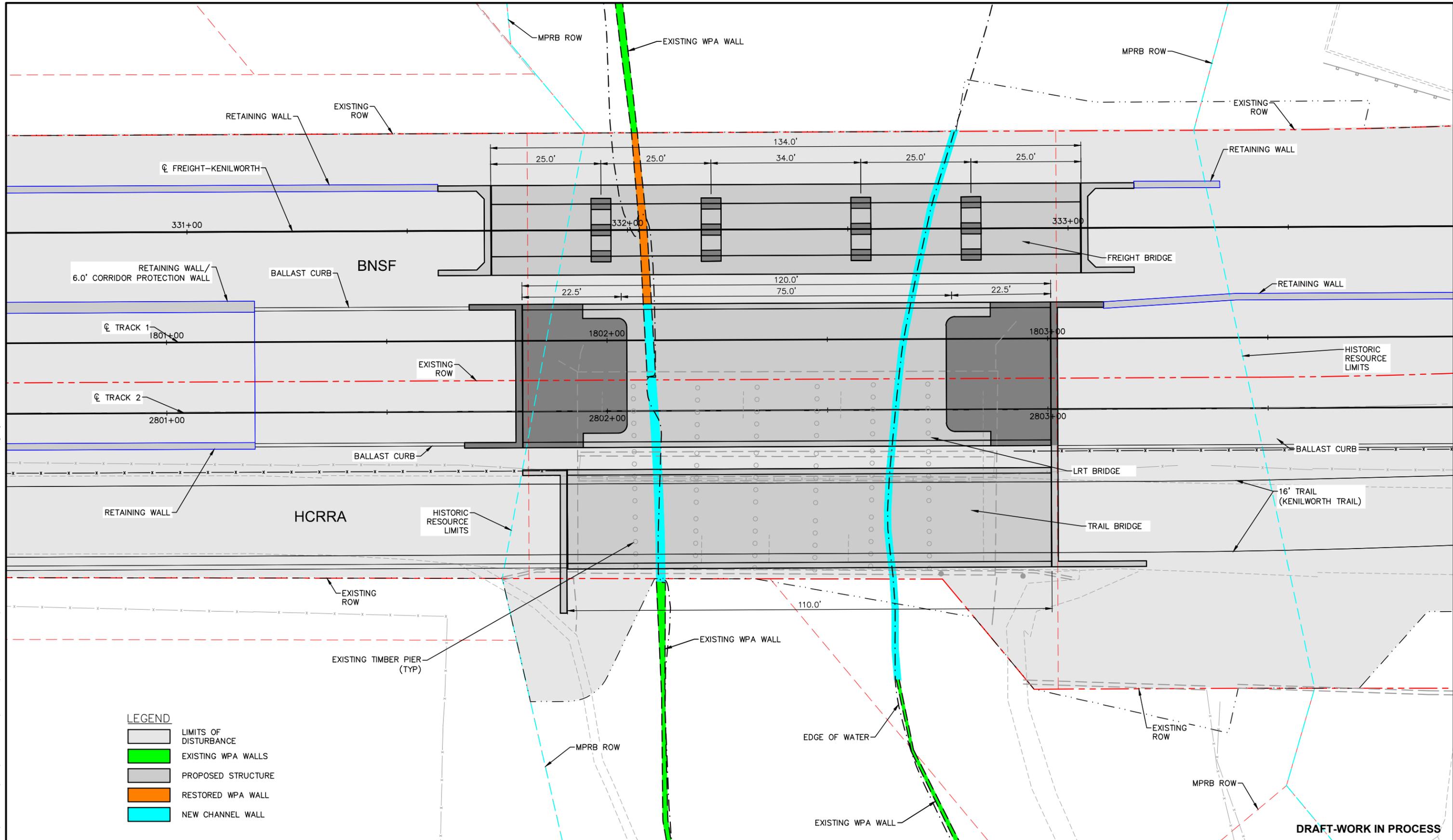


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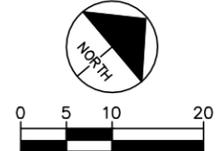
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- LIMITS OF DISTURBANCE
 - EXISTING WPA WALLS
 - PROPOSED STRUCTURE
 - RESTORED WPA WALL
 - NEW CHANNEL WALL

DRAFT-WORK IN PROCESS

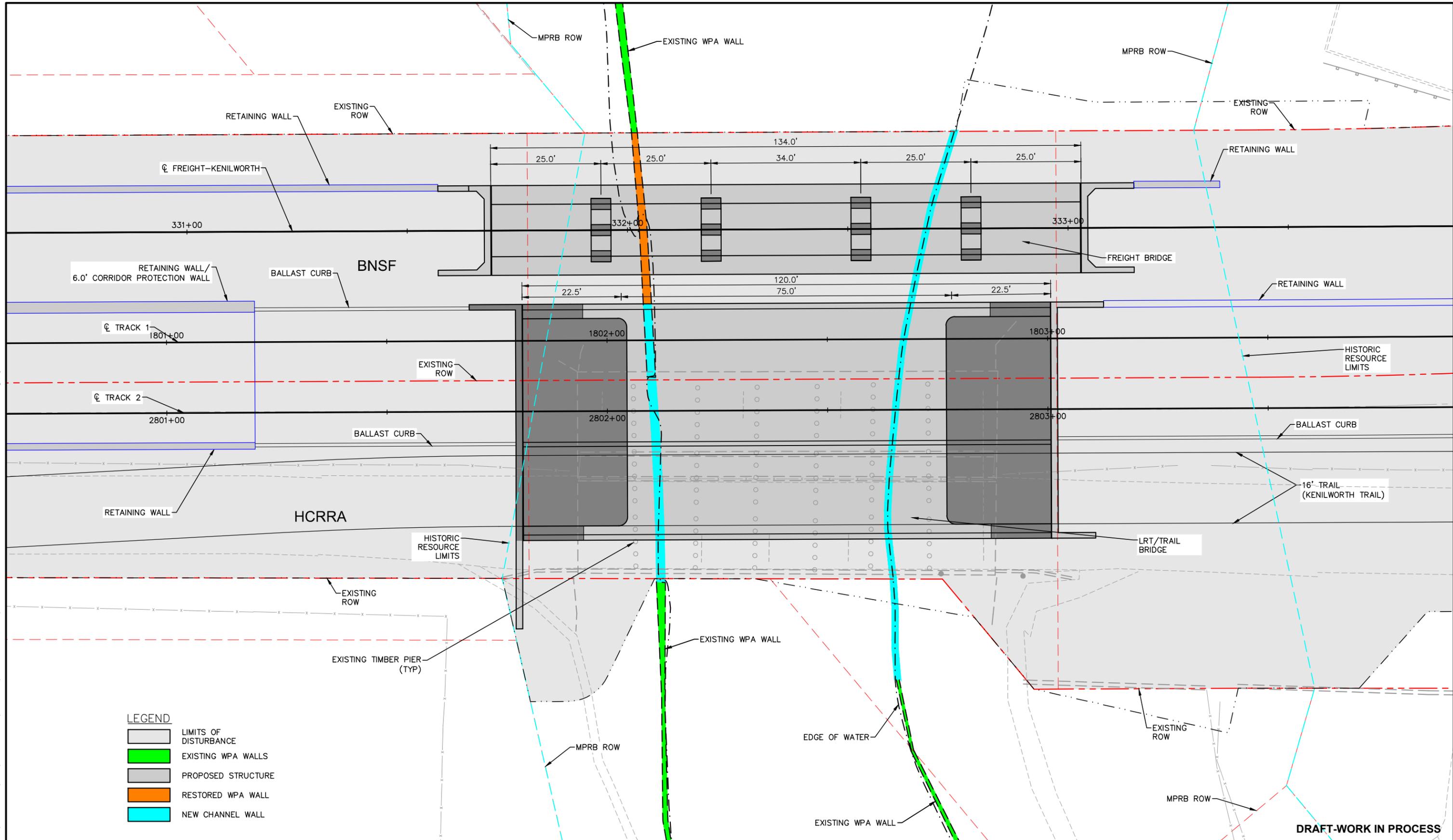


SOUTHWEST LIGHT RAIL
LAGOON/CHANNEL BRIDGE - COMBO DESIGN 1
3 BRIDGE LAYOUT

Rev 0
07/20/2015

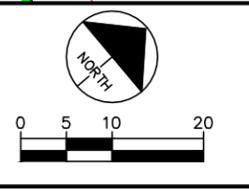


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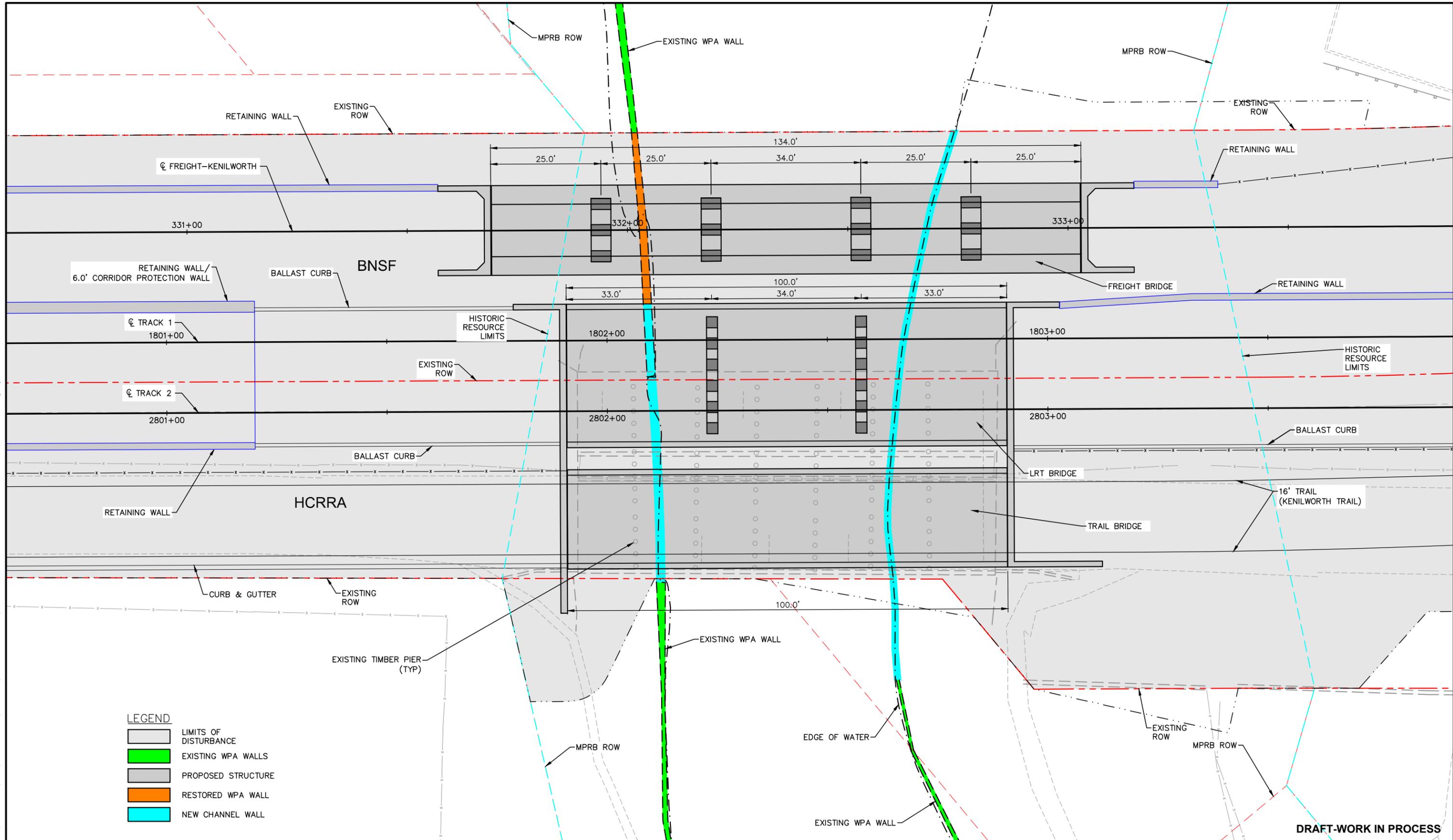


SOUTHWEST LIGHT RAIL
LAGOON/CHANNEL BRIDGE - COMBO DESIGN 1
2 BRIDGE LAYOUT

Rev 0
07/20/2015



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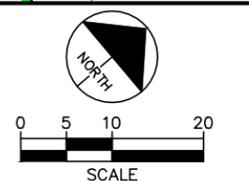
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- LIMITS OF DISTURBANCE
 - EXISTING WPA WALLS
 - PROPOSED STRUCTURE
 - RESTORED WPA WALL
 - NEW CHANNEL WALL

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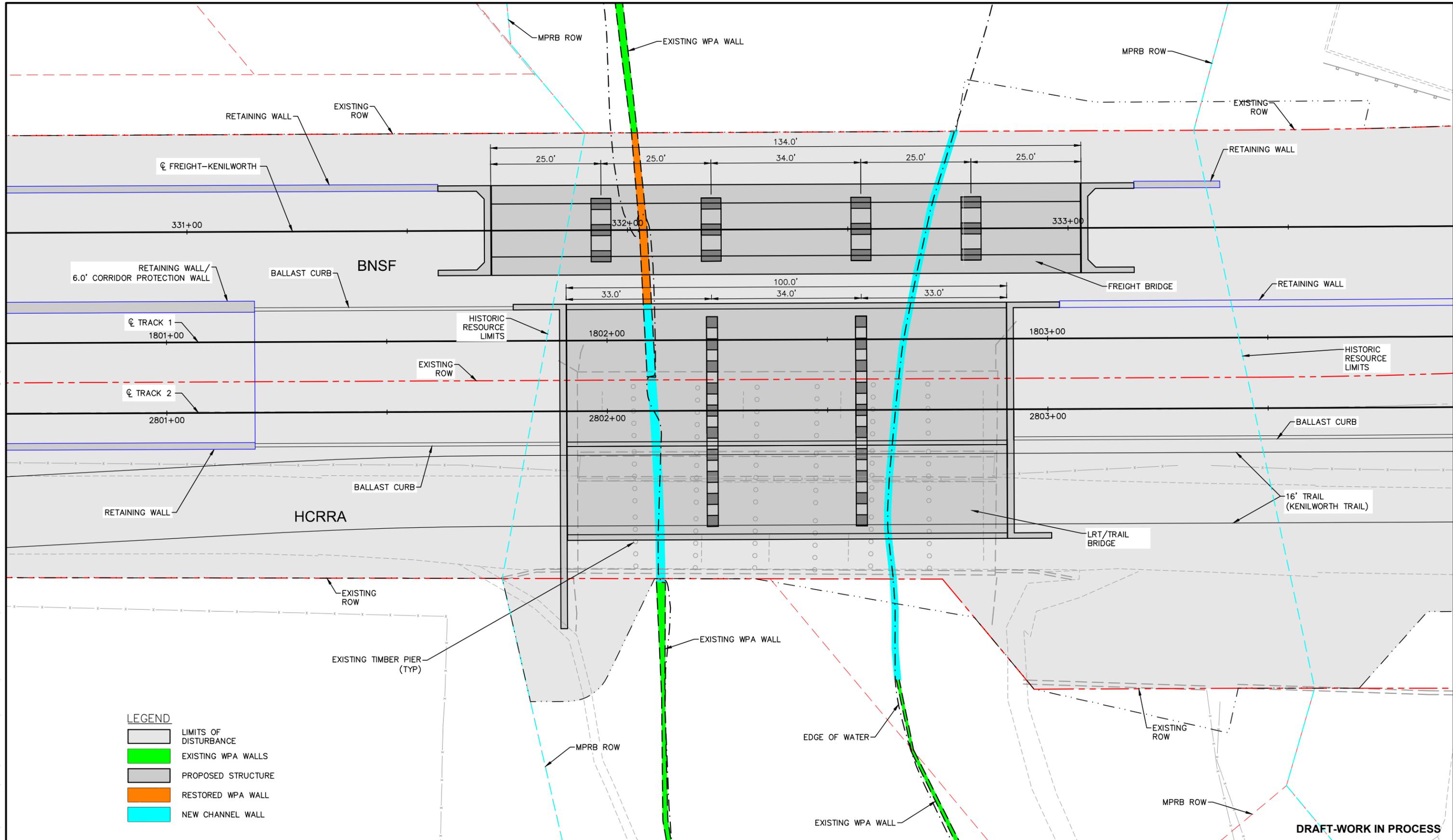


SOUTHWEST LIGHT RAIL
LAGOON/CHANNEL BRIDGE - COMBO DESIGN 2
3 BRIDGE LAYOUT

Rev 0
07/20/2015



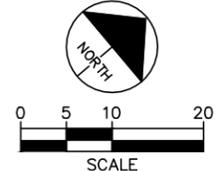
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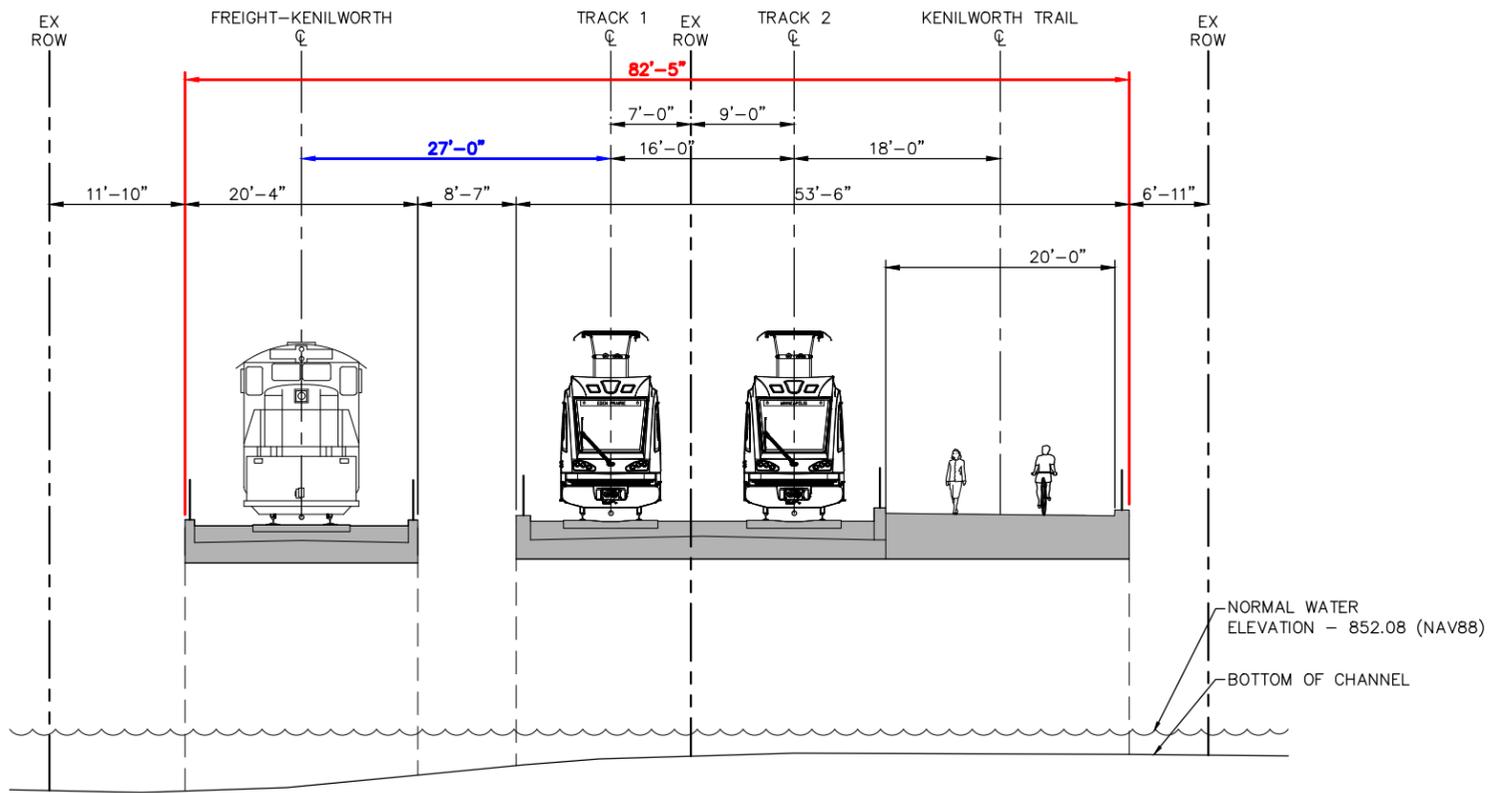
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 - EXISTING WPA WALLS
 - PROPOSED STRUCTURE
 - RESTORED WPA WALL
 - NEW CHANNEL WALL

SOUTHWEST LIGHT RAIL
LAGOON/CHANNEL BRIDGE - COMBO DESIGN 2
2 BRIDGE LAYOUT

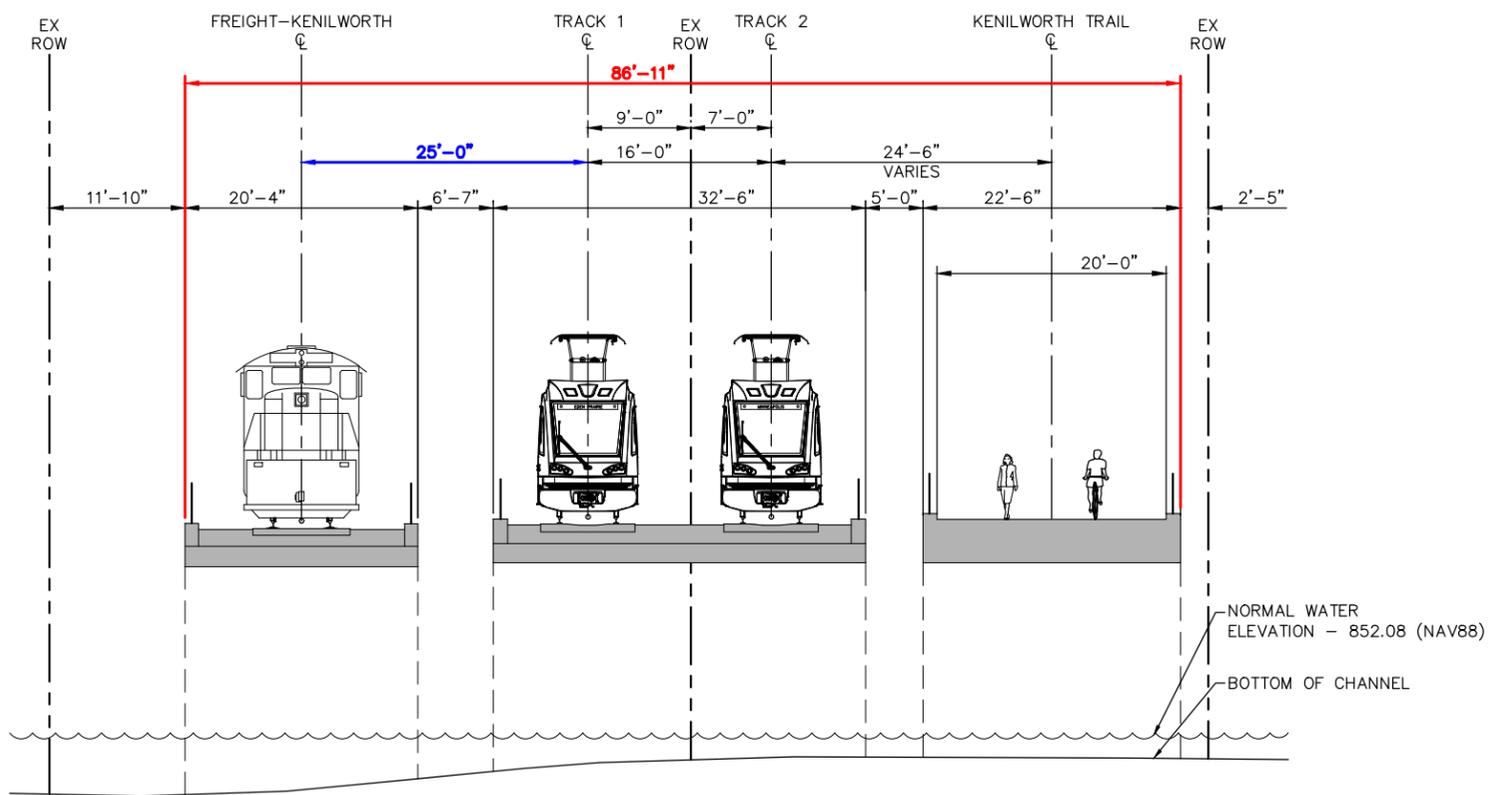
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07/20/2015



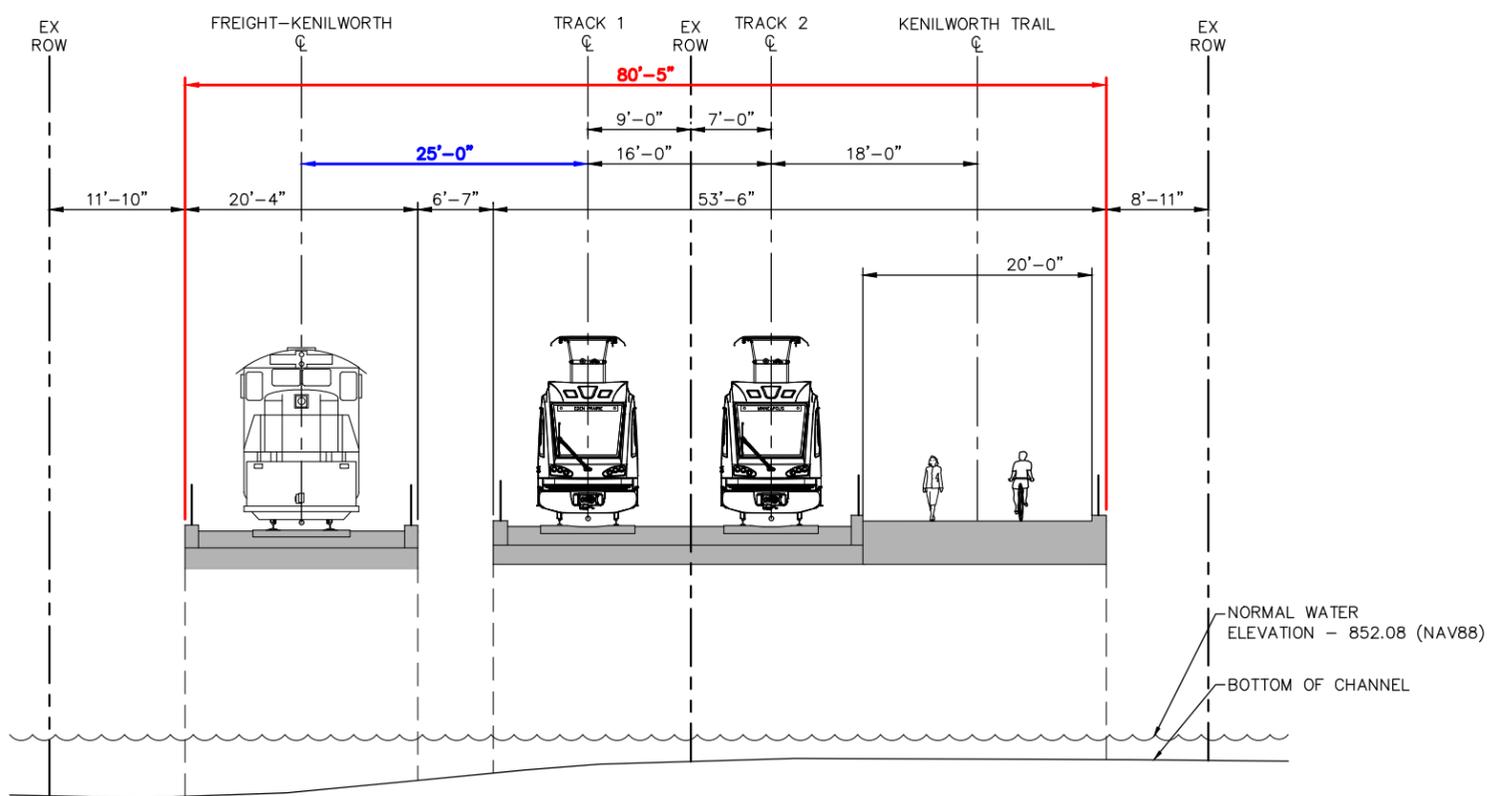
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NOVEMBER 2014



APRIL 2015



JUNE 2015

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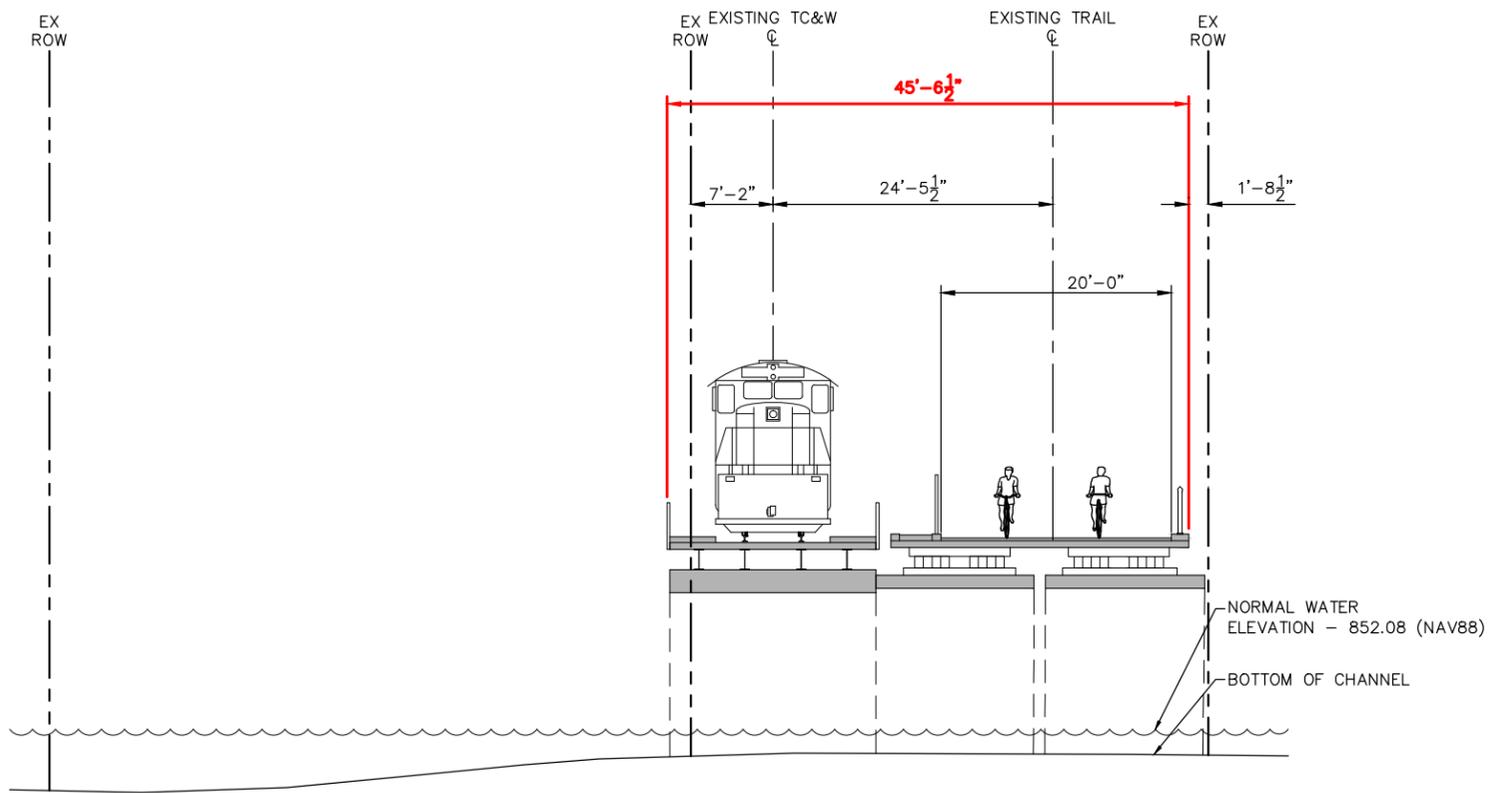


SOUTHWEST LIGHT RAIL
CHANNEL BRIDGE - CONFIGURATIONS
STATION 2802+38

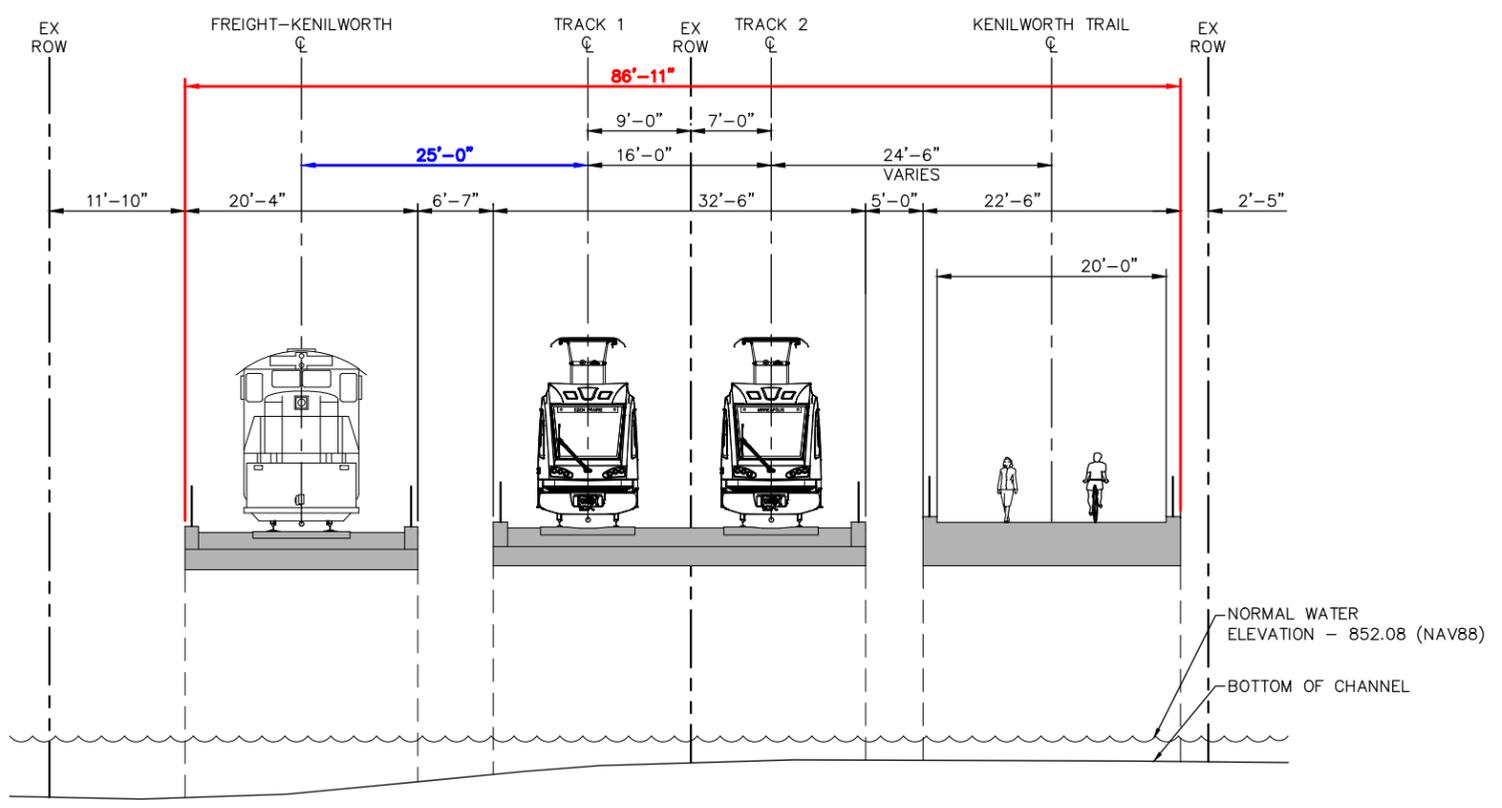
Rev 0
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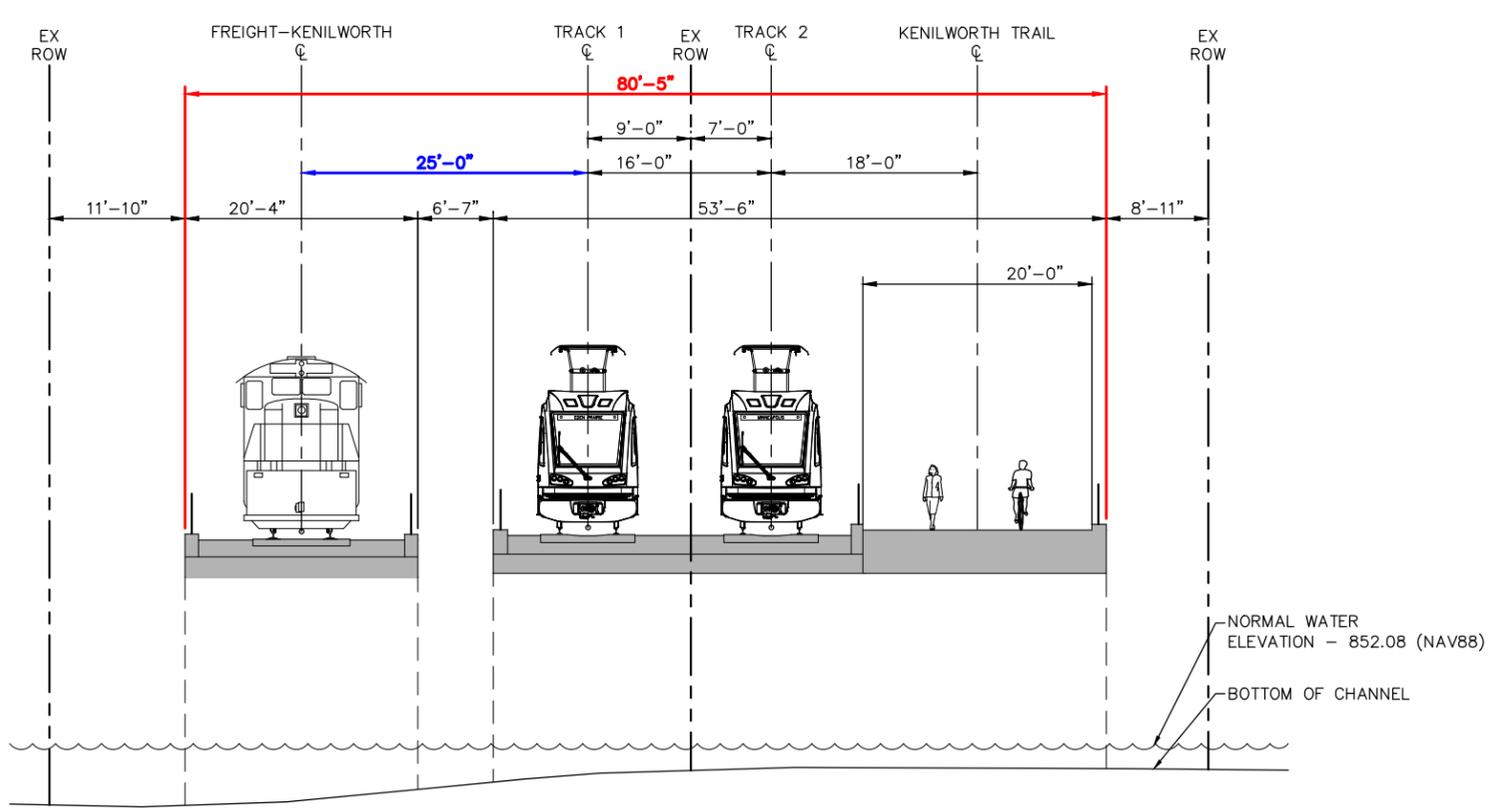
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EXISTING



APRIL 2015



JUNE 2015

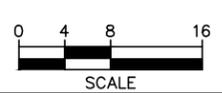
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SOUTHWEST LIGHT RAIL
CHANNEL BRIDGE - CONFIGURATIONS
STATION 2802+38

Rev 0
06/26/2015



DESIGN OPTIONS

2-BRIDGE & 3-BRIDGE COMBINATIONS

DRAFT - WORK IN PROCESS



KENILWORTH CORRIDOR

JULY 2015





DRAFT - WORK IN PROCESS



KENILWORTH CORRIDOR

EXISTING CONDITIONS

VIEW 2

JULY 2015

AECOM

miller dunwiddie
ARCHITECTURE

Kimley»Horn

SNOW
KREILICH
ARCHITECTS



DRAFT - WORK IN PROCESS



KENILWORTH CORRIDOR

COMBINATION DESIGN 1

3-BRIDGE LAYOUT

VIEW 2

JULY 2015

AECOM

miller dunwiddie
ARCHITECTURE

Kimley»Horn

SNOW
KREILICH
ARCHITECTS



DRAFT - WORK IN PROCESS



KENILWORTH CORRIDOR

COMBINATION DESIGN 1

2-BRIDGE LAYOUT

VIEW 2

JULY 2015





DRAFT - WORK IN PROCESS



KENILWORTH CORRIDOR

COMBINATION DESIGN 2

3-BRIDGE LAYOUT

VIEW 2

JULY 2015

AECOM

miller dunwiddie
ARCHITECTURE

Kimley»Horn

SNOW
KREILICH
ARCHITECTS



DRAFT - WORK IN PROCESS



KENILWORTH CORRIDOR

COMBINATION DESIGN 2

2-BRIDGE LAYOUT

VIEW 2

JULY 2015

AECOM

miller dunwiddie
ARCHITECTURE

Kimley»Horn

SNOW
KREILICH
ARCHITECTS



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KENILWORTH CORRIDOR

EXISTING CONDITIONS
(PHOTO COMPOSITE)

VIEW 4
JULY 2015

AECOM

miller dunwiddie
ARCHITECTURE

Kimley»Horn

SNOW
KREILICH
ARCHITECTS



DRAFT - WORK IN PROCESS



KENILWORTH CORRIDOR

COMBINATION DESIGN 1

3-BRIDGE LAYOUT

VIEW 4

JULY 2015

AECOM

miller dunwiddie
ARCHITECTURE

Kimley»Horn

SNOW
KREILICH
ARCHITECTS



DRAFT - WORK IN PROCESS



KENILWORTH CORRIDOR

COMBINATION DESIGN 1

2-BRIDGE LAYOUT

VIEW 4

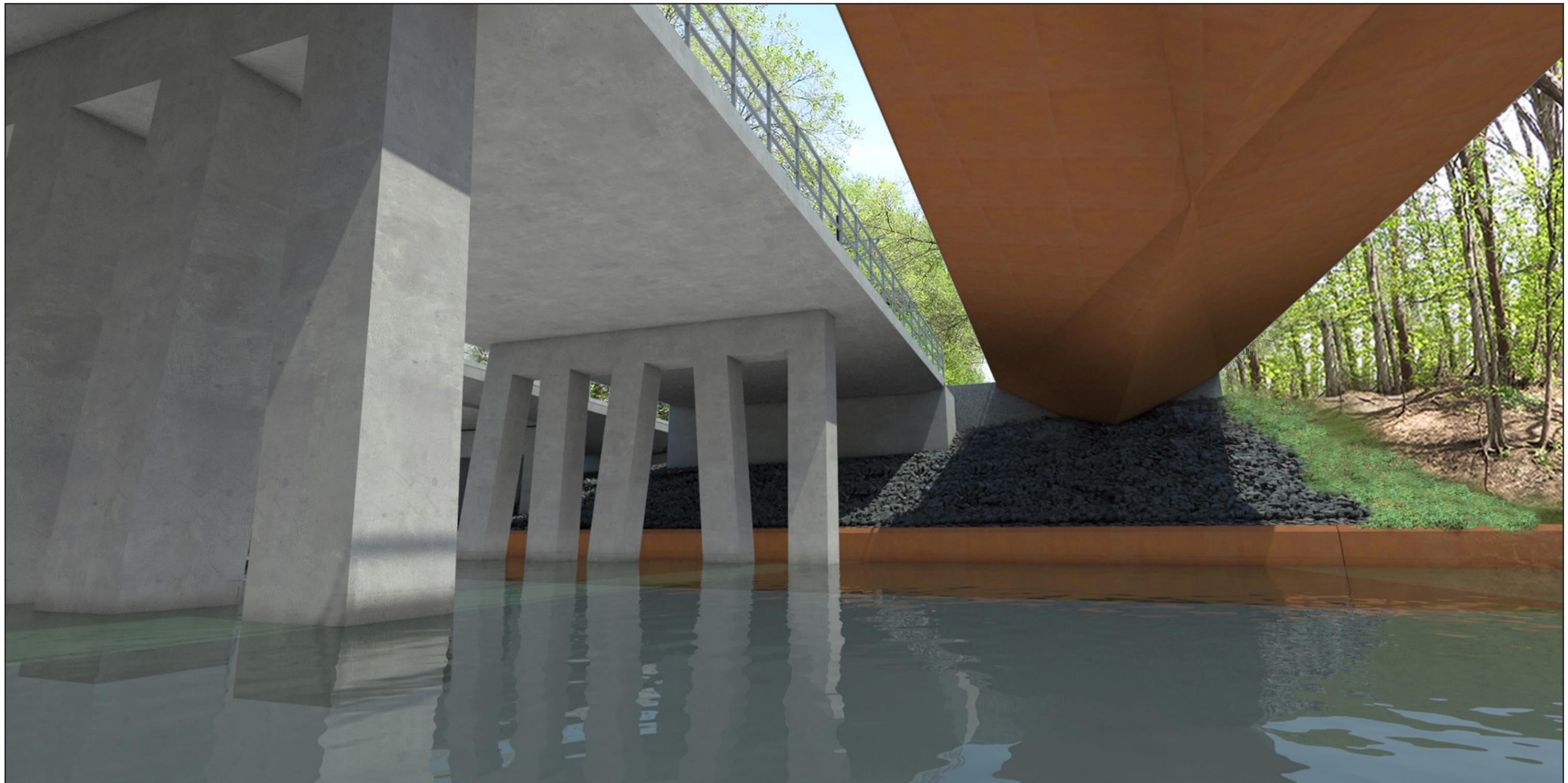
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miller dunwiddie
ARCHITECTURE

Kimley»Horn

SNOW
KREILICH
ARCHITECTS



DRAFT - WORK IN PROCESS



KENILWORTH CORRIDOR

COMBINATION DESIGN 2

3-BRIDGE LAYOUT

VIEW 4

JULY 2015





DRAFT - WORK IN PROCESS



KENILWORTH CORRIDOR

COMBINATION DESIGN 2

2-BRIDGE LAYOUT

VIEW 4

JULY 2015

AECOM

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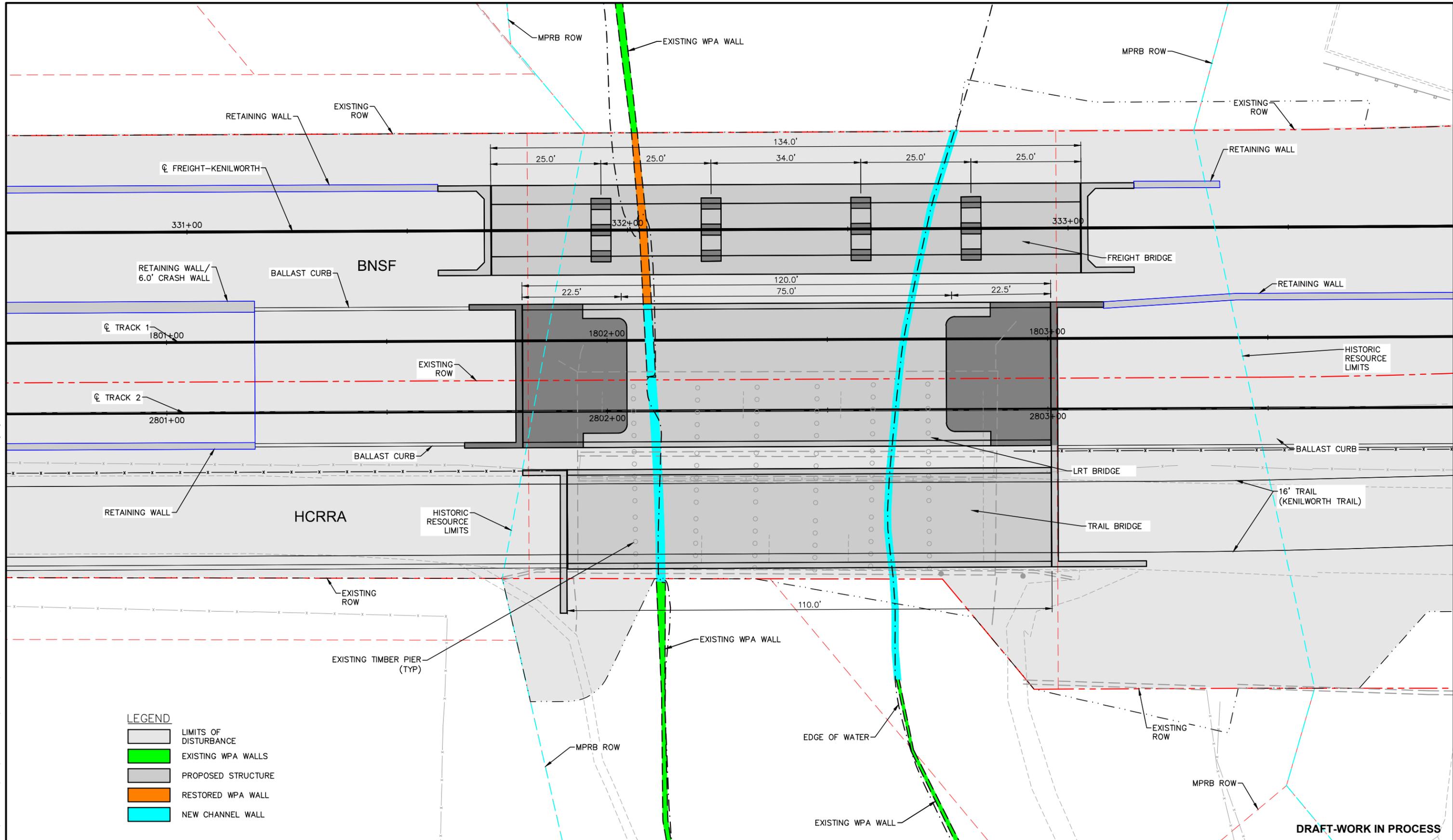
SNOW
KREILICH
ARCHITECTS

Bridge Design Concepts and Configurations Considered

		Bridge Configurations - April 2015				Bridge Design Concepts - July 2015		
Bridge Concept / Configuration	Existing Trail/ Freight Bridge: Timber Pile (7 span)	Configuration 4A:	Configuration 4B:	Configuration 4C:	Configuration 4B-Skew:	Combination Design 1	Combination Design 2	Combination Design 3
		3 Bridge	3 Bridge	3 Bridge	3 Bridge	3 Bridge	3 Bridge	3 Bridge
Total No. of Piers	6	Freight - 4 LRT - 2 Trail - 0	Freight - 2 LRT - 2 Trail - 0	Freight - 2 LRT - 2 Trail - 0	Freight - 2 LRT - 2 Trail - 0	Freight - 4 LRT - 0 Trail - 0	Freight - 4 LRT - 2 Trail - 0	Freight - 4 LRT - 2 Trail - 0
No. of Piers at water level	4	Freight - 2 LRT - 2 Trail - 0	Freight - 2 LRT - 0 Trail - 0	Freight - 2 LRT - 1 Trail - 0	Freight - 2 LRT - 0 Trail - 0	Freight - 2 LRT - 0 Trail - 0	Freight - 2 LRT - 2 Trail - 0	Freight - 2 LRT - 2 Trail - 0
Individual Span Length (Centerline to Centerline)	Varies 12'-9" to 13'-11"	Freight - 25' and 34' LRT - 33' & 34' Trail - 100'	Freight - 35' and 50' LRT - 22.5' & 75' Trail - 110'	Freight - 35' and 50' LRT - 30' & 65' Trail - 110'	Freight - 35' and 50' LRT - 22.5' & 75' Trail - 108'	Freight - 25' and 34' LRT - 75' Trail - 110'	Freight - 25' and 34' LRT - 33' & 34' Trail - 110'	Freight - 25' and 34' LRT - 33' & 34' Trail - 100'
Clearance Between Piers	+/-11'-5"	TBD	TBD	TBD	TBD	TBD	TBD	TBD
Pier Width	Single Row 14"-16" Dia.	TBD	TBD	TBD	TBD	TBD	TBD	TBD
Bridge Length (Abutment-to-Abutment)	96'	Freight - 134' LRT - 100' Trail - 100'	Freight - 120' LRT - 120' Trail - 110'	Freight - 120' LRT - 115' Trail - 110'	Freight - 120' LRT - 120' Trail - 108'	Freight - 134' LRT - 120' Trail - 110'	Freight - 134' LRT - 100' Trail - 110'	Freight - 134' LRT - 100' Trail - 100'
Pier Cap (Width x Depth)	14" SQ.	TBD	TBD	TBD	TBD	TBD	TBD	TBD
Total Bridge Thickness without Railing (Parapet+Deck+Beams)	+/- 5'	Freight - 2'-3" & 3'-0" LRT - 1'-6" & 2'-0" Trail - TBD	Freight - 3'-0" & 4'-9" LRT-25' span: 1'-3" & 1'-8", 75' span: 3'-3" & 4'-4" Trail - TBD	Freight - 3'-0" & 4'-9" LRT-30' span: 1'-6" & 2'-0", 65' span: 2'-9" & 3'-8" Trail - TBD	Freight - 3'-0" & 4'-9" LRT-25' span: 1'-3" & 1'-8", 75' span: 3'-3" & 4'-4" Trail - TBD	Freight - 3'-0" LRT - 4'-0" Trail - 3'-0"	Freight - 3'-0" LRT - 2'-6" Trail - 3'-0"	Freight - 3'-0" LRT - 2'-6" Trail - 3'-0"
Vertical Clearance	14'	Freight - 13.4' LRT - 14.4' & 13.9' Trail - TBD	Freight - 11.7' LRT - 12.7' & 11.6' Trail - TBD	Freight - 11.7' LRT - 13.1' & 12.2' Trail - TBD	Freight - 11.7' LRT - 12.7' & 11.6' Trail - TBD	Freight - 13.4' LRT - 12.4' Trail - 14.8'	Freight - 13.4' LRT - 13.9' Trail - 14.8'	Freight - 13.4' LRT - 13.9' Trail - 14.8'
Trail Bridge Width	22'-0"	22'-6"				22'-6"		
LRT Bridge Width	N/A	32'-6"				32'-6"		
Freight Rail Bridge Width	23'-0"	20'-4"				20'-4"		
Total Width of Bridges	45'-0"	75'-4"				75'-4"		
Open Space Between Freight & LRT Bridge	N/A	6'-7"				6'-7"		
Open Space Between LRT & Trail Bridge	N/A	5'-0"			5'-0" Min 14'-0" Max	5'-0"		
Total Width of Bridges + Clear Space Between Bridges	45'	87'-0"			87'-0" Min 96'-0" Max	87'-0"		

DRAFT - WORK IN PROCESS

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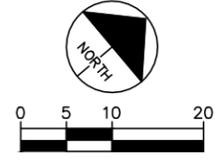
- LEGEND**
- LIMITS OF DISTURBANCE
 - EXISTING WPA WALLS
 - PROPOSED STRUCTURE
 - RESTORED WPA WALL
 - NEW CHANNEL WALL

DRAFT-WORK IN PROCESS

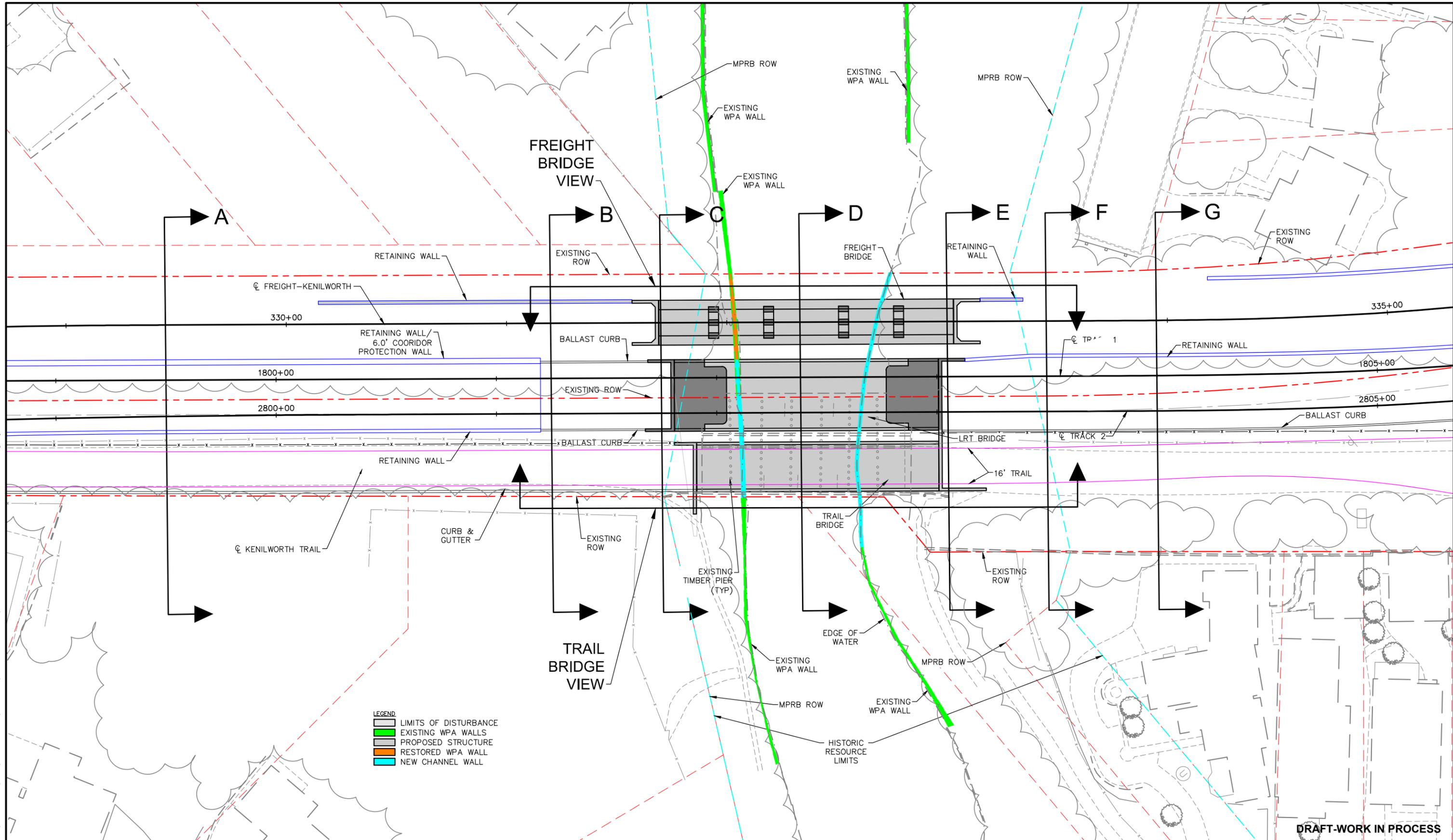


SOUTHWEST LIGHT RAIL
LAGOON/CHANNEL BRIDGE - COMBO DESIGN 1

Rev 0
07/20/2015

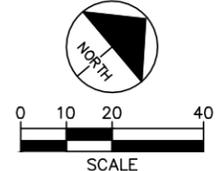


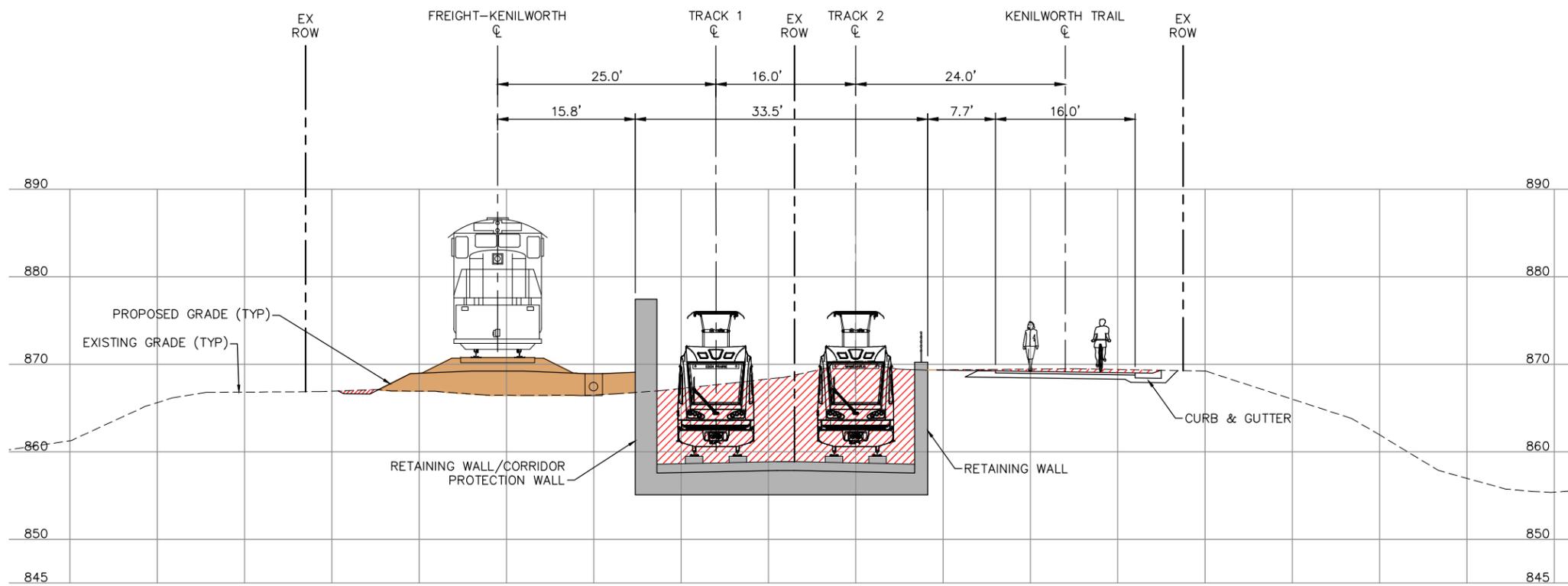
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SOUTHWEST LIGHT RAIL
LAGOON/CHANNEL BRIDGE - COMBO DESIGN 1

Rev 0
07/20/2015





COLOR LEGEND	
	EXISTING GROUND CUT
	PROPOSED FILL
	PROPOSED STRUCTURE

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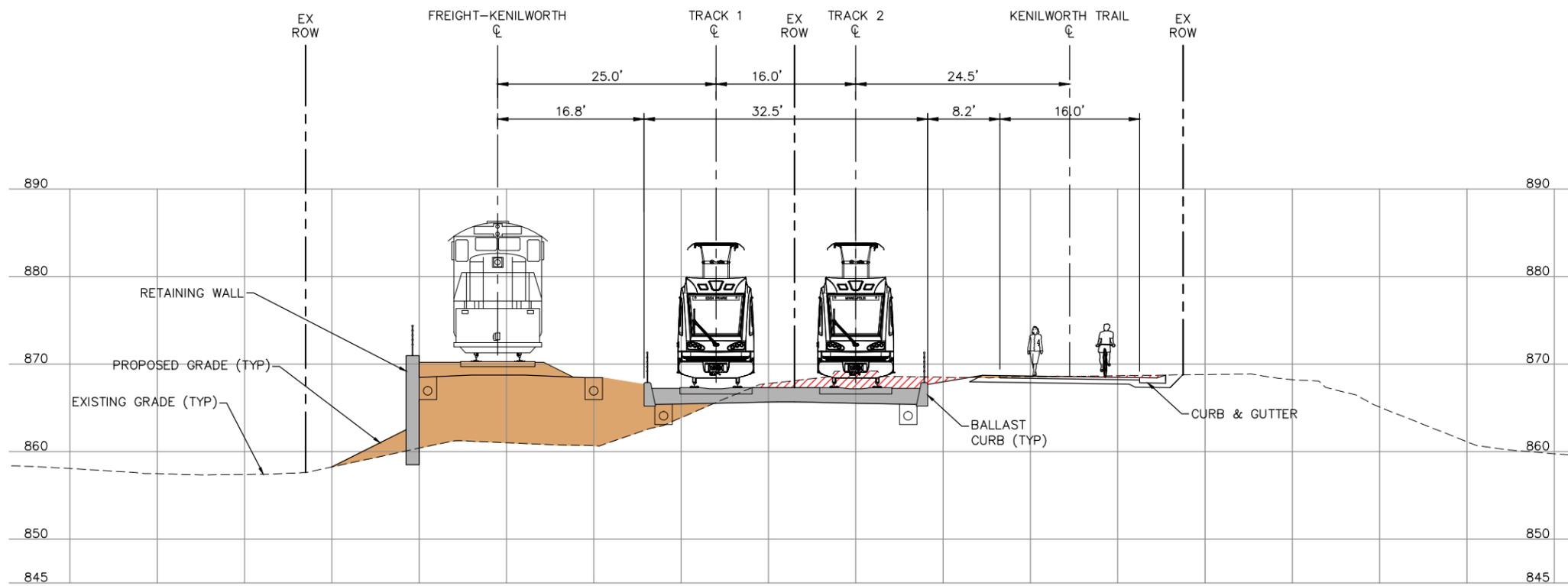


SOUTHWEST LIGHT RAIL
 COMBO DESIGN 1
 SECTION A - STATION 2799+50

Rev 0
 07/20/2015



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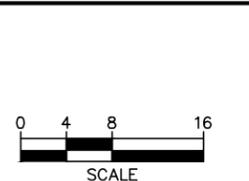
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	EXISTING GROUND CUT
	PROPOSED FILL
	PROPOSED STRUCTURE

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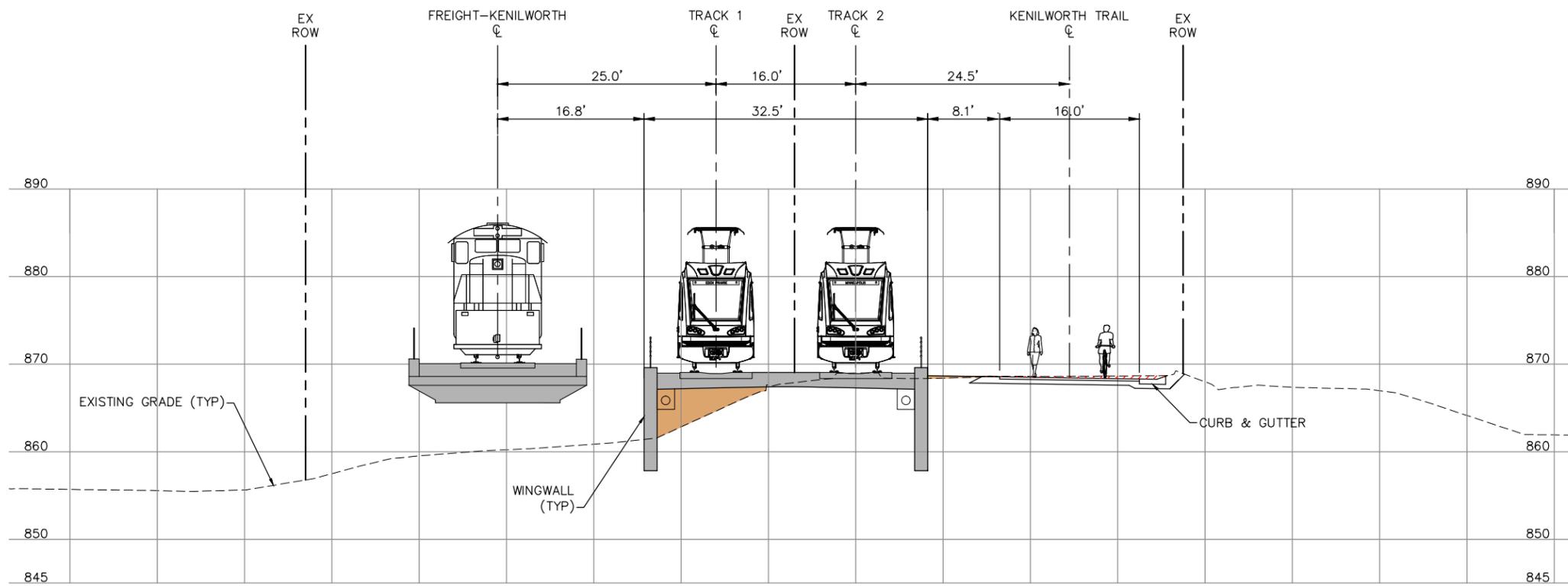


SOUTHWEST LIGHT RAIL
 COMBO DESIGN 1
 SECTION B - STATION 2801+25

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 07/20/2015

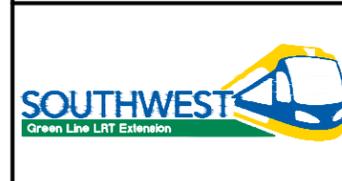


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COLOR LEGEND	
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	PROPOSED FILL
	PROPOSED STRUCTURE

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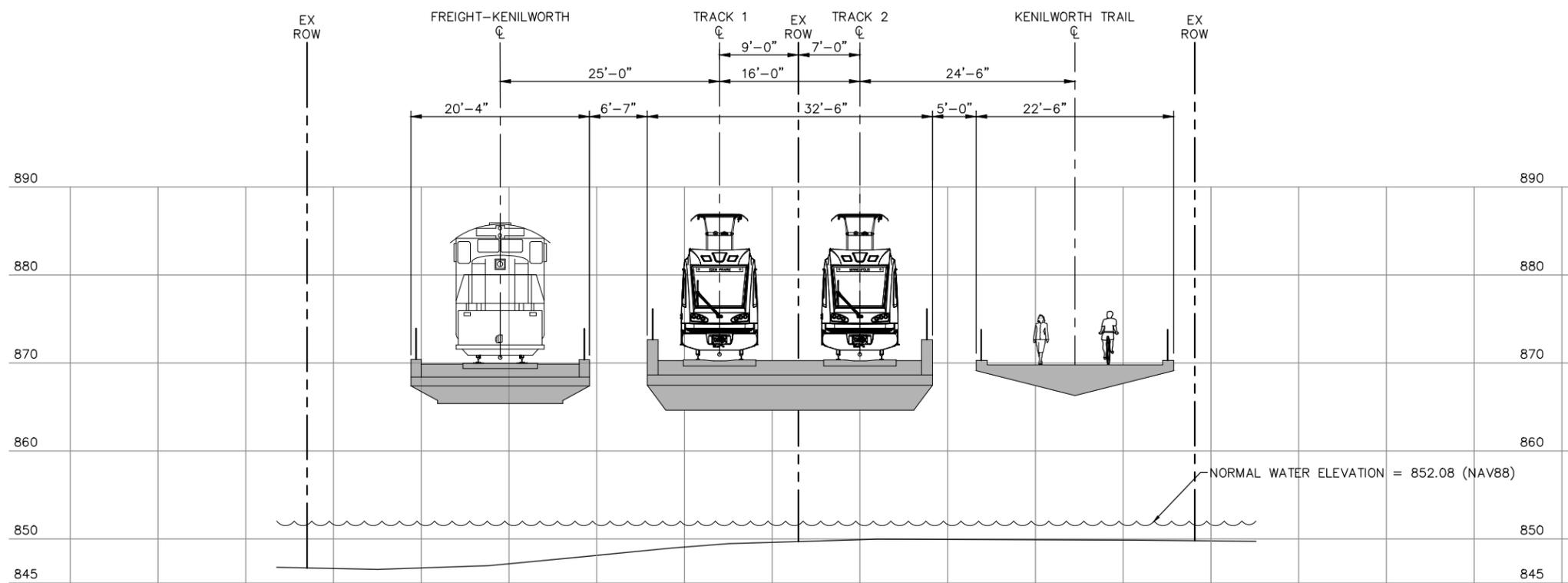


SOUTHWEST LIGHT RAIL
 COMBO DESIGN 1
 SECTION C - STATION 2801+75

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COLOR LEGEND	
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	PROPOSED FILL
	PROPOSED STRUCTURE

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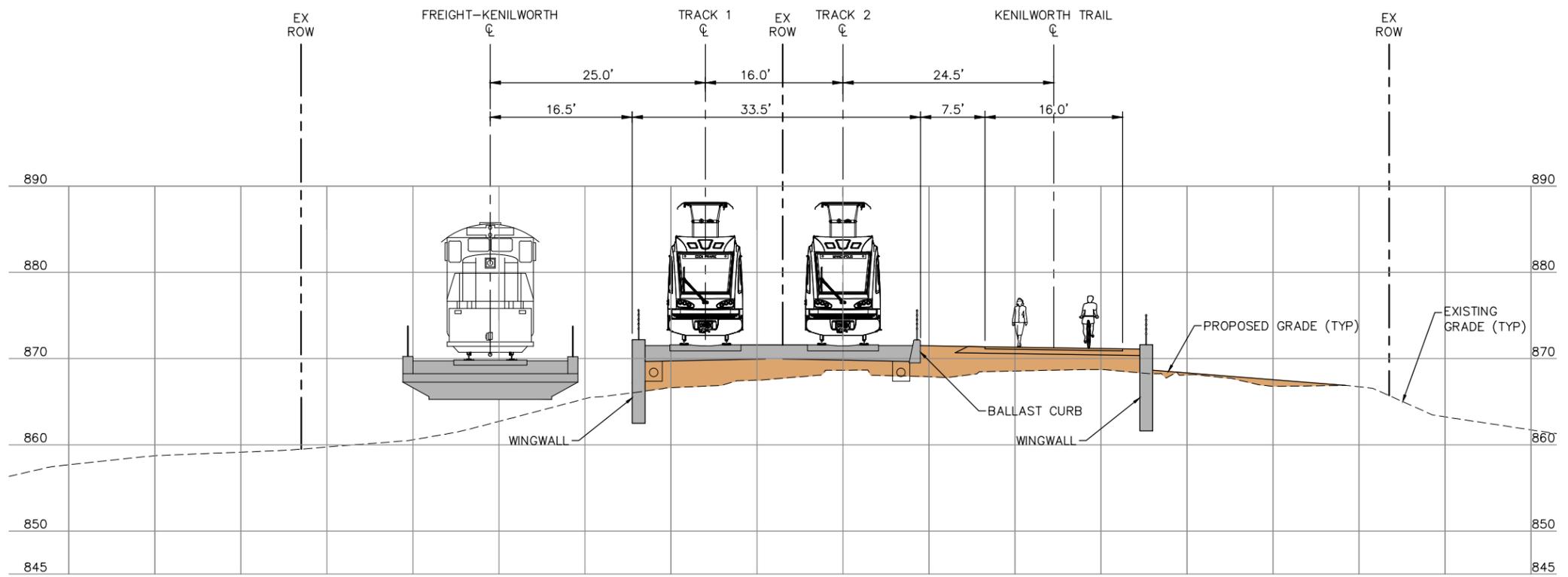


SOUTHWEST LIGHT RAIL
 COMBO DESIGN 1
 SECTION D - STATION 2802+38

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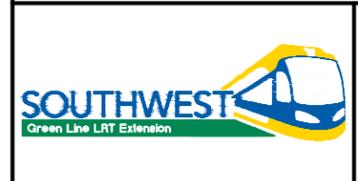


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COLOR LEGEND	
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	PROPOSED FILL
	PROPOSED STRUCTURE

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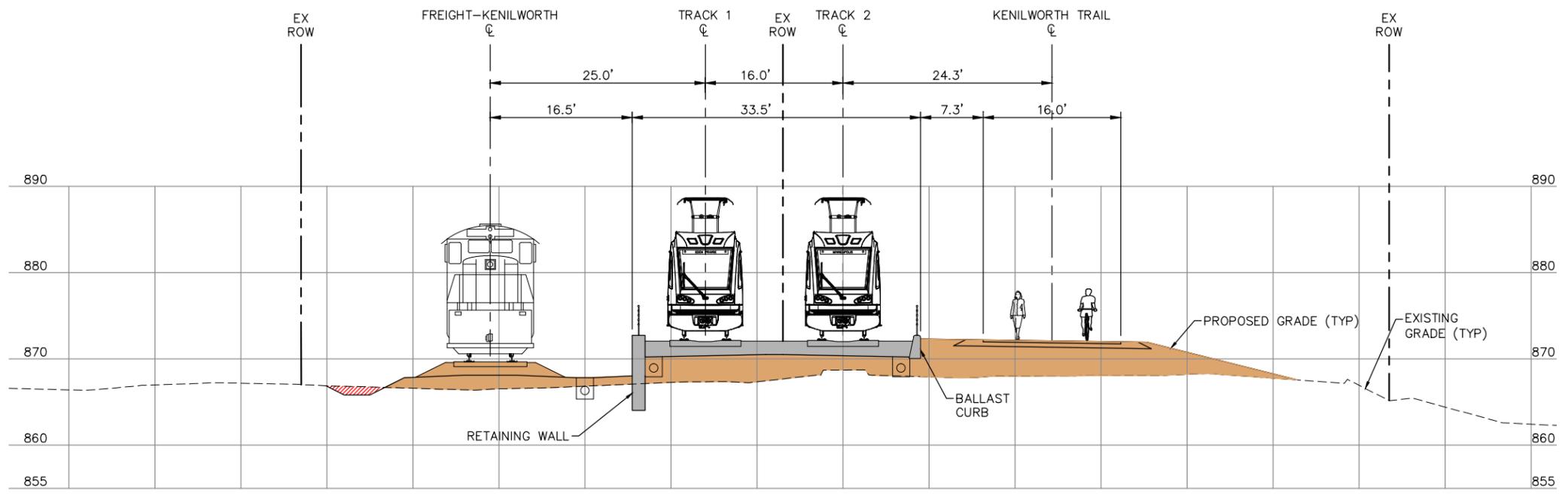


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 COMBO DESIGN 1
 SECTION E - STATION 2803+05

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COLOR LEGEND	
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	PROPOSED FILL
	PROPOSED STRUCTURE

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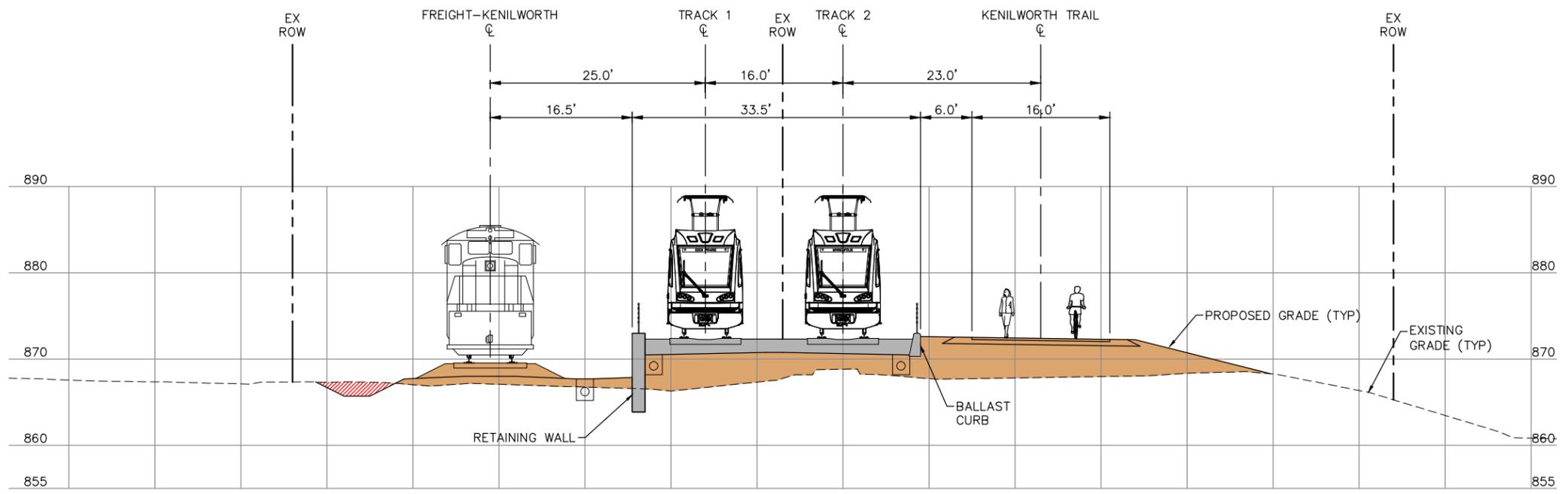


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 SECTION F - STATION 2803+50

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 07/20/2015



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COLOR LEGEND	
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	PROPOSED FILL
	PROPOSED STRUCTURE

DRAFT-WORK IN PROCESS

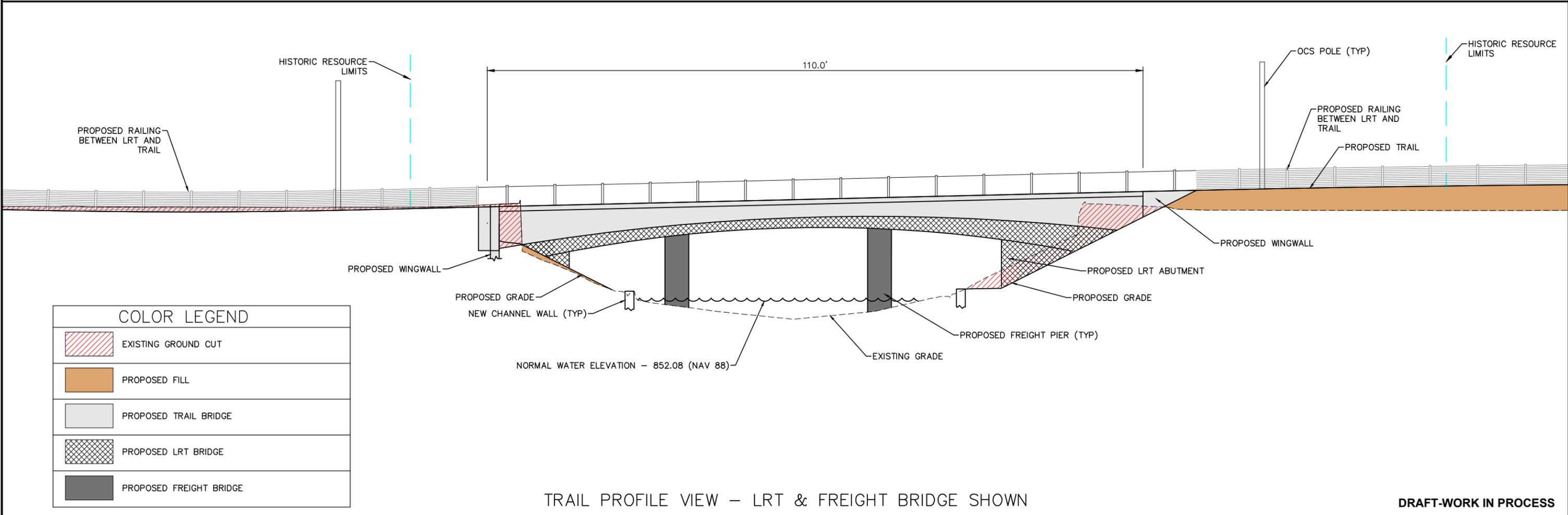
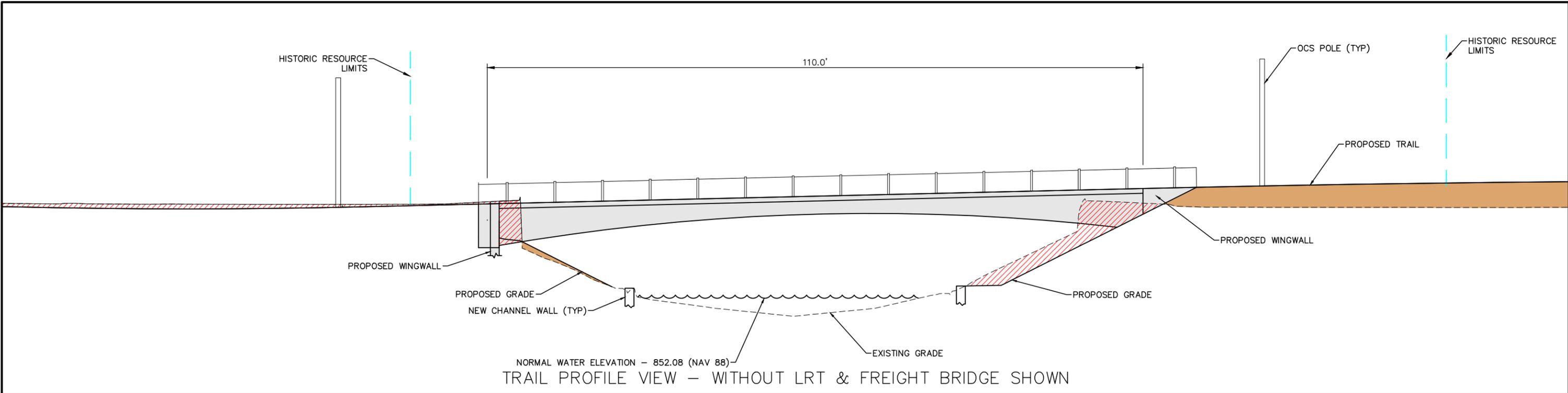


SOUTHWEST LIGHT RAIL
 COMBO DESIGN 1
 SECTION G - STATION 2804+00

Rev 0
 07/20/2015

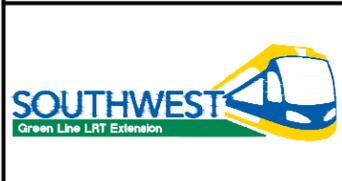


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COLOR LEGEND	
	EXISTING GROUND CUT
	PROPOSED FILL
	PROPOSED TRAIL BRIDGE
	PROPOSED LRT BRIDGE
	PROPOSED FREIGHT BRIDGE

DRAFT-WORK IN PROCESS



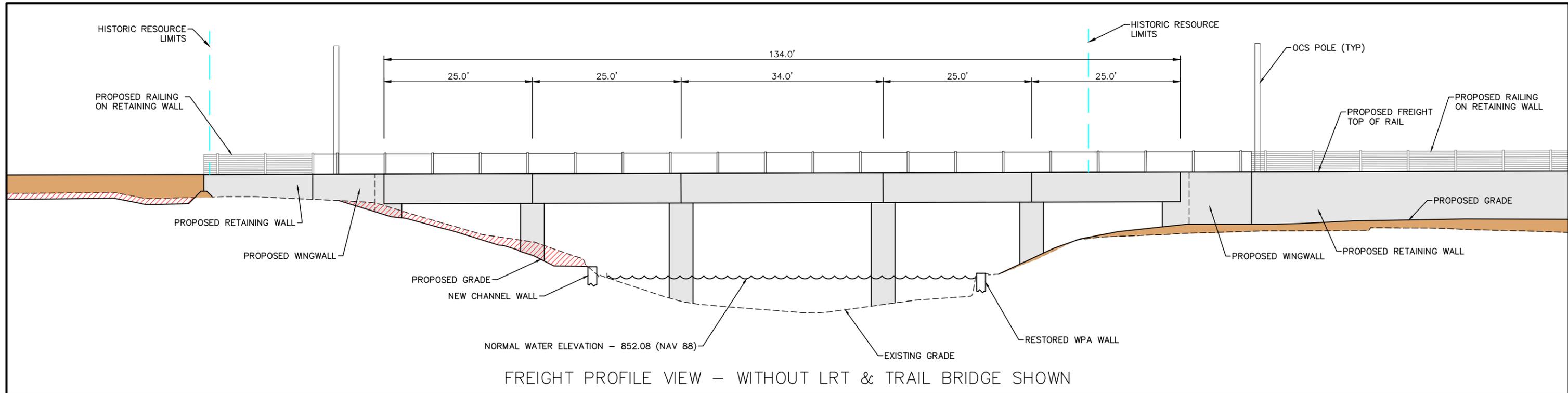
SOUTHWEST LIGHT RAIL
LAGOON/CHANNEL BRIDGE - COMBO DESIGN 1
TRAIL BRIDGE VIEW

Rev 0
07/20/2015

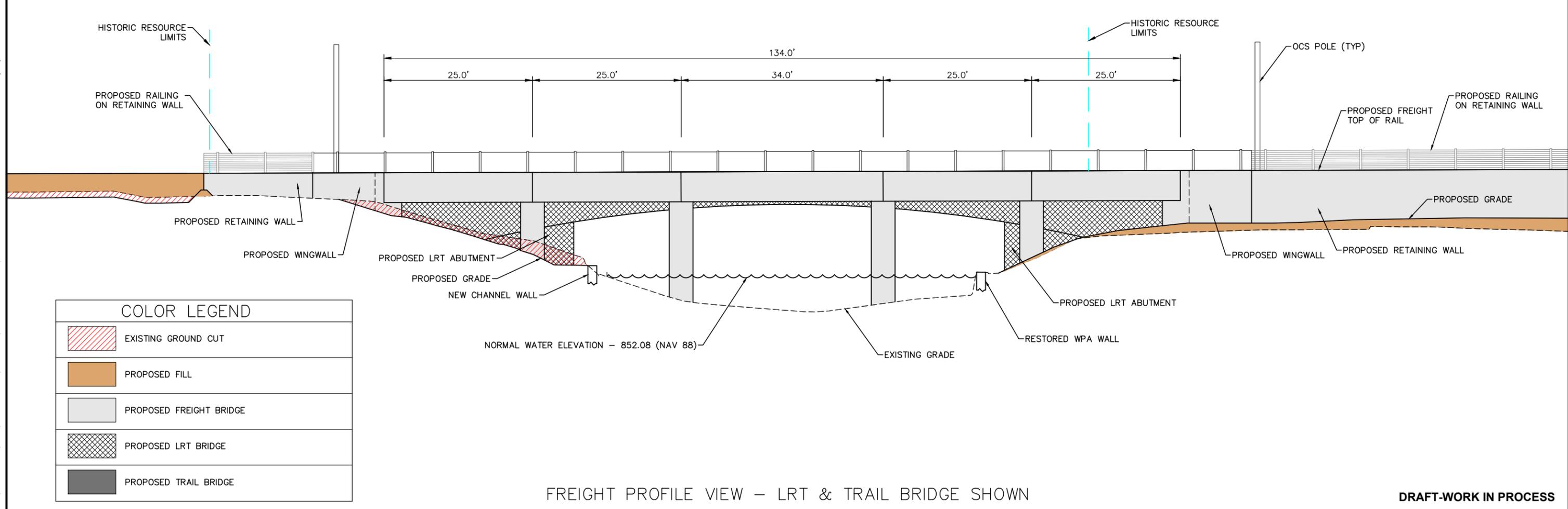


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FREIGHT PROFILE VIEW - WITHOUT LRT & TRAIL BRIDGE SHOWN



FREIGHT PROFILE VIEW - LRT & TRAIL BRIDGE SHOWN

DRAFT-WORK IN PROCESS

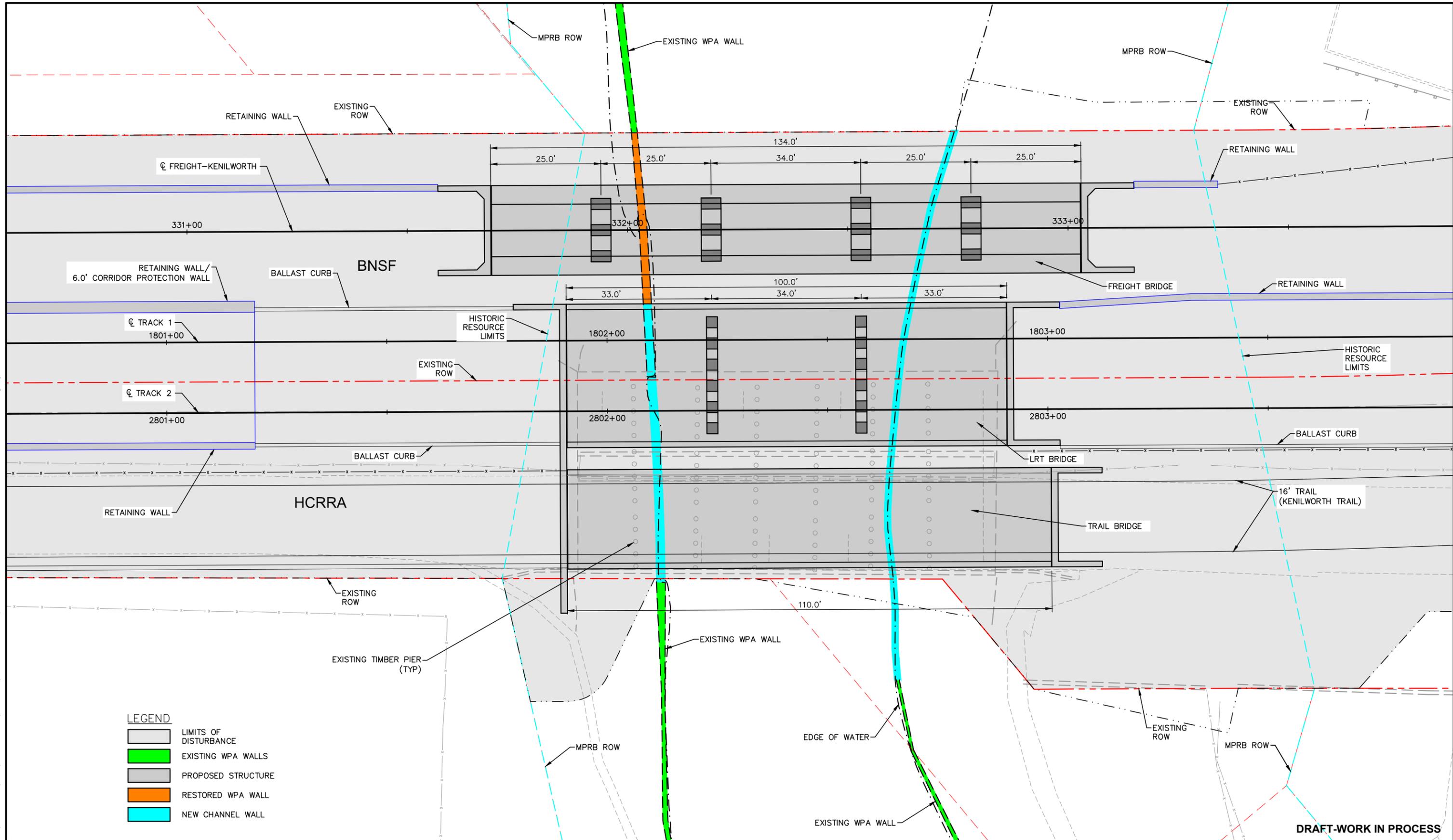


SOUTHWEST LIGHT RAIL
LAGOON/CHANNEL BRIDGE - COMBO DESIGN 1
FREIGHT BRIDGE VIEW

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07/20/2015



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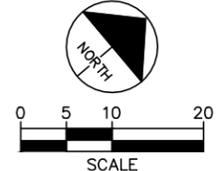
- LEGEND**
- LIMITS OF DISTURBANCE
 - EXISTING WPA WALLS
 - PROPOSED STRUCTURE
 - RESTORED WPA WALL
 - NEW CHANNEL WALL

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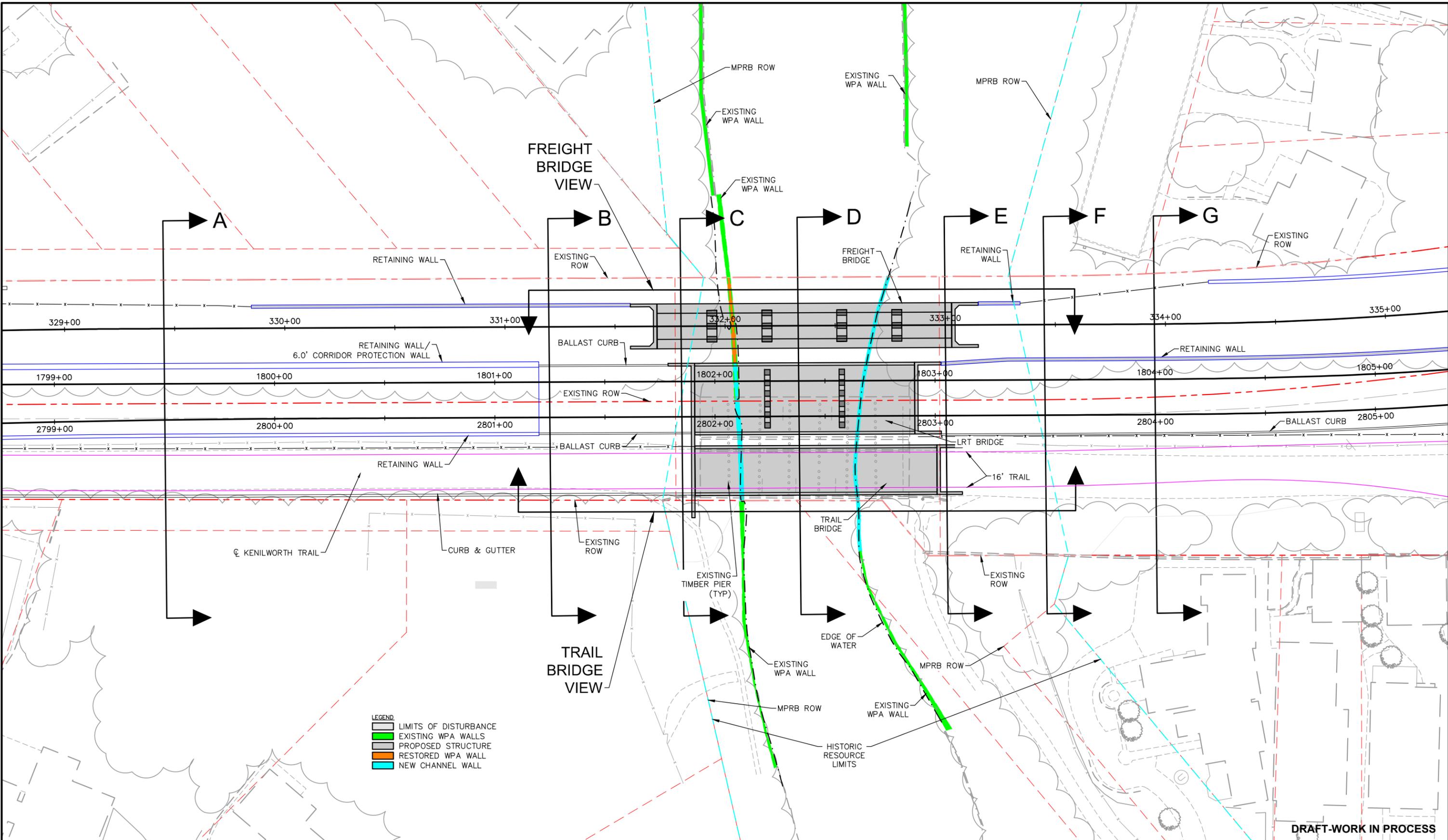


SOUTHWEST LIGHT RAIL
LAGOON/CHANNEL BRIDGE - COMBO DESIGN 2

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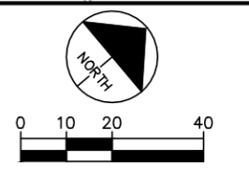


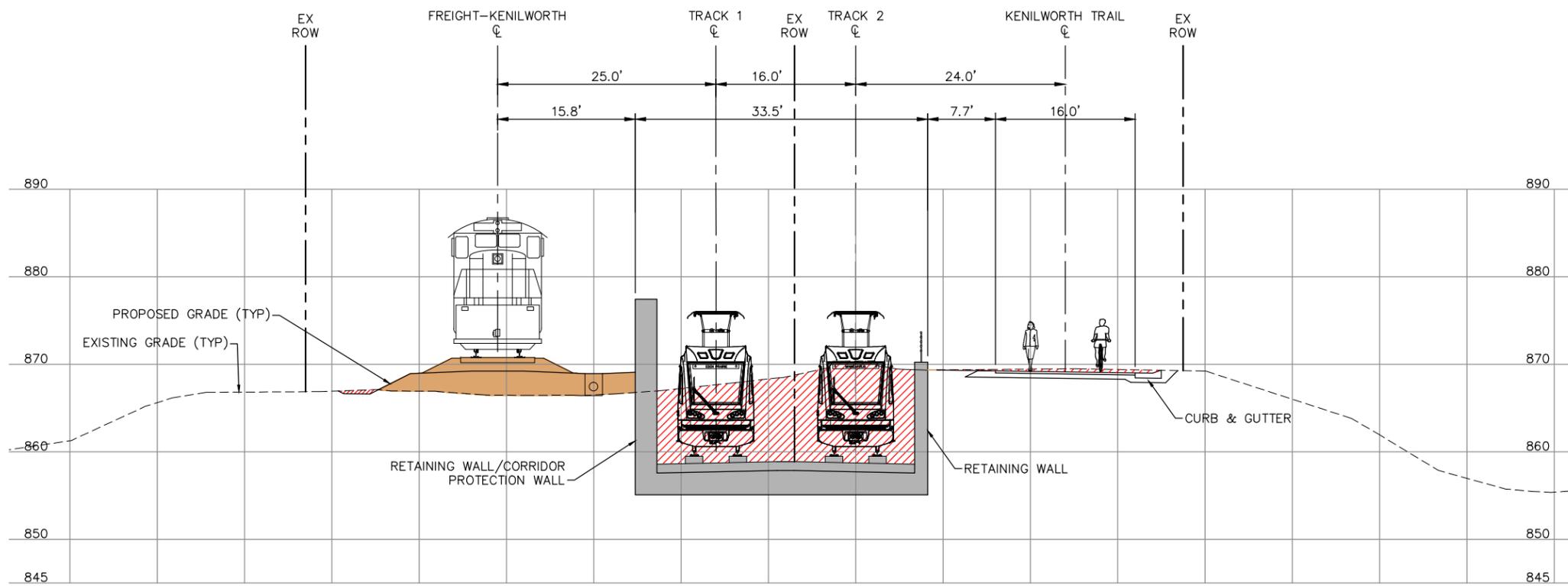
DRAFT-WORK IN PROCESS



SOUTHWEST LIGHT RAIL
LAGOON/CHANNEL BRIDGE - COMBO DESIGN 2

Rev 0
07/20/2015





COLOR LEGEND	
	EXISTING GROUND CUT
	PROPOSED FILL
	PROPOSED STRUCTURE

DRAFT-WORK IN PROCESS

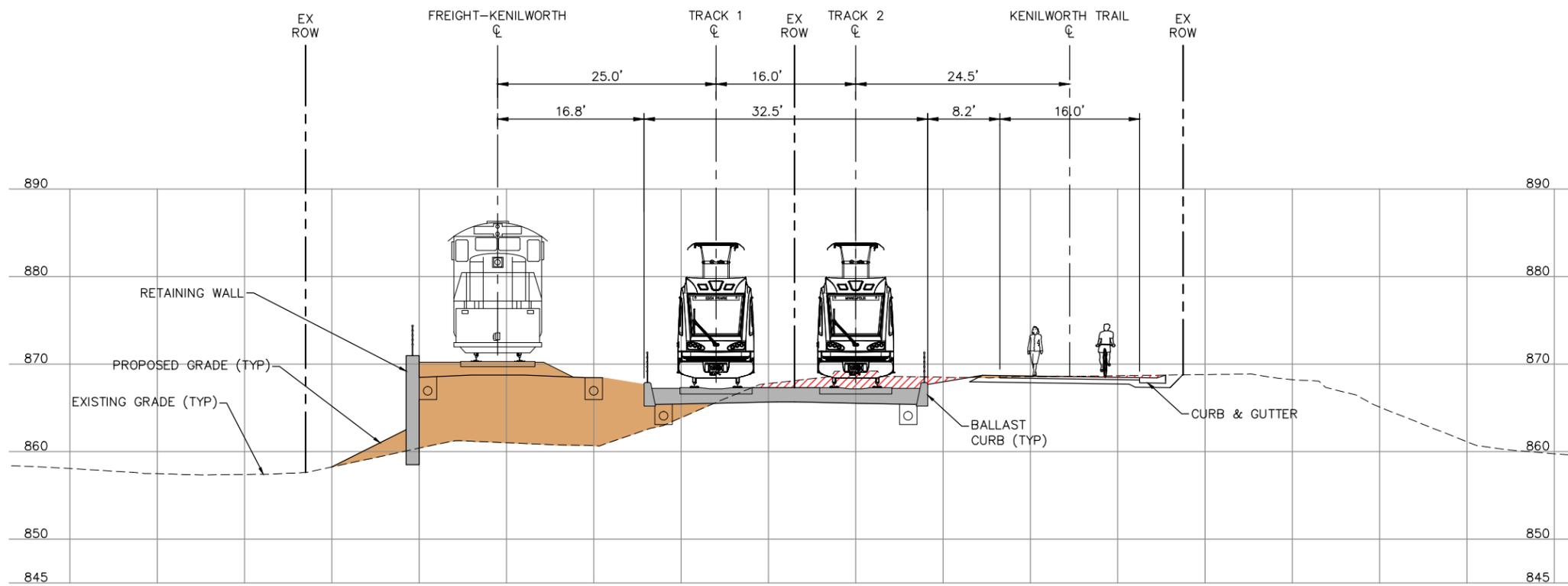


SOUTHWEST LIGHT RAIL
 COMBO DESIGN 2
 SECTION A - STATION 2799+50

Rev 0
 07/20/2015



Jul, 20 2015 08:13 am V:\3400_ADC\CAD\SEGMENT E3\EXHIBITS\CHANNEL BRIDGE\E3-CIV-BRIDGE-ADM-CONCEPT_A-SECX.dwg By: BunderCC



COLOR LEGEND	
	EXISTING GROUND CUT
	PROPOSED FILL
	PROPOSED STRUCTURE

DRAFT-WORK IN PROCESS

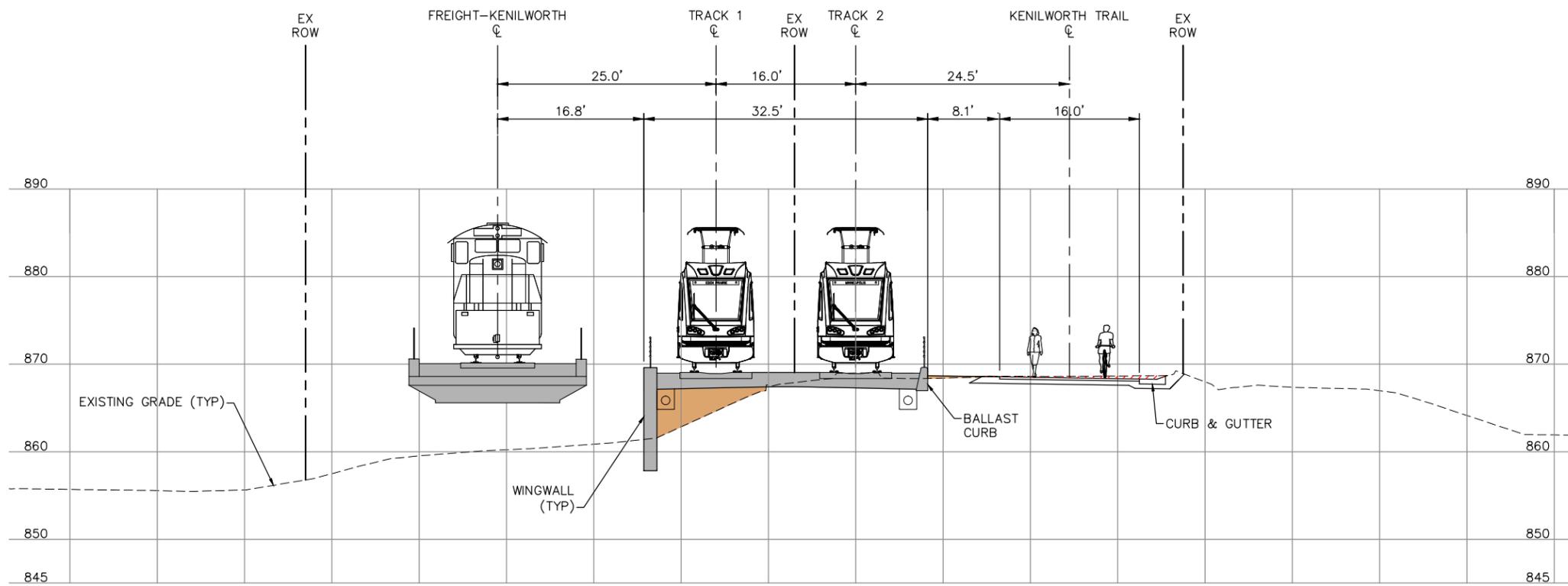


SOUTHWEST LIGHT RAIL
 COMBO DESIGN 2
 SECTION B - STATION 2801+25

Rev 0
 07/20/2015



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COLOR LEGEND	
	EXISTING GROUND CUT
	PROPOSED FILL
	PROPOSED STRUCTURE

DRAFT-WORK IN PROCESS

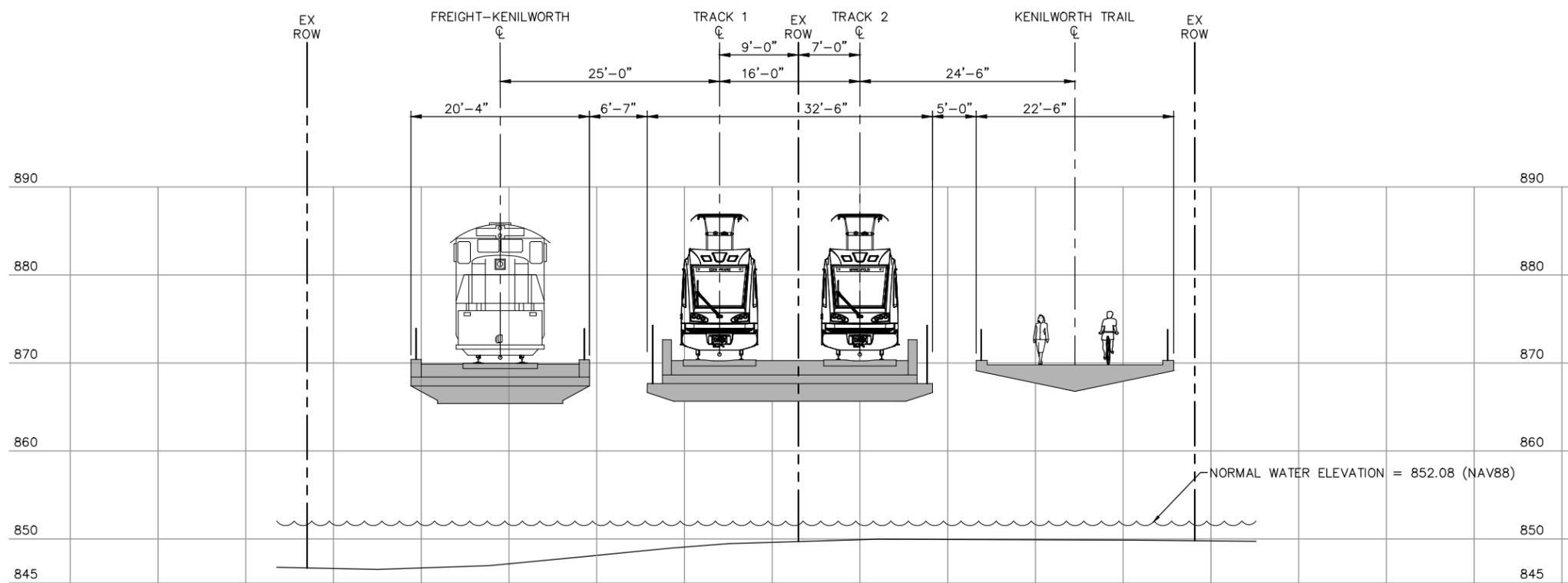


SOUTHWEST LIGHT RAIL
 COMBO DESIGN 2
 SECTION C - STATION 2801+85

Rev 0
 07/20/2015



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COLOR LEGEND	
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	PROPOSED FILL
	PROPOSED STRUCTURE

DRAFT-WORK IN PROCESS

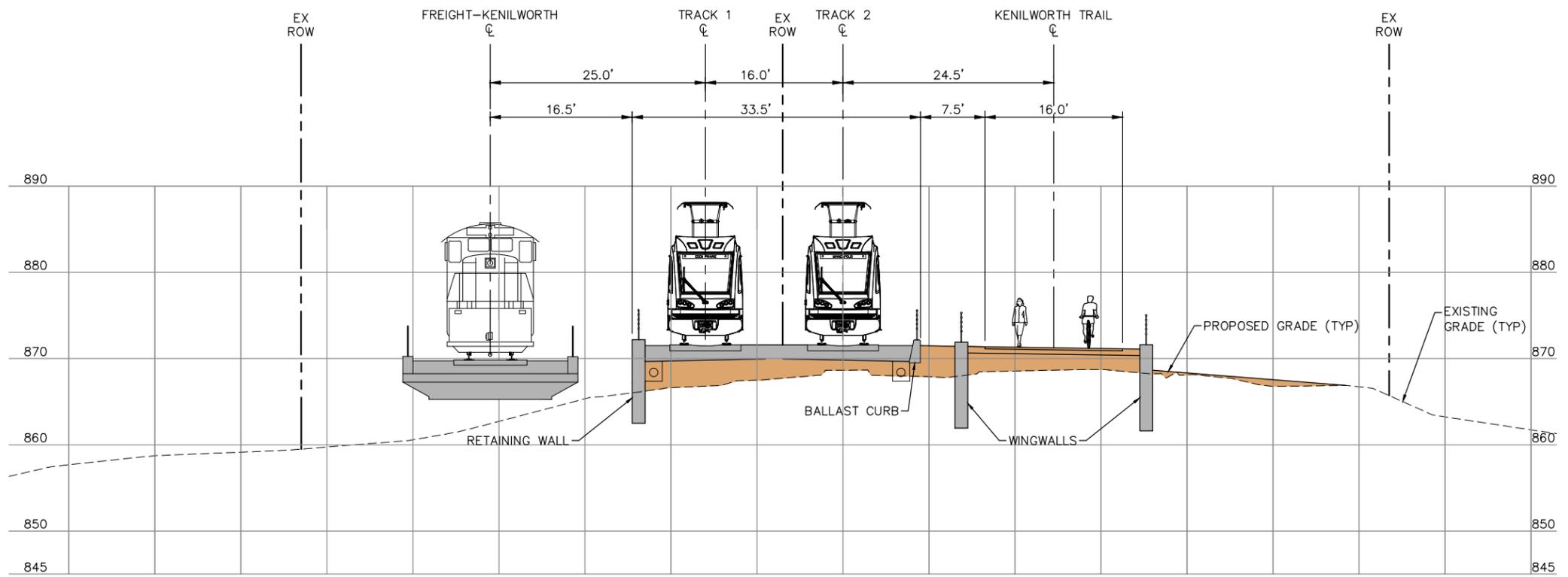


SOUTHWEST LIGHT RAIL
 COMBO DESIGN 2
 SECTION D - STATION 2802+38

Rev 0
 07/20/2015



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COLOR LEGEND	
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	PROPOSED FILL
	PROPOSED STRUCTURE

DRAFT-WORK IN PROCESS

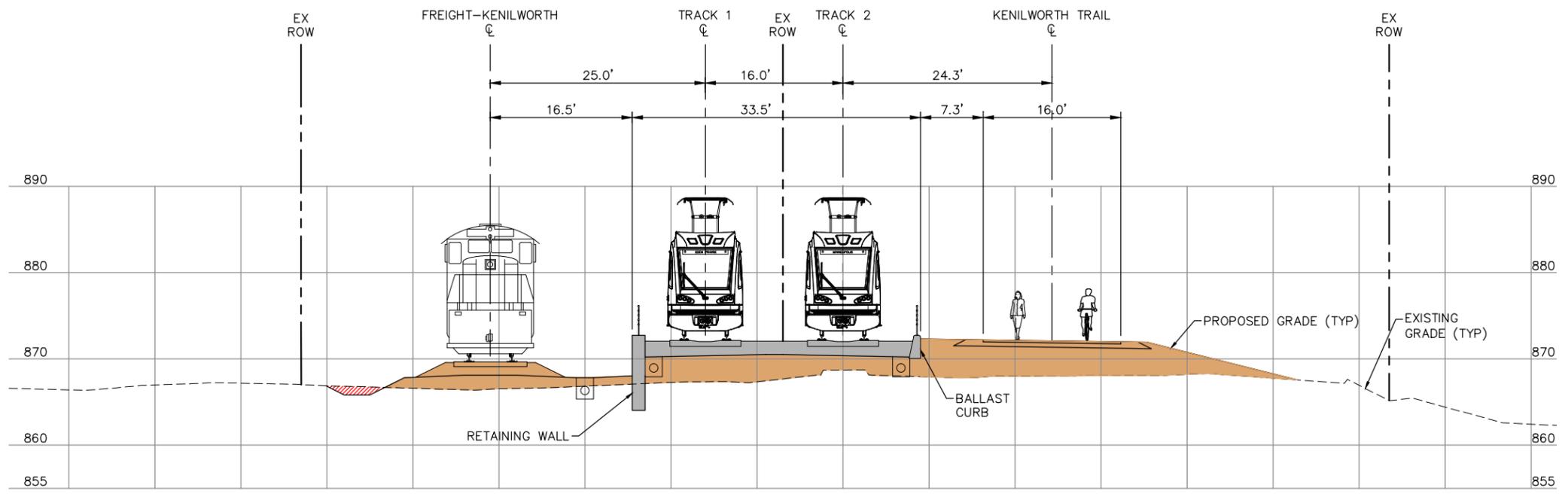


SOUTHWEST LIGHT RAIL
 COMBO DESIGN 2
 SECTION E - STATION 2803+05

Rev 0
 07/20/2015



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COLOR LEGEND	
	EXISTING GROUND CUT
	PROPOSED FILL
	PROPOSED STRUCTURE

DRAFT-WORK IN PROCESS

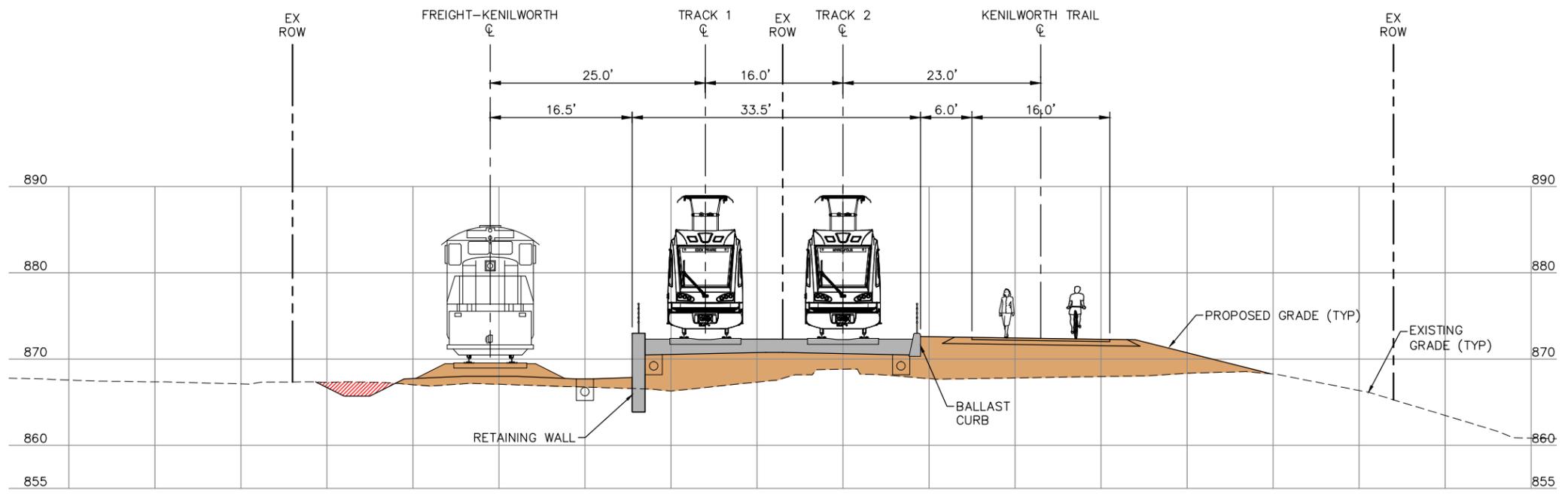


SOUTHWEST LIGHT RAIL
 COMBO DESIGN 2
 SECTION F - STATION 2803+50

Rev 0
 07/20/2015



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COLOR LEGEND	
	EXISTING GROUND CUT
	PROPOSED FILL
	PROPOSED STRUCTURE

DRAFT-WORK IN PROCESS



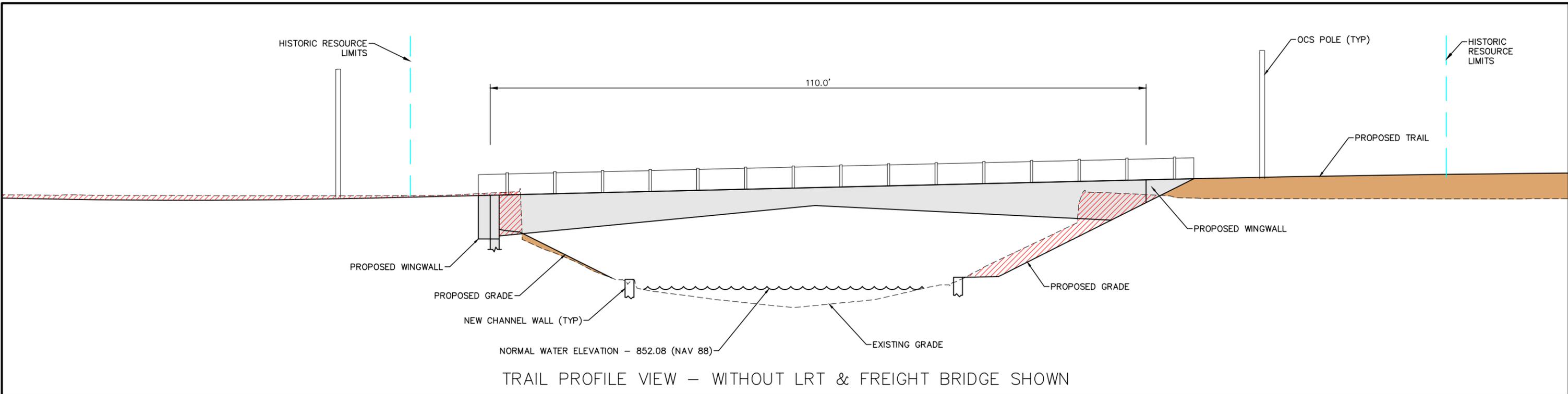
SOUTHWEST LIGHT RAIL
 COMBO DESIGN 2
 SECTION G - STATION 2804+00

Rev 0
 07/20/2015

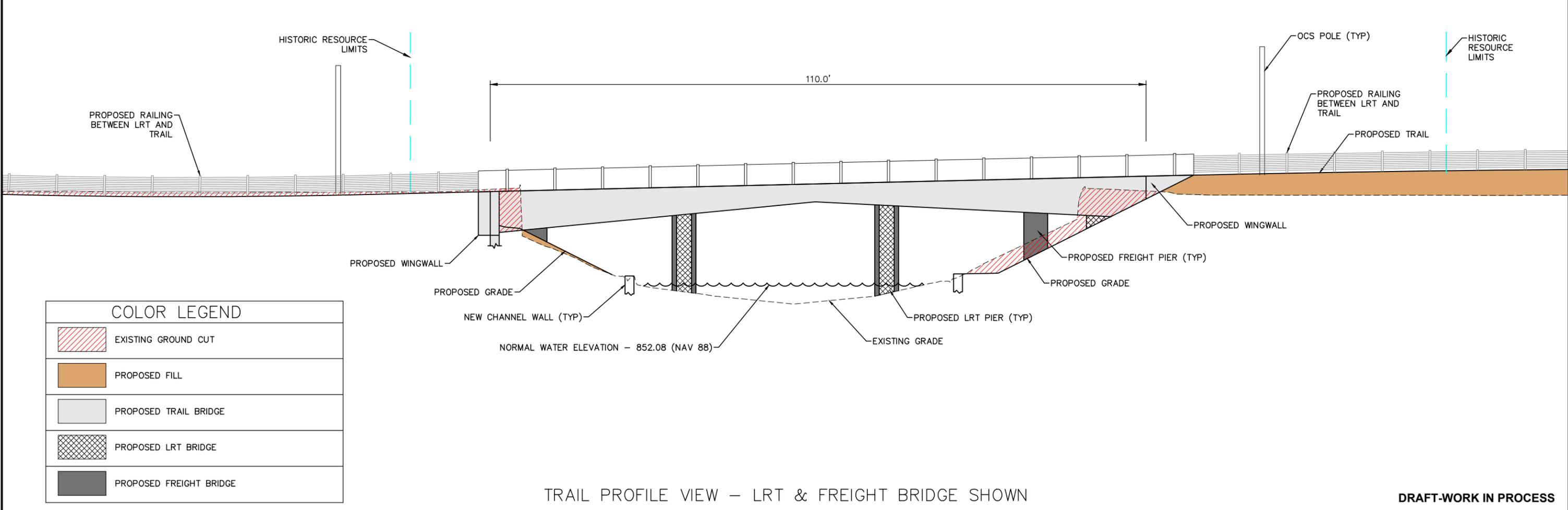


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Jul, 20 2015 09:16 am V:\3400_ADC\CAD\SEGMENT E3\EXHIBITS\CHANNEL BRIDGE\E3-CIV-BRIDGE-ADM-CONCEPT_7-THIN DECK-ANGULAR.dwg By: BunderCC



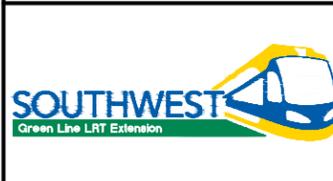
TRAIL PROFILE VIEW - WITHOUT LRT & FREIGHT BRIDGE SHOWN



TRAIL PROFILE VIEW - LRT & FREIGHT BRIDGE SHOWN

COLOR LEGEND	
	EXISTING GROUND CUT
	PROPOSED FILL
	PROPOSED TRAIL BRIDGE
	PROPOSED LRT BRIDGE
	PROPOSED FREIGHT BRIDGE

DRAFT-WORK IN PROCESS

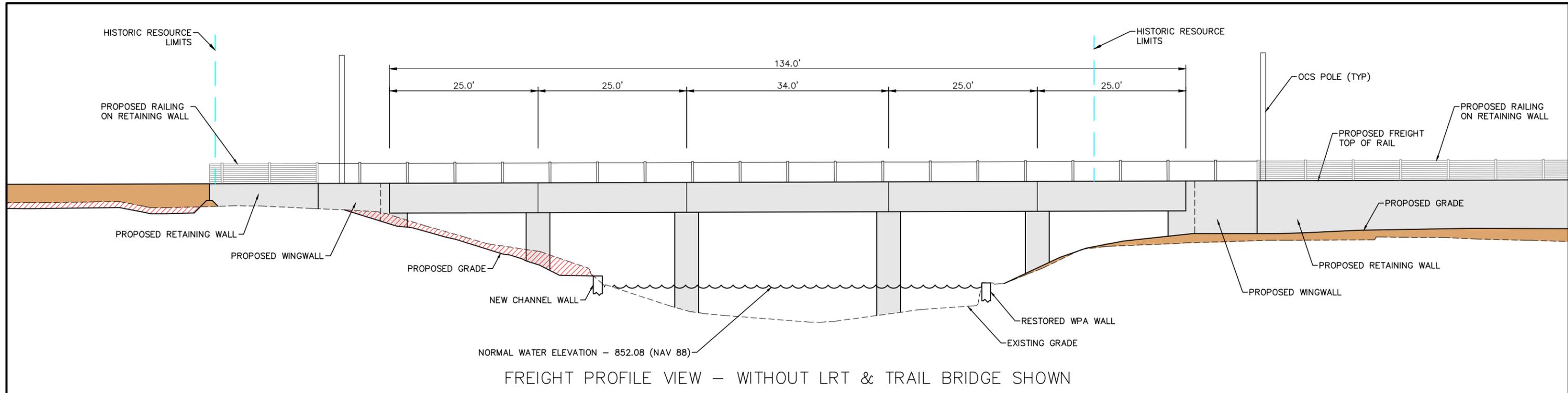


SOUTHWEST LIGHT RAIL
LAGOON/CHANNEL BRIDGE - COMBO DESIGN 2
TRAIL BRIDGE VIEW

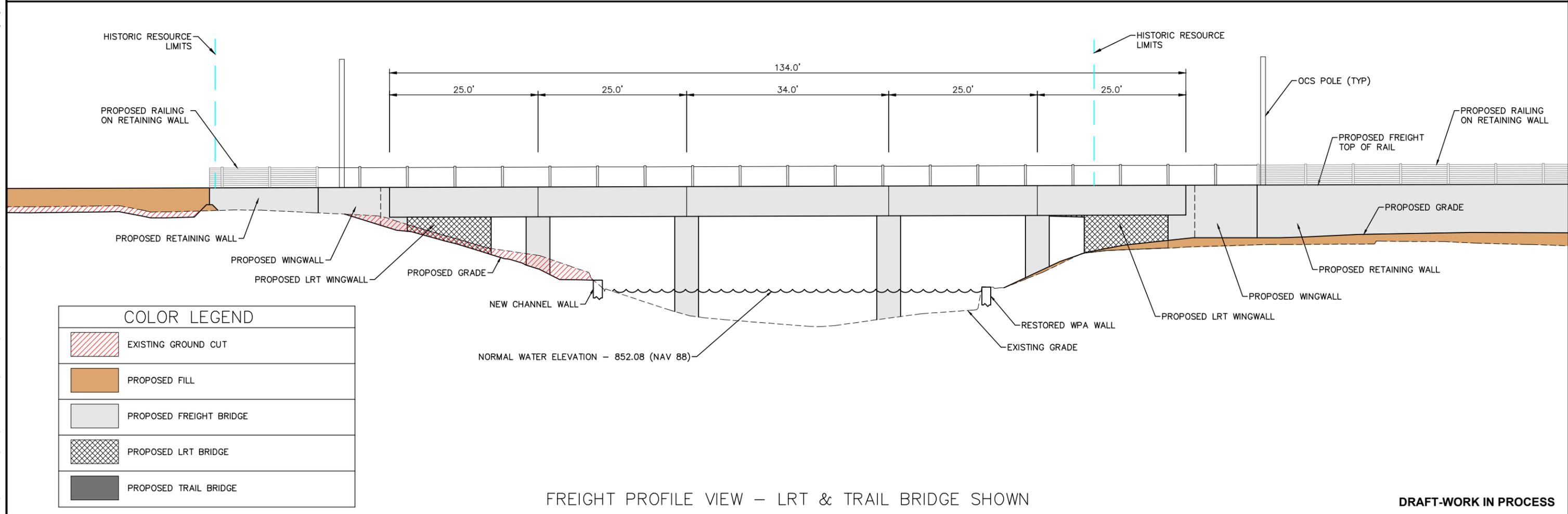
Rev 0
07/20/2015



Jul, 20 2015 03:43 pm V:\3400_ADC\CAD\SEGMENT E3\EXHIBITS\CHANNEL BRIDGE\E3-CIV-BRIDGE-ADM-CONCEPT_7-THIN DECK-ANGULAR.dwg By: BunderCC



FREIGHT PROFILE VIEW - WITHOUT LRT & TRAIL BRIDGE SHOWN



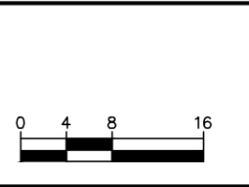
FREIGHT PROFILE VIEW - LRT & TRAIL BRIDGE SHOWN

DRAFT-WORK IN PROCESS

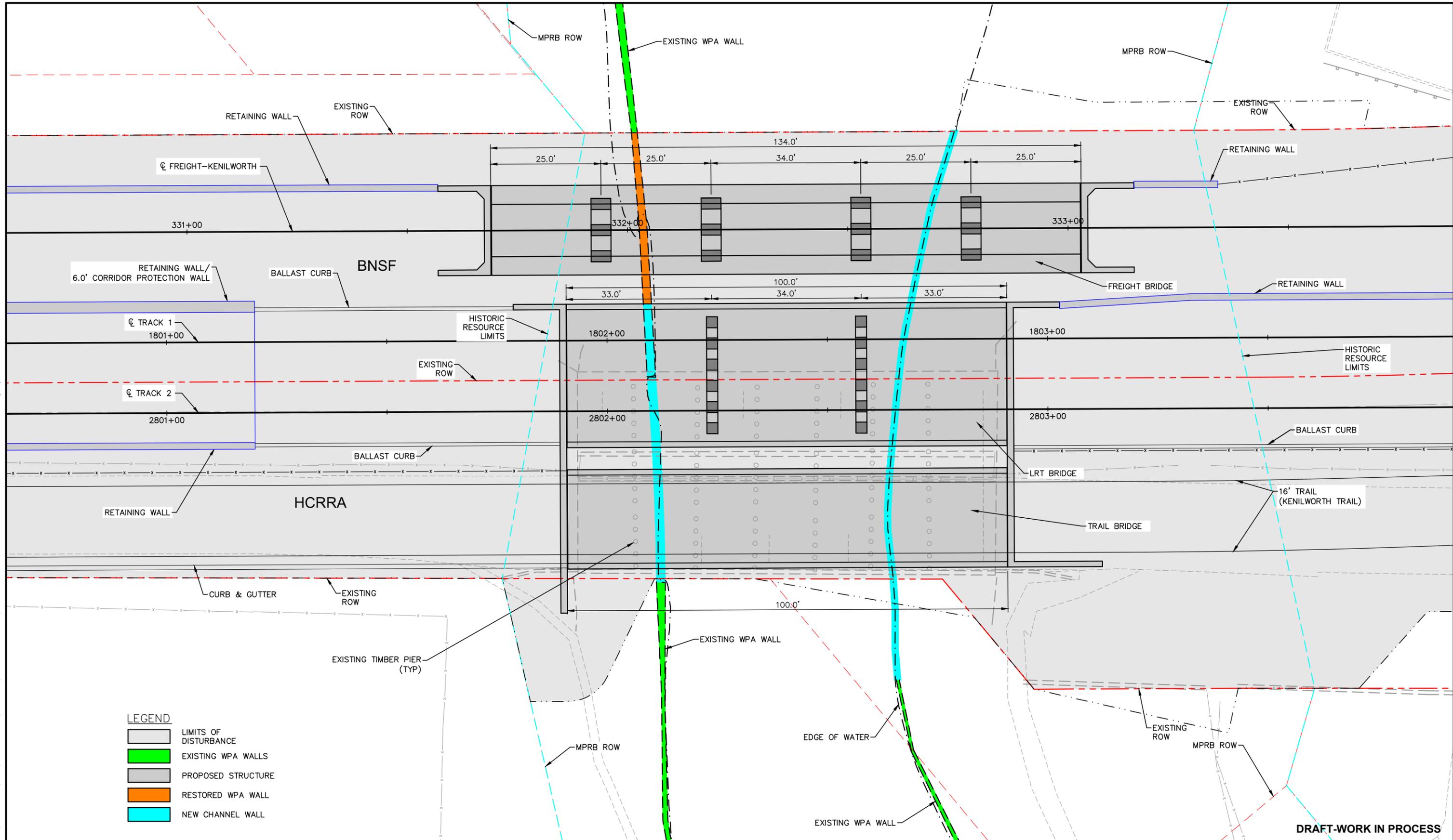


SOUTHWEST LIGHT RAIL
LAGOON/CHANNEL BRIDGE - COMBO DESIGN 2
FREIGHT BRIDGE VIEW

Rev 0
07/20/2015



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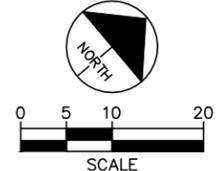
- LEGEND**
- LIMITS OF DISTURBANCE
 - EXISTING WPA WALLS
 - PROPOSED STRUCTURE
 - RESTORED WPA WALL
 - NEW CHANNEL WALL

DRAFT-WORK IN PROCESS

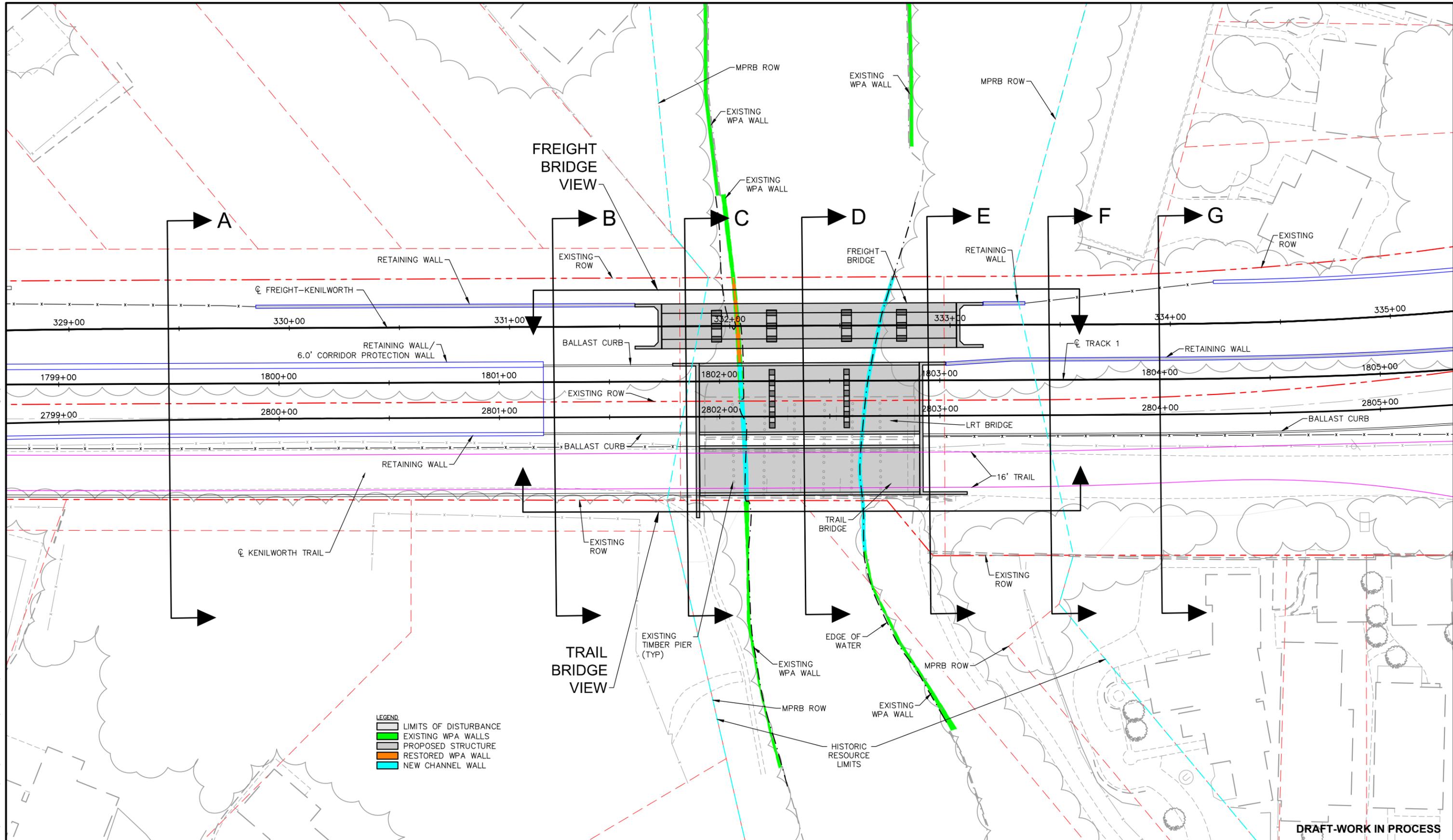


SOUTHWEST LIGHT RAIL
LAGOON/CHANNEL BRIDGE - COMBO DESIGN 3

Rev 0
07/20/2015

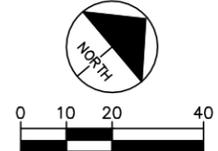


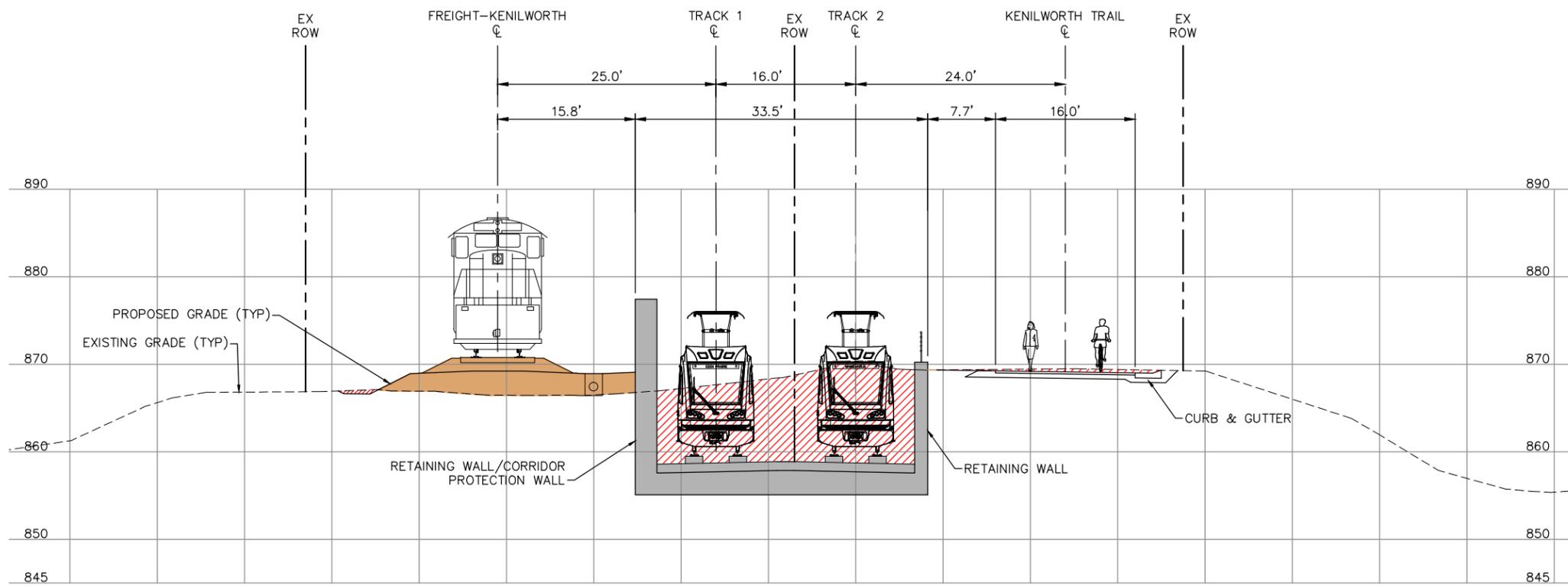
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SOUTHWEST LIGHT RAIL
LAGOON/CHANNEL BRIDGE - COMBO DESIGN 3

Rev 0
07/20/2015





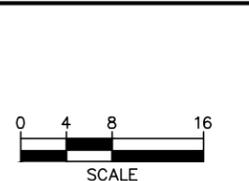
COLOR LEGEND	
	EXISTING GROUND CUT
	PROPOSED FILL
	PROPOSED STRUCTURE

DRAFT-WORK IN PROCESS

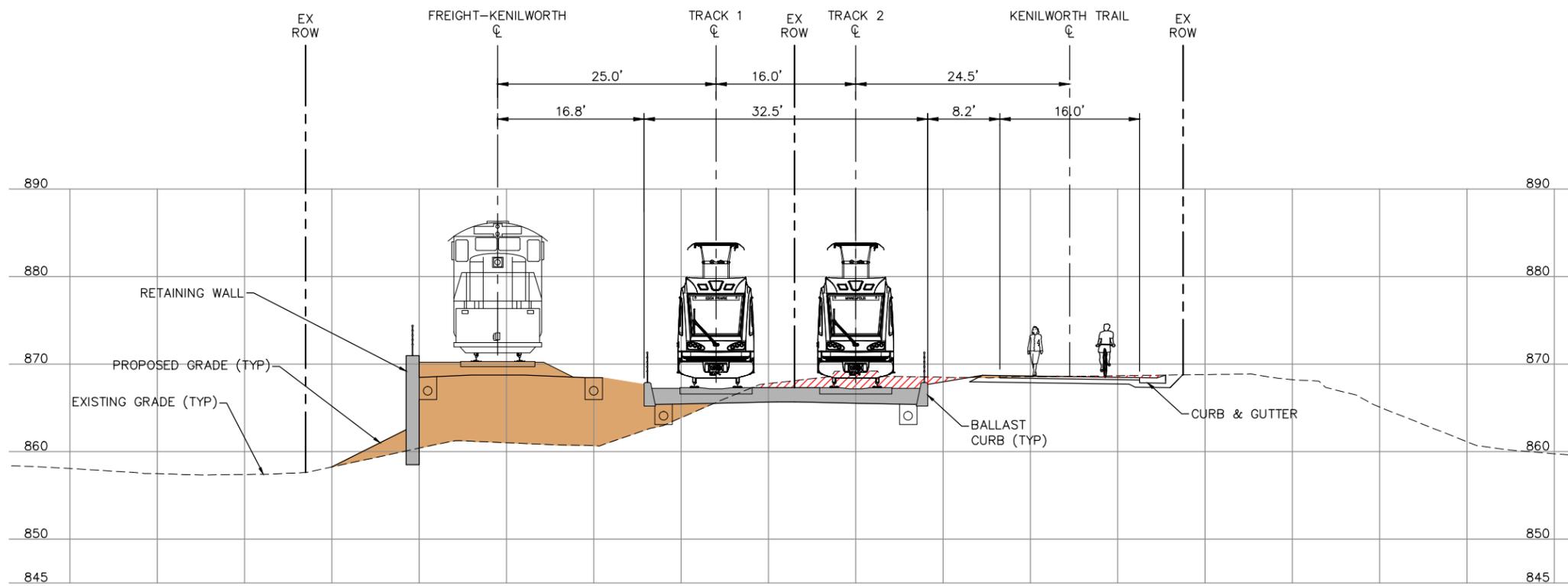


SOUTHWEST LIGHT RAIL
 COMBO DESIGN 3
 SECTION A - STATION 2799+50

Rev 0
 07/20/2015



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COLOR LEGEND	
	EXISTING GROUND CUT
	PROPOSED FILL
	PROPOSED STRUCTURE

DRAFT-WORK IN PROCESS

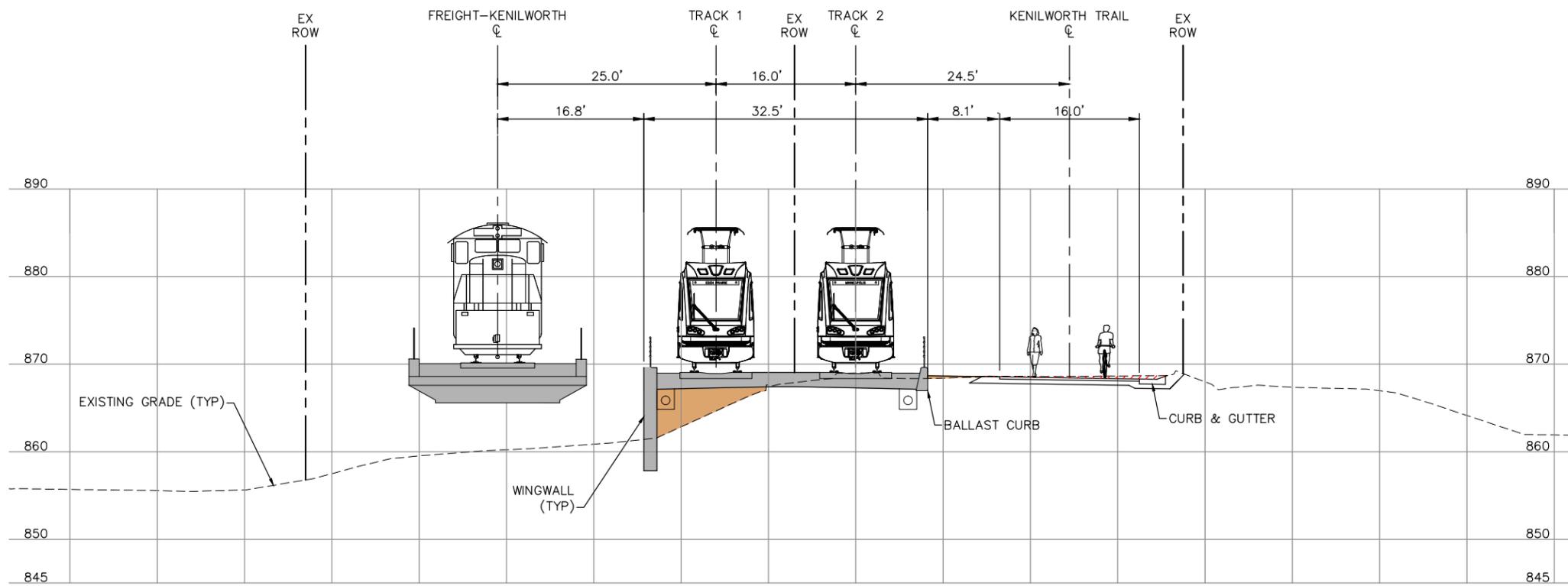


SOUTHWEST LIGHT RAIL
 COMBO DESIGN 3
 SECTION B - STATION 2801+25

Rev 0
 07/20/2015



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COLOR LEGEND	
	EXISTING GROUND CUT
	PROPOSED FILL
	PROPOSED STRUCTURE

DRAFT-WORK IN PROCESS

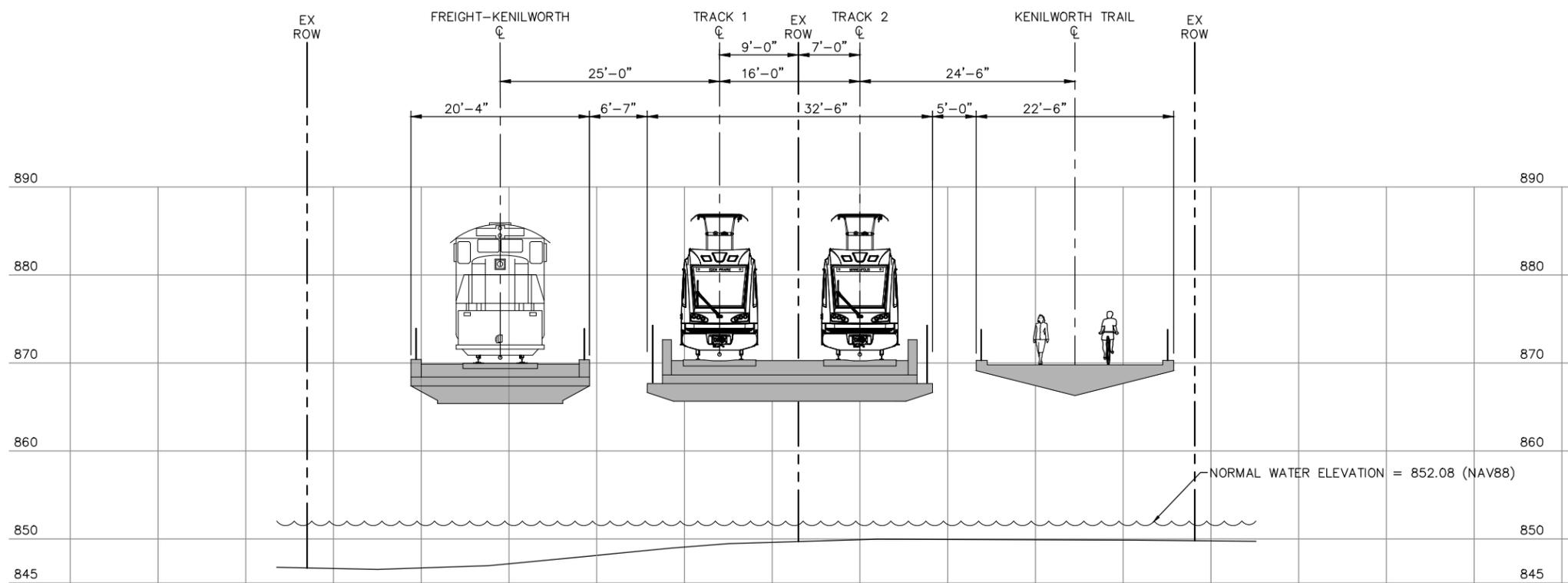


SOUTHWEST LIGHT RAIL
 COMBO DESIGN 3
 SECTION C - STATION 2801+85

Rev 0
 07/20/2015



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COLOR LEGEND	
	EXISTING GROUND CUT
	PROPOSED FILL
	PROPOSED STRUCTURE

DRAFT-WORK IN PROCESS

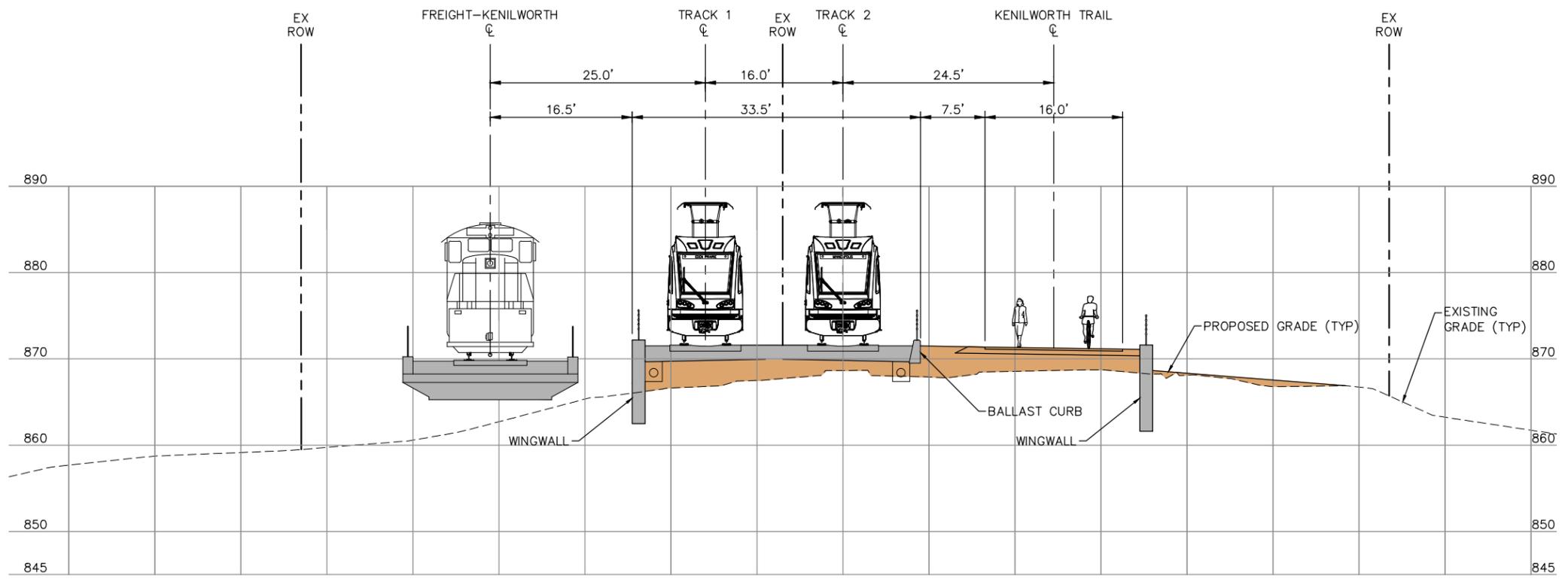


SOUTHWEST LIGHT RAIL
 COMBO DESIGN 3
 SECTION D - STATION 2802+38

Rev 0
 07/20/2015

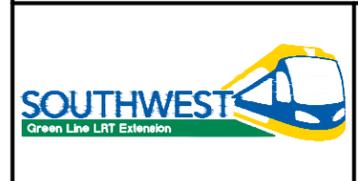


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COLOR LEGEND	
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	PROPOSED FILL
	PROPOSED STRUCTURE

DRAFT-WORK IN PROCESS

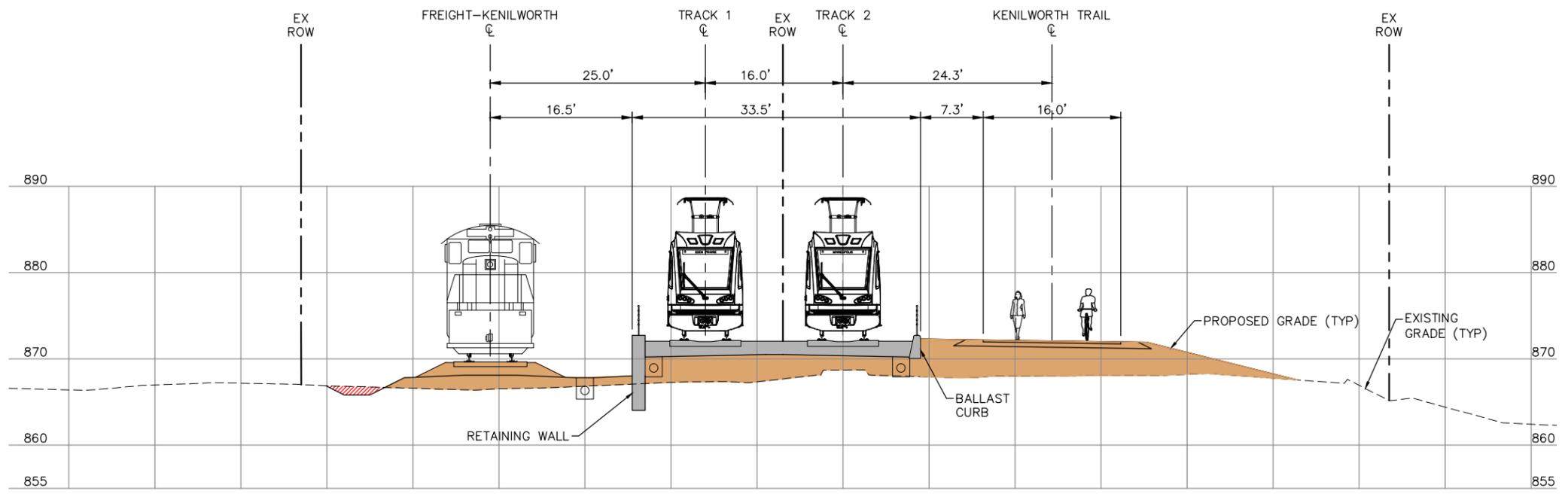


SOUTHWEST LIGHT RAIL
 COMBO DESIGN 3
 SECTION E - STATION 2802+95

Rev 0
 07/20/2015

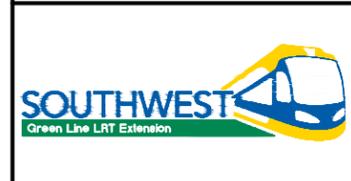


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COLOR LEGEND	
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	PROPOSED FILL
	PROPOSED STRUCTURE

DRAFT-WORK IN PROCESS

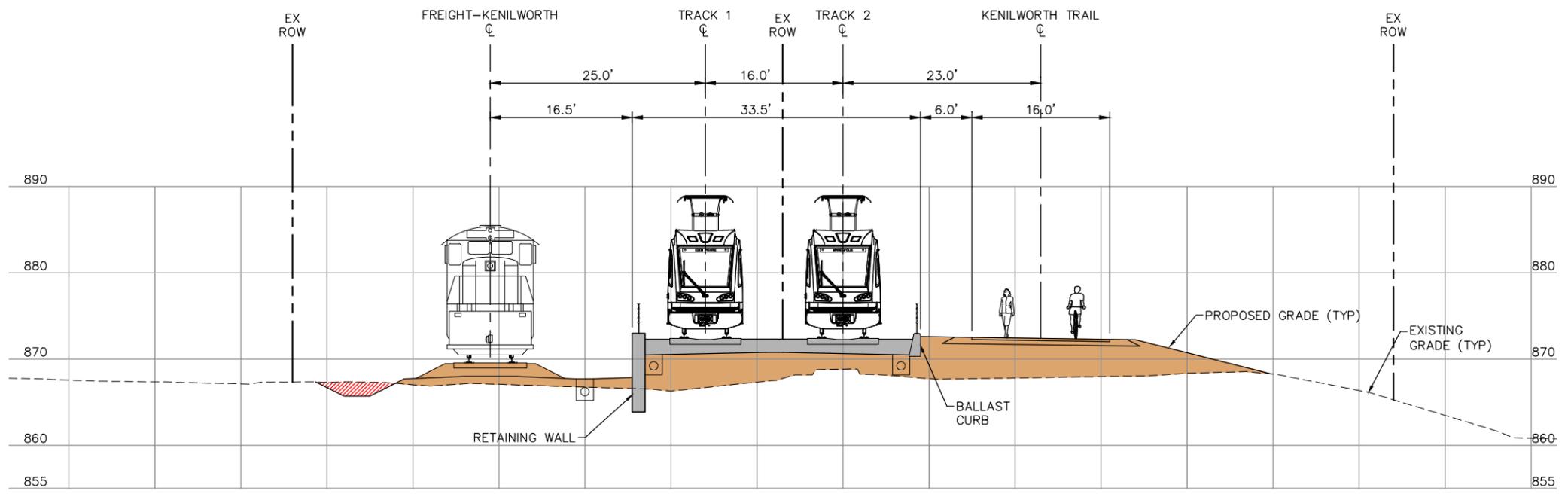


SOUTHWEST LIGHT RAIL
 COMBO DESIGN 3
 SECTION F - STATION 2803+50

Rev 0
 07/20/2015



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COLOR LEGEND	
	EXISTING GROUND CUT
	PROPOSED FILL
	PROPOSED STRUCTURE

DRAFT-WORK IN PROCESS

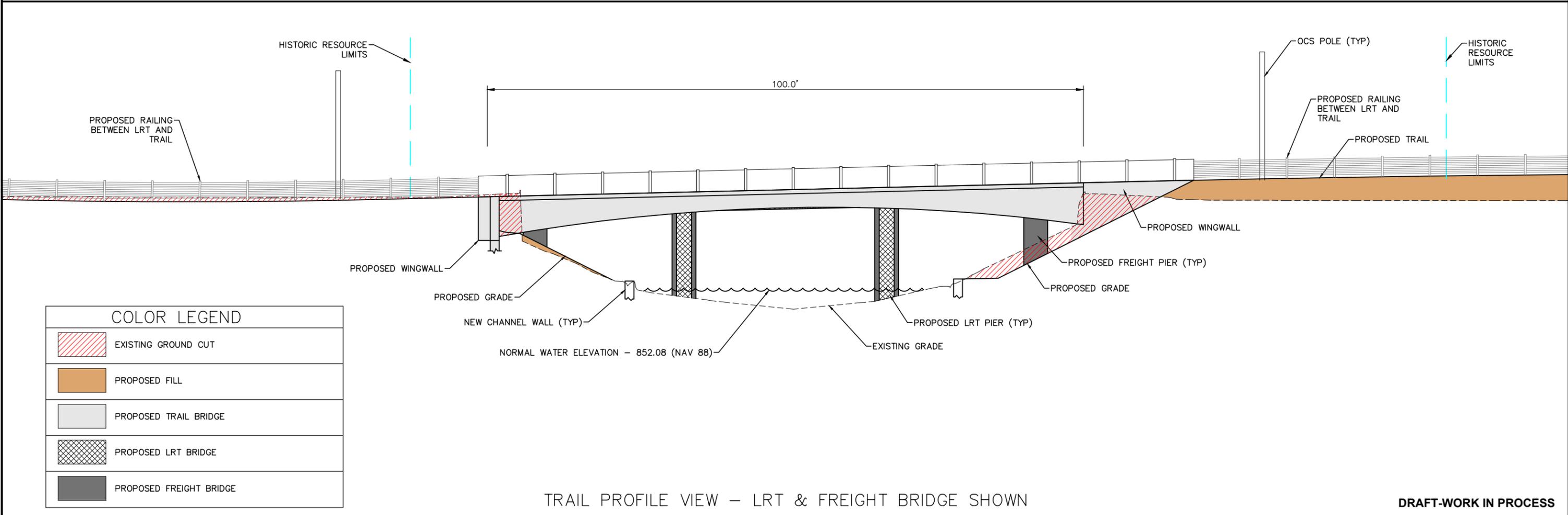
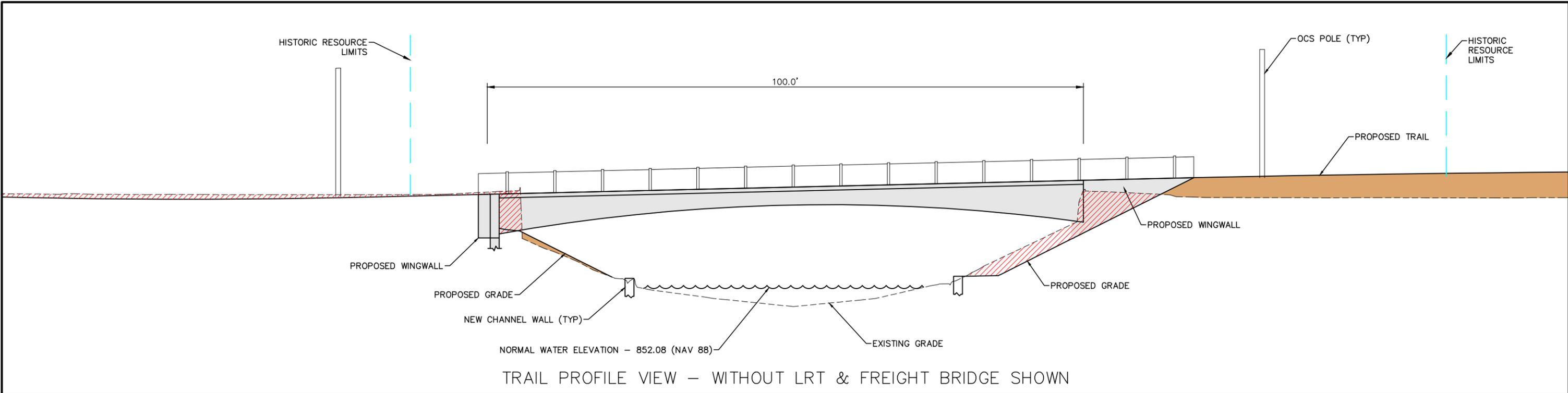


SOUTHWEST LIGHT RAIL
 COMBO DESIGN 3
 SECTION G - STATION 2804+00

Rev 0
 07/20/2015



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COLOR LEGEND	
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	PROPOSED FILL
	PROPOSED TRAIL BRIDGE
	PROPOSED LRT BRIDGE
	PROPOSED FREIGHT BRIDGE

DRAFT-WORK IN PROCESS



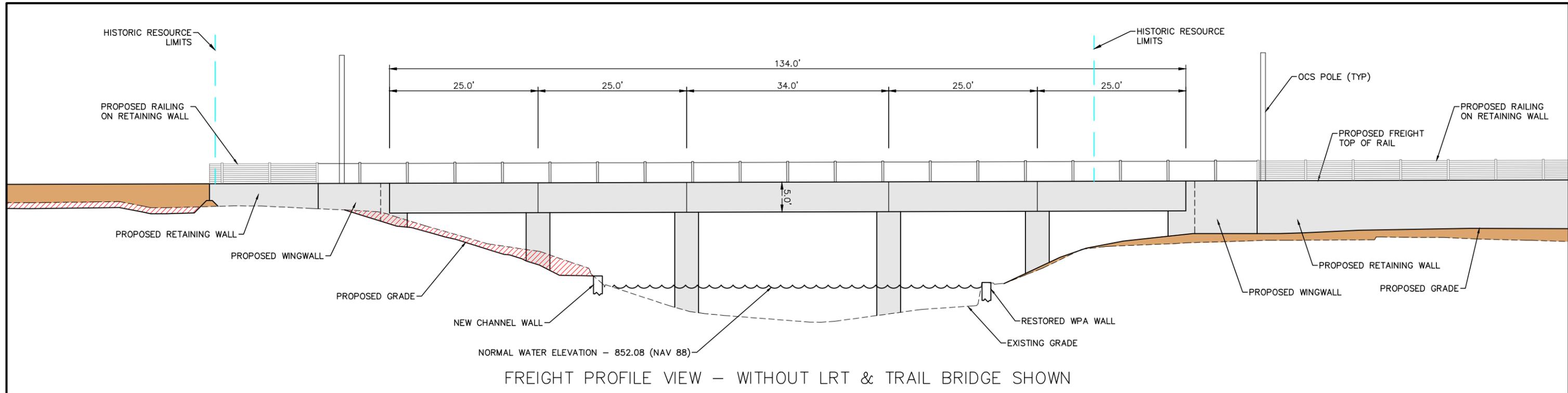
SOUTHWEST LIGHT RAIL
LAGOON/CHANNEL BRIDGE - COMBO DESIGN 3
TRAIL BRIDGE VIEW

Rev 0
07/20/2015

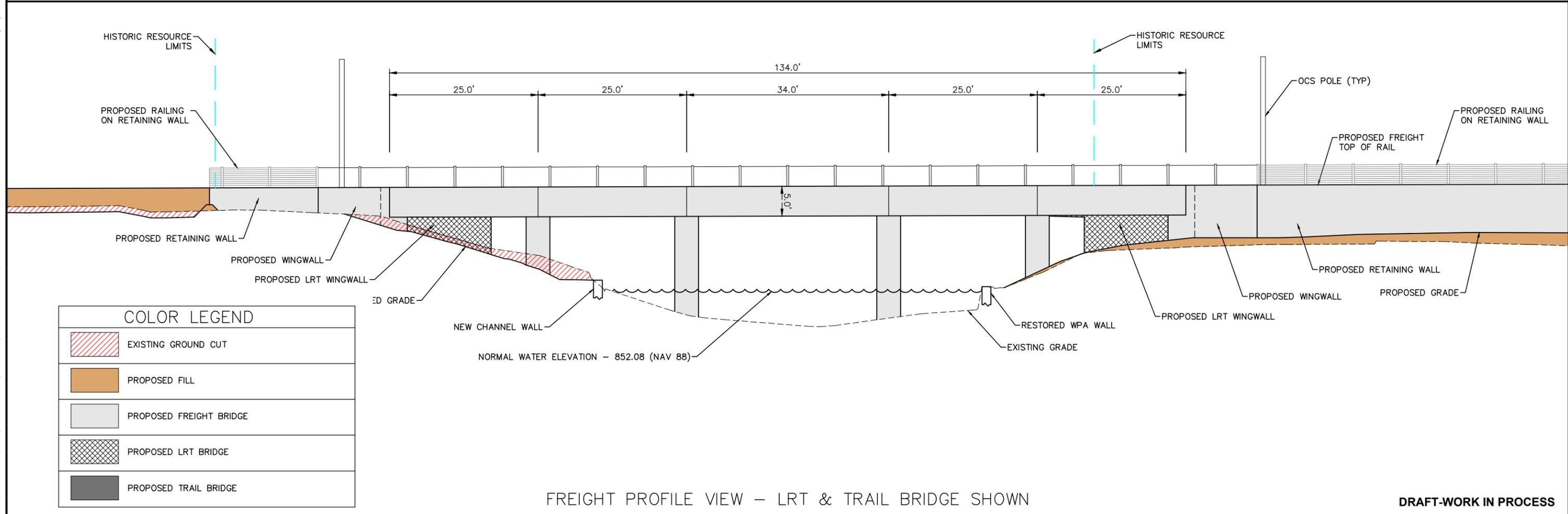


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FREIGHT PROFILE VIEW - WITHOUT LRT & TRAIL BRIDGE SHOWN



FREIGHT PROFILE VIEW - LRT & TRAIL BRIDGE SHOWN

DRAFT-WORK IN PROCESS



SOUTHWEST LIGHT RAIL
LAGOON/CHANNEL BRIDGE - COMBO DESIGN 3
FREIGHT BRIDGE VIEW

Rev 0
07/20/2015



DESIGN OPTIONS

DRAFT - WORK IN PROCESS



KENILWORTH CORRIDOR

JULY 2015





DRAFT - WORK IN PROCESS



KENILWORTH CORRIDOR

EXISTING CONDITIONS
VIEW 1

JULY 2015

AECOM

miller dunwiddie
ARCHITECTURE

Kimley»Horn

SNOW
KREILICH
ARCHITECTS



DRAFT - WORK IN PROCESS



KENILWORTH CORRIDOR

COMBINATION DESIGN 1

VIEW 1

JULY 2015

AECOM

miller dunwiddie
ARCHITECTURE

Kimley»Horn

SNOW
KREILICH
ARCHITECTS



DRAFT - WORK IN PROCESS



KENILWORTH CORRIDOR

COMBINATION DESIGN 2

VIEW 1

JULY 2015

AECOM

miller dunwiddie
ARCHITECTURE

Kimley»Horn

SNOW
KREILICH
ARCHITECTS



DRAFT - WORK IN PROCESS



KENILWORTH CORRIDOR

COMBINATION DESIGN 3

VIEW 1

JULY 2015

AECOM

miller dunwiddie
ARCHITECTURE

Kimley»Horn

SNOW
KREILICH
ARCHITECTS



DRAFT - WORK IN PROCESS



KENILWORTH CORRIDOR

EXISTING CONDITIONS
VIEW 2

JULY 2015

AECOM

miller dunwiddie
ARCHITECTURE

Kimley»Horn

SNOW
KREILICH
ARCHITECTS



DRAFT - WORK IN PROCESS



KENILWORTH CORRIDOR

COMBINATION DESIGN 1

VIEW 2

JULY 2015

AECOM

miller dunwiddie
ARCHITECTURE

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KREILICH
ARCHITECTS



DRAFT - WORK IN PROCESS



KENILWORTH CORRIDOR

COMBINATION DESIGN 2

VIEW 2

JULY 2015



miller dunwiddie
ARCHITECTURE



SNOW
KREILICH
ARCHITECTS



DRAFT - WORK IN PROCESS



KENILWORTH CORRIDOR

COMBINATION DESIGN 3

VIEW 2

JULY 2015





DRAFT - WORK IN PROCESS



KENILWORTH CORRIDOR

EXISTING CONDITIONS

VIEW 3

JULY 2015

AECOM

miller dunwiddie
ARCHITECTURE

Kimley»Horn

SNOW
KREILICH
ARCHITECTS



DRAFT - WORK IN PROCESS



KENILWORTH CORRIDOR

COMBINATION DESIGN 1

VIEW 3

JULY 2015





DRAFT - WORK IN PROCESS



KENILWORTH CORRIDOR

COMBINATION DESIGN 2

VIEW 3

JULY 2015





DRAFT - WORK IN PROCESS



KENILWORTH CORRIDOR

COMBINATION DESIGN 3

VIEW 3

JULY 2015

AECOM

miller dunwiddie
ARCHITECTURE

Kimley»Horn

SNOW
KREILICH
ARCHITECTS



DRAFT - WORK IN PROCESS



KENILWORTH CORRIDOR

EXISTING CONDITIONS
(PHOTOGRAPH COMPOSITE)

VIEW 4
JULY 2015

AECOM

miller dunwiddie
ARCHITECTURE

Kimley»Horn

SNOW
KREILICH
ARCHITECTS



DRAFT - WORK IN PROCESS



KENILWORTH CORRIDOR

COMBINATION DESIGN 1

VIEW 4

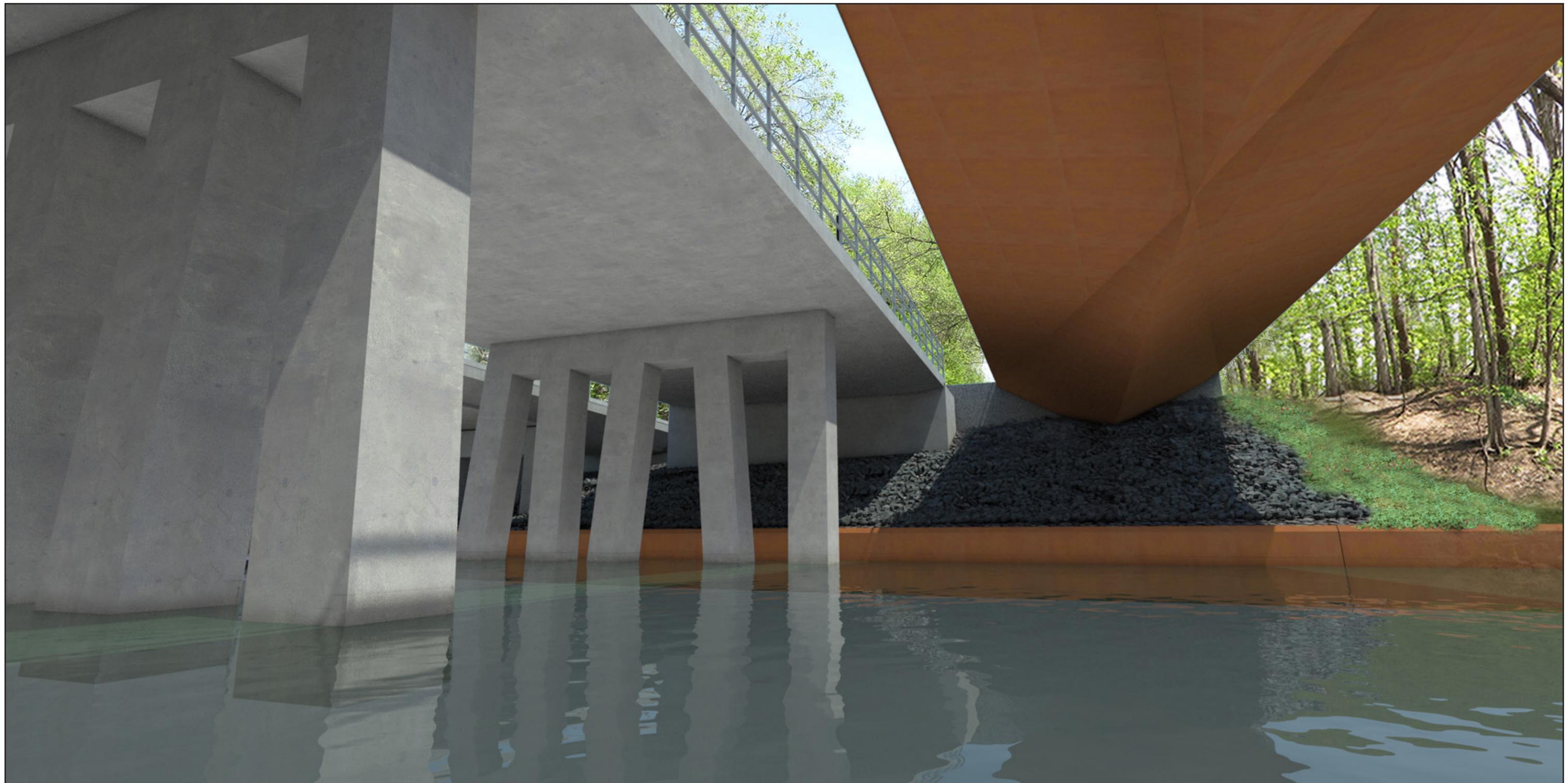
JULY 2015

AECOM

miller dunwiddie
ARCHITECTURE

Kimley»Horn

SNOW
KREILICH
ARCHITECTS



DRAFT - WORK IN PROCESS



KENILWORTH CORRIDOR

COMBINATION DESIGN 2

VIEW 4

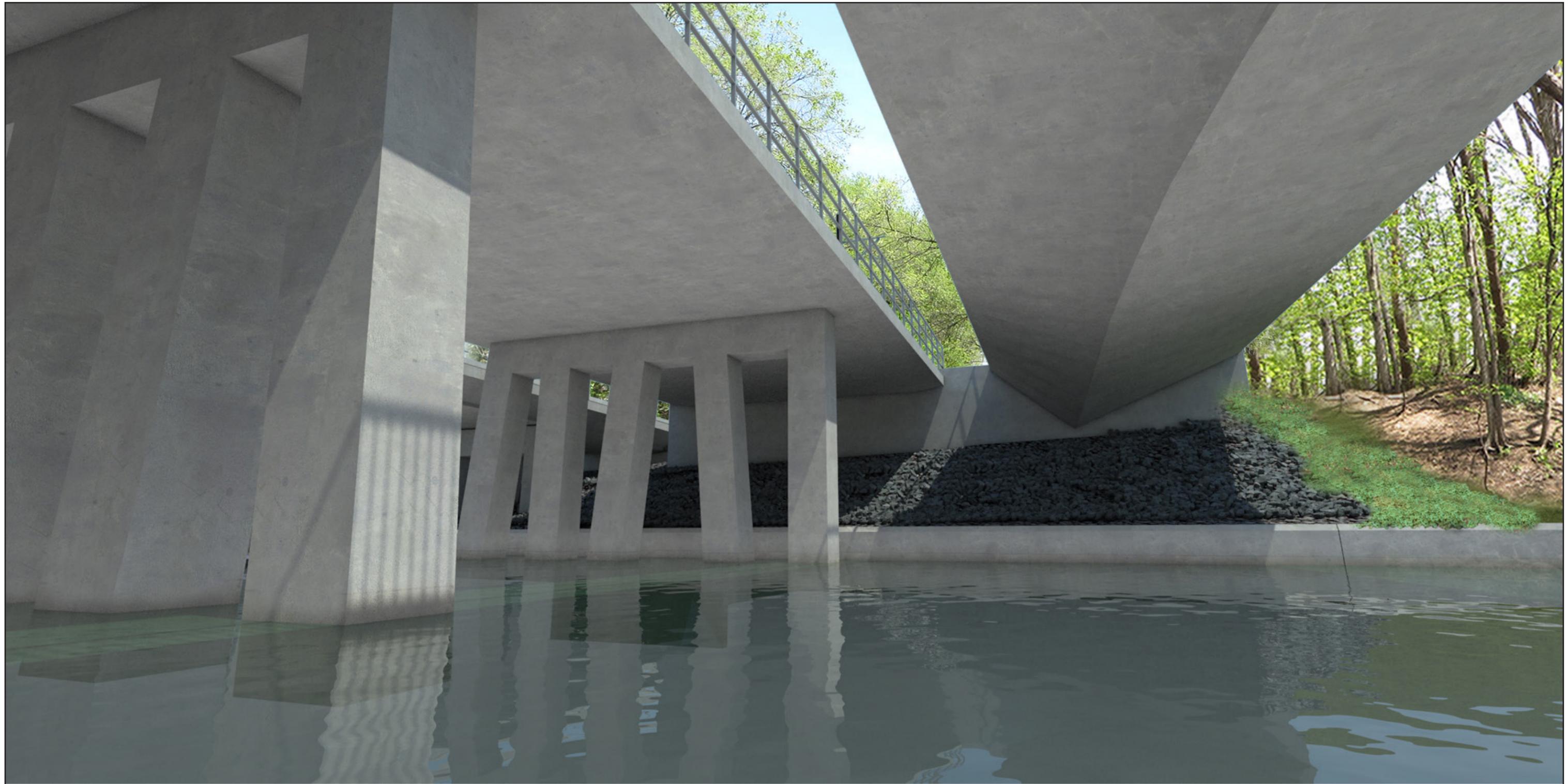
JULY 2015

AECOM

miller dunwiddie
ARCHITECTURE

Kimley»Horn

SNOW
KREILICH
ARCHITECTS



DRAFT - WORK IN PROCESS



KENILWORTH CORRIDOR

COMBINATION DESIGN 3

VIEW 4

JULY 2015

AECOM

miller dunwiddie
ARCHITECTURE

Kimley»Horn

SNOW
KREILICH
ARCHITECTS



DRAFT - WORK IN PROCESS



KENILWORTH CORRIDOR

EXISTING CONDITIONS

VIEW 5

JULY 2015

AECOM

miller dunwiddie
ARCHITECTURE

Kimley»Horn

SNOW
KREILICH
ARCHITECTS



DRAFT - WORK IN PROCESS



KENILWORTH CORRIDOR

COMBINATION DESIGN 1

VIEW 5

JULY 2015





DRAFT - WORK IN PROCESS



KENILWORTH CORRIDOR

COMBINATION DESIGN 2

VIEW 5

JULY 2015





DRAFT - WORK IN PROCESS



KENILWORTH CORRIDOR

COMBINATION DESIGN 3

VIEW 5

JULY 2015





DRAFT - WORK IN PROCESS



KENILWORTH CORRIDOR
COMBINATION DESIGN 1
(RAILING DETAIL)

JULY 2015





DRAFT - WORK IN PROCESS



KENILWORTH CORRIDOR
COMBINATION DESIGN 2
(RAILING DETAIL)

JULY 2015





DRAFT - WORK IN PROCESS



KENILWORTH CORRIDOR
COMBINATION DESIGN 3
(RAILING DETAIL)

JULY 2015



CHANNEL WALLS AND BANKS

DRAFT - WORK IN PROCESS



KENILWORTH CORRIDOR

JUNE 2015





Figure 68. WPA Rustic Style Retaining Wall, north shore of lagoon, facing north

DRAFT - WORK IN PROCESS



KENILWORTH CORRIDOR





DRAFT - WORK IN PROCESS



KENILWORTH CORRIDOR
CHANNEL BRIDGE CONCEPTS
EXISTING - NORTH EAST





DRAFT - WORK IN PROCESS



KENILWORTH CORRIDOR
CHANNEL BRIDGE CONCEPTS
EXISTING - NORTH WEST





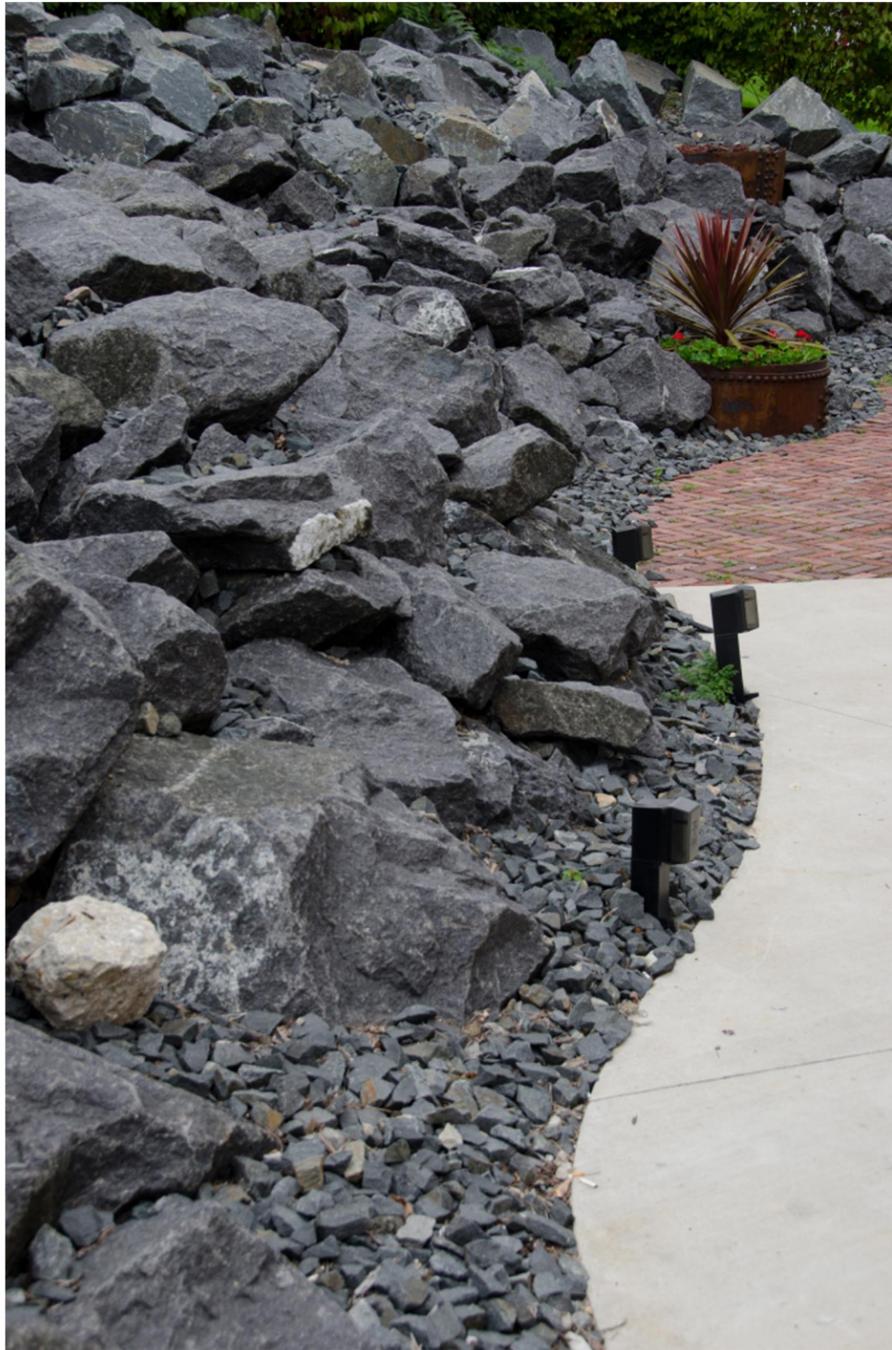
DRAFT - WORK IN PROCESS



KENILWORTH CORRIDOR

CHANNEL BRIDGE CONCEPTS
BANK PRECEDENT - RIP RAP





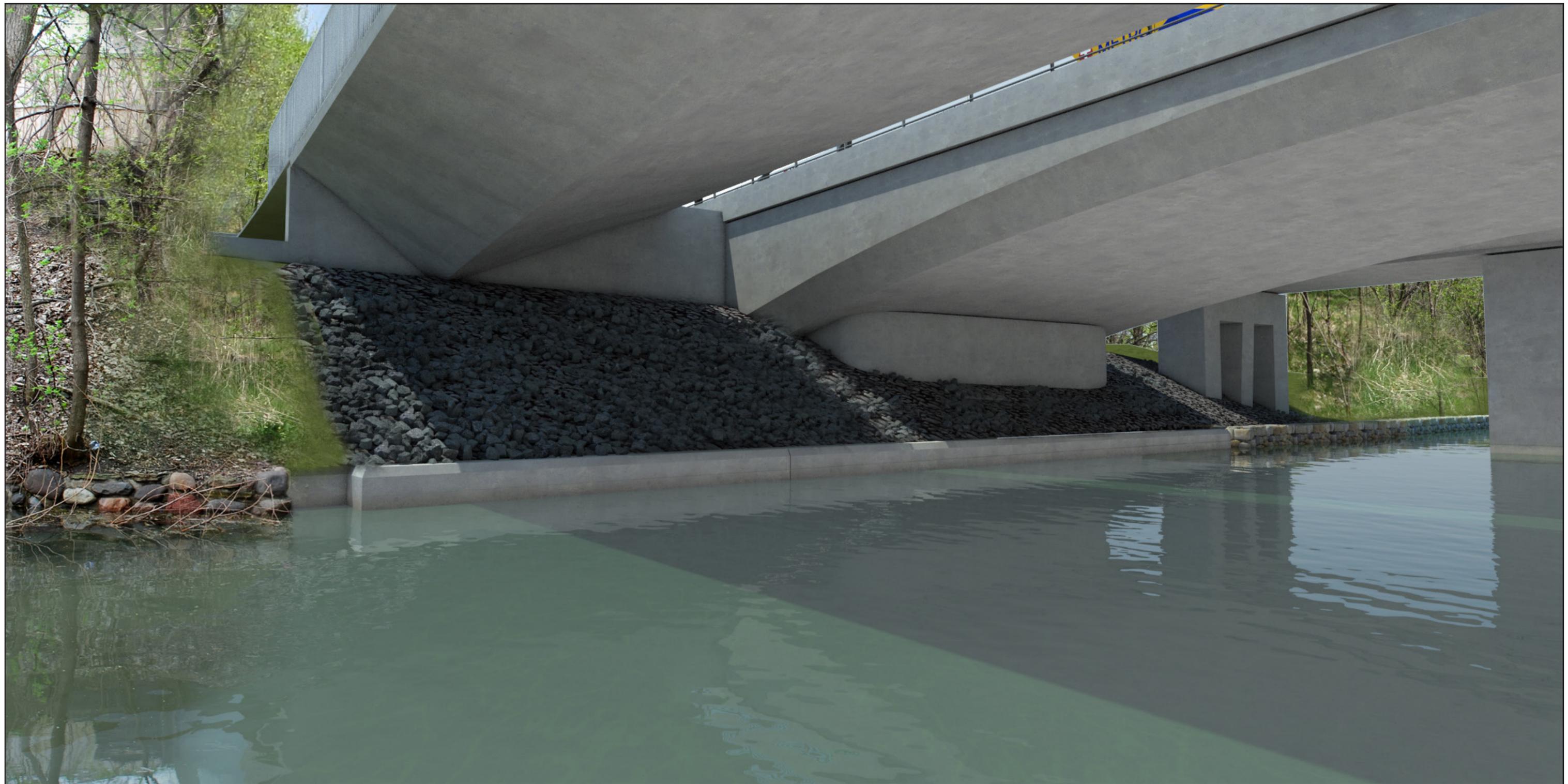
DRAFT - WORK IN PROCESS



KENILWORTH CORRIDOR

CHANNEL BRIDGE CONCEPTS
BANK PRECEDENT - RIP RAP





DRAFT - WORK IN PROCESS



KENILWORTH CORRIDOR

COMBINATION DESIGN 1

VIEW 6

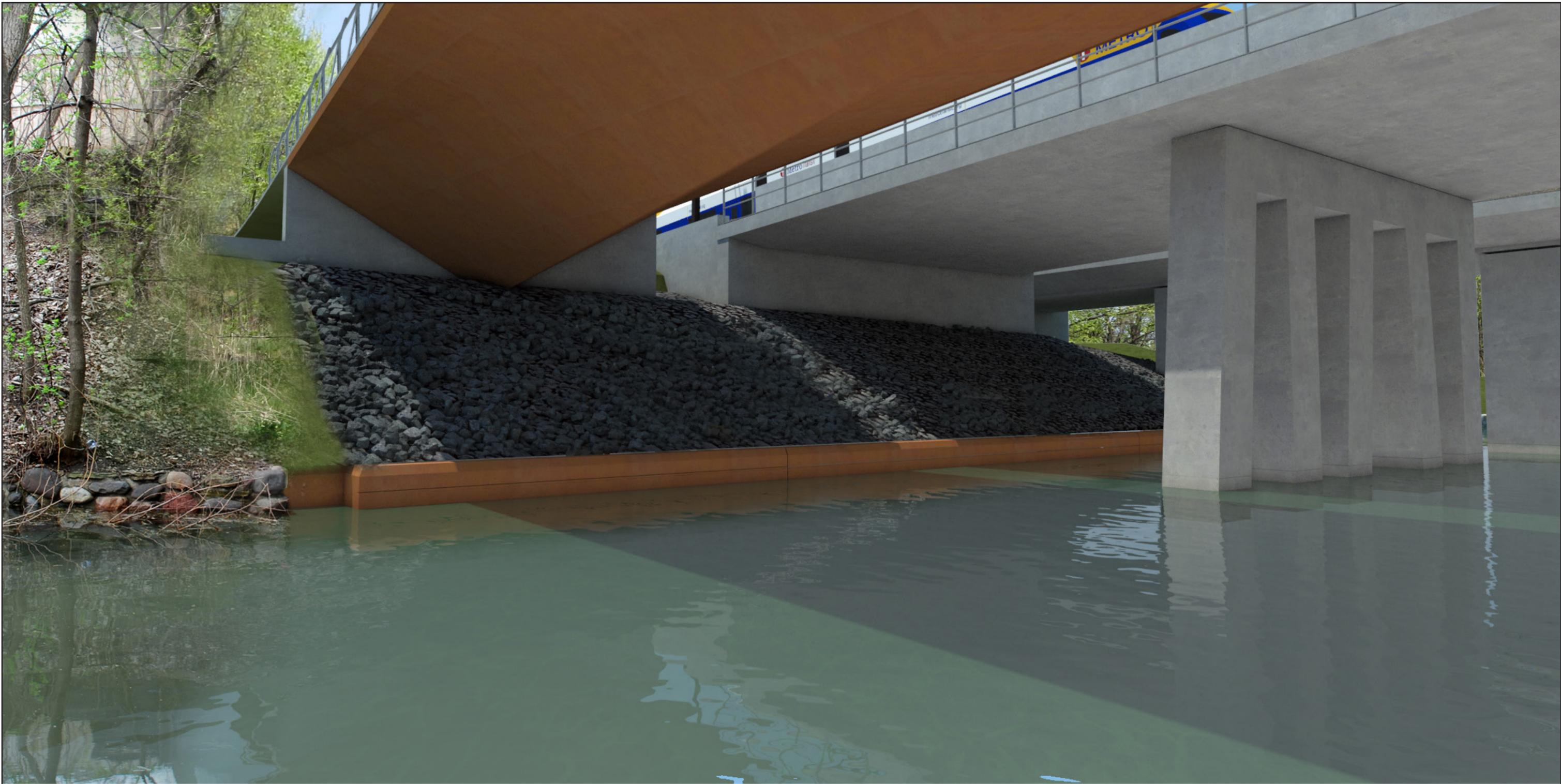
JULY 2015

AECOM

miller dunwiddie
ARCHITECTURE

Kimley»Horn

SNOW
KREILICH
ARCHITECTS



DRAFT - WORK IN PROCESS



KENILWORTH CORRIDOR

COMBINATION DESIGN 2

VIEW 6

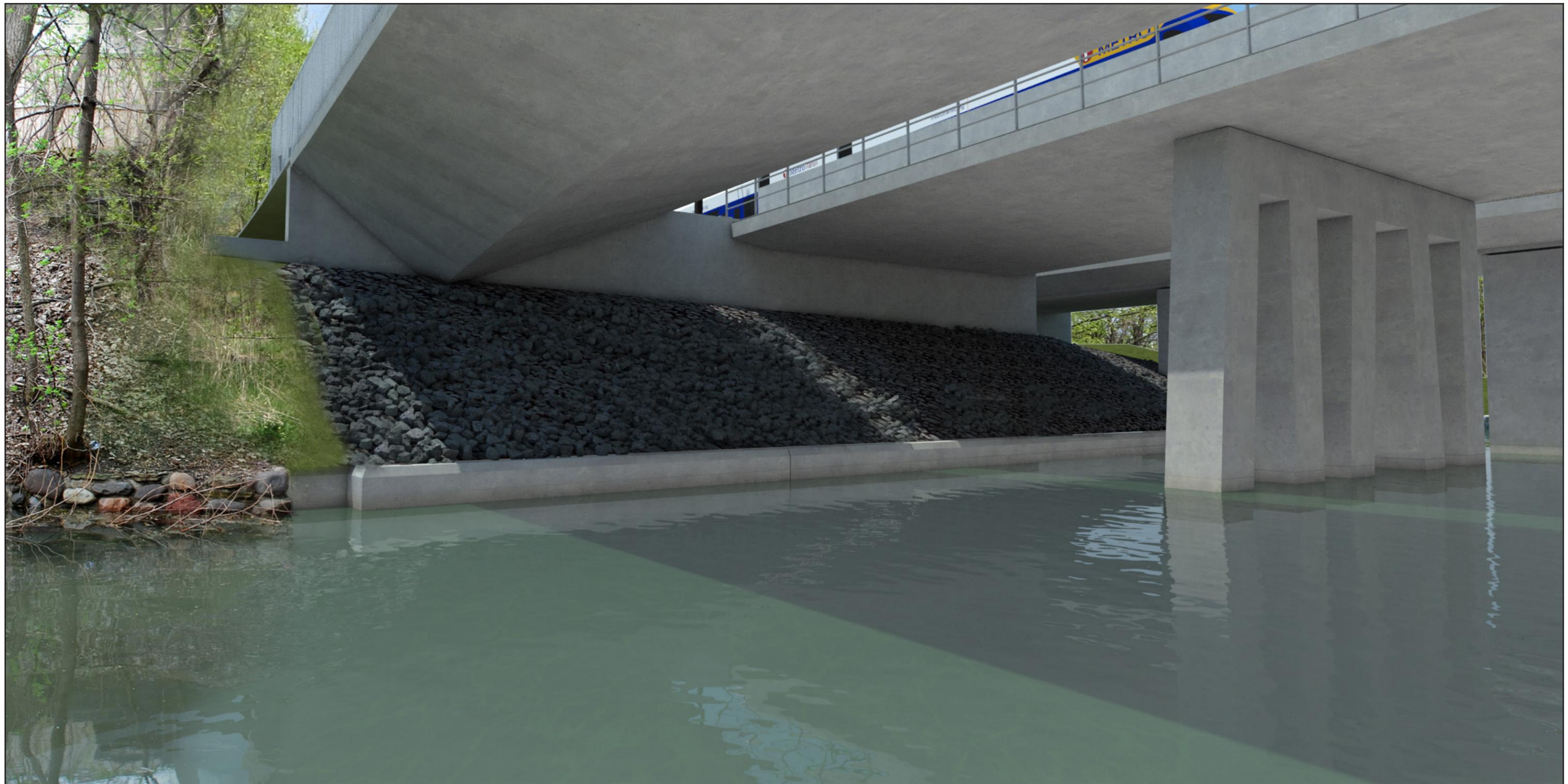
JULY 2015

AECOM

miller dunwiddie
ARCHITECTURE

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DRAFT - WORK IN PROCESS



KENILWORTH CORRIDOR

COMBINATION DESIGN 3

VIEW 6

JULY 2015

AECOM

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Internal Memorandum

DATE: July 20, 2015
SUBJECT: Kenilworth Bridge Design Process

April Consultation

- Presented revised bridge design configurations that addressed the following
 - Three separate bridges to increase light reaching the channel
 - Clear span trail bridge
 - Increased structure depth allows longer spans and minimizes piers in channel
 - Maintain a minimum 10.6 feet clearance above water
 - Focus on modern and authentic use of materials
- Bridge Configurations:
 - 4A: Thinner structure, shorter spans, more piers in water
 - 4B: Thicker structure, longer spans, less piers in water
 - 4C: Similar to 4B but with more piers in water
 - 4B-Skew: Skewed trail bridge with more open space between LRT bridge at north end

June Consultation – BRIDGE DESIGN UPDATE

- Of the four configurations (4A, 4B, 4C, 4B-skew), eliminated configuration 4C because of the following:
 - Very similar bridge span lengths as 4B
 - No added benefit of reducing structure depth or reducing the number of piers in the water as 4B
 - Span configuration and pier placement unbalanced and unrationalized in relation to the channel banks
- Prepared four design concepts based on the three remaining configurations
 - Concept 1 – Angular Steel: Based on Configuration 4B
 - Concept 2 – Angular Steel with Skew: Based on Configuration 4B-Skew
 - Concept 3 – Arched Deck: Based on Configuration 4B
 - Concept 4 – Thin Taper: Based on Configuration 4A
- Presented alternatives to locations and materials for restoring the WPA walls
 - Recognized that mimicking historic materials would not be appropriate for the channel
 - Looked at modern materials that could be considered, including concrete, gabion, and steel piles
- Presented alternatives to sloped area beneath bridge
 - Looked at sloped pavement, precast concrete bank stabilization, and rip-rap of various size, shape, and color.

July Consultation

- Studied the June bridge designs as a 2-bridge concept for comparison to the 3-bridge designs. Determined that the 2 bridges created a darker, more enclosed experience to the channel and was not preferable compared to the 3-bridge designs.
- Based on feedback from the June update which guided a preference to the thin deck freight bridge, design team prepared 3 combination designs for the bridges:
 - Combo Design 1: 5-span thin deck freight, clear-span arched LRT, and clear-span arched trail bridge
 - Freight bridge is Precast concrete bridge with tapered edges supported by cast-in-place concrete beam on canted square column frame
 - LRT bridge is cast-in-place concrete arch with tapered edges.
 - Trail bridge is Cast-in-place concrete bridge with arched bottom and flat top.
 - Combo Design 2: 5-span thin deck freight, 3-span thin deck LRT, and clear-span angular steel box beam trail bridge
 - Freight bridge is Precast concrete bridge with tapered edges supported by cast-in-place concrete beam on canted square column frame
 - LRT bridge is Post-tensioned concrete slab bridge deck with tapered edges supported by cast-in-place concrete beam on canted square column frame.
 - Trail bridge is w
 - Combo Design 3: 5-span thin deck freight, 3-span thin deck LRT, and clear-span arched trail bridge
 - Freight bridge is Precast concrete bridge with tapered edges supported by cast-in-place concrete beam on canted square column frame
 - LRT bridge is Post-tensioned concrete slab bridge deck with tapered edges supported by cast-in-place concrete beam on canted square column frame.
 - Trail bridge is Cast-in-place concrete bridge with arched bottom and flat top.
- WPA walls will be replaced in kind under freight bridge where there is existing material. Beneath the LRT and trail bridge where there is not enough existing wall material, a new wall will be designed to complement the new bridges. Two materials are being studied for the new channel walls, concrete and steel.
- The sloped bank under the bridge will be finished with approx. 4"-10" dark gray angular stone

**SWLRT Historic Properties
Noise and Vibration Assessment**

Inventory #	Property Name	City	FTA Noise Category¹	FTA Vibration Category²	Notes
HE-HOC-0026	Hopkins City Hall (E)	Hopkins	None	None	Not noise/vibration sensitive
HE-HOC-0027	Hopkins Commercial Historic District (E)	Hopkins	None	None	Not noise/vibration sensitive
HE-HOC-0014	Minneapolis & St. Louis Rwy. Depot (E)	Hopkins	None	None	Not noise/vibration sensitive
HE-SLC-0008	Chicago Milwaukee & St. Paul R.R. Depot (L)	St. Louis Park	None	None	Not noise/vibration sensitive
HE-SLC-0009	Peavey-Haglin Concrete Grain Elevator (L) ³	St. Louis Park	None	None	Not noise/vibration sensitive
HE-SLC-0055	Hoffman Callan Building (E)	St. Louis Park	None	None	Not noise/vibration sensitive
HE-MPC-17102	Minikahda Club (E)	Minneapolis	3	3	Outside area of concern for noise/vibration
HE-MPC-1811	Lake Calhoun (GRHD) (E)	Minneapolis	3	N/A	Outside area of concern for noise
HE-MPC-1833	Cedar Lake Parkway (GRHD) (E)	Minneapolis	None	N/A	Not noise sensitive
HE-MPC-1822	Kenilworth Channel/Lagoon Bank (GRHD, LIRHD) (E)	Minneapolis	3/1 ⁴	N/A	Noise impact identified at the channel and not at the lagoon bank.
HE-MPC-1820	Cedar Lake (GRHD) (E)	Minneapolis	3	N/A	Outside area of concern for noise
HE-MPC-1825	Lake of the Isles Parkway (GRHD, LIRHD) (E)	Minneapolis	None	N/A	Not noise sensitive
HE-MPC-1824	Lake of the Isles (GRHD, LIRHD) (E)	Minneapolis	3	N/A	Outside area of concern for noise
HE-MPC-1796	Kenwood Parkway (GRHD, KPRHD) (E)	Minneapolis	None	N/A	Not noise sensitive
HE-MPC-6901	Park Board Bridge No. 4 / Bridge L5729 (Individual, GRHD, LIRHD) (E)	Minneapolis	None	N/A	Not noise sensitive
HE-MPC-1797	Kenwood Park (GRHD) (E)	Minneapolis	3	N/A	Outside area of concern for noise
HE-MPC-6475	Kenwood Water Tower (Individual, GRHD) (E)	Minneapolis	None	None	Not noise/vibration sensitive
HE-MPC-1782	The Parade (GRHD) (E) ⁵	Minneapolis	None	N/A	Not noise sensitive

Inventory #	Property Name	City	FTA Noise Category ¹	FTA Vibration Category ²	Notes
XX-PRK-001	Grand Rounds Historic District (GRHD) (E)	Minneapolis	3/1	None	See Kenilworth Channel/Lagoon Bank. Not vibration sensitive.
21HE0409	Archaeology site	Minneapolis	None	None	No structures; not vibration sensitive
HE-MPC-18059	Kenwood Parkway Residential Historic District (KPRHD) (E)	Minneapolis	2	2	Assessed for noise and vibration impact. No impacts identified.
HE-MPC-9860	Lake of the Isles Residential Historic District (LIRHD) (E)	Minneapolis	2	2	Outside area of concern for noise/vibration
HE-MPC-6766	Mahalia & Zachariah Saveland House (E)	Minneapolis	2	2	Outside area of concern for noise/vibration
HE-MPC-6603	Frank & Julia Shaw House (E)	Minneapolis	2	2	Outside area of concern for noise/vibration
HE-MPC-6068	Frieda & Henry J. Neils, House (L)	Minneapolis	2	2	Outside area of concern for noise/vibration
HE-MPC-8763	Mac Martin House (E)	Minneapolis	2	2	Outside area of concern for noise/vibration
HE-MPC-16387	St. Paul, Minneapolis & Manitoba R.R./ Great Northern Rwy. Historic District (E)	Minneapolis	None	None	Not noise/vibration sensitive
HE-MPC-16389	Osseo Branch, St. Paul, Minneapolis & Manitoba R.R. Historic District (E)	Minneapolis	None	None	Not noise/vibration sensitive
21HE0436 and 21HE0437	Archaeology sites	Minneapolis	N/A	N/A	Does not apply, sites no longer present after data recovery prior to construction.
HE-MPC-6641	Dunwoody Institute (E)	Minneapolis	3	3	Outside area of concern for noise/vibration
HE-MPC-0441	Minneapolis Warehouse Historic District (L)	Minneapolis	None	None	Not noise/vibration sensitive
<p>¹None – Not included in any of the FTA noise sensitive categories. Not noise sensitive. ²None – Not included in any of the FTA vibration sensitive categories. Not vibration sensitive. ³Also a National Historic Landmark ⁴The Channel is considered a Category 3 sensitive noise receptor due to the presence of noise-sensitive activities that occur on the channel. The grassy area on the banks of the lagoon is considered a Category 1 land use due to the passive and noise-sensitive recreational activities that occur there (where quietude is an essential feature of the park). ⁵The Parade was a non-contributing element of the GRHD prior to SHPO and the MPRB considering extending the period of significance for the Grand Rounds into the 1970's. (E) – Eligible for listing under the National Historic Preservation Act (L) – Listed under the National Historic Preservation Act</p>					

Inventory #	Property Name	City	FTA Noise Category ¹	FTA Vibration Category ²	Notes
GRHD – Grand Rounds Historic District LIRHD – Lake of the Isles Residential Historic District KPRHD – Kenwood Parkway Residential Historic District N/A – Vibration not assessed for outdoor land uses.					

DRAFT



July 21, 2015

Sarah Beimers
State Historic Preservation Office
Minnesota Historical Society
345 Kellogg Blvd. W.
St. Paul, MN 55102

RE: Southwest Light Rail Transit Project, Hennepin County, Minnesota; design of new crossing over Kenilworth Lagoon, SHPO #2009-0080

Dear Ms. Beimers,

We are writing to continue consultation regarding the design of the Southwest Light Rail Transit (LRT) Project (Project) crossing over the Kenilworth Lagoon, which is a contributing element of the Grand Rounds Historic District (GRHD). Following standard practice, all Section 106 consulting parties for this Project are copied on this letter.

Per authority delegated by the Federal Transit Administration (FTA), on November 12, 2014, we notified your office of our preliminary determination that the construction of the Projects crossing over the Kenilworth Lagoon would result in an adverse effect to the Kenilworth Lagoon, which is a contributing element of the GRHD. In our letter, we also confirmed our intent to consider ways to minimize and mitigate the adverse effect through sensitive project design and incorporation of protective measures that would be documents in the Project's Section 106 agreement. In your letter of December 12, 2014, you confirmed the State Historic Preservation Office's (SHPO) agreement with the preliminary determination of an adverse effect and proposed action steps, noting that the SHPO would defer concurrence with any "no adverse effect" or "adverse effect" determinations, preliminary or otherwise, until such time FTA provides these determinations to your office for review. As part of our effort to consider measures to minimize and mitigate the adverse effect, we have held meetings with your office and consulting parties on November 24, 2014, February 2, 2015, and April 22, 2015, to consider a range of design alternatives for the crossing, including tunnel options, various bridge configurations, and different bridge types. Thank you for participating in these meetings and for the comments you provided. Per our previous communication, we are holding another meeting to continue consultation on the design of the Kenilworth Lagoon crossing on July 29, 2015 at 1:00 p.m. at:

Southwest Light Rail Project Office
6465 Wayzata Boulevard, Suite 500
St. Louis Park, MN

Thank you for your letter of May 28, 2015, which included comments on materials provided on April 22, 2015, related to the design of the new crossing over the Kenilworth Lagoon. In response to the SHPO's comments, we have explored a number of measures to minimize and mitigate the adverse effect of the new crossing on the Kenilworth Lagoon. These measures are summarized below:

- The skewed alignment for the pedestrian/bicycle bridge has been dropped from further consideration – our office agrees the SHPO's assessment that a skewed alignment of this bridge would result in additional adverse effects to the historic property compared to configurations that follow an alignment that parallels the proposed LRT and freight rail bridges.
- A potential overlook on the pedestrian/bicycle bridge has been dropped from further consideration. Several design concepts presented on April 22, 2015 for the pedestrian/bicycle bridge included an overlook. At its greatest width, the overlook added approximately six feet to the width of the bridge deck, so it has been eliminated from the project to minimize the adverse effect on the historic property related to crossing width.

- In an effort to explore additional potential measures for minimizing the adverse effect related to the width of the crossing, new two bridge (freight rail and combined LRT/trail) concepts have been developed. The following table provides a comparison of the different configurations. The difference between the width of the two-bridge concepts provided for comment in November 2014 and the current two-bridge configurations is due to advancements in project engineering.

Crossing Concept	Two-Bridges (freight rail, combined LRT/trail)	Three Bridges (freight rail, LRT, trail)	Two-Bridges (new) (freight rail, combined LRT/trail)
Date Presented	November 2014	April 2015	July 2015
Crossing Width	82' 5"	86' 11"	80' 5"
Total Deck Width	73' 10"	75' 4"	73' 10"
Total Open Space Between Bridges	8' 7"	11' 7" (6' 7" & 5' 0")	6' 7"

All concepts (two and three bridge) will result in an adverse effect due to the greater width of the crossing compared to the existing crossing, therefore, it is a matter of which does a better job of minimizing the adverse effect. Although the three-bridge concepts result in a wider overall crossing compared to the two-bridge concepts, they reduce structure width, thus breaking up their scale when experienced from the waterway level. While the two-bridge configurations results in a slightly narrower overall crossing, it is our opinion they result in a more pronounced adverse effect on the feeling of the historic property at the waterway level given its more intimate scale and spatial relationships compared to the impact of the slightly wider width of the three-bridge configurations on the feeling of the historic property as a whole given the much larger scale and spatial relationships of the broader landscape.

- New combination designs have been developed that incorporate the most minimal elements from previously provided crossing configurations and bridge design concepts to further minimize the adverse effect on the feeling of the historic property as a whole. These new combinations designs all include a five-span, thin-deck freight-rail bridge that minimizes the thickness of the freight rail bridge superstructure. The new combination designs also utilize a single, clear span for the pedestrian/bicycle trail bridge, but several variations of this structure in terms of aesthetics and materials are being provided for your consideration. For the LRT bridge, two different bridge configurations and concepts are being provided for your consideration (three-span thin deck with piers in the water and a clear span arc).
- Plans provided on April 22, 2015 showed the removal of the WPA retaining walls within the entire width of the new crossing and replacing them with new retaining walls. The WPA retaining walls are a contributing feature of the Kenilworth Lagoon and we agree with the SHPO that it is important, if possible, to avoid a direct adverse effect, and if direct avoidance cannot be achieved, that the most minimal treatment must be considered. The Project office has confirmed that it is not possible to leave the walls in place during construction of the new crossing as the construction of the sheet pile and pier foundation piles and pile cap construction of the new bridge will overlap and disturb the walls. Therefore, we are proposing to document the walls prior to construction, including numbering of stones, deconstruct the portion of the walls within the Project construction limits, and then reconstructed the walls with the historic materials after the substructure of the new bridges has been completed. Since the walls are deteriorated and some stone is missing, there may not be enough available to reconstruct the full extent of the walls, so the intent will be to reconstruct the walls under the freight rail bridge, and if any stone remains, use it to repair portions of the walls outside the construction limits.

The following materials on the design of the Kenilworth Lagoon crossing are included with this submittal for your consideration:

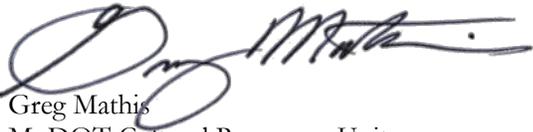
- Memo: Kenilworth Bridge Design Process (2 sheets)
- Two vs. three bridge comparison materials for combined designs (two design concepts)

- Plans and sections (6 sheets)
- Photo simulations (11 sheets)
- Bridge Design Concepts and Configurations Considered (matrix) (1 sheet)
- Three-Bridge combination design materials (three design concepts)
 - Plan, sections, and profile views (elevations) of crossing – trail bridge east elevation and freight rail bridge west elevations (33 sheets)
 - Photo simulations (24 sheets)
- Channel walls and banks materials (9 sheets)

Also attached for your review are the meeting notes from the June 17, 2015 consultation meeting and an updated noise and vibration assessment table for historic properties. The table is an update of the one provided on June 17, 2015, and incorporates comments provided by consulting parties at the consultation meeting that day.

We request that you please provide comments on the enclosed materials by August 21, 2015.

Sincerely,



Greg Mathis
MnDOT Cultural Resources Unit

Enclosures

cc: Bill Wheeler, Federal Transit Administration
Maya Sarna, Federal Transit Administration
Amy Zaref, Federal Transit Administration
Melissa Jenny, United States Army Corps of Engineers
Brad Johnson, United States Army Corps of Engineers
Nani Jacobson, Metropolitan Council
David Jaeger, Hennepin County
John Doan, Hennepin County
Kim Zlimen, Hennepin County
Lori Creamer, City of Eden Prairie
Regina Rojas, City of Eden Prairie
Nancy Anderson, City of Hopkins
Brian Schaffer, City of Minneapolis
John Byers, City of Minneapolis
Elise Durbin, City of Minnetonka
Meg McMonigal, City of St. Louis Park
Jennifer Ringold, Minneapolis Park and Recreation Board
Michael Schroeder, Minneapolis Park and Recreation Board
Bill Walker, Three Rivers Park District
Craig Westgate, Cedar-Isles-Dean Neighborhood Association
Jeanette Colby, Kenwood Isles Area Association
Tamara Ludt, Preservation Design Works

Meeting Title: SWLRT Section 106 Consultation

Date: 6/17/2015 **Time:** 1:00 pm **Duration:** 2.0 hrs

Location: Southwest LRT Project Office , Conference Room A
6465 Wayzata Boulevard, Suite 500
St Louis Park, MN 55426

Meeting called by: Greg Mathis, MnDOT Cultural Resources Unit (CRU)

Attendees: SHPO: Sarah Beimers
Minnetonka: Elise Durbin
Hopkins: Nancy Anderson
Minneapolis: Brian Schaffer
MPRB: Michael Schroeder
KIAA: Jeannette Colby
Hennepin County: Kim Zlimen
CIDNA: Craig Westgate, Kathy Dikeman
SPO: Nani Jacobson, Ryan Kronzer, Mark Bishop, Leon Skiles, Sophia
Ginis, Dan Pfeiffer, Jenny Bring, Lance Meister, Tim Murphy, Kelly Wilder
MnDOT CRU: Jon Vimr, Linda Pate, Renee Barnes
Preservation Design Works: Laurel Fritz

Purpose of Meeting: Meeting with consulting parties to continue Section 106 consultation process

--- Meeting Notes ---

1. Welcome & Introductions

- Nani Jacobson from SPO welcomed participants, led introductions, and provided an overview of the agenda.
 - Greg Mathis from MnDOT CRU noted that the draft operational analysis for noise and vibration is included in the Supplemental Draft EIS (SDEIS). Nani added that since that is a draft document, the FEIS will have a more detailed noise and vibration analysis and discussion on mitigation measures. Greg explained that MnDOT and FTA would be making their final determination on any noise and vibration impacts to historical properties once that final analysis is completed. He also noted that there will be another consultation meeting in late July that will focus on the design for the Kenilworth crossing bridges and today's discussion will provide an update on the ongoing design process.
-

2. Historic Properties and Transit Noise and Vibration Overview

- Lance Meister from SPO explained the goals of his presentation are to provide consulting parties with information on how noise and vibration are assessed for transit projects, what the criteria are for determining impacts, how historic resources are assessed, what impacts there are to historic resources on the SWLRT project, and what mitigation options are available.

Noise Assessment

- Three basic considerations in building a noise model for assessing impacts and mitigation:
 - Source – What it is generating the noise.
 - Path – The path the noise is moving over.
 - Receiver – What is receiving the noise (school, church, residence, etc.).
- Inputs considered include the number of cars per train, the number of trains per hour, speed, hours of operation, source noise level, path factors, track type (elevated versus at-grade, ballasted versus tie), and distance (from source to receiver).
 - In residential locations, nighttime noise has a 10x penalty assessed in the modeling between 10 p.m. and 7 a.m.
 - Craig Westgate from CIDNA asked whether horns are considered. Lance confirmed they are considered and incorporated into the analysis.
- Lance then explained the three land use categories that receivers (i.e., receptors) can fall into:
 - Category 1 – Unique situations where quiet is an essential element to the use of the property (e.g., recording studio, concert hall).
 - Category 2 – Residences and where people normally sleep, and the most common category for the project.
 - Category 3 – Institutional land use (e.g., church, school, library) where there may be sensitivity to noise but no nighttime use for sleeping. This category also includes passive parks where people expect quiet; however, active use parks (e.g., ballfields, bike trails) are not considered noise sensitive.
- The noise metric used for analysis takes into account all available data – loudness, duration, frequency, the nighttime penalty – rather than just considering the maximum one-time noise level. For example, a freight train may take 4-5 minutes to pass versus an LRT train that takes 20 seconds.
 - Jeannette Colby from KIAA asked why bike paths are not considered noise sensitive and whether they are categorized. Lance said they are not categorized as noise sensitive because people are generating their own noise and because noise is analyzed over an hour, and bikes do not stay in one place long enough to experience impacts. He noted, however, that one place can have a combination of uses and categories, and that gray areas exist where they look to the landowners and users for discussion around the property's use.
- Lance then discussed noise mitigation, noting that for LRT, it is possible to treat the source (most preferred), the path, and the receiver:
 - Source mitigation:
 - Vehicle noise specs.
 - Lubrication/friction modification.
 - Wheel truing/rail grinding – Smooth on smooth surfaces reduces noise and vibration.

- Vehicle body treatments.
- Wheel treatments – E.g., noise skirts (metal covers over wheels). Most transit agencies leave this space open, but it is where most noise is generated from a light rail vehicle (LRV). Vehicles used in Minnesota have these covers.
- Crossovers – Wheels bump the gap, leading to noise.
- Quiet zones.
- Wayside horns – Certain uses of these may be able to be eliminated.
- Path mitigation:
 - Barriers – Most common, although LRT does not generate as much noise as highways do.
 - Berms – Not generally effective because there is usually not adequate space since you need twice as much width as the height required. They do exist along the Blue Line on Hiawatha because they were completed as part of the roadway project, but most suburban and urban areas do not have adequate right-of-way.
- Receiver mitigation:
 - Sound insulation (of buildings)
- Lance presented the FTA’s noise impact criteria, which involves measuring the existing noise level and adding the change in level anticipated from the project to determine “no,” “moderate,” or “severe” impact. The project noise level is calculated using all of the above elements.
 - The distance for potential impacts from a typical LRT is about 100-150 feet beyond the track, and a bit farther for horns – beyond that it is pretty quiet and you do not see impacts.
 - FTA’s noise mitigation policy is as follows:
 - No Impact – Mitigation not required.
 - Moderate Impact – Mitigation generally not required, may be considered if reasonable.
 - Severe Impact – Seek alternatives to avoid impacts. If not practical to avoid, mitigation must be considered.
- There are three common sources of potential construction noise impacts:
 - Diesel engines – E.g. excavators, backhoes, dozers.
 - Impact sources – E.g. jackhammer, pile drivers, hoe rams.
 - Backup alarms – Not very loud, but are annoying.
- Potential noise mitigation for construction can include:
 - Design considerations and project layout – E.g., piling equipment in order to block noise.
 - Sequence of operations – E.g., trying to use all loud things at once, or spreading out their use.
 - Alternative construction operations – E.g., using a quieter equipment.

Noise and Historic Resources

- Lance explained how the noise assessment is applied to historic resources. Historic resources are assessed for noise impacts based on the sensitivity of their use – just like other properties – not on their historic designation. For example, a historic warehouse is likely not sensitive to noise, while a historic home is based on its use. However, the need for mitigation can be greater for historic resources with

noise impacts – the thresholds may be lowered, and FTA and the project sponsor may need to look more closely at the effects, and seek additional input.

- The SDEIS identified one moderate noise impact, at the Kenilworth Channel, where areas within 40 feet of the bridge will be targeted for mitigation.
 - Craig asked how the 40-foot limit was determined. Lance explained that while they typically begin with a distance and determine if there are impacts, in this case they reversed the approach and investigated how far from the channel there would be an effect. Craig noted that LRT will be heard farther out than this. Nani clarified that the impact being measured is on the channel, not on the trail. Lance explained that audibility is not the impact threshold – if it were, it would be difficult to build anything. Rather, the threshold is based on a human’s ability to perceive the noise. He explained that the most severe impacts are directly within the ROW, that moderate impacts are found farther out, and then finally there is no impact, which is how it was determined that there is a moderate effect overall.
 - Jeannette asked for clarification on how they came up with that assessment, is it correct that they measured the existing noise and added the project noise. Lance confirmed that was correct, and that a reading was taken from two houses away from the channel to determine current noise levels. Jeannette asked how long the reading was, and Lance answered that it was a 24-hour reading. Lance also clarified that the project levels considered are those during the peak hour of the day.
 - Craig asked why the list of historic resources with an impact is not longer, and Lance explained that some resources, such as the Kenwood Parkway Residential Historic District, are beyond the area of noise impacts, while other resources, such as the Cedar Lake Parkway and the Peavey-Haglin Concrete Grain Elevator, are not noise sensitive. A full list of historic resources was provided as a handout.

Vibration/Ground Borne Noise Assessment

- Lance explained that three elements are considered – source, path, and receiver. Inputs considered in the modeling include:
 - Speed – Increases vibration.
 - Number of trains per day – Increased vibration.
 - Source vibration level – How much vibration the LRV is generating, and the characteristics of the surrounding soil.
 - Track type – Elevated versus at-grade, ballasted versus tie.
 - Distance – Vibration drops as distance increases.
 - Building foundation – This is an additional consideration, in that vibration is reduced as it goes through a building’s foundation. A large building with a large foundation sees a substantial drop in vibration, while for a single family home, there is almost no reduction.
- Lance described the three components:
 - Source – Vehicle suspension, wheel/track condition, track support system, speed, and transit structure.
 - Path – Soil type/layering and rock layers.
 - Receiver – Foundation type and building construction.
- He noted that the tunnel in this Project presents a unique consideration, and that vibration for the above elements in measured empirically.

- Jeannette asked where vibration was measured adjacent to the channel. Lance indicated it was tested by the Calhoun-Isles Condos and at 21st Street to determine the type of soil and layering.
- Lance showed a graphic of typical vibration levels and explained the following points:
 - Typical levels for the project are around 70 vibration decibels (VdB), and as long as they are not maintained for an ongoing period, they can exceed 80 VdB without causing impacts.
 - The threshold for minor cosmetic damage to very sensitive buildings is 100 VdB, which is two to three magnitudes higher than project levels. A person running up the stairs, slamming doors, or even an unbalanced washing machine is more impactful than LRT.
- There are three basic categories for vibration impacts:
 - Category 1 is buildings where vibration would interfere with interior operations (e.g., recording studio, research equipment).
 - Category 2 is residences and where people normally sleep.
 - Category 3 is institutional land uses with primarily daytime use.
- Lance noted that annoyance from vibration is an indoor phenomenon, so outdoor vibration is not assessed in the models because people do not perceive it outdoors.
- For mitigating vibration, the three components are considered – source, path, and receiver.
 - Mitigation related to the source and path of vibration can include special trackwork (e.g., track support systems that provide cushioning or resilient fasteners), wheel truing/rail grinding, and vehicle specifications.
 - For the Central Corridor LRT project, a one-foot, “floating” slab of concrete topped with rubber pucks was used near the University of Minnesota and Minnesota Public Radio studios to absorb vibration. However, mitigation such as this is done in only very sensitive locations due to the high cost.
 - Lance noted that trenches do not work well because the depth would have to equal the vibration wavelength, which for a typical 20 hertz LRT would mean a 50-foot wavelength, hence a 50-foot trench. Similarly, there is generally not enough space for a buffer in urban settings.
 - On the receiving end, building modifications are the main mitigation technique, but are uncommon – retrofitting buildings or installing floating tables is only done in sensitive research labs or concert halls and is a daunting task.
- Lance provided an overview of FTA’s vibration mitigation policy, which has only “impact” or “no impact” classifications.
 - If there is no impact, then no mitigation is required.
 - If there is an impact, then mitigation is to be considered and adopted, if it is reasonable and feasible.
 - A key point is that final vibration mitigation is determined during engineering design, because if mitigation is designed wrong, it can actually make things worse, so it is better to wait as long as possible into design before determining a final method.
 - Construction vibration can originate from a relatively few number of sources including: compactors/vibratory rollers, moving heavy equipment, and pile driving. Potential vibration impacts typically only accompany construction of elevated structures and are uncommon with at-grade construction.

- Transit does not generate high enough vibration levels to cause damage to typical houses, and the threshold for human perception is several orders of magnitude below even the most stringent damage criteria.
- Typically when people see cracks in their buildings, it is superficial cracking due to settlement, changes in the water table, and freeze/thaw cycles.
- Conducting a pre-construction photo survey on structures that may be subject to vibration is a good strategy to document existing conditions and be able to monitor over time. In addition, vibration monitoring can track continuous levels of vibration during a project.
- In terms of mitigating construction vibration, Lance mentioned design considerations and project layout (e.g., piling equipment to block), sequencing operations (e.g., spread out or all at once), and implementing alternative construction operations.

Vibration and Historic Resources

- Historic resources are assessed for vibration impacts based on the sensitivity of the use (e.g., warehouse versus home), not their categorization as historic.
- The potential for damage from vibration is based on the structure type (e.g., wood-frame, adobe, concrete). However, as with sound, FTA and the project sponsor take a closer look and seek additional public input when historical resources are involved.
- There are two thresholds for vibration impacts – “damage” and “annoyance” – but no vibration impacts were identified in the Project. Vibration impacts are not assessed for outdoor land use, so no vibration impacts were assessed at the Kenilworth Channel. Locations such as Kenwood Parkway Residential Historic District are outside the area of vibration impact, which are typically 80-100 feet at the most from the alignment, and often closer to 50 feet. Other locations such as the Minneapolis & St. Louis RR Depot and the Hopkins City Hall are not vibration sensitive. Lance noted that it is very rare to see damage from a project’s operations.
- Nani referred attendees to a handout listing all historic properties and their FTA noise and/or vibration category, as applicable, as well as notes about their noise/vibration sensitivity and invited questions on the presentation.
 - Lance noted that most of the properties are beyond the limits of anticipated noise and vibration impacts. For example, Nani clarified that although the Minikahda Club is Category 3 for both noise and vibration, it is outside the area of impact for noise and vibration. Lance explained again that “hearing” does not necessarily constitute an impact if it does not exceed thresholds.
 - Craig asked whether the table (handout) applied to operations or construction. Lance replied that it is primarily applicable to operations; however, construction impacts are similar, but with additional criteria for damage.
 - Jeannette asked why Kenilworth Lagoon is listed as a noise Category 3. Lance replied that it is because it is a passive park. However the grassy area north of the lagoon is a Category 1 and the table will be updated to reflect this. Michael Schroeder of the Minneapolis Park and Recreation Board (MPRB) confirmed that would be possible. Jeannette asked why the SDEIS categorized the grassy banks of the Lagoon as Category 1, and Lance explained that the determination was made based on communication between MPRB, FTA, and SPO based on the use of the area. Nani added that different parts of the park have different sensitivity and that Category 3 is the overall category for the channel with active use (eg. Kayakers, skiers) and Category 1 is for the area used for contemplative purposes.

- Sarah asked how this all fits in with the Grand Rounds Historic District (GRHD) – does the district get categorized based on an average category of all of its contributing resources? She noted that MPRB may have had an opportunity to discuss this with FTA, but she has not seen it split out like in the table provided. Nani noted it is split out in the SDEIS noise analysis.
- Craig noted that some people would argue that parts of the GRHD are concert halls. Sarah agreed and noted that some parts are even quieter than that. Nani replied that they look at the portion of the resources in the vicinity of the Project. Craig responded that Cedar Lake Parkway and Cedar Lake fall into that class. Jeannette noted that a theater production was held near the potential 21st Street Station just the other day. Nani noted that these are not noise sensitive properties and clarified that the noise and vibration analysis considers use, not historic designation. Lance confirmed this, noting that Cedar Lake and Lake Calhoun are too far away to experience noise impacts regardless of how they are categorized. Many individual residences in the neighborhoods are outside the area of anticipated impacts as well – there is a limited area where impacts will occur.
- Greg confirmed that they would update the table to list different categories for various resources within the GRHD and reflect the Kenilworth Channel analysis.
- Sarah asked whether it is possible for FTA to consider how all individual resources are related within a historic property that is a park system, since lumping them all together disregards certain areas that are more sensitive. She said that in looking at the park’s historic significance, it was designed to be an urban respite. Nani asked whether urban parks are generally categorized as noise sensitive, and Lance said it depends on their use.
- Jeannette said it does not make sense to say noise does not matter when you are outside, and Lance clarified that noise levels are examined for parks and other outdoor locations, and that there are locations and historic resources within parks that are sensitive. However, it requires looking at the use and asking whether it is a sensitive use or not, which is what they are looking at in this project.
- Linda Pate with MnDOT clarified that it is noise, not vibrations that matter outdoors. Lance confirmed this was correct. For structures, both are considered, but for outdoor resources vibration impacts are not considered.
- Craig pointed out that if nothing is there, there is nothing to classify. This means that if a person is spending time in a place because nothing else is there, that use does not get categorized. Lance confirmed that this is true for vibration, but for noise that use typically falls into Category 3.
- Jeannette asked whether noise impacts to the channel were identified. Lance responded that moderate impacts were found and mitigation is being considered. Kathy Dikeman from CIDNA asked if Lance had mentioned a severe impact. Lance confirmed that within three feet of an LRV on the bridge, there will be a severe impact. However, over the length of the channel, there will be only a moderate impact beyond that, to 40 feet away.
- Jeannette asked if mitigation options are being considered yet. Greg responded that these are being developed and will be discussed at a future meeting.
- Jeannette asked if wheel skirts on LRVs are significant enough to reduce the Project’s noise to a typical noise level. Lance replied that system-wide, noise levels from the Project are 2-4 dB higher without wheel skirts, with every 3 dB constituting a doubling of noise. Jeannette asked if the analysis assumes going 45 mph, and Lance confirmed that it does and that actual speeds are considered in the models.
- Jeanette asked whether if, in the SDEIS, it estimated 66 dB over the channel. Nani clarified that 66 dB is the threshold for severe impacts from LRT, while 60 dB is the threshold for moderate impacts, and the actual project levels are 60 dB. Jeannette asked if 66 dB is typical for LRT, and Lance replied that

is the maximum, whereas he looks at levels aggregated over an hour. The LRVs used for the Project are fairly quiet compared to ones used elsewhere, for example on the East Coast.

- Jeannette shared that since freight rail in the channel was intended to be moved out of the corridor, it should not be considered as an existing condition and will include this in her comments on the SDEIS.

3. Kenilworth Crossing Bridge Design Update

- Greg recapped the April 2015 consultation meeting and reminded consulting parties that “configuration” referred to the placement and number of piers and overall arrangement of the spans, while “design concepts” concerned the girders, trusses, and other aesthetic elements. The April meeting included a presentation of revised bridge design configurations and three separate bridges, a clear span trail bridge, and increased deck thickness for LRT and freight rail bridges to allow for longer spans. Four configurations were presented:
 - 4A: Thinner structure, shorter spans, more piers in water.
 - 4B: Thicker structure, longer spans, less piers in water.
 - 4C: Similar to 4B but with more piers in water.
 - 4B-Skew: Skewed trail bridge with more open space between LRT bridge at north end.
- A number of comments were received that were reviewed during the meeting so the engineering team can move forward with design and present more detailed concepts at the next meeting:
 - Kenwood Isles Area Association
 - Does not support Bridge Configuration 4B-Skew, would needlessly increase the impact on private residences.
 - Minneapolis Park and Recreation Board
 - Supports design configurations that reduce direct impacts to the Kenilworth Channel, particularly related to the number of piers in the water.
 - Supports separated trail and LRT bridge, resulting in a trail bridge that spans the channel without pier support.
 - Favorable to separate bridges for more light.
 - Wants to continue exploration of skewed option, does not believe negative impact on adjacent residential properties has been demonstrated.
 - State Historic Preservation Office
 - Proposal is moving in the wrong direction, a wider crossing and adding additional infrastructure does not minimize adverse the effect.
 - Configuration 4B-Skew is the most intrusive design of the four options.
 - Need to explore a design solution that considers a combination of the most minimal design elements, to minimize the adverse effect, including:
 - Reconsideration of the original two-bridge crossing option.
 - Pier numbers and configuration.
 - Deck thinness.
 - Wing walls.
 - Retaining walls.

- City of Minneapolis
 - Reviewed the four new bridge configurations and looks forward to continued consultation as the bridge designs evolve.
- Greg asked if this reflects everyone's comments, and there was general agreement.
- Ryan Kronzer from SPO provided an overview of engineering changes made in response, noting that they are moving forward with using the term "design concepts."
 - Eliminated Configuration 4C:
 - Very similar bridge span lengths as 4B.
 - No added benefit of reducing structure depth or reducing the number of piers in the water as 4B.
 - Span configuration and pier placement unbalanced and unrationalized in relation to the channel banks.
 - Prepared four design concepts and applied them to three remaining configurations:
 - Concept 1 – Angular Steel, based on Configuration 4B
 - Concept 2 – Angular Steel, with skew based on Configuration 4B-Skew
 - Concept 3 – Arched Deck, based on Configuration 4B
 - Concept 4 – Thin Taper, based on Configuration 4A (with thin decks but another pier)
- Sarah noted that she provided comment in support of avoiding most direct impacts to the WPA walls. Mark Bishop from SPO said that time would be reserved to review concepts pertaining to treatment specific to the walls.
- Mark presented concepts the engineering team is working on, as well as schematics of each to compare against existing conditions. Mark noted that Concepts 1, 2, and 3 are all based on the 4B Configuration, with a clear span trail bridge, an LRT bridge with two piers that are outside the channel on the banks, and a freight bridge that is clear span, but with piers on the shoreline where the WPA walls are today. He explained that Concept 1 portrays an angular steel design for the trail bridge, while Concept 2 has a skewed alignment for the trail bridge to let in more light.
 - Craig asked how this affects the bridge's height from the water. Mark explained that there is no difference in height, only in the horizontal arrangement. Jeannette noted that these are not final designs because they are lacking any decorative elements, and Mark agreed that railings and other elements will be added based on input to minimize and mitigate the bridge's effect.
 - Mark explained that Concept 3 portrays an arched deck for the trail bridge that adds more curvature into the beams, emphasizing the difference between an angular and smoother shape. All designs have flat undersides, consisting primarily of slabs as opposed to many beams.
 - Concept 4 incorporates a thin taper on the freight and LRT bridges, reminiscent of configuration 4A, with the goal of achieving a thinner deck. It requires more piers in the water – the freight bridge has four piers, and the LRT bridge has piers in the water but not on the banks.
 - The concepts were driven by the goal of minimizing the number of piers in the water (direct impact to the channel), which requires thicker decks.
- Greg explained that the materials presented are a preview of the concepts and that so that there can be a more detailed discussion at the next meeting. To prepare for this, Mark said it would be ideal to get some feedback now to get down to one or two concepts to present in July and asked if those who made

comments previously could elaborate on their previous comments. Greg clarified the request, pointing out that there needs to be resolution on the incompatible goals of removing piers and thinning decks.

- Michael said they recognize the channel is historic and are trying to minimize intrusions to the historic resource – the channel is the historic resource, not the bridge. It is necessary to separate the spans so that the trail bridge can be clear span. However, Jeannette noted that the design should reflect the historic nature of the resource. Michael explained that they have looked at Theodore Wirth’s writings and believe that a concrete structure with no ornamentation would be in line with his intentions. Kathy pointed out that Wirth might not have been able to anticipate the need for such a large structure.
- Jeannette explained that the bridge is part of a series of views, which must be respected as a whole, so it should give a nod to the other structures. Michael said they are not trying to replicate a historic bridge, but rather build a bridge actually designed today. Jeannette reiterated the importance of the idea of creating an integrated whole, using the example that if you are renovating a historic home, you would seek to respect the original architecture. She thinks Concept 3 is very heavy, though she appreciates the attempt to minimize piers in the water.
- Kathy said the arch makes it softer and more welcoming. She said she was not suggesting that is what it would look like 100 years ago, but that this is a nature area, so the bridge should fit in, and softening the concrete look would allow people going by in canoes to retain the feeling of serenity in nature, rather than a sense they are passing underneath a freeway underpass.
- Craig asked if the height changes due to the arches. Mark responded that while the arches could help to optimize the height, right now they are superfluous because the narrowest height is what is needed for construction. There is the possibility to minimize these to thin the overall appearance of the deck.
- Jeannette asked if these documents being shown could be provided to share with others. Michael noted that they are on the MPRB website, and Nani said that all the materials will also be posted on the Project website soon.
- Sarah said that SHPO supports the two bridge configuration and asked if it is now gone. Mark said the three-bridge configuration creates more distributed openings for light, though it has a wider footprint. Sarah said the question is whether the extra 5-6 feet of footprint is an acceptable trade off for more light and no piers on the trail bridge.
- Jeannette asked if the skew concept presented today has less of a skew than the one presented at the last meeting. Mark said it did not, rather the perspective shown is a bit more oblique. The view not shown is the one from the trail bridge, which MPRB did receive. Michael indicated that the non-skew concept emphasizes visual length along the trail, while the skew violates the feeling of a long linear corridor that people want and are used to. Therefore, the MPRB is willing to eliminate the skewed option. Michael added that as a historic place, the channel should have a place where you can step out of traffic, which is why they are looking at an overlook. He asked for SHPO’s opinion on that and pointed out that the other bridges are not very visible from this view. Mark pointed out that the overlook point is not ideally situated to, for example, look back to the Lake of the Isles, and to do so would take more footprint. Michael added that you are actually over the bank, not the channel itself.
- Nani and Greg discussed the goal of getting to one configuration and one or two design concepts by next month. Mark noted that while they have framed the options, the choice between fewer piers and a larger structure is a tough one. He noted again that the design needs to progress, for example the concepts show simple concrete for the walls, and do not take into account some areas where new or repaired walls are needed.

- Sarah asked if walls are needed because these will be new structures. Mark confirmed this was correct. Michael added that they are also trying to accommodate a future six-foot walking path under the bridge that does not appear on these illustrations, by doing any required grading.
- Nani said the skew is not desirable and that Concept 1 is more angular with the overlook, Concept 3 has more arches and curves, and Concept 4 is concrete, building off Concept 1 but thinner because it has more piers.
- Jeannette asked whether it would be possible to do an overlook with the arched design. Mark said they would look into this, but the design does not easily accommodate this.
- Craig asked if the load requirements are driving the designs. Mark responded that they are being driven more by constructability and aesthetic considerations.
- Sarah asked if SHPO is the only one that wants two bridges. Brian Schaffer from the City of Minneapolis acknowledged that minimizing impacts and deciding what to do with the walls are both key, but that the City does not have a preference between two and three bridge configurations. The City understands the tradeoffs, but has not clearly come down on one side or another.
- Craig asked if noise impacts vary when you go from two to three bridges. Lance responded “no,” that a bridge blocks the noise above it regardless, and directly underneath will be quieter than off to the sides. Sarah asked if the number of bridges amplifies the noise at all. Lance responded that it would not.
- Jeannette said that all the concepts incorporate a lot of concrete and a lot of impact, and that this would have been minimized if freight had moved. Ryan acknowledged this and said they are trying to soften the edges through design. Michael pointed out that though it is difficult to see in the angular views, the bridge deck of Concept 4 tapers to a narrower edge, which is more visible in the dynamic modeling. Sarah asked if the slope beneath the trail bridge could be less landscaped and more naturalized to better blend with the surroundings. Mark said wherever new walls are needed, they need to consider what materials will be used, and whether the walls will be dismantled and reassembled, or replaced. Today, there is a mix of retaining walls, from the wood pile in the channel, more formalized concrete walls near Dean Parkway bridge, and the Rustic Style stone WPA walls in the lagoon. He then presented a slide with slope treatment options that are being considered, including rock walls, metal cages, corrugated metals, and concrete with or without jointing. He noted, however, that the railing in the lower middle image is not part of the options being considered.
- Mark explained that the existing channel banks will be disturbed for bridge construction. Craig asked how far the disturbed area goes. Mark confirmed it is just under the bridges, illustrated by a grey shaded area in the plans provided at the April meeting. Craig asked for confirmation that construction will not necessitate broader impacts. Mark explained that construction work will be done from the banks down into the channel and that existing conditions will need to change through a restorative approach because it is no longer acceptable to leave erodible material exposed. He presented a slide with slope treatment options that have been looked at, including: paving, articulated materials, rocks/rubble/boulders – all varying in size and angularity. Greg noted that they have already decided that concrete and formal design treatments are not the right choice, that stone would be better, and that it is too dark of an area for vegetation.
 - Craig noted that the area that needs to be treated will require a lot of material.
 - Sarah asked if the banks could be vegetated like Basset Creek, with a log roll integrated with vegetation.



- Jeannette noted that people will want to climb on whatever is there, so the size of the treatment components should discourage this, and if they are too small, they will just end up on the ice.
- Brian asked if the Kenilworth landscape design group will tie into these efforts. Mark confirmed they will.

4. Next Steps

- Greg provided several updates:
 - The next consulting parties meeting will be the week of July 27 and he asked that people let him know of any dates that do not work. He also clarified that they are not looking for formal comments coming out of today’s meeting, but hope to emerge from the next meeting with a single concept for the Kenilworth Crossing bridges.
 - In terms of the overall Section 106 process, the development of the memorandum of agreement will likely begin in August and that the cultural resources analysis and determination of effects for the FEIS is progressing.
- Nani thanked attendees, invited them to speak with Lance after the meeting, and invited people to attend the SDEIS open houses in progress.

	ACTION ITEMS:	PERSON RESPONSIBLE:	DEADLINE:
1.	Follow up with the City of Minneapolis and begin planning for mitigation through interpretation incorporated into the Royalston Station Design.	Greg Mathis	August 2015
2.	Consider the bridge concept options after the meeting and prepare for more detailed discussion at next consultation meeting the week of July 27.	Consulting parties	July 29
3.	Updated SWLRT Historic Properties Noise and Vibration Assessment table with clarification related to the Grand Rounds Historic District.	Greg Mathis	July 29
4.			
5.			
6.			