PENNSYLVANIA PUBLIC UTILITY COMMISSION
Uniform Cover and Calendar Sheet

1. REPORT DATE:	January 10, 1986	2. BUREAU AGENDA NO.	JAN-86-ALJ-39
3. BUREAU:	ALJ		
4. SECTION(S):		5. PUBLIC MEETING DATE:	January 29, 1986
6. APPROVED BY:	Chief ALJ: William H. Smith Director: Ext. 7-6108 Supervisor:		
7. MONITOR:			
8. PERSON IN CHARGE:	ALJ Gesoff 8-645-3550		
9. DOCKET NO:	C-844440		

10. (a) CAPTION (abbreviate if more than 4 lines)
(b) Short summary of history & facts, documents & briefs
(c) Recommendation

(a) Pennsylvania Department of Transportation v. Consolidated Rail Corporation, Snyder Township, Blair County, and The Bell Telephone Company of Pennsylvania

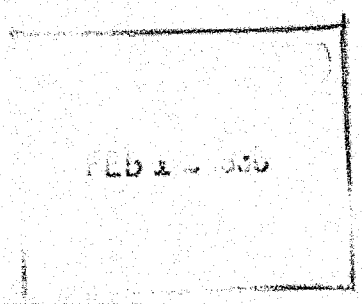
(b) Complaint filed November 2, 1984 alleging bridge carrying State Highway Route 55 above Conrail tracks in Snyder Township, Blair County suffers from deterioration due to lack of preventative maintenance. Conrail answer filed November 21, 1984 denying it is responsible for maintenance. Hearing held June 26, 1985 in Hollidaysburg. No briefs filed.

(c) ALJ Gesoff issued a Recommended Decision sustaining the complaint, directing (1) PennDOT to perform an evaluation study of the bridge deck, (2) that the bridge be posted for a weight limit of 12 tons for single unit vehicles and 20 tons for combination vehicles, (3) that Conrail make repairs and maintain the bridge, (4) that Conrail and PennDOT split the repair costs 85%/15%, and (5) that further hearing be held after PennDOT's study is submitted.

Recommended Decision served: December 3, 1985.
Exceptions filed by: Pennsylvania Department of Transportation, December 18, 1985.

11. MOTION BY: Commissioner Fischl — Commissioner Chm. Taliaferro - Yes
Commissioner
SECONDED: Commissioner Shane — Commissioner

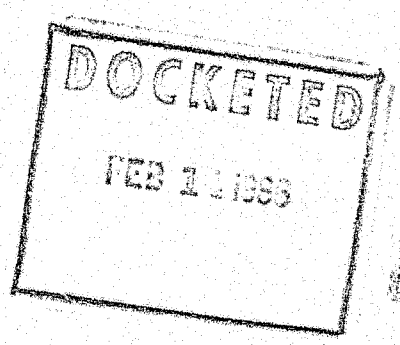
CONTENT OF MOTION: That the Decision of ALJ Gesoff be adopted as the action of the Commission.



COMMONWEALTH OF PENNSYLVANIA
PENNSYLVANIA PUBLIC UTILITY COMMISSION
P. O. BOX 3265, HARRISBURG, Pa. 17120
February 10, 1986

IN REPLY PLEASE
REFER TO OUR FILE

C-844440



To All Parties

Pennsylvania Department of Transportation
v.
Consolidated Rail Corporation, Snyder Township, Blair County, and The Bell Telephone Company of Pennsylvania

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To Whom It May Concern:

This is to advise you that an Order has been adopted by the Commission in public meeting held January 29, 1986.

A Copy of an Order has been enclosed for your records.

Very truly yours,

Jerry Rich, Secretary

lg
Encls.
Cert. Mail

Copy of Order to: See Initial Decision Letter dated December 3, 1985.

PENNSYLVANIA
PUBLIC UTILITY COMMISSION
Harrisburg, PA 17120

Public Meeting held January 29, 1986

Commissioners Present:

Linda C. Taliaferro, Chairman
Frank Fischl
Bill Shane

Pennsylvania Department of
Transportation

v. C-844440

Consolidated Rail Corporation,
Snyder Township, Blair County,
and The Bell Telephone Company
of Pennsylvania

O R D E R

BY THE COMMISSION:

We adopt as our action the Recommended Decision of Administrative Law Judge Larry Gesoff dated November 18, 1985, and that Exceptions be denied; THEREFORE,

IT IS ORDERED:

1. That the Complaint of Pennsylvania Department of Transportation at C-844440 is sustained.

2. That Pennsylvania Department of Transprtation, at its initial cost and expense, within six months of the date of service of the Commission's order, perform and submit to all parties of record and to this Commission, an evaluation study of the bridge deck:

(a) to determine the chloride concentration in the deck concrete, the structural integrity of the deck and whether or not the deck should be replaced. If so, the estimated cost of said work;

(b) to determine whether the curbs and sidewalks should be repaired or eplaced and the estimated cost;

(c) to present plans and cost estimates for the installation of a "Jersey type" or other appropriate safety barrier to protect the trusses from the impact of vehicles;

(d) to ascertain if federal funds or funds from other sources will be available for rehabilitation of the deck, and if so, the percentage that would be paid by those funds;

(e) to determine the cost of installing an impermeable membrane on the deck, if the old deck is to remain;

(f) an evaluation on the removal of all concrete encasement to increase the load carrying capacity of the bridge and what that capacity would be, as well as the estimated cost of painting the steel members which would be exposed by removal of the concrete encasement.

3. That Pennsylvania Department of Transportation, at its sole cost and expense, install and maintain at appropriate locations on each end of the bridge and on the highway approaches, signs which restrict the weight limit on the bridge to 12 tons for single unit vehicles and 20 tons for combination vehicles.

4. That Consolidated Rail Corporation, at its initial cost and expense, within one year of the service of the Commission's order, provide all materials and perform all work necessary to complete the following repairs:

(a) repair the hole in the pavement at the northeast corner of the bridge. This will include repairs to the concrete backwall at this location.

(b) clean and paint all exposed structural steel.

(c) monitor the expansion joint in the southwest wingwall for further lateral displacement.

(d) stabilize the erosion at the southeast and northwest embankments.

(e) remove debris and vegetation which has accumulated on the superstructure.

(f) remove all debris from around the beam expansion bearings.

5. That until further order of this Commission, Consolidated Rail Corporation, at its sole cost and expense, maintain the entire bridge sturcture, exclusive of the bituminous paving on the superstructure.

6. That until further order of this Commission, Pennsylvania Department of Transportation, at its sole cost and expense, maintain both highway approaches to the bridge and the bituminous paving on the superstructure.

7. That upon completion of the repairs ordered in Paragraph No. 4, Pennsylvania Department of Transportation, when and as certified by this Commission, pay to Consolidated Rail Corporation a sum or sums of money equal to 15% of the actual cost of work performed and material furnished by Consolidated Rail Corporation.

8. That Consolidated Rail Corporation bear the remaining 85% of cost it incurred in complying with Paragraph No. 4 above.

9. That upon submission of PennDOT's study, further hearing be held to consider said study and additional repairs to be completed such as repair or replacement to the expansion dams and beam expansion bearings.

BY THE COMMISSION,

Jerry Rich
Secretary

(SEAL)

ORDER ADOPTED: January 29, 1986

ORDER ENTERED: February 10, 1986

CONRAIL

October 13, 1986

Jerry Rich, Secretary
Pennsylvania Public Utility Commission
Room G-18
North Office Building
Harrisburg, PA 17120

RE: Pennsylvania Department of Transporation v. Consolidated Rail Corporation, Snyder Township, Blair County, and The Bell Telephone Company of Pennsylvania; Pa.PUC C-844440; Law Department File No. MPCB 111

Dear Mr. Rich:

Attached for filing and for the consideration of the Commission are an original and two copies of Consolidated Rail Corporation's Petition for Modification of the Order entered on February 10, 1986, in this proceeding.

I hereby certify that a copy of this Petition has been served this date upon each of the persons set forth below by first class, United States mail, properly addressed, and with postage prepaid.

Very truly yours,

Daniel F. Donovan
Senior General Attorney

1138 Six Penn Center Plaza
Philadelphia, PA 19103
(215) 977-5016

DFD/cmt

cc: Steven F.J. Martin, Assistant Counsel
Pennsylvania Department of Transportation
521 Transportation and Safety Building
Harrisburg, PA 17120

Richard S. Herskovitz, Esquire
Assistant Counsel
Pennsylvania Public Utility Commission
P.O. Box 3265
Harrisburg, PA 17120

Merle K. Evey, Esquire
401 Allegheny Street
Holidaysburg, PA 16648

Allan Gibboney, Esquire
701 Second Street
Juniata, Altoona, PA 16601

William M. Posner, Esquire
Bell Telephone Company of Pennsylvania
One Parkway
Philadelphia, PA 19102

William B. Calder, P.E.
Pennsylvania Public Utility Commission
P.O. Box 3265
Harrisburg, PA 17120

BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

Pennsylvania Department of Transportation	:	C-84440
v.	:	
Consolidated Rail Corporation, Snyder Township, Blair County, and The Bell Telephone Company of Pennsylvania	:	

PETITION OF

CONSOLIDATED RAIL CORPORATION FOR

MODIFICATION OF ORDER

COMES NOW, Consolidated Rail Corporation (Conrail), by its attorney, and in support of its Petition seeking a modification of order entered in this proceeding on February 10, 1986 to provide for an extension of time for the completion of repairs directed under such order, says as follows:

1. Ordering paragraph 4 of the order entered on February 10, 1986 provided as follows:

> That Consolidated Rail Corporation, at its initial cost and expense, within one year of the service of the Commission's order, provide all materials and perform all work necessary to complete the following repairs:

(a) repair the hole in the pavement at the northeast corner of the bridge. This will include repairs to the concrete backwall at this location.

(b) clean and pain all exposed structural steel.

(c) monitor the expansion joint in the southwest wingwall for further lateral displacement.

(d) stabilize the erosion at the southeast and northwest embankments.

(e) remove debris and vegetation which has accumulated on the superstructure.

(f) remove all debris from around the beam expansion bearings.

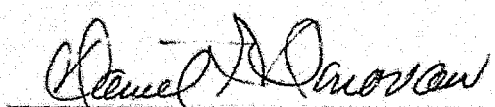
2. Although it was initially anticipated that the work ordered by your Commission would be performed by Conrail forces, it was subsequently determined that it would be necessary to have the work performed by contract. All necessary labor clearances were obtained and bid proposals were prepared, based upon Pennsylvania Department of Transportation (PennDOT) specifications. A pre-bid meeting was held on September 24, 1986. It is anticipated that a contract will not be awarded until the middle of November, 1986.

3. PennDOT specifications require that the painting of a bridge structure be done only when temperatures are 50° F. or more, and when the surface to be painted is dry. Such requirements effectively negate the commencement of such work during winter months. Accordingly, PennDOT's Engineers have

suggested that the painting of the bridge be delayed until the 1987 construction season.

WHEREFORE, Conrail respectfully prays your Commission to enter an order modifying ordering paragraph 4 of the order entered on February 10, 1986 by striking the words "within one year of the service of the Commission's order" and inserting in lieu thereof, the words "on or before December 31, 1987", and for such other and further relief as may be indicated in the premises.

Respectfully submitted,



Daniel F. Donovan
Senior General Attorney

1138 Six Penn Center Plaza
Philadelphia, PA 19103-2959
(215) 977-5016

AFFIDAVIT

COMMONWEALTH OF PENNSYLVANIA:

: SS

COUNTY OF PHILADELPHIA :

Daniel F. Donovan, being duly sworn according to law, deposes and says that he is Senior General Attorney for Consolidated Rail Corporation; that as such, he is authorized to and does make this Affidavit for it; and that the facts set forth in the foregoing Petition, are true and correct to the best of his knowledge, information and belief.

Daniel F. Donovan

Sworn to and subscribed
before me this 14th day
of October 1986.

Notary Public
ALFONSO J. DIGREGORIO
Notary Public, Philadelphia, Philadelphia Co.
My Commission Expires September 24, 1988

ORIGINAL

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
Harrisburg
October 20, 1986

IN REPLY REFER TO

Blair County
L. R. 55
Snyder Township (Grazierville)
PUC. C. 84440 44440

RECEIVED
OCT 22 1986
SECRETARY'S OFFICE
Public Utility Commission

Mr. Jerry Rich, Secretary
Public Utility Commission
Harrisburg, PA 17120

Dear Mr. Rich:

As required by Paragraph 2 of your Commission's Order adopted January 29, 1986, we are attaching a copy of the evaluation report.

A copy of this letter and a copy of the attached report are being forwarded this date to the parties of record, namely:

Daniel F. Donovan, Senior General Attorney, 1138 Six Penn Center Plaza, Philadelphia, PA 19103
Richard S. Herskovitz, Esquire, Assistant Counsel, Pennsylvania Public Utility Commission, P. O. Box 3265, Harrisburg, PA 171720
Merle K. Evey, Solicitor for Blair County, 401 Allegheny Street, Hollidaysburg, PA 16648
Allen E. Gibboney, Esquire, Counsel for Snyder Township, 701 Second Street, Juniata, Altoona, PA 16601
William M. Posner, Esquire, The Bell Telephone Company of PA, One Parkway, Philadelphia, PA 19102

Very truly yours,

W. J. Clements

For: William R. Moyer, P. E.
Acting Chief Engineer
Highway Administration

Attachment

CONDITION SURVEY REPORT
FOR
L.R. 55 (S.R. 4027), Station 931+54
SNYDER TOWNSHIP, BLAIR COUNTY
PUC. C. 844440

CONDITION SURVEY REPORT
FOR
L.R. 55 (S.R. 4027) STATION 931+54
SNYDER TOWNSHIP, BLAIR COUNTY
PUC. C. 844440

Prepared By:
Commonwealth of Pennsylvania
Department of Transportation
Engineering District 9-0
Bridge Unit
September 1986

TABLE OF CONTENTS

LISTING OF TABLES

LISTING OF EXHIBITS

1. BACKGROUND AND PURPOSE

On February 10, 1986, the Pennsylvania Public Utility Commission ordered the Pennsylvania Department of Transportation to perform an evaluation study of the L.R. 55, Station 931+54 bridge deck. The bridge is located in Snyder Township, Blair County.

This evaluation study was to examine the following items:

- -Determine chloride concentration in the deck concrete.
- -Determine structural integrity of the deck.
- -Determine whether or not the deck should be replaced. (If the deck is to be replaced, give an estimated cost).
- -Determine whether the curbs and sidewalks should be repaired or replaced.
- -Estimate cost of the selected curb and sidewalk option.
- -Present plans and cost estimates for the installation of a "Jersey type" or other appropriate safety barrier to protect both trusses from vehicular impact.
- -Ascertain if federal or other funds will be available for deck rehabilitation.
- -Determine cost of installing impermeable membrane on the deck, if old deck is to remain.
- -Evaluate increase in load carrying capacity if concrete encasement is removed.
- -Estimate cost of painting steel members exposed by concrete encasement removal.

This report is based on examination of existing records along with field observations, petrographic analysis, chloride ion tests, and load carrying capacity analyses.

The purpose of this report is to provide data in order that a cost effective solution can be obtained to correct the existing bridge deck deficiencies.

2. EXISTING BRIDGE DATA:

The bridge was originally constructed in 1939 by the Commonwealth of Pennsylvania Department of Highways. The bridge carries Old U.S. Route 220 (L.R. 55) across the CONRAIL mainline (three tracks) in Snyder Township, Blair County. The bridge also carries a listing of Railroad Overhead Bridge No. 224.13. The location of the bridge is shown on Exhibit I.

Structure data concerning the bridge is depicted on Table A. The bridge was posted to restrict the weight limit on the bridge to 12 tons for a single unit vehicle and 20 tons for combination vehicles on April 17, 1986. (See photos 1 and 2, Exhibit IV).

Additional details of the existing structure are shown on Exhibit II, Framing Plan and Exhibit III, Elevation and Cross Section Details.

TABLE A
STRUCTURE DATA

Route: L.R. 55 (S.R. 4027) over Conrail Mainline Tracks in Blair County
Station: 931+54
Township: Snyder
Type: Steel Through Truss, Trusses at 48'-6" on Center
Span: 1 @ 228'-9" centerline Bearing to centerline Bearing
Skew: 90 degrees to roadway; 30 degrees to railroad
Clear Roadway Width: 44'-0", 3 Traffic Lanes
Sidewalk: One (West Side), 5'9" Clear Width
Underclearance: 22'-4" (SIRS September 1986)
SIRS Ratings:
Deck: 3
Superstructure: 4
Substructure: 3
Deck Type:
- 8" Reinforced Concrete Slab (Non-Composite) with 2 1/2" Plain Cement Concrete and 5" plus or minus Bituminous Overlays

Superstructure:
- Steel Trusses
- Steel Floor Beams: Ten Built-Up Beams at 25'-5" spacing
- Steel Stringers: Ten I 24x74 at 4'-9" spacing

Substructure: Reinforced Concrete Abutments and Wingwalls on Spread Footings
FHWA Bridge Structure Inventory and Appraisal Data:
- Structure Number: 090710000550050931S4
- Inventory Route Number: 131000550
- Sufficiency Rating: 15.3 September 26, 1986

Bridge Number: S-952
Construction: Erected in 1939
Average Daily Traffic:
- 8,646 (PARIS 1986)
- %Trucks: 2%

3. VISUAL INSPECTION:

A visual inspection of the bridge was performed to determine the sources, types, and extent of deterioration of the deck and other related affected components of the bridge. Photographs of the bridge were taken on August 12, 1986, and are included as Exhibit IV of the report.

The bridge traffic wearing surface is in generally good condition. (Photos 4,5 and 6) However, there are transverse pavement cracks at the north and south ends of the bridge at the deck joints. (Photo 7)

The sidewalk and curbs are in poor condition. The curbs are spalled and broken away to almost the level of the traffic wearing surface. The sidewalk surface is severely scaled and large spalls exist where the railing is anchored. For sidewalk location see Photo 8.

There are holes in the concrete deck in the following locations:

-Southwest corner of the bridge (Photo 9).
-Along west curb near south end of the bridge (Photo 10).
-Along west curb near north end of the bridge (Photo 11).
-Northwest corner of the bridge at the start of the sidewalk (Photo 12).
-Along east edge of the bridge near north end (Photo 13).

These holes have exposed reinforcing bars which have become severely rusted.

Concrete has spalled off the entire length of the deck on both the east and west sides. The reinforcing bars are exposed and severely rusted. (Photos 13 and 14) Additionally, the underside of the deck has experienced numerous large spalls near each curbline. The underside of the deck exhibits fine cracks and leaching throughout, with evidence of moisture migrating through the deck.

The holes in the deck are permitting roadway drainage to find its way under the bridge, resulting in damage to bearings and abutments. (Photos 15 and 16)

4. PETROGRAPHIC ANALYSIS:

On April 2, 1986 ten, 4-inch diameter by 13 to 15 inch long cores were taken from various locations on the bridge deck. The locations of the deck cores are shown on Exhibit II, Framing Plan. The cores were cut and retrieved for measurement and analysis. The cores indicated that an original portland cement concrete wearing course approximately 2 1/2-inches thick and subsequent bituminous overlays approximately 5-inches thick are on the 8-inch reinforced concrete deck.

The samples were prepared for petrographic analysis which determined:

- % of entrained air
- % of entrapped air
- % of total air
- coarse aggregate type, gradation, amount of cracking, and bond.
- cement paste type, internal cracking, fine and coarse aggregate pullout, and quality
- sufficiency of entrained air in concrete to resist normal freezing and thawing conditions.

The results of the petrographic analyses are depicted in Exhibit V.

All samples were found to have insufficient entrained air for the concrete to resist normal freezing and thawing conditions. Six out of seven samples were observed to contain some internal cracking of the cement paste and/or coarse aggregate cracking.

5. CHLORIDE ION TEST:

The chloride ion content was determined from laboratory analysis of the concrete core samples. The locations of the deck cores are shown on Exhibit II, Framing Plan.

The raw data for the chloride ion test is found in Exhibit V and is summarized on Table B.

The samples were tested for chloride ion content because of the corrosive effects and associated internal pressures which result in the concrete when chloride ions contact the reinforcement steel. The Federal Highway Administration (FHWA) considers a deck contaminated when it contains two or more pounds of chloride per cubic yard of concrete (BD76-22).

A chain drag test is normally conducted on concrete bridge decks to determine the extent of delamination; however one could not be made on this bridge because the deck has a bituminous overlay.

TABLE B

CHLORIDE ION CONTENT SUMMARY

CORE NUMBER	CHLORIDE ION CONTENT(lbs. per cu. yd.)
1a	3.9
2a	1.4
3a	0.7
5a	4.3
6a	0.6
7	5.2
8	3.9
9a	1.5
10	1.9

6. ECONOMIC ANALYSIS

The cost comparison shown in Exhibit VI, Economic Analysis, was prepared in accordance with BD81-40 dated August 11, 1981, GUIDELINES FOR COST EFFECTIVE BRIDGE DECK REHABILITATION.

The bridge deck has been completely overlaid with bituminous material; therefore the actual percentage of spalled and delaminated area cannot be determined.

Chloride ion tests done on the structure indicate the bridge deck contains a large amount of trapped chloride (See Exhibit V). However, since there is no information available to determine the percentage of the deck area that is spalled and delaminated, a comparable bridge deck must be used for the economic analysis.

A bridge in Blair County on L.R. 07021 at Station 3+61 will be used as a comparable bridge. The bridge was built in 1928 and was to be widened in 1980. When the bituminous overlay was removed, it was determined that the deck was so deteriorated that it became necessary to remove the deck entirely before the widening could be completed.

Another comparable bridge is L.R. 55, Section 29M at Station 33+75 in Blair County. The bridge was built in 1956 and later was overlaid with a bituminous material. In 1985 the bituminous material was to be removed and then Type 2 Repairs made to the deck. Upon bituminous material removal, it was found that 65 percent of the deck was deteriorated. For economic reasons, it was decided to replace the entire deck rather than try to repair it.

For the economic analysis, a deterioration rate of 50 percent will be assumed for the existing bituminous overlayed deck. This figure is based on the above two comparable bridges. At the time a latex overlay is required in the future, it is assumed the deck will be 40 percent deteriorated. The 40 percent deterioration is the minimum value at which it is economically feasible to perform Type 2 Repairs with a latex overlay. This value is found in Professor P.D. Cady's report "A Study of Policies for the Protection, Repair, Rehabilitation, and Replacement of Concrete Bridge Decks.

The following schemes were examined in the Economic Analysis of the deck structure:

SCHEME 1:

The first possible consideration is an entire deck and parapet replacement of the structure at the present time. The deck replacement is assumed to have a maintenance free life of twenty-five years. After twenty-five years, the deck surface would receive a latex overlay with an assumed maintenance free life of fifteen years. After forty years, the deck would again be replaced, with an assumed maintenance free life of twenty-five years. This cycle of deck replacement and interim latex overlays would be repeated indefinitely.

SCHEME 2:

The second possible consideration would entail a latex overlay of the existing bridge deck. After a fifteen year maintenance free life, the deck would be replaced for an estimated maintenance free life of twenty-five years. After forty years, the deck would again receive a latex overlay. This cycle of deck overlay and replacement would be repeated indefinitely.

The unit prices in the Economic Analysis were obtained from recent contract prices.

The analysis shown in Exhibit VI results in a savings of $85,000 if the bridge deck is replaced at this time instead of placing a latex overlay on the existing deck.

7. LOAD CAPACITY WITH MODIFICATIONS

Four loading conditions were analyzed to determine the resulting load capacity of the bridge. The results are found in Exhibit VII, Bridge Loading Analyses.

The first case is an analysis of the existing bridge. The ratings indicate that various members are overstressed.

The second case is an analysis of the existing bridge with the concrete encasement removed from the beams and stringers. The ratings indicate that the bridge has substandard load carrying capabilities and would require posting of the structure.

The third case is an analysis of the existing deck with the excess overlays removed, deck repairs made, and then a latex overlay provided for deck protection. The concrete encasement is also considered removed for this case. The ratings indicate that the bridge is adequate to carry all legal loads.

The fourth case is an analysis with a new deck, and the stringers and floorbeams made composite with the deck. The concrete encasement is also considered removed for this case. The ratings indicate that the bridge is adequate to carry all legal loads.

8. CONCLUSIONS

The visual inspection of the bridge revealed that the existing deck is completely covered with bituminous material. The sidewalk and curbs are in poor condition; and in some cases the curbs are completely missing. There are five locations where there are holes through the deck or sidewalk. The deck has many fine cracks and evidence of leaching.

The petrographic analysis revealed that all samples were found to have insufficient entrained air to resist freeze/thaw. The samples were also observed to contain internal cracking of the cement paste and coarse aggregate.

The chloride ion test revealed that excessive amounts of chloride ions are present in the existing deck. The chloride ions are of such levels to severely deteriorate the reinforcement bars.

The economic analysis revealed that a savings of $85,000 can be realized if the bridge deck is replaced at this time instead of placing a latex overlay on the existing deck.

The load capacity analyses indicate that the existing bridge, as it presently exists and with concrete encasement removed, is of insufficient strength to handle maximum legal loads. Two other cases, involving various degrees of repair, were investigated and both were found to be able to handle maximum legal loads.

9. RECOMMENDATIONS

As a result of the field view, testing, and subsequent representative Economic Analysis (EXHIBIT VI), it is recommended that Scheme 1 be considered for upgrading of the deck on the L.R. 55, Station 931+54 structure. This scheme involves removal of the concrete encasement on the beams, removal of the existing deck and overlays, and replacement with a new reinforced concrete deck, curb, parapets, and sidewalk.

In addition to the above listed factors, removal of the existing deck will permit the top of the beams and stringers to be properly painted to prolong their life; studs may also be attached to the beam tops to provide a composite action with the deck.

A latex overlay scheme would have the disadvantage that any milling performed to try and remove some of the deck dead load would cause undesirable vibrations and tend to debond the reinforcement from the concrete.

Comments on Item 2 (PaDOT involvement) of PUC Order C 844440.

(a) The chloride concentration is excessive and is presented in Article 5, "Chloride Ion Test" and is summarized on Table B.

The structural integrity is poor and is presented in Article 4, "Petrographic Analysis" and in Exhibit V.

Due to the high concentrations of the chloride ion, the insufficient amount of entrained air, the evidence of internal cracking of the cement paste and/or coarse aggregate in the deck, and the Economic Analysis presented in Article 6, we recommend that the deck be replaced with a new reinforced concrete deck.

The Economic Analysis shows the cost to replace the deck as $468,000, but in our opinion, while this work is being performed, the entire structure should be rehabilitated. The additional work would include guiderail adjustments, drainage, new expansion dams, approach modifications, painting, and substructure repairs. The estimated cost to rehabilitate the entire structure is $1,000,000.

(b) The curbs and sidewalk are in poor condition as presented in Article 3, "Visual Inspection". We recommend that new curbs and sidewalk be constructed.

The cost to replace the curb is $20,000 and the cost to replace the sidewalk is $40,000.

(c) A plan to provide installation of a "Jersey type" safety barrier to protect the trusses is presented in Exhibit VIII, "Safety Barrier Plan". The cost to perform this work is $45,000.

(d) At this time the Department is not aware of any federal funds or funds from other sources that are available for rehabilitation of this deck. However, the bridge was included in the Billion Dollar Bridge Bill No. 2 (House Bill 385).

This program will be broken into three four-year segments and requires State Transportation Commission concurrence prior to implementation. Until a formal plan for implementation is approved, we cannot enter into reimbursement agreements or authorize the start of any work. Action on this proposed plan by the State Transportation Commission is expected later this year or early in 1987.

Billion Dollar Bridge Bill No. 2 authorizes full funding for rehabilitation of this bridge.

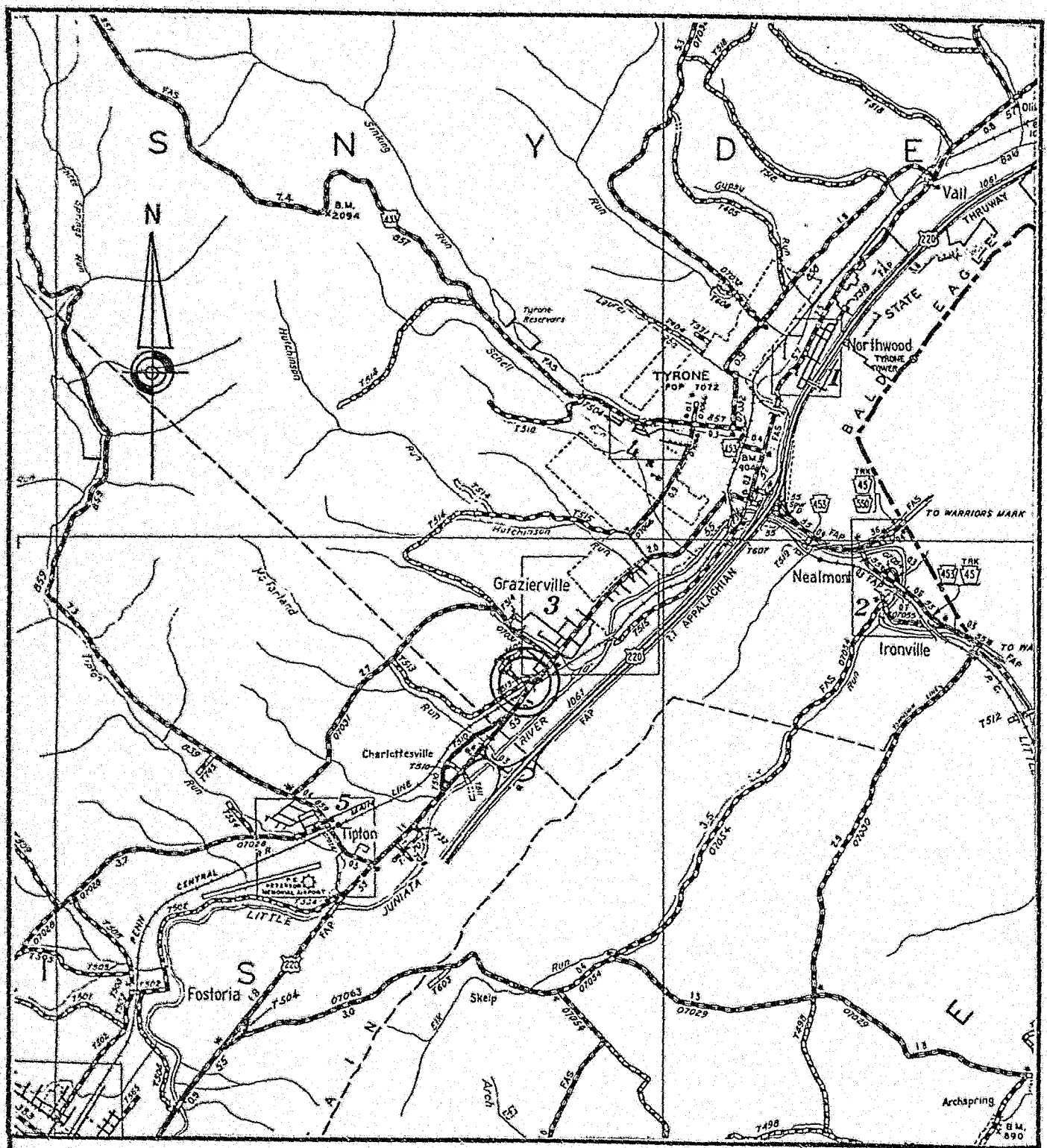
(e) Since the Economic Analysis indicates that a new deck should be constructed, it is not necessary to install an impermeable membrane on the deck.

(f) An evaluation of the removal of the concrete encasement is presented in Article 7, "Load Capacity with Modifications". The ratings indicate that the encasement removal improves the rating of the existing bridge but would still require posting. This, plus other factors presented in this report, confirms that more repair is required to the bridge than just concrete encasement removal.

The estimated cost of painting the steel members that would be uncovered by removal of the concrete encasement is $30,000.

EXHIBITS

EXHIBIT I
LOCATION MAP



LOCATION MAP

U.S. TRAFFIC ROUTE

PA. TRAFFIC ROUTE

05063 LEGISLATIVE ROUTE

T528 TOWNSHIP ROAD

PROJECT LOCATION

0 1 2

Scale in Miles

EXHIBIT II
FRAMING PLAN

BY ..... DATE ..... SUBJECT ..... SHEET NO. ..... OF .....

CHKD. BY ..... DATE .....

CONDITION SURVEY REPORT

EXHIBIT H

JOB NO. .....

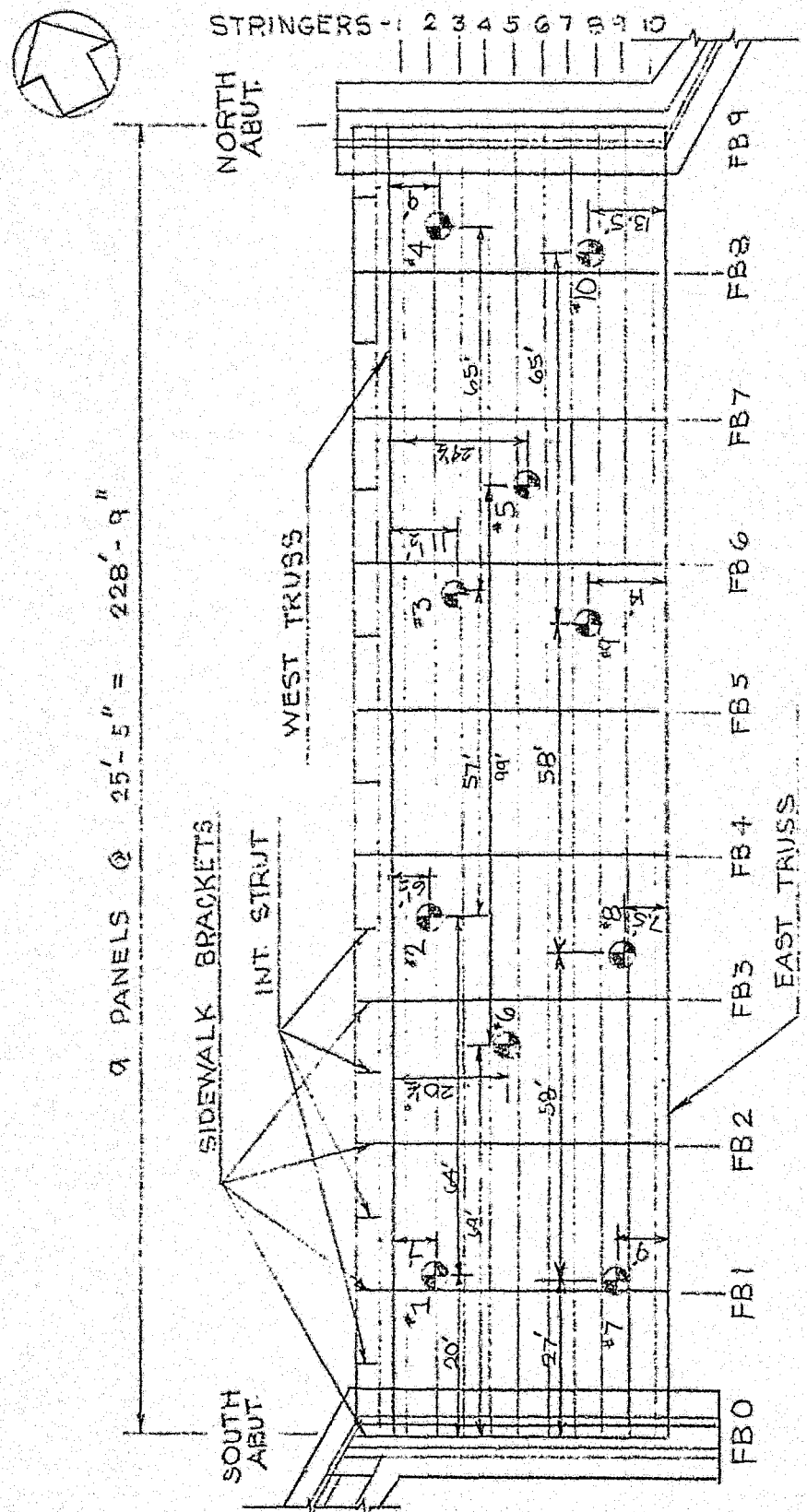
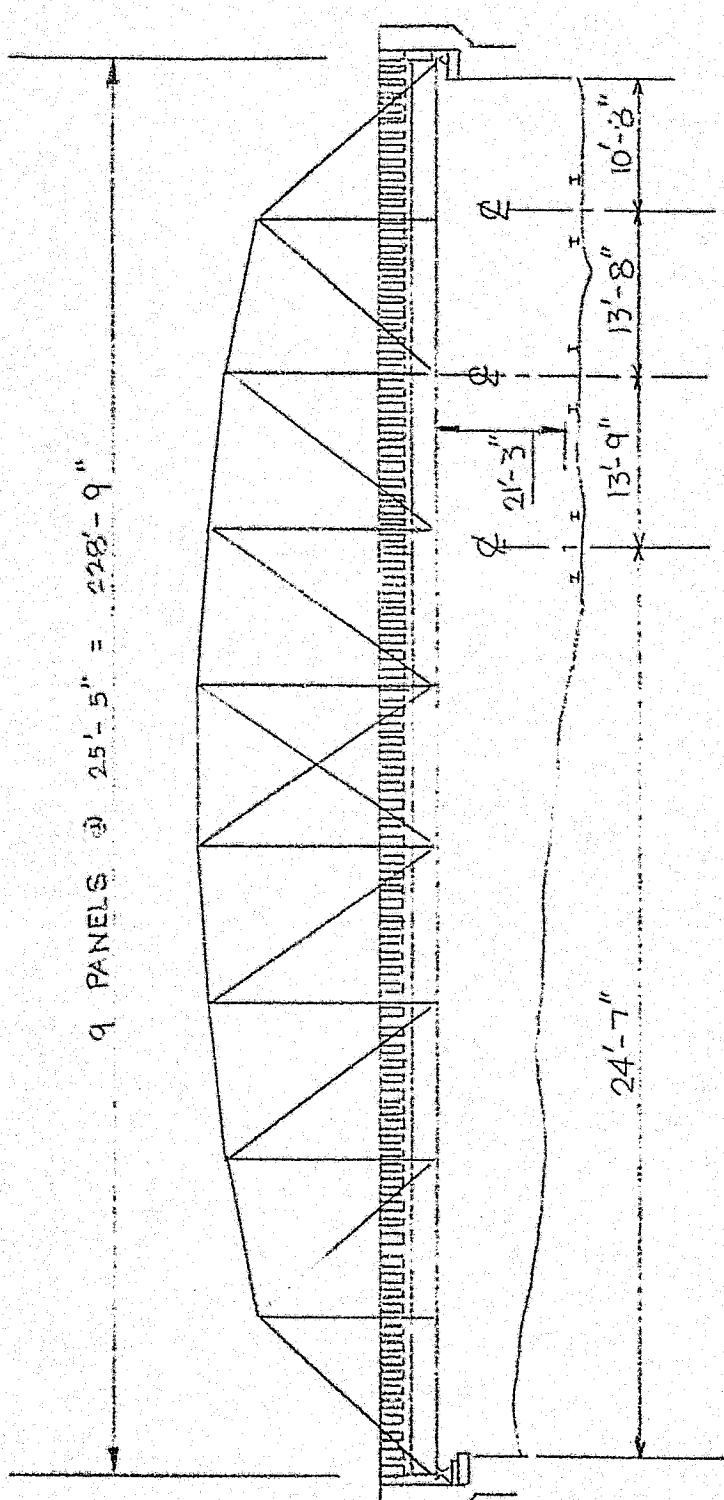


EXHIBIT III
ELEVATION AND CROSS SECTION DETAILS

BY A.M.R DATE 5/14/15 SUBJECT L.R.55 (SR 4027) STA 931+54 SHEET NO. 1 OF 2

CHKD. BY ..... DATE ..... CONDITION SURVEY REPORT JOB NO. 0910040400000320612

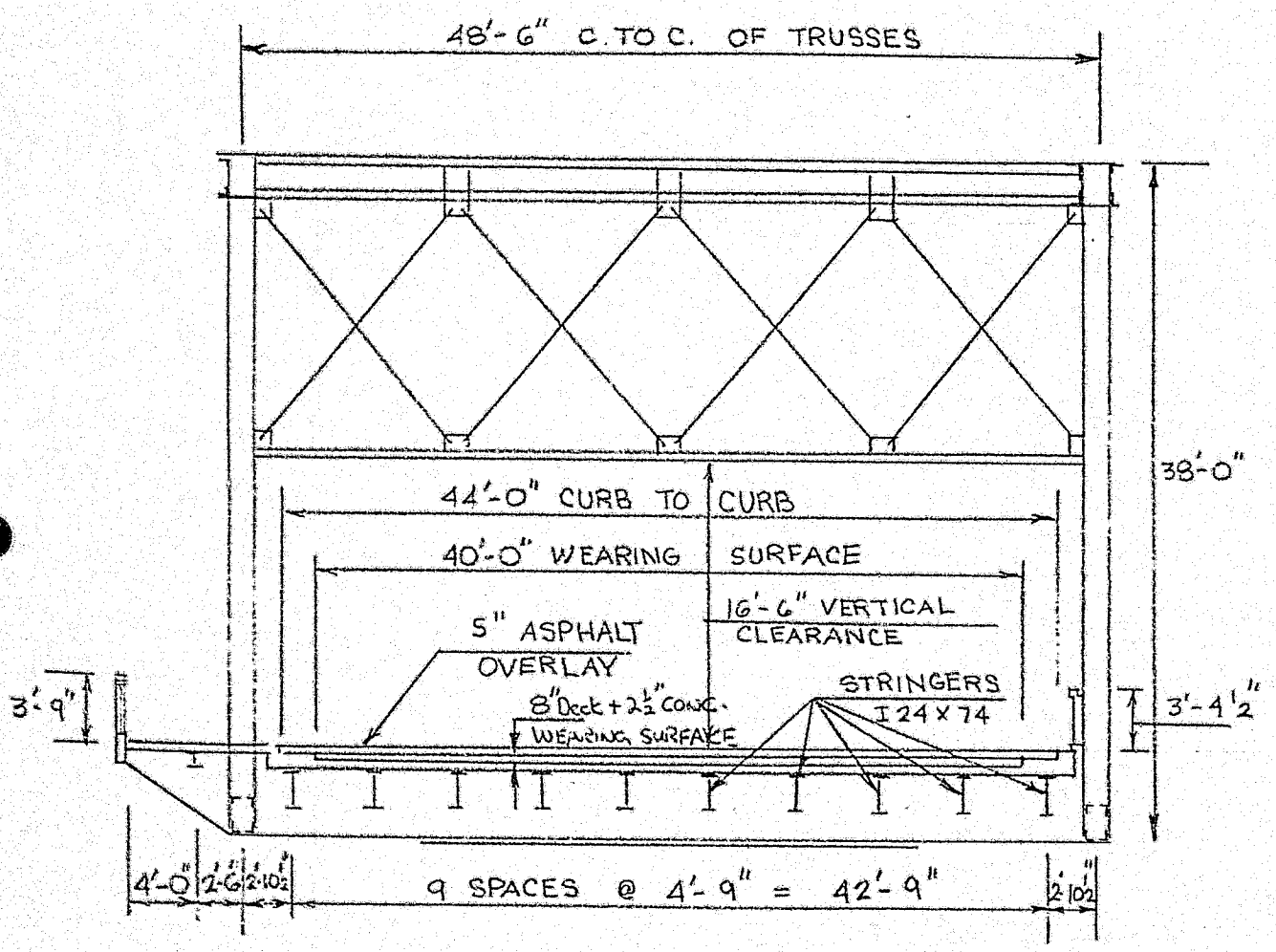
EXHIBIT III



WEST ELEVATION

1" = 30'-0"

NOTE : HORIZONTAL DIMENSION OF TRACKS ARE MEASURED ⊥ TO ℄ OF TRACK



CROSS SECTION
1" = 10'-0"

EXHIBIT IV
PHOTOGRAPHS

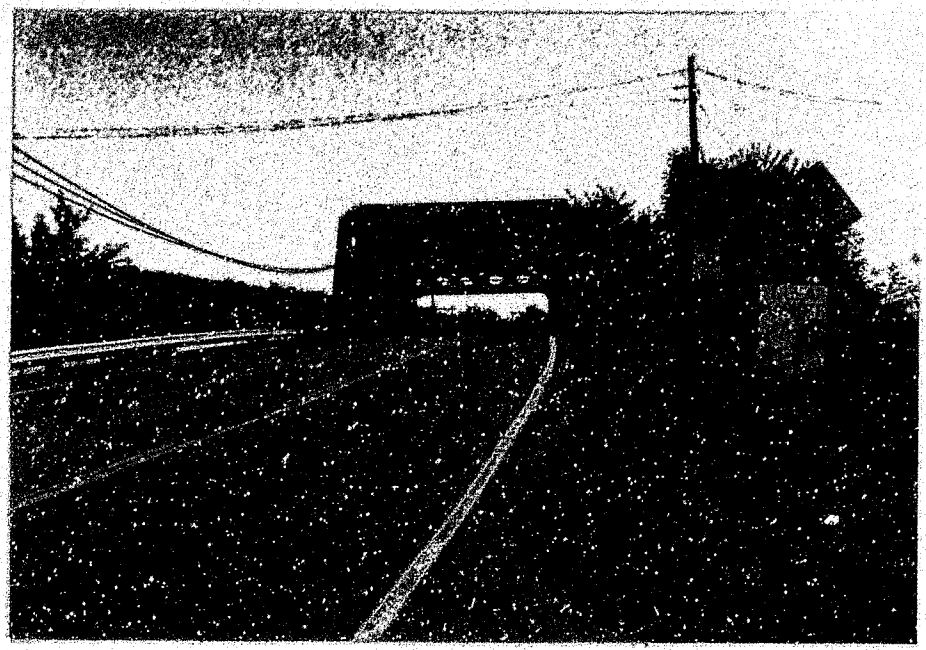


Photo 1
Approach, Looking North

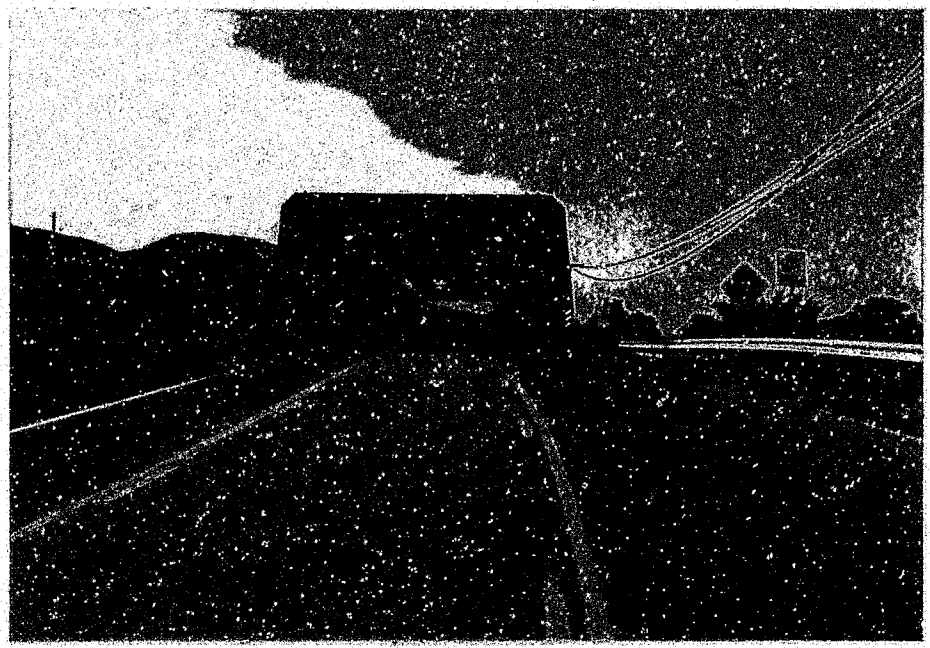


Photo 2
Approach, Looking South

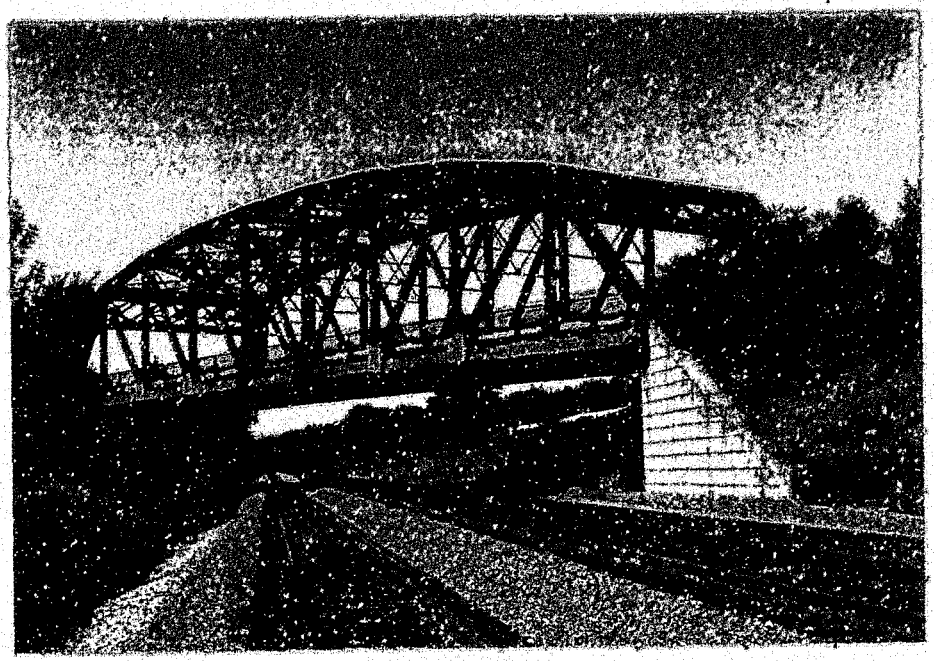


Photo 3
Elevation, Looking West

Photo 4
View of Deck,
North End

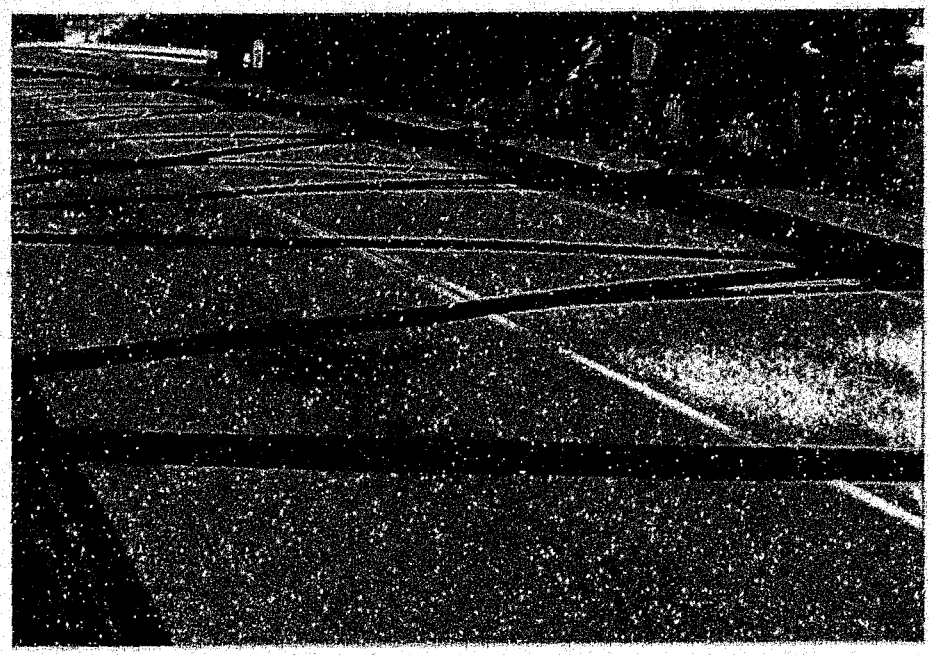


Photo 5
View of Deck,
Middle Third

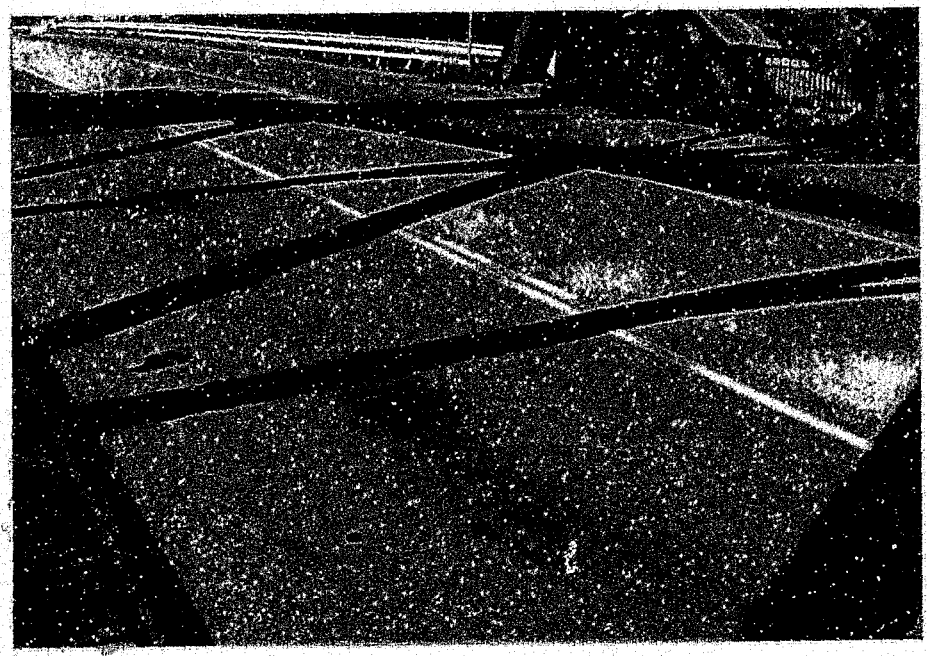


Photo 6
View of Deck,
South End

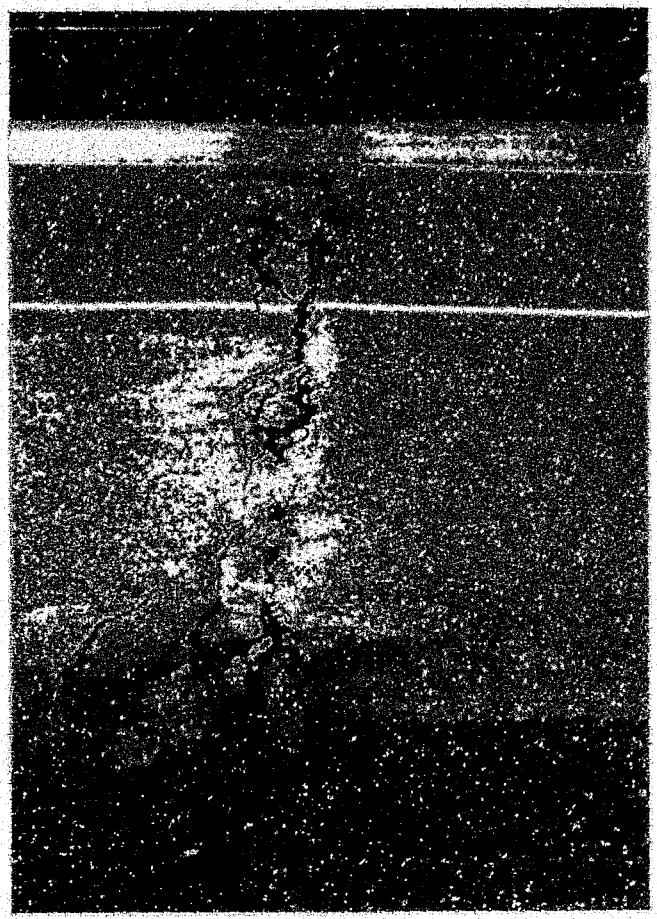


Photo 7
Typical Deck Joint

Photo 8
Sidewalk, Looking North

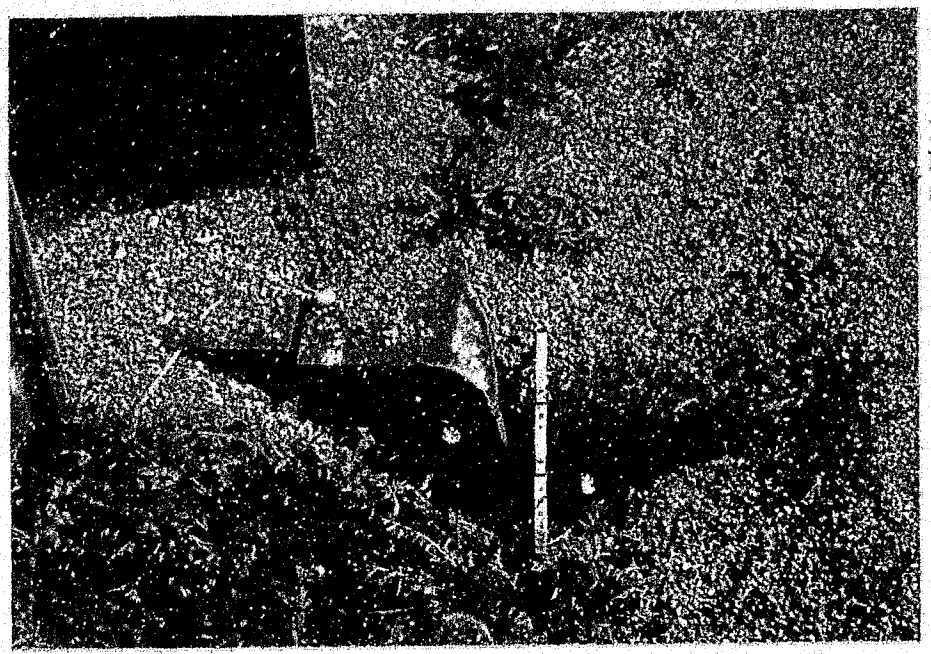


Photo 9
Deck Deterioration,
Southwest Corner

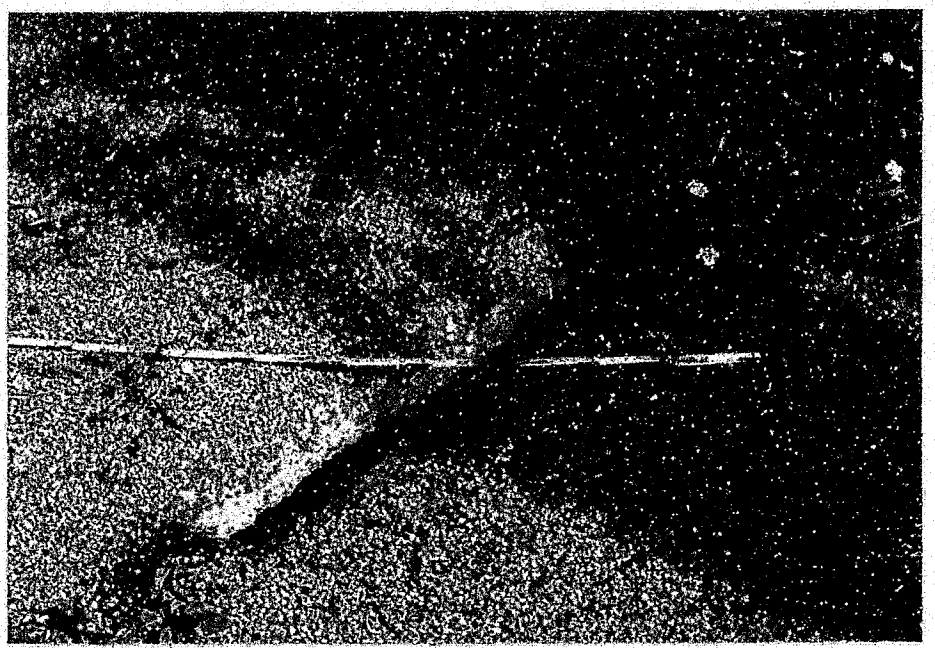


Photo 10
Deck Deterioration,
Southwest Corner

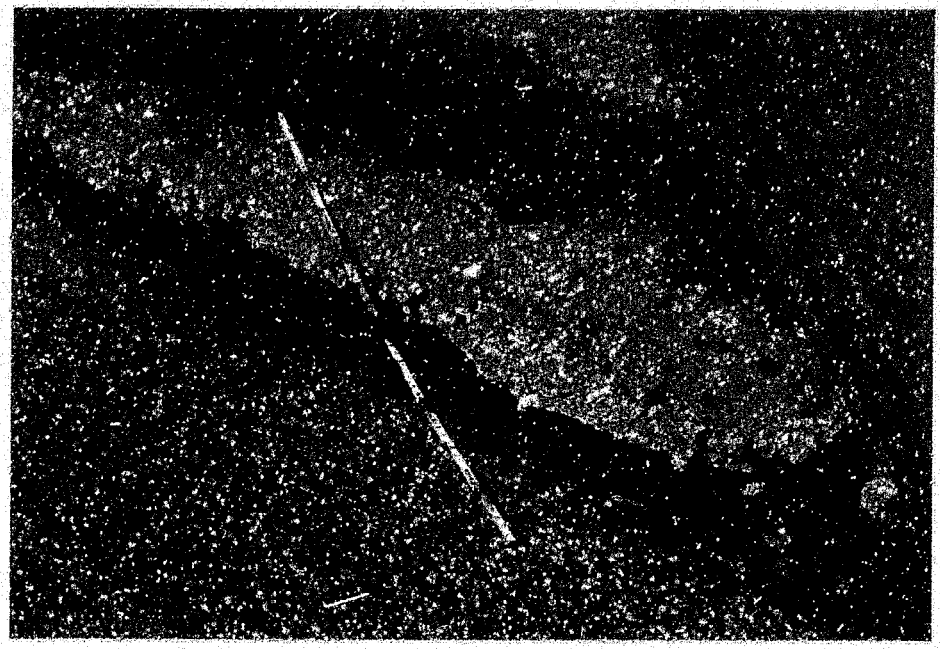


Photo 11
Deck Deterioration,
Northwest Corner

Photo 12
Deck Deterioration,
Northwest Corner

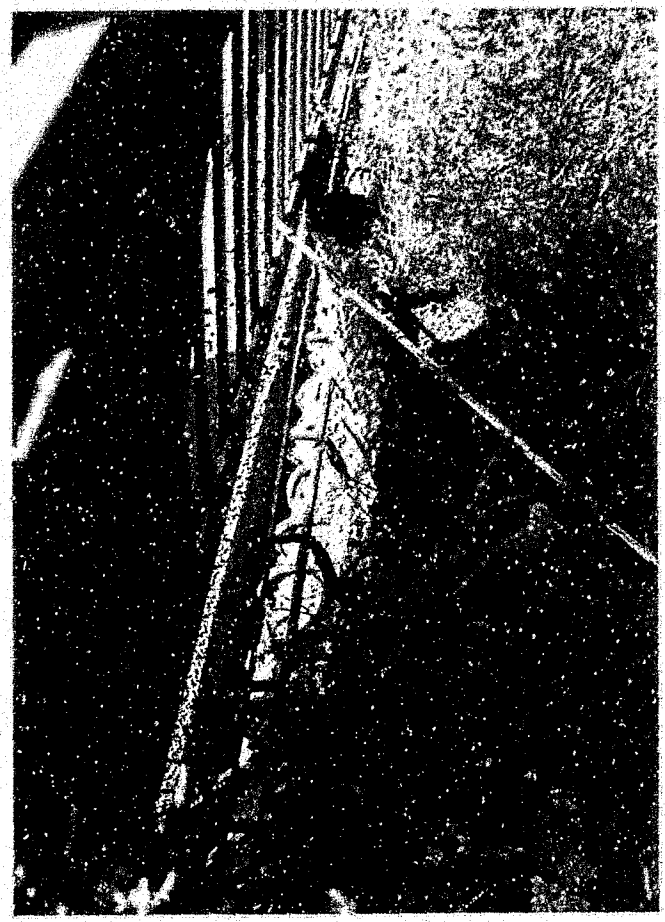


Photo 13
Deck Deterioration,
Northeast Corner

Photo 14
Deck Deterioration
From underside

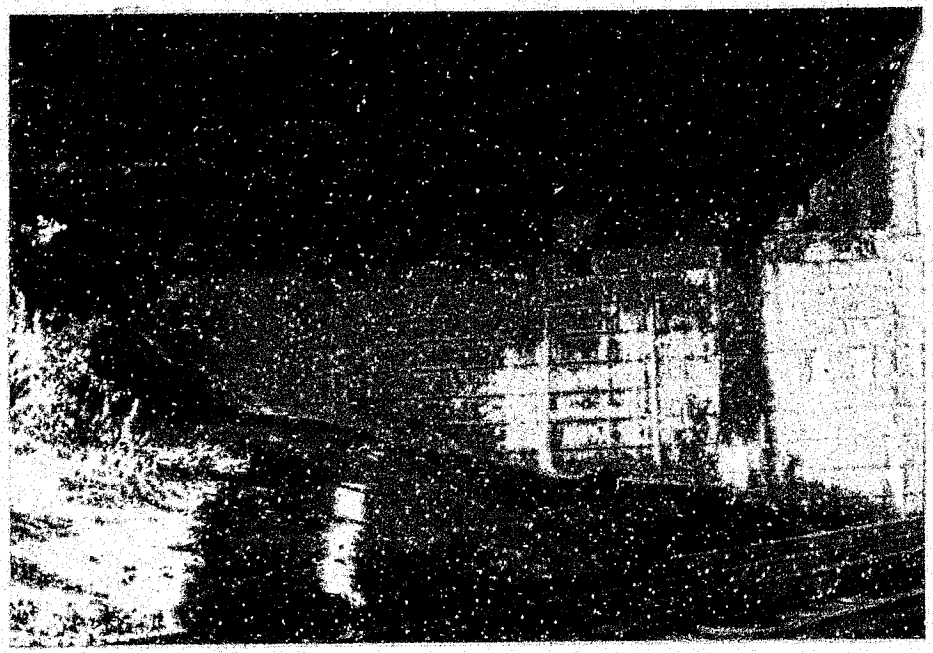


Photo 15
South Abutment

Photo 16
North Abutment

EXHIBIT V
PETROGRAPHIC ANALYSES AND CHLORIDE ION CONTENTS

TR-447 (8/82)

SAMPLE IDENTIFICATION

Routine Distribution

E 71475

ID	LAB SERIAL NO.			DATE	
	L	Yr.	Serial	Mo.	Day
2-3	6	7-8	9-13	14-15	16-17
7 4	0	8 6	4 8 2 0 7	0 4	2 1

COST CENTER 01

Material (PDT Nomenclature): Concrete from Bridge Deck

Brand Name-Trade Name, Etc.

Lot-ID

County: Blair

Item No.

Purchase Order No.: N.A.

Type of Construction: N.A.

Manufacturer-Producer: N.A.

Manufacturer-Producer Location of Supply: N.A.

Prime Contractor: N.A.

Place Collected: Bridge Deck L.R. 55 Sta. 931+54 Core # 1

Item Spec. or Special Provisions: 1a Chloride Ion Content 1b Petrographic Analysis

Sampled by: Ed Stoltz C.E. III

Date: 4-2-86

STATE PROJECT NUMBER						ALLOT	COST FUNC	P C	SMP CODE	N P	CST CNT	M-T CODE		NT		
S	LR or WO	SP	P	Sect	Org.							Mt'l.	Test			
18	19-23	24	25	26-28	29-31	32-34	35-37	38	39-40	41	42-43	44-46	47-49	50	51	52
0	8 8 0 8 3	0	3	0 1 0	0920	3 8 3	9959		0 1	1	0 1	2 8 2	9 2 1	0	0	1
											0 1	2 1 8	2 8 5	0	0	1
											0 2	1 1 1	1 9 7	0	0	1
											0 2	3 9 5	6 1 6	0	0	1

QUANTITY REPRESENTED: Lot Size | No. Sample Increments

Sample Represents: ☐ Final Record Sample ☐ Progress Record Sample

COPY FOR DISTRICT ENGINEER

R-459 (5-72)

AIR CONTENT OF HARDENED CONCRETE BY LINEAR TRAVERSE ANALYSIS

LABORATORY NO. 86-48207

DATE REPORTED 5-1-86

Mix Design Data: Paste ____%, Air ____%

Other ____

LINEAR TRAVERSE DATA:

Average width of void .016 inch

Specific Surface 250 sq. in. per cu. in.

Spacing factor .040 inch

Voids per inch .667

Total traverse length 81.0 inches

Entrained Air 5.8 % Entrapped Air .68 %

Total Air 1.06 % Paste ____% Aggregate ____%

Evaluation: This sample contains an amount of entrained air generally considered adequate ____, insufficient ✓, excessive ____ for the concrete to resist normal freezing and thawing conditions.

COARSE AGGREGATE:

Carbonate ✓, Gravel ____, Slag ✓, Other ____

Gradation: Narrow ____, Broad ✓, Gap Graded ____

Cracking: None ____, Some ✓, Moderate ____, Extensive ____

Bond: Very Good ____, Good ✓, Fair ____, Poor ____

Amount of Coarse Aggregate ____% (If required)

CEMENT PASTE:

Type: Glassy ____, Glassy & Granular ____, Granular ✓, Chalky ____

Internal Cracking: None ____, Some ✓, Moderate ____, Extensive ____

Fine Aggregate Pullout: None ✓, Some ____, Considerable ____

Coarse Aggregate Pullout: None ✓, Some ____, Considerable ____

Paste Quality: Very Good ____, Good ✓, Fair ____, Poor ____

SUPPLEMENTAL PHYSICAL TESTING DATA:

HEIGHT	DIAMETER	COMPRESSIVE STRENGTH
in	in	psi

CORE NO. 1

REMARKS: Chloride Ion Content - 3.9 lb/cu yd.

Routine Distribution

EXTRA COPY TO: Reidenour

TR-447 (8/82)

Routine Distribution

SAMPLE IDENTIFICATION E

E 71476

ID	LAB SERIAL NO.			DATE	
	L	Yr.	Serial	Mo.	Day
2-3	6	7-8	9-13	14-15	16-17
7|4	0	8|6	4|8|2|0|8	0|4	2|1

COST CENTER 01

Material (PDT Nomenclature)	STATE PROJECT NUMBER						ALLOT	COST FUNC	P C	SMP CODE	N P	CST CNT	M-T CODE		NT		
	S	LR or WO	SP	P	Sect	Org.							Mt'l.	Test			
	18	19-23	24	25	26-28	29-31	32-34	35-37	38	39-40	41	42-43	44-46	47-49	50	51	52
Concrete from Bridge Deck	0	8|8|0|8|3	0	3	0|0|0	0920	3|8|3	9959		0|1	1	0|1	2|8|2	9|2|1	0	0	1
Brand Name-Trade Name, Etc.																	
Lot-ID												0|1	2|1|8	2|8|5	0	0	1
County: Blair / Item No.												0|2	[redacted]	1|9|7	0	0	1
Purchase Order No.: N.A.												0|2|3|9|5	6|1|6	0	0	1	
Type of Construction: N.A.																	
Manufacturer-Producer: N.A.																	
Manufacturer-Producer Location of Supply: N.A.																	
Prime Contractor: N.A.																	

QUANTITY REPRESENTED

Lot Size	No. Sample Increments

2a Chloride Ion Content 2c petrographic analysis

Place Collected: Bridge Deck L.R. 55 sta. 931+54 Core #2

Item Spec. or Special Provisions

Sampled by: Ed Stoltz C.E. III Date: 4-2-86

Sample Represents: ☐ Final Record Sample ☐ Progress Record Sample

COPY FOR DISTRICT ENGINEER

TR-459 (5-72)

AIR CONTENT OF HARDENED CONCRETE BY LINEAR TRAVERSE ANALYSIS

LABORATORY NO. 86-48208

DATE REPORTED 5-1-86

Mix Design Data: Paste ____%, Air ____%

Other ____

LINEAR TRAVERSE DATA:

Average width of void .007 inch

Specific Surface 571 sq. in. per cu. in.

Spacing factor .023 inch

Voids per inch 395

Total traverse length 81.0 inches

Entrained Air .12 % Entrapped Air .27 %

Total Air .49 % Paste ____ % Aggregate ____ %

Evaluation: This sample contains an amount of entrained air generally considered adequate ____, insufficient ✓, excessive ____ for the concrete to resist normal freezing and thawing conditions.

COARSE AGGREGATE:

Carbonate ✓, Gravel ____, Slag ✓, Other ____

Gradation: Narrow ____, Broad ✓, Gap Graded ____

Cracking: None ____, Some ✓, Moderate ____, Extensive ____

Bond: Very Good ____, Good ✓, Fair ____, Poor ____

Amount of Coarse Aggregate ____ % (If required)

CEMENT PASTE:

Type: Glassy ____, Glassy & Granular ____, Granular ✓, Chalky ____

Internal Cracking: None ____, Some ✓, Moderate ____, Extensive ____

Fine Aggregate Pullout: None ✓, Some ____, Considerable ____

Coarse Aggregate Pullout: None ____, Some ✓, Considerable ____

Paste Quality: Very Good ____, Good ✓, Fair ____, Poor ____

SUPPLEMENTAL PHYSICAL TESTING DATA:

HEIGHT	DIAMETER	COMPRESSIVE STRENGTH
in	in	psi

CORE NO. #2

REMARKS:

Chloride Ion Content - 1.4 lb/cu. yd.

[redacted]

Routine Distribution

EXTRA COPY TO: Residence

TR-447 (8/82)

SAMPLE IDENTIFICATION

Routine Distribution

E 71477

ID	LAB SERIAL NO.			DATE	
	L	Yr.	Serial	Mo.	Day
2-3	6	7-8	9-13	14-15	16-17
7 4	0	8	6448	20	9 1

COST CENTER 01

Material (PDT Nomenclature): Concrete from Bridge Deck

	STATE PROJECT NUMBER					ALLOT	COST FUNC	P C	SMP CODE	N P	CST CNT	M-T CODE		NT		
	S	LR or WO	SP	P	Sect	Org.							Mt'l.	Test			
	18	19-23	24	25	26-28	29-31	32-34	35-37	38	39-40	41	42-43	44-46	47-49	50	51	52
Brand Name-Trade Name, Etc.	0	8 8 0 8 3	0	3	0 0 0	0 9 2 0	3 8 3	9 9 5 9		0 1	1	0 1	2 8 2	9 2 1	0	0	1
Lot-ID												0 1	2 1 8	2 8 5	0	0	1
County: Blair / Item No.												0 2	1 1 1	1 9 1 7	0	0	1
Purchase Order No.: N.A.												0 2	3 9 5	6 1 6	0	0	1
Type of Construction: N.A.																	
Manufacturer-Producer: N.A.																	
Manufacturer-Producer Location of Supply: N.A.																	
Prime Contractor: N.A. 3a Chloride Ion Content 3b petrographic Analysis																	
Place Collected: Bridge Deck L.R. 55 Sta. 931 +54 Core #3																	
Item Spec. or Special Provisions																	

QUANTITY REPRESENTED: Lot Size | No. Sample Increments

Sampled by: Ed Steltz C.E. III — Date: 4-2-86

Sample Represents: ☐ Final Record Sample ☐ Progress Record Sample

COPY FOR
DISTRICT ENGINEER

R-459 (5-72)

AIR CONTENT
OF HARDENED CONCRETE
BY LINEAR TRAVERSE ANALYSIS

LABORATORY NO. 86-48209

DATE REPORTED 5-1-86

Mix Design Data: Paste ____%, Air ____%
Other ____

LINEAR TRAVERSE DATA:
Average width of void .055 inch
Specific Surface 160 sq. in. per cu. in.
Spacing factor .050 inch
Voids per inch .5??
Total traverse length 22.10 inches
Entrained Air 1.35 % Entrapped Air 1.0 %
Total Air 2.25 % Paste ____% Aggregate ____%
Evaluation: This sample contains an amount of entrained air generally considered adequate ____, insufficient ✓, excessive ____ for the concrete to resist normal freezing and thawing conditions.

COARSE AGGREGATE:
Carbonate ✓, Gravel ____, Slag ____, Other ____
Gradation: Narrow ____, Broad ✓, Gap Graded ____
Cracking: None ✓, Some ____, Moderate ____, Extensive ____
Bond: Very Good ____, Good ✓, Fair ____, Poor ____
Amount of Coarse Aggregate ____% (If required)

CEMENT PASTE:
Type: Glassy ____, Glassy & Granular ____, Granular ✓, Chalky ____
Internal Cracking: None ✓, Some ____, Moderate ____, Extensive ____
Fine Aggregate Pullout: None ____, Some ____, Considerable ____
Coarse Aggregate Pullout: None ____, Some ✓, Considerable ____
Paste Quality: Very Good ____, Good ✓, Fair ____, Poor ____

SUPPLEMENTAL PHYSICAL TESTING DATA:

CORE NO.	HEIGHT	DIAMETER	COMPRESSIVE STRENGTH
#3	in	in	psi

REMARKS:

Chloride Ion Content - 0.7 lb/cu. yd.

Routine Distribution

EXTRA COPY TO: Residence

TR-447 (8/82)

Routine Distribution

SAMPLE IDENTIFICATION

E 71478 E

ID	LAB SERIAL NO.			DATE	
	L	Yr.	Serial	Mo.	Day
2-3	6	7-8	9-13	14-15	16-17
7	4	0	8 6 4 8 2 1	0	4 2 1

COST CENTER 01

Material (PDT Nomenclature): Concrete from Bridge Deck

Brand Name-Trade Name, Etc.

Lot-ID

County: Blair | Item No.

Purchase Order No.: N.A.

Type of Construction: N.A.

Manufacturer-Producer: N.A.

Manufacturer-Producer Location of Supply: N.A.

Prime Contractor: N.A.

Place Collected: Bridge Deck L.R. 55 Sta. 931 + 54 Core #A

Item Spec. or Special Provisions: 4 b Petrographic Analysis

Sampled by: Ed Stoltz C.E. III

Date: 4-2-86

Sample Represents: ☐ Final Record Sample ☐ Progress Record Sample

STATE PROJECT NUMBER						ALLOT	COST FUNC	P C	SMP CODE	N P	CST CNT	M-T CODE		NT		
S	LR or WO	SP	P	Sect	Org.							Mt'l.	Test			
18	19-23	24	25	26-28	29-31	32-34	35-37	38	39-40	41	42-43	44-46	47-49	50	51	52
0 8 8 0 8 3		0	3	0 0 0	C 9 2 0	3 8 3	9 9 5 9		0 1	1	0 1	2 8 1 2	9 2 1	0	0	1

QUANTITY REPRESENTED: Lot Size | No. Sample Increments

COPY FOR INSPECTOR

R-459 (5-72)

AIR CONTENT OF HARDENED CONCRETE BY LINEAR TRAVERSE ANALYSIS

LABORATORY NO. 86-48210

DATE REPORTED 5-1-86

Mix Design Data: Paste ____%, Air ____%

Other ____

LINEAR TRAVERSE DATA:

Average width of void .017 inch

Specific Surface 235 sq. in. per cu. in.

Spacing factor .054 inch

Voids per inch .346

Total traverse length 78.12 inches

Entrained Air .10 % Entrapped Air .50 %

Total Air .60 % Paste ____% Aggregate ____%

Evaluation: This sample contains an amount of entrained air generally considered adequate ____, insufficient ✓, excessive ____ for the concrete to resist normal freezing and thawing conditions.

COARSE AGGREGATE:

Carbonate ✓, Gravel ____, Slag ____, Other ____

Gradation: Narrow ____, Broad ✓, Gap Graded ____

Cracking: None ____, Some ✓, Moderate ____, Extensive ____

Bond: Very Good ____, Good ✓, Fair ____, Poor ____

Amount of Coarse Aggregate ____% (If required)

CEMENT PASTE:

Type: Glassy ____, Glassy & Granular ____, Granular ✓, Chalky ____

Internal Cracking: None ____, Some ✓, Moderate ____, Extensive ____

Fine Aggregate Pullout: None ✓, Some ____, Considerable ____

Coarse Aggregate Pullout: None ✓, Some ____, Considerable ____

Paste Quality: Very Good ____, Good ✓, Fair ____, Poor ____

SUPPLEMENTAL PHYSICAL TESTING DATA:

HEIGHT	DIAMETER	COMPRESSIVE STRENGTH
in	in	psi

CORE NO.

REMARKS:

Routine Distribution

EXTRA COPY TO: Reidenour

TR-447 (8/82)

Routine Distr

SAMPLE IDENTIFICATION

E 71479

ID	LAB SERIAL NO.			DATE	
	L	Yr.	Serial	Mo.	Day
2-3	6	7-8	9-13	14-15	16-17
7 4	0 8 6	4 8 2	1 1	0 ft	0 1

COST CENTER 07

Material (PDT Nomenclature): Concrete from Bridge Deck

Brand Name-Trade Name, Etc.

Lot-ID

County: Blair | Item No.

Purchase Order No.: N.A.

Type of Construction: N.A.

Manufacturer-Producer: N.A.

Manufacturer-Producer Location of Supply: N.A.

Prime Contractor: N.A. 5a Chloride Ion Content 5c petrographic Analysis

Place Collected: Bridge Deck L.R. 55 Sta. 931+54 Core # 5

Item Spec. or Special Provisions

Sampled by: Ed Stoltz C.E. III Date: 4-2-86

Sample Represents: ☐ Final Record Sample ☐ Progress Record Sample

S	STATE PROJECT NUMBER: LR or WO	SP	P	Sect	Org.	ALLOT	COST FUNC	PC	SMP CODE	NP	CST CNT	M-T CODE: Mt'l.	M-T CODE: Test	NT
18	19-23	24	25	26-28	29-31	32-34	35-37	38	39-40	41	42-43	44-46	47-49	50 51 52
	0 8 8 0 8 3 0	3	0	1 0 0	0920	3 8 3	9959		0 1	1	0 1	2 8 2	9 2 1	0 0 1
									0 1	1	0 1	2 1 8	2 8 5	0 0 1
										1	0 2	1 1 1	1 9 7	0 0 1
										1	0 2 3	9 5	6 1 6	0 0 1

QUANTITY REPRESENTED	
Lot Size	No. Sample Increments

COPY FOR DISTRICT
MATERIALS ENGINEER

R-459 (5-72)

AIR CONTENT
OF HARDENED CONCRETE
BY LINEAR TRAVERSE ANALYSIS

LABORATORY NO. 86-48211

DATE REPORTED 5-1-86

Mix Design Data: Paste ____%, Air ____%
Other ____

LINEAR TRAVERSE DATA:
Average width of void .009 inch
Specific Surface 444 sq. in. per cu. in.
Spacing factor .034 inch
Voids per inch .455
Total traverse length 81.25 inches
Entrained Air .22 % Entrapped Air .20 %
Total Air .42 % Paste ____% Aggregate ____%
Evaluation: This sample contains an amount of entrained air generally considered adequate ____, insufficient ✓, excessive ____ for the concrete to resist normal freezing and thawing conditions.

COARSE AGGREGATE:
Carbonate ✓, Gravel ____, Slag ____, Other ____
Gradation: Narrow ____, Broad ✓, Gap Graded ____
Cracking: None ✓, Some ____, Moderate ____, Extensive ____
Bond: Very Good ____, Good ✓, Fair ____, Poor ____
Amount of Coarse Aggregate ____% (If required)

CEMENT PASTE:
Type: Glassy ____, Glassy & Granular ____, Granular ✓, Chalky ____
Internal Cracking: None ____, Some ✓, Moderate ____, Extensive ____
Fine Aggregate Pullout: None ✓, Some ____, Considerable ____
Coarse Aggregate Pullout: None ✓, Some ✓, Considerable ____
Paste Quality: Very Good ____, Good ✓, Fair ____, Poor ____

SUPPLEMENTAL PHYSICAL TESTING DATA:

HEIGHT	DIAMETER	COMPRESSIVE STRENGTH
in	in	psi

CORE NO. #5

REMARKS:

Chloride Ion Content - 4.3 lb/cu. yd.

Routine Distribution

EXTRA COPY TO: Reidenour

TR-447 (8/82)

SAMPLE IDENTIFICATION

Routine Distribution

E 11480

F

ID	LAB SERIAL NO.			DATE	
	L	Yr.	Serial	Mo.	Day
2-3	6	7-8	9-13	14-15	16-17
7 4	6	8 6	4 8 2 1 2	0 4	2 1

COST CENTER 01

Material (PDT Nomenclature) Concrete from Bridge Deck

Brand Name-Trade Name, Etc.

Lot-ID

County Blair | Item No.

Purchase Order No. N.A.

Type of Construction N.A.

Manufacturer-Producer N.A.

Manufacturer-Producer Location of Supply N.A.

Prime Contractor N.A. 6a Chloride Ion Content 6b petrographic Analysis

Place Collected Bridge Deck L.R. 55 Sta. 931 + 54 Core #6

Item Spec. or Special Provisions

Sampled by Ed Stoltz C.E. III Date 4-2-86

Sample Represents: ☐ Final Record Sample ☐ Progress Record Sample

S	LR or WO	SP	P	Sect	Org.	ALLOT	COST FUNC	P C	SMP CODE	N P	CST CNT	M-T CODE Mt'l.	M-T CODE Test	NT
18	19-23	24	25	26-28	29-31	32-34	35-37	38	39-40	41	42-43	44-46	47-49	50 51 52
0	8 8 0 8 3	0	3	0 1 0	0920	3 8 3	9959		0 1	1	0 1	2 8 2	9 2 1	0 0 1
											0 1	2 1 8	2 8 5	0 0 1
											0 2	1 1 1	1 9 7	0 0 1
											0 2	3 9 5	6 1 6	0 0 1

QUANTITY REPRESENTED	
Lot Size	No. Sample Increments

COPY FOR DISTRICT MATERIALS ENGINEER

R-459 (5-72)

AIR CONTENT OF HARDENED CONCRETE BY LINEAR TRAVERSE ANALYSIS

LABORATORY NO. 86-48212

DATE REPORTED 4-30-86

Mix Design Data: Paste ____%, Air ____%

Other ____

LINEAR TRAVERSE DATA:

Average width of void .030 inch

Specific Surface 133 sq. in. per cu. in.

Spacing factor .053 inch

Voids per inch .838

Total traverse length 80.0 inches

Entrained Air .40 % Entrapped Air 2.10 %

Total Air 2.50 % Paste ____% Aggregate ____%

Evaluation: This sample contains an amount of entrained air generally considered adequate ____, insufficient ✓, excessive ____ for the concrete to resist normal freezing and thawing conditions.

COARSE AGGREGATE:

Carbonate ✓, Gravel ____, Slag ____, Other ____

Gradation: Narrow ____, Broad ✓, Gap Graded ____

Cracking: None ✓, Some ____, Moderate ____, Extensive ____

Bond: Very Good ____, Good ✓, Fair ____, Poor ____

Amount of Coarse Aggregate ____% (If required)

CEMENT PASTE:

Type: Glassy ____, Glassy & Granular ____, Granular ✓, Chalky ____

Internal Cracking: None ____, Some ✓, Moderate ____, Extensive ____

Fine Aggregate Pullout: None ✓, Some ____, Considerable ____

Coarse Aggregate Pullout: None ____, Some ✓, Considerable ____

Paste Quality: Very Good ____, Good ✓, Fair ____, Poor ____

SUPPLEMENTAL PHYSICAL TESTING DATA:

HEIGHT	DIAMETER	COMPRESSIVE STRENGTH
in	in	psi

CORE NO. #6

REMARKS: Chloride Ion Content - 0.6 lb/cu. yd.

Routine Distribution

EXTRA COPY TO: Reidenouer

TR-447 (8/82)

SAMPLE IDENTIFICATION: Routine Distribution E 71481

COST CENTER 01

ID	LAB SERIAL NO.			DATE	
	L	Yr.	Serial	Mo.	Day
2-3	6	7-8	9-13	14-15	16-17
7 4	0	8 6	4 8 2 1 3	0 4	2 1

Material (PDT Nomenclature): Concrete from Bridge Deck

Brand Name-Trade Name, Etc.

Lot-ID

County: Blair

Item No.

Purchase Order No.: N.A.

Type of Construction: N.A.

Manufacturer-Producer: N.A.

Manufacturer-Producer Location of Supply: N.A.

Prime Contractor: N.A.

Chloride Ion Content

Place Collected: Bridge Deck L.R. 55 Sta. 931 + 54 Core #7

Item Spec. or Special Provisions

Sampled by: Ed Stoltz C.E. III

Date: 4-2-86

S	LR or WO	SP	P	Sect	Org.	ALLOT	COST FUNC	P C	SMP CODE	N P	CST CNT	M-T CODE Mt'l.	M-T CODE Test	NT
18	19-23	24	25	26-28	29-31	32-34	35-37	38	39-40	41	42-43	44-46	47-49	50 51 52
	0 8 8 1 0 8 3	0	3	0 1 0	0 9 2 0	3 8 3	9 9 5 9		0 1	1	0 1	2 1 8	2 8 5	0 0 1
									C		0 2	1 1 1	1 9 7	0 0 1
											0 2	3 9 5	6 1 6	0 0 1

QUANTITY REPRESENTED: Lot Size | No. Sample Increments

Sample Represents: ☐ Final Record Sample ☐ Progress Record Sample

MTR LABORATORY

COPY FOR DISTRICT MATERIALS ENGINEER

R-459 (5-72)

AIR CONTENT OF HARDENED CONCRETE BY LINEAR TRAVERSE ANALYSIS

LABORATORY NO. 86- 48213

DATE REPORTED 5-16-86

Mix Design Data: Paste_____%, Air_____%

Other_____

LINEAR TRAVERSE DATA:

Average width of void_____inch

Specific Surface_____sq. in. per cu. in.

Spacing factor_____inch

Voids per inch_____

Total traverse length_____inches

Entrained Air_____% Entrapped Air_____%

Total Air_____% Paste_____% Aggregate_____%

Evaluation: This sample contains an amount of entrained air generally considered adequate_____, insufficient_____, excessive_____ for the concrete to resist normal freezing and thawing conditions.

COARSE AGGREGATE:

Carbonate_____, Gravel_____, Slag_____, Other_____

Gradation: Narrow_____, Broad_____, Gap Graded_____

Cracking: None_____, Some_____, Moderate_____, Extensive_____

Bond: Very Good_____, Good_____, Fair_____, Poor_____

Amount of Coarse Aggregate_____% (If required)

CEMENT PASTE:

Type: Glassy_____, Glassy & Granular_____, Granular_____, Chalky_____

Internal Cracking: None_____, Some_____, Moderate_____, Extensive_____

Fine Aggregate Pullout: None_____, Some_____, Considerable_____

Coarse Aggregate Pullout: None_____, Some_____, Considerable_____

Paste Quality: Very Good_____, Good_____, Fair_____, Poor_____

SUPPLEMENTAL PHYSICAL TESTING DATA:

HEIGHT	DIAMETER	COMPRESSIVE STRENGTH
in	in	psi

CORE NO. 7

REMARKS:

Chloride Ion Content - 5.2 lb/cu. yd.

Routine Distribution

EXTRA COPY TO: Reidenour

TR-447 (8/82)

SAMPLE IDENTIFICATION

Routine Distribution

E 23275

ID	LAB SERIAL NO.			DATE	
	L	Yr.	Serial	Mo.	Day
2-3	6	7-8	9-13	14-15	16-17
7 4	0	86	48214	04	21

COST CENTER 01

Material (PDT Nomenclature): Concrete from Bridge Deck

Brand Name-Trade Name, Etc.

Lot-ID

County: Blair Item No.

Purchase Order No.: N.A.

Type of Construction: N.A.

Manufacturer-Producer: N.A.

Manufacturer-Producer Location of Supply: N.A.

Prime Contractor: N.A.

Chloride Ion Content

Place Collected: Bridge Deck L.R. 55 Sta. 931+54 Core #8

Item Spec. or Special Provisions

Sampled by: Ed Stoltz C.E. III Date: 4-2-86

Sample Represents: ☐ Final Record Sample ☐ Progress Record Sample

STATE PROJECT NUMBER						ALLOT	COST FUNC	P C	SMP CODE	N P	CST CNT	M-T CODE		NT		
S	LR or WO	SP	P	Sect	Org.							Mt'l.	Test			
18	19-23	24	25	26-28	29-31	32-34	35-37	38	39-40	41	42-43	44-46	47-49	50	51	52
0 8 8 0 8 3		0	3	0	0920	3 8 3	9959		0 1	1	0 1	2 1 8	2 8 5	0	0	1
											0 2	1 1 1	1 9 7	0	0	1
											0 2	3 9 5	6 1 6	0	0	1

QUANTITY REPRESENTED	
Lot Size	No. Sample Increments

'ITR LABORATORY

COPY FOR DISTRICT MATERIALS ENGINEER

R-459 (5-72)

AIR CONTENT OF HARDENED CONCRETE BY LINEAR TRAVERSE ANALYSIS

LABORATORY NO. 86-48214

DATE REPORTED 5-16-86

Mix Design Data: Paste_____%, Air_____%

Other_____

LINEAR TRAVERSE DATA:

Average width of void_____inch

Specific Surface_____sq. in. per cu. in.

Spacing factor_____inch

Voids per inch_____

Total traverse length_____inches

Entrained Air_____% Entrapped Air_____%

Total Air_____% Paste_____% Aggregate_____%

Evaluation: This sample contains an amount of entrained air generally considered adequate_____, insufficient_____, excessive_____ for the concrete to resist normal freezing and thawing conditions.

COARSE AGGREGATE:

Carbonate_____, Gravel_____, Slag_____, Other_____

Gradation: Narrow_____, Broad_____, Gap Graded_____

Cracking: None_____, Some_____, Moderate_____, Extensive_____

Bond: Very Good_____, Good_____, Fair_____, Poor_____

Amount of Coarse Aggregate_____% (If required)

CEMENT PASTE:

Type: Glassy_____, Glassy & Granular_____, Granular_____, Chalky_____

Internal Cracking: None_____, Some_____, Moderate_____, Extensive_____

Fine Aggregate Pullout: None_____, Some_____, Considerable_____

Coarse Aggregate Pullout: None_____, Some_____, Considerable_____

Paste Quality: Very Good_____, Good_____, Fair_____, Poor_____

SUPPLEMENTAL PHYSICAL TESTING DATA:

HEIGHT	DIAMETER	COMPRESSIVE STRENGTH
in	in	psi

CORE NO. 8

REMARKS:

Chloride Ion Content - 3.9 lb/cu. yd.

Routine Distribution

EXTRA COPY TO: Residence

TR-447 (8/82)

SAMPLE IDENTIFICATION

Routine Distribution

E 23276

ID	LAB SERIAL NO.			DATE	
	L	Yr.	Serial	Mo.	Day
2-3	6	7-8	9-13	14,15	16-17
7 4	0	8 6	4 8 2 1	5 0	4 2 1

COST CENTER 01

Material (PDT Nomenclature) Concrete from Bridge Deck

	STATE PROJECT NUMBER						ALLOT	COST FUNC	P C	SMP CODE	N P	CST CNT	M-T CODE		NT		
	S	LR or WO	SP	P	Sect	Org.							Mt'l.	Test			
	18	19-23	24	25	26-28	29-31	32-34	35-37	38	39-40	41	42-43	44-46	47-49	50	51	52
Brand Name-Trade Name, Etc.	0	8 8 0 8 3	0	3	0 1 0	0920	3 8 3	9959				0 1	0 1	2 8 2	9 2 1	0	0 1
Lot-ID													0 1	2 1 8	2 8 5	0	0 1
County Blair / Item No.													0 2	1 1 1	1 9 7	0	0 1
Purchase Order No. N.A.													0 2	3 9 5	6 1 6	0	0 1
Type of Construction N.A.																	
Manufacturer-Producer N.A.																	
Manufacturer-Producer Location of Supply N.A.																	
Prime Contractor N.A.																	
Place Collected Bridge Deck L.R. 55 Sta. 931 + 54 Core #9																	
Item Spec. or Special Provisions																	

QUANTITY REPRESENTED: Lot Size | No. Sample Increments

9a Chloride Ion Content 9b Petrographic Analysis

Sampled by Ed Stoltz C.E. III Date 4-2-86

Sample Represents: ☐ Final Record Sample ☐ Progress Record Sample

MTR LABORATORY

COPY FOR DISTRICT ENGINEER

R-459 (5-72)

AIR CONTENT OF HARDENED CONCRETE BY LINEAR TRAVERSE ANALYSIS

LABORATORY NO. 86 4821 5

DATE REPORTED 4-30-86

Mix Design Data: Paste ____%, Air ____%
Other ____

LINEAR TRAVERSE DATA:
Average width of void .022 inch
Specific Surface 182 sq. in. per cu. in.
Spacing factor .051 inch
Voids per inch .524
Total traverse length 84.0 inches
Entrained Air 2.5 % Entrapped Air .89 %
Total Air 3.14 % Paste ____% Aggregate ____%
Evaluation: This sample contains an amount of entrained air generally considered adequate ____, insufficient ✓, excessive ____ for the concrete to resist normal freezing and thawing conditions.

COARSE AGGREGATE:
Carbonate ✓, Gravel ____, Slag ____, Other ____
Gradation: Narrow ____, Broad ✓, Gap Graded ____
Cracking: None ✓, Some ____, Moderate ____, Extensive ____
Bond: Very Good ____, Good ✓, Fair ____, Poor ____
Amount of Coarse Aggregate ____% (If required)

CEMENT PASTE:
Type: Glassy ____, Glassy & Granular ____, Granular ✓, Chalky ____
Internal Cracking: None ____, Some ✓, Moderate ____, Extensive ____
Fine Aggregate Pullout: None ✓, Some ____, Considerable ____
Coarse Aggregate Pullout: None ✓, Some ____, Considerable ____
Paste Quality: Very Good ____, Good ✓, Fair ____, Poor ____

SUPPLEMENTAL PHYSICAL TESTING DATA:

HEIGHT	DIAMETER	COMPRESSIVE STRENGTH
in	in	psi

CORE NO. #9

REMARKS: Chloride Ion Content - 1.5 lb/cu.yd.

Routine Distribution

EXTRA COPY TO: Reidenour

TR-447 (8/82)

SAMPLE IDENTIFICATION

Routine Distribution

E 23277

E

ID	LAB SERIAL NO.			DATE	
	L	Yr.	Serial	Mo.	Day
2-3	6	7-8	9-13	14-15	16-17
7 4	0	8 6	4 8 2 1 6	0 4	2 1

COST CENTER 01

Material (PDT Nomenclature): Concrete from Bridge Deck

Brand Name-Trade Name, Etc.

STATE PROJECT NUMBER					ALLOT	COST FUNC	P C	SMP CODE	N P	CST CNT	M-T CODE		NT		
S	LR or WO	SP	P	Sect	Org.						Mt'l.	Test			
18	19-23	24	25	26-28	29-31	32-34	35-37	38	39-40	41	42-43	44-46	47-49	50	51	52
0 8 8 0 8 3		0	3	0 0 0	0920	3 8 3	9959		0 1	1	0 1	2 1 8	2 8 5	0	0	1
											0 2	1 1 1	1 9 7	0	0	1
											0 2	3 9 5	6 1 6	0	0	1

Lot-ID

County: Blair

Item No.

Purchase Order No.: N.A.

Type of Construction: N.A.

Manufacturer-Producer: N.A.

Manufacturer-Producer Location of Supply: N.A.

Prime Contractor: N.A.

QUANTITY REPRESENTED

Lot Size	No. Sample Increments

Chloride Ion Content

Place Collected: Bridge Deck L.R. 55 Sta. 931+54 Core # 10

Item Spec. or Special Provisions

Sampled by: Ed Stoltz C.E. III

Date: 4-2-86

Sample Represents: ☐ Final Record Sample ☐ Progress Record Sample

MTR LABORATORY

COPY FOR DISTRICT MATERIALS ENGINEER

TR-459 (5-72)

AIR CONTENT OF HARDENED CONCRETE BY LINEAR TRAVERSE ANALYSIS

LABORATORY NO. 86-48216

DATE REPORTED 5-16-86

Mix Design Data: Paste _____%, Air _____%

Other _____

LINEAR TRAVERSE DATA:

Average width of void _____ inch

Specific Surface _____ sq. in. per cu. in.

Spacing factor _____ inch

Voids per inch _____

Total traverse length _____ inches

Entrained Air _____% Entrapped Air _____%

Total Air _____% Paste _____% Aggregate _____%

Evaluation: This sample contains an amount of entrained air generally considered adequate _____, insufficient _____, excessive _____ for the concrete to resist normal freezing and thawing conditions.

COARSE AGGREGATE:

Carbonate _____, Gravel _____, Slag _____, Other _____

Gradation: Narrow _____, Broad _____, Gap Graded _____

Cracking: None _____, Some _____, Moderate _____, Extensive _____

Bond: Very Good _____, Good _____, Fair _____, Poor _____

Amount of Coarse Aggregate _____% (If required)

CEMENT PASTE:

Type: Glassy _____, Glassy & Granular _____, Granular _____, Chalky _____

Internal Cracking: None _____, Some _____, Moderate _____, Extensive _____

Fine Aggregate Pullout: None _____, Some _____, Considerable _____

Coarse Aggregate Pullout: None _____, Some _____, Considerable _____

Paste Quality: Very Good _____, Good _____, Fair _____, Poor _____

SUPPLEMENTAL PHYSICAL TESTING DATA:

HEIGHT	DIAMETER	COMPRESSIVE STRENGTH
in	in	psi

CORE NO. 10

REMARKS:

Chloride Ion Content - 1.9 lb/cu. yd.

Routine Distribution

EXTRA COPY TO: Bob Simonen

EXHIBIT VI
ECONOMIC ANALYSIS

BLAIR COUNTY
L.R. 55
STA. 931+54

SCHEME 1
ESTIMATED COST OF DECK REPLACEMENT AT THE PRESENT

ITEM DESCRIPTION	QUANTITY	UNIT COST	TOTAL
Removal of Existing Deck	560 CY	$ 150.00	$ 84,000
Class AAA Cement Concrete (Deck)	280 CY	450.00	126,000
Class AA Cement Concrete (Parapet)	35 CY	450.00	15,750
Reinforcement Bars, Epoxy Coated	60,000 LB	0.85	51,000
Protective Coating for Reinforced Concrete Surfaces	1,300 SY	2.25	2,925
Maintenance and Protection of Traffic During Construction (Detour)	Lump Sum	---	5,000
Pedestrian Railing	233 LF	75.00	17,475
Sidewalk (7.25' wide)	233 LF	60.00	13,980
Removal of Encasement Concrete	230 CY	500.00	115,000
Painting Existing Structural Steel after Encasement Removal	325 Ton	(Approx 90.00)	30,000
Removal Existing Sidewalk & Railing	233 LF	30.00	6,990
		TOTAL	$ 468,120
		Call	468,000

ESTIMATED COST OF DECK REPLACEMENT IN THE FUTURE
(ASSUMES NO INFLATION)

ITEM DESCRIPTION	QUANTITY	UNIT COST	TOTAL
Removal of Existing Deck (9")	300 CY	$ 150.00	$ 45,000
Class AAA Cement Concrete (Deck)	280 CY	450.00	126,000
Class AA Cement Concrete (Parapet)	35 CY	450.00	15,750
Reinforcement Bars, Epoxy Coated	60,000 LB	0.85	51,000
Protective Coating for Reinforced Concrete Surfaces	1,300 SY	2.25	2,925
Approach Modifications (Lower)	Lump Sum	---	10,000
Maintenance and Protection of Traffic During Construction (Detour)	Lump Sum	---	$ 5,000
		TOTAL	$ 255,675
		CALL	256,000

Note: Guiderail, Drainage, expansion dams, attenuators, and initial Approach Modifications not included because similar for each initial scheme.

BLAIR COUNTY
L.R. 55
STA. 931+54

SCHEME 2
ESTIMATED COST FOR LATEX OVERLAY AT THE PRESENT

ITEM DESCRIPTION	QUANTITY	UNIT COST	TOTAL
Removal of Existing Bituminous Overlay (5")	1,150 SY	4.00	$ 4,600
Removal of Existing Concrete Overlay (2 1/2")	1,150 SY	5.00	5,750
Removal of Existing Curb	466 LF	3.50	1,631
Type 2 Repair (50%)	5,400 SF	35.00	189,000
Scarification (1/2")	600 SY	15.00	9,000
Latex Modified Concrete Wearing Surface, 1 1/4" Depth	1,200 SY	45.00	54,000
Pecast Concrete Median Barrier	466 LF	30.00	13,980
Maintenance and Protection of Traffic During Construction (Thru Traffic)	Lump Sum	---	35,000
Pedestrian Railing	233 LF	75.00	17,475
Sidewalk (7.25' Wide)	233 LF	60.00	13,980
Removal of Encasement Concrete	230 CY	500.00	115,000
Painting of Existing Structural Steel after Encasement Removal	325 Ton	(Approx. 90.00)	30,000
Removal Existing Sidewalk & Railing	233 LF	30.00	6,990
		TOTAL	$496,406
		CALL	$496,000

ESTIMATED COST FOR LATEX OVERLAY IN THE FUTURE
(ASSUMES NO INFLATION)

ITEM DESCRIPTION	QUANTITY	UNIT COST	TOTAL
Type 2 Repair (40%)	4,100 SF	35.00	$143,500
Scarification 1/4"	685 SY	15.00	10,275
Latex Modified Concrete Wearing Surface, 1 1/4" Depth	1,140 SY	45.00	51,300
Approach Modifications (Raise)	Lump Sum	---	5,000
Maintenance and Protection of Traffic During Construction (Thru Traffic)	Lump Sum	---	35,000
		TOTAL	$245,075
		CALL	$245,000

Note: Guiderail, Drainage, expansion dams, attenuators, and initial Approach Modifications not included because similar for each initial scheme.

BLAIR COUNTY
L.R. 55
STA. 931+54

PRESENT WORTH CALCULATIONS

SCHEME 1
PRESENT REPLACEMENT OF DECK

1. Present New Bridge Deck = $ 468,000

2. Future Latex Overlay @ Year 25 = $245,000
   Adjust to Year 0=(P/F, 5%, 25 yrs.) = 0.2953
   Present Worth = 0.2953 ($245,000) = $ 72,349

3. Future New Deck @ Year 40 = $256,000
   Note: Begin Cycle Here:

4. Future Latex Overlay @ Year 65 = $245,000
   Adjust to Year 40 (Start of Cycle)
   P/F, 5%, 25 yrs. = 0.2953
   Year 40 Worth = 0.2953 ($245,000) = $ 72,349
   Total Cycle Value = $328,349

5. Convert Cycle Value @ Year 40 to Annual Uniform Series of Payments (A)
   A/P, 5%, 40 Yrs. = 0.05828
   A=0.05828 ($328,349) = $19,136

6. Convert Cycle Value from 40 yrs. to infinity, to Worth at Year 40
   P/A, 5%, infinity = 20.000
   P_{40}= 20.000 ($19,136) = $382,720

7. Convert Year 40 Worth to Year 0 Worth
   P/F, 5%, 40 yrs. = 0.1420
   Present Worth = 0.1420 ($382,720) =$ 54,346

TOTAL PRESENT WORTH =$ 594,695
CALL $ 595,000

BLAIR COUNTY
L.R. 55
STA. 931+54

PRESENT WORTH CALCULATIONS

SCHEME 2
PRESENT LATEX OVERLAY

1. Present Latex Overlay = $496,000

2. Future New Deck @ Year 15 = $256,000
   Adjust to Year 0 (P/F, 5%, 15 yrs) = 0.4810
   Present Worth = 0.4810 ($256,000) = $123,136

3. Future Latex Overlay @ Year 40 = $245,000
   Note: Begin Cycle Here:

4. Future New Deck @ Year 55 = $256,000
   Adjust to Year 40 (Start of Cycle)
   P/F, 5%, 15 yrs = 0.4810
   Year 40 Worth = 0.4810 ($256,000) = $123,136
   Total Cycle Value = $368,136

5. Convert Cycle Value @ Year 40 to Annual Uniform Series of Payments (A)
   A/P, 5%, 40 yrs. = 0.05828
   A = 0.05828 ($368,136) = 21,455

6. Convert Cycle Value from 40 yrs to infinity, to Worth at Year 40
   P/A, 5%, infinity = 20.000
   P_{40} = 20.000 ($21,455) = $429,100

7. Convert Year 40 Worth to Year 0 Worth
   P/F, 5%, 40 yrs. = 0.1420
   Present Worth = 0.1420 ($429,100) = $ 60,932

TOTAL PRESENT WORTH = $680,068
CALL = $680,000

BLAIR COUNTY
L.R. 55
STA. 931+54

PRESENT WORTH ANALYSIS

SCHEME 1

PRESENT REPLACEMENT OF DECK

	PRESENT NEW DECK	FUTURE LATEX OVERLAY	FUTURE NEW DECK	FUTURE LATEX OVERLAY	FUTURE NEW DECK
YEARS	0	25	40	65	80 ... ∞
$ SPENT	$468,000	245,000	256,000	245,000	256,000

CAPITALIZED COST $595,000

SCHEME 2
PRESENT LATEX OVERLAY

	PRESENT LATEX OVERLAY	FUTURE NEW DECK	FUTURE LATEX OVERLAY	FUTURE NEW DECK	FUTURE LATEX OVERLAY
YEARS	0	15	40	55	80 ... ∞
$ SPENT	$496,000	256,000	245,000	256,000	245,000

CAPITALIZED COST $680,000

EXHIBIT VII
BRIDGE LOADING ANALYSES

BARS - BRIDGE ANALYSIS AND RATING (REVISION 5) 09/23/86 09:17

P4353116

STRUCTURE ID - 090710000550050931S4 (GRAZ1) EXISTING

BRIDGE TYPE	SLC STRESS LEVEL	LANES	LIVE LOAD	OUTPUT	IMPACT FACTOR	GAGE DISTANCE	PASSING DISTANCE
TFS	125.	L		1	0.00	6.00	4.00

DECK WIDTH	OVERHANG OR SPACING	CL OF GIRDER OR TRUSS TO CURB	ROADWAY WIDTH	DISTRIBUTION FACTORS SHEAR	MOMENT	DEFLECT
48.50	0.00	2.25	44.00	0.579	0.432	0.300

SLAB THICKNESS	HAUNCH	DEAD LOADS DL1	DL2	F'C	N	SYMMETRY
8.00	0.00	0.111	3.351	2.375	0.	Y

LIVE LOAD LOCATION	NO. OF PANELS	END COND.	CORS	HINGE AT	TEMP CHANGE
L	9	R	S	L 0	0.

* * * * * SPAN LENGTHS * * * * *

SPAN #	1	2	3	4	5	6	7	8
LENGTH	228.74							

* * * * * TRAFFIC LANE LOCATIONS * * * * *

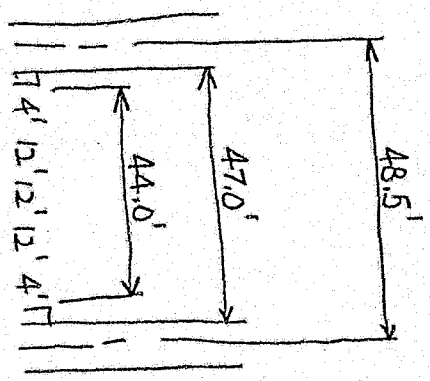
LANE #	1	2	3	4	5	6
DIST	4.00	16.00	28.00			
WIDTH	12.00	12.00	12.00			
% LL	90.	90.	90.			

* * * * * STRINGER SPAN LENGTHS * * * * *
(SIMPLE)

SPAN #	1	2	3	4	5	6	7	8
LENGTH	25.42	25.41						

* * * * * STRINGER LOCATIONS * * * * *

STRINGER #	1	2	3	4	5	6	7	8
DISTANCE	2.88	7.63	12.38	17.13	21.88	26.63	31.38	36.13



LR 55, Sta 931+54
(Grazerville)
Existing Bridge
Includes Concrete Encasement & 7½" Deck Overlay
WWW 9-23-86

STRINGER # 9 10 11
DISTANCE 40.88 45.63 48.50

* * * * * TRUSS GEOMETRY * * * * *

PANEL NO.	PANEL WIDTH	PHI	VERTICAL POST H1	H2	H3	PANEL TYPE
1	25.42	Y	29.20	0.00	0.30	1.
2	25.41	Y	33.71	0.00	0.54	6.
3	25.42	Y	36.30	0.00	0.70	6.
4	25.41	Y	37.23	0.00	0.77	6.
5	25.42	Y	37.23	0.00	0.77	13.

* * * * * TRUSS DEAD LOADS * * * * *

LOCAT	LOAD	LOCAT	LOAD	LOCAT	LOAD	LOCAT	LOAD
L 0	131.30	L 1	262.70	L 2	262.70	L 3	262.70
L 4	262.70	0	0.00	0	0.00	0	0.00

* * * * * TRUSS MEMBER PROPERTIES * * * * *

MEMBER	GROSS	NET	INERTIA	FY	L	ECC	FLANGE	C
L 0U 1	106.66	106.66	10436.0	33.0	0.00	0.00	0.00	0.00
U 1U 2	106.66	106.66	10436.0	33.0	0.00	0.00	0.00	0.00
U 2U 3	106.66	106.66	10436.0	33.0	0.00	0.00	0.00	0.00
U 3U 4	116.16	116.16	10767.0	33.0	0.00	0.00	0.00	0.00
U 4U 5	116.16	116.16	10767.0	33.0	0.00	0.00	0.00	0.00
L 0L 1	63.76	50.76	5000.0	33.0	0.00	0.00	0.00	0.00
L 1L 2	63.76	50.76	5000.0	33.0	0.00	0.00	0.00	0.00
L 2L 3	93.76	75.76	5000.0	33.0	0.00	0.00	0.00	0.00
L 3L 4	109.76	89.76	5000.0	33.0	0.00	0.00	0.00	0.00
L 4L 5	117.76	96.76	5000.0	33.0	0.00	0.00	0.00	0.00
U 1L 1	25.20	20.66	1108.0	33.0	0.00	0.00	0.00	0.00
U 1L 2	47.36	39.46	1137.0	33.0	0.00	0.00	0.00	0.00
U 2L 2	25.20	20.66	1108.0	33.0	0.00	0.00	0.00	0.00
U 2L 3	32.36	26.46	856.0	33.0	0.00	0.00	0.00	0.00
U 3L 3	25.20	20.66	1108.0	33.0	0.00	0.00	0.00	0.00
U 3L 4	23.60	18.82	698.0	33.0	0.00	0.00	0.00	0.00
U 4L 4	25.20	20.66	1108.0	33.0	0.00	0.00	0.00	0.00
U 4L 5	14.70	11.09	288.0	33.0	23.00	0.00	0.00	0.00
L 4U 5	14.70	11.09	288.0	33.0	23.00	0.00	0.00	0.00
U 5L 5	25.20	20.66	1108.0	33.0	0.00	0.00	0.00	0.00

* * * * * STEEL BEAM PROPERTIES * * * * *

WF BEAM OR WEB BUILT-UP SECTION	WF OR WEB PLATE DEPTH	TOP PLATE	BOTTOM PLATE

TYPE	AN	RANGE	INERTIA	AREA	LEFT	RIGHT	V	THIC	WIDTH	THICK	WIDTH	THICK	COMP	FY
F	2	0.00	53547.0	128.10	48.75	0.00		0.0000	0.00	0.0000	0.00	0.0000	Y	33.0
S	0	0.00	2033.8	21.77	23.87	0.00		0.0000	0.00	0.0000	0.00	0.0000	Y	33.0

THE STRINGER LOACATED AT 12.38 FT. FROM THE CENTER LINE OF GIRDER OR TRUSS IS CRITICAL.

LIVE LOAD DISTRIBUTION FACTORS

BASED ON DESIGN LANES			BASED ON LOADED LANES	
TRUSS FORCE	TRUSS DEFLECTION	FLOORBEAM MOMENT	TRUSS FORCE	FLOORBEAM MOMENT
1.809	1.500	23.875	1.406	21.487

IF THE LIVE LOAD STRESS IS ZERO AT ANY SECTION, THE RATING FACTOR IS PRINTED AS 999.999 INDICATING IT IS INFINITE.

NOTE: THE ALLOWABLE STRESS IN AN ECCENTRICALLY LOADED COMPRESSION MEMBER IS COMPUTED BY THE SECANT FORMULA. SEE ARTICLE 5.4.2 OF THE 1978 AASHTO MANUAL FOR MAINTENANCE INSPECTION OF BRIDGES.

****
* TRUSS ANALYSIS - LIVE LOAD H20 *
****

***** MEMBER FORCES AND RATINGS *****

MEMBER L 4L 5 IS CRITICAL. SEE DETAILS BELOW.

MEMBER ID	DL FORCE		LL + IMPACT FORCE COMP	LL + IMPACT FORCE TENS		ALLOWABLE FORCE COMP	ALLOWABLE FORCE TENS		RATING FACTOR	RATING TONS
L 4L 5	1793.4	DESIGN	0.0	247.0 L	IR	-1767.9	1756.2	IR (DESIGN)	-0.151	-3.01
		LOADED	0.0	213.2	OR	-2204.7	2394.8	OR (DESIGN)	2.435	48.70
								IR (LOADED)	-0.174	-3.49
								OR (LOADED)	2.821	56.42

****
* TRUSS ANALYSIS - LIVE LOAD HS20 *
****

***** MEMBER FORCES AND RATINGS *****

MEMBER L 4L 5 IS CRITICAL. SEE DETAILS BELOW.

MEMBER ID	DL FORCE		LL + IMPACT FORCE COMP	LL + IMPACT FORCE TENS		ALLOWABLE FORCE COMP	ALLOWABLE FORCE TENS		RATING FACTOR	RATING TONS
L 4L 5	1793.4	DESIGN	0.0	247.0 L	IR	-1767.9	1756.2	IR (DESIGN)	-0.151	-5.42
		LOADED	0.0	213.2	OR	-2204.7	2394.8	OR (DESIGN)	2.435	87.67
								IR (LOADED)	-0.174	-6.28
								OR (LOADED)	2.821	101.56

****
* TRUSS ANALYSIS - LIVE LOAD ML80 *
****

***** MEMBER FORCES AND RATINGS *****

MEMBER L 4L 5 IS CRITICAL. SEE DETAILS BELOW.

MEMBER ID	DL FORCE		LL + IMPACT FORCE COMP	LL + IMPACT FORCE TENS		ALLOWABLE FORCE COMP	ALLOWABLE FORCE TENS		RATING FACTOR	RATING TONS
L 4L 5	1793.4	DESIGN	0.0	189.5	IR	-1767.9	1756.2	IR (DESIGN)	-0.196	-7.41
		LOADED	0.0	163.6	OR	-2204.7	2394.8	OR (DESIGN)	3.174	119.82
								IR (LOADED)	-0.227	-8.58
								OR (LOADED)	3.677	138.80

****
* TRUSS ANALYSIS - LIVE LOAD 3S2 *
****

***** MEMBER FORCES AND RATINGS *****

MEMBER L 4L 5 IS CRITICAL. SEE DETAILS BELOW.

MEMBER ID	DL FORCE		LL + IMPACT FORCE COMP	LL + IMPACT FORCE TENS		ALLOWABLE FORCE COMP	ALLOWABLE FORCE TENS		RATING FACTOR	RATING TONS
L 4L 5	1793.4	DESIGN	0.0	176.6	IR	-1767.9	1756.2	IR (DESIGN)	-0.211	-7.58
		LOADED	0.0	152.4	OR	-2204.7	2394.8	OR (DESIGN)	3.406	122.61
								IR (LOADED)	-0.244	-8.78

OR (LOADED) 3.945 142.03

****
* TRUSS ANALYSIS - LIVE LOAD 3-3 *
****

***** MEMBER FORCES AND RATINGS *****

MEMBER L 4L 5 IS CRITICAL. SEE DETAILS BELOW.

MEMBER ID	DL FORCE		LL + IMPACT FORCE COMP	LL + IMPACT FORCE TENS		ALLOWABLE FORCE COMP	ALLOWABLE FORCE TENS		RATING FACTOR	RATING TONS
L 4L 5	1793.4	DESIGN	0.0	189.8	IR	-1767.9	1756.2	IR (DESIGN)	-0.196	-7.84
		LOADED	0.0	163.8	OR	-2204.7	2394.8	OR (DESIGN)	3.169	126.77
								IR (LOADED)	-0.227	-9.08
								OR (LOADED)	3.671	146.86

****
* STRINGER ANALYSIS - LIVE LOAD H20 *
****

SECTION 5 IN SPAN 1 IS CRITICAL. SEE DETAILS BELOW.

MAXIMUM MOMENTS, SHEARS AND DEFLECTIONS

SPAN 1

SECT	X	DL1 MOMENT	DL2 MOMENT	+(LL+I) MOMENT	-(LL+I) MOMENT	DL1 SHEAR	DL2 SHEAR	+(LL+I) SHEAR	-(LL+I) SHEAR	DEFLECTIONS DL1	DL2	LL + I
5	12.71	44.4	49.2	114.2	0.0	0.0	0.0	9.0	-9.0	0.086	0.094	0.120

MAXIMUM STRESSES AND RATING FACTORS

SPAN 1

SECT	TOP FIBER STEEL DL1	DL2	LL+I	BOTTOM FIBER STEEL DL1	DL2	LL+I	TOP FIBER CONC DL2	LL+I	IR (DESIGN)	OR (DESIGN)	IR (LOADED)	OR (LOADED)
5	-3.123	-3.408	-7.653	3.123	3.446	7.909	-0.011	-0.027	1.464	2.299	1.464	2.299

THE RATINGS FOR CRITICAL SECTION ARE:

	FACTOR	TONS
IR (DESIGN)	1.464	29.29
OR (DESIGN)	2.299	45.97
IR (LOADED)	1.464	29.29
OR (LOADED)	2.299	45.97

****
* STRINGER ANALYSIS - LIVE LOAD HS20 *
****

SECTION 6 IN SPAN 1 IS CRITICAL. SEE DETAILS BELOW.

MAXIMUM MOMENTS, SHEARS AND DEFLECTIONS

SPAN 1

SECT	X	DL1 MOMENT	DL2 MOMENT	+(LL+I) MOMENT	-(LL+I) MOMENT	DL1 SHEAR	DL2 SHEAR	+(LL+I) SHEAR	-(LL+I) SHEAR	DEFLECTIONS DL1	DL2	LL + I
6	15.25	42.6	47.2	118.6	0.0	-1.4	-1.5	7.2	-11.7	0.082	0.090	0.139

MAXIMUM STRESSES AND RATING FACTORS

SPAN 1

SECT	TOP FIBER STEEL DL1	DL2	LL+I	BOTTOM FIBER STEEL DL1	DL2	LL+I	TOP FIBER CONC DL2	LL+I	IR (DESIGN)	OR (DESIGN)	IR (LOADED)	OR (LOADED)
6	-2.998	-3.272	-7.950	2.998	3.308	8.216	-0.011	-0.028	1.442	2.245	1.442	2.245

THE RATINGS FOR CRITICAL SECTION ARE:

	FACTOR	TONS
IR (DESIGN)	1.442	51.90
OR (DESIGN)	2.245	80.81
IR (LOADED)	1.442	51.90
OR (LOADED)	2.245	80.81

****
* STRINGER ANALYSIS - LIVE LOAD ML80 *
****

SECTION 5 IN SPAN 1 IS CRITICAL. SEE DETAILS BELOW.

MAXIMUM MOMENTS, SHEARS AND DEFLECTIONS

SPAN 1

SECT	X	DL1 MOMENT	DL2 MOMENT	+(LL+I) MOMENT	-(LL+I) MOMENT	DL1 SHEAR	DL2 SHEAR	+(LL+I) SHEAR	-(LL+I) SHEAR	DEFLECTIONS DL1	DL2	LL + I
5	12.71	44.4	49.2	174.3	0.0	0.0	0.0	11.9	-11.9	0.086	0.094	0.210

MAXIMUM STRESSES AND RATING FACTORS

SPAN 1

SECT	TOP FIBER STEEL DL1	DL2	LL+I	BOTTOM FIBER STEEL DL1	DL2	LL+I	TOP FIBER CONC DL2	LL+I	IR (DESIGN)	OR (DESIGN)	IR (LOADED)	OR (LOADED)
5	-3.123	-3.408	-11.679	3.123	3.446	12.070	-0.011	-0.041	0.960	1.506	0.960	1.506

THE RATINGS FOR CRITICAL SECTION ARE:

	FACTOR	TONS
IR (DESIGN)	0.960	36.22
OR (DESIGN)	1.506	56.86
IR (LOADED)	0.960	36.22
OR (LOADED)	1.506	56.86

****
* STRINGER ANALYSIS - LIVE LOAD 3S2 *
****

SECTION 5 IN SPAN 1 IS CRITICAL. SEE DETAILS BELOW.

MAXIMUM MOMENTS, SHEARS AND DEFLECTIONS

SPAN 1

		DL1	DL2	+(LL+I)	-(LL+I)	DL1	DL2	+(LL+I)	-(LL+I)	DEFLECTIONS		
SECT	X	MOMENT	MOMENT	MOMENT	MOMENT	SHEAR	SHEAR	SHEAR	SHEAR	DL1	DL2	LL + I
5	12.71	44.4	49.2	98.0	0.0	0.0	0.0	7.3	-7.3	0.086	0.094	0.115

MAXIMUM STRESSES AND RATING FACTORS

SPAN 1

	TOP FIBER STEEL			BOTTOM FIBER STEEL			TOP FIBER CONC		IR	OR	IR	OR
SECT	DL1	DL2	LL+I	DL1	DL2	LL+I	DL2	LL+I	(DESIGN)	(DESIGN)	(LOADED)	(LOADED)
5	-3.123	-3.408	-6.569	3.123	3.446	6.789	-0.011	-0.023	1.706	2.678	1.706	2.678

THE RATINGS FOR CRITICAL SECTION ARE:

	FACTOR	TONS
IR (DESIGN)	1.706	61.41
OR (DESIGN)	2.678	96.41
IR (LOADED)	1.706	61.41
OR (LOADED)	2.678	96.41

****
* STRINGER ANALYSIS - LIVE LOAD 3-3 *
****

SECTION 5 IN SPAN 1 IS CRITICAL. SEE DETAILS BELOW.

MAXIMUM MOMENTS, SHEARS AND DEFLECTIONS

SPAN 1

		DL1	DL2	+(LL+I)	-(LL+I)	DL1	DL2	+(LL+I)	-(LL+I)	DEFLECTIONS		
SECT	X	MOMENT	MOMENT	MOMENT	MOMENT	SHEAR	SHEAR	SHEAR	SHEAR	DL1	DL2	LL + I
5	12.71	44.4	49.2	84.2	0.0	0.0	0.0	6.6	-6.6	0.086	0.094	0.097

MAXIMUM STRESSES AND RATING FACTORS

SPAN 1

	TOP FIBER STEEL			BOTTOM FIBER STEEL			TOP FIBER CONC		IR	OR	IR	OR
SECT	DL1	DL2	LL+I	DL1	DL2	LL+I	DL2	LL+I	(DESIGN)	(DESIGN)	(LOADED)	(LOADED)
5	-3.123	-3.408	-5.643	3.123	3.446	5.832	-0.011	-0.020	1.986	3.118	1.986	3.118

THE RATINGS FOR CRITICAL SECTION ARE:

	FACTOR	TONS
IR (DESIGN)	1.986	79.44
OR (DESIGN)	3.118	124.71
IR (LOADED)	1.986	79.44
OR (LOADED)	3.118	124.71

****
**** FLOORBEAM RATINGS ****
****

THE CRITICAL SECTION IN THE FLOORBEAM IS
ASSUMED AT THE CENTER OF THE FLOORBEAM SPAN.

***** LIVE LOAD - H20 *****

FLOORBEAM NO. 2 IS CRITICAL.

DL	MOMENT CAPACITY		LL + IMP MOMENT	
MOMENT	INVENTORY	OPERATING	DESIGN	LOADED
1942.9	3322.7	4530.9	985.2	985.2

	FACTOR	TONS
IR (DESIGN)	1.400	28.01
OR (DESIGN)	2.627	52.54
IR (LOADED)	1.400	28.01
OR (LOADED)	2.627	52.54

***** LIVE LOAD - HS20 *****

FLOORBEAM NO. 2 IS CRITICAL.

DL	MOMENT CAPACITY		LL + IMP MOMENT	
MOMENT	INVENTORY	OPERATING	DESIGN	LOADED
1942.9	3322.7	4530.9	1383.1	1383.1

	FACTOR	TONS
IR (DESIGN)	0.998	35.91
OR (DESIGN)	1.871	67.36
IR (LOADED)	0.998	35.91
OR (LOADED)	1.871	67.36

***** LIVE LOAD - ML80 *****

FLOORBEAM NO. 2 IS CRITICAL.

DL	MOMENT CAPACITY		LL + IMP MOMENT	
MOMENT	INVENTORY	OPERATING	DESIGN	LOADED
1942.9	3322.7	4530.9	1701.5	1701.5

	FACTOR	TONS
IR (DESIGN)	0.811	30.61
OR (DESIGN)	1.521	57.42
IR (LOADED)	0.811	30.61
OR (LOADED)	1.521	57.42

***** LIVE LOAD - 3S2 *****

FLOORBEAM NO. 2 IS CRITICAL.

DL	MOMENT CAPACITY		LL + IMP MOMENT	
MOMENT	INVENTORY	OPERATING	DESIGN	LOADED
1942.9	3322.7	4530.9	961.7	961.7

	FACTOR	TONS
IR (DESIGN)	1.435	51.65
OR (DESIGN)	2.691	96.88
IR (LOADED)	1.435	51.65
OR (LOADED)	2.691	96.88

***** LIVE LOAD - 3-3 *****

FLOORBEAM NO. 2 IS CRITICAL.

DL	MOMENT CAPACITY		LL + IMP MOMENT	
MOMENT	INVENTORY	OPERATING	DESIGN	LOADED
1942.9	3322.7	4530.9	889.0	889.0

	FACTOR	TONS
IR (DESIGN)	1.552	62.08
OR (DESIGN)	2.911	116.45
IR (LOADED)	1.552	62.08
OR (LOADED)	2.911	116.45

BAR5 - BRIDGE ANALYSIS AND RATING (REVISION 5) 09/24/86 14:25

P4353110

STRUCTURE ID - 090710000S5005093154 - GRAZ4 EXIST W/O EN

BRIDGE TYPE	SLC STRESS LEVEL	LANES	LIVE LOAD	OUTPUT	IMPACT FACTOR	GAGE DISTANCE	PASSING DISTANCE
TFS	125.	L		1	0.00	6.00	4.00

DECK WIDTH	OVERHANG OR SPACING	CL OF GIRDER OR TRUSS TO CURB	ROADWAY WIDTH	DISTRIBUTION FACTORS SHEAR	MOMENT	DEFLECT
48.50	0.00	2.25	44.00	0.579	0.432	0.300

SLAB THICKNESS	HAUNCH	DEAD LOADS DL1	DL2	F'C	N	SYMMETRY
8.00	0.00	0.111	2.203	2.375	0.	Y

LIVE LOAD LOCATION	NO. OF PANELS	END COND.	CORS	HINGE AT	TEMP CHANGE
L	9	R	S	L 0	0.

* * * * * SPAN LENGTHS * * * * *

SPAN #	1	2	3	4	5	6	7	8
LENGTH	228.74							

* * * * * TRAFFIC LANE LOCATIONS * * * * *

LANE #	1	2	3	4	5	6
DIST	4.00	16.00	28.00			
WIDTH	12.00	12.00	12.00			
% LL	90.	90.	90.			

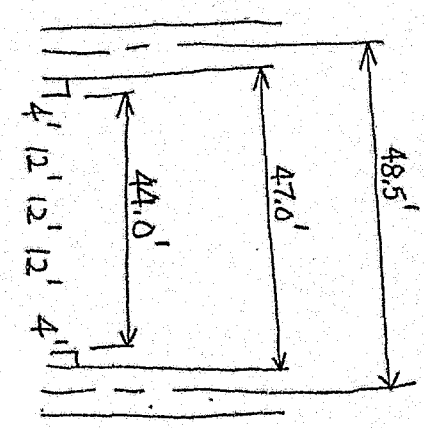
* * * * * STRINGER SPAN LENGTHS * * * * *

(SIMPLE)

SPAN #	1	2	3	4	5	6	7	8
LENGTH	25.42	25.41						

* * * * * STRINGER LOCATIONS * * * * *

STRINGER #	1	2	3	4	5	6	7	8
DISTANCE	2.88	7.63	12.38	17.13	21.88	26.63	31.38	36.13



LR 55, Sta. 931+54
(Grazerville)
Existing Bridge w/o
Concrete Encasement
WWW 9-23-86

STRUCTURE #	9	10	11
DISTANCE	40.88	45.63	48.50

* * * * * TRUSS GEOMETRY * * * * *

PANEL NO.	PANEL WIDTH	PHI	VERTICAL POST H1	H2	H3	PANEL TYPE
1	25.42	Y	29.20	0.00	0.30	1.
2	25.41	Y	33.71	0.00	0.54	6.
3	25.42	Y	36.30	0.00	0.70	6.
4	25.41	Y	37.23	0.00	0.77	6.
5	25.42	Y	37.23	0.00	0.77	13.

* * * * * TRUSS DEAD LOADS * * * * *

LOCAT	LOAD	LOCAT	LOAD	LOCAT	LOAD	LOCAT	LOAD
L 0	121.40	L 1	242.90	L 2	242.90	L 3	242.90
L 4	242.90	0	0.00	0	0.00	0	0.00

* * * * * TRUSS MEMBER PROPERTIES * * * * *

MEMBER	GROSS	NET	INERTIA	FY	L	ECC	FLANGE	C
L 0U 1	106.66	106.66	10436.0	33.0	0.00	0.00	0.00	0.00
U 1U 2	106.66	106.66	10436.0	33.0	0.00	0.00	0.00	0.00
U 2U 3	106.66	106.66	10436.0	33.0	0.00	0.00	0.00	0.00
U 3U 4	116.16	116.16	10767.0	33.0	0.00	0.00	0.00	0.00
U 4U 5	116.16	116.16	10767.0	33.0	0.00	0.00	0.00	0.00
L 0L 1	63.76	50.76	5000.0	33.0	0.00	0.00	0.00	0.00
L 1L 2	63.76	50.76	5000.0	33.0	0.00	0.00	0.00	0.00
L 2L 3	93.76	75.76	5000.0	33.0	0.00	0.00	0.00	0.00
L 3L 4	109.76	89.76	5000.0	33.0	0.00	0.00	0.00	0.00
L 4L 5	117.76	96.76	5000.0	33.0	0.00	0.00	0.00	0.00
U 1L 1	25.20	20.66	1108.0	33.0	0.00	0.00	0.00	0.00
U 1L 2	47.36	39.46	1137.0	33.0	0.00	0.00	0.00	0.00
U 2L 2	25.20	20.66	1108.0	33.0	0.00	0.00	0.00	0.00
U 2L 3	32.36	26.46	856.0	33.0	0.00	0.00	0.00	0.00
U 3L 3	25.20	20.66	1108.0	33.0	0.00	0.00	0.00	0.00
U 3L 4	23.60	18.82	698.0	33.0	0.00	0.00	0.00	0.00
U 4L 4	25.20	20.66	1108.0	33.0	0.00	0.00	0.00	0.00
U 4L 5	14.70	11.09	288.0	33.0	23.00	0.00	0.00	0.00
L 4U 5	14.70	11.09	288.0	33.0	23.00	0.00	0.00	0.00
U 5L 5	25.20	20.66	1108.0	33.0	0.00	0.00	0.00	0.00

* * * * * STEEL BEAM PROPERTIES * * * * *

WF BEAM OR WEB BUILT-UP SECTION	WF OR WEB PLATE DEPTH	TOP PLATE	BOTTOM PLATE

TYPE	SPAN	RANGE	INERTIA	AREA	LEFT	RIGHT	V	THICK	WIDTH	THICK	WIDTH	THICK	COMP	FY
F	2	0.00	53547.0	128.10	48.75	0.00		0.0000	0.00	0.0000	0.00	0.0000	Y	33.0
S	0	0.00	2033.8	21.77	23.87	0.00		0.0000	0.00	0.0000	0.00	0.0000	Y	33.0

THE STRINGER LOACATED AT 12.38 FT. FROM THE CENTER LINE OF GIRDER OR TRUSS IS CRITICAL.

LIVE LOAD DISTRIBUTION FACTORS

BASED ON DESIGN LANES			BASED ON LOADED LANES	
TRUSS FORCE	TRUSS DEFLECTION	FLOORBEAM MOMENT	TRUSS FORCE	FLOORBEAM MOMENT
1.809	1.500	23.875	1.406	21.487

IF THE LIVE LOAD STRESS IS ZERO AT ANY SECTION, THE RATING FACTOR IS PRINTED AS 999.999 INDICATING IT IS INFINITE.

NOTE: THE ALLOWABLE STRESS IN AN ECCENTRICALLY LOADED COMPRESSION MEMBER IS COMPUTED BY THE SECANT FORMULA. SEE ARTICLE 5.4.2 OF THE 1978 AASHTO MANUAL FOR MAINTENANCE INSPECTION OF BRIDGES.

****
* TRUSS ANALYSIS - LIVE LOAD H20 *
****

***** MEMBER FORCES AND RATINGS *****

MEMBER L 4L 5 IS CRITICAL. SEE DETAILS BELOW.

MEMBER ID	DL FORCE		LL + IMPACT FORCE COMP	LL + IMPACT FORCE TENS		ALLOWABLE FORCE COMP	ALLOWABLE FORCE TENS		RATING FACTOR	RATING TONS
L 4L 5	1658.2	DESIGN	0.0	247.0 L	IR	-1767.9	1756.2	IR (DESIGN)	0.397	7.93
		LOADED	0.0	213.2	OR	-2204.7	2394.8	OR (DESIGN)	2.983	59.65
								IR (LOADED)	0.460	9.19
								OR (LOADED)	3.455	69.10

****
* TRUSS ANALYSIS - LIVE LOAD HS20 *
****

***** MEMBER FORCES AND RATINGS *****

MEMBER L 4L 5 IS CRITICAL. SEE DETAILS BELOW.

MEMBER ID	DL FORCE		LL + IMPACT FORCE COMP	TENS		ALLOWABLE FORCE COMP	TENS		RATING FACTOR	TONS
L 4L 5	1658.2	DESIGN	0.0	247.0 L	IR	-1767.9	1756.2	IR (DESIGN)	0.397	14.28
		LOADED	0.0	213.2	OR	-2204.7	2394.8	OR (DESIGN)	2.983	107.37
								IR (LOADED)	0.460	16.54
								OR (LOADED)	3.455	124.38

****
* TRUSS ANALYSIS - LIVE LOAD ML80 *
****

***** MEMBER FORCES AND RATINGS *****

MEMBER U 2U 3 IS CRITICAL. SEE DETAILS BELOW.

MEMBER ID	DL FORCE		LL + IMPACT FORCE COMP	TENS		ALLOWABLE FORCE COMP	TENS		RATING FACTOR	TONS
U 2U 3	-1539.6	DESIGN	-190.1	0.0	IR	-1634.4	1935.9	IR (DESIGN)	0.499	18.82
		LOADED	-164.1	0.0	OR	-2038.2	2639.8	OR (DESIGN)	2.623	99.00
								IR (LOADED)	0.578	21.80
								OR (LOADED)	3.039	114.69

****
* TRUSS ANALYSIS - LIVE LOAD 3S2 *
****

***** MEMBER FORCES AND RATINGS *****

MEMBER L 4L 5 IS CRITICAL. SEE DETAILS BELOW.

MEMBER ID	DL FORCE		LL + IMPACT FORCE COMP	TENS		ALLOWABLE FORCE COMP	TENS		RATING FACTOR	TONS
L 4L 5	1658.2	DESIGN	0.0	176.6	IR	-1767.9	1756.2	IR (DESIGN)	0.555	19.97
		LOADED	0.0	152.4	OR	-2204.7	2394.8	OR (DESIGN)	4.171	150.16
								IR (LOADED)	0.643	23.14

OR (LOADED) 4.832 173.95

****
* TRUSS ANALYSIS - LIVE LOAD 3-3 *
****

***** MEMBER FORCES AND RATINGS *****

MEMBER L 4L 5 IS CRITICAL. SEE DETAILS BELOW.

MEMBER ID	DL FORCE		LL + IMPACT FORCE COMP	LL + IMPACT FORCE TENS		ALLOWABLE FORCE COMP	ALLOWABLE FORCE TENS	RATING	FACTOR	TONS
L 4L 5	1658.2	DESIGN	0.0	189.8	IR	-1767.9	1756.2	IR (DESIGN)	0.516	20.65
		LOADED	0.0	163.8	OR	-2204.7	2394.8	OR (DESIGN)	3.882	155.26
								IR (LOADED)	0.598	23.92
								OR (LOADED)	4.497	179.86

****
* STRINGER ANALYSIS - LIVE LOAD HS20 *
****

SECTION 5 IN SPAN 1 IS CRITICAL. SEE DETAILS BELOW.

MAXIMUM MOMENTS, SHEARS AND DEFLECTIONS

SPAN 1

SECT	X	DL1 MOMENT	DL2 MOMENT	+(LL+I) MOMENT	-(LL+I) MOMENT	DL1 SHEAR	DL2 SHEAR	+(LL+I) SHEAR	-(LL+I) SHEAR	DEFLECTIONS DL1	DL2	LL + I
5	12.71	44.4	32.4	114.2	0.0	0.0	0.0	9.0	-9.0	0.086	0.062	0.120

MAXIMUM STRESSES AND RATING FACTORS

SPAN 1

SECT	TOP FIBER STEEL DL1	DL2	LL+I	BOTTOM FIBER STEEL DL1	DL2	LL+I	TOP FIBER CONC DL2	LL+I	IR (DESIGN)	OR (DESIGN)	IR (LOADED)	OR (LOADED)
5	-3.123	-2.240	-7.653	3.123	2.265	7.909	-0.008	-0.027	1.614	2.448	1.614	2.448

THE RATINGS FOR CRITICAL SECTION ARE:

	FACTOR	TONS
IR (DESIGN)	1.614	32.27
OR (DESIGN)	2.448	48.96
IR (LOADED)	1.614	32.27
OR (LOADED)	2.448	48.96

****
* STRINGER ANALYSIS - LIVE LOAD MS20 *
****

SECTION 6 IN SPAN 1 IS CRITICAL. SEE DETAILS BELOW.

MAXIMUM MOMENTS, SHEARS AND DEFLECTIONS

SPAN 1

SECT	X	DL1 MOMENT	DL2 MOMENT	+(LL+I) MOMENT	-(LL+I) MOMENT	DL1 SHEAR	DL2 SHEAR	+(LL+I) SHEAR	-(LL+I) SHEAR	DEFLECTIONS DL1	DL2	LL + I
6	15.25	42.6	31.1	118.6	0.0	-1.4	-1.0	7.2	-11.7	0.082	0.059	0.139

MAXIMUM STRESSES AND RATING FACTORS

SPAN 1

SECT	TOP FIBER STEEL DL1	DL2	LL+I	BOTTOM FIBER STEEL DL1	DL2	LL+I	TOP FIBER CONC DL2	LL+I	IR (DESIGN)	OR (DESIGN)	IR (LOADED)	OR (LOADED)
6	-2.998	-2.151	-7.950	2.998	2.175	8.216	-0.007	-0.028	1.579	2.383	1.579	2.383

THE RATINGS FOR CRITICAL SECTION ARE:

	FACTOR	TONS
IR (DESIGN)	1.579	56.86
OR (DESIGN)	2.383	85.78
IR (LOADED)	1.579	56.86
OR (LOADED)	2.383	85.78

****
* STRINGER ANALYSIS - LIVE LOAD ML80 *
****

SECTION 5 IN SPAN 1 IS CRITICAL. SEE DETAILS BELOW.

MAXIMUM MOMENTS, SHEARS AND DEFLECTIONS

SPAN 1

SECT	X	DL1 MOMENT	DL2 MOMENT	+(LL+I) MOMENT	-(LL+I) MOMENT	DL1 SHEAR	DL2 SHEAR	+(LL+I) SHEAR	-(LL+I) SHEAR	DEFLECTIONS DL1	DL2	LL + I
5	12.71	44.4	32.4	174.3	0.0	0.0	0.0	11.9	-11.9	0.086	0.062	0.210

MAXIMUM STRESSES AND RATING FACTORS

SPAN 1

SECT	TOP FIBER STEEL DL1	DL2	LL+I	BOTTOM FIBER STEEL DL1	DL2	LL+I	TOP FIBER CONC DL2	LL+I	IR (DESIGN)	OR (DESIGN)	IR (LOADED)	OR (LOADED)
5	-3.123	-2.240	-11.679	3.123	2.265	12.070	-0.008	-0.041	1.057	1.604	1.057	1.604

THE RATINGS FOR CRITICAL SECTION ARE:

	FACTOR	TONS
IR (DESIGN)	1.057	39.91
OR (DESIGN)	1.604	60.56
IR (LOADED)	1.057	39.91
OR (LOADED)	1.604	60.56

****
* STRINGER ANALYSIS - LIVE LOAD 3S2 *
****

SECTION 5 IN SPAN 1 IS CRITICAL. SEE DETAILS BELOW.

MAXIMUM MOMENTS, SHEARS AND DEFLECTIONS

SPAN 1

		DL1	DL2	+(LL+I)	-(LL+I)	DL1	DL2	+(LL+I)	-(LL+I)	DEFLECTIONS		
SECT	X	MOMENT	MOMENT	MOMENT	MOMENT	SHEAR	SHEAR	SHEAR	SHEAR	DL1	DL2	LL + I
5	12.71	44.4	32.4	98.0	0.0	0.0	0.0	7.3	-7.3	0.086	0.062	0.115

MAXIMUM STRESSES AND RATING FACTORS

SPAN 1

	TOP FIBER STEEL			BOTTOM FIBER STEEL			TOP FIBER CONC		IR	OR	IR	OR
SECT	DL1	DL2	LL+I	DL1	DL2	LL+I	DL2	LL+I	(DESIGN)	(DESIGN)	(LOADED)	(LOADED)
5	-3.123	-2.240	-6.569	3.123	2.265	6.789	-0.008	-0.023	1.880	2.852	1.880	2.852

THE RATINGS FOR CRITICAL SECTION ARE:

	FACTOR	TONS
IR (DESIGN)	1.880	67.67
OR (DESIGN)	2.852	102.67
IR (LOADED)	1.880	67.67
OR (LOADED)	2.852	102.67

****
* STRINGER ANALYSIS - LIVE LOAD 3-3 *
****

SECTION 5 IN SPAN 1 IS CRITICAL. SEE DETAILS BELOW.

MAXIMUM MOMENTS, SHEARS AND DEFLECTIONS

SPAN 1

		DL1	DL2	+(LL+I)	-(LL+I)	DL1	DL2	+(LL+I)	-(LL+I)	DEFLECTIONS		
SECT	X	MOMENT	MOMENT	MOMENT	MOMENT	SHEAR	SHEAR	SHEAR	SHEAR	DL1	DL2	LL + I
5	12.71	44.4	32.4	84.2	0.0	0.0	0.0	6.6	-6.6	0.086	0.062	0.097

MAXIMUM STRESSES AND RATING FACTORS

SPAN 1

	TOP FIBER STEEL			BOTTOM FIBER STEEL			TOP FIBER CONC		IR	OR	IR	OR
SECT	DL1	DL2	LL+I	DL1	DL2	LL+I	DL2	LL+I	(DESIGN)	(DESIGN)	(LOADED)	(LOADED)
5	-3.123	-2.240	-5.643	3.123	2.265	5.832	-0.008	-0.020	2.188	3.320	2.188	3.320

THE RATINGS FOR CRITICAL SECTION ARE:

	FACTOR	TONS
IR (DESIGN)	2.188	87.53
OR (DESIGN)	3.320	132.81
IR (LOADED)	2.188	87.53
OR (LOADED)	3.320	132.81

****
**** FLOORBEAM RATINGS ****
****

THE CRITICAL SECTION IN THE FLOORBEAM IS
ASSUMED AT THE CENTER OF THE FLOORBEAM SPAN.

***** LIVE LOAD - H20 *****

FLOORBEAM NO. 2 IS CRITICAL.

DL	MOMENT CAPACITY		LL + IMP MOMENT	
MOMENT	INVENTORY	OPERATING	DESIGN	LOADED
1614.7	3322.7	4530.9	985.2	985.2

	FACTOR	TONS
IR (DESIGN)	1.734	34.67
OR (DESIGN)	2.960	59.20
IR (LOADED)	1.734	34.67
OR (LOADED)	2.960	59.20

***** LIVE LOAD - HS20 *****

FLOORBEAM NO. 2 IS CRITICAL.

DL	MOMENT CAPACITY		LL + IMP MOMENT	
MOMENT	INVENTORY	OPERATING	DESIGN	LOADED
1614.7	3322.7	4530.9	1383.1	1383.1

	FACTOR	TONS
IR (DESIGN)	1.235	44.46
OR (DESIGN)	2.108	75.90
IR (LOADED)	1.235	44.46
OR (LOADED)	2.108	75.90

***** LIVE LOAD - ML80 *****

FLOORBEAM NO. 2 IS CRITICAL.

DL MOMENT	MOMENT CAPACITY INVENTORY	MOMENT CAPACITY OPERATING	LL + IMP MOMENT DESIGN	LL + IMP MOMENT LOADED
1614.7	3322.7	4530.9	1701.5	1701.5

	FACTOR	TONS
IR (DESIGN)	1.004	37.89
OR (DESIGN)	1.714	64.70
IR (LOADED)	1.004	37.89
OR (LOADED)	1.714	64.70

***** LIVE LOAD - 3S2 *****

FLOORBEAM NO. 2 IS CRITICAL.

DL MOMENT	MOMENT CAPACITY INVENTORY	MOMENT CAPACITY OPERATING	LL + IMP MOMENT DESIGN	LL + IMP MOMENT LOADED
1614.7	3322.7	4530.9	961.7	961.7

	FACTOR	TONS
IR (DESIGN)	1.776	63.94
OR (DESIGN)	3.033	109.17
IR (LOADED)	1.776	63.94
OR (LOADED)	3.033	109.17

***** LIVE LOAD - 3-3 *****

FLOORBEAM NO. 2 IS CRITICAL.

DL MOMENT	MOMENT CAPACITY INVENTORY	MOMENT CAPACITY OPERATING	LL + IMP MOMENT DESIGN	LL + IMP MOMENT LOADED
1614.7	3322.7	4530.9	889.0	889.0

	FACTOR	TONS
IR (DESIGN)	1.921	76.85
OR (DESIGN)	3.280	131.22
IR (LOADED)	1.921	76.85
OR (LOADED)	3.280	131.22

BAR5 - BRIDGE ANALYSIS AND RATING (REVISION 5) 09/24/86 14:11

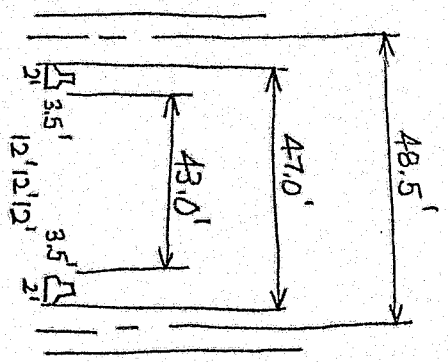
STRUCTURE ID - 090710000550050931S4 - GRAZZ EXIST LATEX

BRIDGE TYPE	SLC STRESS LEVEL	LANES	LIVE LOAD	OUTPUT	IMPACT FACTOR	GAGE DISTANCE	PASSING DISTANCE
TFS	125.	L		1	0.00	6.00	4.00

DECK WIDTH	OVERHANG OR SPACING	CL OF GIRDER OR TRUSS TO CURB	ROADWAY WIDTH	DISTRIBUTION FACTORS SHEAR	MOMENT	DEFLECT
48.50	0.00	2.75	43.00	0.579	0.432	0.300

SLAB THICKNESS	HAUNCH	DEAD LOADS DL1	DL2	F'C	N	SYMMETRY
8.00	0.00	0.111	0.702	2.375	0.	Y

LIVE LOAD LOCATION	NO. OF PANELS	END COND.	CORS	HINGE AT	TEMP CHANGE
L	9	R	S	L 0	0.



* * * * * SPAN LENGTHS * * * * *

SPAN #	1	2	3	4	5	6	7	8
LENGTH	228.74							

* * * * * TRAFFIC LANE LOCATIONS * * * * *

LANE #	1	2	3	4	5	6
DIST	3.50	15.50	27.50			
WIDTH	12.00	12.00	12.00			
% LL	90.	90.	90.			

* * * * * STRINGER SPAN LENGTHS * * * * *
(SIMPLE)

SPAN #	1	2	3	4	5	6	7	8
LENGTH	25.42	25.41						

* * * * * STRINGER LOCATIONS * * * * *

STRINGER #	1	2	3	4	5	6	7	8
DISTANCE	2.88	7.63	12.38	17.13	21.88	26.63	31.38	36.13

LR 55, Sta. 931+54
(Grazeville)
Existing w/Latex Overlay
(Net +1" over 8" Slab)
Concrete Encasement Removed
WWW 9-24-86

STRINGER #	9	10	11
DISTANCE	40.88	45.63	48.50

* * * * * TRUSS GEOMETRY * * * * *

PANEL NO.	PANEL WIDTH	PHI	VERTICAL POST H1	H2	H3	PANEL TYPE
1	25.42	Y	29.20	0.00	0.30	1.
2	25.41	Y	33.71	0.00	0.54	6.
3	25.42	Y	36.30	0.00	0.70	6.
4	25.41	Y	37.23	0.00	0.77	6.
5	25.42	Y	37.23	0.00	0.77	13.

* * * * * TRUSS DEAD LOADS * * * * *

LOCAT	LOAD	LOCAT	LOAD	LOCAT	LOAD	LOCAT	LOAD
L 0	92.00	L 1	184.00	L 2	184.00	L 3	184.00
L 4	184.00	0	0.00	0	0.00	0	0.00

* * * * * TRUSS MEMBER PROPERTIES * * * * *

MEMBER	GROSS	NET	INERTIA	FY	L	ECC	FLANGE	C
L 0U 1	106.66	106.66	10436.0	33.0	0.00	0.00	0.00	0.00
U 1U 2	106.66	106.66	10436.0	33.0	0.00	0.00	0.00	0.00
U 2U 3	106.66	106.66	10436.0	33.0	0.00	0.00	0.00	0.00
U 3U 4	116.16	116.16	10767.0	33.0	0.00	0.00	0.00	0.00
U 4U 5	116.16	116.16	10767.0	33.0	0.00	0.00	0.00	0.00
L 0L 1	63.76	50.76	5000.0	33.0	0.00	0.00	0.00	0.00
L 1L 2	63.76	50.76	5000.0	33.0	0.00	0.00	0.00	0.00
L 2L 3	93.76	75.76	5000.0	33.0	0.00	0.00	0.00	0.00
L 3L 4	109.76	89.76	5000.0	33.0	0.00	0.00	0.00	0.00
L 4L 5	117.76	96.76	5000.0	33.0	0.00	0.00	0.00	0.00
U 1L 1	25.20	20.66	1108.0	33.0	0.00	0.00	0.00	0.00
U 1L 2	47.36	39.46	1137.0	33.0	0.00	0.00	0.00	0.00
U 2L 2	25.20	20.66	1108.0	33.0	0.00	0.00	0.00	0.00
U 2L 3	32.36	26.46	856.0	33.0	0.00	0.00	0.00	0.00
U 3L 3	25.20	20.66	1108.0	33.0	0.00	0.00	0.00	0.00
U 3L 4	23.60	18.82	698.0	33.0	0.00	0.00	0.00	0.00
U 4L 4	25.20	20.66	1108.0	33.0	0.00	0.00	0.00	0.00
U 4L 5	14.70	11.09	288.0	33.0	23.00	0.00	0.00	0.00
L 4U 5	14.70	11.09	288.0	33.0	23.00	0.00	0.00	0.00
U 5L 5	25.20	20.66	1108.0	33.0	0.00	0.00	0.00	0.00

* * * * * STEEL BEAM PROPERTIES * * * * *

WF BEAM OR WEB BUILT-UP SECTION	WF OR WEB PLATE DEPTH	TOP FLATE	BOTTOM PLATE

TYPE	N	RANGE	INERTIA	AREA	LEFT	RIGHT	V	THICK	WIDTH	THICK	WIDTH	THICK	COMP	FY
F	2	0.00	53547.0	128.10	48.75	0.00		0.0000	0.00	0.0000	0.00	0.0000	Y	33.0
S	0	0.00	2033.8	21.77	23.87	0.00		0.0000	0.00	0.0000	0.00	0.0000	Y	33.0

THE STRINGER LOACATED AT 12.38 FT. FROM THE CENTER LINE OF GIRDER OR TRUSS IS CRITICAL.

LIVE LOAD DISTRIBUTION FACTORS

BASED ON DESIGN LANES			BASED ON LOADED LANES	
TRUSS FORCE	TRUSS DEFLECTION	FLOORBEAM MOMENT	TRUSS FORCE	FLOORBEAM MOMENT
1.778	1.500	23.875	1.406	21.487

IF THE LIVE LOAD STRESS IS ZERO AT ANY SECTION, THE RATING FACTOR IS PRINTED AS 999.999 INDICATING IT IS INFINITE.

NOTE: THE ALLOWABLE STRESS IN AN ECCENTRICALLY LOADED COMPRESSION MEMBER IS COMPUTED BY THE SECANT FORMULA. SEE ARTICLE 5.4.2 OF THE 1978 AASHTO MANUAL FOR MAINTENANCE INSPECTION OF BRIDGES.

****
* TRUSS ANALYSIS - LIVE LOAD H20 *
****

***** MEMBER FORCES AND RATINGS *****

MEMBER U 2L 3 IS CRITICAL. SEE DETAILS BELOW.

MEMBER ID	DL FORCE		LL + IMPACT FORCE COMP	LL + IMPACT FORCE TENS		ALLOWABLE FORCE COMP	ALLOWABLE FORCE TENS		RATING FACTOR	RATING TONS
U 2L 3	312.0	DESIGN	-40.6 L	101.6 L	IR	-424.9	480.2	IR (DESIGN)	1.655	33.11
		LOADED	-35.6	89.3	OR	-529.9	654.9	OR (DESIGN)	3.373	67.47
								IR (LOADED)	1.885	37.70
								OR (LOADED)	3.841	76.82

****
* TRUSS ANALYSIS - LIVE LOAD HS20 *
****

***** MEMBER FORCES AND RATINGS *****

MEMBER U 2L 3 IS CRITICAL. SEE DETAILS BELOW.

MEMBER ID	DL FORCE		LL + IMPACT FORCE COMP	TENS		ALLOWABLE FORCE COMP	TENS		RATING FACTOR	TONS
U 2L 3	312.0	DESIGN	-47.3	101.6 L	IR	-424.9	480.2	IR (DESIGN)	1.655	59.59
		LOADED	-41.6	89.3	OR	-529.9	654.9	OR (DESIGN)	3.373	121.44
								IR (LOADED)	1.885	67.85
								OR (LOADED)	3.841	138.28

****
* TRUSS ANALYSIS - LIVE LOAD ML80 *
****

***** MEMBER FORCES AND RATINGS *****

MEMBER U 1L 1 IS CRITICAL. SEE DETAILS BELOW.

MEMBER ID	DL FORCE		LL + IMPACT FORCE COMP	TENS		ALLOWABLE FORCE COMP	TENS		RATING FACTOR	TONS
U 1L 1	185.5	DESIGN	0.0	118.1	IR	-374.5	375.0	IR (DESIGN)	1.604	60.54
		LOADED	0.0	103.8	OR	-467.0	511.3	OR (DESIGN)	2.758	104.11
								IR (LOADED)	1.826	68.93
								OR (LOADED)	3.140	118.54

****
* TRUSS ANALYSIS - LIVE LOAD 3S2 *
****

***** MEMBER FORCES AND RATINGS *****

MEMBER U 2L 3 IS CRITICAL. SEE DETAILS BELOW.

MEMBER ID	DL FORCE		LL + IMPACT FORCE COMP	TENS		ALLOWABLE FORCE COMP	TENS		RATING FACTOR	TONS
U 2L 3	312.0	DESIGN	-36.7	77.5	IR	-424.9	480.2	IR (DESIGN)	2.172	78.18
		LOADED	-32.3	68.0	OR	-529.9	654.9	OR (DESIGN)	4.426	159.33
								IR (LOADED)	2.473	89.02

OR (LOADED) 5.039 181.41

****
* TRUSS ANALYSIS - LIVE LOAD 3-3 *
****

***** MEMBER FORCES AND RATINGS *****

MEMBER U 2L 3 IS CRITICAL. SEE DETAILS BELOW.

MEMBER ID	DL FORCE		LL + IMPACT FORCE COMP	TENS		ALLOWABLE FORCE COMP	TENS	RATING	FACTOR	TONS
U 2L 3	312.0	DESIGN	-34.7	82.7	IR	-424.9	480.2	IR (DESIGN)	2.035	81.40
		LOADED	-30.6	72.6	OR	-529.9	654.9	OR (DESIGN)	4.147	165.88
								IR (LOADED)	2.317	92.68
								OR (LOADED)	4.722	188.87

****
* STRINGER ANALYSIS - LIVE LOAD H20 *
****

SECTION 5 IN SPAN 1 IS CRITICAL. SEE DETAILS BELOW.

MAXIMUM MOMENTS, SHEARS AND DEFLECTIONS

SPAN 1

SECT	X	DL1 MOMENT	DL2 MOMENT	+(LL+I) MOMENT	-(LL+I) MOMENT	DL1 SHEAR	DL2 SHEAR	+(LL+I) SHEAR	-(LL+I) SHEAR	DEFLECTIONS DL1	DL2	LL + I
5	12.71	44.4	10.3	114.2	0.0	0.0	0.0	9.0	-9.0	0.086	0.020	0.120

MAXIMUM STRESSES AND RATING FACTORS

SPAN 1

	TOP FIBER STEEL			BOTTOM FIBER STEEL			TOP FIBER CONC		IR	OR	IR	OR
SECT	DL1	DL2	LL+I	DL1	DL2	LL+I	DL2	LL+I	(DESIGN)	(DESIGN)	(LOADED)	(LOADED)
5	-3.123	-0.714	-7.653	3.123	0.722	7.909	-0.002	-0.027	1.809	2.643	1.809	2.643

THE RATINGS FOR CRITICAL SECTION ARE:

	FACTOR	TONS
IR (DESIGN)	1.809	36.17
OR (DESIGN)	2.643	52.86
IR (LOADED)	1.809	36.17
OR (LOADED)	2.643	52.86

****
* STRINGER ANALYSIS - LIVE LOAD HS20 *
****

SECTION 6 IN SPAN 1 IS CRITICAL. SEE DETAILS BELOW.

MAXIMUM MOMENTS, SHEARS AND DEFLECTIONS

SPAN 1

SECT	X	DL1 MOMENT	DL2 MOMENT	+(LL+I) MOMENT	-(LL+I) MOMENT	DL1 SHEAR	DL2 SHEAR	+(LL+I) SHEAR	-(LL+I) SHEAR	DEFLECTIONS DL1	DL2	LL + I
6	15.25	42.6	9.9	118.6	0.0	-1.4	-0.3	7.2	-11.7	0.082	0.019	0.139

MAXIMUM STRESSES AND RATING FACTORS

SPAN 1

SECT	TOP FIBER STEEL DL1	DL2	LL+I	BOTTOM FIBER STEEL DL1	DL2	LL+I	TOP FIBER CONC DL2	LL+I	IR (DESIGN)	OR (DESIGN)	IR (LOADED)	OR (LOADED)
6	-2.998	-0.685	-7.950	2.998	0.693	8.216	-0.002	-0.028	1.760	2.563	1.760	2.563

THE RATINGS FOR CRITICAL SECTION ARE:

	FACTOR	TONS
IR (DESIGN)	1.760	63.35
OR (DESIGN)	2.563	92.27
IR (LOADED)	1.760	63.35
OR (LOADED)	2.563	92.27

****
* STRINGER ANALYSIS - LIVE LOAD ML80 *
****

SECTION 5 IN SPAN 1 IS CRITICAL. SEE DETAILS BELOW.

MAXIMUM MOMENTS, SHEARS AND DEFLECTIONS

SPAN 1

SECT	X	DL1 MOMENT	DL2 MOMENT	+(LL+I) MOMENT	-(LL+I) MOMENT	DL1 SHEAR	DL2 SHEAR	+(LL+I) SHEAR	-(LL+I) SHEAR	DEFLECTIONS DL1	DL2	LL + I
5	12.71	44.4	10.3	174.3	0.0	0.0	0.0	11.9	-11.9	0.086	0.020	0.210

MAXIMUM STRESSES AND RATING FACTORS

SPAN 1

SECT	TOP FIBER STEEL DL1	DL2	LL+I	BOTTOM FIBER STEEL DL1	DL2	LL+I	TOP FIBER CONC DL2	LL+I	IR (DESIGN)	OR (DESIGN)	IR (LOADED)	OR (LOADED)
5	-3.123	-0.714	-11.679	3.123	0.722	12.070	-0.002	-0.041	1.185	1.732	1.185	1.732

THE RATINGS FOR CRITICAL SECTION ARE:

	FACTOR	TONS
IR (DESIGN)	1.185	44.74
OR (DESIGN)	1.732	65.38
IR (LOADED)	1.185	44.74
OR (LOADED)	1.732	65.38

****
* STRINGER ANALYSIS - LIVE LOAD 3S2 *
****

SECTION 5 IN SPAN 1 IS CRITICAL. SEE DETAILS BELOW.

MAXIMUM MOMENTS, SHEARS AND DEFLECTIONS

SPAN 1

		DL1	DL2	+(LL+I)	-(LL+I)	DL1	DL2	+(LL+I)	-(LL+I)	DEFLECTIONS		
SECT	X	MOMENT	MOMENT	MOMENT	MOMENT	SHEAR	SHEAR	SHEAR	SHEAR	DL1	DL2	LL + I
5	12.71	44.4	10.3	98.0	0.0	0.0	0.0	7.3	-7.3	0.086	0.020	0.115

MAXIMUM STRESSES AND RATING FACTORS

SPAN 1

	TOP FIBER STEEL			BOTTOM FIBER STEEL			TOP FIBER CONC		IR	OR	IR	OR
SECT	DL1	DL2	LL+I	DL1	DL2	LL+I	DL2	LL+I	(DESIGN)	(DESIGN)	(LOADED)	(LOADED)
5	-3.123	-0.714	-6.569	3.123	0.722	6.789	-0.002	-0.023	2.107	3.079	2.107	3.079

THE RATINGS FOR CRITICAL SECTION ARE:

	FACTOR	TONS
IR (DESIGN)	2.107	75.86
OR (DESIGN)	3.079	110.86
IR (LOADED)	2.107	75.86
OR (LOADED)	3.079	110.86

****
* STRINGER ANALYSIS - LIVE LOAD 3-3 *
****

SECTION 5 IN SPAN 1 IS CRITICAL. SEE DETAILS BELOW.

MAXIMUM MOMENTS, SHEARS AND DEFLECTIONS

SPAN 1

		DL1	DL2	+(LL+I)	-(LL+I)	DL1	DL2	+(LL+I)	-(LL+I)	DEFLECTIONS		
SECT	X	MOMENT	MOMENT	MOMENT	MOMENT	SHEAR	SHEAR	SHEAR	SHEAR	DL1	DL2	LL + I
5	12.71	44.4	10.3	84.2	0.0	0.0	0.0	6.6	-6.6	0.086	0.020	0.097

MAXIMUM STRESSES AND RATING FACTORS

SPAN 1

	TOP FIBER STEEL			BOTTOM FIBER STEEL			TOP FIBER CONC		IR	OR	IR	OR
SECT	DL1	DL2	LL+I	DL1	DL2	LL+I	DL2	LL+I	(DESIGN)	(DESIGN)	(LOADED)	(LOADED)
5	-3.123	-0.714	-5.643	3.123	0.722	5.832	-0.002	-0.020	2.453	3.585	2.453	3.585

THE RATINGS FOR CRITICAL SECTION ARE:

	FACTOR	TONS
IR (DESIGN)	2.453	98.12
OR (DESIGN)	3.585	143.39
IR (LOADED)	2.453	98.12
OR (LOADED)	3.585	143.39

****
**** FLOORBEAM RATINGS ****
****

THE CRITICAL SECTION IN THE FLOORBEAM IS
ASSUMED AT THE CENTER OF THE FLOORBEAM SPAN.

***** LIVE LOAD - H20 *****

FLOORBEAM NO. 2 IS CRITICAL.

DL	MOMENT CAPACITY		LL + IMP MOMENT	
MOMENT	INVENTORY	OPERATING	DESIGN	LOADED
1185.5	3322.7	4530.9	985.2	985.2

	FACTOR	TONS
IR (DESIGN)	2.169	43.38
OR (DESIGN)	3.396	67.91
IR (LOADED)	2.169	43.38
OR (LOADED)	3.396	67.91

***** LIVE LOAD - HS20 *****

FLOORBEAM NO. 2 IS CRITICAL.

DL	MOMENT CAPACITY		LL + IMP MOMENT	
MOMENT	INVENTORY	OPERATING	DESIGN	LOADED
1185.5	3322.7	4530.9	1383.1	1383.1

	FACTOR	TONS
IR (DESIGN)	1.545	55.63
OR (DESIGN)	2.419	87.08
IR (LOADED)	1.545	55.63
OR (LOADED)	2.419	87.07

***** LIVE LOAD - ML80 *****

FLOORBEAM NO. 2 IS CRITICAL.

DL MOMENT	MOMENT CAPACITY INVENTORY	MOMENT CAPACITY OPERATING	LL + IMP MOMENT DESIGN	LL + IMP MOMENT LOADED
1185.5	3322.7	4530.9	1701.5	1701.5

	FACTOR	TONS
IR (DESIGN)	1.256	47.42
OR (DESIGN)	1.966	74.22
IR (LOADED)	1.256	47.42
OR (LOADED)	1.966	74.22

***** LIVE LOAD - 3S2 *****

FLOORBEAM NO. 2 IS CRITICAL.

DL MOMENT	MOMENT CAPACITY INVENTORY	MOMENT CAPACITY OPERATING	LL + IMP MOMENT DESIGN	LL + IMP MOMENT LOADED
1185.5	3322.7	4530.9	961.7	961.7

	FACTOR	TONS
IR (DESIGN)	2.222	80.01
OR (DESIGN)	3.479	125.24
IR (LOADED)	2.222	80.01
OR (LOADED)	3.479	125.24

***** LIVE LOAD - 3-3 *****

FLOORBEAM NO. 2 IS CRITICAL.

DL MOMENT	MOMENT CAPACITY INVENTORY	MOMENT CAPACITY OPERATING	LL + IMP MOMENT DESIGN	LL + IMP MOMENT LOADED
1185.5	3322.7	4530.9	889.0	889.0

	FACTOR	TONS
IR (DESIGN)	2.404	96.16
OR (DESIGN)	3.763	150.53
IR (LOADED)	2.404	96.16
OR (LOADED)	3.763	150.53

BAR5 - BRIDGE ANALYSIS AND RATING (REVISION 5) 09/23/86 09:36

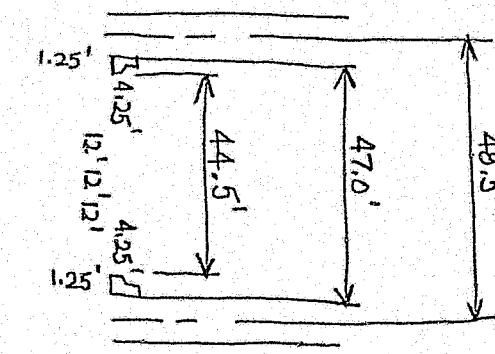
STRUCTURE ID - 090710000550050931S4 - GRAZ3 REHAB

BRIDGE TYPE	SLC STRESS LEVEL	LANES	LIVE LOAD	OUTPUT	IMPACT FACTOR	GAGE DISTANCE	PASSING DISTANCE
TFS	125.	L		1	0.00	6.00	4.00

DECK WIDTH	OVERHANG OR SPACING	CL OF GIRDER OR TRUSS TO CURB	ROADWAY WIDTH	DISTRIBUTION FACTORS SHEAR	MOMENT	DEFLECT
48.50	0.00	2.00	44.50	0.579	0.432	0.300

SLAB THICKNESS	HAUNCH	DEAD LOADS DL1	DL2	F'C	N	SYMMETRY
8.00	0.00	0.111	1.185	4.500	7.	Y

LIVE LOAD LOCATION	NO. OF PANELS	END COND.	CORS	HINGE AT	TEMP CHANGE
L	9	R	S	L 0	0.



* * * * * SPAN LENGTHS * * * * *

SPAN #	1	2	3	4	5	6	7	8
LENGTH	228.74							

* * * * * TRAFFIC LANE LOCATIONS * * * * *

LANE #	1	2	3	4	5	6
DIST	4.25	16.25	28.50			
WIDTH	12.00	12.00	12.00			
% LL	90.	90.	90.			

* * * * * STRINGER SPAN LENGTHS * * * * *
(SIMPLE)

SPAN #	1	2	3	4	5	6	7	8
LENGTH	25.42	25.41						

* * * * * STRINGER LOCATIONS * * * * *

STRINGER #	1	2	3	4	5	6	7	8
DISTANCE	2.88	7.63	12.38	17.13	21.88	26.63	31.38	36.13

LR 55, Sta. 931+54
(Grazerville)
Rehab Structure
(New Deck + FWS)
Concrete Encasement Removed
WAW 9-23-86

STRINGER #	9	10	11
DISTANCE	40.88	45.63	48.50

* * * * * TRUSS GEOMETRY * * * * *

PANEL NO.	PANEL WIDTH	PHI	VERTICAL POST H1	H2	H3	PANEL TYPE
1	25.42	Y	29.20	0.00	0.30	1.
2	25.41	Y	33.71	0.00	0.54	6.
3	25.42	Y	36.30	0.00	0.70	6.
4	25.41	Y	37.23	0.00	0.77	6.
5	25.42	Y	37.23	0.00	0.77	13.

* * * * * TRUSS DEAD LOADS * * * * *

LOCAT	LOAD	LOCAT	LOAD	LOCAT	LOAD	LOCAT	LOAD
L 0	90.40	L 1	180.90	L 2	180.90	L 3	180.90
L 4	180.90	0	0.00	0	0.00	0	0.00

* * * * * TRUSS MEMBER PROPERTIES * * * * *

MEMBER	GROSS	NET	INERTIA	FY	L	ECC	FLANGE	C
L 0U 1	106.66	106.66	10436.0	33.0	0.00	0.00	0.00	0.00
U 1U 2	106.66	106.66	10436.0	33.0	0.00	0.00	0.00	0.00
U 2U 3	106.66	106.66	10436.0	33.0	0.00	0.00	0.00	0.00
U 3U 4	116.16	116.16	10767.0	33.0	0.00	0.00	0.00	0.00
U 4U 5	116.16	116.16	10767.0	33.0	0.00	0.00	0.00	0.00
L 0L 1	63.76	50.76	5000.0	33.0	0.00	0.00	0.00	0.00
L 1L 2	63.76	50.76	5000.0	33.0	0.00	0.00	0.00	0.00
L 2L 3	93.76	75.76	5000.0	33.0	0.00	0.00	0.00	0.00
L 3L 4	109.76	89.76	5000.0	33.0	0.00	0.00	0.00	0.00
L 4L 5	117.76	96.76	5000.0	33.0	0.00	0.00	0.00	0.00
U 1L 1	25.20	20.66	1108.0	33.0	0.00	0.00	0.00	0.00
U 1L 2	47.36	39.46	1137.0	33.0	0.00	0.00	0.00	0.00
U 2L 2	25.20	20.66	1108.0	33.0	0.00	0.00	0.00	0.00
U 2L 3	32.36	26.46	856.0	33.0	0.00	0.00	0.00	0.00
U 3L 3	25.20	20.66	1108.0	33.0	0.00	0.00	0.00	0.00
U 3L 4	23.60	18.82	698.0	33.0	0.00	0.00	0.00	0.00
U 4L 4	25.20	20.66	1108.0	33.0	0.00	0.00	0.00	0.00
U 4L 5	14.70	11.09	288.0	33.0	23.00	0.00	0.00	0.00
L 4U 6	14.70	11.09	288.0	33.0	23.00	0.00	0.00	0.00
U 5L 5	25.20	20.66	1108.0	33.0	0.00	0.00	0.00	0.00

* * * * * STEEL BEAM PROPERTIES * * * * *

WF BEAM OR WEB BUILT-UP SECTION	WF OR WEB PLATE DEPTH	TOP PLATE	BOTTOM PLATE

TYPE	AN	RANGE	INERTIA	AREA	LEFT	RIGHT	V	THIC	WIDTH	THICK	WIDTH	THICK	COMP	FY
F	2	0.00	53547.0	128.10	48.75	0.00		0.0000	0.00	0.0000	0.00	0.0000	Y	33.0
S	0	0.00	2033.8	21.77	23.87	0.00		0.0000	0.00	0.0000	0.00	0.0000	Y	33.0

THE STRINGER LOACATED AT 12.38 FT. FROM THE CENTER LINE OF GIRDER OR TRUSS IS CRITICAL.

LIVE LOAD DISTRIBUTION FACTORS

BASED ON DESIGN LANES			BASED ON LOADED LANES	
TRUSS FORCE	TRUSS DEFLECTION	FLOORBEAM MOMENT	TRUSS FORCE	FLOORBEAM MOMENT
1.825	1.500	23.875	1.401	21.375

IF THE LIVE LOAD STRESS IS ZERO AT ANY SECTION, THE RATING FACTOR IS PRINTED AS 999.999 INDICATING IT IS INFINITE.

NOTE: THE ALLOWABLE STRESS IN AN ECCENTRICALLY LOADED COMPRESSION MEMBER IS COMPUTED BY THE SECANT FORMULA. SEE ARTICLE 6.4.2 OF THE 1978 AASHTO MANUAL FOR MAINTENANCE INSPECTION OF BRIDGES.

****
* TRUSS ANALYSIS - LIVE LOAD H20 *
****

***** MEMBER FORCES AND RATINGS *****

MEMBER U 2L 3 IS CRITICAL. SEE DETAILS BELOW.

MEMBER ID	DL FORCE		LL + IMPACT FORCE COMP	LL + IMPACT FORCE TENS		ALLOWABLE FORCE COMP	ALLOWABLE FORCE TENS	RATING	FACTOR	TONS
U 2L 3	306.7	DESIGN	-41.6 L	104.3 L	IR	-424.9	480.2	IR (DESIGN)	1.664	33.27
		LOADED	-35.5	89.0	OR	-529.9	654.9	OR (DESIGN)	3.338	66.76
								IR (LOADED)	1.950	39.00
								OR (LOADED)	3.913	78.26

****
* TRUSS ANALYSIS - LIVE LOAD HS20 *
****

***** MEMBER FORCES AND RATINGS *****

MEMBER U 2L 3 IS CRITICAL. SEE DETAILS BELOW.

MEMBER ID	DL FORCE		LL + IMPACT FORCE COMP	LL + IMPACT FORCE TENS		ALLOWABLE FORCE COMP	ALLOWABLE FORCE TENS	RATING	FACTOR	TONS
U 2L 3	306.7	DESIGN	-48.6	104.3 L	IR	-424.9	480.2	IR (DESIGN)	1.664	59.89
		LOADED	-41.4	89.0	OR	-529.9	654.9	OR (DESIGN)	3.338	120.17
								IR (LOADED)	1.950	70.20
								OR (LOADED)	3.913	140.86

****
* TRUSS ANALYSIS - LIVE LOAD ML80 *
****

***** MEMBER FORCES AND RATINGS *****

MEMBER U 1L 1 IS CRITICAL. SEE DETAILS BELOW.

MEMBER ID	DL FORCE		LL + IMPACT FORCE COMP	LL + IMPACT FORCE TENS		ALLOWABLE FORCE COMP	ALLOWABLE FORCE TENS	RATING	FACTOR	TONS
U 1L 1	182.4	DESIGN	0.0	121.2	IR	-374.5	375.0	IR (DESIGN)	1.589	59.98
		LOADED	0.0	103.4	OR	-467.0	511.3	OR (DESIGN)	2.714	102.44
								IR (LOADED)	1.862	70.30
								OR (LOADED)	3.181	120.08

****
* TRUSS ANALYSIS - LIVE LOAD 3S2 *
****

***** MEMBER FORCES AND RATINGS *****

MEMBER U 2L 3 IS CRITICAL. SEE DETAILS BELOW.

MEMBER ID	DL FORCE		LL + IMPACT FORCE COMP	LL + IMPACT FORCE TENS		ALLOWABLE FORCE COMP	ALLOWABLE FORCE TENS	RATING	FACTOR	TONS
U 2L 3	306.7	DESIGN	-37.7	79.5	IR	-424.9	480.2	IR (DESIGN)	2.183	78.57
		LOADED	-32.2	67.8	OR	-529.9	654.9	OR (DESIGN)	4.379	157.66
								IR (LOADED)	2.558	92.10

OR (LOADED) 5.133 184.80

****
* TRUSS ANALYSIS - LIVE LOAD 3-3 *
****

***** MEMBER FORCES AND RATINGS *****

MEMBER U 2L 3 IS CRITICAL. SEE DETAILS BELOW.

MEMBER ID	DL FORCE		LL + IMPACT FORCE COMP	TENS		ALLOWABLE FORCE COMP	TENS		RATING FACTOR	TONS
U 2L 3	306.7	DESIGN	-35.6	84.8	IR	-424.9	480.2	IR (DESIGN)	2.045	81.81
		LOADED	-30.4	72.4	OR	-529.9	654.9	OR (DESIGN)	4.104	164.14
								IR (LOADED)	2.397	95.89
								OR (LOADED)	4.810	192.40

****
* STRINGER ANALYSIS - LIVE LOAD H20 *
****

SECTION 5 IN SPAN 1 IS CRITICAL. SEE DETAILS BELOW.

MAXIMUM MOMENTS, SHEARS AND DEFLECTIONS

SPAN 1

SECT	X	DL1 MOMENT	DL2 MOMENT	+(LL+I) MOMENT	-(LL+I) MOMENT	DL1 SHEAR	DL2 SHEAR	+(LL+I) SHEAR	-(LL+I) SHEAR	DEFLECTIONS DL1	DL2	LL + I
5	12.71	44.4	17.4	114.2	0.0	0.0	0.0	9.0	-9.0	0.086	0.033	0.120

MAXIMUM STRESSES AND RATING FACTORS

SPAN 1

	TOP FIBER STEEL			BOTTOM FIBER STEEL			TOP FIBER CONC		IR	OR	IR	OR
SECT	DL1	DL2	LL+I	DL1	DL2	LL+I	DL2	LL+I	(DESIGN)	(DESIGN)	(LOADED)	(LOADED)
5	-3.123	-1.205	-7.653	3.123	1.219	7.909	-0.004	-0.027	1.746	2.580	1.746	2.580

THE RATINGS FOR CRITICAL SECTION ARE:

	FACTOR	TONS
IR (DESIGN)	1.746	34.92
OR (DESIGN)	2.580	51.61
IR (LOADED)	1.746	34.92
OR (LOADED)	2.580	51.61

****
* STRINGER ANALYSIS - LIVE LOAD HS20 *
****

SECTION 6 IN SPAN 1 IS CRITICAL. SEE DETAILS BELOW.

MAXIMUM MOMENTS, SHEARS AND DEFLECTIONS

SPAN 1

		DL1	DL2	+(LL+I)	-(LL+I)	DL1	DL2	+(LL+I)	-(LL+I)	DEFLECTIONS		
SECT	X	MOMENT	MOMENT	MOMENT	MOMENT	SHEAR	SHEAR	SHEAR	SHEAR	DL1	DL2	LL + I
6	15.25	42.6	16.7	118.6	0.0	-1.4	-0.5	7.2	-11.7	0.082	0.032	0.139

MAXIMUM STRESSES AND RATING FACTORS

SPAN 1

	TOP FIBER STEEL			BOTTOM FIBER STEEL			TOP FIBER CONC		IR	OR	IR	OR
SECT	DL1	DL2	LL+I	DL1	DL2	LL+I	DL2	LL+I	(DESIGN)	(DESIGN)	(LOADED)	(LOADED)
6	-2.998	-1.157	-7.950	2.998	1.170	8.216	-0.004	-0.028	1.702	2.505	1.702	2.505

THE RATINGS FOR CRITICAL SECTION ARE:

	FACTOR	TONS
IR (DESIGN)	1.702	61.26
OR (DESIGN)	2.505	90.18
IR (LOADED)	1.702	61.26
OR (LOADED)	2.505	90.18

****
* STRINGER ANALYSIS - LIVE LOAD ML80 *
****

SECTION 5 IN SPAN 1 IS CRITICAL. SEE DETAILS BELOW.

MAXIMUM MOMENTS, SHEARS AND DEFLECTIONS

SPAN 1

		DL1	DL2	+(LL+I)	-(LL+I)	DL1	DL2	+(LL+I)	-(LL+I)	DEFLECTIONS		
SECT	X	MOMENT	MOMENT	MOMENT	MOMENT	SHEAR	SHEAR	SHEAR	SHEAR	DL1	DL2	LL + I
5	12.71	44.4	17.4	174.3	0.0	0.0	0.0	11.9	-11.9	0.086	0.033	0.210

MAXIMUM STRESSES AND RATING FACTORS

SPAN 1

	TOP FIBER STEEL			BOTTOM FIBER STEEL			TOP FIBER CONC		IR	OR	IR	OR
SECT	DL1	DL2	LL+I	DL1	DL2	LL+I	DL2	LL+I	(DESIGN)	(DESIGN)	(LOADED)	(LOADED)
5	-3.123	-1.205	-11.679	3.123	1.219	12.070	-0.004	-0.041	1.144	1.691	1.144	1.691

THE RATINGS FOR CRITICAL SECTION ARE:

	FACTOR	TONS
IR (DESIGN)	1.144	43.19
OR (DESIGN)	1.691	63.83
IR (LOADED)	1.144	43.19
OR (LOADED)	1.691	63.83

****
* STRINGER ANALYSIS - LIVE LOAD 3S2 *
****

SECTION 5 IN SPAN 1 IS CRITICAL. SEE DETAILS BELOW.

MAXIMUM MOMENTS, SHEARS AND DEFLECTIONS

SPAN 1

		DL1	DL2	+(LL+I)	-(LL+I)	DL1	DL2	+(LL+I)	-(LL+I)	DEFLECTIONS		
SECT	X	MOMENT	MOMENT	MOMENT	MOMENT	SHEAR	SHEAR	SHEAR	SHEAR	DL1	DL2	LL + I
5	12.71	44.4	17.4	98.0	0.0	0.0	0.0	7.3	-7.3	0.086	0.033	0.115

MAXIMUM STRESSES AND RATING FACTORS

SPAN 1

	TOP FIBER STEEL			BOTTOM FIBER STEEL			TOP FIBER CONC		IR	OR	IR	OR
SECT	DL1	DL2	LL+I	DL1	DL2	LL+I	DL2	LL+I	(DESIGN)	(DESIGN)	(LOADED)	(LOADED)
5	-3.123	-1.205	-6.569	3.123	1.219	6.789	-0.004	-0.023	2.034	3.006	2.034	3.006

THE RATINGS FOR CRITICAL SECTION ARE:

	FACTOR	TONS
IR (DESIGN)	2.034	73.22
OR (DESIGN)	3.006	108.22
IR (LOADED)	2.034	73.22
OR (LOADED)	3.006	108.22

****
* STRINGER ANALYSIS - LIVE LOAD 3-3 *
****

SECTION 5 IN SPAN 1 IS CRITICAL. SEE DETAILS BELOW.

MAXIMUM MOMENTS, SHEARS AND DEFLECTIONS

SPAN 1

		DL1	DL2	+(LL+I)	-(LL+I)	DL1	DL2	+(LL+I)	-(LL+I)	DEFLECTIONS		
SECT	X	MOMENT	MOMENT	MOMENT	MOMENT	SHEAR	SHEAR	SHEAR	SHEAR	DL1	DL2	LL + I
5	12.71	44.4	17.4	84.2	0.0	0.0	0.0	6.6	-6.6	0.086	0.033	0.097

MAXIMUM STRESSES AND RATING FACTORS

SPAN 1

	TOP FIBER STEEL			BOTTOM FIBER STEEL			TOP FIBER CONC		IR	OR	IR	OR
SECT	DL1	DL2	LL+I	DL1	DL2	LL+I	DL2	LL+I	(DESIGN)	(DESIGN)	(LOADED)	(LOADED)
5	-3.123	-1.205	-5.643	3.123	1.219	5.832	-0.004	-0.020	2.368	3.500	2.368	3.500

THE RATINGS FOR CRITICAL SECTION ARE:

	FACTOR	TONS
IR (DESIGN)	2.368	94.72
OR (DESIGN)	3.500	139.99
IR (LOADED)	2.368	94.72
OR (LOADED)	3.500	139.99

****
**** FLOORBEAM RATINGS ****
****

THE CRITICAL SECTION IN THE FLOORBEAM IS
ASSUMED AT THE CENTER OF THE FLOORBEAM SPAN.

***** LIVE LOAD - H20 *****

FLOORBEAM NO. 2 IS CRITICAL.

DL	MOMENT CAPACITY		LL + IMP MOMENT	
MOMENT	INVENTORY	OPERATING	DESIGN	LOADED
1323.6	3322.7	4530.9	985.2	980.1

	FACTOR	TONS
IR (DESIGN)	2.029	40.58
OR (DESIGN)	3.255	65.11
IR (LOADED)	2.040	40.79
OR (LOADED)	3.273	65.45

***** LIVE LOAD - HS20 *****

FLOORBEAM NO. 2 IS CRITICAL.

DL	MOMENT CAPACITY		LL + IMP MOMENT	
MOMENT	INVENTORY	OPERATING	DESIGN	LOADED
1323.6	3322.7	4530.9	1383.1	1375.9

	FACTOR	TONS
IR (DESIGN)	1.445	52.03
OR (DESIGN)	2.319	83.48
IR (LOADED)	1.453	52.31
OR (LOADED)	2.331	83.92

***** LIVE LOAD - ML80 *****

FLOORBEAM NO. 2 IS CRITICAL.

DL	MOMENT CAPACITY		LL + IMP MOMENT	
MOMENT	INVENTORY	OPERATING	DESIGN	LOADED
1323.6	3322.7	4530.9	1701.5	1692.6

	FACTOR	TONS
IR (DESIGN)	1.175	44.35
OR (DESIGN)	1.885	71.16
IR (LOADED)	1.181	44.59
OR (LOADED)	1.895	71.53

***** LIVE LOAD - 3S2 *****

FLOORBEAM NO. 2 IS CRITICAL.

DL	MOMENT CAPACITY		LL + IMP MOMENT	
MOMENT	INVENTORY	OPERATING	DESIGN	LOADED
1323.6	3322.7	4530.9	961.7	956.6

	FACTOR	TONS
IR (DESIGN)	2.079	74.84
OR (DESIGN)	3.335	120.07
IR (LOADED)	2.090	75.23
OR (LOADED)	3.353	120.70

***** LIVE LOAD - 3-3 *****

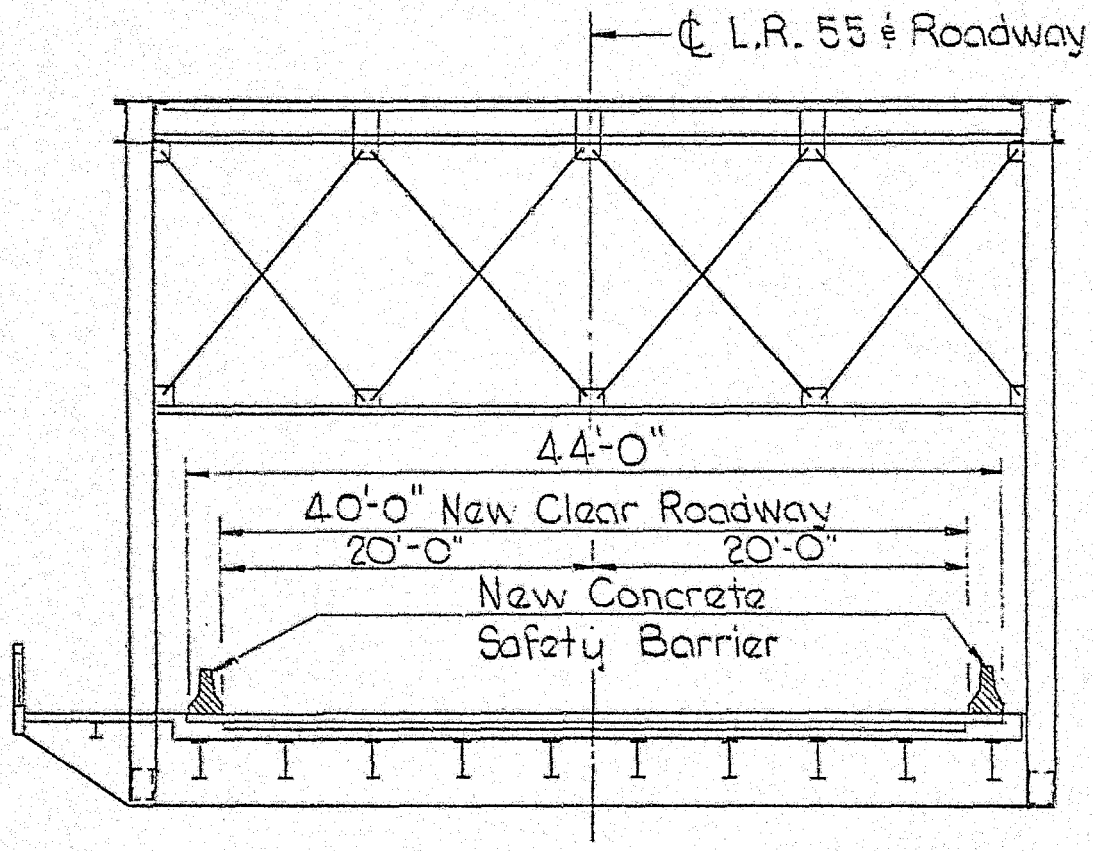
FLOORBEAM NO. 2 IS CRITICAL.

DL	MOMENT CAPACITY		LL + IMP MOMENT	
MOMENT	INVENTORY	OPERATING	DESIGN	LOADED
1323.6	3322.7	4530.9	889.0	884.3

	FACTOR	TONS
IR (DESIGN)	2.249	89.95
OR (DESIGN)	3.608	144.31
IR (LOADED)	2.261	90.42
OR (LOADED)	3.627	145.07

EXHIBIT VIII
SAFETY BARRIER PLAN

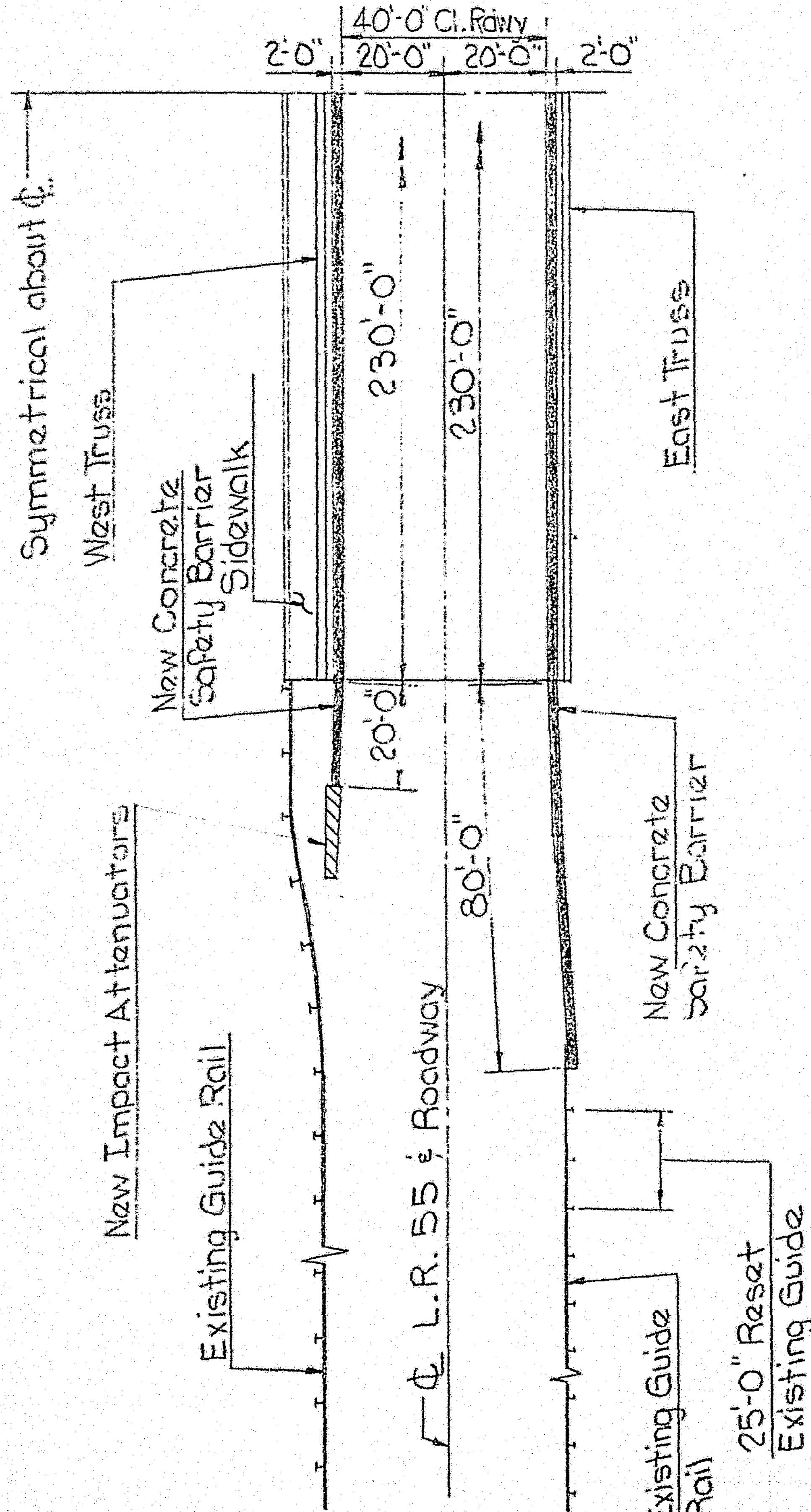
BY J.H.E DATE 4-30 SUBJECT Bar Down L.R.55
CHKD. BY ..... DATE ..... (S.R.04027) Sta. 931+54
SHEET NO. 1 OF 2
JOB NO. .....



PROPOSED TYPICAL CROSS-SECTION

-No Scale-

BY .... DATE .... SUBJECT Blair County LR 55 SHEET NO. 2 OF 2
CHKD. BY .... DATE .... (S.R. 04027) Sta. 93+54 JOB NO. ....



PLAN
No Scale