CEAO Bridge Workers, Supervisors & Engineers Conference & Trade Show

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Jim Wiechart, P.E., P.S.
Mercer County Engineer
jim.wiechart@mercercountyohio.org
419-586-7759

Preferred Superstructure Type

- Structures built through force account

Bridge related employees:

"The Do-ers"

Richard Gray	Bridge Worker II
Anthony (Tony) Knapke	Bridge Worker II
TJ Smalley	Bridge Supervisor

"The Planners"

Mark Linn	Eng Tech II/Survey Tech
Aaron Moeller	Survey Design Tech/ Drainage Deputy
Jim Wiechart	Mercer Co. Engineer

How/Why are bridge large culvert projects selected for replacement/rehab?

- Non-political/mostly engineering/non-precise logical process related to some (not all of below criteria) - As much science as art
  - General appraisal from annual inspection
  - Sufficiency Rating
  - Width of structure
  - Type of facility use of road
  - Funding opportunities

We keep & maintain a 5 year plan for large culverts/bridge replacements/rehabilitations so we at least have a script for our operations employees to know what they are likely to be working on in the next several years.

	YEAR 2015	ROAD	SURVEY
TOWNSHIP	BRIDGE/CULV.	NAME	DESIGN
WAS	C31A-0.85B	WABASH	NO
WAS	C31A-3.32B	WABASH	NO
FRA	C163-1.34B	CHICKASAW	NO
HOP	C156-3.35C	MILLER	NO
WAS	C80-5.36C	SIEGRIST JUTTE	NO

	YEAR 2016	ROAD	SURVEY
TOWNSHIP	BRIDGE/CULV.	NAME	DESIGN
WAS	T21C-1.21B	RAUH	YES
GIB	C61-2.12B	TOWNSHIP LINE	YES
BUT	C61-6.75B	TOWNSHIP LINE	YES
BUT	C70-5.75B	PHILOTHEA	NO
MAR	T125-0.77B	STELZER	YES/LIMITED
CEN	T171C-1.03B	KUCK	NO
CEN	C200C-1.40B	DENNY	NO
		FEDERAL-AID	
LIB	T190-1.99B	SCHAADT	YES

	YEAR 2017	ROAD	SURVEY
TOWNSHIP	BRIDGE/CULV.	NAME	DESIGN
GIB	C10-1.36B	WATKINS	NO
JEF	T71A-4.01B	GAUSE	NO
CEN	T145D-0.47B	HAYES	NO
BLA	C250-0.82B	WINKLER	YES
BLA	C250-5.10B	WINKLER	NO
GIB	C10-4.20C	WATKINS	NO
REC	C21B-1.13C	WABASH	NO
REC	C21B-1.23C	WABASH	NO
REC	T56-01.02	ST. JOE	NO
BUT	C110-8.06C	ST. ANTHONY	NO
HOP	C170A-2.57C	MORROW	NO
DUB	T260-4.51C	MERCER VW CO LINE	NO
		FEDERAL-AID	
REC	C21B-3.50B	WABASH	YES

	YEAR 2018	ROAD	SURVEY
TOWNSHIP	BRIDGE/CULV.	NAME	DESIGN
MAR	C00-16.97B	MER-DARKE CO LINE	YES

Hydrology

Quantification of watershed & estimates of

theoretical flow values (Cu.Ft./Sec.) for theoretical design years (10, 25, 50, 100)

Hydraulics

From 10 year theoretical storm event, utilize ODOT nomographs to size for 0.5' head buildup on structure (similar to ODOT's sizing process)

Scoping/designing/planning bridge

1 page field scope form filled out on site

- decision made at that time whether or not survey needed or if it can just be a field stake project.
- (In the case of a culvert as a possible replacement type) At the time of the construction, it is field staked and extend ends, no headwalls simplifies

Generally, if sizing process dictates less than 12’-14’ span, we will use a reinforced concrete culvert type structure.

Generally, for structures per end area, the cost per end area is least for round culvert, more for elliptical, highest for 4-sided boxes.

So if possible, we try to utilize more round structures unless head room limitations force us into elliptical/box structures.

If the hydraulics dictate larger than 12’-14’ span box, then usually a simple spill thru stub capped pile abutment design with either reinforced concrete beams (we cast up to including 40’) or if necessary, a prestressed reinforced concrete non-composite box beam deck is selected. The span and skew are selected more to fit the channel.

Simplicity, reproducibility, simple construction processes

- No back wall
- No approach slabs
- Simple closure pours on wings
- Standard 3’ wide abutment design

Our costs to cast last 3 bridge decks:

(Does not include crane costs)

(18" deep beams - 3' wide/beam)

T21C-1.21B	C31A-3.32B	T20-1.08B
2016	2015	2013
33' wide	33' wide	36' wide
40' o/o	40' o/o	34' o/o
0° skew	0° skew	0° skew
$21,274.16	$20,318.51	$12,760.92
$16.12/sq.ft	$15.39/sq.ft.	$10.43/sq.ft.

For larger prestressed reinforced concrete box beams that are beyond our 40’ span limit, we are at the mercy of a diminishing, consolidated prestressing market place. This is not as much of a problem on federally funded projects, but is of great concern for us looking ahead for projects funded out of our own budget.

"THANK YOU" FOR THE BRIDGES YOU BUILD!