railing assembly with enough effectiveness to meet any current pedestrian or vehicular bridge rail standard. Additionally, the top rail element, a 5" x 12" concrete member does not have sufficient strength to span the 28' and 40' railing spans that currently exist between the widely spaced posts. Inspection of condition of the existing sidewalk indicates that the sidewalk sections will need to be replaced, affording the opportunity to change rail type if so deemed appropriate.

A comparison of two types of historic guardrail are made here:

1. The urn-style baluster guardrail as exists presently. It would be suggested that more post elements would be added to cut down on the span of the top rail. As a finished bridge rail, the assembly would meet the standards of pedestrian rail, but would be inadequate to meet present vehicular traffic rail standards.

2 The modified arch-style baluster is currently available constructed as a one piece "monolithic" casting which allows for the integration of reinforcing steel to resist vehicular loads. This rail is not an exact duplicate of the original arch-style baluster (as was called out on the original plans for this W.6th St. Bridge), but reasonably replicates the original detail while providing adequate vehicle restraint capability. This would be the preferred alternate if only engineering concerns are addressed

We request an opinion from you as to whether we should pursue other historic configurations for the bridge rail which may more appropriately fit the need. We bring this to your attention at this time, believing that it would be appropriate to get input from City on their concerns and opinions. We would prefer getting informal, but written, comment on the issue, and welcome any questions that may arise during the discussions.

Sincerely,

Dennis M. McGee, P.E.

General Contractor
(541) 298-8025
CCL # 63613

CIVIL CONSTRUCTION COMPANY, INC.

1840 West 16th Street
The Dalles, OR 97058

January 11, 2001

Dale McCabe
City Engineer
Public Works Dept.
1900 W. 6th
The Dalles, OR 97058

RE: West 6th Street - Mill Creek Bridge Improvements

Dear Dale,

Enclosed is a letter from McGee Engineering addressing some concerns and options to restore or replace the existing bridge rail.

Our concern with duplicating the current style of rail is that it does not meet safety standards.

McGee has included pictures and drawings of other options for consideration. I have also bid on ODOT jobs with a replicated arch style, such as is used along the Columbia River Historical Road (see pictures attached.)

These alternate styles would meet higher safety standards and crash tests. One concern that would need addressed is if there could be an increase in stress to the over-hang supports.

Whatever style the City chooses to use, Civil Construction Company, Inc. and McGee Engineering cannot be liable for the resulting safety factors. The Dalles City would be responsible for the safety liability factors for the new rail.

Please let us know which rail system you choose or contact Dennis or myself to discuss any concerns.

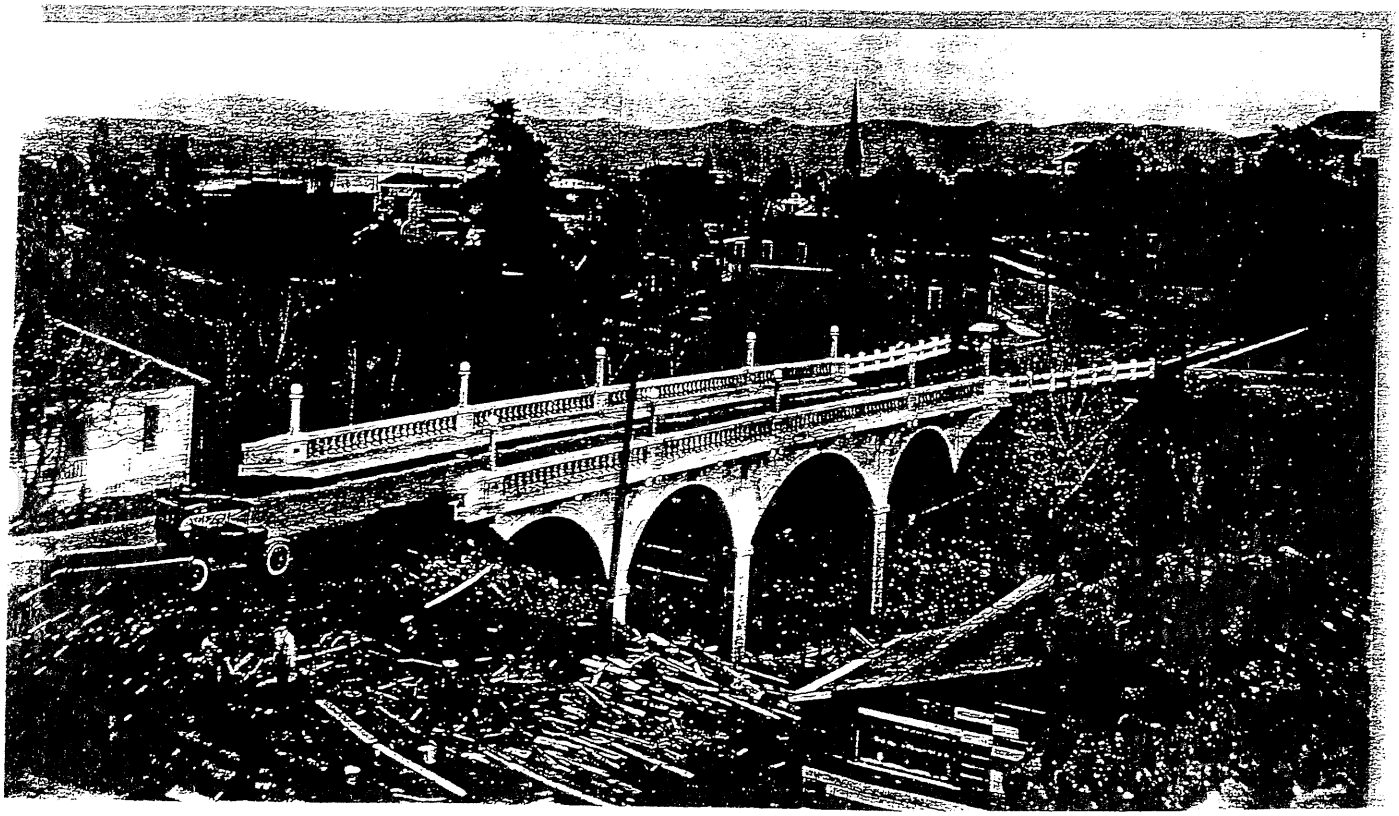
Sincerely,

Paul C. Wolf

Technical Evaluation Report

McDonald Street Bridge over Mill Creek

Benton County, Oregon



REGISTERED PROFESSIONAL ENGINEER
OREGON

02/04/01

Expires: 12/31/02

Fall, 2000

McGee Engineering
3933 Sitka Place, Corvallis, OR 97330

TABLE OF CONTENTS

Introduction

This report is prepared by McGee Engineering (Corvallis, OR) working in conjunction with Civil Construction Company, Inc (The Dalles, OR) as per a design-build contract with the City of The Dalles. This design report is the contractual responsibility of McGee Engineering, and opinions herein originate with that company. Civil Construction was actively involved in the planning and conducting of the inspection and report preparation, and remains abreast of developments in this project.

On December 11 through 13, 2000, as a first step toward meeting our contract requirement to develop design-build documents for the restoration of the West Sixth Street Bridge, we conducted a three day inspection of the bridge. We closed traffic during the days on which we used a snooper truck to access the below deck superstructure regions (Photo 1). Our inspection included measurements, photography, strength testing, and visual observation. We made direct hands-on contact with 90% of the area below the deck. We also set up a total station transit and recorded elevations and locations, using location datum from the original plans. We did not remove the asphalt from the deck surface at this time to inspect the deck surface, as we were concerned about leaving it exposed to traffic for the duration of the design phase. When asphalt surfacing is removed, we will extract and test cores from the deck to supplement the observations made below the deck. The information developed from our inspection, the design criteria from your request for design proposals, and information from specialists in historical highway structures was used in developing our recommendations.

Description of the Structure

The structure is a four-span (28'-28'-40'-28') reinforced concrete deck girder bridge with a false arch facing (Photo 2). The bridge carries a 20' wide roadway and two 4' wide sidewalks. The bridge rail is concrete with spaced ornate urn-style concrete balusters. Concrete lamp posts rise from the top of the bridge rail posts. The false arch facing gives the impression of arch construction, but actually the spanning is accomplished by simple concrete girders (four per span across the roadway width.) The abutments are high bearing walls with short flared wingwall sections. All the abutments and interior bents are supported on concrete spread footings below or nearly below stream bed elevation. The deck is presently surfaced with about 3" of asphalt concrete wearing surface. The bridge is typical of many concrete deck girder bridges constructed throughout Oregon in the 1920's. The prominent features of the bridge that evoke historic interest are as follows:

1. The original 1920 plans were developed under the direction of the renown engineer, Conde McCullough, who designed dozens of ornate bridges throughout Oregon (and more specifically along the historic Columbia River Highway).
2. The false arch facing, giving the projected elevation view of the bridge a distinct look of an arch bridge.
3. The ornate concrete bridge railing and the concrete lamp posts located atop the bridge railing.

Observed Conditions

Sidewalks

We noted that the entire length of the sidewalks show significant map cracking or surface crazing. In some instances this cracking has progressed to the further stage of complete sidewalk surface crumbling. Additionally, at some locations, the curb faces have undergone some traffic impact damage, and in a few areas are crumbled by rusting of embedded reinforcing steel located too near the surface. Nearly half of the underside of the sidewalk girder shows spalling at the reinforcing bar locations.(Photos 3 & 12) Similar reinforcing steel exposure was noted on the underside of the sidewalk itself.

Bridge Rail

On the south side of the bridge, 40' of the bridge rail is missing (with part of the missing pieces evidenced in the stream below). Throughout the bridge rail length, many of the concrete balusters are cracked (Photo 4). At all lamp post locations (corresponding to all bent locations) the embedded conduit is located too near the concrete lower rail face. This occurs because, during construction, it was necessary to bend the conduit outside the vertical sidewalk bars to allow the conduit to mate up to the junction boxes. This lightly protected conduit has corroded, and the ensuing rust has spalled the concrete faces at these locations (Photo 5). As a result, at nearly every lamp post location, the lower bridge rail is badly spalled. The remaining top bridge rail is in good condition. The urn-style balusters remaining are mostly cracked and weathered.

Bridge Rail End Posts

The bridge rail end and interior post are only minimally damaged by collision and age-related deterioration and collision. Testing the concrete with the Schmidt hammer indicated that the concrete strength remains high. However, the embedded electrical conduit system, which feeds the lamps atop the lamp posts, is severely deteriorated.

Bridge Deck

The inspection of the underside of the bridge deck did not reveal any obvious problems with the structural integrity of the deck. There were occasional instances of minor cracking , and all measurements of concrete strength (Schmidt hammer testing) indicated adequate concrete strength in all areas of the deck. Areas of concern were the vicinities of the deck drains. At these locations deck drainage has apparently created long-term wetting conditions to the underdeck surfaces in these specific areas (Photo 6). Those conditions have caused localized corrosion of the reinforcing steel with the consequent spalling of the surface concrete.

Sidewalk Brackets

The sidewalk brackets extend about 4 feet out from the exterior face of the exterior girders (Photo 7). There are 11 brackets on each side of the bridge. It was estimated that three of the brackets were damaged beyond repair. The most prevalent spalling damage occurred due to inadequate concrete cover over the reinforcing steel. On the north side of the bridge, the brackets carried a steel gas main suspended by hangers anchored into the underside of the brackets. These

Page 3 of this report is missing from the packet.

as is often done in more modern structures. This slab cantilever method was determined to be difficult to accomplish while maintaining the same historic appearance features, and additionally had the detrimental effect of placing a higher portion of the sidewalk load to the exterior main girder. For these reasons, it was decided to replicate the structural configuration as well as the appearance in the sidewalk construction.

Bridge Rail

Each new version of the American Association of State Highway Officials (AASHTO) design code increases the requirements on bridge rail design. These changes further compromise use of replicated historic bridge rail configurations. Our research reveals that local jurisdictions and owners generally confer with the design engineers on the adequacy of a specific historic bridge rail configuration and agree to the code compliance trade-off involved with its use.

We recommend replacing the existing bridge rail with a crashworthy rail system meeting crash Test Level 1 (NCHRP). This test criteria is appropriate for a low speed local street (AASHTO 13.7.2). However to comply with the contract and your desire to have an historic replication, you may wish to consider replacement in-kind with replication of the urn style balusters (a non-tested system). To clarify the bridge rail issues and assist you in further understanding the various features of the available historic bridge rail, we will assess historic and functional features of three types of bridge rail in the following discussion. See also Sheet 1 and Sheet 2 in the Exhibit

Existing Urn-syle Baluster Bridge Rail

The replicated bridge rail can serve only as a pedestrian rail since the decorative balusters do not provide required levels of traffic rail restraint. While the balusters provide only minimal structural strength, they appear to address the geometric requirements for vehicular restraint on this bridge. Some current applications of reconstructed bridge rail with historic significance are subjectively predicated on the assumption that if a 9" curb height is used in conjunction with a 4' width of sidewalk and pedestrian rail, the restraint requirements are met for a 25 mph design speed. ODOT has set the precedent on this interpretation of historic replicated bridge rail adequacy in several instances (Ellsworth Bridge in Albany, OR as one example). While we feel use of this rail may be a practical solution, it nevertheless does not meet all the requirements of current bridge rail design standards as set forth by the American Associations of State Highway Officials (AASHTO) and is not crashworthy.

A Cast-In-Place (CIP) Arch Bridge Rail (Shown on Sheet 1 of the attached drawings)

In several applications in Oregon, a durable conventionally-formed historically configured bridge rail has been used in the last five years. This rail is similar in configuration to the bridge rail shown in the original McCullough plans for the W. 6th Street Bridge, but prior to original construction, a decision was made to shift to the urn-style balusters, apparently to provide tighter geometric spacing for enhanced pedestrian safety. The bridge rail shown on Sheet 1 was used on a bridge on Ehlan Road in the Aurora Historic District (near Wilsonville). The forms to produce these bridge rails are available from several

contractors in Oregon. This bridge rail is crashworthy to Test Level Three, more than adequate to meet all requirements on the W.6th Street Bridge.

A Precast Tee Arch Baluster Bridge Rail (Shown on Sheet 1 of the attached drawings) In some applications in Oregon, ODOT is using a baluster type replication which utilized precast tee section, which when assembled form gothic arch openings in the bridge rail. This system is currently being used on the Ross Island Bridge restoration. On the Ross Island project, the design speed is over 45 mile per hour, required higher levels of crash testing. Therefore on that bridge metal tube railing is added to enhance the restraint and deflection function of the bridge rail. There are other applications in which design speed is lower and sufficient curb height is present so that the subjective deference to historic features prevails and the metal tube rail is omitted. The Ellsworth Bridge in Albany is one such example. Again, it is noted that this bridge rail does not meet all the current AASHTO bridge rail standards.

Flared Rail End Posts

We initially examined the possibility of saving the bridge rail flared end posts (located at the four corners of the bridge). Further examination of the problems involved with providing electrical power to the new lamps indicated that it was not practical to save the end post assemblies. The existing conduits and junction boxes were rendered unusable by corrosion and it was deemed impractical to incorporate new concealed electrical conduit in the old end posts, thus necessitating their replacement.

Bridge Street Lights

We recommend the street lights on the bridge be replaced by replications of the existing concrete lamp posts or metal lamp posts with antique configurations appropriate to the early 20th century replication. The posts will be capped with globe lighting fixtures with energy efficient long-life high pressure sodium 50 watt lamps, similar in function and appearance to the original, but with the globes made of translucent break resistant glass or plastic. If during demolition, it is demonstrated that the posts can be removed without damage and that the embedded conduit is not corroded beyond reuse, consideration will be given to restoring them to their original function in the replicated bridge rail. Examples of the metal lamp posts are shown in Photo 13 which shows the nine foot high metal lamp posts used at Ehlan Road bridge in the Aurora Historic District. These posts are available in shorter lengths making it possible to situate the lamps about ten feet above the bridge surface.

Sidewalk Brackets

We recommend that at least three of the concrete sidewalk brackets be replaced in entirety. To accomplish this, the irretrievably damaged brackets will be demolished back to the exterior girder faces , leaving the main reinforcing steel in place to effect monolithic cantilever effect in the replacement bracket. The replacement bracket will be replaced in similar configuration to the removed original. On the salvageable brackets, the areas of exposed reinforcing steel will

undergo concrete excavation and reinforcing steel cleaning to provide suitable preparation for the concrete patch-back.

Bridge Deck

Prior to removing the sidewalk and bridge rail, the asphalt surfacing will be removed sufficiently to allow inspection of the top deck surface. At this time the asphalt does not have to be completely removed, but enough concrete deck needs to be exposed to establish condition trends. Specific conditions requiring repair will be identified and representative saw-cut cores will be extracted in the various areas to assist in determining the nature and extent of the damage. The deck will be observed carefully visually, and the entire deck area will be explored and mapped for delamination effects by dragging a length of chain and sounding with a hammer or drop bar. It should again be noted that careful inspection of the underside of the deck indicated that the deck is not structurally compromised. Judging from that observation, it is likely that we will find primarily abrasion concerns on the top surface, and little detrimental delamination effect. If delamination were rampant, more leaching and cracking would normally be appearing on the underside of the deck than that which we observed.

Depending on the nature of the discoveries during these observations, several cases of deck repair scenarios are recommended. They are as follows:

Case 1: If large areas of delamination and top reinforcing steel exposure are encountered:

In this case, the deck surface shall be milled or ground to remove the loose concrete, the delaminated areas of concrete shall be excavated by chipping hammer and all corrosion shall be cleaned off the exposed steel. It should be noted that Civil Construction's contract limited the extent of this chipping to 20% of the deck area. The chipping and cleaning shall be followed with an application of a microsilica fume overlay about 2 1/2 inches thick. This dense deck overlay would not require an asphalt overlay.

Case 2: Small areas of delamination are identified with little, if any, reinforcing steel exposure.

Those areas shall be excavated by chipping hammer. In this case, milling the deck surface will be avoided as milling is potentially disruptive to the existing concrete bond to the top reinforcing steel. After cleaning the reinforcing steel, the excavated areas shall be patched back with concrete patching mix. After the patches are cured, the deck shall receive a light sand blast, a deck waterproofing membrane shall be applied, and an asphalt overlay, similar to that existing now, shall be applied.

Case 3: Traffic rutting of deck is observed but no delamination or reinforcing steel exposure.

The deck shall be completely cleaned, receive a light sand blast, a deck waterproofing membrane shall be applied, the rutting shall be leveled with a special compacted first lift of asphalt, and an asphalt overlay shall be applied.

In all cases above, the areas immediately around the deck drains will be completely removed, with the deck reinforcing steel left intact and cleaned. These drain areas shall be formed and new concrete placed to reestablish the existing drain assemblies. We would recommend that, as extra work, a diverting pipe be added to direct the water away from the substructure below to avoid recreating the existing corrosion conditions caused by the deck drainage water.

Substructure repair (Extra Work)

The Oregon Department of Transportation had conducted inspections of the bridge within the last year and generally gave the substructure a favorable rating as shown in the rating sheets included as the Exhibits. While we were contracted to primarily concentrate on concerns with the superstructure on this bridge, we did conduct a thorough inspection of the above ground substructure and made the following observations.

Areas of spalling and reinforcing steel were observed on vertical surfaces of substructure elements (Photo __). These areas occur predominantly where drainage water from the deck drains flowed onto the substructure concrete surfaces. We preliminarily excavated the loosened concrete from some of the areas of reinforcing area corrosion (for photography purposes), and sounded out the limits of the damage in other areas without excavating the concrete. The major damage occurs at the south end of the west abutment near the drainage from the local deck drain, and at Bent 3, where the deck joint occurs and allows water to spill through onto substructure surfaces. It is estimated that about 250 s.f. of substructure surface should be air-chisel excavated to expose the reinforcing steel, the exposed reinforcing steel should be cleaned and coated, and new concrete patching material should be applied at the excavated areas. The average depth of this concrete excavation is about 3 ½ inches.

At the east abutment, the work involves abatement of the movement causing the vertical abutment crack, and epoxy injection of the crack. We feel that a this can be accomplished by construction of a concrete counterfort rib, which engages the existing footing and extends about 1/3 the height of the abutment wall. The crack above this counterfort rib structure should be repaired with epoxy injections.

Finishes and coatings

The patching and segmental nature of the bridge rail construction and bracket repairs will most likely result in coloration mismatching of the old work to the new work. That effect can be minimized with a competently applied general surface finish, as called for in ODOT Spec 00540.52(b) followed by a Class I surface finish without paint coating . If precast balusters are used, they shall not require any field finishing.

Traffic Control:

Traffic should be routed away from the structure for the duration of work on the superstructure. We recommend doing this by detouring traffic similarly to the methods used during our inspection. We suggest the City review our methods of traffic control during inspection and make whatever adjustments they deem necessary to assure emergency service to all affected areas.

Conclusion

Our work addresses the concerns discovered during our December 11-13, 2000, inspection of the bridge. Based on those observations we recommended the following repairs be made:

1. The deck asphalt should be removed sufficiently to observe deck surface conditions. Based on observed conditions one of three deck resurfacing methods shall be utilized to restore the deck integrity and riding surface.
    a. Case 1 - General milling of the deck surface followed by selective chipping to completely expose and clean debonded deck steel, followed by application of a microsilica fume overlay. No asphalt overlay required.
    b. Case 2 -Selective concrete excavation (chipping) to completely expose and clean debonded deck steel, followed by concrete patching, application of a cementing overlayment, application of a waterproof deck membrane , and placement of an 1 ½" asphalt overlay.
    c. Case 3 - Lightly sandblast the deck, apply a topping overlay to level the rutting, apply a cementing overlayment, apply a waterproof membrane, even up the rutting with a first lift of asphalt, finish with an asphalt overlay.

2. The sidewalk and bridge rail should be completely removed and replaced, replicating the existing configuration.
3. Several sidewalk brackets should be replaced, with the remainder being salvaged and repaired.
4. Observed areas of deterioration to substructure elements be repaired by patching and construction of strengthening assemblies (courterforts, etc). This substructure work is extra work, outside the scope of our contract.

The work recommended in this report consists of the effort necessary to design and build repairs to the West Sixth Street Bridge which will place the bridge in sound condition for continued levels of existing use. The proposed effort provides use by speed-restricted (25 mile per hour) traffic on a 20' wide roadway surface with two 4' concrete surfaces. We understand this level of traffic usage does not meet current AASHTO standards for urban streets with usage level of 12,000 vehicles per day. Our instructions were to maintain the existing width geometry of the bridge and not make attempts to improve it at the expense of historic detail.
The inspection work revealed conditions prompting us to make recommendations beyond the scope of the proposed construction work, specifically the construction work proposed in Civil Construction Company's proposal response of October 3, 2000. Those items specifically excluded, and to be included as extra work, are itemized in the following:

1. The reconstruction of the four bridge end flares
2. The drain pipe diverting mechanisms added to the deck drain assemblies

3. The repairs to the substructure.
4. Any added deck joint detail required in various cases of deck repair. (There was filled deck joint discovered during inspection at the west end of the main span, not shown in the plans)

There is potential for cost savings depending on discoveries revealed when the deck surface is exposed. The Case 1 deck repair was quoted in the proposal response. The other three cases would probably allow cost credits which could possibly be used to address the substructure repairs. As any recommended extra work changes relate to design fee, there have been no changes that would indicate additional design fees are necessary.

Due to the subjective nature of the selection of the historical bridge rail and street light alternate, we require input from the City to guide the selection. While awaiting this input, we are proceeding with design details for the sidewalk demolition, the sidewalk bracket selective demolition, the sidewalk and sidewalk bracket replacements, substructure repairs (extra work), and deck drain repairs. Civil Construction Company is planning to close the street in late February to begin the demolition process. We would request expeditious approval of the demolition portions of these recommendations. The bridge rail selections have more time as all versions of the bridge rail fit to the sidewalk and sidewalk bracket reconstruction. We will again ask for involvement from the City in the selection of the deck repair case, once the demolition progress has allowed us adequate discovery to advance our recommendations. If there are questions, or further clarifications requested, don't hesitate to contact us. Thank you for the opportunity to present our opinions on this project.

McGee Engineering

Photo 1 - A truck-mounted hydraulic overhang scaffold was used to access the underside of the bridge. The truck was used for two days.

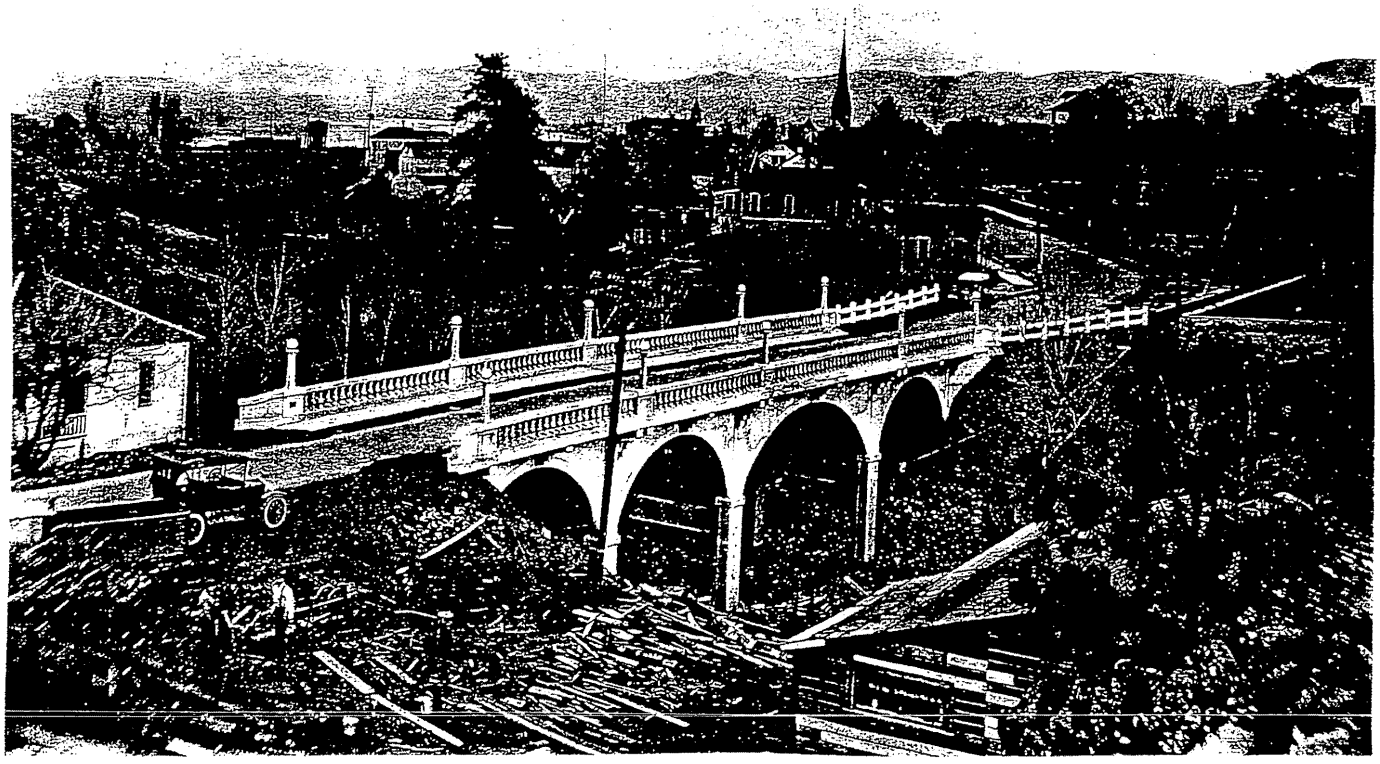


Photo 2 - A photo taken in 1920 when the bridge was nearing completion. This is one of best photographs of the complete bridge available as it was taken before the surrounding trees matured and obscured full views of the bridge. The photo is taken from a vantage point on the bluff southwest of the bridge, looking northeasterly.

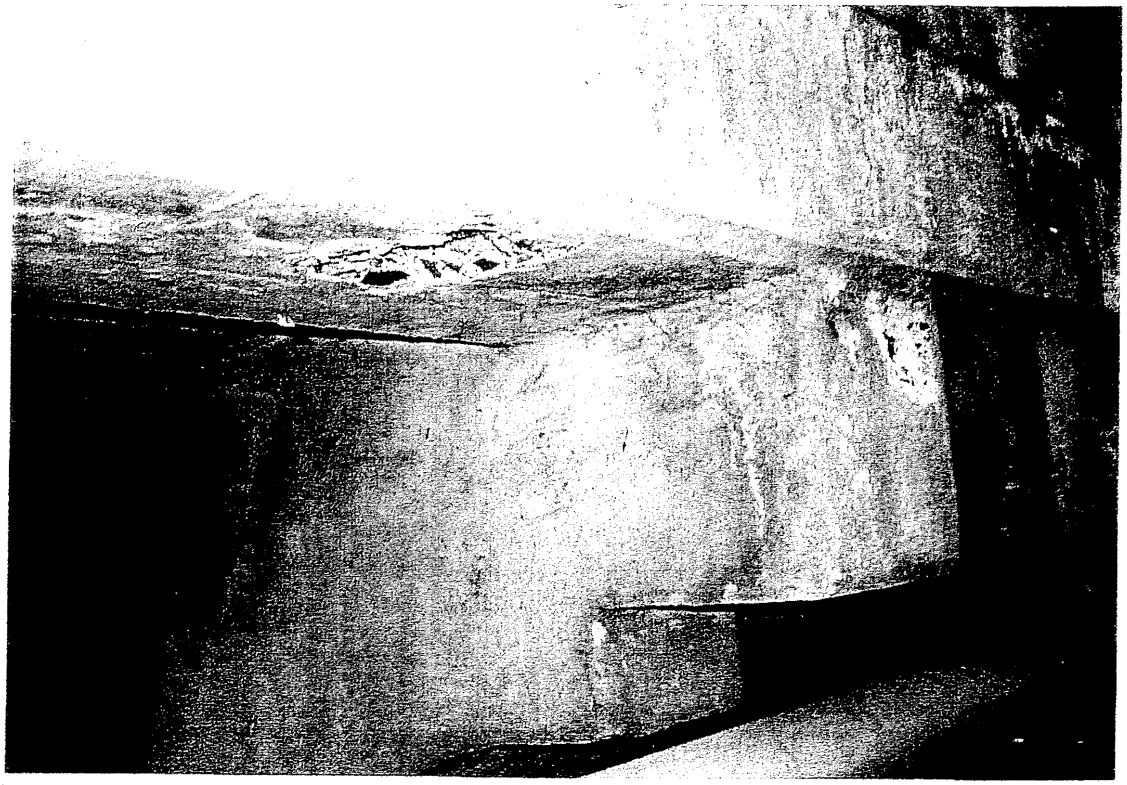


Photo 3 - This photo shows typical problems with corrosion spalling under the sidewalk girder. Also shown is typical spalling at the sidewalk bracket.

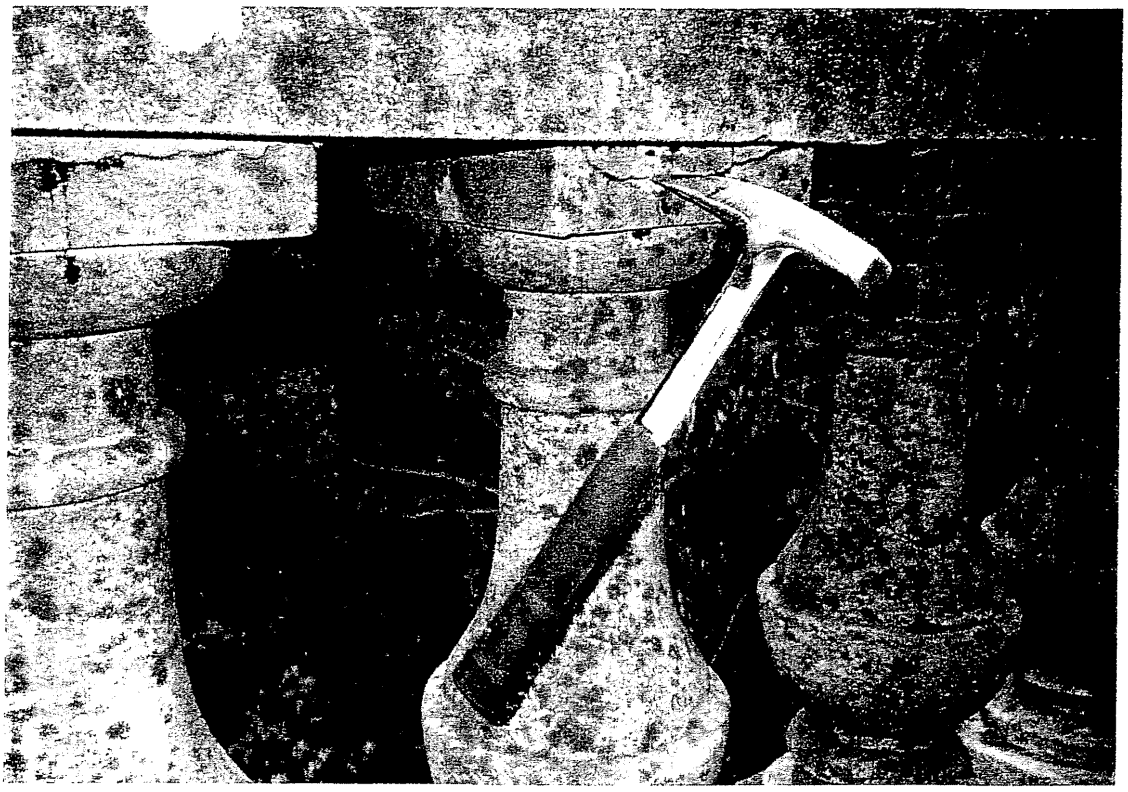


Photo 4 This photo show lthe cracking on the urn-style balusters. For lack of better analogy, we refer to it as "puzzle cracking" because in a majority of cases, the balusters are cracked into pieces yet retain shape by adhering (like puzzle pieces) to a single reinforcing bar which runs up the center of the baluster. Any structural strength the baluster may have ever had is entirely gone when this type of deterioration exists.

Photo 5 - This photo shows deterioration of the existing conduit that occurs in each rail post area. This damage essentially eliminates any possibility of reuse of the conduit.

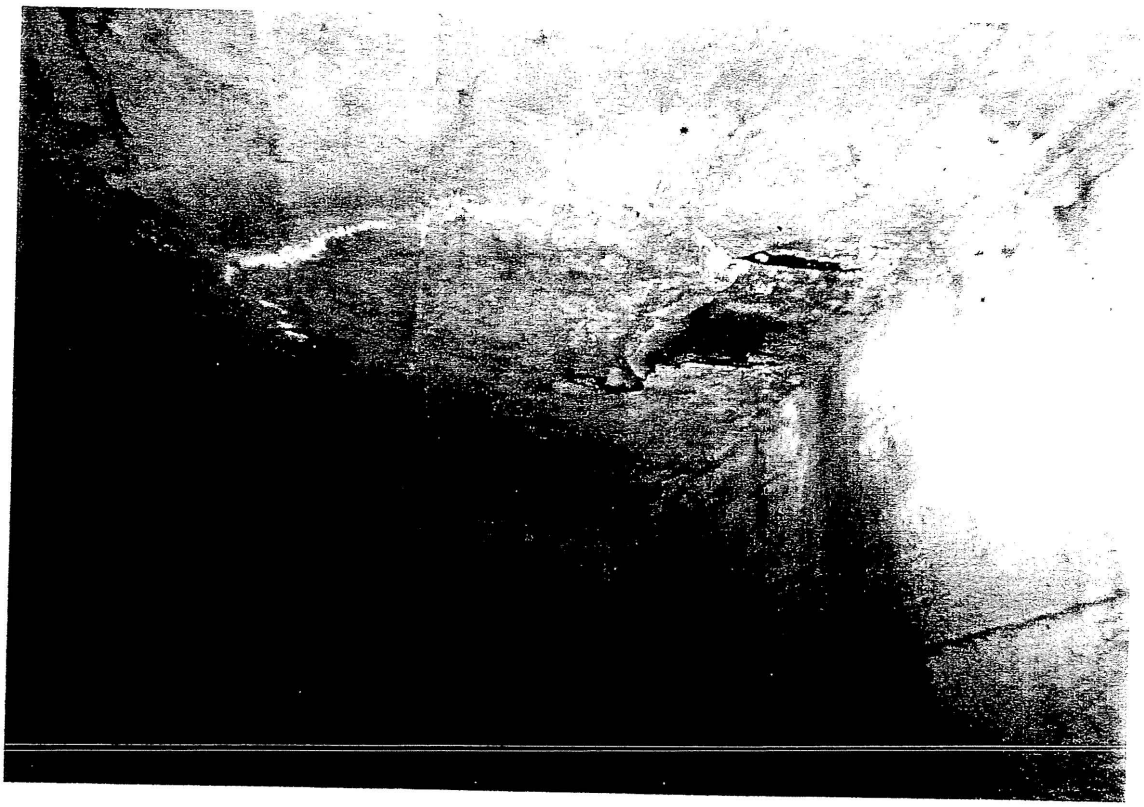


Photo 6 - This photo shows typical damage to the underside of the deck at the deck drain locations. Notice also (the discoloration) how the water has run on the lower bridge surfaces.

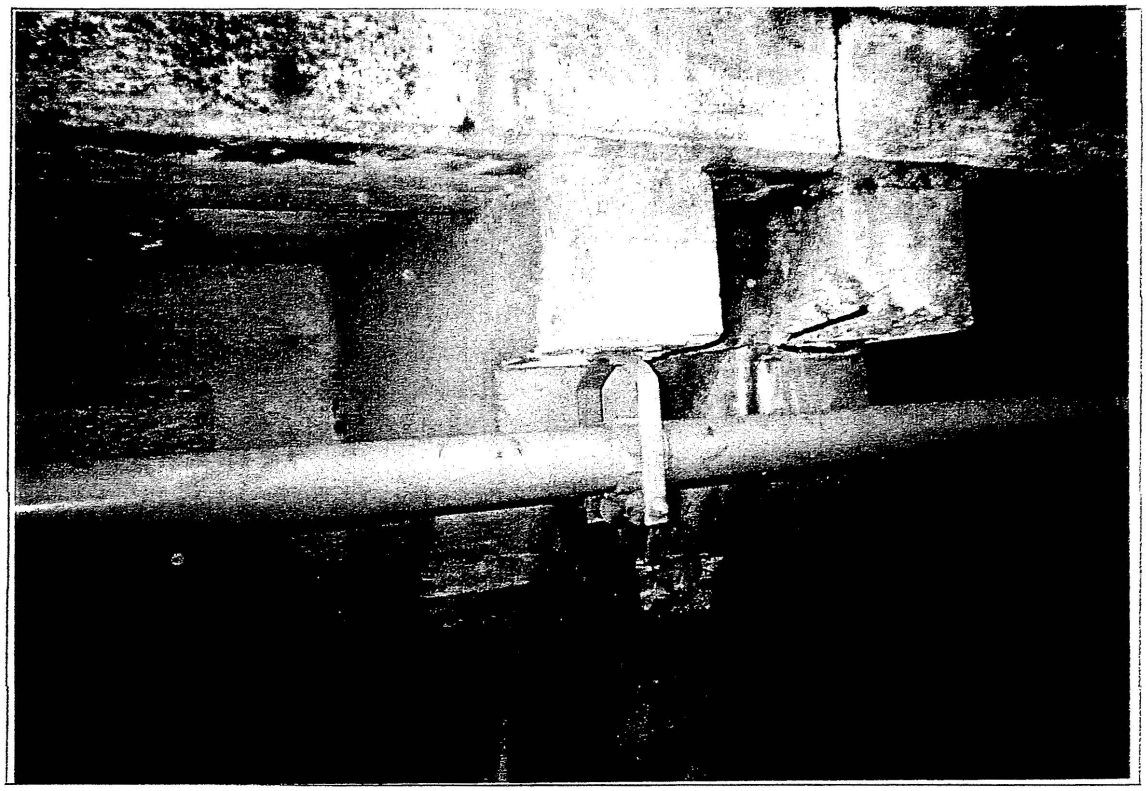


Photo 7 - This photo shows typical sidewalk bracket detail, this specific photo being taken at a bent location on the north side of the bridge, where a pair of brackets exists. Note the spalling of the bracket at areas of reinforcing steel corrosion. Notice, also, the gas main support required at all bracket locations along the north side.

Photo 8 - This is an additional photo of a broken bridge rail baluster showing the reinforcing steel that exists in the middle of each baluster. This reinforcing steel does not extend into either the top or bottom rail elements.

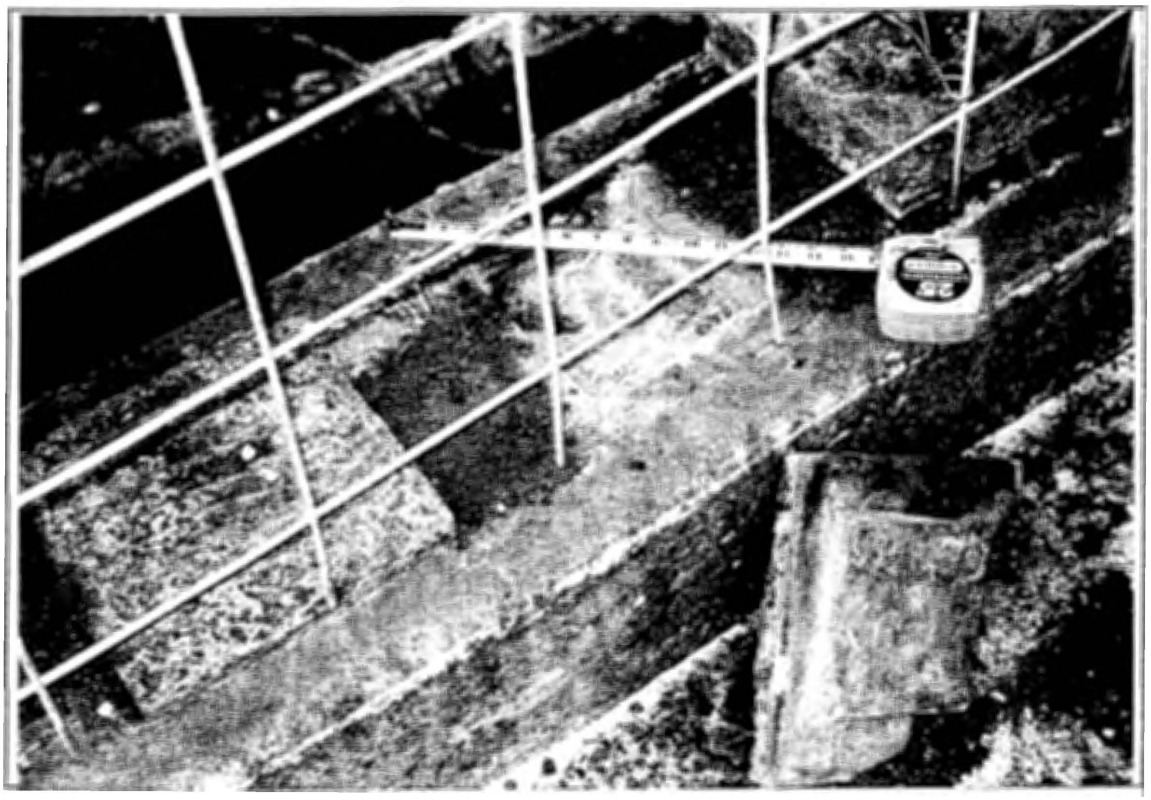


Photo 9 - This photo shows the bottom recess formed at the base of each existing urn-style baluster The structural aspects of the baluster are developed entirely by keying action in these recesses. It was probably done to allow simpler replacement of damaged balusters without affecting the upper or lower rail. This detail does not structurally develop enough restraint action to meet today's modern bridge rail standards.

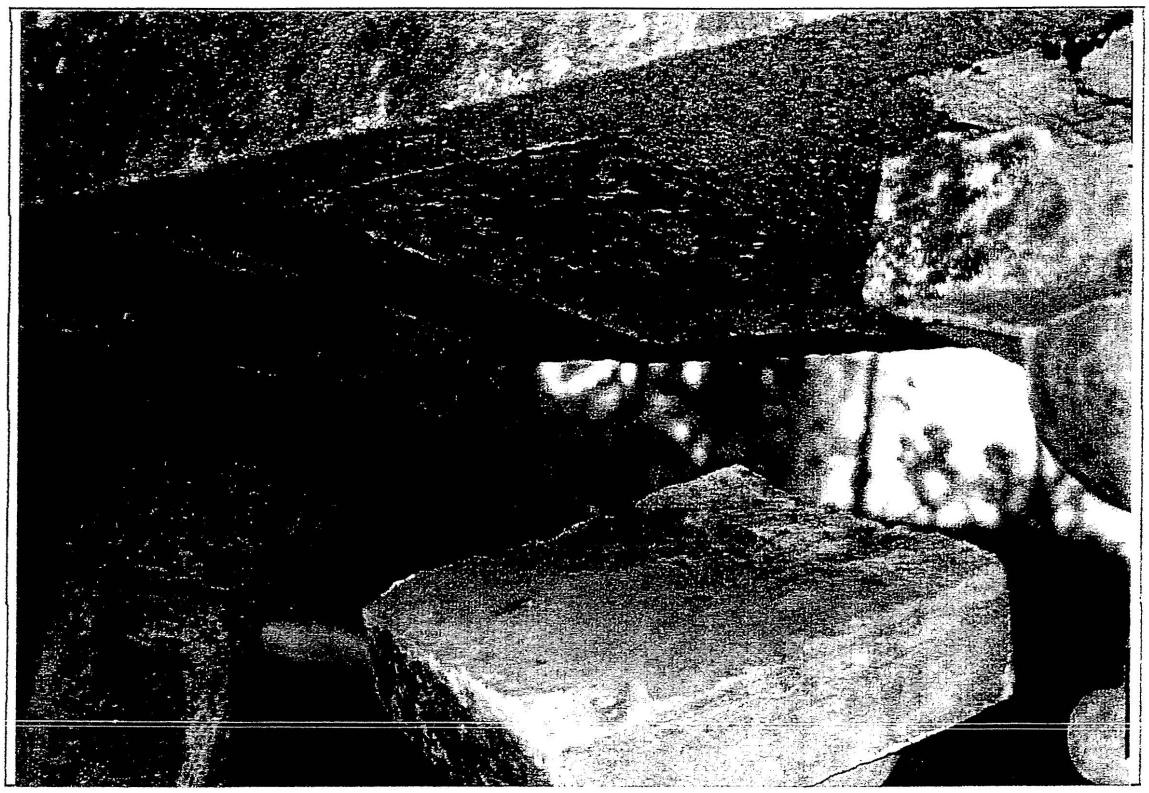


Photo 10 - This photo show the recess left on the underside of the top rail element (on a removed existing baluster). Notice the dry pack concrete left on top of the baluster. The recess apparently was formed in the top precast rail element, and the baluster top was dry-packed into postion into square key in the top rail element. Again this does not develop enough restraint for modern code.

Photo 11 - This photo looks at the upper portions of the column at the south end of the west abutment, near a deck drain. This photo shows typical concrete deterioration which has occurred when deck water has, for decades, been allowed to flow on the face of the substructure. This happens at drain locations an at deck joint locations.

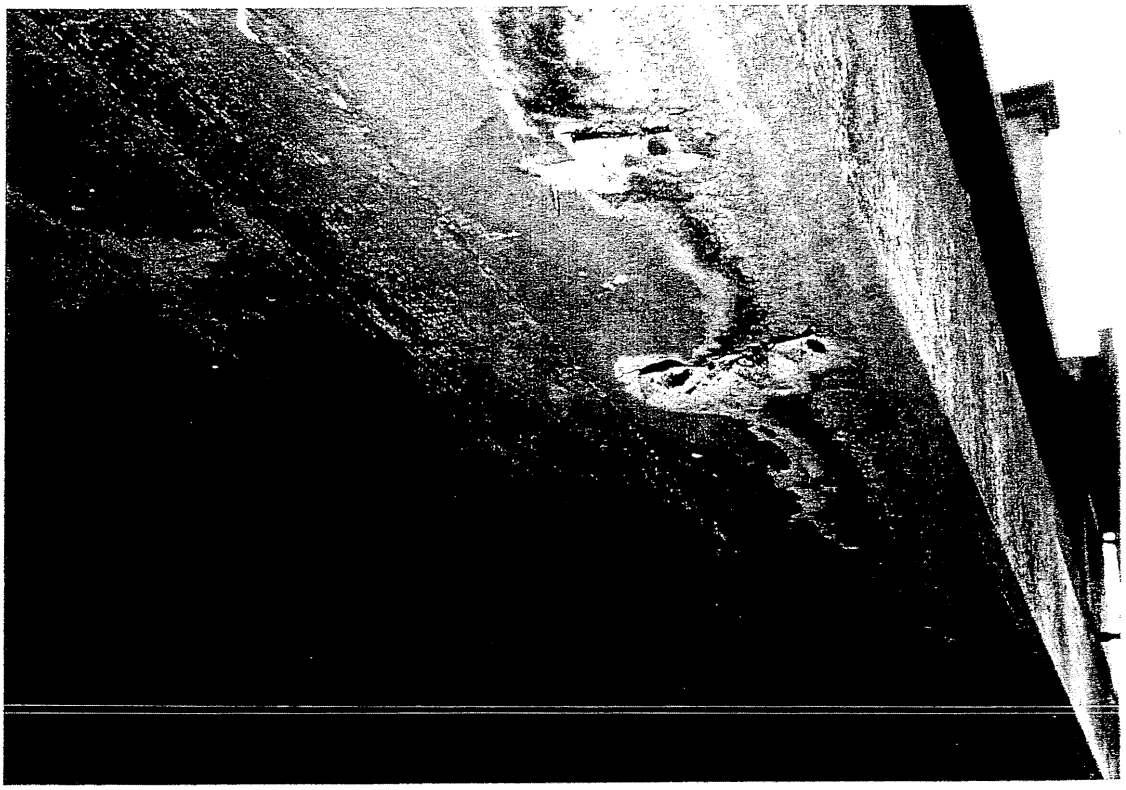
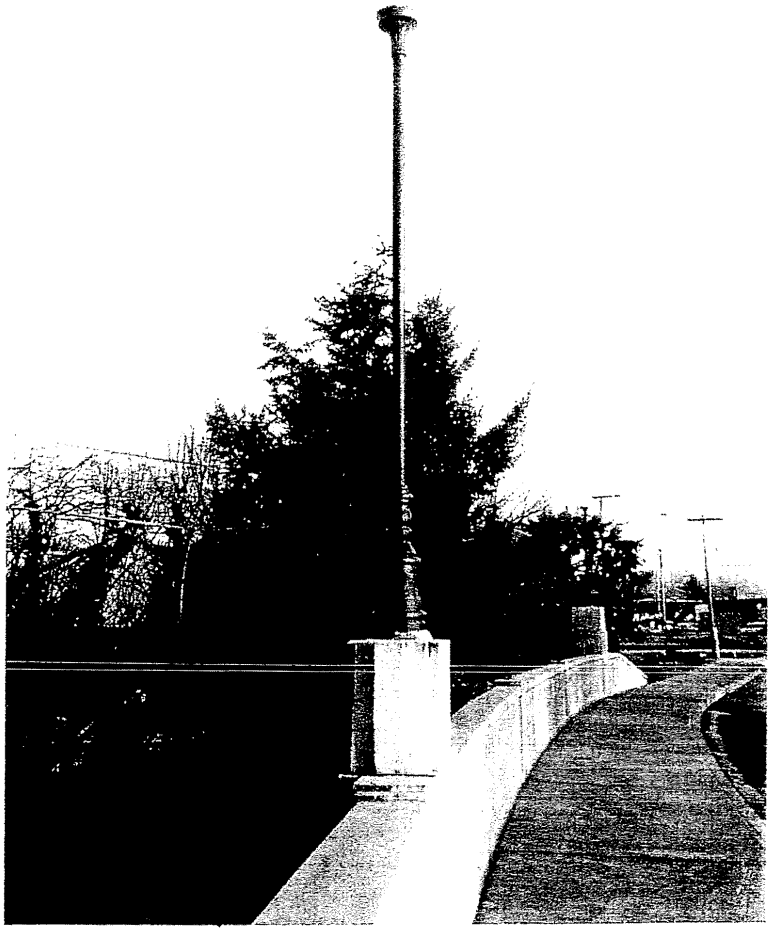


Photo 12 - This photo is looking up at the underside of the sidewalk girder, again showing concrete spalling a reinforcing steel corrosion. This probably occurred because insufficient concrete cover over the reinforcing steel. Typically, we see the cover in this specific detail to be about 1/2 to 3/4" on this bridge. It should be a minimum of 1.5" and preferably 2".

Photo 13- Show the metal lamp post used at Ehlan Road in the Aurora Historic District.

Photo 14 - This photo shows another view of the metal bridge rail posts used at Ehlan Road. The metal posts were about 9' tall, placing the lampsabout 15 to 16 feet above the bridge deck. It would probably be better to have the have the lamps located about 10' above the bridge deck. This is high enough to reduce vandalism, but low enough to impart warm, low-level light to the sidewalk.



OREGON DEPT OF TRANSPORTATION
BRIDGE INSPECTION REPORT

District	District 9	**Owner**	City or Municipal Highway Agency	**Bridge ID**	00464
Bridge Name	MILL CREEK	**County**	Wasco	**Fac Carried**	W 6TH STREET
Local Name		**Record Type**	1	**Mile Post**	0.59
Local ID		**Insp Freq**	24 Months	**Inspector 1**	Whiteman, Tom (C0031)
Suff Rating	57.90	**Insp Date**	06/08/00	**Inspector 2**	
AC Depth	2.0 in	**Bridge Length**	127.0 ft	**Bridge Width**	31.2 ft

Signature: T. M. L.

ELEMENT CONDITION STATES

Elem	Description	Env	Qty	Units	Element Condtion States 1	2	3	4	5	Temp
13	Conc Deck Unprt w/AC Olay	Moderate	4000	sqft	0%	100%	0%	0%	0%	N
110	Conc Open Girder	Moderate	500	ft	100%	0%	0%	0%	0%	N
155	Conc Floor Beam	Moderate	60	ft	100%	0%	0%	0%	0%	N
205	Conc Column/Pile Extn	Moderate	6	ea	83%	17%	0%	0%	0%	N
215	Conc Abutment	Moderate	2	ea	50%	50%	0%	0%	0%	N
331	Conc Bridge Railing	Moderate	264	ft	0%	0%	100%	0%	0%	N
359	SF - Deck Soffit	Moderate	8	ea	67%	22%	11%	0%	0%	N

APPRAISAL

Appraisal	NBI #	Rating

No appraisal records found.

NBI CATEGORY

Category	NBI #	Rating
Approach Condition		6 Satisfactory
Deck Wearing Surface		6 Satisfactory
Deck	58	6 Satisfactory
Superstructure	59	6 Satisfactory
Substructure	60	6 Satisfactory
Channel	61	6 Bank beginning to slump
Culvert/Retaining Walls	62	N Not Applicable

REMARKS

Element #	Bent/Span	Member ID	Deficiency Description
13	SP 1-4	DECK	DEEP RUTS AND POTENTINEL SPALL
13	SP 1-4	S WALK	MAP CRACKING IN SURFACE,SPALLS W/EXPOSED REBAR IN CURBS, MINOR TRANS. CRACKS UNDERNEATH
110	SP 1-4	GIRDER	HAIRLINE CRACKS IN GIRDERS. .
155	BT 2-4	FL BMS	RANDOM HAIRLINE CRACKS IN FLOORBEAMS.
205	BT 2-4	COLUMN	SOME MINOR SPALLING AND CRACKING EXISTS.
215	BENT 1	ABUT	VERTICAL CRACK 1/8" FULL HEIGHT OTHER RANDOM CRACKS.
215	BENT 5	ABUT	RANDOM HAIRLINE CRACKS IN BREASTWALL.
215	BT 1&5	W WALL	RANDOM CRACKING AND SPALLING OF CONCRETE.
331	SP 1-4	RAIL	NUMEROUS SPALLS AND EXPOSED CORRODED REBAR US&DS SIDES.
331	SP 2	RAIL	NUMEROUS PEDESTALS ARE BROKEN & MISSING ON US SIDE. SPAN 2 U/S RAIL HAS BROOKEN OFF TEMP. STEEL RAIL IN PLACE. EXPOSED REBARE AND SPALLS AT RAIL FASCIA
334	SP 2	RAIL	MISSING SEGMENT AT SPAN 2 - TEMP REPAIR
334	BT 3	RAIL	RAIL BRACKET AT BENT #3 - BOTTOM IS CRUSHED / SPALLS W/ EXPOSED REBARE
359	SP 1-4	SOFFIT	NUMEROUS SPALLS & EXPOSED CORRODED REBAR W/DELAMINATION. SEVERAL SPALLS W/ EXPOSED REBAR AND DELAM. UNDER BROKEN RAIL ON U/S SPAN 2

MAINTENANCE RECOMMENDATIONS

Crew #	Work Order	Priority	Elem #	Bent/ Span	Member	Work	Est Cost	Comp Date
			13	SP 1, 4	DECK	PATCH POTHOLES OR AC OVERLAY	0	
			215	BENT 5	APPR	WO_NO: CITY SEAL TRANSVERSE CRACKS & PAVE.	1500	
			215	BT 1	ABUT	WO_NO: CITY MONITOR CRACKING AND SPALLS.	0	
			331	SP 1-4	RAIL	WO_NO: CITY REPLACE RAILING.	25000	
			359	SP 1-4	SOFFIT	WO_NO: CITY MONITOR DELAMINATIONS & SPALLS	0	
			359	BT 3 D/S	SIDWALK	D/S, REPAIR SIDEWALK BRACKETS	1000	

LOAD RATING

Rating Date	01/19/95	**Posting Req**	(3) 10.0 - 19.9
Design Load	HS20	**OR Method**	Load Factor (LF)
Operating Rating	26.0 ton	**IR Method**	Load Factor (LF)
Inventory Rating	16.0 ton		

Truck	Operating Rating	Inventory Rating	% Below	Posting Required	Controlling Member	Actual Posting	Posting Date
Type 3	23.0		(4) 0.1 - 9.9	No	INT. GIRDER, SPAN 1 OF 4 V AT 1.0L	ton	
Type 3S-2	33.600000000000001		(3) 10.0 - 19.9	No	INT. GIRDER, SPAN 1 OF 4 V AT 1.0L	ton	
Type 3-3	36.799999999999997		(4) 0.1 - 9.9	No	INT. GIRDER, SPAN 1 OF 4 V AT 1.0L	ton	

LOAD RATING CONDITION COMPARISON CHART

Category	NBI #	Rating Condition	Current Condition
Approach Condition			6 Satisfactory
Deck Wearing Surface		2 in	6 Satisfactory
Deck	58	8 Very good	6 Satisfactory
Superstructure	59	7 Good	6 Satisfactory
Substructure	60	6 Satisfactory	6 Satisfactory
Temporary Repairs	103	No	No
Wearing Surface Thickness		8 Very good	2.0 in

INSPECTION SCHEDULE

Activity	Conducted On	Frequency	Next Inspection
Routine Inspection	06/08/00	Every 2 yr	06/08/02
X-Channel Profile	08/12/94	Every 10 yr	08/12/04

57.9 SUFF RATING Not Deficient or Obsolete

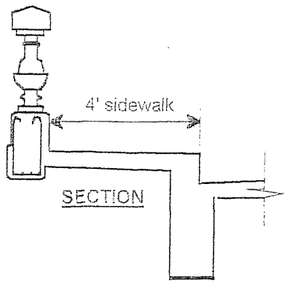
STRUCTURE AND INVENTORY APPRAISAL

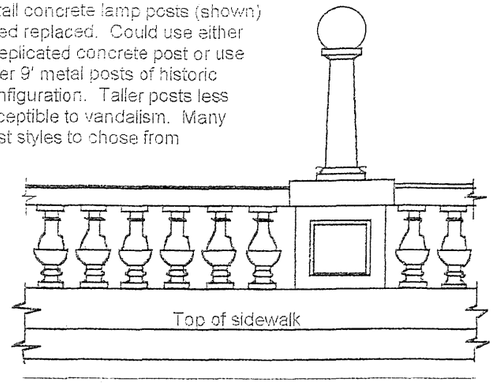
BRIDGE NO 00464
INSP DATE 06/00

(122) HIGHWAY/CO RD.	000000						
(2) HIGHWAY DISTRICT	9	(43) STRUCT MAIN	2 Concrete continuous 02 Stringer/Multi-beam or Girder	(92) CRITICAL FEAT INSP	DATE	(93) DATE	
(3) COUNTY	65	(44) STRUCT APPR	0 Other 00 Not Applicable	(A) FRACTURE CRIT	n 00	2000	
(4) CITY	13425	(45) NUMBER MAIN SPANS	4	(B) UNDERWATER INSP	n 00	2000	
(5) INVENTORY ROUTE	151000000	(46) NUMBER APPR SPANS	0				
(6) FEATURES INT	MILL CREEK	(47) HORIZONTAL CLEARANCE	20.2	(94) COSTOF IMPROVEMENT		509000.0	
(7) FACILITY CARRIED	W 6TH STREET	(48) MAXIMUM SPAN LENGTH	40.0	(95) ROADWAY IMPROVEMENT		53000.0	
(8) STRUCTURE NUMBER	00464 000000059	(49) STRUCTURE LENGTH	127.0	(96) PROJECT COST		585000.0	
(9) LOCATION	CITY OF THE DALLES	(50) SIDEWALK WIDTH	LT 4.0 RT 4.0	(97) YR OF IMPROVEMENT		1996-01-01 00:00:00	
(10) VERT CLEARANCE	100.0 ft	(51) BRIDGE ROADWAY WIDTH	20.2	(98) BORDER BR ST-CODE		%	
(11) MILEPOINT	0.59	(52) DECK WIDTH	31.2	(99) BORDER STRUCTURE NO			
(16) LATITUDE	45.6033 N	(53) VERT CLEAR OVER DECK	100.0 ft	(100) DEFENSE HIGHWAY		0	
(17) LONGITUDE	120.1933 W	(54) VERT CLEAR UNDER DECK CD	0.00 ft	(101) PARALLEL STRUCTURE		N	
(19) BYPASS DETOUR	1.0	(55) MIN LAT UNDERCLEAR CD	N RT 0.0	(102) DIRECTION OF TRAFFIC		2	
(20) TOLL	3 On free road	(56) MIN LAT UNDERCLEAR	LT 0.0	(103) TEMPORARY STRUCTURE		0	
(21) CUSTODIAN	04 City or Municipal Highway Agency			(104) HIGHWAY SYSTEM		0	
		*** CONDITION ***					
(22) OWNER	04 City or Municipal Highway Agency			(106) YEAR RECONSTRUCTED			
(26) FUNC CLASS	16 Urban Minor Arterial	(58) DECK	6	(107) DECK STRUCTURE		1	
(27) YEAR BUILT	1920	(59) SUPERSTRUCTURE	6	(108) WEARING SURFACE		600	
		(60) SUBSTRUCTURE	6				
(28) LANES ON 2	LANES UNDER 0	(61) CHANNEL	6	(109) TRUCK ADT		10.0%	
(29) AVERAGE DAILY TRAFFIC	12800	(62) CULVERT	N	(110) DESIGNATED NATIONAL NETWORK		0	
(30) YEAR OF ADT	1998	(64) OPERATING RATING	26.0	(111) PIER PROTECTION			
		(66) INVENTORY RATING	16.0				
(31) DESIGN LOAD	5 HS20			(112) NBIS BRIDGE LENGTH		Y	
(32) APPROACH ROADWAY	21.0 ft	*** APPRAISAL ***		(113) SCOUR CRITICAL BRIDGE			
(33) BRIDGE MEDIAN	0 None			(114) FUTURE ADT		20608.0	
		(67) STRUCTURE CONDITION					
(34) SKEW	0	(68) DECK GEOMETRY		(115) YEAR OF FUTURE ADT		2018	
(35) STRUCTURE FLARED	0	(69) UNDERCLEARANCE		(116) VERT-LIFT CLEARANCE		0.0	
(36) TRAFFIC SAFETY FEATURE		(70) POSTING	3				
(37) HISTORICAL SIGNIFICANCE	4	(71) WATERWAY ADEQUACY		*** STATE INFORMATION ***			
(38) NAVIGATION CONTROL	0	(72) APPR RDWY ALIGNMENT		(117) EST MAINT COST			
(39) NAVIGATION VERT CLEAR	0.0	(75) TYPE OF WORK	1 Done by contract	(118) CULVERT LENGTH		ft	
				(119) CULVERT INSIDE HEIGHT		ft	
(40) NAVIGATION HORZ CLEAR	0.0	(76) IMPROVEMENT LENGTH	130.0	(120) INSPECTOR NUMBER		Whiteman, Tom (C0031)	
(41) OPEN STATUS	B	(90) INSPECTION DATE	0600	(121) MAINTENANCE NOTES			
(42) TYPE SERVICE	5 Highway-pedestrian 5 Waterway	(91) INSPECTION FREQUENCY	24 MO				

(12) BASE HIGHWAY NETWORK	0	(63) OPER RATING METHOD	1
(13) LRS INVENTORY ROUTE		(65) INV RATING METHOD	1
(105) FEDERAL LANDS HWY			

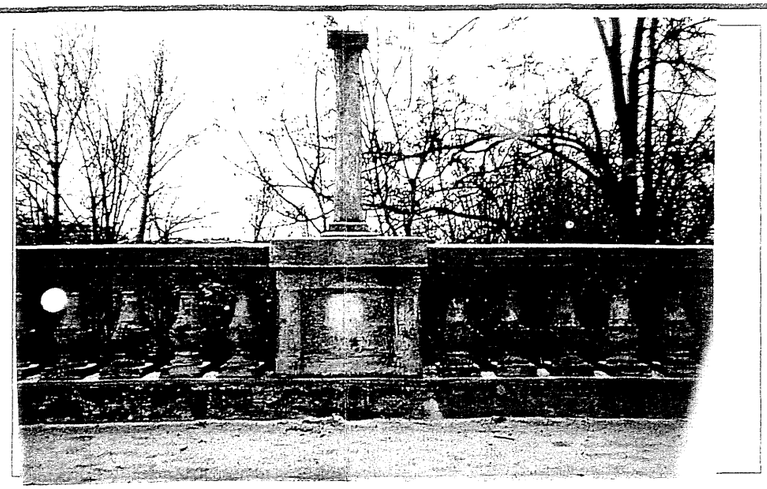
4' tall concrete lamp posts (shown) need replaced. Could use either a replicated concrete post or use taller 9' metal posts of historic configuration. Taller posts less suceptible to vandalism. Many post styles to chose from





ELEVATION VIEW OF EXISTING BRIDGE RAIL

This bridge rail not crash tested, meets no traffic rail standard, meets handrail structural standards only if more rail posts are added when rebuilt, balaster spacing provides too large openings to meet code. (in excess of 6")

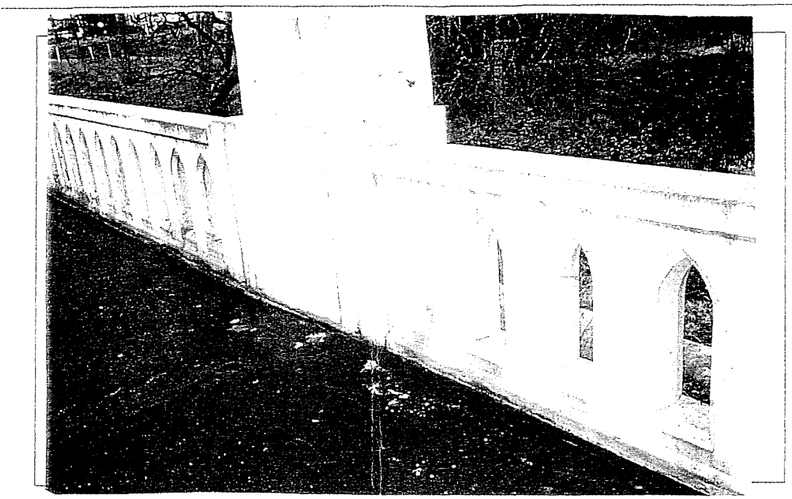


ELEVATION VIEW OF CIP ARCH BRIDGERAIL

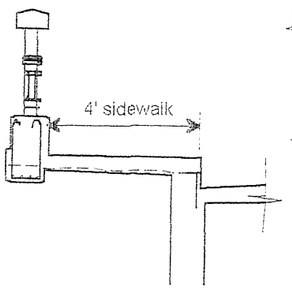
Used at Aurora Historic District

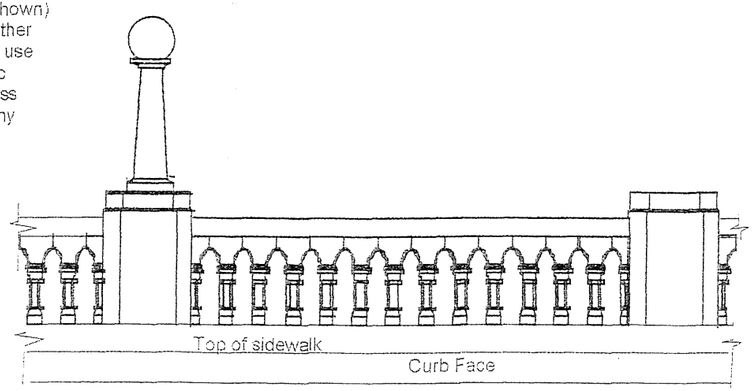
This rail is cast monolithlically with the sidewalk curb. Meet traffic rail standards and is crash-tested for 25 mph curb-protected use (Level T1 crash test). 6" opening widths.

Notice the steel posts (about 9' tall) They are capped with high pressure sodium lamps (50 watt) in plastic globes. These could be used instead of the 4' high concrete lamp posts.

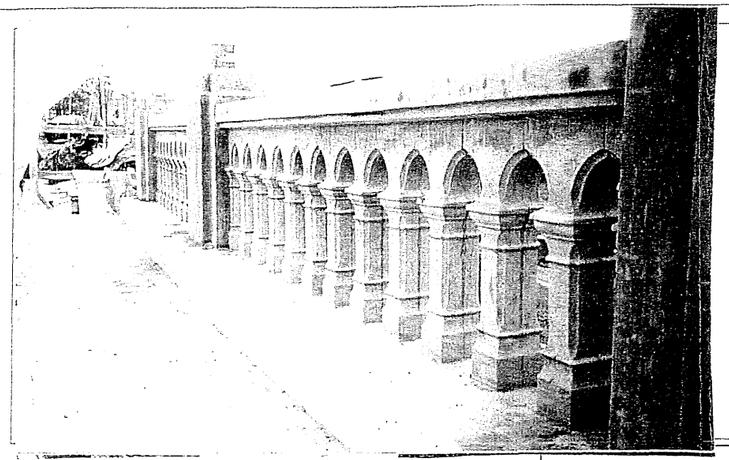


4' tall concrete lamp posts (shown) need replaced. Could use either a replicated concrete post or use taller 9' metal posts of historic configuration. Taller posts less suceptible to vandalism. Many post styles to chose from





ELEVATION VIEW OF PRECAST TEE ARCH BRIDGE RAIL



Used as photographed in reconstruction of the Ross Island Bridge

This bridge rail is meets traffic standard if curb-protected, 25 mph traffic. The balusters are precast in ornate "tee shape segements" that are field cast into the upper and lower rail members. Meets pedestrial rail structural and literal stands

Scale Note

1" Measures 1" on original drawing
If line does not measure as 1", adjust scales accordingly

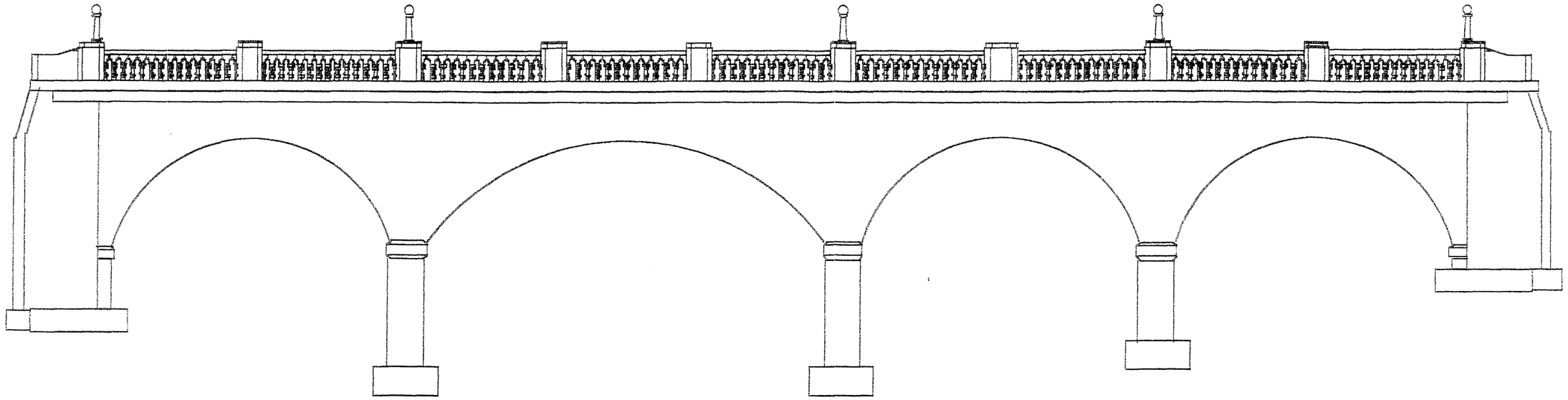
McGee Engineering.
3933 Sitka Place
Corvallis, OR 97330
Phone: 541/757/9833

City of The Dalles, OR

W. 6th Street Bridge Repair

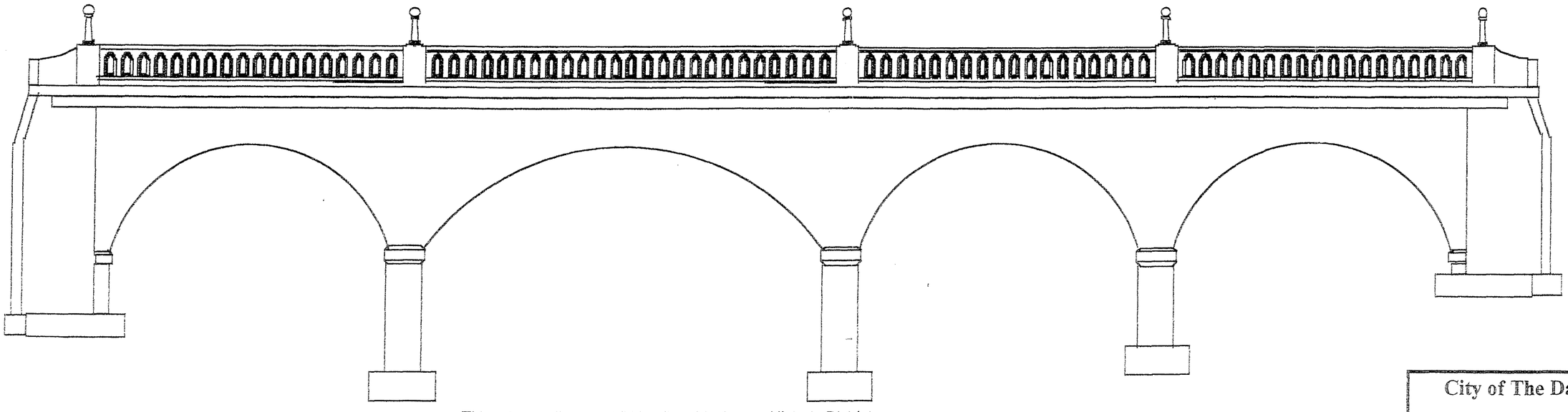
Prelim.Plan & Elev.

Design:	D. McGee	Sht 1
Date:	01/01	



(This bridge rail is used at the Ross Island Bridge renovation)

Elevation View Using Precast Tee Arch Bridge Rail (Type 2)



This bridge rail used at Ehlan Road in Aurora Historic District

Elevation View Using CIP Arch Bridge Rail (Type 3)

Scale Note

1" — Measures 1" on original drawing
If line does not measure as 1", adjust scales accordingly

McGee Engineering
3933 Sitka Place
Corvallis, OR 97330
Phone: 541/757/9833

City of The Dalles, OR

W. 6th Street Bridge Repair

Prelim.Plan & Elev.

Design:	D. McGee	Sht 2
Date:	01/01	

FAX MEMO

McGee Engineering
3933 Sitka Place
Corvallis, OR 97330
Fax: (541) 758-6585

From: Dennis McGee
Date/Time: February 22, 2001
To: Dale McCabe @ The City of the Dalles Pub. Wks.

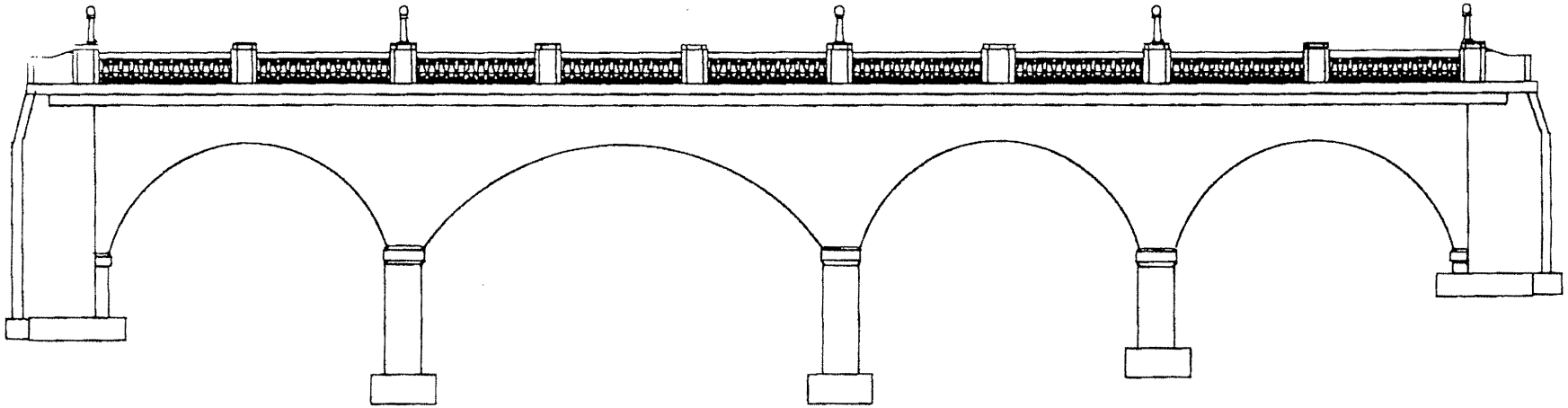
RE: Urn Style Baluster Bridge Rail
Dale,

The attached excerpts from the plans were reduced to faxable size. It is hard to get good detail in such a small drawing. I excerpted a portion of a larger detail to let you get a better idea of the scale of the balusters. Call me if there are questions

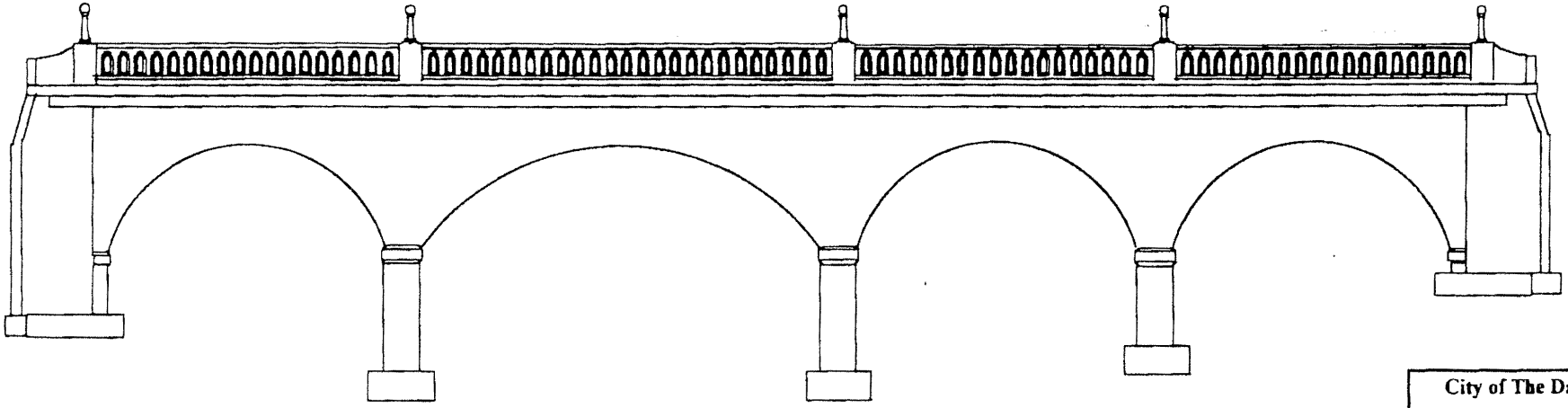
There are four end posts, ten lights, 16 interior posts , 228 urn-style balusters, in the bridge rail. This is about 140% more balusters than the existing bridge has due to the need to tighten spaces to meet pedestrian safety standards.

Please contact me if you need more information

Dennis McGee
(541)757-9833



Elevation View Using Urn Style Balusters



This bridge rail used at Ehlan Road in Aurora Historic District

Elevation View Using CIP Arch Bridge Rail (Type 3)

Scale Note

1" Measures 1" on original drawing
If line does not measure as 1", adjust scales accordingly

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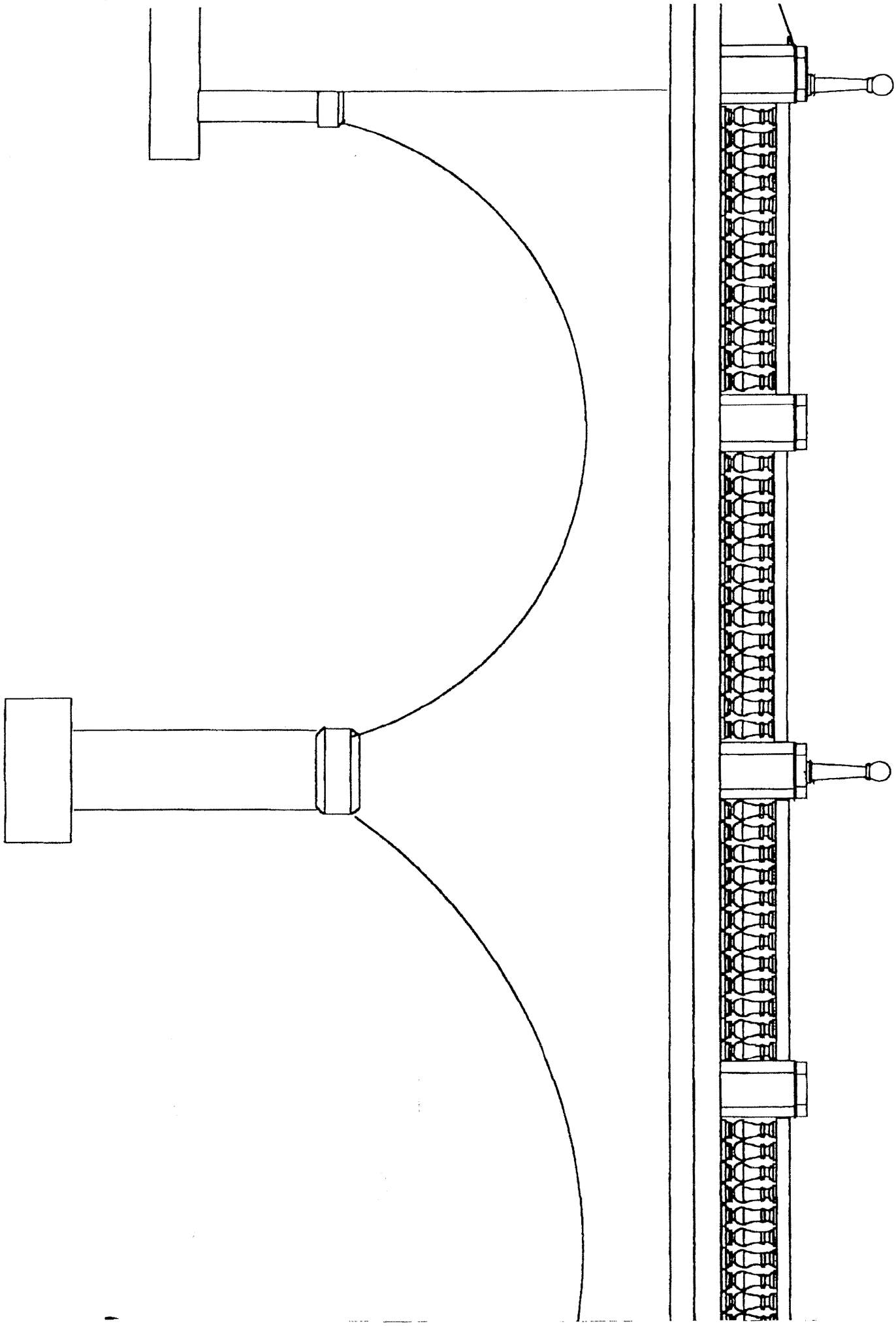


McGee Engineering

3933 Sitka Place, Corvallis, OR 97330
Fax: (541)758-6585 Phone: (541)757-9833
bridgeman6@juno.com

February 18, 2001

City of The Dalles, Oregon
1900 West 6th Street
The Dalles, OR 97058

Attn: Dale McCabe, P.E.

RE: Additional bridge rail information to supplement the Technical Report

This week, we have visited several bridge sites throughout Western Oregon and the Columbia Gorge Scenic Highway to further our knowledge of bridge rail types. We have included details and photos of some of the observed bridge rails in the attachments. Some of these systems could be utilized on the West 6th Street Bridge if one of the adequate rail systems became the preference of the review committee.

The urn-style balusters forming the existing balustrade bridge rail on the W. 6th Street Bridge could be replicated, with modifications such as a 9" high curb, to meet current standards for urban low-speed streets. It is our understanding that the City is interested in this type of replication. It would remain to be shown by Civil Construction that this style of handrail can be constructed for a reasonable cost. The bridge rail will need at least 10 more posts (five on each side) than the current bridge rail, as the maximum rail span attainable for the pedestrian loading is 15'. Currently there are three interior posts and the two flared end posts on each side, with rail spans of 28' and 40'.

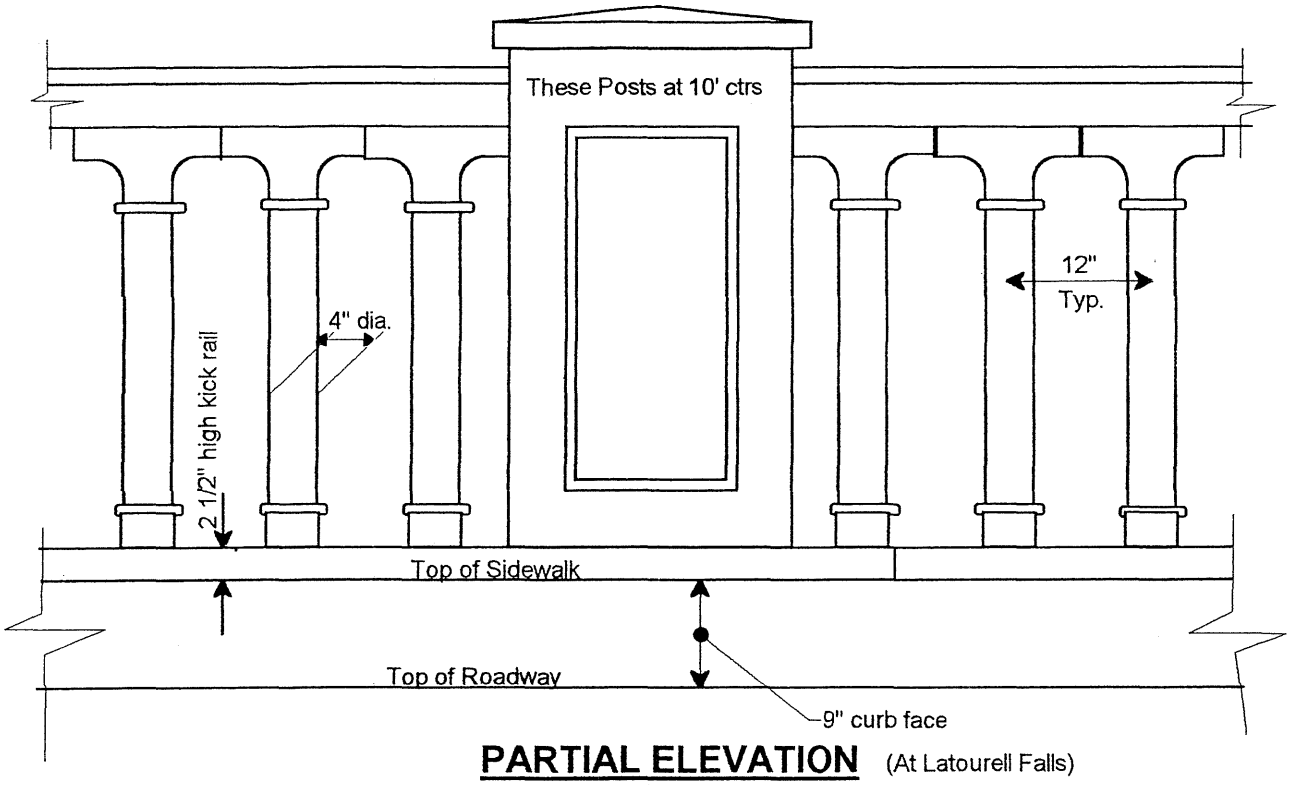
We are continuing with plans for the demolition phase of the work. We will await your responses to the bridge rail selection before completing plans for the new sidewalk rail. If you have any questions, please contact us.

Sincerely,

Dennis M. McGee, P.E.

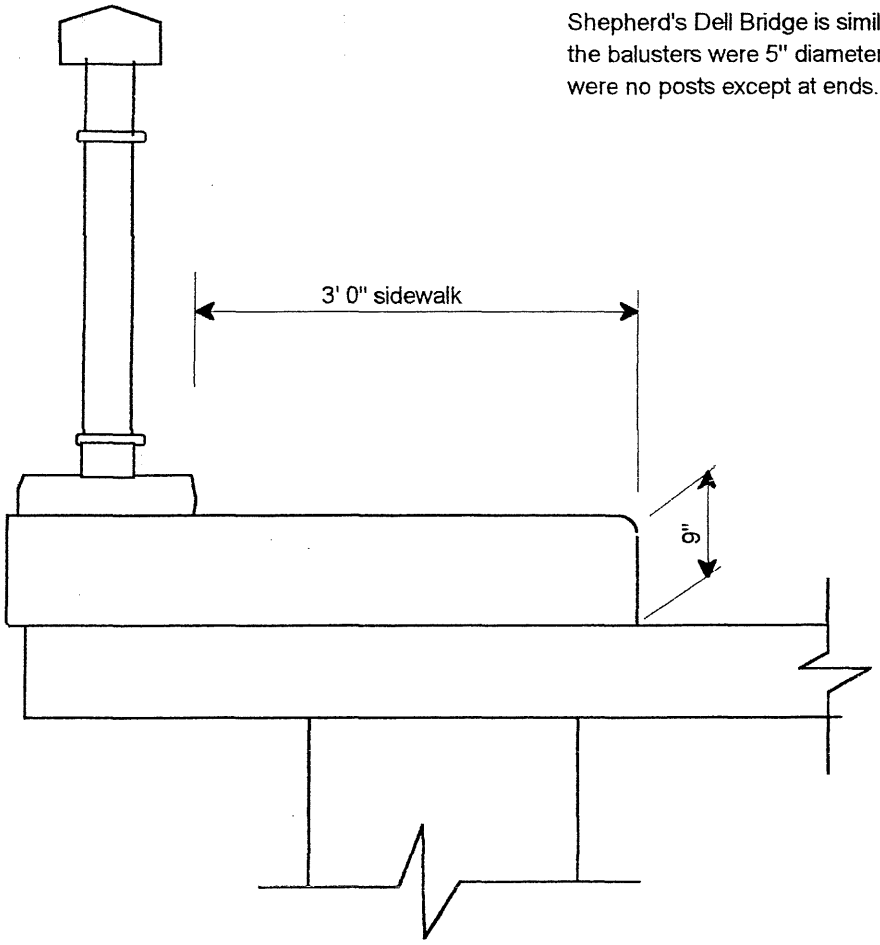
Enclosures:

Two 8 x 11 pages of historic bridge rail drawings (Multnomah Falls and Latourell Falls)
Three 8 x 11 pages of photographs of historic bridge rails.



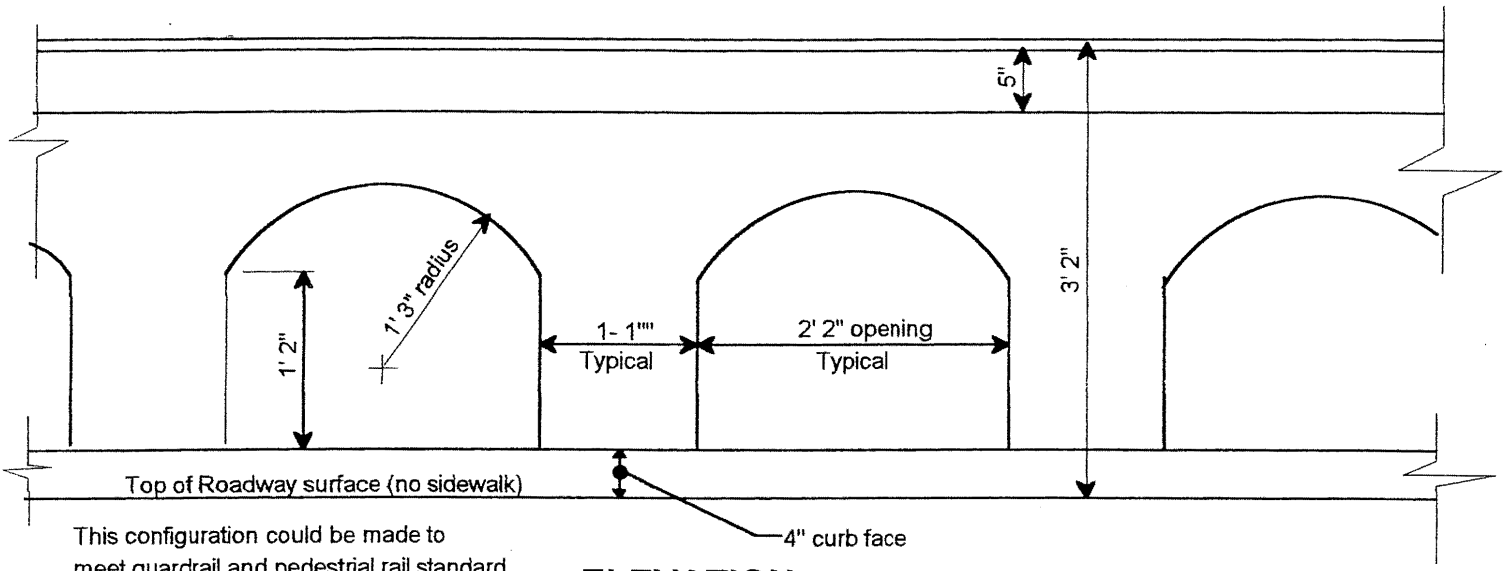
PARTIAL ELEVATION (At Latourell Falls)
Scale: 3/4" = 1' 0"

Shepherd's Dell Bridge is similar, but the balusters were 5" diameter and there were no posts except at ends.



PARTIAL SECTION (At Latourall Falls)
Scale: 3/4" = 1' 0"

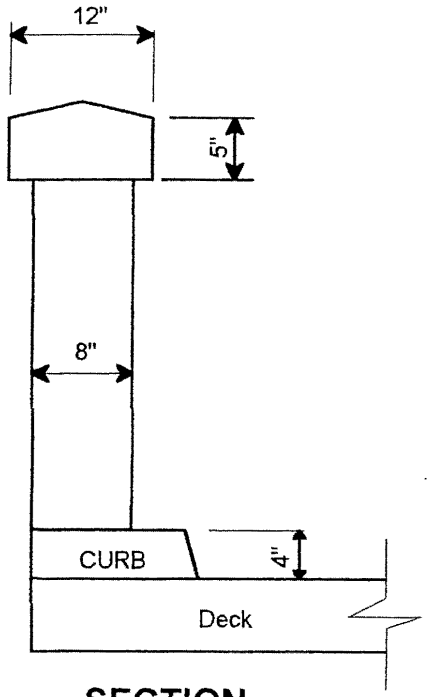
LATOURELL FALLS BRIDGE RAIL



This configuration could be made to meet guardrail and pedestrial rail standard.

ELEVATION

Scale: 3/4" = 1' 0"



SECTION

Scale: 3/4" = 1' 0"

Lower Bridge at Multnomah Falls

Scale: 3/4" = 1' 0"

MULTNOMAH FALLS BRIDGE RAIL

This is the bridge rail shown at the bridge at Latourrel Falls (Guy Webster Talbot Wayside). This has precast balusters (4" diameter concrete) at 12 " ctrs with rail posts at 10' centers. This guardrail could be replicated' to meet pedestrian rail standards and bridge rail standard at the West 6th Street Bridge.

This is the bridge rail at Shepherds Dell Bridge. It is similar to the bridge rail at Latourell Falls, but has 5" diameter balusters. It is very questionable if this bridge rail could be configured to meet even a pedestrian rail standard. It has no bridge rail posts and depends entirely on the balusters for post action. It almost certainly would never meet a bridge rail standard.

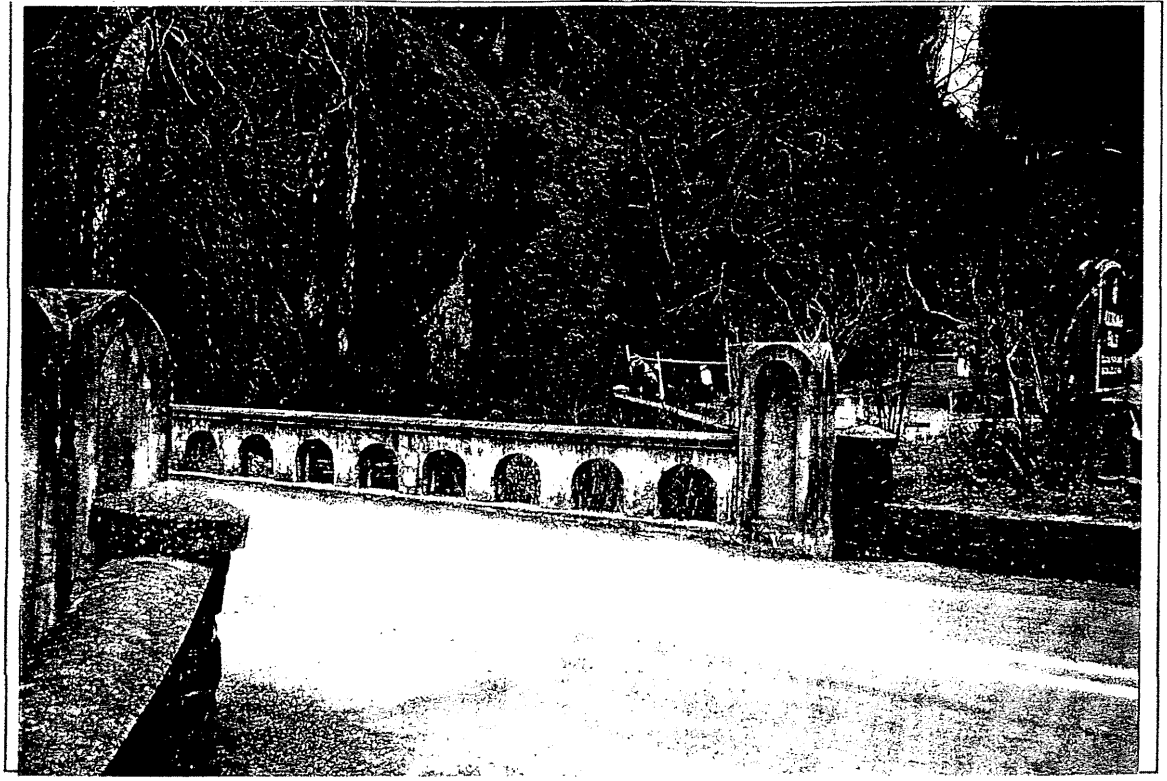
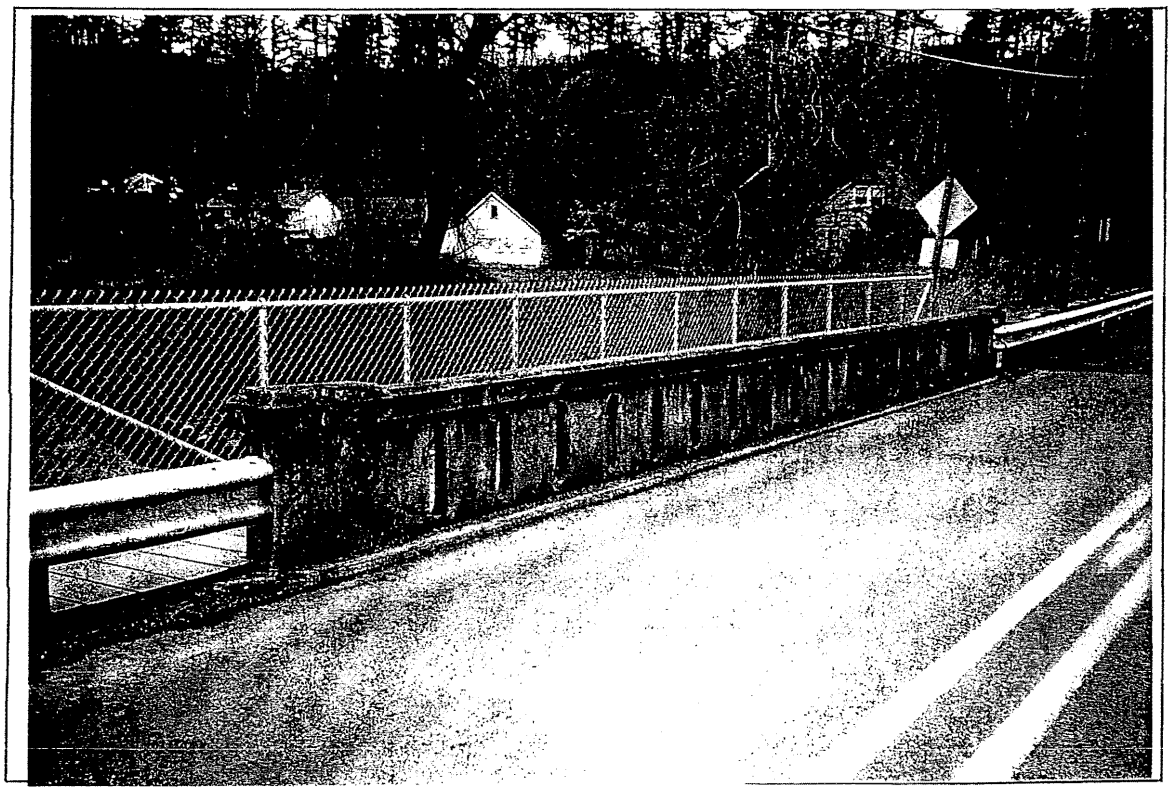


Photo at Multnomah Falls, lower bridge near walkway to restaurant and gift shop. This rail had no sidewalk. This bridge rail could be made to accomodate both bridge rail and pedestrian rail specifications. The openings are presently so wide that some form of accomodation would have to be made to close in the opening. At the coast, (Hwy 101 over the Rogue River), openings which are too wide were closed in by embedding smooth steel rods (epoxy anchored) to make the openings smaller. The steel rods are not visually noticable in that application. This is the rail shown on original W. 6th Street Bridge plans.



Bridge Rail on the Columbia Gorge Scenic Highway just east of Troutdale. This bridge rail could be made to meet all standards for bridge rail and pedestrian rail.