

PRELIMINARY ENGINEERING REPORT

FOR

**REPLACEMENT OF BRIDGE NO. 017041
FIELD STREET
OVER UNNAMED STREAM
BRISTOL, CONNECTICUT**



PREPARED FOR

CITY OF BRISTOL

MAY 10, 2022

CARDINAL
ENGINEERING ASSOCIATES

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EXECUTIVE SUMMARY

PRESENT CONDITIONS

- 6'-10" concrete slab on masonry abutments constructed in 1939.
- Superstructure exhibits widespread scaling with some spalled areas and exposed rusted rebar (Condition Rating 3 – Serious).

PROPOSED SCOPE OF WORK

Based upon the inspection and evaluation of the existing structure, Cardinal Engineering Associates recommends replacement of the structure, consisting of the following:

- Replacement of the structure with a 11' x 5' precast concrete box culvert with cast in place wingwalls.
- Placement of riprap for scour protection downstream of the structure and stabilizing the stream channel and embankments.
- Reconstruct downstream channel walls from culvert outlet to property line.
- Reconstruction of the road within the project limits.

REASONS FOR RECOMMENDATION

- Meets ConnDOT Criteria for small structure. City may investigate seeking State funding
- Larger hydraulic opening reduces velocities in channel
- Improved hydraulic capacity compared to existing.

ESTIMATED CONSTRUCTION COST

The estimated project cost is \$818,000.

CONSTRUCTION DURATION

Construction duration is expected to be six months.

ROW IMPACTS

Temporary construction easements are anticipated to be required.

UTILITIES

Relocation of gas main and sanitary sewer is anticipated.

PERMITS

The following permits will be required

- Local Inland Wetlands / Watercourses
- ACOE SV Permit

Introduction:

Field Street is located in the central portion of Bristol and generally runs east-west in the area south of Park Street and Rockwell Park. Bridge No. 017041 carries Field Street over an unnamed stream which merges with another unnamed stream approximately 100 feet downstream of the structure before discharging into the Pequabuck River further downstream.

Present Conditions:

The existing bridge was built in 1939, is in poor condition and approaching the end of its service life. The superstructure consists of a reinforced concrete deck slab on stone masonry abutments, has an approximate span length of 6'-10" and is skewed approximately 5° to the road. The hydraulic opening has a height of approximately 3'-4". The substructure consists of stone masonry abutments and wingwalls. The roadway at the bridge has a bituminous concrete surface with bituminous concrete curbs and a width of approximately 30 feet with concrete sidewalks on both sides of the roadway. The approach roadway width is also approximately 30 feet. Field Street is classified as an urban local road with a posted speed limit of 25 M.P.H. The 1991 average daily traffic (ADT) is estimated at approximately 50 vehicles per day according to the previous inspection reports.



Upstream Elevation



West Roadway Approach –Looking East

A routine inspection was performed by Cardinal Engineering Associates, Inc. on March 23, 2022 which found the superstructure to be in poor condition with widespread moderate deterioration and isolated areas of advanced deterioration. The inspection report noted the following conditions:

Approach Condition:

- The bituminous concrete roadway approaches have been recently resurfaced are in good condition.
- There are no approach guiderails.

Concrete Abutments & Wingwalls:

- Abutments and wingwalls exhibit numerous areas of missing mortar with some cracks and damage to the wingwalls.

Reinforced Concrete Deck Slab:

- Deck slab underside exhibits widespread scaling with some spalled areas and exposed rusted rebar.
- Deterioration is greatest around the drain openings in the slab

Channel and Channel Protection:

- Upstream channel alignment is poor with moderate vegetation along the streambanks. Downstream channel is narrow with vertical masonry walls.



Channel – Looking Upstream



Channel – Looking Downstream

Hydrology:

The drainage area of the unnamed stream at the Field Street crossing is 0.156 square miles (100 acres), which is considered a small structure according to the CTDOT. In accordance with CTDOT's Drainage Design Manual, small structures should be designed to pass a discharge equal to the 50-year flood.

Stream flows were determined using Hydroflow Hydrographs software utilizing the NRCS Runoff Method with TR-55. This method is an approved CTDOT method for determining peak flows. TR-55 is applicable to small watersheds that are urbanized. NRCS (formerly SCS) uses curve numbers based on land use types to generate stormwater runoff hydrographs. The following flows were calculated at the bridge:

$$Q_2=72 \text{ cfs}, Q_{10} = 174 \text{ cfs}, Q_{25} = 243 \text{ cfs}, Q_{50} = 295 \text{ cfs}, Q_{100} = 354 \text{ cfs}$$

The bridge is located in a FEMA Zone X designation (Areas of minimal flood hazard).

Hydraulics:

The 25 thru 100-year headwater elevations caused by the hydraulic crossing were calculated using the FHWA's Culvert Analysis HY-8, Version 7.7 computer program. The culvert is designated by CTDOT as a small structure, with a drainage area less than one square mile with an established watercourse. The DOT design criteria require the replacement structure to pass the 50-year design flow with 1 foot of freeboard. Typical limiting factors for culvert designs per CTDOT are:

- Non-damaging to upstream property
- 1 foot below the established hydraulic control
- Equal to an HW/D no greater than 1.5

These criteria can be waived by the City in lieu of a lessor design in conjunction with sound engineering. Replacement options for the proposed bridge/culvert will attempt to meet DOT design criteria while considering effects on private property, environmental and permitting concerns and construction costs.

The following table is a summary of the hydraulic capacity the existing bridge:

Table 1 – Existing Culvert - Headwater Surface Elevations and Flows

STORM FREQUENCY (years)	HW ELEV. (ft.)	Freeboard (ft.)	FLOW (cfs)	
			Thru Culvert	Over Roadway
25	405.71	*-0.41	204	39
50	405.96	*-0.66	214	81
100	406.20	*-0.90	223	130

*Note: Negative numbers indicate the extent of overtopping at the low point (el. 405.3±)

Proposed Condition:

The proposed replacement structure consists of a 11’W. x 5’H. Pre-Cast Concrete Box Culvert with concrete wingwalls. This structure will meet the DOT hydraulic design criteria and pass the 50-year storm with 1 foot of freeboard but will require changes to the vertical alignment of the roadway to raise the low point approximately 0.7 feet. A structure of this size and the changes to roadway will result in considerable impacts to the surrounding properties which will need to be further evaluated during the next design phase.

An alternate replacement structure consisting of a smaller 7’W. x 5’H. Pre-Cast Concrete Box Culvert with concrete wingwalls was also evaluated. This option will not meet the hydraulic design criteria, but is presented for comparison should it be determined that impacts required to meet the hydraulic design criteria are excessive.

Another third option was considered which involves the rehabilitation of the existing bridge by repairing the deterioration. Given the widespread extent of deterioration and the overall age of the existing structure, the rehabilitation alternative is not recommended and was not considered a practical alternative.

The proposed alternative will involve the removal of the existing bridge and construction of precast box culvert with concrete wingwalls. The invert of the precast concrete box culvert will be depressed one foot below the existing channel elevation with one foot of natural streambed material placed in the bottom of the new culvert to facilitate fish passage. The project will also include

approximately 150' of approach roadway reconstruction. Refer to the summary of structure alternatives at the end of this section for additional information.

This proposed replacement structure will consist of a Single Cell 11'W. x 5'H. Pre-Cast Concrete Box Culvert with concrete end walls, wingwalls, cut-off walls and return walls. Form-liner could be considered to provide a natural stone façade on the exposed concrete surfaces. Due to the invert being depressed 1 foot below the channel, the resulting Hydraulic Opening will be 11'W x 4'H.

The following table is a summary of the alternatives analyzed:

Summary of Structure Alternatives for the Replacement of Bridge No. 017041 Field Street over Unnamed Stream						
Structure Type	Design Storm-Return Frequency	Headwater Elevation @ Low Point	Freeboard @ Low Point	Additional Notes	Environmental Permitting	Estimated Construction Cost (Spring 2023 \$)
Existing – 6'-10" Single Span Concrete Slab on Stone Masonry Abutments	10-Yr.	405.00	0.30'	None	All permits to replace the structure will include the removal of the existing bridge	N/A
	25-Yr.	405.71	-0.41'			
	50-Yr.	405.96	-0.66'			
	100-Yr.	406.20	-0.90'			
Proposed –11' Wide x 5' High Pre-cast Concrete Box Culvert - 1' Streambed Material in Bottom Roadway elev. to 406.0	10-Yr.	403.52	2.48'	None	ACOE 404 GP-19 404 Self-verification (SV) CTDEEP 401-WQC LOCAL IWC	\$818,000
	25-Yr.	404.36	1.64'			
	50-Yr.	404.99	1.01'			
	100-Yr.	405.73	0.27'			
Proposed –7' Wide x 5' High Pre-cast Concrete Box Culvert - 1' Streambed Material in Bottom Roadway elev. unchanged	10-Yr.	404.72	0.58'	None	ACOE 404 GP-19 404 Pre-Construction Notice (PCN), if state-funded CTDEEP 401-WQC LOCAL IWC	\$712,000
	25-Yr.	405.62	-0.32'			
	50-Yr.	405.86	-0.56'			
	100-Yr.	406.11	-0.81'			

Note: Negative value indicates that roadway is overtopped.

Maintenance and Protection of Traffic:

Potential local detour routes, and current traffic volumes do not require the existing bridge to remain open to traffic during construction. The new structure can be constructed in a single phase and in less than six-months, saving construction time and cost. With an estimated average daily traffic count of approximately 50 vehicles on Field Street, it is anticipated the detour route during construction will be approximately 0.6 miles and include Peck Lane,

Divinity Street and View Street.

Roadway Improvements:

The roadway approaches will not require horizontal realignment. The roadway width over the culvert will be maintained at 30' (2 – 12' lanes with 3' shoulders) with 5' wide sidewalks provided on both sides of the roadway. For the proposed alternate, in order to meet the hydraulic criteria, the roadway profile will require a change in the vertical alignment. The roadway will need to be raised approximately 0.7' in order to pass the 50-year design flow with 1 foot of freeboard. Impacts to adjacent properties as a result of this change will need to be evaluated during the next design phase. If impacts are determined to be excessive, the City may elect to waive the hydraulic design criteria and design the culvert for a higher frequency storm.

Roadway safety improvements will be included as a part of the project. The close proximity of driveways near the structure will prevent the use of metal beam guiderail at the approaches. The proposed alternative will evaluate the use of barrier walls or locating parapets and wingwalls outside of the clear zone.

Right of Way Impacts:

The proposed work will require work on private property adjacent to the structure. Easements will be required where a permanent encumbrance on a parcel is created by construction of the proposed structure. Rights will be required where construction creates a temporary inconvenience to a property owner's ability to fully utilize their property.

Utilities:

Underground utilities in the project vicinity include a gas main and an 8" sanitary sewer. Both of these utilities are exposed in the channel disrupting flow and will likely require relocation, both temporarily during construction and permanently to move them under the proposed culvert.

Based upon mapping provided by the City, there is also an 8" water main in the project area crossing the culvert beneath the channel. Test pits to determine the depth of the water main will be required and relocation of this water main may be required.

Overhead wires are located on the south side of Field Street with services that cross the roadway. Temporary relocation of these utilities may be required during construction to move them out of the way of any equipment needed for placement of the new structure.

Water Handling:

Water handling during construction will be accomplished by diverting flow around the construction area by using temporary water handling cofferdams upstream and downstream with bypass pipe(s) sized as needed. Dewatering will be required to complete construction.

Environmental Considerations:

Mitigation of the environmental impacts of construction will be a key component of this project. CTDEEP Stream Crossing Guidelines and the U.S. ACOE require several potential environmental concerns be addressed in the design phase of this project, including:

- Excessive Water Velocity: makes fish and wildlife passage more difficult.
- Multiple Culverts: are discouraged where a single culvert can meet design objectives.
- Openness Ratio: the relationship of the length vs. width, shorter culverts are preferred.
- Preservation of Natural Streambed Substrates: at least 1 foot of natural streambed material placed in the culvert for continuity of channel bottom.

Permitting Considerations

Local Inland Wetlands Permit:

The proposed alternative will require approval of the local Inland Wetlands and Watercourses Commission. Cardinal will assist the City of Bristol as required in obtaining the local permit based on a review of the semi-final design. Any concerns brought up by the commission will be addressed and incorporated into the final design.

U.S. ACOE 404 Permit:

This project will be eligible for a Self-Verification (SV) General Permit (GP19 and Appendix G – Connecticut General Permits – Stream Crossing Best Management Practices – BMP’s), with less than 5,000 square feet of wetland disturbance during construction if state funding is used. The GP-19 Self Verification is allowed at this location because it is anticipated that the proposed structure will be able to pass the 50-year flood frequency. All the design parameters required for the SV can be accommodated in the proposed structure.

Conclusions and Recommendations:

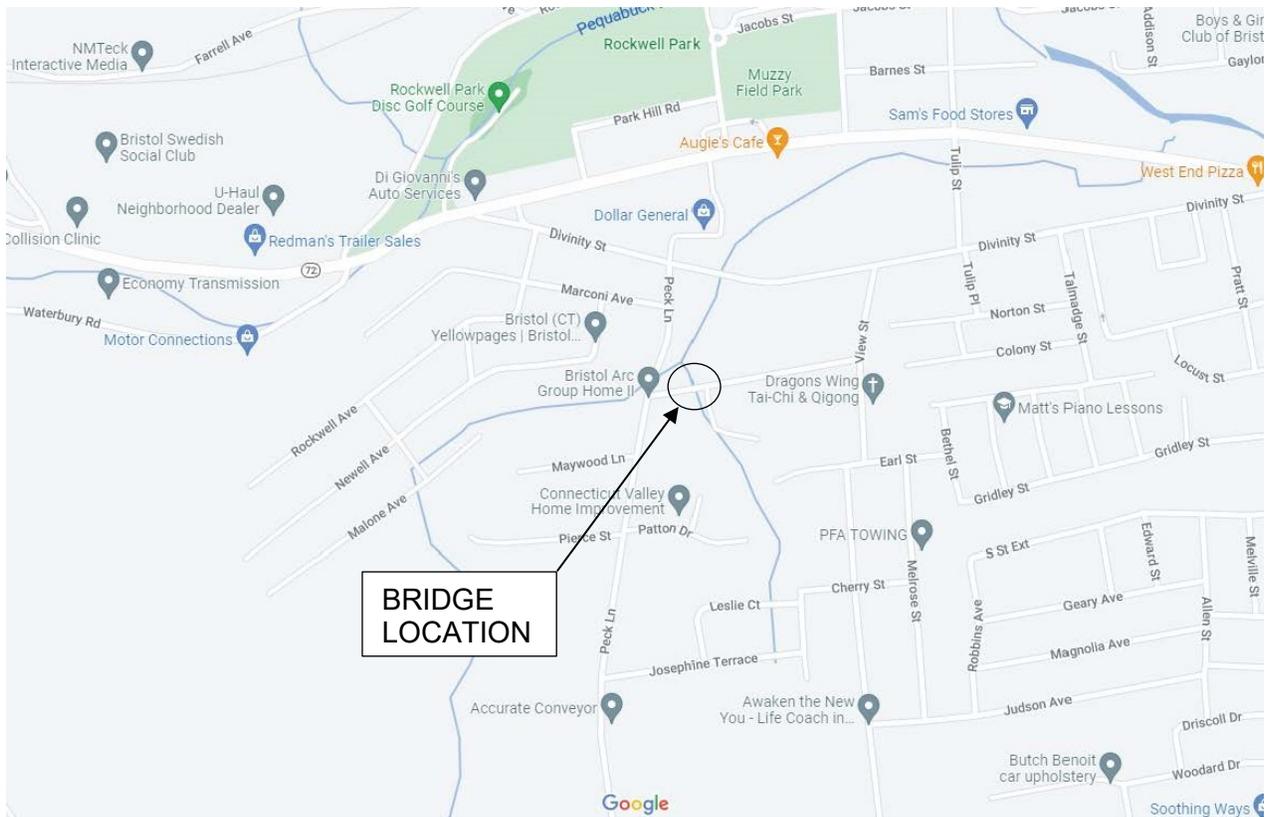
Cardinal Engineering Associates recommends that the proposed alternative - **11’W. x 5’H. Precast Concrete Box Culvert** be selected for the following reasons:

- Low long-term maintenance costs and meets DOT hydraulic criteria for small structure
- Permitting –Project is eligible for a Self-Verification (SV) General Permit
- With S.L.B.P. funding participation (50%) – provides an economical long-term solution for the City.

During the next phase of design, the impacts of this proposed alternative to the surrounding area will need to be evaluated relative to the hydraulic design criteria. If impacts are determined to be excessive as a result of the widening of the channel at the proposed structure or the increase in the roadway elevation, a smaller structure that does not meet the hydraulic design criteria may be considered.

The construction cost estimate for the recommended bridge replacement is \$818,000. This cost includes 10% for Contingencies, 20% for Incidentals (construction inspection and contract administration) and \$10,000 for right of way acquisition and utilities allowance. Design costs are not included

APPENDIX A



Location Map # 1
Bristol, CT
Bridge 017041, Field Street over Unnamed Stream
Latitude: 41° 40' 07.63" N
Longitude: -72° 57' 42.66" W

APPENDIX B

APPENDIX C

Inspection Type: Routine



BRIDGE NO.017041

Bristol

Field Street
over
Unnamed Stream

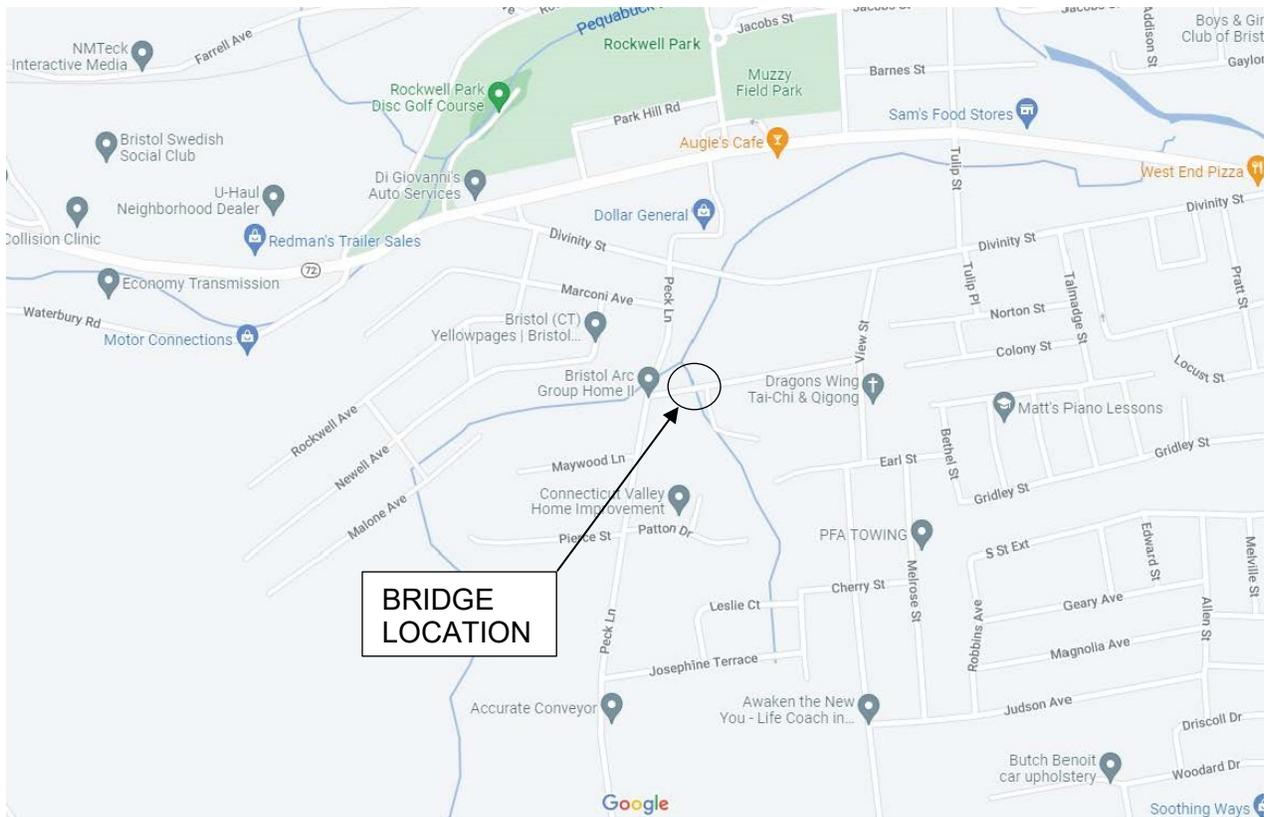
Routine Inspection
03/23/2022

Inspected by: Cardinal Engineering Associates, Inc.



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Location Map # 1
Bristol, CT
Bridge 017041, Field Street over Unnamed Stream
Latitude: 41° 40' 07.63" N
Longitude: -72° 57' 42.66" W

EXECUTIVE SUMMARY

Bridge 017041 carries Field Street over an unnamed stream in the City of Bristol. This structure consists of a 6'-10" concrete slab on stone masonry abutments. The paved width of the roadway is 30'± with sidewalks on both sides of the road and the out-to-out width of the structure is 50'±.

During this bridge inspection performed according to CTDOT standards for routine bridge inspections, the structure was found to be in serious condition with a full bridge replacement recommended.

Deck

Overall Rating: 5

The Bridge Approaches are in fair condition. See Approach Condition Section in the Bridge Inspection Report BRI-18 Form for more information.

Superstructure

Overall Rating: 3

Culvert: The Superstructure is in serious condition. See Superstructure Section in the Bridge Inspection Report BRI-18 Form for more information.

Substructure

Overall Rating: 5

Culvert: The Substructure is in fair condition. See Substructure Section in the Bridge Inspection Report BRI-18 Form for more information.

Approach Condition

Overall Rating: 8

The Approach Condition is in good condition. See Approach Condition Section in the Bridge Inspection Report BRI-18 Form for more information.

Channel Protection

Overall Rating: 5

The Channel and Channel Protection are in fair condition. See Channel Protection Section in the Bridge Inspection Report BRI-18 Form for more information.

Traffic Safety Features

Approach Guardrails: Safety features in place do not meet current design standards.

See Traffic Safety Features Section in the Bridge Inspection Report BRI-18 Form for more information.

STRUCTURE INVENTORY & APPRAISAL

INSPECTION

Structurally Deficient Y Functionally Obsolete Y

Sufficiency Rating

(90) Inspection Date 03/23/2022 (91) Frequency

Indepth Insp N Proposed next Indepth Year

Survey Date Class

Access Flagman

	Frequency	Date	Type
Fracture	<input type="text"/>	<input type="text"/>	<input type="text"/>
Underwater	<input type="text"/>	<input type="text"/>	<input type="text"/>
Special	<input type="text"/>	<input type="text"/>	<input type="text"/>

IDENTIFICATION

Bridge Name

Town Code - Name 08490 - BRISTOL

(5) Inventory Route

(A) Record Type 1 - ROUTE CARRIED ON STRUCTURE

(B) Signing Prefix 5 - TOWN ROAD

(C) Level of Service

(D) Route Number. 00000

(E) Dir Suffix 0 - NOT APPLICABLE

(6A) Featured Intersected UNNAMED STREAM

(6B) Critical Facility Indicator

(7) Facility Carried FIELD STREET

(9) Location 0.1 mi. East of Peck Lane

(11) Mile Post Miles

(16) Latitude 41 Deg. 40 Min. 7.63 Sec.

(17) Longitude -72 Deg. 57 Min. 42.66 Sec.

(98) Border Bridge

(A) State Code (B) Percent Responsibility %

(C) Border Town Name

(99) Border Bridge Structure No.

STRUCTURE TYPE & MATERIALS

(43) Structure Type, Main

A) Material 1 - CONCRETE

B) Design Type 01 - SLAB

(44) Structure Type, Approach

A) Material 0

B) Design Type 0

(45) Number of Spans, Main Unit 1

(46) Number of Approach Spans 0

(107) Deck Structure Type N

(108) Wearing Surface/Protection Systems

A) Type of Wearing Surface 6 - BITUMINOUS

B) Type of Membrane N

C) Type of Deck Protection N

Substructure

A) Material N

B) Design Type N

Paint

Type

Year

Comment

GEOMETRIC DATA

(48) Length of Maximum Span 6.83 ft.

(49) Structure Length 8 ft.

(50) Curb or Sidewalk Widths

A) Left 4 ft. 3 in. B) Right 4 ft. 3 in.

(51) Bridge Roadway Width Curb to Curb 30 ft. 2.5 in.

(52) Deck Width, Out to Out 50 ft. 0 in.

(32) Approach Roadway Width 30 ft.

(33) Bridge Median

Deck Area sq. ft.

(34) Skew Angle deg.

(35) Structure Flared

(10) Inv. Rte. Min. Vert. Clearance ft. in.

(47) Inv. Rte. Total Horiz. Clr. ft. in.

Log Inv. Rte. Total Horiz. Clr. ft. in.

RLog Inv. Rte. Total Horiz. Clr. ft. in.

(53) Min. Vert. Clearance Over Bridge ft. in.

(54) Log-Min. Vert. Underclearance ref. ft. in.

(55) Min. Lat Underclearance on Right ref. ft. in.

(56) Min. Lat Underclearance on Left ft. in.

CONDITION

(58) Deck

(59) Superstructure

(60) Substructure

(61) Channel & Channel Protections

(62) Culverts

(36) Traffic Safety Features

A) Bridge Railings

B) Transitions

C) Approach Guardrail

D) Approach Guardrail Ends

WATERWAY

Drainage Basin Waterway

(38) Navigation Control

(39) Navigation Vertical Clearance ft.

(40) Navigation Horiz. Clr. ft.

(111) Pier/Abutment Navigation

(116) Vert-Lift Brg Nav Min ft. in.

AGE AND SERVICE

Year Built (106) Year Reconstructed

(42) Type of Service

A) On

B) Under

(28) Number of Lanes

A) On B)

(29) Average Daily Traffic

Is Above Half ADT?

(109) Percent Truck %

(30) Years of ADT

(19) Bypass, Detour Length Miles

APPRAISALS

(67) Structural Evaluation

(68) Deck Geometry

(69) Underclearances, Vert. & Horiz.

(71) Waterway Adequacy

(72) Approach Roadway Alignment

(113) Scour Critical

COMMENTS

CLASSIFICATION

(112) NBIS Bridge Length

(104) Highway System

(26) Functional Class

(100) Defense Highway

(101) Parallel Structure

(102) Direction of Traffic

Form: BRI-19, Rev. 2/15
 Inspection type: ROUTINE
 Inspection Date: 03/23/2022
 Inspected by: CARDINAL ENGINEERING ASSOCIATES. INC.

Bridge No: 017041

Town: BRISTOL
 Carried: FIELD STREET
 Crossed: UNNAMED STREAM
 Inventory Route: Non-NHS

(103) Temporary Structure
 (110) Designated National Network
 (20) Toll
 (21) Maintain
 (22) Owner
 Report Class
 (37) Historical Significance

POSTED SIGNS

Other Posted Sign 1
 Other Posted Sign 2

	Actual	Recomended	
Posted Load Single Unit Truck	<input type="text"/>	<input type="text"/>	tons
Posted Load Semi-Trailer Truck	<input type="text"/>	<input type="text"/>	tons
Posted Load 4 Axle Truck	<input type="text"/>	<input type="text"/>	tons
Posted Load 3S2 Truck	<input type="text"/>	<input type="text"/>	tons
All Vehicles	<input type="text"/>	<input type="text"/>	tons

Posted Vert. Clearance on Bridge ft. in.
 Posted Vert. Underclearance ft. in.
 Posted Speed Limit on Bridge m.p.h.

OTHER FEATURES

Fence Required
 Fence Present
 Fence Type
 Fence Height
 Fence Material
 Fence Top Type
 Barrel Ladders
 Stand Pipes
 Catwalks
 Moveable Inspection System
 Haunches Present over Roadway
 Utilities

PROPOSED IMPROVEMENTS

(75A) Type of Work Proposed
 (75B) Work Done By
 (76) Length of Structure Improvement ft.
 (94) Bridge Improvement Cost \$
 (95) Roadway Improvement Cost \$
 (96) Total Project Cost \$
 (97) Year of Improvement Estimate
 (114) Future ADT
 (115) Year of Future ADT
 DOT Bridge Program List No
 Project No
 Advertised Date

LOAD RATING & POSTING

(31) Design Load
 (63) Operating Rating Type
 (64) Operating Rating
 (65) Inventory Rating Type
 (66) Inventory Rating
 Evaluation Code
 Year of Evaluation
 (70) Bridge Posting
 (41) Structure Status

Connecticut Department of Transportation

Bridge Inspection Report BRI-18

BRIDGE #:	017041	INSPECTION DATE:	03/23/22
INSPECTION TYPE:	Special	PREVIOUS INSPECTION DATE:	Unknown
INSPECTION PERFORMED BY:	Cardinal Engineering Associates, Inc.	SNOOPER REQUIRED:	N
SNOOPER USED:			
TOWN:	Bristol	FEATURE CARRIED:	Field Street
LOCATION:	0.1 mile east of Peck Lane	FEATURE INTERSECTED:	unnamed stream
YEAR BUILT:		YEAR REBUILT:	
MAIN MATERIAL:	1 - Concrete	MAIN DESIGN:	01 - Slab
INVENTORY ROUTE:		INVENTORY ROUTE:	Non-NHS

INSPECTION VISITS:		INSPECTORS:	
Inspection Date:	3/23/2022	Start Time:	8:45am
Temperature:	40°F	End Time:	10:15am
		Inspector:	Charles Hornak
		Inspector:	Michael Cermola
		Inspector:	
		Task:	Inspector
		Task:	Inspector
		Task:	

58. DECK	Reinforced Concrete Slab	OVERALL RATING	5
	RATING		
OVERLAY	8	Recently installed bituminous concrete overlay with no deficiencies noted.	
DECK STR. CONDITION	N	Deck is integral with superstructure. Top of deck/superstructure not inspected.	
CURBS	4	Bituminous curb significantly deteriorated. Curb reveal reduced to approximately 2 inches due to deterioration and thickness of bituminous overlay.	
MEDIAN	N		
SIDEWALKS	4	Scaling on surface of sidewalks. Cracks in sidewalk at limits of structure.	
PARAPET	4	Concrete surfaces exhibit significant scaling. Base of north parapet heavily spalled.	
RAILING	n		
PAINT	N		
FENCE	N		
DRAINS	7	Minor accumulation of debris at drain inlets. Frames and grates in good condition.	
LIGHTING STANDARD	N		
UTILITIES TYPE/SIZE	N		
CONSTRUCTION JOINTS	N		
EXPANSION JOINTS	N		

Connecticut Department of Transportation

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59. SUPERSTRUCTURE

Reinforced Concrete Slab

OVERALL RATING

3

RATING

BEARING DEVICES	N	
STRINGERS	N	
GIRDERS	N	
FLOOR BEAMS	3	Areas of spalled concrete with exposed rebar around drain openings. Advanced section loss on exposed rebar. Widespread areas of scaling of concrete on underside of superstructure.
TRUSSES-GENERAL	N	
TRUSSES-PORTALS	N	
TRUSSES-BRACING	N	
PAINT	N	
RUST	N	
MACHINERY MOV SPAN	N	
RIVETS & BOLTS	N	
WELDS & CRACKS	N	
TIMBER DECAY	N	
CONCRETE CRACKING	N	
COLLISION DAMAGE	N	
MEMBER ALIGNMENT	N	
DEFLECT. UNDER LOAD	N	
VIBR. UNDER LOAD	N	
STAND PIPES	N	
BARREL LADDERS	N	

ARE BARREL LADDERS OSHA COMPLIANT?

N/A

Connecticut Department of Transportation

Bridge Inspection Report BRI-18

60. SUBSTRUCTURE

Stone Masonry Abutments

OVERALL RATING

5

RATING

ABUTMENTS-STEM	5	Missing mortar between stones with some displaced stones.
ABUTMENTS-BACKWALL	N	
ABUTMENTS-FOOTINGS	6	No apparent undermining of footing.
ABUT.-SETTLEMENT	N	
ABUTMENTS-WINGWALLS	5	Cracks in both northern wingwalls Concrete cap is heavily scaled on all wingwalls with some damage at corners.
PIERS/BENTS-CAPS	N	
PIERS/BENTS-PILE BENT	N	
PIERS/BENTS-COLUMN	N	
PIERS/BENTS-FOOTINGS	N	
PIERS/BENTS-SETTLEMENT	N	
EROSION-SCOUR	5	Portions of the original stone masonry channel floor are missing exposing the natural channel bottom. There is an area of minor scour (about 1 foot deep) downstream of the exposed sanitary sewer pipe.
CONCRETE CRACK-SPALL	N	
STEEL CORROSION	N	
PAINT	N	
TIMBER DECAY	N	
COLLISION DAMAGE	N	
DEBRIS	N	

Connecticut Department of Transportation Bridge Inspection Report BRI-18

61. CHANNEL PROTECTION	<input type="text" value="Average water depth at time of inspection 0.5 to 1.5 feet."/>	OVERALL RATING 5
	RATING	
CHANNEL SCOUR	5	Exposed gas main and sanitary sewer in bottom of channel with scour (approximately 1 foot deep) downstream of sanitary sewer.
EMBANKMENT EROSION	5	Downstream channel walls have some areas of missing mortar between stones.
DEBRIS	5	Minor debris accumulation at structure inlet
VEGETATION	5	Brush and trees along channel banks upstream of structure.
CHANNEL CHANGE	5	Upstream channel not aligned with structure.
FENDER SYSTEM	N	
SPUR DIKES & JETTIES	N	
RIP RAP	N	

62. CULVERTS & RETAINING WALL	<input type="text"/>	OVERALL RATING N/A
	RATING	
BARREL	N	
CONCRETE	N	
STEEL	N	
TIMBER	N	
HEADWALL	N	
CUTOFF WALL	N	
DEBRIS	N	
RETAINING WALL STEM	N	
FOOTING	N	

APPROACH CONDITION	<input type="text"/>	OVERALL RATING 8
	RATING	
APPROACH SLAB	N	
RELIEF JOINTS	N	
APPROACH GUIDE RAIL	N	
APPROACH PAVEMENT	8	Recently installed bituminous concrete overlay with no deficiencies noted.
APPROACH EMBANKMENT	N	

Connecticut Department of Transportation

Bridge Inspection Report BRI-18

TRAFFIC SAFETY FEATURES:

BRIDGE RAILINGS	<input type="checkbox"/> N	
TRANSITIONS	<input type="checkbox"/> N	
APPROACH GUARDRAILS	<input type="checkbox"/> N	
APPR. GUARDRAIL ENDS	<input type="checkbox"/> N	

LOAD POSTING

		None noted
SINGLE UNIT (TONS)	<input type="checkbox"/>	
HS (TONS)	<input type="checkbox"/>	
4 AXLE (TONS)	<input type="checkbox"/>	
2S3 (TONS)	<input type="checkbox"/>	
ADVANCE WARNING Y/N	<input type="checkbox"/>	
LEGIBILITY	<input type="checkbox"/>	
VISIBILITY/LOCATION	<input type="checkbox"/>	

MISC.

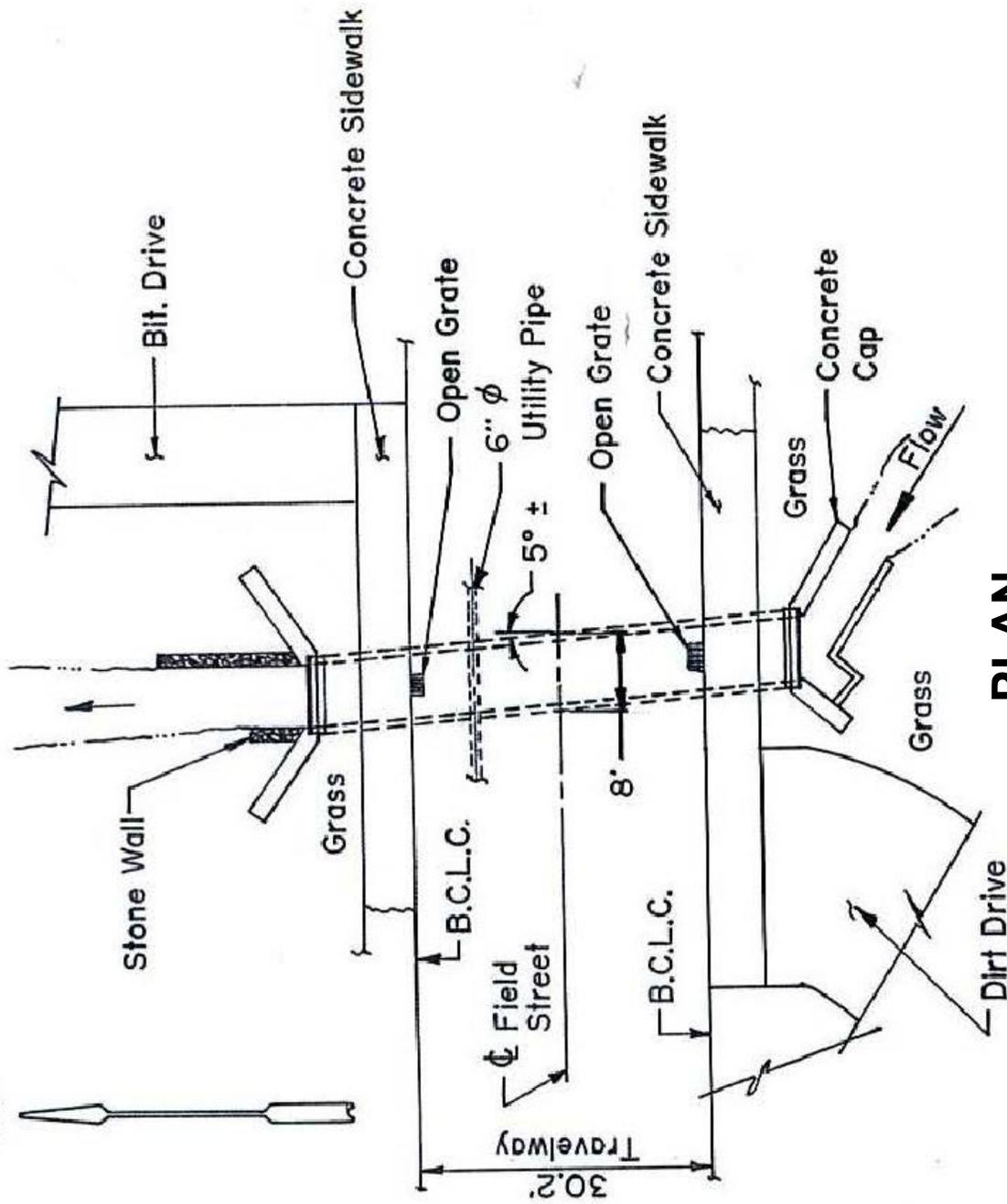
MIN VERT. UNDERCLR.	<input type="checkbox"/>	'	<input type="checkbox"/>	"	
POSTED CLR UNDER BRIDGE	<input type="checkbox"/>	'	<input type="checkbox"/>	"	
POSTED CLR UNIT (TONS)	<input type="checkbox"/>	'	<input type="checkbox"/>	"	
ADVANCE WARNING (Y/N)	<input type="checkbox"/>				
SPEED LIMIT (IF ANY)	<input type="checkbox"/>	MPH			
CHARACTER OF TRAFFIC					

ADDITIONAL NOTES

ADDITIONAL COMMENTS:

Bus stop shelter located southeast of structure.

Inspectors' Signatures:	1)	<i>Chh. A. Kowalek</i>	DATE:	3/23/2022
	2)		DATE:	_/_/_
	3)		DATE:	_/_/_
P.E. Signature:			DATE:	_/_/_
P.E. #:				
Reviewed by:			CDOT DATE:	_/_/_



PLAN

SCALE: N.T.S.

PROJECT TITLE: BRIDGE NO. 017041
FIELD STREET
OVER UNNAMED STREAM

DRAWING TITLE: PLAN

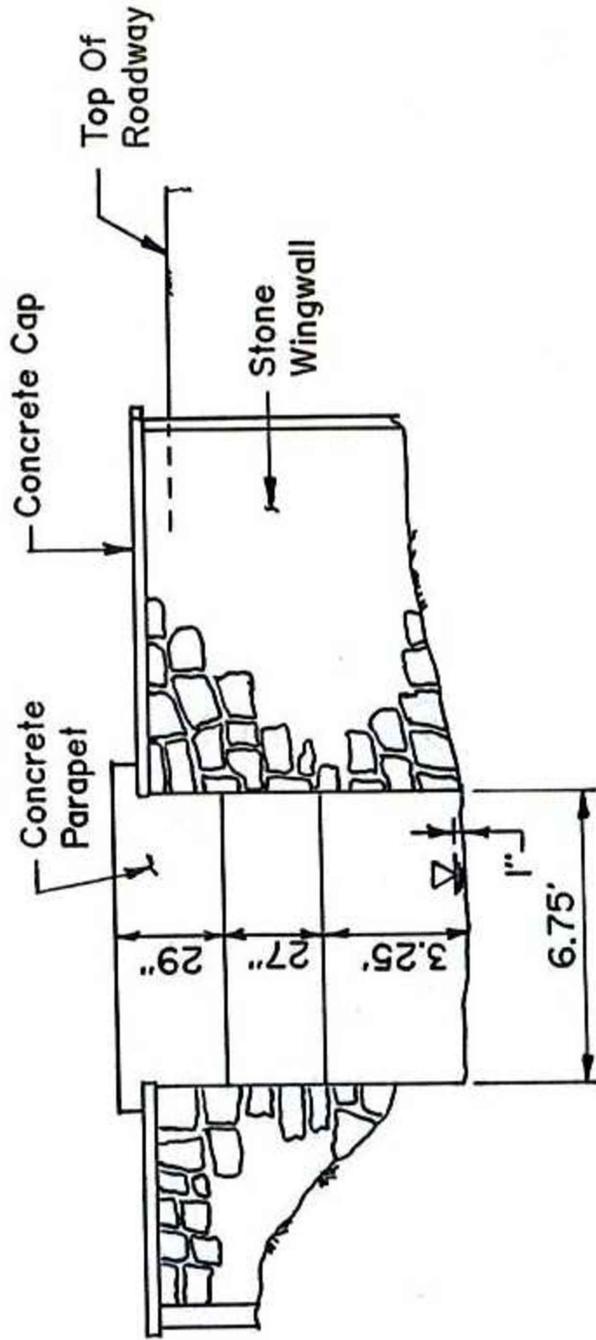
DRAFTER: CH

DATE: 03/24/2022

DRAWING NUMBER: SK-01

CARDINAL
ENGINEERING ASSOCIATES

200 HARTFORD STREET, SUITE 100
WATERBURY, CONNECTICUT 06708-1000
TEL: 860.241.1111 FAX: 860.241.1112

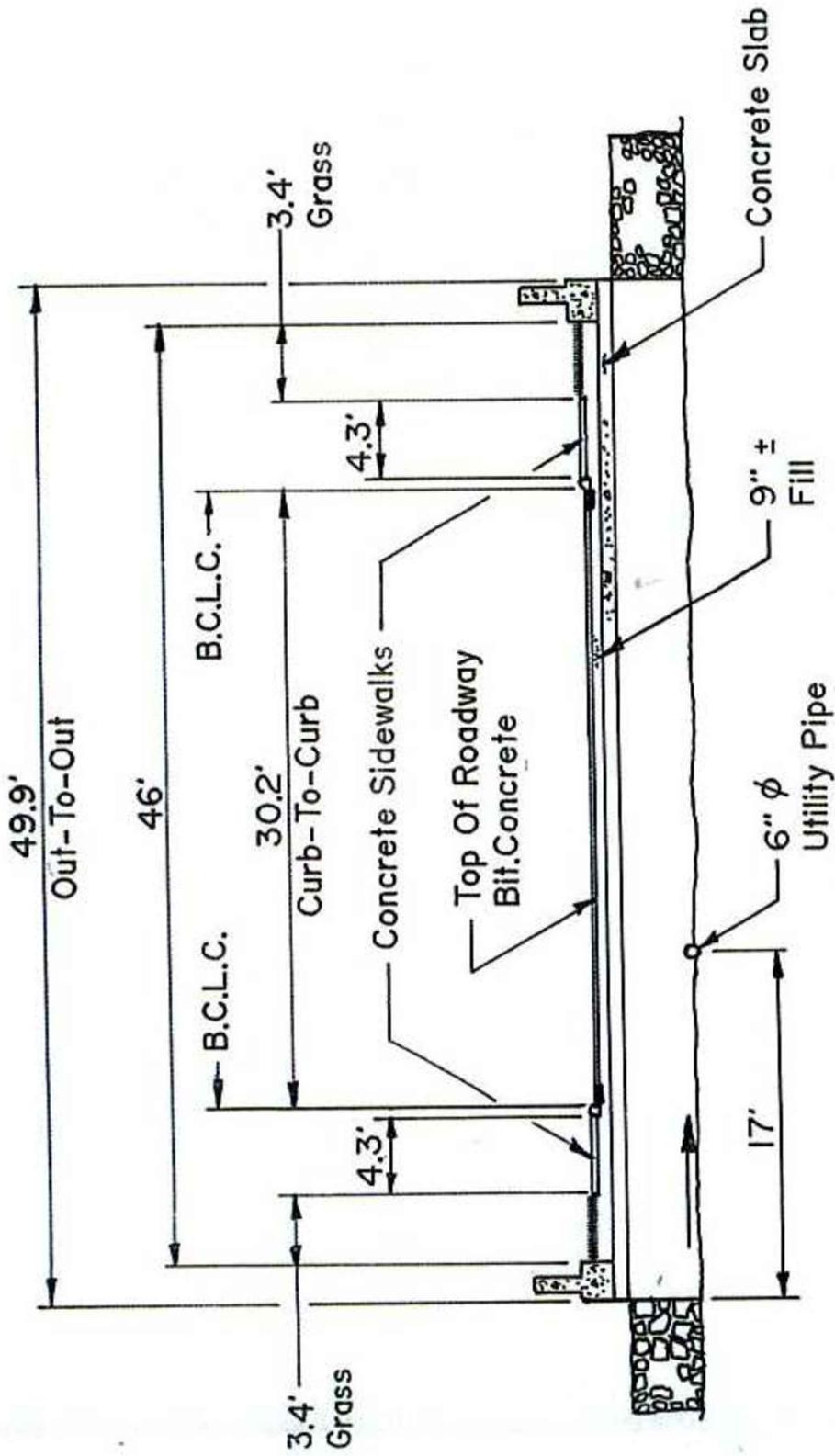


ELEVATION

SCALE: N.T.S.

PROJECT TITLE: BRIDGE NO. 017041 FIELD STREET OVER UNNAMED STREAM		DRAWING NUMBER: SK-02	
DRAWING TITLE: ELEVATION		DATE: 3/24/2022	DRAWING NUMBER: SK-02
DRAFTER: CH			

CARDINAL
ENGINEERING ASSOCIATES
200 HARTFORD STREET, SUITE 200
HARTFORD, CONNECTICUT 06108-4974
TEL: 860-234-8888 FAX: 860-234-8889



CROSS SECTION

SCALE: N.T.S.

PROJECT TITLE:		BRIDGE NO. 017041 FIELD STREET OVER UNNAMED STREAM	
DRAWING TITLE:		CROSS SECTION	
DRAFTER:	DATE:	DRAWING NUMBER:	
CH	3/24/2022	SK-03	

CARDINAL
ENGINEERING ASSOCIATES
200 WASHINGTON STREET, SUITE 200
NEWTON, MASSACHUSETTS 02459-1000
TEL: 617.552.1100 FAX: 617.552.1101

Form: Asset Photos

Inspection type: ROUTINE

Inspection Date: 03/23/2022

Inspected by: CARDINAL ENGINEERING ASSOCIATES

Bridge No. 017041

Town: BRISTOL

Carried: FIELD STREET

Crossed: UNNAMED STREAM

Inventory Route: Non-NHS

Photo Number: 1

Photo Taken: 03/23/2022



West Approach – Looking East

Form: Asset Photos

Inspection type: ROUTINE

Inspection Date: 03/23/2022

Inspected by: CARDINAL ENGINEERING ASSOCIATES

Bridge No. 017041

Town: BRISTOL

Carried: FIELD STREET

Crossed: UNNAMED STREAM

Inventory Route: Non-NHS

Photo Number: 2

Photo Taken: 03/23/2022



East Approach – Looking West

Form: Asset Photos

Inspection type: ROUTINE

Inspection Date: 03/23/2022

Inspected by: CARDINAL ENGINEERING ASSOCIATES

Bridge No. 017041

Town: BRISTOL

Carried: FIELD STREET

Crossed: UNNAMED STREAM

Inventory Route: Non-NHS

Photo Number: 2

Photo Taken: 03/23/2022



Upstream Channel

Form: Asset Photos

Inspection type: ROUTINE

Inspection Date: 03/23/2022

Inspected by: CARDINAL ENGINEERING ASSOCIATES

Bridge No. 017041

Town: BRISTOL

Carried: FIELD STREET

Crossed: UNNAMED STREAM

Inventory Route: Non-NHS

Photo Number: 3

Photo Taken: 03/23/2022



Downstream Channel

Form: Asset Photos

Inspection type: ROUTINE

Inspection Date: 03/23/2022

Inspected by: CARDINAL ENGINEERING ASSOCIATES

Bridge No. 017041

Town: BRISTOL

Carried: FIELD STREET

Crossed: UNNAMED STREAM

Inventory Route: Non-NHS

Photo Number: 4

Photo Taken: 03/23/2022



Downstream Elevation

Photo Number: 5

Photo Taken: 03/23/2022

Form: Asset Photos

Inspection type: ROUTINE

Inspection Date: 03/23/2022

Inspected by: CARDINAL ENGINEERING ASSOCIATES

Bridge No. 017041

Town: BRISTOL

Carried: FIELD STREET

Crossed: UNNAMED STREAM

Inventory Route: Non-NHS



North Parapet

Form: Asset Photos

Inspection type: ROUTINE

Inspection Date: 03/23/2022

Inspected by: CARDINAL ENGINEERING ASSOCIATES

Bridge No. 017041

Town: BRISTOL

Carried: FIELD STREET

Crossed: UNNAMED STREAM

Inventory Route: Non-NHS

Photo Number: 6

Photo Taken: 03/23/2022



South Parapet

Form: Asset Photos

Inspection type: ROUTINE

Inspection Date: 03/23/2022

Inspected by: CARDINAL ENGINEERING ASSOCIATES

Bridge No. 017041

Town: BRISTOL

Carried: FIELD STREET

Crossed: UNNAMED STREAM

Inventory Route: Non-NHS

Photo Number: 7

Photo Taken: 03/23/2022



Interior Showing Exposed Utilities

Form: Asset Photos

Inspection type: ROUTINE

Inspection Date: 03/23/2022

Inspected by: CARDINAL ENGINEERING ASSOCIATES

Bridge No. 017041

Town: BRISTOL

Carried: FIELD STREET

Crossed: UNNAMED STREAM

Inventory Route: Non-NHS

Photo Number: 8

Photo Taken: 03/23/2022



Drain Opening in Top Slab with Spalled Concrete and Corroded Rebar

Form: Asset Photos

Inspection type: ROUTINE

Inspection Date: 03/23/2022

Inspected by: CARDINAL ENGINEERING ASSOCIATES

Bridge No. 017041

Town: BRISTOL

Carried: FIELD STREET

Crossed: UNNAMED STREAM

Inventory Route: Non-NHS

Photo Number: 9

Photo Taken: 03/23/2022



Spalled Concrete and Corroded Rebar in Bottom of Slab

Form: Asset Photos

Inspection type: ROUTINE

Inspection Date: 03/23/2022

Inspected by: CARDINAL ENGINEERING ASSOCIATES

Bridge No. 017041

Town: BRISTOL

Carried: FIELD STREET

Crossed: UNNAMED STREAM

Inventory Route: Non-NHS

Photo Number: 10

Photo Taken: 03/23/2022



Top Slab with Deteriorated Concrete

Form: Asset Photos

Inspection type: ROUTINE

Inspection Date: 03/23/2022

Inspected by: CARDINAL ENGINEERING ASSOCIATES

Bridge No. 017041

Town: BRISTOL

Carried: FIELD STREET

Crossed: UNNAMED STREAM

Inventory Route: Non-NHS

Photo Number: 11

Photo Taken: 03/23/2022



Masonry Abutment with Missing Mortar

Form: Asset Photos

Inspection type: ROUTINE

Inspection Date: 03/23/2022

Inspected by: CARDINAL ENGINEERING ASSOCIATES

Bridge No. 017041

Town: BRISTOL

Carried: FIELD STREET

Crossed: UNNAMED STREAM

Inventory Route: Non-NHS

Photo Number: 12

Photo Taken: 03/23/2022



Northeast Wingwall – Note Cracks and Missing Mortar between Stones

BRIDGE NO.017041

08490 - BRISTOL
Field Street
over
an unnamed stream

Screening Inspection

6/28/2017

Inspected by: Prime



SCREENING - INVENTORY DATA



Bridge: 017041 **Town:** 08490 - BRISTOL **Carried:** Field Street **Crossed:** an unnamed stream

IDENTIFICATION

(4) Town	<input type="text" value="08490 - BRISTOL"/>	(98) Border Bridge		
(6A) Feature Intersected	<input type="text" value="an unnamed stream"/>	(A) State Code	<input type="text"/>	
(7) Facility Carried	<input type="text" value="Field Street"/>	(B) Percent Responsibility	<input type="text"/>	
(9) Location	<input type="text" value="0.05 Mi E of Peck Lane"/>	(C) Border Town Name	<input type="text"/>	
	Deg. Min. Sec.	(99) Border Bridge No.	<input type="text"/>	
(16) Latitude	<input type="text" value="41"/>		<input type="text" value="40"/>	<input type="text" value="7.63"/>
(17) Longitude	<input type="text" value="-72"/>		<input type="text" value="57"/>	<input type="text" value="42.66"/>

STRUCTURE TYPE AND MATERIAL

(43) Structure Type, Main	
A) Material	<input type="text" value="1 - Concrete"/>
B) Design Type	<input type="text" value="01 - Slab"/>
(44) Structure Type, Approach	
A) Material	<input type="text"/>
B) Design Type	<input type="text"/>
(45) Number of Spans, Main Unit	<input type="text" value="1"/>
(46) Number of Approach Spans	<input type="text"/>
(107) Deck Structure Type	<input type="text" value="1 - Concrete Cast-in-Place"/>
(108) Wearing Surface Protective Systems	
A) Type of Wearing Surface	<input type="text" value="6 - Bituminous"/>

AGE AND SERVICE

(27) Year Built	<input type="text" value="1939"/>	(29) Average Daily Traffic	<input type="text" value="50"/>
(106) Year Reconstructed	<input type="text"/>	Is Above Half ADT?	<input type="text"/>
(28) Number Of Lanes (A) On	<input type="text" value="02"/>	(30) Year Of ADT	<input type="text" value="1991"/>

GEOMETRIC DATA

(48) Length of Maximum Span ft in
(49) Structure Length ft in
(51) Bridge Roadway Width
 Curb to Curb ft in
(52) Deck Width, Out to Out* ** ft in

Deck Area* ** sq ft
(34) Skew Angle
(35) Structure Flared

Creation Date: 06/28/2017

Created By: Souliere, Michael

**Inventory Data
Reviewed By:**

David Tassavor

* Record measurements to the nearest whole number.

** Under the screening phase of the program, Bridge Width (Out-Out) and Deck Area are not applicable to culverts that are significantly wider than the roadway (i.e. inlet-to-Outlet measurement is significantly greater than the curb-to-curb measurement.)



SCREENING REPORT

Bridge: 017041 Town: 08490 - BRISTOL Carried: Field Street Crossed: an unnamed stream

Inspection Date: 10/18/2016 Inspection Team: Prime

OVERLAY

Depression/Settlement	Fair/Worse	No depression noted, numerous sealed cracks in bituminous concrete surface
Sidewalk	Fair/Worse	Concrete sidewalks on both side of roadway
Bridge Rail/Fence	N/A	

STRUCTURE

Deck	Sat/Better	Some scaling and light spalls on bottom of deck, efflorescence on deck
Superstructure	Sat/Better	See above
Substructure	Sat/Better	Debris and rocks at inlet, open joints in mortar at flowline

CULVERT

Cell	N/A	
Headwall/Wingwalls	N/A	

WATERWAY

Debris	Fair/Worse	Concrete lined channel bottom on downstream side. Debris and rocks block flow at inlet causing waterfall.
Stream Alignment	Fair/Worse	Fair alignment
Embankment/Erosion	Sat/Better	Stone lined channel upstream. Masonry retaining walls downstream with concrete bottom.

COMMENTS

To be followed by full inspection

Form: Asset Photos
Inspection type: Screening
Inspection Date: 6/28/2017
Inspected by: Prime

:Bridge No 017041

Town: BRISTOL
Carried: Field Street
Crossed: an unnamed stream
Inventory Route: 8



Photo Number: 1

Photo Taken: 10/18/2016

Top of Deck
Looking west across bridge



Photo Number: 2

Photo Taken: 10/18/2016

South Elevation
Looking downstream at inlet

Form: Asset Photos
Inspection type: Screening
Inspection Date: 6/28/2017
Inspected by: Prime

:Bridge No 017041

Town: BRISTOL
Carried: Field Street
Crossed: an unnamed stream
Inventory Route: 8



Photo Number: 3

Underside of deck looking downstream from inlet

Photo Taken: 10/18/2016

Town Bridges (Span of 20 FT & under) – Inventory and Screening Form

Town: Bristol Bridge No.: 017041 Date of Inspection: 10/18/2016
Lat.: 41.668785
Long.: -72.961850



Consultant Co Name: PRIME AE Group Inc.

Inspector: BD [Signature]
Inspector: MS [Signature]

Reviewed by: _____ Date: _____

Inventory Data

Road: Field Street Crossing: unnamed stream

Location to nearest intersection: 0.0 Miles (E) from Junction with Peck Lane

Is this a border bridge? Yes/ No Border Town (and state): _____

Functional Classification of Roadway: Rural principal arterial (interstate)/ Rural principal arterial (other)/ Rural minor arterial/ Rural major collector/ Rural minor collector/ Rural local/ Urban principal arterial (interstate)/ Urban principal arterial (other freeway)/ Urban other principal arterial/ Urban minor arterial/ Urban collector/ Urban local

ADT: _____ Date of ADT: _____

Source: CDOT Town ADT map, Town source, Project source, other _____
(Do not use the ADT from previous 1991 report and do not estimate ADT – if no source, leave blank)

Main Span:

-Bridge Material: Concrete/ Continuous Conc/ Pre-stressed Conc/ Continuous Pre-Stressed Conc/ Steel/ Continuous Steel/ Timber/ Masonry/ Aluminum/ Other _____

-Type of Bridge: Slab/ Multi-Beam/ Girder & Floorbeam/ Tee Beam/ Multiple Box Beam/ Spread box Beam/ Frame/ Deck Arch/ Pipe culvert or Box Culvert/ Channel Beam/ Other _____

Approach Span:

-Bridge Material: Concrete/ Continuous Conc/ Pre-stressed Conc/ Continuous Pre-Stressed Conc/ Steel/ Continuous Steel/ Timber/ Masonry/ Aluminum/ Other _____

-Type of Bridge: Slab/ Multi-Beam/ Girder & Floorbeam/ Tee Beam/ Multiple Box Beam/ Spread box Beam/ Frame/ Deck Arch/ Pipe culvert or Box Culvert/ Channel Beam/ Other _____

NBIS Bridge Length: 6.8' Structure Length: 8'

Number of Spans: 1 Span Lengths: Span1- 6.8' Span2- _____ Span3- _____ Span4- _____

Bridge Width (out-to-out)**: 50' (curb-to-curb): 30'

Deck Area**: 400 s.f. Number of Lanes on Structure: 2

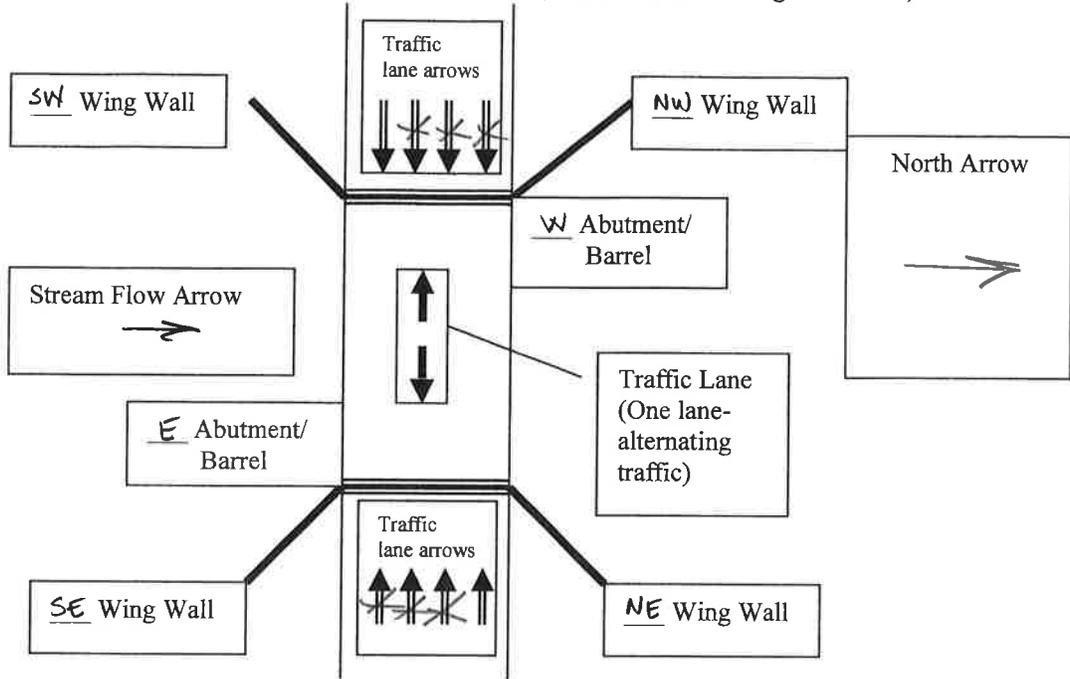
** Under the screening phase of the program, Bridge Width (out to out) and Deck Area are not applicable to culverts that are significantly wider than the roadway (i.e. inlet-to-outlet measurement is significantly greater than the roadway curb-to-curb measurement)

Town Bridges (Span of 20 FT & under)– Inventory and Screening Form

Town: Bristol Bridge No.: 017041 Date of Inspection: 10/18/2016

Basic Orientation Sketch:

(Add north arrow, stream flow arrow, traffic lane arrows, and abutment & wing wall labels)



Screening Data (Limited Inspection)

Was structure inspected under the previous CDOT project (#170-936)? Yes No
 Is structure new or significantly modified since last CDOT inspection? Yes No
 Has the structure been inspected by others since the last CDOT inspection? . . . unkn Yes No
 Date of last inspection by others: _____

Inspection Access

- Is there ready access to both sides of bridge (up & downstream)? Yes No
- Can stream be walked with waders? Yes No
- Items for full inspection - Boat or raft/ Divers/ Ladder/ Tidal/ Low FB/ Confined space/ Other _____

Topside (Bridge and Culvert)

- Condition of Topside (overlay, top of deck). Sat. Or Better Fair or worse
- Safety concerns of urgent nature on topside? (include parapets, railing, etc) No Yes

Underside (Bridge)

- Condition of underside of deck Sat. Or Better Fair or worse
- Condition of superstructure. Sat. Or Better Fair or worse
- Condition of abutments Sat. Or Better Fair or worse
- Condition of wingwalls Sat. Or Better Fair or worse
- Safety concerns of urgent nature on underside? No Yes

Underside (Culvert)

- Condition of roof Sat. Or Better Fair or worse
- Condition of sidewalls. Sat. Or Better Fair or worse
- Condition of invert Sat. Or Better Fair or worse
- Condition of wingwalls Sat. Or Better Fair or worse
- Safety concerns of urgent nature on underside? No Yes

Town Bridges (Span of 20 FT & under)- Inventory and Screening Form

Town: Bristol Bridge No.: 017041 Date of Inspection: 10/18/2016

Channel

- Condition of scour Sat. Or Better Fair or worse
- Condition of channel Sat. Or Better Fair or worse
- Alignment of channel Sat. Or Better Fair or worse
- Adequacy of channel to carry high flow Sat. Or Better Fair or worse

General Assessment Based on Above:

- 58. Deck Sat. Or Better Fair or worse
- 59. Superstructure Sat. Or Better Fair or worse
- 60. Substructure Sat. Or Better Fair or worse
- 61. Channel Sat. Or Better Fair or worse
- 62. Culvert N/A Sat. Or Better Fair or worse
- 67. Structural Evaluation Sat. Or Better Fair or worse
- 71. Waterway adequacy Sat. Or Better Fair or worse

Safety Items:

Was town notified of any urgent safety concerns by e-mail (with photos) Yes No
 Date the town was notified: _____

Comments and Observations:

Topside - Numerous cracks (sealed) in Bit. Conc. surface
No guiderail
Sidewalks both sides

Underside - Some scaling & light spalls on bottom of
deck
debris/rocks @ inlet / efflor on deck
No flow thru bridge / Open joints in mortar @ flowline

Channel - stone line / some ret. wall channel on both
sides 18" ± waterfall @ inlet
Conc. line channel bottom downstream

ORIGINAL

**CONNECTICUT
DEPARTMENT OF TRANSPORTATION**

Inspection of Town Owned Structures

Project No. 170-936

Town of Bristol

Field St. over Stream

Bridge No. 017041

STEINMAN BOYNTON GRONQUIST & BIRDSALL

ROCKY HILL, CT. 06067

JULY 17, 1991

BRIDGE NUMBER 017041	TOWN NAME BRISTOL	NBIS BRG LGTH N 18
FACILITY CARRIED FIELD STREET		FEATURE CROSSED STREAM

BS&E RECEIVED
COPIES MADE

DATA ENTRY DATE: _____
INITIAL: _____

INSPECTED BY: LUKE BRISTOL & ANDREW HAYNES

STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION
DIVISION OF BRIDGE SAFETY & EVALUATION
STRUCTURE INVENTORY
SHEET 1 OF 2 FORM BRI19 REV 10/90

SHEET OF (INSP. REPORT)
LAST INSPECTED ON: _____
SUFFICIENCY RATING: _____

IDENTIFICATION

BRIDGE NAME: _____

(4) TOWN NAME BRISTOL PLACE CODE: 08490

(5) INVENTORY ROUTE: _____

(6) SIGNING PREFIX _____

(7) LEVEL OF SERVICE _____

(8) NUMBER 5

(9) FEATURE INTERSECTED STRIBELM

(10) FACILITY CARRIED FIELD STREET

(11) LOCATION 1.1 MILES OFF PUBLIC LANE

(12) MILEPOINT _____

(13) LATITUDE _____

(14) LONGITUDE _____

** (98) BORDER BRIDGE

A) STATE CODE _____

B) PERCENT RESPONSIBILITY _____

C) BORDER TOWN NAME _____

(99) BORDER BRIDGE STRUCTURE NO. _____

STRUCTURE TYPE AND MATERIAL

(43) STRUCTURE TYPE, MAIN _____

A) MATERIAL _____

B) DESIGN TYPE _____

(44) STRUCTURE TYPE, APPROACH _____

A) MATERIAL _____

B) DESIGN TYPE _____

(45) NUMBER OF SPANS, MAIN UNIT _____

(46) NUMBER OF APPROACH SPANS _____

** (107) DECK STRUCTURE TYPE _____

** (108) WEARING SURFACE / PROTECTIVE SYSTEM:

A) TYPE OF WEARING SURFACE _____

B) TYPE OF MEMBRANE _____

C) TYPE OF DECK PROTECTION _____

RED FLAG

INSPECTION DATE MONTH DAY YEAR 01 13 91	INSP. TEAM	(91) FREQUENCY
IN-DEPTH INS DECK SURVEY	ACCESS	FLAG MAN
CRITICAL FEATURE INSPECTIONS (93) INSPECTION DATE (CODE IF CHANGED)		
Insp. Type (92) FREQUEN. Last Insp.		
A) _____		
B) _____		
C) _____		

AGE AND SERVICE

(27) YEAR BUILT _____

(28) YEAR RECONSTRUCTED _____

(42) TYPE OF SERVICE _____

A) ON _____

B) UNDER _____

+ (28) NUMBER OF LANES _____

A) ON _____

B) UNDER _____

* (29) AVERAGE DAILY TRAFFIC _____

* (30) PERCENT TRUCK _____

* (30) YEAR OF ADT _____

(19) BYPASS, DETOUR LENGTH _____

GEOMETRIC DATA

** (48) LENGTH OF MAXIMUM SPAN _____ Ft

** (49) STRUCTURE LENGTH _____ Ft

(50) CURB-OR SIDEWALK WIDTHS _____

A) LEFT _____

B) RIGHT _____

** (51) BRG RDWY WIDTH, CURB-CURB _____

(52) DECK WIDTH, OUT TO OUT _____

(32) APPROACH ROADWAY WIDTH _____

(33) BRIDGE MEDIAN _____

DECK AREA _____ Sqft

(34) SKEW ANGLE _____ Deg

(35) STRUCTURE FLARED _____

+ (10) INV. RTE, MIN. VERT CLEAR _____ Ft

+ (47) INV. RTE, TOTAL HORIZ CLEAR _____ Ft

+ (53) MIN VERT CLEAR OVER BRG RDWY _____ Ft

+ (54) MIN VERT UNDERCLEARANCE _____ Ft

+ (55) MIN LAT UNDERCLEAR ON RIGHT _____ Ft

+ (56) MIN LAT UNDERCLEAR ON LEFT _____ Ft

STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION
DIVISION OF BRIDGE SAFETY & EVALUATION
STRUCTURE INVENTORY
SHEET 2 OF 2 FORM BRI19 REV 10/90

BRIDGE NUMBER 07041	TOWN NAME BRISTOL	NBIS BRG LGTH. N 8'
FACILITY CARRIED FIELD STREET	FEATURE CROSSED STREAM	

INSPECTED BY: CURT BRISTOL & ANDREW HAYNES

LOAD RATING AND POSTING

(31) DESIGN LOAD	
(64) OPERATING RATING	
(66) INVENTORY RATING	
(70) BRIDGE POSTING	
* (41) STRUCTURE OPERATIONAL STATUS	A

SHEET OF (INSP. REPORT)

CONDITION

Rating	By
6	CEB
6	CEB
7	CEB
7	CEB
N	CEB

CLASSIFICATION

- ** (112) NBIS BRIDGE LENGTH
- (104) HIGHWAY SYSTEM
- (26) FUNCTIONAL CLASS
- (100) DEFENSE HIGHWAY
- ** (101) PARALLEL STRUCTURE
- ** (102) DIRECTION OF TRAFFIC
- ** (103) TEMPORARY STRUCTURE
- ** (110) DESIGNATED NATIONAL NETWORK
- (20) TOLL
- (21) MAINTAIN
- (22) OWNER
- (37) HISTORICAL SIGNIFICANCE

WATERWAY

- DRAINAGE BASIN WATERWAY CODE
- (38) NAVIGATION CONTROL
- (39) NAVIGATION VERT CLEAR
- (40) NAVIGATION HORIZ CLEAR
- ** (116) VERT-LIFT BRG NAV MIN
- ** (111) PIER NAV PROTECTION

APPRAISALS

Rating	By
6	CEB
7	ALH
N	ALH
7	ALH
8	ALH

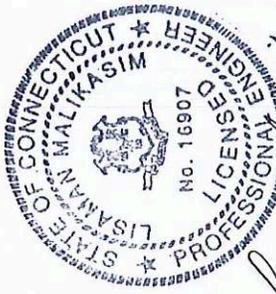
- (67) STRUCTURE EVALUATION
- ** (68) DECK GEOMETRY
- +(69) UNDERCLEARANCES, VERT & HORIZ
- +(71) WATERWAY ADEQUACY
- +(72) APPROACH ROADWAY ALIGNMENT

0 0 0 0 0 0

ITEMS 58 THRU 72 CHECKED BY: CEB

ADDITIONAL COMMENTS:

PROPOSED NEXT ROUTINE INSPECTION DATE:
PROPOSED NEXT UNDERWATER INSPECTION DATE:
PROPOSED NEXT INDEPTH INSPECTION YEAR:



REVIEWED BY: Lisman Malikasiz DATE: 7/10/91

- OFFICE CHECK 98B.99.113
* FILL OUT ON EVERY INSPECTION...29,109,30,41,58,59,60,61,62,36
+ VERIFY EVERY INSPECTION...107,108(A,B,C,D),28(A+B),10,47,50,54,55,56(ALL POSTED SIGNS + UTILITIES) 69,71,72,103
** MUST BE FILLED OUT OR VERIFIED ON THE FIRST INSPECTION MADE BASED ON THE NEW FHWA CODING GUIDE.
98(A,B),107,108,109,112,101,102,103,116,111,113

PROPOSED IMPROVEMENT

(75A) TYPE OF WORK PROPOSED			
(75B) WORK DONE BY:			
(76) LENGTH OF STRU IMPROV			
(94) BRIDGE IMPROVEMENT COST	\$		
(95) ROADWAY IMPROVEMENT COST	\$		
(96) TOTAL PROJECT COST	\$		
(97) YEAR OF IMPROV COST EST			
(114) FUTURE ADT			
(115) YEAR OF FUTURE ADT			
DOT BRIDGE PROGRAM LIST NO			
PROJECT NUMBER			

POSTED SIGNS & UTILITIES

POSTED LOAD FOR SINGLE UNIT TRUCK	Tons	
POSTED LOAD FOR SEMI-TRAILER TRUCK	Tons	
POSTED VERT CLEARANCE ON THE BRIDGE	ft	
POSTED VERT UNDERCLEARANCE	ft	
POSTED SPEED LIMIT AT THE BRIDGE	mph	
OTHER POSTED SIGNS		
UTILITIES CARRIED BY BRIDGE		

BRIDGE INSPECTION

SHEET 1 of 2

BRI-18 REV. 11/83

STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION
BUREAU OF HIGHWAYS

OPER REQUIRED YES NO

SNOOPER USED YES

ROUTE Field Street		BRIDGE NO. 017041	TOWN Bristol	TYPE R.C. Slab	
OVER/UNDER Stream		YEAR BUILT 1939	INSPECTED BY C. Bristol, A. Haynes		DATE 6/18/91

58 DECK		RATING 9-0		INSP. RATING 9-0
1.	OVERLAY Bit. Conc.	7	Cracks	
2.	DECK-STR. COND. Conc.	6	See 59-2. for comments	6
3.	CURBS Bit. Conc.	7	Cracks + gouges	
4.	MEDIAN	N		
5.	SIDEWALKS Conc.	7	Cracks	
6.	PARAPET Conc.	7	Spalls	
7.	RAILING	N		
8.	PAINT			
9.	DRAINS	↓		
10.	LIGHTING STANDARD	N		
11.	UTILITIES - TYPE AND SIZE	8	6" ∅ Gas Pipe	
12.	CONSTRUCTION JOINTS	N		
13.	EXP. JOINT	N		

59 SUPERSTRUCTURE		RATING 9-0		INSP. RATING 9-0
1.	BEARING DEVICES	N		
2.	STRINGERS Conc. Slab	6	Catch basins have been added to original structure - holes made in struc., filled with basin, poured around. Poured surrounds have spalled, some rebar exposed. Other areas, some spalling, efflorescence	6
3.	GIRDERS	N		
4.	FLOOR BEAMS			
5.	TRUSSES - GENERAL			
PORTALS				
BRACING				
6.	PAINT			
7.	MACHINERY MOV. SPAN			
8.	RIVETS & BOLTS			
9.	WELDS - CRACKS			
10.	RUST			
11.	TIMBER DECAY			
12.	CONCRETE CRACKING			
13.	COLLISION DAMAGE			
14.	DEFLECTION UNDER LOAD		<input type="checkbox"/> NORMAL <input type="checkbox"/> EXCESSIVE	
15.	ALIGNMENT OF MEMBERS			
16.	VIBRATION UNDER LOAD	N	<input type="checkbox"/> NORMAL <input type="checkbox"/> EXCESSIVE	

60 SUBSTRUCTURE		RATING 9-0		INSP. RATING 9-0
1.	ABUTMENTS STEM Stone	7	Minor loss of mortar	
	BACKWALL	N		7
	FOOTING	N		
	EROSION	7	Minor loss of mortar	
	SETTLEMENT	8		
	WINGWALLS Stone	7	Minor loss of mortar. Conc. cap, cracks	
2.	PIERS OR BENTS - CAPS	N	North wingwalls meet and continue as channel walls	
	COLUMNS			
	FOOTING			
	SCOUR			
	SETTLEMENT			
3.	PILE BENT			
4.	CONCRETE CRACK - SPALL			
5.	STEEL CORROSION			
6.	TIMBER DECAY			
7.	DEBRIS ON SEATS			
8.	PAINT			
9.	COLLISION DAMAGE	N		

BRIDGE INSPECTION

SHEET 2 of 2

BRI-18 REV. 11/83

STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION
 BUREAU OF HIGHWAYS

BRIDGE NO. 017041	OVERALL LENGTH 6'	SUFFICIENCY RATING	DATE 6/18/91
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61 CHANNEL & CHANNEL PROTECTION				INSP. RATING 9-0
		RATING 9-0		
1.	CHANNEL SCOUR	7	Minor loss of mortar at base of wingwalls	7
2.	EMBANKMENT EROSION	8		
3.	DEBRIS	7	Rocks + dead vegetation - exposed utility causes blockage	
4.	VEGETATION	7	Few plants upstream	
5.	CHANNEL CHANGE	8	45° upstream - no damage - accommodated by wings	
6.	FENDER SYSTEM	N		
7.	SPUR DIKES AND JETTIES	N		
8.	RIP RAP	N		

62 CULVERT & RETAINING WALLS				INSP. RATING 9-0
		RATING 9-0		
1.	BARREL	N		
	CONCRETE			
	STEEL			N
	TIMBER			
2.	HEADWALL			
3.	CUTOFF WALL			
4.	DEBRIS			
5.	RETAINING WALL-STEM			
6.	FOOTING	N		

63 ESTIMATED REMAINING LIFE	YEARS 15
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64. PERMIT CAPACITY

65 APPROACH CONDITION

		RATING 9-0		INSP. RATING 9-0
1.	APPROACH SLAB	N		
2.	RELIEF JOINTS	N		
3.	APPROACH - GUIDE RAIL Stone	8 7	Minor loss of mortar	7
	PAVEMENT Bit. Conc.	7	Cracks	
	EMBANKMENT	N		
4.	TRAFFIC SAFETY FEATURE	N		

66. RATED LOADING

1.	POSTED LOADING	TONS:	SINGLE UNIT	SEMI TRAILER
2.	ADVANCE WARNING	<input type="checkbox"/> YES <input type="checkbox"/> NO		
3.	LEGIBILITY			
4.	VISIBILITY & LOCATION			

INSPECTOR'S APPRAISAL OF GENERAL CONDITION OF THE STRUCTURE

RECORD VERTICAL CLEARANCE IF 14'6" or less ()	RECORD POSTED CLEARANCE ()	ADVANCE WARNING: <input type="checkbox"/> YES <input type="checkbox"/> NO	INSP. RATING 9-0
RECORD SPEED LIMIT AT BRIDGE IF ANY.			6
CHARACTER OF TRAFFIC: Light 50 ADT			
ADDITIONAL NOTES: Bit. conc. flooring - mostly broken up			

TOWN OF: BRISTOL

BRIDGE NO.: 017041

FIELD STREET OVER STREAM

1. DEFICIENCIES: Debris caught at 6" dia. gas pipe

RECOMMENDED REPAIRS: Remove/clean

ESTIMATED COST: None - considered maintenance
2. DEFICIENCIES: Spalls, exposed rebar at catch basins

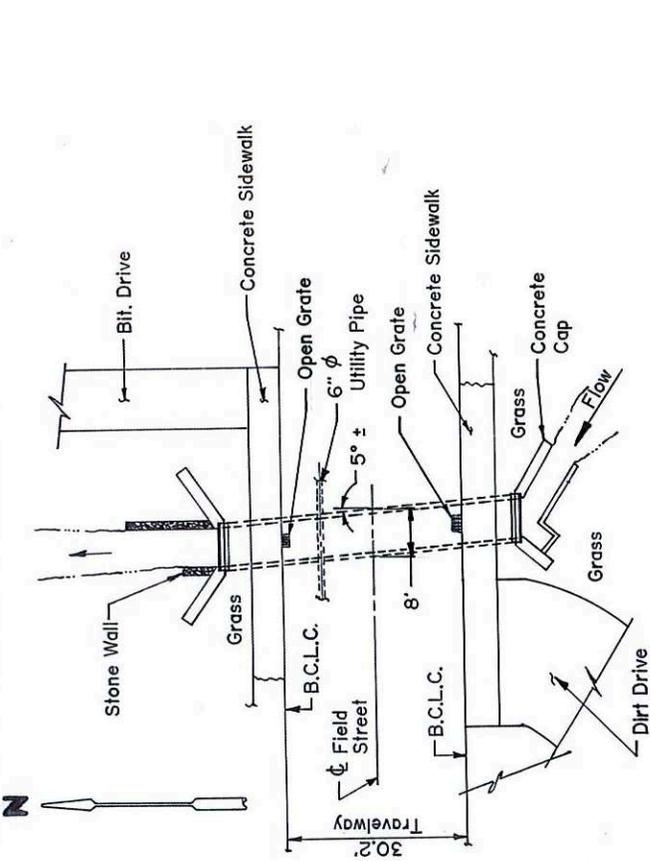
RECOMMENDED REPAIRS: Patch concrete

ESTIMATED COST: 20 s.f. x \$12.50/s.f. = \$250
3. DEFICIENCIES: Loss of mortar, abutments, wingwalls

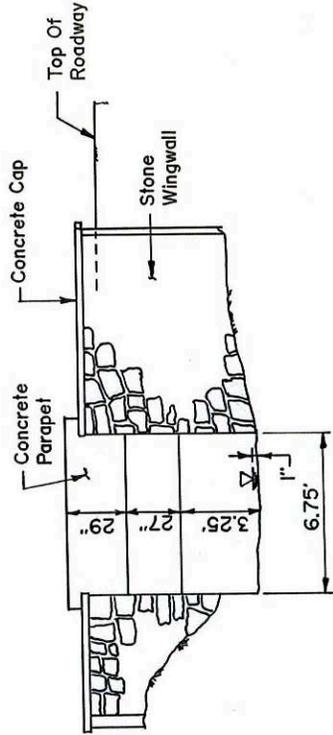
RECOMMENDED REPAIRS: Repoint

ESTIMATED COST: 90 s.f. x \$5/s.f. = \$450

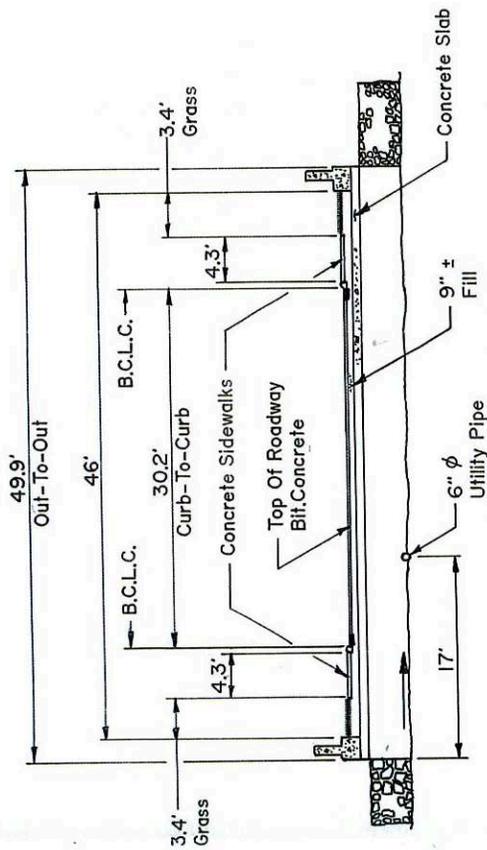
TOTAL ESTIMATED REPAIR COST: \$700



PLAN
SCALE: 1" = 20' - 0"



ELEVATION
SCALE: 1" = 5' - 0"



CROSS SECTION
SCALE: 1" = 10' - 0"

STATE OF CONNECTICUT DEPARTMENT OF TRANSPORTATION
BRISTOL FIELD STREET OVER STREAM
Steinman Boynton Gronquist & Birdsall 1880 Silas Deane Highway Rocky Hill, CT 06067
SCALE: NOTED DATE: 6/18/91 BR. NO. 017041

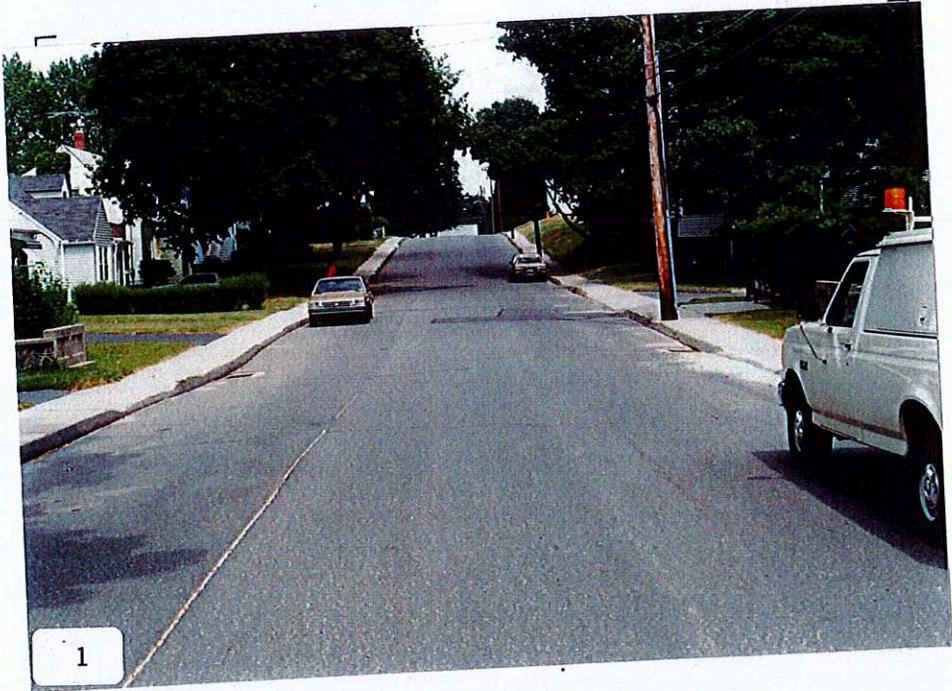
TOWN OF BRISTOL

BRIDGE NO. 017041

FIELD STREET OVER STREAM

LIST OF PHOTOGRAPHS

1. Approach Looking East
2. Approach Looking West
3. South Elevation Looking Downstream
4. North Elevation Looking Upstream
5. Underside of Slab
6. Spall in Roadway Drain
7. Debris Caught Under Bridge
8. Spall in South Roadway Drain



STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION

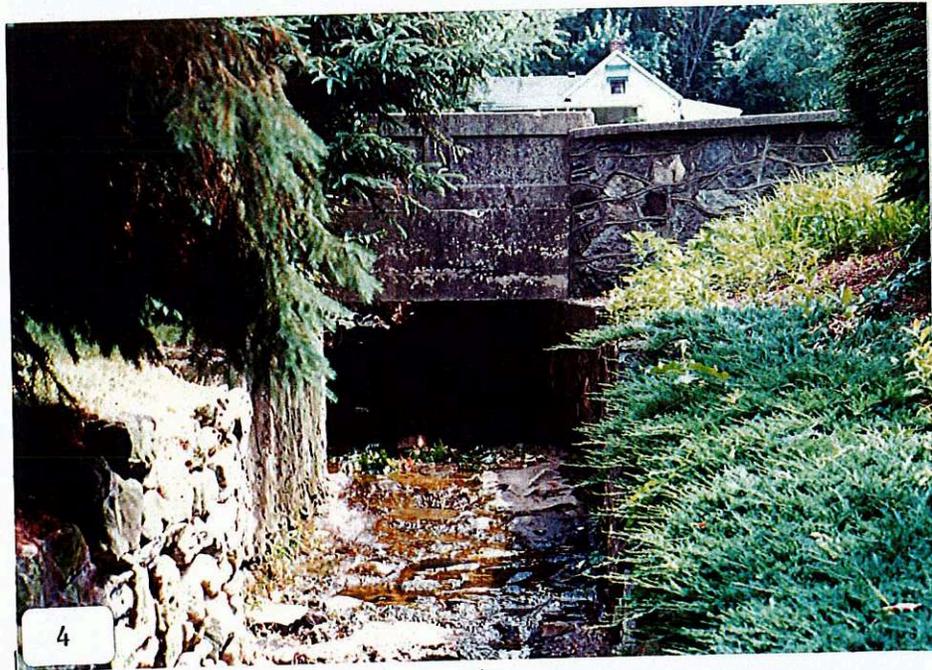
BRISTOL
FIELD STREET OVER STREAM

Steinman Boynton Gronquist & Birdsall
1880 Silas Deane Highway Rocky Hill, CT 06067

SCALE: N/A

DATE: 6/18/91

BR. NO. 017041



STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION

BRISTOL
FIELD STREET OVER STREAM

Steinman Boynton Gronquist & Birdsall
1880 Silas Deane Highway Rocky Hill, CT 06067

SCALE: N/A

DATE: 6/18/91

BR. NO. 017041



STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION

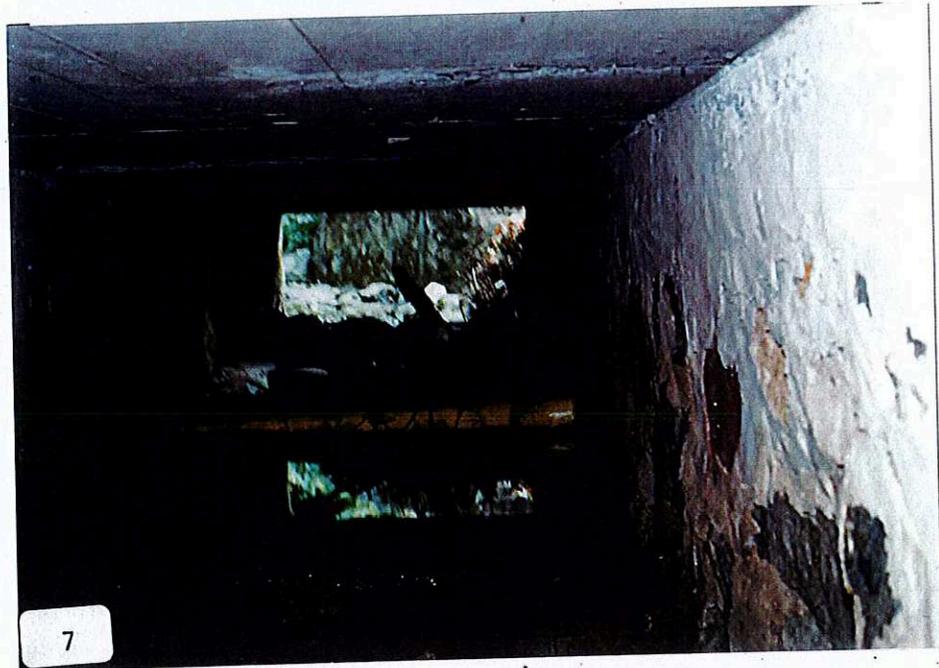
BRISTOL
FIELD STREET OVER STREAM

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1880 Silas Deane Highway Rocky Hill, CT 06067

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STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION

BRISTOL
FIELD STREET OVER STREAM

Steinman Boynton Gronquist & Birdsall
1880 Silas Deane Highway Rocky Hill, CT 06067

SCALE: N/A DATE: 6/18/91 BR. NO. 017041

APPENDIX D

Sufficiency Rating Computations:

Ref: FHWA Recording & Coding Guide for the Structure Inventory & Appraisal of the Nation's Bridges, December 1995
Connecticut Department of Transportation Bridge Inspection Manual, September 2001, with Interim Revisions through May 2017.
Connecticut Department of Transportation Local Bridge Program Manual, April 2019 - Section 2.1

1. Structural Adequacy and Safety (55% maximum)

Lesser of Item 59 or Item 60	=	3
and		
Item 62	=	N
a. Controlling lowest rating code	=	3

If controlling lowest rating <=	2, then	=	55.0%
=	3	=	40.0%
=	4	=	25.0%
=	5	=	10.0%
>	5	=	0.0%
Therefore, A		=	40.0%

b. Reduction for Load Capacity:

Inventory Rating (IR) - NOT currently posted		=	36 tons	
Therefore,	IR	=	32.66 metric tons	
B=	$(32.4-IR)^{1.5} \times 0.3254$	=	0.00%	
S1	=	55-(A+B)	=	15.00%

2. Serviceability & Functional Obsolescence (30% maximum)

a. Rating Reductions (13% maximum)

Item 58	=	5	, then A	=	1.0%	
Item 67	=	3	, then B	=	4.0%	
Item 68	=	7	, then C	=	0.0%	
Item 69	=	N	, then D	=	0.0%	
Item 71	=	7	, then E	=	0.0%	
Item 72	=	8	, then F	=	0.0%	
J =					A+B+C+D+E+F	5.0%
					but no greater than	13.0%
					J = (controlling)	5.0%

b. Width of Roadway Insufficiency (15% of maximum)

Item 51	=	9.14	meters		
Item 32	=	9.14	meters		
(Item 51+0.6)>Item32		Therefore:	G =		0.0%
			ADT =	50	
			Lanes =	2	
			X=(ADT/Lane) =	25	
			Y=(Width/Lane) =	4.57	
X≤50 & Y≥2.7		Therefore:	H =	0.0%	
			G+H =	0.0%	
			but not greater than	15.0%	
			G+H = (controlling)	0.0%	

c. Vertical Clearance Insufficiency:

Item 100	=	0			
Item 53	=	30.30	(unlimited clearance)	therefore I =	0.0%
				(#100=0, #53>4.26)	
S2	=	30-(J+(G+H)+I)		=	25.00%

3. Essentiality for Public Use (15% Maximum)

a. $K = (S1+S2)/85 = 0.4706$
 Detour Length = 0.6 miles = 0.97 km
 b. $A = 15*(ADT*Detour Length)/(320000*K) = 0.0\%$
 c. Item 100 = 0 therefore B = 0.0%
S3 = 15-(A+B) = 15.00%

4. Special Reductions (Use only when S1+S2+S3 >= 50%)

$S1+S2+S3 = 55.00\%$
 if $S1+S2+S3 > 50.0\%$ Special Reductions Apply
 a. Detour Length Reduction
 A = $(\#19)^4 \times (7.9 \times 10^{-9}) = 0.0\%$ (0%<A<5%)
 B = 5% if 2nd/3rd digits of #43=10,12,13,14,15,16or17 = 0.0%
 C = 1%,2%or3% if #36 digits = 00,000,0000, resp. = 3.0%
S4 = A+B+C = 3.0%
 but no greater than 13.0%
 $S1+S2+S3 = 55.00\% (<50)$
therefore S4 = 3.00%

Sufficiency Rating	=	S1+S2+S3-S4	=	52.00%
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Project: 2406
Field Street
Over Unnamed Stream
Bristol, CT

Computed By: CAH
Date: 5/4/2022
Checked By:
Date:

Priority Rating Computations:

Ref: Connecticut Department of Transportation Local Bridge Program Manual, April 2019 - Section 2.2

Deck Condition (DC) = 5
Substructure Condition (SUB) = 5
Superstructure Condition (SUP) = 3
Inventory Rating (IR) = 36 tons (NOT currently posted)
Sufficiency Rating (SR) = 52.00

Priority Rating	=	SR-2[1-(DC+SUB+SUP)/27]-4[1-(IR/36)]	=	50.96
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