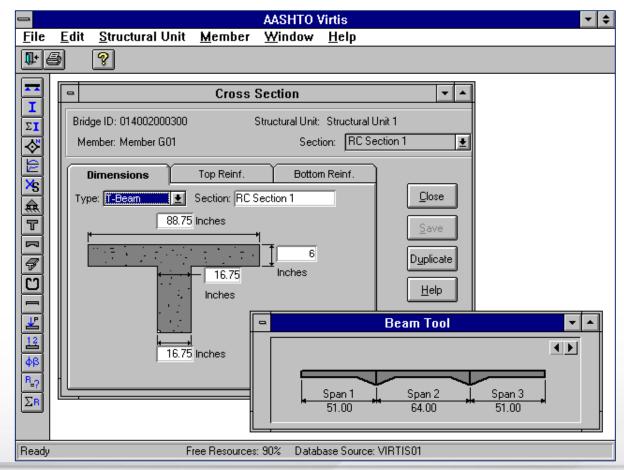
Michael Baker

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1997 Newsletter - Chairman's Message

The AASHTOWare Task Force is pleased with the progress to date on the Virtis project including the first release of Version 1.0 of Virtis on March 6, 1997.



RADBUG Meeting, 2019





Agenda

- Overview of BrDR 6.8.4 and 7.0
 - User Interface Changes, Discontinued Features and Postponed Features
 - Modernized User Interface Demo
- BrDR 7.1
 - Steel Plate Girder Design Tool
 - Bridge Integration through Web Services
- BrDR CMP Culverts Conceptual Design
- Using BrDR For Research (NCHRP 15-54)

Micha	Bri	dge Design/Rating	g 3-Year Release Ro	admap
INTERN We Make		Legacy System	Modernized System	Notes
	2018	6.8.3 Legacy User Interface Legacy & Modernized AASHTO Engine	 Modernization Phase 1 release ✓ Modernized AASHTO Engine Modernization Phase 2 release: ✓ Modernized User Interface and AASHTO Engine 	Software Requirements \checkmark Windows 7, 8 and 10 \checkmark SQL Server 2014 \checkmark Oracle 10.2, 11.2 and 12.1 Upgrade Path \checkmark 6.8.3 \Rightarrow 6.8.4 \checkmark 6.8.3 \Rightarrow 7.0
	2019	6.8.4 Legacy User Interface Legacy & Modernized AASHTO Engine	7.0 Modernized User Interface Modernized AASHTO Engine	Software Requirements \checkmark Windows 7, 8 and 10 \checkmark SQL Server 2017 2014 \checkmark Oracle 11.2 and 12.2 Upgrade Path \checkmark 6.8.4 \Rightarrow 7.0 \checkmark 6.8.4 \Rightarrow 7.1 \checkmark 7.0 \Rightarrow 7.1
	2020	Support for 6.8.4 and all earlier versions will cease effective June 30, 2021	7.1 Modernized User Interface Modernized AASHTO Engine 3	Software Requirements ✓ Windows 8 and 10 ✓ SQL Server 2017 ✓ Oracle 11.2 and 12.2 Upgrade Path ✓ 7.1 ⇒ 7.2 8/13



User Interface Changes

- Bridge and Library's Materials Concrete windows
 - Rearrange the inputs and add a Compute button

A	Bridge Materials - Concrete
	Name: Class A (US) Description: Class A cement concrete
	Compressive strength at 28 days (f'c) = 4.000 ksi Initial compressive strength (f'ci) = ksi Coefficient of thermal expansion = 0.0000060000 1/F Density (for dead loads) = 0.150 kcf Density (for modulus of elasticity) = 0.145 kcf Std Modulus of elasticity (Ec) = 3644.15 ksi LRFD Modulus of elasticity (Ec) = 3644.15 ksi Std Initial modulus of elasticity = ksi LRFD Initial modulus of elasticity = ksi Poisson's ratio = 0.200 Composition of concrete = Normal Modulus of rupture = 0.480 ksi Shear factor = Splitting tensile strength (fct) = ksi
	Splitting tensile strength (fct) =ksi Copy To Library Copy from Library OK Apply Cancel

Michael Baker

🗛 Bridge Materials - Concrete	_		×		
Name: 4500 psi Concrete	Description	n:			
Compressive strength at 28 days (f'c):	4.500	ksi			
Initial compressive strength (f'ci):		ksi			
Composition of concrete:	Normal 🗸				
Density (for dead loads):	0.150	kcf			
Density (for modulus of elasticity):	0.145	kcf			
Poisson's ratio:	0.200				
Coefficient of thermal expansion (α):	0.0000060000	1/F			
Splitting tensile strength (fct):		ksi			
Compute					
Std modulus of elasticity (Ec):	3865.20	ksi			
LRFD modulus of elasticity (Ec):	3865.20	ksi			
Std initial modulus of elasticity:		ksi			
LRFD initial modulus of elasticity:		ksi			
Modulus of rupture:	0.503	ksi			
Shear factor:					
Copy t	o library Copy f	rom library OK App	lγ	Cance	el 🛛

- Bridge Impact / Dynamic Load Allowance window
 - Remove the bridge level's Impact / Dynamic Load Allowance window

🗛 Bridge Impact / Dynamic Load Allowance 💶 💷 📧
Standard Impact Factor For structural components where impact is to be included per AASHTO 3.8.1, choose the impact factor to be used:
● Standard AASHTO impact = L + 125
O Modified impact = times AASHTO impact
◯ Constant impact override =
LRFD Dynamic Load Allowance
Fatigue and fracture limit states: 15.0 \gtrsim
All other limit states: 33.0 🕺
OK Apply Cancel

- Deck Profile window's Shear Connectors tab
 - Switch the order of the Number per Row and Number of Spaces columns

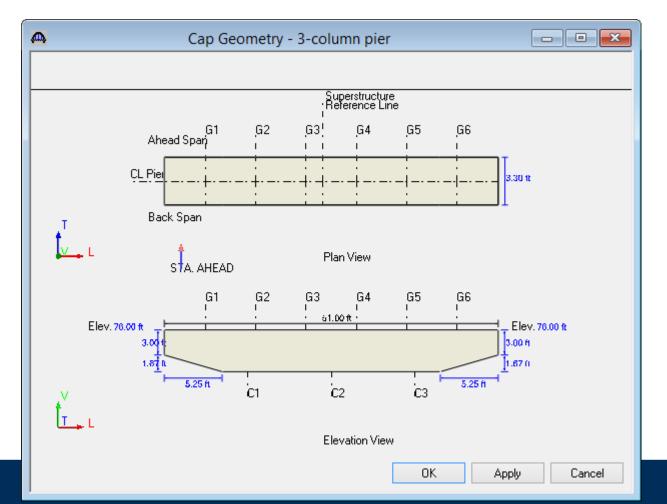
A	Deck Profile	- • •
Type: Plate Deck Concrete Reinforcem	ent Shear Connectors	
Support Start Distance (ft)	End Distance (ft) ID Row Spaces (in)	
1 💌 0.00 161.00	161.00 Stud 0.875	
, Shear Stud Design Tool View (Cales New Duplicat	te Delete
	ОК Арг	oly Cancel

- Beam Details window's Span Detail tab
 - Move the Use Creep data to the Member Alternative window

D ,					Beam Details								
S	Span Detail Continuous Support Detail Stress Limit Ranges Slab Interface Continuity Diaphragm Web End Block												
	Beam Shane		Girder Material	Prestress Properties		Use Creep		n	Beam Pr Left End (in)	ojection Right End (in)			
	1	BT-72	<	Beam Concr 🐱	Prestress Properties	ł	Yes	¥	5.6	6.0000	6.0000		
	2	BT-72	¥	Beam Concr 🗸	Prestress Properties	ł	Yes	~	5.6	6.0000	6.0000		
	3	BT-72	¥	Beam Concr 🗸	Prestress Properties	1	Yes	¥	9.6	6.0000	6.0000		
									OK	Apply	Cancel		

			native #2 (9		·					
Desc <u>r</u> iption	<u>S</u> pecs	<u>Factors</u>	<u>E</u> ngine	<u>I</u> mport	<u>C</u> or	trol options				
Description:					1	Material type:	Prestressed (Pret	ensioned)		
					(Girder type:	PS Precast I			
					1	Default units:	US Customary	~		
Girder pr	operty inpu	it method -	1							
	ule based									
O Cross-	section bas	ed								
Self load					Defa	ult rating met	hod:			
Load case	:	Engine As	signed	~	LFD	-	~			
Additiona	l self load:		kip/ft							
Additiona	l self load:		%							
Creak and	ntrol param	atas (7)		Exposur	6+-					
Top of be	-	eter (Z)	kip/in	Top of b			✓ Use o	reep		
Bottom o			kip/in	Bottom						
Bottom o			кір/ш	Bottom	or bea	m				

- Pier Alternative's Geometry windows
 - Replace the custom OpenGL view with static bitmap and labeled text boxes



8/13/2019

- Add Create New in the Dropdown List
 - Select Create New will open the window for the item and a new item can be input or select from the library

<u>A</u>	Stringer Profile
Type: Rolled Shape Shape Top Cover Pl.	ate Bottom Cover Plate
Shape	Start Length (ft) Length (ft) Length Distance (ft) Material
W 21x62 Create new shap W 21x62 W 6x20	✓ 0.00 39.92 39.92 FY 36ksi Steel ✓
	New Duplicate Delete
	OK Apply Cancel

- Preferences window's Bridge Workspace tab
 - Move the Rating Live Load Distribution Factor data to the System Defaults window's Superstructure Analysis tab

Preferences	×
Bridge Explorer Bridge Workspace Confirmations Analysis Report Tool	ОК
Options	Cancel
✓ Backup data to file every: 15 minutes	
✓ Validate before saving	Help
Display the entered number of decimal positions	
Rating Live Load Distribution Factor	
Compute simple beam distribution factor based on:	
LFD/ASD	
AASHTO Standard Specifications for Highway Bridges Article 3.6.3	
AASHTO Manual for Bridge Evaluation Article 6B.6.2.2	
LFD/ASD Distribution Factor for Exterior Beams	
Use only lever rule for exterior beams	

System Defaults

General	Bridge worksp	pace Superstructure analysis	Specific	cations	Substructure a	nalysis	Tolerance	Custom agency fiel	ds	
Line g	Line girder analysis engine 3D FEM analysis engine									
Rating	method:	LFD	~	LRFD	analysis module:	AASHT	O LRFD	\checkmark		
LRFD a	analysis module:	AASHTO LRFD	~	LFD a	nalysis module:	AASHT	O LFD	~		
LFD ar	nalysis module:	AASHTO LFD	~	ASD a	analysis module:	AASHT	O ASD	~		
ASD a	nalysis module:	AASHTO ASD	~	LRFR	analysis module:	AASHT	O LRFR	~		
LRFR a	analysis module:	AASHTO LRFR	~							
Culver	rt analysis engine	2			DF applicability ra	anges				
	method:	LRFR	~		AASHTO LRFD R	-		~		
LRFD a	analysis module:	AASHTO Culvert LRFD	~							
LFD ar	alysis module:	AASHTO Culvert LFD	~							
LRFR a	analysis module:	AASHTO Culvert LRFR	~							
)/ASD AASHTO Standar AASHTO Manual)/ASD Distributio	ution factor distribution factor based on: of Specifications for highway brid for bridge evaluation article 68.6 on factor for exterior beams le for exterior beams	-	≘ 3.6.3						

Save Close

3/13/2019

We Make a D

- System Defaults window's Bridge Workspace tab
 - Move the Corrosion condition and Stress limit coef. (US) override data to the Stress Limit Sets - Concrete window

System	Defaults
System General Bridge Workspace Control Options Superstructure A New Bridge System of Units US Customary PS Values Default Average Humidity %	
Corrosion condition: Moderate Stress limit coef.(US) override LRFD Wind Loads Default Strength III 3-Second Gust Wind Speed 115.00	mph
	Save Close

A Stress Limit Sets -	Concrete					_		×
Name:	Stress Limit Set #1							
Description:								
Corrosion condition:	Moderate		~					
Final allowable ter	nsion stress li	mit coef. (US)	override:					
Concrete material:	Beam Conce	rete	~					
	Compute							
		LFD		LRFD				
Initial allowable comp	pression:	3.300	ksi	3.300	ksi			
Initial allowable tension	on:	0.200	ksi	0.200	ksi			
Final allowable comp	ression:	4.200	ksi	4.200	ksi			
Final allowable tensio	n:	0.502	ksi	0.503	ksi			
Final allowable DL co	mpression:	2.800	ksi	3.150	ksi			
Final allowable slab compression:		2.400	ksi	2.400	ksi			
Final allowable compression: (LL+1/2(Pe+DL))		2.800	ksi	2.800	ksi			
				0	K	Apply	Can	cel

We Make a D

- System Defaults window's Control Options tab
 - Remove the Control Options tab from the System Defaults window

\$	System Defaults										
General Bridge W	/orkspace	Control Options	Superstructure Analysis	Specifications	Tolerance	Custom	Agency F 🔹 🕨				
LRFD Distribution Fa O By axle O By PO	в	ation Method	ОВ	tion Factor Applic ly axle ly POI	ation Method						
LFD Distribution Fa O By axle O By PD Include bea	e I										
						S	ave	Close			

8/13/2019

We Make a Diffe

- Deck Details window's Adjustment Factors tab
 - Remove the Adjustment Factors tab from the Deck Details window

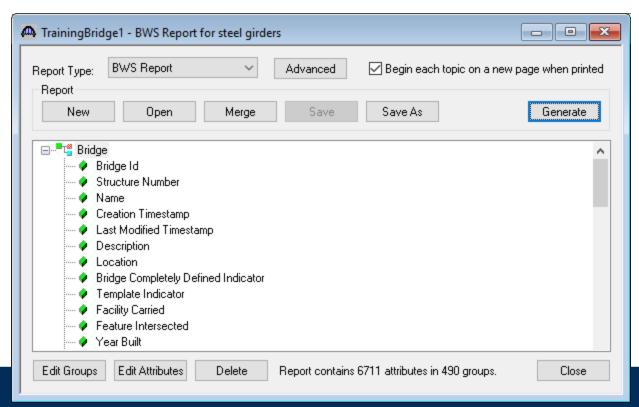
Bridge Workspace - TimberTrainingBridge1		
💷 🗛 TimberTrainingBridge1		^
🗄 📄 Materials		
🗄 📄 Beam Shapes	🕰 Deck Details	
🗄 📖 Appurtenances		
🗄 📖 🦲 Connectors		
🛄 Diaphragm Definitions		
🛄 Lateral Bracing Definitions	Adjustment Factors	
📑 Impact / Dynamic Load Allowance		1.4.1
MPF LRFD Multiple Presence Factors	Moisture con	dition for shear/flexure: Wet
🛓 📖 Factors	Moistur	e condition for bearing: Wet
📖 💼 LRFD Substructure Design Settings	Maistura	e condition for modulus: Wet
EC Environmental Conditions	Moisture	condition for modulus.
DP Design Parameters	Shear factor: 2.00	Flat use factor:
🚊 🚥 SUPERSTRUCTURE DEFINITIONS	Shear factor.	
🖃 🛲 Structure Definition #1	Wet service (flexure):	Repetitive use factor: 1.15
📑 Impact / Dynamic Load Allowance	Wet service (shear):	Load duration factor:
Load Case Description		
🛲 Framing Plan Detail	Wet service (bearing):	
🧰 Bracing Deterioration	Wet service (modulus):	This data is no longer applicable. See the Deck window for this data.
BSC Bracing Spec Check Selection	wet service (modulus).	
🙇 Deck	Size factor (flexure):	Compute
IIII Structure Typical Section		
🚟 Superstructure Loads		OK Apply Cancel
	1	
i∎ I G1		
□ I G2		Oladar sustan austration defait -
		Girder system superstructure definition
🚡 Supports		with timber deck and timber member
interior Beam (E) (C)		
∎T Default Materia		
LL Dist. Live Load Distri		
Hinge Location	5	
Beam Details		
Deck Details		
Points of Interes	st	

- Relocate the beam description items in the Bridge Workspace tree before the Live Load Distribution item or after the Impact item if the Live Load Distribution item is not there
 - Girder Profile
 - Floorbeam Profile
 - Stringer Profile
 - Cross Sections and Cross Section Ranges
 - Beam Details

- Bridge Explorer Toolbar's System Units
 - Remove association with Bridge Workspace windows
 - Associate Bridge Workspace windows' display units with the Default Units specified in the Bridge Description window, Superstructure Definition window and Member Alternative/Definition window

Bridge Explorer	Bridge Explorer Toolbar							
	🚧 🔀 ALL NXT 🚹 隆 🕕 📉 🕕 Customary 🗸							
A Member Alternative Description								
Member Alternative: Plate Girder								
Description Specs Factors Er	ngine Import Control Options							
Description:	A Material Type: Steel							
	Girder Type: Plate							
	✓ Default Units: US Customary ✓							
Girder property input method Schedule based Cross-section based	End bearing locations Left: in Right: in							

- Report Tool's BWS Report
 - New BWS Report format and Report Definition format
 - New BWS Report format is not compatible with reporting using Crystal Reports' RPT files
 - New Report Definition format is not backward compatible





Discontinued Features

Project Explorer

Br														
Fil	le Edit View Window	He	lp											
F	Preliminary 🗸 🖄 🤛 🗹 🐨 📾 📽 💽 🦮 🤘													
	● ■ ■ ● ◎ ょう 「 言 / * * * * * * * ● ■ ■ ● ●													
R	۹.					Projec								• ×
	□ All Projects	BID	Project ID		District			Project Description	Project Bridge ID	Status	Bridge ID	Feat. Intersected	Engineering Manager	Structural Engineer
	Project D1		Project D1		01	01			1	In-design	TrainingBridge1		PM1	SE1
	District 2	2	Project D1	1	01	01			2	In-service	TrainingBridge2	N/A	PM1	SE1
	Project D2													
	In oject be													
1_														

Prestress Design Tool

A	Prestress Design Tool										x	
Pass/Fail	Span Number	Beam Sha	ре	Material		Stress Limit		Strand Config		Harp Distance (ft)		
	1	BT-72	V	Beam Concrete	~	Stress Limit Set #1	×	Harped	V	32.00		
	2	BT-72	V	Beam Concrete	¥	Stress Limit Set #1	v	Harped	v	32.00		
Fail	3	BT-72	v	Beam Concrete 🗸		Stress Limit Set #1	¥	Harped	¥	32.00		
Number Jacking I Eccentric Eccentric Initial PS Initial PS	Review Details Compute Span Apply Span Compute All Apply All Span Number 3 Number of strands = 46 Jacking P = 1425.19 kips Image: Compute All Span = 30.25 inches Image: Compute All Span =											

BWS Report

Br

res File Edit View Bridge Substructure Tools Window Help D 🖆 🖬 🖆 🐚 海 | X 🖻 🖻 | 🗇 🤣 💆 🛍 🗞 -----🗐 🎟 🚈 👯 🧤 🗄 🗐 🦓 🕄 ALL NXT 🚺 🏄 🖉 🕕 🔆 Preliminary 🗸 😕 🎢 🞼 🖝 🗹 🖬 🖉 🗟 🎠 🤟 🖆 💷 📳 🎬 🖉 💩 🖌 🦳 🛄 📉 🚴 🤌 🖺 🖹 🗑 EQ. B View BWS Report 33 Bridge Design/Rating b ß Bridge Workspace - TrainingBridge1 - C X A TrainingBridge **—**····· - O X TrainingBridge1 , and a Username: brr Date: Tuesday, September 27, 2016 10:15:14 Bridge ID TrainingBridge1 Training Bridge 1(LRFD) NBI Structure ID (8): TrainingBridge1 Description: Description Location: Pittsburgh Total Length: 161.00 (ft) Facility Carried: SR 0051 Route Number: 0051 Feature Intersected: SR 6060 Mi Post: 17.00 (mi) Units: US Customary Year Built: 1999 Recent ADTT: District: District 11 County: 01 Abbeville State Highway Agency Owner: 1 On the NHS National Highway System: Functional Class: Unknown Global Reference Point X Coordinate: 0.000 (ft) >

BRASS, BARS and BAR7 Import Utilities

File	Edit	View	Bridge	Tools	Window	Help		
				В	RASS Impo			
				BARS Import				
				BAR7 Import				



Postponed Features

 Bridge Association is to be implemented in the 7.1 release through the BrM Web Service Integration

AASHTOWare Association								
The selected bridge should be available to:								
🗹 BrB	🖂 BrD							
Is there a corresponding BrM bridge you would like to link to?								
⊖ Yes (● No								
No link to BrM bridge requested.								
Help	OK Cancel							

Michael Baker

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Virtis 1.0 Delivered !

The first Virtis interim release was made in early March 1997 to the 30 states participating in the AASHTO project. This release allows users to load rate reinforced concrete superstructures. Although this was the first interim release of four originally planned, it is now also the last interim product to be delivered.

The original plan, developed nearly a year and a half ago, called for four interim product releases for reinforced concrete, steel, prestressed concrete, and truss bridge superstructures. It was aimed at a quick replacement of the AASHTO BARS program The interim products were to stress design methods. One or more members can be load rated with one or more vehicles at a time. Virtis will compute the rating factor for a given bridge, structural unit, or member and store the results in the database. Virtis also allows the rating results to be viewed graphically, be sorted and queried.

Virtis 1.0 has undergone considerable testing (see related article) for the Windows Microsoft 3.1 platform. This software also runs under the Microsoft Windows for Workgroups, Windows95 and WindowsNT platforms. Virtis comes with Watcom desktop two databases, a sample database

Questions?

RADBUG Meeting, 2019

