

Maryland State Highway Administration (MD SHA) **Bridge Management System** Greg Roby, P.E. **Deputy Director** Structure Inspection and Remedial Engineering

Topics

- Organization
- Repair/Preventative Maintenance
- BR/BH Bridge Management (Tour)

MD SHA Owned Bridge Inventory

- 2500 + Bridges
- 3000 + Small Bridges (3'< Span< 20')
- 90 + Miles of Noise Walls
- 45 + Miles Retaining Walls
- 18 Movable Bridges
- There are 2500 + non SHA Owned bridges in MD. Total MD Bridges = 5000+

Organizational Structure



Repair/Preventative Maintenance

- Element Level Inspection Since 1993
- Internally Developed Access Inspection Database Program (Not a PONTIS user)
- Repair/Maintenance Needs are Flagged by Inspectors
 - Set of Policies and Procedures for when issues are to be flagged by the Inspection Team
 - Currently flags are not automatic or programmed
 - Flag types
 - Minor Maintenance
 - Engineering request
 - Each Team is Assigned Structures by Geographical Area
- Engineering Requests are logged into another Database Program "Worklist"

Sample Inspection Report

MARYLAN	D STATE HIGHWAY ADMINISTRATION BRIDGE INSPECTION REPORT
BRIDGE: WE ST NUR SERV R	0221700 IN SPECTION DATE: 09/12/2009 DAD over MD 295 88R
(68) DECK:	4 (69) SUPER STRUCTURE: 8 (80) SUB STRUCTURE: 6
(61) CHANNEL:	N (82) CULVERT: N (71) WATERWAY: N
(72) APPROACH R	OADWAY ALIGNMENT: 8
INSPECTOR:	LJH TEAM: 910
REMEWER:	EV8 HOURS TO IN SPECT: 8
PUNCTURE8:	3 % SKETCHES ?: No
PLANKING:	80 % FOWER WA SHING ?: No
PATCHING:	26 % D NUMBER ?: Yes
BLOCKING :	0 <u>#</u>
LOOKING:	WEST TOWARD: HAMMONDS FERRY RD
MOT:	Yes
MOT COMMENT:	104.04-01, 04-03 WEEKEND
(64b) CLEARANCE	1609 LOCATION: OIRDER 1, LANE 2
CAUTION:	
ELEMENT	TQ C\$1 C\$2 C\$3 C\$4 C\$5
001	
EngReq ()	F.Y.L.O District @ Ineccessible? ()
1) REPAIR TORN	AND MISSING FENCE ON THE SOUTH SIDE.
002	
EngReq.g	F.Y.L() District () Inscressible?()
1) ELEVIENT 359 CONDITION COM	IS BEING REQUESTED. THIS HAS BEEN REQUESTED PREMOUSLY AND (TINUES TO WORSEN.
003	
EngRegio	F.Y.L. District () Inscressible?
1) DECK PLANKI INSPECTION.	NG MAKES SOME OF STRUCTURE INACCESSIBLE FOR HANDS ON

Repair/Preventative Maintenance Data Analysis/Decisions

- All Engineering Requests Get Assigned to Design Team Bridge "Owner"
- Engineering Analysis, Repair History, Future Needs, Priorities, etc. are Done
- Report is Submitted to Design Division Chief for Review and Decision on Needs/Priorities
- Designs are Completed, Plans Prepared, Permits Received, etc. and Project is Assigned for Construction.

Sample Engineering Worklist

►	Print Const	ruction Assi	gnment	Wor	klist	Print Worl	klist Prir	nt Worklist T	otals
	Job Numbe	r: 18044	Design Tra	cking Pont	tis Constru	uction Tracki	<mark>ng</mark> Team	Leader: 🔽	VNP 💌
	Structure N	o: 2103600	🔽 Descriptio	on: MD 68		over Cl	DNOCOCHEA	GUE CREEK	
	District Number: 6 Suspense/Ad Date: 06/08/2010 Status: UC 👽 Completion Date:								
	Constr. Con	tract: JP 💽	Priority:	E 🔽 Con	str. Assign [ate: 05/03/	/2010 Scour	Rate: 7	
	Permit Type	: Nontidal	×	Stream Clas	ss: 🔽	Co	ontract No:	AX744A51	
	Permit Rest	riction Date	s: Th	ru:	Thru:	Pe	rmit Expirati	ion Date:	
	Env. Inv. (EI) Require Yes 🔽 EI Sub.: 04/05/2010 El Rec.: El Expiration:								
	Engineer's f	Estimate:	\$66,000	Final Co	st:	FY:		Resp. Req.	0 💌
	Work Required: 1) Repair stone mansonry bullnose at pier no. 3 2) Repoint stone masonry where needed as determined by the engineer 3) Repair the sidewalk at the northwest and northeast corners 4) Remove vegetation from the tops of the wing walls 5) Remove timber debris from waterway unstream of bridge. to be done by SHA								
	Remarks: MMD 04/13/10 Job created per phone conversation with Stan Miner, Bridge Inspector. Job to be done pending a underwater inspection of Pier 3 footer. WNP, 8/26/10 - Added item 6 to address safety concerns per G.S.R.								
	Ins. Date	To Frank	To Ryan	To Eng.	Susp.	Eng. Insp.	To Rod	Sign-Off	Eng. Days
			1					1	1

Sample Construction Tracking

▶	BIRED Construction Worklist
	Job Number: 18044 Print Full Report Print Short Report Print Engineer's Report
	Team Leader: 🗰 WNP 🐱 Construction Priority: E 🛛 Status: UC 💌 District Number: 6
	Structure No: 2103600 💟 Description: MD 68 over CONOCOCHEAGUE CREEK
	Permit Type: Nontida Permit Restr.: Thru: and Thru: Permit Exp.:
	Env. Inv. (EI) Require(Yes 🐱 El Sub.: 04/05/2010 El Rec.: El Expiration:
	Work Required: 1) Repair stone mansonry bullnose at pier no. 3 2) Repoint stone masonry where needed as determined by the engineer
	 3) Repair the sidewalk at the northwest and northeast corners 4) Remove vegetation from the tops of the wing walls 5) Remove timber debris from waterway unstream of bridge, to be done by SHA
	Construction Contract: JP 💌 Contract Type: Multiple Tasks 🔽 🛛 Billing Type: Lump Sum 🔽
	Construction Assign Date: 05/03/2010 Log In Date: 05/03/2010 Assigned To Contractor: 05/05/2010
	Contractor: PDI-Sheetz Construction Corp. 🔽 Contract No.: AX744A51 Charge No.: AX744A51
	Construction Start Construction Complete Final Inspection Billing Complete Close Out Date:
	07/19/2010
	Eng. Est.: \$66,000 Contractor. Est.: \$126,726.86 Final Cost:
	Construction Notes: Log date: 5/3/2010. Priority E. Assigned to PDI Sheetz, Inspector Fife/Hatch. Contractor Estimate of \$85,091.00 for Item# 1 ONLY. Repairs started 7/19/2010. Total estimate \$ 126,726.86 from Steve kight (PDI). Meeting at job site on 08/20/2010. PDI (Stone mason) will take care of Items 1 and 2 ONLY. Items 3,4 and 5 will be completed by one of our fixed span crews.

BR/BH Bridge Management (Yearly Bridge Tour) Data

- Yearly Bridge Tour Has Been Conducted for 20 Years
- All Structurally Deficient Bridges That Are Not Within 6 Months of Construction
- Structures Recommended to be Monitored from Previous Year's Tour (Tour rating of C, D, or E)
- Structures Recommended by Local District Maintenance Offices
- Structures Recommended by Structure Inspection and Remedial Engineering Team Leaders (Bridge Owners)
- All the Information is Inputted into a Tour Database

Yearly Bridge Tour Analysis, Projections, Decisions

- Consistent Evaluation of Structures Across State by the Same Senior Cross Functional Staff (Typically 4)
- Opportunity to Review Condition Information for Accuracy and Consistency
- Evaluated to Decide if Major Rehabilitation is Necessary or is Repair Sufficient
- Structures Receive an Overall Tour Rating and are Prioritized for BR/BH Programs Where Appropriate
- Evaluate What Repairs May Be Necessary to Hold Structure While Waiting for Major Rehabilitation
- Approximately 200 bridges visited each year.

Bridge Tour Ratings

- A. Structure is in good condition no work needed.
- B. Structure is good condition. May require minor low priority remedial repair. No additional monitoring required.
- C. Structure requires monitoring and is kept on tour for following year. Preliminary engineering may be started or additional laboratory testing may be requested. Structure's receiving this rating may be structurally deficient and in the BH program as a lower priority. In many cases remedial repairs will address the deficiencies.
- D. Structure condition is deteriorating. Priority 2 candidate in BR/BH program.
- E. Structure is in poor condition. Priority 1 candidate in BR/BH program

Bridge Tour Priorities

- P-1 Advertise for construction within 3 years.
- P-2 Advertise for construction within 5 years.
- P-3 Project is in program, but is a lower priority for available funding

O104300 MD 47 OVER NORTH BRANCH (Structure No.) ADD STRUCTURE (Description) 2010 Tour Date: 09/09/2010 Tour Order: 11 (Tour Year) Inspectors: GCV, GBR, MA, RST PHOTOS Recommended By: TOUR SD BSR SIRE DIST OOS OMT 2010 SUBMITTAL CONDITION DATA General Info. ADT 2432 Vr Built 1923 Deck Clear Flood Rdwy Yr Built 1923 Deck Sub Culv Posted BSR Scour Deck Clear Flood Rdwy Yr Built 1923 Deck Sup Sub Culv Posted BSR 2 N 9 7 Deck Sup Sub Culv Posted BSR 2 N 9 7 Deck Sup Sub Culv Posted BSR 2 N 9 7 Deck Sup Sub Culv Posted BSR 2 N 9 7 Deck Sup Sub Fig. Sup	TOUR RATINGS COMMENTS NBI HISTORY WORKLIST DESIGN CONTRACT DECK SUFF. PLANS LOAD RATINGS AL3605180 10/25/2012 (P) AC \$3,000,000.00 (Eng. Estimate) (Contract No.) (AD Date, Finac. or Prod.) (SE Team Leader) (Eng. Estimate) Type Date In Resolved Design Milestones:				
Current Prev. Rust on Steel: % Patch: % Punct.: % HMA Patch: 0 None Part Full Exp. Rebar/Spalls: Planking: SIP Forms:	SIRE Tour Questions: Jared, What is the status of the rating of this bridge for its present condition? Close out Job No. 11742. Note in the remarks that the bridge is going to be replaced by new design and they are actively working on. The rating of this bridge should be done at the same time as Bridge No. 0100300. Be-SIRE Tour Answers:				
SUBSTRUCTURE CONDITION ABUTMENT Maj Mod Min None PIER Maj Mod Min None Beam Seat: Beam Seat: Bridge Seat: Bridge Seat: Back Wall: Column/Stem: Conc. Repairs: Conc.Repairs:	Tour Comments/Follow Up: Tour rating lowered based on SD super rating. SIRE to perfrom load rating based onsection loss in exterior beams. 3/2/10-Latest inspection lowered Sup rating from 5 to 4 making bridge SD. 8/25/09-Glenn indicates H & H ok. Ali C. to start preliminary work using H & H PE number. TOUR RATING/PRIORITY FOLLOW UP ACTIONS Complete				
SITE CONDITIONS Yes No Does bridge need to carry additional approach lanes? Image: Comparison of the second s	D P-2 Under Design (Status/Phase) Request/Recieve Deck Cores (Tour Rating) (Program Priority) Status/Phase) Request/Recieve Sub. Cores New/Replacement SE Start H and H (Program/Scope) (Lead Divisions) SIRE to Repair District Responses: SIRE to Evaluate Ratings SIRE to Evaluate for Paint QVIEW TOUR REPORT				

State Highway Administration Structurally Deficient Bridges



There are now only 87 structurally deficient bridges remaining on our system, or 3% of our total number of structures.

1-7





BRIDGE CONDITION TRENDS

11211



MD State Highway Administration Questions?

Greg Roby, P.E. Deputy Director Structure Inspection and Remedial Engineering