Before
THE PENNSYLVANIA PUBLIC UTILITY COMMISSION

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In re: Borough of Homewood and Borough of Big Beaver v. Penn Central Transportation Company, et al. Further hearing.

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Complaint Docket No. 18925

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Thursday, April 26, 1973, Beaver, Pa.

Pages 118 To 170

MOHRBACH & MARSHAL, INC.
SHORTHAND & STENOTYPE REPORTERS
2000 STATE STREET
HARRISBURG, PA. 17103
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Before
THE PENNSYLVANIA PUBLIC UTILITY COMMISSION

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In re: Borough of Homewood and Borough of Big Beaver v. Penn Central Transportation Company, Department of Highways of the Commonwealth of Pennsylvania, Pennsylvania Turnpike Commission and County of Beaver - Alleging dangerous conditions existing at crossing where State Highway Route No. 77 (Legislative Route No. 04057) crosses, above grade, the tracks and right-of-way of the Pennsylvania Turnpike in the Boroughs of Homewood and Big Beaver, Beaver County, Pennsylvania.

Further hearing.

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Complaint Docket No. 18925

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Stenographic report of hearing held in Courthouse, Beaver, Beaver County, Pennsylvania, Thursday,

April 26, 1973
at 10:00 o'clock a.m.

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THOMAS C. MANNIX, ESQ., EXAMINER

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APPEARANCES:

DAVID L. GROPP, ESQ.
Beaver Trust Bldg.
Beaver, Pa.
For - Borough of Homewood and Big Beaver Borough.

WALLACE D. STEWART, ESQ.
925 Penn Central Station
Pittsburgh, Pa. 15222
For - Trustees of Penn Central Transportation Co.

WILLIAM E. BETHARDS, ESQ.
Transportation & Safety Bldg.
Harrisburg, Pa. 17120
For - PennDOT.

GEORGE H. SHAFFER, ESQ.
P. O. Box 2531
Harrisburg, Pa. 17120
For - Pennsylvania Turnpike Commission.

(John L. Storch - Pa. P.U.C.
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Harrisburg, Pa.)

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THE EXAMINER: This is a further hearing on a complaint filed by Borough of Homewood and Borough of Big Beaver at Complaint Docket No. 18925, against the Penn Central Transportation Company, Department of Highways, Pennsylvania Turnpike Commission and County of Beaver, the last hearing on this matter having been held in October 1970.

Notice of this hearing was given, in addition to those parties who have signed the appearance sheet, to the County of Beaver.

Is there anyone here representing the County of Beaver? (No response) Let the record show there is not.

I think it probably would be advisable to begin this hearing with testimony from the railroad and we understand that you're ready to proceed in that fashion.

MR. STEWART: That's correct. I'd like to make just a brief statement. It appears to me that we are here today to have an opportunity to comment upon, following the Commission's Questions and Procedure, with respect to the detailed engineering report that was required of each of the parties by the Commission's order of August 23, 1971.

Penn Central, on May 26, 1972, in compliance with the requirements of paragraphs 2 and 3 of the August 23, 1971 order, sent to the Commission Secretary, Mr. Will Ketner, three copies of the complete inspection report

and engineering assessment that we were directed to make, and copies of that were sent to Mr. Masters for the County, Mr. Bethards for PennDOT, and Mr. David L. Gropp, who here represents the two boroughs.

THE EXAMINER: May I ask one thing: Do these detailed inspection reports reach a conclusion and recommend something, or are they even more preliminary than that?

MR. STEWART: I haven't read them, sir, I don't know. I think that the answer is, whatever they say, we have something else to recommend.

THE EXAMINER: Let's go ahead then.

MR. STEWART: I'll call Mr. Walker.

STAFFORD C. WALKER, called as a witness on behalf of Penn Central, being first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. STEWART:

Q Would you give us your full name, sir?

A Stafford C. Walker.

Q And by whom are you employed?

A Penn Central Transportation Company.

Q In what capacity?

A As a civil engineer.

Q I don't believe you were the witness in the original hearing in this matter, were you, Mr. Walker?

A That's correct, I was not.

Q What is your engineering background, Mr. Walker?

A I'm a graduate civil engineer and have been practicing civil engineering for 24 years. All of that has been with Penn Central Transportation Company or its predecessor Pennsylvania Railroad.

Q In the course of practicing civil engineering, to what extent and for how long has your field of activity been that of rail-highway crossings?

A Since 1965 my experience has been almost exclusively with matters pertaining to highway-rail crossings. Prior to that I had 10 or 12 years as supervisor of structures and I was involved in the repairing and maintenance of bridges for The Pennsylvania Railroad.

Q Have you testified concerning rail-highway crossings in proceedings before this Commission since 1965?

A Scores of times, yes, sir.

Q As you know, Mr. Walker, the Commission has presented to each of the interested parties four questions to answer set forth in their Questions and Procedure dated March 1973. I will ready each question and after each question, will you please give us your answer on behalf of Penn Central:

1. Trustees of Penn Central Transportation Company submit in the record a copy of the in-depth inspection report prepared by it in accordance with the Commission's order in this proceeding issued August 23, 1971, together with testimony and/or exhibits in explanation of the results and findings thereof.

MR. STEWART: Mr. Examiner, may I have identified Penn Central's Exhibit No. 1.

(Penn Central's Exhibit No. 1, being a copy of the in-depth inspection report, was produced and marked for identification)

Is Penn Central's Exhibit No. 1, Mr. Walker, the result of the efforts of Penn Central to carry out the directions of the Commission's order of August 23, 1971?

A Yes, sir, it is.

Q Without going into a great deal of detail, can you tell us briefly what the gist of this report is?

A The report contains photographs, design calculations, showing the result of an in-depth detailed inspection that was made of this structure by our structural engineers, and it does not draw a specific conclusion -- all it does is point to the conditions found -- but from the report it can be concluded that this structure is capable of bearing a maximum load of three tons, and so the bridge has been posted for that three-ton limit. There is one condition at Spans

6 and 7 that are the critical conditions, requiring the reduction to the three-ton limit. Those two spans are the most deteriorated of the entire structure.

Q With that explanation, the report speaks for itself, is that correct?

A That is correct.

Q The second question propounded by the Commission, Mr. Walker, reads: "Trustees of Penn Central Transportation Company submit testimony as to what measures, if any, are necessary to be undertaken at this location to restore the structure to original design capacity and safe condition, suitable for use by traffic normally using the highway at this location, together with such exhibits, preliminary plans, cost estimates, or other supporting data in explanation of its recommendations for an improvement."

What have you to say on behalf of Penn Central in response to that question?

A This question is a double-barreled one. In the first instance it asks that we submit testimony concerning the restoration of the structure to its original design capacity, and that's one thing; restoring it to a safe condition is another thing. Our structural engineering people have told me that it is their conclusion that this bridge cannot be restored to its original design capacity and remain in a safe condition, that is to say, we can restore it but

it's a temporary thing and they would not consider it to be really safe. An analogy might be drawn by taking an old jalopy automobile with bald tires and broken windshield and no headlights and asking that it be restored to its speed capacity, and it can be by motor tuneup made capable of traveling 100 miles on Interstate 80, but it still wouldn't be safe since something else could collapse at any time, so we feel that this bridge is somewhat analogous to that, and we would not recommend restoration of the existing structure be undertaken. Instead we recommend that the bridge be re-designed and reconstructed. This would be the result of a study of the street layout in the area. We think there's a possibility that by combination of structure and fill the bridge may be shortened considerably. We recognize that there is a small stream beneath the structure on what I call the south end, together with what appears to be a borough street or a township street. The reconstructed bridge would need to accommodate this creek and this street perhaps, but we feel that an economical design can be made by a combination of structure and fill, especially on the south end. The structure over the railroad could be modified and restored without too much work. The structure over the Turnpike would not require too much work and modification, but we believe that a new design is the answer to this problem here, and for that reason we have not gone to the expense and trouble of

preparing plans and supporting data and cost estimatea for the restoration. We do not feel that restoration is feasible, and therefore, we have no testimony along that line as was required of us in Question No. 2.

Q Would you please then, Mr. Walker, give your answer to Question No. 3, reading as follows: "Trustees of Penn Central Transportation Company submit testimony as to the estimated time required to complete a detailed plan and cost estimates providing for all work in accordance with its recommendations should the Commission order such plan prepared by it."

A Again in consultation with our engineer of structures, he suggests that a time limit of nine months be established for the preparation of detailed plans for the reconstruction of this bridge. He said if the Commission is interested in preliminary plans that those could be prepared in five months, but detailed plans would require nine months. He does not have the in-house force to accomplish the preparation of this plan and it would have to be put out to a consultant for design; however, if ordered to do so by the Commission, Penn Central would not object to undertaking the design of a new structure at this point.

Q Would you please then, Mr. Walker, give Penn Centrals answer to the fourth question promulgated by the Commission, reading: "Trustees of Penn Central Transpor-

tation Company submit testimony as to what portion, if any, of the proposed work that it will agree to perform, and what portion, if any, of the costs of same that it will agree to bear, and what work and costs of future maintenance that it will assume; and the portions of said construction, maintenance and costs thereof which should be performed and borne by each of the other parties hereto", and then they warn you, "response should be specific as to percentage of such allocations suggested and should include the reason therefor."

A In view of the fact that it is recommended that this bridge be reconstructed on perhaps a new alignment, we feel it is premature to suggest a specific cost allocation because we don't know what those costs are; however, as a general policy, Penn Central is prepared to say that 100 per cent of the cost should be borne by parties other than Penn Central and the reason therefor is that we are broke.

Q Very succinctly stated. At this point you don't care to cut the cake up between the other parties?

A I think at this point it would be premature. If pressed, I could so do but I don't think it would serve any useful purpose. If the Commission orders us to prepare plans and estimates for a redesigned structure at this point, we would ask that the Commission consider the costs of the preparation of those plans as a part of the project costs to be finally allocated by the Commission after further hearing and

consideration.

Q Mr. Walker, would you please give your response on behalf of Penn Central to Question No. 8 in the Questions and Procedure, reading: "Trustees of Penn Central Transportation Company state whether it has reviewed the inspection report and rehabilitation proposals submitted of record by other parties and whether it has any constructive criticism thereof or comment thereon, and whether it has any reasonable alternative proposal to offer."

There's some overlapping there, Mr. Walker, perhaps, but would you try to answer that?

A We have examined the report prepared by PennDOT, our own report, of course, and the conclusions that we have reached are as we have answered in response to Questions 1, 2, 3 and 4, but we see nothing in the inspection reports that would alter our prior testimony.

Q Do you have anything further?

A No, sir.

MR. STEWART: Cross-examine.

CROSS-EXAMINATION

BY MR. BETHARDS:

Q Mr. Walker, can you tell us in detail what maintenance the railroad has performed on this bridge over the years?

A I have no records of what the maintenance

was, but a visual inspection would indicate not too much. There have been some support beams installed to reinforce the bearing on some of the stringers and some of the spans, and I think that's pointed out in the inspection report, but as far as routine maintenance is concerned, I don't think there's been too much. I might say this type of construction doesn't lend itself too well to routine maintenance.

MR. BETHARDS: Thank you very much, Mr. Walker, that's all I have.

THE EXAMINER: Mr. Shaffer.

BY MR. SHAFFER:

Q Mr. Walker, I believe you stated in your direct testimony that you felt that some work is required on the Turnpikc bridge.

Can you state what work you feel is required there?

A I think I stated that I didn't think there would be much, and if there is any, it would be perhaps in the alteration of the piers at the end of the structure to accommodate any change of alignment that might be necessary. If we install fill, for instance, between the Turnpike and the railroad, there might be a change from a pier to an abutment at the ends of the Turnpike span, but the structure itself over the Turnpike we do not believe would require any work.

MR. SHAFFER: Thank you, that's all.

THE EXAMINER: Mr. Gropp.

BY MR. GROPP:

Q Mr. Walker, you stated that the bridge was posted to a three-ton limit.

Is the railroad responsible for that posting?

A No, sir.

Q Who did the posting on that?

A PennDOT.

Q At your company's request or whose request?

A I don't know.

Q Was it as a result of this preliminary study report that your company had made?

A Beg pardon?

Q Was the posting a result of the study that your company made and submitted here into evidence?

A That I do not know. I think it may have been the result of a site conference that was held at the bridge several months ago. There is perhaps correspondence in someone's file that could answer that question, but I'm sorry I cannot.

Q You did not participate in the making of this inspection report that your company is submitting in the

record today?

A That is correct, I did not participate.

Q Do I understand it's your company's position that this bridge cannot be restored or repaired to its original design strength?

A That's correct.

Q And you feel that different plans should be drawn up or submitted in this matter.

Are you able to give us at all today any idea as to what these different plans would entail -- what would they affect for the Borough of Homewood and what would they affect for the Borough of Big Beaver?

A Offhand I would say that serious consideration should be given to a realignment of the south end of the bridge so as to minimize property damage. There are two very nice homes built immediately adjacent to the structure at the south end. If that portion of the bridge, for insrance, were put on fill, the slope of the fill would impinge on the adjoining properties, and to minimize that impact, the bridge perhaps could be swung on a curve to meet the borough streets approaching the bridge from either direction.

Q Beginning on the south side of the bridge, and in your inspection report you have a diagram of the bridge dated February 10, 1972, showing the original span of the bridge as constructed in 1922.

Can you give us any idea how many spans or to what pier you are proposing land fill to?

A There is a creek and a road about Span 9 or 10, as I recall, and if that creek and roadway could be shifted say to about the area of Span 6, then it would appear that all of the roadway could be placed on fill through what is called Spans 13, 12, 11, 10, 9, 8 and possibly even 7.

Q Otherwise you're planning fill from the south end of the bridge up to the area of possibly pier No. 7?

A I'm suggesting that as a possibility. It would have to be looked into as to the economics of fill and moving the creek and the road as weighed against building a new structure.

Q Has your company made any preliminary study as to redesign of the bridge or realignment of the bridge as to which way they would want to realign it?

A No, sir, it would be strictly a matter of economics and that has not been made.

MR. GROPP: That's all the questions I have.

THE EXAMINER: Is there anything further?

MR. STEWART: No redirect, sir. Mr. Examiner, may I move the admission of Penn Central's Exhibit No. 1.

THE EXAMINER: I'm sure there's no objection.

MR. BETHARDS: No objection, but I have one or two more questions.

THE EXAMINER: The exhibit will be received.

BY MR. BETHARDS:

Q Mr. Walker, what is the factual basis for your conclusion that PennDOT posted the bridge for three ton?

MR. STEWART: May we go off the record for a minute before we get into that?

THE EXAMINER: Sure.

. . . OFF RECORD DISCUSSION . . .

A Following some off the record comments here this morning, my memory has been refreshed. I now must withdraw my prior statement that PennDOT posted this bridge. I do now recall that our people in Pittsburgh posted the thing; in fact I can recall now receiving a telephone call from our people in Pittsburgh telling me that the posting had been changed to three ton, and my prior testimony was incorrect in the respect that PennDOT posted it.

MR. BETHARDS: Thank you very much, Mr. Walker, and I must confess that even my memory must be refreshed from time to time.

REDIRECT EXAMINATION

BY MR. STEWART:

Q Mr. Walker, is it also correct that Mr. Merle Forst, Director of the Bureau of Transportation, was

notified immediately of the change in posting?

A My memory hasn't been refreshed to that extent.

MR. STEWART: I think that was done by telephone and I think I did it, but I can't prove it.

THE EXAMINER: Any other questions, Mr. Bethards?

MR. BETHARDS: Nothing more, sir.

THE EXAMINER: Mr. Gropp.

MR. GROPP: No questions.

THE EXAMINER: You have no more witnesses, right, Mr. Stewart?

MR. STEWART: No, we have no more witnesses.

THE EXAMINER: Let's take PennDOT's testimony next.

MR. BETHARDS: I call Mr. Sellers on behalf of PennDOT.

HOWARD A. SELLERS, called as a witness on behalf of PennDOT, being first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. BETHARDS:

Q Please state your full name, occupation

and business address.

A Howard A. Sellers, Department of Transportation, Transportation & Safety Building, Room 1120, Harrisburg, Pennsylvania; I'm a civil engineer for the Department of Transportation.

Q Did you testify in the prior hearing regarding this matter, Mr. Sellers?

A Yes, sir, I did.

Q Are you duly authorized to testify here today, sir?

A Yes, sir, I am.

Q In accordance with the Commission's Questionnaire issued in this case, Question No. 1, will you please submit into the record a copy of the in-depth inspection report prepared by the Department in accordance with the Commission's order dated August 23, 1971, together with testimony and/or exhibits in explanation of the results and findings thereof?

A The Department of Transportation, under letter of May 8, 1972, did submit three copies of its in-depth inspection report of vehicular wearing surface, expansion dams and underlying supporting elements of Homewood Bridge, Homewood Borough, in accordance with paragraphs 8 and 9 of the Commission's order issued August 23, 1971. A copy of the said letter and a copy of the Department's report were also

forwarded to each party of record, namely, Penn Central Transportation Company, County of Beaver, Pennsylvania Turnpike Commission, Boroughs of Homewood and Big Beaver.

Q The report speaks for itself, Mr. Sellers, but I take it you will somewhat amplify its findings in your answers to subsequent questions, is that right, sir?

A Yes, sir.

Q Will you please state on behalf of the Department what measures, if any, are necessary to be undertaken at this location to restore the structure to original design capacity and safe condition suitable for use by traffic normally using the highway at this location, together with such exhibits, preliminary plans, cost estimates or other supporting data in explanation of the Deparrment's recommendations for an improvement?

A In accordance with paragraphs 8 and 9 of the Commission's order dated August 23, 1971, the Department did comply by submitting its said in-depth study with recommendations and estimates to restore and practically maintain the wearing surface for a safe and proper condition. The recommendations are as follows, and they're found on page 6 of the Department's study. Based on the physical inspection of these elements of the structure the Department was asked to inspect in detail at Complaint Docket No. 18925, the following rehabilitation is necessary: Remove the existing bituminous

wearing surface and replace it with a 1-1/2-inch I.D. 2 binder course, topped with a 1-1/2-inch I.D. 2 wearing surface; however, prior to these repairs, any repairs required to the concrete deck must be completed. Item 1, removal of existing roadway wearing surface and replace of the new - $10,200. No. 2, remove and replace the existing expansion dams, exclusive of the expansion dams over Pier 14 and 15 of the Turnpike section; also included in this work is the rebuilding of certain concrete stringers and portions of the underside of the deck as well as previous concrete patch repair as to provide the necessary bearing area for the new expansion dams. Removal of the existing expansion dams and their replacement - $16,100. Rebuilding of expansion dams supporting structure - $5,900. Total rehabilitation cost - $32,200; however, we would like to reiterate that it must be emphasized that prior to these recommended repairs, any repairs required to the concrete deck must first be completed. The Department of Transportation has no record or knowledge of the original design capacity since such structure was designed and constructed by Penn Central Transportation Company.

Q Mr. Sellers, state the estimated time required to complete a detailed plan and cost estimate providing for all work in accordance with the Department's recommendations, should the Commission order such a plan prepared by the Department.

A Should the Commission order repairs to the subject structure in accordance with the Department's recommendations, said work could be completed within 90 days after all repairs required to the concrete deck are completed.

Q State on behalf of the Department, Mr. Sellers, what portion, if any, of the proposed work it will agree to perform, and what portion, if any, of the cost of same it will agree to bear, and what work and cost of future maintenance that it will assume, and what portions of said construction, maintenance and costs thereof which should be performed and borne by each of the parties hereto.

A The Department of Transportation will agree, at its sole cost and expense, to perform all work in accordance with its recommendations estimated to cost $32,200, provided Penn Central Transportation at the expense of parties other than the Department do all required work on the substructure and superstructure of the bridge preparatory to the Department performing its recommended work. Also the Department of Transportation agrees to do said work at its sole cost and expense, based on the condition that no future maintenance on the subject crossing carrying State Street, a borough street, across the tracks of Penn Central Company be allocated on the Department.

Q Mr. Sellers, did you hear the testimony of Mr. Walker on behalf of the Trustees of the Penn Central Trans-

portation Company?

A Yes, sir, I did.

Q And do you concur in his conclusion that it's not feasible to restore the bridge?

A Even though the Department did not make a full in-depth study of the substructure and superstructure, and by studying Penn Central's in-depth study and by visual inspection, the Department would agree with Mr. Walker's recommendation.

Q Do you have any further testimony to offer at this time, Mr. Sellers?

A Should the Commission deem it necessary to replace the subject structure in full or in part, it would seem reasonable and feasible to consider replacing the southerly seven or eight spans with fill embankment.

MR. BETHARDS: Mr. Examiner, I submit the witness for cross-examination.

CROSS-EXAMINATION

BY MR. STEWART:

Q Mr. Sellers, your testimony concerning what is covered by the $32,200 estimate, concerning which you testified, deals, as I gather, principally with the wearing surface, the expansion dams and does not deal with whatever may be left of the superstructure and the substructure, is that right?

A That's correct.

Q Your recommendation which costs $32,200, of course, presupposes that the substructure and the superstructure, other than the wearing surface and perhaps part of the deck -- I'm not sure how much -- would have to be renewed or repaired substantially?

A Yes, sir, the deck would have to be repaired substantially prior to our improving the wearing surface.

Q In the event the Commission adopts Mr. Walker's recommendation, then this $32,200 figure you gave would no longer have application, would it?

A No, sir.

MR. STEWART: Thank you, that's all I have.

THE EXAMINER: Mr. Shaffer.

MR. SHAFFER: I have no questions.

THE EXAMINER: Mr. Gropp.

BY MR. GROPP:

Q You stated on behalf of PennDOT that they are willing to perform this work of putting down a new surface across this span at their sole expense, is this correct?

A The repair work, yes, sir.

Q And once PennDOT would accomplish this work, you then would want the Commission to relieve you of the present orders back in 1922 when the original bridge was made and when the Turnpike was made and the boroughs then would take over

the maintenance of the surface?

A Since there's no State road presently crossing the viaduct and because PennDOT is reimbursing the boroughs with liquid fuel tax for that distance of roadway, the Department feels that it should not be allocated any maintenance in the future.

Q Then your Department would be asking the Commission to relieve it from the 1922 order and I believe the 1950 order which requires PennDOT to maintain the roadway surface?

A The wearing surface, yes, sir.

MR. GROPP: That's all the questions I have.

MR. BETHARDS: I would move, sir, that the Department's inspection report previously forwarded to the Commission and to each party of record be made part of the official record today.

THE EXAMINER: It will be received. Does the Turnpike Commission have any witness to call?

MR. SHAFFER: Yes, I call Mr. Schwartz.

G. EDWARD SCHWARTZ, called as a witness on behalf of the Turnpike Commission, being first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. SHAFFER:

Q Will you state your full name, please?

A G. Edward Schwartz.

Q And by whom are you employed?

A Pennsylvania Turnpike Commission.

Q And what is your capacity?

A Bridge engineer.

Q How long have you been in bridge engineering for the Turnpike Commission?

A Since October 1967.

Q What experience, if any, did you have in the area of bridge engineering prior thereto?

A I was on bridge construction in a supervisory capacity for a period of approximately 15 years prior to that, and my present duties are the maintenance of all the bridges on the Turnpike.

Q Mr. Schwartz, in your capacity as bridge engineer for the Pennsylvania Turnpike Commission, did you take any action with respect to the Commission's direction to make an in-depth inspection report for the Commission's portion of the subject bridge?

A I did.

Q And what did your activity consist of?

A An in-depth report was made October 27, 1971 of that portion of the subject structure constructed in

1952 by the Pennsylvania Turnpike Commission. An in-depth report was made, copies of which were forwarded to the Public Utility Commission and also the other respondents.

Q Will you state whether you have any testimony or exhibits in explanation of the results and findings thereof?

A I think the conclusion reached in the in-depth inspection report submitted by the Turnpike Commission is as valid today as it was at the time of the report, and that conclusion was: The portion of the structure built and maintained by the Pennsylvania Turnpike Commission is in good structural condition and is capable of accommodating the current AASHO HS20-44 loading, which is identical to the AASHO H20S-16 loading used in the original design.

Q With respect to the second question which pertains to this proceeding, are there any measures that you feel are necessary to be undertaken to restore the structure to original design capacity and safe condition suitable for use by traffic normally using the highway at this location?

A There are no indicated deficiencies in the Pennsylvania Turnpike Commission's in-depth inspection report which require restoration to meet original design capacity. Minor deficiencies as noted do not adversely affect the load-carrying capability of the structure and will be corrected by Commission bridge maintenance forces during routine maintenance

operations.

Q Have you made any estimate of any time required to complete a detailed plan for this work, and do you have any recommendations should the Commission order such plan prepared?

MR. SHAFFER: Mr. Examiner, may I suggest here that the plans which Mr. Schwartz is talking about relate only to that portion of the structure which is its maintenance responsibility under prior Commission orders, and perhaps to that extent, Mr. Schwartz's answers may not relate to the portion of the bridge which is the responsibility of other parties.

THE EXAMINER: Do I understand that in 1952 by reason of the construction of the Turnpike in the area, a portion of this bridge or perhaps an extension of this bridge had to be built or rebuilt, and that was done by the Turnpike Commission, is that essentially it?

MR. SHAFFER: That is correct. The most northerly three spans of the structure as it exists were constructed at the time of the Turnpike construction, and those are the only portions of the structure for which we are assuming any responsibility for maintenance.

THE EXAMINER: And your answer throughout your testimony is that following your in-depth inspection of those north three spans, you find nothing seriously wrong with

them?

MR. SHAFFER: That is correct.

THE EXAMINER: Let's try to summarize his testimony then relative to these three northernmost spans so that it doesn't get confused with the overall picture of this bridge which everyone seems to feel should be rebuilt.

BY MR. SHAFFER:

Q Mr. Schwartz, can you summarize again to clarify this matter what you found to be the condition of what we could perhaps term the Turnpike Commission's portion of the bridge?

A With respect to concrete deck surfaces between curbs in the three northerly spans of the structure, for which the Pennsylvania Turnpike Commission is charged with maintenance responsibility, the Commission forces will schedule repair procedures in co-operation with others when the bituminous surface course is removed. Concrete restoration will be done as required by the Commission at their sole expense. The Pennsylvania Turnpike Commission will continue to assume full responsibility for maintenance of that portion of the structure as directed by the Public Utility Commission by order issued October 16, 1950 at Application Docket No. 76051. All necessary data is not available to the Pennsylvania Turnpike Commission to permit making a valid judgment as to the allocation of costs for the several portions of the structure

which are the responsibility of others as defined in the above order issued October 16, 1950. It is the position of the Pennsylvania Turnpike Commission that it should not be assessed for any costs of maintenance or replacement associated with any sections of the structure other than those originally assigned to it.

Q Mr. Schwartz, have you reviewed the inspection reports and rehabilitation proposals submitted of record by other parties?

A The in-depth inspection report submitted by Penn Central Transportation Company and Pennsylvania Transportation have been received and were given cursory review. No in-depth inspection report was received from Homewood Borough. Without additional data relative to the shear and compressive strengths of existing concrete in and at critical locations in the structure, it is not possible to evaluate the conclusions as to structural integrity reached by the Penn Central report. The estimated cost for concrete and expansion repairs as indicated in the Department of Transportation's report are lower than contract prices experienced by the Pennsylvania Turnpike Commission for work of a similar nature. As an alternative to restoration or replacement of all spans of the existing structure, several spans might be replaced with earth embankment or a combination of corrugated metal pipe or sectional plate arches and earth embankment.

Q Mr. Schwartz, then your last statement relative to possible restoration replacement is more or less in accord with the recommendation submitted earlier by Mr. Walker?

A It is.

MR. SHAFFER: I submit Mr. Schwartz for cross-examination.

MR. STEWART: I have no questions, sir.

MR. BETHARDS: No questions, sir.

THE EXAMINER: Mr. Gropp.

CROSS-EXAMINATION

BY MR. GROPP:

Q Mr. Schwartz, in the report that you have submitted, you refer to Pier 0, which would be part of the 1922 structure of this bridge, in which the Turnpike's newer part ties into.

Is the Turnpike Commission satisfied that the support of that Pier 0 is, as you designated in your report, sufficient to tie your remaining part of the bridge into?

A Yes, sir, the newly added portion of the pier is more than adequate to support the reaction of the No. 1 span as constructed by the Turnpike Commission. The compressive forces in the concrete would be very, very minimal.

Q You said that Penn Central's report figures

did not give you sufficient information to come to the same conclusion that they do about the strength of the concrete. I was wondering had your company made a separate investigation as to that Pier 0 in your report.

A Yes, at the time of the in-depth inspection, calculations were made to determine what the compressive stresses were in the portions of Pier 0 that was added at the time of Turnpike construction. I don't recall offhand without referring to my notes what those forces were, but they were very well within safe limits, and I might add that that was exclusive of any support provided by the original Pier 0.

Q In other words, you made no inspection of the original Pier 0 -- you just did an inspection on what the Turnpike constructed when they put their bridge in?

A I made a visual inspection of the entire Pier 0 but my computations were based only on the support provided by the new part of Pier 0 which was constructed by the Turnpike.

Q You made no inspection of the original part of that Pier 0 as constructed in 1922 -- you rested your conclusions on the part that was built when the Turnpike was built, is that correct?

A I would like to refer to the in-depth inspection report on page 3. Pier 0 is a modification of the northernmost pier of the original structure. The modification

completed by the Pennsylvania Turnpike Commission in 1952 consists of a reinforced concrete facing have an average thickness of 1.0 and 1/4 inches resting upon and doweled into the footing on the pier face and is the only part of Pier 0 for which the Commission is responsible for maintenance. The original portion of the pier structure reveals substantial surface deterioration at various locations, with loss of concrete to depths of up to six inches. Several reinforcing bars are exposed and show corrosion; however, the corrosion affects a relatively small percentage of the toal area of reinforcing steel. This observed deterioration has not progressed to the point where Pier 0 is considered to be incapable of sustaining the lateral or longitudinal forces imposed by Span 1 of the Commission's structure. The concrete modification added at the time of Turnpike construction shows a small area of unpatched honeycomb and a small area of superficial deterioration due to moisture reaching through a construction joint. Neither of these deficiencies are deemed to adversely affect the capability of the modification to safely support the reaction on the south end of Span 1.

Q Other than a visual inspection of the original part of that pier designated as Pier 0 in the report, did your Commission make any engineering test on that pier?

A No.

MR. GROPP: That's all I wanted to know,

thank you.

THE EXAMINER: Mr. Schwartz, in the event the Commission should issue an order in the future directing that this bridge be redesigned and reconstructed, are you in a position today to state what, if any, portion of the cost relative thereto the Commission would be willing on a voluntary basis to assume?

THE WITNESS: Mr. Examiner, I'm not able to make a commitment of that kind for the Turnpike Commission. I'm sure that they would study any plan that's proposed and give it their best consideration.

THE EXAMINER: Thank you.

MR. SHAFFER: Mr. Examiner, the Pennsylvania Turnpike Commission now at this time renews its motion to dismiss the Commission as a party to these proceedings.

THE EXAMINER: I'll not grant that motion as an Examiner. If you wish to file a formal written request with the Commission, you may do so.

MR. SHAFFER: I now move that the Turnpike Commission's in-depth inspection report be made a part of the record here.

THE EXAMINER: It will be made a part of this record. We'll take a five-minute recess and then come back with one witness for the Borough of Big Beaver and one witness for the Borough of Homewood.

. . . RECESS . . .

ALFRED E. DeSANZO, called as a witness on behalf of Borough of Homewood, being first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. GROPP:

Q Mr. DeSanzo, would you give your full name and address, please?

A Alfred E. DeSanzo, Box 4117, Racine.

Q You're president of council of Homewood Borough, is that correct?

A Yes, sir.

Q And you have previously testified in the proceedings involving this bridge, is that correct?

A Yes, sir.

Q Back in August of 1971, the Commission ordered various parties in this proceedings to obtain in-depth inspection reports as to portions of the bridge or ramps that they were responsible for.

Has the Borough of Homewood obtained such an in-depth inspection?

A The Borough of Homewood did not submit an in-depth inspection report of the ramp surface because at this time it is not used as a vehicular roadway. Back in '54 it was assigned to Homewood Borough as a walkway.

Q Did the Borough make an inquiry as to a local firm that could do in-depth inspection reports?

A Yes, it did.

Q And what was the quoted price for such an in-depth inspection?

A The quoted price for an in-depth inspection report would be in excess of $8,000.

Q And what is the annual budget of Homewood Borough?

A Approximately $8500.

Q In other words, your whole budget would go in one shot?

A Yes, sir.

Q As to the part of this span that Homewood Borough is responsible for, have you visually inspected that yourself?

A Yes, I have.

Q What is the condition that you found that portion and what portion is it?

A Homewood Borough is responsible for the land fill portion of a land fill approach to the viaduct which connects to the bridge proper, and in visually inspecting the land fill portion, it was found that the road surface is in excellent condition.

Q What is that road surface constructed of?

A The road surface is constructed of brick.

Q This is now used for pedestrian traffic?

A For pedestrian traffic only. It is blocked off on top and bottom ends -- that would be east and west.

Q On the part of the in-depth inspection report of the Penn Central, they had a diagram in the back which was dated February 10, 1972 and which we referred to before. The part that the Borough is responsible for would be the part of the bridge that goes down to this ramp that is shown between Piers 4 and 5, is that correct?

A Yes.

Q That does not show any part that the Borough is responsible for, is that correct?

A No, it does not.

Q But the Borough is responsible for the land fill that is beyond that portion shown there?

A Beyond the last pier shown on this drawing.

Q In regard to any work that has to be done either as to this ramp or as to the remaining part of the bridge, what portion of the cost would the Borough of Homewood be willing to participate in?

A The Borough of Homewood would not be willing to accept any of the cost or relocating or upgrading of

this bridge.

Q How about as to anything that might be done to the ramp?

A To the ramp surface, Homewood Borough would assume the responsibility.

MR. GROPP: You gentlemen may cross-examine.

CROSS-EXAMINATION

BY MR. STEWART:

Q In the event the Public Utility Commission should order Penn Central or PennDOT, or a combination of both, to prepare plans for a new structure, or plans which would carry the highway on a land fill, would the Borough of Homewood be willing to co-operate to the extent of furnishing to the other parties all the engineering information which you may have in your files concerning the structure?

A The structure of the viaduct as it stands now?

Q Whatever you may have -- I don't know what it is.

A Yes, we would.

Q Have you, sir, that is your borough, have you any records concerning the level to which the stream flows through a portion of the affected area rises in times of high water?

A No, sir.

Q Does it in fact ever create a flooding condition of which you are aware?

A No, it does not.

Q I'm informed there's a little baseball field in the area.

Can you tell me, sir, whether it has ever been under water?

A It has been under water to my knowledge back several years ago whenever the run, which by name is Clark's Run, which was dammed up at the western end of the borough and caused it to flood over into the ball field area, but this happens on very rare occasions, and I can remember it only once to my knowledge, and I have lived in the community for 43 years.

Q The ramp concerning which you were questioned on direct examination is one that gave access to a platform and station building, is that correct?

A Yes, you might also add that it gave access to the Methodist Church.

Q And do the Methodists still use it as an access to and from the church?

A It's only used as a walkway.

Q There is no vehicular use of the ramp?

A No, it's impossible for vehicles to have access to it because it's blocked off on the west and also

on the eastern approach.

Q And by whom was that blocking off done?

A To my knowledge, it was done by the Penn Central Railroad.

Q You saw it done by Penn Central, is that what you're saying?

A I did not -- it was before my time on council.

Q You said to your knowledge it was done by Penn Central?

A To my knowledge. According to the minutes of the Borough Council meetings, it was done by Penn Central.

Q Then you don't mean by your knowledge -- it's according to something you read, is that right?

A I'll concede to that.

Q Is there any significant need for that ramp at the present time?

A Other than pedestrian traffic, I would say no.

Q Could not a newer replacement bridge having a sidewalk on it serve the need you have mentioned concerning the pedestrian use of the ramp?

A This would depend upon the location of it which we would have to review.

Q If the ramp is no longer needed and removed

in the course of whatever solution is found for this problem, to that extent the borough would benefit, would it not, by not having any future maintenance obligation?

A The maintenance obligations of the borough are not such that it is a handicap to the borough. If the ramp exists as a walkway, the borough is financially able to maintain it as a walkway.

Q You don't want to be relieved of that obligation?

A If the railroad is willing to accept the responsibility of it and the obligation of it, I would say yes.

Q You're willing to transfer the obligation to someone?

A Put it that way, I would say yes.

Q If the obligation is dissipated altogether, you don't consider this of any benefit to the borough, or do you?

A Yes, I do. I misunderstood the question -- I thought you were referring to the removal of the ramp as such so that we would not have any obligations.

Q That is exactly what I am referring to.

If the ramp no longer exists, your obligation to maintain the ramp no longer exists, is that right?

A Yes, sir.

Q To that extent that would be a benefit that the ramp no longer exists?

A If it would no longer exist, it would be a benefit, but it would not benefit the pedestrian traffic that we have on the ramp.

MR. STEWART: I have no further questions.

THE EXAMINER: PennDOT.

BY MR. BETHARDS:

Q Mr. DeSanzo, does the borough acknowledge maintenance responsibility for the station ramp from the point where it touches down to the earth all the way up to the viaduct?

A Only the earth fill portion. There's approximately two spans that the borough is not responsible for, one of them is 38'4" long and the other one is 39'4-1/2" long.

Q What is the basis for your statement that the borough is not responsible for the maintenance of the two ramps you've mentioned?

A Because the span as such, not the land fill portion, was assigned to The Pennsylvania Railroad as their responsibility because it is part of the viaduct superstructure, as you can on this drawing.

Q I show you a copy of the Commission's order dated August 23, 1971, and I direct your attention to page 2,

the third paragraph, which I'll read, quote: "The orders at C. 1971 directed the Borough of Homewood to maintain the station ramp, Pennsylvania Highway Department to maintain the paving across the viaduct, and The Pennsylvania Railroad Company to maintain the viaduct for its entire length."

Now, I would construe that as placing the maintenance obligation for the station ramp from the point where it touches the ground up to the viaduct, would you agree with me?

A I will agree with that if the viaduct is considered this last pier on the ramp, and as stated in the P.U.C. assignment of responsibility, if I can remember when the bridge was first constructed, it clearly states that Homewood Borough is only responsible for the earth fill portion which we will assume the responsibility for.

Q So you're telling me, sir, that you consider the two ramps involved to be part of the viaduct, is that right?

A The one section of the ramp I consider to be part of the viaduct.

MR. BETHARDS: Thank you.

MR. SHAFFER: I have no questions.

THE EXAMINER: Do you have anything further, Mr. Gropp?

MR. GROPP: No.

THE EXAMINER: Thank you.

MR. GROPP: Mr. Cunning.

DANIEL H. CUNNING, called as a witness on behalf of Borough of Big Beaver, being first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. GROPP:

Q Mr. Cunning, would you give us your full name and address, please?

A My name is Daniel H. Cunning; my address is R. D. 2, Darlington in Big Beaver Borough.

Q And you are the Mayor of Big Beaver Borough, is that correct?

A That's correct.

Q And you have testified previously in this proceeding in regard to the Homewood Bridge?

A Yes, sir.

Q The Borough of Big Beaver was not required to submit an in-depth inspection report and they had one question placed to them by the Commission, and that mainly deals with what portion of the cost would the Borough of Big Beaver be willing to participate in in any remodeling or reconstruction of this bridge.

Can you tell us what the attitude of Big

Beaver Borough is on that, Mr. Cunning?

A In view of what I have heard this morning, I am sure that Big Beaver Borough would take into consideration any plan that was put forward and would give an honest accounting of what they would see, although you know full well we operate under not too large of a budget.

Q In other words, you're saying what we have heard this morning about the proposed plans, you'd have to wait and see how it affected us, and if it did affect us, whether we'd be willing to participate in any of the costs?

A This is true.

MR. GROPP: You gentlemen may cross-examine.

CROSS-EXAMINATION

BY MR. STEWART:

Q I assume that Big Beaver Borough would be willing to the extent of its fund of information to co-operate with anyone who may be directed to prepare a plan for the rebuilding of the structure, partly as a bridge and partly on fill, would it not?

A We would help in any way.

Q Do you have any information concerning the flood history of the stream in the area?

A I lived there for quite a few years and the creek area underneath that bridge I would say for approximately 3- to 400 feet north is channelled into a nice deep

channel at present and would be no threat to any flooding.

MR. STEWART: Thank you, sir, that's all.

THE EXAMINER: PennDOT.

MR. BETHARDS: No questions, Mr. Examiner.

THE EXAMINER: Turnpike Commission.

MR. SHAFFER: No questions.

THE EXAMINER: Do you have anything further, Mr. Gropp?

MR. GROPP: No, I have no more questions of Mr. Cunning but I'd like to make a statement. I am requesting that some urgent action be taken to hasten any plans that are to be drawn up. Nine months, as indicated, is going to put us into another calendar year. This bridge is down to a three-ton weight limit now; we have fire protection to worry about because fire trucks weigh more than three tons; we have school buses that weigh more than three tons, and there was evidence in the prior hearing about what inconvenience it would cause to the various functions that the local governments must provide, including the school district, and I would request that the Commission review this matter and put some pressure on the parties who have the ability to come up with these plans as soon as possible so that something could be resolved.

THE EXAMINER: Is there any statement that counsel for one of the other parties wishes to make? (No response) There is one thing I would like to ask on behalf of the Com-

mission. I'll direct this to Mr. Stewart as counsel or to Mr. Walker.

Apparently there is one particular area in the south seven or eight piers that is the most dangerous at the present time. I can't exactly define which one or two, but it seems to boil down to one or two points are the most dangerous.

Is there any immediate remedial action that could be taken by the railroad at this time to shore up that particular area so that the weight limit could be increased now while any redesign work is being performed by any party pursuant to any order of the Commission issued following this hearing?

MR. STEWART: I think, Mr. Examiner, your question is a technical one, and if Mr. Walker, who is sitting beside me can answer it, he's already under oath and will do so.

Mr. Walker: Mr. Examiner, in Penn Central's report, pages 4 and 5, and in conjunction with the sketch plan that has been referred to dated 2/10/72, which identifies the spans numbers, pier numbers and stringer row numbers, my previous testimony I think referred to the critical conditions as being found in Spans 6 and 7. On page 5, stringer No. 5, the third paragraph down from the top, concrete spalling has caused exposure of four 1-1/4" square bars 1'-0" from pier No.

6 to 2'-0" from pier No. 7. About 50 per cent of the bars are encased in good concrete for most of the span, except at midspan all four bars are completely exposed and hanging freely. There is no reduction to the steel.

Span No. 7, stringer No. 5, concrete spalling has caused exposure of four 1-1/4" square reinforcing bars for full length of span. At midspan the bars are completely free and in the remainder of the span the concrete is spalled off flush with the bottom of steel. There is no reduction to the steel.

That is the critical area considered by our structural engineers in reducing this loading to three ton, and since the reinforcing steel is exposed for the full length of the stringer, a temporary type of shoring couldn't be done. The whole stringer has to be supported. As I gather from the report, stringers 1, 2 and perhaps 3 are in better condition. If I were faced with an emergency situation and had to get a vehicle across there in excess of three ton, I think discretion would cause me to drive over stringers 1, 2 and 3 rather than stringers 4 and 5. I'm not saying those stringers are good for designed load, but I am saying they are in better shape than 4 and 5.

THE EXAMINER: To me as a layman, stringers mean almost nothing. Which lane of traffic would you drive over?

Mr. Walker: On the plan at the right end of the plan there, we show stringer row No. 1, 2, 3, 4 and 5, so that if we were avoiding stringers 4 and 5, we would travel in the northbound lane of traffic.

THE EXAMINER: Then I take it, Mr. Walker, your opinion is that no temporary engineering or remedial work could be done -- it would really be a matter of where the vehicles were directed on the presently existing surface?

Mr. Walker: That's correct, yes, sir. The stringers in those two spans would need to be rebuilt, especially in the southbound lane of traffic.

THE EXAMINER: Is your reason for feeling that should not be undertaken at this time or in the near future because it would be so expensive, if the bridge is to be redesigned and rebuilt, that it would not be practical to spend that money for replacing stringers?

Mr. Walker: That's partly it, and partly from a practical standpoint that when you get in there and start chipping out this old rotten concrete, there is no stopping place. Concrete is setting there and is effective from habit, but once you start chipping at it, it crumbles and there's no effective stopping place. If we went in there to rebuild, say 4 and 5, we wouldn't be able to determine a good joint between 4 and 3, and the first thing you know, we've gone across the entire width of the structure. There is no

firm stopping place. Once you start chipping, you can't stop.

MR. BETHARDS: Mr. Examiner, the Department might have a suggestion regarding the question, and I would therefore request that I recall Mr. Sellers and ask him one or two questions.

THE EXAMINER: All right. Is there any further comment you want to make to my questions, Mr. Walker?

Mr. Walker: No, sir, that's all.

THE EXAMINER: Mr. Sellers, you may sit right there and make your comments.

Mr. Sellers: As a solution which will have to be checked into and looked into in more detail, a temporary traffic signal might be set up on each side of the structure limiting it to one-way structure, channelling vehicles to use a certain area of these critical spans by using drums or something of that nature; in other words, one vehicle will cross the critical area at one time, and they will cross the higher strength sections of the spans. It will be somewhat of an inconvenience for the people using the structure, but it will be considerably safer.

MR. GROPP: That brings one question to me for people who are using it: What weight limit will that maintain then?

Mr. Sellers: We'd have to check into that.

MR. GROPP: Can our school buses go across

it; can our cars go across it?

Mr. Sellers: That will at least double the present load.

MR. GROPP: I don't want to see a busload of kids go through it.

Mr. Sellers: It would have to be taken into consideration.

THE EXAMINER: Well, we have two suggestions. We have an explanation of why we should not go in there now and start to make structural repairs, and then the Highway Department has made a suggestion that may have some temporary merit while any redesigning is being performed. Thank you. Would the Highway Department be willing voluntarily to provide to the engineering section of the Public Utility Commission this type of information and suggestion without waiting for a formal order to come out?

Mr. Sellers: Yes. We would appreciate the co-operation of Penn Central coming up with a load limit for the structure.

THE EXAMINER: I presume the railroad is willing to do that?

MR. STEWART: We will.

THE EXAMINER: Could we sort of stipulate on the record that between the railroad and PennDOT this information be provided to the Commission within 30 days?

MR. STEWART: I think 30 days is reasonable.

THE EXAMINER: Some of it may already be in your inspection reports.

MR. STEWART: Yes. We'll certainly make every effort to do it within 30 days. It might be 32 days, but if it does, we'll do it in 32 days.

MR. BETHARDS: That's agreeable to the Department, Mr. Examiner.

THE EXAMINER: In view of this commitment between the railroad and the Department of Transportation, Mr. Gropp, on behalf of the borough, would the borough be willing to live with this one-way situation?

MR. GROPP: We brought this proceedings into Court several years ago because we thought this structure was unsafe. It's not a question of whether we're willing to live with it -- it's a question of we have to live with it because nothing has been done before this, so of course, we'll go along with whatever is needed to provide fire protection and get the school kids to school. We have to go along with it -- what choice do we have.

THE EXAMINER: Is there any further final comment to be made? I think this answers the question the Commission asks, "Is there any further comment to be made by any parties before we conclude"? (No response)

Is it the desire of all parties to submit the matter on the present record?

MESSRS. STEWART, BETHARDS and SHAFFER: Yes, sir.

THE EXAMINER: This hearing is concluded and the complaint proceedings will be submitted on the present record and hopefully an order will be promptly forthcoming.

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CERTIFICATE

I hereby certify that the proceedings and evidence are contained fully and accurately in the notes taken by me during the hearing on the above cause before the Public Utility Commission of the Commonwealth of Pennsylvania, and that this copy is a correct transcript of the same.

MOHRBACH & MARSHAL, INC.

By Arlene B. Kiger
Official Reporter

Reported by:
Arlene B. Kiger
Mohrbach & Marshal, Inc.
2000 State St.
Harrisburg, Pa.

Subject: Homewood Junction, Pa. - Valley Division - Main Line - O.H. Bridge No. 34.88.

INSPECTION REPORT

The structure is a two-lane, thirteen-span, reinforced concrete deck bridge supported by fourteen reinforced concrete piers. Eleven of the spans have five reinforced concrete stringers supporting the deck, and the two spans over the railroad have structural steel girders and floorbeams supporting the deck. The bridge was built in 1922.

A detailed inspection of the above-mentioned bridge was made on December 9 and 10, 1971, by Messrs. L. R. Kubacki, J. S. Strivieri, D. H. McKibben and E. Morgan. The following items were noted during the inspection (see attached plan for location of component parts of structure).

Span No. 1

Pier No. 1 - underside of pier cap is spalled midway between columns exposing two 1" square reinforcing bars. There is no reduction in the steel. Column under stringers No. 1 and No. 2 is spalled exposing two 1" square corner reinforcing bars. No reduction in the steel (see Photo 1).

Stringer No. 1 - bottom of stringer spalled for a length of 1'-0" at a distance of 12'-0" from face of pier No. 1 exposing four 1-1/4" square reinforcing bars. The concrete is spalled off flush with the bottom of steel with no reduction in steel. Three 1/2" square steel stirrups are exposed on the east face of stringer at this location with no reduction to steel.

Stringers No. 2 and No. 3 are intact. No spalling has occurred.

Stringer No. 4 - bottom of stringer is spalled at a location of 12'-0" from face of pier No. 1 exposing five 1-1/4" square reinforcing bars and leaving about 50% of the bottom row of reinforcing steel encased in good concrete for the spalled portion of the stringer. There is no reduction to the portion of reinforcing steel which is exposed. On the bottom of the stringer where the concrete has not spalled off, there is a horizontal crack along the line of the bottom reinforcing steel but no steel exposure.

Stringer No. 5 - bottom of stringer is spalled from pier No. 1 to center of span, exposing the four bottom row 1-1/4" square reinforcing bars. The concrete is spalled off flush with the bottom of steel for three of the bars. The fourth bar is about 50% encased in good concrete. There is no reduction in reinforcing steel. Bottom of stringer is also spalled from pier No. 2 for nine feet to the north, exposing one 1-1/4" square reinforcing bar, leaving about 50% of the bar encased in good concrete with no reduction in steel.

Deck Slab

At pier No. 1, between stringers Nos. 1 and 2, the underside of the

concrete deck is spalled for a length of 2'-6" and a width of 4'-0" exposing the reinforcing steel but not destroying the bond between the steel and concrete.

At pier No. 1, between stringers Nos. 3 and 4, the underside of the concrete deck is spalled for a length of 3'-0" and a width of 5'-6" exposing the reinforcing steel but not destroying the effective bond. At pier No. 1, between stringers 4 and 5, the underside of the concrete deck is spalled for a length of 3'-0" and a width of 5'-6" exposing the reinforcing steel but not destroying the effective bond.

Under the expansion dam, there is a hole in the underside of the deck 9" long by 3'-6" wide between stringers 4 and 5.

Span No. 2

Stringer No. 1 - end of stringer over pier No. 2, bearing portion of stringer spalled off from end of stringer for 4" on the base along the length of the stringer and 12" vertically in a triangular configuration (see Detail 1). Spalling is evident for a depth of 4" into the west side of the stringer. Four 1/2" square stirrups are exposed on west side of stringer at pier No. 2 with no reduction to steel. Bottom of stringer is spalled off flush with the bottom of steel with no reduction to steel.

Stringer No. 1, at end of stringer over pier No. 3, bearing portion of stringer spalled off from end of stringer for 6" on the base along the length of the stringer and from the end of the west side of the stringer for a depth of 6", forming a 45° angle at the base for the height of the stringer (see Detail 2). East face of stringer No. 1, beginning at pier No. 3, has four 1/2" square stirrups exposed for 3/4 height of stringer, and two stirrups exposed for 1/4 height of stringer. West face of stringer No. 1, beginning at pier No. 3, has six stirrups exposed for full height of the stringer. There is no reduction in steel.

Stringer No. 2 is in satisfactory condition.

Stringer No. 3 at end of stringer over pier No. 2 is cracked on west side. Crack begins at the base 8" in from the end of the stringer and extends up on a 45° angle to a vertical height of 8" on the end of the stringer. Crack penetrates through to east side of stringer No. 3 (see Detail 3 and Photo 2).

Stringer No. 4 is in satisfactory condition.

Stringer No. 5 - bottom of stringer is spalled the full length exposing bottom row of four 1-1/4" square reinforcing bars. The concrete is spalled off flush with the bottom of steel for three of the bars. The fourth bar is about 50% encased in good concrete. There is no reduction in reinforcing steel. Stringer No. 5, at end of stringer over pier No. 3, bearing portion of stringer spalled off from end of stringer for 6" on the base along the

length of the stringer, and from the end of the west side of the stringer for a depth of 4", forming a 45° angle at the base for the height of the stringer (see Detail 4). West face of stringer over pier No. 3 has two 1/2" square stirrups exposed with no reduction to the steel.

Deck Slab

At pier No. 2, between stringers 1 and 2, the underside of the concrete deck is spalled 18" by 18" flush with the bottom of steel, exposing the reinforcing bars but with no steel reduction. At pier No. 2, between stringers 3 and 4, an area 3'-0" x 5'-6" is spalled flush with the bottom of steel, exposing five transverse reinforcing bars with no steel reduction. Over pier No. 3, between stringers 3 and 4, an area 3'-0" x 2'-6" is spalled flush with the bottom of steel, exposing the reinforcing bars with no steel reduction. Over pier No. 3, between stringers 4 and 5, an area 4'-0" x 4'-0" is spalled, exposing 8 transverse reinforcing bars. The concrete is spalled off flush with the bottom of steel for 7 of the bars. The 8th bar is completely exposed and not bound in this area. There is no reduction in steel.

Under the expansion dam, there is a hole in the underside of the deck 6" long by 6" wide between stringers 1 and 2, 2 and 3, and 4 and 5.

Pier No. 2 is in satisfactory condition, except that the pier cap under stringer No. 1 is spalled 2", exposing the stirrups (no steel reduction). Pier No. 3 is in satisfactory condition.

Span No. 3

Span No. 3 consists of ten steel floorbeams and two steel girders. The structural steel girders are still encased in good concrete. The concrete is spalled off of the steel floorbeams. There is no reduction to the structural steel in the girders and floorbeams.

The underside of the deck slab is spalled for the full length of the span a depth of about 12" and a width of 1'-0" beneath the west curb. The concrete is spalled off flush with the bottom of steel, exposing three reinforcing bars with no reduction to the steel.

The underside of the deck slab is spalled for an area 2'-0" wide by 4'-0" long under the east curb between the first and second floorbeams from the north end of the span; also, spalled 4'-0" wide by 4'-0" long under the east curb between the second and third floorbeams from the north end of the span; also, spalled 2'-0" wide by 2'-0" long under the east curb between the first and second floorbeams from the south end of the span. The concrete is spalled off flush with the bottom of steel with no reduction in steel.

Span No. 4

Stringers 1, 2 and 3 show no spalling and are in satisfactory condition.

Stringer No. 4 - two 1/2" stirrups are exposed over pier No. 4 with no reduction in steel.

Stringer No. 5 over pier No. 4 - bearing area has been reduced by spalling to a width of 10" and a length of 12".

Deck Slab

Between stringers 1 and 2, spalling on underside of deck has occurred 2'-0" from face of pier No. 4 and for a width of 5'-6". Spalling also has occurred between stringers 3 and 4 over pier No. 4 for a 2'-0" length. The concrete is spalled off flush with the bottom of steel with no reduction in the steel.

Under the expansion dam over pier No. 4 there is a hole in the deck beginning at stringer No. 3 and proceeding to midpoint between stringers 4 and 5. Maximum width of the hole is 8" at stringer No. 4.

Pier No. 4 is in satisfactory condition.

Span No. 5

This is a structural steel span consisting of two girders and twenty floorbeams, the end two of which are skewed.

Structural steel girders are still encased in good concrete. Concrete has spalled off of the steel floorbeams. No reduction to structural steel in girders and floorbeams.

The underside of the deck slab is spalled for the full length of the span under the west curb flush with the bottom of the reinforcing steel. Also, spalling has occurred flush with the bottom of the reinforcing steel under the east curb between floorbeams 8-9, 11-14, 17-18, 21-22 from pier No. 5. All exposed reinforcing steel has no reduction and is still adequately bound with concrete.

Pier No. 5 is in satisfactory condition.

Span No. 6

Stringer No. 1 - bottom of stringer spalled from pier No. 6 for 2'-0", exposing four 1-1/4" square reinforcing bars. The concrete is spalled off flush with the bottom of steel with no reduction to the steel.

Stringers No. 2 and No. 3 - no spalling has occurred.

Stringer No. 4 - spalling full length of stringer, exposing all five 1-1/4" square bars in the bottom row for the full length of the span. The concrete is spalled off flush with the bottom of steel for four of the bars. The fifth bar

is completely exposed for the length of the span. At the midpoint, all five bars are completely exposed and hanging freely. There is no reduction in reinforcing steel.

At pier No. 6 a crack exists on a 45° angle from the end of stringer to the top of stringer on both east and west side of the stringer. The concrete is also spalled back to the masonry plate on the pier cap.

Stringer No. 5 - concrete spalling has caused exposure of four 1-1/4" square bars 1'-0" from pier No. 6 to 2'-0" from pier No. 7. About 50% of the bars are encased in good concrete for most of the span, except at midspan all four bars are completely exposed and hanging freely. There is no reduction to the steel.

Deck slab is not spalled at all in this span.

Pier No. 6 is in satisfactory condition.

Span No. 7

Stringers No. 1 and No. 2 have full section, no spalling.

Stringer No. 3 - concrete spalling has caused exposure of five 1-1/4" square reinforcing bars at midspan. Bars are 50% encased in good concrete with no reduction to steel.

Stringer No. 4 - concrete spalling has caused exposure of five 1-1/4" square reinforcing bars for full length of the span. At midspan all five bars are completely exposed and hanging freely, and in the remainder of the span the concrete is spalled off flush with the bottom of steel. There is no reduction to steel.

Stringer No. 5 - concrete spalling has caused exposure of four 1-1/4" square reinforcing bars for full length of span. At midspan the bars are completely free and in the remainder of the span the concrete is spalled off flush with the bottom of steel. There is no reduction to the steel.

Deck Slab

Between stringers 1 and 2, 2 and 3, and 4 and 5 spalling on the underside of the deck slab has caused exposure of the deck reinforcing steel for 1/4 of the span from pier No. 8. The concrete is spalled off flush with the bottom of steel with no reduction in the steel.

Pier No. 7 is in satisfactory condition.

Pier No. 8 - cantilever ends of pier No. 8 are spalled so that the pier no longer can support stringers No. 1 and No. 5 on both spans 7 and 8. On each side of pier No. 8 a new steel supporting structure has been erected

(see Detail 5 and Photo 3). The 36 WF beam is now supporting stringers 1 and 5 at pier No. 8. All the bearings on this pier have become inadequate.

Span No. 8

Stringer No. 1 - concrete spalling has caused exposure of four 1-1/4" square reinforcing bars from pier No. 8 to midspan. The concrete is spalled off flush with the bottom of steel with no reduction in steel.

Stringers No. 2 and No. 3 have full section, no spalling.

Stringer No. 4 - concrete spalling has caused exposure of five 1-1/4" square reinforcing bars for 20' at midspan. The concrete is spalled off flush with the bottom of steel with no reduction in steel.

Stringer No. 5 - concrete spalling has caused exposure of four 1-1/4" square reinforcing bars for full length of span. The concrete is spalled off flush with the bottom of steel with no reduction in steel.

Over pier No. 9, six stirrups on the west side of the stringer are exposed. No reduction to steel.

Deck slab - spalled between stringers 3 and 4.

The expansion dam over pier No. 8 is loose and pounding under traffic. Under the east curb at the expansion dam the slab is spalled, creating a 1'-0" square hole. Under the west curb at the dam there is a hole also (see Photo 4).

Pier No. 9 is in satisfactory condition.

Span No. 9

Stringer No. 1 - concrete spalling has caused exposure of four 1-1/4" square reinforcing bars for full length of span. The concrete is spalled off flush with the bottom of steel with no reduction in steel.

Stringers Nos. 2, 4 and 5 have full section, no spalling.

Stringer No. 3 - concrete spalling has caused exposure of five 1-1/4" square bars for 20' at midspan. The concrete is spalled off flush with the bottom of steel with no reduction in steel.

Over pier No. 9 stringer No. 5, east face, has six stirrups exposed.

Deck Slab

Between stringers 1 and 2, over pier 10, the concrete is spalled off flush with the bottom of the reinforcing steel with no reduction in steel. Between stringers 3 and 4, from pier 10 to midspan, the concrete is spalled off flush with the bottom of the reinforcing steel with no reduction in steel. Between

stringers 4 and 5 at pier 10 the concrete is spalled off flush with the bottom of the reinforcing steel with no reduction in steel.

Pier No. 10 - bearing of stringer No. 1 from span No. 9 has been reduced to 15" along the stringer due to spalling at the end of the stringer. A space of 1'-0" exists between stringer No. 1 from span No. 9 and stringer No. 1 from span No. 10 (see Photo 5). On the west face of this stringer, the two end 1/2" stirrups are exposed over pier No. 10. There is no reduction to this steel. Bearing of this stringer from span No. 10 has also been reduced to 15" along the stringer.

Bearing of stringer No. 3 from span No. 9 has been reduced to 15" along the stringer and reduced by 3" in width. Stringer No. 3 from span No. 10 has a crack from the masonry plate to the top of the stringer on the east side only. Also, on the east face the end five 1/2" square stirrups are exposed, and on the west face the end two 1/2" square stirrups are exposed. These stirrups appear to be strained. There is no reduction in steel.

Bearing on stringer No. 4 is reduced to 6" along the stringer on the east side (see Photo 6).

Pier No. 10, other than bearings, is in satisfactory condition.

Span No. 10

Stringers Nos. 1, 2, 3 and 4 have full section, no spalling.

Stringer No. 5 - concrete spalling has caused exposure of four 1-1/4" square reinforcing bars from pier No. 10 to midspan. The concrete is spalled off flush with the bottom of steel for three of the bars. The fourth bar is completely exposed and completely free. There is no reduction to steel.

Deck slab is not spalled and is in satisfactory condition.

Pier No. 11 is in satisfactory condition.

Span No. 11

Stringer No. 1 - concrete spalling has caused exposure of four 1-1/4" square reinforcing bars for the full length of the span. At the midspan the reinforcing bars are hanging freely from the concrete. In the remainder of the span the concrete is spalled off flush with the bottom of steel. There is no reduction in the steel.

Stringers Nos. 2, 3 and 4 have full section, no spalling.

Stringer No. 5 - concrete spalling has caused exposure of four 1-1/4" square reinforcing bars for the full length of the span. Three of the four 1-1/4" square bars are about 50% encased in good concrete. The fourth bar is hanging freely at midspan. There is no reduction to steel.

Deck Slab

Between stringers 4 and 5 over pier No. 12 and extending for 10' in span No. 11, ten bars are exposed on underside of deck with no reduction to steel. The concrete is spalled off flush with the bottom of steel.

Pier No. 12 - the east end cantilever is spalled completely, exposing the top reinforcing bars and the stirrups in this cantilever (see Photo 7). The west end cantilever is beginning to spall also. There is no steel reduction in these sections. Pier column bars are protruding from the pier cap due to cap spalling.

Ends of stringer No. 5 on spans 11 and 12 are spalled, leaving a 6" space between stringers. This has reduced the bearing area.

Over expansion dam at west curb, there is a 6" diameter hole in the deck slab.

Span No. 12

Stringers Nos. 1, 2 and 3 have full section, no spalling.

Stringer No. 4 - concrete is spalled at midspan for 20', exposing five 1-1/4" square reinforcing bars. The concrete is spalled off flush with the bottom of steel. There is no reduction in the steel.

Stringer No. 5 - concrete is spalled for 3'-0" from pier No. 12 but no steel is exposed. Concrete is also spalled from pier No. 13 to midspan, exposing four 1-1/4" square reinforcing bars. The concrete is spalled off flush with the bottom of steel. There is no reduction in the steel.

Deck Slab

Between stringers Nos. 1 and 2, the underside of slab reinforcing steel is exposed for an area 6' long by 5' wide at pier No. 13. The concrete is spalled off flush with the bottom of steel. There is no reduction in the steel.

Pier No. 13 is in satisfactory condition.

Span No. 13

Stringers Nos. 1, 2, 3 and 4 have full section, no spalling.

Stringer No. 5 - the concrete is spalled off for the full length, exposing four 1-1/4" square reinforcing bars. At midspan for 10'-0" all four bars are completely free. In the remainder of the span, the concrete is spalled off flush with the bottom of steel. There is no reduction in the steel.

Deck Slab

Between stringers 1 and 2 the slab concrete is spalled, exposing the reinforcing bars at a location 7'-0" from pier No. 13 for a distance of 12'-0" and a width of 5'-6". The concrete is spalled off flush with the bottom of the steel. There is no reduction in the steel.

Between stringers 4 and 5 the concrete is spalled next to a manhole near pier No. 3.

Pier No. 14 is in satisfactory condition.

Throughout all spans there is leaching of moisture through the deck. This leaching is due to the surface drainage being very poor and is contributing to the deterioration of the underside of the bridge.

Surface Condition

The exterior of all parapets have spalling conditions. From spans 1 through 4, the west curb along the sidewalk is deteriorating. At pier No. 2, the top of the pier at the west end is cracked for the full width of pier down to the pier cap. This is not a supporting member and the crack is only superficial. At the end of the expansion dam over pier No. 2 at the east curb there is a hole 6" long by 6" wide, making pier No. 2 visible from above. There is also a hole in the roadway surface at the expansion dam (2" square) in the northbound lane, making pier No. 2 visible below.

At the ends of the expansion dam over pier No. 3, there is a (5" x 15") hole at the west curb and a (3" x 3") hole at the east curb, making pier No. 3 visible below.

In spans 5 to 9, there is no concrete curb remaining on the west side along the sidewalk. On the east curb, some places are deteriorated.

Over pier No. 5, cracks along the expansion joint have formed at both curbs and the sidewalk. At the sidewalk, a hole next to the expansion dam has formed 1" wide and 2'-6" long. At the east curb, next to the expansion dam, a hole exists 6" wide and 15" long.

Over pier No. 6, the expansion dam is buckled at the sidewalk curb and a hole (4" x 12") exists. At the east curb a (4" x 4") hole exists.

Over pier No. 8, the expansion dam is loose and pounding in the northbound lane. A hole exists all along the expansion dam at the sidewalk (5'-6" long). The east parapet has a 1'-0" square hole at its base (see Photo 8).

At pier No. 10, the west parapet has a hole in it.

Spans 10 to 13 - the concrete curb is spalled on both sides at numerous

locations. There are many cinders lying against the curbs which are obstructing the drainage.

At the expansion dam over pier No. 10, at the east curb, a hole (3" x 12") exists. The west parapet top is spalled off 2" for the full length. The east parapet has a hole 5'-0" from pier No. 10 in span No. 10.

At expansion dam over pier No. 12, at the sidewalk, there exists a hole 3" x 12". At the east curb next to the expansion dam there is a 3" x 3" hole. The west parapet top is spalled 3" for 8'-0" from pier No. 13 in span 12, and for the full length in span No. 13.

In general, the roadway has many cracks and potholes, the curbs are spalled away completely, and cinders and broken asphalt lie next to the curbs for the entire length of the bridge. This prevents proper drainage of the bridge deck. The roadway width curb to curb is 23'-0" and has a 2-1/2" blacktop wearing surface which is severely deteriorated over the concrete deck (see Detail 6).

J. S. Strivieri

J. S. Strivieri
Structural Engineer

Office of Chief Engineer
Philadelphia, Pa.
February 10, 1972

PIER #1

1

STRINGER #3
AT PIER #2
LOOKING EAST

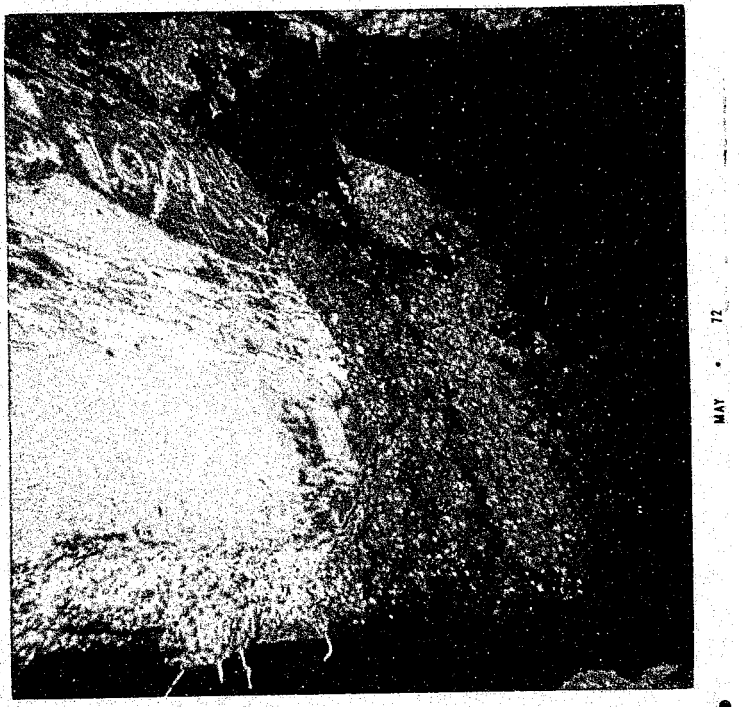
2

PIER #8

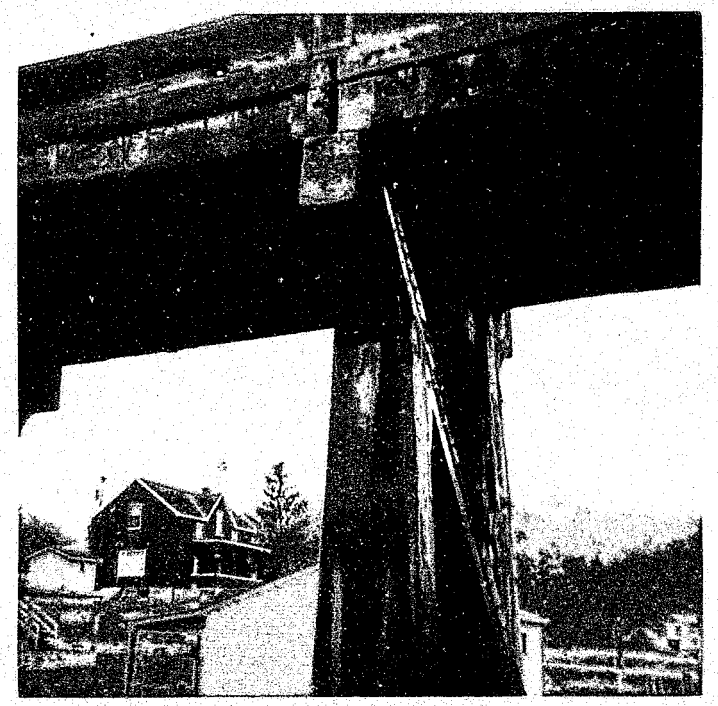
LOOKING EAST

3

LINDERSIDE EXP
DAM PIER #8



4



PIER #10

LOOKING WEST

5

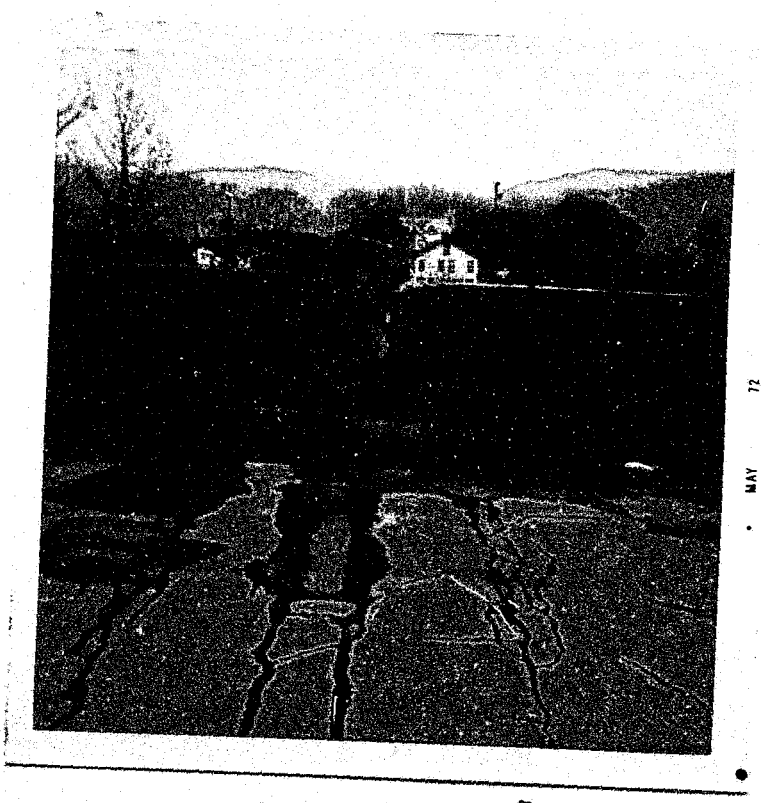
STRINGER #4
AT PIER #10 LOOKING WEST

6

7

PIER #12
EAST END LOOKING WEST

EAST END
EXP. JT. PIER #8



8

PENN CENTRAL COMPANY
ENGINEERING DEPARTMENT

SHEET 1 OF 4

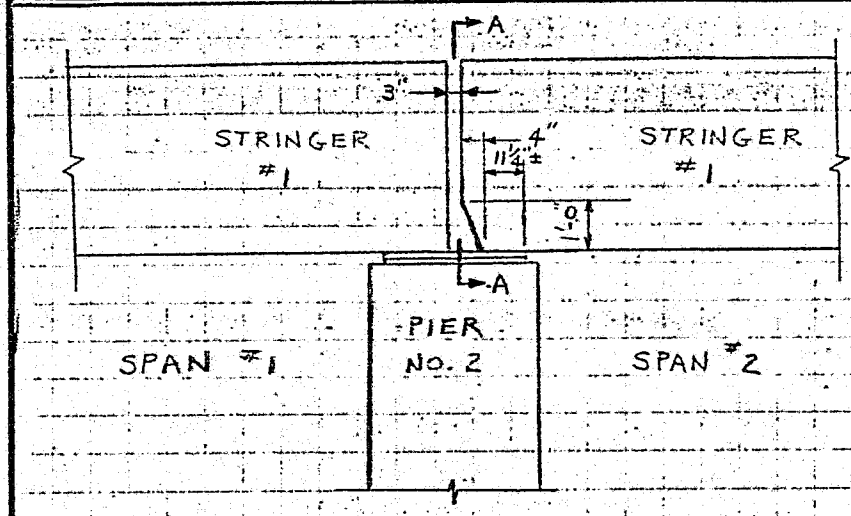
COMPUTED BY: J. [illegible]

CHECKED BY:

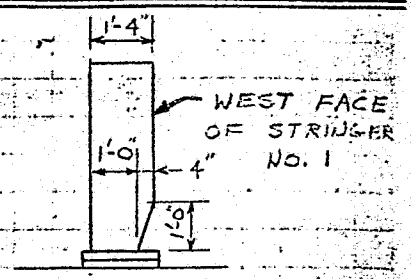
SUBJECT: O.H. BR. No. 34.88

STRUCTURAL DETAILS NOTING FIELD MEASUREMENTS

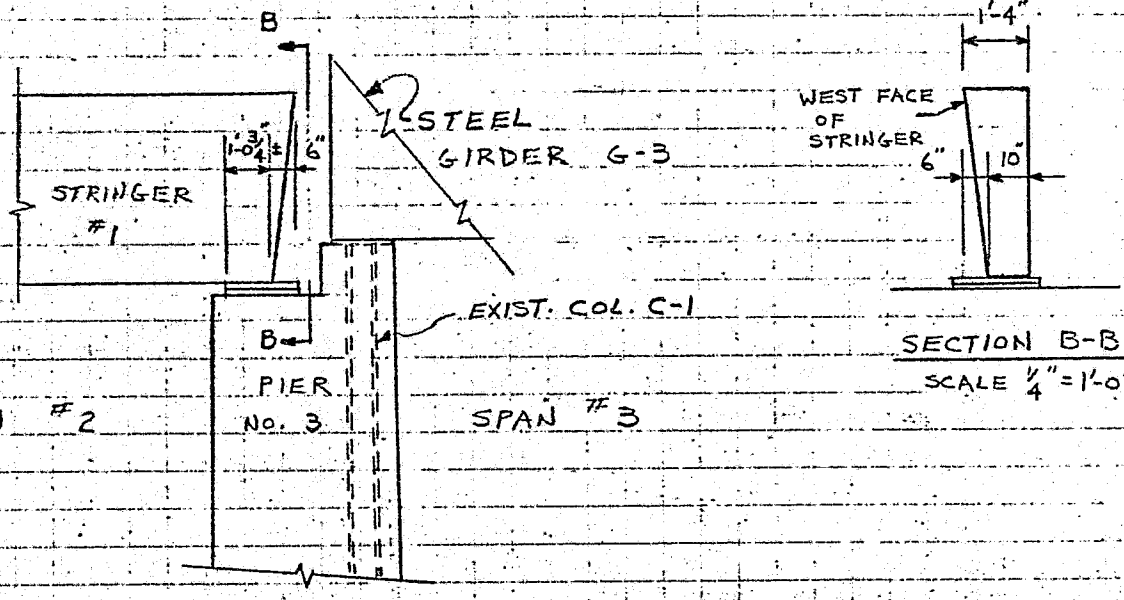
LOCATION: HOMEWOOD JCT., PA. DIVISION DATE 2/[illegible]/72



DETAIL 1
SCALE ¼"=1'-0"



SECTION A-A
SCALE ¼"=1'-0"



DETAIL 2
SCALE ¼"=1'-0"

SECTION B-B
SCALE ¼"=1'-0"

PENN CENTRAL COMPANY

ENGINEERING DEPARTMENT

SHEET 2 OF 4

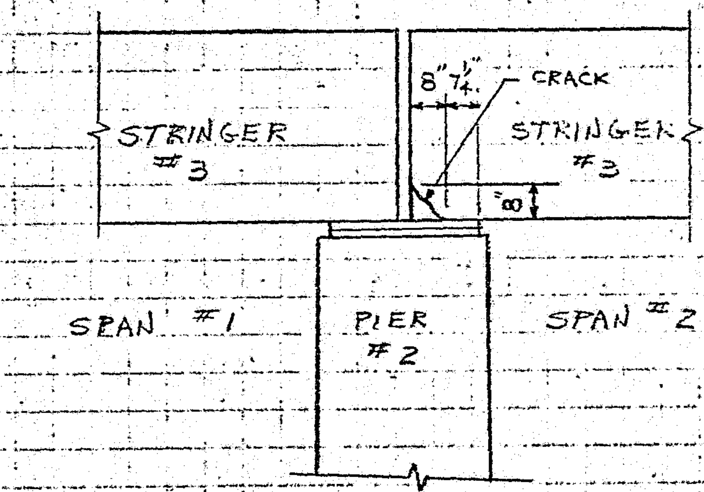
COMPUTED BY: J. S. STRINGER

CHECKED BY:

SUBJECT: O. H. BR. No. 34.88

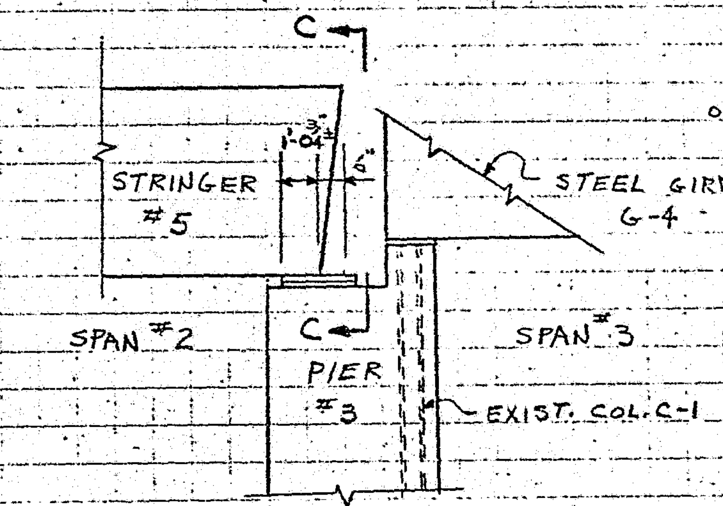
STRUCTURAL DETAILS NOTING FIELD MEASUREMENTS

LOCATION: HOMEWOOD JCT. PA DIVISION DATE: 2/2/72



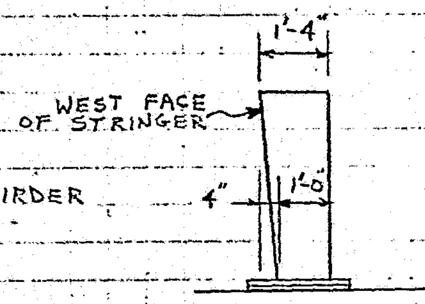
DETAIL 3

SCALE ¼" = 1'-0"



DETAIL 4

SCALE ¼" = 1'-0"



SECTION C-C

SCALE ¼" = 1'-0"

PENN CENTRAL COMPANY
ENGINEERING DEPARTMENT

COMPUTED BY: J. S. STRIVIERI

SHEET 3 OF 4

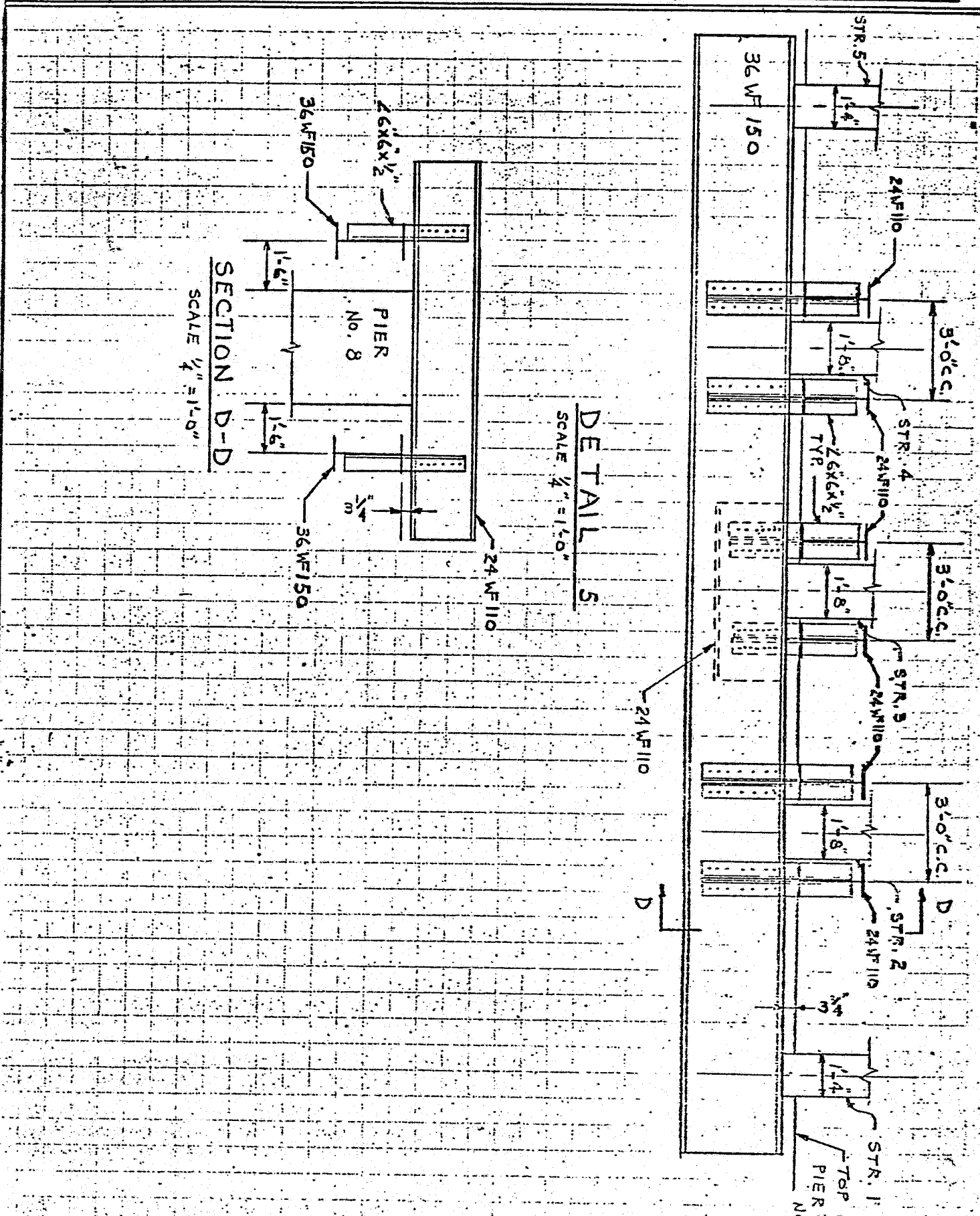
CHECKED BY:

SUBJECT: O.H BR. No. 34.88

STRUCTURAL DETAILS NOTING FIELD MEASUREMENTS

LOCATION: [illegible] DIVISION

DATE 2/2/72



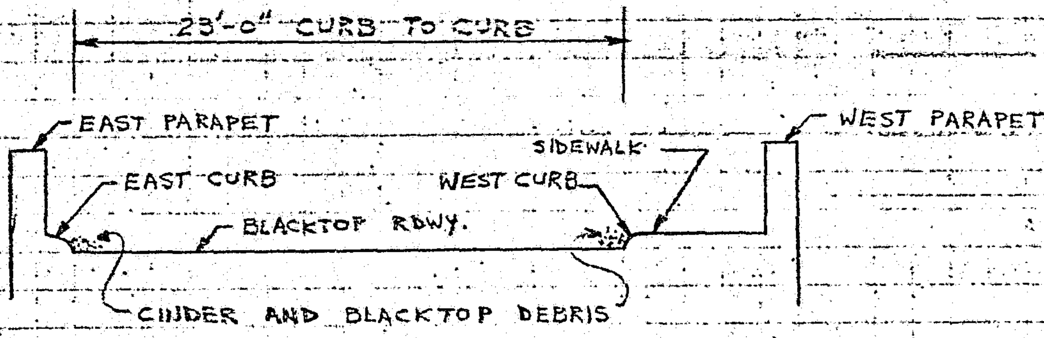
PENN CENTRAL COMPANY
ENGINEERING DEPARTMENT

COMPUTED BY: J. S. ST[illegible]

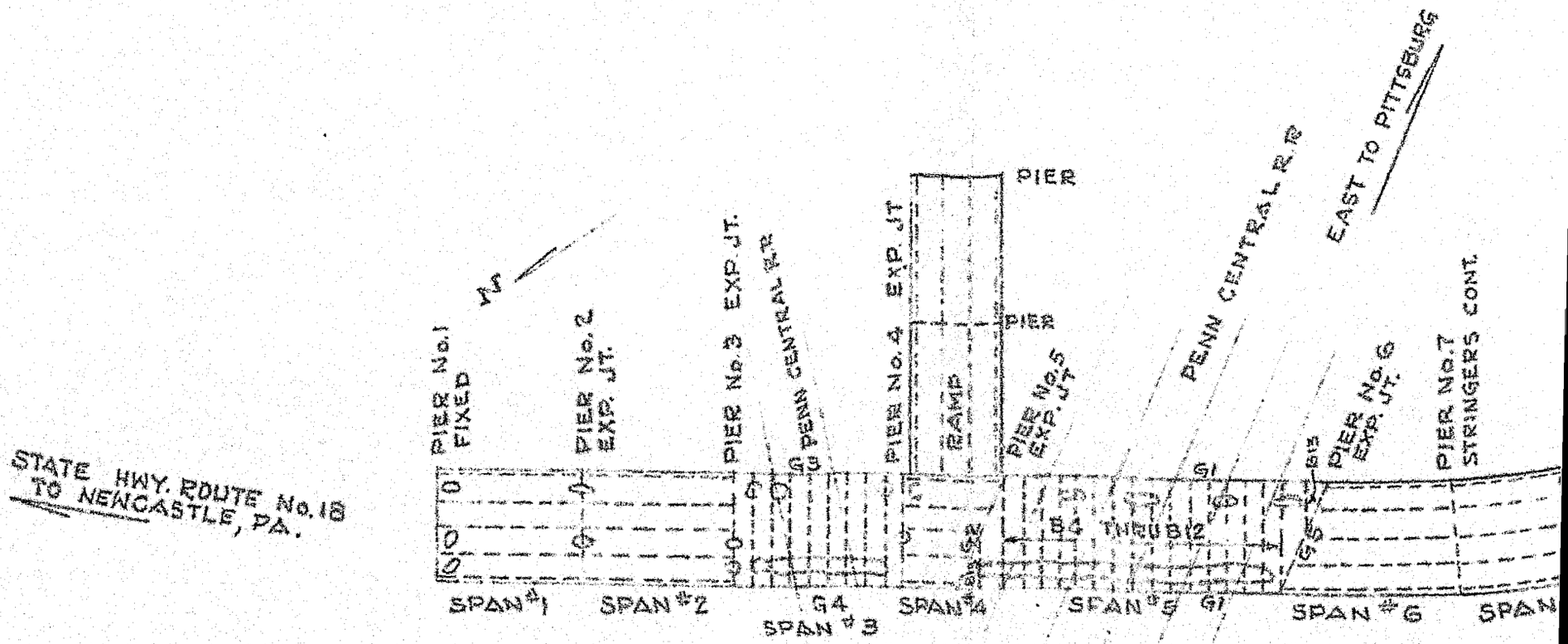
CHECKED BY:

SUBJECT: O. H. BR. NO. 34.8?
STRUCTURAL DETAILS NOTING FIELD MEASUREMENTS

LOCATION: HOMEWOOD JCT. PA **DIVISION** **DATE** 2/5/72



ROADWAY ELEVATION

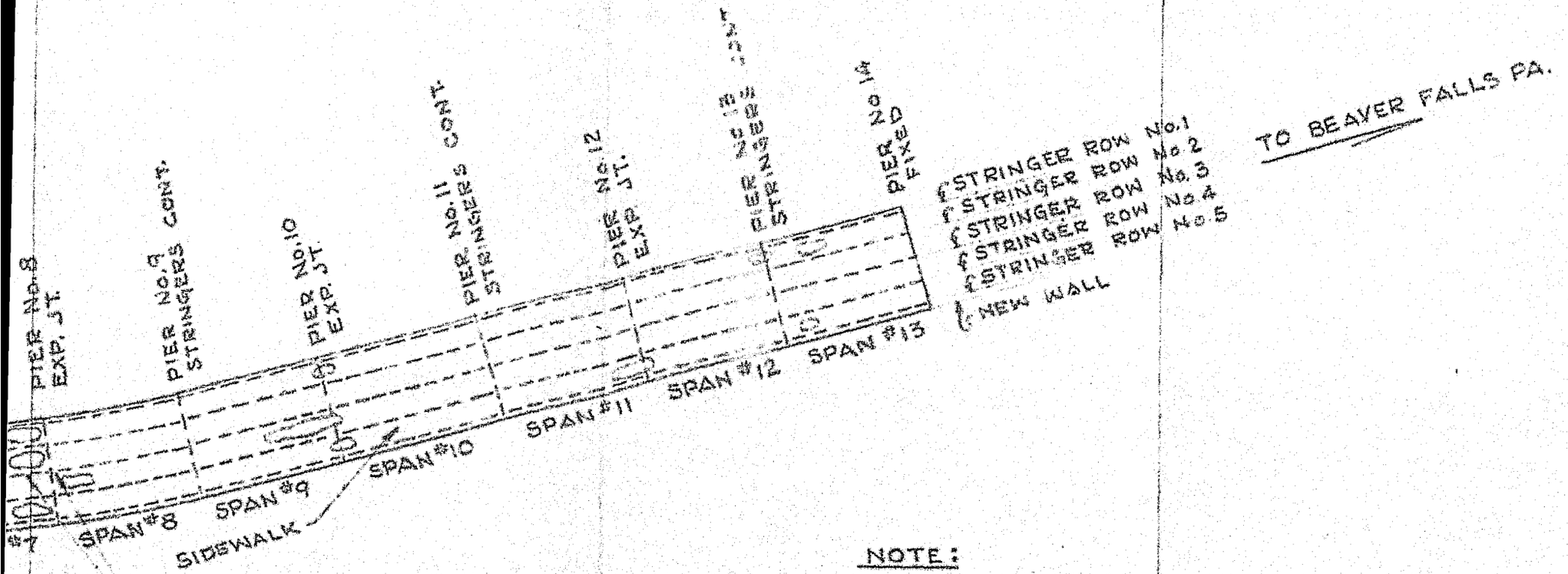


O REPRESENT LOCATIONS WHERE UNDERSIDE OF DECK IS SPALLED

LOCATION

SCALE: 1"

J.H.Z.



THESE STRINGERS ARE SUPPORTED BY A STRUCTURAL FRAME AT PIER No.8. SEE ENGR OF BRIDGE & BLDG PLAN No. 81488

PLAN
40'

NOTE:
SKETCH TO ACCOMPANY INSPECTION REPORT DATED FEB. 10, 1972.

PENN CENTRAL TRANSPORTATION CO.
CENTRAL REGION
VALLEY DIV. MAIN LINE

O.H. BRIDGE 34.88
AT
HOMEWOOD JCT., PA.

OFFICE OF CHIEF ENGINEER PHILADELPHIA, PENNA
DATE: 2-10-72

FILE No. C-22-3

PENN CENTRAL COMPANY
ENGINEERING DEPARTMENT

COMPUTED BY: J. RIVERA SHEET 1 OF 4

CHECKED BY: E.H.S.

SUBJECT: O.H. BR. NO 34.88

ENGINEERING ASSESSMENT OF LOAD CARRYING CAPACITY

LOCATION: HOMEWOOD JCT. PA. DIVISION ,DATE

SUMMARY

	ORIGINAL RATING	REDUCED RATING
DECK (SPANS 1,2,4,6-13)		
RDWY:	H-16.8	H-16.8
SDWK.	650 PSF.	650 PSF.
DECK (SPANS 3 & 5)		
CONTINUOUS RDWY.	H-18.3	H-18.3
SDWK.	56 PSF.	56 PSF.
STRINGERS (SPANS 6-13)		
(CONTINUOUS INTERM. 2,3,4)		SPANS (6-7) / SPANS (8-13)
POS. MOM.	H-41.8	H-3.4 / H-41.8
NEG. MOM.	H-15.5	H-12.3 / H-15.5
SHEAR (ENDS)	H-62.6	H-58.9 / H-62.6
SHEAR (CENTER SUPPORT)	H-37.4	H-34.2 / H-37.4
(CONT. INTERM. 1)		SPANS (6-8,10,12,13) / SPANS (9 & 11)
POS. MOM.	H-97.5	H 97.5 / H-17.3
NEG. MOM.	H-22.7	H-22.7 / H-15.5
SHEAR (ENDS)	H-138	H-138 / H-132
SHEAR (CENTER SUPPORT)	H-78.9	H-78.9 / H-73.2
(CONT. INTERM 5)		SPANS (6-8,10-13) / SPAN 9
NEG. MOM. (SDWK.)	182 PSF	134 PSF / 182 PS.
STRINGERS (SPANS 1,2)		
(SIMPLE SPAN INTERM. 2,3,4)		
MOMENT	H-23.5	H-23.5
SHEAR	H-58.4	H-58.4
(SIMPLE SPAN STR. 1)		
MOMENT	H-53.3	H-53.3
SHEAR	H-48.8	H-48.8
(SIMPLE SPAN STR 5)		
MOMENT (SIDEWALK)	344 PSF	* .0 PSF.
SHEAR (SIDEWALK)	604 PSF	570 PSF.
STRINGERS (SPAN 4)		
B-4 MOM.	H-59.5	H-59.5
SHEAR	H-48.8	H-48.8
B-5 MOM.	H-19.2	H-19.2
SHEAR	H-47.4	H-47.4
B-6 MOM.	H-15.45	H-15.45
SHEAR	H-15.9	H-15.9

SP 10191 B

* REINFORCING STEEL CONSIDERED INEFFECTIVE

PENN CENTRAL COMPANY

ENGINEERING DEPARTMENT

COMPUTED BY: _____ SHEET 2 OF 4

CHECKED BY: E.H.S.

SUBJECT: O H BK No. 34.77

ENGINEERING ADJUSTMENT OF LOAD CARRYING CAPACITY

LOCATION: HOMEWOOD JCT. PA. DIVISION _____ DATE _____

SUMMARY

	ORIGINAL RATING	REDUCED RATING
SPAN 3		
FLOORBEAMS	H-17.6	H-17.6
GIRDERS	H-56.5	H-56.5
COLUMNS	H-26.0	H-26.0
SPAN 5		
FLOORBEAMS (B4-B12)	H-17.6	H-17.6
(B13)	H-42.6	H-42.6
GIRDERS (G2 & G5)	H-27.9	H-27.9
(G1)	H-40	H-40
COLUMNS	H-21.2	H-21.2
CONCRETE PIERS		
PIER CAP (@ CENTER)	H-20.7	H-20.7
(@ CANT.)	H-68.3	H-68.3
(@ COLS.)	H-218	H-218
STEEL BENTS		
12 BM. 64.5	H-26	H-26
14 BM. 99	H-21.2	H-21.2

DETERIORATED BEARINGS UNDER STRINGERS STILL HAVE SATISFACTORY AREA FOR BEARING.

STRUCTURAL STEEL OVER PIER 8 RATES SATISFACTOR

SP 18191 B

PENN CENTRAL COMPANY — ENGINEERING DEPARTMENT

SHEET 3 OF 4

COMPUTED BY: T.S. STRIVIERI — CHECKED BY: E.H.S.

SUBJECT: ENGINEERING ASSESSMENT OF LOAD CARRYING CAPACITY

LOCATION: O.H. BR. NO. 34.83 Hammond Tr. PA. DIVISION _____ DATE 3/15/72

CONCRETE SPANS

STRINGERS	POS. MOM. ORIG.	POS. MOM. RED.	NEG. MOM. ORIG.	NEG. MOM. RED.	SHEAR @ ENDS ORIG.	SHEAR @ ENDS RED.	SHEAR @ CENTER SUPPORT ORIG.	SHEAR @ CENTER SUPPORT RED.	BEARINGS ORIG.	BEARINGS RED.
SPAN 1										
STR. 1	H-53.3	H-53.3	—	—	H-48.8	H-48.8	—	—	H-84.5	H-84.5
STR 2	H-23.5	H-23.5	—	—	H-58.4	H-58.4	—	—	H-115	H-115
STR 3	H-23.5	H-23.5	—	—	H-58.4	H-58.4	—	—	H-115	H-115
STR 4	H-23.5	H-23.5	—	—	H-58.4	H-58.4	—	—	H-115	H-115
STR 5	344 PSF.	O L.L.	—	—	604 PSF.	570 PSF.	—	—	1160 PSF.	1160 PSF
SPAN 2										
STR 1	H-53.3	H-53.3	—	—	H-48.8	H-48.8	—	—	H-84.5	H-28.3 @ PIER 2 / H-24.6 @ 3
STR 2	H-23.5	H-23.5	—	—	H-58.4	H-58.4	—	—	H-115	H-115
STR 3	H-23.5	H-23.5	—	—	H-58.4	H-58.4	—	—	H-115	H-33 @ 2 / H-115 @ 3
STR 4	H-23.5	H-23.5	—	—	H-58.4	H-58.4	—	—	H-115	H-115
STR 5	344 PSF	O L.L.	—	—	604 PSF.	570 PSF	—	—	1160 PSF.	1160 PSF @ 2 / 600 PSF @ 3
SPAN 4										
STR 1	H-59.5	H-59.5	—	—	H-48.8	H-48.8	—	—	—	—
STR 2	H-19.2	H-19.2	—	—	H-47.4	H-47.4	—	—	—	—
STR 3	H-15.5	H-15.5	—	—	H-15.9	H-15.9	—	—	—	—
STR 4	—	—	—	—	—	—	—	—	—	—
STR 5	—	—	—	—	—	—	—	—	—	—
SPAN 6										
STR 1	H-97.5	H-97.5	H-22.7	H-22.7	H-138	H-138	H-78.9	H-78.9	H-520	H-520
STR 2	H-41.8	H-41.8	H-15.5	H-15.5	H-62.6	H-62.6	H-37.4	H-37.4	H-266	H-266
STR 3	H-41.8	H-41.8	H-15.5	H-15.5	H-62.6	H-62.6	H-37.4	H-37.4	H-266	H-266
STR 4	H-41.8	H-3.4	H-15.5	H-12.3	H-62.6	H-58.9	H-37.4	H-34.2	H-266	H-266
STR 5	—	—	182 PSF	134 PSF	720 PSF	720 PSF	275 PSF	275 PSF	2940 PSF	2940 PSF
SPAN 7										
STR 1	H-97.5	H-97.5	H-22.7	H-22.7	H-138	H-138	H-78.9	H 78.9	H-188	H-188
STR 2	H-41.8	H-41.8	H-15.5	H-15.5	H-62.6	H-62.6	H-37.4	H-37.4	H-103	H-103
STR 3	H-41.8	H-41.8	H-15.5	H-15.5	H-62.6	H-62.6	H-37.4	H-37.4	H-103	H-103
STR 4	H-41.8	H-3.4	H-15.5	H-12.3	H-62.6	H-58.9	H-37.4	H-84.2	H-103	H-103
STR 5	—	—	182 PSF	134 PSF	720 PSF.	720 PSF	275 PSF	275 PSF	1176 PSF	1176 PSF

SP 10151 B

PENN CENTRAL COMPANY
ENGINEERING DEPARTMENT

SHEET 4 OF 4

COMPUTED BY J.S. STRIVIERI CHECKED BY E.H.S.

SUBJECT O.H BR. No. 34.88
ENGINEERING ASSESSMENT OF LOAD CARRYING CAPACITY

LOCATION: Homewood Jct. PA. DIVISION DATE 2/15/72

CONCRETE SPANS

STRINGERS	POS. MOM.		NEG. MOM.		SHEAR @ ENDS		SHEAR @ CENTER SUPPORT		BEARING	
	ORIG.	RED	ORIG.	RED.	ORIG.	RED.	ORIG.	RED.	ORIG.	RED.
SPAN 8										
STR 1	H-97.5	H-97.5	H-22.7	H-22.7	H-138	H-138	H-78.9	H-78.9	H-188	H-188
STR 2	H-41.8	H-41.8	H-15.5	H-15.5	H-62.6	H-62.6	H-37.4	H-37.4	H-103	H-103
STR 3	H-41.8	H-41.8	H-15.5	H-15.5	H-62.6	H-62.6	H-37.4	H-37.4	H-103	H-103
STR 4	H-41.8	H-41.8	H-15.5	H-15.5	H-62.6	H-62.6	H-37.4	H-37.4	H-103	H-103
STR. 5	—	—	182 PSF	134 PSF	720 PSF	720 PSF	275 PSF	275 PSF	1176 PSF	1176 PSF
SPAN 9										
STR 1	H-97.5	H-17.3	H-22.7	H-15.5	H-138	H-132	H-78.9	H-73.2	H-188	H-188
STR 2	H-41.8	H-41.8	H-15.5	H-15.5	H-62.6	H-62.6	H-37.4	H-37.4	H-103	H-103
STR 3	H-41.8	H-41.8	H-15.5	H-15.5	H-62.6	H-62.6	H-37.4	H-37.4	H-103	H-81.7
STR 4	H-41.8	H-41.8	H-15.5	H-15.5	H-62.6	H-62.6	H-37.4	H-37.4	H-103	H-16.25
STR 5	—	—	182 PSF	182 PSF	720 PSF	720 PSF	275 PSF	275 PSF	1176 PSF	1176 PSF
SPAN 10										
STR 1	H-97.5	H-97.5	H-22.7	H-22.7	H-138	H-138	H-78.9	H-78.9	H-188	H-188
STR 2	H-41.8	H-41.8	H-15.5	H-15.5	H-62.6	H-62.6	H-37.4	H-37.4	H-103	H-103
STR 3	H-41.8	H-41.8	H-15.5	H-15.5	H-62.6	H-62.6	H-37.4	H-37.4	H-103	H-103
STR 4	H-41.8	H-41.8	H-15.5	H-15.5	H-62.6	H-62.6	H-37.4	H-37.4	H-103	H-103
STR 5	—	—	182 PSF	134 PSF	720 PSF	720 PSF	275 PSF	275 PSF	1176 PSF	1176 PSF
SPAN 11										
STR 1	H-97.5	H-17.3	H-22.7	H-15.5	H-138	H-132	H-78.9	H-73.2	H-188	H-188
STR 2	H-41.8	H-41.8	H-15.5	H-15.5	H-62.6	H-62.6	H-37.4	H-37.4	H-103	H-103
STR 3	H-41.8	H-41.8	H-15.5	H-15.5	H-62.6	H-62.6	H-37.4	H-37.4	H-103	H-103
STR 4	H-41.8	H-41.8	H-15.5	H-15.5	H-62.6	H-62.6	H-37.4	H-37.4	H-103	H-103
STR 5	—	—	182 PSF	134 PSF	720 PSF	720 PSF	275 PSF	275 PSF	1176 PSF	916 PSF
SPAN 12										
STR 1	H-97.5	H-97.5	H-22.7	H-22.7	H-138	H-138	H-78.9	H-78.9	H-188	H-188
STR 2	H-41.8	H-41.8	H-15.5	H-15.5	H-62.6	H-62.6	H-37.4	H-37.4	H-103	H-103
STR 3	H-41.8	H-41.8	H-15.5	H-15.5	H-62.6	H-62.6	H-37.4	H-37.4	H-103	H-103
STR 4	H-41.8	H-41.8	H-15.5	H-15.5	H-62.6	H-62.6	H-37.4	H-37.4	H-103	H-103
STR 5	—	—	182 PSF	134 PSF	720 PSF	720 PSF	275 PSF	275 PSF	1176 PSF	916 PSF
SPAN 13										
STR 1	H-97.5	H-97.5	H-22.7	H-22.7	H-138	H-138	H-78.9	H-78.9	H-188	H-188
STR 2	H-41.8	H-41.8	H-15.5	H-15.5	H-62.6	H-62.6	H-37.4	H-37.4	H-103	H-103
STR 3	H-41.8	H-41.8	H-15.5	H-15.5	H-62.6	H-62.6			H-103	H-103
STR 4	H-41.8	H-41.8	H-15.5	H-15.5	H-62.6	H-62.6	H-37.4	H-37.4	H-103	H-103
STR 5	—	—	182 PSF	134 PSF	720 PSF	720 PSF	275 PSF	275 PSF	1176 PSF	1176 PSF

SP 10191 B

PENN CENTRAL COMPANY
ENGINEERING DEPARTMENT

COMPUTED BY: _____ SHEET 1 OF 31

CHECKED BY: E.H.S.

SUBJECT: O.H. BRIDGE NO. 34.33

LOCATION: HOMEWOOD JCT PA DIVISION _____ DATE 2/10/72

RATING OF ORIGINAL SECTION

REINFORCED CONCRETE SPANS

DECK @ CENTER

UNSUPPORTED LENGTH $7'-5\frac{1}{2}" - (1'-8") = 5'-9\frac{1}{2}"$

D.L. 12" CONC. DECK (MAX) 150 #/l

2½" ASPHALT $\frac{2.5}{12} \times 130\ \#/cf = 27\ \#/l$

TOT = 177 #/l

$D.L.\ MOM. = \frac{wl^2}{10} = \frac{177(5.79')^2}{10} = 591'^{\#}$

L.L. MOM. FOR H-15 $M = \frac{(S+2)}{32} P_{15} = \frac{(5.79+2)}{32} \times 12^K = 2.92'^K$

$2.92'^K \times 1.3$ FOR IMPACT $\times .8$ ALLOWABLE FOR CONTINUOUS

$= 3.04'^K$

COMPRESSION IN CONC. D.L.M. (SEE BELOW) $= .59'^K$ TOT. $3.63'^K$

$m = q = \frac{nA_s}{bd} = \frac{10(.666)}{12.0(6.75)} = .0824$ SEE TABLE II $k = .323$

$j = 1 - .33(.323) = .891$ $f_s = \frac{12{,}000\,M}{j\,d\,A_s} = \frac{12{,}000(3.63'^K)}{.891(6.75)(.666)} = 10.$

$f_c = \frac{f_s}{n} \times \frac{k}{1-k} = \frac{10{,}850}{10} \times \frac{.328}{.672} = 530$ PSI ALL. 1350 PSI

$\frac{1350}{530} \times 15 = \underline{H-38.2}$

DECK @ CURBS

D.L. 8" CONC. DECK (MAX) 100 #/l

1" ASPHALT $\frac{1}{12} \times 130\ \#/cf = 10.8\ \#/l$

TOT = 110.8 #/l

$D.L.M. = \frac{wl^2}{10} = \frac{110.8(5.77')^2}{10} = 370'^{\#}$

L.L.M. FOR H-15 $3.04'^K$ TOT $3.41'^K$

COMPRESSION IN CONC.

$m = q = \frac{nA_s}{bd} = \frac{10(.666)}{12(6.75)} = .0824$ $k = .328$

$j = 1 - .33(.328) = .891$ $f_s = \frac{12{,}000(3.41'^K)}{.891(6.75)(.666)} = 10{,}200$ PSI

$f_c = \frac{10{,}200}{10} \times \frac{.328}{.672} = 498$ PSI $\frac{1350}{498} \times 15 = \underline{H-40.7}$

CHECK STEEL IN THE DECK

ANALIZE DECK AS A SIMPLE BEAM

$D.L.\ MAX = \frac{wl^2}{8} = \frac{177\ \#/l\ (5.77')^2}{8} = 740'^{\#}$

L.L. MAX $= 2.92'^K \times 1.3 = 3.8'^K$

TOT. $4.54'^K$

$A_s = \frac{4.54'^K}{1.13(6.75)} = .595\ \square"$ REQ'D. ACTUALLY HAVE $.666\ \square"$

.666

DECK UNDER SIDEWALK

UNSUPPORTED LENGTH $7'-5\frac{1}{2}" - (1'-6") = 5'-11\frac{1}{2}"$

D.L. 8" CONC. DECK (MAX.) $100^{\#}/_{\ell}$

SIDEWALK $12\frac{3}{4}"/_{12}" \times 150^{\#}/_{cf} \times 1' = 153^{\#}/_{\ell}$

TOT $= 253^{\#}/_{\ell}$

D.L. MOM. $= \frac{w\ell^2}{10} = \frac{253(5.76)^2}{10} = 900'^{\#}$ L.L.M. $= \frac{.085(5.96)^2}{10} = .302'^{K}$

COMP. IN CONC. $M = 1.202'^{K}$

$n = g = .0824$ $k = .328$ $j = .891$

$$f_s = \frac{12,900(1.202)}{.891(6.75)(.666)} = 3.6^{KSI}$$

$$f_c = \frac{3,600}{10} \times \frac{.328}{.672} = 176\ PSI \qquad \frac{1350}{176} \times 85 = \underline{652^{\#}/_{SF}}$$

CHECK STEEL IN THE DECK

ANALIZE DECK AS A SIMPLE BEAM

$$D.L.\ M_{MAX} = \frac{253^{\#}/_{\ell}(5.96')^2}{8} = 1125'^{\#}$$

$A_S = .666^{\square"}$

M_{MAX} ALL. $= .666^{\square"} \times 1.13 \times 6.75 = 5.09'^{K}$

D.L.M. $= 1.13'^{K}$

AVAIL. L.L.M $= 3.96'^{K}$

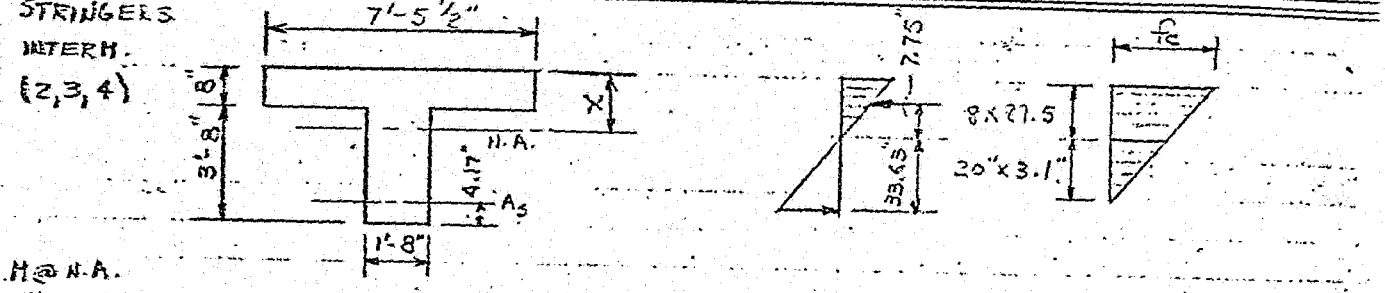
$$M_{MAX} = \frac{w\ell^2}{8} \qquad w = \frac{3.96'^{K} \times 8}{(5.96')^2} = \underline{890^{\#}/_{SF}}\ \text{L.L. ALL.}$$

COMPUTED BY: J. A. TELFER | PENN CENTRAL COMPANY ENGINEERING DEPARTMENT | SHEET 2 OF 4

SUBJECT: O.H. B.R. No. 34.88 | CHECKED BY: E.H.S.

LOCATION: HOMEWOOD JCT. I.C. DIVISION DATE 2/11/72

STRINGERS INTERM. (2,3,4)



M @ N.A.

$$(10 \times 14.04^{D}")(47.83 - x) = (8 \times 89.5)(x-4) + (20x(x-8))\left(\frac{x-8}{2}\right)$$

$$6,710 - 140.4x = 716x - 2864 + (20x - 160)\left(\frac{x-8}{2}\right)$$

$$6,710 - 140.4x = 716x - 2864 + 10x^2 - 80x - 80x^2 + 640$$

$$0 = 10x^2 + 696.4x - 8934$$

$$0 = .0144x^2 + x - 12.8$$

$$x = \frac{-1 + \sqrt{1 - 4(.0144)(-12.8)}}{.0288} = \frac{-1 + \sqrt{1.738}}{.0288} = \frac{.32}{.0288} = 11.1"$$

F	ARM	M
$\left(\frac{20" \times 3.1"}{2}\right) \times \frac{3.1}{11.1} f_c$	$\frac{2}{3}(3.1)$	$17.9 f_c$
$8" \times 89.5" \times \frac{3.1}{11.1} f_c$	$\frac{1}{2}(8.0) + 3.1$	$1,420 f_c$
$\left(\frac{8" \times 89.5"}{2}\right) \times \frac{8.0}{11.1} f_c$	$\frac{2}{3}(8.0) + 3.1$	$2,175 f_c$

$$\Sigma F = 8.65 f_c + 200 f_c + 258 f_c = 466.65 f_c \qquad \Sigma M = 3,612.9 f_c$$

$$\bar{y} = \frac{\Sigma M}{\Sigma F} = \frac{3612.9 f_c}{466.65 f_c} = 7.75"$$

TOTAL RESIST. $T = 14.04^{D}" \times 16,000 \times \frac{36.73 + 7.75}{12} = 835,000\#$

TOT. SUPER. WT. $1357\#/1/5 = 271\#/1 = .27\ K/1$

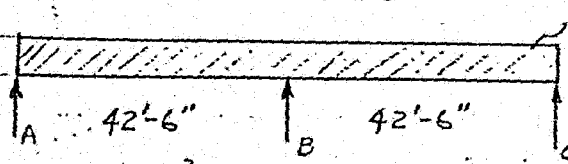
WT. OF DECK $177\#/1^2 \times 7.46' = 1.32\ K/1$

WT. OF STRINGER $1.67' \times 3.67' \times 150\#/cf = .92\ K/1$

TOT $= 2.51\ K/1$

ADDITIONAL SUPER. WT. FROM a) WT. OF TWO PARAPETS $800\#/1$
b) WT. OF SDWK. $500\#/1$
c) WT. OF CURB $57\#/1$
TOT. $1357\#/1$

CONTINUOUS FOR TWO SPANS



$$M_{MAX}^{+} = .0703\ wL^2$$

$$M^{+} = .0703 \times 2.51\ K/1 \times (42.5')^2 = 318'K$$

$$M_{MAX}^{-} = -.125\ wL^2$$

$$M^{-} = -.125 \times 2.51\ K/1 \times (42.5')^2 = 567'K$$

PENN CENTRAL COMPANY
ENGINEERING DEPARTMENT

SHEET 4 OF 31

COMPUTED BY: [illegible]

CHECKED BY: E.H.S.

SUBJECT: [illegible] No. 34.??

LOCATION: [illegible] PA DIVISION

DATE [illegible]

TOT. RESIST + 835'K
D.L. M + 318'K
AVAIL FOR L.L. + 517'K

TOT. RESIST − $A_s = \frac{M_{MAX}^-}{1.13 d}$ $A_s^- = 5 \times 1\frac{1}{4} \times 1\frac{1}{4} + 4 \times 1\frac{1}{4} \times 1\frac{1}{4}$

$A_s^- = 7.8\square'' + 6.24$

$M_{MAX}^- = 1.13(50'')(7.8\square'') + 1.13(44)(6.24\square'') = 440'^K + 310'^K = 750'^K$

TOT. RESIST − 750'K
D.L.M. − 567'K
AVAIL. FOR L.L. 183'K

FRACTION OF A WHEEL LOAD ON A STRINGER S/6.0

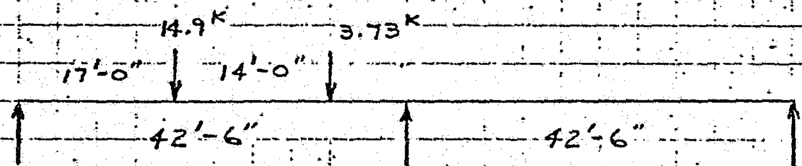
S = 7'-5½" $\frac{7.46}{6.0} = 1.242$

POS.

FOR H-15 ↓ 14'-0" ↓

$3^K \times 1.242 = 3.73^K$ $12^K \times 1.242 = 14.9^K$

Table A.2.0



.4 × 42.5 = 17'-0" 31'-0" = 42.5 × .73

$.2064 \times 14.9^K \times 42.5' + .07444 \times 3.73^K \times 42.5' = M_{MAX}^+$

$131'^K + 11.8'^K = M_{MAX}^+$

$M_{MAX}^+ = 142.8'^K$

$I = \frac{50}{L+125} = \frac{50}{167.5} = .30$

$M_{MAX}^+ = 142.8'^K \times 1.3 = 185.5'^K$

INV. RATING $\frac{517'^K}{185.5'^K} \times 15 =$ **H-41.8**

NEG. TABLE 2.0 $M_{MAX}^- = -292.3'^K \times \frac{1}{2} \times 1.242 = -182.0'^K$

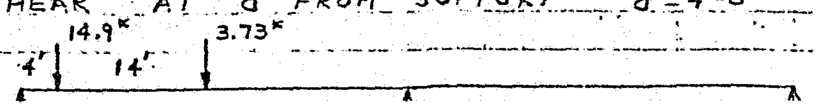
$M_{MAX}^- = -182.0'^K \times 1.3 = -236.0'^K$

INV. RATING $\frac{183'^K}{236'^K} \times 20 =$ **H-15.5**

SHEAR

D.L. $2.51^{K/'} \times 42.5' = 106.5^K \times 5/8$ @ B = 66.5K

MAX. SHEAR AT d FROM SUPPORT d = 4'-0" $106.5^K \times 3/8$ @ A&C = 40K



COMPUTED BY: J. STEINER — PENN CENTRAL COMPANY — ENGINEERING DEPARTMENT — SHEET 5 OF 21 — CHECKED BY: E.H.S.

SUBJECT: O.H. BR. No. 24.88

LOCATION: HOMEWOOD, JCT. PA. DIVISION ____ DATE 2/14/72

V @ A & @ C

L.L. $^{4}/_{42.5'} = .094$; $^{18}/_{42.5'} = .424$

$V_{AB} = .8830 \times 14.9^K \times 1.3 + .4886 \times 3.73^K \times 1.3$

$V_{AB} = 17.1^K + 2.37^K = 19.47^K$ TRUCK LOADING

D.L. $40.0^K - 2.51^{K}/_{L} \times 4' = 30.0^K = V_{AB}$

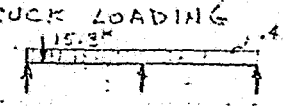
TOTAL V ALL.

4 - ½" □ STIRRUPS = 1.0 S.I.

TRY LANE LOADING

$9.75^K \times 1.242 \times 1.3 = 15.8^K$

$.24^{K}/_{L} \times 1.242 \times 1.3 = .387^{K}/_{L}$



$V_{L.L.} = .387 \times 42.5' \times .375 + 15.8^K$

$V_{LL} = 6.16^K + 15.8^K = 21.96^K$

$V = \nu bd = 60 psi\ (20")(48") = 57.6^K$

V' FROM STIRRUPS $= \frac{A_v f_v d}{s} = \frac{1.0 \times 16^{K}/_{\square"} \times 48"}{12"} = 64^K$ IN 1'-0"

$V_{TOT} = 121.6^K$

$V_{D.L.} = 30.0^K$

AVAIL $V_{L.L.} = 91.6^K$ ACT. $V_{LL} = 19.47^K$

$\frac{91.6}{21.96} \times 15 = H\ 62.6$

V @ B

$V_{BA} = -.9462 \times 14.9^K \times 1.3 + -.6704 \times 3.73^K \times 1.3$

$V_{BA} = -18.35^K - 3.25^K = -21.6^K$ TRUCK

D.L. $66.5^K - 2.51^{K}/_{L} \times 4' = 56.5^K$

LANE LOADING

$V_{L.L.} = 15.8^K + .387 \times 42.5' \times .625$

$V_{L.L.} = 15.8 + 10.3 = 26.1^K$ LANE

$V = 57.6^K$

$V' = 64.0^K$

$V_{TOT} = 121.6^K$

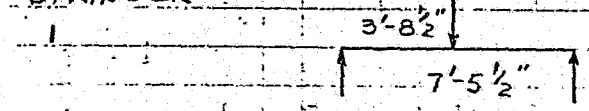
$V_{D.L.} = 56.5^K$

AVAIL $V_{LL} = 65.1$ ACT. $V_{LL} = 21.6^K$ TRUCK

$\frac{65.1}{26.1} \times 15 = H\ 37.4$

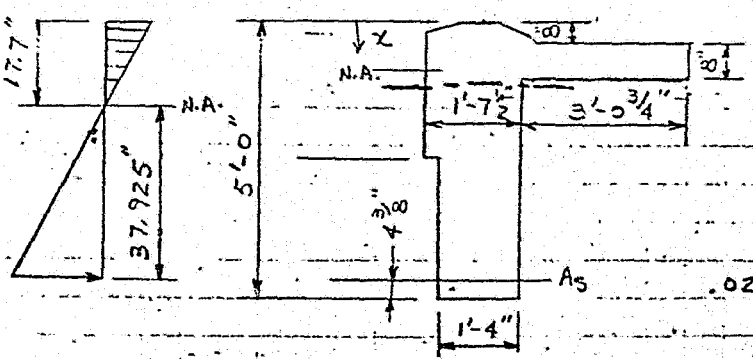
OUTSIDE RDWY. STRINGERS

STRINGER



$\frac{3.71}{7.46} = .5$ USE ½ A WHEEL LOAD ON STRINGER

$12^K \times .5 = 6^K$ $3^K \times .5 = 1.5^K$



$A_s = 3 \times 1.25 \times 1.25 = 12.5^{\square"}$

M @ N.A.

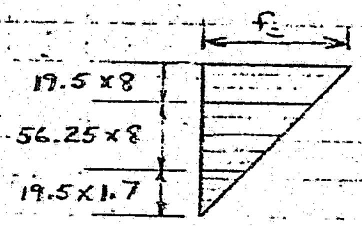
$19.5x\left(\frac{x}{2}\right) + 36\frac{3}{4}(8")(x-12) = (10 \times 12.5^{\square"})(55.625 - x)$

$9.75x^2 + 294x - 3528 = -125x + (125)(55.625)$

$.0233x^2 + x - 25 = 0$

$x = \frac{-1 + \sqrt{1 - 4(.0233)(-25)}}{.0466}$

$x = \frac{-1 + \sqrt{3.33}}{.0466} = \frac{.825}{.0466} = 17.7"$



F		ARM	M
$\left(\frac{19.5 \times 1.7}{2}\right) \times \frac{1.7}{17.7} f_c$		$\frac{2}{3}(1.7)$	$1.8 f_c$
$56.25 \times 8 \times \frac{1.7}{17.7} f_c$		$\frac{1}{2}(8.0) + 1.7$	$246.5 f_c$
$\left(\frac{56.25 \times 8}{2}\right) \times \frac{8.0}{17.7} f_c$		$\frac{2}{3}(8.0) + 1.7$	$716 f_c$
$19.5 \times 8 \times \frac{9.7}{17.7} f_c$		$\frac{1}{2}(8.0) + 9.7$	$1170 f_c$
$\frac{19.5 \times 8}{2} \times \frac{8.0}{17.7} f_c$		$\frac{2}{3}(8.0) + 9.7$	$530 f_c$

$\Sigma F = 1.59 f_c + 43.2 f_c + 102 f_c + 85.5 f_c + 35.2 f_c = 267.49 f_c$

$\Sigma M = 1.8 f_c + 246.5 f_c + 716 f_c + 1170 f_c + 530 f_c = 2664.3 f_c$

$y = \frac{\Sigma M}{\Sigma F} = \frac{2664.3 f_c}{267.49 f_c} = 10''$

TOT. RESIST = $T = 12.5^{\square''} \times 16{,}000 \times \frac{37.925 + 10}{12} = 796{,}000'^{\#}$

TOT RESIST NEG. OVER SUPPORTS

$A_S = \frac{M_{MAX}^-}{1.13\, d} = 12.5^{\square''}$

$M_{MAX}^- = 1.13 \times 47'' \times 12.5 = 664'^K$

D.L. TOT. SUPER WT. $.27^{K/\prime}$

WT. OF DECK $177^{\#/\square'} \times 3.73' = 660^{\#/\prime}$

WT. OF STRINGER $(1.33' \times 3.17' + 1.61' \times 1.83')\, 150^{\#}/cf = 1075^{\#/\prime}$

WT. OF PARAPET $.67' \times 4' \times 150^{\#}/cf = 400^{\#/\prime}$

WT. OF CURB $.67' \times .57' \times 150^{\#}/cf = 57^{\#/\prime}$

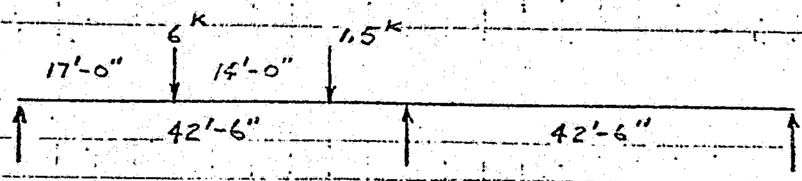
TOT. $= 2.46^{K/\prime}$

D.L. $M_{MAX}^+ = .0703\, wL^2 = .0703 \times 2.46^{K/\prime} \times (42.5')^2 = 312'^K$

$M_{MAX}^- = -.125\, wL^2 = -.125 \times 2.46^{K/\prime} \times (42.5')^2 = 556'^K$

TOT RESIST +	796 'K	TOT. RESIST −	664 'K
D.L.M. +	312 'K	D.L.M. −	556 'K
AVAIL. FOR L.L.+	484 'K	AVAIL. FOR L.L.−	108 'K

L.L.



$.2064 \times 6^K \times 42.5' + .07444 \times 1.5^K \times 42.5' = M_{MAX}^+$

$52.7'^K + 4.74'^K = M_{MAX}^+ = 57.44'^K$

$M_{MAX}^+ + I = 57.44 \times 1.3 = 74.5'^K$

PENN CENTRAL COMPANY
ENGINEERING DEPARTMENT

COMPUTED BY: C. S. STEINERT   SHEET 7 OF 31
CHECKED BY: E. H. S.

SUBJECT: O. H. BR. No. 34.39

LOCATION: HOMEWOOD JCT. PA.   DIVISION ______   DATE 2/16/72

INV. RATING $\frac{484'^K}{74.5'^K} \times 15 = \underline{H-97.5}$

NEG. TABLE 2.0 $M^{-}_{MAX} = -292.3'^K \times \frac{1}{2} \times \frac{1}{2} = -73.2'^K$

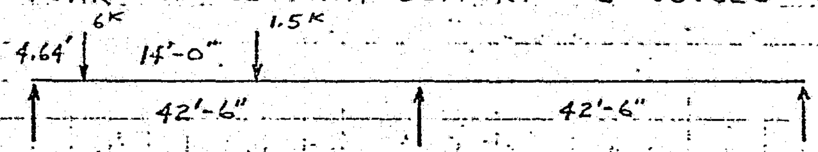
$M^{-}_{MAX} = -73.2'^K \times 1.3 = -95.1'^K$

INV. RATING $\frac{108'^K}{95.1'^K} \times 20 = \underline{H-22.7}$

SHEAR

D.L. $2.46^{K/'} \times 42.5' = 104.5^K \times \frac{5}{8} @ B = 65.4^K$ $104.5 \times \frac{3}{8} @ A \& C = 39.2^K$

MAX. SHEAR AT d FROM SUPPORT $d = 55.625'' = 4.64'$



V @ A & @ C

L.L. $4.64'/42.5' = .109$ $V_{AB} = .8630 \times 6^K \times 1.3 + .4733 \times 1.5^K \times 1.3$

$18.64'/42.5' = .439$ $V_{AB} = 6.73^K + .92^K = 7.65^K$ TRUCK LOADING

LANE LOADING
$9.75^K \times .5 \times 1.3 = 6.35^K$
$.24^{K/'} \times .5 \times 1.3 = .156$
$V_{LL} = .156 \times 42.5 \times .375 + 6.35^K = 2.48 + 6.35$
$= 8.83^K$ LANE

$V_{DL} = 39.2^K - 2.46^{K/'} \times 4.64' = 27.8^K = V_{DL}$

TOT. V_{ALL}

$4 - \frac{1}{2}''^{\square}$ STIRRUPS = 1 si   1 si IN 1'-4" = .75□" IN 1'-0"

$V = v\,bd = 60\,PSI\,(16'')(55.625'') = 53.5^K$

V' FROM STIRRUPS IN 1'-0" $= \frac{.75 \times 16^{K/\square''} \times 55.625}{12} = \frac{A_v f_v d}{S} = 55.7^K$

$V_{TOT} = 109.2^K$

$V_{D.L.} = 27.8^K$

AVAIL. $V_{LL} = 81.4^K$ ACT. $V_{LL} = 7.65^K$ $\frac{81.4}{8.83} \times 15 = \underline{H-138}$

V @ B $V_{BA} = -.9357 \times 6^K \times 1.3 + (-.6560) \times 1.5^K \times 1.3$

LANE LOADING
$V_{LL} = 6.35^K + .156 \times 42.5 \times .625$
$V_{LL} = 6.35^K + 4.15^K$
$V_{LL} = 10.5^K$ LANE

$V_{BA} = -7.3^K - 1.28^K = -8.58^K$

$V_{D.L.} = 65.4^K - 2.46^{K/'} \times 4.64' = 54.0^K$

$V = v\,bd = 60\,PSI\,(16)(55.625) = 53.5^K$

V' FROM STIRRUPS IN 1'-0" $= \frac{.75 \times 16^{K/\square''} \times 55.625}{12} = 55.7^K$

$V_{TOT} = 109.2^K$

$V_{DL} = 54.0^K$

PENN CENTRAL COMPANY
ENGINEERING DEPARTMENT

COMPUTED BY: J. J. STRINIERI — SHEET 8 OF 31 — CHECKED BY: E. H. C.

SUBJECT: [illegible]

LOCATION: [illegible] DIVISION ________ DATE 2/15/72

$\frac{55.2}{10.5} \times 15 = H\text{-}78.9$

SIDEWALK STRINGER (STRINGER 5)

$A_s = 4 \times 1\frac{1}{4} \times 1\frac{1}{4} = 6.25 + 3 \times 1\frac{1}{4} \times 1\frac{1}{4} = 4.69$

$4.69x = 6.25(3.75 - x)$

$4.69x = 23.42 - 6.25x$

$10.94x = 23.42$

$x = 2.14''$

$3.75 - 2.14 = 1.61''$

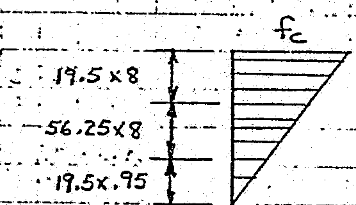
$2.5'' + 1.61'' = 4.11''$

$19.5x\left(\frac{x}{2}\right) + 36\frac{3}{4}''(8'')(x - 12'') = (10 \times 10.94'')(55.89 - x)$

$9.75x^2 + 294x - 3528 = -109.4x + 6110$

$.0242x^2 + x - 23.9 = 0$

$x = \frac{-1 + \sqrt{1 - 4(.0242)(-23.9)}}{.0484} = \frac{-1 + \sqrt{3.315}}{.0484} = \frac{.82}{.0484} = 16.95''$



F	ARM	M
$\left(\frac{19.5 \times .95}{2}\right) \times \frac{.95}{16.95} f_c$	$\frac{2}{3}(.95)$	$.333 f_c$
$56.25 \times 8 \times \frac{.95}{16.95} f_c$	$\frac{1}{2}(8.0) + .95$	$125 f_c$
$\left(\frac{56.25 \times 8}{2}\right) \times \frac{8.0}{16.95} f_c$	$\frac{2}{3}(8.0) + .95$	$666 f_c$
$19.5 \times 8 \times \frac{8.95}{16.95} f_c$	$\frac{1}{2}(8.0) + 8.95$	$1065 f_c$
$\frac{19.5 \times 8}{2} \times \frac{8.0}{16.95} f_c$	$\frac{2}{3}(8.0) + 8.95$	$525 f_c$

$\Sigma M = 2381.3 f_c$

$y = \frac{\Sigma M}{\Sigma F} = 9.5''$

$\Sigma F = .52 f_c + 25.2 f_c + 106 f_c + 82.4 f_c + 36.8 f_c = 250.92 f_c$

TOT. RESIST. $T = 10.94'' \times 16{,}000 \times \frac{38.94 + 9.5}{12} = 706{,}000^{\#} = 706^{K}$

NEG. $A_s = \frac{M_{MAX}}{1.13\,d} = 10.94''^2$ $\quad M_{MAX} = 10.94'' \times 1.13 \times 48'' = 594^{'K}$

PENN CENTRAL COMPANY
ENGINEERING DEPARTMENT

COMPUTED BY: [illegible] SHEET 7 OF 31

CHECKED BY: E.H.S.

SUBJECT: [illegible]

LOCATION: [illegible] DIVISION [illegible] DATE [illegible]

D.L. WT. OF DECK $100^{\#}/_{\square'} \times 3.73' = 373^{\#}/_{'}$

WT. OF STRINGER $(1.33' \times 3.17' + 1.61' \times 1.83') \; 150^{\#}/_{cf} = 1075^{\#}/_{'}$

WT. OF PARAPET $.67 \times 4' \times 150^{\#}/_{cf} = 400^{\#}/_{'}$

WT. OF SIDEWALK $5' \times .67' \times 150^{\#}/_{cf} = 500^{\#}/_{'}$ TOT D.L. 2348

L.L. ON SIDEWALK $85^{\#}/_{SF} \times 5' = 425^{\#}/_{'}$

D.L. $M^{+}_{MAX} = .0703 \; wL^2 = .0703 \times 2.35^{K}/_{'} \times (42.5')^2 = 298'^{K}$

$M^{-}_{MAX} = -.125 \; wL^2 = -.125 \times 2.35^{K}/_{'} \times (42.5')^2 = 531'^{K}$

TOT RESIST $^{+}$	$706'^{K}$	TOT RESIST $^{-}$	$594'^{K}$
D.L. M.$^{+}$	$298'^{K}$	D.L.M.$^{-}$	$531'^{K}$
AVAIL. FOR L.L.$^{+}$	$408'^{K}$	AVAIL. FOR L.L.$^{-}$	$63'^{K}$

L.L. $M^{+}_{MAX} = .0703 \times .425 \times (42.5')^2 = 54'^{K} < 408'^{K}$ O.K.

$M^{-}_{MAX} = -.125 \times .425 \times (42.5')^2 = 96'^{K} > 63'^{K}$ N.G.

$63'^{K} = -.125 \times (42.5)^2 \; x \quad x = .279^{K}/_{'}$ $(x = 56^{\#}/_{SF})$

D.L. $.27^{K}/_{'} + .373^{K}/_{'} + 1.075^{K}/_{'} = 1.718^{K}/_{'}$

D.L. $M^{+}_{MAX} = .0703 \times 1.718 \times (42.5)^2 = 218'^{K}$

$M^{-}_{MAX} = -.125 \times 1.718 \times (42.5)^2 = 388'^{K}$

TOT RESIST $^{+}$	$706'^{K}$	TOT RESIST $^{-}$	$594'^{K}$
D.L.M $^{+}$	$218'^{K}$	D.L.M $^{-}$	$388'^{K}$
AVAIL FOR L.L^{+}	$488'^{K}$	AVAIL FOR L.L^{-}	$206'^{K}$

L.L. $M^{+}_{MAX} = 54'^{K} < 488'^{K}$ O.K.

$M^{-}_{MAX} = 96'^{K} < 206'^{K}$ O.K.

$M_{MAX} = 206'^{K} = -.125 \; x \; (42.5)^2 \; x = .712^{K}/_{'}$ $.912/5 = .182^{K}/_{'^2}$ $(.182^{\#}/_{\square'})$

SHEAR

D.L. $1.718^{K}/_{'} \times 42.5' = 73^{K} \times 5/8$ @ B $= 45.6^{K}$ $73^{K} \times 3/8$ @ A & C $= 27.4^{K}$

V@A&C TOT V_{ALL} $V = v \; b \; d = 60 \text{PSI} \; (16") \; (55.89") = 53.6^{K}$

V' FROM STIRRUPS IN 1'-0" $= \dfrac{.572 \times 16^{K}/_{0"} \times 55.87}{12} = 42.5^{K}$ 1 SI IN 1'-9" = .572 IN 1'-0"

$V_{TOT} = 96.1^{K}$

$V_{D.L} = 27.4^{K} - 1.718 \times 4.66' = 19.4^{K}$

V_{TOT} 76.1

$V_{D.L}$ 19.4

AVAIL $V_{LL} = 76.7$ $\dfrac{76.7}{21.25'} = w = 3.6^{K}/_{'}$

$V_{LL} = wL = w \cdot 21.25$ $\dfrac{3.6^{K}/_{'}}{5'} = 720^{\#}/_{SF}$

V@B $V_{TOT} = 96.1^{K}$

$V_{D.L} = 45.6^{K} - 1.718 \times 4.66' = 37.6^{K}$

AVAIL. $V_{LL} = 58.5^{K}$ $V_{LL} = 42.5 \; w$ $w = \dfrac{58.5}{42.5} = 1.375^{K}/_{'}$

$\dfrac{1.375}{5} = 275^{\#}/_{SF}$

SPANS (1, 2) 5 CONC. STRINGERS SIMPLY SUPPORTED
RATE FOR MAX. SPAN (SPAN 2) 40'-6"

INTERM. STRINGERS 2, 3, 4

TOTAL RESIST 835'K (SEE PAGE 3)

TOTAL D.L. 2.51 K/l (SEE PAGE 3)

$M_{MAX} = \frac{wL^2}{8} = \frac{2.51(40.5)^2}{8} = 515'K$

TOT. RESIST. 235'K D.L M = 515'K AVAIL. FOR L.L.M = 320'K

FRACTION OF A WHEEL LOAD ON A STRINGER $\frac{7.46}{6.0} = 1.242$

L.L. MOM $= \frac{263.2'K}{2} \times 1.242 \times 1.245$
$= 204'K$

$I = \frac{40.5}{165.5} = .245$

INV. RATING $\frac{320'K}{204'K} \times 15 = \underline{H-23.5}$

SHEAR

$V_{D.L.} = 2.51^{K/l} \times 20.25' = 50.8^K$ $V_{TOT} = 121.6^K$ (SEE PAGE 5)

$V_{TOT} - V_{DL} = 70.8^K$

$V_{LL} = \frac{29.2^K}{2} \times 1.245 = 18.2^K$ $\frac{70.8^K}{18.2^K} \times 15 = \underline{H-58.4}$

STRINGER 1

TOT. RESIST. 796'K (SEE PAGE 6)

TOT. D.L. 2.46 K/l (SEE PAGE 6)

$M_{MAX} = \frac{wL^2}{8} = \frac{2.46(40.5)^2}{8} = 505'K$

AVAIL. FOR L.L.M. 291'K

FRACTION OF A WHEEL LOAD ON A STRINGER .50

L.L.MOM. $= \frac{263.2'K}{2} \times .50 \times 1.245 = 82'K$

INV. RATING $= \frac{291'K}{82'K} \times 15 = \underline{H\,53.3}$

SHEAR

$V_{D.L} = 2.46 \times 20.25' = 50.0^K$ $V_{TOT} = 109.2^K$ (SEE PAGE 7)

$V_{TOT} - V_{DL} = 59.2^K$

$V_{LL} = \frac{29.2^K}{2} \times 1.245 = 18.2^K$ $\frac{59.2}{18.2} \times 15 = \underline{H-48.8}$

STRINGER 5

TOT RESIST. 706'K (SEE PAGE 8)

TOT. D.L. 1.718 K/l (SEE PAGE 9)

$M_{MAX} = \frac{wL^2}{8} = \frac{1.718(40.5)^2}{8} = 353'K$

AVAIL FOR L.L.M 353'K

$M_{MAX\ L.L.} = \frac{wL^2}{8} = 353'K$ $w = \frac{353 \times 8}{(40.5)^2} = 1.72^{K/l} = \frac{1720}{5}$

$= 344^{\#/in}$

PENN CENTRAL COMPANY
ENGINEERING DEPARTMENT

COMPUTED BY: J.S. STEVIERI SHEET 11 OF 21

CHECKED BY: E.H.S

SUBJECT: O H ER. NO. 24.38

LOCATION: Northeast Jct, PA. DIVISION DATE 2/23/72

SHEAR

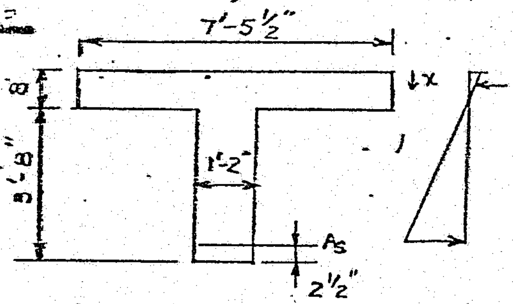
$V_{D.L} = 1.718^{K/l} \times 20.25' = 34.8^{K}$ $V_{TOT} = 96.1^{K}$ (SEE PAGE 9)

$V_{TOT} - V_{D.L} = 61.3^{K}$

$V = wL = w \times 20.25$ $w = \frac{61.3}{20.25} = 3.02^{K/l}$ $3.02/5 = 604^{\#/sq.ft.}$

SPAN 1

STRINGER 2
(BEAM B-5 ON DESIGN DRWGS)



$\frac{1}{2} x (89.5 x) = (10 \times 4.7^{\square}")(49.5 - x)$

$44.75 x^2 = -47x + 47(49.5)$

$.953x^2 + x - 49.5 = 0$

$x = \frac{-1 \pm \sqrt{1 - 4(.953)(-49.5)}}{1.906}$

$x = \frac{-1 + \sqrt{190}}{1.906} = \frac{12.8}{1.906} = 6.72"$

$A_s = 3 \times 1\frac{1}{4}" \times 1\frac{1}{4}" = 4.7^{\square}"$

$x/3 = 2.24"$

LEVER ARM = 49.5 − 2.24 = 47.26"

TOTAL RESIST = $4.7^{\square}" \times 16{,}000 \times \frac{47.26}{12} = 296'^{K}$

TOTAL SUPER. WT .27 K/'
WT. OF DECK 1.32 K/'
WT. OF STRINGER $1.17' \times 3.67' \times 150$ #/cf = .645 K/'
TOT. = 2.235 K/' = 2.24 K/' L = 24'-2½"

D.L. $M_{MAX} = \frac{wL^2}{8} = \frac{2.24^{K/'}(24.2)^2}{8} = 164'^{K}$

AVAIL. FOR L.L. M = 132'K

FRACTION OF A WHEEL LOAD ON A STRINGER $\frac{7.46}{6.0} = 1.242$

$I = \frac{24.2}{174.2} = .139$

$L.L.M = \frac{145.2}{2} \times 1.242 \times 1.139 = 103'^{K}$

INV. RATING $\frac{132'^{K}}{103'^{K}} \times 15 = $ H-19.2

SHEAR $V_{D.L.} = 2.24^{K/'} \times 12.1' = 27.1^{K}$

$V = v\,bd = 60 psi\,(14")(49.5") = 41.6^{K}$

V' FROM STIRRUPS @ d FROM SUPPORT 4 − ½□ STIRRUPS = 1 si @ 2'-0" .5 si/'

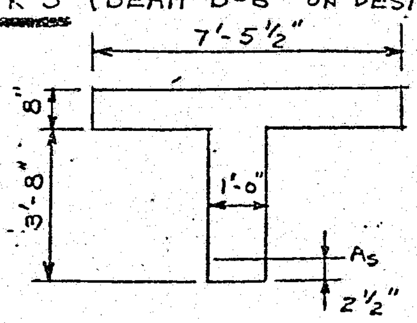
$V' = \frac{A_v f_v d}{s} = \frac{.5 \times 16 \times 49.5}{12} = 33^{K}$

$V_{TOT} = 74.6^{K}$
$V_{D.L} = 27.1^{K}$
AVAIL. $V_{L.L.} = 47.5^{K}$

$V_{L.L.} = \frac{26.5}{2} \times 1.139 = 15.05^{K}$

INV. RATING $\frac{47.5}{15.05} \times 15 = $ H-47.4

STRINGER 3 (BEAM B-6 ON DESIGN DRWGS.)



$A_s = 3 \times 1^{\square}" = 3^{\square}"$

NOTE: STRINGERS 4 & 5 SAME AS STRINGER 3 WITH SHORTER SPAN.

$\frac{1}{2} x (89.5x) = (10 \times 3)(49.5 - x)$

$44.75x^2 = -30x + 30(49.5)$

$1.49x^2 + x - 49.5 = 0$

$x = \frac{-1 + \sqrt{1 - 4(1.49)(-49.5)}}{2.98}$

$x = \frac{-1 + \sqrt{295}}{2.98} = \frac{-1 + 17.2}{2.98}$

$x = 5.44"$

LEVER ARM = 49.5 − 1.81 = 47.69"

TOT. RESIST. = 3□" × 16,000 × $\frac{47.69}{12}$ = 191'K

WT. OF DECK 1.32 K/'

WT. OF STR. 1' × 3.67' × 150 #/cf = .55 K/'

TOT. D.L. = 1.87 K/'

D.L.M. = $\frac{w\ell^2}{8}$ = $\frac{1.87^{K/'}(20.46)^2}{8}$ = 98'K

∴ TOT. MOM. 191'K
D.L.M. 98'K
AVAIL. L.L.M. 93'K
ACT. L.L.M. = 90.3'K   INV. RATING $\frac{93'K}{90.3'K}$ × 15 = H-15.45

SHEAR

$V_{D.L.}$ = 1.87 K/' × 10.73' = 20.1 K

V = 35.7 K

AVAIL. V_{LL} = 15.6 K   ACT. V_{LL} = 14.7 K

INV. RATING $\frac{15.6^K}{14.7^K}$ × 15 = H-15.9

STRINGER 1 (B-4 ON DESIGN DWGS.)

NOT CRITICAL (IT HAS A HIGH RATING BECAUSE IT WAS DESIGNED TO ALSO CARRY THE RAMP. RATING SAME AS STRINGER 1 (B-2) SPANS 1 & 2 MOM. H-59.5 SHEAR H-4

STRINGER BEARINGS (ORIGINAL SECTION)

STRINGERS 2, 3, 4   BRG. AREA 15¼" × 20" = 305 SI

$R_{D.L.}$ = 40 K   40 K/305 SI = 131 PSI   ALL. 625 PSI

AVAIL. L.L. = 494 PSI

R_{LL} = 21.96 K   21.96 K/305 SI = 72 PSI

CONT. SPANS
PIERS 8, 10, 12

$\frac{494}{72}$ × 15 = H-103

STRINGER 1   BRG. AREA 15¼ × 16 = 244 SI

$R_{D.L.}$ = 39.2 K $\frac{39.2}{244}$ = 163.5 PSI

AVAIL. L.L. = 461.5 PSI

R_{LL} = 8.83 K $\frac{8.83}{244}$ = 36.8 PSI

$\frac{461.5}{36.8}$ × 15 = H-188

STRINGER 5   BRG AREA 15¼ × 16 = 244 SI

$R_{D.L.}$ = 27.4 K $\frac{27.4}{244}$ = 112.5 PSI

AVAIL. L.L. = 512.5 PSI

512.5 × 244 = 125 K $\frac{125^K}{21.25'}$ = 5.88 K/' $\frac{5.88}{5}$ = 1,176

PIER 6

STRINGERS 2, 3, 4   BRG. AREA 20 × 34 = 680 SI

R.D.L. = 40 K   40/680 = 59 PSI   625 − 59 = 566 P

R_{LL} = 21.96 K   21.96/680 = 32 PSI $\frac{566}{32}$ × 15 = H-266

STRINGER 1   BRG. AREA 16 × 34" = 544 SI

$R_{D.L.}$ = 39.2 K $\frac{39.2}{544}$ = 72 PSI   625 − 72 = 553 PSI

R_{LL} = 8.83 K $\frac{8.83}{544}$ = 16 PSI $\frac{553}{16}$ × 15 = H-520

PENN CENTRAL COMPANY
ENGINEERING DEPARTMENT

COMPUTED BY: J. B. STRIVIERI SHEET 14 OF 31
CHECKED BY: E. H. S.

SUBJECT: D. H. ER. No. 34.82

LOCATION: Homewood Sct. PA. DIVISION DATE 3/13/72

PIER 6 STRINGER 5 BRG. AREA 16" x 34" = 544 si

$R_{D.L.} = 27.4^K$ $\frac{27.4}{544} = 50.5$ 625 - 50.5 = 574.5

574.5 x 544 = 312^K $\frac{312^K}{21.25'} = 14.7^{K/}$ $\frac{14.7}{5} = 2.94^K$

PIER #2 & #3

STR 1 BRG. AREA 15 1/4" x 16" = 244 si

$R_{D.L.} = 50^K$ $\frac{50}{244} = .205^{ksi}$ ALL. 625 PSI

AVAIL. L.L. = 420 PSI

$R_{LL.} = 18.2^K$ $\frac{18.2}{244} = 74.5$ PSI

$\frac{420}{74.5} \times 15 = \underline{H\ 84.5}$

STR 2, 3, 4 BRG. AREA 15 1/4 x 20 = 305 si

$R_{D.L.} = 50.8$ $\frac{50.8}{305} = .167^{ksi}$ ALL. 625 PSI

AVAIL 458 PSI

$R_{LL.} = 18.2$ $\frac{18.2}{305} = 59.7$ PSI

$\frac{458}{59.7} \times 15 = \underline{H-115}$

STR 5 BRG. AREA 15 1/4 x 16 = 244 si

$R_{D.L} = 34.8^K$ $\frac{34.8}{244} = 143$ PSI ALL. 625 PSI

AVAIL. L.L. = 482 PSI

244 x 482 = 118^K $\frac{118^K}{20.25'} = 5.8^{K/}$ $\frac{5.8}{5} = \underline{1,160\ PSF.}$

SP 10191 B

SPAN 3

CONC. DECK

MAIN REINFORCEMENT PARALLEL TO TRAFFIC

$E = 4 + .06\,S$

S = DIST. BTW. EDGES OF FLANGES + ½ STR. FLANGE WIDTH

C.C. STR. 5'-0" 10" FLANGE

4'-2" + 5" = 4'-7" = S

$E = 4 + .06(4.57') = 4.274'$ = WIDTH OF SLAB OVER WHICH A WHEEL IS DISTRIBUTED

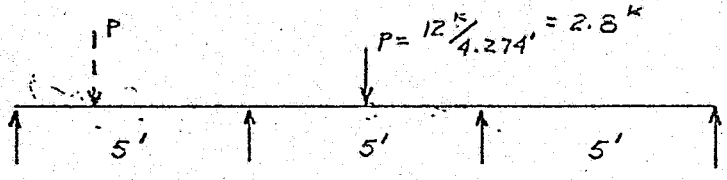
FORMULAS FOR MOMENTS

CONTINUOUS SPANS $M = \pm .2\,\frac{P}{E}\,S$ $P = 12^K$ $S = 4.57'$

$M = \pm .2\,\frac{12^K}{4.0} \times 4.57' = 2.74'^K$

$E = .175\,S + 3.2 = .175(4.57') + 3.2 = 4.0$

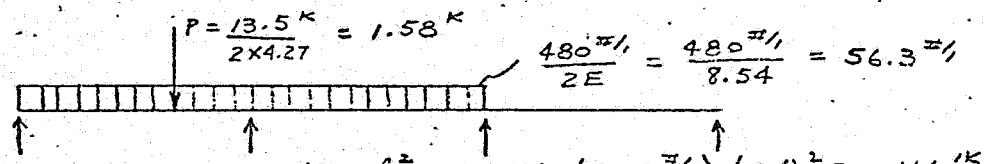
$M^{\pm} = 2.74'^K$



$M^+ = .2042\,PL = .2042 \times 2.8^K \times 5' = 2.86'^K$ ---

$M^+ = .1750\,PL = .1750 \times 2.8^K \times 5' = 2.46'^K$ ——

$M^- = -.1024\,PL = -.1024 \times 2.8^K \times 5' = 1.44'^K$



$M_{MAX\ L.L.}^- = -.1167\,wl^2 = -.1167(56.3^{\#/1})(5')^2 = .164'^K$

$+(-.1024) \times 1.58^K \times 5' = .81'^K$ TOT = $.974'^K$

$m = p = \frac{n A_s}{bd} = \frac{10(.545)}{12(6)} = .076$ TABLE 11 $k = .320$ $j = 1 - .33(.32) = .895$

$f_s = \frac{12{,}000\,M}{j d A_s} = \frac{12{,}000(3.022)}{.875(6)(.545)} = 12{,}400^{PSI}$

D.L.M.$^+ = .08\,wl^2$ $f_c = \frac{12{,}400}{10} \times \frac{.32}{.68} = 585\ PSI$

$w = 1' \times 7/12' \times 150 + 1' \times 2\,1/2/12 \times 120 = 112.5^{\#/1}$

$+ .08\,wl^2 = .08 \times .1125 \times 5^2 = .225'^K$

$- .1\,wl^2 = -.1 \times .1125 \times 5^2 = .222'^K$

COMPRESSION IN CONC

$\frac{1350}{585} \times 15 = H - 34.6$

CHECK STEEL IN DECK

D.L.M.$^+ = .225'^K$ } $M_{MAX}^+ = 2.965'^K$

L.L.M$^+ = 2.74'^K$ }

D.L.M$^- = .282'^K$ } $M_{MAX}^- = 3.022'^K$

L.L.M$^- = 2.74'^K$ }

A_s^+ @ MID. SPAN $= \frac{M_{MAX}}{1.13(6)} = \frac{2.965'^K}{1.13(6)} = .438^{\square"}$ REQ'D.

$1/2 \times 1/2 \times 12/5.5 = .545^{\square"}$ INV. RATING $\frac{.545}{.438} \times 15 = H\text{-}18.6$

A_s^- @ SUPPORTS $= \frac{3.022'^K}{1.13(6)} = .447^{\square"}$ INV. RATING $\frac{.545}{.447} \times 15 = H\text{-}18.3$

SP 10191 B

COMPRESSION IN CONC.

SIDEWALK SLAB $n = \frac{E_s}{E_c} = \frac{10}{12.(3)}(1.545) = .15$ $k = .418$

$j = 1 - .33(.418) = .862$ $M = 1.71'^K$

$f_s = \frac{12,000(1.71)}{.862(3)(.545)} = 14,600$ PSI $f_c = \frac{14,500}{10} \times \frac{.418}{.582} = 1050$

D.L. $w = 1' \times 4/12 \times 150 + 1' \times 2/12 \times 120 = 50 + 20 = 70^{\#/l}$

$\frac{1350}{1050} \times 85 = 109^{\#/sf}$

$D.L.M.^+ = .08 w l^2 = .08 \times .07 \times 5^2 = .140'^K$

$D.L.M.^- = -.1 w l^2 = -.1 \times .07 \times 5^2 = .175'^K$

$L.L.M.^+ = \frac{wl^2}{10}$ $w = \frac{1.325'^K \times 10}{5^2} = .53^{K/l}$ $530/5 = 106^{\#/sf}$

$L.L.M^- = \frac{wl^2}{16}$ $w = \frac{1.325 \times 16}{5^2} = .848^{K/l}$ $848/5 = 169^{\#/sf}$

A_s^+ @ MIDSPAN $= 1/2 \times 1/2 \times 12/5.5 = .545^{\square''}$ $M^+_{MAX\ (ALL)} = .545 \times 1.13 \times 3 = 1.8$

A_s^- @ SUPPORTS $= .545^{\square''}$ $M_{MAX\ (ALL)} = .545 \times 1.13 \times 1 = .61$

$M^+_{MAX\ (LL)} = 1.85'^K - .14'^K = 1.71'^K$

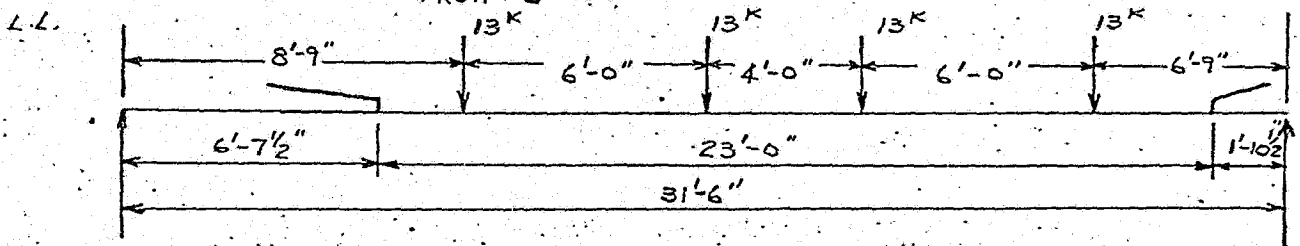
$M^-_{MAX\ (LL)} = .615'^K - .175'^K = .44'^K$

$\frac{wl^2}{10} = 1.71'^K$ $w = \frac{1.71'^K \times 10}{5^2} = .685^{K/l}$ $.685/5 = 137^{\#/sf}$

$\frac{wl^2}{16} = .44'^K$ $w = \frac{.44'^K \times 16}{5^2} = .282^{K/l}$ $.282/5 = 56^{\#/sf}$

FLOORBEAMS

DIST. TO ℄ RESULTANT OF FORCES FROM ℄ SPAN = DIST. FROM ℄ SPAN TO NEAREST LOAD



$P = 12^K \times 5/6$ $S = 5'$ $P = .12 \times 5/6 = 10^K$

$10^K \times 1.3 = 13^K$ $I = \frac{50}{31.5 + 125} = .32$

FLBM.

30 BI @ 120# $S = 349.3\ IN^3$

D.L. $11/12' \times 5' \times 150^{\#/cf} = .69^{K/l}$ TOT. $.846^{K/l}$ $10/12 \times 5' \times 150^{\#/cf} = .626^{K/l}$

$2\ 1/2/12' \times 5' \times 150^{\#/cf} = .156^{K/l}$

@ SIDEWALK AVE. $w = .736^{K/l}$

$6/12' \times 5' \times 150^{\#/cf} = .375^{K/l} > .475^{K/l}$

$8/12 \times 1' \times 150^{\#/cf} = .100^{K/l}$

D.L. SLAB $.736^{K/l}$

FLBM. $.120^{K/l}$ CONC. ENCASE $6/12 \times 2.5' \times 150^{\#/cf} = 187.5^{\#}$

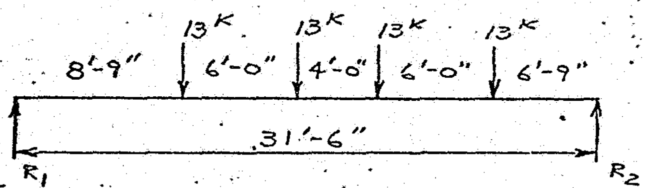
TOT $= .856^{K/l} + .188^{K/l} = 1.044^{K/l}$

TOT. RESIST = $349.3\,IN^3 \times \frac{16^{KSI}}{12''/'} = 465'^K$

$D.L.M. = \frac{wl^2}{8} = \frac{1.044^{K/'}(31.5)^2}{8} = 129.5'^K$

AVAIL. L.L.M = $334.5'^K$

L.L.M.



$R_1 + R_2 = 52^K$

$\Sigma M_{R_1} = 0 \quad 13(8.75') + 13(14.75') + 13(18.75') + 13(24.75') = 31.5R_2$

$103.9'^K + 192'^K + 244'^K + 322'^K = 31.5R_2$

$861.9 = 31.5R_2 \quad R_2 = 27.4^K$

$R_1 = 24.6^K$

$M_{MAX} = 8.75' \times 24.6^K + 6' \times 11.6^K = 215'^K + 69.6'^K = 284.6'^K = L.L.\ MAX.$

INV. RATING = $\frac{334.5}{284.6} \times 15$ = H-17.6

SHEAR $V = 32.5^K$ $d = 30''$ $t = .52''$

$V/dt = \frac{32.5 + 1.044(15.75')}{30(.52)} = \frac{48.95}{15.6} = 3.13^{KSI}$ O.K. ALL 11^{KSI}

$D.L.\ V_1 = \frac{16.45}{15.6} = 1.055^{KSI}$ AVAIL. L.L. = 9.94^{KSI} $V_{LL.AVAIL} = 9.94^{KSI} \times 15.6 = 155^K$

$155/32.5 \times 15$ = H-71.5

GIRDERS

1 WEB. PL. 89½ × 7/16
2 TOP FL. ∠ 6×6 × 7/16
2 BOT. FL. ∠ 6×6× 7/16
T & B C.P. 14"×½"
(7'-6" b.b ∡s)

PIECE	A □"	y	Ay²	I₀	WT.
WEB	39.1	–	–	26,100	133 #/'
2 TOP ∡s	10.12	43.34"	19,000		68.8 #/'
T.C.P.	7.0	45.25"	14,350		47.6 #/'
					TOT 249.4 #/'

$I_0 = \frac{1}{12} bh^3 = \frac{1}{12}(89.5)^3(7/16) = 26,100$

$I_{TOT} = 2(19,000) + 2(14,350) + 26,100 = 92,800\ IN^4$

$S = I/c = \frac{92,800\,IN^4}{45.5\,IN} = 2,040\,IN^3$

TOT. RESIST. $2040\,IN^3 \times 16/12 = 2,720'^K$

D.L.M. TOT. D.L. PER FLBM. $1.044^{K/'} \times 15.75' = 16.45^K \times 8 = 131.5^K$
$.676^{K/'} \times 15.75' = 10.65^K \times 2 = 21.3^K$
TOT = 152.8^K

$152.8^K/45' = 3.4^{K/'}$

GIRD. ENCASE. $1' \times 6\frac{1}{2}' \times 150^{\#/cf} + .33' \times 1.5' \times 150^{\#/cf} = .15^{K/'}$

TOT. $w = 3.4^{K/'} + .25^{K/'} + .15^{K/'} = 3.8^{K/'}$

$D.L.M. = \frac{wl^2}{8} = \frac{3.8^{K/'}(45)^2}{8} = 963'^K$

AVAIL. L.L = $1757'^K$

COMPUTED BY: J.S. STRIVIERI | PENN CENTRAL COMPANY ENGINEERING DEPARTMENT | SHEET 18 OF 31 | CHECKED BY: E.H.S.

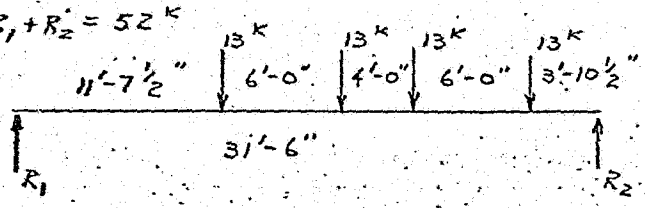
SUBJECT: O.H. RR No. 34.88

LOCATION: Hokendauqua, Pa. DIVISION DATE 2/29/72

L.L.M.

SPAN 45' FOR H-15 $M = 296.8^{'K}$ 1 LANE/SPD

$R_1 + R_2 = 52^K$



$R_1 + R_2 = 52^K$

$\Sigma M_{R_1} = 0$

$11.62 \times 13^K + 17.62 \times 13^K + 21.62 \times 13^K + 27.62 \times 13^K = 31.5 R_2$

$151.2^{'K} + 229^{'K} + 281.8^{'K} + 359^{'K} = 31.5 R_2$

$1021 = 31.5 R_2 \qquad R_2 = 32.5^K$

$R_1 = 19.5^K$

$\frac{32.5^K}{52^K} = .625 \qquad .625 \times 2 = 1.25$ LANES MAX.

$1.25 \times 296.8 = 371^{'K}$

$I = \frac{50}{45+150} = .256 \qquad 1.256 \times 371^{'K} = 466^{'K}$

INV. RATING $\frac{1757^{'K}}{466^{'K}} \times 15 = \underline{H-56.5}$

SHEAR

$V_{D.L.} = 3.8^{K/'} \times 22.5' = 85.5^K$ ALL. 11^{KSI}

$d\ell = 89.5 \times \frac{7}{16} = 39.1^{\square''}$

$V_{D.L}/d\ell = 2.19^{KSI}$ AVAIL: L.L. V. $= 11 - 2.19 = 8.81^{KSI}$

$8.81^{KSI} \times 39.1^{\square''} = 344^K$

$V_{LL} = 30.3^K \times 1.25 \times 1.256 = 47.5^K$

INV. RATING $\frac{344^K}{47.5} \times 15 = \underline{H-109}$

SP 10191 B

SPAN 5

CONC. DECK & SIDEWALK SAME AS SPAN 3

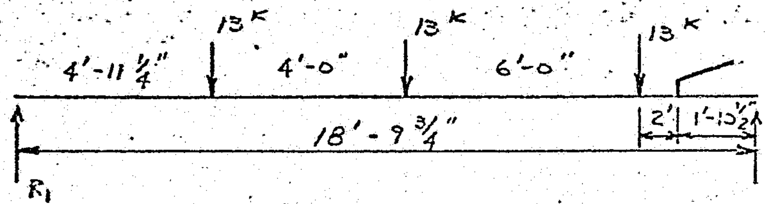
DECK

CONTINUOUS H-18.3 RDWY (NEG. MOM.)

56 #/SF. SIDEWALK (NEG. MOM.)

FLOORBEAMS (B4 - 12) H - 17.6

B-13 28 BI 105# 18'-9 3/4"



$R_1 + R_2 = 39^K$ $\Sigma M_{R_1} = 0$ $13^K(4.94') + 13^K(8.94') + 13^K(14.94') = 18.81$

$64.1'^K + 116'^K + 194'^K = 18.81 R_2$

$374.1/18.81 = R_2 = 19.9^K$

$R_1 = 19.1^K$

$19.1^K \times 4.94' + 6.1^K \times 4.0' = M_{MAX}$

$94.5'^K + 24.4'^K = M_{MAX}$

L.L. $M_{MAX} = 118.9'^K$

D.L. $.105^{K/\prime} + 6/12 \times 2.33' \times 150\ \#/cf + .736^{K/\prime} = 1.016^{K/\prime}$

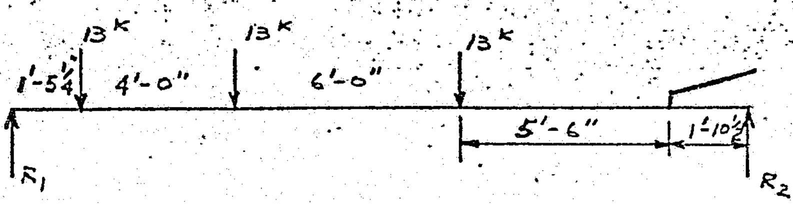
D.L.M $= \frac{wl^2}{8} = \frac{1.016(18.81)^2}{8} = 45'^K$

TOT. RESIST $S = 286.7 \times 16/12 = 382'^K$

AVAIL. L.L. $= 382'^K - 45'^K = 337'^K$

INV. RATING $\frac{337'^K}{118.9'^K} \times 15 =$ H-42.6

SHEAR



$R_1 + R_2 = 39^K$

$\Sigma M_{R_1} = 0$ $13^K(1.44') + 13^K(5.44') + 13^K(11.44') = 18.81 R_2$

$18.7 + 70.6'^K + 149'^K = 18.81 R_2$

$238.3'^K = 18.81 R_2$

$R_2 = 12.7^K$ $R_1 = 26.3^K$

ALL. 11^{KSI} $dt = 14 si$ D.L. $w = 1.016^{K/\prime}$

$11^{KSI} \times 14 si = 154^K$ $1.016^{K/\prime} \times 9.41' = 9.55^K$

AVAIL. L.L.V 144.45^K $\frac{144.45}{26.3} \times 15 =$ H-82.5

ACT. L.L.V. 26.3^K

GIRDERS G-2 & G-5

WEB PL. 32 x 7/16" — WT. 47.6 — WEB $I_o = \frac{1}{12}(\frac{7}{16})(32)^3 = 1,195\ IN^4$

FL ∠S 6x4x7/8" — 107.8 — $A = 31.72^{\square"}$ $y = 14.13$ $Ay^2 = 6,390\ IN^4$

b.b. ∠s = 2'-8½ — 156.4 #/' — $I_{TOT} = 7,585\ IN^4$ $c = 16.25"$

$S = I/c = 7,585/16.25 = 466\ IN^3$

TOT. RESIST. $466\ IN^3 \times 16/12 = 621'^K$

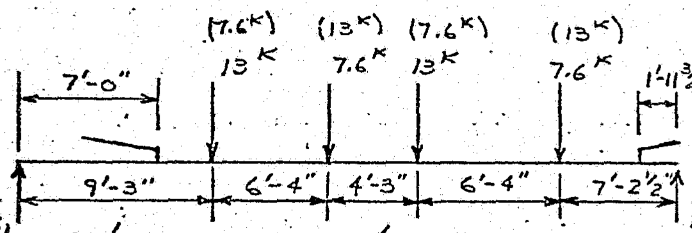
D.L. $.736^{K/'} \times \frac{1}{2} + .156^{K/'} + \frac{6}{12} \times 2.71 \times 150^{\#/cf} = .727^{K/'}$
SLAB + GRD + ENCASE.
+ CONC. LOAD FROM B-13 $= 9.55^K$

D.L. $M = \frac{w\ell^2}{8} = \frac{.727(33.37)^2}{8} = 101'^K$

D.L. $M_{MAX} = 101'^K + \frac{P\ell}{4} = 99'^K + \frac{9.55 \times 33.37}{4} = 101'^K + 79.5'^K = 180.5'^K$

AVAIL. L.L.M $= 621'^K - 180.5'^K = 440.5'^K$

ACT. L.L.M.



$\ell = 33'-4\frac{1}{2}"$

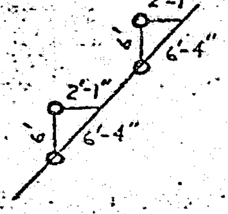
$\sin 70°-53' = \frac{1.87'}{x}$ $x = \frac{1.87'}{.9449} = 1.98' = 1'-11\frac{3}{4}"$ $x_1 = \frac{8.75}{.9449} = 9.26' = 9'$

$y = \frac{6.62}{.9449} = 7.0 = 7'-0"$ $x_2 = \frac{6.0}{.9449} = 6.35' = 6'-4"$

$z = \frac{23.0}{.9449} = 24'-4\frac{3}{4}"$ $x_3 = \frac{4.0}{.9449} = 4.24' = 4'-3"$

$P = 12^K \times 5/6 = 10^K$ $I = \frac{50}{33.37 + 125} = .316$

$10^K \times 1.3 = 13^K$



$\frac{2.92'}{5.0'} = .585$ $.585 \times 13^K = 7.6^K$

$R_1 + R_2 = 41.2^K$

$\Sigma M_{R_1} = 0$ $9.25' \times 13^K + 15.57' \times 7.6^K + 19.83' \times 13^K + 26.17 \times 7.6^K = 33.37 R_2$

$120'^K + 118.2'^K + 258'^K + 198.5'^K = 33.37 R_2$

$694.7 = 33.37 R_2$

$R_2 = 20.8^K$

$R_1 = 20.4^K$

(OR: $\Sigma M_{R_1} = 0$ $9.25' \times 7.6^K + 15.57' \times 13^K + 19.83' \times 7.6^K + 26.17' \times 13^K = 33.37 R_2$ $R_2 = 22.9^K$
$R_1 = 18.3^K$)

$M_{MAX} = 20.4^K \times 9.25' + 7.6^K \times 6.33' = 188.5'^K + 48.0'^K = 236.5'^K$ ACT L.L. MAX

($M_{MAX} = 18.3^K \times 9.25' + 10.7^K \times 6.33' = 169.2'^K + 67.7'^K = 236.9'^K$)

$\frac{440.5'^K}{236.9'^K} \times 15 =$ H-27.9

SHEAR $V_{D.L} = .727^{K/'} \times 16.68' + 4.78^K = 16.88^K$

$dt = 32 \times 7/16 = 14\ \square"$ $V_{DL}/dt = 1.21^{KSI}$ AVAIL. L.L = 9.79

$14 \times 9.79^{KSI} = 137^K$

PENN CENTRAL COMPANY

ENGINEERING DEPARTMENT

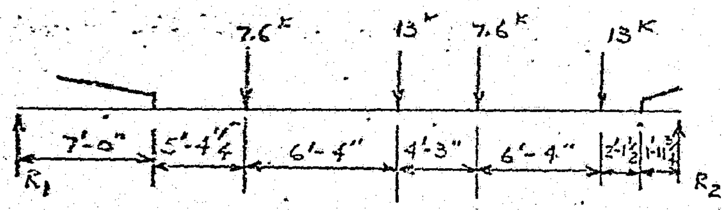
COMPUTED BY: T.S. STIVIERI

SHEET 21 OF 31

CHECKED BY E.H.S.

SUBJECT: [illegible] No. 34.??

LOCATION: [illegible] DIVISION ______ DATE [illegible]



$R_1 + R_2 = 41.2^K \quad \Sigma M_{R_1} = 12.35' \times 7.6^K + 18.68' \times 13^K + 22.93' \times 7.6^K + 29.26' \times 13^K$

$= 33.37\, R_2$

$R_2 = \dfrac{93.9 + 242.1 + 174.2 + 380}{33.37} = \dfrac{890.2}{33.37} = 26.7^K$

$V = 26.7^K \qquad \dfrac{137}{26.7^K} \times 15 = H\text{-}77$

SUBJECT: W.B. ST. No. 34.99

LOCATION: HOMEWOOD JCT. PA. DIVISION DATE 2/23/72

GIRDER G1

	PIECE	A	y	Ay²	I_o	WT.
1)	WEB 89½ x 7/16"	—	—	—	26,100 IN⁴	133
2)	T. FL. ℄s 6x6x¾	16.88	43.22	31,550		114.
3)	I CP. 14 x ¾	10.50	45.38	21,600		71.
4)	I CP 14 x ¾	10.50	46.13	22,400		71.
5)	I CP 14 x ½	7.0	46.75	15,300		47.
6)	I CP 14 x ½	7.0	47.25	15,600		47.
7)	2 SIDE PLS. 16 x ½	16.0	TOT.	106,450		485.

$I = \frac{1}{12}(16)^3 \times \frac{1}{2} \times 2 = 342\ IN^4$

WEB $I_o = \frac{1}{12}(89.5)^3 \times 7/16 = 26,100\ IN^4$

$I_{TOT} = 212,900 + 26,100 = 239,000\ IN^4 + 684\ IN^4 = 239,684\ IN^4$

$c = 45" + 2\frac{1}{2}" = 47.5"$ $\quad S = \frac{239,684}{47.5} = 5,040\ IN^3$

TOT. RESIST. $5,040\ IN^3 \times 16/12 = 6,710'^K$

D.L.M. TOT. D.L. PER FLBM = $1.044^{K/'} \times 15.75' = 16.45^K \times 16 = 263^K$

PER G2 OR G5 = $.727^{K/'} \times 16.69' = 12.15 \times 2 = 24.3^K$

$+ 4.78^K = 4.78 \times 2 = 9.6^K$

PER 28 BI 105 = $9.55^K = 9.55 \times 1 = 9.6^K$

TOT = 306.5^K

$306.5^K/_{86'} = 3.56^{K/'}$ D.L. $+ .49^{K/'} = 4.05^{K/'}$

D.L.M. $= \frac{wl^2}{8} = \frac{4.05^{K/'}(86)^2}{8} = 3,740'^K$

AVAIL. L.L.M. $= 2970'^K$

L.L.M. SPAN 86' FOR H-15 (SEE P.17) $M = 734.3'^K$ 1 LANE/GRD.

$1.25 \times 734.3'^K = 916'^K$

$I = \frac{50}{86+150} = .212$ $\quad 1.212 \times 916'^K = 1111'^K$

INV. RATING $\frac{2970'^K}{1111'^K} \times 15 = H-40$

SHEAR

$V_{D.L.} = 4.05^{K/'} \times 43' = 174^K$ ALL 11 KSI

$d_k = 89.5 \times 7/16 = 39.1^{0"}$

$V_{D.L.}/_{d_k} = 4.45\ KSI$ AVAIL. L.L. = 6.55 KSI

$6.55^{KSI} \times 39.1^{0"} = 256^K$

$V_{LL} = 40.14^K \times 1.25 \times 1.212 = 61^K$

INV. RATING $256^K/_{61^K} \times 15 = H-63.0$

COMPUTED BY: T.S. STEINER | PENN CENTRAL COMPANY ENGINEERING DEPARTMENT | SHEET 25 OF 51

CHECKED BY: E.H.S.

SUBJECT: D = 22 1/2 - 72

LOCATION: HOMEWOOD JCT. PA. DIVISION DATE 1/2/72

CONC. (1,2,7-13)

PIER BENTS MAX SPANS 42 1/2 C.-C. OF PIERS (CONT.) 2/8 5/8 5/8 3/8

PIER CAP BTW. COLS.

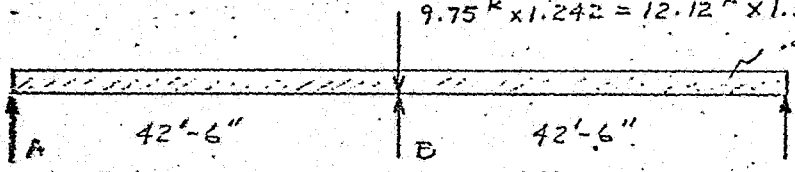
D.L. @ B

STRINGER 1	2.46 K/L	× 42.5'	=	104.5 K	× 1.25	= 130.8 K
STRINGERS 2,3,4	2.51 K/L	× 42.5'	=	106.7 K	× 1.25	= 133.0 K
STRINGER 5	1.72 K/L	× 42.5'	=	73.1 K	× 1.25	= 91.4 K

L.L. @ B

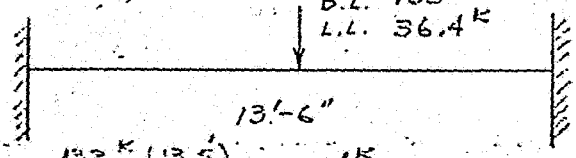
9.75 K × 1.242 = 12.12 K × 1.3 = 15.8 K

.48 K/L × 1/2 × 1.242 = .298 K/L × 1.3 = .387



$R_B = .387 \times 42.5' \times 1.25 + 15.8^K = 36.4^K$

D.L. 133 K
L.L. 36.4 K



PIER CAP

$D.L.\ M_{MAX} = \frac{Pl}{8} = \frac{133^K (13.5')}{8} = 225'^K$

$L.L.\ M_{MAX} = \frac{Pl}{8} = \frac{36.4^K (13.5')}{8} = 61.5'^K$

A_S = 5-1" □ BARS = 5 si $\quad A_S = \frac{M_{MAX}}{1.13d}$ $\quad d = 4'-6\ 7/8" = 54\ 7/8"$

ALL. $M_{MAX} = 5si \times 1.13 \times 54.875 = 310'^K$

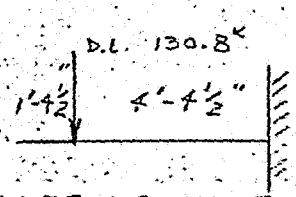
D.L. M. = $225'^K$

AVAIL. L.L.M = $85'^K$

$\frac{85'^K}{61.5^K} \times 15 = \underline{H = 20.7}$ L.L. ON STR. 3

PIER CAP CANT.

D.L. 130.8 K



R_B L.L. $= \frac{.48}{2} \times .5 \times 1.3 \times 42.5' \times 1.25 + 9.75 \times .5 \times 1.3 = 8.3^K + 6.34^K = 14.64$

$R_B = 8.3^K + 6.34^K = 14.64^K$

$DL.M_{MAX} = Pb = 130.8^K \times 4.37' = 571'^K$

$L.L.M_{MAX} = Pb = 14.64^K \times 4.37' = 64'^K$

A_S = 7-1" □ BARS = 7si $\quad A_S = \frac{M_{MAX}}{1.13d}$ $\quad d = 9'-1"$ $\quad d = 109"$

$M_{MAX} = 7 \times 1.13 \times 109 = 862'^K$

D.L.M. = $571'^K$

AVAIL. L.L.M. = $291'^K$

ACT. L.L. M. = $83.5'^K$

$\frac{291'^K}{64'^K} \times 15 = \underline{H\ 68.3}$

SP 10131 B

PIERS

D.L. $130.8^K + 132.0^K + 66.5^K = 330.3^K$

D.L. PIER $4' \times 3.5' \times 150^{\#}/_{cf} \times 5.75' + 5.33' \times 3.5' \times 5.75' \times \frac{1}{2} \times 150^{\#}/_{cf}$
$+ 6.75' \times 4.83' \times 3.5' \times 150^{\#}/_{cf} + 6.75' \times 4.5' \times 3.5' \times \frac{1}{2} \times 150$

$= (20.5 + 53.6 + 114 + 53.2)\, 150^{\#}/_{cf} = 301.3 \times 150^{\#}/_{cf} = 45^K$

TOT D.L. ON PIER $330.3^K + 45^K = 375.3^K$

L.L. 1 LANE/PIER

$19.5^K \times 1.3 + .48^{K}/_{ft} \times 1.3 \times 42.5' \times 1.25 = 25.4^K + 33.2^K = 58.6$

PERMISSIBLE P

$P = .85 \times A_g \times (.25 f_c' + f_s p_g)$

$P = .85 \times (42 \times 42) \times (.25 \times 3{,}000 + 16{,}000 \times .0045)$

$p_g = \frac{A_s}{A_g} = \frac{8\text{-}1^{\#}\text{ BARS}}{42 \times 42} = \frac{8}{42 \times 42} = .0045$

$P = 1{,}500 \times (750 + 72) = 1230^K$

D.L. P. $= 375.3^K$

AVAIL. L.L. P. $= 854.7^K$ $\qquad \frac{854.7}{58.6} \times 15 = \underline{H\text{-}218}$

$P/A = \frac{433.9}{42 \times 42} = .246^K/_{SI} = \underline{246\ PSI}$

STEEL BENTS COLS. 12 BM. $64.5^{\#}$

SPAN 3

D.L. $= 85.5^K$

L.L. $= 47.5^K$

$f = 16{,}000 - 70 \frac{24 \times 12}{5.13} = 12{,}000$

$f = 16000 - 70 \frac{10 \times 12}{2.78} = 13{,}000$ MAX

$A = 19^{\square''}$ $\qquad f_{ALL} = 12{,}000\ PSI$ $\qquad f_{D.L.} = \frac{85.5}{19} = 4{,}500 PSI$

$f_{AVAIL\ L.L} = 7{,}500 PSI$ $\qquad f_{L.L.\ ACT} = \frac{47.5}{19} = 2{,}500 PSI$

$7500/2500 \times 15 = \underline{H\text{-}45}$

FROM COMPUTATIONS ON PLANS

$f_{D.L.} = \frac{103{,}500}{19} = 5{,}450 PSI$

$f_{L.L.\ ACT} = \frac{71{,}900}{19} = 3{,}780 PSI$

$f_{AVAIL.\ L.L} = 12 - 5.45 = 6{,}550 PSI$ $\qquad 6550/3780 \times 15 = \underline{H\text{-}26}$

SPAN 5 COLS. M B.H. 99

D.L. $= 174^K$

L.L. $= 61^K$

$f = 16{,}000 - 70 \frac{24 \times 12}{6.07} = 12{,}600$

$f = 16{,}000 - 70 \frac{9 \times 12}{2.72} = 13{,}000$ MAX

$f_{ALL} = 12{,}600 PSI$ $\qquad f_{D.L} = 174/29.06 = 6{,}000 PSI$

$A = 29.06$

$f_{AVAIL.\ L.L.} = 6{,}600 PSI$ $\qquad f_{LL\ ACT} = 61/29.06 = 2{,}100$

$6600/2100 \times 15 = \underline{H\text{-}47.1}$

FROM COMPUTATIONS ON PLANS $f = 17.7^{KSI}$ $\qquad f_{L.L.} = 119/29.06 = 4.1^{KSI}$ $\frac{5.8}{4.1}$

SF 10151 B

SUBJECT: C. H. BR No 24.73

LOCATION: Harrisburg Dist. PA. DIVISION DATE 2/1/72

RATING OF REDUCED SECTION

REINFORCED CONCRETE SPANS

DECK @ CENTER (BOTTOM OF DECK SLAB SPALLED TO UNDERSIDE OF REINF. STEEL IN VARIOUS SPANS)

SINCE A_s IS NOT REDUCED THE RATING IS NOT REDUCED AND THE COMPRESSION IN CONCRETE ALSO REMAINS THE SAME.

RATINGS ARE UNCHANGED.

STRUCTURAL STEEL SPANS

DECK - SINCE A_s IS NOT REDUCED THE RATING IS NOT REDUCED

STRINGERS (CONTINUOUS INTERMEDIATE) STRINGERS 2, 3, 4 (B1)

(SPANS 6-13)

DISTRIBUTING SIDEWALK & PARAPETS D.L. OVER ALL STRINGERS

SPANS 8-13 ORIGINAL RATING APPLIES FOR MOM.$^+$

POS. MOM. H-41.8

ORIGINAL RATING APPLIES FOR M$^-$

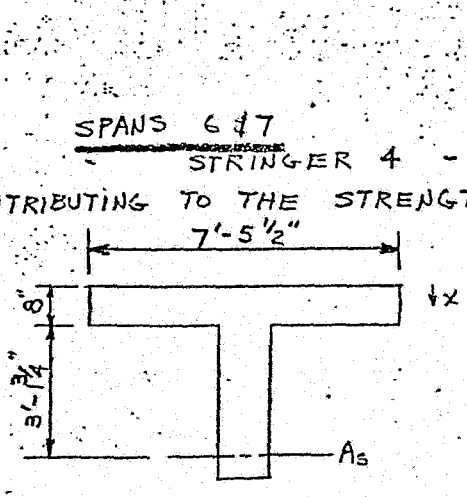
NEG. MOM. H-15.5

ORIGINAL RATING APPLIES FOR SHEAR ALSO

(d IS NOT REDUCED AT SUPPORTS OR AT MIDSPAN)

SPANS 6 & 7

STRINGER 4 - BOTTOM REINF. STEEL IS NO LONGER CONTRIBUTING TO THE STRENGTH OF THE MEMBER



4-1¼" □ BARS $4 \times 1.56 = 6.24^{\square}$"

FIND N.A.

$\frac{1}{2} x (89.5x) = (10 \times 6.24^{\square})(45.75 - x)$

$44.75x^2 = -62.4x + 62.4(45.75)$

$.72x^2 + x - 45.75 = 0$

$x = \frac{-1 + \sqrt{1 - 4(.72)(45.75)}}{1.44} = \frac{-1 + \sqrt{133}}{1.44}$

$= \frac{10.52}{1.44} = 7.32$"

$x/3 = 2.44$"

LEVER ARM $45.75 - 2.44 = 43.31$"

TOT. RESIST $= 6.24^{\square}$" $\times 16{,}000 \times \frac{43.31}{12} = 360^{K}$

D.L. M^+_{MAX} (SEE P3) $= 318^{K}$

AVAIL FOR M_{MAX} L.L. $= 42^{K}$

L.L. MAX$^+$ = 185.5'^{K} (P4). INV. RATING = $\frac{42'^K}{185.5'^K} \times 15 =$ H 3.4

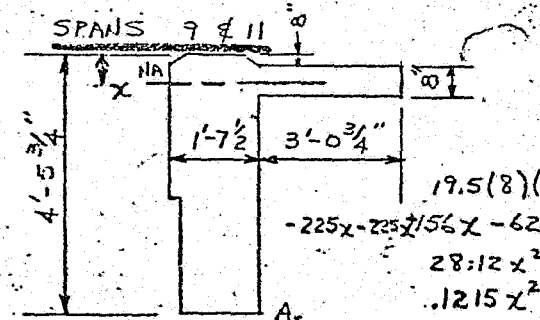
TOT. RESIST$^-$ $M_{MAX}^- = A_S \times 1.13 \times d = 7.80^{\square}" \times 1.13 \times 47.5" + 6.24^{\square}" \times 1.13 \times 41.5$
$M_{MAX}^- = 419'^K + 293'^K = 712'^K$
D.L.M.$^-$ (P3) = 567'^{K}
AVAIL. L.L.M = 145'^{K}
L.L. MAX$^-$ = −236'^{K} (P4)
$\frac{145'^K}{236'^K} \times 20 =$ H 12.3

SHEAR
@ A&C $V = vbd = 60PSI\ (20")(45.75) = 55^K$ > 116^K
$V' = \frac{A_v f_v d}{s} = \frac{1.0 \times 16 \times 45.75}{12} = 61^K$

$V_{D.L.} = 30.0^K$ AVAIL. L.L. = 86^K $\frac{86^K}{21.96^K} \times 15 =$ H 58.9

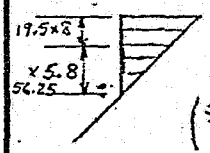
@ B $V = 116^K$
$V_{D.L.} = 56.5^K$
$V_{LL} = 59.5^K$
$\frac{59.5}{26.1} \times 15 =$ H 34.2

STRINGERS (CONT. INTERM) STR. 1 (B2)
SPANS (6, 7, 8, 10, 12, 13)
ORIGINAL RATING APPLIES POS. MOM. H-97.5
NEG. MOM. H-22.7
SHEAR @ ENDS H-138
SHEAR @ CENTER H-78.9



$A_S = 4 \times 1.25 \times 1.25 = 6.25^{\square}"$

FIND N.A.
$19.5(8)(x-4) + 56.25(x-8)\left(\frac{x-8}{2}\right) = (10 \times 6.25)(53.75 - x)$
$-225x - 225x/56x - 624 + 28.12x^2 + 1800 = -62.5x + (62.5)(53.75)$
$28.12x^2 - 231.5x - 2184 = 0$
$.1215x^2 - x - 9.45 = 0$
$x = \frac{+1 \pm \sqrt{1 - 4(.1215)(-9.45)}}{.243} = \frac{+1 + \sqrt{5.59}}{.243}$
$x = \frac{3.36}{.243} = 13.8"$



F	ARM	M
$\left(\frac{56.25 \times 5.8}{2}\right)\frac{5.8}{13.8} f_c$	2/3 (5.8)	264.5 f_c
$19.5 \times 8 \times \frac{5.8}{13.8} f_c$	½(8)+5.8	641.0 f_c
$\left(\frac{19.5 \times 8}{2}\right) \times \frac{8.0}{13.8} f_c$	2/3(8)+5.8	504 f_c

$\Sigma F = 62.5 f_c + 65.5 f_c + 45.2 f_c = 179.2$
$\Sigma M = 1409.5 f_c$
$\bar{y} = \frac{\Sigma M}{\Sigma F} = 7.85"$

TOT. RESIST. $T = 6.25^{\square}" \times 16{,}000 \times \frac{39.95 + 7.85}{12} = 398'^K$
D.L. M_{MAX}^+ (SEE P6) = 312'^{K}
AVAIL. FOR M_{MAX} L.L. = 86'^{K}
ACT. L.L.$^+$ = 74.5'^{K} (P6)

INV. RATING $\frac{86}{74.5^{'k}} \times 15 =$ H-17.3

TOT. RESIST⁻ $M^{-}_{MAX} = A_s \times 1.13 \times d = 12.5 \times 1.13 \times 44.5 = 630^{'k}$

D.L.M⁻ = 556'ᴷ (P6)

AVAIL. L.L.M⁻ = 74'ᴷ

ACT. L.L.M⁻ = 75.1'ᴷ (P7)

INV. RATING $\frac{74}{95.1} \times 20 =$ H 15.5

SHEAR

@ A & C $V = v\,bd = 60\,PSI\,(16")(53.75") = 51.6^{K}$

$V' = \frac{.75 \times 16 \times 53.75}{12} = 53.7^{K}$

$V_{TOT} = 105.3^{K}$

$V_{D.L.} = 27.8^{K}$

AVAIL. $V_{L.L} = 77.5^{K}$

ACT. $V_{L.L.} = 8.83^{K}$ (P7)

INV. RATING $= \frac{77.5}{8.83} \times 15 =$ H-132

@ B $V_{TOT} = 105.3^{K}$

$V_{D.L.} = 54.0^{K}$

AVAIL. $V_{LL} = 51.3^{K}$ ACT. $V_{LL} = 10.5^{K}$

INV. RATING $\frac{51.3}{10.5} \times 15 =$ H-73.2

STRINGERS (CONT. INTERM.) STR. 5

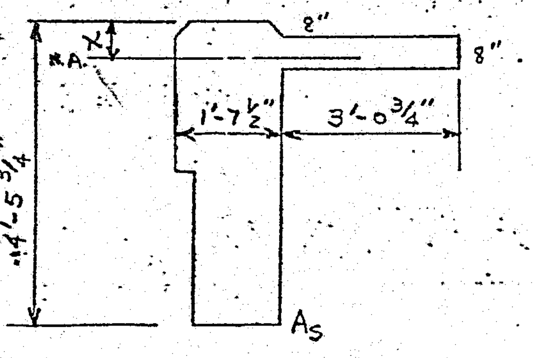
SPAN 9 ORIGINAL RATING APPLIES

M^{-}_{MAX} GOVERNS NEG. MOM 182 PSF.

SHEAR 275 PSF.

SPANS 6-8, 10-13 $A_s = 4.69^{\square"}$

FIND N.A.



$19.5(8)(x-4) + 56.25(x-8)\left(\frac{x-8}{2}\right) = (10 \times 4.69)(53.75 - x)$

$156x - 450x - 624 + 28.12x^2 + 1800$

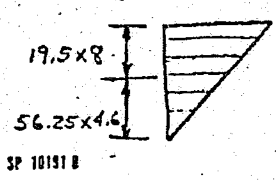
$= -46.9x + 2520$

$28.12x^2 - 247.1x - 1344 = 0$

$.114x^2 - x - 5.45$

$x = \frac{1 + \sqrt{1 - 4(.114)(-5.45)}}{.228} = \frac{1 + \sqrt{3.49}}{.228} = \frac{2.87}{.228}$

$x = 12.6"$



F	ARM	M
$\left(\frac{56.25 \times 4.6}{2}\right)\frac{4.6}{12.6} f_c$	$\frac{2}{3}(4.6)$	$145 f_c$
$19.5 \times 8 \times \frac{4.6}{12.6} f_c$	$\frac{1}{2}(8) + 4.6$	$490 f_c$
$\left(\frac{19.5 \times 8}{2}\right)\frac{8.0}{12.6} f_c$	$\frac{2}{3}(8) + 4.6$	$492 f_c$

$\Sigma F = 47.2 f_c + 57 f_c + 49.5 f_c = 153.7 f_c$

$\Sigma M = 11{,}127 f_c$ $\quad \bar{y} = \frac{\Sigma M}{\Sigma F} = 7.34"$

TOT. RESIST.

$T = 4.69^{\square"} \times 16{,}000 \times \frac{41.15 + 7.34}{12} = 303^{K}$

D.L.M.$^{+}$ (P9) $= 218^{K}$

AVAIL. FOR L.L.M. $= 85^{K}$

ACT. L.L.$^{+}$ MAX $= 54^{K}$

$85^{K} = .0703 \times (42.5')^2$

$x = \frac{85}{.0703(42.5)^2} = .67^{K/'}$ $\quad \frac{.67^{K/'}}{5} = \underline{134 \text{ PSF}}$

$M_{MAX}^{-} = 10.94^{\square"} \times 1.13 \times 45.5" = 562^{'K}$

(P9) D.L.M. $= 388^{'K}$

AVAIL. L.L.M. $= 174^{'K}$ $\quad$ ACT. L.L.M. $= 96^{'K}$ (P9)

$-174^{'K} = -.125 \times (42.5)^2$ $\quad x = .77^{K/'}$ $\quad .77/5 = \underline{154 \text{ PSF}}$

SHEAR

$V = v\,bd = 60(16)(53.75) = 51.6^{K}$

$V' = \frac{.572 \times 16 \times 53.75}{12} = 41.0^{K}$

TOT 92.6^{K}

V@B $\quad 92.6^{K} - 37.6^{K} = 55^{K}$ $\quad w = \frac{55}{42.5} = 1.295$ $\quad \frac{1.295}{5} = .259$

$\underline{259 \text{ PSF}}$

STRINGERS SPANS 1&2 STR. 2,3,4 (B1)

ORIGINAL RATING APPLIES

STRINGERS SPANS 1&2 STR 1 (B2)

ORIGINAL RATING APPLIES

STRINGERS SPAN 1&2 STR 5 (B3)

TOT. REDUCED RESIST. $= 303^{'K}$

D.L.M. $= 353^{'K}$ (0 L.L.)

SHEAR $\quad V_{TOT.} = 92.6^{K}$

$V_{D.L.} = 34.8^{K}$

$V_{AVAIL} = 57.8^{K}$ $\quad w = \frac{57.8}{20.25} = 2.85^{K/'}$ $\quad 2.85/5 = .57$ $\quad \underline{570 \text{ PSF}}$

STRINGERS SPAN 4

ORIGINAL RATING APPLIES

SPAN 3 DECK (CONTINUOUS)

MAIN REINFORCEMENT PARALLEL TO TRAFFIC $\quad E = 4 + .06S$

ORIG. RATING FOR MOM.$^{+}$ & COMPRESSION IN CONC.

$A_S^{-} = \frac{3.022^{'K}}{1.13(5)} = .535^{\square"}$ $\quad$ INV. RATING $\frac{.545}{.535} \times 15 = \underline{H\text{-}15.3}$

SPAN 5

ORIGINAL RATING FOR ALL MEMBERS SAME AS SPAN 3

SP 10191 B

CONC. PIERS

ALTHOUGH THERE IS STEEL EXPOSURE, THERE IS NO REDUCTION IN RATIN

BEARINGS

/ PIER #2 STR. 1 BRG. AREA 12"X 11.25" = 135 SI

$R_{D.L.} = 50.0^K$ $\frac{50.0^K}{135\ SI} = .370\ KSI$ ALL. 625 PSI

AVAIL FOR L.L. 255 PSI

$R_{L.L.} = 18.2^K$ $\frac{18.2^K}{135} = 135\ PSI$

$\frac{255}{135} \times 15 = H\text{-}28.3$

STR 3 BRG. AREA 7.25" X 20" = 145 SI

$R_{D.L.} = 50.8^K$ $\frac{50.8^K}{145\ SI} = 350\ PSI$ AVAIL FOR LL. 275 PSI

$R_{L.L.} = 18.2^K$ $\frac{18.2}{145} = 125\ PSI$

$\frac{275}{125} \times 15 = H\text{-}33$

/ PIER #3 STR. 1 BRG. AREA 12.75"X 10" = 127.5 SI

$R_{D.L} = 50.0^K$ $\frac{50.0}{127.5} = 392\ PSI$ AVAIL. FOR L.L 233 PSI

$R_{LL} = 18.2^K$ $\frac{18.2}{127.5} = 143\ PSI$

$\frac{233}{143} \times 15 = H\text{-}24.6$

STR. 5 BRG. AREA 12.75 X 12" = 153 SI

$R_{D.L.} = 34.8^K$ $\frac{34.8}{153} = 228\ PSI$ AVAIL. FOR L.L 397 PSI

$w = 85^{\#}/_{SF} \times 5' = .425^{K}/_{'}$

$R_{LL} = wL = .425 \times 20.25 = 8.6^K$

$\frac{8.6}{153} = 56\ PSI$

$397 \times 153 = 60.6^K$ $\frac{60.6^K}{20.25'} = 3.0^{K}/_{F}$ $\frac{3.0^{K}/_{'}}{5'} = \underline{600\ PSF}$

PIER #4 STR. 5 BRG. AREA 12"X10" = 120 SI

$R_{D.L} = 23^K$ MAX. $\frac{23.0}{120} = 192\ PSI$ AVAIL. FOR L.L. 433 PSI

$433 \times 120 = 52^K$ $\frac{52^K}{10.73'} = 4.84^{K}/_{'}$ $\frac{4.84^{K}/_{'}}{5} = \underline{947\ PSF}$

✓ PIER #6 STR. 4 BRG AREA 20"X 34" = 680 SI

$R_{D.L.} = 40^K$ $\frac{40^K}{680 SI} = 59\ PSI$ H-266

$R_{LL} = 21.96^K$ $\frac{21.96^K}{680 SI} = \frac{32\ PSI}{91\ PSI}$ ALL. 625 X.75 = 469 PSI

/ PIER #10 STR. 1 BRG. AREA 15"X 16" = 240 SI

$R_{D.L.} = 39.2^K$ $\frac{39.2^K}{240} = 163.5\ PSI$ AVAIL L.L. = 461 PSI

$R_{LL} = 8.83^K$ $\frac{8.83^K}{240} = 36.8\ PSI$

$\frac{461.5}{36.8} \times 15 = H\text{-}188$

SP 10191 B

COMPUTED BY: T. S. STRIVER | CHECKED BY: E.H.S.

SUBJECT: C. H. BR. NO. 54.79

LOCATION: HOMEWOOD JCT., PA. DIVISION DATE 3/3/72

✓ PIER #10. STR. 3 BRG. AREA 15" x 17" = 255 SI

$R_{D.L.} = 40^K$ $\frac{40^K}{255} = 157$ PSI AVAIL. L.L. 468 PSI

$R_{L.L} = 21.96^K$ $\frac{21.96^K}{255.} = 86$ PSI $\frac{468}{86} \times 15 = H-81.7$

STR 4. BRG AREA 6 X 17" = 102 SI

$R_{D.L.} = 40^K$ $\frac{40^K}{102SI} = 392$ PSI AVAIL. L.L. = 233 PSI.

$R_{L.L.} = 21.96^K$ $\frac{21.96^K}{102SI} = 215$ PSI $\frac{233}{215} \times 15 = H-16.25$

✓ PIER #12 STR. 5 BRG. AREA 13.75" X 16" = 220 SI

$R_{D.L.} = 40^K$ $\frac{40^K}{220} = 182$ PSI AVAIL. L.L. 443 PSI

$443 \times 220 = 97.5^K$ $\frac{97.5}{21.25} = 4.59^{K/I}$ $4.59/5 = 916$ PSF

PIER #8

STR 2, 3, 4 $R_{D.L.} = 40^K$ $R_{L.L.}$ (STR 2 & 4) $= 21.96^K$

STR 1 $R_{D.L.} = 39.2^K$ $R_{L.L.} = 8.83^K$

STR 5 $R_{D.L.} = 27.4^K$ $R_{LL} = .085 \times 21.25' \times 5' = 9.05^K$

$M_{MAX} = Pl = 39.2^K \times 7.46' = 292'^K$ $+M_{MAX} = \frac{wa^2}{2} = \frac{.15(6)^2}{.2} = 2.7'^K$

$S_{REQ'D} = 294.7'^K \times \frac{12"/'}{16\ KSI} = 221\ IN^3$ S OF 36 WF 150 = 502. IN^3

S OF 36 WF 150 WITH ½ TOP FLANGE CUT $S = 364\ IN^3$

TOT. RESIST. $M_{MAX} = 364 \times \frac{16}{12} = 485'^K$

D.L.M. $= 294.7'^K$

AVAIL. L.L.M. $= 190.3'^K$

ACT. L.L.M $= 8.83^K \times 7.46' = 65.9'^K$

$\frac{190.3'^K}{65.9'^K} \times 15 = H-43.4$ 36 WF 150

SHEAR 35.84" x .625" = 22.4 SI

$V_{D.L.} = 39.2^K$ $\frac{39.2}{22.4} = 1.75$ KSI AVAIL. L.L. 9.25 KSI

$V_{LL} = 8.83^K$ $\frac{8.83}{22.4} = .394$ KSI $\frac{9.25}{.394} \times 15 = H-352$

COMPUTED BY: J.S. STRIVIERI CHECKED BY: E.H.S.

SUBJECT: O.H.B.R. No. 1.98

LOCATION: HOMEWOOD JCT. PA. DIVISION DATE 3/9/72

SHEAR ON 24WF110

$V_{D.L.} = 40^K$

$V_{LL} = 21.96^K$

$dt = 24.16" \times .510 = 12.3\ si$

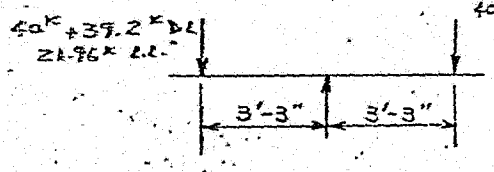
$40/12.3 = 3.25\ KSI$

$21.96^K/12.3 = 1.78\ KSI$

$11\ KSI - 3.25\ KSI = 7.75$

$\frac{7.75}{1.78} \times 15 = H\text{-}65.4$

CROSS BEAM 24WF110



$150\#/' \times 15' = 2.25^K$ WT. OF BM.

$M_{MAX\ D.L.} = 81.45^K \times 3.25' = 265'^K$

$S = 274.4\ IN^3$

TOT. RESIST $= 274.4\ IN^3 \times 16/12 = 366'^K \times 2 = 732'^K$

D.L.M. $= 265'^K$

AVAIL. L.L.M $= 101'^K$ $= 467'^K$

$M_{MAX\ L.L.} = 21.96^K \times 3.25' = 71.3'^K$

$\frac{101'^K}{71.3'^K} \times 15 = \underline{H\text{-}21.2}$

$\frac{467}{71.3} \times 15 = \underline{H98.5}$

SHEAR $A = 12.3\ si \times 2 = 24.6\ si$

$V_{D.L} = 2 \times 79.2^K = 158.4^K$

$V_{LL} = 2 \times 21.96^K = 43.92^K$

$158.4/24.6 = 6.45\ KSI$

$43.92/24.6 = 1.78\ KSI$

AVAIL. $4.55\ KSI$

$\frac{4.55}{1.78} \times 15 = H38.3$

Before
THE PENNSYLVANIA PUBLIC UTILITY COMMISSION
- - - - -

In re: Borough of Homewood and Borough of Big Beaver v. Penn Central Transportation Company, et al. Third Hearing.

- - - - -

Complaint Docket No. 18925

- - - - -

Friday, June 3, 1977, Beaver, Pa.

Pages 171 To 210

MOHRBACH & MARSHAL, INC.
CERTIFIED SHORTHAND & STENOTYPE REPORTERS
27 NORTH LOCKWILLOW AVENUE
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Before
THE PENNSYLVANIA PUBLIC UTILITY COMMISSION

- - - - -

In re: Borough of Homewood and Borough of Big Beaver v. Penn Central Transportation Company, Department of Highways of the Commonwealth of Pennsylvania, Pennsylvania Turnpike Commission, County of Beaver and Consolidated Rail Corporation - Alleging dangerous conditions existing at crossing where State Highway Route No. 77 (Legislative Route No. 04057) crosses, above grade, the tracks and right-of-way of Penn Central Transportation Company and the right-of-way of the Pennsylvania Turnpike in Boroughs of Homewood and Big Beaver, Beaver County, Pennsylvania.

Third Hearing.

- - - - -

Complaint Docket No. 18925

- - - - -

Stenographic report of hearing held in the Municipal Building, 469 Third Street, Beaver, Beaver County, Pennsylvania, Friday,

June 3, 1977
at 10:00 o'clock a.m.

- - - - -

ALVIN J. LUDWIG, ESQ.,
ADMINISTRATIVE LAW JUDGE

- - - - -

APPEARANCES:

CANDACE KREIGER, ESQ.
North Office Bldg.
Harrisburg, Pa. 17120
For - Pa. P.U.C.

GEORGE D. WENICK, ESQ.
Office of Chief Counsel
Department of Transportation
Harrisburg, Pa. 17120
For - PennDOT.

JOEL E. MAZOR, ESQ.
1138 Six Penn Center Plaza
Philadelphia, Pa. 19104
For - Consolidated Rail Corporation.

DAVID L. GROPP, ESQ.
240 Commerce St.
Beaver, Pa. 15009
For - Boroughs of Homewood and Big Beaver.

ALSO PRESENT:

MR. JOHN L. STORCH
Commerce Bldg.
Harrisburg, Pa.
(Commission staff)

INDEX TO WITNESSES

THE ADMINISTRATIVE LAW JUDGE: We're ready to proceed.

MR. MAZOR: Just to bring the record up to date where we stand right now, I think it would be helpful for the record and for all the parties, this complaint was originally filed in May of 1970. After a field conference in July of that year, there was a hearing on October 8 and the initial Commission order was issued on August 23, 1971, which ordered four of the parties, the then owned railroad Penn Central, the Turnpike Commission, the Borough of Homewood and PennDOT, to make certain in-depth inspections and reports. Each party, other than the Borough of Homewood, for financial reasons, made the required reports and they were all presented at further hearing on April 26, 1973.

In June of that year, there was an interim order of the Commission ordering a three-ton limit be posted in order that Penn Central could make certain repairs to the structure, which Penn Central ultimately did, and the bridge was so posted and so remains posted to this date.

On June 17, 1974 was a second full Commission order, which ordered Penn Central to prepare designs for making studies and detailed construction plans for a new structure.

On July 19, 1974, the Commission was advised

by the Trustess of Penn Central that pursuant to the provisions of Section 77(c)2 of the Bankruptcy Act that they would not comply with that Commission order to prepare the plans at their initial cost and expense.

In June of 1975, the P.U.C. and other parties petitioned the Interstate Commerce Commission for an order compelling the Trustess of Penn Central to comply with that Commission order. I don't think that that ever reached a final determination because before it could, on April 1, 1976 certain properties of Penn Central, including the line of railroad involved in this proceeding, were conveyed to Consolidated Rail Corporation pursuant to the Regional Rail Reorganization Act of 1973.

Then in June of 1976, after conveyance, by a letter, Consolidated Rail Corporation was added as a party to the proceeding and without any hearing was ordered to comply with the Commission's order of June 17, 1974 with respect to the obligations that had been imposed upon Penn Central in that order. Then June 17, 1976, Consolidated Rail Corporation advised the Commission that it desired to make its position in that respect known and the Commission granted that petition, and this hearing is basically to get ConRail's position on the record and I think that brings us up to date.

THE ADMINISTRATIVE LAW JUDGE: Okay.

MR. MAZOR: To that end I would call

Mr. Walker.

STAFFORD C. WALKER, called as a witness on behalf of ConRail, being first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. MAZOR:

Q Would you please give your full name and address?

A Stafford C. Walker, 1528 Walnut Street, Philadelphia 19102.

Q Mr. Walker, by whom are you now employed and in what capacity?

A I am employed as senior civil engineer by Consolidated Rail Corporation.

Q And are you authorized to testify in behalf of that corporation at this hearing?

A I am.

Q And you are familiar with the structure which is the subject matter of the hearing?

A Yes, sir.

Q Just to set the record straight, you are the same Mr. Walker who at previous hearings testified on behalf of the Trustees of Penn Central Transportation Company,

is that correct?

A Yes, sir.

Q But you're no longer employed by them or represent them in any way?

A That's correct.

Q And the purpose of this hearing is to state ConRail's position with respect to its willingness to prepare any plans, studies and detailed construction plans for a new structure which is the subject matter of this hearing.

Will you please state ConRail's position in that respect?

A The position of Consolidated Rail Corporation is that it is not in the usual sense a successor to Penn Central Transportation Company. It has acquired certain of Penn Central's properties. Those acquisitions did not include the maintenance responsibility for overhead structures -- structures carrying highway over railroad. Consolidated Rail Corporation has no staff adequate to design the new structure at the site of the crossing, which is the subject of this hearing today.

MR. WENICK: I'd like to move to strike that portion of Mr. Walker's testimony in which he states the railroad has not taken over any maintenance responsibility of any of the structure. I think that's a legal con-

clusion. I think he's qualified to present the position of ConRail with respect to the outstanding order and is qualified to testify to certain facts which may be relevant, but I think the legal conclusion itself is inappropriate.

MR. MAZOR: If I may, sir, he is stating that as ConRail's position. While it may be a legal conclusion, it is their position. The letter of the Commission said he would be allowed to state --

THE ADMINISTRATIVE LAW JUDGE: Continue, Mr. Walker.

A ConRail does not have the staff to design this structure, nor does ConRail believe that it has the obligation to design a structure carrying highway over railroad. This type of design is better made by parties responsible for highway traffic. There are circumstances at the site, geometry of the layout indicating that relocations may be in order for any new structure built at this location. Decisions relating to that relocation could better be made by agencies responsible for vehicular highway traffic and not Consolidated Rail Corporation.

For these reasons, it is ConRail's position that the order requiring Penn Central to prepare plans is not binding upon Consolidated Rail Corporation, nor does Consolidated Rail Corporation feel it should volunteer to assume any responsibilities in this respect.

MR. MAZOR: The witness is available for cross-examination.

CROSS-EXAMINATION

BY MR. WENICK:

Q Mr. Walker, you stated in partial support of ConRail's position that ConRail itself does not have the staff or expertise to adequately study the layout in the area and to adequately decide on a proper place to locate a new structure, if one was to be built, but wouldn't ConRail have that work done by a private consulting engineering firm? If it were ordered to do that work, would it not do that work through an engineering consultant?

A An engineering consultant would have to be hired to do it, yes, sir.

Q In fact any partywho would be ordered, would likely use an engineering consultant whether it could do so?

A Yes, sir.

Q And every party has equal access to such consultants, is that so?

A Yes, sir.

Q Mr. Walker, does not ConRail benefit by the continued existence of a separated crossing at this location?

A If the alternative is a crossing at grade,

then certainly there is an inherent benefit in a grade separation structure.

MR. WENICK: I have no further questions.

BY MR. GROFF:

Q Mr. Walker, you stated your titls is senior civil engineer, is that correct?

A Yes, sir.

Q Would that infer there are junior civil engineers?

A Yes, sir.

Q How many engineers does ConRail have on its staff?

A Overall in the ConRail system, there would be hundreds. In the office of the Chief Engineer/Design and Construction, of which my group is a part, there probably are fifty or sixty.

Q In your own department there's fifty or sixty?

A Yes, within the Department of Design and Construction, but they are concerned with design of rail facilities. There are electrical engineers, structural engineers, environmental engineers, industrial engineers and mechanicals, architects, all the engineering disciplines are represented within that department.

Q You, yourself, have testified at prior hearings on behalf of Penn Central Trustees in bankruptcy and you held yourself out as a person having knowledge to do with bridges, is that correct?

A Yes, sir.

Q In addition to yourself, how many people are on your staff that have similar capabilities as yourself?

A Perhaps a dozen.

Q So at least thirteen of you are bridge experts?

A Yes, sir.

Q Following Mr. Wenick's question about engaging outside expertise or consultants, to your knowledge, has Penn Central since it took over the operation engaged any outside consultant for any engineering plans or design?

MR. MAZOR: Penn Central is no longer --

Q I mean since ConRail has taken over the operation.

A To answer your question as originally stated, my knowledge of Penn Central's operations indicated Penn Central did so some jobs by consultants. Consolidated Rail, to my personal knowledge, has not engaged a consultant for the design of any bridges. My intimate knowledge is confined to the State of Pennsylvania. There may be some cases in other states of which I am not familiar, but I do

not know of any.

Q Has ConRail engaged outside consultants for other engineering work other than bridges?

A Yes, sir.

Q So it is a practice to hire outside consultants?

A It has been done. It's not a common practice, but it has been done.

Q You've stated the position of ConRail that Mr. Wenick objected to as to the legal conclusion about your statement that ConRail believes it is not required to maintain overhead structures of areas it has been granted rights that were formerly held by Penn Central.

Who directed such decision to be stated by you?

A My immediate superior is assistant chief engineer of staff, Don Taylor, andhis direct superior is Mr. J. T. Sullivan, who's Chief Engineer/Design and Construction, and it is the opinion of both of those gentleman in my consultation with them that that is ConRail's position.

Q What is their capacity with ConRail?

A Assistant Chief Engineer/Staff and Chief Engineer/Design and Construction.

Q They are not in the administration or the main body of --

A Mr. Sullivan's direct superior is Mr. B. J. Gordon, who is chief engineering officer for Consolidated Rail Corporation and he is management.

Q To your knowledge then, this is the directive from the Engineering Department?

A Yes, sir.

Q And not from any other departments. You have not spoken to anyone other than those two individuals?

A I have not spoken to anyone other than those gentlemen.

Q So it's an engineering decision, as far as you know, that they're not responsible, to your knowledge?

A To my knowledge, yes, that's correct.

Q Do you know the area of the particular tracks that go underneath this bridge -- what kind of traffic and where that traffic comes from and goes to?

A The rail traffic?

Q Yes.

A The tracks under the bridge are those of our Pittsburgh-Chicago main line.

Q Would cargo carried by ConRail come from other areas other than Pittsburgh and Chicago such as being funnelled in and switched at freight yards -- how large an area of freight is being transported over those tracks -- the entire system?

MR. MAZOR: I'm going to object, first of all to its relevancy, and secondly, I think it's far afield from the purpose of this hearing.

THE ADMINISTRATIVE LAW JUDGE: Overruled. You may answer, Mr. Walker.

A These tracks serve rail traffic that's gathered throughout the midwestern part of the state and funnels it to the entire eastern seaboard area and the reverse traffic is the same. Perhaps what you're getting at is whether there are alternate routes available. Yes, there are but they would be circuitous. We have a main line from Pittsburgh to St. Louis called the Panhandle main that goes down through Carnegie and that direction.

Q Mr. Walker, you stated it would be very beneficial to have the grade or the crossing separated. What I'm trying to get to —

MR. MAZOR: I object to the word "very" beneficial characterizing Mr. Walker's testimony.

THE ADMINISTRATIVE LAW JUDGE: He did say as an alternate to a grade crossing, it would be preferable but we understand. Go ahead.

Q What I'm trying to get to is, these tracks don't serve an isolated area — they do serve the entire Con-Rail system, isn't that correct, Mr. Walker?

A Yes, sir, this is one of our most vital

main lines.

Q What I'm trying to point out by this is that these rails and this bridge don't just benefit an isolated area in Beaver County, is that correct?

A That's correct, as far as rail is concerned.

Q And it doesn't solely benefit Pennsylvania as far as rail traffic goes?

A That is correct.

MR. GROPP: That's all the questions I have.

BY MISS KREIGER:

Q Mr. Walker, is it ConRail's position that ConRail has no responsibility at this crossing?

A Yes, ma'am.

Q Are you aware that under the final systems plan regarding conveyance of real property from the bankrupt carriers to ConRail that ConRail is responsible for all items included in I.C.C. Account 39?

A Yes, ma'am.

Q Isn't it true that Account 39 includes highway improvements and specifically one of the items under that account is bridges carrying highways over railroads?

A Account 39 is a capital account and not a maintenance account. Maintenance is under expense account,

which some accountants feel does not include maintenance of overhead bridges. It was carried under another account. The capital portion of overhead bridges is included in Account 39, yes.

Q Have you consulted with ConRail to make a determination of whether this structure is on the books of ConRail?

A Yes, as a capital item it is, but Pennsylvania Railroad made an original investment in the separation of the crossings when the bridge was built back, as I recall, in the '20s, and Pennsylvania Railroad was assessed a major portion of the cost of that construction at that time, and for that reason it went into Account 39 because that was a capital investment, and remains in Account 39.

Q How do you separate maintenance from a capital item?

A If it's an improvement of the vested interests of the railroad, then it becomes a capital item; if it's an expenditure to maintain what has already been built, then it's a maintenance item, and as I recall, it was carried in Account 273.

Q Is it true that ConRail currently operates the rail facilities at this crossing?

A That's correct.

Q Have you had an opportunity to observe

the structure recently?

A Yes, as recently as a couple of hours ago.

Q What is your opinion of the condition of the crossing?

A Very poor.

Q Would you say the bridge is presently safe for the current three-ton load limit?

A Yes.

Q And how long would you estimate that it would remain safe for this load limit?

A Maybe a day, maybe a year, six months, it may be three, four years, it's hard to tell.

Q Is the railroad performing any kind of maintenance on the structure?

A Within the past few weeks, I'd say within a month or so ago, our maintenance forces were out and put a steel plate over a hole that developed in the deck of the bridge.

Q At whose direction was this maintenance work performed?

A Well, it was a round robin telephone conversation. I suppose we could say the decision to do it originated with me.

Q Would you say it is ConRail's policy to

perform certain types of maintenance work on the structure?

A Yes, where there's apparent danger to the traveling public, and for lack of any better vehicle to use at the time, we have made what might be called emergency type repairs to several overhead bridges. That does not violate our real position that we have no responsibility for these structures, but as an indication of our concern for the traveling public, we have done it. We don't like it but we think it best under the circumstances to do it.

Q What would be your recommendation concerning the bridge insofar as eliminating the safety hazards which you say do exist there?

A I've given a lot of thought to this over the years and I've about reached the conclusion that probably the best solution to this problem here would be to develop the crossing at grade which lies about a half a mile to the west of this bridge. The crossing there exists already, it is on the program of the 1973 Federal Highway Safety Act for the installation of lights and gates. It is not PennDOT's policy to invest in the improvement of highway approaches to those grade crossings, but I think that this would be a prime candidate for PennDOT to consider relenting in their policy and permit some of those federal highway funds to be expended on the highway approaches to that grade crossing, create a relatively safe grade crossing at that point, and then all

parties considered, including the Commission, think seriously of eliminating this bridge entirely.

Q Is this your own opinion, or is this something that ConRail has adopted as their position with regard to this structure?

A This is my own opinion. I have discussed it with my superior and he took no exception to it.

Q I realize you are today testifying on behalf of ConRail and that in the past you testified on behalf of Penn Central.

It is true, however, isn't it, that at the prior hearing which was in April of 1973 that you recommended replacement or construction of major portions of the structure?

A Yes, that was prior to the 1973 Highway Safety Act and the program to upgrade grade crossings.

Q Then the basis for your changed position would primarily be that Act?

A Yes.

Q And why is that?

A Since that Act, we have traveled all over the state examining grade crossings and the protection facilities at grade crossings, and I think we have progressed in our thinking considering grade crossings. We still do not recommend grade crossings as the best way to get highways

across railraads or railroads across highways; however, since a grade crossing does exist, it's my opinion that here it can be utilized. In fact at the time of the last hearing in this case, I'm not even sure that I was aware that the grade crossing existed west of the bridge.

Q If it were determined that the at grade crossing should be used and this bridge would be closed, would ConRail voluntarily agree to perform any of the work or contribute to any of the costs of upgrading that crossing?

A We would certainly perform the work. Most of the funds for the upgrading of the crossing are already committed on the 90/10 —

MR. GROPP: I'll object to that because there is no such application and there is no such program. If you can verify that —

THE WITNESS: I can't verify it here but I can verify it from other files that we have.

MR. GROPP: I happen to represent the Borough of Big Beaver and I know that it's not in existence. It was considered but never followed through.

THE ADMINISTRATIVE LAW JUDGE: Off the record.

. . . OFF RECORD DISCUSSION . . .

THE ADMINISTRATIVE LAW JUDGE: Let's go back on the record. In view of what Mr. Gropp has said,

do you want to change your testimony?

THE WITNESS: I am not aware that the crossing was dropped from the 1973 grade crossing program; however, there is a 1976 grade crossing program which we are now putting projects on, and if this particular crossing were dropped from the provisions of the 1973 Act, then certainly it would be my prime recommendation that it be put on the 1976 list.

BY MISS KREIGER:

Q Mr. Walker, then you do not know directly or it is not something you are definitely aware of that this crossing is on a program at this time?

A In this portion of Pennsylvania, I administered this program for ConRail and was not aware that it had been dropped. I don't have that file with me and there are I guess dozens, perhaps even hundreds, of crossings that we have considered over the years and this one could have been dropped either without my knowledge, or perhaps my memory is faulty only, but certainly I was not presently aware that it had been dropped from consideration.

Q What is your estimate as to the additional mileage that would be involved in utilizing that route?

A Perhaps a mile and two or three tenths. I think it's about six-tenths of a mile from the bridge to the grade crossing.

Q And does that involve a major highway route which could serve this area?

A It's a public road, perhaps a township or borough street. It's paved, it's not a first class highway, but I think it could be made adequate to serve the volume of traffic that it would be called upon to serve.

Q Do you know what that volume of traffic would be?

A I think it's in the record. As I recall at previous hearings, some 200 vehicles a day.

Q I think that was some years ago, so possibly it might have increased.

A My visit to the site this morning wouldn't indicate to me that there's any real reason for that traffic to have changed considerably.

Q Has there been any significant change in the operations at the crossing by ConRail since the take-over of the rail properties?

A No, the rail traffic is substantially the same.

Q How many tracks are at the site?

A I believe there are three. It's in the record.

Q What is the, if you know, volume, class and approximate speed of the trains operating daily over the

tracks?

A I did not come prepared to testify to that today.

MR. MAZOR: That's all in the previous testimony. I'm sure it was testified to at previous hearings and Mr. Walker has indicated there has been no substantial change.

Q Mr. Walker, you said you had recently observed the condition of the structure?

A Yes.

Q Did you notice any loose concrete which was scaling off of the structure?

A Yes, there's a lot of it.

Q Would ConRail be willing to send a maintenance crew out to scale off some of the loose material to protect it from falling on any vehicles or in any way creating a potential hazard to the traveling public?

A I don't think we would volunteer to do it, no, because I think that would be a rather major undertaking.

Q Mr. Walker, how would you say the scaling would affect the roadway under the bridge?

A There's not too much loose concrete directly over the little roadway. I think over the years that most of that has fallen. The major portion of the loose concrete

that appears ready to fall next are in the areas to either side of the roadway, primarily toward the south end of the bridge, south of the road, but the effect on the road itself, if it were to fall, of course, would create a hazard to anybody on the road below.

MISS WALKER: We have nothing further of Mr. Walker.

THE ADMINISTRATIVE LAW JUDGE: Any other questions of this witness?

BY MR. GROPP:

Q Mr. Walker, you stated only recently you became aware of the grade crossing to the west of the bridge, is that correct?

A By recent, I think it's since the inception of the 1973 Highway Act we had two or three site conferences at the crossing and I think it was then that I first became aware of the presence of the crossing.

Q Are you familiar with any other above grade crossing or below grade crossings of the railroad west of the subject bridge within the confines of Big Beaver Borough?

A I don't think there are any -- none that I know of.

Q Were you not involved in the Summit Cut Bridge conference?

A Yes.

Q Do you know where that's located?

A I believe that was in Big Beaver.

Q So there's at least that you know of?

A But that's not a grade crossing.

Q I said above grade or below grade.

A I'm sorry. Yes, I am aware of the Summit Cut Bridge and that was the subject of another proceeding.

Q Between the Homewood and Summit Cut Bridge, are you familiar with any other grade crossings?

A No, sir.

Q Do you have any knowledge of the complaints received by either ConRail or by its predecessor as to the condition of the grade crossing and the failure of maintenance?

A I think there was a complaint proceeding about this grade crossing located just west of the Homewood Bridge.

Q Did you, yourself, examine those crossings?

A Yes, sir, I was at the site of that crossing on at least two occasions.

Q Were you responsible for the work that was done at that crossing and other grade crossings in Big Beaver Borough?

A Directly responsible, no, sir, if there was some proceeding involving the Public Utility Commission.

Q Not the Public Utility Commission. The

main item I'm talking about was the complaint at the time was the failure of the railroad to keep the area between the tracks and next to the rails properly filled. Who would it have been to take care of that?

A If the mail is routed correctly as it comes into the Consolidated Rail Corporation, if it were not directed to someone specifically and just directed to Consolidated Rail Corporation, the letter most likely would go to our maintenance people who would be responsible for the handling; however, if the mail desk sees that it involves a public body, such as a township, borough or the state, they sometimes direct it to our department which handles public affairs.

Q Are you familiar with any work that ConRail may have done in completing the paving and care of the grade crossings in reference to fill between the tracks and right next to the rail tracks?

A No, sir, not specifically. I do believe my trip across the tracks this morning was smoother than it had been three or four years ago. I think there were some potholes and chuck holes in the crossing at that time that have since been repaired.

MISS KREIGER: I wonder if we could go off the record for a minute?

THE ADMINISTRATIVE LAW JUDGE: Sure.

OFF RECORD DISCUSSION

MR. GROPP: That's all the questions I have.

BY MR. WENICK:

Q In discussing this crossing to the west, may we refer to that as the Midvale crossing, I'd like to ask you a few more questions.

You say that the railroad would not object to increasing the traffic on this at grade crossing which would be a result of closing the subject structure, is that correct?

A Provided at the same time the improved protection were installed.

Q That's generally against the railroad's nationwide policy, is it not?

A Yes. We primarily, of course, object to the establishment of a new crossing at grade. Here is one already existing in poor condition and with very poor approaches.

Q But the reason you would agree to an increase in traffic at this crossing is because you feel with crossing protection this crossing could be made safe?

A Yes, sir, considerably safer than it is now.

Q And the railroad has come around to this position since the inception of the Highway Safety Act of 1973, particularly to 230 programs, is that correct?

A Your question implies a convolution. I don't know that we've really come around but we recognize facts and I don't know that it's a real change in position.

Q You stated that PennDOT's administrative policy that the monies in question be used only for crossing protection and not for approaches, which position PennDOT has decided upon because they wish to maximize the amount of protection provided with the money.

There are so many of these crossings in the state and given that so many involve ConRail, don't you agree that the most cost-wise way of spending this money is to spend it solely for protection?

A I agree with PennDOT's rationale; however, I'm not quite sure that I would agree that there would not be extenuating circumstances. By putting automatic protection and gates at this crossing and leaving those approaches the way they are is like putting a fifty dollar saddle on a ten dollar horse.

Q Have you made or intending to now make a cost estimate of an improvement to the grade crossing, except for the approaches, for the flashing lights and gates or whatever protection you might recommend?

A I think that was done at the site conferences that were held there. As I recall, there was some figure of $20,000 bandied about as the estimate of cost for

raising the approaches. One factor that was considered but was not thrown into the cost estimate was the possibility of some property damage on the Turnpike side of the track.

Q Do you remember what the estimated cost was for the lights and gates?

A As I recall, somewhere around forty to forty-five thousand plus.

Q And it was that sort of protection that ConRail recommended?

A Yes, lights and gates.

Q Can you estimate the width of Midvale Road with respect to the crossing area?

A Probably no more than 15 or 16 feet.

Q Would you recommend if this crossing were created that it be widened?

A Yes, sir.

Q A number of railroads in addition to ConRail have been involved at the site of the subject crossing and the Commission may determine that ConRail has a responsibility at that crossing.

If the Commission were to order the railroad work in the alternative, either at the at grade crossing or at the structure, would ConRail prefer to do the work and spend the money at the at grade crossing?

A Yes, sir.

MR. WENICK: I have no further questions.

THE ADMINISTRATIVE LAW JUDGE: Any further questions of Mr. Walker?

REDIRECT EXAMINATION

BY MR. MAZOR:

Q Mr. Walker, we didn't discuss this at all but I'm going to ask this any way: As part of your thinking and recommending the possibility of exploring the at grade crossing as an alternative, the volume of traffic currently using the bridge and the expense that would be involved in reconstructing the bridge in any form as contrasted to upgrading the grade crossing, that is one of the bases for your answer?

A Yes.

MR. MAZOR: Thank you.

RECROSS-EXAMINATION

BY MR. GROPP:

Q Mr. Walker, what traffic do you think goes over that bridge?

A I think 200 vehicles a day.

Q Do you recall it was roughly 900 to 1300 a day?

A If the record shows that, I certainly wouldn't quarrel with it.

Q Does that change your theory?

A No, sir.

Q What would you propose to do for the fire protection and police protection?

A Upgrading the crossing at grade would give fire and police better access to both sides of the track than what they have at the present time because they're restricted from using the bridge.

Q There's no question about that, but what do you do when the train went across the grade and there's a police car at the grade?

A They'd do the same as they do now.

Q Wait?

A Yes, sir. I don't know what it would cost to replace this bridge in kind but it would be upwards of a million dollars I suspect, and I think the overall economy of the nation would be better served by providing a new firehouse and a new fire truck on the other side of the track.

Q Would ConRail be willing to do so?

A In lieu of a million dollar bridge, we would, yes, but that doesn't imply that we volunteer to spend a million dollars on a bridge.

MR. GROPP: That's all.

THE ADMINISTRATIVE LAW JUDGE: You're excused, Mr. Walker.

(Witness excused)

THE ADMINISTRATIVE LAW JUDGE: Is that all you have?

MR. MAZOR: Yes, sir.

THE ADMINISTRATIVE LAW JUDGE: Do you have some witnesses?

MR. WENICK: Yes, sir. Mr. Sellers.

HOWARD A. SELLERS, called as a witness on behalf of PennDOT, being first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. WENICK:

Q Would you state your name and address, please?

A Howard A. Sellers, Room 1120 Transportation and Safety Building, Harrisburg, Pennsylvania, and I'm employed by the Pennsylvania Department of Transportation as a civil engineer.

Q Are you authorized to speak on behalf of the Department with respect to the Department's position con-

cerning this crossing with respect to engineering matters related to this crossing?

A Yes, I am.

Q Will you state what the traffic count is at the subject crossing?

A The Department has made no traffic counts per se, but I can refer to the order of August 23, 1971 by the Public Utility Commission and refer directly to page 4 that the traffic count concluded by the Borough indicated 976 vehicles and 75 pedestrians crossed the viaduct between 6:00 a.m. and 8:00 p.m. on September 22, 1970; and 979 vehicles and 63 pedestrians on September 24, 1970. Needed vehicular counts furnished by the County at the Borough's request showed 880 vehicles on September 23, 1,105 vehicles on September 24, 1,197 vehicles on September 25, 1,052 vehicles on September 26 and 1,246 on September 27, 1970. All the latter counts, with the exception of September 23, are for 24-hour periods.

Q Have you observed the subject structure recently?

A Yes, sir, I looked at it yesterday.

Q And did you observe any scaling of the concrete on the structure?

A Yes, there is quite a bit of scaling, and in particular on one of the beams immediately above the bituminous roadway beneath the structure I'd estimate there's

possibly an eight to ten-foot section of scaling, which, in my opinion, is going to fall in the very near future, and I would estimate the scaling would be up to and possibly even above some of the reinforcement bars in the beam, so it is a considerable amount of concrete which could fall in the very near future above the roadway, and there are other smaller sections of scaling throughout the structure from the Turnpike section over but I can't recall them specifically.

Q Are there sections of serious scaling above the railroad tracks?

A I don't recall anything serious because it is a steel structure above the tracks.

Q Would you briefly explain the intent of the Highway Safety Act of 1973, No. 230, and 1976, No. 203-C?

A The 1973 Highway Safety Act, the main purpose was to provide and upgrade additional traffic at rail-highway crossings at grade throughout the state and throughout the nation, and it's the Department's administrative policy to follow that intent in upgrading protection at at grade crossings thereby deriving the most benefit from the monies available to protect the greatest number of people traversing at grade rail-highway crossings throughout the State of Pennsylvania, and to get into extensive approach work or grade separations would eliminate the funds available with one or two projects, depending on whatever project you're talking

about above the extent of providing protection at the at grade crossings.

Q So it's the Department's position the best way of maximizing the increase in safety to be brought about by these funds that the funds be expended solely for crossing protection and not for any approaches?

A That is correct, and particularly the 1973 230 funding was expended almost immediately because of the large number of available crossings that were on our program. There just was no money left, there isn't now and there's nothing we can do about the 1973 230 funding at this time. It's expended.

Q If the subject structure were closed and the traffic which now uses that structure would be diverted to the Midvale at grade crossing, in your estimation would the hazard created at the crossing justify the expenditure of the 203-C money of the 1976 Act, if it were available?

A Yes, I think that it would require protection and it certainly would be of benefit to the traveling public to have the approaches improved, the crossing itself widened and improved.

Q And if this money were to be expended at this crossing, would the Department require anything further of any other parties at the crossing before the money could be released -- who would pick up the additional 10% of the

cost?

A Well, the Department would only go along under the 1976 203-C funding, which replaces the 230 funding of the 1973 Act, would still only program the protection upgrading at the crossing. The approach work should be borne by parties other than the Department. The protection would be participated at 90% federal funds and 10% local funds since it is a local road.

Q Was this crossing originally scheduled under the 1973 Act?

A Yes, sir, it was.

Q And was it later withdrawn?

A It was withdrawn from the program.

Q And it's not now scheduled under the 1976 Act?

A No, sir, it is not.

Q Do you have any further testimony to offer at this time?

A No, sir.

MR. WENICK: I offer my witness for cross-examination.

MR. GROPP: I have no questions.

CROSS-EXAMINATION

BY MR. NAZOR:

Q Mr. Sellers, these counts which you referred to which were recited in the Commission's order and taken in 1970, does the order indicate or do you know whether there was a load limit restriction on the bridge at that time?

A I'll have to read the order.

Q Do you know the three-ton limit was imposed subsequent to that order, was it not, some time in '73?

A I don't recall. I'd have to check to get that.

Q Now, if my recital at the beginning was correct and that recital was made from the record, the three-ton limit was posted subsequent to that traffic count, so the actual count today, which I assume has not been taken recently, might be substantially less because of that load limit?

A Due to the fact that you say "might be", I would say yes, it might be — not necessarily true.

Q With respect to funds under the '73 Act or the '76 Act, has there been any change in the position of the Department with respect to the surfacing of the approaches?

A No, sir, the Department would consider that area to be widened within the crossing area to be incorporated under the 203-C funds — only the area to be widened; in other words, the crossing that's there presently

should be rehabilitated or brought up to reasonable conditions by the party responsible for it.

Q As part of the '76 program, is there not a program throughout the state for installation of rubberized crossing at some crossings which has nothing to do with protection?

A Yes, sir, there are.

Q Is there any program that you know of, federal or otherwise, that is available for funds for a situation like this — emergency bridge programs? I understand there may be but I'd like to know if you have any knowledge — some kind of urban funding that's available for replacement of bridges in emergency situations?

A Not to my knowledge.

Q I heard at some other hearing that there were and I wasn't too sure of the type.

Under the present orders, is not the Department presently responsible for the maintenance of the riding surface on the present bridge?

A Yes, sir, it is, only the Department neglected to be relieved of maintenance when we rebuilt and relocated L.R. 77.

Q If this crossing were abolished, the Department to the extent that it would be relieved of that maintenance would benefit some?

A Yes, sir, that's correct.

MR. MAZOR: Thank you.

MISS KREIGER: We have nothing.

THE ADMINISTRATIVE LAW JUDGE: Any more questions of this witness? (No response). You're excused, Mr. Sellers.

(Witness excused)

THE ADMINISTRATIVE LAW JUDGE: Do you have any other witnesses, Mr. Wenick?

MR. WENICK: No, I don't.

THE ADMINISTRATIVE LAW JUDGE: How about the Boroughs, any witnesses or testimony to be presented?

MR. GROPP: I have no testimony to present today in the context of Mr. Walker's position of ConRail. I am not prepared to go into any testimony in reference to the Midvale crossing.

THE ADMINISTRATIVE LAW JUDGE: Are you going to request an additional hearing for that purpose?

MR. GROPP: If we are going to the idea of the Midvale crossing, yes, but I have no witnesses to present today.

THE ADMINISTRATIVE LAW JUDGE: Off the record.

. . . OFF RECORD DISCUSSION . . .

THE ADMINISTRATIVE LAW JUDGE: Have

you any witnesses?

MISS KREIGER: No.

THE ADMINISTRATIVE LAW JUDGE: I presume the Commission will set further hearings on this matter.

MISS KREIGER: Off the record.

. . . OFF RECORD DISCUSSION . . .

THE ADMINISTRATIVE LAW JUDGE: All right, that concludes the hearing for today.

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CERTIFICATE

I hereby certify that the proceedings and evidence are contained fully and accurately in the notes taken by me during the hearing on the above cause before the Public Utility Commission of the Commonwealth of Pennsylvania, and that this copy is a correct transcript of the same.

MOHRBACH & MARSHAL, INC.

By Arlene B. Kiger
Official Reporter

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