BRIDGE INSPECTION RESEARCH

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Research Report No. 61

Research Project No. 71-2M(B)
Louisiana HPR 1 (9)

Conducted by
LOUISIANA DEPARTMENT OF HIGHWAYS
Maintenance Section
and
Research and Development Section
In Cooperation with
U. S. Department of Transportation
FEDERAL HIGHWAY ADMINISTRATION

January 1972

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SYNOPSIS

Since the collapse of the Silver Bridge into the Ohio River, the enactment of the Federal Aid Highway Act and a marked increase in national concern for the safety of the traveling public, highway departments throughout the country have directed much more attention to the problem of Bridge Maintenance Inspection.

A comprehensive bridge inspectors training program was developed as a cooperative research project between the states of Florida, Georgia and Louisiana, the Federal Highway Administration and the Link Division of Singer General Precision Inc. of Silver Spring, Maryland.

This report shows generally what three states attempted to do about developing and implementing a bridge inspection program, and more specifically the procedures to be implemented by the State of Louisiana.

Of primary concern was the quality of the inspections being conducted and whether the inspectors themselves were adequately trained to perform this function. It was decided a training program would be needed.

In addition to training personnel, it was decided an inspection system, a filing system, a bridge numbering system and a method of computerizing all structural and inventory and appraisal items to make them available for total or partial recall would be necessary. This has essentially been accomplished, although all information necessary for computerization has

not been obtained, and all bridges have not yet been numbered.

The ground work for the total Bridge Inspection program in Louisiana has been laid, and personnel have been trained to accomplish inspections. It is felt this is a good program, and complete implementation within the AASHO and Bridge Inspection Training Course guidlines is recommended.

IMPLEMENTATION

The pilot demonstration training program has been validated in Louisiana through the training of 20 Department employees in bridge inspection. These employees will handle the State's immediate bridge inspection needs. The bridge inspection procedures as outlined in the AASHO manual and as presented in the Bridge Inspectors Training Course are being implemented by the Department as quickly as possible. Inventory information is being accumulated, and the bridges are being numbered by the District bridge inspectors. It is anticipated that eventually the total bridge inspection program will be fully implemented in Louisiana.

INTRODUCTION

The use of modern technology, increased inspections and numerous safety precautions by present day engineers in designing, constructing and maintaining our highway system would seem an almost fool proof way of assuring the safety of the traveling public. Nevertheless, the tragedy of the Silver Bridge's collapse into the Ohio River in 1967 occurred. This collapse prompted the United States Congress to enact the Federal-Aid Highway Act of 1968 which required the Secretary of Transportation to establish national bridge inspection standards and to develop a program to train bridge inspectors.

While some states use graduate engineers for bridge inspection, this is an impossibility in other states. Louisiana is one of the latter states; however, Louisiana recognizes the importance of bridge safety, high inspection standards and properly trained personnel to conduct inspections. Realizing that it would not have enough engineers to assign to bridge inspection, Louisiana sought to find a way to train and utilize the personnel it did have available. Therefore, Louisiana, along with the states of Georgia and Florida, participated in a contract with the Link Division of Singer General Precision Inc. of Silver Spring, Maryland for the purpose of preparing a comprehensive bridge inspection training program. This project was to be conducted as a cooperative research project and funded by 100 percent HPR funds.

The purpose of the bridge program was:

1. To serve as a pilot demonstration program, which if successful, would lead to adoption of this course by the Federal Highway Administration as a base line for all training on a national scale.
2. To train personnel presently conducting bridge inspections in the three states.

The Bridge Inspection Research study was initiated as a support activity to the development of the training program.

PURPOSE AND SCOPE

It was the intent of the study to provide all the necessary support work connected with the pilot demonstration training course and the subsequently developed inventory, inspection, and data storage and retrieval systems.

The support work consisted of:

(1) Furnishing photographs which illustrated good, fair, poor and critical bridge conditions in the state. The Technical Policy Committee, comprised of representatives from the three states, the FHWA and Link Division, was to review the photographs for possible inclusion into the training course.

Validation of the training methods and recommendations for the revisions ultimately would be a large part of this work.

(2) Developing an inventory and a structural evaluation form for use by the bridge inspectors. Present forms were inadequate for use because they were not compatible to the AASHO guidelines for bridge inspection. In conjunction with the new forms, an inspection checklist was to be developed to assure that all inspection items were checked by the inspectors.

(3) Developing or modifying the present data storage and retrieval system. This would involve a system of computerizing all inventory and inspection data to make it available for immediate total or partial recall. Consideration was also to be given in regard to maintaining a separate bridge file for each structure in addition to the computerized information.

(4) Making recommendations to the Department in regard to whether or not the Singer-Link training methods were adequate for training personnel.

METHOD OF PROCEDURE

It was obvious from the beginning that for the Bridge Inspection Research study to be successful and for a meaningful bridge inspection program to be developed, a joint effort involving several sections within the Department would be necessary. The sections involved were Maintenance, Bridge Design, Traffic and Planning, Data Processing, Research and Development and Project Control.

The Maintenance and Research and Development sections would have the responsibility for:

(1) Providing photographs as previously discussed.

(2) Assisting Singer-Link in conducting the training course and validating the training methods.

(3) Developing the structural evaluation inspection form and the checklist to be used in conjunction with the form.

(4) Recommending a filing system.

The Maintenance and Bridge Design sections would be responsible for recommending staffing and methods implementation.

The Traffic and Planning and Data Processing sections would have the task of developing the data storage and retrieval systems, the bridge numbering system and the coding for the input forms.

Project Control would supply supplemental field data on maintenance repairs, primarily on the types and estimated costs of repairs.

With the responsibilities delegated to the concerned sections, the job of developing training methods and bridge inspection procedures to be used by Louisiana began.

Training Method Validation and Form Development

Photographs illustrating the bridge conditions in Louisiana were taken. These photos, along with slides depicting similar conditions in Georgia and Florida, were reviewed by the Technical Policy Committee. The slides best illustrating the desired conditions were incorporated into the course. The majority of the slides showing bridge conditions were supplied by Louisiana.

The pilot demonstration training course for Louisiana was conducted at the Bellemont Motor Hotel, Baton Rouge, Louisiana from May 10 through June 4, 1971. The request was made for each of the nine highway Districts to send two employees to attend this class. These were to be the employees whose primary responsibilities were or would be inspecting bridges. In addition, two training specialists were asked to attend the pilot program. It was the Department's intent to use these two specialists to assist in administering this course to additional personnel at a later date.

The training course was 160 hours long, with 120 hours of instruction provided directly by Singer-Link and 40 hours by the State. The method of instruction was audio-visual in nature. The visual aids consisted of slides and Vu-graphs while the audio part was provided by Link instructors, Department representatives and guest speakers. Also included in the 160 hours of training were several field trips.

The trainees were tested prior to the beginning of the training and after the course was completed. The exams consisted of two parts, a written test and practical exercise in actual bridge inspection.

Several different types of inspection forms and checklists were designed, proposed and field tested. In the final analysis it was decided that the checklist would be used as a guide in the field but would not be made a part of the records. (See Appendix A.) The structural evaluation form (Bridge Inspection Report) was revised to include all the inspection items in accordance with the AASHO guidelines. (See page 33 of Appendix A.)

It was decided to set up a bridge file which would have a jacket on each structure that was inspected in the State.

Data Storage and Retrieval and Bridge Coding and Numbering Systems

It was decided by parties concerned that all input data that could possibly pertain to bridges be listed so that there was little possibility that anything would be omitted. The responsibility of obtaining the field data to compile this master file was divided among four sections: Maintenance, Project Control, Bridge Design and Traffic and Planning. Individual forms (Supplemental Field Data) for use by the involved sections except for Traffic and Planning were drawn up. (See Appendix B.) From this data, a master structure file would be made listing all inventory and inspection items that could be obtained. (See Appendix C.)

A coding system for the master structure file was then designed. (See Appendix D, pages D-1 through D-28.) This included special coding instructions for supplemental field data to be furnished by the respective sections. Although this coding guide is different from that suggested in the FHWA coding guide of April 1971, the two systems can be equated to each

other. It should be particularly noted that some of the 84 inventory and appraisal items to be provided have already been accumulated and designated by a plus (+) sign. (See Appendix D, pages D-29 through D-32.) Those items not presently on file that are to be provided by this task force are shown on the bottom of page D-32. Pages D-33 through D-41 show the specific information that the involved sections are to provide for the master structure file.

All of the items on the master structure file will be available for immediate total or partial recall from the computer. An example of the computer printout form is shown in Appendix E.

The next step was to design a bridge numbering system. The bridge number is to be a ten digit number which is composed of the control section (5 digits); the control section log mile (4 digits) and the structure number at the same log mile. This gives a total of ten digits. When an actual number is not in existence in the control section or log mile, a zero (0) will be inserted to insure the ten digit number.

For example: Picture a 4 lane divided highway with 2 service roads. The structure in the right roadway, in the direction of the control, will be bridge number 1. The structure at the same log mile in the left roadway (opposite direction from control) will be bridge number 2. The structure in the right service road will be number 3, and the structure in the left service road will be number 4.

For examples of the bridge numbering system, especially when there is more than one structure at the same log mile, see Appendix F.

The bridge number is to be stenciled in black paint on the inside faces of each bridge rail at the midpoint of the bridge in question. If background color is needed in order for the bridge number to stand out, yellow paint is to be used for background.

Staffing and Implementation

The Department decided that in most cases each District would continue making inspections on its bridges. Each District had sent two men to the pilot training program, and these men would conduct the normal routine bridge inspections.

Inspection of large structures would probably necessitate a task force comprised of personnel from the District and from the Maintenance and Design sections at headquarters level. The District inspectors would give a rating on the component parts of the bridge, and headquarters personnel would give an overall structural rating for the bridge. A staff increase to handle this overall evaluation will probably be necessary.

Pilot Demonstration Training Course

The trainees who participated in the project had wide variance in age, education and experience. These differences in background provided a large amount of class discussion and a beneficial exchange of knowledge. It must be recognized that this training course was designed for three states and was a pilot program. Each state has definite and different training needs. While all needs may not have been satisfied by the course, it is felt that Louisiana has the basic structure of a course, and that with some modification within subject areas it is flexible enough to yield satisfactory results.

The scores on the written part of the final or exit examination were significantly better than on the written entrance examination. The second part of the exit exam, the practical field exercise, also showed the same improvement. However, the practical exercise improvement could possibly be attributed to an increase in time spent inspecting the structure. The time actually spent on the structure varied from 1.5 hours (maximum on entrance examination) to 4.5 hours (maximum on exit examination).

It should be significantly noted that one accomplishment of this training was standardization, not only in terminology but in thinking and evaluation as well. This is borne out by the fact that 17 of the 20 students gave the structure inspected identical ratings on the exit practical examination.

Table 1 shows the entrance and exit examination scores for the trainees (number wrong out of 75).

TABLE 1 *

ENTRANCE EXAM	EXIT EXAM
25	7
29	7
33	8
33	9
34	10
34	10
34	10
35	10
35	11
36	12
37	13
38	13
38	14
38	15
38	15
39	16
39	16
39	17
43	21
44	25

* Final Report for Bridge Inspectors Training Program, Table 5, p. 15. (See Bibliography.)

It is not known how much of the improvement noted was attributed to the course itself or to a change in attitudes or motivation. It would be desirable to evaluate inspectors' performance after a period of time. Then an effort should be made to determine which shortcomings in the inspection reports are due to lack of technical knowledge and which can be tied to poor attitudes or lack of motivation. Feedback is very important to the inspector. If he receives no comments, it is logical for him to assume that his reports are good or that they are not being read. Either case will be detrimental toward good attitudes.

It was not the intent here to give a detailed description on the conduct of the pilot training program, but instead to present a concise overview of what the course results were in Louisiana. For a detailed report on the pilot program, refer to the Final Report for Bridge Inspectors Training

Program, DOT-FH-11-7667 of August 9, 1971, by the Link Division of Singer General Precision, Inc.

All revisions recommended by the Technical Policy Committee Chairman as the result of course validation have been made and received by the three involved states and the FHWA.

Structural Inspection Form and Inspector Checklist

After considerable discussion and deliberation over possible formats, the Maintenance Section decided to modify and use the current inspection form for distribution in lieu of the entire checklist. The Research and Development Section's Training Unit devised a checklist patterned after the checklist shown in the Bridge Inspection Training course, and this along with the inspection form is shown in Appendix A. The use of the checklist greatly insures that all inspection items will be checked, and the one page inspection form which consists of subjective ratings by the bridge inspectors gives a concise picture of the condition of the major bridge components. The subjective rating system used is a modification of the AASHO numerical rating system. Again, it is to be noted that the overall structural rating will not be included on this form, but will be determined at the headquaters level.

A separate inventory form for Louisiana was not developed. The inventory information as recommended on page 59 in the AASHO Manual for Maintenance Inspection of Bridges - 1970 will be provided along with additional information afforded by the supplemental field data forms when acquisition of input data is complete.

Data Storage and Retrieval Systems and Bridge Coding and Numbering Systems

All the information needed for computerizing bridge inspection inventory and evaluation is not yet complete. Much of the information has been obtained and some of it is already stored in the computer, but much more information will be obtained and stored as time permits, until all items shown in this report are obtained.

Each District is charged with the responsibility for numbering the structures located within that District. All the structures are presently being numbered in accordance with the established numbering system.

Staffing and Implementation Procedures

The responsibility for making recommendations for staffing and implementation has been placed under the jurisdiction of the Chief Maintenance & Operations Engineer. It is understood that the Department will attempt to implement these new procedures with few, if any, increases in personnel assigned to this function. It is felt that the District inspections can be handled by personnel presently engaged in this activity.

Filing System

In all probability a file jacket will be made up containing all pertinent information (as built-plans, shop drawings, inspection reports, photographs, etc.) on each structure in the State. The exact method of filing or location

of these files is still being discussed; however, it is felt that a decision will be reached shortly, and a filing system will be implemented.

CONCLUSIONS

1. The Bridge Inspection Training course has met its principal objectives. Much knowledge was acquired, and increased accuracy of reporting and substantial standardization were also obtained.

2. With certain modifications and updating the course could be totally effective for training bridge inspectors.

3. The system of inspecting and reporting bridge conditions, as well as computerizing all inventory and inspection information, should greatly increase efficiency of the total system.

4. Greater bridge safety for the traveling public should be provided by new inspection procedures.

5. Long range savings of Maintenance funds should occur if inspection findings are used to program timely and efficient repairs.

RECOMMENDATIONS

1. All personnel engaged in making bridge maintenance inspections should complete the Bridge Inspection Training course.

2. Steps should be taken towards a career development training program for bridge inspectors.

3. The AASHO Manual for Maintenance Inspection of Bridges - 1970 should be implemented and adhered to.

4. The total system of inspecting and reporting, as well as all phases of the bridge inspection program discussed herein, should be implemented.

5. The need for periodic recycling of personnel should be evaluated.

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Manual for Maintenance Inspection of Bridges 1970. Prepared by the Operating Committee on Bridges and Structures, American Association of State Highway Officials. Washington: American Association of State Highway Officials, 1970.

Recording and Coding Guide for the Structure Inventory and Appraisal of the Nation's Bridges, April 1971. U. S. Department of Transportation, Federal Highway Administration. Washington: U.S. Department of Transportation, 1971.

APPENDIX A

NOTE

This inspection checklist is numbered to coincide with the structural inspection report form on the last page of this appendix.

Example:

#59 (Superstructure) - major heading

#17 (Bearings) - subheading

This checklist in no way relates to the rating given a component part of a structure, but is used as a guide for the inspector to follow so that all factors may be considered prior to arriving at a rating.

59. SUPERSTRUCTURE

17. BEARINGS

Elastomeric
- Split or torn pads
- Buldging
- Variable thickness
- Abnormal flattening

Metal
- Performing design function
- Rockers free of corrosion, debris
- Rollers free of corrosion, debris
- Anchor bolts frozen to bearing
- Bearing surfaces clean
- Deflection slots clean
- Alignment
- Lubricated bearings functioning properly
- Bronze sliding plates corroded
- Rattles under loads
- Loose or missing nuts in anchor bolts
- Rocker tilt
- Horizontal end travel of sliding bearings
- Binding or damaged
- Lateral shear keep binding or damaged
- Corrosion and alignment of cantilever girder hanger connections
- Corrosion and alignment in pin bearing connections

20. LOWER CHORD

- Rusted
- Needs painting
- Corroded
- Damaged

23. FLOORBEAMS

Cracked or spalled
Twisted or swayed
Reinforcing steel exposed
Collision or fire damage
Excessive vibration or deflection
Poor alignment
Cracked or spalled cast-in-place diaphragms
Area around bearings
Corroded end connections or top flanges
Cracks in welds

26. GIRDERS

Corrosion
Deterioration
Reduced cross-sectional area
Signs of slippage
Clean and free from debris
Welds cracked
Misaligned or distorted members
Webs and flanges
Stiffener connections
Excessive deflections or vibrations
Hinges and hangers
Hanger links out-of-plumb
Wind locks
Insides of box girders

29. STRINGERS

Steel

- Rust or deterioration
- Sagging
- Canted
- Loose fasteners at connections
- Loose clip angles at connections
- Cracks in floor beam web
- Bottom flange dirty
- Cracked welds
- Worn or damaged pins
- Worn or damaged pin holes
- Scaling paint

Timber

- Crushed
- Decayed
- Unsound
- Split
- Horizontal cracks
- Deflecting
- Bridging between stringers functioning properly

32. DIAPHRAGMS

- Loose or broken connections
- Rust or other deterioration
- Buckling
- Twisting
- Cracking
- Spalling

35. LATERAL BRACING

Bolts or rivet heads rusted
Loose or broken connections
Properly adjusted and functioning properly
Adequate under transverse movement and vibration
Rusting, twisting, bending
Members properly adjusted
Cracking in welds, flanges

38. SWAY BRACING

Bolts or rivet heads rusted
Loose or broken connections
Sash and sway bracing repeated at 10-ft. intervals
Adequate under transverse movement and vibration
Rusting, twisting, bending

41. VERTICALS

Rusted
Corroded
Need painting
Damaged

44. DIAGONALS

Rusted
Corroded
Need painting
Damaged

47. PORTALS

Rusted
Corroded
Need painting
Collision damage

50. UPPER CHORD

Rusted
Corroded
Need painting

53. RIVETS AND BOLTS

Loose or insecure
Corroded
Nuts:
- rusted
- corroded
- loose

56. PAINT

Cracking, chipping, scaling
Rusting, Chalking
"Alligatoring"
Exposed prime coat, metal surface
Repainting needed
"Spot" painting needed
Paint failure on upper chord horizontal surfaces
Painting needed in:
- difficult to paint areas
- areas that retain moisture

59. TRUSSES

Steel
- On through trusses, rust causing rapid deterioration between adjacent faces of:
  - eyebar heads
  - pin plates
  - other
- On riveted trusses, horizontal surfaces and connections of lower chord members corroding
- Expanding rust on inside surfaces of laminated or overlapping plates causing deformation
- Members:
  - buckled
  - torn
  - misaligned
- Local buckling, indicating overstress of a compression member
- Joints:
  - looseness
  - slippage
- Pins:
  - scoured
  - worn
- In place:
  - spacers
  - nuts
  - retaining caps
  - keys
- Metal clashes under live loads
- Stresses evenly divided in sections of tension members
- Counter members properly adjusted
- Abnormal cracking in looped rod tension members
- Cracks in eyes of eyebar member
- Spacers on pins holding in proper position:
  - eyebars
  - looped rods
- Physical condition of threaded members

Timber

- Weathering
- Checking
- Splitting
- Decay
- Crushing:
  - ends of compression chord
  - diagonal members
- Splices decayed
- Bolts and connections tight
- Decay:
  - at contact surfaces of joints
  - around holes where bolts are fitted
  - end panel joints
- Bridge seat:
  - dirt accumulation
  - debris
- Adequate protection to structural members by:
  - roof
  - slides
- Is truss misaligned
- Fire hazards:
  - brush or drift
  - combustible materials
  - vehicle parking
  - fires built

18. Welds

- Cracked
- Broken

21. COLLISION DAMAGE

24. DEFLECTION UNDER LOAD

27. VIBRATION UNDER LOAD

30. ALIGNMENT OF MEMBERS

33. CLEANLINESS

36. UTILITIES

Pipe, ducts, etc.
    leaking, broken, cracked
    coverings deteriorating
Corrosion, damage, loose connections
General lack of rigidity
Mounts
    rattle under traffic
    need padding
Leaking in:
    annular space between pipe
    blocked up area where utilities pass through abutments
Leaky water or sewer pipe:
    above decks
    on top of beams
Mutually hazardous transmittants sufficiently
    isolated from each other
Adequate roadway clearances
Obstructing waterway area
Hindering drift removal
Damage to encasements of pipes carrying
    fluids under pressure
Leaks in:
    vents, drains

Shut-off valves on pipelines carrying
    hazardous pressurized fluids adequately
    supported
Power cables:
    wearing
    deteriorating shielding, insulation
Impairing structural integrity
Interfering with bridge maintenance operations
Cracking in support members due to:
    vibrations
    expansion movements
Adverse aesthetic effect on bridge

MOVABLE SPANS

42. WEDGES

Loose knee pins
Excessive play
Function properly on:
    closing
    releasing

45. OPERATING MACHINERY

Alignment of:
    gears, locks
    other interlocking mechanisms
Movable parts adequately lubricated
Lubrication schedule:
    frequency sufficient
Pin locks function properly on:
    closing
    releasing
Cracks in gears
Shafts:
    twisting
    straining
    play within bearings
Keyways:
    loose on shafts and gears
    loose on keys
Cracking in:
    braces
    bearings
    housings

Cracks in concrete at:
    bearing plate attachments
    brace attachments
Bolt tight
Brake devices functioning properly
Stops: used, needed
Debris on machinery
Rust on machinery
Motors and Engines:
    If belt drive: wear, slippage, belts need replacing
    If friction drive: wear, uneven bearing areas
    If direct drive: brackings and bearings tight
    If liquid coupling: proper quantity of fluid being used leaks
    Flexible cable to motor in good condition
Auxiliary Power
    Condition good and reliable
    On double-leaf bascules: both sides have auxiliary power systems
    On hand-cranked systems:
        standing platform free of grease, debris
        can a portable generator-powered device replace manpower

48. MACHINERY GREASING

Visual signs of wear
Frequency of greasing
Cable greasing

51. ELECTRICAL SYSTEM

Excess play
Sparks
Proper functioning of:
    wiring, motors, conducts, lights
Worn or broken lines
Hazardous conditions
Rusty or mismatched members
Controller outdated
Parts need replacing
Electrical interlock working
Overheating of Span Speed control resistor banks

54. CONTROL HOUSE AND PANEL

Changes from normal operation
Structure:
    cracking
    windproof, insulated
Bulletins posted:
    Coast Guard
    Corps of Engineers
    local
Hazardous operating conditions
Accumulating combustible material
Panels:
    doors secured
    located in proper relation to:
        roadway
        waterway
    if control box with no tender:
        security system functioning properly
    tender has any complaints about panel
    tender's log up-to-date
    tender has good view of approaching:
        boats
        vehicles

57. NAVIGATION SIGNAL DEVICES

Working properly
Sufficient amount of alternate warning devices available:
    bull horns
    lanterns
    flasher lights
    flags

ADD: COUNTERWEIGHTS AND ATTACHMENTS

Sound
Properly affixed to bridge
Steel members corroded
Concrete:
    rust stained
    cracked, spalled
Debris, animals
Insect nests, birds nest
Deteriorated:
    links, slides
    housings, storage area bridge balanced

Extra weight blocks available
Pain periodically removed
Properly drained

ADD: SUBMARINE CABLES

Proper sized conductors in cable
Proper number of conductors in cable
Spares available
Any failures
Protected from boats, the public
Behind fender system
Kinked, hooked
Exposed above water, below water
Cable ends:
    conditioned
    protected from moisture
Excess marine or plant growth on cable
If spliced cable:
    condition of box seal still good
Clamps and securing clips satisfactory

58. DECK

19. DECK

Concrete
- Scaling, spalling
- Reflection cracking
- Potholes
- Hollow areas
- Surface cracking
- Underside cracking
- Wet concrete leaching
- Reinforcing steel:
  - exposed
  - rusting
- Surface:
  - worn
  - polished
- Joints:
  - grout in good condition
  - spalled
- Rod nuts:
  - loose
  - tight
  - rusted
- Curb alignment good

Steel
- Corrosion
- Cracked welds
- Broken welds, clips
- Deck securely fastened
- Loss of section due to: rust, wear
- Deck slippery when wet
- Effect of utilities bad
- If an open-grating deck:
  - cracked welds
  - slippery when wet

Timber
- Planks:
  - loose
  - broken
  - worn
- Fasteners:
  - loose
  - missing
- Decay
- Asphalt overlay:
  - potholes
  - cracks
- Members under traffic:
  - looseness
  - excessive deflection
- Deck slippery

Deck draining properly
Effect of utilities bad
Felloe guards:
    properly aligned
    in good condition
    bolted in place
Ballast:
    potholes
    rust
Tread plates:
    loose
    slick
Striping needed

22. CURBS

Concrete
    cracking
    spalling
    deteriorating
Timber:
    splitting
    warping
    decaying
Projecting onto roadway, shoulders
Loss of curb height:
    due to build-up of deck surface
Timber wheel guards or scupper blocks:
    split
    checked
    decayed
Bolted securely in place
Paint in good condition

25. SIDEWALKS

Cracking
Spalling
Deterioration
Differential movement at joints
Corrosion
Connections secure
Timber sound
Floor planks adequately supported

Planks:
- missing
- cracking
- decaying
- warping
- nails protruding

Sidewalks slippery, rough
Drainage adequate
Structural intergrity of brackets

28. BRIDGE RAILS

Collision damage
Weakening from deterioration
In concrete or rebars:
- cracking
- corrosion
- disintegration

In steel or aluminum:
- loose posts or rails
- rusting or deteriorating

Post connections to deck:
- in good condition

Timber:
- decaying
- loose connections
- missing rails
- damaged rails

Vertical and horizontal alignment:
- show settlement in substructure
- bearing deficiencies

Handrail joints:
- open
- functioning properly

Handrails:
- height adequate
- secure
- free of slivers
- free of hazardous projections

Rust stains on concrete around steel posts
Barrier railings:
- extend beyond parapet end
- extend beyond end of bridge railing
- anchored to inside face
- damaged
- misaligned
- cracked
- deteriorated
- corroded

Parapet ends:
- unprotected
- need installation of flared, tapered railing

Anchor bolts and nuts tight

34. EXPANSION JOINTS

Freedom of movement
Proper clearance
Proper vertical alignment
Sufficient room for expansion
Closed
Widely opened
Seals:
- pulling away from joint edges
- abrasive
- shriveling
- deteriorating

Stains, leaking
Voids, laminations
Any improperly sealed joints need:
- cleaning
- resealing

Free of:
- stones
- debris

Steel finger type joints:
- loose anchorages
- cracking or breaking of welds jammed by resurfacing

Sliding plate joints:
- loose anchorages
- cracking or breaking of welds

31. FIXED JOINTS

Any movement
Proper clearance
Proper vertical alignment
Stains, signs of leaking
Free of stones, debris
Any clogged by resurfacing

37. JOINT LEAKAGE

40. DRAINAGE

Deck or deck inlets:
    clogged
    inadequate openings
Any water stains on:
    beams
    piers
    abutments
Drain outlets discharging water
    where detrimental to other members
Pipes damaged by:
    freezing
    corrosion
    collision
Pipes clogged
Any deck sand or soil accumulation

43. PROFILE ELEVATION

Visible settlement

46. PARAPET

Spalled
Cracked
Damaged

49. LIGHT STANDARDS

Poles:
- dented, scraped
- cracked, inclined
- otherwise damaged

Aluminum standards cracking in:
- mast arms
- cast fittings
- base
- cast elements

Steel rusted

Concrete:
- cracked
- spalled

Exposed wiring insulation:
- faulty
- worn
- damaged

Evidence of:
- bad wiring practices
- bunches of excess wires
- poor wire splices
- inadequate securing of ground lines
- loose wires

Junction boxes:
- poor wire splices
- loose connections
- excessive moisture
- outlet or switch box covers out of place

Conduits:
- rustedmissing sections

Conduit braces and boxes properly secured

Hanging braces and boxes properly secured

Hanging fishing lines or moss

Missing lamps

Sign lighting adequate

60. SUBSTRUCTURE

63. ABUTMENTS

Scour
Erosion
Movement
Settlement
Drains and weepholes:
    clear
    functioning properly
Bearing seats:
    cracked
    spalled
Deteriorating concrete
Backwalls:
    cracked
    weathered
    spalled
    leaking

66. BACKWALL

Settlement
Tilting
Spalling
Cracking
Rotting
Damaged

69. WINGWALL

Settlement
Tilting
Spalling
Cracking

72. BULKHEAD

Rotting
Broken timbers

75. CAPS

Concrete
- cracking
- spalling
- cleanliness, debris

Timber
- rotting
- broken, cracked
- cleanliness

Splitting
Crushing
Breaking
Showing excessive deflection under heavy loads
Collecting dirt and debris

78. BENT PILES

Concrete
- Erosion
- Undermining of foundation by scour
- Exposed piles
- Evidence of tilt
- Settlement
- Disintegration:
  - in splash zone
  - wherever exposed to roadway drainage
  - at water line
  - at ground line
- Pier columns cracked
- Pier caps cracked
- Bearing seats:
  - cracked
  - spalled
- Stone masonry piers:
  - cracked
  - water or vegetation in cracks
- Stones:
  - spalled
  - split
  - loose
  - missing
- Corroded steel piers or bents at:
  - joints
  - splices

Grout pads or pedestals:
cracked
spalled
deteriorated
Steel piles in splash zone or below surface:
rusted
deteriorated
Any significant changes in clearance, indicating pier movement
Structural damage to:
piers
bents
Where steel cap girder and continuous longitudinal beams are framed together, any cracked
top flanges
welds
webs
Unusual movement in bent members under heavy loads
Movement of freely rotating rocker bents restrained by:
severe corrosion
foreign particles
other debris
Earth or rock fills, piled against piers

Steel

Rust:
at ground level
in splash zone (2' above high tide or mean water level)
in submerged part
Debris around bases
Steel caps rotating due to eccentric connections
In bracing:
broken connections
loose rivets
loose bolts
Condition of web stiffeners

Timber

Decay in:
piles
caps
bracing
Decay beginning at:
ground line
water line
joints and splices
Loose bolts in:
splices
connections

Fungi
Marine borers
Shipworms
Footing piles exposed
Damage to:
wood
bolt holes
daps
other connections

9. BENTS AND 64. PIERS

Erosion or undermining of foundation by scour
Evidence of:
tilt
settlement
Disintegration of concrete:
splash zone
water line
ground line
where exposed to roadway drainage
Pier columns cracked
Pier caps cracked
Bearing seats:
cracked
spalled
Corroded steel piers or bents at:
joints
splices
Grout pads or pedestals:
cracked
spalled
deteriorated
Steel piles in splash zone or below surface:
rusted
deteriorated
Pier movement, indicated by changes in clearance
Structural damage
Where steel cap girder and continuous
longitudinal beams are framed together:
cracked top flanges
cracked welds
cracked webs
Unusual movement under heavy loads
Where freely rotating rocker bents, movement
restrained by:
severe corrosion
foreign particles
other debris
Earth or rock fills piled against piers

67. COLUMNS

Steel
- rusted, corroded
- damaged by collision

Concrete
- spalled
- cracked
- damaged by collision

70. PEDESTAL

- Undermining and erosion
- Cracked
- Broken

73. FOOTINGS

- Settlement
- Tilting
- Undermining by erosion
- Cracking

76. FOUNDATION PILES

- Exposed

79. BRACING

10. SETTLEMENT

65. CONCRETE CRACKS AND SPALLS

68. STEEL CORROSION

71. TIMBER DECAY

74. COLLISION DAMAGE

77. PAINT

80. CLEANLINESS

72. APPROACH

15. CONSTRUCTION JOINT

Vertical displacment at joint of bridge
    backwall
Joint seal:
    damaged
    missing
Clogged
Other transverse joints:
    closed
    clogged

18. PAVEMENT

Uneven
Rough
Cracked
Potholes
Approach:
    too wide for bridge
    to narrow

21. RELIEF JOINT

Is 4" opening correct
Clogged

24. APPROACH SLAB

Under or alongside of slab:
    erosion
    voids
Settlement
Tilting
Spalling
Cracking

27. GUARDRAIL

Good condition
Collision damage
Constructed according to standard plans

30. ALIGNMENT

33. RETAINING WALL

Soil under embankment settling
Timber cribs:
    decayed
    termite ridden
Concrete cribs:
    chipped
    spalled
Locking keys:
    damaged
    missing
Flanges:
    damaged
    missing

36. SHOULDER

Proper width
Good condition
At proper grade

39. EMBANKMENT

Slopes:
    adequate
    maintained

42. DRAINAGE

Adequate
Maintained
Erosion

61. WATERWAY

GENERAL

Water marks on:
    painted structure
    trees
Existing bank and shore:
    adequate
    in good condition
Levee erosion cuased by:
    improper location
    skew of bridge piers or abutments
Existing protection need to be:
    added to
    revised
High backwater caused by:
    high fills
    inadequate or debris-jammed culverts
Wave action affecting:
    bridge
    approaches
Problem areas around:
    bridge
    approaches

16. REVETMENT

Undermining

19. RIPRAP

Undermining

22. SPUR DYKE

Erosion
Functioning properly

25. EMBANKMENT EROSION

28. CHANNEL SCOUR

Scour tendencies indentified by taking:
- channel profiles
- channel soundings

Degradation

31. CHANNEL CHANGE

Impairing or decreasing effectiveness of present protection

34. VEGETATION

37. DRIFT

Debris:
- under deck
- on bridge seats
- along banks upstream
- around bridge

other signs of structural failures
loose cables
broken cables
missing walers
missing blocks
missing bolts
Protective treatment
need patching
need replacing
Catwalks in good condition

43. ADEQUACY OF OPENING

TRAFFIC SERVICES

17. SIGNS

Additional ones needed
If built before 1940:
is weight limit posted
Clearances meet 13' 6" minimum standard
If sub-standard:
"Low Clearance" sign
If bridge is narrower than approach:
"Narrow Bridge" sign
If a narrow underpass:
traffic effectively warned
Speed and traffic markers appropriate
If movable bridge:
warning signs for:
draw spans
submarine cables
interconnected traffic signals
drawbridge gates
warning signs in advance
Side-mounted signs:
30' from roadway edge
located behind barrier or guardrail
affixed to a breakaway installation
Hazardous sign supports

Caution signs:
- in good condition
- vandalized
- meet minimum size requirement
- reflectorization or painting adequate for night visibility
- obscured by heavy growth
- need to be relocated

Supports:
- bent
- twisted
- otherwise damaged

20. STRIPING

Adequate for night visibility
Needs to be re-done

23. HAZARD MARKER

26. AERIAL SIGNAL

29. WARNING DEVICES

32. CLEARANCE SIGN

38. LEGIBILITY

41. VISIBILITY

44. NAVIGATION LIGHTS

All present
Properly located
If a fixed bridge:
    green light suspended from
        superstructure over channel centerline
    red lights:
        marking channel edges
        on piers, fenders
If a movable span:
    lighting meets requirements of:
        Section 68, Coast Guard Pamphlet CG 204
Lighting devices:
    rusted
    broken lenses
    missing lenses
If a movable span:
    lighting meets requirements of:
        Section 68, Coast Guard Pamphlet CG 204
Lighting devices:
    rusted
    broken lenses
Functioning properly
Loose or corroded:
    wiring
    conduits
    securing devices
Aerial obstruction lights:
    functioning properly
    meet requirements of that brige

PAGE ☐/☐

STATE OF LOUISIANA
DEPARTMENT OF HIGHWAYS

FORM 306
REV. 11/71

BRIDGE INSPECTION REPORT

TYPE INSPECTION
CURSORY ☐
IN DEPTH ☐
SUPPLEMENTAL ☐

DIST. _____
BRIDGE NAME OR FEATURE _____ YR. BUILT _____

1 ☐ CONTROL SECTION ☐☐☐☐☐ LOG MI ☐☐☐☐ 2 I.D. NO. ☐ 3 RECALL NO. ☐☐☐☐☐☐ 8 9 FIELD BOOK NO. ☐☐☐☐☐☐ 14

PARISH _____ ROUTE _____ BRIDGE TYPE _____

BRIDGE LENGTH _____ RDWY. WIDTH _____ SURFACE TYPE _____ ADT _____

59 SUPERSTRUCTURE	OVERALL RATING 15 ☐					58 DECK	OVERALL RATING 16 ☐		REMARKS
17	☐	BEARINGS	18	☐	WELDS	19	☐	DECK	
20	☐	LOWER CHORD	21	☐	COLLISION DAMAGE	22	☐	CURBS	
23	☐	FLOOR BEAMS	24	☐	DEFLECTION UNDER LOAD	25	☐	SIDEWALK	
26	☐	GIRDERS	27	☐	VIBRATION UNDER LOAD	28	☐	BRIDGE RAIL	
29	☐	STRINGERS	30	☐	ALIGNMENT OF MEMBERS	31	☐	FIXED JOINT	
32	☐	DIAPHRAMS	33	☐	CLEANLINESS	34	☐	EXPANSION JOINT	
35	☐	LATERAL BRACING	36	☐	UTILITIES	37	☐	JOINT LEAKAGE	
38	☐	SWAY BRACING	MOVABLE SPANS	OVERALL RATING 39 ☐		40	☐	DRAINAGE	
41	☐	VERTICALS	42	☐	WEDGES	43	☐	PROFILE ELEV.	
44	☐	DIAGONALS	45	☐	OPERATING MACHINERY	46	☐	PARAPET	
47	☐	PORTALS	48	☐	MACHINERY GREASING	49	☐	LIGHT STANDARDS	
50	☐	UPPER CHORD	51	☐	ELECTRICAL SYSTEM	52	☐		
53	☐	RIVETS & BOLTS	54	☐	CONTROL PANEL	55	☐		
56	☐	PAINT	57	☐	NAVIGATION SIGNAL DEVICES	58	☐		
59	☐		60	☐		61	☐		

60 SUBSTRUCTURE						OVERALL RATING 62 ☐			
63	☐	ABUTMENTS	64	☐	PIERS	65	☐	CONC. CRACKS & SPALLS	
66	☐	BACKWALL	67	☐	COLUMNS	68	☐	STEEL CORROSION	
69	☐	WINGWALL	70	☐	PEDESTAL	71	☐	TIMBER DECAY	
72	☐	BULKHEAD	73	☐	FOOTINGS	74	☐	COLLISION DAMAGE	
75	☐	CAPS	76	☐	FOUNDATION PILES	77	☐	PAINT	
1 78	☐	BENT PILES	79	☐	BRACING	80	☐	CLEANLINESS	
2 9	☐	BENTS	10	☐	SETTLEMENT	11	☐		

72 APPROACH	OVERALL RATING 12 ☐		61 WATERWAY	OVERALL RATING 13 ☐		TR. SER.	OVERALL RATING 14 ☐		
15	☐	CONST. JOINT	16	☐	REVETMENT	17	☐	SPEED LIMIT SIGN	
18	☐	PAVEMENT	19	☐	RIPRAP	20	☐	STRIPING	
21	☐	RELIEF JOINT	22	☐	SPUR DYKE	23	☐	HAZARD MARKER	
24	☐	APPROACH SLAB	25	☐	EMBANKMENT EROSION	26	☐	AERIAL SIGNAL	
27	☐	GUARDRAIL	28	☐	CHANNEL SCOUR	29	☐	WARNING DEVICES	
30	☐	ALIGNMENT	31	☐	CHANNEL CHANGE	32	☐	CLEARANCE SIGN	
33	☐	RETAINING WALL	34	☐	VEGETATION	35	☐	BARRIERS & GATES	
36	☐	SHOULDER	37	☐	DRIFT	38	☐	LEGIBILITY	
39	☐	EMBANKMENT	40	☐	FENDER SYSTEM	41	☐	VISIBILITY	
42	☐	DRAINAGE	43	☐	ADEQUACY OF OPENING	44	☐	NAVIGATION LIGHTS	
45	☐		46	☐		47	☐		

CRITICAL 0-1-2 POOR 3-4-5 FAIR 6-7 GOOD 8-9

RECOMMENDED NEXT INSPECTION 48 ☐☐☐☐ 51

INSPECTED BY _____ DATE 52 ☐☐ MO. 55 ☐☐ YR.

TOTAL RATING 56 ☐ OVERALL STRUCTURAL RATING 57 ☐

APPROVED BY _____ DATE _____

POSTED LOAD 58 59 ☐☐ DESIGN LOAD 60 61 ☐☐

SCHEDULE MAINT. REPAIRS
☐ IMMEDIATELY
☐ ROUTINE

USE – WHEN ITEM NOT APPLICABLE

APPENDIX B

SUPPLEMENTAL FIELD DATA

NOTE

In addition to the supplemental data provided by these forms the inspection data from the last bridge inspection report (Appendix A page 33) is also furnished for compilation into Master Structure File (Appendix C).

FORM ECS-035

APPLICATION SUPPLEMENTAL DATA FOR MASTER STRUCTURE FILE

CODED BY PROJECT CONTROL

LOUISIANA DEPT. OF HIGHWAYS
ENGINEERING COMPUTER SECTION
GENERAL CODING SHEET

DATE _____

SHEET ____ OF ____

I. D. NUMBER (0–5)	PLANS		DATE OF MAJOR CONSTRUCTION (10)	TOTAL NUMBER OF REPAIRS (15)	PAINT									
	AS BUILT	WHERE FILED			PROJECT NUMBER (20)	SYSTEM (25)	DATE COMPLETE (30)	PAINTED BY (35–45)	CLEANING METHOD	QUANTITY OF PAINT (50)	COLOR (55)	# OF COATS	COST (60)	(65–80)

B-3

FORM ECS-035

APPLICATION SUPPLEMENTAL DATA FOR MASTER STRUCTURE FILE

CODED BY BRIDGE DESIGN

LOUISIANA DEPT. OF HIGHWAYS

ENGINEERING COMPUTER SECTION

GENERAL CODING SHEET

DATE _____

SHEET ____ OF ____

I.D. NUMBER (0–5)	MAJOR BRIDGE	OPERATING RATING (10)	INVENTORY RATING	DESIGN ADT (15)	WATERWAY CLASS	NORMAL STREAM VELOCITY (20)	STREAM BED MATERIAL	RELIEF STRUCTURE	HYDRO - SURVEY (25)	MICRO - INDEX	DATE OF LATEST HYDRO - SURVEY (30)	HYDRO - SURVEY RATING	DRAINAGE OPENING (35–40)	AREA DRAINED	QUANTITIES: CONCRETE (45)	QUANTITIES: DEFORMED STEEL (50)	QUANTITIES: STRUCTURAL STEEL (55)	STRESS ANALYSIS WHERE FILED (60)	(65–80)

FORM ECS-035

APPLICATION MASTER STRUCTURE FILE
CODED BY PROJECT CONTROL

LOUISIANA DEPT. OF HIGHWAYS
ENGINEERING COMPUTER SECTION
GENERAL CODING SHEET

DATE _____
SHEET ____ OF ____

I. D. NUMBER (0–5)	STATE PROJECT NUMBER CONSTRUCTED UNDER (10–15)	COST OF STRUCTURE (20)	SHARED COST (25)	FEATURE CROSSED (30–40)	LAST FIVE REPAIRS: LATEST DATE (45)	LATEST TYPE	SECOND LATEST DATE (50)	SECOND LATEST TYPE	THIRD LATEST DATE (55)	THIRD LATEST TYPE	FOURTH LATEST DATE (60)	FOURTH LATEST TYPE	FIFTH LATEST DATE (65)	FIFTH LATEST TYPE	BRIDGE I. D.	CONT. - DIST.	PLANS AVAIL. (70)	(75–80)

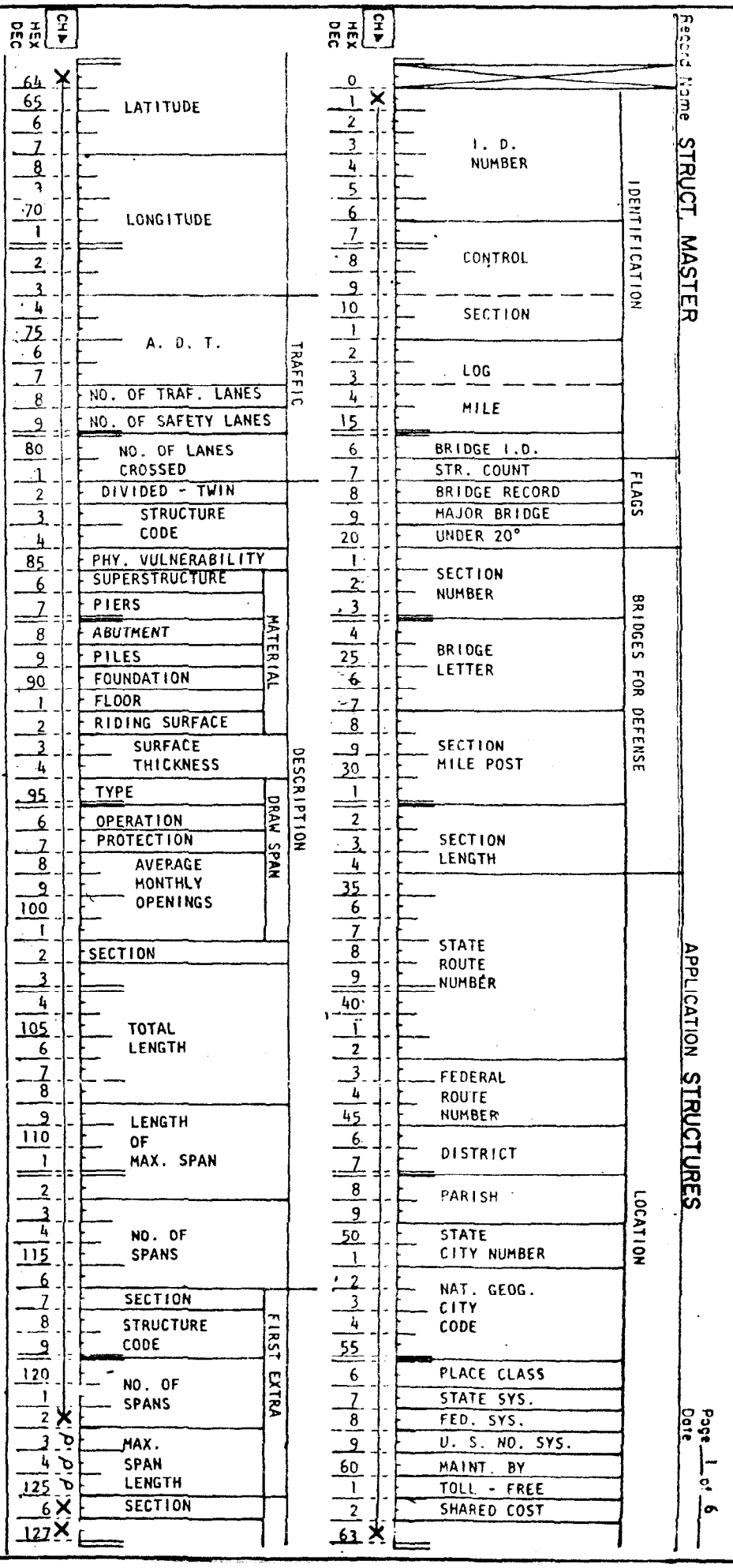
APPENDIX C

MASTER STRUCTURE FILE

LOUISIANA DEPARTMENT OF HIGHWAYS RECORD LAYOUT SHEET

Record Name STRUCT. MASTER — APPLICATION STRUCTURES

Page 1 of 6
Date



LOUISIANA DEPARTMENT OF HIGHWAYS RECORD LAYOUT SHEET

Record Name STRUCT. MASTER — APPLICATION STRUCTURES — Page 2 of 6 — Date

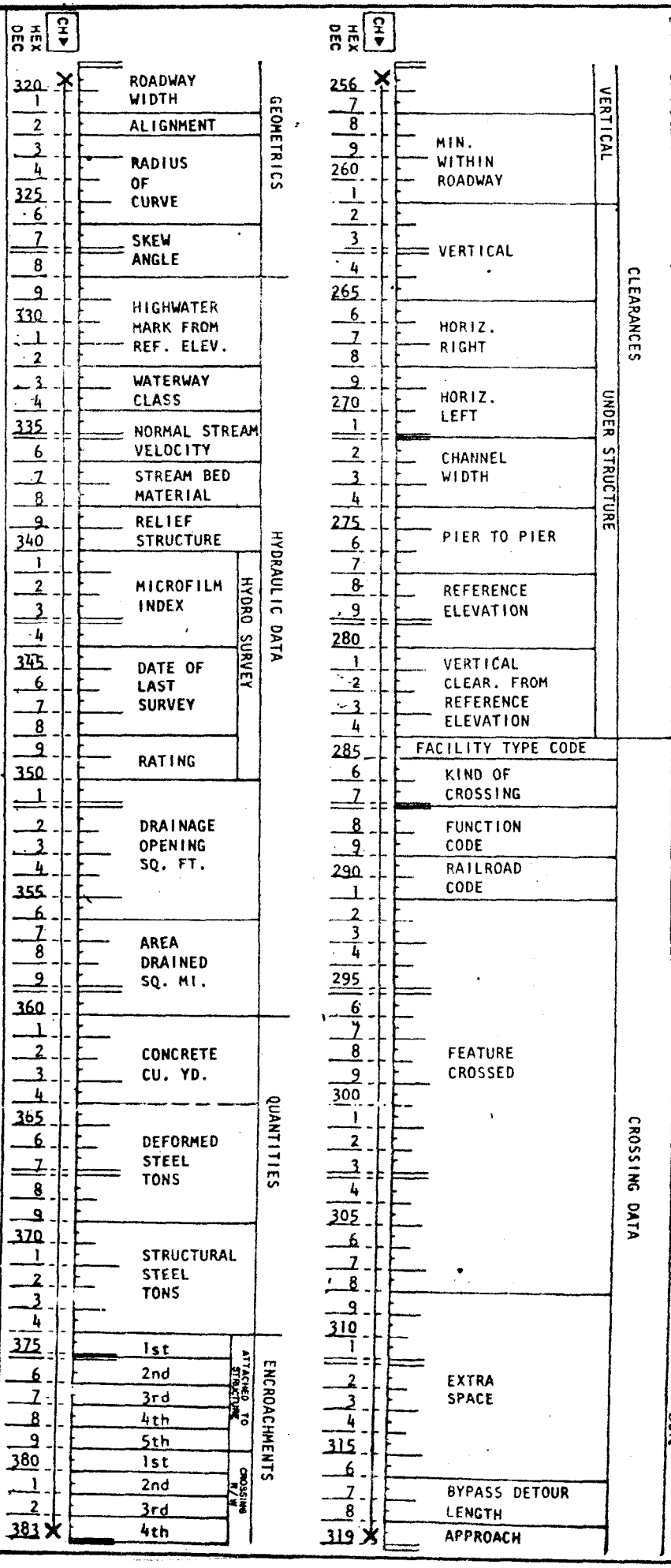
EXTRA DESCRIPTIONS

HEX	DEC	CH▶		
			STRUCTURE CODE	SECOND EXTRA
128		X		
9			NO. OF SPANS	
130		X		
1		P	MAX. SPAN LENGTH	
2		P		
3		P		
4		P		
135		X	SECTION	THIRD EXTRA
6			STRUCTURE CODE	
7				
8			NO. OF SPANS	
9				
140		X		
1		P	MAX. SPAN LENGTH	
2		P		
3		P		
4		X	SECTION	FOURTH EXTRA
145			STRUCTURE CODE	
6				
7			NO. OF SPANS	
8				
9		X		
150		P	MAX. SPAN LENGTH	
1		P		
2		P		
3		X	SECTION	FIFTH EXTRA
4			STRUCTURE CODE	
155				
6			NO. OF SPANS	
7				
8		X		
9		P	MAX. SPAN LENGTH	
160		P		
1		P		
2		X	SECTION	SIXTH EXTRA
3			STRUCTURE CODE	
4				
165			NO. OF SPANS	
6				
7		X		
8		P	MAX. SPAN LENGTH	
9		P		
170		P		
1		X	SECTION	SEVENTH EXTRA
2			STRUCTURE CODE	
3				
4			NO. OF SPANS	
175				
6		X		
7		P	MAX. SPAN LENGTH	
8		P		
9		P		
180		X	SECTION	EIGHTH EXTRA
1			STRUCTURE CODE	
2				
3			NO. OF SPANS	
4				
185		X		
6		P	MAX. SPAN LENGTH	
7		P		
8		P		
9		X	SECTION	NINTH
190		X	STRUCTURE CODE	
191		X		

HEX	DEC	CH▶		
192		X	NO. OF SPANS	EXTRA
3		X		
4		X		
195		P	MAX. SPAN LENGTH	
6		P		
7		P		
8		X	DESIGN LOAD	CAPACITY DATA
9				
200			OPERATING RATING	
1				
2				
3			INVENTORY RATING	
4				
205				
6			POSTED LOAD LIMIT	
7				
8			POSTED SPEED LIMIT	
9				
210			DESIGN A.D.T.	
1				
2				
3			STRUCTURE FLARED	CLEARANCES
4			CURB/CURB SHOU/SHOU RIGHT	HORIZONTAL
215				
6				
7			CURB/CURB SHOU/SHOU LEFT	
8				
9				
220			RAIL/RAIL RIGHT	
1				
2				
3			RAIL/RAIL LEFT	
4				
225				
6			TYPE	RAILING
7				
8			MATERIAL	
9			NUMBER	SIDEWALKS
230			WIDTH	
1				
2			SIDE OF STR.	
3			OUT TO OUT STRUCTURE WIDTH	
4				
235				
6				
7			WIDTH @ MAX. OVERHEAD	
8				
9				
240			TOTAL SHOULDER WIDTH	
1				
2				
3			MEDIAN TYPE	
4			MEDIAN WIDTH	
245				
6				VERTICAL
7			CENTERLINE	
8				
9				
250			RIGHT CURB	
1				
2				
3				
4			LEFT CURB	
255		X		

LOUISIANA DEPARTMENT OF HIGHWAYS RECORD LAYOUT SHEET

Record Name STRUCT. MASTER — APPLICATION STRUCTURES — Page 2 of 6 — Date



LOUISIANA DEPARTMENT OF HIGHWAYS RECORD LAYOUT SHEET

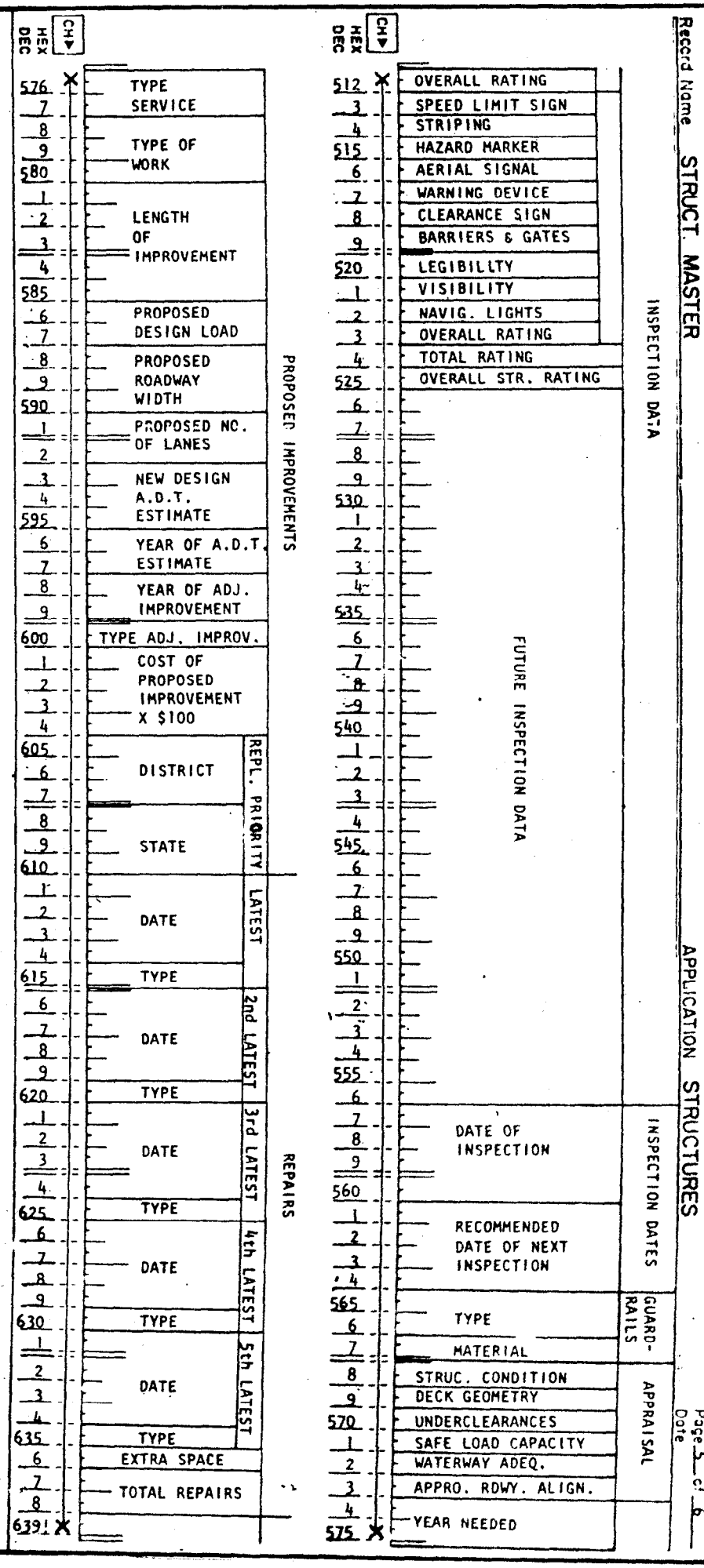
Record Name **STRUCT. MASTER** — **APPLICATION STRUCTURES**

HEX DEC	CH▶			
448	X	CLEANLINESS	DECK DATA	MOVABLE SPANS
9		UTILITIES		
450		OVERALL RATING		
1		WEDGES		
2		MACHINERY		
		GREASING		
4		ELECTRICAL		
455		CONTROL PANEL		
*6		SIGNAL DEVICES		
7		OVERALL RATING		
8		DECK		DECK
9		CURBS		
460		SIDEWALKS		
1		BRIDGE RAIL		
2		FIXED JOINT		
3		EXPANSION JOINT		
4		JOINT LEAKAGE		
465		DRAINAGE		
6		PROFILE ELEV.		
7		PARAPET		
8		LIGHT STANDARDS		
9		OVERALL RATING		
470		ABUTMENTS		SUBSTRUCTURE
1		BACKWALL		
2		WINGWALL		
3		BULKHEAD		
4		CAPS		
475		BENT PILES		
6		BENTS		
7		PIERS		
8		COLUMNS		
9		PEDESTAL		
480		FOOTINGS		
1		FOUND. PILES		
2		BRACING		
3		SETTLEMENT		
4		CRACKS & SPALLS		
485		STEEL CORROSION		
6		TIMBER DECAY		
7		COLL. DAMAGE		
8		PAINT		
9		CLEANLINESS		
490		OVERALL RATING		
1		CONST. JOINT		APPROACH
2		PAVEMENT		
3		RELIEF JOINT		
4		APPROACH SLAB		
495		GUARDRAIL		
6		ALIGNMENT		
7		RETAINING WALL		
8		SHOULDER		
9		EMBANKMENT		
500		DRAINAGE		
1		OVERALL RATING		
2		REVETMENT		WATERWAY
3		RIPRAP (APRON)		
4		SPUR DIKE		
505		EMBANK. ERROS.		
6		CHANNEL SCOUR		
7		CHANNEL CHANGE		
8		VEGETATION		
9		DRIFT		
510		FENDER SYSTEM		
511	X	ADEQ. OPENING		

HEX DEC	CH▶			
384	X	5th	PLANS DATA	
385		STATE PROJECT NUMBER CONSTRUCTED UNDER		
6				
7				
8				
9				
390				
1				
2				
3				
4		TYPE PLANS AVAILABLE		
395		AS BUILT?		
6				
7		WHERE FILED		
8				
9		EXTRA SPACE		
400				
1				
2				
3		COST OF STRUCTURE		
4				
405				
6				
7				
8				
9				
410				
1				
2		STRESS ANAL. DATA		
3		WHERE FILED		
4				
415		DATE OF COMPLETION		
6				
7				
8				
9		DATE OF MAJOR RECONSTRUCTION		
420				
1				
2				
3		DATE OF INVENTORY		
4				
425				
6				
7				
8				
9		BEARINGS	SUPERSTRUCTURE	INSPECTION
430		LOWER CHORD		
1		FLOOR BEAMS		
2		GIRDERS		
3		STRINGERS		
4		DIAPHRAGMS		
435		LATERAL BRACING		
6		SWAY BRACING		
7		VERTICALS		
8		DIAGONALS		
9		PORTALS		
440		UPPER CHORD		
1		RIVETS & BOLTS		
2		PAINT		
3		WELDS		
4		COLLISION DAMAGE		
445		DEFLECTION		
6		VIBRATION		
447	X	ALIGNMENT		

LOUISIANA DEPARTMENT OF HIGHWAYS RECORD LAYOUT SHEET

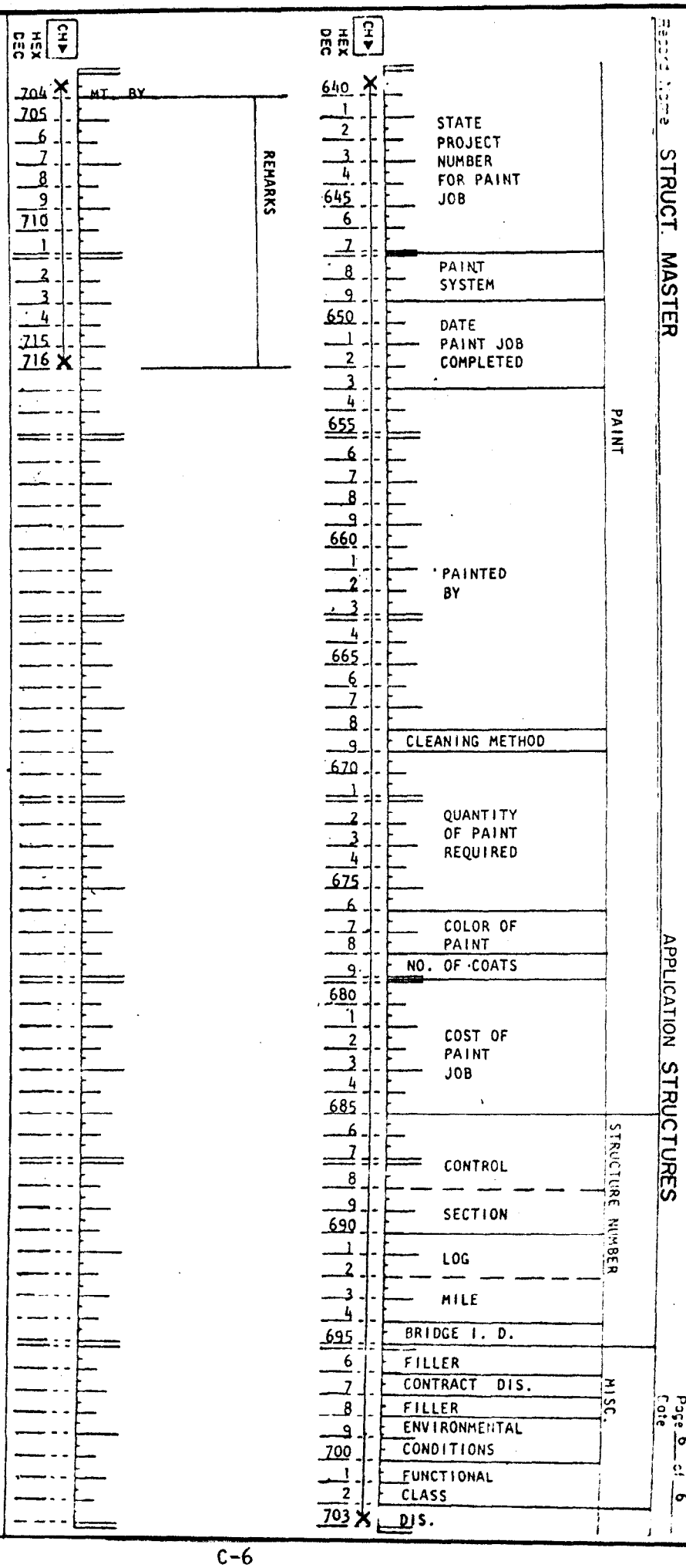
Record Name STRUCT. MASTER — APPLICATION STRUCTURES



Page 5 of 6
Date

LOUISIANA DEPARTMENT OF HIGHWAYS RECORD LAYOUT SHEET

Record Name STRUCT. MASTER — APPLICATION STRUCTURES



Page 6 of 6 Date

APPENDIX D

MASTER STRUCTURE FILE CODES

IDENTIFICATION

RECALL NUMBER - Columns 1-6

A unique 6 digit number for each structure.

CONTROL NUMBER - Columns 7-9

Code the control number, assigned by Project Control, of the section of road being coded. Prefix the code with zeros to complete the field.

SECTION NUMBER - Columns 10-11

Code the section number, assigned by Project Control, of the control being coded. Prefix with zeros to complete the field.

LOG MILE - Columns 12-15

The log mile location is the distance from the beginning of the control section to the structure being coded. Record this distance in these columns prefixing enough zeros to form a 4-digit code.

BRIDGE I.D. - Column 16

Code one of the following numbers in this field:

Right Main Roadway	1
Left Main Roadway	2
Right Frontage Road	3
Left Frontage Road	4

When on a two-lane highway, the number should be "1". When traveling under an underpass the number should also be "1" unless it only involves the left roadway of a divided highway in which case the number should be "2".

FLAGS

STRUCTURE COUNT - Column 17

Code (*) if the structure is to be counted with this control section.

BRIDGES FOR DEFENSE - Column 18

Code (*) if bridge for defense.

MAJOR BRIDGES - Column 19

Code (*) if designated major.

UNDER 20 FEET - Column 20

Code (*) if bridge is not 20 feet long.

BRIDGES FOR DEFENSE

SECTION NUMBER - Columns 21-23

As required by "Bridges for Defense".

BRIDGE LETTER - Columns 24-27

As required by "Bridges for Defense".

SECTION MILE POST - Columns 28-31

As required by "Bridges for Defense".

SECTION LENGTH - Columns 32-34

As required by "Bridges for Defense".

LOCATION

STATE ROUTE NUMBER - Columns 35-42

Code the interstate, U.S., state, or other highway route number.

FEDERAL ROUTE NUMBER - Columns 43-45

Code the federal route number.

DISTRICT - Columns 46-47

Code the number of the "Highway Construction and Maintenance District" in which the structure is located.

PARISH - Columns 48-49

Code the number assigned to the parish in which the structure is located.

CITY

STATE CODE NO. - Columns 50-51

When structures are within incorporated places or within delimited unincorporated areas it will be necessary to code the number assigned to that place.

NATIONAL GEOGRAPHIC CODE NO. - Columns 52-55

As coded by 1970 U.S. Census Geographic coding scheme.

PLACE CLASS - Column 56

Code 1 - Rural areas.

2 - In incorporated places under 2500 population.

3 - In incorporated places between 2500 - 4999 population.

4 - In incroporated places between 5000 - 9999 population.

5 - In incorporated places between 10,000 - 24,999 population.

6 - In incorporated places between 25,000 - 49,999 population.

7 - In incorporated places between 50,000 - 99,999 population.

8 - In incorporated places 100,000 population and over.

9 - In approved urban unincorporated areas adjacent to places of 5000 or more population.

0 - In other delimited urban unincorporated places.

SYSTEM

STATE - Column 57

Code 1 - Interstate (Fed. aid interstate).

2 - Primary (designated by Legislature as State primary).

3 - Secondary (designated by Legislature as State secondary).

4 - Farm-To-Market (designated by Legislature as State farm-to-market).

7 - Local (all public roads, rural and urban, that are not part of the State maintained system).

FEDERAL - Column 58

Code I - Interstate (Fed. aid interstate).

P - Primary (Fed. aid primary).

S - Secondary (Fed. aid secondary).

If not on any federal aid system, leave blank.

U.S. NUMBERED - Column 59

Code a U if the structure is on a road which is part of the US Numbered System of Highways. If not, leave columns blank.

MAINT. BY - Column 60

1 - State funded and maintained

2 - Partially State funded and State maintained.

3 - Not State funded and State maintained.

4 - Funded and maintained by other agency.

TOLL - FREE - Column 61

If there is a toll for crossing this structure, code a "1" in this column. If not leave blank.

SHARED COST - Column 62

Code an (*) if the operation and/or maintenance costs are to be shared by LDH and some other agency.

LATITUDE - Columns 63-67

Enter latitude in degrees, minutes, and tenths of minutes.

LONGITUDE - Columns 68-73

Enter longitude in degrees, minutes, and tenths of minutes.

TRAFFIC

CURRENT ADT - Columns 74-77

Code to nearest 10 vehicles.

NUMBER OF TRAFFIC LANES - Column 78

Code actual number of traffic lanes.

NUMBER OF SAFETY LANES - Column 79

Code actual number of safety lanes.

NUMBER OF LANES CROSSED - Columns 80-81

Code actual number of traffic lanes of the roadway being intersected.

DESCRIPTION

DIVIDED-TWIN - Column 82

If opposing traffic on the structure is physically separated by means of barrier curb, bridge superstructure, raised median, etc., place "D" in this column. For parallel structures (each carrying traffic in opposite directions) place "R" (Right) for the structure in the direction of inventory and "L" (Left) for the structure in the opposite direction of inventory. If none of the above situtations exist, leave this column blank.

TYPE CODE - Column 83-84

As given in Control Section Manual.

PHYSICAL VULNERABILITY - Column 85

Timber trestle	Code - 1
Concrete girder	Code - 2
Steel girder	Code - 3
Cantilever and truss	Code - 4

Suspension	Code - 5
Reinforced concrete - massive arch	Code - 6
Dam bridge	Code - 7
Box culverts	Code - 8
Tunnels	Code - 9
No structure	Code - 0

MATERIAL

SUPERSTRUCTURE - Column 86

Code the material or combination of materials in the superstructure including everything above the caps or piers except the floor.

MATERIAL - CODES FOR SUBSTRUCTURE-SUPERSTRUCTURE

Untreated Timber	1	1
Untreated Timber & Treated Timber	2	2
Treated Timber	3	3
Treated Timber & Concrete	4	4
Treated Timber & Steel	5	5
Reinforced Concrete	6	6
Reinforced Concrete & Steel	7	7
Steel	8	8
Steel (Concrete Filled)	9	-
Concrete Piling (Hollow)	0	-

PIERS - Column 87

Same codes as superstructure.

ABUTMENTS - Column 88

Same codes as superstructure.

PILES - Column 89

Same codes as superstructure.

FOUNDATION - Column 90

Same codes as superstructure.

FLOOR - Column 91

Code the material or combination of material in the floor.

MATERIAL	CODE
Untreated Timber	1
Untreated Timber - Steel Traffic Plates	2
Treated Timber	3
Treated Timber - Steel Traffic Plates	4
Steel Grill	5
Corrugated Steel - Asphalt	6
Concrete Reinforced	7

RIDING SURFACE - Column 92

1 - Soil, Dirt, etc.

2 - Gravel, Shell, etc.

3 - Bituminous - Low type

4 - Bituminous - High type

5 - Bituminous Concrete

6 - Light weight concrete

7 - Portland cement concrete

0 - Same as floor of structure

SURFACE THICKNESS - Column 93-94

Code to nearest half inch.

DRAW SPAN

Type - Column 95

Indicate the type of draw span using the following codes:

Code 1 - Single leaf bascule

2 - Double leaf bascule

3 - Vertical lift

4 - Rotary (Swing)

5 - Pontoon (Swing)

6 - I-Beam (Lift out)

7 - Boat (On ferries only)

8 - Barge (On ferries only)

9 - High level fixed crossing

Operation - Column 96

Code the type of operation of draw span using the following codes:

Code 1 - Hand operated

2 - Power operated

3 - Free floating (Ferries)

4 - Cable drawn (Ferries)

PROTECTION - Column 97

Indicate the protection at the structure or crossing using the following codes:

Code 1 - Signs only

2 - Bells only

3 - Wigwag with lights

4 - Wigwag with lights and bells

5 - Flashing lights only

6 - Flashing lights and bells

7 - Chain or cable

8 - Gates or barriers

9 - Watchman only

X - No protection, where protection is needed

AVERAGE MONTHLY OPENINGS (MOVABLE) - Columns 98-101

Average monthly openings from data of previous year.

SECTION - Column 102

Code "1" for structures on the main roadway and "4" for frontage road structures.

TOTAL LENGTH - Columns 103-108

Code actual linear feet with leading zeros.

MAX. SPAN LENGTH - Columns 109-112

Code length in actual linear feet of the longest span.

NUMBER OF SPANS - Columns 113-116

Code actual number of spans in the structure.

FIRST EXTRA

Description of main span when different from approaches.

Section - Column 117

Code "2" when main span is different from approaches.

Structure Code - Columns 118-119

Code type of main span.

No. of Spans - Columns 120-122

Code the number of main spans.

Max. Span Length - Columns 123-125 (P)

Code the length in feet of the longest main span. (Packed)

SECOND THRU NINTH EXTRA - Columns 126-197

Description of approach spans when different from main span. Same configuration as first extra. Code same as first extra except section should be coded "3".

CAPACITY DATA

DESIGN LOAD - Columns 198-199

Code actual tons with leading zeros.

OPERATING RATING - Columns 200-202

Record for the critical vehicle the operating rating as explained in Section 4.1 of the AASHO Manual for Maintenance Inspection of Bridges, 1970. A three-digit code should be used. The first digit will show the type of loading.

1 H truck
2 HS truck
3 Alternate Interstate loading
4 3-Axle truck (type 3)
5 3-S semi-trailer
6 3-3 trailer
7 Railroad loading
8 Pedestrian or special loading
9 Gross load only given

The second and third digits will give the gross loading in tons, except pedestrian and railroad loading. For railroad loading only, the second and third digits will give Cooper Class or equivalent load. Code pedestrian loading as "800".

Example:

3-S semi-trailer, 72000 pounds code 536

INVENTORY RATING - Columns 203-205

Record for the critical vehicle the inventory rating as explained in Section 4.1 of the AASHO Manual for Maintenance Inspection of Bridges, 1970. A three-digit code should be used. The first digit will show the type of loading:

1 H truck
2 HS truck
3 Alternate Interstate loading
4 3-axle truck (type 3)
5 3-S semi-trailer
6 3-3 trailer
7 Railroad loading
8 Pedestrian or special loading
9 Gross load only given

The second and third digits will give the gross loading in tons, except pedestrian and railroad loading. For railroad loading

only, the second and third digits will give Cooper Class or equivalent load. Code pedestrian loading as "800".

Example:

3-S semi-trailer, 72000 pounds code 536

POSTED LOAD LIMIT - Columns 206-207

Code posted load in tons.

POSTED SPEED LIMIT - Columns 208-209

Code posted speed in MPH.

DESIGN ADT - Columns 210-212

Code to nearest 100 vehicles with leading zeros.

CLEARANCES

STRUCTURE FLARED - Column 213

If the horizontal clearance is not consistent, code "1" in this column. Otherwise, leave blank.

ROADWAY

Horizontal

Minimum Roadway

Single Structure or Right - Column 214-216

Code to nearest tenth of a foot for minimum curb to curb or shoulder to shoulder.

Left - Columns217-219

Code to nearest tenth of a foot for minimum curb to curb or shoulder to shoulder.

Railing to Railing

Single Structure or Right - Columns 220-222

Code to nearest tenth of a foot.

Left - Column 223-225

Code to nearest tenth of a foot.

RAILINGS - TYPE - Column 226

Use following codes:

1 - Parapet

2 - Barrier

3 - Brush

RAILINGS - MATERIAL - Columns 227-228

Use following codes:

1 - Aluminum

2 - Aluminum and concrete

3 - Concrete

4 - Concrete and steel

5 - Steel

SIDEWALKS

NUMBER - Column 229

Code actual number of sidewalks on structure.

WIDTH - Column 230-231

Code width to nearest tenth of a foot. If there are two sidewalks with two different widths, code the wider of the two.

SIDE - Column 232

Code "R" or "L" if a sidewalk is on the right or left of the structure. If on both sides, code "B".

MAXIMUM STRUCTURE WIDTH - Columns 233-236

Code to nearest tenth of a foot.

MAXIMUM OH WIDTH AT MAX. VERTICAL - Columns 237-239

Code to nearest tenth of a foot.

TOTAL SHOULDER WIDTH (UNDERPASS) - Columns 240-242

Code to nearest foot.

MEDIAN TYPE - Column 243

Use the following codes:

1 - Curb

2 - Wall

3 - Guardrail

4 - Fence

5 - Bridge superstructure

6 - Open (Twin structures)

7 - Couplet

8 - Painted median

9 - Painted stripe

0 - No Median

MEDIAN WIDTH - Columns 244-245

Code to nearest foot. If median exceeds 99 feet, code "99".

VERTICAL

MINIMUM AT CENTERLINE - Columns 246-249

Code feet in first two columns and inches in last two columns with leading zeros for each.

MINIMUM AT RIGHT CURB - Columns 250-253

Code same as for centerline.

MINIMUM AT LEFT CURB - Columns 254-257

Code same as for centerline.

MINIMUM WITH ROADWAY - Columns 258-261

Code same as for centerline.

WATERWAY (UNDER STRUCTURE)

VERTICAL - Columns 262-265

Code same as for centerline of main roadway.

HORIZONTAL (RIGHT) - Columns 266-268

Code to nearest foot.

HORIZONTAL (LEFT) - Columns 269-271

Code to nearest foot.

MINIMUM CHANNEL - Columns 272-274

Code to nearest foot.

MINIMUM PIER TO PIER - Columns 275-277

Code to nearest foot.

REFERENCE ELEVATION - Columns 278-280

Code to nearest foot.

MINIMUM VERTICAL FROM REFERENCE ELEVATION - Column 281-284

Code to nearest foot.

CROSSING DATA

FACILITY TYPE CODE - Column 285

B - For bridge

C - For overhead pipeline or conveyor

E - For elevated roadway

F - For ferry

I - For interchange

O - For overpass - highway or railroad

R - Overhead sign

S - For subway

T - For tunnel

U - For underpass - highway or railroad

W - Pedestrian overpass

KIND OF CROSSING - Columns 286-287

Use two digit code as follows:

CODE	FIRST DIGIT ON STRUCTURE	SECOND DIGIT UNDER STRUCTURE
1	Highway	Highway
2	Railroad	Railroad
3	Pedestrian	Pedestrian
4	Highway - RR	Highway - RR
5	2nd level - interchange	Waterway
6	3rd level - interchange	Highway - Waterway
7	4th level - interchange	RR - Waterway
8	Building or Plaza	Highway - RR - Waterway
9	Other (see remarks)	Other

FUNCTION CODE - Columns 288-289

As required by "Damage Assessment".

RAILROAD CODE - Columns 290-291

If a railroad is either overpassed or underpassed, enter code for the name of railroad as shown in the Road Inventory Manual of the Traffic and Planning Section.

FEATURE CROSSED - Columns 292-308

Identifying names (streams, roads, railroads, etc.) and descriptive remarks.

RESERVED SPACE - Columns 309-316

Leave these columns blank.

BYPASS DETOUR LENGTH - Columns 317-318

If it is possible to bypass the structure at the site, code "BP". Otherwise, code to the nearest mile the travel distance required to bypass the structure.

GEOMETRICS

APPROACH ROADWAY WIDTH - Columns 319-321

Code to the nearest foot.

ALIGNMENT

CURVE OR TANGENT - Column 322

1 - Curve

2 - Tangent

RADIUS IF CURVED - Columns 323-326

Code radius to nearest tenth of foot with leading zeros.

SKEW ANGLE - Columns 327-328

Code to nearest degree with leading zeros.

HYDRAULIC DATA

HIGH WATER MARK - FROM REF. ELEV. - Columns 329-332

Code to nearest tenth of foot.

WATERWAY CLASS - Column 333-334

Code to be determined.

NORMAL STREAM VELOCITY - Columns 335-336

Code to nearest Ft. per second.

STREAM BED MATERIAL - Columns 337-338

Codes to be determined.

RELIEF STRUCTURE - Columns 339-340

If this structure is one of several in a given flood plain required to handle the design flood, give the number of such structures. Code the number as a 2 digit number.

HYDRO. SURVEY MICRO. INDEX - Columns 341-344

Code to be determined.

DATE OF LAST HYDRO. SURVEY - Columns 345-348

Code month, and last two digits of year as MMYY with leading zeros as required.

RATING OF LAST HYDRO. SURVEY - Columns 349-350

Code to be determined.

OPENING - Columns 351-356

Actual area in square feet bounded by bottom of structure, banks of feature crossed, and bottom of feature crossed.

AREA - Columns 357-360

Area drained in square miles.

MATERIAL QUANTITIES

CONCRETE - Columns 361-364

Code to nearest cubic yard with leading zeros.

DEFORMED STEEL - Columns 365-369

Code to nearest ton with leading zeros.

STRUCTURAL STEEL - Columns 370-374

Code to nearest ton with leading zeros.

ENCROACHMENTS - Column 375-384

Code the number of utilities attached to the structure as follows:

TYPE UTILITY	COLUMN
Power	375
Communication	376
Petroleum Products	377
Water	378
Sewer	379

Code the number of utilities crossing the R/W near the structure as follows:

TYPE UTILITY	COLUMN
Power	380
Communication	381

Petroleum Products	382
Water	383
Sewer	384

PLANS DATA

PROJECT NUMBER CONSTRUCTED UNDER - Columns 385-393

Code 7 digit project numbers as XXX-XX-XX (prefixing each section with leading zeros where necessary and including dashes). Code older project numbers in free format beginning in first column.

TYPE PLANS AVAILABLE - Columns 394-395

1 - Design Plans
2 - Right of Way
3 - Construction
4 - As Built
5 - Ozlid
6 - Blue Print
7 - Shop Drawing
8 - Tracing
9 - Standard Plan
10 - Cross - Section
11 - Drainage
12 - Aerial Photographs
13 - Subgrade Soil Survey
14 - Hydrographic Survey

AS BUILT? - Column 396

1 - Plans are as built.
2 - Plans are not as built.

WHERE FILED - Columns 397-398

Code to be determined.

STRUCTURE COST - Columns 403-411

Code total cost in dollars with leading zeros.

STRESS ANALYSIS

DATA AVAILABLE - Column 412

1 - Yes

2 - No

WHERE FILED - Columns 413-414

Code to be determined.

DATE STRUCTURE COMPLETED - Columns 415-418

Code month and last 2 digits of year.

DATE OF MAJOR RECONSTRUCTION - Columns 419-422

Code month and last 2 digits of year.

DATE OF DATA INVENTORY - Columns 423-428

Code month, day, and last 2 digits of year as MMDDYY showing leading zeros for each as required.

MAINTENANCE INSPECTION DATA

Enter codes as prescribed by Manual for Maintenance Inspection of Bridges - 1970 prepared and published by AASHO. Enter a code 0-9 in each column from 429 through 524 and in column 525 for overall structure rating.

SUPERSTRUCTURE - Columns 429-450

MOVABLE SPANS - Columns 451-457

DECK - Columns 458-469

SUBSTRUCTURE - Columns 470-490

APPROACHES - Columns 491-501

WATERWAY - Columns 502-512

TRAFFIC SERVICES - Columns 513-523

TOTAL RATING - Column 524

OVERALL STRUCTURAL RATING - Column 525

RESERVED SPACE - Columns 526-556

Leave these columns blank. This space is reserved for future inspection data.

DATE INSPECTED - Columns 557-560

Code 2 digit month and last 2 digits of year.

RECOMMENDED DATE NEXT INSPECTION - Columns 561-564

Code same as above.

GUARDRAIL TYPE - Columns 565-566

Code to be determined.

GUARDRAIL MATERIAL - Column 567

Code to be determined.

APPRAISAL - Columns 568-573

STRUCTURE CONDITION - Column 568

Describe major structural deficiencies, giving rating of critical item(s).

DECK GEOMETRY - Column 569

Describe adequacy of roadway width, clearances above deck, etc.

UNDERCLEARANCES - Column 570

Vertical and Horizontal under clearance from thru roadway to superstructure and substructure units, respectively.

SAFE LOAD CAPACITY - Column 571

Describe deficiencies, determine safe load capacity and adequacy.

WATERWAY ADEQUACY - Column 572

Describe waterway inadequacies, i.e., scour, erosion, slope protection, capacity, etc.

APPROACH ROADWAY ALIGNMENT - Column 573

Identify inadequate approach alignment conditions.

The following codes will be used to describe major deficiencies.

RATING	EXPLANATION
9	Conditions superior to present desirable criteria.
8	Conditions equal to present desirable criteria.
7	Condition better than present minimum criteria.
6	Condition equal to present minimum criteria.
5	Condition somewhat better than minimum adequacy to tolerate being left in place as is.
4	Condition meeting tolerable limits to be left in place as is.
3	Basically intolerable condition requiring high priority of repair.
2	Basically intolerable condition requiring high priority in replacement.
1	Immediate repair necessary to put back in service.
0	Immediate replacement necessary to put back in service.

PROPOSED IMPROVEMENTS

YEAR NEEDED - Columns 574-575

Code the last two digits of the year of the proposed improvements.

TYPE SERVICE - Column 576-577

See Kind of Crossing - Columns 286-287.

TYPE WORK - Column 578-580

Codes to be determined.

LENGTH OF IMPROVEMENT - Columns 581-585

Code the length (in feet) of the proposed improvement.

PROPOSED DESIGN LOAD - Column 586-587

Code the design load in tons with leading zeros.

PROPOSED ROADWAY WIDTH - Columns 588-590

Code to nearest foot.

PROPOSED NUMBER OF LANES - Columns 591-592

Code the number of lanes of the proposed improvement.

PROPOSED A.D.T. - Columns 593-595

Code the A.D.T. which controls now design.

YEAR OF A.D.T. - Column 596-597

Code last two digits of the year of the A.D.T. estimate.

YEAR OF ADJACENT IMPRO. - Columns 598-599

Code last two digits of the year in which improvements to the roadway approaches to the bridge will take place.

TYPE ADJ. IMPROVEMENT - Column 600

Use following codes:

0 - Not applicable

1 - Resurface

2 - Reconstruct

3 - Widening

4 - Shoulder improvements

5 - Other (explain in remarks)

COST OF PROPOSED IMPRO. - Columns 601-604

Code the estimated cost to the nearest hundred dollars of the proposed improvement.

REPLACEMENT PRIORITY - Columns 605-610

Code the most critical structure as "001", the least as "999" by district in columns 605-607 and by state in columns 608-610.

REPAIRS

LAST FIVE REPAIRS - Columns 611-635

COLUMNS 611-614

Code month and year of latest repair.

COLUMN 615

Code type of latest repair.

COLUMNS 616-619

Code month and year of 2nd latest repair.

COLUMN 620

Code type for 2nd latest repair.

COLUMNS 621-624

Code month and year of 3rd latest repair.

COLUMN 625

Code type for 3rd latest repair.

COLUMNS 626-629

Code month and year of 4th latest repair.

COLUMN 630

Code type for 4th latest repair.

COLUMNS 631-634

Code month and year of 5th latest repair.

COLUMN 635

Code for 5th latest repair.

Repair Codes are as follows:

Erosion or Scour	A
Fender System	B
Piling	C
Piers	D
Caps	E
Stringers or Girders	F
Decks	G
Resurfacing	H
Handrail	I
Bearings Areas	J
Expansions	K
Approaches	L
Abutments	M
Settlements	N
Steel Truss - Major Members	O
Steel Truss - Secondary Members	P
Steel Truss - Overhead Members	Q
Mechanical	R
Electrical	S
Greasing & Servicing	T
Painting	U

EXTRA SPACE - Column 636

NUMBER OF REPAIRS - Columns 637-638

Code total number of repairs to structure since construction.

PAINT REQUIREMENTS

PROJECT NUMBER FOR PAINT JOB - Columns 639-647

Code 7 digit Project No. as XXX-XX-XX (prefixing each section with leading zeros where necessary and including dashes). Code older project numbers in free format beginning in first column of field.

PAINT SYSTEM - Columns 648-649

Enter code for system used.

DATE PAINT JOB COMPLETED - Columns 650-653

Code 2 digit month and last 2 digits of year.

PAINTED BY - Columns 654-668

Code name of contractor or organization.

CLEANING METHOD - Column 669

Code 1 - Hand tool cleaning

2 - Power tool cleaning

3 - Commercial blast cleaning

4 - Near white blast cleaning

5 - White metal blast cleaning

QUANTITY OF PAINT REQUIRED - Columns 670-676

Code in gallons with leading zeros.

COLOR - Columns 677-678

Color codes to be determined.

NUMBER OF COATS - Column 679

Code actual number of coats.

COST OF PAINT JOB - Columns 680-685

Code to nearest dollar with leading zeros.

STRUCTURE NUMBER - Columns 686-695

The number that is painted on the structure (same as col. 7-16 in most cases).

EXTRA SPACE - Column 696

CONTRACT OR DISTRICT - Column 697

"C" if built under contract.

"D" if built by district.

Blank if unknown.

EXTRA SPACE - Column 698

ENVIRONMENTAL CONDITIONS - Columns 699-700

Use the following codes to describe the normal environment to which the structure is subjected.

1 - Corrosive chemical atmosphere

2 - Salt water

3 - Acid water from plant

4 - High humidity

5 - Electrical plant (Galvanic corrosion)

6 - Cathodic protection

7 - Large flood plain

8 - Swift current - tidal current

9 - Vermin

10 - Freezing (salt action)

11 - Collision and overloads (industrial & commercial hauling)

12 - Dense traffic

13 - Pedestrian

14 - Strong winds (hurricanes)

FUNCTIONAL CLASSIFICATION - Columns 701-702

Use the functional classification code for the section as determined and assigned for the Functional Classification Study. It is suggested that the 1990 classification code be used. The codes given below are for that year.

Population 5-10	10-25	25-50	50+		
11	21	31	41	Interstate	01
12	22	32	42	Other Freeway & Expressway	-
13	23	33	43	Other Principal Arterial	02
14	24	34	44	Minor Arterial	03
15	25	35	45	Collector	-
-	-	-	-	Major	04
-	-	-	-	Minor	05

DISTRICT MT. BY - Columns 703-704

Code the DISTRICT THAT ACTUALLY maintains the structure.

REMARKS - Columns 705-716

Code anything necessary to aid in describing the structure.

SPECIAL CODING INSTRUCTIONS FOR SUPPLEMENTAL FIELD DATA

RECALL NUMBER - Column 1-6, Line 1, 2, 3

Code the recall number of the structure being coded taken from the Control Section manual - Volume II.

If a new structure is encountered in the field that is not in the manual, add 2 to the recall number of the previous structure and code the new number in this space.

If it is found that a structure in the manual does not actually exist, omit that recall number. Do not use that number for another structure.

POSTED SPEED LIMIT - Columns 27-28, Line 1

Code the speed limit posted on the structure. If no speed limit is posted, code the speed limit of the road on which the structure is located.

MEDIAN WIDTH - Columns 56-58, Line 1

The first digit of this field will be used to designate the type of median as explained in the coding manual. The last two digits will be used to code the width to the nearest foot.

REFERENCE ELEVATION - Columns 24-26, Line 2

This field will not be coded.

VERT. CLEARANCE FROM REF. ELEV. - Column 27-30, Line 2

This field will be used to indicate the vertical clearance between low steel and water when at normal level.

HIGHWATER MARK FROM REF. ELEV. - Column 60-63, Line 2

Code the vertical clearance between low steel and high water.

STRUCTURE INVENTORY AND APPRAISAL SHEET

HOW OBTAINED	ITEM NO.	ITEM NAME	MASTER FILE LOCATION
+	1	State (Programmed)	Known
+	2	District	46-47
+	3	Parish	48-49
+ TP	4	City (Programmed)	52-55
+	5	Route	35-42
+ MI,PC	6	Feature Crossed	292-308
+	7	Facility Carried	285
+ PC	8	Structure Number	7-16
-----	9	Location (Narrative) (Not required)	-----
+	10	Control Section	7-11
+	11	Milepost	12-15
+	12	DOD Section Number	21-23
+	13	DOD Bridge Letter	24-27
+	14	DOD Milepost	28-31
+	15	DOD Section Length	32-34
+	16	Latitude	63-67
+	17	Longitude	68-73
+	18	Physical Vulnerability	85
MT	19	Bypass Detour Length	317-318
TP	20	Toll (Very few in state)	61
+	21	Custodian	60
+	22	Owner	60
----	23	Federal-Aid Project number (not required)	Not in file
+	24	Federal System (programmed)	58 & 56

HOW OBTAINED	ITEM NO.	ITEM NAME	MASTER FILE LOCATION
+	25	Administrative Jurisdictions	60
TP	26	Functional Class	701-702
+	27	Year Built	417-418
MT	28	Lanes on/under Structure	78-79 + 80-81
TP	29	ADT	74-77
TP	30	Year of ADT (not required)	427-428
+	31	Design Load	198-199
MT	32	Approach Roadway Width	319-321
MT	33	Median	243
MT	34	Skew	327-328
MT	35	Structure Flared	213
----	36	----------	------
----	37	----------	------
BD	38	Navigation Control	333-334
MT	39	Navigation Vertical Clearance	281-284
MT	40	Navigation Horizontal	272-274
----	41	----------	-------
PROG.	42	Type Service	286-287
+	43	Type Main Span	83-84
+	44	Type Approach Span	127-128
+	45	Number of Main Spans	120-122
+	46	Number of Approach Spans	129-131
----	47	----------	-------
+	48	Length of Maximum Spans	109-112
+	49	Structure Length	103-108
MT	50	Sidewalk Width/Side	230-232
MT	51	Bridge Width, Curb/Curb	214-216
MT	52	Bridge Width, Out/Out	217-219 233-236

HOW OBTAINED	ITEM NO.	ITEM NAME	MASTER FILE LOCATION
+ MT	53	Minimum Vertical Clearance	258-261
MT	54	Minimum Vertical Underclearance	262-265
MT	55	Minimum Lateral Under Right	266-268
MT	56	Minimum Lateral Under Left	269-271
MT	57	Wearing Surface	92
MI	58	Condition - Deck	469
MI	59	- Superstructure	450
MI	60	- Substructure	490
MI	61	- Channel	497
MI	62	- Culverts	497
MT	63	Estimated Remaining Life	574-575
BD	64	Operating Rating	200-202
MT	65	Approach Roadway Alignment	322
BD	66	Inventory Rating	203-205
MI	67	Appraisal - Structural Condition	568
MT	68	- Deck Geometry	9
MT	69	- Underclearances	70
MT	70	- Safe Load Capacity	71
MT	71	- Waterway Adequacy	72
MT	72	- Approach Roadway Alignment	73
MT	73	Proposed Improvements - Year Needed	574-75
MT	74	- Type of Service	576-77
MT	75	- Type of Work	578-80
MT	76	- Length	581-85
MT	77	- Proposed Design Load	586-87

HOW OBTAINED	ITEM NO.	ITEM NAME	MASTER FILE LOCATION
MT	78	Proposed Improvements - Proposed Width	588-90
MT	79	- Proposed No. Lanes	591-92
MT	80	- Design ADT	593-95
MT	81	- Year of ADT Est.	596-97
MT	82	- Year of Adj. Imp.	598-99
MT	83	- Type Adjacent Imp.	600
MT	84	- Cost	601-604

+	Presently in file	30
MT	Coded by Maintenance on Form MT-1	35
MI	Coded by Maintenance on Form 3097	6
BD	Coded by Bridge Design on Form BD-1	3
PC	Coded by Project Control on Form PC-1	0
TP	Coded by Traffic & Planning	4
	Not Required	6
		84

BRIDGE DESIGN

MASTER RECORD COL. #	FIELD NAME	LENGTH	S, I, & A ITEM NO.
19	Major Bridge Flag	1	
200-202	Operating Rating	3	64
203-205	Inventory Rating	3	66
210-212	Design ADT	3	
333-334	Waterway Class	2	38
335-336	Normal Stream Velocity	2	
337-338	Stream Bed Material	2	
339-340	Relief Structure	2	
341-344	Hydro Survey Micro Index	4	
345-348	Date Last Survey	4	
349-350	Rating	2	
351-356	Drainage Opening	6	
357-360	Area Drained	4	
	Quantities (New only)		
361-364	Concrete	4	
365-369	Deformed Steel	5	
370-374	Structural Steel	5	
412	Stress Analysis Data	1	
413-414	Where Filed	1	

PROJECT CONTROL

MASTER RECORD COL. #	FIELD NAME	LENGTH	S, I, & A ITEM NO.
16	Bridge ID (1, 2, 3, 4)	1	8
62	Shared Cost	1	
292-308	Feature Crossed	17	6
385-393	State Project Number	9	
394-395	Type Plans	2	
403-411	Cost of Structure	9	
611-615	Latest Repair	5	
616-620	2nd Latest Repair	5	
621-625	3rd Latest Repair	5	
626-630	4th Latest Repair	5	
631-635	5th Latest Repair	5	
697	Contract - District	1	

MASTER RECORD COL. #	FIELD NAME	LENGTH	S, I, & A ITEM NO.
396	As Built	1	
397-398	Where Filed	2	
419-422	Date of Major Reconstruction	4	
637-638	Total Repairs	2	
639-647	Paint Proj. No.	9	
648-649	System	2	
650-653	Date Camp	4	
654-668	By	15	
669	Cleaning Method	1	
670-676	Quantity	7	
677-678	Color	2	
679	No. of Coats	1	
680-685	Cost	6	

MASTER RECORD COL. #	FIELD NAME	LENGTH	S, I, & A ITEM NO.
565-66	Guardrail Type	2	
567	Guardrail Material	1	
20	Under 20' Flag	1	
697-700	Environmental Conditions	2	
703-716	Remarks	14	

TRAFFIC & PLANNING

MASTER RECORD COL. #	FIELD NAME (UPDATE PROGRAM)	LENGTH	S, I, & A ITEM NO.
74-77	ADT	4	29
423-428	Date of Inventory (ADT)	6	30
61	Toll	1	20
52-55	City (Programmed)	4	4
701-702	Functional Class	2	26

MAINTENANCE SECTION

SUPPLEMENTAL FIELD DATA

MASTER RECORD COLUMN NO.	FIELD NAME	LENGTH	S, I, & A ITEM NO.
1-6	Recall Number	6	
78	Number of Traffic Lanes	1	28
79	Number of Safety Lanes	1	28
80-81	Number of Lanes Crossed	2	28
86	Material - Substructure	1	59
87	- Piers	1	
88	- Abutment	1	
89	- Piles	1	
90	- Foundation	1	
91	- Floor	1	
92	- Riding Surface	1	
93-94	Surface Thickness	2	
98-101	Average Monthly Openings	4	
206-207	Posted Load Limit	2	
208-209	Posted Speed Limit	2	
213	Structure Flared	1	
	HORIZONTAL CLEARANCE		
214-216	Right Curb/Curb	3	51
217-218	Left Curb/Curb	3	51
220-222	Right Rail/Rail	3	52
223-225	Left Rail/Rail	3	52
233-236	Out to Out Width	4	52

MAINTENANCE SECTION

SUPPLEMENTAL FIELD DATA
(Continued)

MASTER RECORD COLUMN NO.	FIELD NAME	LENGTH	S, I, & A ITEM NO.
226	Railing Type	1	
227-228	Material	2	
229	Sidewalks Number	1	
230-231	- Width	2	50
232	- Side	1	50
240-242	Total Shoulder Width	3	
243	Median Type	1	53
244-245	Median Width	2	33
	VERTICAL CLEARANCE		
254-257	Left Curb	4	53
246-249	Centerline	4	53
250-253	Right Curb	4	53
	CLEARANCES UNDER STRCUTURE		
262-265	Vertical	4	54
269-271	Horizontal Left	3	56
266-268	Horizontal Right	3	55
272-274	Channel Width	3	40
275-277	Pier to Pier	3	
281-284	Vertical Clearance from Reference Elevation	4	39
292-308	Feature Crossed	17	6
317-318	Bypass Detour	2	19
319-321	Approach Roadway Width	3	32

MAINTENANCE SECTION

SUPPLEMENTAL FIELD DATA
(Continued)

MASTER RECORD COLUMN NO.	FIELD NAME	LENGTH	S, I, & A ITEM NO.
322	Alignment	1	65
323-326	Radius of Curve	4	
327-328	Skew Angle	2	34
329-332	High Water Mark from Reference Elevation	4	
	ENCROACHMENTS		
375	Attached to Bridge - 1st	1	
376	- 2nd	1	
377	- 3rd	1	
378	- 4th	1	
379	- 5th	1	
380	Crossing R/W - 1st	1	
381	- 2nd	1	
382	- 3rd	1	
383	- 4th	1	
384	- 5th	1	
	APPRAISAL		
569	Deck Geometry	1	68
570	Underclearances	1	69
571	Safe Load Capacity	1	70
572	Waterway Adequacy	1	71
573	Approach Roadway Alignment	1	72

MAINTENANCE SECTION

SUPPLEMENTAL FIELD DATA
(Continuted)

MASTER RECORD COLUMN NO.	FIELD NAME	LENGTH	S, I, & A ITEM NO.
	PROPOSED IMPROVEMENTS		
574-575	Year Needed	2	73
576-577	Type Service	1	74
578-580	Type of Work	3	75
581-585	Length of Improvement	6	76
586-587	Proper Design Load	1	77
588-590	Proper Roadway Width	4	78
591-592	Number of Lanes	2	79
593-595	Design ADT	3	80
596-597	Year of Estimate	2	81
598-599	Year of Adjacent Improvements	2	82
600	Type of Adjacent Improvements	1	83
601-604	Cost	4	84
605-607	District Priority	3	
608-610	State Priority	3	
	LOCATION		
547-551	Central Section	5	8
552-555	Log Mile	4	8
556	Bridge I.D.	1	8
-----	District	2	
-----	Parish	2	

APPENDIX E

COMPUTER PRINTOUT FORM

LA. DEPT. OF HIGHWAYS
MASTER STRUCTURE FILE

STRUCTURE NUMBER

RECALL NUMBER

DISTRICT | PARISH

Form 13-1312

IDENTIFICATION
Recall Number | Control | Section | Log Mile | Bridge I.D.

FLAGS
Str. Count | Bridge Record | Major Bridge | Under 20'

BRIDGES FOR DEFENSE
Section Number | Bridge Letter | Section Milepost | Section Length

LOCATION
State Route Number | Federal Route Number | District | Parish | State City Number | Nat. Geog. City Code | Place Class | SYSTEM: State | Federal | U.S. No. | Maint. By | Toll-Free | Shared Cost | Latitude | Longitude

TRAFFIC
A.D.T. Nearest 10 Veh. | Traf. Lanes | Sat. Lanes | No. of Lanes Crossed

DESCRIPTION
Div.-Twin | Structure Code | Phy. Vul. | MATERIAL: Sup. Struct. | Piers | Abut. | Piles | Foundation | Floor | Riding Surf. | Surf. Thick | DRAW SPAN: Type | Operation | Protection | Average Monthly Openings | Section | Total Length | Length of Max. Span | No. of Spans

EXTRA DESCRIPTION
FIRST EXTRA: Section | Struct. Code | No. of Spans | Max. Span Length
SECOND EXTRA: Section | Struct. Code | No. of Spans | Max. Span Length
THIRD EXTRA: Section | Struct. Code | No. of Spans | Max. Span Length
FOURTH EXTRA: Section | Struct. Code | No. of Spans | Max. Span Length

EXTRA DESCRIPTION
FIFTH EXTRA: Section | Struct. Code | No. of Spans | Max. Span Length
SIXTH EXTRA: Section | Struct. Code | No. of Spans | Max. Span Length
SEVENTH EXTRA: Section | Struct. Code | No. of Spans | Max. Span Length
EIGHTH EXTRA: Section | Struct. Code | No. of Spans | Max. Span Length
NINTH EXTRA: Section | Struct. Code | No. of Spans | Max. Span Length

CAPACITY DATA
Design Load | Operating Rating | Inventory Rating | Posted Load Limit | Posted Speed Limit | Design A.D.T.

CLEARANCES
Str. Flared | HORIZONTAL: Curb-Curb Shoulder-Shoulder: Right | Left; Railing-Railing: Right | Left | RAILINGS: Type | Material

CLEARANCES
SIDEWALKS: Number | Width | Side of Str. | Out to Out Structure Width | Width at Max. of Head | Total Shoulder Width | MEDIAN: Type | Width | VERTICAL: Centerline Ft-In | Right Curb Ft-In | Left Curb Ft-In | Min. Width Within Roadway Ft-In | UNDER STRUCTURE: Vertical Ft-In | HORIZONTAL: Right | Left | Channel Width | Pier To Pier | Ref. Elev. | Vert. Clear. Fr. Ref. Elev. Ft-In

CROSSING DATA
Facility Type | Kind of Crossing | Function Code | Railroad Code | Feature Crossed | Bypass Detour Length

GEOMETRICS
Approach Roadway Width | Align. | Degree of Curve | Skew Angle

HYDRAULIC DATA
Highwater Mark Reference Elevation Ft.-10th's | Waterway Class | Norm. Stream Velocity | Stream Bed Material | Relief Structure | HYDRO. SURVEY: Micro-Film Index | Date of Last Survey | Rating | Drainage Opening Sq. Ft. | Area Drained Sq. Mi.

QUANTITIES
Concrete Cu. Yds. | Deformed Steel Tons | Structural Steel Tons

ENCROACHMENTS
ATT. TO STR.: Power | Commu. | Petro. | Water | Sewer
CROSSING R/W: Power | Commu. | Petro. | Water | Sewer

PLANS DATA
Project Number Constructed Under | Type Plans Available | As Built? | Where Filed

PLANS DATA
Cost of Structure X $100 | STRESS ANALY: Avail.? | Where Filed | Date of Completion | Date of Major Recon-struction | Date of Inventory

INSPECTION DATA
SUPER STRUCTURE: Bearings | Lower Chord | Floor Beams | Girders | Stringers | Diaphrams | Lat. Bracing | Sway Bracing | Verticals | Diagnosis | Portals | Upper Chord | Rivets/Bolts | Paint | Welds | Coll. Dam. | Deflect. | Vibra. | Align. | Clean. | Utilities | Overall Rating
MOVABLE SPANS: Wedges | Mach. | Greasing | Elect. | Control Panel | Signal Devices | Overall Rating
DECK: Deck | Curb | Side-walks | Bridge Rail | Fixed Joints | Expan. Joints | Joint Leakage | Drainage | Profile Elev. | Parapet | Lighting Stand. | Overall Rating

INSPECTION DATA
SUBSTRUCTURE: Abut. Backs | Back-wall | Wing-wall | Bulk-head | Caps | Bent Piles | Bents | Piers | Columns | Ped-estals | Foot-ings | Found. Piles | Bracing | Sett. | Crack/Spalls | Steel Corr. | Timber Decay | Collision Dam. | Paint | Clean-liness | Overall Rating
APPROACH: Const. Joint | Pave-ment | Rel. Joint | Appro. Slab | Guard-rail | Align-ment | Ret. wall | Shoulder | Em-bank. | Drain-age | Overall Rating
WATERWAY: Revet-ment | Rip Rap | Spur Dike | Emb. Erro. | Chan. Scour | Chan. Chge. | Vegeta-tion | Drift | Fender Sys. | Adeq. Open. | Overall Rating
TRAFFIC SERVICES: Speed Limit Sig. | Strip-ing | Haz. Mark. | Aerial Sig. | Warn. Dev. | Clear. Sign | Bar./Gates | Legi-bility | Visi-bility | Nav. Lights | Overall Rating | Total Rating | Overall Str. Rat. | Date of Inspection

PROPOSED IMPROVEMENTS
Year Needed | Type Serv. | Type of Work | Length of Improve-ment | Design Load | Roadway Width | No. of Lanes | Est. Design A.D.T. | Year of A.D.T. | Year of Adj. Impro. | Type Adj. Improve. | Cost of Proposed Improve. X $100

REPAIRS
REPLACE. PR.: District | State
LATEST: Date | Type
2nd LATEST: Date | Type
3rd LATEST: Date | Type
4th LATEST: Date | Type
5th LATEST: Date | Type
Total Repairs

GDRAIL
Type | Material

APPRAISAL
Struct. Con | Deck Geo. | Und. Clear. | Safe Load Cap. | Waterway Adeq. | Appro. Rdwy. Alig

Rec. Date of Next Inspection

PAINT
Project Number For Paint Job | Paint System | Date Paint Job Was Comp. | Painted By | Cleaning Method | Quantity of Paint Required Gal. | Color of Paint | No. of Coats | Cost of Paint Job

NO. ON STRUCTURE
Structure Number

MISC.
Cont/Dist | Environ. Cond. | Functional Class.

REMARKS
District Maint. By

E-3

APPENDIX F

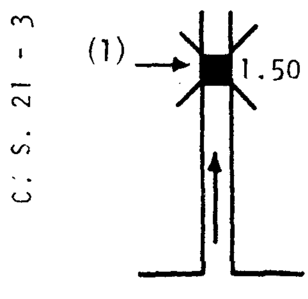
BRIDGE NUMBERING SYSTEM

STRUCTURE NUMBER - - - 10 DIGITS

CONTROL SECTION	CONTROL SECTION LOG MILE	NO. OF STRUCTURES AT SAME LOG MILE
___ ___ ___ ___ ___	___ ___ ___ ___	___

EXAMPLES;

①



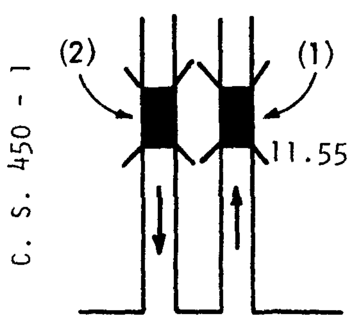
C. S. 21 - 3
STR. AT LOG 1.50

(1)STR. NO. 021 03 0150 1

0.00 Begin Control

C. S. 1 03
STR. AT LOG 0 - 40
STR. NO. 001 03 0040 1

②

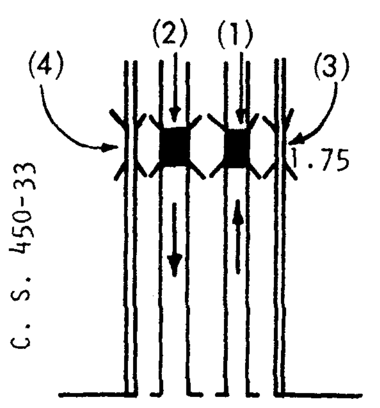


C. S. 450 - 1
STRS. AT LOG 11.55 IN
DIRECTION OF INV.

(1)STR. NO. 450 01 1155 1
(2)STR. NO. 450 01 1155 2

0.00 Begin Control

③

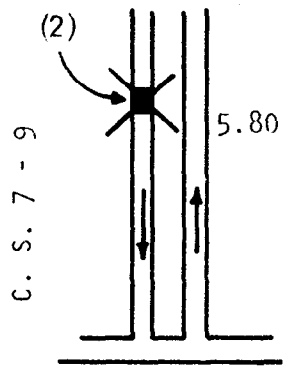


C. S. 450-33 WITH FRONTAGE ROADS.
STRS. AT LOG 1.75 IN DIRECTION OF INV.

(1)STR. NO. 450 33 0175 1
(2)STR. NO. 450 33 0175 2
(3)STR. NO. 450 33 0175 3
(4)STR. NO. 450 33 0175 4

0.00 Begin Control

④

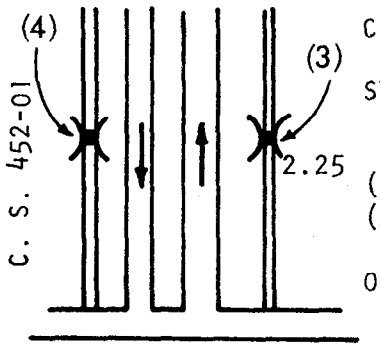


C. S. 7 - 9 WITH STR. OPPOSITE LANE OF DIRECTION OF INV. AT LOG 5.80

STR. NO. 007 09 0580 2

0.00 Begin Control

⑤

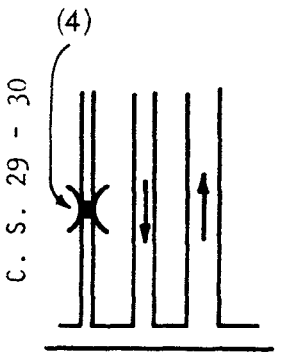


C. S. 452-01 WITH FRONTAGE ROADS.
STRUCTURES ON FRONTAGE ROADS ONLY.

(1)STR. NO. 452 01 0225 3
(2)STR. NO. 452 01 0225 4

0.00

⑥

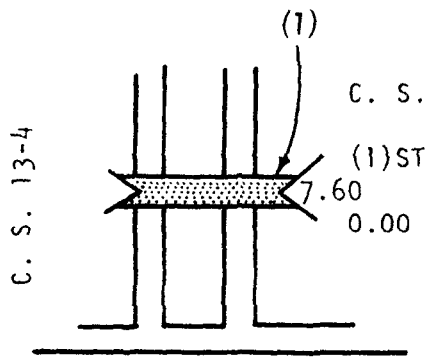


C. S. 29 - 30 WITH FRONTAGE ROAD.
STRUCTURE ON LEFT FRONTAGE ROAD ONLY.

(1)STR. NO. 029 30 0133 4

0.00

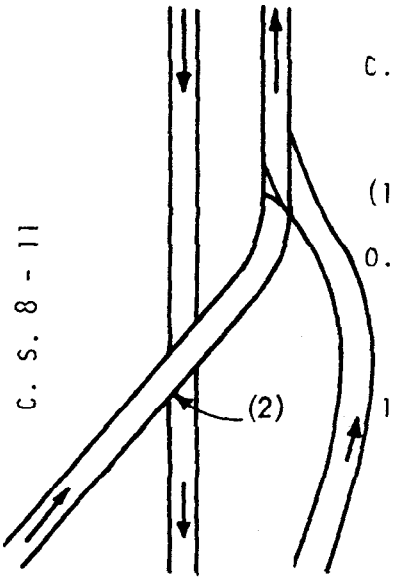
⑦



C. S. 13-4 UNDER OTHER ROAD.

(1)STR. NO. 013 04 0760 1

⑧



C. S. 8 - 11 WITH ROAD OVER LANE IN OPPOSITE DIRECTION OF TRAVEL.

(1)STR. NO. 008 11 0123 2