

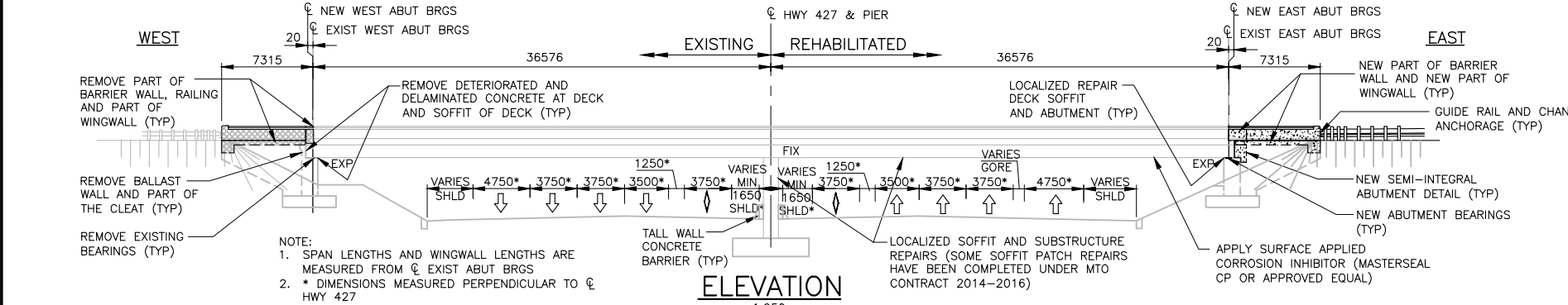
- LEGEND:**
- REMOVALS
 - NEW CONCRETE
 - NEW ASPHALT
- LIST OF ABBREVIATIONS:**
- HOV HIGH OCCUPANCY VEHICLE

- GENERAL NOTES:**
- DESIGN STANDARDS AND CODES:
 - SCHEDULE 15-1 AND SCHEDULE 15-2: PROJECT AGREEMENT
 - DESIGN CODE: CAN/CSA-S6-14
 - MINISTRY OF TRANSPORTATION OF ONTARIO STRUCTURAL MANUAL
 - MINISTRY OF TRANSPORTATION OF ONTARIO STRUCTURE REHABILITATION MANUAL
 - ONTARIO PROVINCIAL STANDARD SPECIFICATIONS (OPSS)
 - LIVE LOAD: CL-625-ONT.
 - CLASS OF CONCRETE 30 MPa
 - CLEAR COVER TO REINFORCING STEEL

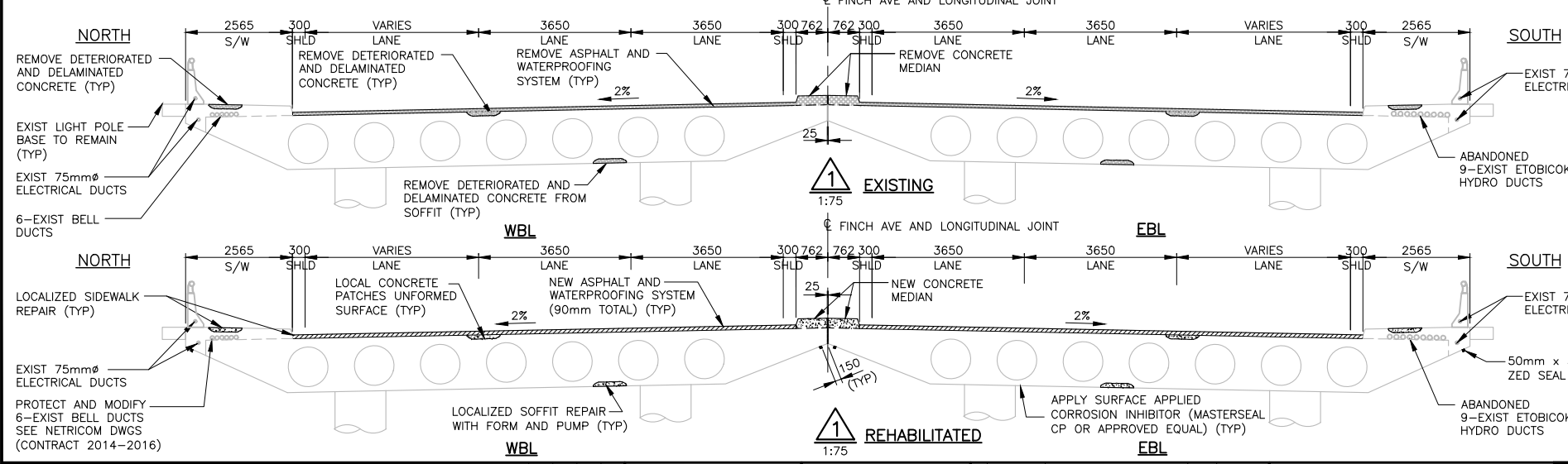
DECK TOP	70±20
BOTTOM	40±10
REMAINDER UNLESS OTHERWISE NOTED	70±20
 - REINFORCING STEEL
REINFORCING STEEL SHALL BE GRADE 400W UNLESS OTHERWISE SPECIFIED.
BAR MARKS WITH PREFIX 'S' DENOTE STAINLESS STEEL BARS.

STAINLESS REINFORCING STEEL SHALL BE TYPE 316 LN OR DUPLEX 2205 AND HAVE A MINIMUM YIELD STRENGTH OF 500 MPa, UNLESS OTHERWISE SPECIFIED. UNLESS SHOWN OTHERWISE, TENSION LAP SPLICES SHALL BE CLASS B.

BAR HOOKS SHALL HAVE STANDARD HOOK DIMENSIONS USING MINIMUM BEND DIAMETERS, WHILE STIRRUPS AND TIES SHALL HAVE MINIMUM HOOK DIMENSIONS. ALL HOOKS SHALL BE IN ACCORDANCE WITH THE STRUCTURAL STANDARD DRAWINGS SS12-1 UNLESS INDICATED OTHERWISE.
 - GLASS FIBRE REINFORCED POLYMER (GFRP)
GLASS FIBRE REINFORCED POLYMER (GFRP) REINFORCING BARS SHALL BE GRADE I, GRADE II OR GRADE III AS SPECIFIED IN THE CONTRACT DOCUMENTS.
THE NOMINAL DIAMETER, TENSILE MODULUS OF ELASTICITY AND GUARANTEED MINIMUM TENSILE STRENGTH SHALL BE AS SPECIFIED IN THE CONTRACT DOCUMENTS.
BAR MARKS WITH THE PREFIX GI DENOTE GRADE I GFRP BARS, BAR MARKS WITH THE PREFIX GII DENOTE GRADE II GFRP BARS AND BAR MARKS WITH THE PREFIX GIII DENOTE GRADE III GFRP BARS.
 - ROADWAY CLASSIFICATION: UAD 80.
 - PROTECTION SYSTEM SHALL CONFORM TO PERFORMANCE LEVEL 2.
 - ALL DIMENSIONS ARE IN MILLIMETERS ALL ELEVATIONS ARE IN METERS UNLESS OTHERWISE SHOWN.



- CONSTRUCTION NOTES:**
- SAWCUTS IN CONCRETE, WHERE DESIGNATED, SHALL BE 25MM DEEP OR TO THE FIRST LAYER OF REINFORCING STEEL, WHICHEVER IS LESS.
 - EXISTING REINFORCING STEEL WHICH IS EXPOSED DURING CONCRETE REMOVALS AND WHICH IS TO REMAIN SHALL BE ABRASIVE BLAST CLEANED.
 - THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS OF THE WORK AND ALL DETAILS ON SITE AND REPORT ANY DISCREPANCIES TO THE ENGINEER BEFORE PROCEEDING WITH THE WORK. THE CONTRACTOR SHALL ADJUST DIMENSIONS OF THE WORK AS REQUIRED TO SUIT EXISTING CONDITIONS.
 - BACKFILL SHALL BE PLACED SIMULTANEOUSLY BEHIND BOTH END OF SUPERSTRUCTURE KEEPING THE HEIGHT OF BACKFILL APPROXIMATELY THE SAME. AT NO TIME SHALL THE DIFFERENCE IN ELEVATION BE GREATER THAN 500mm.
 - ALL EXPOSED EDGES TO RECEIVE A 20x20 CHAMFER.



- APPLICABLE STANDARD DRAWINGS:**
- OPSD 3101.150 WALLS - ABUTMENT, BACKFILL MINIMUM GRANULAR REQUIREMENTS
 - OPSD 3370.100 DECK, WATERPROOFING HOT APPLIED ASPHALT MEMBRANE WITH PROTECTION BOARD
 - OPSD 3370.101 DECK, WATERPROOFING HOT APPLIED ASPHALT MEMBRANE AT ACTIVE CRACKS GREATER THAN 2mm WIDE AND CONSTRUCTION JOINTS
 - OPSD 3419.100 BARRIERS AND RAILINGS - STEEL GUIDE RAIL AND CHANNEL ANCHORAGE
 - OPSD 3941.200 FIGURES IN CONCRETE - SITE NUMBER AND DATE LAYOUT
- LIST OF DRAWINGS:**
- 500 GENERAL ARRANGEMENT
 - 501 CONSTRUCTION STAGING
 - 502 JACKING DETAILS
 - 503 REMOVALS I
 - 504 REMOVALS II
 - 505 NEW CONSTRUCTION I
 - 506 NEW CONSTRUCTION II
 - 507 NEW CONSTRUCTION III
 - 508 NEW CONSTRUCTION IV
 - 509 BEARINGS
 - 510 BARRIER WALL WITH S/W AND RAILING
 - 511 RAILING FOR BARRIER WALL
 - 512 6000mm APPROACH SLAB
 - 513 EXPANSION JOINT AND SLEEPER SLAB
 - 514 STRIP SEAL EXPANSION JOINT FOR SLEEPER SLAB
 - 515 STANDARD DETAILS
 - 516 ELECTRICAL EMBEDDED WORK

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 MODIFIED: 3/19/2018 10:42:44 AM BY: PANG
 DATE PLOTTED: 3/19/2018 10:43:45 AM BY: PANG

DATE	REVISIONS	BY	CHK	LEAD DISC.	PROJ. MAN.
C 18/03/16	90% SUBMISSION TO CA				
B 18/01/09	90% SUBMISSION TO CA				
A 17/10/31	90% SUBMISSION TO CA				

SCALE : AS NOTED

DESIGNED	SUBOOH OBNID
DRAWN	ELENA TSENTER
CHECKED	MAGED IBRAHIM
APPROVED LEAD ENG.	TATIANA QJALA
APPROVED PROJ. MANAGER	

CONSULTANT

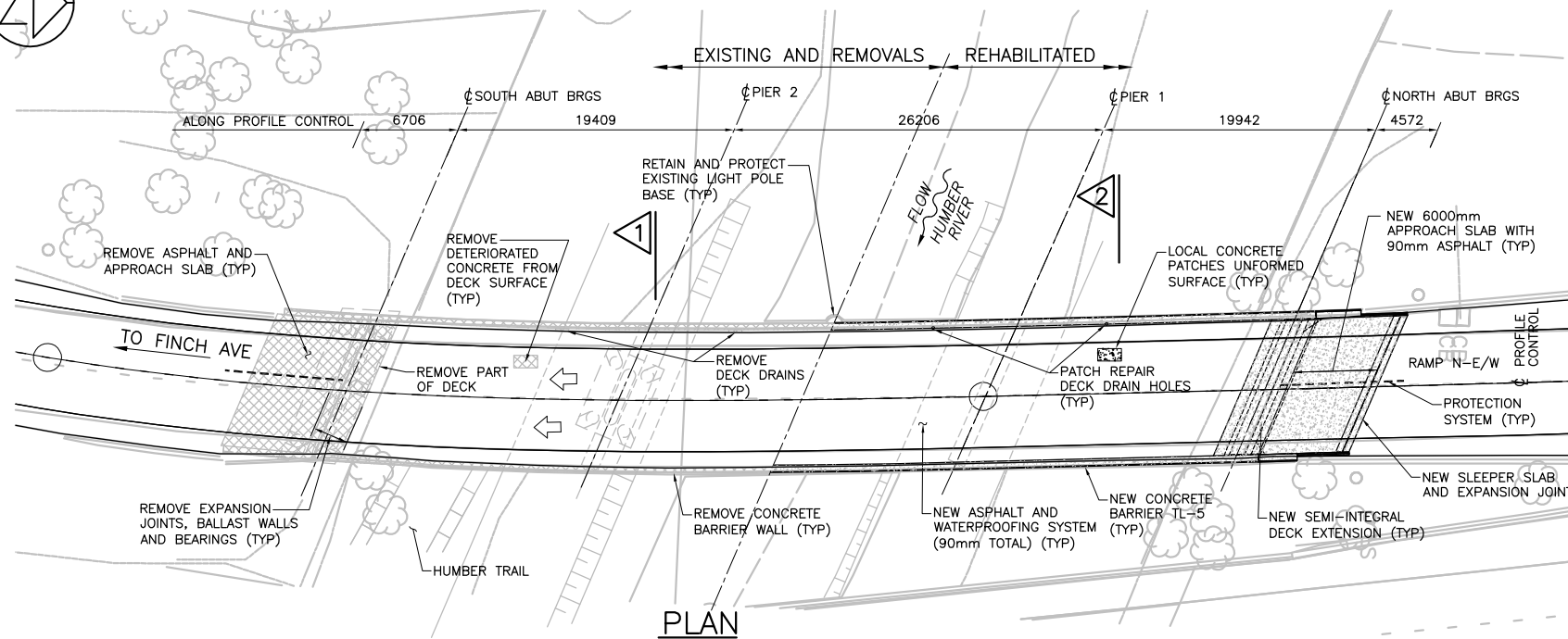
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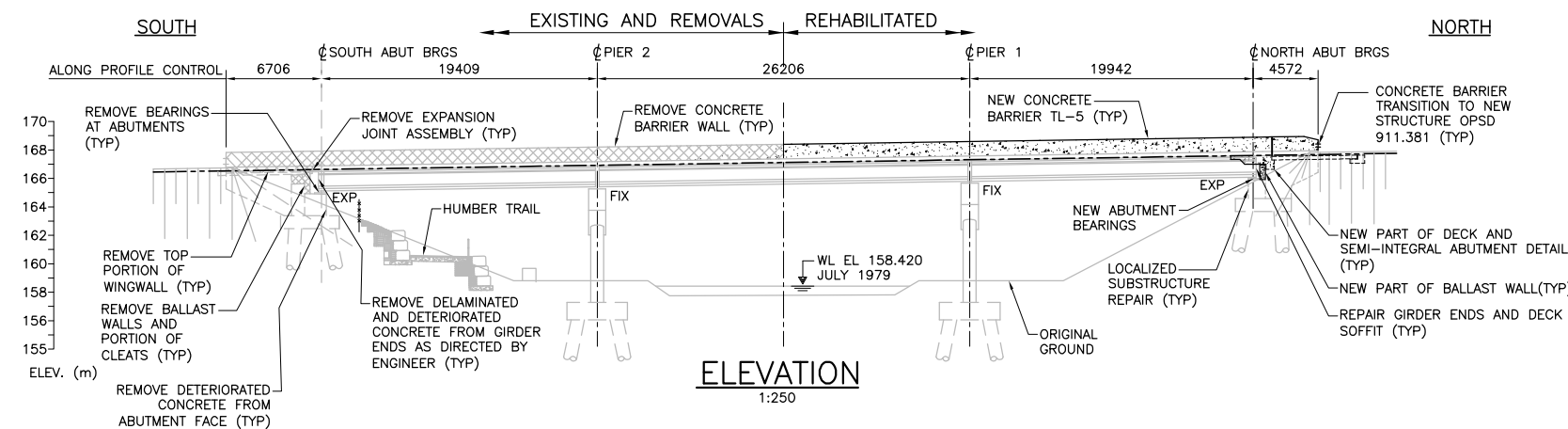
link427
LOCAL | INTEGRATED | NEIGHBOURLY | KNOWLEDGEABLE

**HWY 427 EXPANSION
HWY 427/FINCH AVENUE UNDERPASS
REHABILITATION - R1
SITE 37-1084
GENERAL ARRANGEMENT**

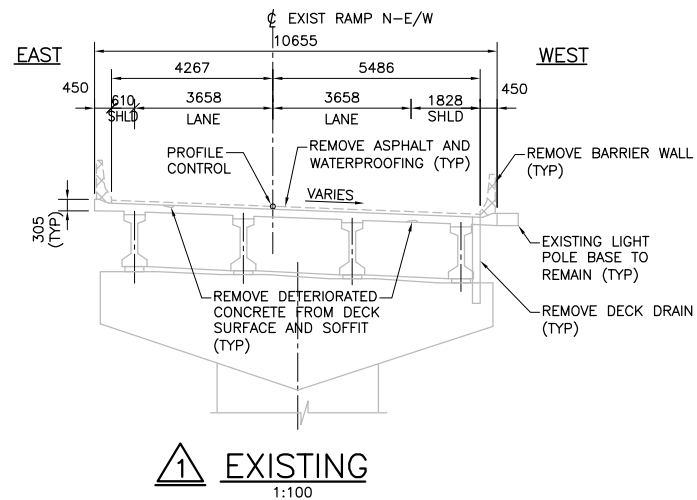
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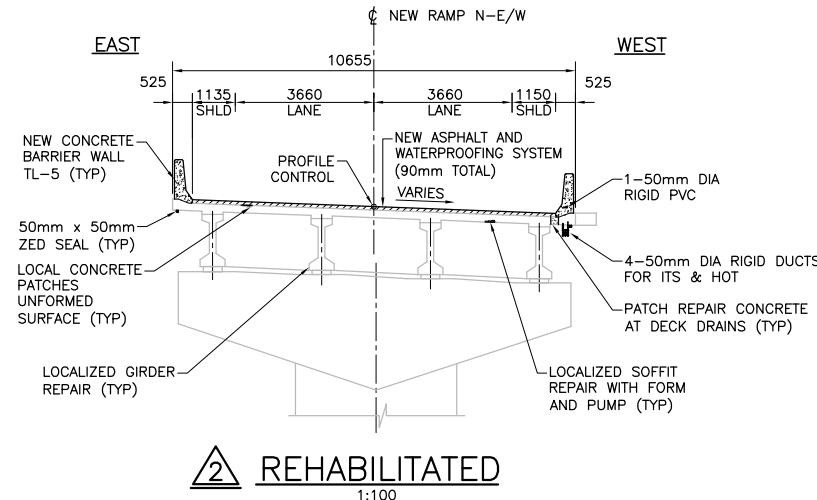
PLAN
1:250



ELEVATION
1:250



1 EXISTING
1:100



2 REHABILITATED
1:100

LIST OF DRAWINGS:

- 600 GENERAL ARRANGEMENT
- 601 CONSTRUCTION STAGING
- 602 JACKING DETAILS AND BEARINGS
- 603 REMOVALS
- 604 NEW CONSTRUCTION I
- 605 NEW CONSTRUCTION II
- 606 BARRIER WALL WITHOUT RAILING, TL-5 (STAINLESS STEEL REBAR)
- 607 6000mm APPROACH SLAB
- 608 EXPANSION JOINT AND SLEEPER SLAB
- 609 STRIP SEAL EXPANSION JOINT FOR SLEEPER SLAB
- 610 STANDARDS DETAILS
- 611 ELECTRICAL EMBEDDED WORK

GENERAL NOTES:

1. DESIGN STANDARDS AND CODES:
 - SCHEDULE 15-1 AND SCHEDULE 15-2: PROJECT AGREEMENT
 - DESIGN CODE: CAN/CSA-S6-14
 - MINISTRY OF TRANSPORTATION OF ONTARIO STRUCTURAL MANUAL
 - MINISTRY OF TRANSPORTATION OF ONTARIO STRUCTURE REHABILITATION MANUAL
 - ONTARIO PROVINCIAL STANDARD SPECIFICATIONS (OPSS)
2. LIVE LOAD: CL-625-ONT.
3. CLASS OF CONCRETE 30 MPa.
4. CLEAR COVER TO REINFORCING STEEL DECK

TOP	70 ± 20
BOTTOM	40 ± 10
REMAINDER UNLESS OTHERWISE NOTED 70 ± 20	
5. REINFORCING STEEL
REINFORCING STEEL SHALL BE GRADE 400W UNLESS OTHERWISE SPECIFIED.
BAR MARKS WITH PREFIX 'S' DENOTE STAINLESS STEEL BARS.
STAINLESS REINFORCING STEEL SHALL BE TYPE 316 LN OR DUPLEX 2205 AND HAVE A MINIMUM YIELD STRENGTH OF 500 MPa, UNLESS OTHERWISE SPECIFIED. UNLESS SHOWN OTHERWISE, TENSION LAP SPLICES SHALL BE CLASS B.
BAR HOOKS SHALL HAVE STANDARD HOOK DIMENSIONS USING MINIMUM BEND DIAMETERS, WHILE STIRRUPS AND TIES SHALL HAVE MINIMUM HOOK DIMENSIONS. ALL HOOKS SHALL BE IN ACCORDANCE WITH THE STRUCTURAL STANDARD DRAWINGS SS12-1 UNLESS INDICATED OTHERWISE.
6. ROADWAY CLASSIFICATION: RFD 80.
7. PROTECTION SYSTEM SHALL CONFORM TO PERFORMANCE LEVEL 2.
8. ALL DIMENSIONS ARE IN MILLIMETERS ALL ELEVATIONS ARE IN METERS UNLESS OTHERWISE SHOWN.

CONSTRUCTION NOTES:

1. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS OF THE WORK AND ALL DETAILS ON SITE AND REPORT ANY DISCREPANCIES TO THE ENGINEER BEFORE PROCEEDING WITH THE WORK. THE CONTRACTOR SHALL ADJUST DIMENSIONS OF THE WORK AS REQUIRED TO SUIT EXISTING CONDITIONS.
2. BACKFILL SHALL BE PLACED SIMULTANEOUSLY BEHIND BOTH END OF SUPERSTRUCTURE KEEPING THE HEIGHT OF BACKFILL APPROXIMATELY THE SAME. AT NO TIME SHALL THE DIFFERENCE IN ELEVATION BE GREATER THAN 500mm.
3. THE CONTRACTOR IS RESPONSIBLE FOR THE DESIGN AND INSTALLATION OF ALL DEBRIS CONTAINMENT SYSTEMS.
4. ALL MATERIAL SHALL BE IN ACCORDANCE WITH MTO DESIGNATED SOURCES FOR MATERIALS (DSM).
5. THE CONTRACTOR SHALL LOCATE AND PROTECT ALL UTILITIES DURING CONSTRUCTION OPERATIONS.
6. STABILITY AND INTEGRITY OF THE STRUCTURE SHALL BE MAINTAINED AT ALL STAGES OF CONSTRUCTION.
7. ALL EXPOSED EDGES TO RECEIVE A 20x20 CHAMFER.
8. ALL AREAS AFFECTED BY CONSTRUCTION ACTIVITIES SHALL BE FULLY REINSTATED TO PRE-CONSTRUCTION OR BETTER CONDITIONS.

APPLICABLE STANDARD DRAWINGS:

- OPSD 3101.150 WALLS - ABUTMENT, BACKFILL MINIMUM GRANULAR REQUIREMENTS
- OPSD 3370.100 DECK, WATERPROOFING HOT APPLIED ASPHALT MEMBRANE WITH PROTECTION BOARD
- OPSD 3370.101 DECK, WATERPROOFING HOT APPLIED ASPHALT MEMBRANE AT ACTIVE CRACKS GREATER THAN 2mm WIDE AND CONSTRUCTION JOINTS
- OPSD 3941.200 FIGURES IN CONCRETE - SITE NUMBER AND DATE LAYOUT

LIST OF ABBREVIATIONS:

WP WORKING POINT

LEGEND:

- REMOVALS
- NEW CONCRETE
- NEW ASPHALT

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 DATE PLOTTED: 3/20/2018 2:20:02 PM BY: PANF

DATE	REVISIONS	BY	CHK	LEAD	PROJ.
B 18/03/16	90% SUBMISSION TO CA				
A 18/01/12	90% SUBMISSION TO CA				

SCALE :

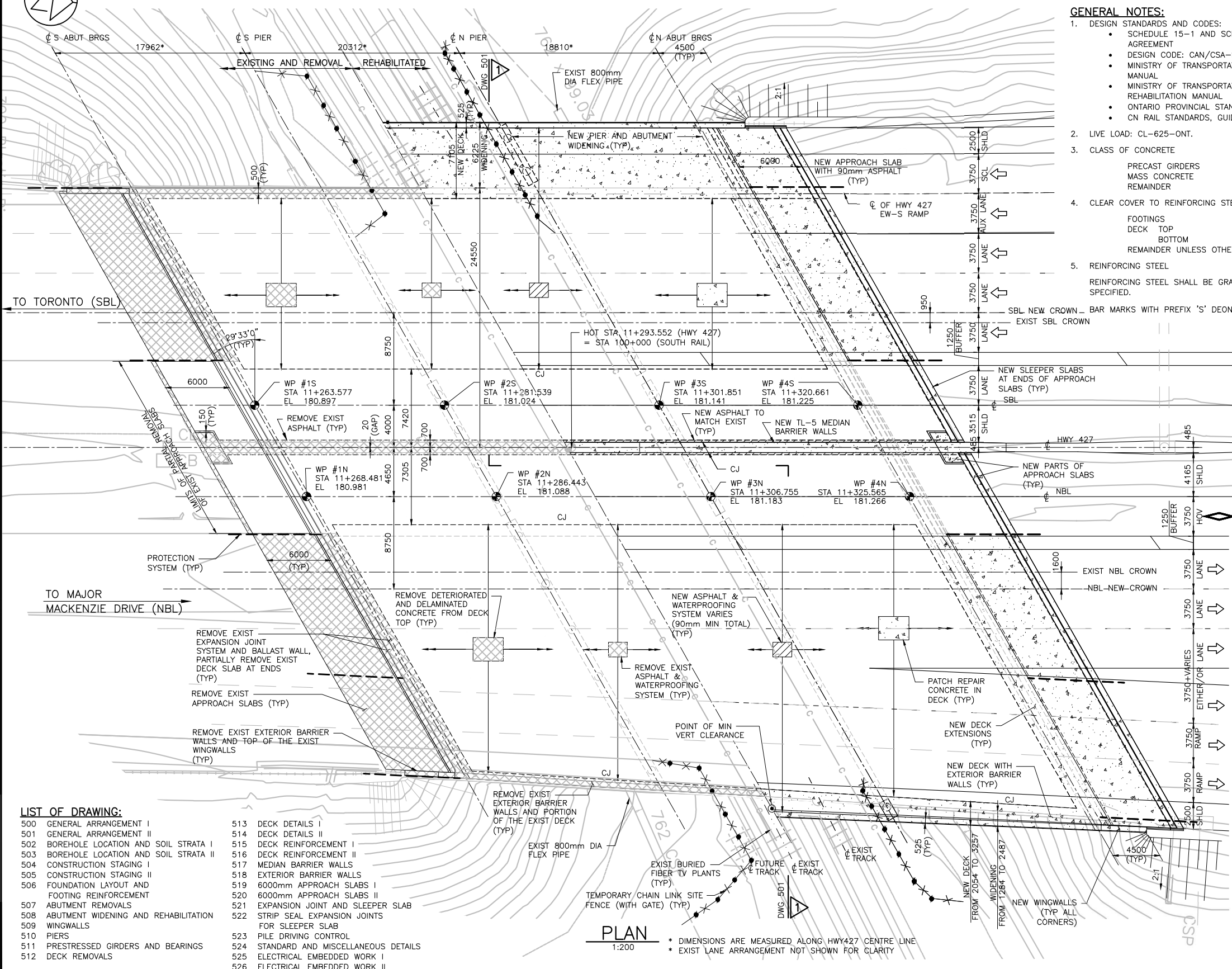
AS NOTED

DESIGNED	ANDREW HACHBORN
DRAWN	ELENA TSENTIER
CHECKED	TATIANA OJALA
APPROVED LEAD ENG.	TATIANA OJALA
APPROVED PROJ. MANAGER	

NAME (PRINT)	INT.	DATE



HWY 427 EXPANSION RAMP HWY 427N TO FINCH AVE E/W OVER HUMBER RIVER REHABILITATION - R1, SITE 37-1087 GENERAL ARRANGEMENT							
PROJECT ID.	STAGE IDENTIFIER	DESIGN PACKAGE NUMBER	DISCIPLINE	STRUCTURE NUMBER	DOCUMENT TYPE	DRAWING NUMBER	REVISION NUMBER
H427-D	N	9	STR	B02	DWG	600	B



NOTE:
 1. READ THIS DRAWING IN CONJUNCTION WITH GENERAL ARRANGEMENT II DWG 501.

GENERAL NOTES:
 1. DESIGN STANDARDS AND CODES:
 • SCHEDULE 15-1 AND SCHEDULE 15-2: PROJECT AGREEMENT
 • DESIGN CODE: CAN/CSA-S6-14
 • MINISTRY OF TRANSPORTATION OF ONTARIO STRUCTURAL MANUAL
 • MINISTRY OF TRANSPORTATION OF ONTARIO STRUCTURE REHABILITATION MANUAL
 • ONTARIO PROVINCIAL STANDARD SPECIFICATIONS (OPSS)
 • CN RAIL STANDARDS, GUIDELINES AND POLICY

2. LIVE LOAD: CL-625-ONT.
 3. CLASS OF CONCRETE
 PRECAST GIRDERS 50 MPa
 MASS CONCRETE 20 MPa
 REMAINDER 30 MPa

4. CLEAR COVER TO REINFORCING STEEL
 FOOTINGS 100±25
 DECK TOP 70±20
 BOTTOM 40±10
 REMAINDER UNLESS OTHERWISE NOTED 70±20

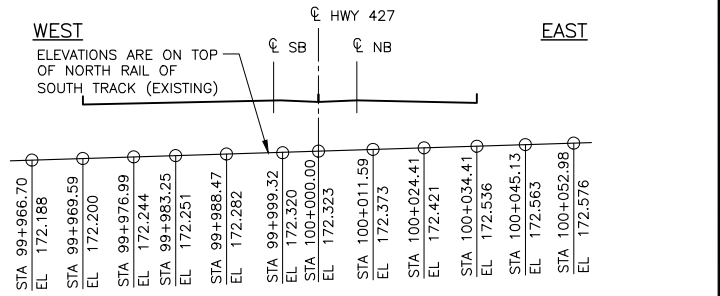
5. REINFORCING STEEL
 REINFORCING STEEL SHALL BE GRADE 400W UNLESS OTHERWISE SPECIFIED.
 SBL NEW CROWN - BAR MARKS WITH PREFIX 'S' DEONTE STAINLESS STEEL BARS
 EXIST SBL CROWN

6. GLASS FIBRE REINFORCED POLYMER (GFRP)
 GLASS FIBRE REINFORCED POLYMER (GFRP) REINFORCING BARS SHALL BE GRADE III AS SPECIFIED IN THE CONTRACT DOCUMENTS
 THE NOMINAL DIAMETER, TENSILE MODULUS OF ELASTICITY AND GUARANTEED MINIMUM TENSILE STRENGTH SHALL BE AS SPECIFIED IN THE CONTRACT DOCUMENTS
 BAR MARKS WITH THE PREFIX GIII DENOTE GRADE III GFRP BARS

7. ROADWAY CLASSIFICATION: UFD 120.
 8. PROTECTION SYSTEM SHALL CONFORM TO PERFORMANCE LEVEL 2.
 9. ALL DIMENSIONS ARE IN MILLIMETERS ALL STATIONS AND ELEVATIONS ARE IN METERS UNLESS OTHERWISE SHOWN.

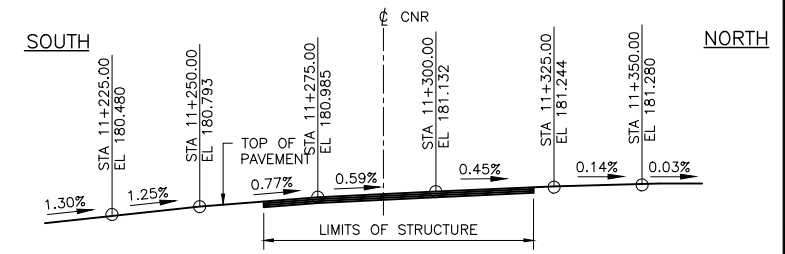
LEGEND:

	EXISTING TO REMAIN		NEW CONCRETE
	REMOVAL		NEW ASPHALT

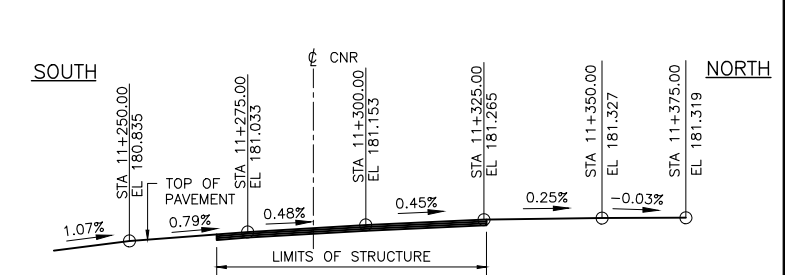


PROFILE OF CNR

NOTE: THE PROFILE OF CNR IS FROM SURVEY DATA BY LINK 427



PROFILE OF HWY 427 SB



PROFILE OF HWY 427 NB

LIST OF DRAWING:

500	GENERAL ARRANGEMENT I	513	DECK DETAILS I
501	GENERAL ARRANGEMENT II	514	DECK DETAILS II
502	BOREHOLE LOCATION AND SOIL STRATA I	515	DECK REINFORCEMENT I
503	BOREHOLE LOCATION AND SOIL STRATA II	516	DECK REINFORCEMENT II
504	CONSTRUCTION STAGING I	517	MEDIAN BARRIER WALLS
505	CONSTRUCTION STAGING II	518	EXTERIOR BARRIER WALLS
506	FOUNDATION LAYOUT AND FOOTING REINFORCEMENT	519	6000mm APPROACH SLABS I
507	ABUTMENT REMOVALS	520	6000mm APPROACH SLABS II
508	ABUTMENT WIDENING AND REHABILITATION	521	EXPANSION JOINT AND SLEEPER SLAB
509	WINGWALLS	522	STRIP SEAL EXPANSION JOINTS FOR SLEEPER SLAB
510	PIERS	523	PILE DRIVING CONTROL
511	PRESTRESSED GIRDERS AND BEARINGS	524	STANDARD AND MISCELLANEOUS DETAILS
512	DECK REMOVALS	525	ELECTRICAL EMBEDDED WORK I
		526	ELECTRICAL EMBEDDED WORK II

PLAN
 1:200
 * DIMENSIONS ARE MEASURED ALONG HWY427 CENTRE LINE
 * EXIST LANE ARRANGEMENT NOT SHOWN FOR CLARITY

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B 18/03/16	90% SUBMISSION TO CA				
A 18/01/12	90% SUBMISSION TO CA				

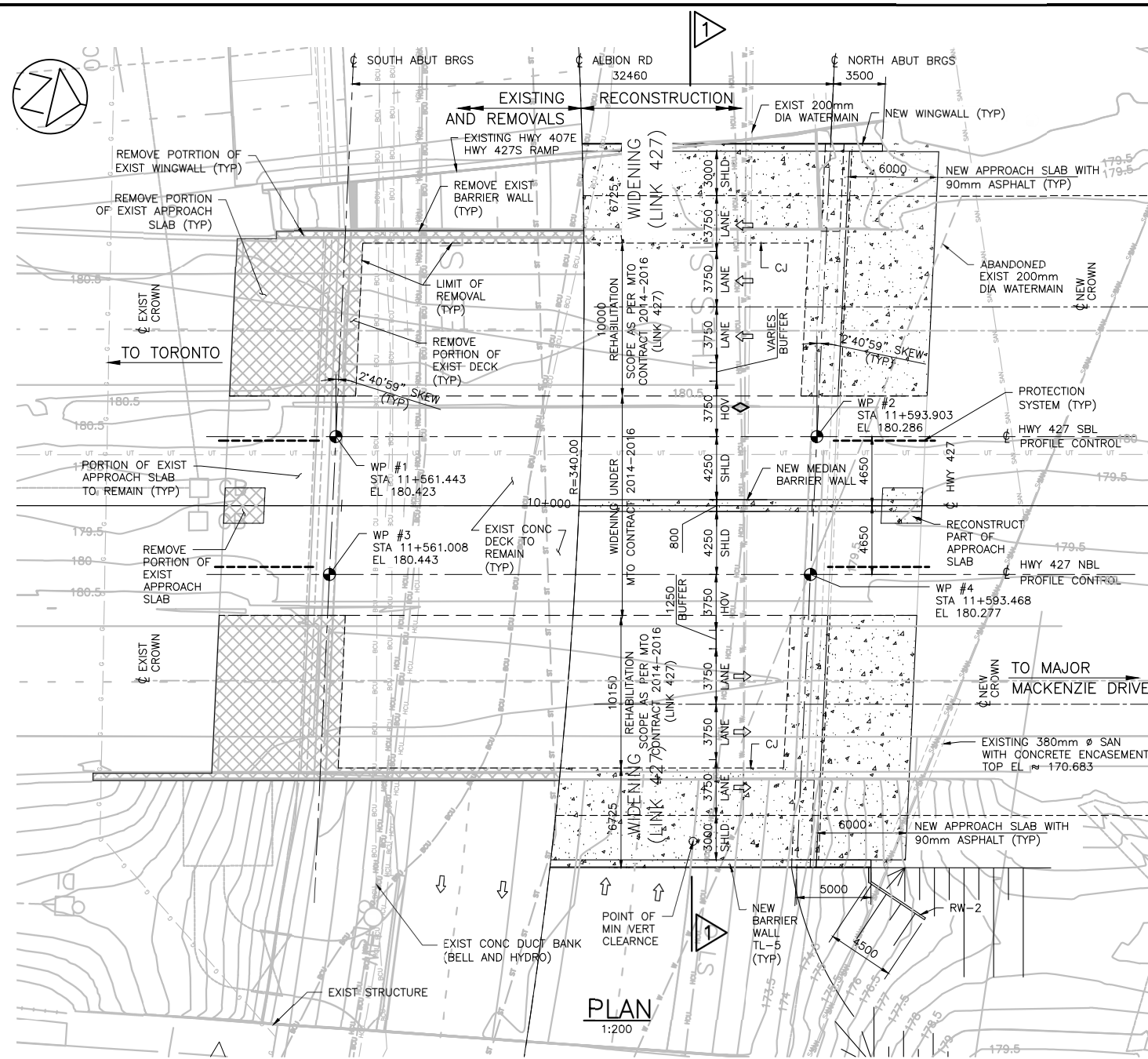
SCALE : AS NOTED

DESIGNED	SHELLEY HUANG
DRAWN	TOM ZHAO
CHECKED	TATIANA OJALA
APPROVED LEAD ENG.	TATIANA OJALA
APPROVED PROJ. MANAGER	



TITLE
HWY 427 EXPANSION
HWY 427 NBL & SBL / CNR OVERHEAD
REHABILITATION AND WIDENING
SITE 37-1109
GENERAL ARRANGEMENT I

PROJECT ID.	STAGE IDENTIFIER	DESIGN PACKAGE NUMBER	DISCIPLINE	STRUCTURE NUMBER	DOCUMENT TYPE	DRAWING NUMBER	REVISION NUMBER
H427-D	N	9	STR	B04	DWG	500	B



GENERAL NOTES:

- DESIGN STANDARDS AND CODES:
 - SCHEDULE 15-1 AND SCHEDULE 15-2: PROJECT AGREEMENT
 - DESIGN CODE: CAN/CSA-S6-14
 - MINISTRY OF TRANSPORTATION OF ONTARIO STRUCTURAL MANUAL
 - MINISTRY OF TRANSPORTATION OF ONTARIO STRUCTURE REHABILITATION MANUAL
 - ONTARIO PROVINCIAL STANDARD SPECIFICATIONS (OPSS)
- LIVE LOAD: CL-625-ONT.
- CLASS OF CONCRETE

MASS CONCRETE	20 MPa
REMAINDER	30 MPa
- CLEAR COVER TO REINFORCING STEEL

FOOTINGS	100±25
DECK	70±20
TOP	40±10
BOTTOM	70±20
REMAINDER UNLESS OTHERWISE NOTED	70±20
- REINFORCING STEEL
REINFORCING STEEL SHALL BE GRADE 40W UNLESS OTHERWISE SPECIFIED.
BAR MARKS WITH PREFIX 'S' DEONTE STAINLESS STEEL BARS.
STAINLESS REINFORCING STEEL SHALL BE TYPE 316 LN OR DUPLEX 2205 AND HAVE A MINIMUM YIELD STRENGTH OF 500 MPa, UNLESS OTHERWISE SPECIFIED.
UNLESS SHOWN OTHERWISE, TENSION LAP SPICES SHALL BE CLASS B.
BAR HOOKS SHALL HAVE STANDARD HOOK DIMENSIONS USING MINIMUM BEND DIAMETERS, WHILE STIRRUPS AND TIES SHALL HAVE MINIMUM HOOK DIMENSIONS. ALL HOOKS SHALL BE IN ACCORDANCE WITH THE STRUCTURAL STANDARD DRAWINGS SS12-1 UNLESS INDICATED OTHERWISE.
- GLASS FIBRE REINFORCED POLYMER (GFRP)
GLASS FIBRE REINFORCED POLYMER (GFRP) REINFORCING BARS SHALL BE GRADE I, GRADE II OR GRADE III AS SPECIFIED IN THE CONTRACT DOCUMENTS.
THE NOMINAL DIAMETER, TENSILE MODULUS OF ELASTICITY AND GUARANTEED MINIMUM TENSILE STRENGTH SHALL BE AS SPECIFIED IN THE CONTRACT DOCUMENTS.
BAR MARKS WITH THE PREFIX GI DENOTE GRADE I GFRP BARS, BAR MARKS WITH THE PREFIX GII DENOTE GRADE II GFRP BARS AND BAR MARKS WITH THE PREFIX GIII DENOTE GRADE III GFRP BARS.
- ROADWAY CLASSIFICATION: UFD 120.
- PROTECTION SYSTEM SHALL CONFORM TO PERFORMANCE LEVEL 2.
- ALL DIMENSIONS ARE IN MILLIMETERS ALL ELEVATIONS ARE IN METERS UNLESS OTHERWISE SHOWN.

CONSTRUCTION NOTES:

- THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS, DETAILS AND ELEVATIONS OF EXISTING STRUCTURE THAT ARE RELEVANT TO THE WORK SHOWN ON THE DRAWINGS PRIOR TO COMMENCEMENT OF WORK. ANY DISCREPANCIES SHALL BE REPORTED TO THE ENGINEER AND THE PROPOSED ADJUSTMENT OF THE WORK REQUIRED TO MATCH THE EXISTING STRUCTURE SHALL BE SUBMITTED FOR APPROVAL.
- THE CONTRACTOR SHALL ESTABLISH THE BEARING SEAT ELEVATIONS BY DEDUCTING THE ACTUAL BEARING THICKNESSES FROM THE TOP OF BEARING ELEVATIONS. IF THE ACTUAL BEARING THICKNESSES ARE DIFFERENT FROM THOSE GIVEN WITH THE BEARING DESIGN DATA, THE CONTRACTOR SHALL ADJUST THE REINFORCING STEEL TO SUIT.
- BACKFILL SHALL NOT BE PLACED BEHIND THE SUPERSTRUCTURE UNTIL THE DECK DIAPHRAGM IS IN PLACE AND HAS REACHED 70% OF ITS DESIGN STRENGTH.
- BACKFILL SHALL BE PLACED SIMULTANEOUSLY BEHIND BOTH END OF SUPERSTRUCTURE KEEPING THE HEIGHT OF BACKFILL APPROXIMATELY THE SAME. AT NO TIME SHALL THE DIFFERENCE IN ELEVATION BE GREATER THAN 500mm.

RETAINED SOIL SYSTEM:

RETAINED SOIL SYSTEM WALLS SHALL HAVE THE FOLLOWING ATTRIBUTES:

APPLICATION: WALL/SLOPE
PERFORMANCE: HIGH
APPEARANCE: HIGH

APPLICABLE STANDARD DRAWINGS:

- OPSD 3101.150 WALLS - ABUTMENT, BACKFILL MINIMUM GRANULAR REQUIREMENTS
OPSD 3370.100 DECK, WATERPROOFING HOT APPLIED ASPHALT MEMBRANE WITH PROTECTION BOARD
OPSD 3370.101 DECK, WATERPROOFING HOT APPLIED ASPHALT MEMBRANE AT ACTIVE CRACKS GREATER THAN 2mm WIDE AND CONSTRUCTION JOINTS
OPSD 3941.200 FIGURES IN CONCRETE - SITE NUMBER AND DATE LAYOUT

LIST OF ABBREVIATIONS:

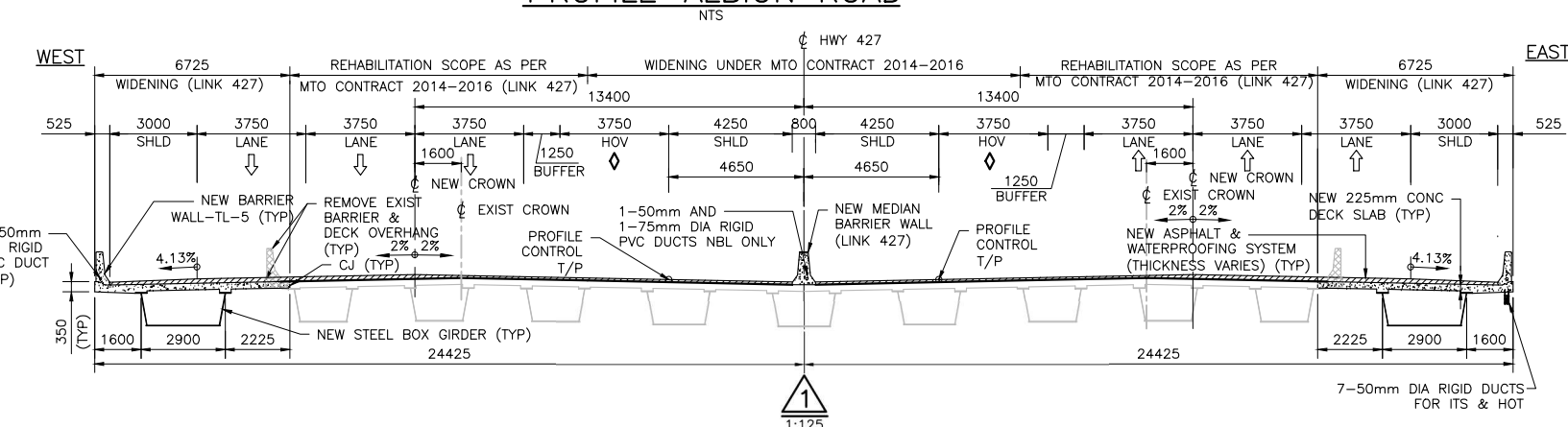
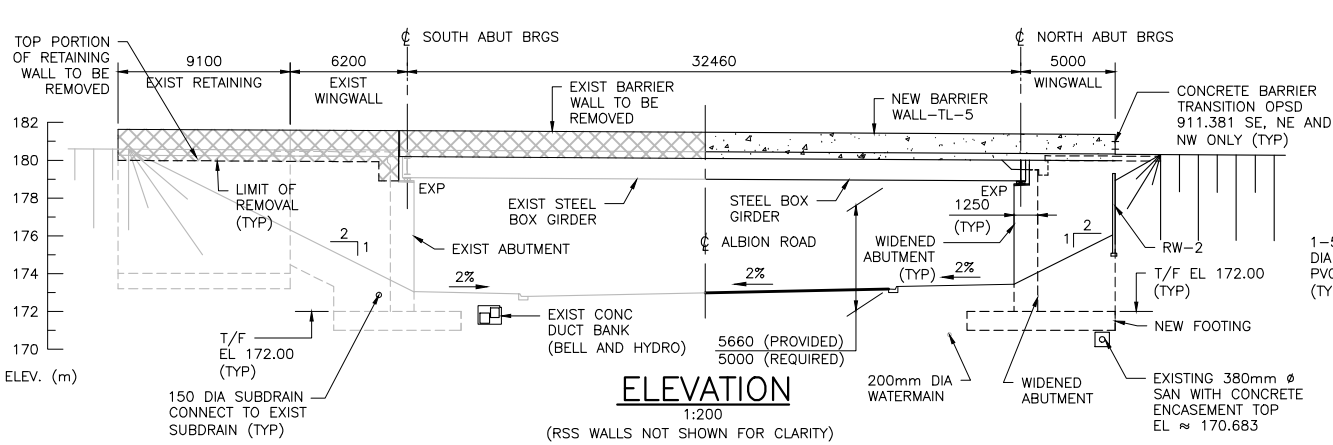
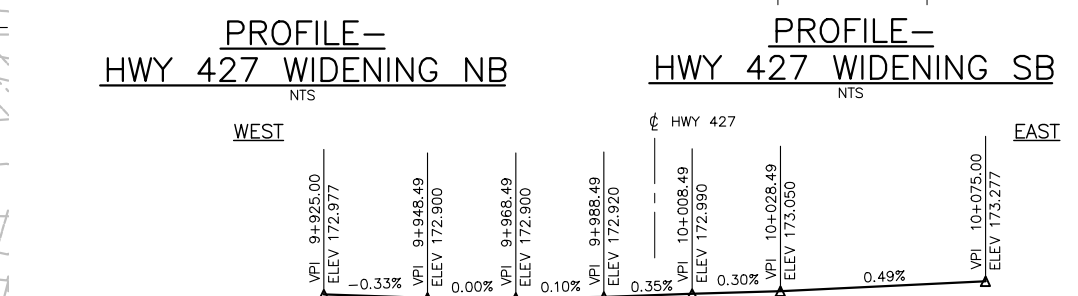
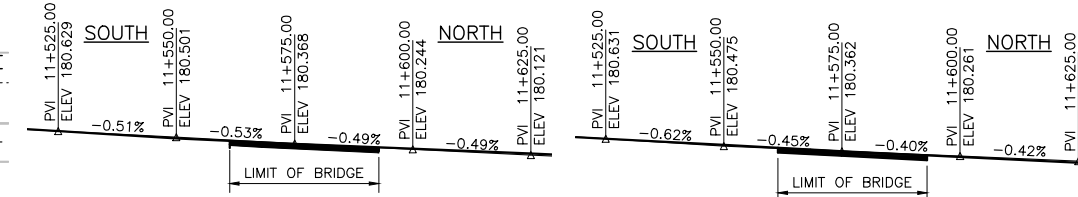
- HOV HIGH OCCUPANCY VEHICLE LANE
PVI POINT OF VERTICAL INTERSECTION
T/F TOP OF FOOTING
WP WORKING POINT

LIST OF DRAWINGS:

- 700 GENERAL ARRANGEMENT
701 BOREHOLE LOCATION AND SOIL STRATA I
702 BOREHOLE LOCATION AND SOIL STRATA II
703 CONSTRUCTION STAGING
704 FOUNDATION LAYOUT AND DETAILS
705 REMOVALS
706 ABUTMENTS
707 WINGWALLS
708 RETAINED SOIL SYSTEM WALLS
709 BEARINGS
710 STRUCTURAL STEEL I
711 STRUCTURAL STEEL II
712 STRUCTURAL STEEL III
713 DECK DETAILS I
714 DECK DETAILS II
715 DECK DETAILS III
716 EXTERIOR BARRIER WALL
717 INTERIOR BARRIER WALL
718 6000mm APPROACH SLAB I
719 6000mm APPROACH SLAB II
720 STANDARD DETAILS
721 ELECTRICAL EMBEDDED WORK

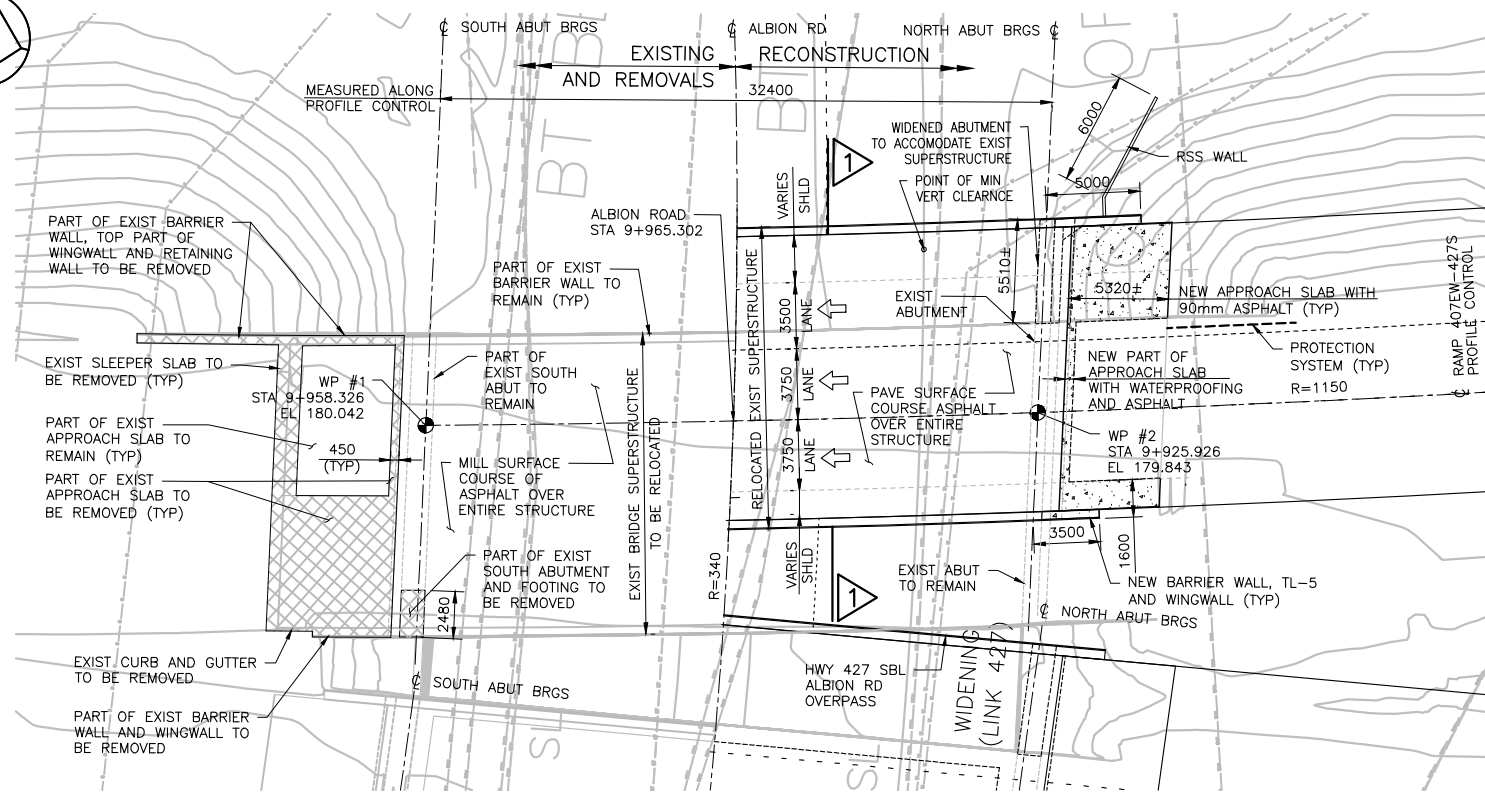
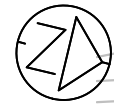
LEGEND:

- REMOVALS
NEW CONCRETE
NEW ASPHALT

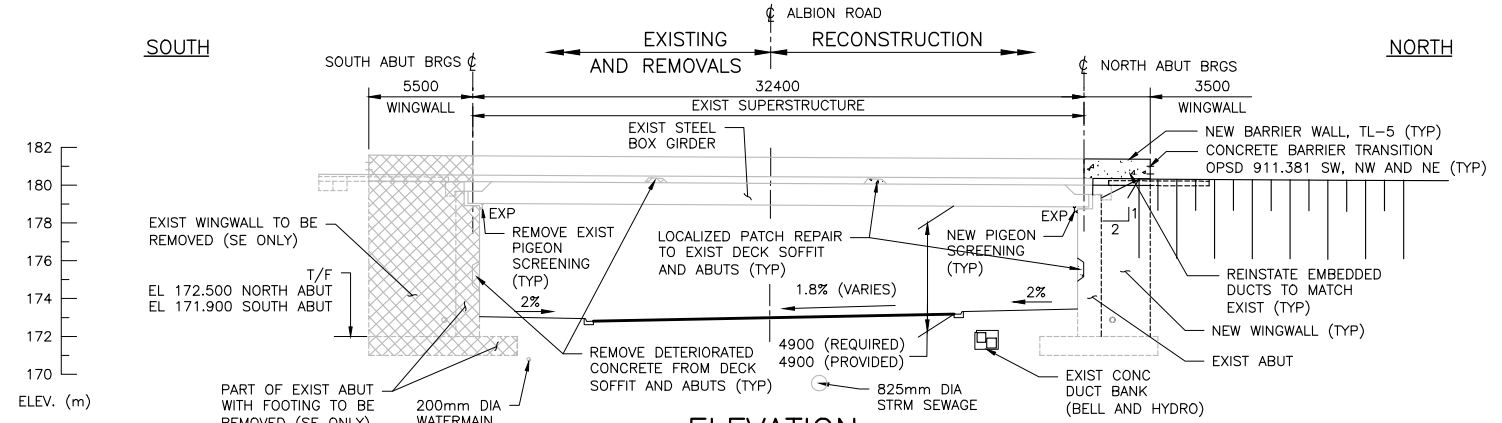


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DATE PLOTTED: 3/19/2018 3:48:47 PM BY:

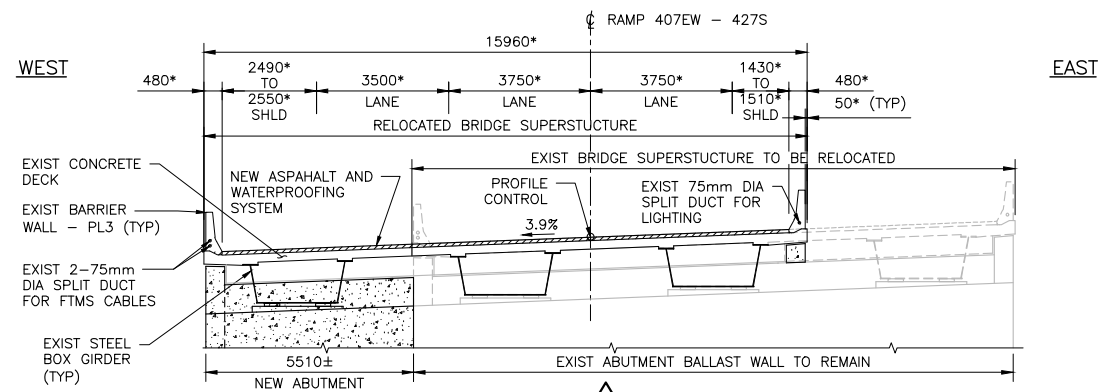
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B	18/03/16	90% SUBMISSION TO CA				PROJECT ID.	H427-D
A	18/01/12	90% SUBMISSION TO CA				STAGE IDENTIFIER	N
						DESIGN PACKAGE NUMBER	9
						DISCIPLINE	STR
						STRUCTURE NUMBER	B05
						DOCUMENT TYPE	DWG
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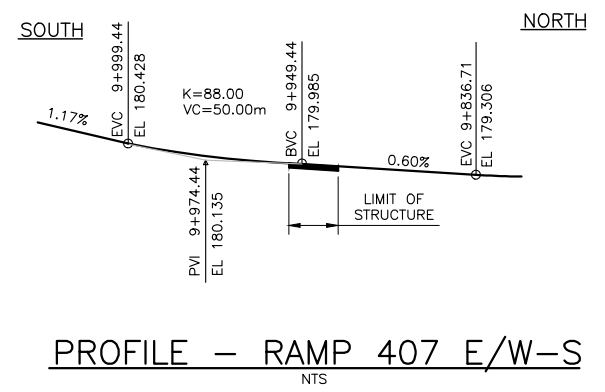
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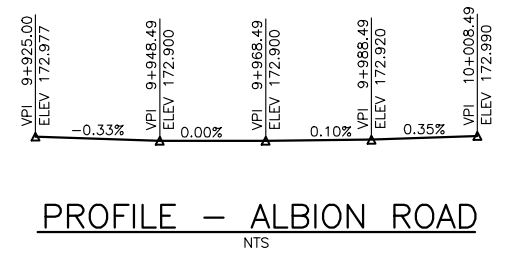
ELEVATION
1:200



ELEVATION
1:100 * DIMENSIONS ARE PERPENDICULAR TO C PROFILE CONTROL



PROFILE - RAMP 407 E/W-S
NTS



PROFILE - ALBION ROAD
NTS

LIST OF DRAWINGS:

- 800 GENERAL ARRANGEMENT
- 801 BOREHOLE LOCATION AND SOIL STRATA
- 802 CONSTRUCTION STAGING
- 803 FOUNDATION LAYOUT AND DETAILS
- 804 REMOVALS
- 805 ABUTMENTS
- 806 WINGWALLS
- 807 RETAINED SOIL SYSTEM WALLS
- 808 JACKING DETAILS
- 809 BARRIER WALL WITHOUT RAILING
- 810 6000mm APPROACH SLAB
- 811 STANDARD DETAILS
- 812 ELECTRICAL EMBEDDED WORK

GENERAL NOTES:

1. DESIGN STANDARDS AND CODES:
 - SCHEDULE 15-1 AND SCHEDULE 15-2: PROJECT AGREEMENT
 - DESIGN CODE: CAN/CSA-S6-14
 - MINISTRY OF TRANSPORTATION OF ONTARIO STRUCTURAL MANUAL
 - ONTARIO PROVINCIAL STANDARD SPECIFICATIONS (OPSS)
2. LIVE LOAD: CL-625-ONT.
3. CLASS OF CONCRETE

MASS CONCRETE	20 MPa
REMAINDER	30 MPa
4. CLEAR COVER TO REINFORCING STEEL

FOOTINGS	100±25
DECK	70±20
TOP	70±20
BOTTOM	40±10
REMAINDER UNLESS OTHERWISE NOTED	70±20
5. REINFORCING STEEL
REINFORCING STEEL SHALL BE GRADE 400W UNLESS OTHERWISE SPECIFIED.
BAR MARKS WITH PREFIX 'S' DENOTE STAINLESS STEEL BARS.
STAINLESS REINFORCING STEEL SHALL BE TYPE 316 LN OR DUPLEX 2205 AND HAVE A MINIMUM YIELD STRENGTH OF 500 MPa, UNLESS OTHERWISE SPECIFIED. UNLESS SHOWN OTHERWISE, TENSION LAP SPLICES SHALL BE CLASS B.
BAR HOOKS SHALL HAVE STANDARD HOOK DIMENSIONS USING MINIMUM BEND DIAMETERS, WHILE STIRRUPS AND TIES SHALL HAVE MINIMUM HOOK DIMENSIONS. ALL HOOKS SHALL BE IN ACCORDANCE WITH THE STRUCTURAL STANDARD DRAWINGS SS12-1 UNLESS INDICATED OTHERWISE.
6. GLASS FIBRE REINFORCED POLYMER (GFRP)
GLASS FIBRE REINFORCED POLYMER (GFRP) REINFORCING BARS SHALL BE GRADE I, GRADE II OR GRADE III AS SPECIFIED IN THE CONTRACT DOCUMENTS.
THE NOMINAL DIAMETER, TENSILE MODULUS OF ELASTICITY AND GUARANTEED MINIMUM TENSILE STRENGTH SHALL BE AS SPECIFIED IN THE CONTRACT DOCUMENTS.
BAR MARKS WITH THE PREFIX GI DENOTE GRADE I GFRP BARS, BAR MARKS WITH THE PREFIX GII DENOTE GRADE II GFRP BARS AND BAR MARKS WITH THE PREFIX GIII DENOTE GRADE III GFRP BARS.
7. ROADWAY CLASSIFICATION: RAMP 80
8. PROTECTION SYSTEM SHALL CONFORM TO PERFORMANCE LEVEL 2.
9. ALL DIMENSIONS ARE IN MILLIMETERS ALL ELEVATIONS ARE IN METERS UNLESS OTHERWISE SHOWN.

CONSTRUCTION NOTES:

1. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS, DETAILS AND ELEVATIONS OF EXIST STRUCTURE THAT ARE RELEVANT TO THE WORK SHOWN ON THE DRAWINGS PRIOR TO COMMENCEMENT OF WORK. ANY DISCREPANCIES SHALL BE REPORTED TO THE CONTRACT ADMINISTRATOR AND THE PROPOSED ADJUSTMENT OF THE WORK REQUIRED TO MATCH THE EXIST STRUCTURE SHALL BE SUBMITTED FOR APPROVAL.
2. THE CONTRACTOR SHALL ESTABLISH THE BEARING SEAT ELEVATIONS BY DEDUCTING THE ACTUAL BEARING THICKNESSES FROM THE TOP OF BEARING ELEVATIONS. IF THE ACTUAL BEARING THICKNESSES ARE DIFFERENT FROM THOSE GIVEN WITH THE BEARING DESIGN DATA, THE CONTRACTOR SHALL ADJUST THE REINFORCING STEEL TO SUIT.

RETAINED SOIL SYSTEM:

RETAINED SOIL SYSTEM WALLS SHALL HAVE THE FOLLOWING ATTRIBUTES:
APPLICATION: WALL/SLOPE
PERFORMANCE: HIGH
APPEARANCE: HIGH

APPLICABLE STANDARD DRAWINGS:

- OPSD 3101.150 WALLS - ABUTMENT, BACKFILL MINIMUM GRANULAR REQUIREMENTS
- OPSD 3370.100 DECK, WATERPROOFING HOT APPLIED ASPHALT MEMBRANE WITH PROTECTION BOARD
- OPSD 3370.101 DECK, WATERPROOFING HOT APPLIED ASPHALT MEMBRANE AT ACTIVE CRACKS GREATER THAN 2mm WIDE AND CONSTRUCTION JOINTS
- OPSD 3941.200 FIGURES IN CONCRETE - SITE NUMBER AND DATE LAYOUT

LIST OF ABBREVIATIONS:

- PVI POINT OF VERTICAL INTERSECTION
- T/F TOP OF FOOTING
- WP WORKING POINT

LEGEND:

- REMOVALS
- NEW CONCRETE
- NEW ASPHALT

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DATE PLOTTED: 3/20/2018 10:19:13 AM BY: PANG, FEI

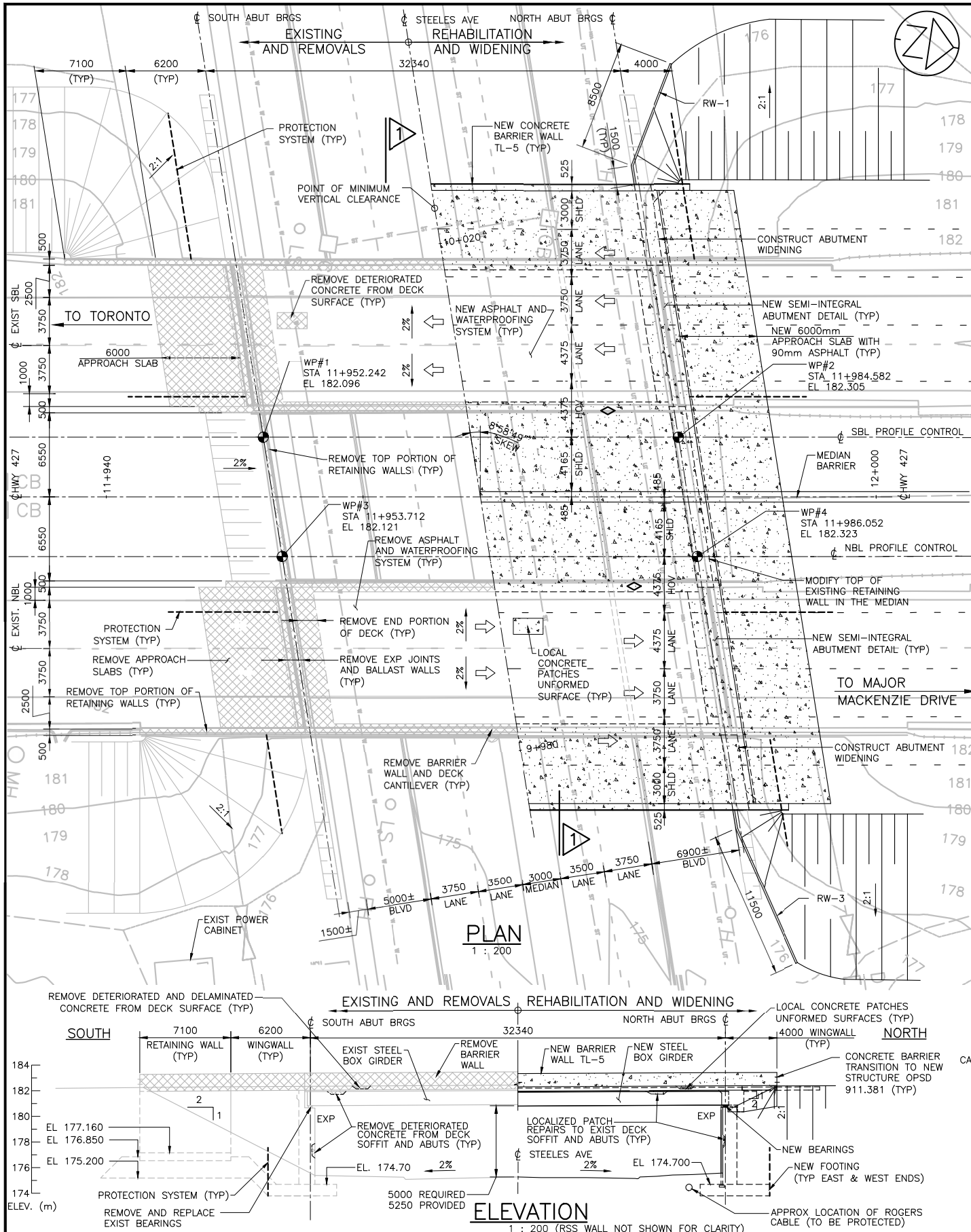
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B 18/03/16	90% SUBMISSION TO CA				
A 18/01/12	90% SUBMISSION TO CA				

SCALE :
AS NOTED

DESIGNED	NIMA MAHMOUDI
DRAWN	FEI PANG
CHECKED	SUBOOHI OBAID
APPROVED LEAD ENG.	TATIANA GJALA
APPROVED PROJ. MANAGER	



HWY 427 EXPANSION HWY 427 RAMP 407EW-427S REHABILITATION R2 SITE 37-1115 GENERAL ARRANGEMENT							
PROJECT ID.	STAGE IDENTIFIER	DESIGN PACKAGE NUMBER	DISCIPLINE	STRUCTURE NUMBER	DOCUMENT TYPE	DRAWING NUMBER	REVISION NUMBER
H427-D	N	9	STR	B06	DWG	800	B



GENERAL NOTES:

- DESIGN STANDARDS AND CODES:
 - SCHEDULE 15-1 AND SCHEDULE 15-2: PROJECT AGREEMENT
 - DESIGN CODE: CAN/CSA-S6-14
 - MINISTRY OF TRANSPORTATION OF ONTARIO STRUCTURAL MANUAL
 - MINISTRY OF TRANSPORTATION OF ONTARIO STRUCTURE REHABILITATION MANUAL
 - ONTARIO PROVINCIAL STANDARD SPECIFICATIONS (OPSS)
- LIVE LOAD: CL-625-ONT.
- CLASS OF CONCRETE

MASS CONCRETE	20 MPa
REMAINDER	30 MPa
- CLEAR COVER TO REINFORCING STEEL

FOOTINGS	100 ± 25
DECK	70 ± 20
REMAINDER UNLESS OTHERWISE NOTED	40 ± 10
	70 ± 20
- REINFORCING STEEL

REINFORCING STEEL SHALL BE GRADE 400W UNLESS OTHERWISE SPECIFIED.

BAR MARKS WITH PREFIX 'S' DENOTE STAINLESS STEEL BARS.

STAINLESS REINFORCING STEEL SHALL BE TYPE 316LN OR DUPLEX 2205 AND HAVE A MINIMUM YIELD STRENGTH OF 500 MPa, UNLESS OTHERWISE SPECIFIED. UNLESS SHOWN OTHERWISE, TENSION LAP SPLICES SHALL BE CLASS B.

BAR HOOKS SHALL HAVE STANDARD HOOK DIMENSIONS USING MINIMUM BEND DIAMETERS, WHILE STIRRUPS AND TIES SHALL HAVE MINIMUM HOOK DIMENSIONS. ALL HOOKS SHALL BE IN ACCORDANCE WITH THE STRUCTURAL STANDARD DRAWINGS SS12-1 UNLESS INDICATED OTHERWISE.
- GLASS FIBRE REINFORCED POLYMER (GFRP)

GLASS FIBRE REINFORCED POLYMER (GFRP) REINFORCING BARS SHALL BE GRADE III AS SPECIFIED IN THE CONTRACT DOCUMENTS.

THE NOMINAL DIAMETER, TENSILE MODULUS OF ELASTICITY AND GUARANTEED MINIMUM TENSILE STRENGTH SHALL BE AS SPECIFIED IN THE CONTRACT DOCUMENTS.

BAR MARKS WITH THE PREFIX 'GIII' DENOTE GRADE III GFRP BARS.
- ROADWAY CLASSIFICATION: UFD 120.
- PROTECTION SYSTEM SHALL CONFORM TO PERFORMANCE LEVEL 2.
- ALL DIMENSIONS ARE IN MILLIMETERS ALL ELEVATIONS ARE IN METERS UNLESS OTHERWISE SHOWN.

CONSTRUCTION NOTES:

- THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS, DETAILS AND ELEVATIONS OF EXISTING STRUCTURE THAT ARE RELEVANT TO THE WORK SHOWN ON THE DRAWINGS PRIOR TO COMMENCEMENT OF WORK. ANY DISCREPANCIES SHALL BE REPORTED TO THE ENGINEER AND THE PROPOSED ADJUSTMENT OF THE WORK REQUIRED TO MATCH THE EXISTING STRUCTURE SHALL BE SUBMITTED FOR APPROVAL.
- THE CONTRACTOR SHALL ESTABLISH THE BEARING SEAT ELEVATIONS BY DEDUCTING THE ACTUAL BEARING THICKNESSES FROM THE TOP OF BEARING ELEVATIONS. IF THE ACTUAL BEARING THICKNESSES ARE DIFFERENT FROM THOSE GIVEN WITH THE BEARING DESIGN DATA, THE CONTRACTOR SHALL ADJUST THE REINFORCING STEEL TO SUIT.
- BACKFILL SHALL NOT BE PLACED BEHIND THE SUPERSTRUCTURE UNTIL THE DECK DIAPHRAGM IS IN PLACE AND HAS REACHED 70% OF ITS DESIGN STRENGTH.
- BACKFILL SHALL BE PLACED SIMULTANEOUSLY BEHIND BOTH END OF SUPERSTRUCTURE KEEPING THE HEIGHT OF BACKFILL APPROXIMATELY THE SAME. AT NO TIME SHALL THE DIFFERENCE IN ELEVATION BE GREATER THAN 500mm.

RETAINED SOIL SYSTEM:

RETAINED SOIL WALLS SHALL HAVE THE FOLLOWING ATTRIBUTES:

APPLICATION: WALL/SLOPE
 PERFORMANCE: HIGH
 APPEARANCE: HIGH

LEGEND:



APPLICABLE STANDARD DRAWINGS:

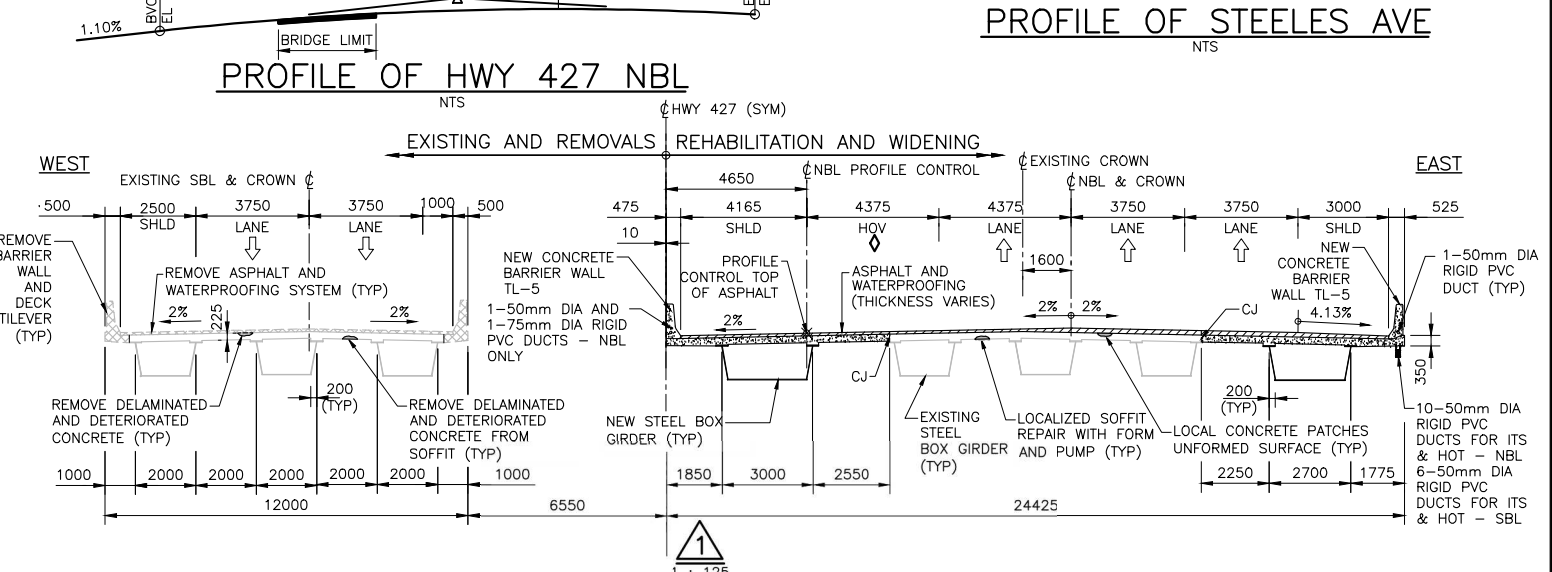
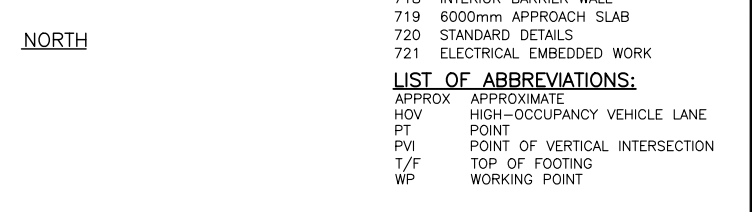
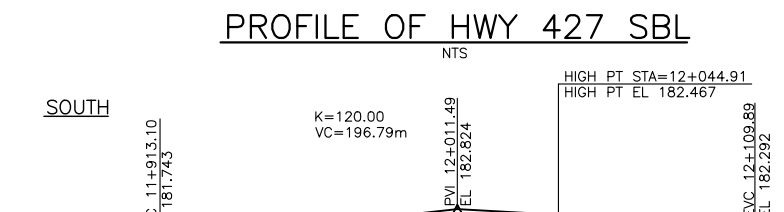
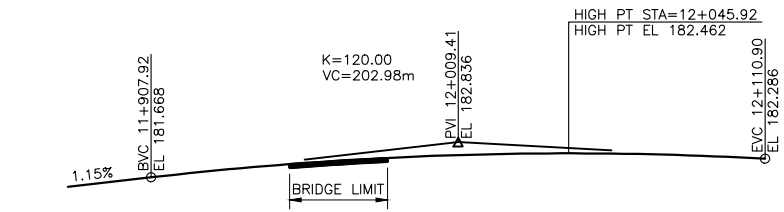
- OPSD 3101.150 WALLS - ABUTMENT, BACKFILL MINIMUM GRANULAR REQUIREMENTS
- OPSD 3370.100 DECK, WATERPROOFING HOT APPLIED ASPHALT MEMBRANE WITH PROTECTION BOARD
- OPSD 3370.101 DECK, WATERPROOFING HOT APPLIED ASPHALT MEMBRANE AT ACTIVE CRACKS GREATER THAN 2mm WIDE AND CONSTRUCTION JOINTS
- OPSD 3941.200 FIGURES IN CONCRETE - SITE NUMBER AND DATE LAYOUT

LIST OF DRAWINGS:

- 700 GENERAL ARRANGEMENT
- 701 BOREHOLE LOCATION AND SOIL STRATA I
- 702 BOREHOLE LOCATION AND SOIL STRATA II
- 703 CONSTRUCTION STAGING
- 704 FOUNDATION LAYOUT AND DETAILS
- 705 REMOVALS
- 706 ABUTMENTS
- 707 WINGWALLS
- 708 RETAINED SOIL SYSTEM WALLS
- 709 BEARINGS
- 710 STRUCTURAL STEEL I
- 711 STRUCTURAL STEEL II
- 712 STRUCTURAL STEEL III
- 713 STRUCTURAL STEEL IV
- 714 DECK DETAILS I
- 715 DECK DETAILS II
- 716 DECK DETAILS III
- 717 EXTERIOR BARRIER WALL
- 718 INTERIOR BARRIER WALL
- 719 6000mm APPROACH SLAB
- 720 STANDARD DETAILS
- 721 ELECTRICAL EMBEDDED WORK

LIST OF ABBREVIATIONS:

- APPROX APPROXIMATE
- HOV HIGH-OCCUPANCY VEHICLE LANE
- PT POINT
- PVI POINT OF VERTICAL INTERSECTION
- T/F TOP OF FOOTING
- WP WORKING POINT



DATE	REVISIONS	BY	CHK	LEAD DISC.	PROJ. MAN.
C 18/03/16	90% SUBMISSION TO CA				
B 18/01/09	90% SUBMISSION TO CA				
A 17/10/31	90% SUBMISSION TO CA				

SCALE :

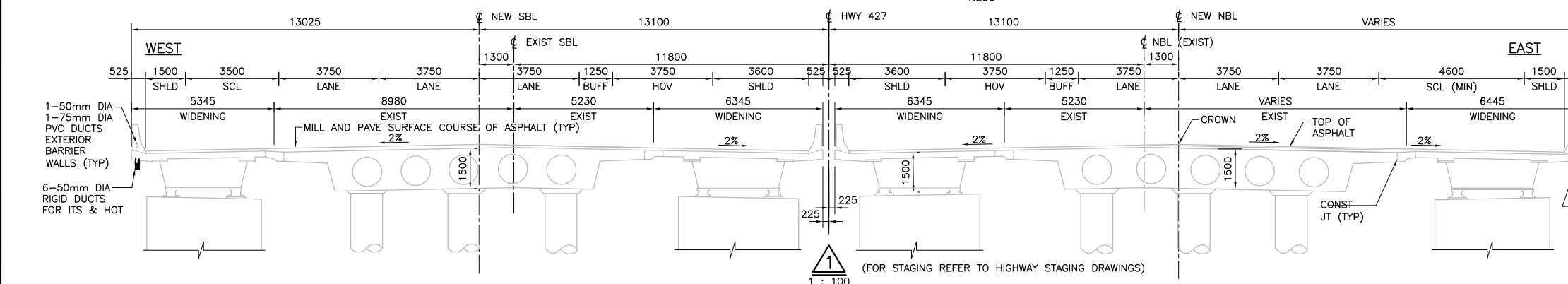
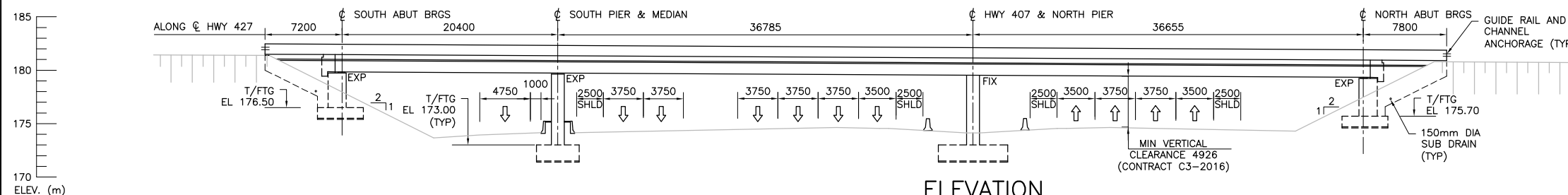
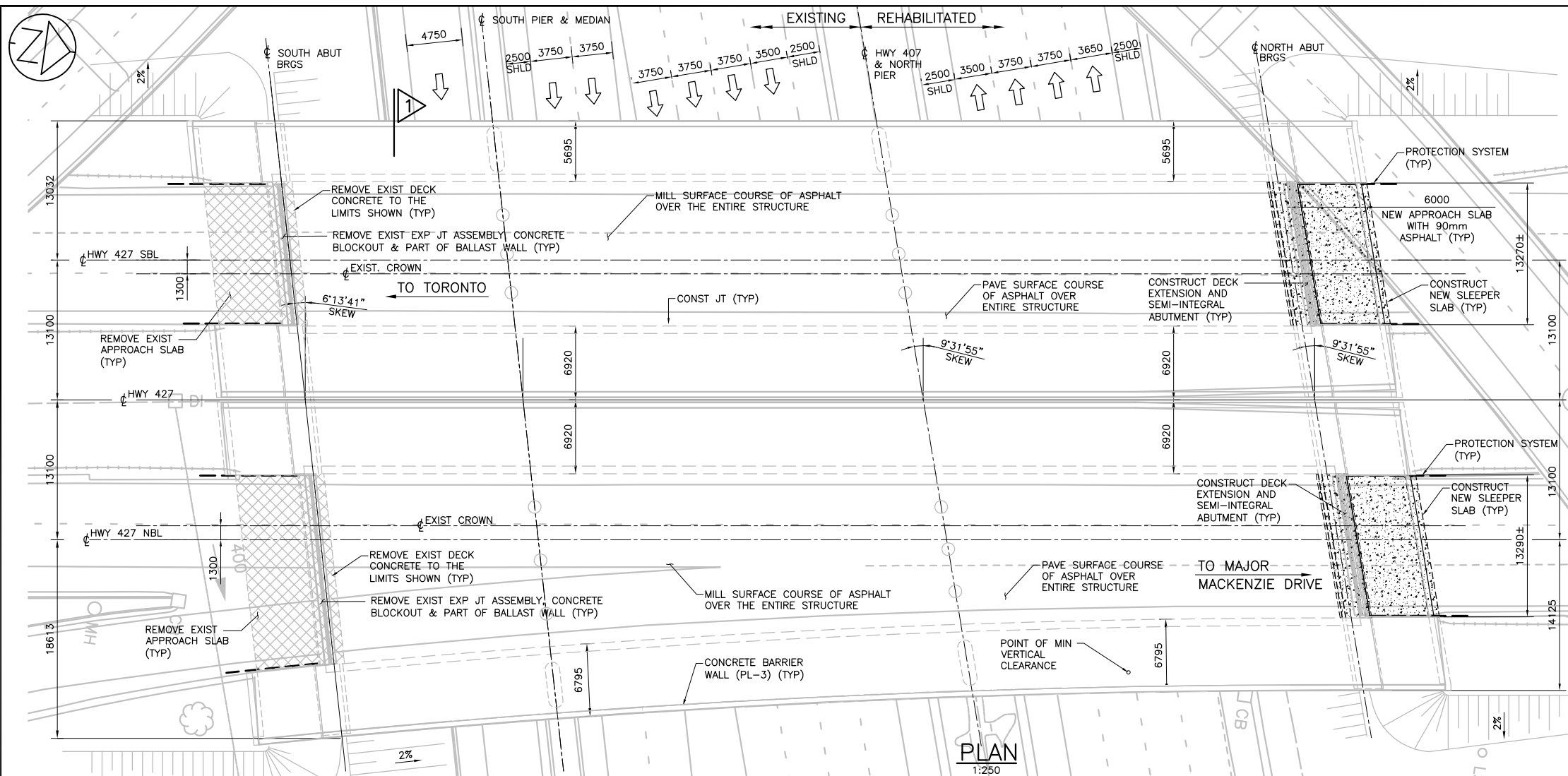
AS NOTED

DESIGNED	SUBOOH OMBD
DRAWN	SOPHA MILLS
CHECKED	NIMA MAHMOUDI
APPROVED LEAD ENG.	TATIANA GJALA
APPROVED PROJ. MANAGER	



TITLE						
HWY 427 EXPANSION						
HWY 427 / STEELES AVE OVERPASS NBL & SBL						
REHABILITATION AND WIDENING R1						
SITE 37-1111						
GENERAL ARRANGEMENT						
PROJECT ID.	STAGE IDENTIFIER	DESIGN PACKAGE NUMBER	DISCIPLINE	STRUCTURE NUMBER	DOCUMENT TYPE	DRAWING NUMBER
H427-D	N	9A	STR	B07	DWG	700
REVISION NUMBER	DATE	DESCRIPTION	BY	CHK	LEAD DISC.	PROJ. MAN.

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 DATE PLOTTED: 3/19/2018 1:40:02 PM BY: PANG, FEI



- GENERAL NOTES:**
- DESIGN STANDARDS AND CODES:
 - SCHEDULE 15-1 AND SCHEDULE 15-2: PROJECT AGREEMENT
 - DESIGN CODE: CAN/CSA-S6-14
 - MINISTRY OF TRANSPORTATION OF ONTARIO STRUCTURAL MANUAL
 - MINISTRY OF TRANSPORTATION OF ONTARIO STRUCTURE REHABILITATION MANUAL
 - ONTARIO PROVINCIAL STANDARD SPECIFICATIONS (OPSS)
 - LIVE LOAD: CL-625-ONT.
 - CLASS OF CONCRETE: 30 MPa
 - CLEAR COVER TO REINFORCING STEEL:

DECK	TOP	70±20
	BOTTOM	40±10
REMAINDER UNLESS OTHERWISE NOTED		70±20
 - REINFORCING STEEL:

REINFORCING STEEL SHALL BE GRADE 400W UNLESS OTHERWISE SPECIFIED.

BAR MARKS WITH PREFIX 'S' DENOTE STAINLESS STEEL BARS.

STAINLESS REINFORCING STEEL SHALL BE TYPE 316 LN OR DUPLEX 2205 AND HAVE A MINIMUM YIELD STRENGTH OF 500 MPa, UNLESS OTHERWISE SPECIFIED.

UNLESS SHOWN OTHERWISE, TENSION LAP SPLICES SHALL BE CLASS B.

BAR HOOKS SHALL HAVE STANDARD HOOK DIMENSIONS USING MINIMUM BEND DIAMETERS, WHILE STIRRUPS AND TIES SHALL HAVE MINIMUM HOOK DIMENSIONS. ALL HOOKS SHALL BE IN ACCORDANCE WITH THE STRUCTURAL STANDARD DRAWINGS SS12-1 UNLESS INDICATED OTHERWISE.
 - ROADWAY CLASSIFICATION: UFD 120.
 - PROTECTION SYSTEM SHALL CONFORM TO PERFORMANCE LEVEL 2.
 - ALL DIMENSIONS ARE IN MILLIMETERS ALL ELEVATIONS ARE IN METERS UNLESS OTHERWISE SHOWN.

- CONSTRUCTION NOTES:**
- SAWCUTS IN CONCRETE, WHERE DESIGNATED, SHALL BE 25mm DEEP OR TO THE FIRST LAYER OF REINFORCING STEEL, WHICHEVER IS LESS.
 - EXISTING REINFORCING STEEL WHICH IS EXPOSED DURING CONCRETE REMOVALS AND WHICH IS TO REMAIN SHALL BE ABRASIVE BLAST CLEANED.
 - THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS OF THE WORK AND ALL DETAILS ON SITE AND REPORT ANY DISCREPANCIES TO THE ENGINEER BEFORE PROCEEDING WITH THE WORK. THE CONTRACTOR SHALL ADJUST DIMENSIONS OF THE WORK AS REQUIRED TO SUIT EXISTING CONDITIONS.
 - BACKFILL SHALL BE PLACED SIMULTANEOUSLY BEHIND BOTH END OF SUPERSTRUCTURE KEEPING THE HEIGHT OF BACKFILL APPROXIMATELY THE SAME. AT NO TIME SHALL THE DIFFERENCE IN ELEVATION BE GREATER THAN 500mm.
 - ALL EXPOSED EDGES TO RECEIVE A 20x20 CHAMFER.

- APPLICABLE STANDARD DRAWINGS:**
- OPSD 3101.150 WALLS - ABUTMENT, BACKFILL MINIMUM GRANULAR REQUIREMENTS
 - OPSD 3370.100 DECK, WATERPROOFING HOT APPLIED ASPHALT MEMBRANE WITH PROTECTION BOARD
 - OPSD 3370.101 DECK, WATERPROOFING HOT APPLIED ASPHALT MEMBRANE AT ACTIVE CRACKS GREATER THAN 2mm WIDE AND CONSTRUCTION JOINTS

- LIST OF ABBREVIATIONS:**
- WP WORKING POINT
- LEGEND:**
- REMOVALS
 - NEW CONCRETE

- LIST OF DRAWINGS:**
- 800 GENERAL ARRANGEMENT
 - 801 CONSTRUCTION STAGING
 - 802 REMOVALS
 - 803 NEW CONSTRUCTION I
 - 804 NEW CONSTRUCTION II
 - 805 6000mm APPROACH SLAB
 - 806 EXPANSION JOINT AND SLEEPER SLAB
 - 807 STRIP SEAL EXPANSION JOINT FOR SLEEPER SLAB
 - 808 STANDARD DETAILS

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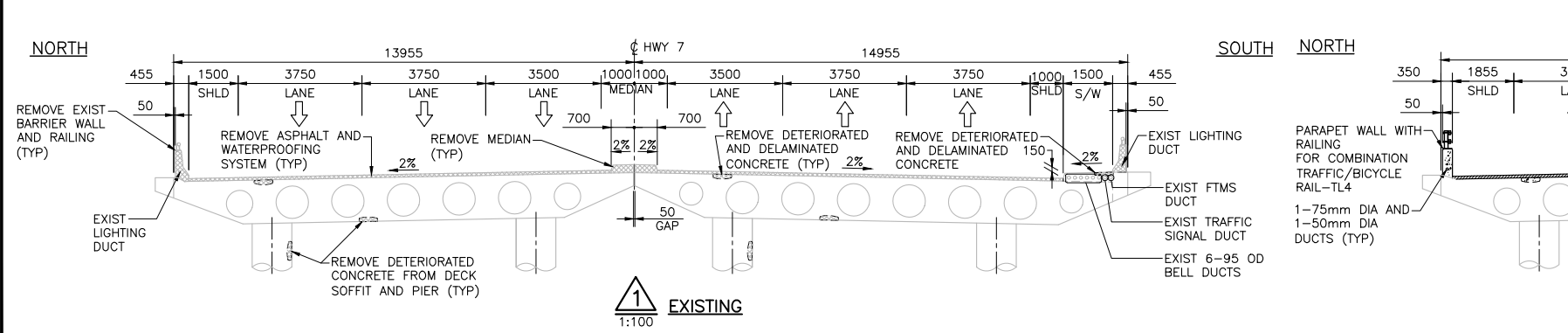
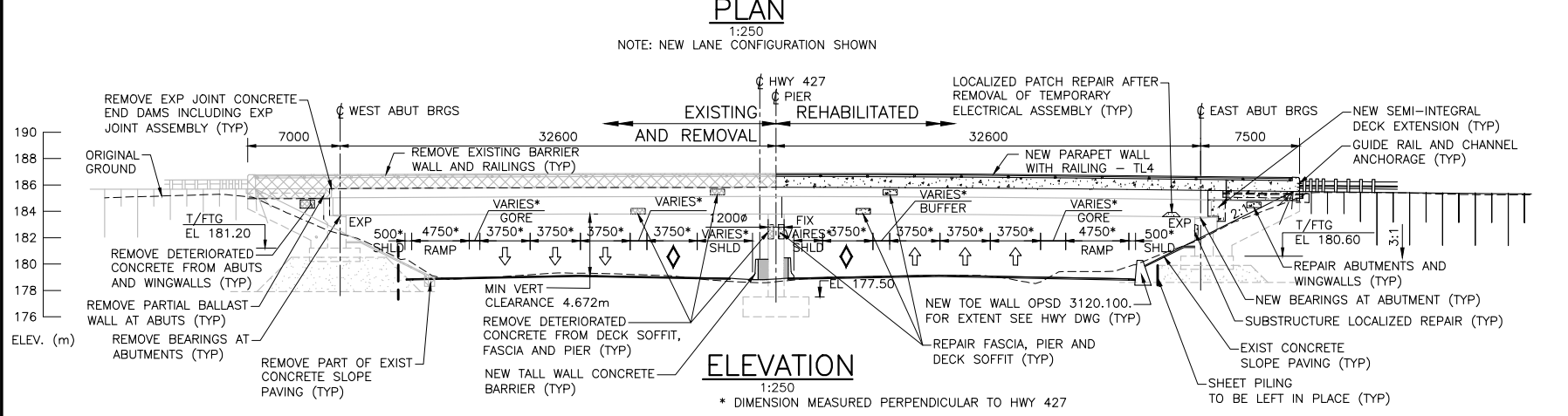
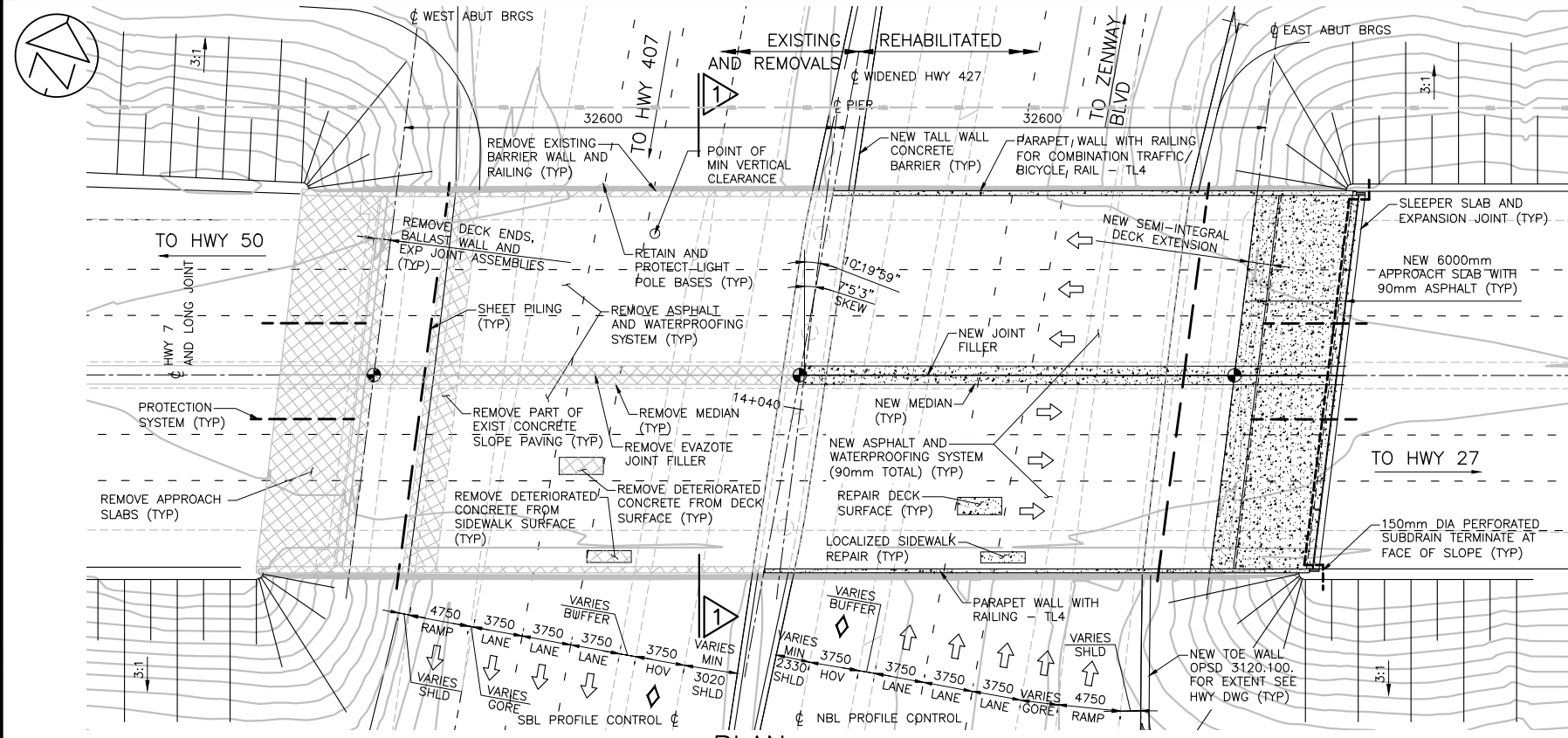
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C	18/03/16	90% SUBMISSION TO CA			
B	18/01/09	90% SUBMISSION TO CA			
A	17/10/31	90% SUBMISSION TO CA			

SCALE :
AS NOTED

DESIGNED	ANDREW HACHBORN	
DRAWN	ELENA TSENIER	
CHECKED	TATIANA QJALA	
APPROVED LEAD ENG.	TATIANA QJALA	
APPROVED PROJ. MANAGER		
NAME (PRINT)	INT.	DATE



TITLE HWY 427 EXPANSION HWY 427 NBL & SBL @ HWY 407 OVERPASSES REHABILITATION R1 SITE 37-1167/8 GENERAL ARRANGEMENT							
PROJECT ID.	STAGE IDENTIFIER	DESIGN PACKAGE NUMBER	DISCIPLINE	STRUCTURE NUMBER	DOCUMENT TYPE	DRAWING NUMBER	REVISION NUMBER
H427-D	N	9A	STR	B08	DWG	800	C



LIST OF DRAWINGS:

- 900 GENERAL ARRANGEMENT
- 901 CONSTRUCTION STAGING
- 902 JACKING DETAILS
- 903 REMOVALS I
- 904 REMOVALS II
- 905 NEW CONSTRUCTION I
- 906 NEW CONSTRUCTION II
- 907 NEW CONSTRUCTION III
- 908 NEW CONSTRUCTION IV
- 909 BEARINGS
- 910 PARAPET WALL WITH RAILING ON SIDEWALK, TL-4
- 911 PARAPET WALL FOR COMBINATION TRAFFIC/BICYCLE RAIL, TL-4
- 912 RAILING FOR PARAPET WALL
- 913 RAILING ON PARAPET WALL FOR COMBINATION TRAFFIC/BICYCLE
- 914 600mm APPROACH SLAB
- 915 EXPANSION JOINT AND SLEEPER SLAB STRIP SEAL EXPANSION JOINT FOR SLEEPER SLAB
- 917 DETAILS OF CONCRETE SLOPE PAVING
- 918 STANDARD DETAILS
- 919 ELECTRICAL EMBEDDED WORKS

LIST OF ABBREVIATIONS:

- LONG LONGITUDINAL
- T/FTG TOP OF FOOTING
- HOV HIGH OCCUPANCY VEHICLE

LEGEND:

- REMOVALS
- NEW CONCRETE
- NEW ASPHALT

GENERAL NOTES:

1. DESIGN STANDARDS AND CODES:
 - SCHEDULE 15-1 AND SCHEDULE 15-2: PROJECT AGREEMENT
 - DESIGN CODE: CAN/CSA-S6-14
 - MINISTRY OF TRANSPORTATION OF ONTARIO STRUCTURAL MANUAL
 - MINISTRY OF TRANSPORTATION OF ONTARIO STRUCTURE REHABILITATION MANUAL
 - ONTARIO PROVINCIAL STANDARD SPECIFICATIONS (OPSS)
2. LIVE LOAD: CL-625-0NT.
3. CLASS OF CONCRETE 30 MPa.
4. CLEAR COVER TO REINFORCING STEEL

DECK	TOP	70 ± 20
	BOTTOM	40 ± 10
REMAINDER UNLESS OTHERWISE NOTED 70 ± 20		
5. REINFORCING STEEL

REINFORCING STEEL SHALL BE GRADE 400W UNLESS OTHERWISE SPECIFIED.

BAR MARKS WITH PREFIX 'S' DENOTE STAINLESS STEEL BARS.

STAINLESS REINFORCING STEEL SHALL BE TYPE 316 LN OR DUPLEX 2205 AND HAVE A MINIMUM YIELD STRENGTH OF 500 MPa, UNLESS OTHERWISE SPECIFIED. UNLESS SHOWN OTHERWISE, TENSION LAP SPLICES SHALL BE CLASS B.

BAR HOOKS SHALL HAVE STANDARD HOOK DIMENSIONS USING MINIMUM BEND DIAMETERS, WHILE STIRRUPS AND TIES SHALL HAVE MINIMUM HOOK DIMENSIONS. ALL HOOKS SHALL BE IN ACCORDANCE WITH THE STRUCTURAL STANDARD DRAWINGS SS12-1 UNLESS INDICATED OTHERWISE.
6. ROADWAY CLASSIFICATION: RAD 100.
7. PROTECTION SYSTEM SHALL CONFORM TO PERFORMANCE LEVEL 2.
8. ALL DIMENSIONS ARE IN MILLIMETERS ALL ELEVATIONS ARE IN METERS UNLESS OTHERWISE SHOWN.

CONSTRUCTION NOTES:

1. SAWCUTS IN CONCRETE, WHERE DESIGNATED, SHALL BE 25MM DEEP OR TO THE FIRST LAYER OF REINFORCING STEEL, WHICHEVER IS LESS.
2. EXISTING REINFORCING STEEL WHICH IS EXPOSED DURING CONCRETE REMOVALS AND WHICH IS TO REMAIN SHALL BE ABRASIVE BLAST CLEANED.
3. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS OF THE WORK AND ALL DETAILS ON SITE AND REPORT ANY DISCREPANCIES TO THE ENGINEER BEFORE PROCEEDING WITH THE WORK. THE CONTRACTOR SHALL ADJUST DIMENSIONS OF THE WORK AS REQUIRED TO SUIT EXISTING CONDITIONS.
4. BACKFILL SHALL BE PLACED SIMULTANEOUSLY BEHIND BOTH END OF SUPERSTRUCTURE KEEPING THE HEIGHT OF BACKFILL APPROXIMATELY THE SAME. AT NO TIME SHALL THE DIFFERENCE IN ELEVATION BE GREATER THAN 500mm.
5. ALL EXPOSED EDGES TO RECEIVE A 20x20 CHAMFER.

APPLICABLE STANDARD DRAWINGS:

- OPSD 3101.150 WALLS - ABUTMENT, BACKFILL MINIMUM GRANULAR REQUIREMENTS
- OPSD 3370.100 DECK, WATERPROOFING HOT APPLIED ASPHALT MEMBRANE WITH PROTECTION BOARD
- OPSD 3370.101 DECK, WATERPROOFING HOT APPLIED ASPHALT MEMBRANE AT ACTIVE CRACKS GREATER THAN 2mm WIDE AND CONSTRUCTION JOINTS
- OPSD 3419.100 BARRIERS AND RAILINGS - STEEL GUIDE RAIL AND CHANNEL ANCHORAGE
- OPSD 3941.200 FIGURES IN CONCRETE - SITE NUMBER AND DATE LAYOUT

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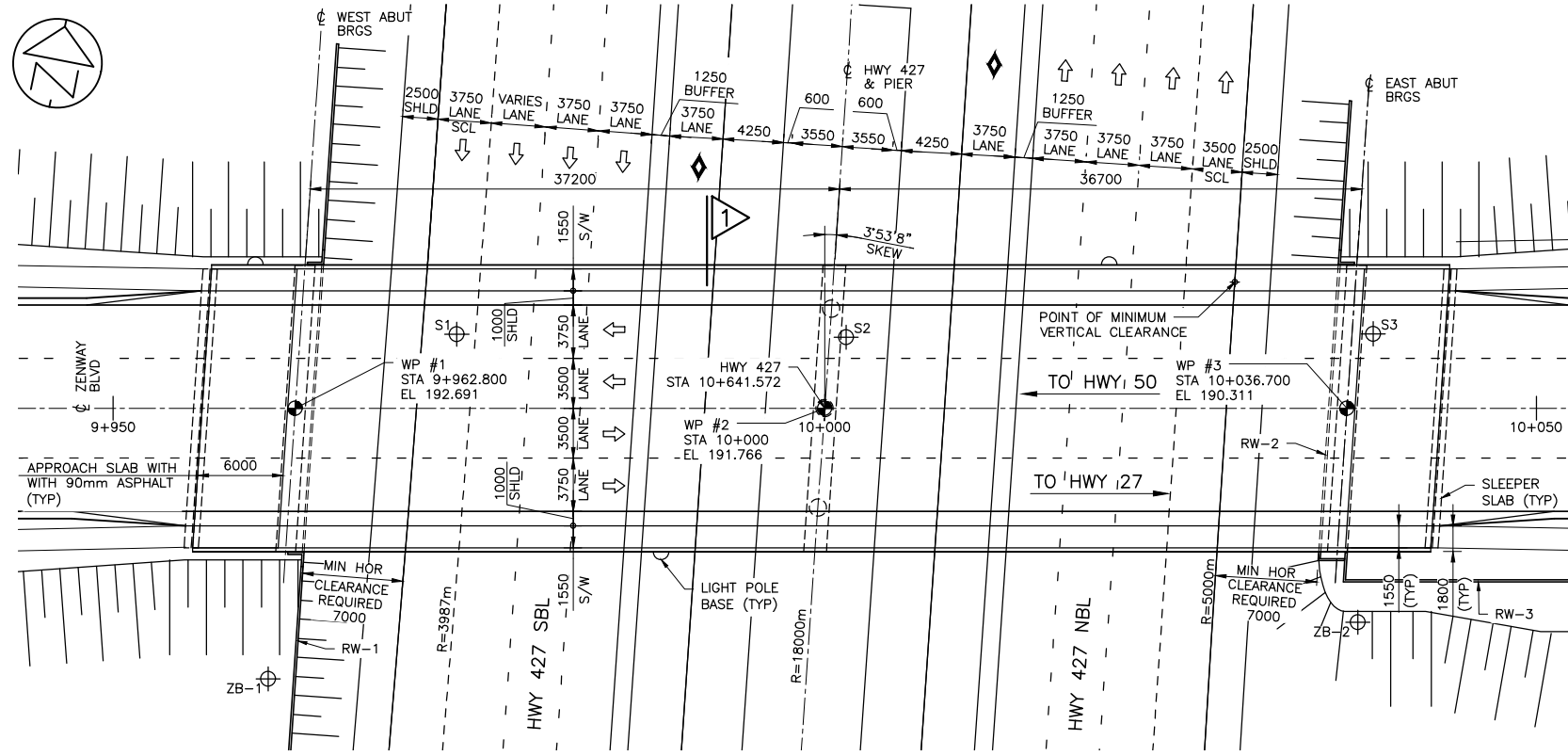
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C	18/03/16	90% SUBMISSION TO CA			
B	18/01/09	90% SUBMISSION TO CA			
A	17/10/31	90% SUBMISSION TO CA			

SCALE : AS NOTED

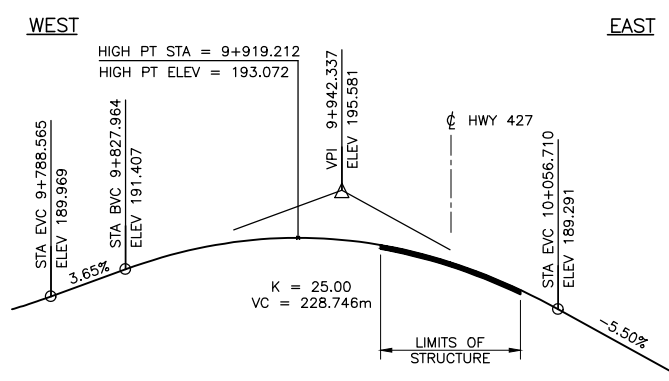
DESIGNED	SUBOOHI OBAD
DRAWN	PATRICK TSANG
CHECKED	NINA SHIRAZI
APPROVED LEAD ENG.	TARIQA QJALA
APPROVED PROJ. MANAGER	



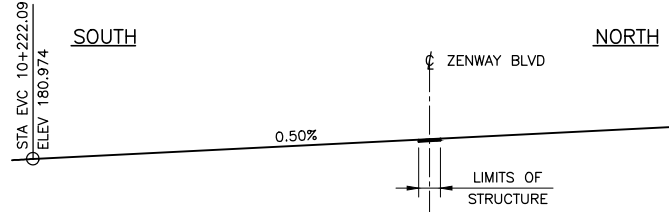
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PROJECT ID.	STAGE IDENTIFIER	DESIGN PACKAGE NUMBER	DISCIPLINE	STRUCTURE NUMBER	DOCUMENT TYPE	DRAWING NUMBER	REVISION NUMBER
H427-D	N	9A	STR	B09	DWG	900	C



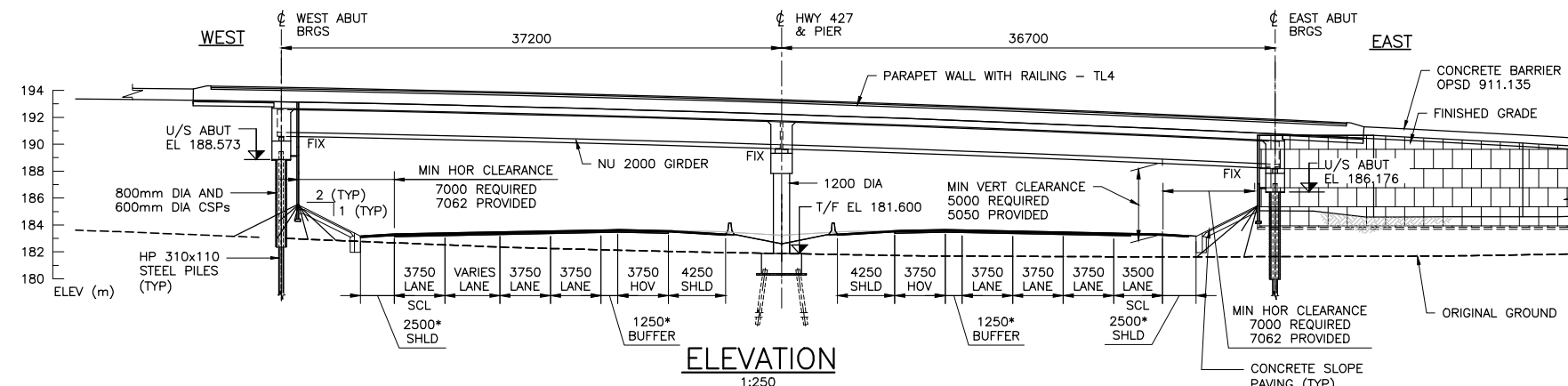
PLAN
1:250



PROFILE OF ZENWAY BLVD
NTS

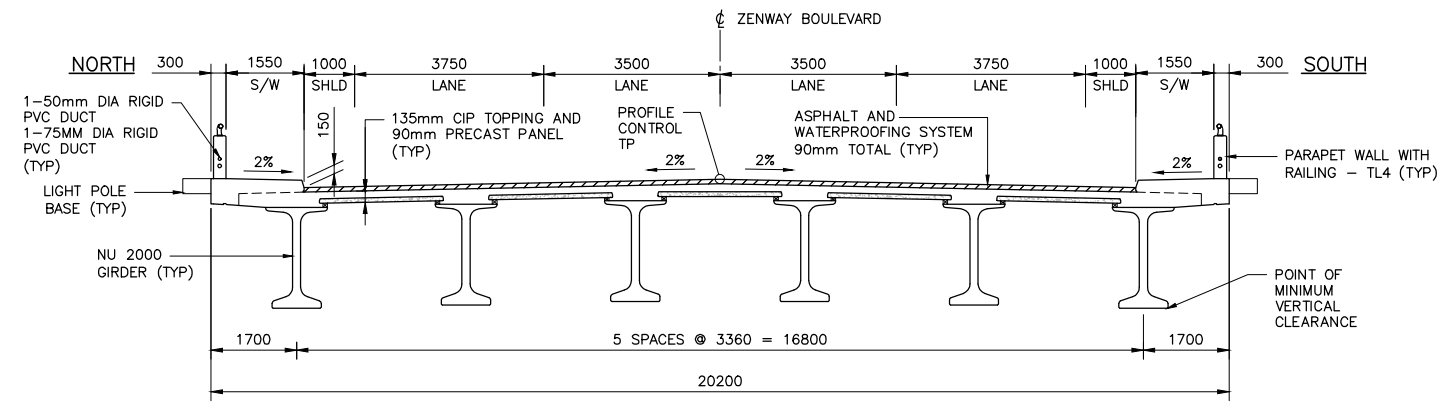


PROFILE OF HWY 427
NTS



ELEVATION
1:250

LANING DIMENSIONS ARE PERPENDICULAR TO THE C OF TRAFFIC LANE
SPAN LENGTHS ARE ALONG THE C



1
1:75

DIMENSIONS ARE PERPENDICULAR TO C OF TRAFFIC LANE

- GENERAL NOTES:**
- DESIGN STANDARDS AND CODES:
 - SCHEDULE 15-1 AND SCHEDULE 15-2: PROJECT AGREEMENT
 - DESIGN CODE: CAN/CSA-S6-14
 - MINISTRY OF TRANSPORTATION OF ONTARIO STRUCTURAL MANUAL
 - ONTARIO PROVINCIAL STANDARD SPECIFICATIONS (OPSS)
 - LIVE LOAD: CL-625-ONT.
 - CLASS OF CONCRETE

PRECAST GIRDERS	60 MPa (HPC)
PRECAST DECK PANELS	40 MPa
REMAINDER	30 MPa
 - CLEAR COVER TO REINFORCING STEEL

FOOTINGS	100 ± 25
DECK	
TOP	70 ± 20
BOTTOM	40 ± 10
REMAINDER UNLESS OTHERWISE NOTED	70 ± 20
 - REINFORCING STEEL

REINFORCING STEEL SHALL BE GRADE 400W UNLESS OTHERWISE SPECIFIED.

BAR MARKS WITH PREFIX 'S' DENOTE STAINLESS STEEL BARS.

STAINLESS REINFORCING STEEL SHALL BE TYPE 316 LN OR DUPLEX 2205 AND HAVE A MINIMUM YIELD STRENGTH OF 500 MPa, UNLESS OTHERWISE SPECIFIED.

UNLESS SHOWN OTHERWISE, TENSION LAP SPLICES SHALL BE CLASS B.

BAR HOOKS SHALL HAVE STANDARD HOOK DIMENSIONS USING MINIMUM BEND DIAMETERS, WHILE STIRRUPS AND TIES SHALL HAVE MINIMUM HOOK DIMENSIONS. ALL HOOKS SHALL BE IN ACCORDANCE WITH THE STRUCTURAL STANDARD DRAWINGS SS12-1 UNLESS INDICATED OTHERWISE.
 - GLASS FIBRE REINFORCED POLYMER (GFRP)

GLASS FIBRE REINFORCED POLYMER (GFRP) REINFORCING BARS SHALL BE GRADE I, GRADE II OR GRADE III AS SPECIFIED IN THE CONTRACT DOCUMENTS.

THE NOMINAL DIAMETER, TENSILE MODULUS OF ELASTICITY AND GUARANTEED MINIMUM TENSILE STRENGTH SHALL BE AS SPECIFIED IN THE CONTRACT DOCUMENTS.

BAR MARKS WITH THE PREFIX GI DENOTE GRADE I GFRP BARS, BAR MARKS WITH THE PREFIX GII DENOTE GRADE II GFRP BARS AND BAR MARKS WITH THE PREFIX GIII DENOTE GRADE III GFRP BARS.

APPLICABLE STANDARD DRAWINGS:

- | | |
|---------------|---|
| OPSD 3000.100 | FOUNDATION PILES - STEEL H-PILE DRIVING SHOE |
| OPSD 3101.150 | WALLS - ABUTMENT, BACKFILL MINIMUM GRANULAR REQUIREMENTS |
| OPSD 3370.100 | DECK, WATERPROOFING HOT APPLIED ASPHALT MEMBRANE WITH PROTECTION BOARD |
| OPSD 3370.101 | DECK, WATERPROOFING HOT APPLIED ASPHALT MEMBRANE AT ACTIVE CRACKS GREATER THAN 2mm WIDE AND CONSTRUCTION JOINTS |
| OPSD 3419.100 | BARRIERS AND RAILINGS - STEEL GUIDE RAIL AND CHANNEL ANCHORAGE |
| OPSD 3941.200 | FIGURES IN CONCRETE - SITE NUMBER AND DATE LAYOUT |

LIST OF DRAWINGS:

- | | |
|-----|---|
| 500 | GENERAL ARRANGEMENT |
| 501 | BOREHOLE LOCATIONS AND SOIL STRATA |
| 502 | FOUNDATION LAYOUT AND FOOTING REINFORCEMENT |
| 503 | ABUTMENT DETAILS AND REINFORCEMENT |
| 504 | RETAINED SOIL SYSTEM WALL LAYOUT I |
| 505 | RETAINED SOIL SYSTEM WALL LAYOUT II |
| 506 | PIER DETAILS AND REINFORCEMENT |
| 507 | PRESTRESSED NU GIRDERS AND BEARINGS (NU 2000) |
| 508 | PRESTRESSED NU GIRDER - DETAILS |
| 509 | DECK LAYOUT & SCREED ELEVATIONS |
| 510 | PRECAST DECK PANEL LAYOUT |
| 511 | PRECAST DECK PANELS FOR CONCRETE GIRDERS - DETAIL I |
| 512 | PRECAST DECK PANELS FOR CONCRETE GIRDERS - DETAIL II |
| 513 | DECK REINFORCEMENT |
| 514 | PARAPET WALL WITH RAILING ON SIDEWALK, TL-4 (GFRP REBAR) |
| 515 | RAILING ON PARAPET |
| 516 | 6000mm APPROACH SLAB |
| 517 | EXPANSION JOINT AND SLEEPER SLAB (10mm < MOVEMENT <= 40mm) |
| 518 | STRIP SEAL EXPANSION JOINT FOR SLEEPER SLAB (10mm < MOVEMENT <= 40mm) |
| 519 | DETAILS OF CONCRETE SLOPE PAVING |
| 520 | STANDARD AND MISCELLANEOUS DETAILS |
| 521 | PILE DRIVING CONTROL |
| 522 | ELECTRICAL EMBEDDED WORK |

LIST OF ABBREVIATIONS:

- | | |
|-----|--------------------------------|
| CIP | CAST IN PLACE |
| VPI | VERTICAL POINT OF INTERSECTION |
| WP | WORKING POINT |
| T/F | TOP OF FOOTING |

LEGEND:

- | | |
|--|----------|
| | BOREHOLE |
|--|----------|

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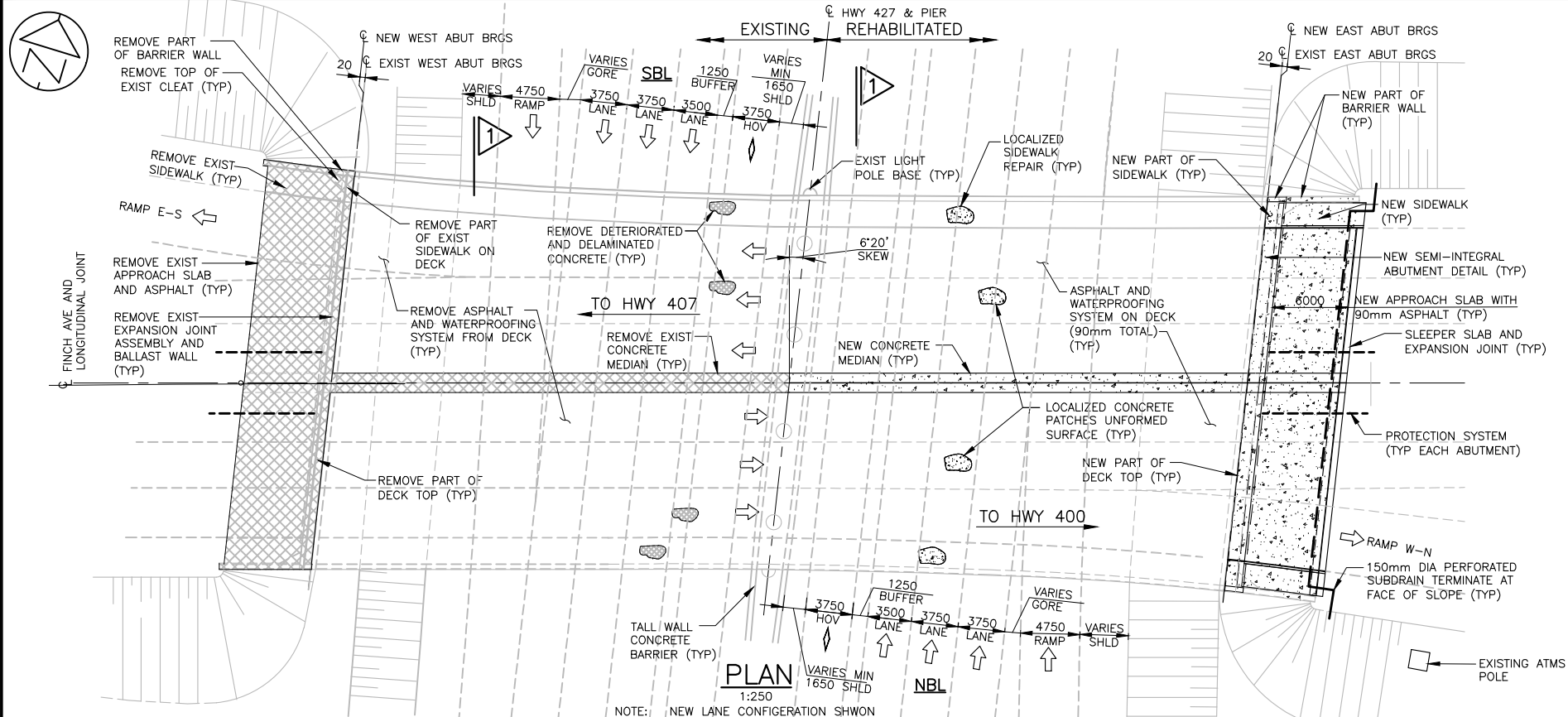
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B	18/03/16	90% SUBMISSION TO CA				
A	18/01/12	90% SUBMISSION TO CA				

SCALE :
AS NOTED

DESIGNED	ZHONG LIU	
DRAWN	JENNIFER MEDEMA	
CHECKED	MICHAEL HATCH	
APPROVED LEAD ENG.	TATIANA GJALA	
APPROVED PROJ. MANAGER		
NAME (PRINT)	INIT.	DATE



TITLE HWY 427 EXPANSION HWY 427 AT ZENWAY BLVD UNDERPASS GENERAL ARRANGEMENT							
PROJECT ID.	STAGE IDENTIFIER	DESIGN PACKAGE NUMBER	DISCIPLINE	STRUCTURE NUMBER	DOCUMENT TYPE	DRAWING NUMBER	REVISION NUMBER
H427-D	N	1	STR	B10	DWG	500	B



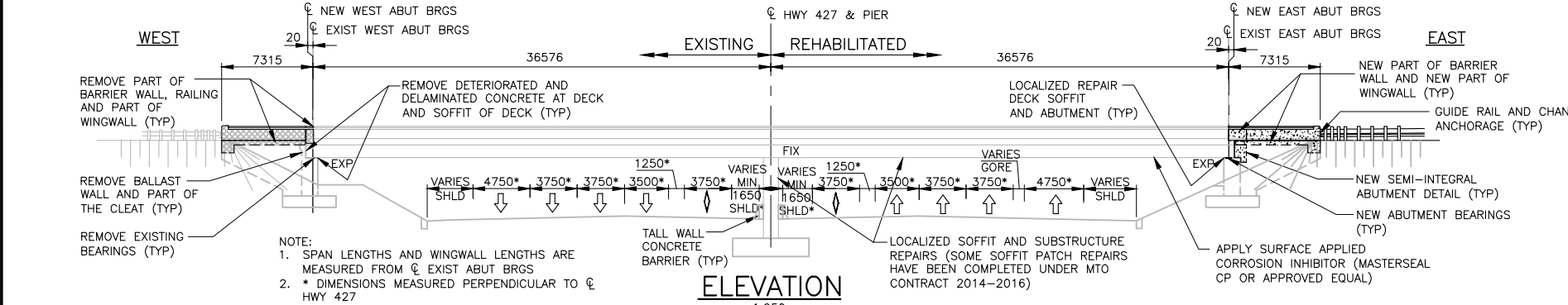
- LEGEND:**
- REMOVALS
 - NEW CONCRETE
 - NEW ASPHALT
- LIST OF ABBREVIATIONS:**
- HOV HIGH OCCUPANCY VEHICLE

- GENERAL NOTES:**
- DESIGN STANDARDS AND CODES:
 - SCHEDULE 15-1 AND SCHEDULE 15-2: PROJECT AGREEMENT
 - DESIGN CODE: CAN/CSA-S6-14
 - MINISTRY OF TRANSPORTATION OF ONTARIO STRUCTURAL MANUAL
 - MINISTRY OF TRANSPORTATION OF ONTARIO STRUCTURE REHABILITATION MANUAL
 - ONTARIO PROVINCIAL STANDARD SPECIFICATIONS (OPSS)
 - LIVE LOAD: CL-625-ONT.
 - CLASS OF CONCRETE 30 MPa
 - CLEAR COVER TO REINFORCING STEEL

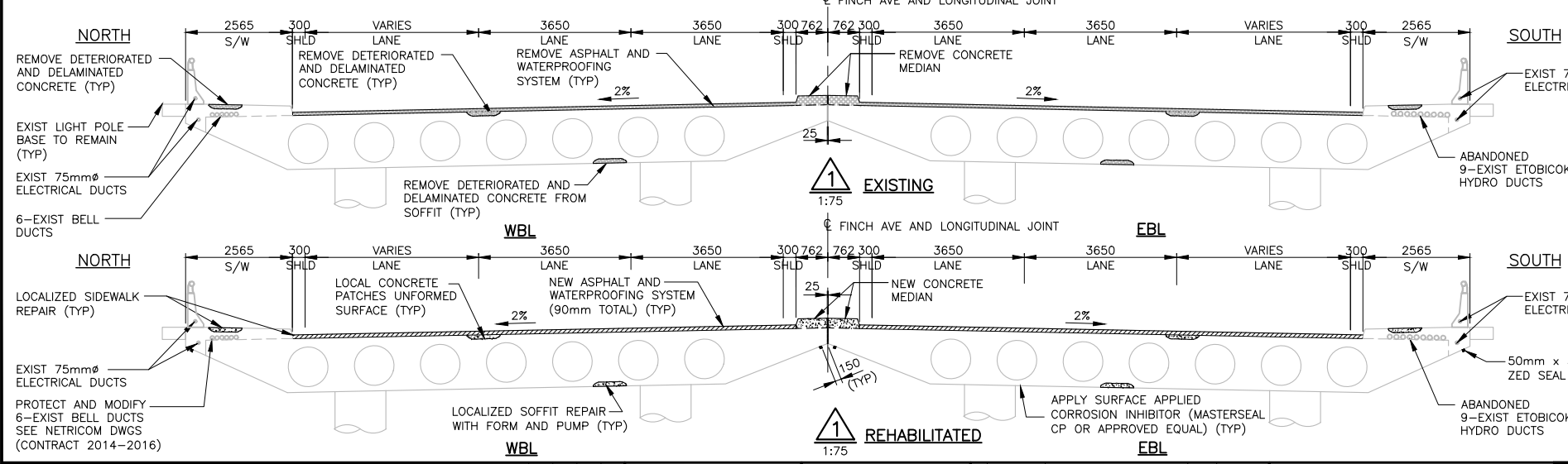
DECK TOP	70±20
BOTTOM	40±10
REMAINDER UNLESS OTHERWISE NOTED	70±20
 - REINFORCING STEEL
REINFORCING STEEL SHALL BE GRADE 400W UNLESS OTHERWISE SPECIFIED.
BAR MARKS WITH PREFIX 'S' DENOTE STAINLESS STEEL BARS.

STAINLESS REINFORCING STEEL SHALL BE TYPE 316 LN OR DUPLEX 2205 AND HAVE A MINIMUM YIELD STRENGTH OF 500 MPa, UNLESS OTHERWISE SPECIFIED. UNLESS SHOWN OTHERWISE, TENSION LAP SPLICES SHALL BE CLASS B.

BAR HOOKS SHALL HAVE STANDARD HOOK DIMENSIONS USING MINIMUM BEND DIAMETERS, WHILE STIRRUPS AND TIES SHALL HAVE MINIMUM HOOK DIMENSIONS. ALL HOOKS SHALL BE IN ACCORDANCE WITH THE STRUCTURAL STANDARD DRAWINGS SS12-1 UNLESS INDICATED OTHERWISE.
 - GLASS FIBRE REINFORCED POLYMER (GFRP)
GLASS FIBRE REINFORCED POLYMER (GFRP) REINFORCING BARS SHALL BE GRADE I, GRADE II OR GRADE III AS SPECIFIED IN THE CONTRACT DOCUMENTS.
THE NOMINAL DIAMETER, TENSILE MODULUS OF ELASTICITY AND GUARANTEED MINIMUM TENSILE STRENGTH SHALL BE AS SPECIFIED IN THE CONTRACT DOCUMENTS.
BAR MARKS WITH THE PREFIX GI DENOTE GRADE I GFRP BARS, BAR MARKS WITH THE PREFIX GII DENOTE GRADE II GFRP BARS AND BAR MARKS WITH THE PREFIX GIII DENOTE GRADE III GFRP BARS.
 - ROADWAY CLASSIFICATION: UAD 80.
 - PROTECTION SYSTEM SHALL CONFORM TO PERFORMANCE LEVEL 2.
 - ALL DIMENSIONS ARE IN MILLIMETERS ALL ELEVATIONS ARE IN METERS UNLESS OTHERWISE SHOWN.



- CONSTRUCTION NOTES:**
- SAWCUTS IN CONCRETE, WHERE DESIGNATED, SHALL BE 25MM DEEP OR TO THE FIRST LAYER OF REINFORCING STEEL, WHICHEVER IS LESS.
 - EXISTING REINFORCING STEEL WHICH IS EXPOSED DURING CONCRETE REMOVALS AND WHICH IS TO REMAIN SHALL BE ABRASIVE BLAST CLEANED.
 - THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS OF THE WORK AND ALL DETAILS ON SITE AND REPORT ANY DISCREPANCIES TO THE ENGINEER BEFORE PROCEEDING WITH THE WORK. THE CONTRACTOR SHALL ADJUST DIMENSIONS OF THE WORK AS REQUIRED TO SUIT EXISTING CONDITIONS.
 - BACKFILL SHALL BE PLACED SIMULTANEOUSLY BEHIND BOTH END OF SUPERSTRUCTURE KEEPING THE HEIGHT OF BACKFILL APPROXIMATELY THE SAME. AT NO TIME SHALL THE DIFFERENCE IN ELEVATION BE GREATER THAN 500mm.
 - ALL EXPOSED EDGES TO RECEIVE A 20x20 CHAMFER.
- APPLICABLE STANDARD DRAWINGS:**
- OPSD 3101.150 WALLS - ABUTMENT, BACKFILL MINIMUM GRANULAR REQUIREMENTS
- OPSD 3370.100 DECK, WATERPROOFING HOT APPLIED ASPHALT MEMBRANE WITH PROTECTION BOARD
- OPSD 3370.101 DECK, WATERPROOFING HOT APPLIED ASPHALT MEMBRANE AT ACTIVE CRACKS GREATER THAN 2mm WIDE AND CONSTRUCTION JOINTS
- OPSD 3419.100 BARRIERS AND RAILINGS - STEEL GUIDE RAIL AND CHANNEL ANCHORAGE
- OPSD 3941.200 FIGURES IN CONCRETE - SITE NUMBER AND DATE LAYOUT



- LIST OF DRAWINGS:**
- 500 GENERAL ARRANGEMENT
 - 501 CONSTRUCTION STAGING
 - 502 JACKING DETAILS
 - 503 REMOVALS I
 - 504 REMOVALS II
 - 505 NEW CONSTRUCTION I
 - 506 NEW CONSTRUCTION II
 - 507 NEW CONSTRUCTION III
 - 508 NEW CONSTRUCTION IV
 - 509 BEARINGS
 - 510 BARRIER WALL WITH S/W AND RAILING
 - 511 RAILING FOR BARRIER WALL
 - 512 6000mm APPROACH SLAB
 - 513 EXPANSION JOINT AND SLEEPER SLAB
 - 514 STRIP SEAL EXPANSION JOINT FOR SLEEPER SLAB
 - 515 STANDARD DETAILS
 - 516 ELECTRICAL EMBEDDED WORK

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C 18/03/16	90% SUBMISSION TO CA				
B 18/01/09	90% SUBMISSION TO CA				
A 17/10/31	90% SUBMISSION TO CA				

SCALE : AS NOTED

DESIGNED	SUBOOH OBNID
DRAWN	ELENA TSENTER
CHECKED	MAGED IBRAHIM
APPROVED LEAD ENG.	TATIANA QJALA
APPROVED PROJ. MANAGER	

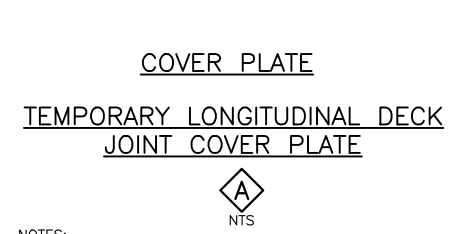
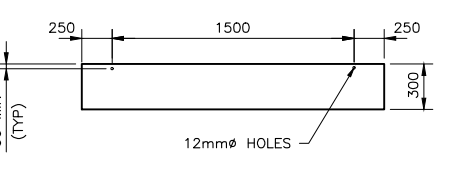
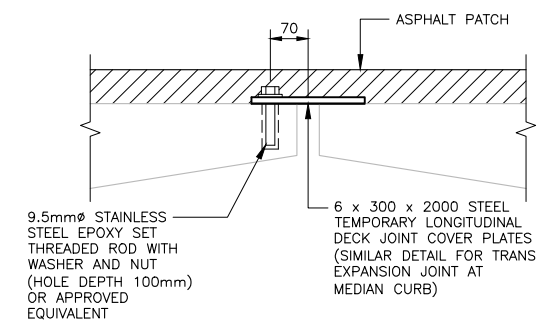
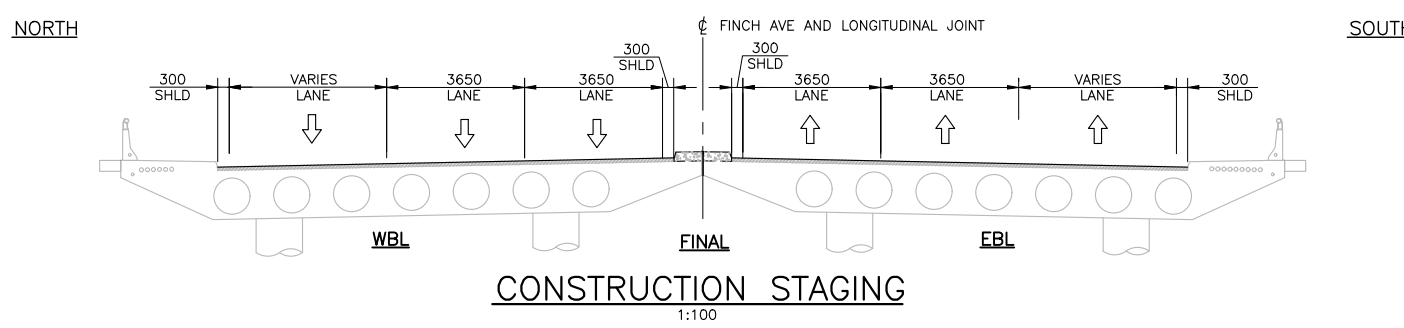
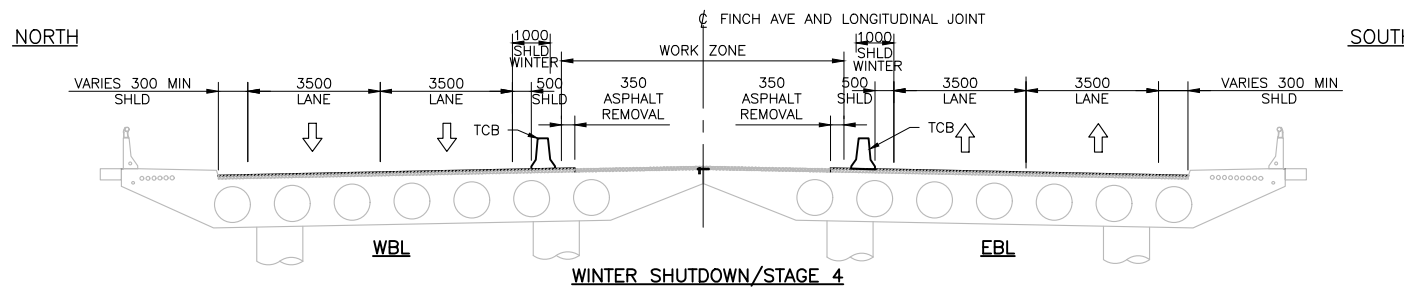
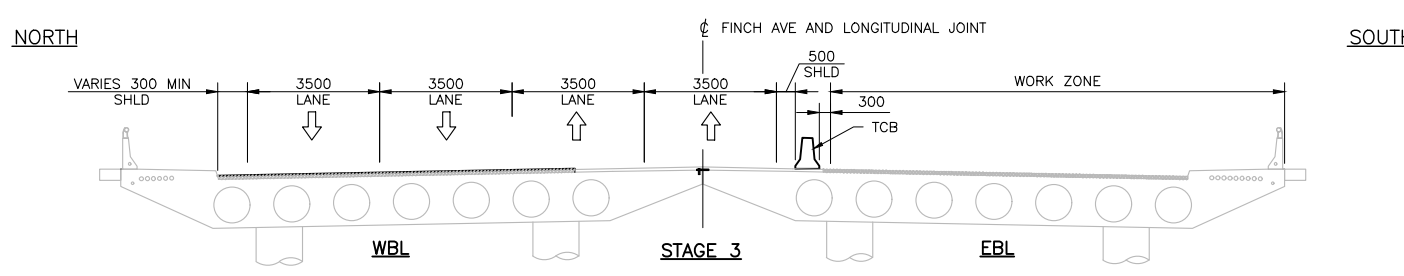
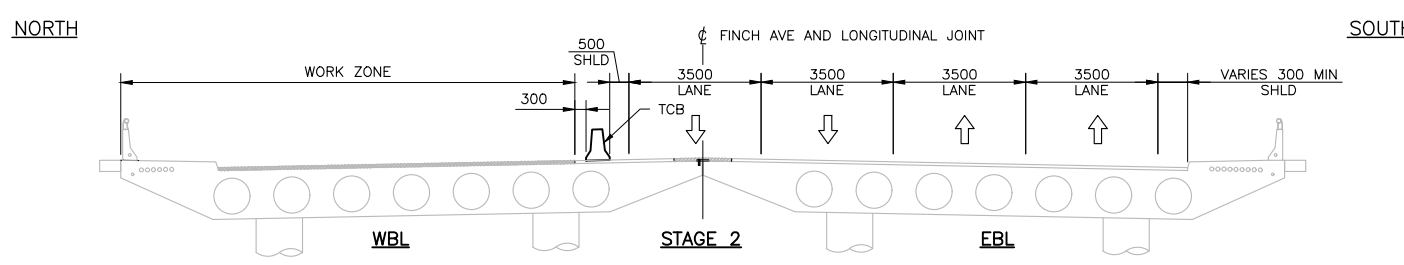
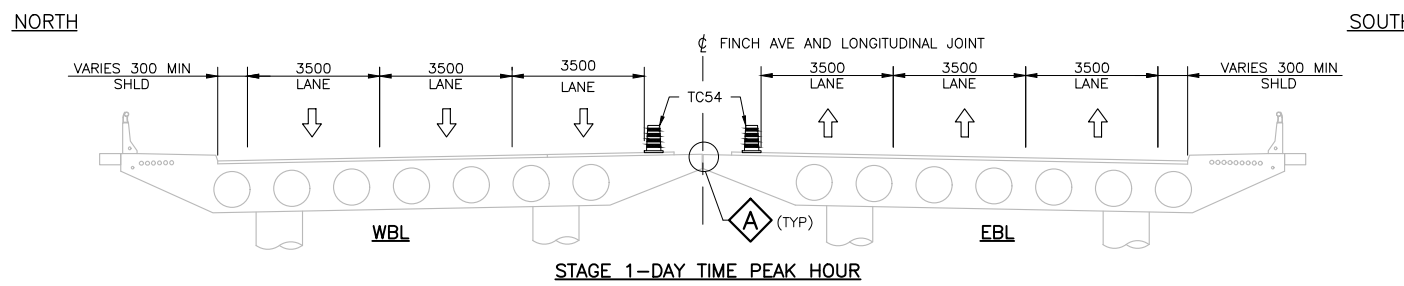
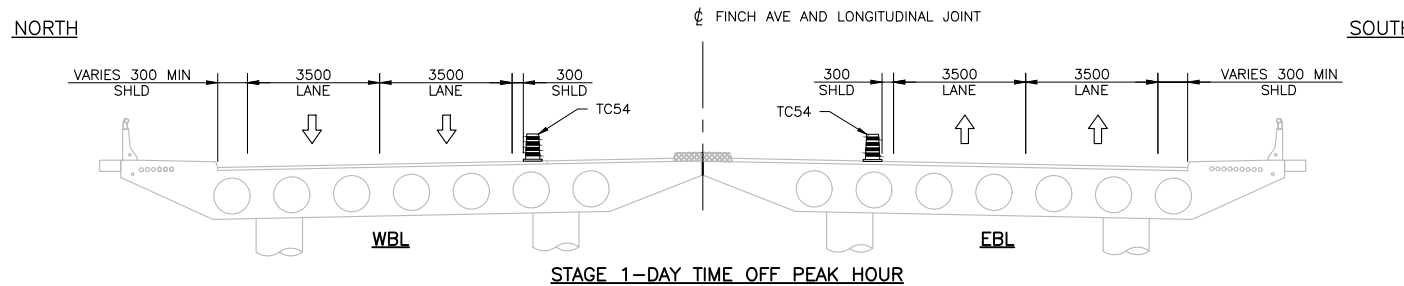
NAME (PRINT)	INT.	DATE



link427
LOCAL | INTEGRATED | NEIGHBOURLY | KNOWLEDGEABLE

**HWY 427 EXPANSION
HWY 427/FINCH AVENUE UNDERPASS
REHABILITATION - R1
SITE 37-1084
GENERAL ARRANGEMENT**

PROJECT ID.	STAGE IDENTIFIER	DESIGN PACKAGE NUMBER	DISCIPLINE	STRUCTURE NUMBER	DOCUMENT TYPE	DRAWING NUMBER	REVISION NUMBER
H427-D	N	9A	STR	B01	DWG	500	C



NOTES:
 1. THIS DRAWING TO BE READ IN CONJUNCTION WITH GENERAL ARRANGEMENT AND HIGHWAY STAGING DRAWINGS.

SCOPE OF REHABILITATION WORK AND STAGING

- STAGE 1:**
- REPAIR SUBSTRUCTURE AND DECK SOFFIT. REPLACE ABUTMENT BEARINGS.
 - SHIFT TRAFFIC TO OUTSIDE OF BRIDGES.
 - INSTALL TEMPORARY TRAFFIC BARRIERS.
 - INSTALL DEBRIS PLATFORM, REMOVE CONCRETE MEDIAN, FASTEN STEEL PLATE OVER THE GAP BETWEEN TWO BRIDGES AND PAVE.
- STAGE 2:**
- RE-ARRANGE TEMPORARY TRAFFIC BARRIERS TO ALLOW SHIFT OF TRAFFIC TO THE EB BRIDGE AND THE MEDIAN.
 - REMOVE EXISTING ASPHALT AND WATERPROOFING FROM DECK.
 - REMOVE PART OF CONCRETE SIDEWALK ON DECK, PART OF BARRIER WALL, PART OF RAILING AND POSTS.
 - REMOVE PART OF APPROACH SLAB AND SIDEWALK ON APPROACHES.
 - INSTALL ROADWAY PROTECTION SYSTEM AS REQUIRED.
 - EXCAVATE BEHIND ABUTMENTS.
 - REMOVE PART OF BALLAST WALLS INCLUDING EXPANSION JOINT CONCRETE END DAMS AND EXPANSION JOINT ASSEMBLY. REMOVE PART OF WINGWALLS.
 - REMOVE DELAMINATED AND DETERIORATED CONCRETE FROM THE DECK ENDS.
 - RECONSTRUCT PART OF WINGWALLS AND CONSTRUCT PART OF SEMI-INTEGRAL ABUTMENT DETAIL.
 - CONSTRUCT PART OF NEW BARRIER WALL AND INSTALL NEW RAILING AND POSTS.
 - BACKFILL BEHIND ABUTMENT.
 - CONSTRUCT PART OF APPROACH SLABS AND SIDEWALK ON APPROACHES.
 - WATERPROOF AND PAVE ASPHALT. ADDITIONAL LAYER OF 300mm WATERPROOFING PROTECTION BOARD TO BE ADDED AT CONSTRUCTION JOINT.

- STAGE 3:**
- RE-ARRANGE TEMPORARY TRAFFIC BARRIERS TO ALLOW SHIFT OF TRAFFIC TO THE WB BRIDGE AND THE MEDIAN.
 - REPEAT STEPS 6 TO 17.

- STAGE 4:**
- RE-ARRANGE TEMPORARY TRAFFIC BARRIERS TO SHIFT TRAFFIC TO THE OUTSIDE OF BRIDGES.
 - REMOVE EXISTING ASPHALT AND WATERPROOFING FROM DECK.
 - REMOVE TEMPORARY COVER PLATE, CUT STAINLESS STEEL THREADED RODS FLUSH WITH CONCRETE SURFACE.
 - RECONSTRUCT MEDIAN CURBS.
 - EXCAVATE BEHIND ABUTMENTS.
 - REMOVE PART OF BALLAST WALLS INCLUDING EXPANSION JOINT CONCRETE END DAMS AND EXPANSION JOINT ASSEMBLY.
 - REMOVE DELAMINATED AND DETERIORATED CONCRETE FROM THE DECK ENDS.
 - CONSTRUCT PART OF SEMI-INTEGRAL ABUTMENT DETAIL.
 - BACKFILL BEHIND ABUTMENTS AND CONSTRUCT PART OF APPROACH SLABS AND MEDIAN CURB.
 - REMOVE 350mm OF ASPHALT AND 300mm PROTECTION BOARD FROM STAGE 2 AND STAGE 3.
 - WATERPROOF AND PAVE ASPHALT.
 - SURFACE APPLIED CORROSION INHIBITOR SHALL BE APPLIED ON THE DECK SOFFIT.

- PRE-FINAL:**
- REMOVE TOP COURSE OF ASPHALT AND REPAVE.

LEGEND:

	REMOVALS
	NEW CONCRETE
	NEW ASPHALT

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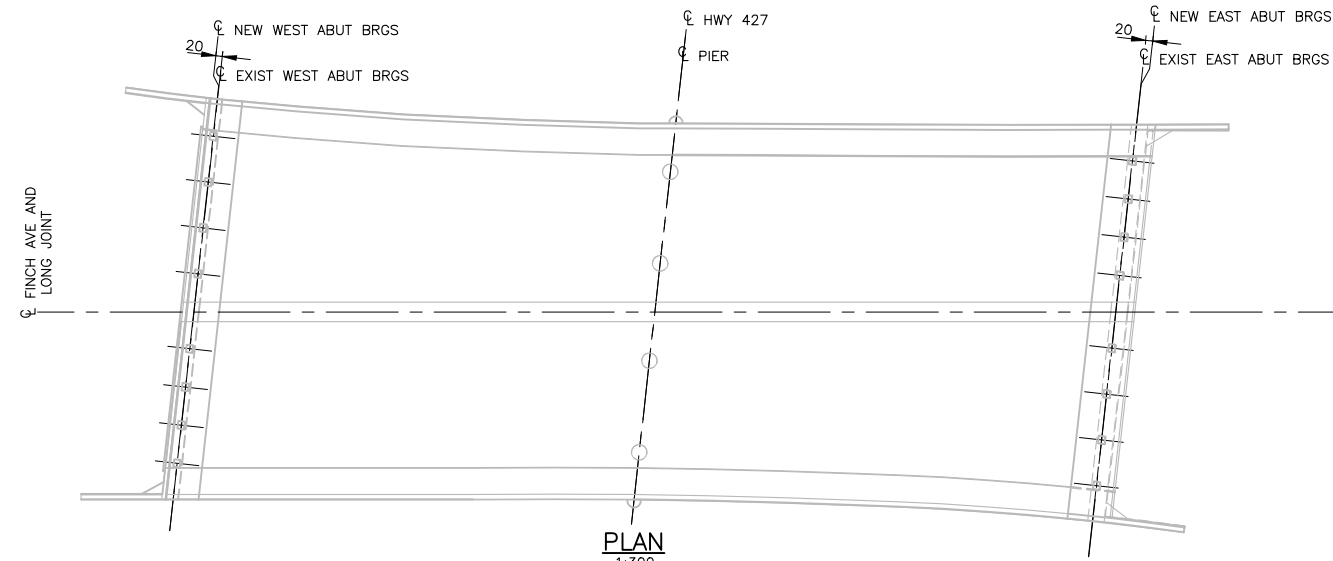
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B	18/01/09	90% SUBMISSION TO CA			
A	17/10/31	90% SUBMISSION TO CA			

SCALE : AS NOTED

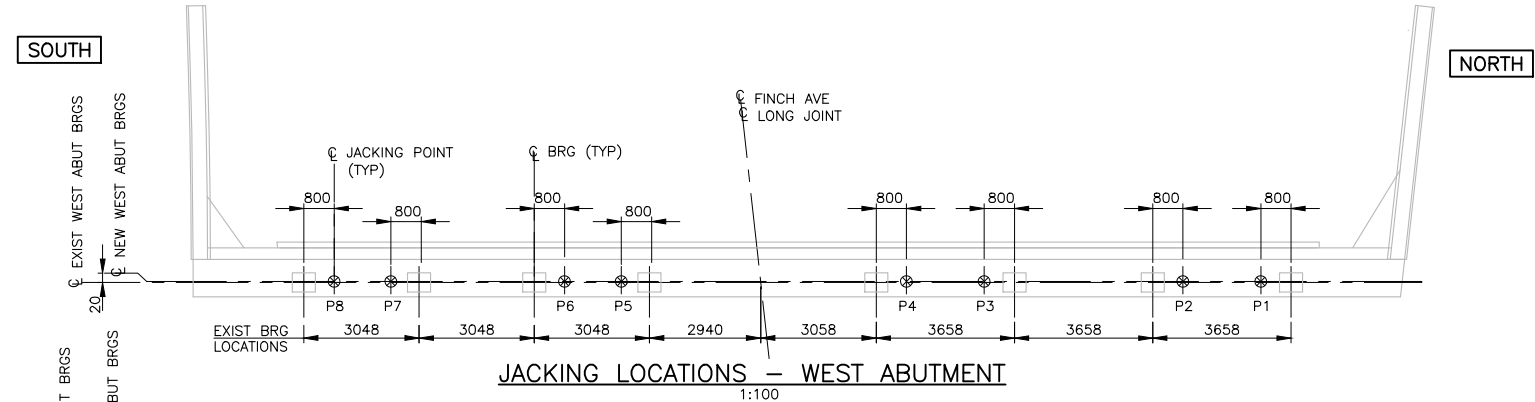
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APPROVED PROJ. MANAGER	
NAME (PRINT)	INT. DATE



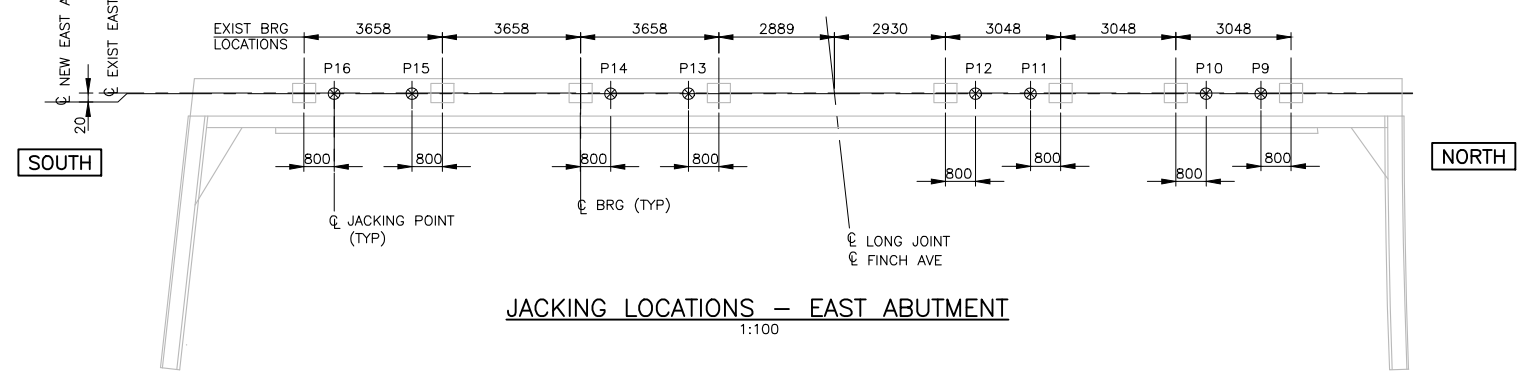
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PROJECT ID.	STAGE IDENTIFIER	DESIGN PACKAGE NUMBER	DISCIPLINE	STRUCTURE NUMBER	DOCUMENT TYPE	DRAWING NUMBER	REVISION NUMBER
H427-D	N	9A	STR	B01	DWG	501	C



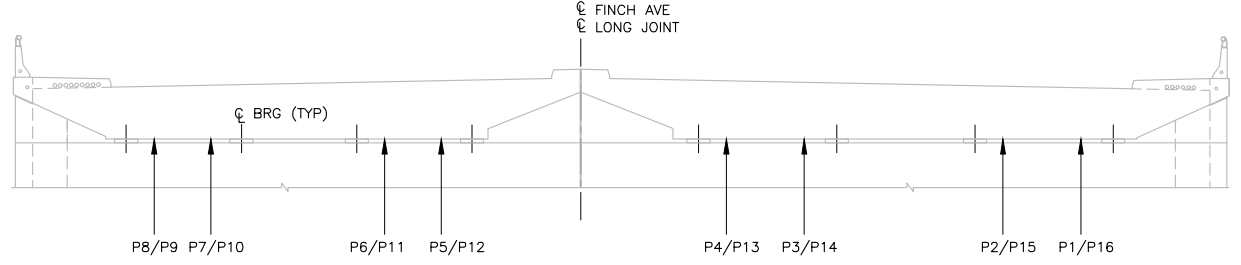
PLAN
1:300



JACKING LOCATIONS - WEST ABUTMENT
1:100



JACKING LOCATIONS - EAST ABUTMENT
1:100



UNFACTORED DEAD LOAD (KN)	2000	550	630	2000	1150	1600	1200	2000
MAX FACTORED JACKING FORCE	2450	900	1000	3130	1950	1950	1600	2600
⊙ SLS 1 (KN)								

JACKING LOADS
1:100

NOTES:

- SEE NOTES ON GENERAL ARRANGEMENT DWG 500.
- JACKING SUPPORT SYSTEM SHOWN ON THE DRAWINGS IS SCHEMATIC ONLY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DESIGN OF JACKING SUPPORT SYSTEM AND SHALL SUBMIT DETAILED SHOP DRAWINGS ALONG WITH DESIGN CALCULATIONS AND PROCEDURES TO THE ENGINEER. ALL DRAWINGS SHALL BE STAMPED BY AN ENGINEER LICENSED IN THE PROVINCE OF ONTARIO.
- JACKING EQUIPMENT AND PROCEDURES OUTLINED IN THE CONTRACTOR'S SHOP DRAWINGS SHALL BE CERTIFIED IN THE FIELD BY THE ENGINEER RESPONSIBLE FOR THOSE DRAWINGS.
- THE CONTRACTOR SHALL SITE MEASURE THE EXISTING STRUCTURE AT SUPPORT LOCATIONS TO ENSURE PROPER FIT.
- TRAFFIC SHALL NOT BE ALLOWED ON THE STRUCTURE DURING JACKING OPERATIONS. JACKING, TEMPORARY SUPPORT AND BEARING REPLACEMENT SHALL ONLY BE CARRIED OUT AT ONE ABUTMENT AT A TIME.
- THE DECK SHALL BE JACKED UP SIMULTANEOUSLY ACROSS THE ENTIRE WIDTH. JACKING MEASUREMENTS SHALL BE RECORDED AND SUPPLIED TO THE ENGINEER.
- THE DECK SHALL BE JACKED UP SUFFICIENTLY TO REMOVE PRESSURE ON THE EXISTING BEARINGS AND FACILITATE THEIR REMOVAL. THE LIFT SHALL BE LIMITED TO A MAXIMUM OF 8mm AND CONTROLLED SO AS TO AVOID DAMAGING ADJACENT AREAS OF THE STRUCTURE.
- JACKING REACTIONS SHOWN ON THE DRAWINGS ARE APPROXIMATE ONLY. THE CONTRACTOR SHALL SUPPLY JACK CAPACITY OF AT LEAST 150% OF THE THEORETICAL JACKING REACTIONS INDICATED.
- THE CONTRACTOR SHALL PROVIDE LATERAL RESTRAINTS CAPABLE OF RESISTING A LOAD OF NO LESS THAN 10% OF VERTICAL JACKING REACTION DURING REPLACEMENT OF THE BEARINGS. LATERAL RESTRAINTS SHALL BE INSTALLED PRIOR TO REMOVAL OF EXISTING BEARINGS AND REMAIN IN PLACE UNTIL NEW BEARINGS ARE INSTALLED.
- CONTRACTOR SHALL USE SELF-LOCKING JACKS.
- STAINLESS STEEL AND TEFLON SURFACES SHALL BE PROTECTED FROM ABRASION OR SCRATCHING AND KEPT CLEAN AT ALL TIMES DURING CONSTRUCTION.
- TOP AND BASE PLATES FOR JACKS AND TEMPORARY SUPPORT SHALL BE DESIGNED TO SUIT THE BEARING SEAT AND THE DECK SOFFIT GEOMETRY. TAPERED PLATES WILL BE REQUIRED. THE CONTRACTOR SHALL ESTABLISH THE PLATE SIZE SUCH THAT CONTACT PRESSURE UNDER JACKING OR TEMPORARY SUPPORT LOADS AT SLS IS NOT GREATER THAN 25 MPa.

LIST OF ABBREVIATIONS:

LONG LONGITUDINAL

LEGEND:

- ⊕ EXIST BEARING
- ⊗ JACKING POINTS

CAD FILE LOCATION AND NAME: C:\projects\hwy427\dwg\hwy427-d0-9a-str-b01-dwg-502.rvt
 MODIFIED: 3/19/2018 10:42:41 AM BY: PANGF
 DATE PLOTTED: 3/19/2018 10:43:47 AM BY:

DATE	REVISIONS	BY	CHK	LEAD DISC.	PROJ. MAN.
C 18/03/16	90% SUBMISSION TO CA				
B 18/01/09	90% SUBMISSION TO CA				
A 17/10/31	90% SUBMISSION TO CA				

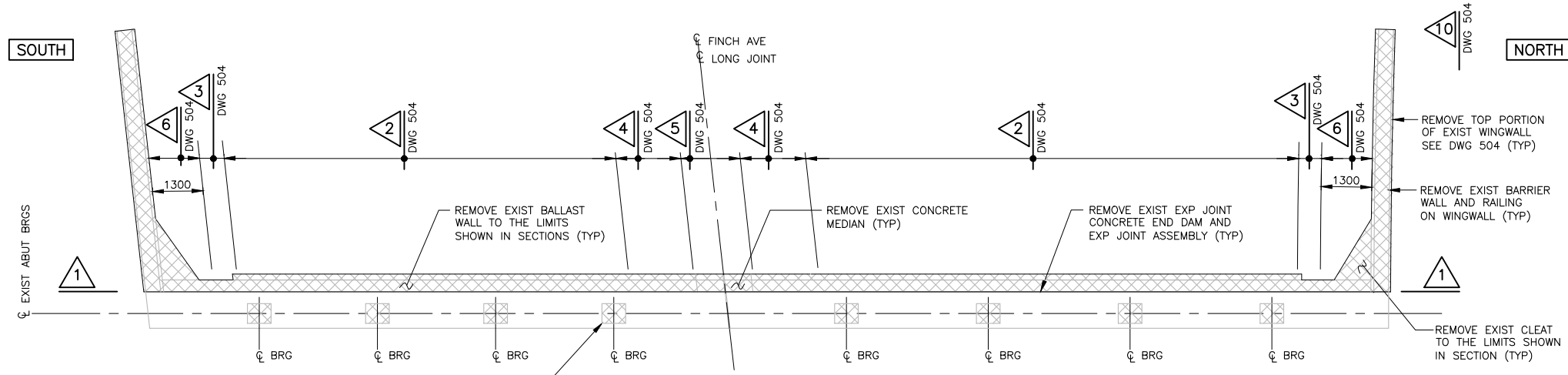
SCALE :

AS NOTED

DESIGNED	SUBOOH OBAD
DRAWN	ELENA TSENIER
CHECKED	MAGED IBRAHIM
APPROVED LEAD ENG.	TATIANA OJALA
APPROVED PROJ. MANAGER	
NAME (PRINT)	INT. DATE



TITLE							
HWY 427 EXPANSION HWY 427/FINCH AVENUE UNDERPASS REHABILITATION - R1 SITE 37-1084 JACKING DETAILS							
PROJECT ID.	STAGE IDENTIFIER	DESIGN PACKAGE NUMBER	DISCIPLINE	STRUCTURE NUMBER	DOCUMENT TYPE	DRAWING NUMBER	REVISION NUMBER
H427-D	N	9A	STR	B01	DWG	502	C



SUBSTRUCTURE REMOVALS PLAN

1:75
WEST ABUTMENT SHOWN
EAST ABUTMENT SIMILAR - OPPOSITE HAND
NOTE: EXIST APPROACH SLAB, SIDEWALKS AND CURBS TO BE REMOVED - NOT SHOWN FOR CLARITY

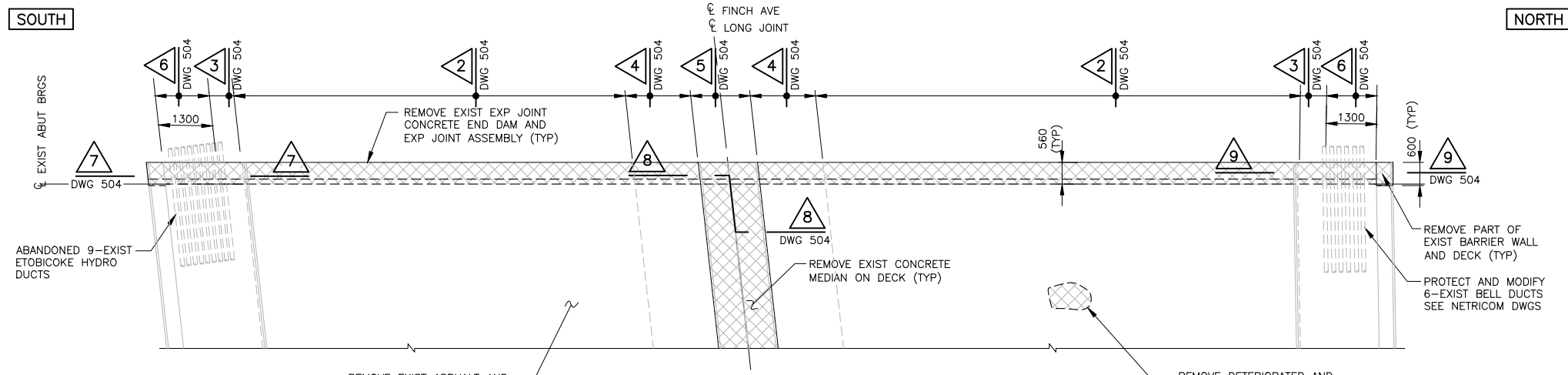
- NOTES:**
- THIS DRAWING TO BE READ IN CONJUNCTION WITH DWG 500, 501 AND 504.
 - EXISTING REINFORCING STEEL TO REMAIN SHALL BE ABRASIVE BLAST CLEANED.
 - FOR REINFORCING STEEL THAT IS CUT AND WILL NOT BE EMBEDDED IN CONCRETE THE FOLLOWING APPLIES:
 - CHIP CONCRETE 25mm AROUND REBAR TO A DEPTH OF 50mm.
 - CUT REBAR AND PATCH HOLE WITH PROPRIETARY PRODUCT.
 - SAWCUTS IN CONCRETE, WHERE DESIGNATED, SHALL BE 25mm DEEP OR TO THE FIRST LAYER OF REINFORCING STEEL, WHICHEVER IS LESS.

LIST OF ABBREVIATIONS:

REINF STL REINFORCING STEEL
LONG LONGITUDINAL

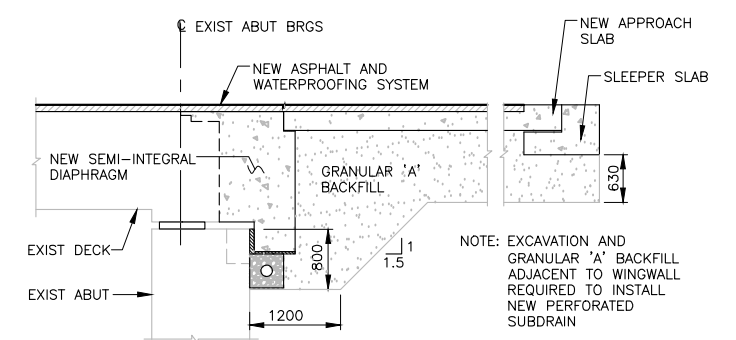
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CONCRETE REMOVALS
LIMIT OF REMOVAL

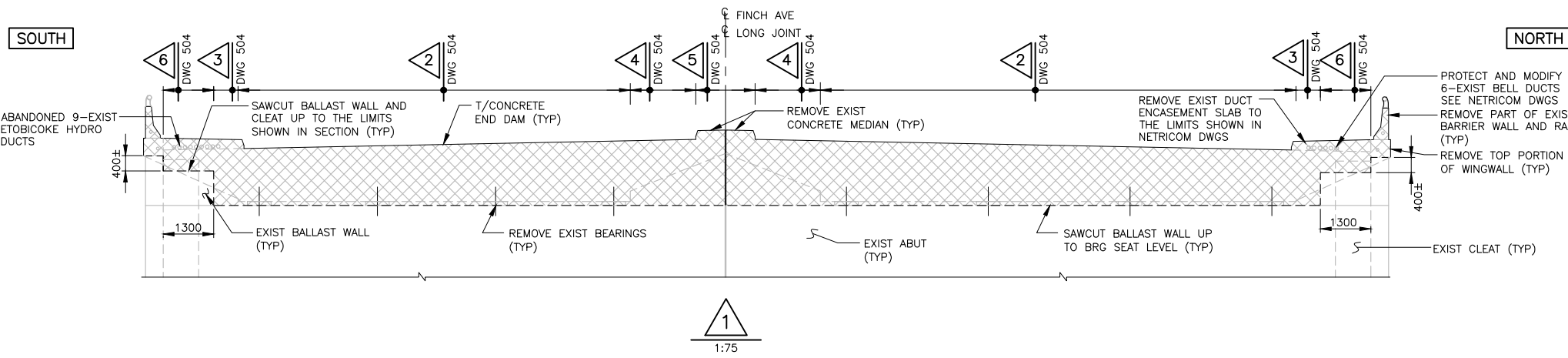


SUPERSTRUCTURE REMOVALS PLAN

1:75
WEST ABUTMENT SHOWN
EAST ABUTMENT SIMILAR - OPPOSITE HAND



LIMITS OF EXCAVATION AND GRANULAR FILL
NTS



CAD FILE LOCATION AND NAME: C:\projects\hwy427\dwg\503\503RM.dwg
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 DATE PLOTTED: 3/19/2018 10:43:48 AM BY:

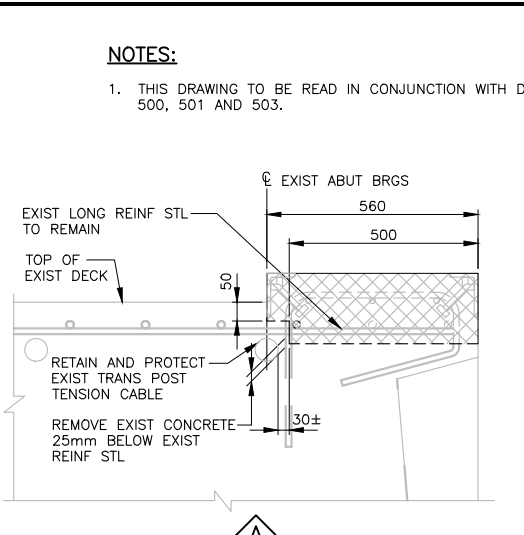
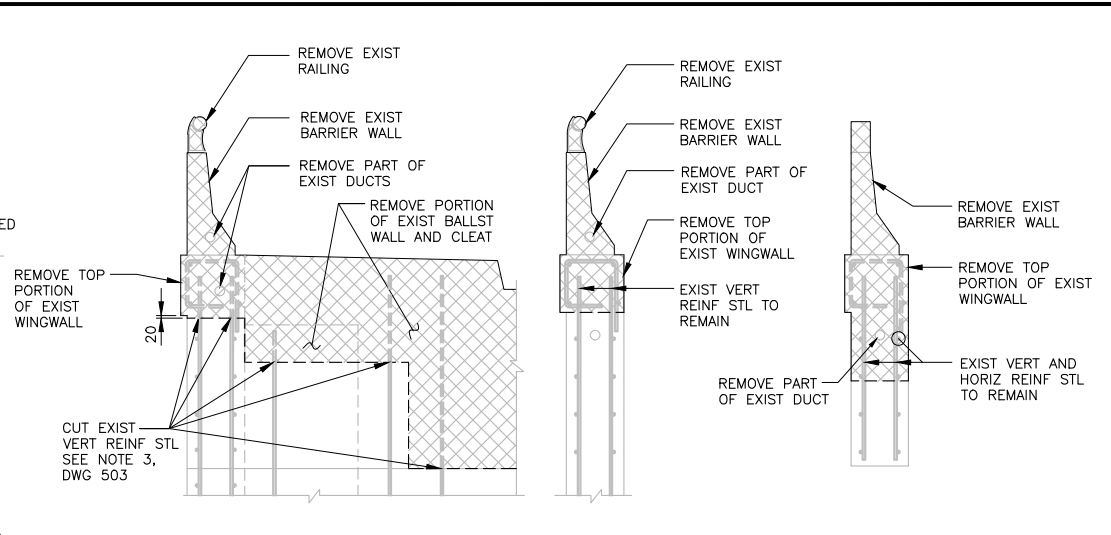
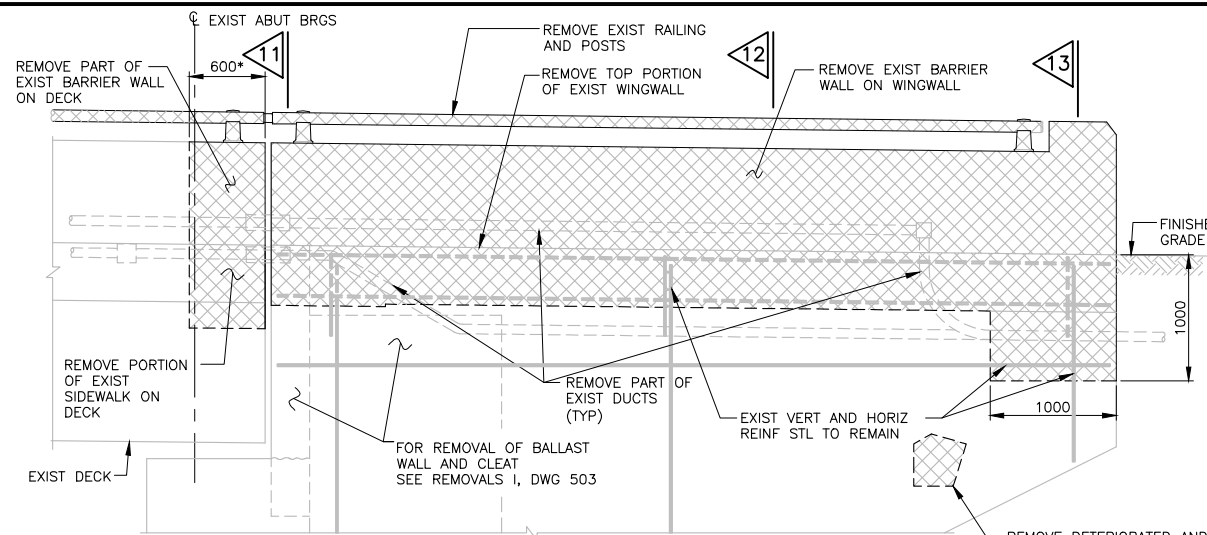
DATE	REVISIONS	BY	CHK	LEAD DISC.	PROJ. MAN.
C	18/03/16	90% SUBMISSION TO CA			
B	18/01/09	90% SUBMISSION TO CA			
A	17/10/31	90% SUBMISSION TO CA			

SCALE :
AS NOTED

DESIGNED	SUBOOHI OBAD
DRAWN	ELENA TSENER
CHECKED	MAGED IBRAHIM
APPROVED LEAD ENG.	TATIANA OJALA
APPROVED PROJ. MANAGER	
NAME (PRINT)	INT.
	DATE



HWY 427 EXPANSION HWY 427/FINCH AVENUE UNDERPASS REHABILITATION - R1 SITE 37-1084 REMOVALS I							
PROJECT ID.	STAGE IDENTIFIER	DESIGN PACKAGE NUMBER	DISCIPLINE	STRUCTURE NUMBER	DOCUMENT TYPE	DRAWING NUMBER	REVISION NUMBER
H427-D	N	9A	STR	B01	DWG	503	C



NOTES:
 1. THIS DRAWING TO BE READ IN CONJUNCTION WITH DWGS 500, 501 AND 503.

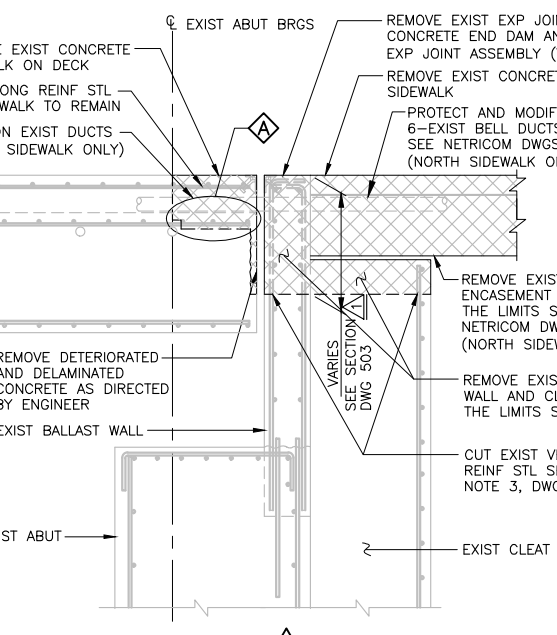
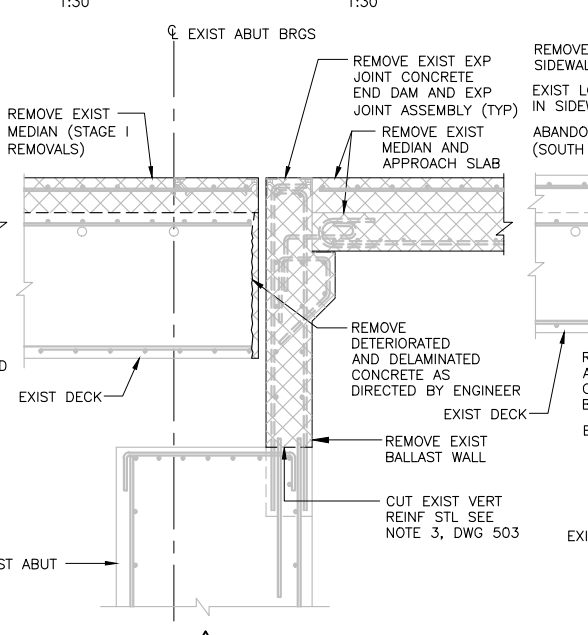
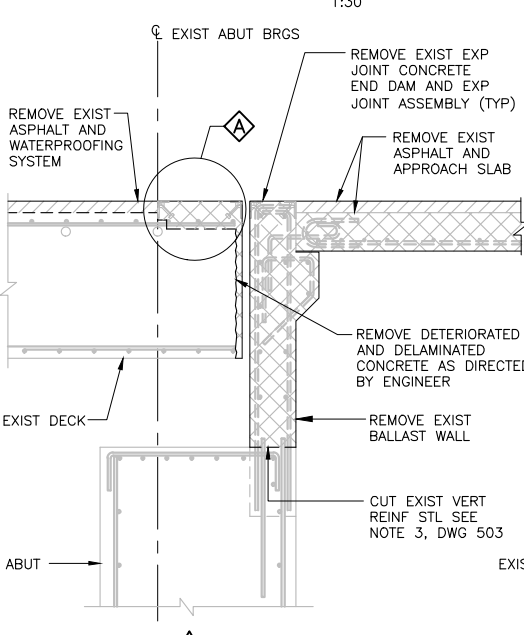
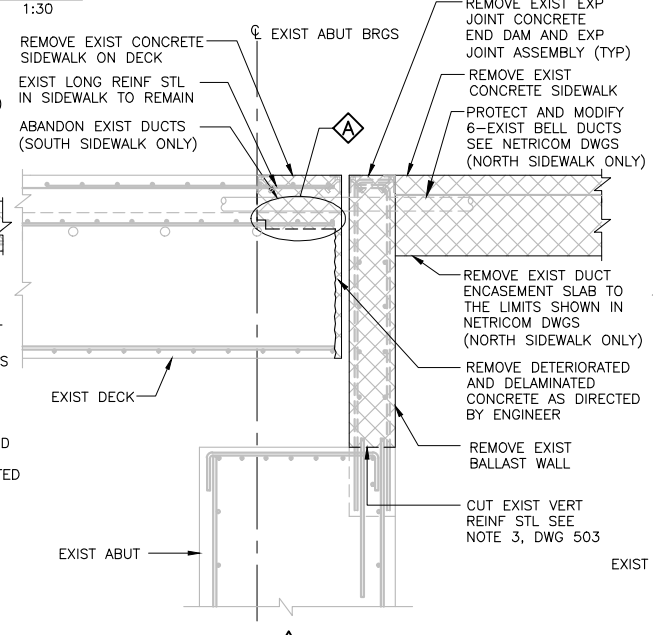
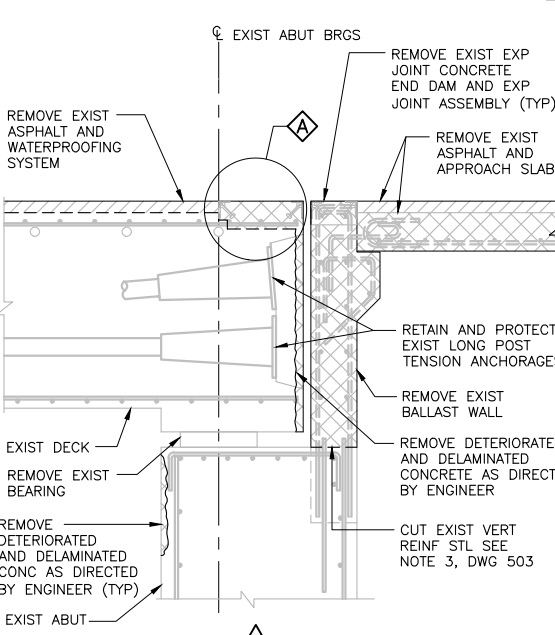
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 10 1:30

11 1:30

12 1:30

13 1:30

A 1:10



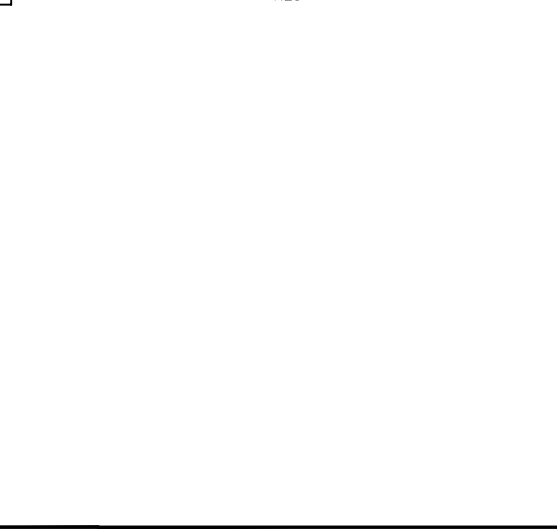
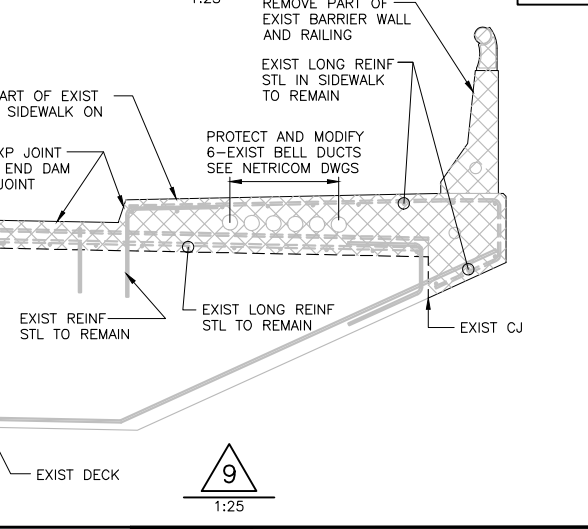
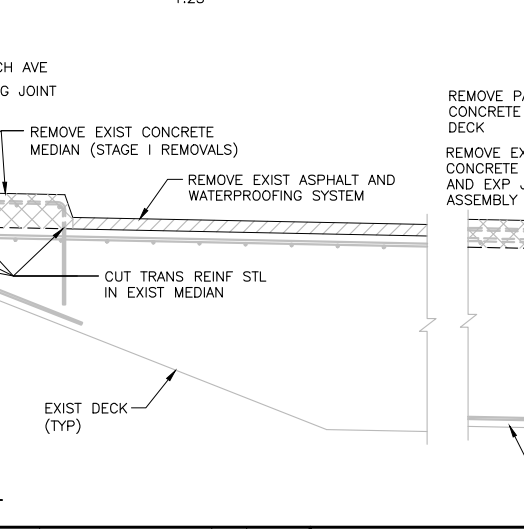
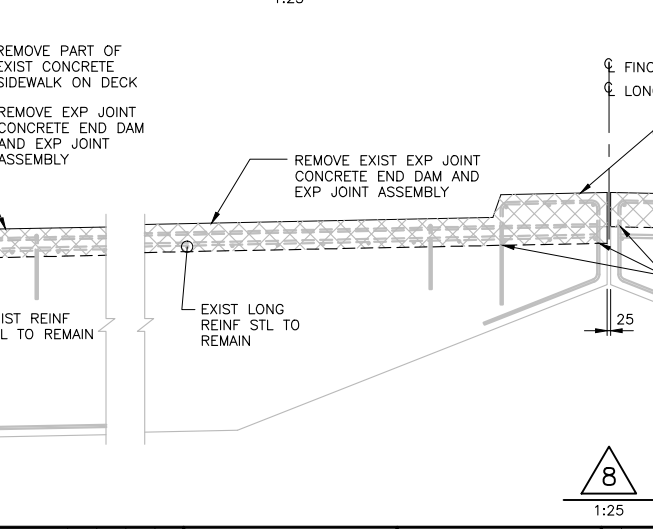
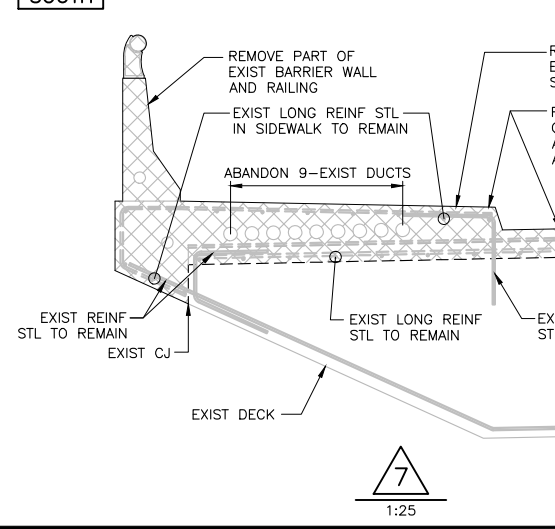
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3 1:25

4 1:25

5 1:25

NORTH 1:25



7 1:25

8 1:25

9 1:25

9 1:25

9 1:25

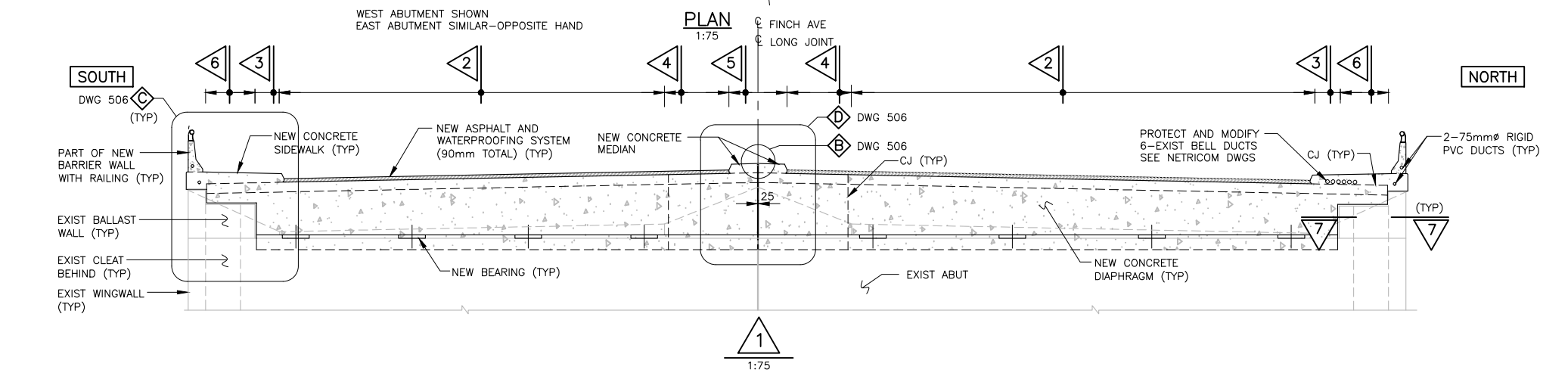
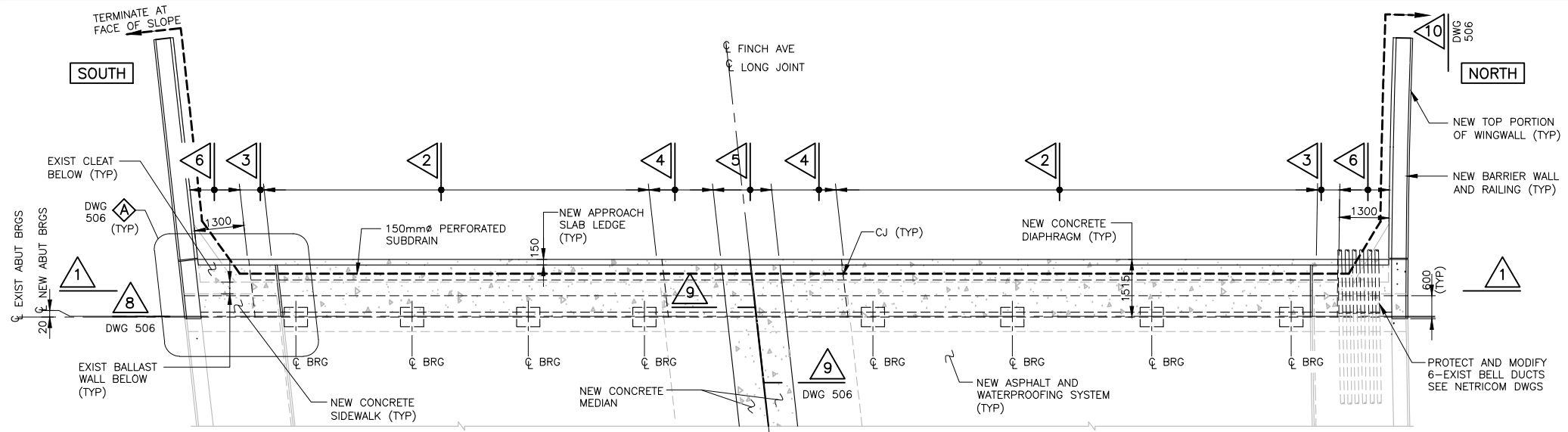
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 DATE PLOTTED: 3/19/2018 10:43:49 AM BY:

SCALE :
 AS NOTED

DESIGNED	SUBOOH OBNID
DRAWN	ELENA TSENER
CHECKED	MAGED IBRAHIM
APPROVED LEAD ENG.	TATIANA QJALA
APPROVED PROJ. MANAGER	
CONSULTANT	
NAME (PRINT)	INT. DATE



TITLE						
HWY 427 EXPANSION HWY 427/FINCH AVENUE UNDERPASS REHABILITATION - R1 SITE 37-1084 REMOVALS II						
PROJECT ID.	STAGE IDENTIFIER	DESIGN PACKAGE NUMBER	DISCIPLINE	STRUCTURE NUMBER	DOCUMENT TYPE	REVISION NUMBER
H427-D	N	9A	STR	B01	DWG	504 C

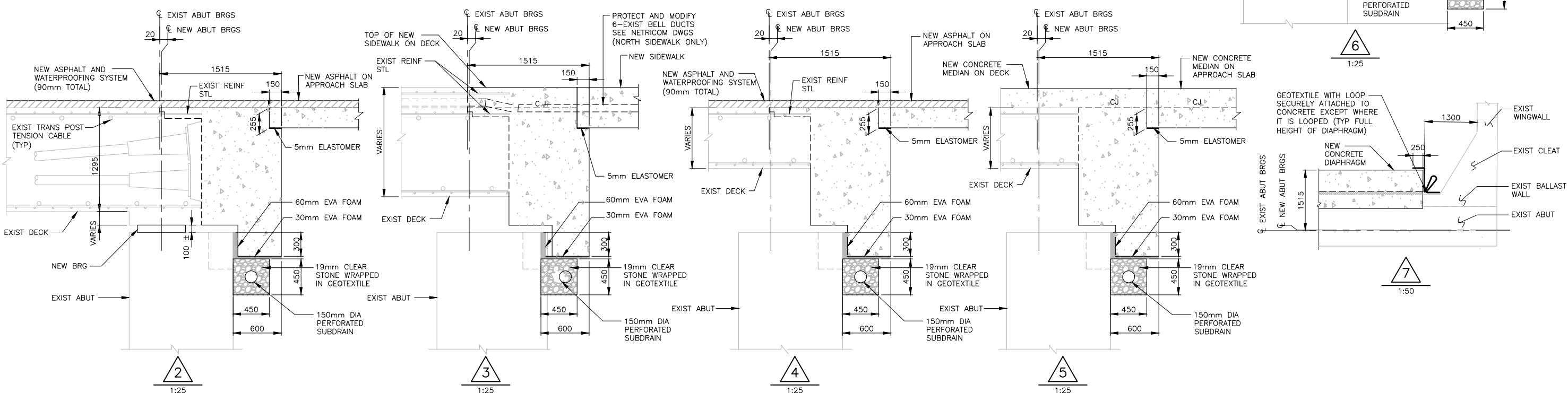
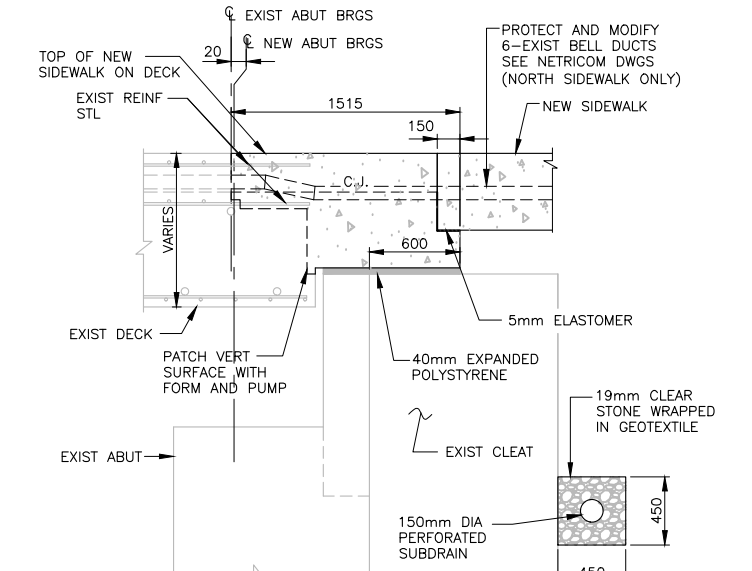


LEGEND:
 NEW CONCRETE
 NEW ASPHALT

NOTES:
 1. THIS DRAWING TO BE READ IN CONJUNCTION WITH DWGS 500, 501, 503, 504 AND 506.

LIST OF ABBREVIATIONS:
 EVA ETHYLENE VINYL ACETATE
 LONG LONGITUDINAL

APPLICABLE STANDARD DRAWING
 OPSD 3329.100 DECK, REINFORCEMENT - SUPPORTS FOR REINFORCING STEEL FOR SLAB DEPTHS 300mm OF LESS.
 OPSD 3329.101 DECK, REINFORCEMENT - SUPPORTS FOR REINFORCING STEEL FOR SLAB DEPTHS GREATER THAN 300mm.
 OPSD 3390.100 DECK, DRIP CHANNEL.
 OPSD 3950.100 JOINTS - CONCRETE EXPANSION AND CONSTRUCTION ON STRUCTURE.



CAD FILE LOCATION AND NAME: C:\projects\hwy427\dwg\hwy427-d0-9a-str-b01-505nc.dwg
 MODIFIED: 3/19/2018 10:42:36 AM BY: PANGF
 DATE PLOTTED: 3/19/2018 10:43:50 AM BY:

DATE	REVISIONS	BY	CHK	LEAD DISC.	PROJ. MAN.
C 18/03/16	90% SUBMISSION TO CA				
B 18/01/09	90% SUBMISSION TO CA				
A 17/10/31	90% SUBMISSION TO CA				

SCALE :
 AS NOTED

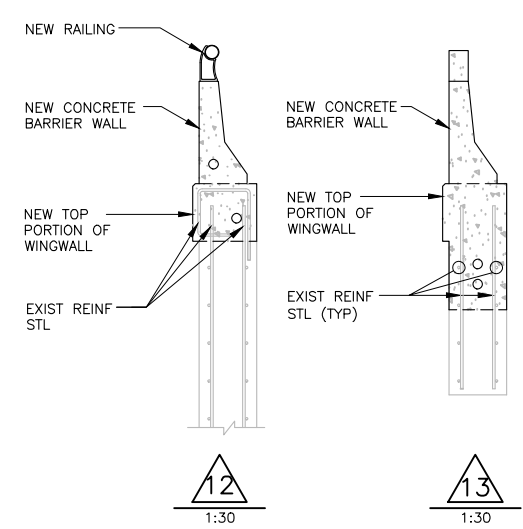
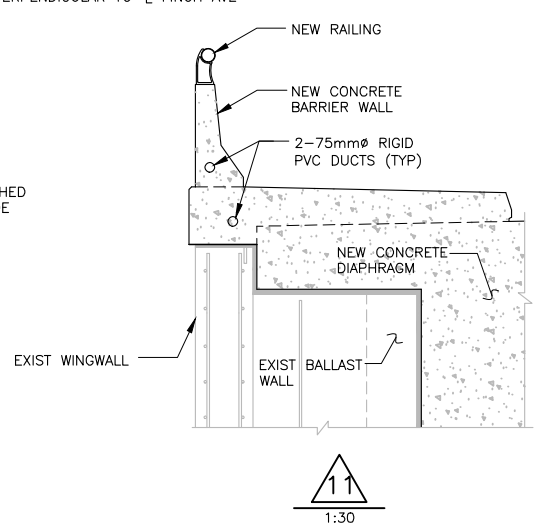
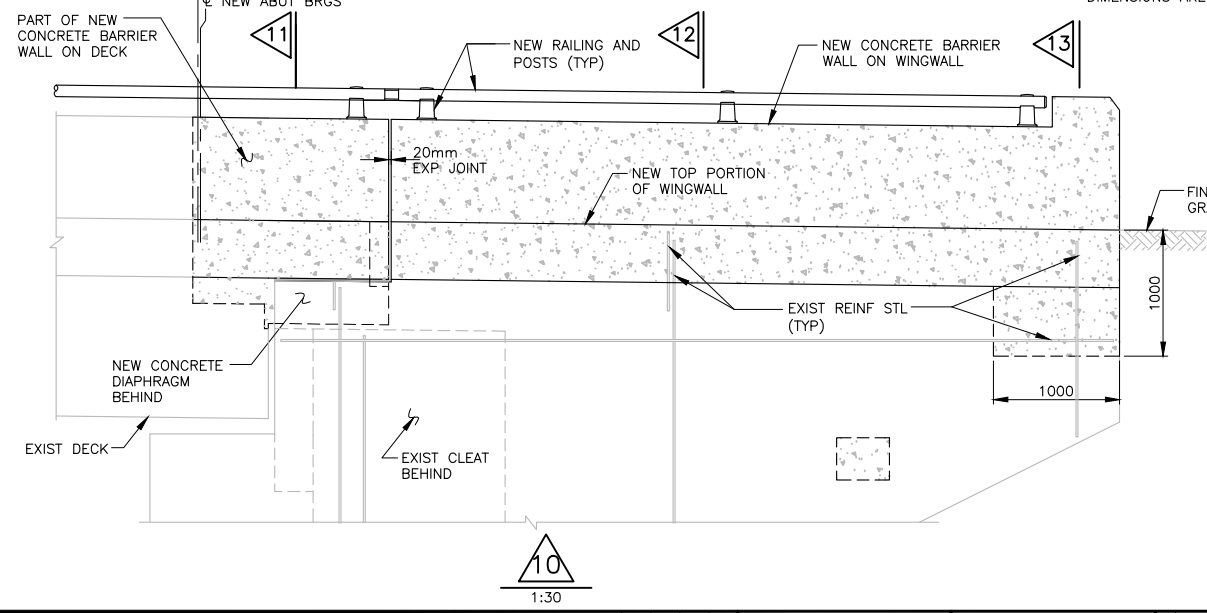
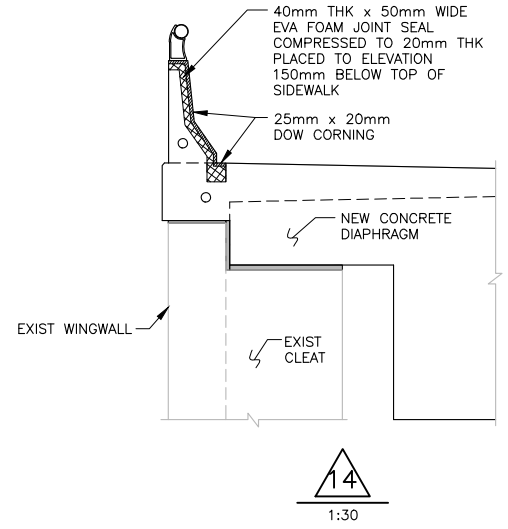
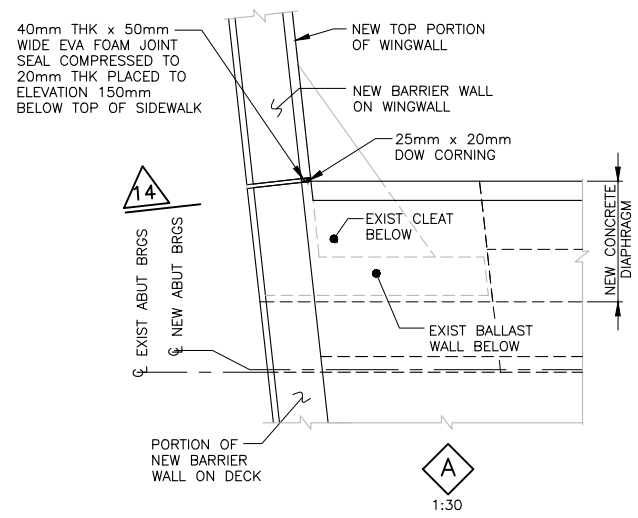
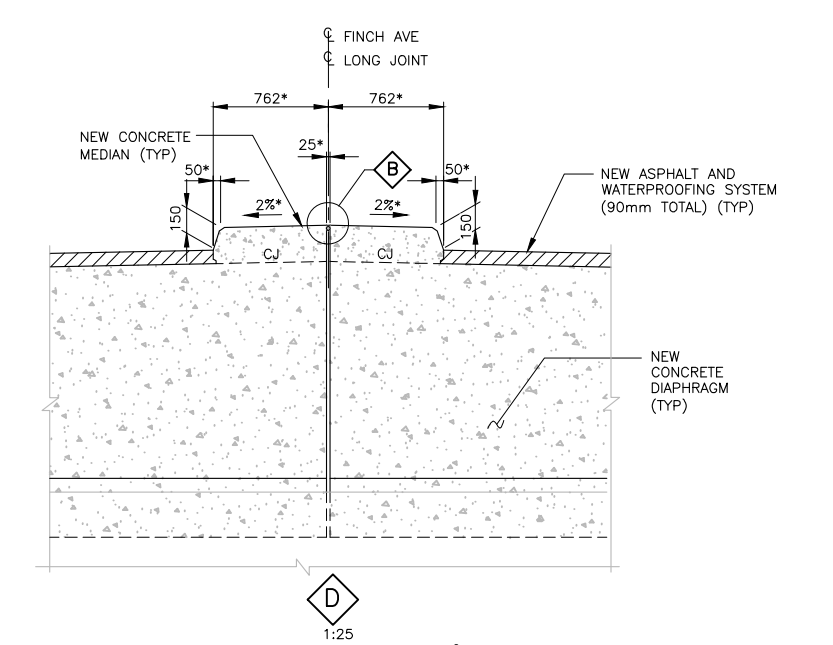
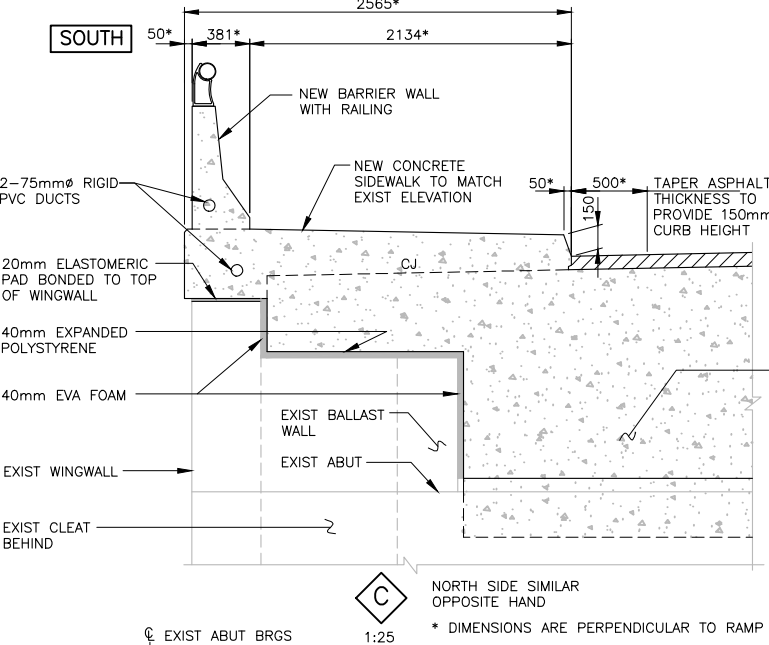
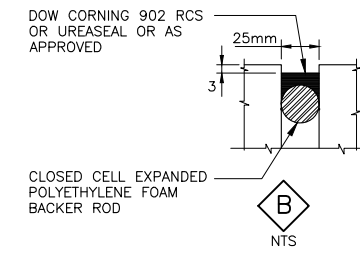
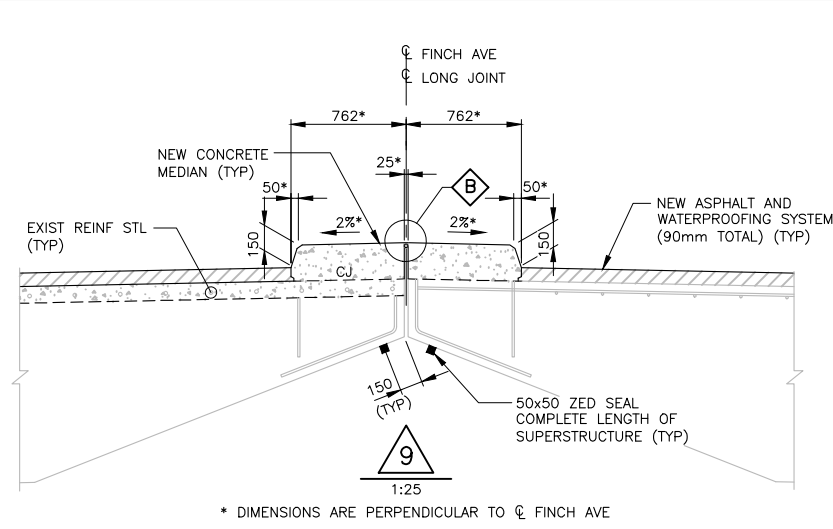
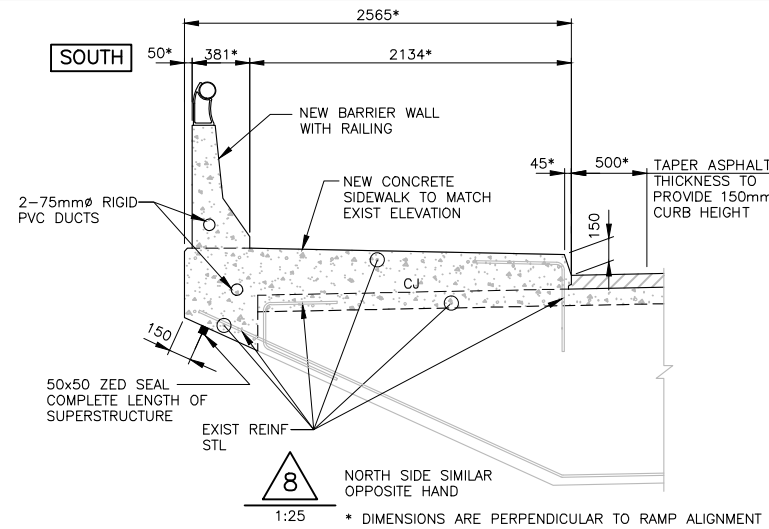
DESIGNED	SUBOOH OBAD
DRAWN	ELENA TSENER
CHECKED	MAGED IBRAHIM
APPROVED LEAD ENG.	TATIANA QJALA
APPROVED PROJ. MANAGER	
NAME (PRINT)	INT. DATE



HWY 427 EXPANSION HWY 427/FINCH AVENUE UNDERPASS REHABILITATION - R1 SITE 37-1084 NEW CONSTRUCTION I							
PROJECT ID.	STAGE IDENTIFIER	DESIGN PACKAGE NUMBER	DISCIPLINE	STRUCTURE NUMBER	DOCUMENT TYPE	DRAWING NUMBER	REVISION NUMBER
H427-D	N	9A	STR	B01	DWG	505	C

NOTES:

1. THIS DRAWING TO BE READ IN CONJUNCTION WITH DWGS 500, 501, 503, 504 AND 505.



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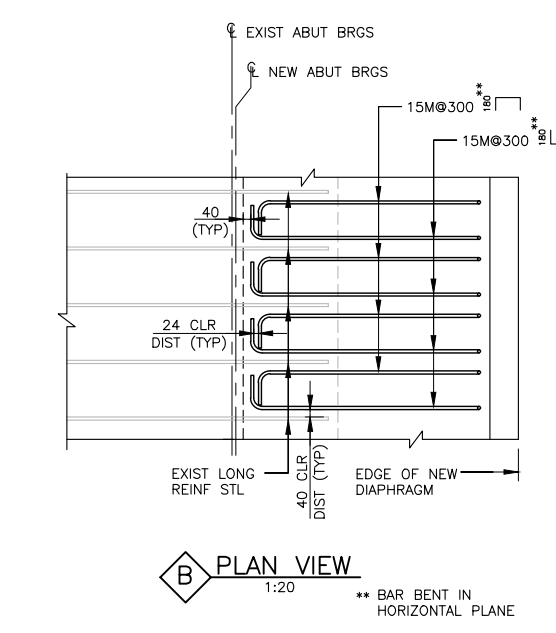
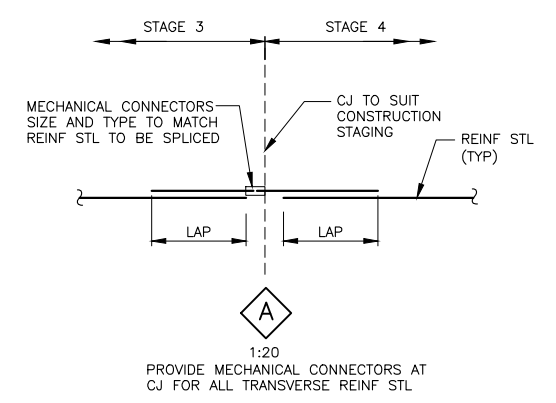
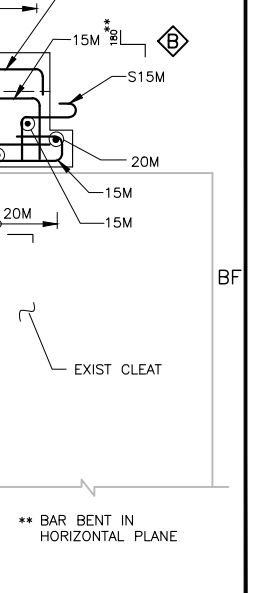
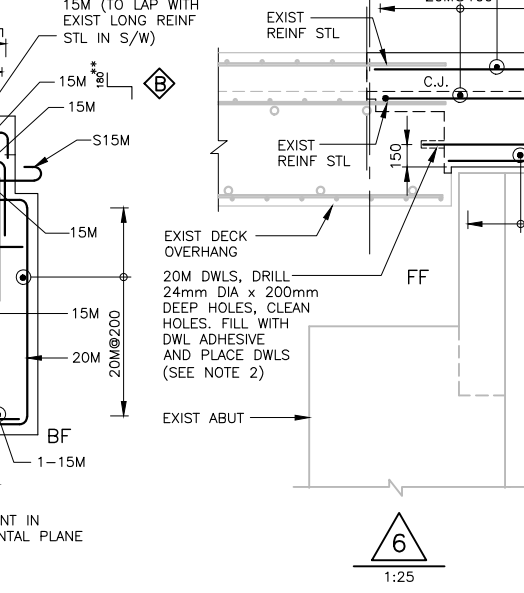
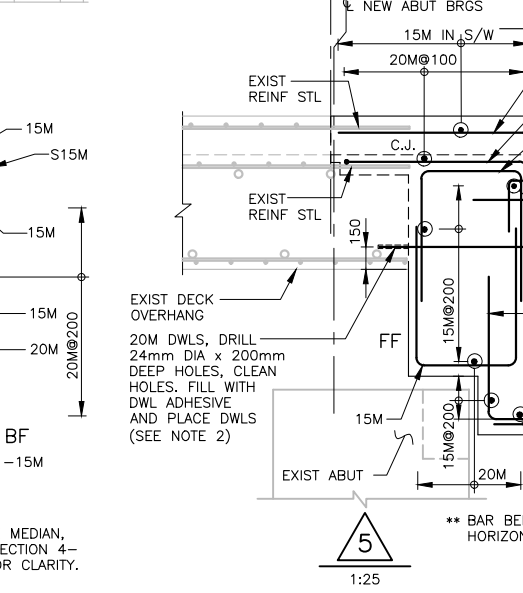
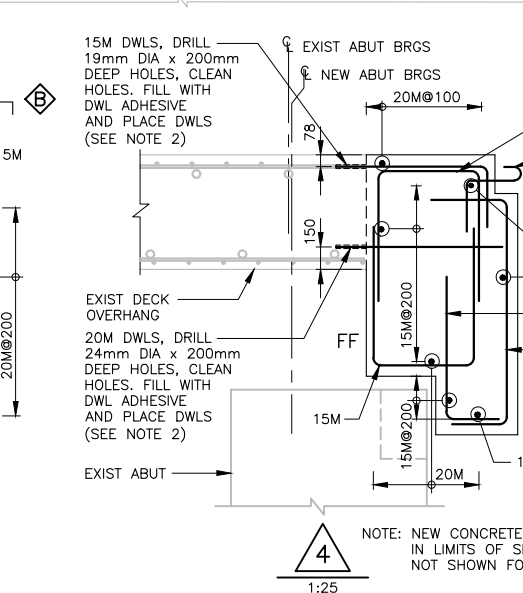
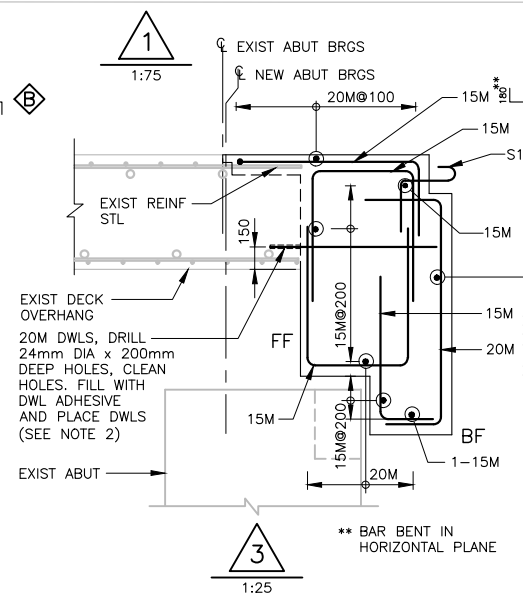
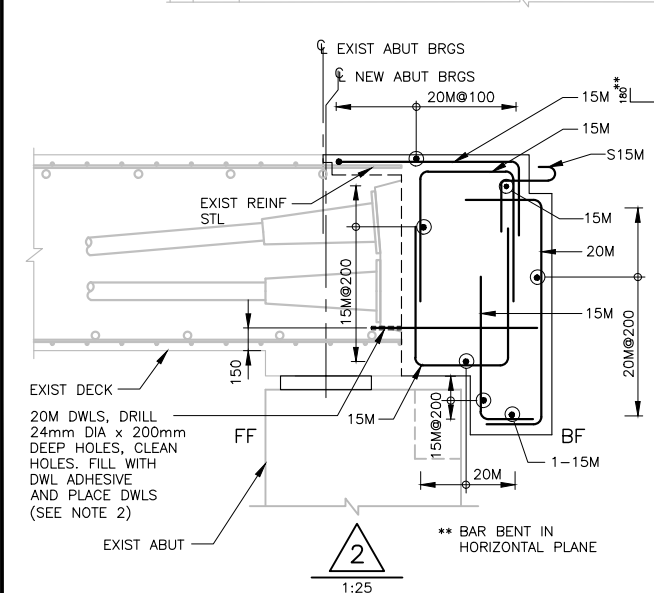
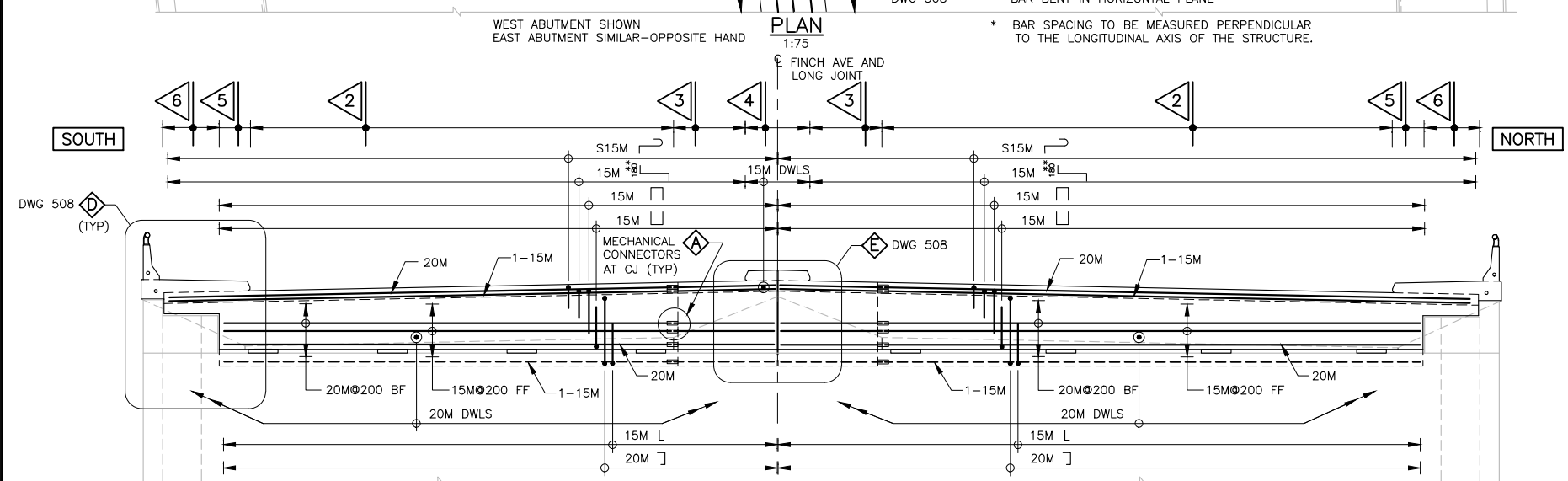
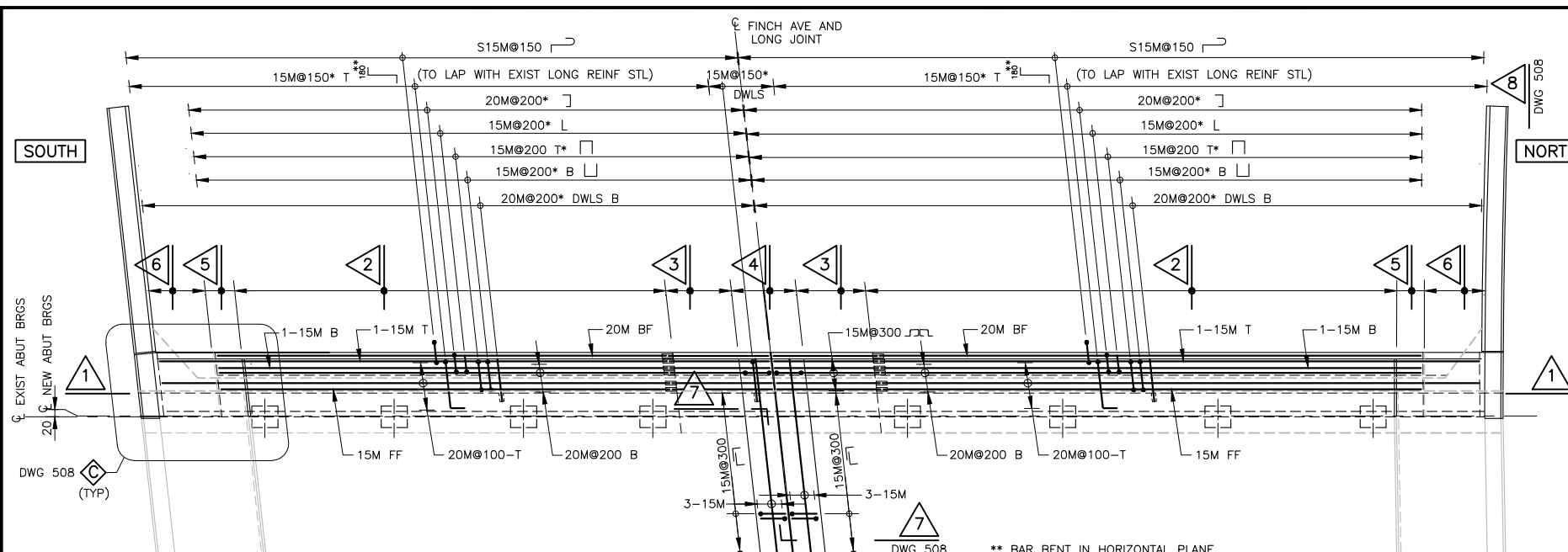
DATE	REVISIONS	BY	CHK	LEAD DISC.	PROJ. MAN.
C 18/03/16	90% SUBMISSION TO CA				
B 18/01/09	90% SUBMISSION TO CA				
A 17/10/31	90% SUBMISSION TO CA				

SCALE :
AS NOTED

DESIGNED	SUBOOH OBAD
DRAWN	ELENA TSENER
CHECKED	MAGED IBRAHIM
APPROVED LEAD ENG.	TATIANA QJALA
APPROVED PROJ. MANAGER	
NAME (PRINT)	INT.
	DATE



TITLE HWY 427 EXPANSION HWY 427/FINCH AVENUE UNDERPASS REHABILITATION - R1 SITE 37-1084 NEW CONSTRUCTION II							
PROJECT ID.	STAGE IDENTIFIER	DESIGN PACKAGE NUMBER	DISCIPLINE	STRUCTURE NUMBER	DOCUMENT TYPE	DRAWING NUMBER	REVISION NUMBER
H427-D	N	9A	STR	B01	DWG	506	C



- NOTES:**
- THIS DRAWING TO BE READ IN CONJUNCTION WITH DWGS 500, 501, 505, 506 AND 508.
 - HOLES TO BE DRILLED AFTER DETERIORATED AND DELAMINATED CONCRETE HAS BEEN REMOVED.

- LIST OF ABBREVIATIONS:**
- CLR DIST CLEAR DISTANCE
 - EQ SP EQUALLY SPACED
 - LONG LONGITUDINAL
 - REINF STL REINFORCING STEEL

- APPLICABLE STANDARD DRAWINGS**
- OPSD 3329.100 DECK, REINFORCEMENT - SUPPORTS FOR REINFORCING STEEL FOR SLAB DEPTHS 300mm OR LESS
 - OPSD 3329.101 DECK, REINFORCEMENT - SUPPORTS FOR REINFORCING STEEL FOR SLAB DEPTHS GREATER THAN 300mm

CAD FILE LOCATION AND NAME: C:\projects\hwy427\dwg\507-9A-DWG-507NC.dwg
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 DATE PLOTTED: 3/19/2018 10:43:53 AM BY:

DATE	REVISIONS	BY	CHK	LEAD DISC.	PROJ. MAN.
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B 18/01/09	90% SUBMISSION TO CA				
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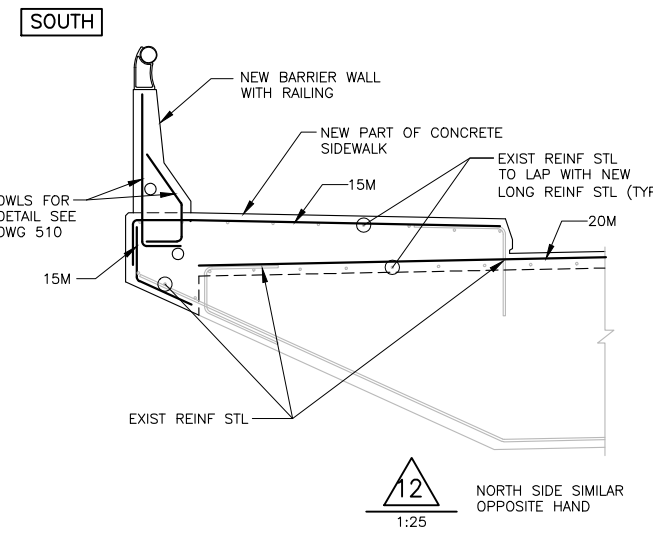
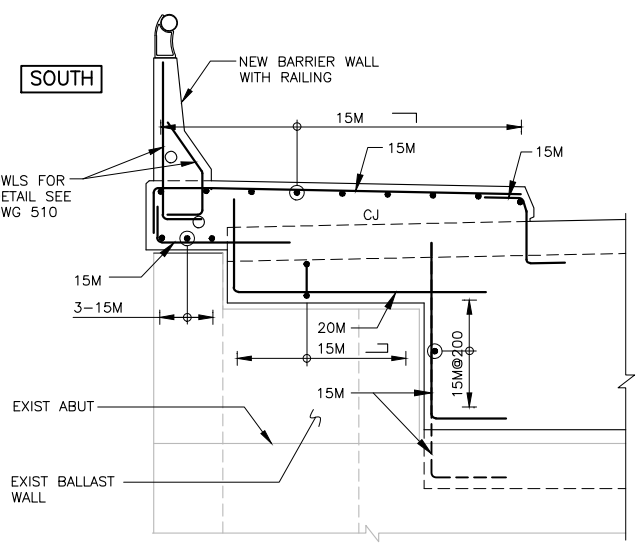
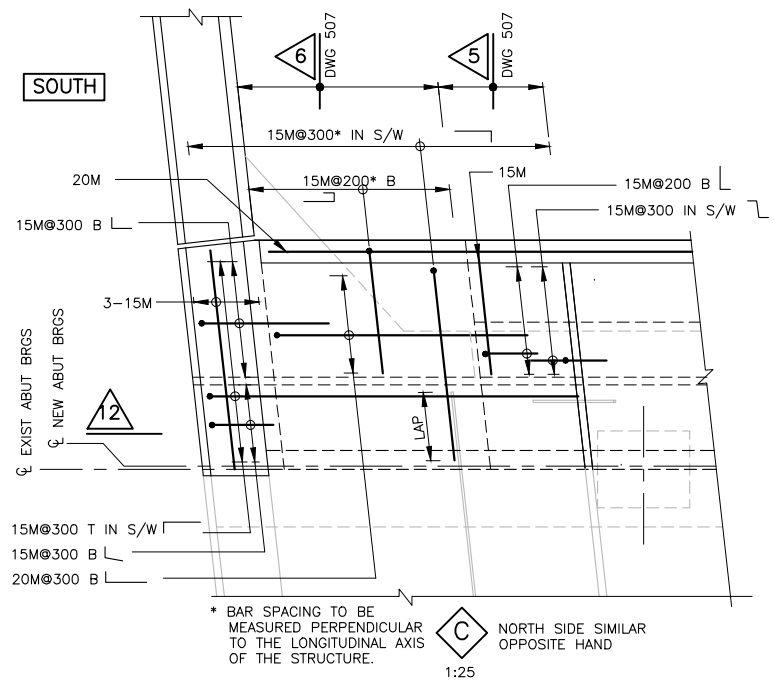
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AS NOTED

DESIGNED	SUBOOH OBAD
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APPROVED PROJ. MANAGER	

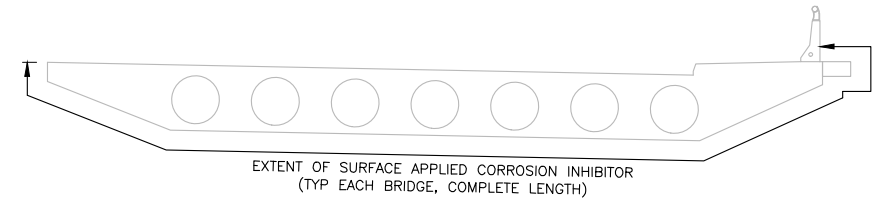


TITLE HWY 427 EXPANSION HWY 427/FINCH AVENUE UNDERPASS REHABILITATION - R1 SITE 37-1084 NEW CONSTRUCTION III							
PROJECT ID.	STAGE IDENTIFIER	DESIGN PACKAGE NUMBER	DISCIPLINE	STRUCTURE NUMBER	DOCUMENT TYPE	DRAWING NUMBER	REVISION NUMBER
H427-D	N	9A	STR	B01	DWG	507	C

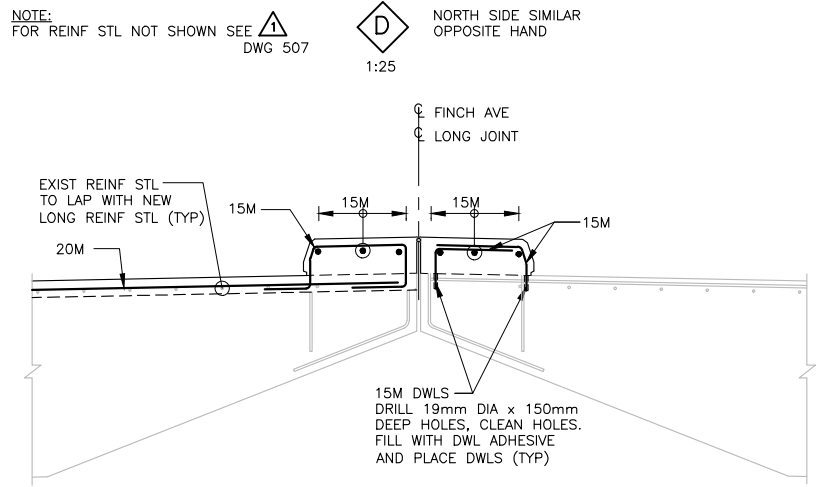
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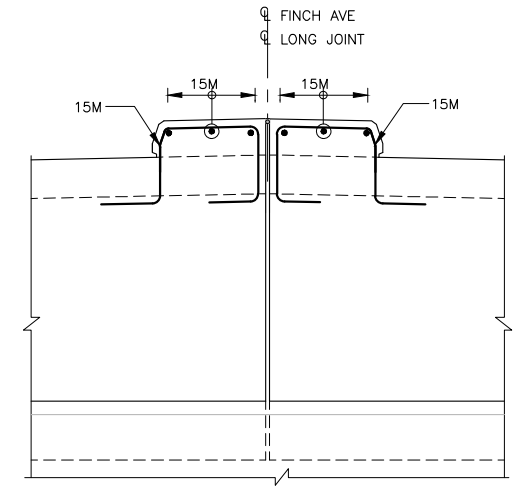
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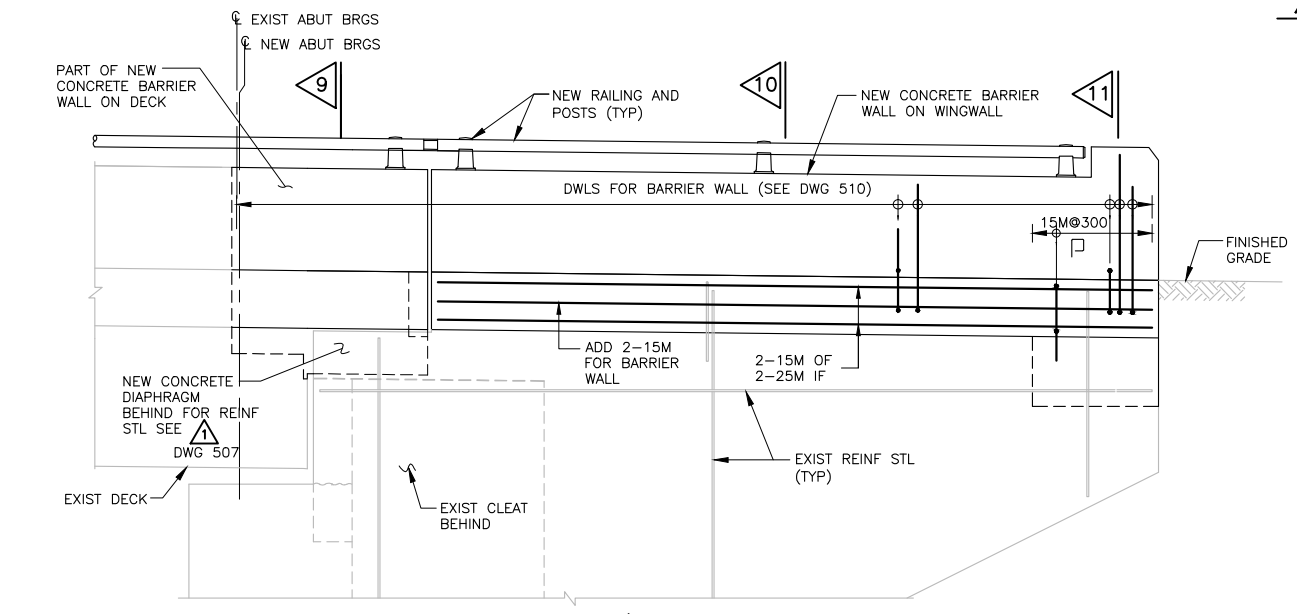
LIMITS OF SURFACE APPLIED CORROSION INHIBITOR
 1:75
 SOUTH STRUCTURE SHOWN
 NORTH STRUCTURE SIMILAR-OPPOSITE HAND



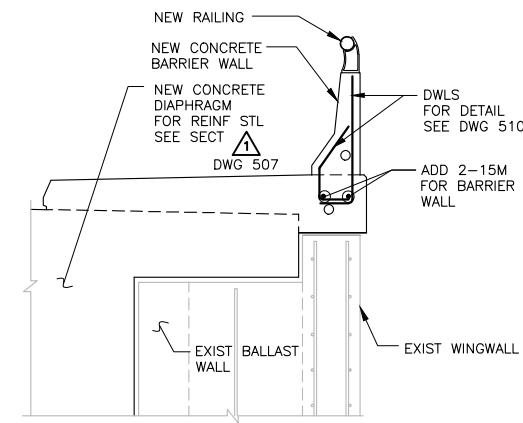
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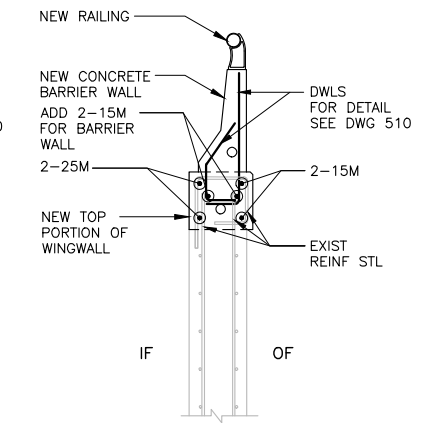
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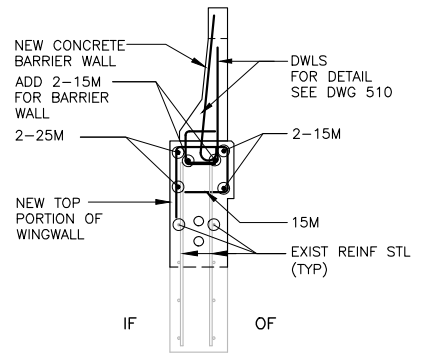
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 1:30



9
 1:30



10
 1:30



11
 1:30

SCALE :
 AS NOTED

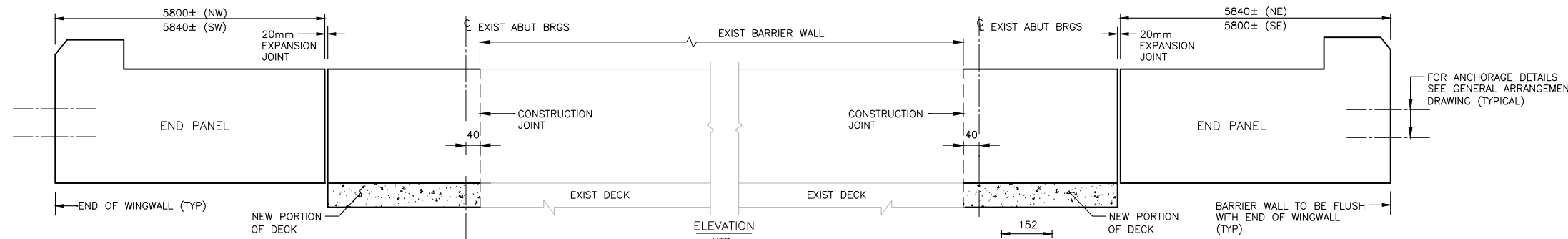
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DRAWN	ELENA TSENIER
CHECKED	MAGED IBRAHIM
APPROVED LEAD ENG.	TATIANA OJALA
APPROVED PROJ. MANAGER	
CONSULTANT	
NAME (PRINT)	INT. DATE



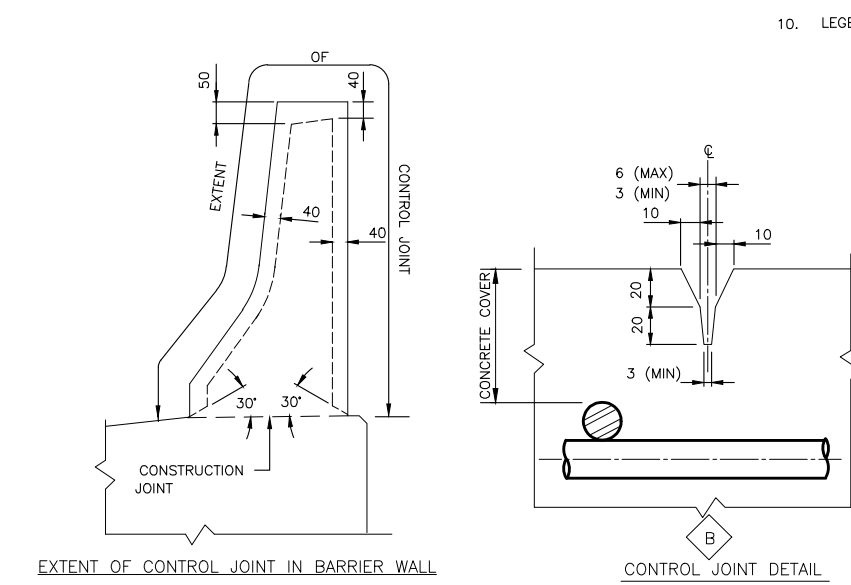
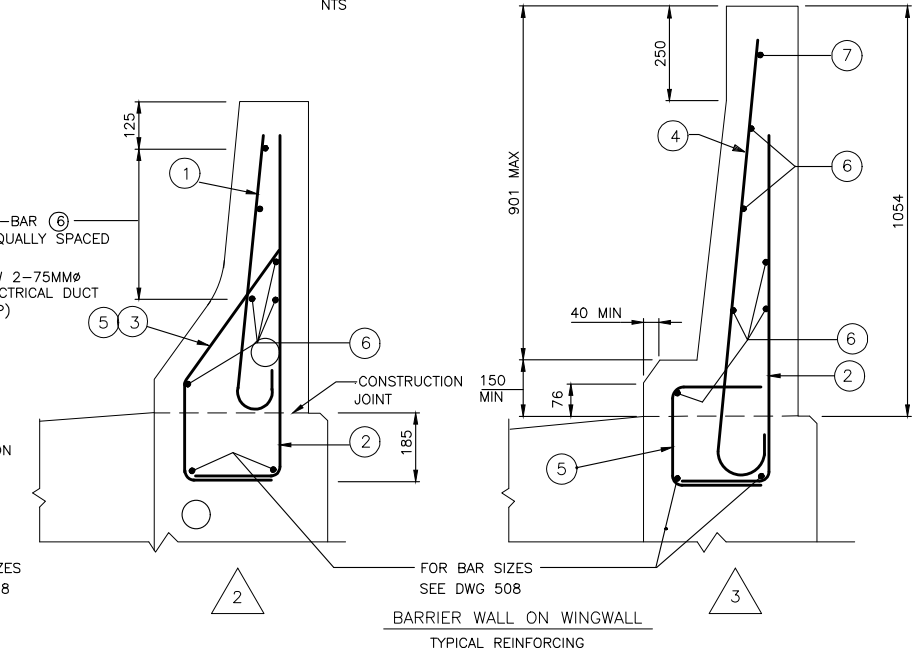
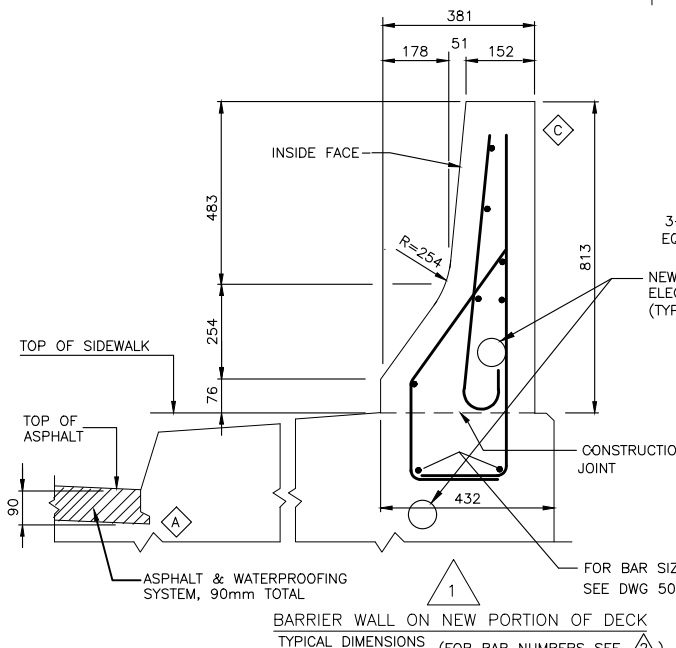
TITLE
 HWY 427 EXPANSION
 HWY 427/FINCH AVENUE UNDERPASS
 REHABILITATION - R1
 SITE 37-1084
 NEW CONSTRUCTION IV

DATE	REVISIONS	BY	CHK	LEAD DISC.	PROJ. MAN.
C 18/03/16	90% SUBMISSION TO CA				
B 18/01/09	90% SUBMISSION TO CA				
A 17/10/31	90% SUBMISSION TO CA				

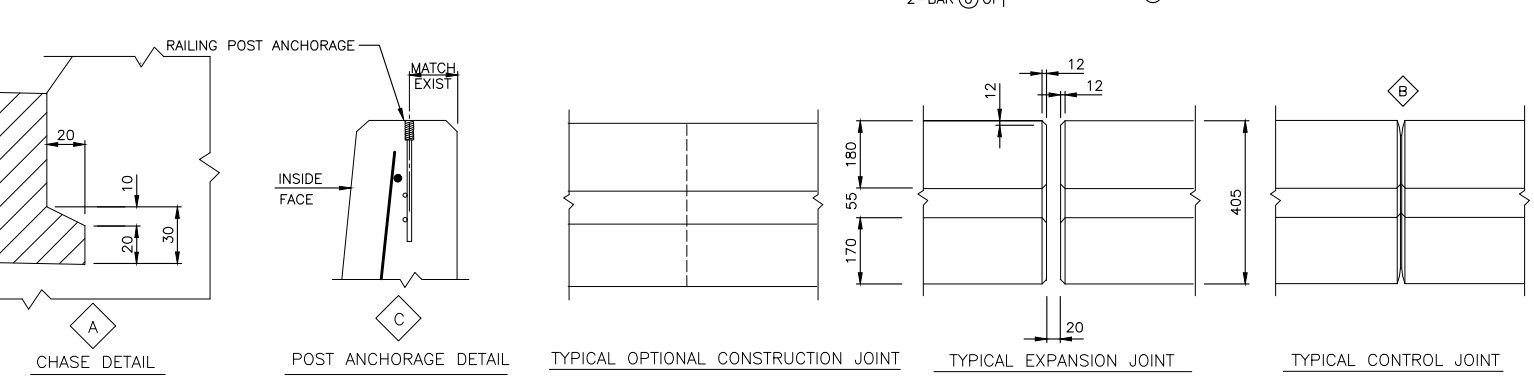
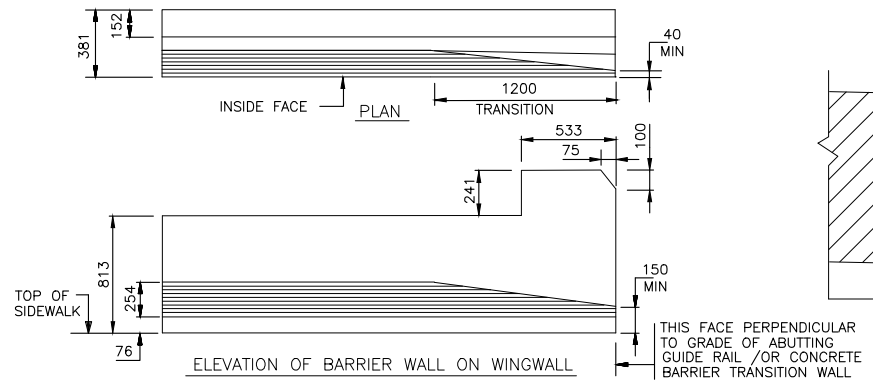
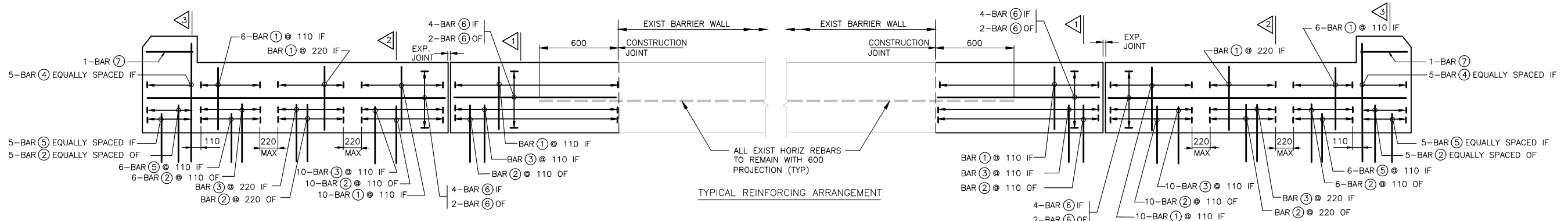
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H427-D	N	9A	STR	B01	DWG	508	C



- NOTES:**
- CHASE REQUIRED ON HIGH AND LOW SIDE OF CROSSFALL
 - CONCRETE COVER TO REINFORCING STEEL 70 ±20mm.
 - BAR LAP SPLICE FOR HORIZONTAL REINFORCEMENT MUST NOT LAP THROUGH CONTROL JOINT.
 - MINIMUM BAR LAP SPLICE TO BE 550mm.
 - LENGTH OF HORIZONTAL BAR TO SUIT CONTRACTOR'S OPERATIONS. BAR LENGTHS NEED NOT MATCH DISTANCE BETWEEN CONTROL JOINTS.
 - CONTROL JOINT TO BE FORMED.
 - SAWCUTS NOT PERMITTED.
 - CONTROL JOINT FORM HARDWARE NOT TO BE LEFT IN PLACE.
 - OPTIONAL CONSTRUCTION JOINTS TO BE LOCATED WITHIN LIMITS OF CONCRETE DAMS ON DECK OR BALLAST WALL
 - LEGEND
EF DENOTES EACH FACE
IF DENOTES INSIDE FACE
OF DENOTES OUTSIDE FACE



BAR MARK	SIZE	SHAPE
①	15M	
②	15M	
③	15M	
④	15M	
⑤	15M	
⑥	15M	STRAIGHT
⑦	15M	STRAIGHT



APPLICABLE STANDARD DRAWINGS
SS110-21 RAILING FOR BARRIER/PARAPET WALL

MODIFIED	
STANDARD DRAWING MARCH 1980	SS110-11
BARRIER WALL WITH S/W & RAILING	

CAD FILE LOCATION AND NAME: \\projectwise\wsp-ca\wsp-ca\wsp-ca\wsp-ca\H427-D0-9A-STR-B01-DWG-510B.dwg
 MODIFIED: 19/03/2018 10:56:05 AM BY: PANGF
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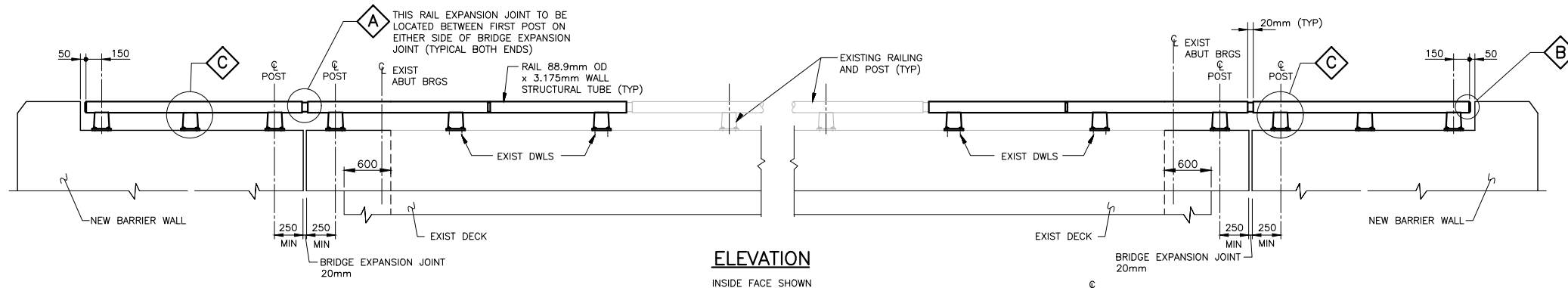
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C 18/03/16	90% SUBMISSION TO CA				
B 18/01/09	90% SUBMISSION TO CA				
A 17/10/31	90% SUBMISSION TO CA				

SCALE :
AS NOTED

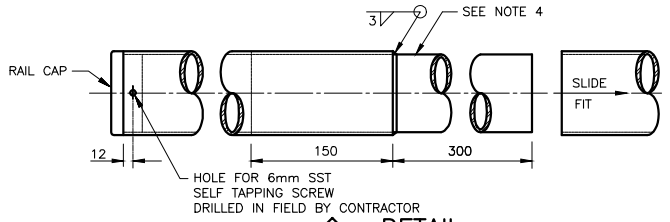
DESIGNED	SUBOOH OBAD
DRAWN	ELENA TSENIER
CHECKED	MAGED IBRAHIM
APPROVED LEAD ENG.	TATIYANA OJALA
APPROVED PROJ. MANAGER	
NAME (PRINT)	INT. DATE



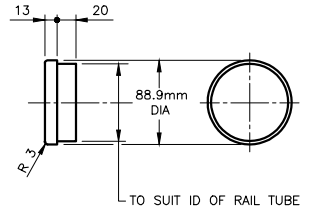
HWY 427 EXPANSION HWY 427/FINCH AVENUE UNDERPASS REHABILITATION - R1 SITE 37-1084 BARRIER WALL WITH S/W AND RAILING							
PROJECT ID.	STAGE IDENTIFIER	DESIGN PACKAGE NUMBER	DISCIPLINE	STRUCTURE NUMBER	DOCUMENT TYPE	DRAWING NUMBER	REVISION NUMBER
H427-D	N	9A	STR	B01	DWG	510	C



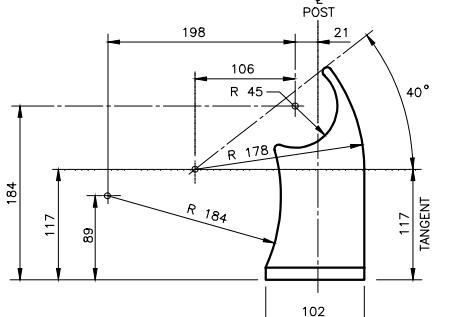
ELEVATION
INSIDE FACE SHOWN



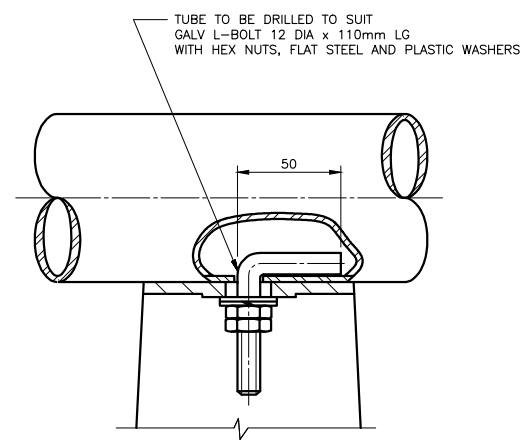
DETAIL A



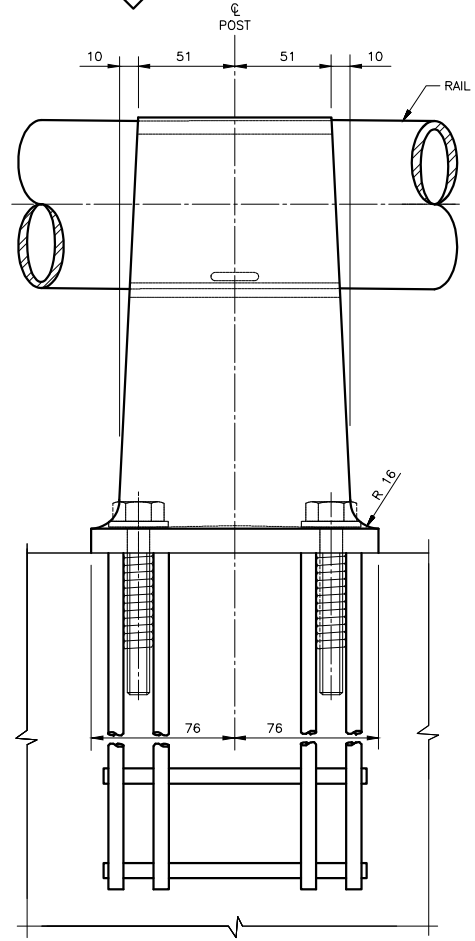
RAIL CAP



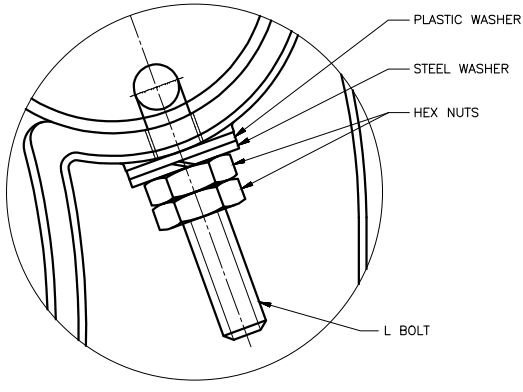
POST DETAILS



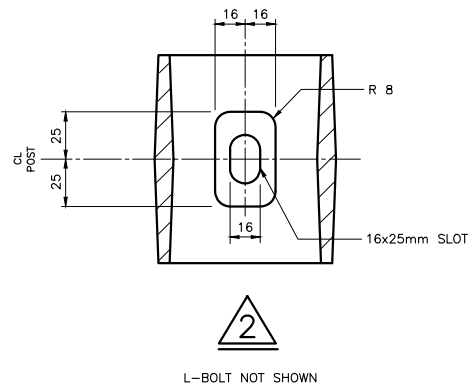
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BACK VIEW



DETAIL D



2

L-BOLT NOT SHOWN

	MINIMUM	MAXIMUM
POST* SPACING FOR STEEL RAIL	2 500mm	3 500mm
POST* SPACING FOR ALUMINUM RAIL	2 000mm	2 500mm

* POSTS MAY BE STEEL OR ALUMINUM

MODIFIED
STANDARD DRAWING APRIL 2011 | **SS110-21**
RAILING FOR BARRIER/PARAPET WALL

NOTES:

- RAIL ELEMENTS SHALL BE STRUCTURAL TUBING SUPPLIED IN ACCORDANCE TO CAN/CSA-G40.20-04/G40.21-04 GRADE 350, EXCEPT WHERE NOTED.
- STEEL IN POSTS SHALL BE CAST STEEL SUPPLIED IN ACCORDANCE WITH ASTM A27-60 GRADE 65-35.
- RAIL SHALL BE SUPPLIED WITH SPLICE IN LENGTHS OF 6980mm (EXCLUDING SPLICE) EXCEPT AS NOTED.
- GALVANIZED RAIL TUBING MATING SURFACES TO HAVE A 2 ± 0.5mm GAP ALL AROUND TO ENSURE A SLIDE FIT.
- STEEL POSTS AND RAILS SHALL BE GALVANIZED IN ACCORDANCE TO CAN/CSA-G164-M92. ALL GALVANIZING SHALL BE DONE AFTER FABRICATION.
- ELECTRODES SHALL BE A LOW HYDROGEN SPECIFICATION E7015, E7016 OR E7018.
- POST AND ANCHORAGE TO INCLUDE ALL BOLTS AND WASHERS.
- END CAP TO INCLUDE SST SELF TAPPING FASTENERS.
- L-BOLT, NUT AND WASHERS FOR FASTENING STEEL TUBING TO POSTS SHALL BE GALVANIZED (CSA G164-M92).
- RAIL CAP MATERIAL SHALL BE STEEL OR ALUMINUM.
- RAIL SHALL BE PRESENT TO FOLLOW ROAD CURVATURE WHERE RADIUS IS LESS THAN 150m.
- RAIL POSTS SHALL BE SET PERPENDICULAR TO GRADE.
- WHERE LAYOUT OF POSTS IS NOT SHOWN, POST LOCATION SHALL BE DETERMINED BY THE CONTRACTOR.
- RAIL MAY BE CUT AS REQUIRED IN FIELD WITH PIPE CUTTERS. CUT TO BE SURFACE TREATED WITH ZINC RICH PAINT.
- WHEN CONNECTING TO EXISTING RAILING, RAIL MUST BE MADE CONTINUOUS AND POST SPACING DETERMINED WITH REFERENCE TO EXISTING POSTS.
- ALTERNATIVE ALUMINUM RAIL AND POST DESIGNS WILL BE PERMITTED. THE RAIL SHALL BE 6061 ALLOY T-6 HEAT TREATED. WHEN AN EXTRUDED POST IS USED, THE ALLOY AND HEAT TREATMENT SHALL BE THE SAME AS SPECIFIED FOR THE RAIL. WHEN A CAST POST IS USED THE ALLOY SHALL BE A 444.2-T4.
- LENGTH FOR 88.9 mm OD PIPE WITH SPLICE GIVEN IN TABLE DOES NOT INCLUDE 300 mm PROTRUSION OF SPLICE TUBE.
- SPLICING OF RAIL TUBES MAY BE DONE BY WELDING ON OF SPLICE PIECE OR BY SWEDGING OF RAIL END.
- RAILING ANCHORAGE INSERT TO BE PLACED PRIOR TO CONCRETING.
- THE COMBINATION OF STEEL RAIL AND ALUMINUM POSTS IS PERMITTED.
- ALL 'L' BOLTS SHALL BE INSTALLED AT THE MIDDLE OF THE SLOT AND SHALL BE TIGHTENED TO A CONDITION THAT WILL ALLOW RAIL MOVEMENT.
- END CAP CAN BE SAND CAST 356 ALUMINUM ALLOY.

ITEM	NO. REQ'D	LINEAR mm	BENDING RADIUS	LOCATION
POST AND ANCHORAGE	12	-	-	NORTH
	12	-	-	SOUTH
END CAP	2	-	-	NORTH
	2	-	-	SOUTH
88.9 OD PIPE (3900mm ± LG)	4	15600±	-	NORTH
	4	15600±	-	SOUTH
88.9 OD PIPE (5200mm ± LG)	2	10400±	-	NORTH
	2	10400±	-	SOUTH

APPLICABLE STANDARD DRAWINGS
OPSD 3419.150 BARRIERS AND RAILINGS STEEL SINGLE RAILING ANCHORAGE

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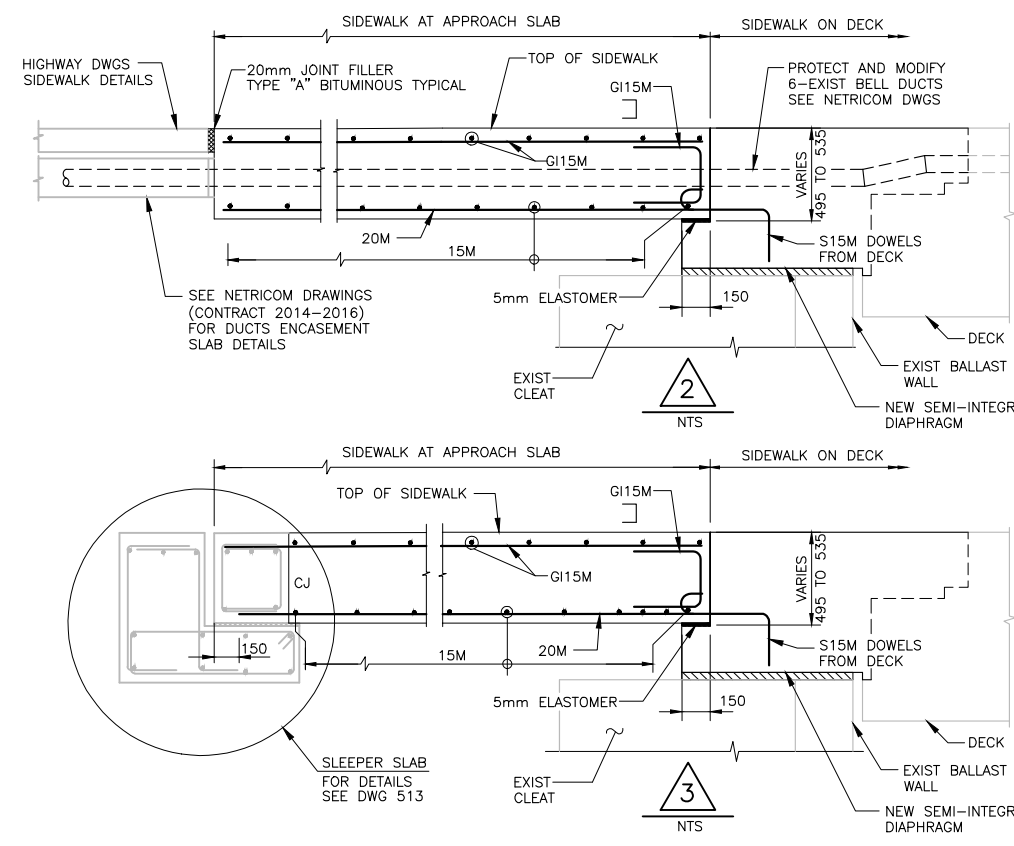
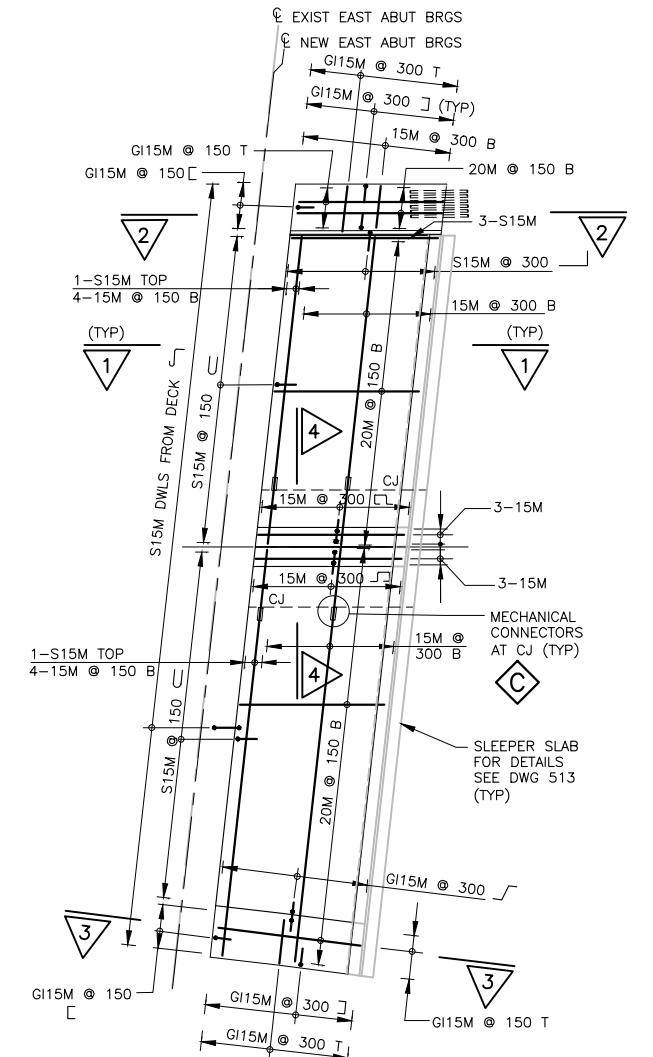
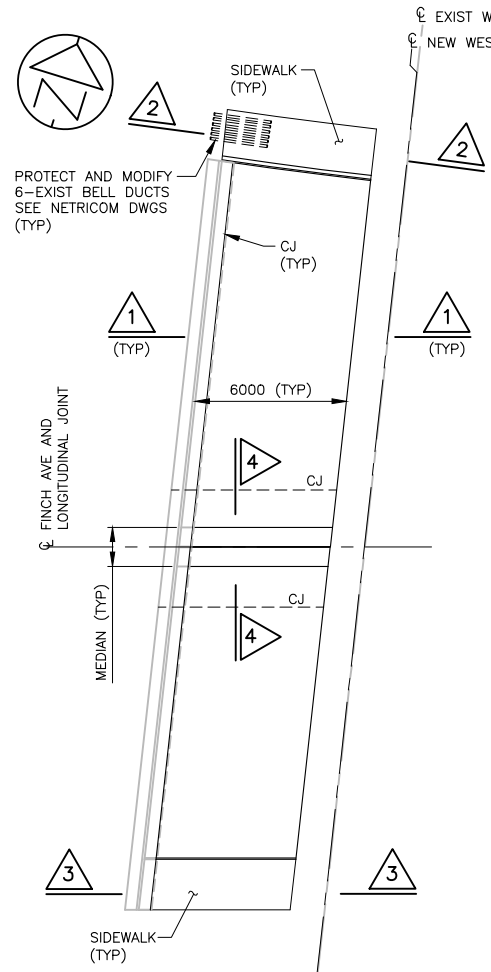
DATE	REVISIONS	BY	CHK	LEAD DISC.	PROJ. MAN.
C 18/03/16	90% SUBMISSION TO CA				
B 18/01/09	90% SUBMISSION TO CA				
A 17/10/31	90% SUBMISSION TO CA				

SCALE :
AS NOTED

DESIGNED	SUBOOH OBAD
DRAWN	ELENA TSENIER
CHECKED	MAGED IBRAHIM
APPROVED LEAD ENG.	TATIANA OJALA
APPROVED PROJ. MANAGER	
NAME (PRINT)	INT. DATE



HWY 427 EXPANSION HWY 427/FINCH AVENUE UNDERPASS REHABILITATION - R1 SITE 37-1084 RAILING FOR BARRIER WALL							
PROJECT ID.	STAGE IDENTIFIER	DESIGN PACKAGE NUMBER	DISCIPLINE	STRUCTURE NUMBER	DOCUMENT TYPE	DRAWING NUMBER	REVISION NUMBER
H427-D	N	9A	STR	B01	DWG	511	C



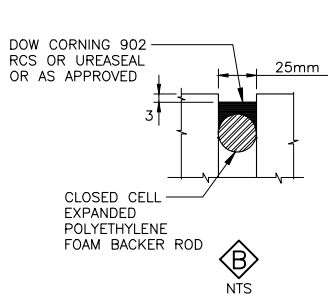
- NOTES:**
- CLEAR COVER TO REINFORCING STEEL 70 ± 20 mm EXCEPT AS NOTED.
 - LAYOUT OF REINFORCING STEEL WILL BE SIMILAR FOR LEFT HAND AND ZERO DEGREE SKEW.
 - STAINLESS STEEL BARS SHALL BE TYPE 316 LN OR DUPLEX 2205 WITH A MINIMUM YIELD STRENGTH OF 500 MPA. REINFORCING STEEL SHALL BE GRADE 400W.
 - WATERPROOFING AT JOINT BETWEEN BRIDGE AND APPROACH SLAB TO BE IN ACCORDANCE WITH OPSD-3370.1000.
 - WATERPROOFING FOR BRIDGES WITHOUT EXPANSION JOINTS (RIGID FRAMES AND INTEGRAL ABUTMENTS) TO BE IN ACCORDANCE WITH OPSD-3370.1010.
 - BARS MARK WITH PREFIX S DENOTE STAINLESS STEEL BARS.

APPLICABLE STANDARD DRAWINGS

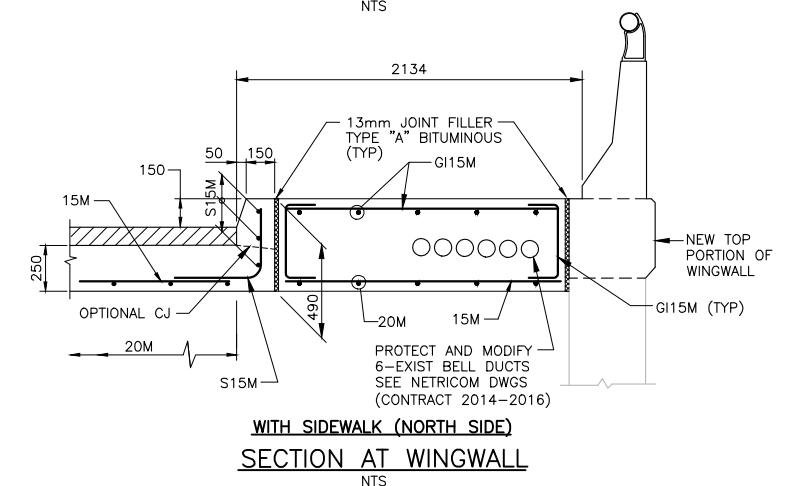
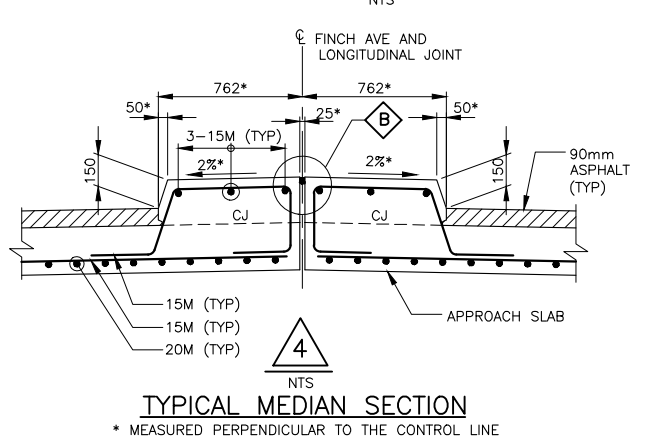
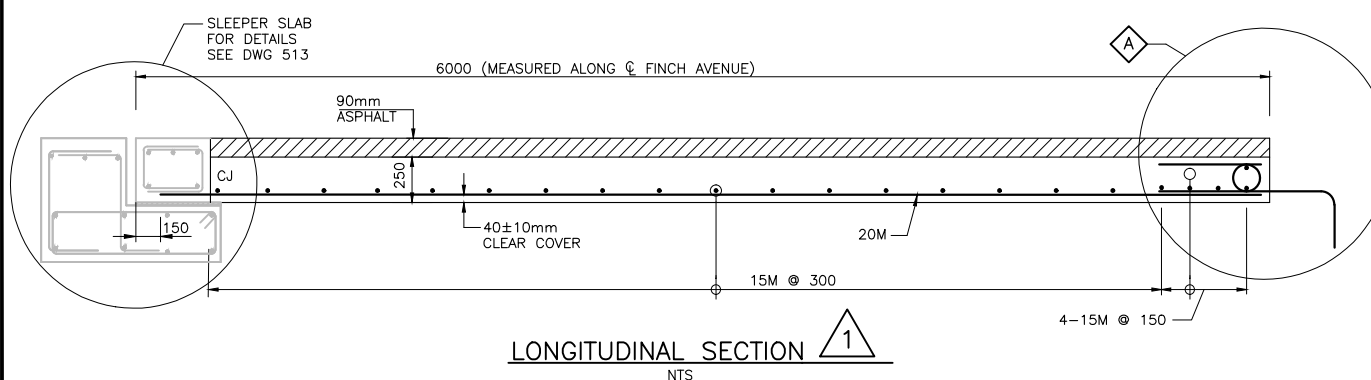
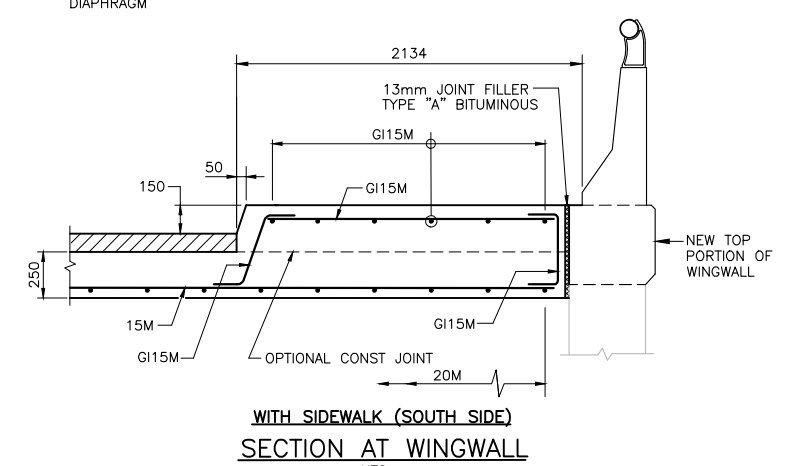
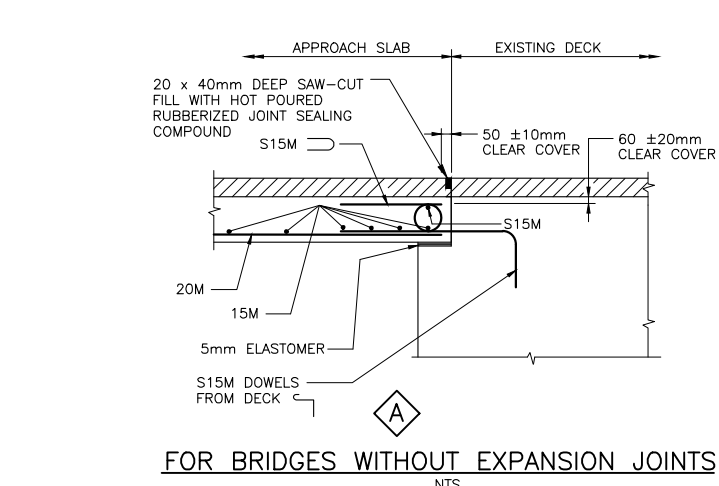
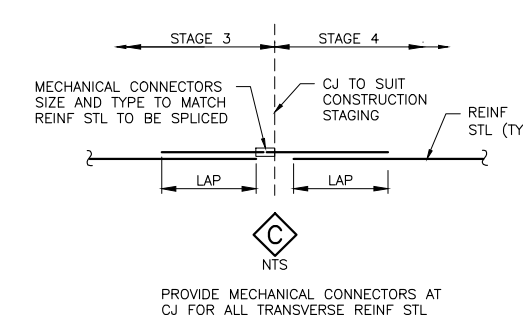
OPSD-3370.100 DECK, WATERPROOFING HOT APPLIED ASPHALT MEMBRANE WITH PROTECTION BOARD

OPSD-3370.101 DECK, WATERPROOFING HOT APPLIED ASPHALT MEMBRANE AT ACTIVE CRACKS GREATER THAN 2mm WIDE AND CONSTRUCTION JOINTS

MODIFIED	
STANDARD DRAWING MARCH 2016	SS116-1
6000 mm APPROACH SLAB	



- PLAN**
1:150
- REINFORCING SHOWN FOR EAST APPROACH SLAB REINFORCING FOR WEST APPROACH SLAB SIMILAR
 - TOP OF CONCRETE TO SUIT FINISHED GRADE AFTER REHABILITATION



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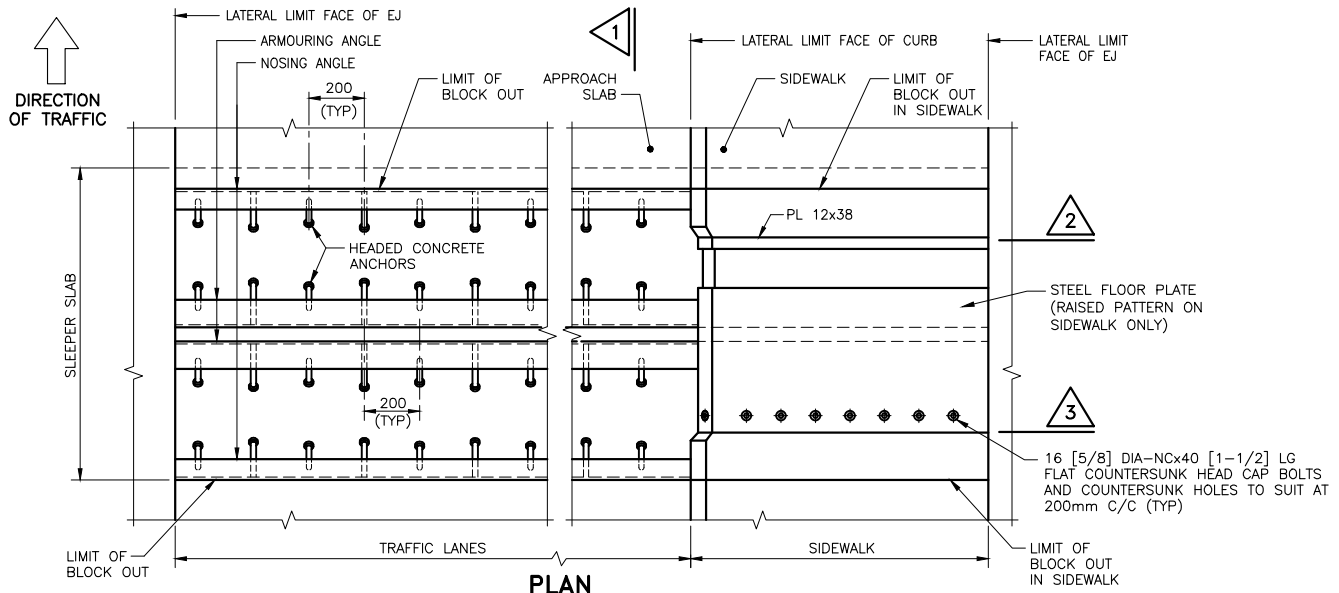
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C 18/03/16	90% SUBMISSION TO CA				
B 18/01/09	90% SUBMISSION TO CA				
A 17/10/31	90% SUBMISSION TO CA				

SCALE :
AS NOTED

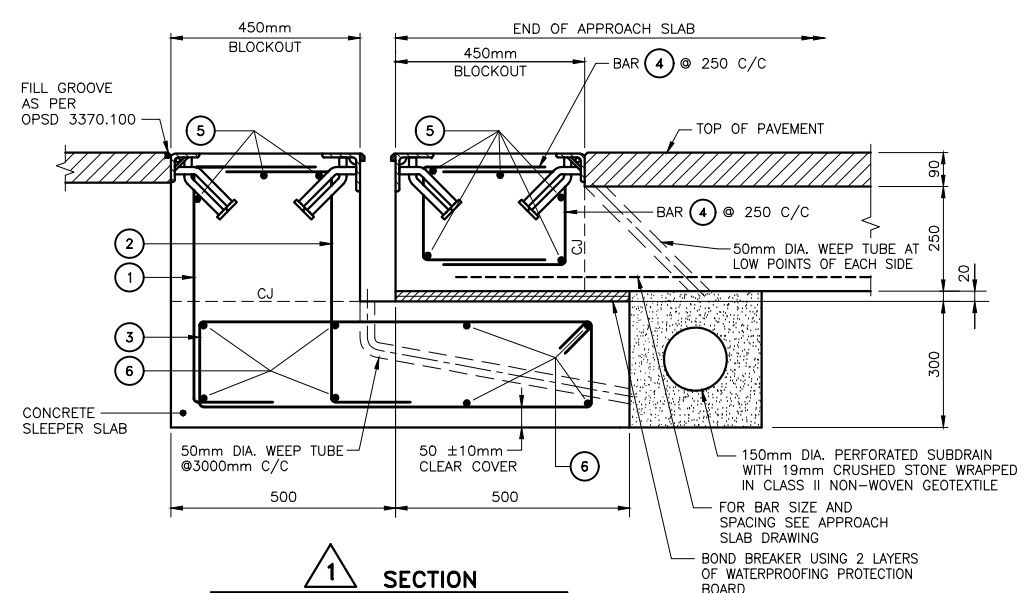
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DRAWN	ELENA TSENER
CHECKED	MAGED IBRAHIM
APPROVED LEAD ENG.	TATIANA OJALA
APPROVED PROJ. MANAGER	



HWY 427 EXPANSION HWY 427/FINCH AVENUE UNDERPASS REHABILITATION - R1 SITE 37-1084 6000mm APPROACH SLAB						
PROJECT ID.	STAGE IDENTIFIER	DESIGN PACKAGE NUMBER	DISCIPLINE	STRUCTURE NUMBER	DOCUMENT TYPE	REVISION NUMBER
H427-D	N	9A	STR	B01	DWG	512 C



PLAN
(FOR EJ AND ASSEMBLY DETAILS SEE SS113-19)

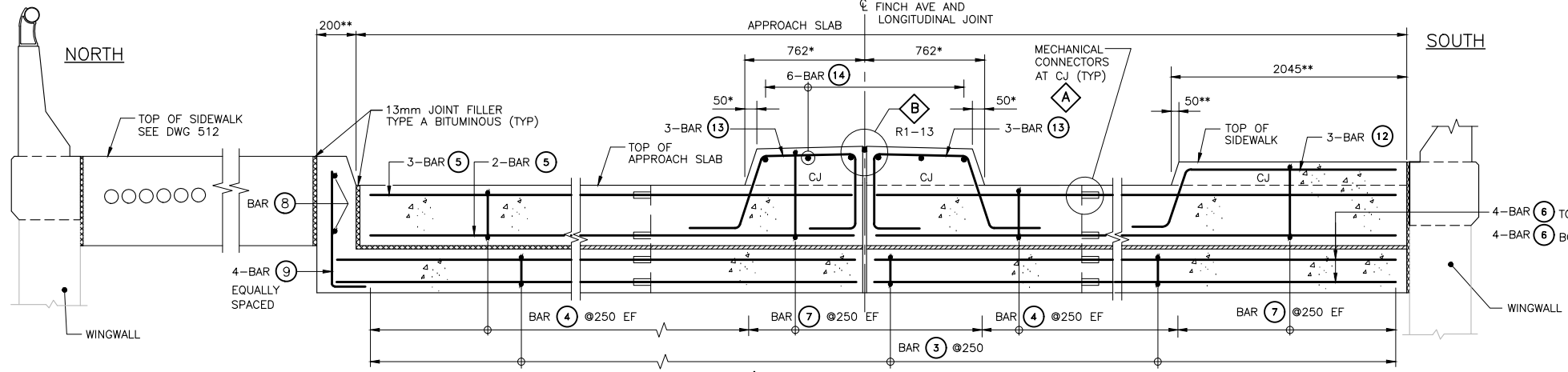


SECTION 1
(EXPANSION JOINT SEAL NOT SHOWN)

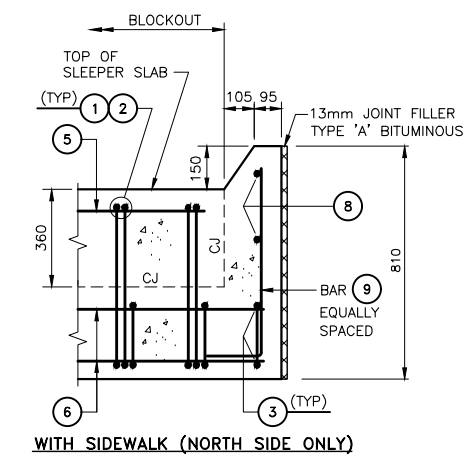
- NOTES:**
- THIS DRAWING TO BE READ IN CONJUNCTION WITH DRAWING SS113-19.
 - CLASS OF CONCRETE TO BE 30MPa.
 - REINFORCEMENT STEEL SHALL BE GRADE 400W. STAINLESS STEEL SHALL BE TYPE 316 LN OR DUPLEX 2205 WITH A MINIMUM YIELD STRENGTH OF 500 MPA. BARS MARKED WITH PREFIX S DENOTE STAINLESS STEEL BARS.
 - COVER TO REINFORCING STEEL 70 ± 20mm EXCEPT AS NOTED.
 - FOR SKEWED STRUCTURE, WORKING DRAWING SHALL BE DETAILED TO SUIT GEOMETRY OF STRUCTURE.

- LEGEND:**
- [] - DENOTED FASTENER SIZE IN INCHES
 - EJ - DENOTED EXPANSION JOINT
 - CJ - DENOTED CONSTRUCTION JOINT

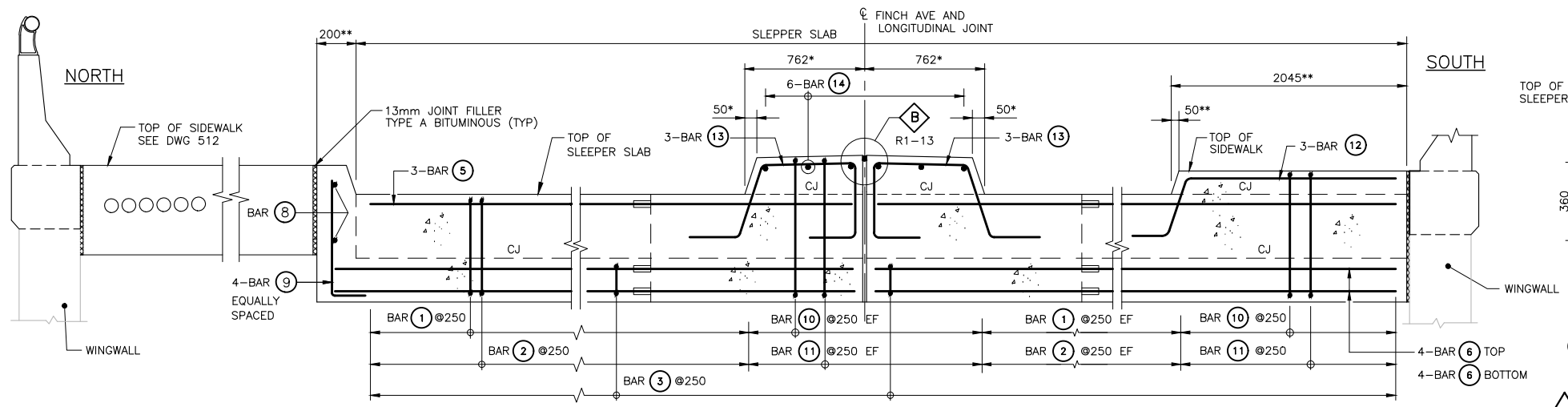
BAR MARK	SIZE	SHAPE
1	S15M	310 520 180
2	S15M	300 520 180
3	15M	160 860
4	S15M	200 310
5	S15M	STRAIGHT
6	15M	STRAIGHT
7	S15M	350 310
8	S15M	STRAIGHT
9	S15M	180 670
10	S15M	310 670 180
11	S15M	300 670 180
12	S15M	
13	S15M	
14	S15M	STRAIGHT



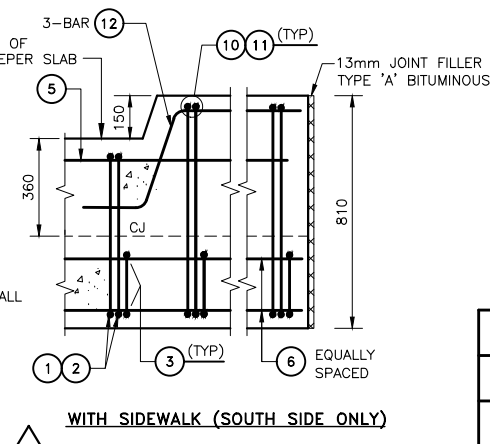
SECTION 2
(ARMOURING DETAIL NOT SHOWN FOR CLARITY)



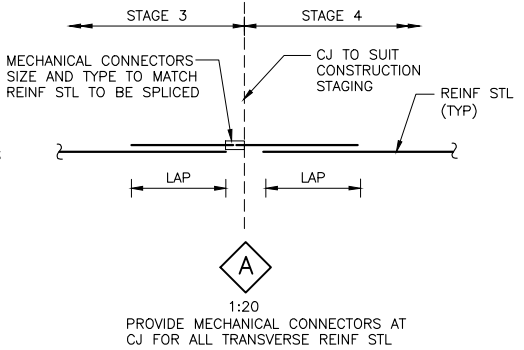
SECTION 3
WITH SIDEWALK (NORTH SIDE ONLY)



SECTION 3
(ARMOURING DETAIL NOT SHOWN FOR CLARITY)



SECTION 3
WITH SIDEWALK (SOUTH SIDE ONLY)



MODIFIED	
STANDARD DRAWING SEPTEMBER 2016	SS113-37
EXPANSION JOINT AND SLEEPER SLAB FOR INTEGRAL AND SEMI-INTEGRAL ABUTMENT BRIDGES (10mm < MOVEMENT < 40mm)	

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 MODIFIED: 3/19/2018 10:37:02 AM BY: PANG
 DATE PLOTTED: 3/19/2018 10:51:44 AM BY:

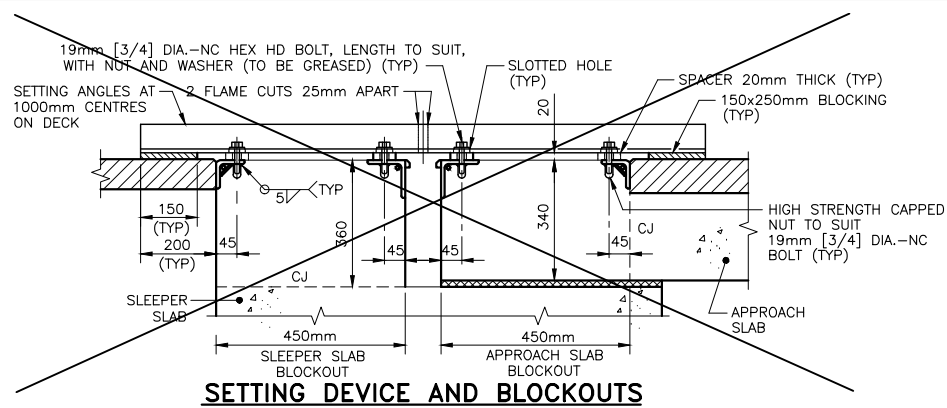
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C 18/03/16	90% SUBMISSION TO CA				
B 18/01/09	90% SUBMISSION TO CA				
A 17/10/31	90% SUBMISSION TO CA				

SCALE :
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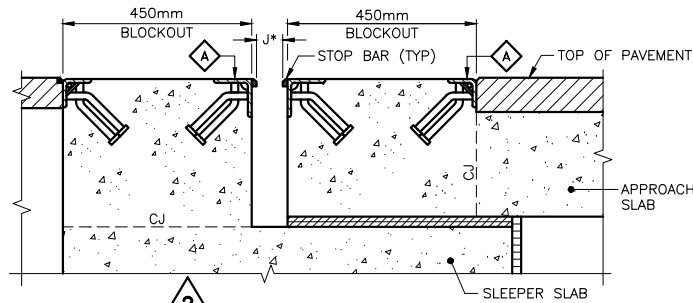
DESIGNED	SUBOOH OBAD
DRAWN	ELENA TSENTER
CHECKED	MAGED IBRAHIM
APPROVED LEAD ENG.	TATIANA QJALA
APPROVED PROJ. MANAGER	



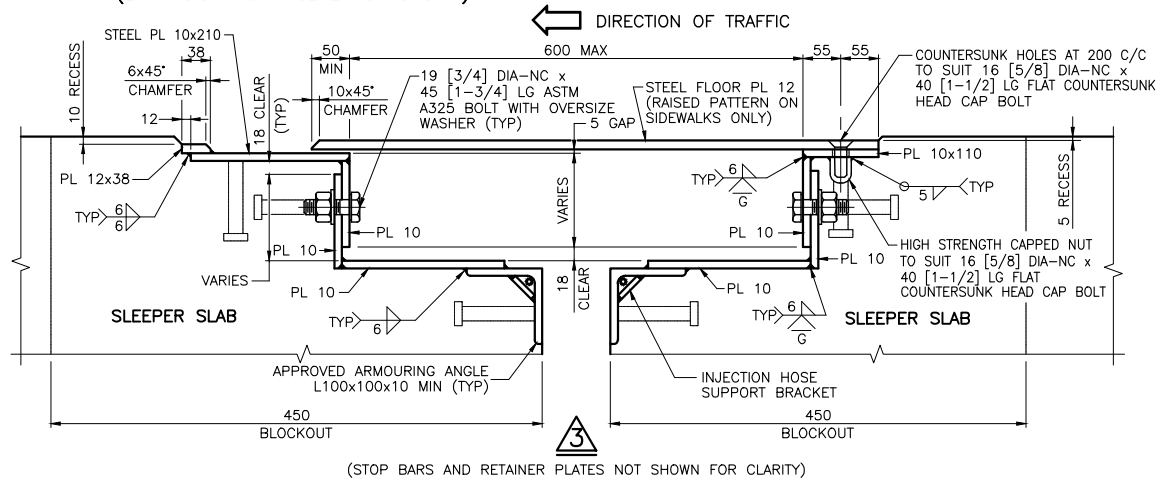
HWY 427 EXPANSION HWY 427/FINCH AVENUE UNDERPASS REHABILITATION - R1 SITE 37 - 1084 EXPANSION JOINT AND SLEEPER SLAB						
PROJECT ID.	STAGE IDENTIFIER	DESIGN PACKAGE NUMBER	DISCIPLINE	STRUCTURE NUMBER	DOCUMENT TYPE	DRAWING NUMBER
H427-D	N	9A	STR	B01	DWG	513
						C



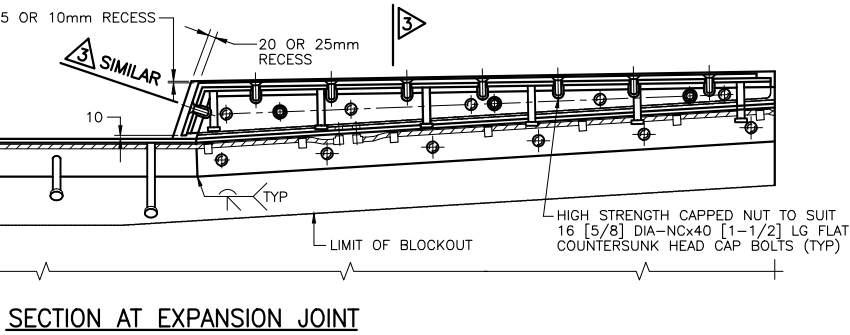
SETTING DEVICE AND BLOCKOUTS



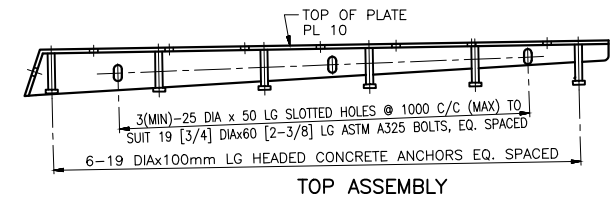
SECTION AT EXPANSION JOINT (EXPANSION JOINT SEAL NOT SHOWN)



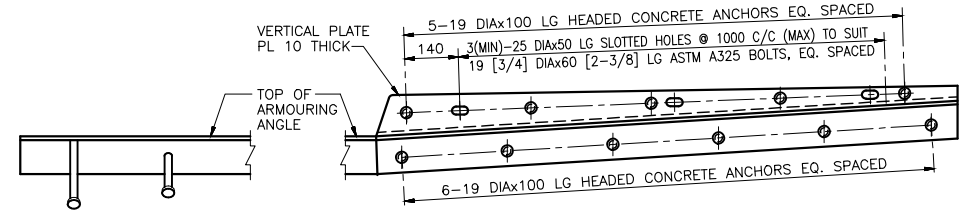
DETAIL OF ARMOURING WITHOUT SIDEWALK



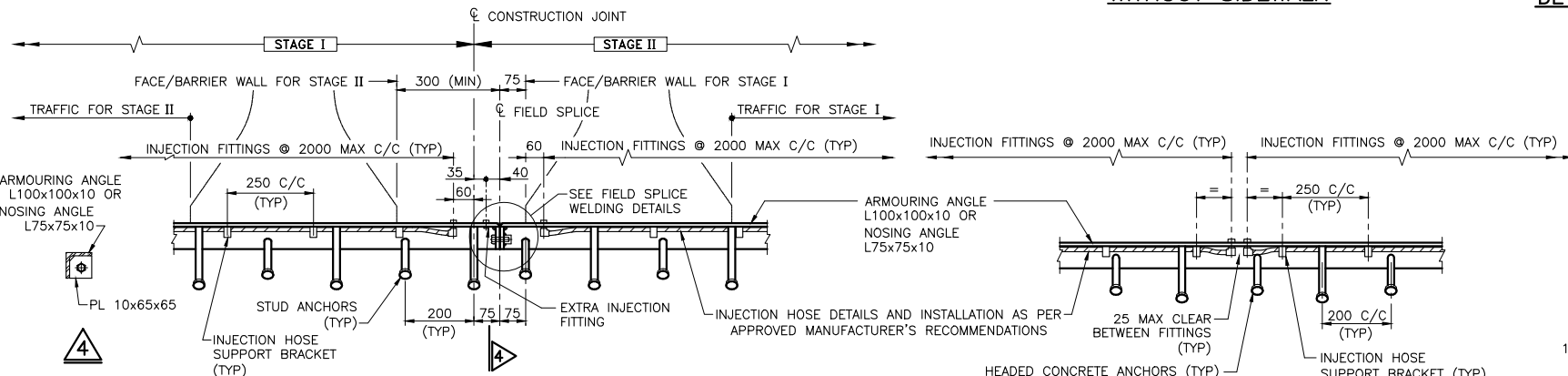
SECTION AT EXPANSION JOINT



TOP ASSEMBLY

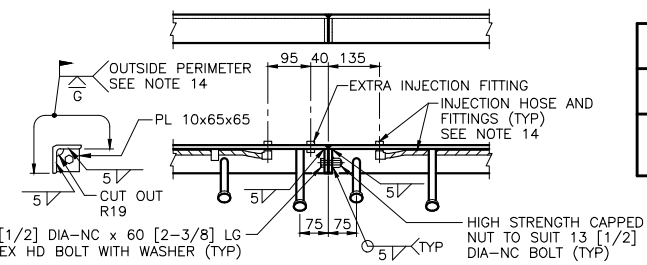


**BOTTOM ASSEMBLY
DETAIL OF ARMOURING AT SIDEWALK**



FIELD SPLICE DETAILS AT STAGED CONSTRUCTION FOR ARMOURING AND NOSING ANGLES

DETAILS OF HEADED CONCRETE ANCHORS AND INJECTION HOSE FOR ARMOURING AND NOSING ANGLES



ARMOURING AND NOSING ANGLES FIELD SPLICE DETAIL

NOTES:

- THIS DRAWING SHOWS EXPANSION JOINT AND SLEEPER SLAB AT THE END OF APPROACH SLAB OF INTEGRAL AND SEMI-INTEGRAL ABUTMENT BRIDGES WITH A MOVEMENT BETWEEN 10 AND 40MM.
- EXPANSION JOINT TO BE SUPPLIED BY MANUFACTURERS LISTED IN DSM 9.40.27 FOR THE SUPPLY OF TYPE 'C' STRIP SEAL EXPANSION JOINT.
- EXPANSION JOINT ASSEMBLY CONSTRUCTION AND MATERIAL SHALL BE ACCORDING TO OPSS 920 AND OPSS 1210, AND AS SPECIFIED IN THE CONTRACT DOCUMENTS.
- JOINT ASSEMBLY SHALL BE COMPLETELY SHOP ASSEMBLED (EXCEPT FOR SEALS) AND PRESET TO DIMENSION 'J' FOR 15°C AND ADJUSTED IN THE FIELD TO SUIT INSTALLATION TEMPERATURE.
- JOINT ASSEMBLY INSTALLATION TEMPERATURE SHALL BE TAKEN AS MEAN SHADE AIR TEMPERATURE AT STRUCTURE PRIOR TO JOINT INSTALLATION AS FOLLOWS:
 - FOR CONCRETE STRUCTURES - 48 HOURS
 - FOR STEEL STRUCTURES - 24 HOURS
- FIELD SPLICES IN JOINT ASSEMBLY ARE ONLY PERMITTED AT STAGED CONSTRUCTION, AND/OR AS SHOWN ON THE CONTRACT DRAWINGS.
- IF THE JOINT ASSEMBLY FOR A SKEW STRUCTURE IS SPLICED AT A CROWN, THE SPLICE SHALL BE DETAILED PARALLEL TO THE CENTRELINE OF THE TRAFFIC LANE.
- SETTING ANGLES SHALL BE FLAME CUT ACCORDING TO OPSS 920, BUT IN NO CASE PRIOR TO CONCRETE REACHING INITIAL SET.
- AFTER CURING OF THE CONCRETE HAS BEEN COMPLETED, THE SETTING DEVICES MAY BE REMOVED. THE VOIDS UNDER THE ARMOURING ANGLE AND NOSING ANGLE SHALL THEN BE PRESSURE INJECTED.
- PREFORMED SEALS SHALL HAVE MINIMUM THICKNESS OF 5mm OR AS PER DSM.
- ALL STEEL RETAINER SURFACES COMING IN CONTACT WITH PREFORMED SEAL SHALL BE CLEANED PRIOR TO INSTALLATION OF THE SEAL.
- PREFORMED SEALS SHALL BE INSTALLED AFTER JOINT ASSEMBLY HAS BEEN CAST, STYROFOAM OR FILLER BETWEEN APPROACH SLAB AND SLEEPER SLAB REMOVED, AND EXPANSION GAP CLEARED OF ANY DEBRIS.
- PROTECT INJECTION HOSE AND FITTINGS ADJACENT TO FIELD SPLICE DURING WELDING AND REMOVE PROTECTION PRIOR TO PLACING OF CONCRETE IN BLOCKOUT.
- ALL JOINT ANCHORAGES SHALL BE DETAILED ON WORKING DRAWINGS PERPENDICULAR TO THE EXPANSION JOINT ON BOTH THE APPROACH SLAB SIDE AND THE SLEEPER SLAB SIDE EXCEPT STRUCTURE SKEWED FROM OVER 15° AND UP TO 45° SHALL HAVE ANCHORAGES DETAILED 30° OFFSET FROM THE PERPENDICULAR TO THE EXPANSION JOINT ON THE APPROACH SLAB SIDE.
- LEGEND: [] DENOTES FASTENER SIZE IN INCHES
EJ - DENOTES EXPANSION JOINT

ADDITIONAL NOTES FOR BOLTS:

- 19 [3/4] DIAMETER BOLTS SHALL BE IN ACCORDANCE WITH WITH ASTM A325. ALL BOLTS USED IN 25 DIA. x 50 LONG SLOTTED HOLES SHALL BE INSTALLED WITH OVERSIZE WASHERS.
- 16 [5/8] DIAMETER FLAT COUNTERSUNK HEAD CAP BOLTS SHALL BE IN ACCORDANCE WITH ASTM F835.
- ALL BOLTS SHALL BE INSTALLED USING MOLY50 LUBRICANT.
- ALL BOLTS SHALL BE TENSIONED USING THE TURN-OF-NUT TIGHTENING METHOD IN ACCORDANCE WITH CAN/CSA S6-14.

TABLE OF DESIGN REQUIREMENTS (TO BE FULLY COMPLETED BY DESIGNER)

EXP. JOINT LOCATION	MTO GAP ** RATING (mm)	DESIGN *** MOVEMENT	* "J" AT INSTALLATION TEMPERATURE (C) (mm)								
			-5°	0°	5°	10°	15°	20°	25°	30°	
WEST AND EAST ABUT	35	100	30	53	51	49	47	45	43	41	39

- * DIMENSION 'J' MEASURED PERPENDICULAR TO CENTRELINE OF EXPANSION JOINT. WHERE MIN. AND MAX. FOR JOINT SUPPLIED DIFFER FROM THOSE SHOWN IN TABLE, 'J' DIMENSIONS SHALL BE REVISED BY CONTRACTOR AND SHOWN ON SHOP DRAWINGS.
- ** MTO GAP, MEASURED BETWEEN PROJECTING FACES OF STEEL CLAMPING BAR, IS TAKEN FROM DSM 9.40.27, TYPE 'C'.
- *** CALCULATED TOTAL MOVEMENT AT SLS OCCURRING AFTER TIME OF JOINT INSTALLATION. (MEASURED PARALLEL TO CENTRELINE OF STRUCTURE).

MODIFIED	
STANDARD DRAWING SEPTEMBER 2016	SS113-19
STRIP SEAL EXPANSION JOINT FOR SLEEPER SLAB	

CAD FILE LOCATION AND NAME: C:\projects\HWY427\DWG\SS113-19.dwg
 MODIFIED: 3/19/2018 10:37:09 AM BY: PANG
 DATE PLOTTED: 3/19/2018 10:51:46 AM BY:

DATE	REVISIONS	BY	CHK	LEAD DISC.	PROJ. MAN.
C 18/03/16	90% SUBMISSION TO CA				
B 18/01/09	90% SUBMISSION TO CA				
A 17/10/31	90% SUBMISSION TO CA				

SCALE :
AS NOTED

DESIGNED: SUBOOH OBNO
 DRAWN: ELENA TSENTER
 CHECKED: MAGED IBRAHIM
 APPROVED LEAD ENG.: TATIANA QJALA
 APPROVED PROJ. MANAGER:

NAME (PRINT)	INT.	DATE



TITLE							
HWY 427 EXPANSION HWY 427/FINCH AVENUE UNDERPASS REHABILITATION - R1 SITE 37-1084 STRIP SEAL EXPANSION JOINT FOR SLEEPER SLAB							
PROJECT ID.	STAGE IDENTIFIER	DESIGN PACKAGE NUMBER	DISCIPLINE	STRUCTURE NUMBER	DOCUMENT TYPE	DRAWING NUMBER	REVISION NUMBER
H427-D	N	9A	STR	B01	DWG	514	C

STANDARD 90° HOOK

STANDARD 180° HOOK

BAR SIZE	STEEL GRADE	
	400R (2)	400W
10M	70	60
15M	100	90
20M	120	100
25M	150	150
30M	250	200
35M	300	250
45M	450 (1)	400
55M	600 (1)	550

(1) Special fabrication is required for bends exceeding 90° for bars of these sizes and grade.
(2) For stainless steel, with $F_y = 500$, use the same D as for 400R.

BAR SIZE	90° HOOKS		180° HOOKS			
	A OR G (mm)		A OR G (mm)		J (mm)	
	400R	400W	400R	400W	400R	400W
10M	180	180	140	130	90	80
15M	260	250	180	170	130	120
20M	310	300	220	200	160	140
25M	400	400	280	280	200	200
30M	510	490	400	350	310	260
35M	610	590	480	430	370	320
45M	790	770	680	630	540	490
55M	1030	1010	900	850	710	660

NOTE: All Hook Dimensions are according to the CHBDC-2014.

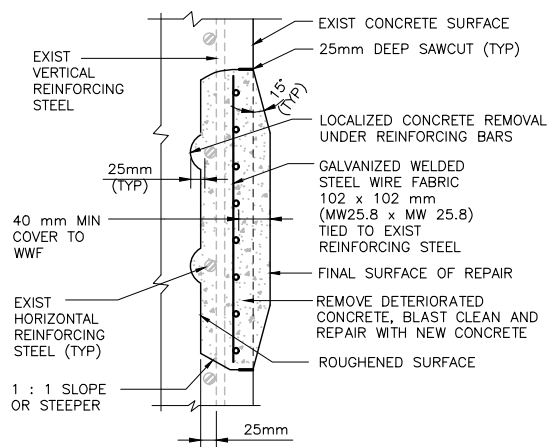
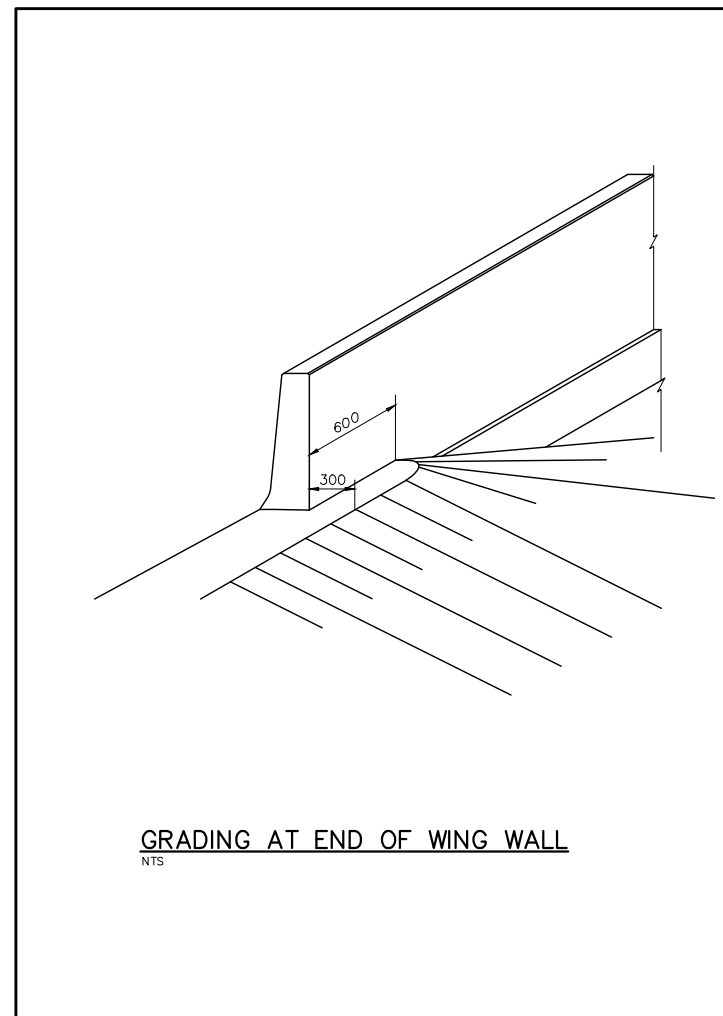
BAR SIZE	BAR DIAM. d_b (mm)	PIN DIAM. D (mm)	90°		135°	
			A OR G (mm)	A OR G (mm)	H (approx.) (mm)	H (approx.) (mm)
10M	11.3	45	100	100	70	70
15M	16.0	65	140	140	100	100
20M	19.5	80	180	175	115	115
25M	25.2	100	230			

MIN. 90° HOOK

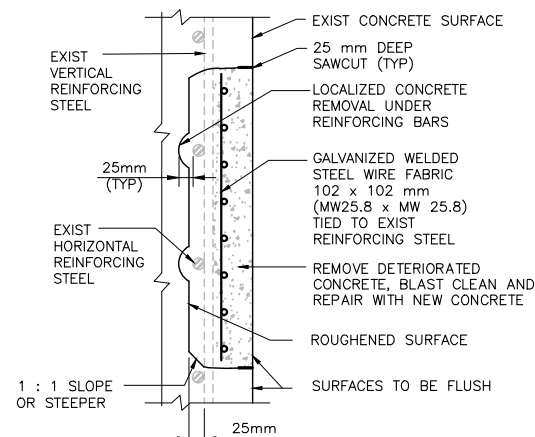
MIN. 135° HOOK

HOOK DIMENSIONS FOR REINFORCING STEEL BARS

Date	Sept. 2016	Rev	
SS12-1			



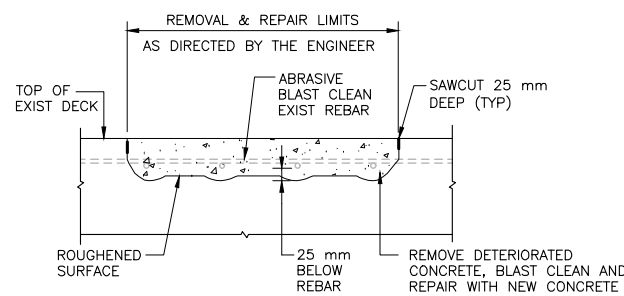
FOR EXIST CONCRETE COVER < 50 mm



FOR EXIST CONCRETE COVER > = 50 mm

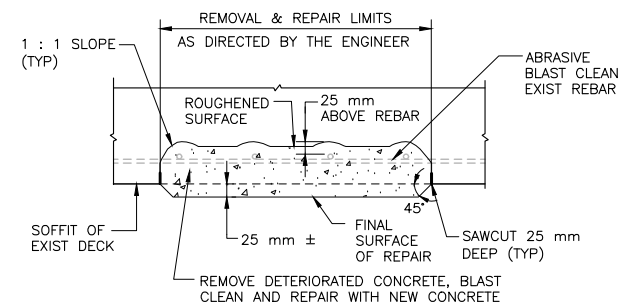
VERTICAL SURFACE LOCAL CONCRETE REPAIR DETAILS

NTS



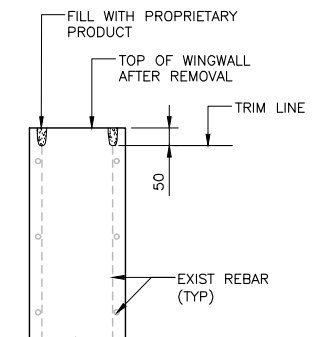
DECK SURFACE LOCAL CONCRETE REPAIR DETAILS

NTS



DECK SOFFIT LOCAL CONCRETE REPAIR DETAIL

NTS



TOP OF WINGWALL PATCH DETAIL

NTS

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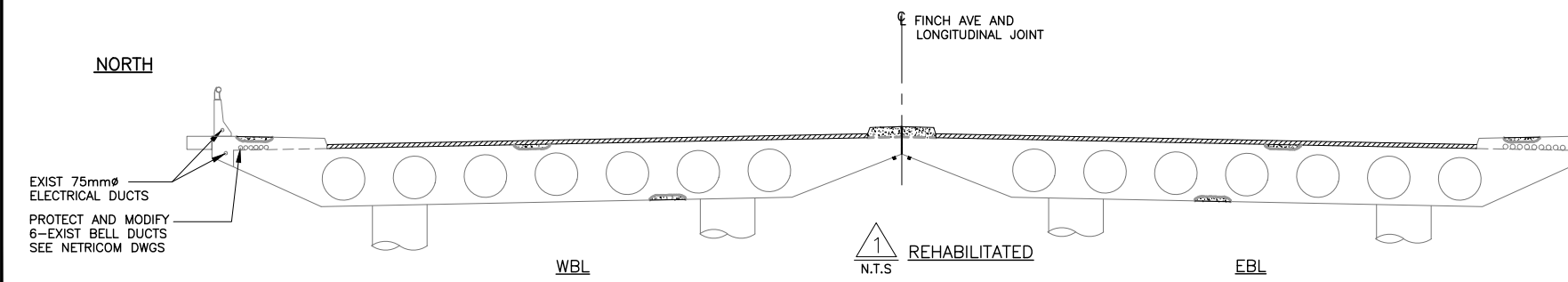
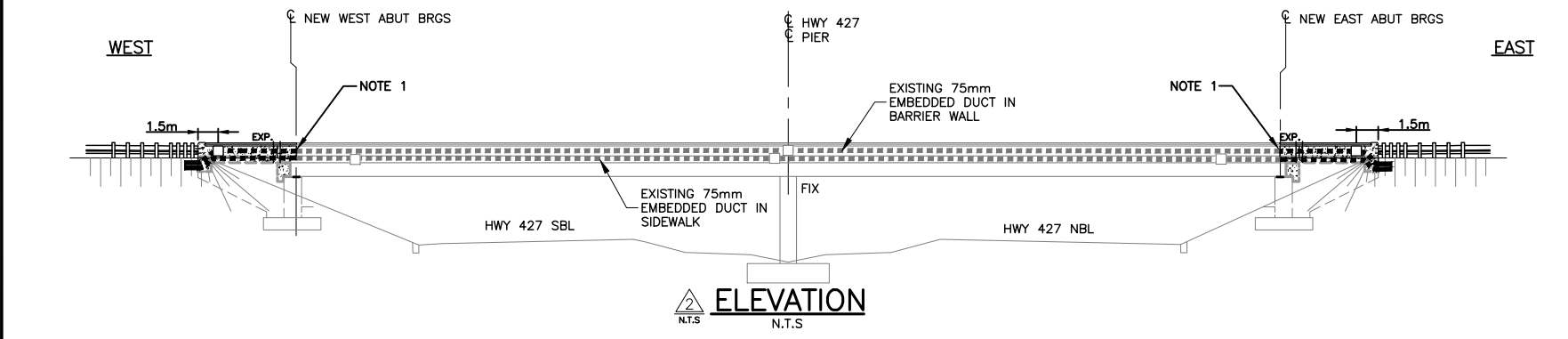
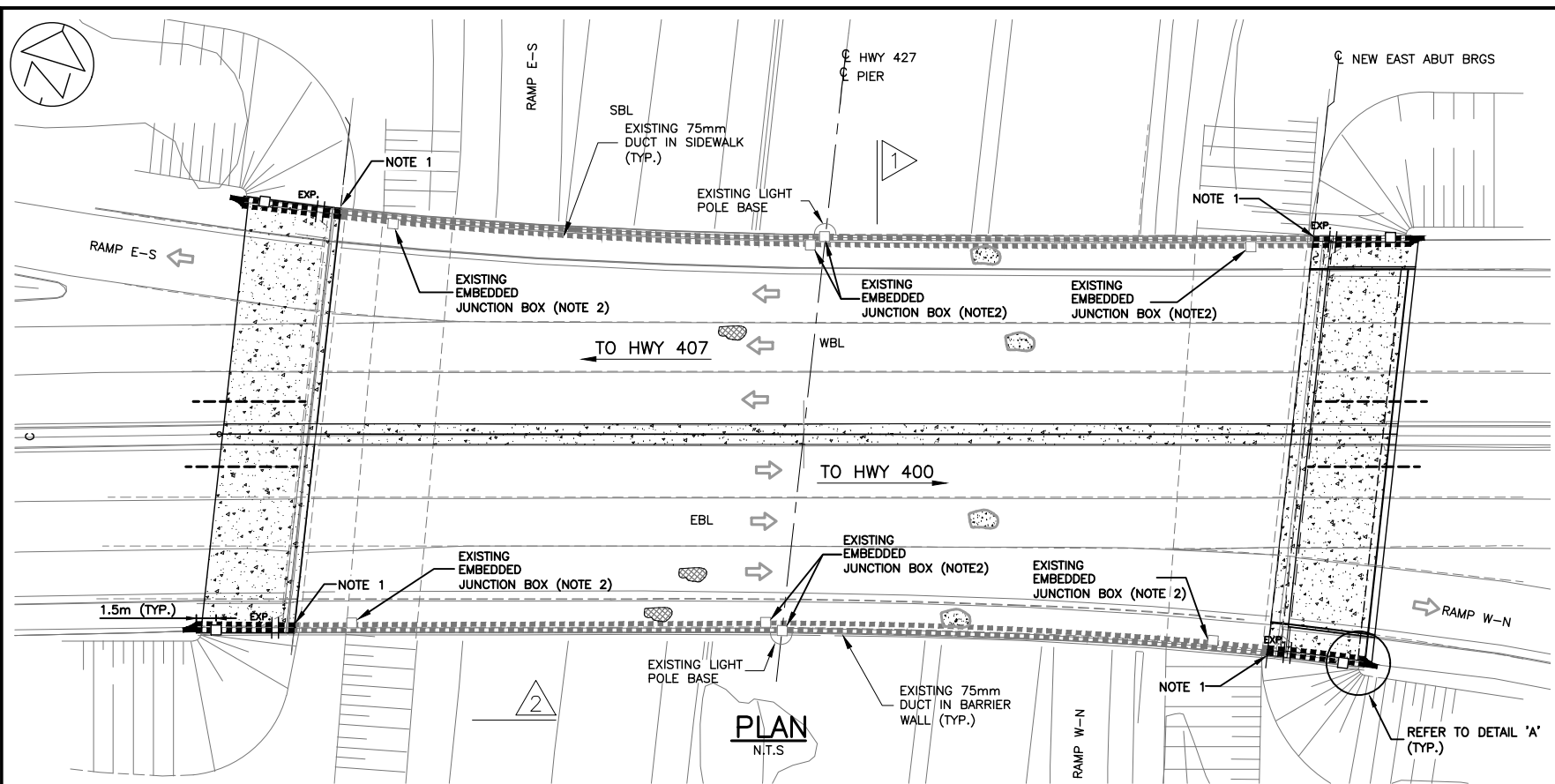
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C	18/03/16	90% SUBMISSION TO CA			
B	18/01/09	90% SUBMISSION TO CA			
A	17/10/31	90% SUBMISSION TO CA			

SCALE : AS NOTED

DESIGNED	SUBOOH OBAD	
DRAWN	ELENA TSENER	
CHECKED	MAGED IBRAHIM	
APPROVED LEAD ENG.	TATIYANA OJALA	
APPROVED PROJ. MANAGER		
NAME (PRINT)	INT.	DATE



PROJECT ID.							STAGE IDENTIFIER							DESIGN PACKAGE NUMBER							DISCIPLINE							STRUCTURE NUMBER							DOCUMENT TYPE							DRAWING NUMBER							REVISION NUMBER						
H427-D							N							9A							STR							B01							DWG							515							C						



NOTES:

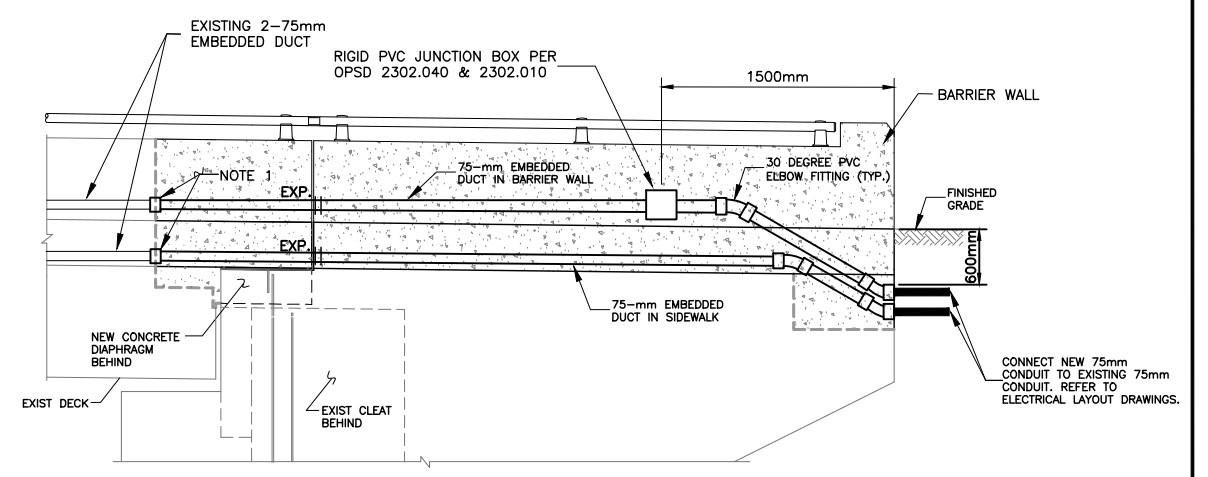
1. CONTRACTOR SHALL CAREFULLY REMOVE SUFFICIENT CONCRETE TO ALLOW FOR INSTALLATION OF A RIGID PVC COUPLING ONTO THE EXISTING EMBEDDED CONDUITS.
2. REPLACE EXISTING JUNCTION BOX COVERS WITH NEW GALVANIZED STEEL COVERS.

APPLICABLE STANDARD DRAWINGS:

- OPSD 2011.101 - GENERAL SYMBOLS
- OPSD 2011.201 - GENERAL SYMBOLS
- OPSD 2302.010 - EMBEDDED WORK DETAIL
- OPSD 2302.020 - EXPANSION AND DEFLECTION FITTING ASSEMBLY
- OPSD 2302.040 - EMBEDDED WORK IN STRUCTURE

SUPPLEMENTARY LEGEND:

- RIGID JUNCTION BOX EMBEDDED TYPE P3-1b OPSD 2302.010 C/W GALVANIZED STEEL COVER
- EXP. || EXPANSION AND DEFLECTION FITTING ASSEMBLY PER OPSD 2302.02



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B	18/01/09				
A	17/10/31				

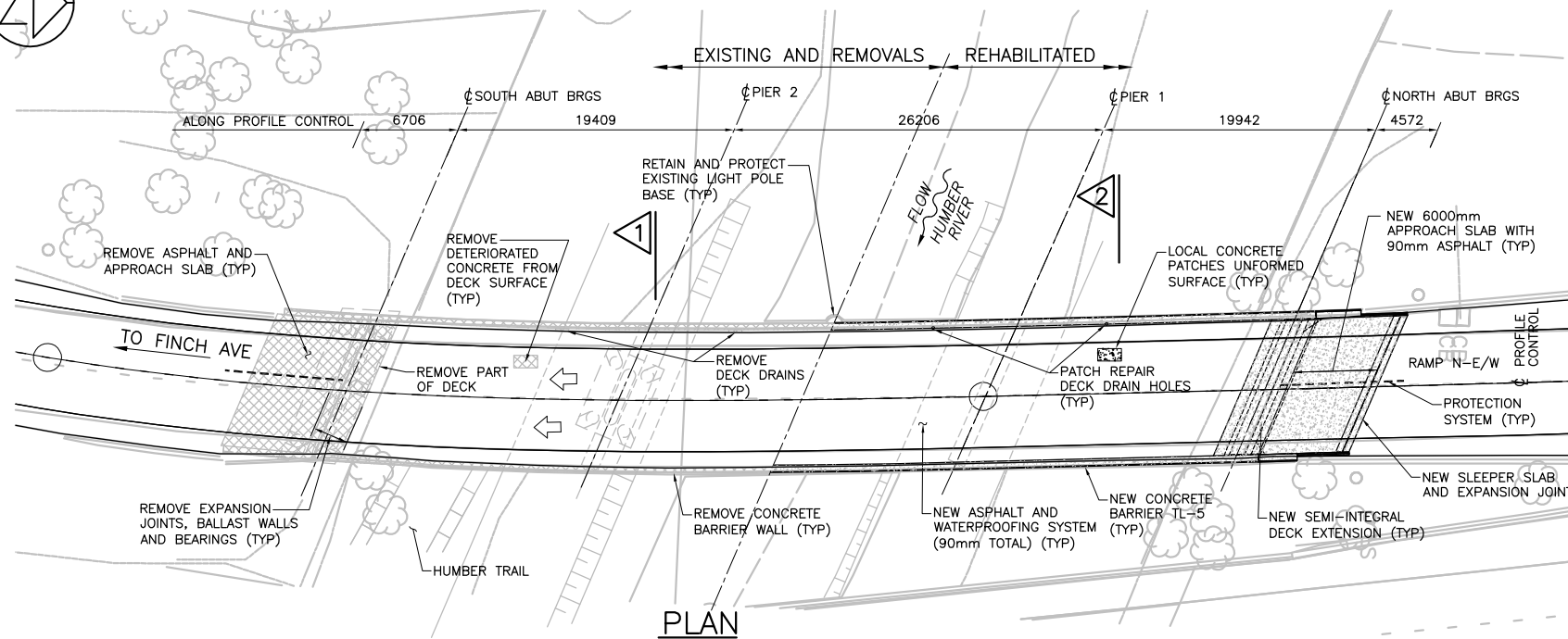
SCALE :
N.T.S.

DESIGNED	MANPREET PANESAR	M.P.
DRAWN	KARAJIT GILL	K.G.
CHECKED	NATALIA MAHABIR	N.B.
APPROVED LEAD ENG.	MARIO TEDESCO	M.T.
APPROVED PROJ. MANAGER		
	NAME (PRINT)	INT. DATE

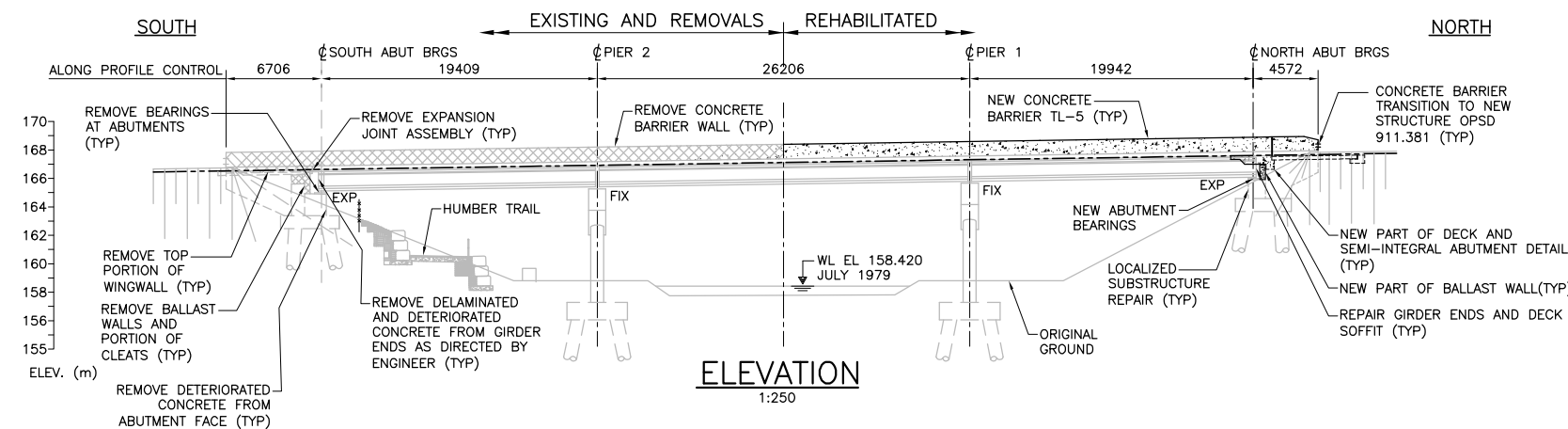
CONSULTANT	
DESIGNED	MANPREET PANESAR
DRAWN	KARAJIT GILL
CHECKED	NATALIA MAHABIR
APPROVED LEAD ENG.	MARIO TEDESCO
APPROVED PROJ. MANAGER	
	NAME (PRINT)
	INT. DATE



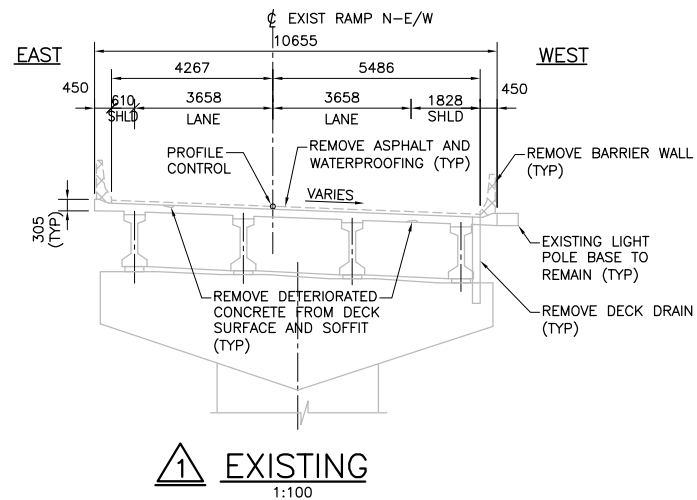
HWY 427 EXPANSION HWY 427/FINCH AVENUE UNDERPASS REHABILITATION - R1 SITE 37-1084 ELECTRICAL EMBEDDED WORK							
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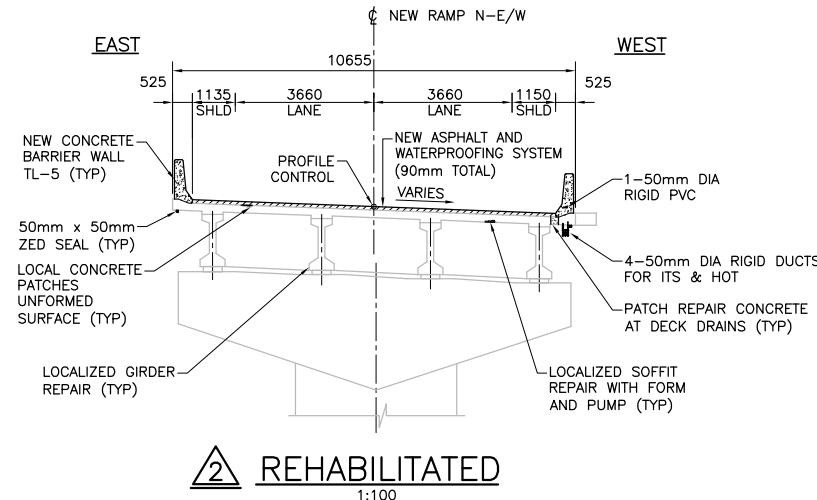
PLAN
1:250



ELEVATION
1:250



1 EXISTING
1:100



2 REHABILITATED
1:100

LIST OF DRAWINGS:

- 600 GENERAL ARRANGEMENT
- 601 CONSTRUCTION STAGING
- 602 JACKING DETAILS AND BEARINGS
- 603 REMOVALS
- 604 NEW CONSTRUCTION I
- 605 NEW CONSTRUCTION II
- 606 BARRIER WALL WITHOUT RAILING, TL-5 (STAINLESS STEEL REBAR)
- 607 6000mm APPROACH SLAB
- 608 EXPANSION JOINT AND SLEEPER SLAB
- 609 STRIP SEAL EXPANSION JOINT FOR SLEEPER SLAB
- 610 STANDARDS DETAILS
- 611 ELECTRICAL EMBEDDED WORK

GENERAL NOTES:

1. DESIGN STANDARDS AND CODES:
 - SCHEDULE 15-1 AND SCHEDULE 15-2: PROJECT AGREEMENT
 - DESIGN CODE: CAN/CSA-S6-14
 - MINISTRY OF TRANSPORTATION OF ONTARIO STRUCTURAL MANUAL
 - MINISTRY OF TRANSPORTATION OF ONTARIO STRUCTURE REHABILITATION MANUAL
 - ONTARIO PROVINCIAL STANDARD SPECIFICATIONS (OPSS)
2. LIVE LOAD: CL-625-ONT.
3. CLASS OF CONCRETE 30 MPa.
4. CLEAR COVER TO REINFORCING STEEL DECK

TOP	70 ± 20
BOTTOM	40 ± 10
REMAINDER UNLESS OTHERWISE NOTED	70 ± 20
5. REINFORCING STEEL
REINFORCING STEEL SHALL BE GRADE 400W UNLESS OTHERWISE SPECIFIED.
BAR MARKS WITH PREFIX 'S' DENOTE STAINLESS STEEL BARS.
STAINLESS REINFORCING STEEL SHALL BE TYPE 316 LN OR DUPLEX 2205 AND HAVE A MINIMUM YIELD STRENGTH OF 500 MPa, UNLESS OTHERWISE SPECIFIED. UNLESS SHOWN OTHERWISE, TENSION LAP SPLICES SHALL BE CLASS B.
BAR HOOKS SHALL HAVE STANDARD HOOK DIMENSIONS USING MINIMUM BEND DIAMETERS, WHILE STIRRUPS AND TIES SHALL HAVE MINIMUM HOOK DIMENSIONS. ALL HOOKS SHALL BE IN ACCORDANCE WITH THE STRUCTURAL STANDARD DRAWINGS SS12-1 UNLESS INDICATED OTHERWISE.
6. ROADWAY CLASSIFICATION: RFD 80.
7. PROTECTION SYSTEM SHALL CONFORM TO PERFORMANCE LEVEL 2.
8. ALL DIMENSIONS ARE IN MILLIMETERS ALL ELEVATIONS ARE IN METERS UNLESS OTHERWISE SHOWN.

CONSTRUCTION NOTES:

1. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS OF THE WORK AND ALL DETAILS ON SITE AND REPORT ANY DISCREPANCIES TO THE ENGINEER BEFORE PROCEEDING WITH THE WORK. THE CONTRACTOR SHALL ADJUST DIMENSIONS OF THE WORK AS REQUIRED TO SUIT EXISTING CONDITIONS.
2. BACKFILL SHALL BE PLACED SIMULTANEOUSLY BEHIND BOTH END OF SUPERSTRUCTURE KEEPING THE HEIGHT OF BACKFILL APPROXIMATELY THE SAME. AT NO TIME SHALL THE DIFFERENCE IN ELEVATION BE GREATER THAN 500mm.
3. THE CONTRACTOR IS RESPONSIBLE FOR THE DESIGN AND INSTALLATION OF ALL DEBRIS CONTAINMENT SYSTEMS.
4. ALL MATERIAL SHALL BE IN ACCORDANCE WITH MTO DESIGNATED SOURCES FOR MATERIALS (DSM).
5. THE CONTRACTOR SHALL LOCATE AND PROTECT ALL UTILITIES DURING CONSTRUCTION OPERATIONS.
6. STABILITY AND INTEGRITY OF THE STRUCTURE SHALL BE MAINTAINED AT ALL STAGES OF CONSTRUCTION.
7. ALL EXPOSED EDGES TO RECEIVE A 20x20 CHAMFER.
8. ALL AREAS AFFECTED BY CONSTRUCTION ACTIVITIES SHALL BE FULLY REINSTATED TO PRE-CONSTRUCTION OR BETTER CONDITIONS.

APPLICABLE STANDARD DRAWINGS:

- OPSD 3101.150 WALLS - ABUTMENT, BACKFILL MINIMUM GRANULAR REQUIREMENTS
- OPSD 3370.100 DECK, WATERPROOFING HOT APPLIED ASPHALT MEMBRANE WITH PROTECTION BOARD
- OPSD 3370.101 DECK, WATERPROOFING HOT APPLIED ASPHALT MEMBRANE AT ACTIVE CRACKS GREATER THAN 2mm WIDE AND CONSTRUCTION JOINTS
- OPSD 3941.200 FIGURES IN CONCRETE - SITE NUMBER AND DATE LAYOUT

LIST OF ABBREVIATIONS:

WP WORKING POINT

LEGEND:

- REMOVALS
- NEW CONCRETE
- NEW ASPHALT

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A 18/01/12	90% SUBMISSION TO CA				

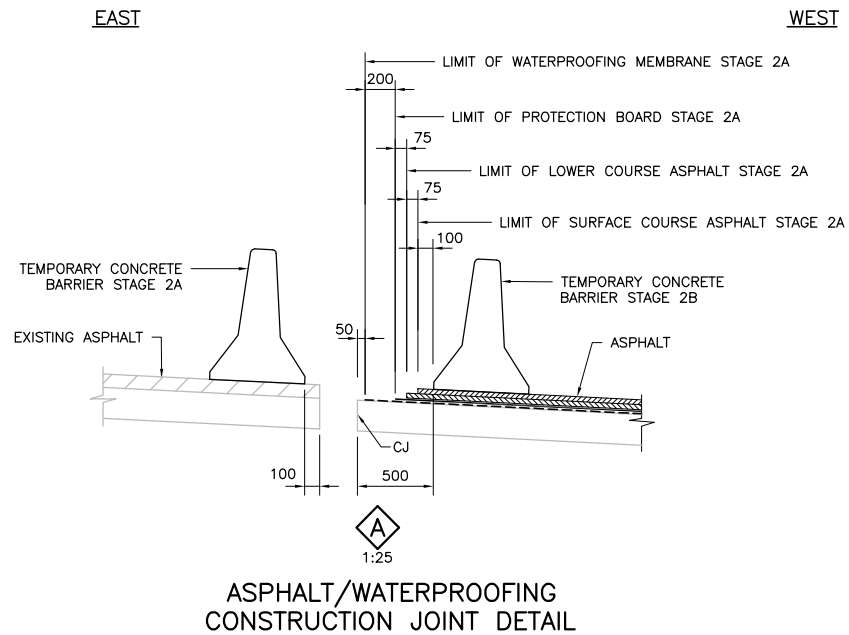
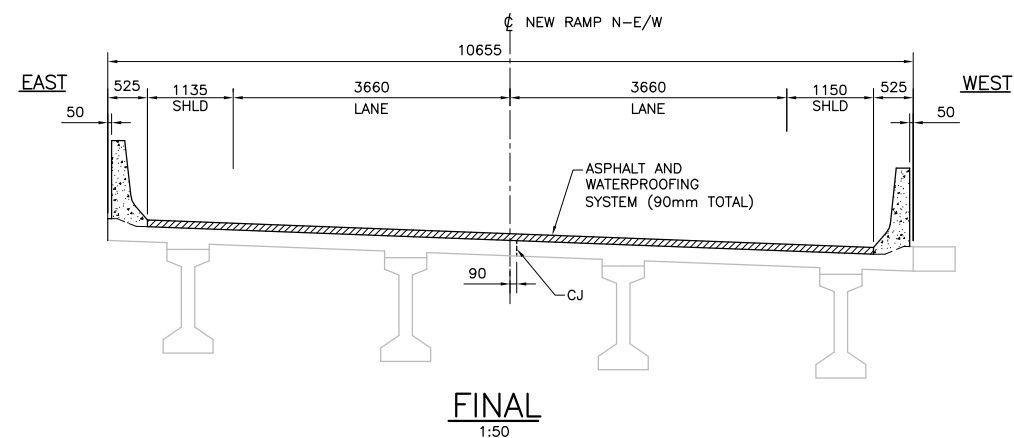
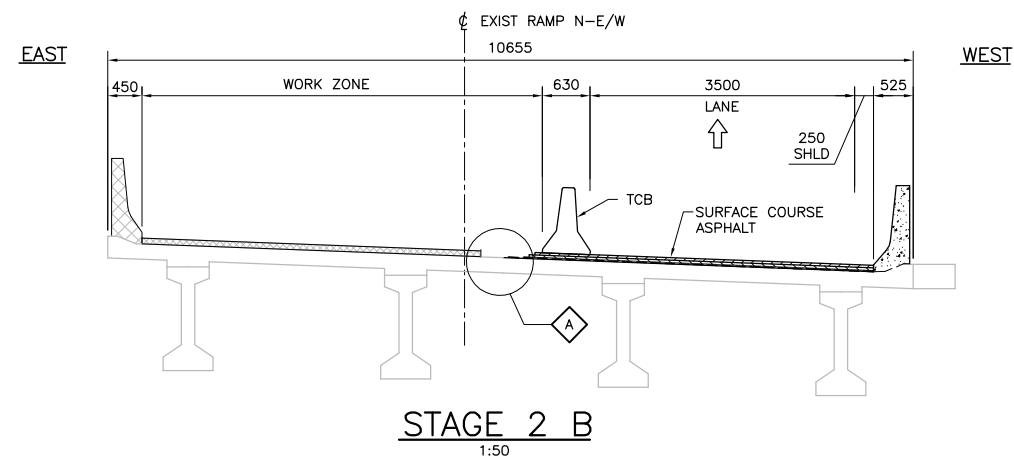
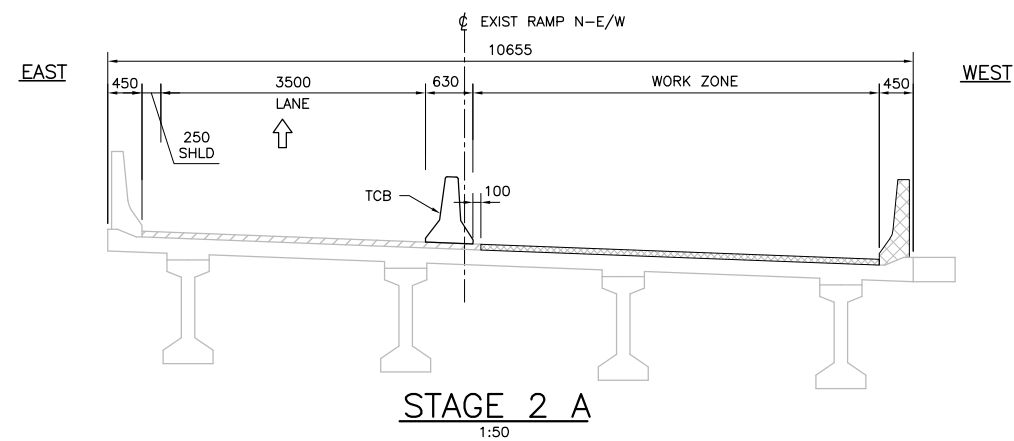
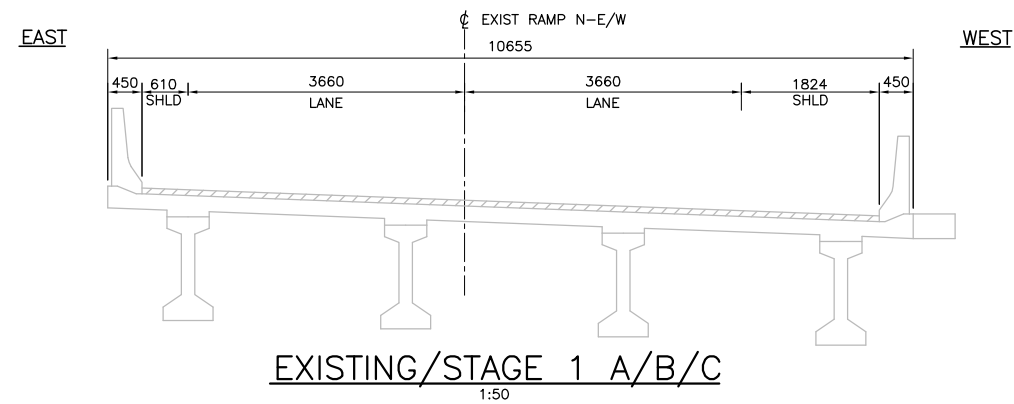
SCALE :

AS NOTED

DESIGNED	ANDREW HACHBORN
DRAWN	ELENA TSENTIER
CHECKED	TATIANA OJALA
APPROVED LEAD ENG.	TATIANA OJALA
APPROVED PROJ. MANAGER	
NAME (PRINT)	INT. DATE



<p>HWY 427 EXPANSION RAMP HWY 427N TO FINCH AVE E/W OVER HUMBER RIVER REHABILITATION - R1, SITE 37-1087 GENERAL ARRANGEMENT</p>							
PROJECT ID.	STAGE IDENTIFIER	DESIGN PACKAGE NUMBER	DISCIPLINE	STRUCTURE NUMBER	DOCUMENT TYPE	DRAWING NUMBER	REVISION NUMBER
H427-D	N	9	STR	B02	DWG	600	B



NOTES:

1. THIS DRAWING TO BE READ IN CONJUNCTION WITH DRAWING 600 AND HIGHWAY STAGING DRAWINGS.

SCOPE OF REHABILITATION WORK AND STAGING

EXISTING:

1. JACK UP THE ENTIRE WIDTH OF THE BRIDGE AT THE NORTH ABUTMENT AND INSTALL TEMPORARY SUPPORTS.
2. REMOVE EXISTING BEARINGS AND REPAIR GIRDER ENDS.
3. PLACE NEW BEARINGS AND LOWER THE BRIDGE.
4. REPEAT STEPS 1 TO 3 FOR THE SOUTH ABUTMENT.

STAGE 2A:

1. SHIFT TRAFFIC TO THE EAST SIDE OF THE EXISTING BRIDGE AND INSTALL TEMPORARY TRAFFIC BARRIER.
2. INSTALL PROTECTION SYSTEM.
3. REMOVE PART OF EXPANSION JOINT ASSEMBLIES, PART OF APPROACH SLABS, WEST BARRIER WALL, PART OF BALLAST WALLS AND CLEATS AND PART OF WINGWALLS.
4. REMOVE PART OF EXISTING DECK ENDS AND PART OF ABUTMENT DIAPHRAGMS TO FACILITATE CONSTRUCTION OF SEMI-INTEGRAL EXTENSION.
5. RECONSTRUCT PART OF THE BALLAST WALL AND CONSTRUCT SEMI-INTEGRAL EXTENSION WITHIN THE WORK ZONE.
6. CONSTRUCT WEST BARRIER WALL ON DECK.
7. CONSTRUCT PART OF APPROACH SLABS WITH THE PART OF BARRIER WALLS ON APPROACH SLABS AND PART OF SLEEPER SLABS.
8. WATERPROOF AND PAVE.

STAGE 2B:

1. SHIFT TRAFFIC TO THE WEST SIDE OF THE BRIDGE.
2. MODIFY PROTECTION SYSTEM.
3. REPEAT STEPS 2 TO 8 FROM STAGE 2A FOR THE EAST SIDE OF THE BRIDGE.

LEGEND:

- REMOVALS
- NEW CONCRETE
- NEW ASPHALT

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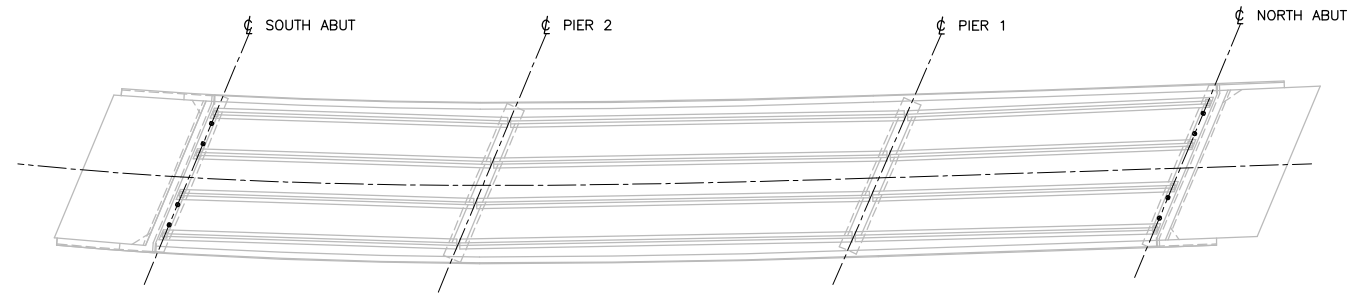
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A	18/01/12	90% SUBMISSION TO CA				

SCALE :
AS NOTED

DESIGNED	ANDREW HACHBORN
DRAWN	ELENA TSENTERE
CHECKED	TATIANA OJALA
APPROVED LEAD ENG.	TATIANA OJALA
APPROVED PROJ. MANAGER	
NAME (PRINT)	INIT. DATE



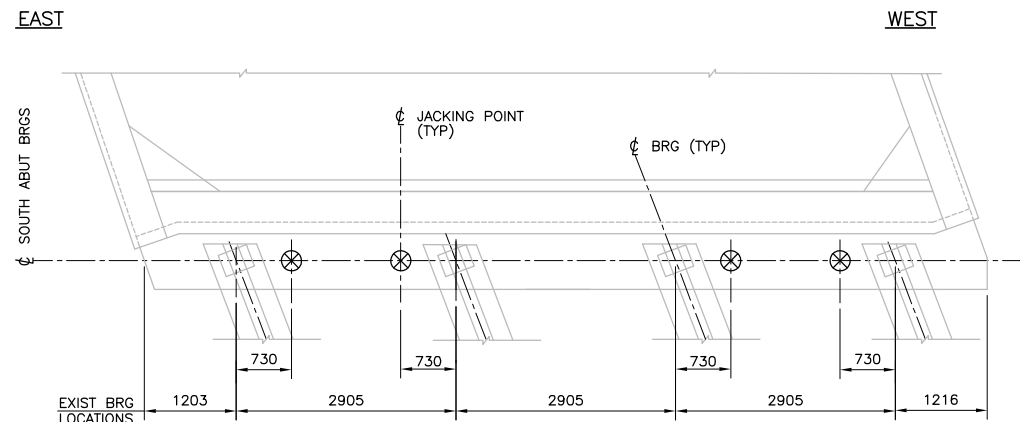
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H427-D	N	9	STR	B02	DWG	601	A



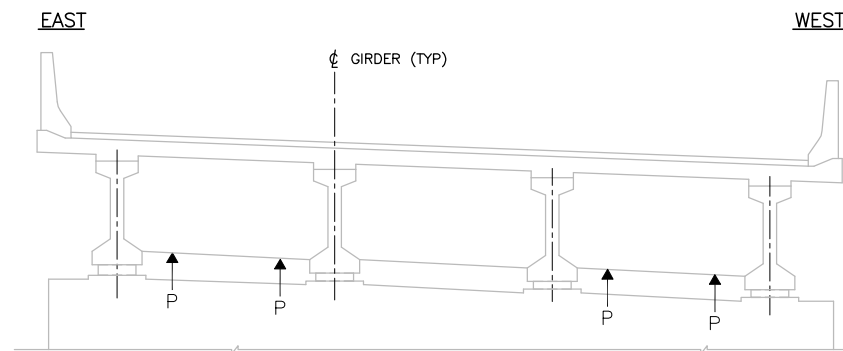
PLAN
1:250

NOTES:

- SEE NOTES ON GENERAL ARRANGEMENT DWG 600.
- JACKING SUPPORT SYSTEM SHOWN ON THE DRAWINGS IS SCHEMATIC ONLY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DESIGN OF JACKING SUPPORT SYSTEM AND SHALL SUBMIT DETAILED SHOP DRAWINGS ALONG WITH DESIGN CALCULATIONS AND PROCEDURES TO THE ENGINEER. ALL DRAWINGS SHALL BE STAMPED BY AN ENGINEER LICENSED IN THE PROVINCE OF ONTARIO.
- JACKING EQUIPMENT AND PROCEDURES OUTLINED IN THE CONTRACTOR'S SHOP DRAWINGS SHALL BE CERTIFIED IN THE FIELD BY THE ENGINEER RESPONSIBLE FOR THOSE DRAWINGS.
- THE CONTRACTOR SHALL SITE MEASURE THE EXISTING STRUCTURE AT SUPPORT LOCATIONS TO ENSURE PROPER FIT.
- TRAFFIC SHALL NOT BE ALLOWED ON THE STRUCTURE DURING JACKING OPERATIONS. JACKING, TEMPORARY SUPPORT AND BEARING REPLACEMENT SHALL ONLY BE CARRIED OUT AT ONE ABUTMENT AT A TIME.
- THE DECK SHALL BE JACKED UP SIMULTANEOUSLY ACROSS THE ENTIRE WIDTH. JACKING MEASUREMENTS SHALL BE RECORDED AND SUPPLIED TO THE ENGINEER.
- THE DECK SHALL BE JACKED UP SUFFICIENTLY TO REMOVE PRESSURE ON THE EXISTING BEARINGS AND FACILITATE THEIR REMOVAL. THE LIFT SHALL BE LIMITED TO A MAXIMUM OF 8mm AND CONTROLLED SO AS TO AVOID DAMAGING ADJACENT AREAS OF THE STRUCTURE.
- JACKING REACTIONS SHOWN ON THE DRAWINGS ARE APPROXIMATE ONLY. THE CONTRACTOR SHALL SUPPLY JACK CAPACITY OF AT LEAST 150% OF THE THEORETICAL JACKING REACTIONS INDICATED.
- THE CONTRACTOR SHALL PROVIDE LATERAL RESTRAINTS CAPABLE OF RESISTING A LOAD OF NO LESS THAN 10% OF VERTICAL JACKING REACTIONS DURING REPLACEMENT OF THE BEARINGS. LATERAL RESTRAINTS SHALL BE INSTALLED PRIOR TO REMOVAL OF EXISTING BEARINGS AND REMAIN IN PLACE UNTIL NEW BEARINGS ARE INSTALLED.
- CONTRACTOR SHALL USE SELF-LOCKING JACKS.
- STAINLESS STEEL AND TEFLON SURFACES SHALL BE PROTECTED FROM ABRASION OR SCRATCHING AND KEPT CLEAN AT ALL TIMES DURING CONSTRUCTION.
- TOP AND BASE PLATES FOR JACKS AND TEMPORARY SUPPORT SHALL BE DESIGNED TO SUIT THE BEARING SEAT AND THE DECK SOFFIT GEOMETRY. TAPERED PLATES WILL BE REQUIRED. THE CONTRACTOR SHALL ESTABLISH THE PLATE SIZE SUCH THAT CONTACT PRESSURE UNDER JACKING OR TEMPORARY SUPPORT LOADS AT SLS IS NOT GREATER THAN 25 MPa.



JACKING LOCATIONS – SOUTH ABUTMENT
1:50

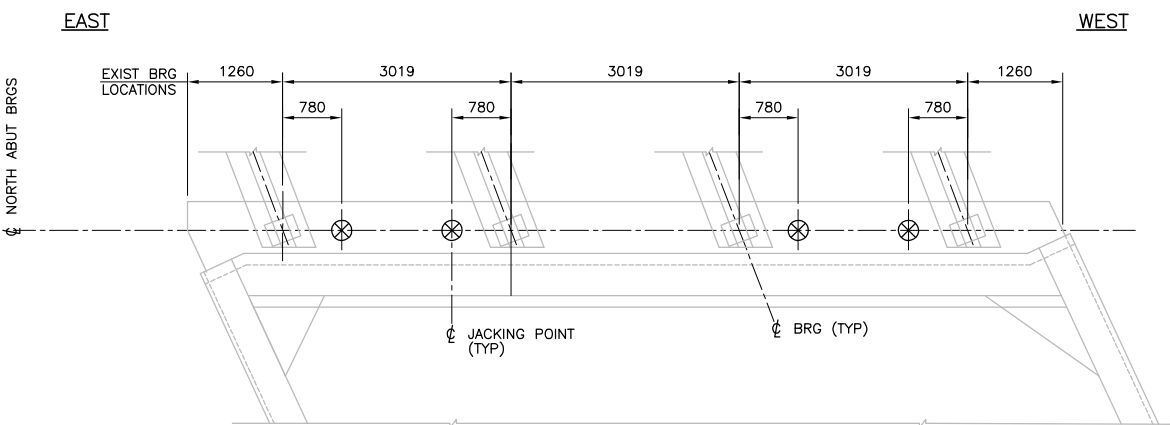


UNFACTORED DEAD LOAD (kN)	350	320	320	350
MAX FACTORED JACKING REACTION @ SLS 1 (kN)	700	800	800	700

JACKING REACTIONS
1:50

LEGEND:

- EXIST BEARING
- JACKING POINTS



JACKING LOCATIONS – NORTH ABUTMENT
1:50

BEARING DATA	REQUIREMENTS AT SERVICEABILITY LIMIT STATES LOADING	
	SOUTH ABUT	NORTH ABUT
DEAD LOAD (kN)	420	420
TOTAL LOAD (kN)	730	730
MOVEMENT (mm)	±17	±17
MAXIMUM SHEAR RATE @ +20°C (kN/mm)	1.19	1.19
BEARING SIZE (mm)	400x300x100	400x300x100
NUMBER REQUIRED	4	4
BEARING TYPE	LAMINATED ELASTOMERIC	LAMINATED ELASTOMERIC

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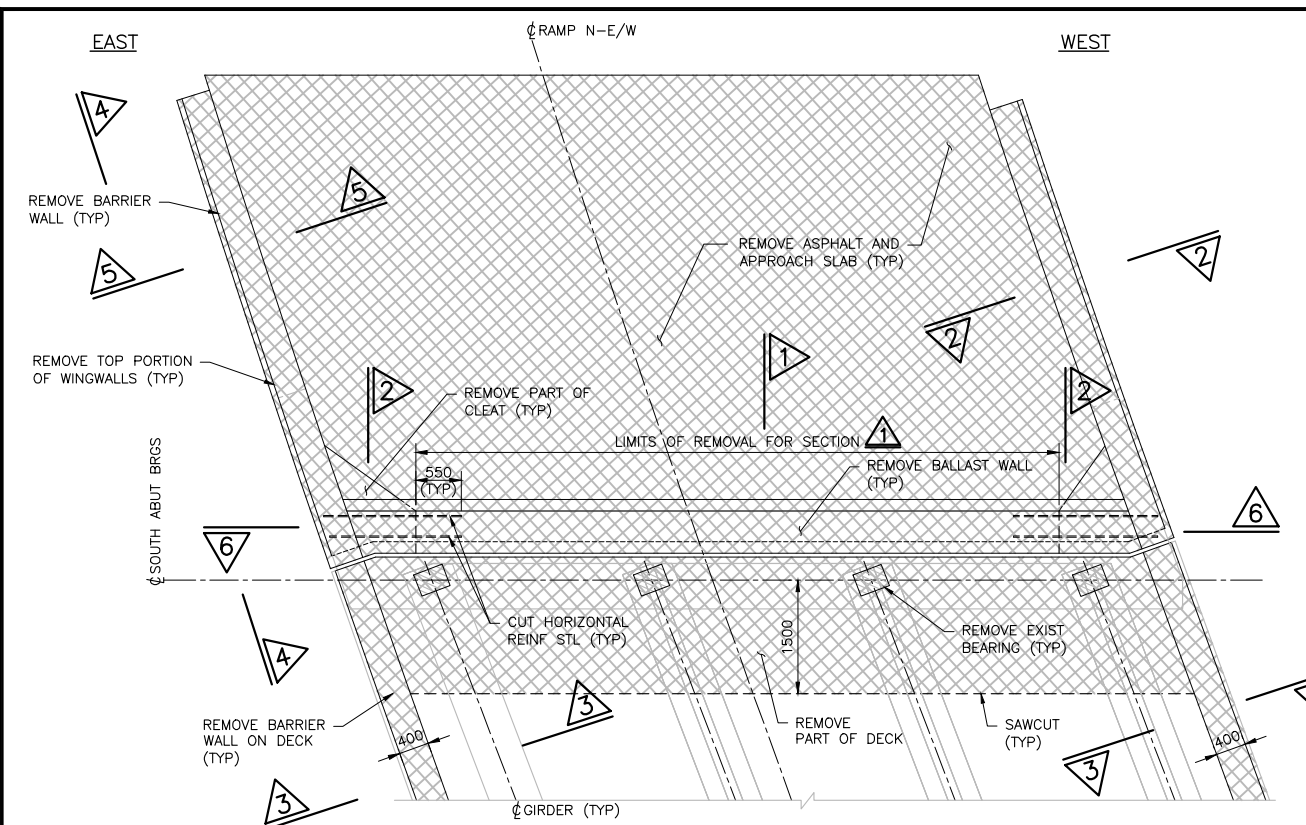
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A 18/01/12	90% SUBMISSION TO CA				

SCALE :
AS NOTED

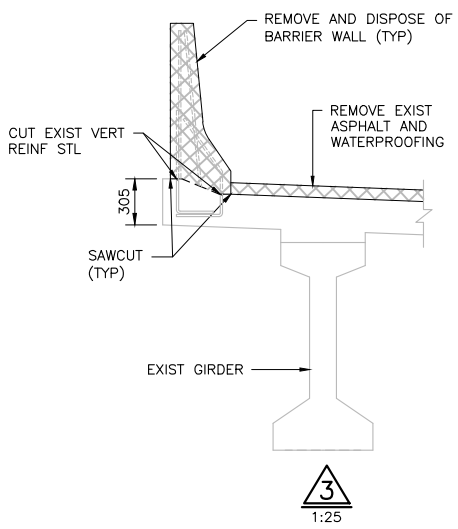
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DRAWN	ELENA TSENTIERE	
CHECKED	TATIANA OJALA	
APPROVED LEAD ENG.	TATIANA OJALA	
APPROVED PROJ. MANAGER		
NAME (PRINT)	INIT.	DATE



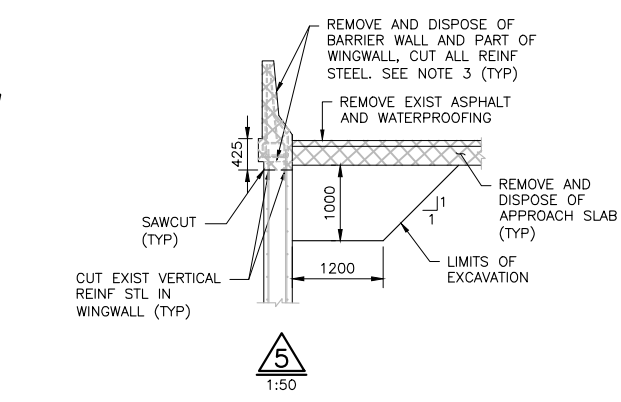
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H427-D	N	9	STR	B02	DWG	602	A



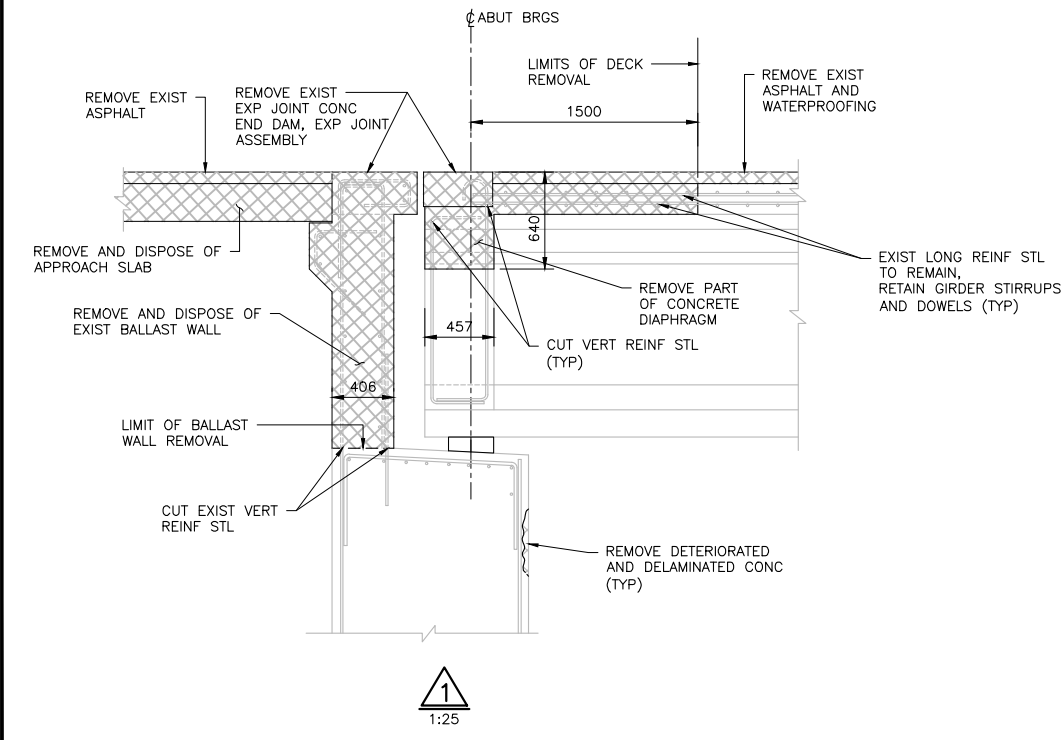
PLAN
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SOUTH ABUTMENT SHOWN
NORTH ABUTMENT SIMILAR



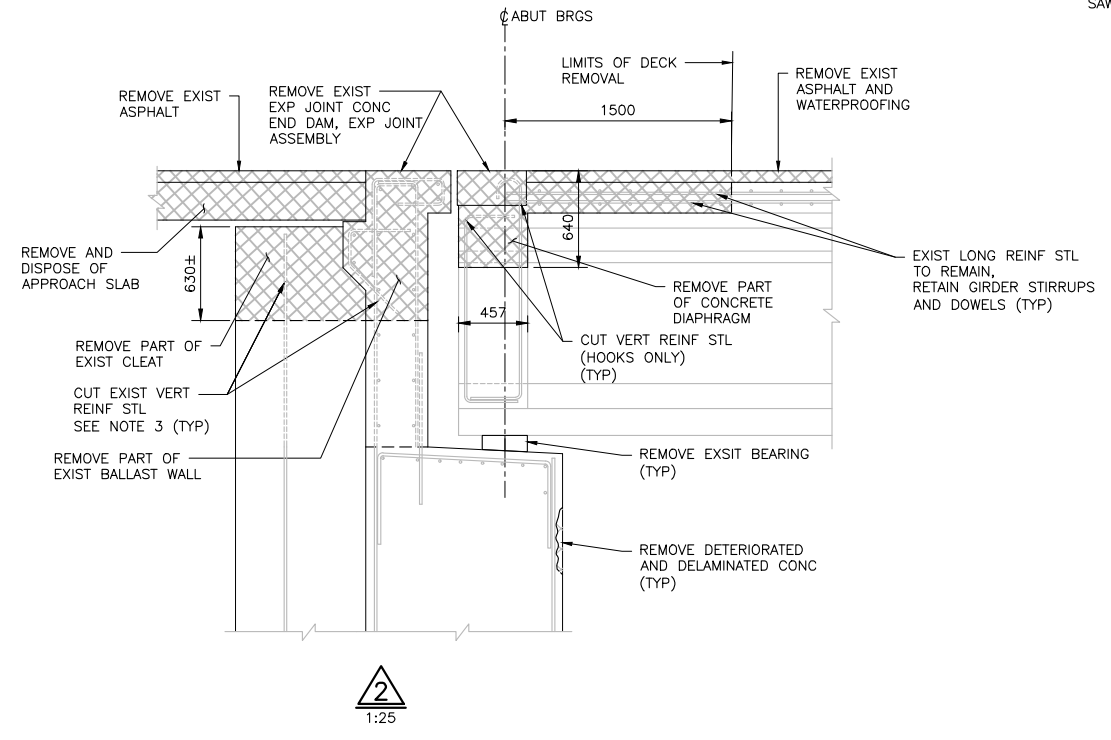
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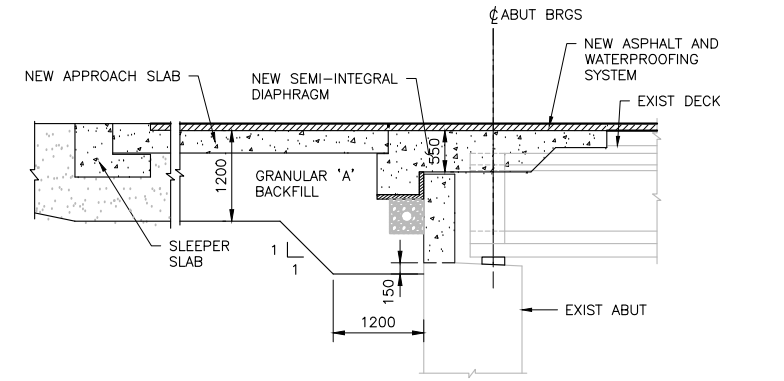
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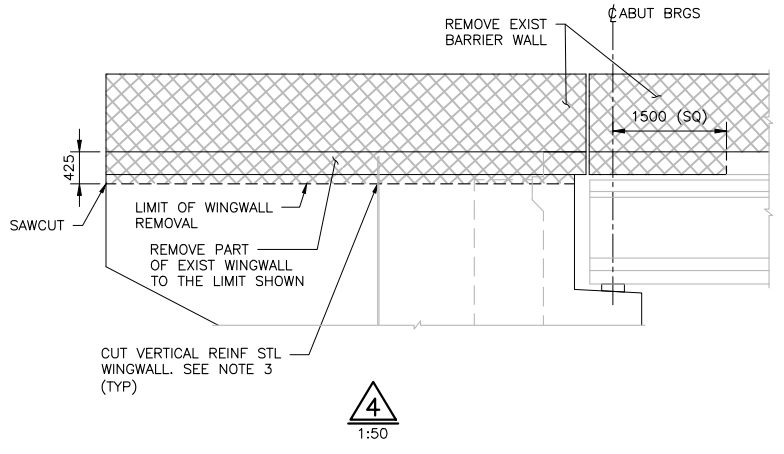
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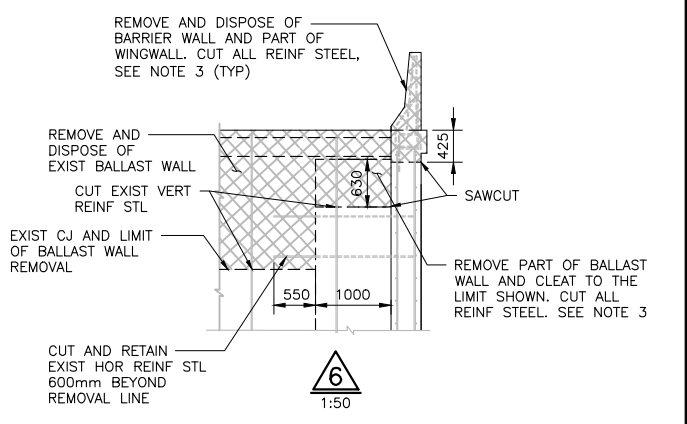
2
1:25



LIMIT OF EXCAVATION AND GRANULAR FILL
NTS



4
1:50



6
1:50

LIST OF ABBREVIATIONS:

REINF STL REINFORCING STEEL
LONG LONGITUDINAL

LEGEND:

[Cross-hatched box] CONCRETE REMOVALS
[Dashed line] LIMIT OF REMOVAL

NOTES:

- THIS DRAWING TO BE READ IN CONJUNCTION WITH DWG 601 AND 602
- EXISTING REINFORCING STEEL TO REMAIN SHALL BE ABRASIVE BLAST CLEANED.
- FOR REINFORCING STEEL THAT IS CUT AND WILL NOT BE EMBEDDED IN CONCRETE THE FOLLOWING APPLIES:
 - CHIP CONCRETE 25mm AROUND REBAR TO A DEPTH OF 50mm.
 - CUT REBAR AND PATCH HOLE WITH PROPRIETARY PRODUCT.
- SAWCUTS IN CONCRETE, WHERE DESIGNATED, SHALL BE 25mm DEEP OR TO THE FIRST LAYER OF REINFORCING STEEL, WHICHEVER IS LESS.

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MODIFIED: 3/20/2018 12:13:28 PM BY: PANGF
DATE PLOTTED: 3/20/2018 2:00:34 PM BY: PANGF

DATE	REVISIONS	BY	CHK	LEAD DISC.	PROJ. MAN.
B 18/03/16	90% SUBMISSION TO CA				
A 18/01/12	90% SUBMISSION TO CA				

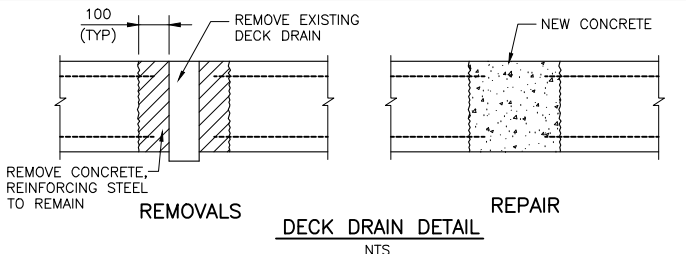
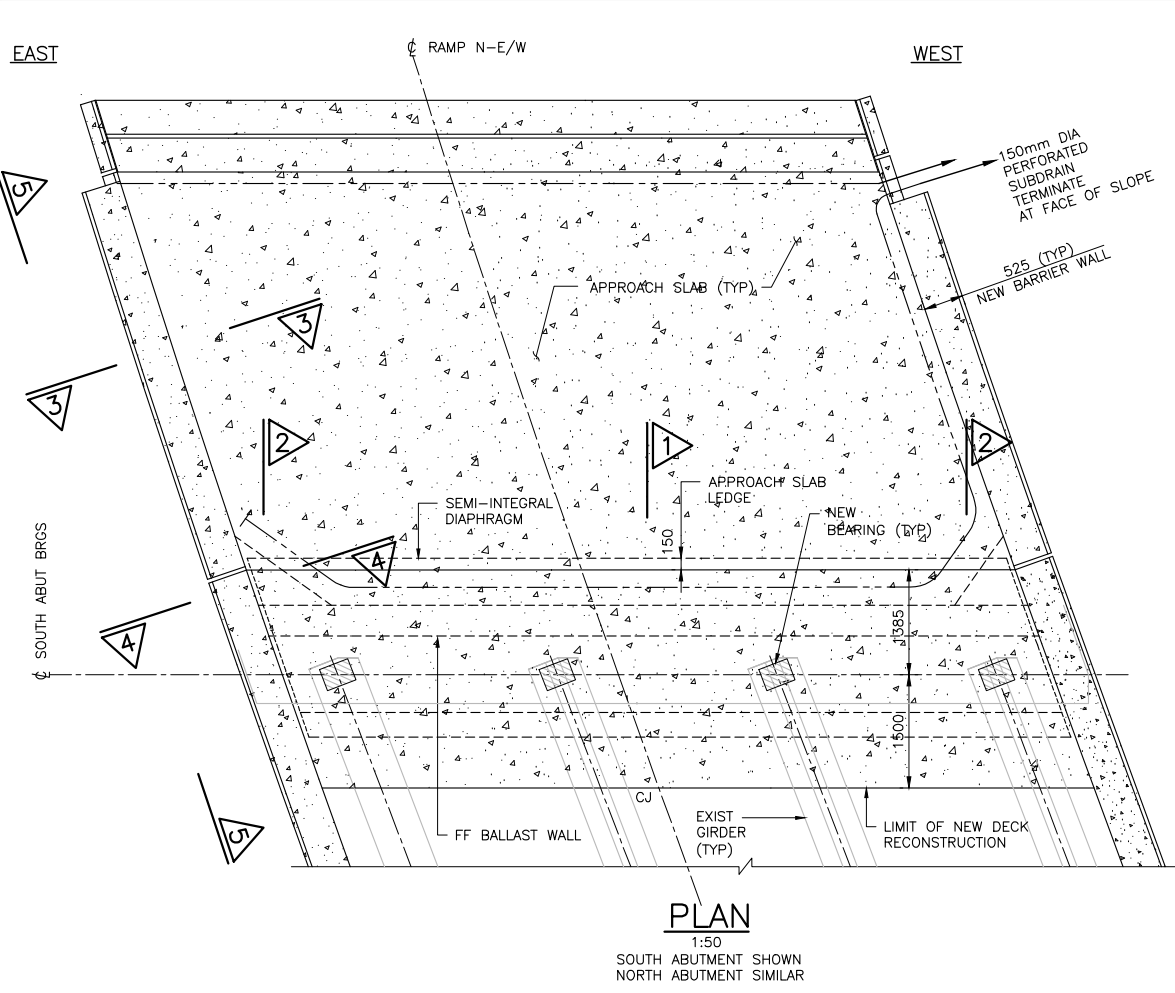
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AS NOTED

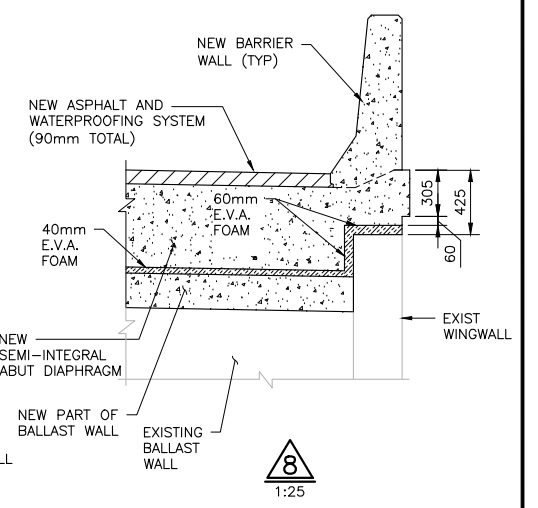
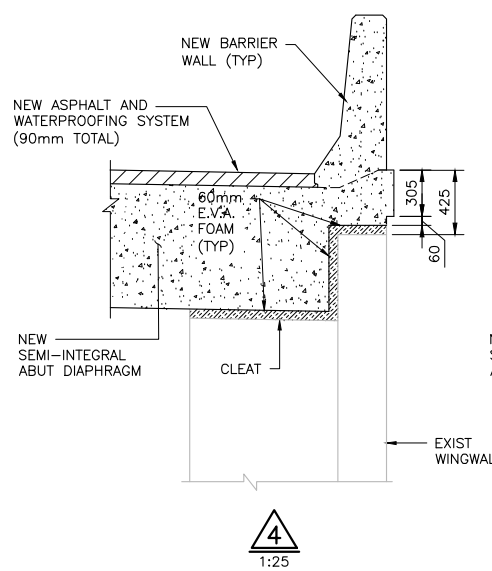
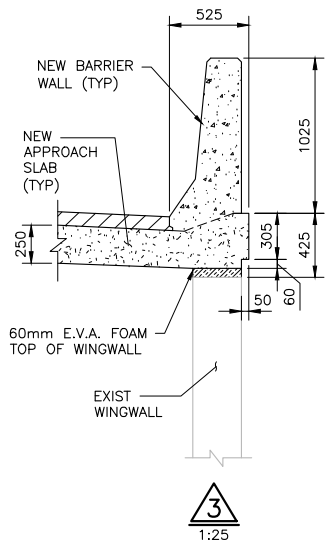
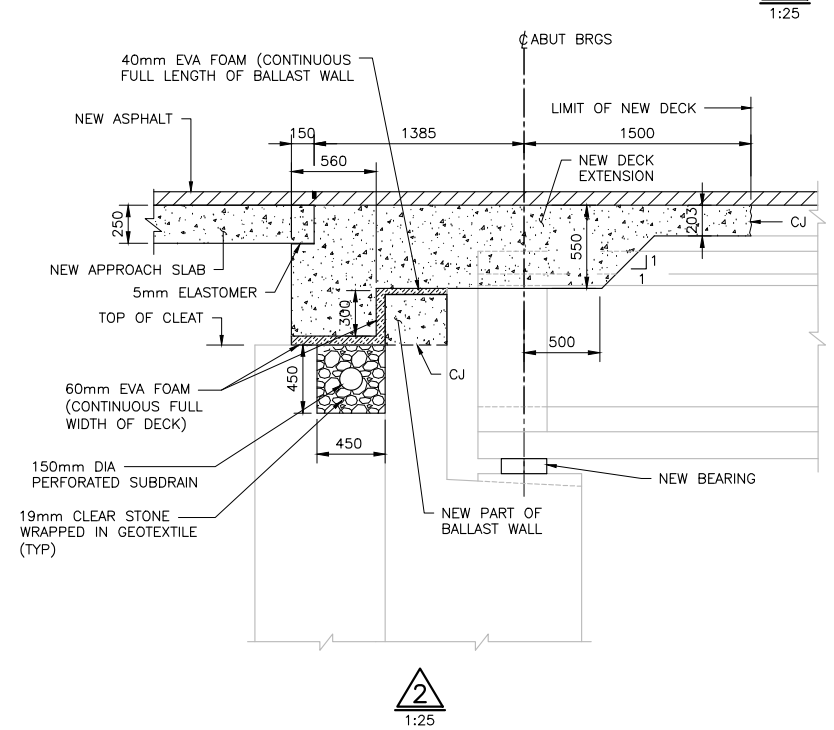
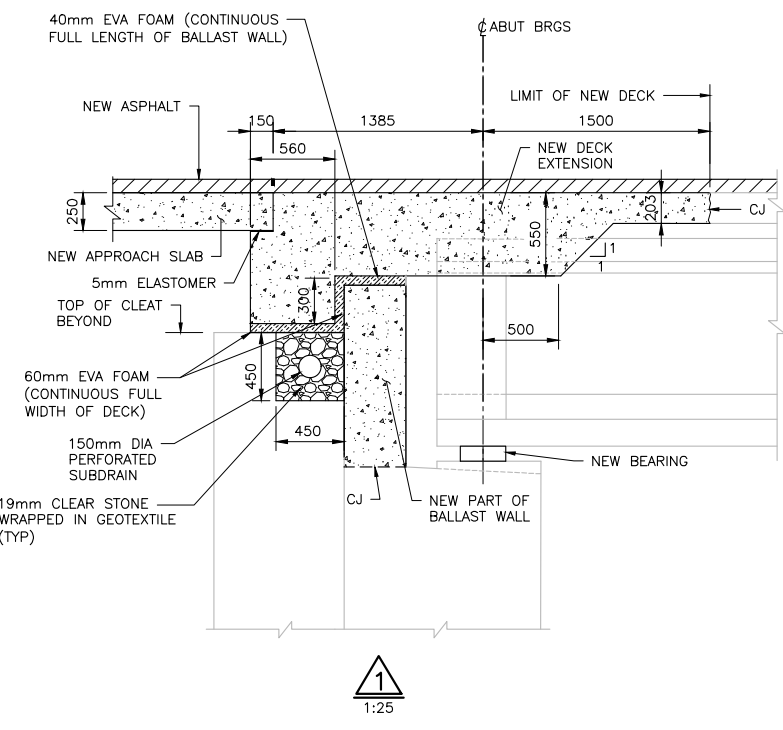
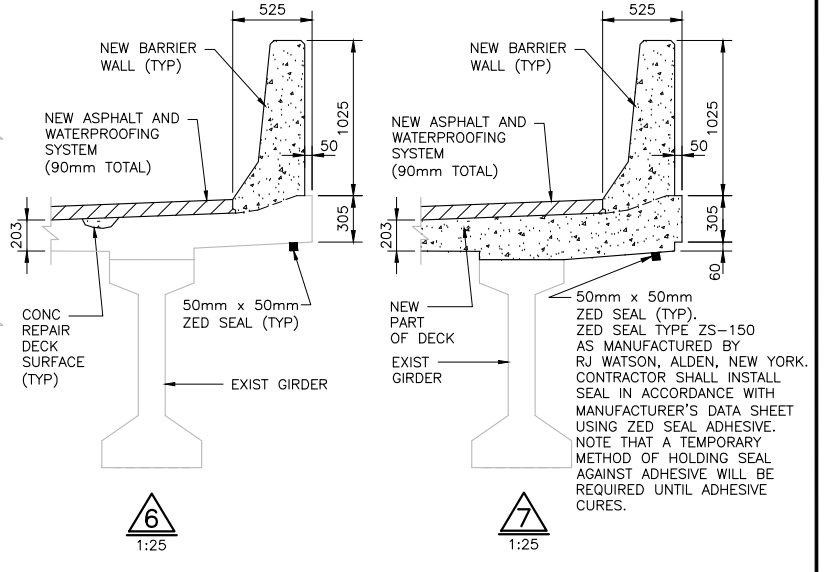
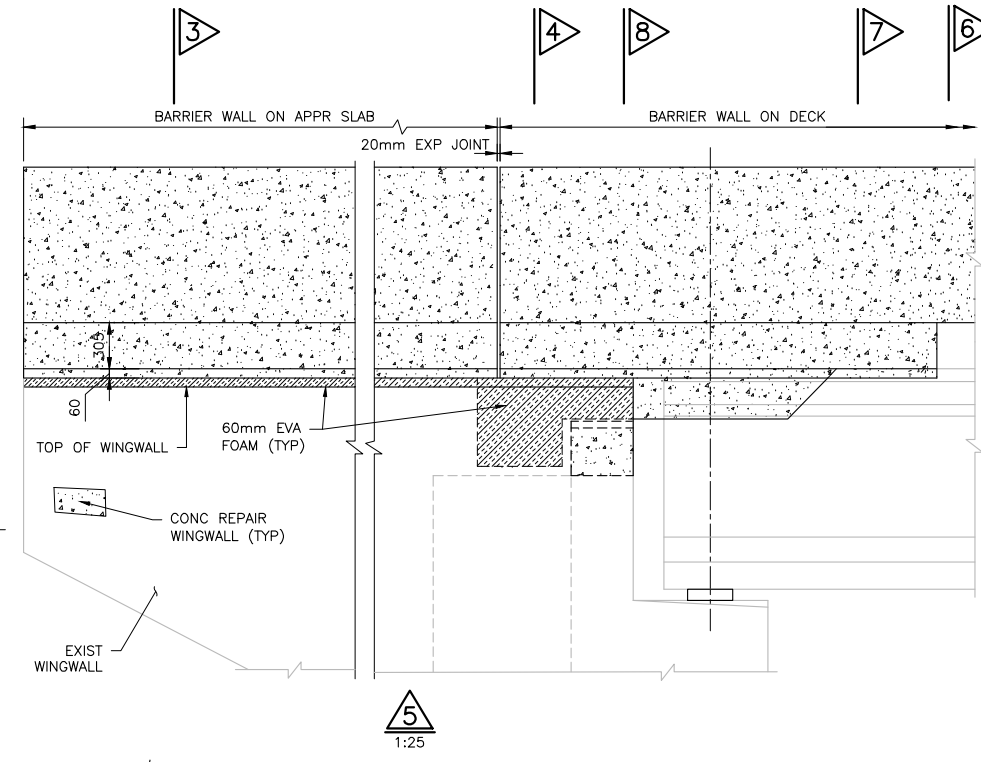
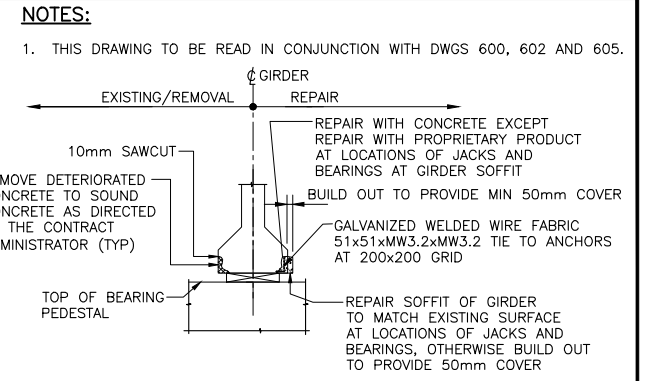
DESIGNED	ANDREW HACHBORN	
DRAWN	ELENA TSENER	
CHECKED	TATIANA QJALA	
APPROVED LEAD ENG.	TATIANA QJALA	
APPROVED PROJ. MANAGER		
NAME (PRINT)	INT.	DATE



TITLE						
HWY 427 EXPANSION RAMP HWY 427N TO FINCH AVE E/W OVER HUMBER RIVER REHABILITATION - R1, SITE 37-1087 REMOVALS						
PROJECT ID.	STAGE IDENTIFIER	DESIGN PACKAGE NUMBER	DISCIPLINE	STRUCTURE NUMBER	DOCUMENT TYPE	DRAWING NUMBER
H427-D	N	9	STR	B02	DWG	603
						REVISION NUMBER
						B



- LEGEND:**
- NEW CONCRETE
 - NEW ASPHALT
 - EVA FOAM



CAD FILE LOCATION AND NAME: C:\projects\h427-D-H-9-STR-B02-DWG-604NC.dwg
 MODIFIED: 3/20/2018 12:13:31 PM BY: PANGF
 DATE PLOTTED: 3/20/2018 2:00:40 PM BY: PANGF

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A 18/01/12	90% SUBMISSION TO CA				

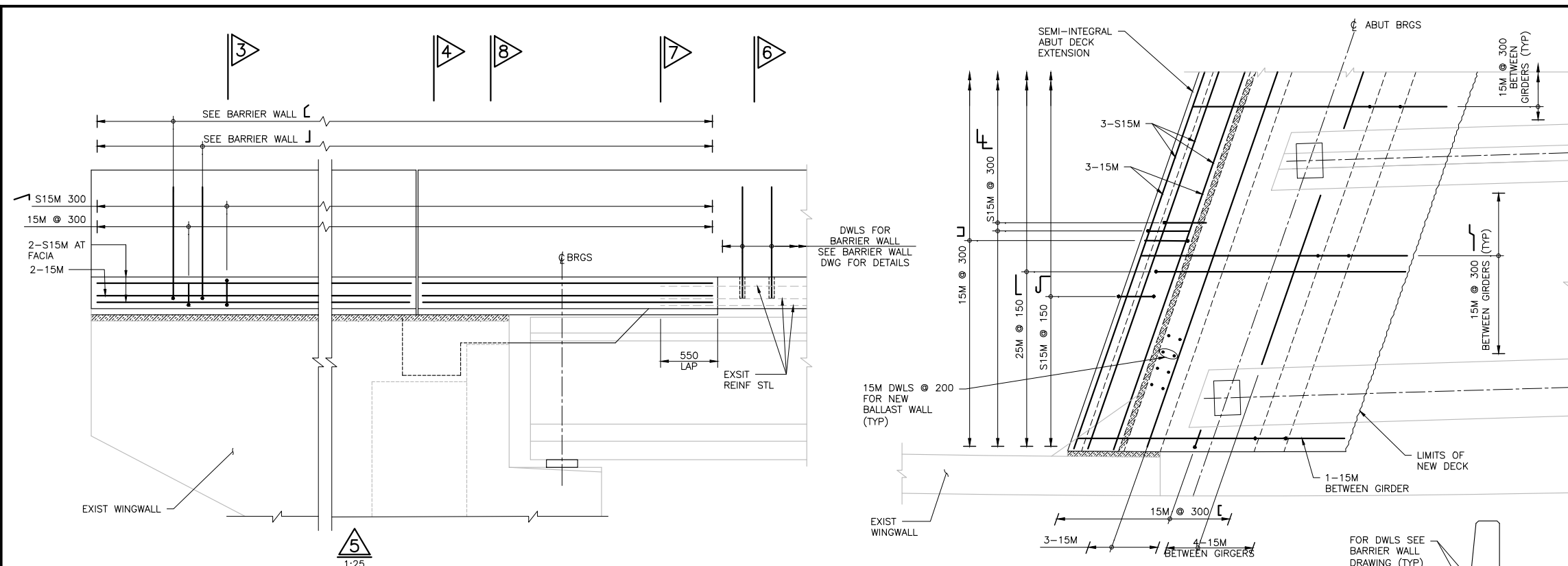
SCALE :
AS NOTED

DESIGNED	ANDREW HACHBORN	
DRAWN	ELENA TSENTER	
CHECKED	TATIANA QJALA	
APPROVED LEAD ENG.	TATIANA QJALA	
APPROVED PROJ. MANAGER		
NAME (PRINT)	INT.	DATE



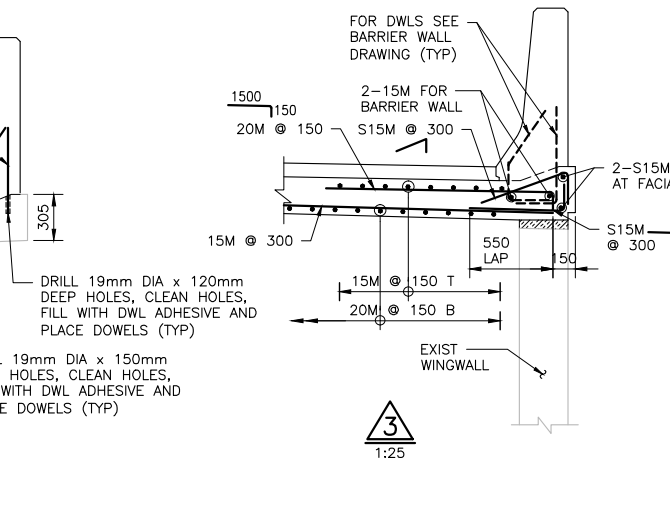
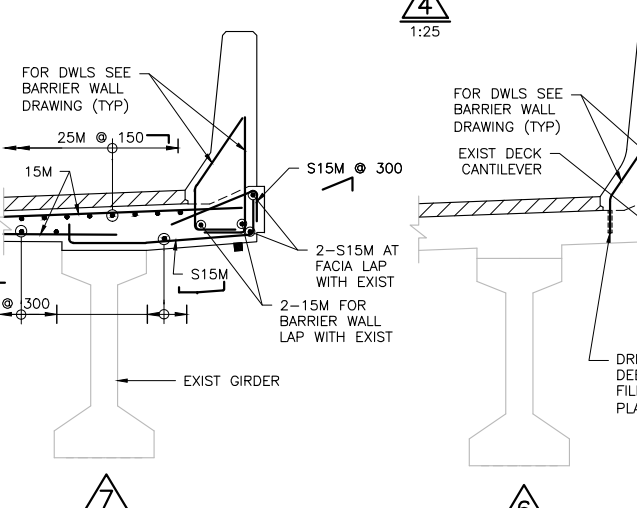
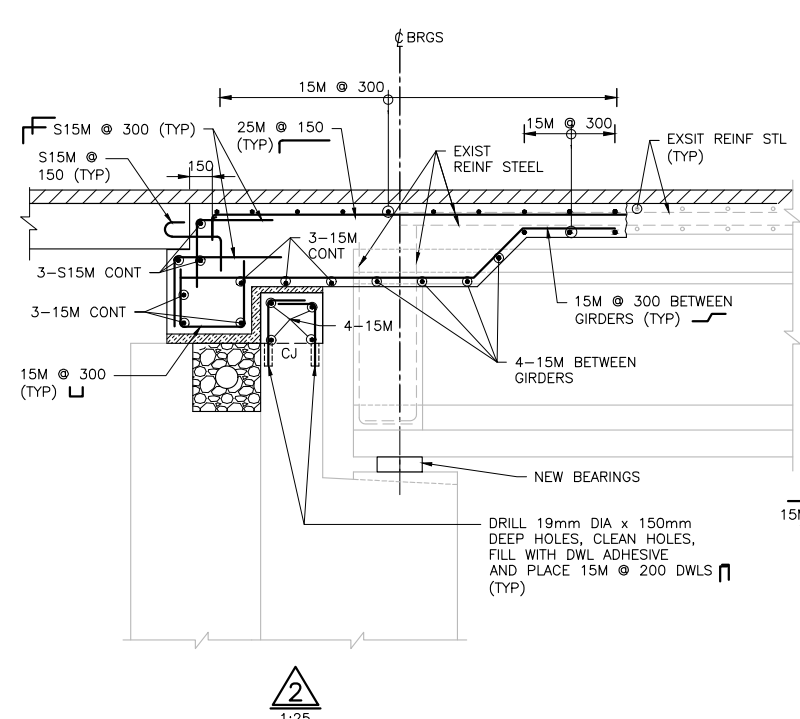
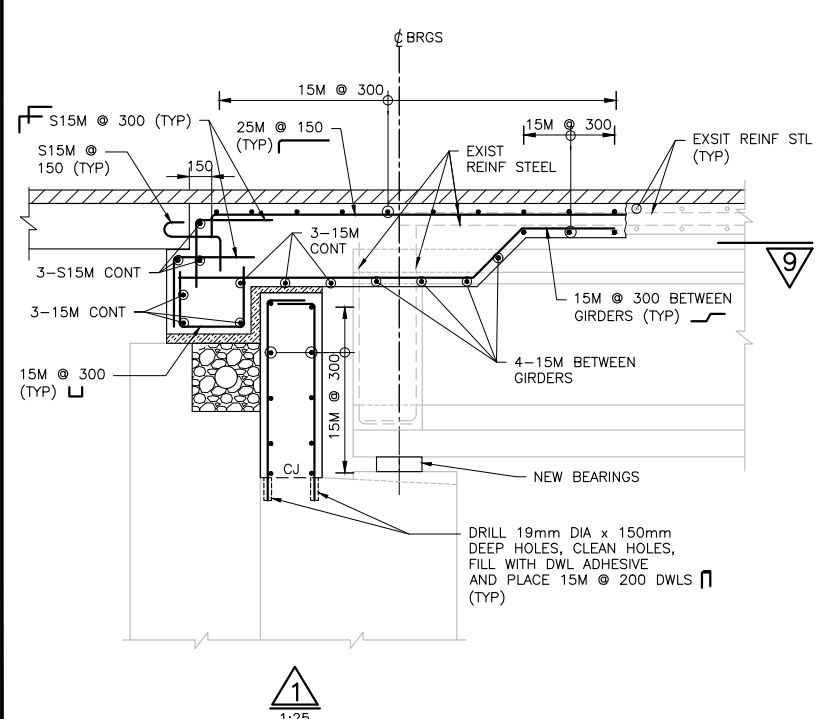
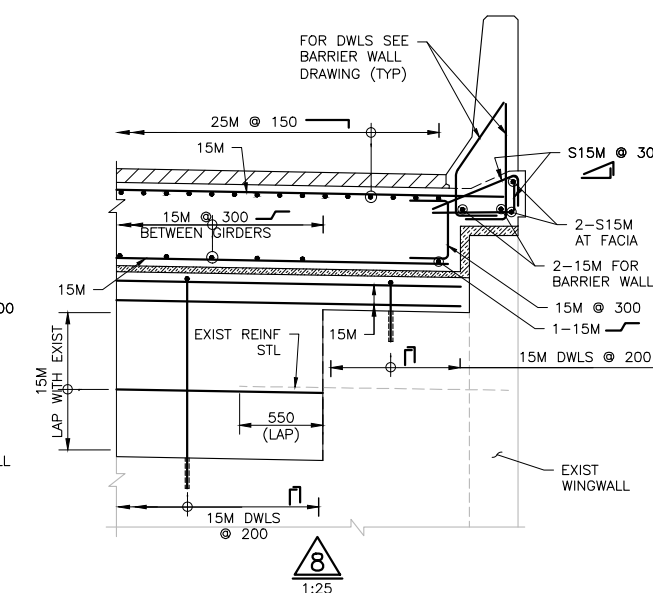
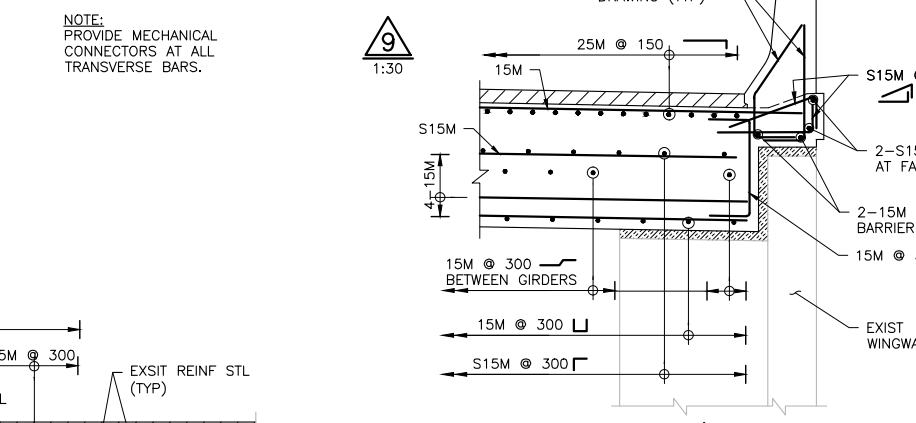
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H427-D	N	9	STR	B02	DWG	604	B

TITLE
HWY 427 EXPANSION
RAMP HWY 427N TO FINCH AVE E/W
OVER HUMBER RIVER
REHABILITATION - R1, SITE 37-1087
NEW CONSTRUCTION I



- NOTES:**
- THIS DRAWING TO BE READ IN CONJUNCTION WITH DRAWINGS 604 AND 606.
- APPLICABLE STANDARD DRAWINGS:**
- OPSD 3329.100 DECK, REINFORCEMENT-SUPPORTS FOR REINFORCING STEEL FOR SLAB DEPTHS 300mm OR LESS
 - OPSD 3329.101 DECK, REINFORCEMENT-SUPPORTS FOR REINFORCING STEEL SLAB DEPTHS GREATER THAN 300mm
 - OPSD 3370.101 DECK, WATERPROOFING HOT APPLIED ASPHALT MEMBRANE AT ACTIVE CRACKS GREATER THAN 2mm WIDE AND CONSTRUCTION JOINTS
 - OPSD 3950.100 JOINTS-CONCRETE EXPANSION AND CONSTRUCTION ON STRUCTURE

- LIST OF ABBREVIATIONS:**
- BTWN BETWEEN
 - DWLS DOWELS



CAD FILE LOCATION AND NAME: C:\projects\h427-d-h-h-9-str-b02-dwg-605nc.dwg
 MODIFIED: 3/20/2018 12:13:34 PM BY: PANGF
 DATE PLOTTED: 3/20/2018 2:00:46 PM BY: PANGF

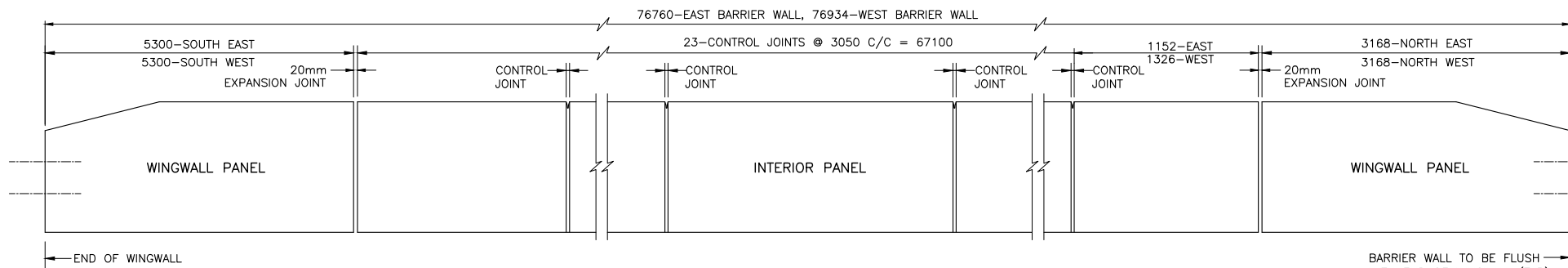
DATE	REVISIONS	BY	CHK	LEAD DISC.	PROJ. MAN.
18/03/16	90% SUBMISSION TO CA				
18/01/12	90% SUBMISSION TO CA				

SCALE :
AS NOTED

DESIGNED	ANDREW HACHBORN
DRAWN	ELENA TSENTER
CHECKED	TATIANA QJALA
APPROVED LEAD ENG.	TATIANA QJALA
APPROVED PROJ. MANAGER	



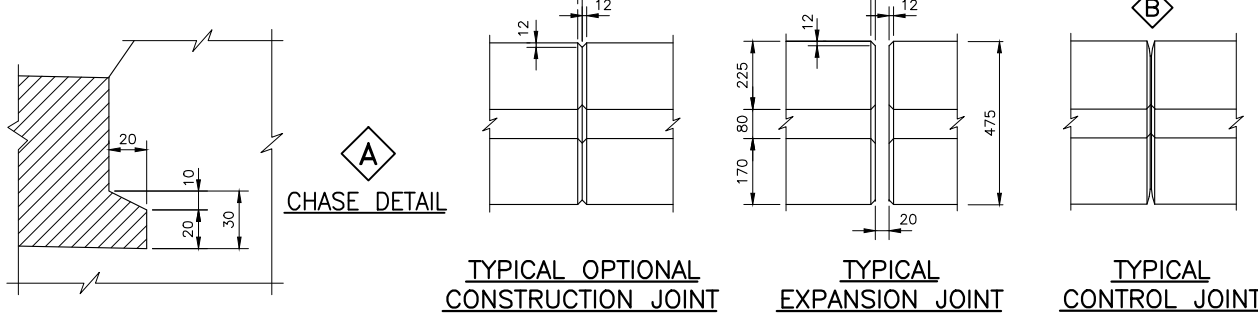
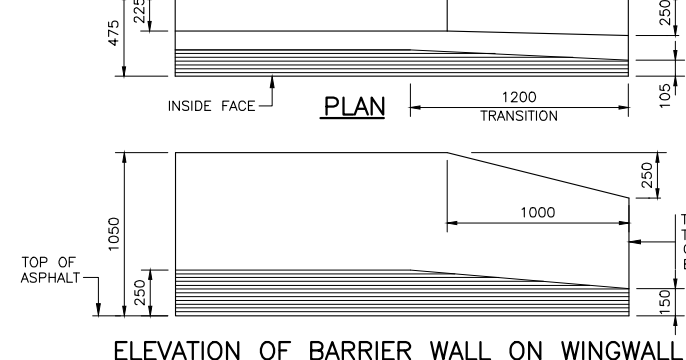
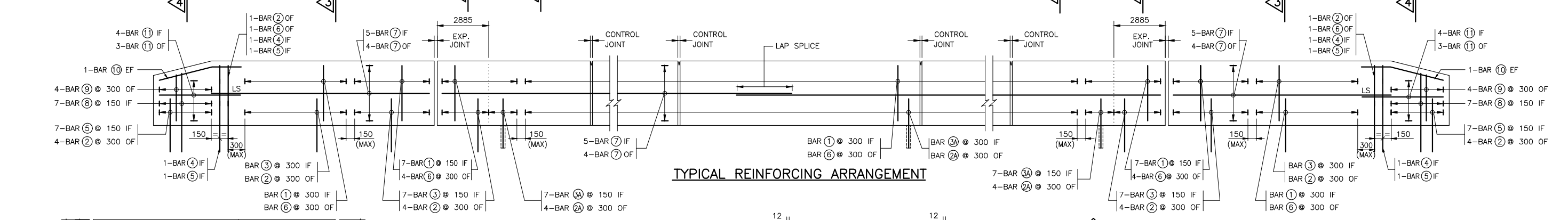
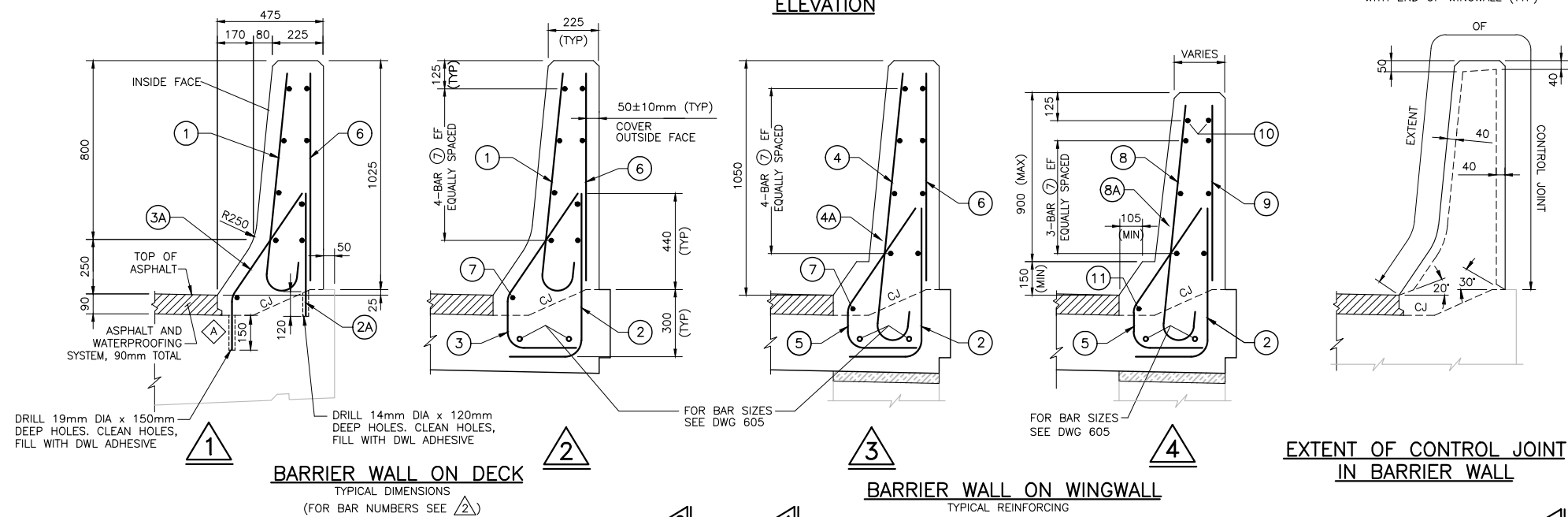
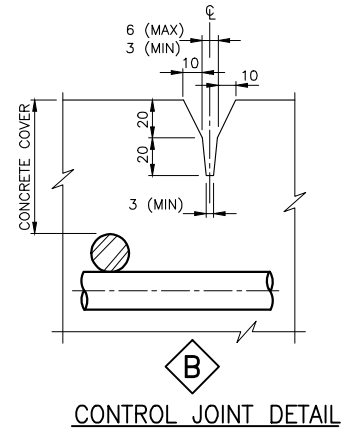
HWY 427 EXPANSION RAMP HWY 427N TO FINCH AVE E/W OVER HUNTER RIVER REHABILITATION - R1, SITE 37-1087 NEW CONSTRUCTION II							
PROJECT ID.	STAGE IDENTIFIER	DESIGN PACKAGE NUMBER	DISCIPLINE	STRUCTURE NUMBER	DOCUMENT TYPE	DRAWING NUMBER	REVISION NUMBER
H427-D	N	9	STR	B02	DWG	605	B



ELEVATION

BAR MARK	SIZE	SHAPE
①	S15M	
②A	S10M	
②	S10M	
③A	S15M	
③	S15M	
④	S15M	
⑤	S15M	
⑥	S10M	STRAIGHT
⑦	S15M	STRAIGHT
⑧	S15M	
⑨	S10M	STRAIGHT, LENGTH VARIES
⑩	S15M	
⑪	S15M	STRAIGHT

- NOTES:**
1. SYSTEM CONFIGURATION MEETS THE REQUIREMENTS OF NCHRP 350.
 2. CONCRETE COVER TO REINFORCING STEEL 60±10mm EXCEPT AS NOTED.
 3. REINFORCING STEEL SHALL BE STAINLESS TYPE 316LN OR DUPLEX 2205 WITH A MINIMUM YIELD STRENGTH OF 500MPa.
 4. BAR LAP SPLICE FOR HORIZONTAL REINFORCEMENT MUST NOT LAP THROUGH CONTROL JOINT.
 5. MINIMUM BAR LAP SPLICE TO BE 550mm, UNLESS OTHERWISE SHOWN.
 6. LENGTH OF HORIZONTAL BAR TO SUIT CONTRACTOR'S OPERATIONS. BAR LENGTHS NEED NOT MATCH DISTANCE BETWEEN CONTROL JOINTS.
 7. CONTROL JOINT TO BE FORMED.
 8. SAWCUTS NOT PERMITTED.
 9. CONTROL JOINT FORM HARDWARE NOT TO BE LEFT IN PLACE.
 10. OPTIONAL CONSTRUCTION JOINTS TO BE LOCATED WITHIN LIMITS OF CONCRETE DAMS ON DECK OR BALLAST WALL.
 11. CHASE REQUIRED ON HIGH AND LOW SIDE OF CROSSFALL.
 12. LEGEND: EF - DENOTES EACH FACE
 IF - DENOTES INSIDE FACE
 OF - DENOTES OUTSIDE FACE
 CJ - CONSTRUCTION JOINT
 LS - LAP SPLICE



MODIFIED	
STANDARD DRAWING SEPTEMBER 2016	SS110-61
BARRIER WALL WITHOUT RAILING, TL-5 (STAINLESS STEEL REBAR)	

DRAWING NOT TO BE SCALED
100mm ON ORIGINAL DRAWING

CAD FILE LOCATION AND NAME: C:\projects\hwy427\hwy427-d-h-9-str-b02-dwg-606BW.dwg
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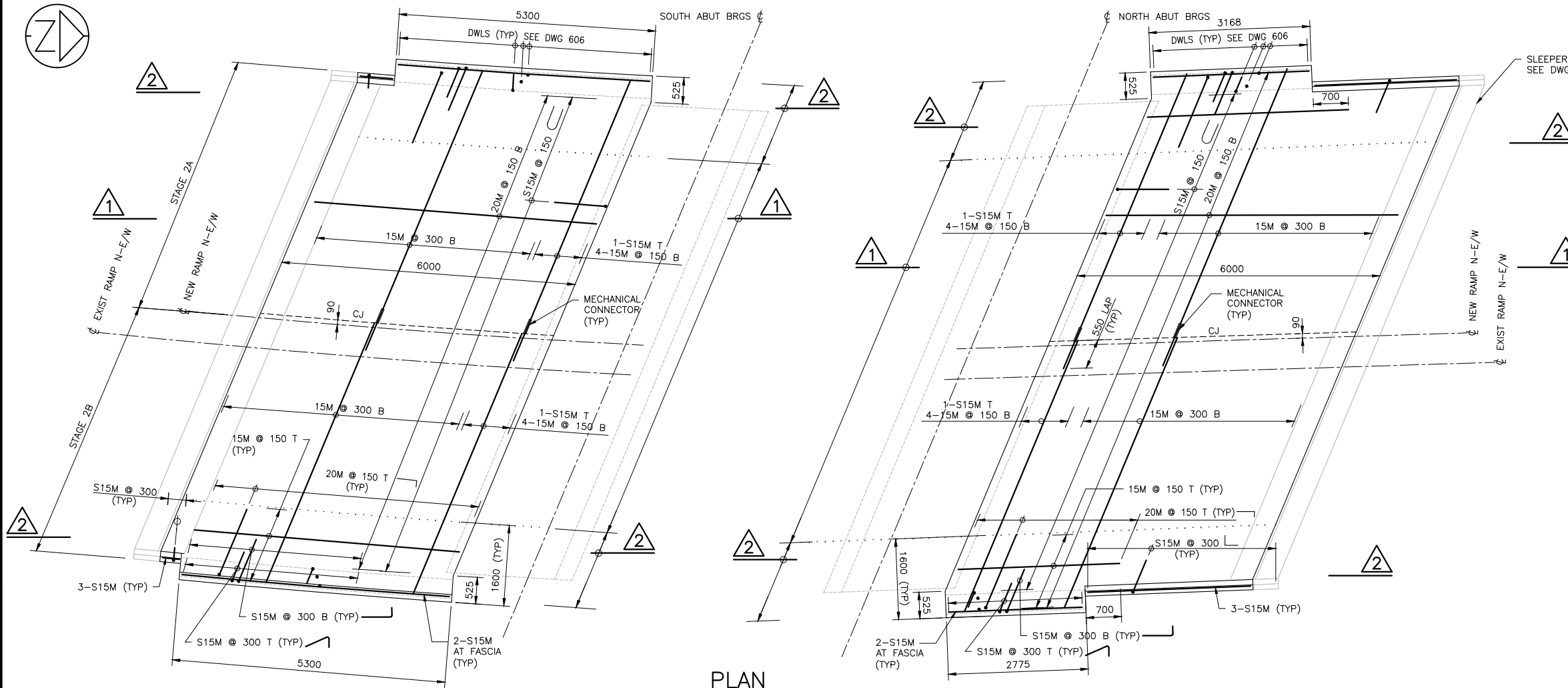
DATE	REVISIONS	BY	CHK	LEAD	PROJ. MGR.
B 18/03/16	90% SUBMISSION TO CA				
A 18/01/12	90% SUBMISSION TO CA				

SCALE : AS NOTED

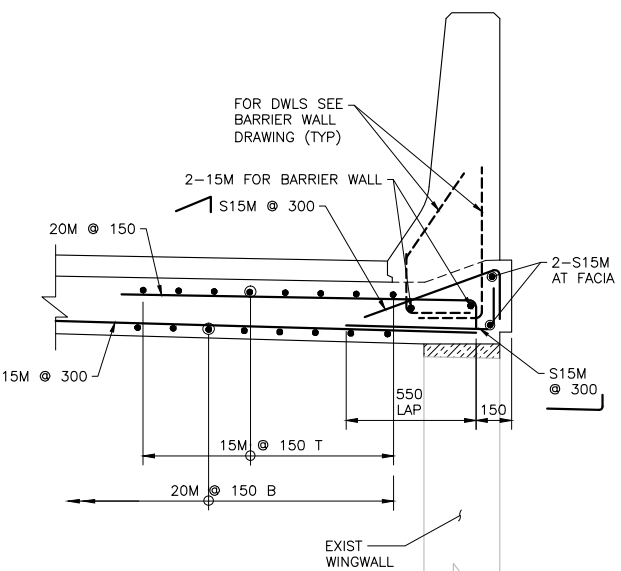
DESIGNED	ANDREW HACHORN
DRAWN	ELENA TSENER
CHECKED	TATIANA OJALA
APPROVED LEAD ENGR.	TATIANA OJALA
APPROVED PROJ. MANAGER	



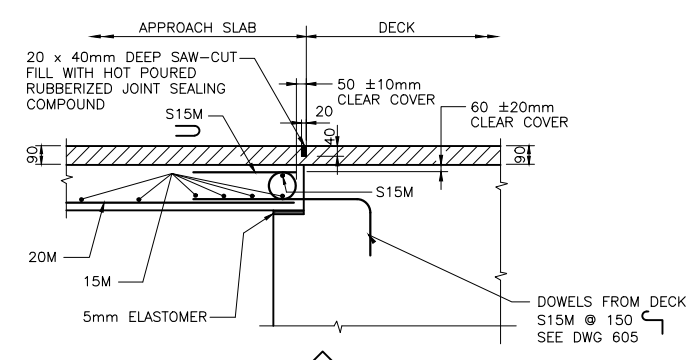
HWY 427 EXPANSION RAMP HWY 427N TO FINCH AVE E/W OVER HUMBER RIVER REHABILITATION - R1, SITE 37-1087 BARRIER WALL WITHOUT RAILING, TL-5						
PROJECT ID.	STAGE IDENTIFIER	DESIGN PACKAGE NUMBER	DISCIPLINE	STRUCTURE TYPE	DOCUMENT TYPE	REVISION NUMBER
H427-D	N	9	STR	B02	DWG	606 B



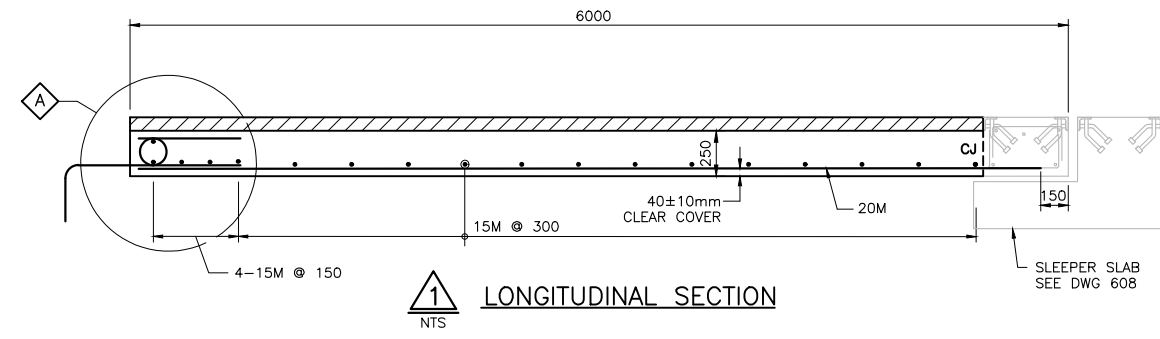
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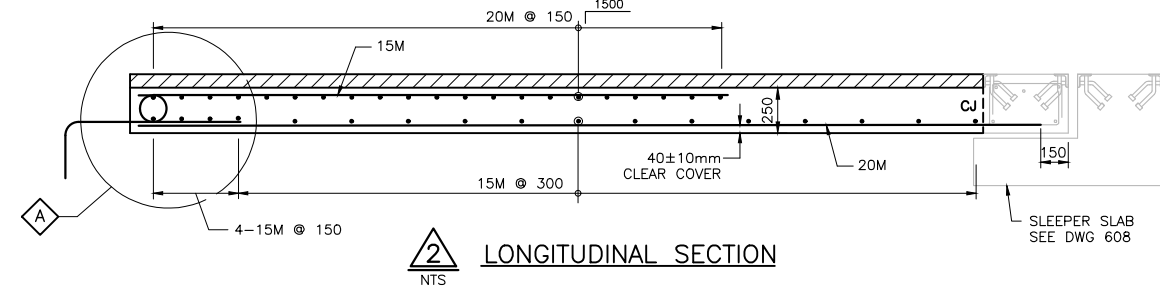
WITHOUT SIDEWALK
SECTION AT WINGWALL
NTS



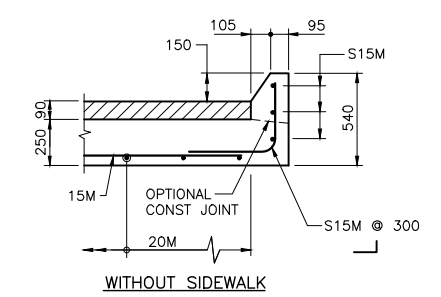
FOR BRIDGES WITHOUT EXPANSION JOINTS
NTS



1
NTS
LONGITUDINAL SECTION



2
NTS
LONGITUDINAL SECTION



WITHOUT SIDEWALK
SECTION BEYOND WINGWALL
NTS

MODIFIED	
STANDARD DRAWING MARCH 2016	SS116-1
6000 mm APPROACH SLAB	

- NOTES:**
- CLEAR COVER TO REINFORCING STEEL 70 ± 20 mm EXCEPT AS NOTED.
 - STAINLESS STEEL BARS SHALL BE TYPE 316 LN OR DUPLEX 2205 WITH A MINIMUM YIELD STRENGTH OF 500 MPA. REINFORCING STEEL SHALL BE GRADE 400W.
 - WATERPROOFING FOR BRIDGES WITHOUT EXPANSION JOINTS (RIGID FRAMES AND INTEGRAL ABUTMENTS) TO BE IN ACCORDANCE WITH OPSD-3370.1010.
 - BARS MARK WITH PREFIX S DENOTE STAINLESS STEEL BARS.

LIST OF ABBREVIATIONS:

T/C TOP OF CONCRETE
WP WORKING POINT

APPLICABLE STANDARD DRAWINGS

OPSD-3370.100	DECK, WATERPROOFING HOT APPLIED ASPHALT MEMBRANE WITH PROTECTION BOARD
OPSD-3370.101	DECK, WATERPROOFING HOT APPLIED ASPHALT MEMBRANE AT ACTIVE CRACKS GREATER THAN 2mm WIDE AND CONSTRUCTION JOINTS
OPSD-3941.200	FIGURE IN CONCRETE-SITE NUMBER AND DATE LAYOUT

CAD FILE LOCATION AND NAME: C:\projects\hwy427\h427-d-h-9-str-b02-dwg-607ap.dwg
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 DATE PLOTTED: 3/20/2018 2:00:51 PM BY: PANGF

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18/01/12	90% SUBMISSION TO CA				

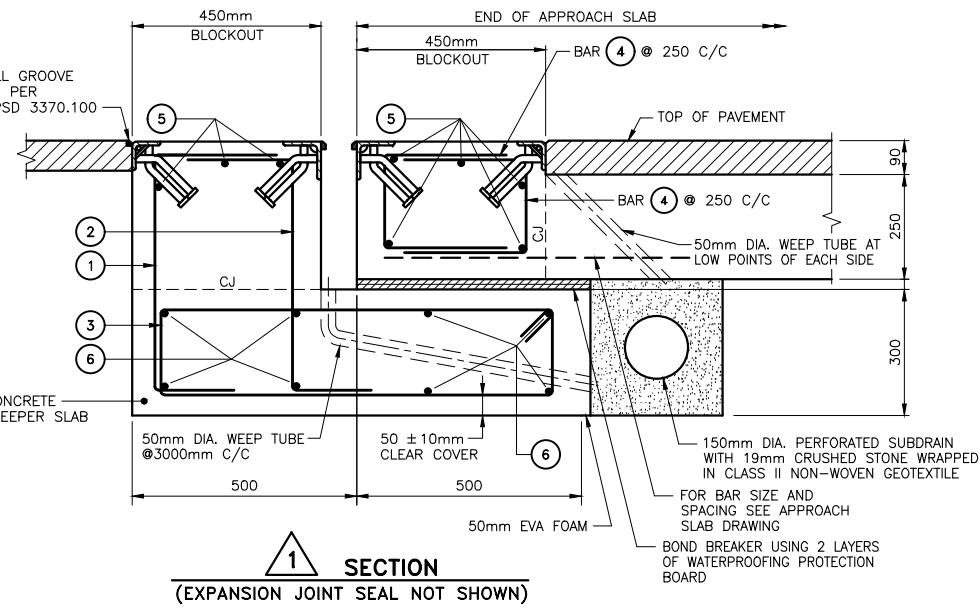
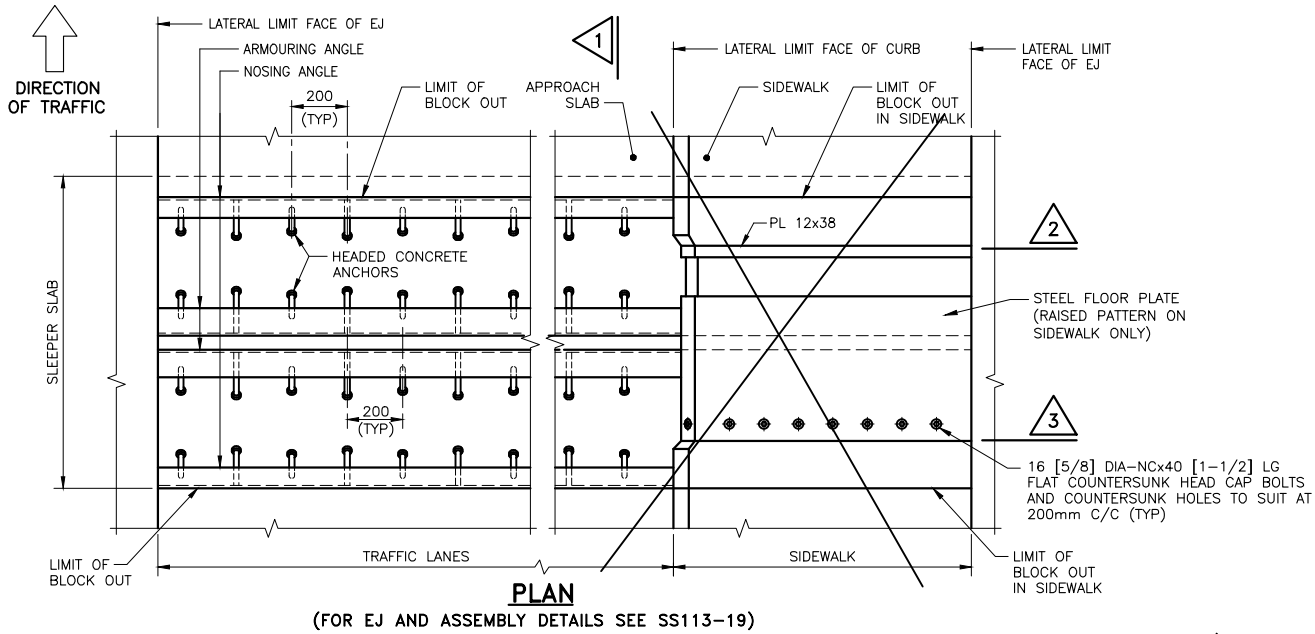
SCALE :

AS NOTED

DESIGNED	ANDREW HACHBORN	
DRAWN	ELENA TSENTER	
CHECKED	TATIANA QJALA	
APPROVED LEAD ENG.	TATIANA QJALA	
APPROVED PROJ. MANAGER		
NAME (PRINT)	INT.	DATE



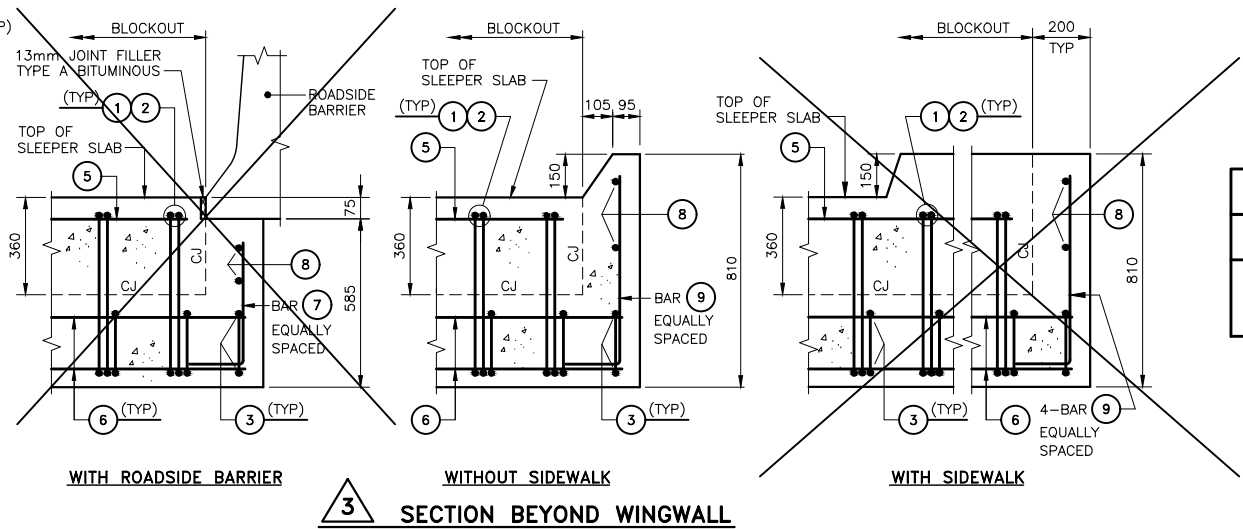
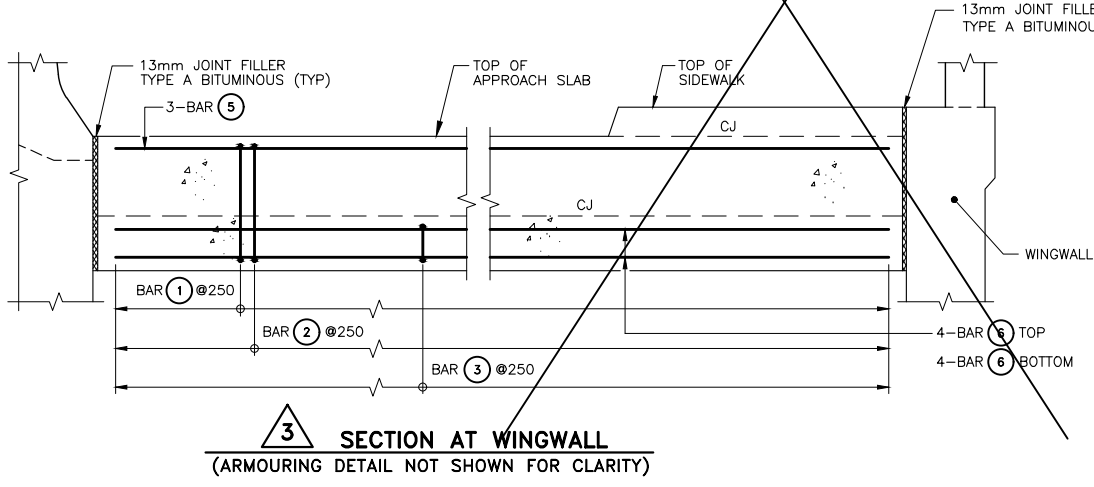
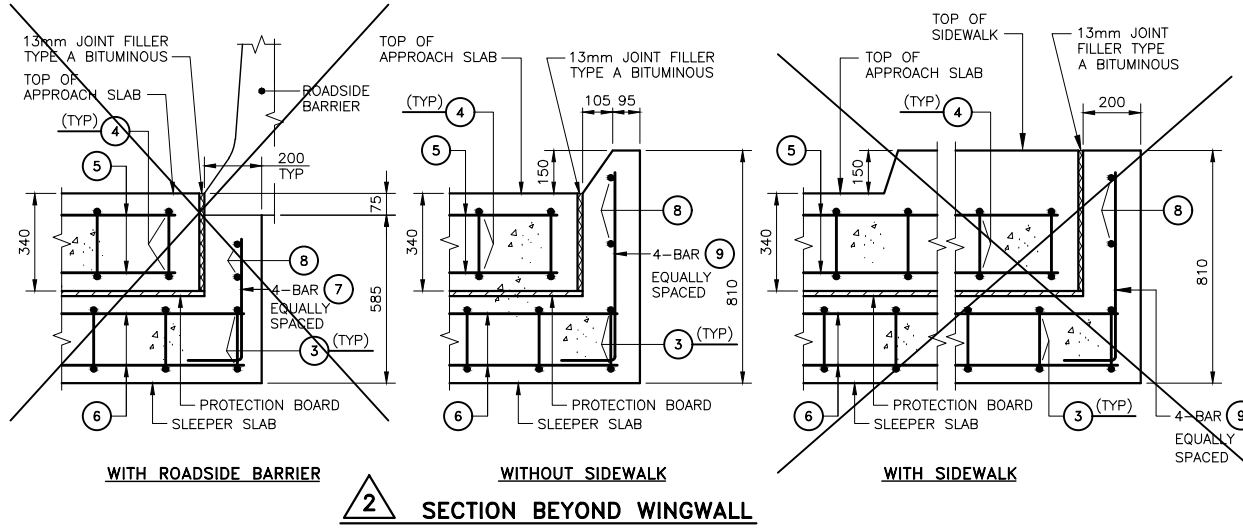
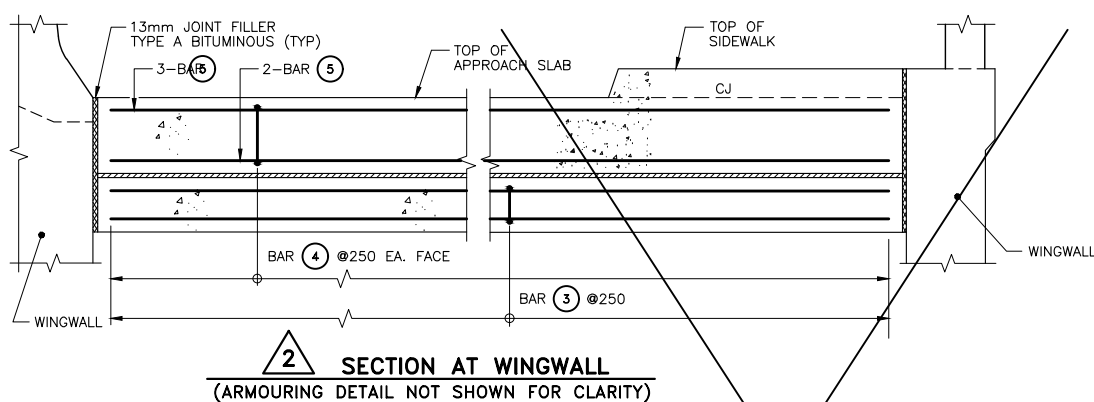
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HWY 427 EXPANSION RAMP HWY 427N TO FINCH AVE E/W OVER HUMBER RIVER REHABILITATION - R1, SITE 37-1087 APPROACH SLAB						
PROJECT ID.	STAGE IDENTIFIER	DESIGN PACKAGE NUMBER	DISCIPLINE	STRUCTURE NUMBER	DOCUMENT TYPE	DRAWING NUMBER
H427-D	N	9	STR	B02	DWG	607
						REVISION NUMBER
						B



- NOTES:**
- THIS DRAWING TO BE READ IN CONJUNCTION WITH DRAWING SS113-19.
 - CLASS OF CONCRETE TO BE 30MPa.
 - REINFORCEMENT STEEL SHALL BE GRADE 400W. STAINLESS STEEL SHALL BE TYPE 316 LN OR DUPLEX 2205 WITH A MINIMUM YIELD STRENGTH OF 500 MPA. BARS MARKED WITH PREFIX S DENOTE STAINLESS STEEL BARS.
 - COVER TO REINFORCING STEEL 70 ± 20mm EXCEPT AS NOTED.
 - FOR SKEWED STRUCTURE, WORKING DRAWING SHALL BE DETAILED TO SUIT GEOMETRY OF STRUCTURE.

- LEGEND:**
- [] - DENOTED FASTENER SIZE IN INCHES
 EJ - DENOTED EXPANSION JOINT
 CJ - DENOTED CONSTRUCTION JOINT

BAR MARK	SIZE	SHAPE
1	S15M	310 520 180
2	S15M	300 520 180
3	15M	160 860
4	S15M	200 310
5	S15M	STRAIGHT
6	15M	STRAIGHT
7	S15M	180 445
8	S15M	STRAIGHT
9	S15M	180 670



MODIFIED

STANDARD DRAWING SEPTEMBER 2016 **SS113-37**

EXPANSION JOINT AND SLEEPER SLAB FOR INTEGRAL AND SEMI-INTEGRAL ABUTMENT BRIDGES (10mm < MOVEMENT < 40mm)

DRAWING NOT TO BE SCALED
100mm ON ORIGINAL DRAWING

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A	18/01/12				90% SUBMISSION TO CA

SCALE : AS NOTED

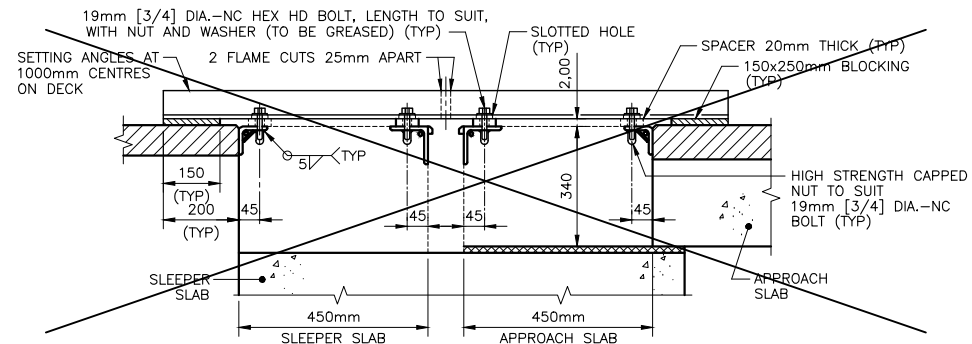
DESIGNED	ANDREW HACHBORN	
DRAWN	ELENA TSENIER	
CHECKED	TATIANA QJALA	
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APPROVED PROJ. MANAGER		
NAME (PRINT)	INT.	DATE



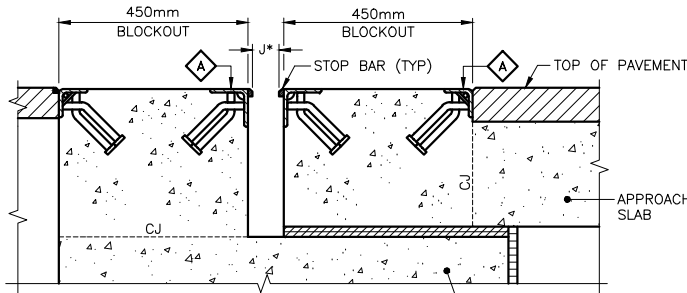
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HWY 427 EXPANSION RAMP HWY 427N TO FINCH AVE E/W OVER HUMBER RIVER REHABILITATION - R1, SITE 37-1087 EXPANSION JOINT AND SLEEPER SLAB

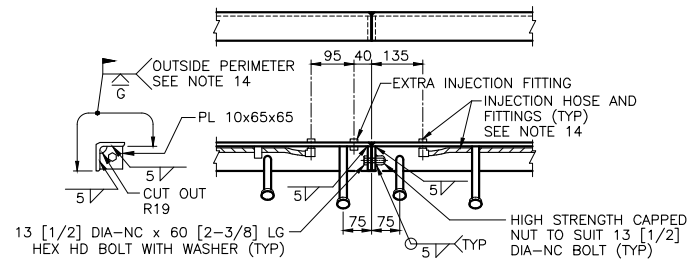
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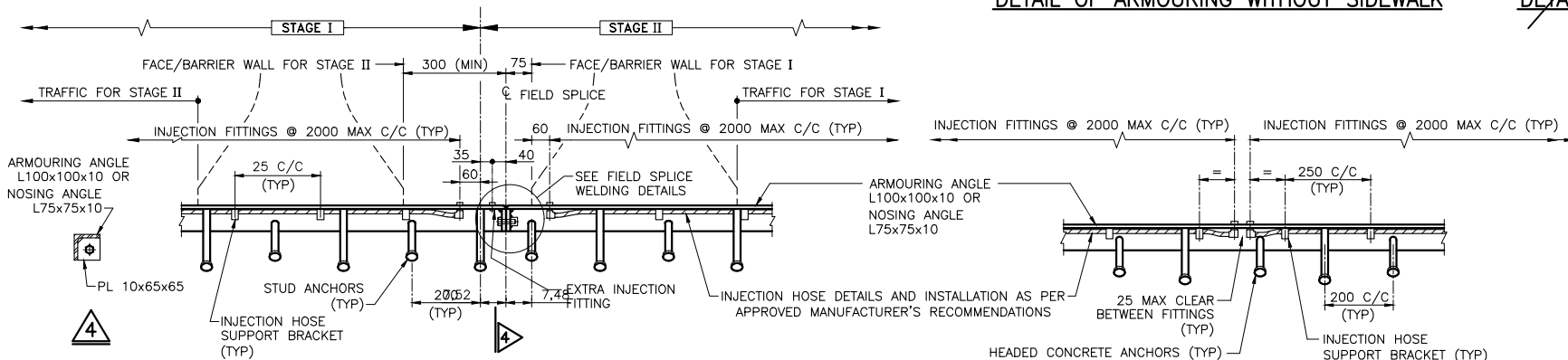
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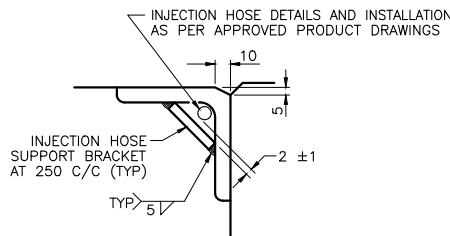
(EXPANSION JOINT SEAL NOT SHOWN)



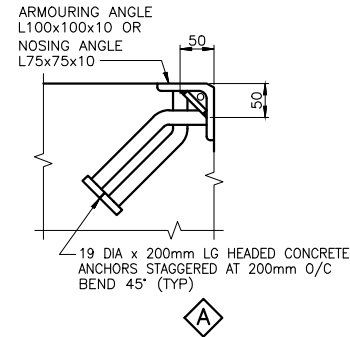
ARMOURING AND NOSING ANGLES FIELD SPICE DETAIL



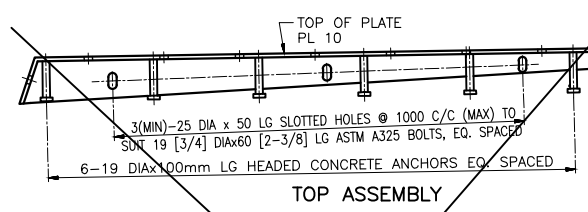
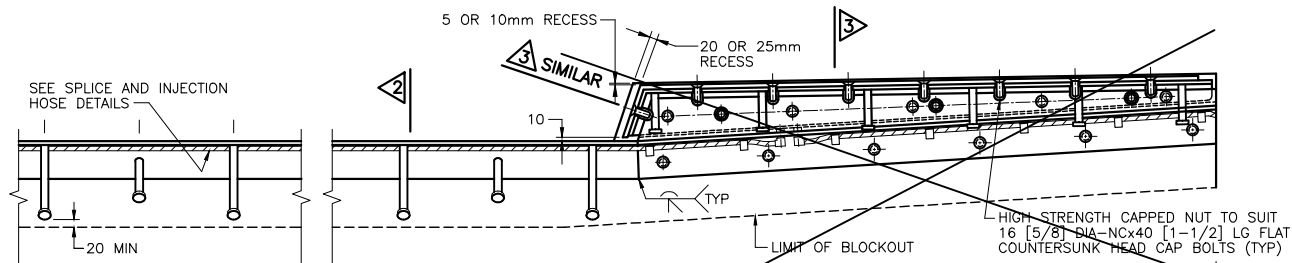
FIELD SPICE DETAILS AT STAGED CONSTRUCTION FOR ARMOURING AND NOSING ANGLES



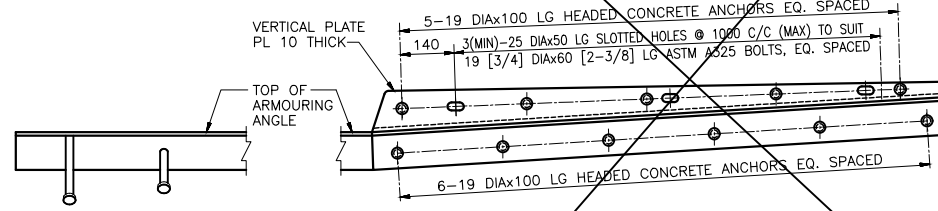
INJECTION HOSE SUPPORT BRACKET DETAIL



SECTION AT EXPANSION JOINT

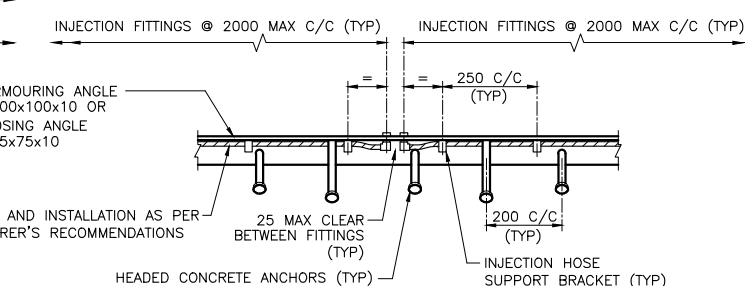


TOP ASSEMBLY



DETAIL OF ARMOURING WITHOUT SIDEWALK

DETAIL OF ARMOURING AT SIDEWALK



DETAILS OF HEADED CONCRETE ANCHORS AND INJECTION HOSE FOR ARMOURING AND NOSING ANGLES

NOTES:

- THIS DRAWING SHOWS EXPANSION JOINT AND SLEEPER SLAB AT THE END OF APPROACH SLAB OF INTEGRAL AND SEMI-INTEGRAL ABUTMENT BRIDGES WITH A MOVEMENT BETWEEN 10 AND 40MM.
- EXPANSION JOINT TO BE SUPPLIED BY MANUFACTURERS LISTED IN DSM 9.40.27 FOR THE SUPPLY OF TYPE 'C' STRIP SEAL EXPANSION JOINT.
- EXPANSION JOINT ASSEMBLY CONSTRUCTION AND MATERIAL SHALL BE ACCORDING TO OPSS 920 AND OPSS 1210, AND AS SPECIFIED IN THE CONTRACT DOCUMENTS.
- JOINT ASSEMBLY SHALL BE COMPLETELY SHOP ASSEMBLED (EXCEPT FOR SEALS) AND PRESET TO DIMENSION 'J' FOR 15°C AND ADJUSTED IN THE FIELD TO SUIT INSTALLATION TEMPERATURE.
- JOINT ASSEMBLY INSTALLATION TEMPERATURE SHALL BE TAKEN AS MEAN SHADE AIR TEMPERATURE AT STRUCTURE PRIOR TO JOINT INSTALLATION AS FOLLOWS:
 - FOR CONCRETE STRUCTURES - 48 HOURS
 - FOR STEEL STRUCTURES - 24 HOURS
- FIELD SPLICES IN JOINT ASSEMBLY ARE ONLY PERMITTED AT STAGED CONSTRUCTION, AND/OR AS SHOWN ON THE CONTRACT DRAWINGS.
- IF THE JOINT ARMOURING FOR A SKEW STRUCTURE IS SPLICED AT A CROWN, THE SPLICE SHALL BE DETAILED PARALLEL TO THE CENTRELINE OF THE TRAFFIC LANE.
- SETTING ANGLES SHALL BE FLAME CUT ACCORDING TO OPSS 920, BUT IN NO CASE PRIOR TO CONCRETE REACHING INITIAL SET.
- AFTER CURING OF THE CONCRETE HAS BEEN COMPLETED, THE SETTING DEVICES MAY BE REMOVED, THE VOIDS UNDER THE ARMOURING ANGLE AND NOSING ANGLE SHALL THEN BE PRESSURE INJECTED.
- PREFORMED SEALS SHALL HAVE MINIMUM THICKNESS OF 5mm OR AS PER DSM.
- ALL STEEL RETAINER SURFACES COMING IN CONTACT WITH PREFORMED SEAL SHALL BE CLEANED PRIOR TO INSTALLATION OF THE SEAL.
- PREFORMED SEALS SHALL BE INSTALLED AFTER JOINT ASSEMBLY HAS BEEN CAST, STYROFOAM OR FILLER BETWEEN APPROACH SLAB AND SLEEPER SLAB REMOVED, AND EXPANSION GAP CLEARED OF ANY DEBRIS.
- PROTECT INJECTION HOSE AND FITTINGS ADJACENT TO FIELD SPICE DURING WELDING AND REMOVE PROTECTION PRIOR TO PLACING OF CONCRETE IN BLOCKOUT.
- ALL JOINT ANCHORAGES SHALL BE DETAILED ON WORKING DRAWINGS PERPENDICULAR TO THE EXPANSION JOINT ON BOTH THE APPROACH SLAB SIDE AND THE SLEEPER SLAB SIDE EXCEPT STRUCTURE SKEWED FROM OVER 15° AND UP TO 45° SHALL HAVE ANCHORAGES DETAILED 30° OFFSET FROM THE PERPENDICULAR TO THE EXPANSION JOINT ON THE APPROACH SLAB SIDE.
- LEGEND: [] DENOTES FASTENER SIZE IN INCHES
EJ - DENOTES EXPANSION JOINT

ADDITIONAL NOTES FOR BOLTS:

- 19 [3/4] DIAMETER BOLTS SHALL BE IN ACCORDANCE WITH WITH ASTM A325. ALL BOLTS USED IN 25 DIA. x 50 LONG SLOTTED HOLES SHALL BE INSTALLED WITH OVERSIZE WASHERS.
- 16 [5/8] DIAMETER FLAT COUNTERSUNK HEAD CAP BOLTS SHALL BE IN ACCORDANCE WITH ASTM F835.
- ALL BOLTS SHALL BE INSTALLED USING MOLY50 LUBRICANT.
- ALL BOLTS SHALL BE TENSIONED USING THE TURN-OF-NUT TIGHTENING METHOD IN ACCORDANCE WITH CAN/CSA S6-14.

TABLE OF DESIGN REQUIREMENTS (TO BE FULLY COMPLETED BY DESIGNER)

EXP. JOINT LOCATION	MTO GAP RATING (mm)		DESIGN MOVEMENT	* "J" AT INSTALLATION TEMPERATURE (C) (mm)							
	MIN	MAX		-5'	0'	5'	10'	15'	20'	25'	30'
NOTRH ABUT	35	100	20	53	51	49	47	45	43	41	39
SOUTH ABUT	35	100	20	53	51	49	47	45	43	41	39

- * DIMENSION 'J' MEASURED PERPENDICULAR TO CENTRELINE OF EXPANSION JOINT. WHERE MIN. AND MAX. FOR JOINT SUPPLIED DIFFER FROM THOSE SHOWN IN TABLE, 'J' DIMENSIONS SHALL BE REVISED BY CONTRACTOR AND SHOWN ON SHOP DRAWINGS. FOR STAGED CONSTRUCTION ON STRUCTURES OTHER THAN POST-TENSIONED, THE CONTRACTOR SHALL USE THE FIRST STAGE OBSERVED 'J' GAP TO INSTALL THE SECOND STAGE.
- ** MTO GAP, MEASURED BETWEEN PROJECTING FACES OF STEEL CLAMPING BAR, IS TAKEN FROM DSM 9.40.27, TYPE 'C'.
- *** CALCULATED TOTAL MOVEMENT AT SLS OCCURRING AFTER TIME OF JOINT INSTALLATION. (MEASURED PARALLEL TO CENTRELINE OF STRUCTURE)

MODIFIED	
STANDARD DRAWING SEPTEMBER 2016	SS113-19
STRIP SEAL EXPANSION JOINT FOR SLEEPER SLAB	

DRAWING NOT TO BE SCALED
100mm ON ORIGINAL DRAWING

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A 18/01/12	90% SUBMISSION TO CA				

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AS NOTED

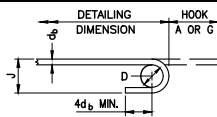
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DRAWN	ELENA TSENTER	
CHECKED	TATIANA QJALA	
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APPROVED PROJ. MANAGER		
NAME (PRINT)	INT.	DATE



TITLE						
HWY 427 EXPANSION RAMP HWY 427N TO FINCH AVE E/W OVER HUMBER RIVER REHABILITATION - R1, SITE 37-1087 STRIP SEAL EXPANSION JOINT FOR SLEEPER SLAB						
PROJECT ID.	STAGE IDENTIFIER	DESIGN PACKAGE NUMBER	DISCIPLINE	STRUCTURE NUMBER	DOCUMENT TYPE	DRAWING NUMBER
H427-D	N	9	STR	B02	DWG	609
						REVISION NUMBER
						B



STANDARD 90° HOOK



STANDARD 180° HOOK

MINIMUM BENDING PIN DIAMETER, D, mm

BAR SIZE	STEEL GRADE	
	400R(2)	400W
10M	70	60
15M	100	90
20M	120	100
25M	150	150
30M	250	200
35M	300	250
45M	450 (1)	400
55M	600 (1)	550

(1) Special fabrication is required for bends exceeding 90° for bars of these sizes and grade.
 (2) For stainless steel, with $F_y = 420$, use the same D as for 400R.

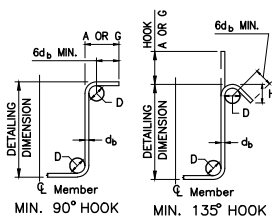
STANDARD HOOK DIMENSIONS

BAR SIZE	90° HOOKS		180° HOOKS			
	A OR G (mm)		A OR G (mm)		J (mm)	
	400R	400W	400R	400W	400R	400W
10M	180	180	140	130	90	80
15M	260	250	180	170	130	120
20M	310	300	220	200	160	140
25M	400	400	280	280	200	200
30M	510	490	400	350	310	260
35M	610	590	480	430	370	320
45M	790	770	680	630	540	490
55M	1030	1010	900	850	710	660

NOTE: All Hook Dimensions are according to the CHBDC-2014.

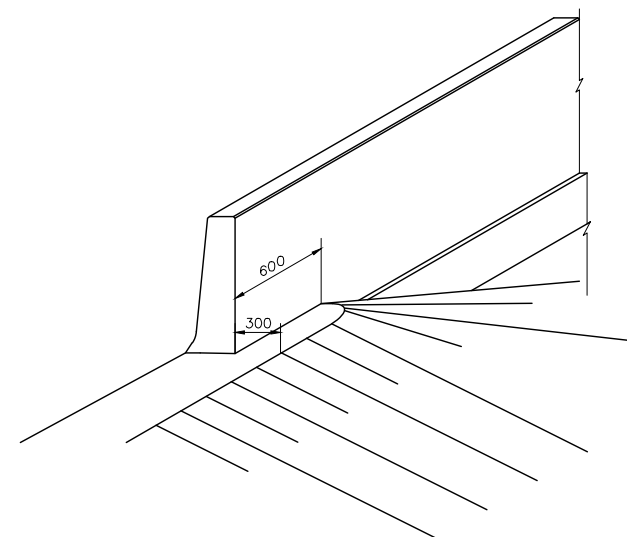
MINIMUM STIRRUP AND TIE HOOK DIMENSIONS

BAR SIZE	BAR DIAM. d_b (mm)	PIN DIAM. D (mm)	90°		135°
			A OR G (mm)	A OR G (mm)	H (approx.) (mm)
10M	11.3	45	100	100	70
15M	16.0	65	140	140	100
20M	19.5	80	180	175	115
25M	25.2	100	230		



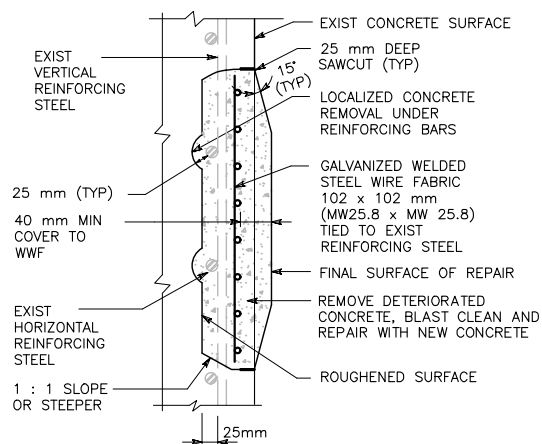
HOOK DIMENSIONS FOR REINFORCING STEEL BARS

Date	SEP 2016	Rev	
SS12-1			

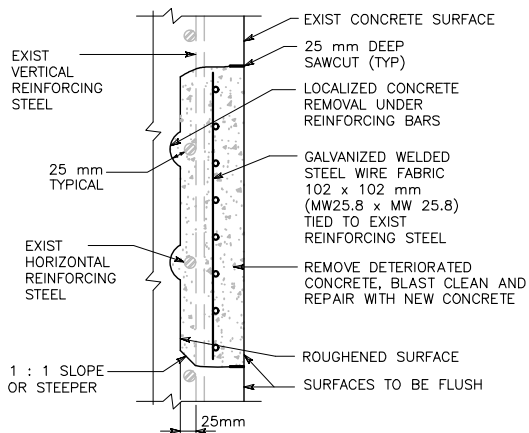


GRADING AT END OF WING WALL

NTS



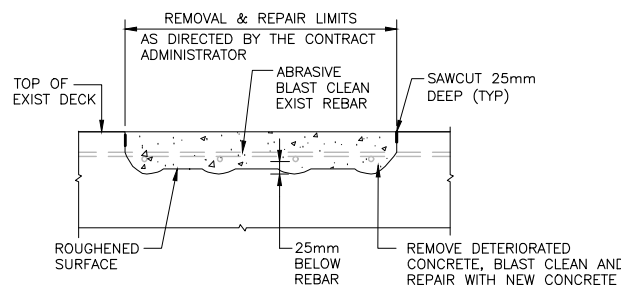
FOR EXIST CONCRETE COVER < 50 mm



FOR EXIST CONCRETE COVER ≥ 50 mm

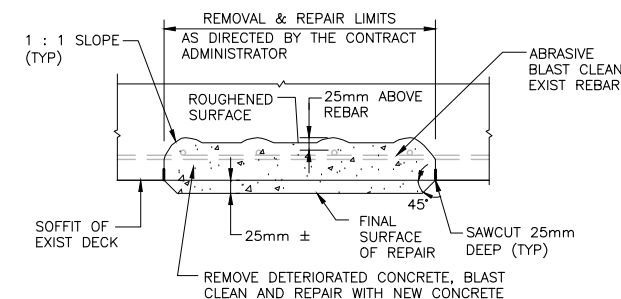
VERTICAL SURFACE LOCAL CONCRETE REPAIR DETAILS

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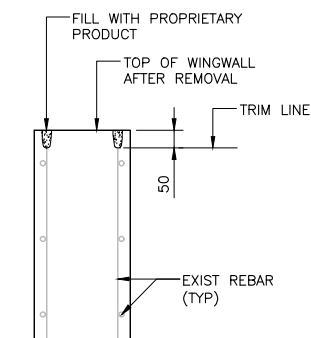
DECK SURFACE LOCAL CONCRETE REPAIR DETAILS

NTS



DECK SOFFIT LOCAL CONCRETE REPAIR DETAIL

NTS



TOP OF WINGWALL PATCH DETAIL

NTS

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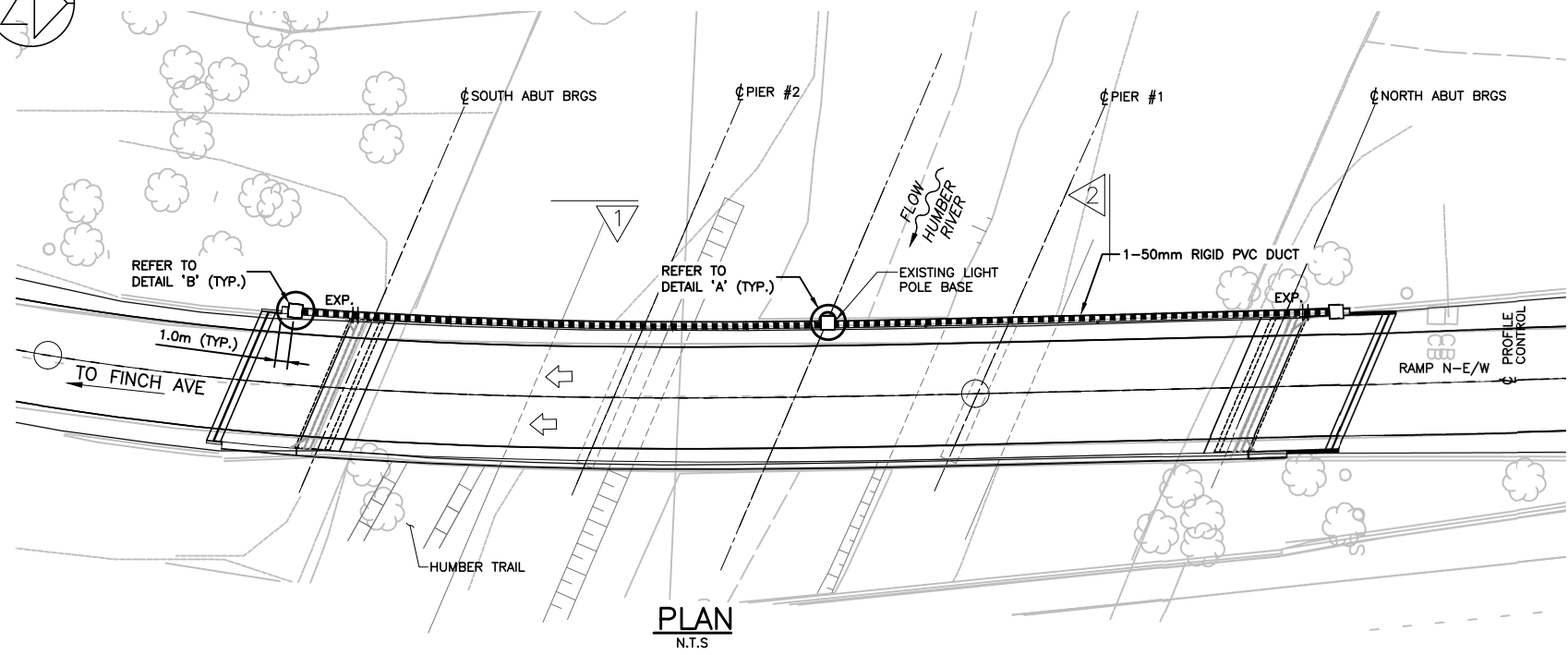
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A 18/01/12	90% SUBMISSION TO CA				

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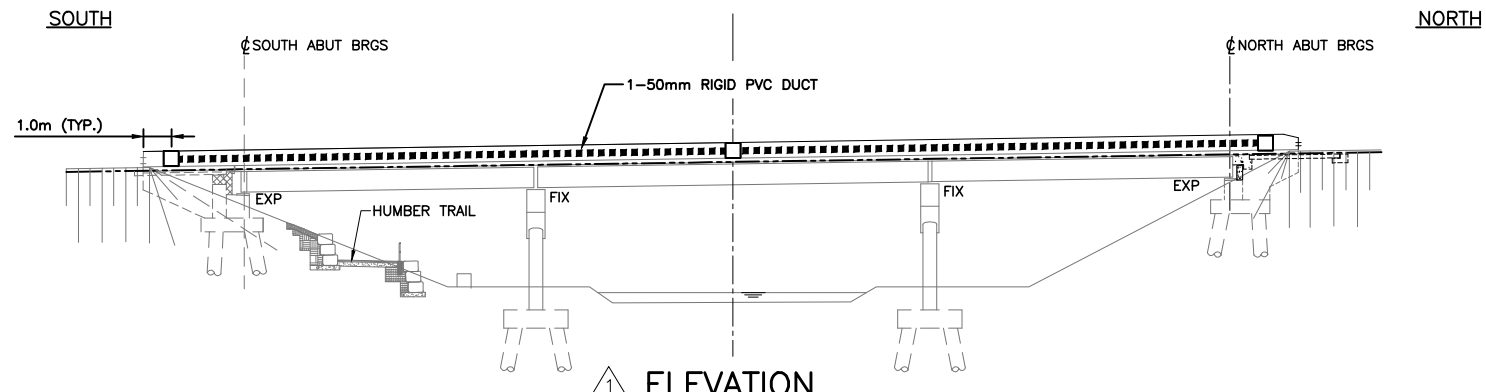
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NAME (PRINT)	INIT.	DATE



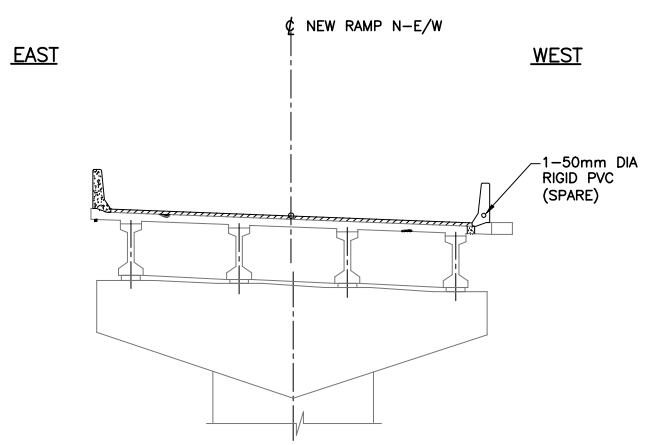
HWY 427 EXPANSION RAMP HWY 427N TO FINCH AVE E/W OVER HUMBER RIVER REHABILITATION - R1, SITE 37-1087 STANDARD DETAILS							
PROJECT ID.	STAGE IDENTIFIER	DESIGN PACKAGE NUMBER	DISCIPLINE	STRUCTURE NUMBER	DOCUMENT TYPE	DRAWING NUMBER	REVISION NUMBER
H427-D	N	9	STR	B02	DWG	610	B



PLAN
N.T.S.



ELEVATION
N.T.S.



REHABILITATED
N.T.S.

NOTES:

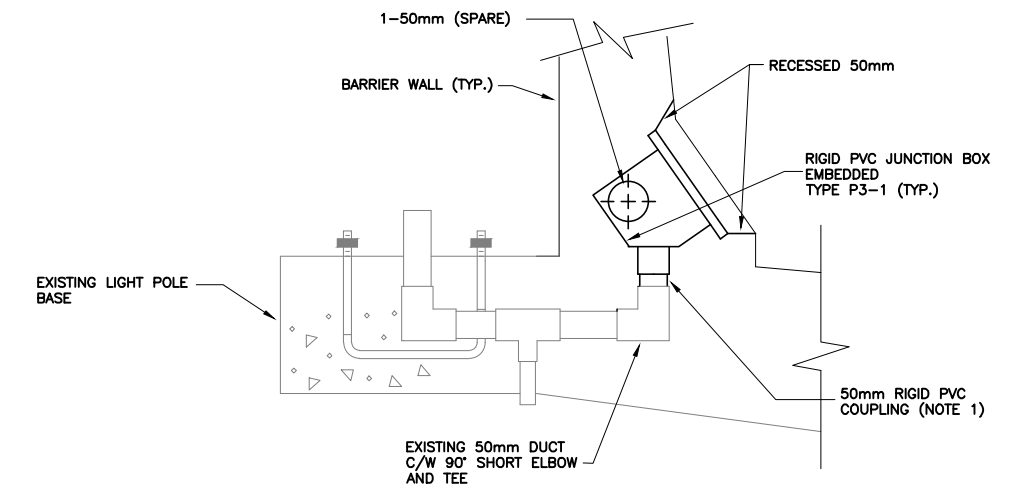
- CONTRACTOR SHALL CAREFULLY REMOVE SUFFICIENT CONCRETE TO ALLOW FOR INSTALLATION OF A RIGID PVC COUPLING ONTO THE EXISTING EMBEDDED CONDUITS.

APPLICABLE STANDARD DRAWINGS:

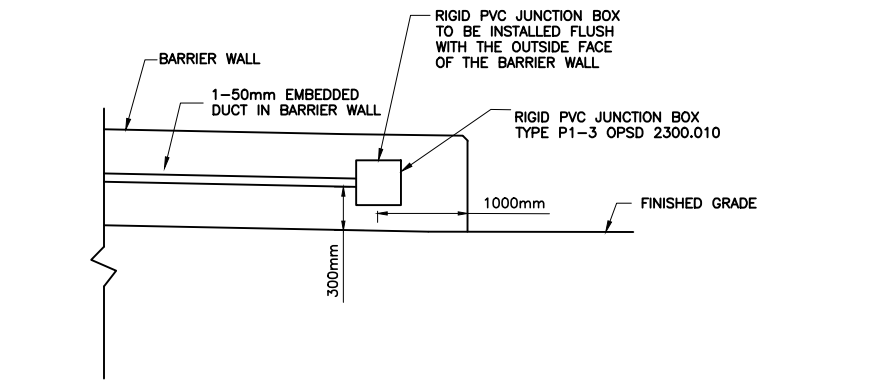
- OPSD 2011.101 - GENERAL SYMBOLS
- OPSD 2011.201 - GENERAL SYMBOLS
- OPSD 2102.010 - UNDERGROUND RIGID DUCT CONNECTION AT CONCRETE STRUCTURE
- OPSD 2302.010 - EMBEDDED WORK DETAIL
- OPSD 2302.020 - EXPANSION AND DEFLECTION FITTING ASSEMBLY
- OPSD 2302.040 - EMBEDDED WORK IN STRUCTURE

SUPPLEMENTARY LEGEND:

- RIGID JUNCTION BOX EMBEDDED TYPE P1-3 OPSD 2300.010
- EXP. || EXPANSION AND DEFLECTION FITTING ASSEMBLY PER OPSD 2302.02



DETAIL 'A'
N.T.S.



DETAIL 'B' - TERMINATION OF EMBEDDED DUCT
N.T.S.

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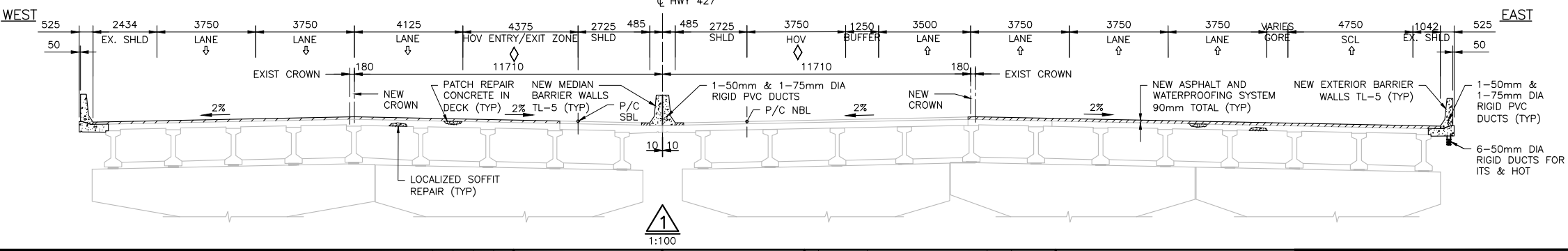
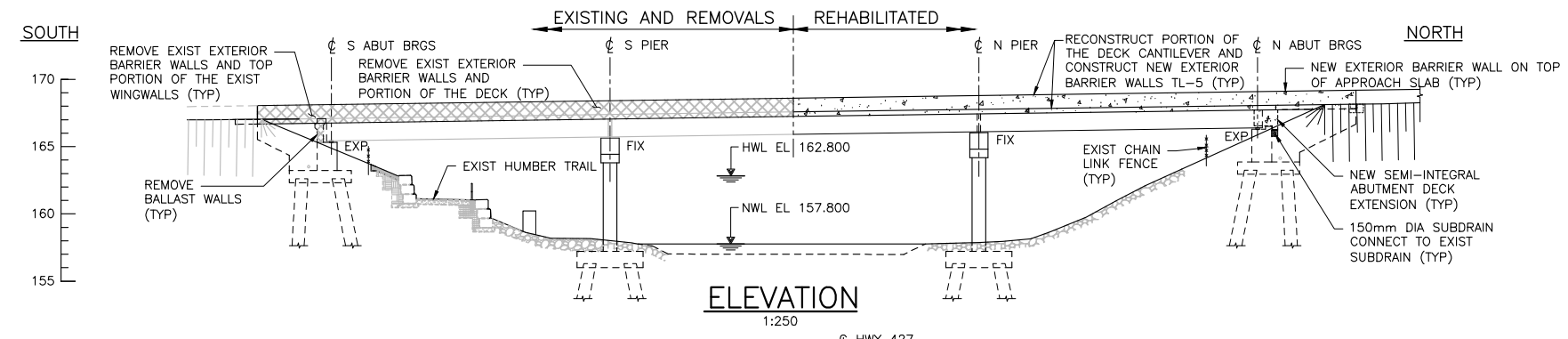
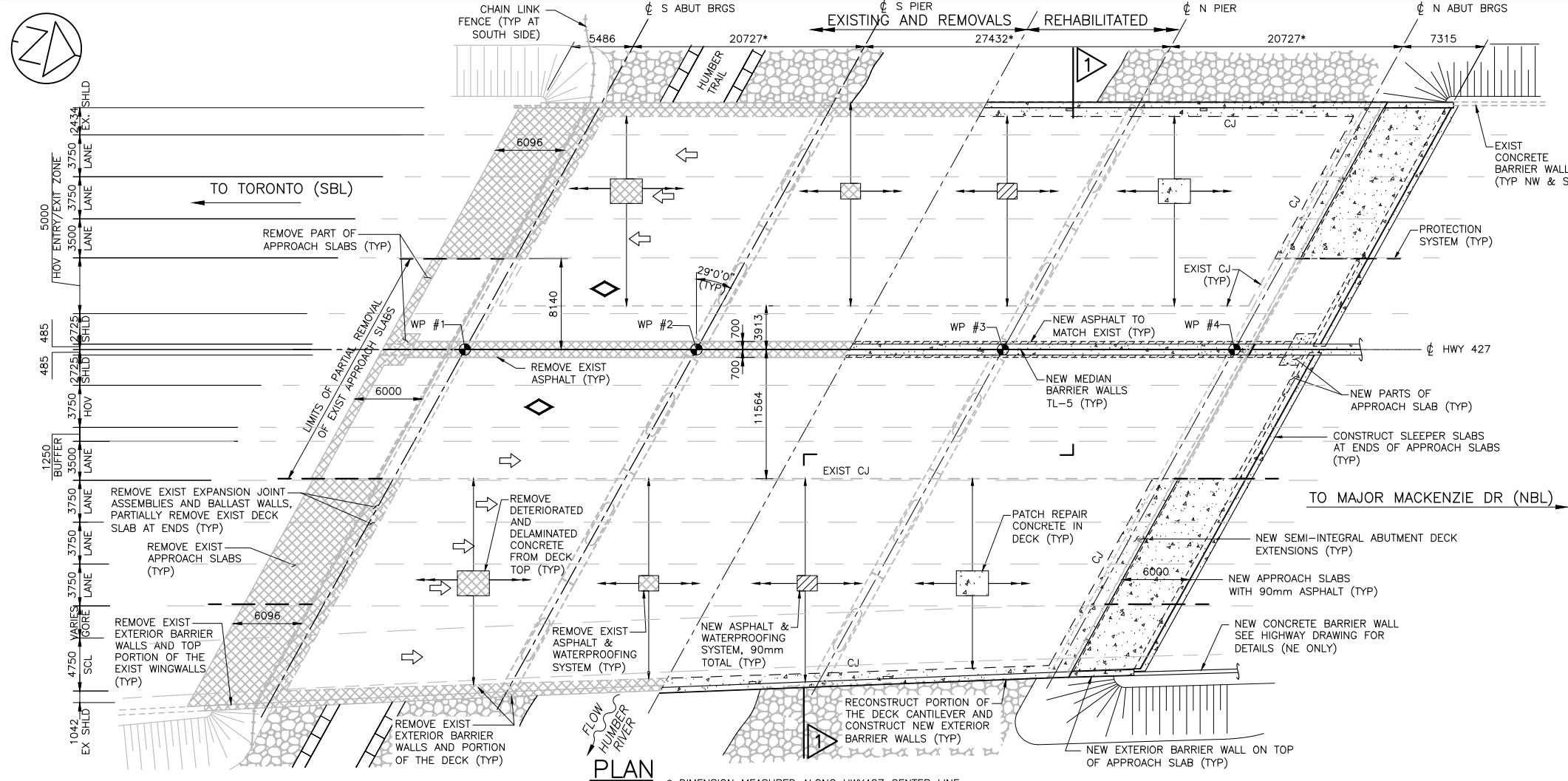
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A 18/01/12	90% SUBMISSION TO CA

SCALE :
N.T.S.

DESIGNED	MANPREET PANESAR	
DRAWN	JOSH SIMMONS	
CHECKED	LENOX LUE	
APPROVED LEAD ENG.	MARIO TEDESCO	
APPROVED PROJ. MANAGER		
NAME (PRINT)	INIT.	DATE



TITLE						
HWY 427 EXPANSION RAMP HWY 427N TO FINCH AVE E/W OVER HUMBER RIVER REHABILITATION - R1, SITE 37-1087 ELECTRICAL EMBEDDED WORK						
PROJECT ID.	STAGE IDENTIFIER	DESIGN PACKAGE NUMBER	DISCIPLINE	STRUCTURE NUMBER	DOCUMENT TYPE	REVISION NUMBER
H427-D	N	9	STR	B02	DWG	611 B



- GENERAL NOTES:**
- DESIGN STANDARDS AND CODES:
 - SCHEDULE 15-1 AND SCHEDULE 15-2: PROJECT AGREEMENT
 - DESIGN CODE: CAN/CSA-S6-14
 - MINISTRY OF TRANSPORTATION OF ONTARIO STRUCTURAL MANUAL
 - MINISTRY OF TRANSPORTATION OF ONTARIO STRUCTURE REHABILITATION MANUAL
 - ONTARIO PROVINCIAL STANDARD SPECIFICATIONS (OPSS)
 - LIVE LOAD: CL-625-ONT.
 - CLASS OF CONCRETE: 30 MPa
 - CLEAR COVER TO REINFORCING STEEL:

DECK TOP	70±20
BOTTOM	40±10
REMAINDER UNLESS OTHERWISE NOTED	70±20
 - REINFORCING STEEL:
 - REINFORCING STEEL SHALL BE GRADE 400W UNLESS OTHERWISE SPECIFIED.
 - BAR MARKS WITH PREFIX 'S' DENOTE STAINLESS STEEL BARS.
 - STAINLESS REINFORCING STEEL SHALL BE TYPE 316 LN OR DUPLEX 2205 AND HAVE A MINIMUM YIELD STRENGTH OF 500 MPa, UNLESS OTHERWISE SPECIFIED.
 - TENSION LAP SPLICES SHALL BE CLASS B, UNLESS SHOWN OTHERWISE.
 - BAR HOOKS SHALL HAVE STANDARD HOOK DIMENSIONS USING MINIMUM BEND DIAMETERS, WHILE STIRRUPS AND TIES SHALL HAVE MINIMUM HOOK DIMENSIONS. ALL HOOKS SHALL BE IN ACCORDANCE WITH THE STRUCTURAL STANDARD DRAWINGS SS12-1 UNLESS INDICATED OTHERWISE.
 - GLASS FIBRE REINFORCED POLYMER (GFRP):
 - GLASS FIBRE REINFORCED POLYMER (GFRP) REINFORCING BARS SHALL BE GRADE III AS SPECIFIED IN THE CONTRACT DOCUMENTS.
 - THE NOMINAL DIAMETER, TENSILE MODULUS OF ELASTICITY AND GUARANTEED MINIMUM TENSILE STRENGTH SHALL BE AS SPECIFIED IN THE CONTRACT DOCUMENTS.
 - BAR MARKS WITH THE PREFIX 'GIII' DENOTE GRADE III GFRP BARS.
 - ROADWAY CLASSIFICATION: UFD 120.
 - PROTECTION SYSTEM SHALL CONFORM TO PERFORMANCE LEVEL 2.
 - ALL DIMENSIONS ARE IN MILLIMETERS ALL STATIONS AND ELEVATIONS ARE IN METERS UNLESS OTHERWISE SHOWN.

- CONSTRUCTION NOTES:**
- THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS OF THE WORK AND ALL DETAILS ON SITE AND REPORT ANY DISCREPANCIES TO THE ENGINEER BEFORE PROCEEDING WITH THE WORK. THE CONTRACTOR SHALL ADJUST DIMENSIONS OF THE WORK AS REQUIRED TO SUIT EXISTING CONDITIONS.
 - SAWCUTS IN CONCRETE, WHERE DESIGNATED, SHALL BE 25MM DEEP OR TO THE FIRST LAYER OF REINFORCING STEEL, WHICHEVER IS LESS.
 - THE CONTRACTOR IS RESPONSIBLE FOR THE DESIGN AND INSTALLATION OF ALL DEBRIS CONTAINMENT SYSTEM.
 - BACKFILL SHALL BE PLACED SIMULTANEOUSLY BEHIND BOTH END OF SUPERSTRUCTURE KEEPING THE HEIGHT OF BACKFILL APPROXIMATELY THE SAME. AT NO TIME SHALL THE DIFFERENCE IN ELEVATION BE GREATER THAN 500mm.
 - ALL EXPOSED EDGES TO RECEIVE A 20x20 CHAMFER.

- LIST OF DRAWING:**
- 600 GENERAL ARRANGEMENT
 - 601 CONSTRUCTION STAGING
 - 602 ABUTMENT REMOVALS
 - 603 ABUTMENT REHABILITATION
 - 604 DECK REMOVALS AND REHABILITATION
 - 605 DECK REINFORCEMENT I
 - 606 DECK REINFORCEMENT II
 - 607 MEDIAN BARRIER WALLS
 - 608 EXTERIOR BARRIER WALLS
 - 609 6000mm APPROACH SLABS I
 - 610 6000mm APPROACH SLABS II
 - 611 EXPANSION JOINT AND SLEEPER SLAB
 - 612 STRIP SEAL EXPANSION JOINT FOR SLEEPER SLAB
 - 613 STANDARD AND MISCELLANEOUS DETAILS
 - 614 ELECTRICAL EMBEDDED WORK

- APPLICABLE STANDARD DRAWINGS:**
- OPSD 911.381 GUIDE RAIL SYSTEM, CONCRETE BARRIER PERMANENT TRANSITION INSTALLATION CONCRETE BARRIER TO STRUCTURE
 - OPSD 911.382 GUIDE RAIL SYSTEM, CONCRETE BARRIER DOWEL CONNECTION DETAIL
 - OPSD 3101.150 WALLS, ABUTMENT, BACKFILL MINIMUM GRANULAR REQUIREMENT
 - OPSD 3370.100 DECK, WATERPROOFING, HOT APPLIED ASPHALT MEMBRANE WITH PROTECTION BOARD
 - OPSD 3370.101 DECK, WATERPROOFING, HOT APPLIED ASPHALT MEMBRANE AT ACTIVE CRACKS GREATER THAN 2mm WIDE AND CONSTRUCTION JOINTS
 - OPSD 3941.200 FIGURES IN CONCRETE, SITE NUMBER AND DATE LAYOUT
 - OPSD 3950.100 JOINTS, CONCRETE EXPANSION AND CONSTRUCTION ON STRUCTURE

- LIST OF ABBREVIATIONS:**
- P/C PROFILE CONTROL
- LEGEND:**
- [Symbol] EXIST TO REMAIN
 - [Symbol] REMOVALS
 - [Symbol] NEW ASPHALT
 - [Symbol] NEW CONCRETE
 - [Symbol] EXIST ROCK PROTECTION

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AS NOTED

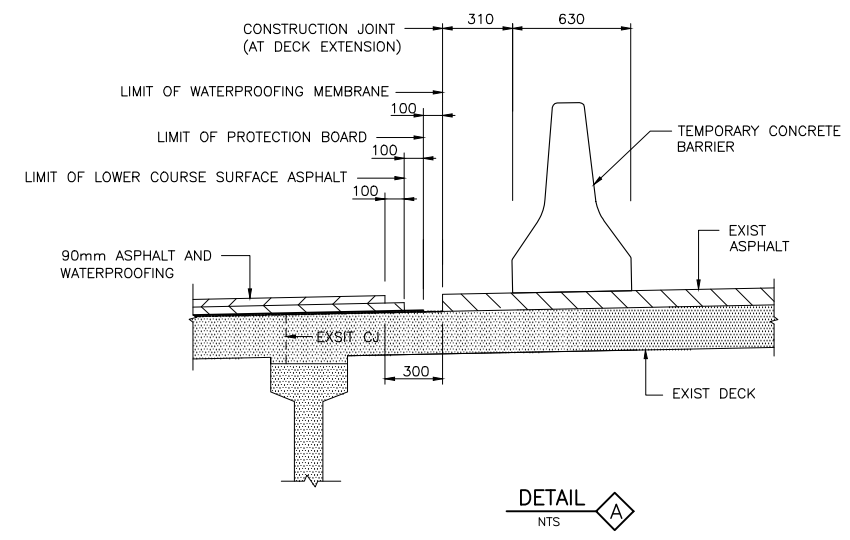
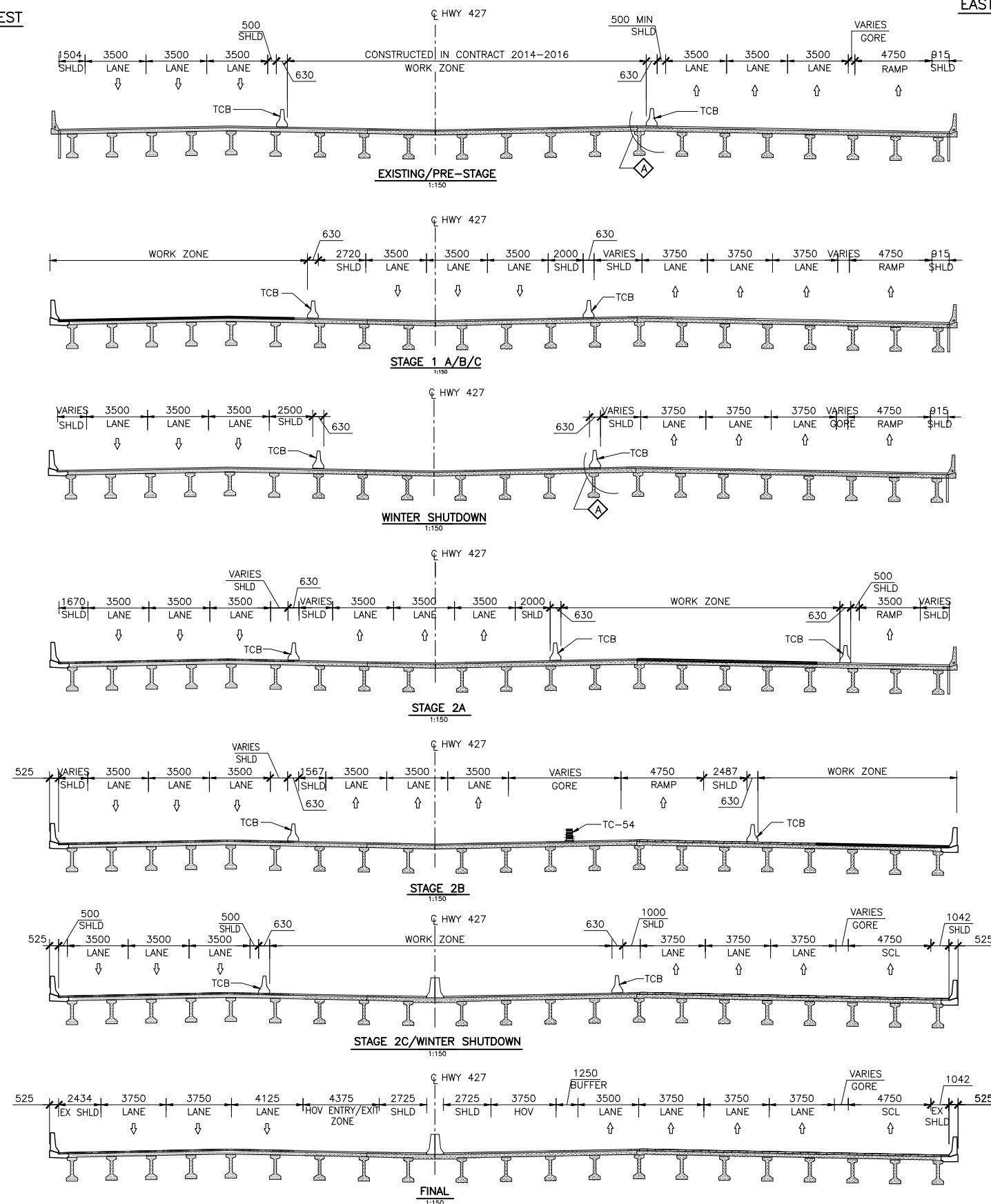
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DRAWN	TOM ZHAO	
CHECKED	TATIANA OJALA	
APPROVED LEAD ENG.	TATIANA OJALA	
APPROVED PROJ. MANAGER		
NAME (PRINT)	INT.	DATE



HWY 427 EXPANSION HWY 427 / HUMBER RIVER BRIDGES REHABILITATION R2 SITE 37-633/1&2 GENERAL ARRANGEMENT							
PROJECT ID.	STAGE IDENTIFIER	DESIGN PACKAGE NUMBER	DISCIPLINE	STRUCTURE NUMBER	DOCUMENT TYPE	DRAWING NUMBER	REVISION NUMBER
H427-D	N	9A	STR	B03	DWG	600	C

WEST

EAST



NOTE:

1. READ THIS DRAWING IN CONJUNCTION WITH DWG 600 AND HIGHWAY STAGING DRAWINGS.

SEQUENCE OF WORK AND STAGING

EXISTING / PRESTAGE

1. RECONSTRUCT MEDIAN APPROACH SLABS AS INDICATED ON DWG 610 AND CONSTRUCT NEW PART OF SLEEPER SLABS.

STAGE 1/A/B/C

1. REPOSITION THE ASSOCIATED TCB AND SHIFT THE SB TRAFFIC IN STAGES EASTERLY TO FACILITATE REHABILITATION OF THE REMAINING WEST PART OF SB BRIDGE.
2. REMOVE ASPHALT, WATERPROOFING, WEST EXTERIOR BARRIER WALL AND APPROACH SLABS FROM EXIST SB BRIDGE.
3. INSTALL PROTECTION SYSTEM, EXCAVATE AND REMOVE TOP PORTION OF EXIST WINGWALLS, BALLAST WALLS & EXPANSION JOINTS.
4. REMOVE DETERIORATED CONCRETE FROM TOP OF DECK AND REPAIR WITH CONCRETE AS DIRECTED BY ENGINEER.
5. REMOVE PART OF TOP OF ABUTMENT AND CONSTRUCT SHEAR KEY.
6. REMOVE PORTION OF EXIST DECK SLAB AT WEST SIDE AND AT END OF THE BRIDGE INCLUDING ABUTMENT DIAPHRAGMS.
7. CONSTRUCT NEW BALLAST WALLS AT EXIST ABUTMENTS.
8. CONSTRUCT NEW BARRIER WALL AND DECK SLAB INCLUDING DECK EXTENSIONS.
9. PLACE BACKFILL BEHIND ABUTMENT AND CONSTRUCT APPROACH SLABS, AND SLEEPER SLABS.
10. PLACE WATERPROOFING AND BASE COURSE ASPHALT.
11. MODIFY BARRIERS FOR WINTER SHUTDOWN.

STAGE 2A

1. SHIFT THE SB & NB TRAFFIC LANES AND TCB TO THE WEST SIDE OF THE BRIDGE.
2. REMOVE ASPHALT, WATERPROOFING AND APPROACH SLABS FROM EXIST NB BRIDGE.
3. INSTALL PROTECTION SYSTEM. EXCAVATE AND REMOVE EXIST BALLAST WALLS & EXPANSION JOINTS.
4. REMOVE DETERIORATED CONCRETE FROM TOP OF DECK AND REPAIR WITH CONCRETE AS DIRECTED BY ENGINEER.
5. REMOVE PART OF TOP OF ABUTMENT AND CONSTRUCT SHEAR KEY.
6. REMOVE PORTION OF EXIST DECK AT END OF THE BRIDGE INCLUDING ABUTMENT DIAPHRAGMS.
7. CONSTRUCT NEW BALLAST WALLS AT EXIST ABUTMENTS.
8. CONSTRUCT NEW DECK EXTENSIONS, BACKFILL AND CONSTRUCT PORTION OF APPROACH SLABS, AND SLEEPER SLABS.
9. PLACE WATERPROOFING AND BASE COURSE ASPHALT.

STAGE 2B

1. REPOSITION THE ASSOCIATED TCB AND SHIFT THE NB RAMP TRAFFIC WESTERLY TO FACILITATE REHABILITATION OF THE REMAINING EAST PART OF NB BRIDGE.
2. SIMILAR STEPS 2 TO 10 FROM STAGE 1 FOR NB BRIDGE.

STAGE 2C/WINTER SHUTDOWN

1. SHIFT SB & NB LANES TO THE TRAFFIC CONFIGURATION SHOWN.
2. REMOVE ASPHALT 700mm EACH SIDE OF LONGITUDINAL JOINT AND WATERPROOFING AT NEW BARRIER LOCATIONS & CLEAN DECK SURFACE.
3. INSTALL DOWELS & CONSTRUCT CONCRETE BARRIER WALLS IN MEDIAN.
4. PLACE WATERPROOFING AND REPLACE REMAINING BASE COURSE ASPHALT.
5. MODIFY BARRIERS FOR WINTER SHUTDOWN.
6. PLACE SURFACE COURSE ASPHALT AND FINAL LANE MARKING FOR BOTH BRIDGES.

ABBREVIATIONS:

TCB - TEMPORARY CONCRETE BARRIER

LEGEND:

- EXIST TO REMAIN
- NEW CONCRETE

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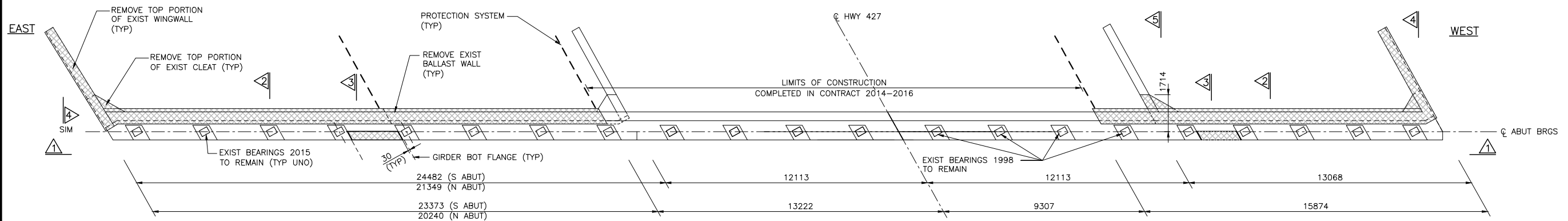
SCALE :
AS NOTED

DESIGNED	SHELLEY HUANG
DRAWN	TOM ZHAO
CHECKED	TATIANA OJALA
APPROVED LEAD ENG.	TATIANA OJALA
APPROVED PROJ. MANAGER	

NAME (PRINT)	INT.	DATE



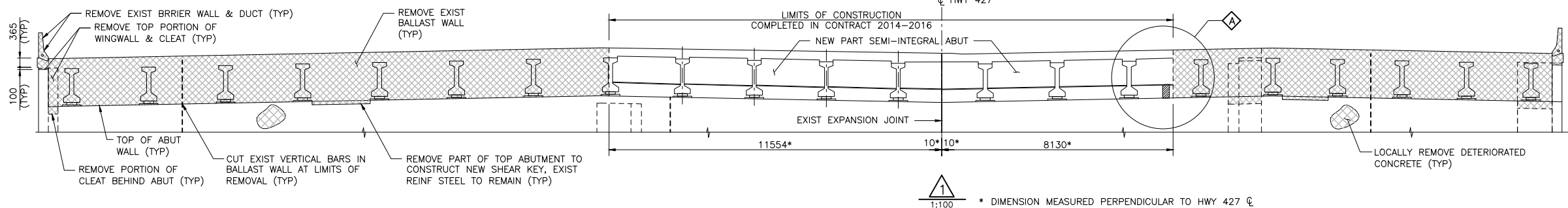
HWY 427 EXPANSION HWY 427 / Humber River Bridges REHABILITATION R2 SITE 37-633/1&2 CONSTRUCTION STAGING							
PROJECT ID.	STAGE IDENTIFIER	DESIGN PACKAGE NUMBER	DISCIPLINE	STRUCTURE NUMBER	DOCUMENT TYPE	DRAWING NUMBER	REVISION NUMBER
H427-D	N	9A	STR	B03	DWG	601	C



SOUTH ABUTMENT PLAN
1:100

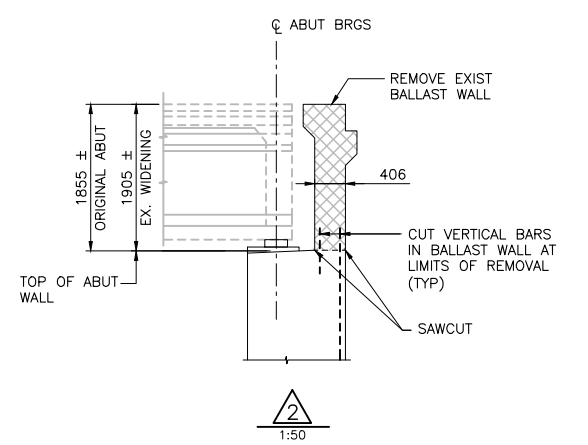
NOTES:
1. SOUTH ABUTMENT SHOWN, NORTH ABUTMENT SIMILAR EXCEPT AS NOTED.
2. GIRDERS, DECK AND APPROACH SLAB NOT SHOWN FOR CLARITY.

- NOTES:**
- THIS DRAWING TO BE READ IN CONJUNCTION WITH DWGS 600, 601 AND 603.
 - EXISTING REINFORCING STEEL TO REMAIN SHALL BE ABRASIVE BLAST CLEANED.
 - FOR REINFORCING STEEL THAT IS CUT AND WILL NOT BE EMBEDDED IN CONCRETE THE FOLLOWING APPLIES:
 - CHIP CONCRETE 25mm AROUND REBAR TO A DEPTH OF 50mm.
 - CUT REBAR AND PATCH HOLE WITH PROPRIETARY PRODUCT.
 - SAWCUTS IN CONCRETE, WHERE DESIGNATED, SHALL BE 25mm DEEP OR TO THE FIRST LAYER OF REINFORCING STEEL, WHICHEVER IS LESS.

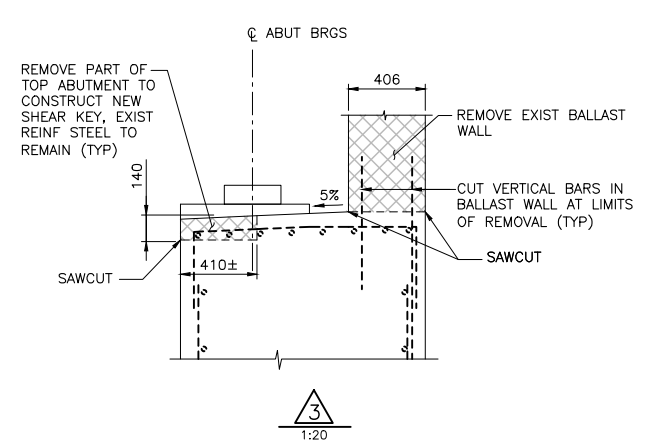


1:100 * DIMENSION MEASURED PERPENDICULAR TO HWY 427 CL

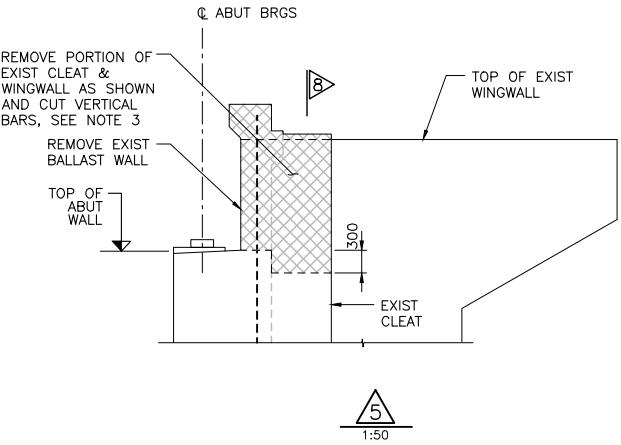
- LEGEND:**
- EXISTING TO REMAIN
 - REMOVALS



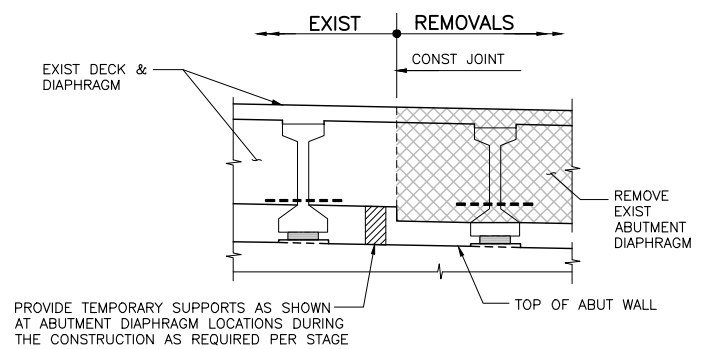
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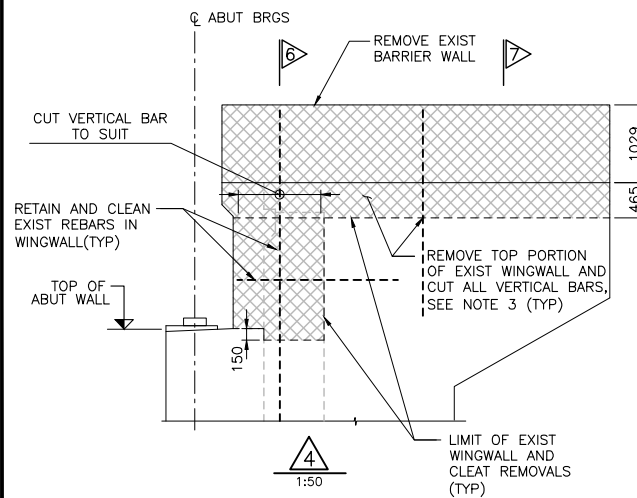
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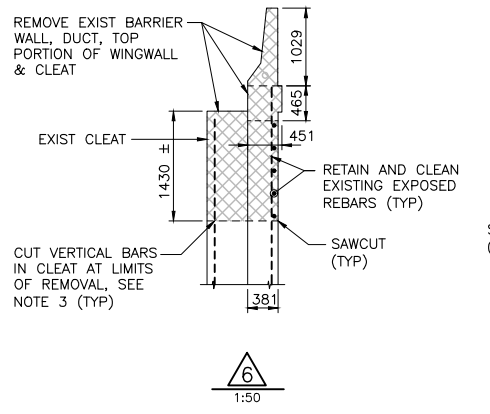
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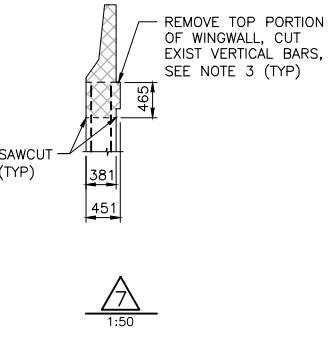
DETAILS A TEMPORARY SUPPORTS AT ABUT DIAPHRAGMS



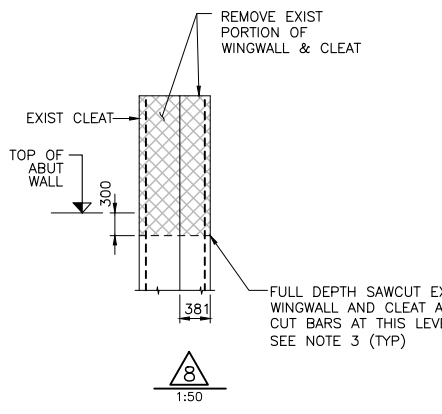
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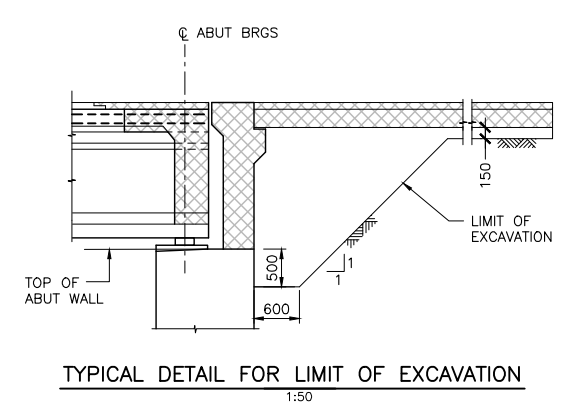
6
1:50



7
1:50



8
1:50



TYPICAL DETAIL FOR LIMIT OF EXCAVATION
1:50

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DATE PLOTTED: 3/19/2018 11:20:50 AM BY: PANGF

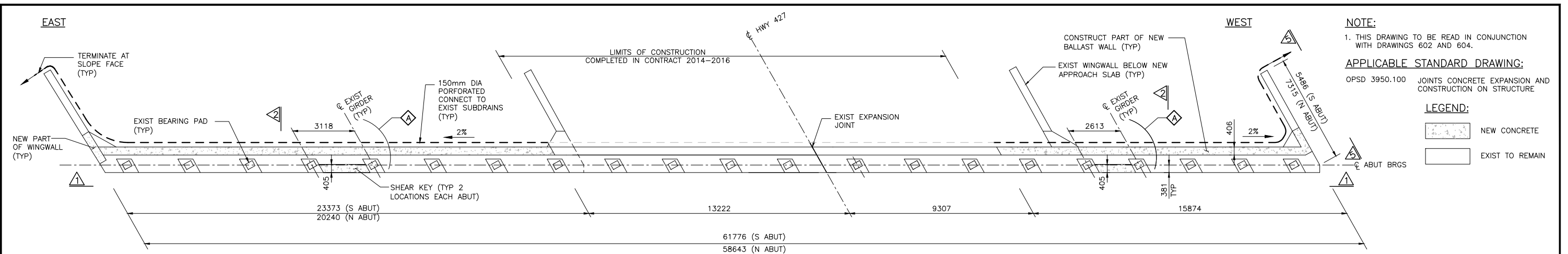
DATE	REVISIONS	BY	CHK	LEAD DISC.	PROJ. MAN.
C	18/03/16				
B	18/01/09				
A	17/10/31				

SCALE :
AS NOTED

DESIGNED	SHELLEY HUANG
DRAWN	TOM ZHAO
CHECKED	TATIANA OJALA
APPROVED LEAD ENG.	TATIANA OJALA
APPROVED PROJ. MANAGER	
NAME (PRINT)	INT.
	DATE



TITLE							
HWY 427 EXPANSION HWY 427 / HUMBER RIVER BRIDGES REHABILITATION R2 SITE 37-633/1&2 ABUTMENT REMOVALS							
PROJECT ID.	STAGE IDENTIFIER	DESIGN PACKAGE NUMBER	DISCIPLINE	STRUCTURE NUMBER	DOCUMENT TYPE	DRAWING NUMBER	REVISION NUMBER
H427-D	N	9A	STR	B03	DWG	602	C



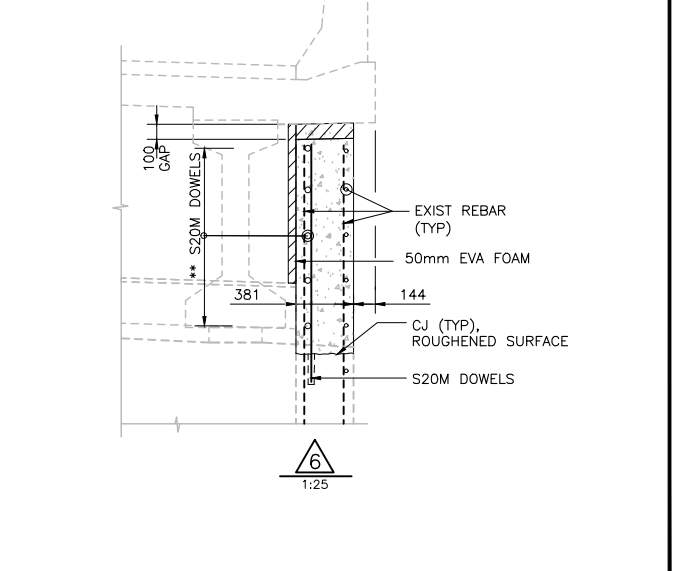
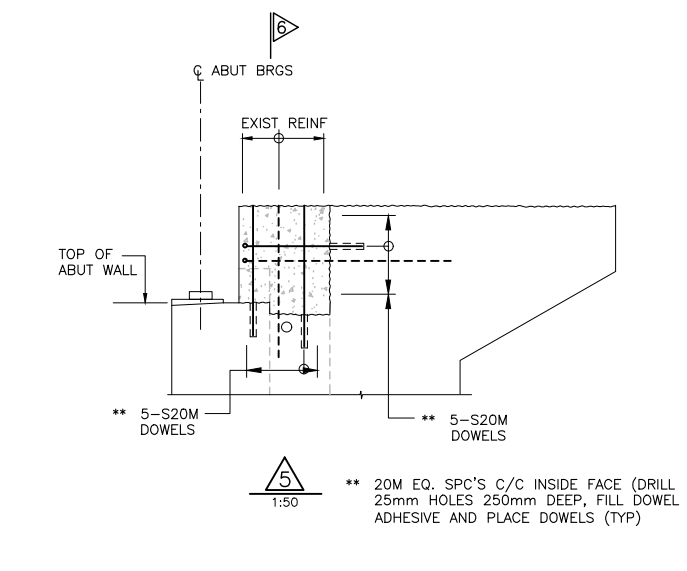
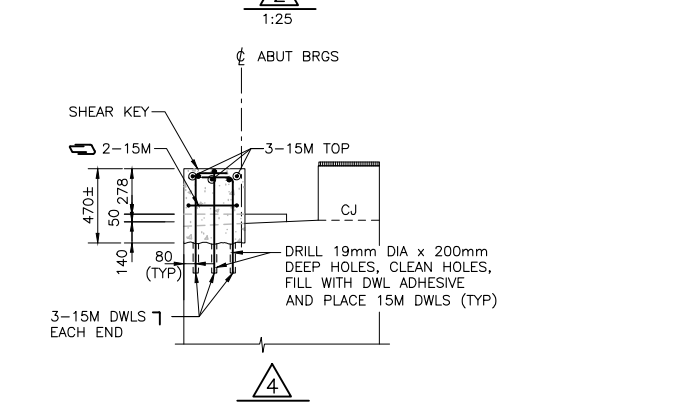
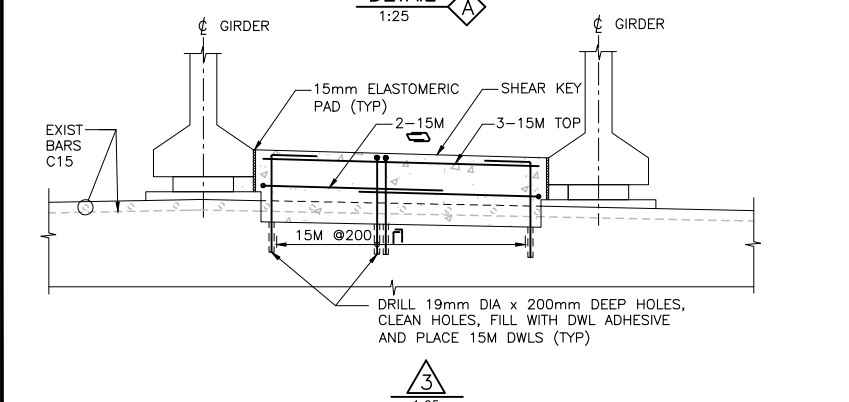
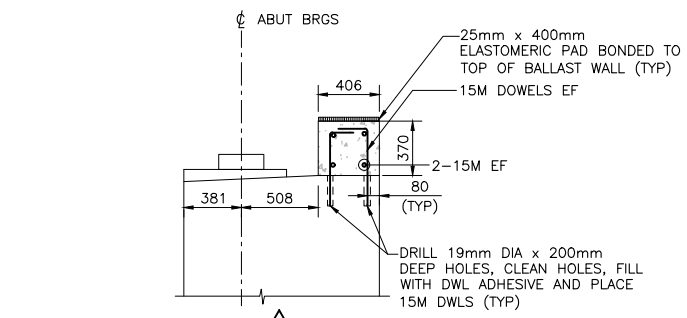
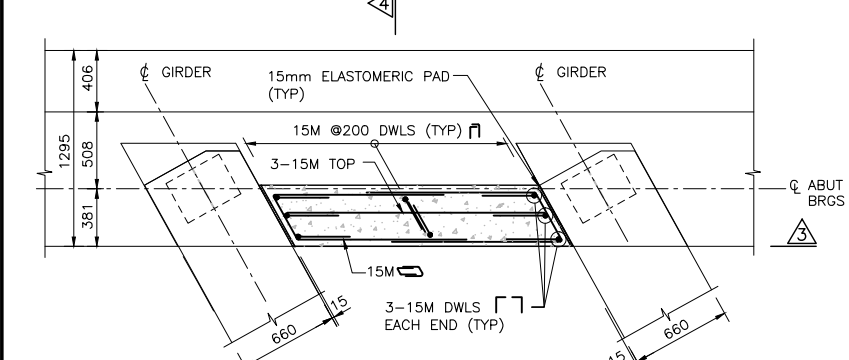
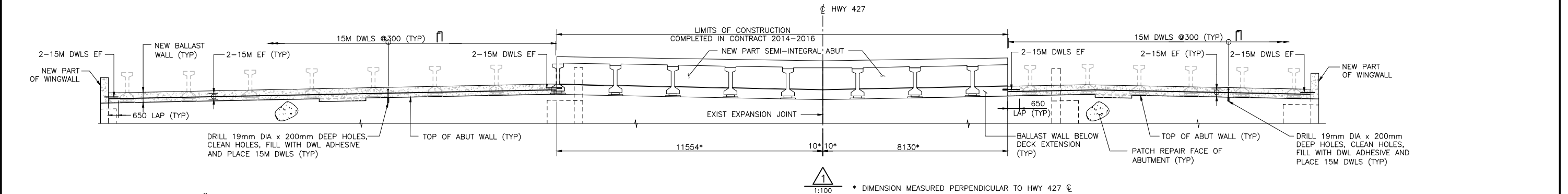
NOTE:
 1. THIS DRAWING TO BE READ IN CONJUNCTION WITH DRAWINGS 602 AND 604.

APPLICABLE STANDARD DRAWING:
 OPSD 3950.100 JOINTS CONCRETE EXPANSION AND CONSTRUCTION ON STRUCTURE

LEGEND:
 [Pattern] NEW CONCRETE
 [Pattern] EXIST TO REMAIN

SOUTH ABUTMENT PLAN
 1:100

NOTES:
 1. SOUTH ABUTMENT SHOWN, NORTH ABUTMENT SIMILAR EXCEPT AS NOTED.
 2. GIRDERS, DECK AND APPROACH SLAB NOT SHOWN FOR CLARITY.



NOTE: CONSTRUCT SHEAR KEY PRIOR TO SEMI-INTEGRAL DECK EXTENSION.

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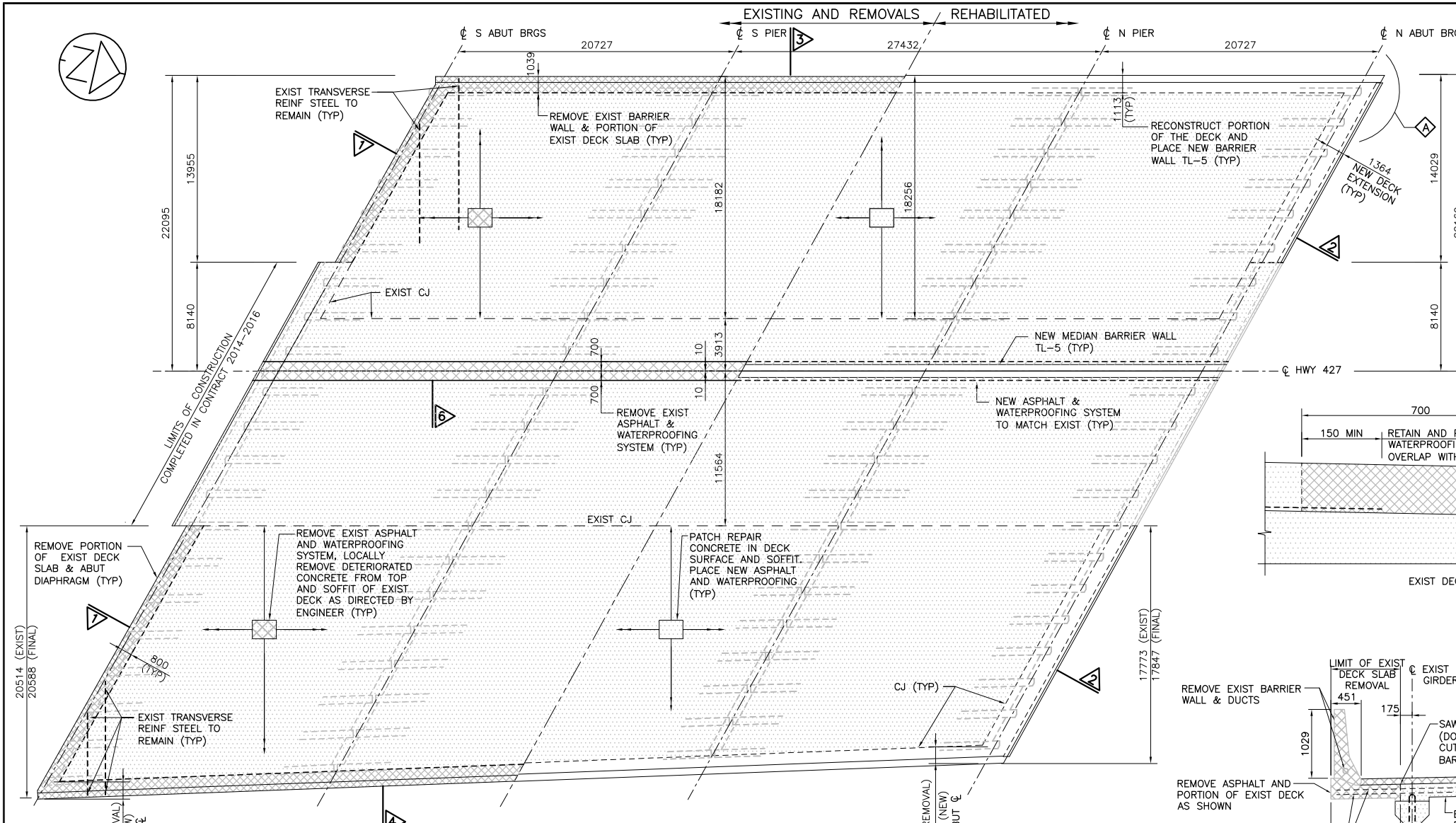
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C 18/03/16	90% SUBMISSION TO CA				
B 18/01/09	90% SUBMISSION TO CA				
A 17/10/31	90% SUBMISSION TO CA				

SCALE :
 AS NOTED

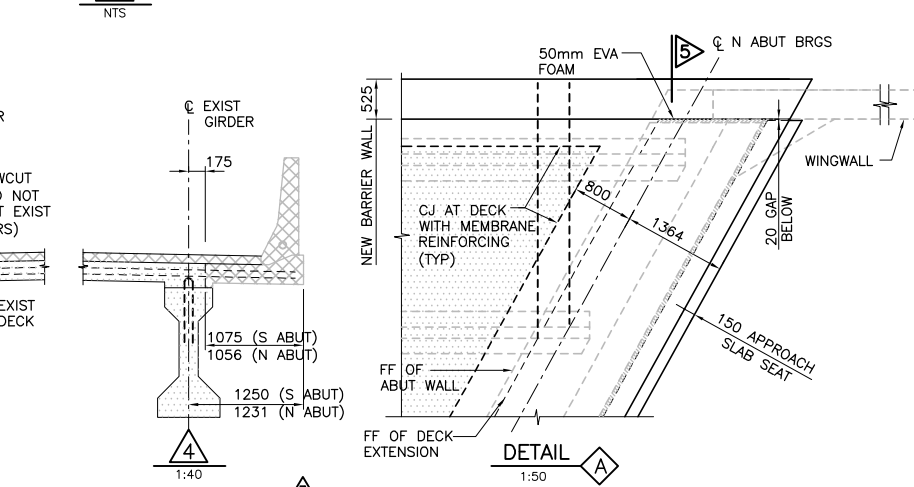
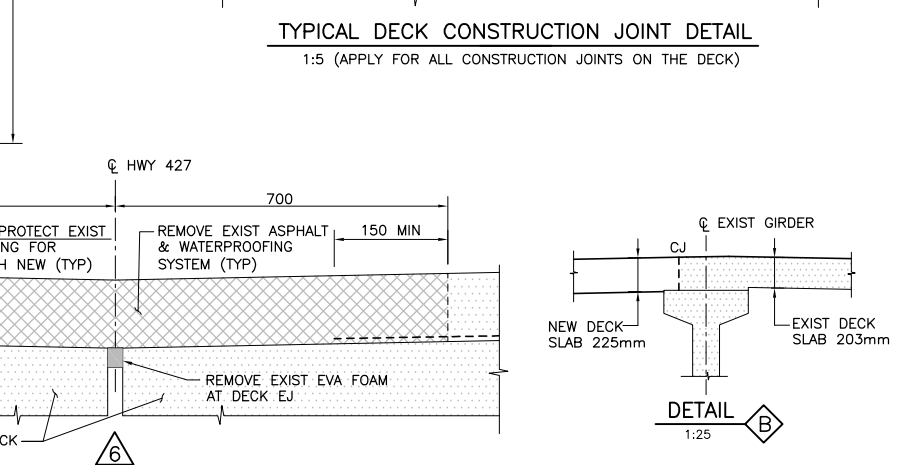
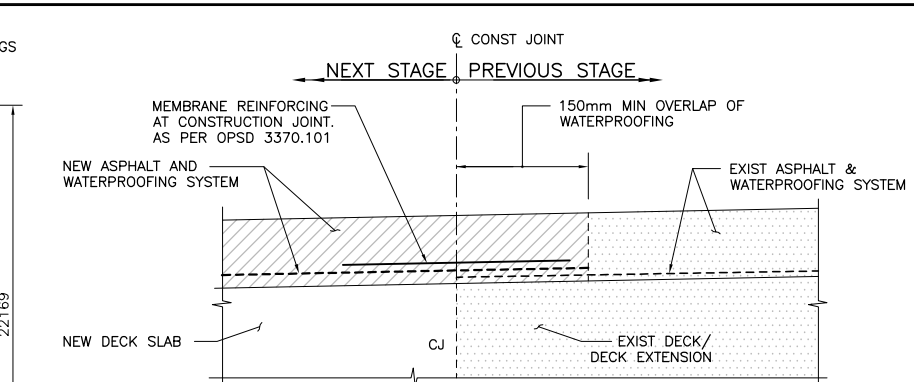
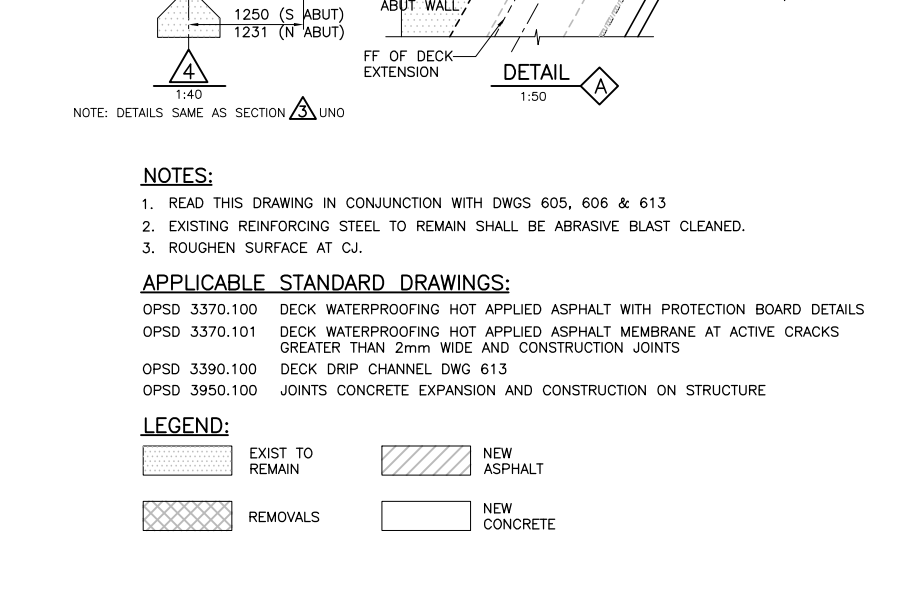
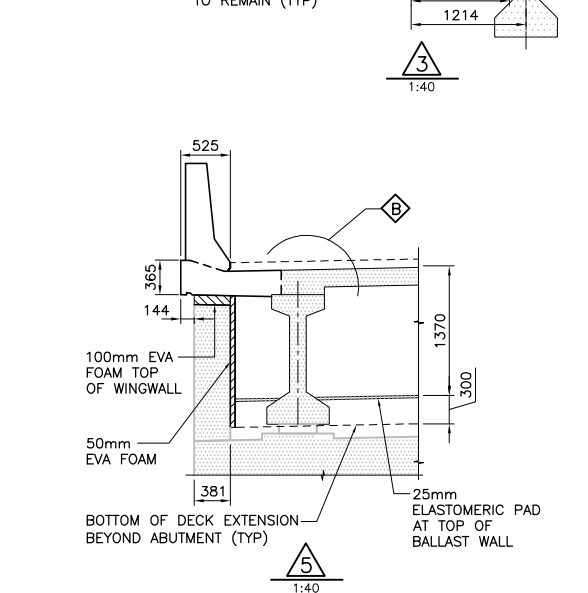
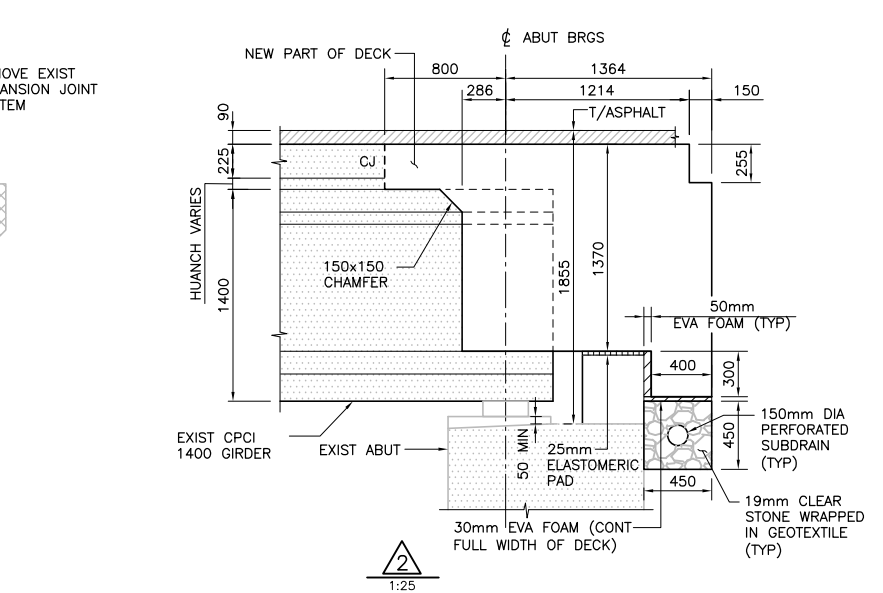
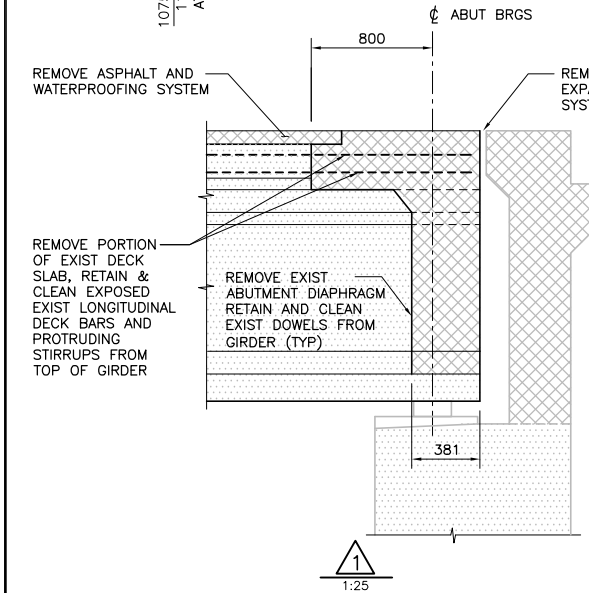
DESIGNED	SHELLEY HUANG	
DRAWN	TOM ZHAO	
CHECKED	TATIANA OJALA	
APPROVED LEAD ENG.	TATIANA OJALA	
APPROVED PROJ. MANAGER		
NAME (PRINT)	INT.	DATE



HWY 427 EXPANSION HWY 427 / HUMBER RIVER BRIDGES REHABILITATION R2 SITE 37-633/1&2 ABUTMENT REHABILITATION							
PROJECT ID.	STAGE IDENTIFIER	DESIGN PACKAGE NUMBER	DISCIPLINE	STRUCTURE NUMBER	DOCUMENT TYPE	DRAWING NUMBER	REVISION NUMBER
H427-D	N	9A	STR	B03	DWG	603	C



DECK PLAN
1:200



NOTE: DETAILS SAME AS SECTION 3 UNO

- NOTES:**
1. READ THIS DRAWING IN CONJUNCTION WITH DWGS 605, 606 & 613
 2. EXISTING REINFORCING STEEL TO REMAIN SHALL BE ABRASIVE BLAST CLEANED.
 3. ROUGHEN SURFACE AT CJ.

- APPLICABLE STANDARD DRAWINGS:**
- OPSD 3370.100 DECK WATERPROOFING HOT APPLIED ASPHALT WITH PROTECTION BOARD DETAILS
 - OPSD 3370.101 DECK WATERPROOFING HOT APPLIED ASPHALT MEMBRANE AT ACTIVE CRACKS GREATER THAN 2mm WIDE AND CONSTRUCTION JOINTS
 - OPSD 3390.100 DECK DRIP CHANNEL DWG 613
 - OPSD 3950.100 JOINTS CONCRETE EXPANSION AND CONSTRUCTION ON STRUCTURE

LEGEND:

	EXIST TO REMAIN		NEW ASPHALT
	REMOVALS		NEW CONCRETE

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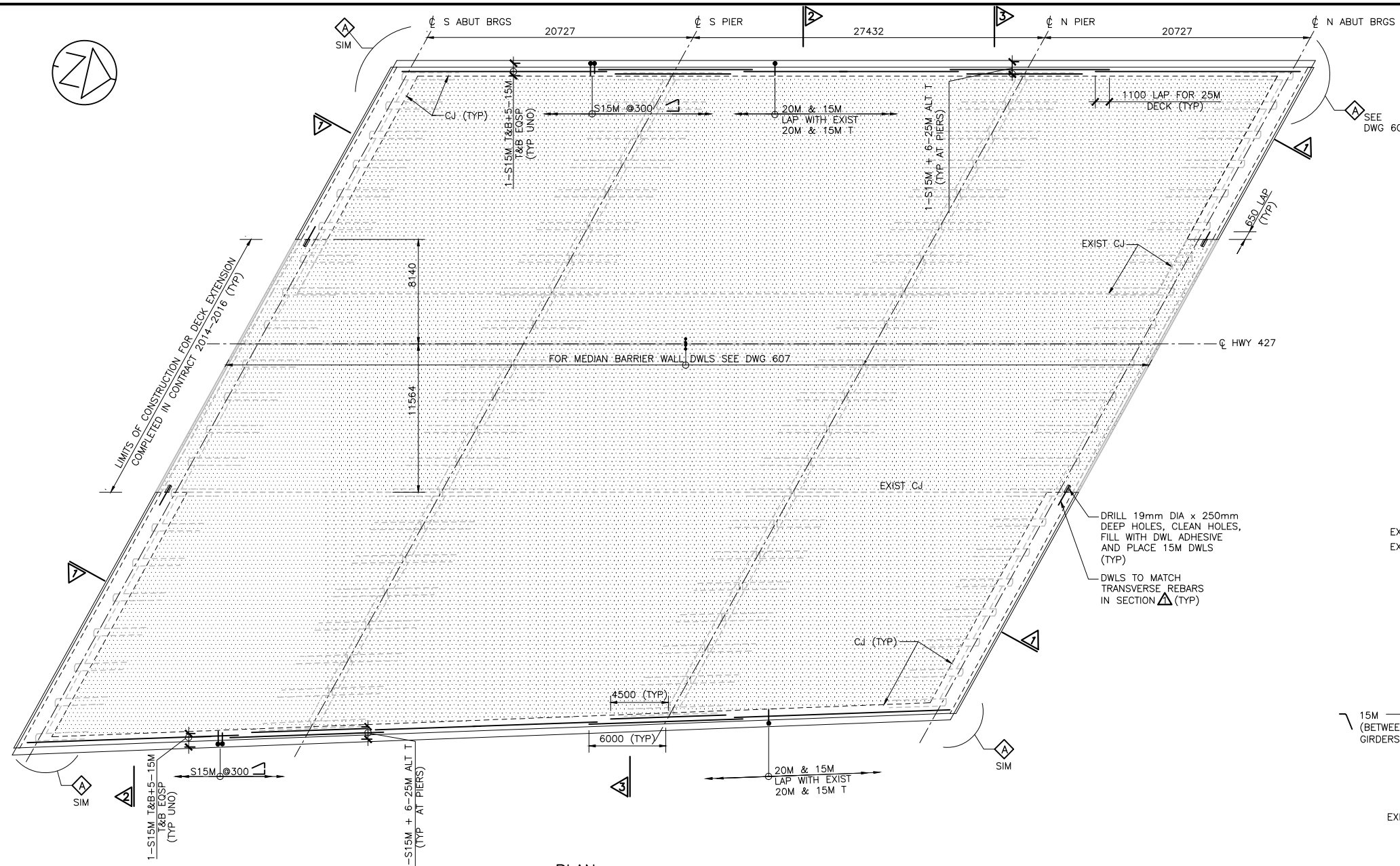
DATE	REVISIONS	BY	CHK	LEAD	PROJ
C 18/03/16	90% SUBMISSION TO CA				
B 18/01/09	90% SUBMISSION TO CA				
A 17/10/31	90% SUBMISSION TO CA				

SCALE :
AS NOTED

DESIGNED	SHELLEY HUANG
DRAWN	TOM ZHAO
CHECKED	TATIANA QJALA
APPROVED LEAD ENG.	TATIANA QJALA
APPROVED PROJ. MANAGER	



TITLE							
HWY 427 EXPANSION HWY 427 / HUMBER RIVER BRIDGES REHABILITATION R2 SITE 37-633/1&2 DECK REMOVALS AND REHABILITATION							
PROJECT ID.	STAGE IDENTIFIER	DESIGN PACKAGE NUMBER	DISCIPLINE	STRUCTURE NUMBER	DOCUMENT TYPE	DRAWING NUMBER	REVISION NUMBER
H427-D	N	9A	STR	B03	DWG	604	C



NOTE:

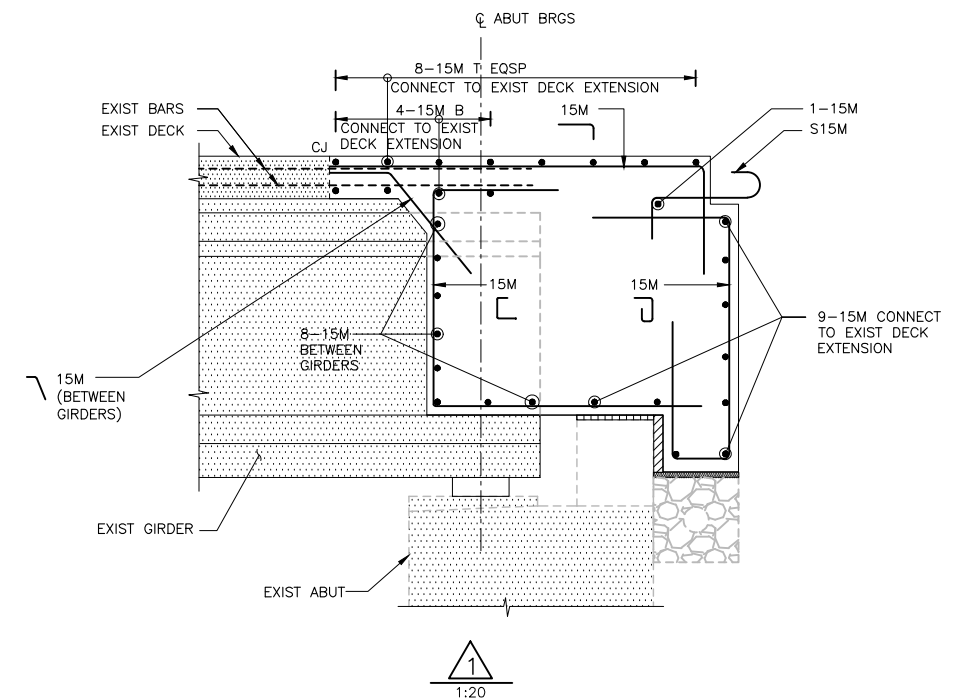
1. READ THIS DRAWING IN CONJUNCTION WITH DWGS 604, 606, 607 AND 608.

APPLICABLE STANDARD DRAWINGS:

- OPSD 3329.100 DECK, REINFORCEMENT SUPPORTS FOR REINFORCING STEEL FOR SLAB DEPTHS 300mm OR LESS
- OPSD 3329.101 DECK, REINFORCEMENT SUPPORTS FOR REINFORCING STEEL FOR SLAB DEPTHS GREATER THAN 300mm

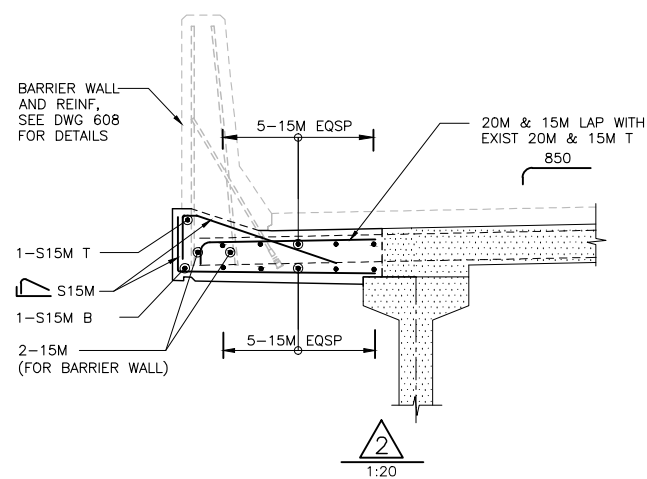
LEGEND:

- EXIST TO REMAIN
- NEW CONCRETE

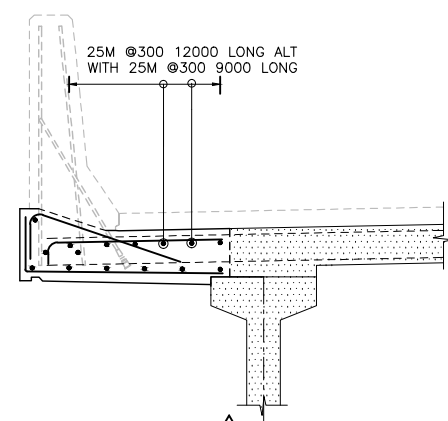


PLAN
1:200

NOTE:
1. EXIST BARS AND BARRIER WALL BARS NOT SHOWN, FOR CLARITY. SEE SECTIONS AND DWGS 607 & 608 FOR DETAILS



2
1:20



3
1:20 (TYPICAL AT PIERS)

CAD FILE LOCATION AND NAME: C:\projectwise\wsp-co\wsp-co\projectwise\wsp-co\wsp-co\H427-D-N-9A-STR-803-LWG-605DK.dwg
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 DATE PLOTTED: 3/19/2018 11:21:01 AM BY: PANGF

DATE	REVISIONS	BY	CHK	LEAD DISC.	PROJ. MAN.
C	18/03/16			90% SUBMISSION TO CA	
B	18/01/09			90% SUBMISSION TO CA	
A	17/10/31			90% SUBMISSION TO CA	

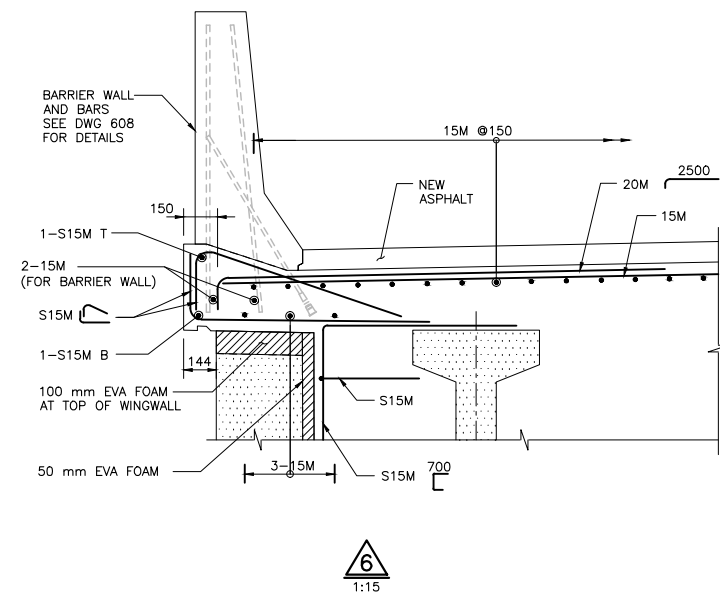
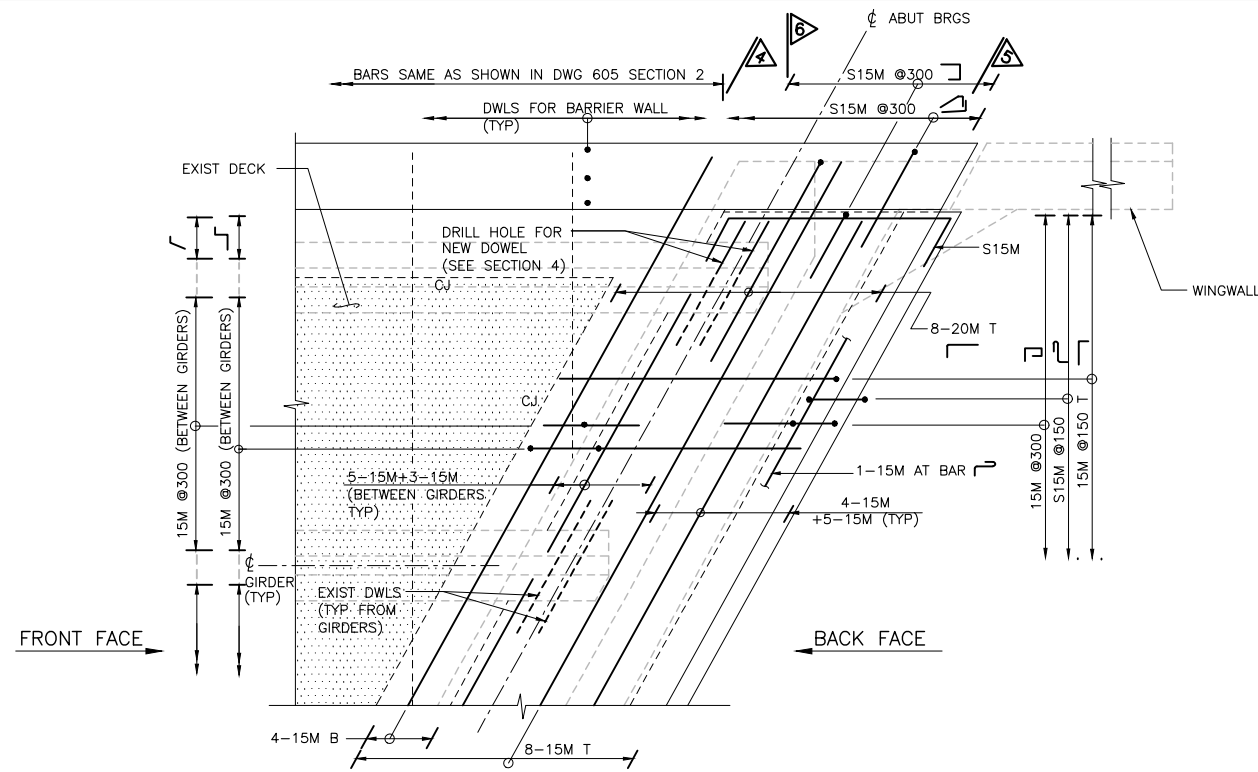
SCALE :

AS NOTED

DESIGNED	SHELLEY HUANG	
DRAWN	TOM ZHAO	
CHECKED	TATIANA OJALA	
APPROVED LEAD ENG.	TATIANA OJALA	
APPROVED PROJ. MANAGER		
NAME (PRINT)	INT.	DATE

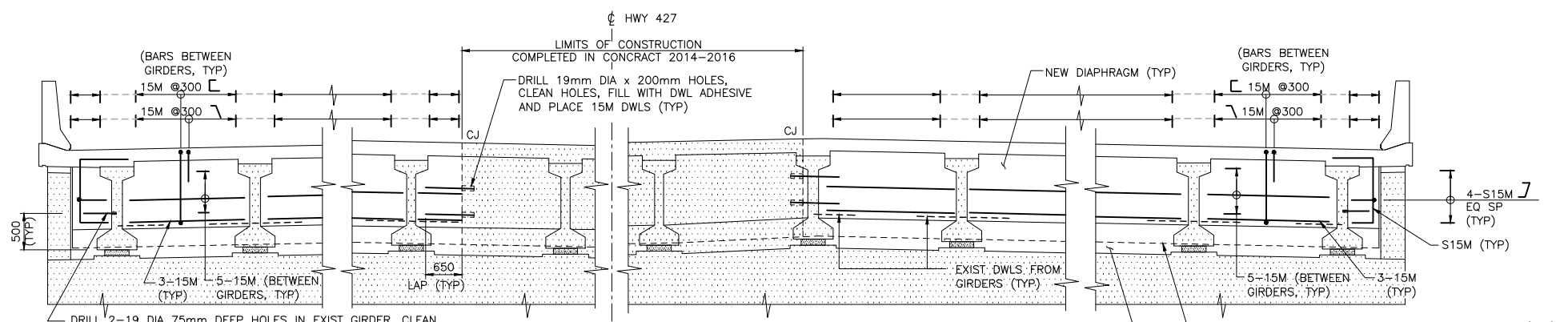


TITLE							
HWY 427 EXPANSION HWY 427 / HUMBER RIVER BRIDGES REHABILITATION R2 SITE 37-633/1&2 DECK REINFORCEMENT I							
PROJECT ID.	STAGE IDENTIFIER	DESIGN PACKAGE NUMBER	DISCIPLINE	STRUCTURE NUMBER	DOCUMENT TYPE	DRAWING NUMBER	REVISION NUMBER
H427-D	N	9A	STR	B03	DWG	605	C



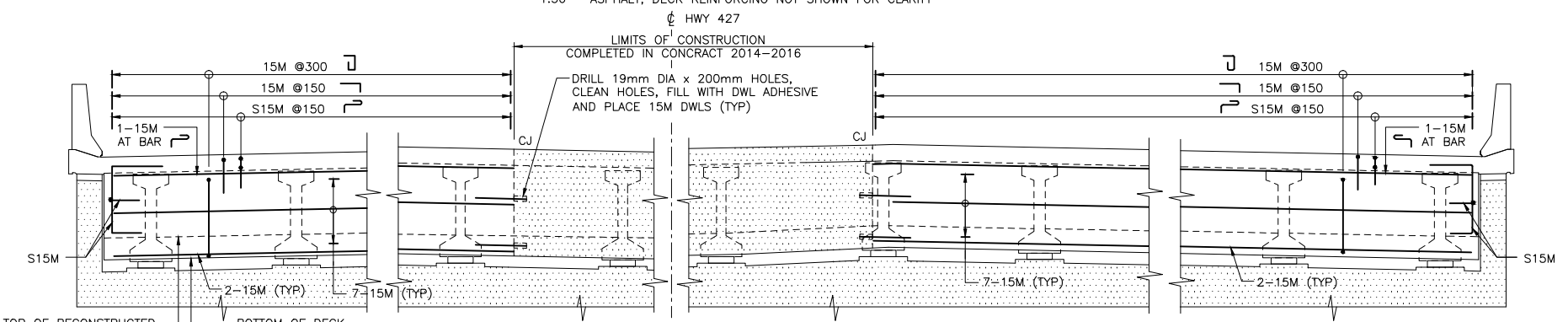
DETAIL A
1:30
(FROM DWG 605)

- NOTES:**
- NW CORNER DECK SHOWN, OTHER CORNERS SIMILAR.
 - BARS IN DECK SLAB NOT SHOWN FOR CLARITY (SEE DWG 605 FOR DETAILS).
 - RETAIN & CLEAN ALL PROTRUDING EXIST BARS (DO NOT DAMAGE).



4 ELEVATION OF ABUTMENT DIAPHRAGM (FRONT FACE)
1:50
ASPHALT, DECK REINFORCING NOT SHOWN FOR CLARITY

(S & N ABUTMENT DIAPHRAGMS ARE SIMILAR, EXCEPT LENGTHS OF DIAPHRAGM)



5 ELEVATION OF ABUTMENT DIAPHRAGM (BACK FACE)
1:50

- NOTES:**
- READ THIS DRAWING IN CONJUNCTION WITH DWGS 604 AND 605.
 - SIDES OF GIRDER IN CONTACT WITH NEW CONCRETE TO BE ROUGHENED.

LEGEND:

EXIST TO REMAIN

NEW CONCRETE

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DATE PLOTTED: 3/19/2018 11:21:04 AM BY: PANG

DATE	REVISIONS	BY	CHK	LEAD DISC.	PROJ. MAN.
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B 18/01/09	90% SUBMISSION TO CA				
A 17/10/31	90% SUBMISSION TO CA				

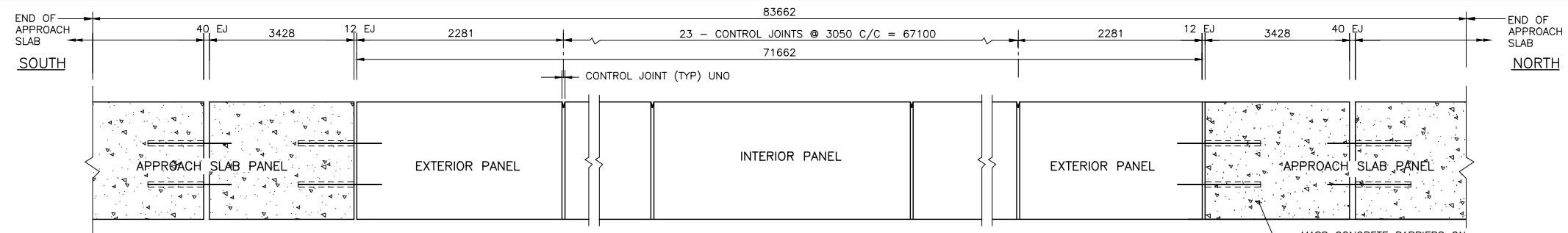
SCALE :

AS NOTED

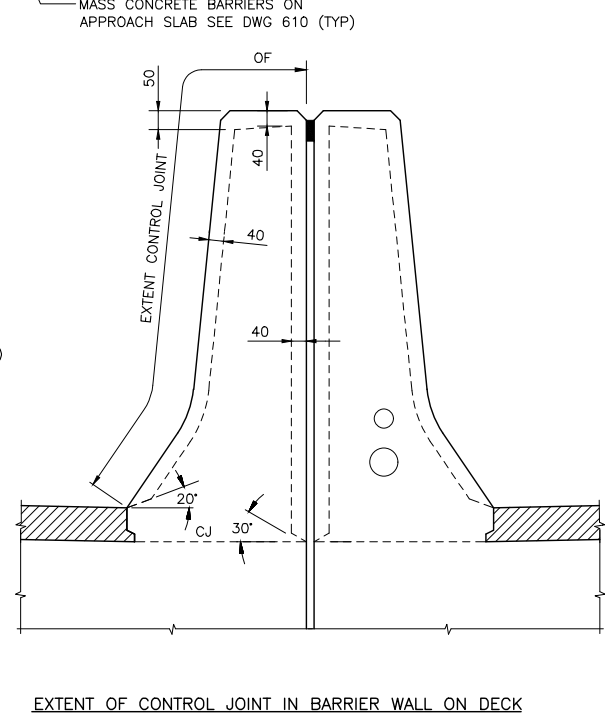
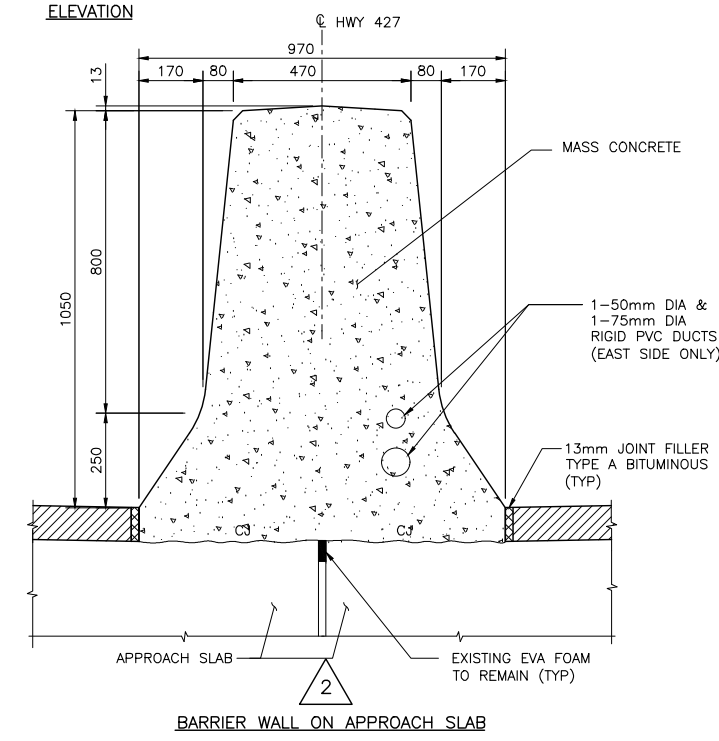
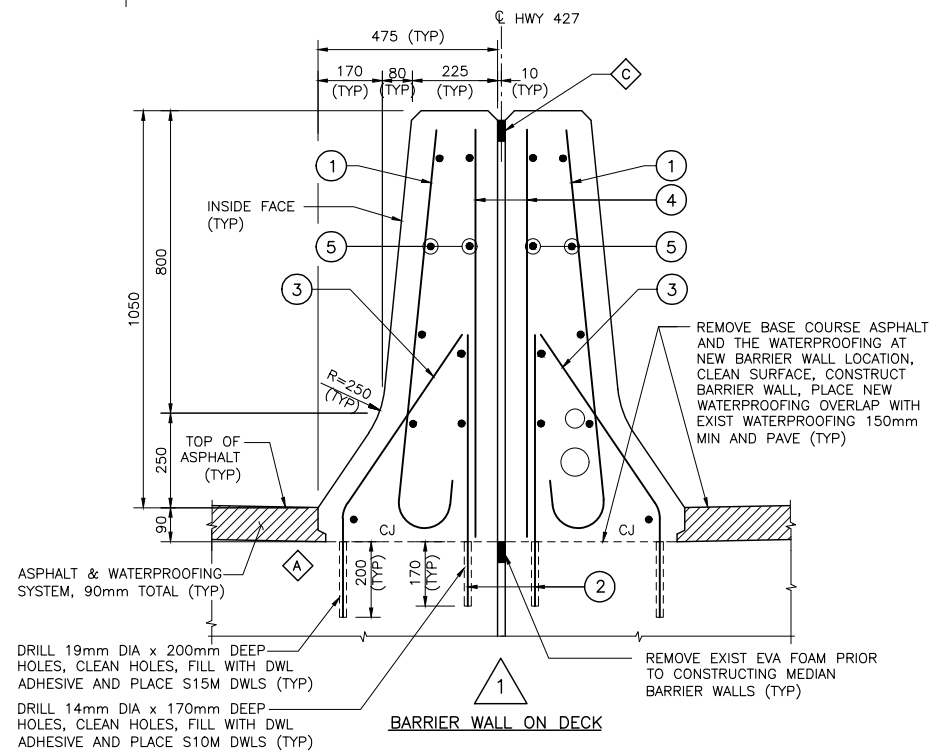
DESIGNED	SHELLEY HUANG	
DRAWN	TOM ZHAO	
CHECKED	TATIANA OJALA	
APPROVED LEAD ENG.	TATIANA OJALA	
APPROVED PROJ. MANAGER		
NAME (PRINT)	INT.	DATE



TITLE							
HWY 427 EXPANSION HWY 427 / HUMBER RIVER BRIDGES REHABILITATION R2 SITE 37-633/1&2 DECK REINFORCEMENT II							
PROJECT ID.	STAGE IDENTIFIER	DESIGN PACKAGE NUMBER	DISCIPLINE	STRUCTURE NUMBER	DOCUMENT TYPE	DRAWING NUMBER	REVISION NUMBER
H427-D	N	9A	STR	B03	DWG	606	C

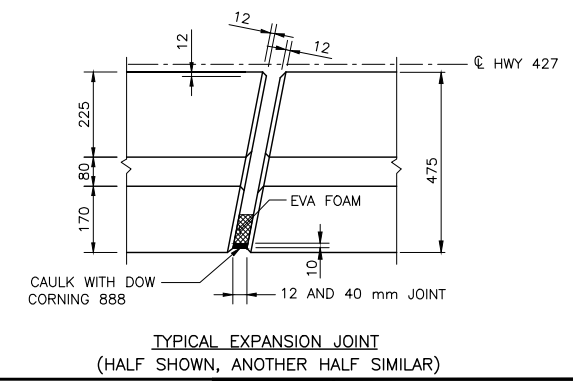
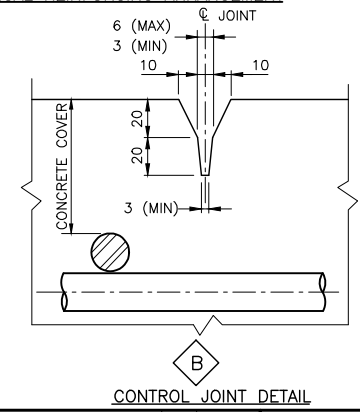
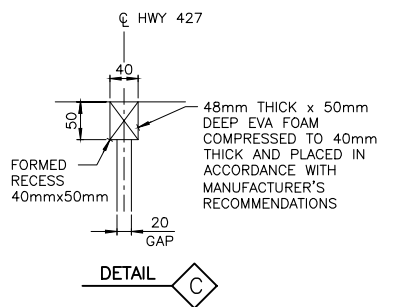
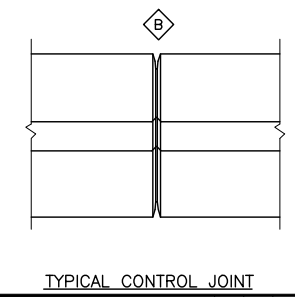
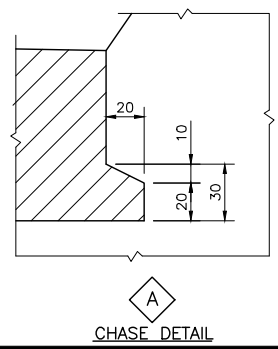
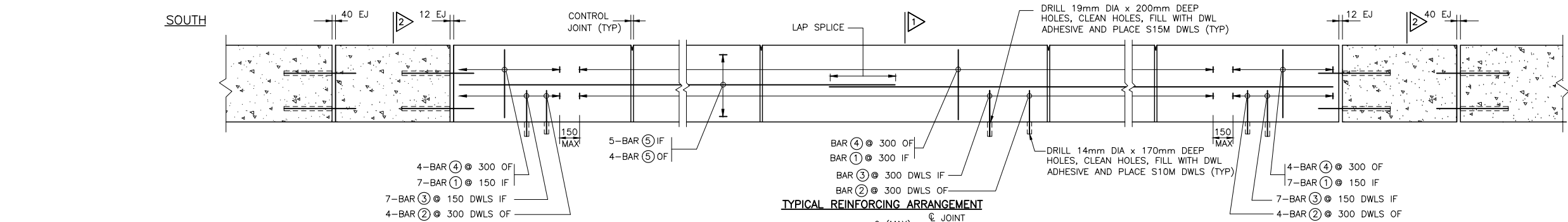


- NOTES:**
- CHASE REQUIRED ON HIGH AND LOW SIDE OF CROSSFALL.
 - CONCRETE COVER TO REINFORCING STEEL 60±10mm EXCEPT AS NOTED.
 - REINFORCING STEEL SHALL BE STAINLESS TYPE 316LN OR DUPLEX 2205 WITH A MINIMUM YIELD STRENGTH OF 500 MPa.
 - BAR LAP SPLICE FOR HORIZONTAL REINFORCEMENT MUST NOT LAP THROUGH CONTROL JOINT.
 - MINIMUM BAR LAP SPLICE TO BE 550mm, UNLESS OTHERWISE SHOWN.
 - LENGTH OF HORIZONTAL BAR TO SUIT CONTRACTOR'S OPERATIONS. BAR LENGTHS NEED NOT MATCH DISTANCE BETWEEN CONTROL JOINTS.
 - CONTROL JOINT TO BE FORMED.
 - SAWCUTS NOT PERMITTED.
 - CONTROL JOINT FORM HARDWARE NOT TO BE LEFT IN PLACE.
 - LEGEND
EF DENOTES EACH FACE
IF DENOTES INSIDE FACE
OF DENOTES OUTSIDE FACE
 - REMOVE PLASTIC CAPS AND CLEAN MECHANICAL CONNECTIONS BEFORE INSTALL BAR ② AND ③.
 - READ THIS DRAWING IN CONJUNCTION WITH GRADING DWGS.
 - ROUGHEN SURFACE AT CJ.



BAR MARK	SIZE	SHAPE
①	S15M	
②	S10M DWLS	
③	S15M DWLS	
④	S10M	STRAIGHT
⑤	S15M	STRAIGHT

LEGEND:
 MASS CONCRETE



MODIFIED	
STANDARD DRAWING SEP 2016	SS110-61
BARRIER WALL WITHOUT RAILING - TL-5 STAINLESS STEEL REBAR	

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 DATE PLOTTED: 3/19/2018 11:21:07 AM BY: PANG

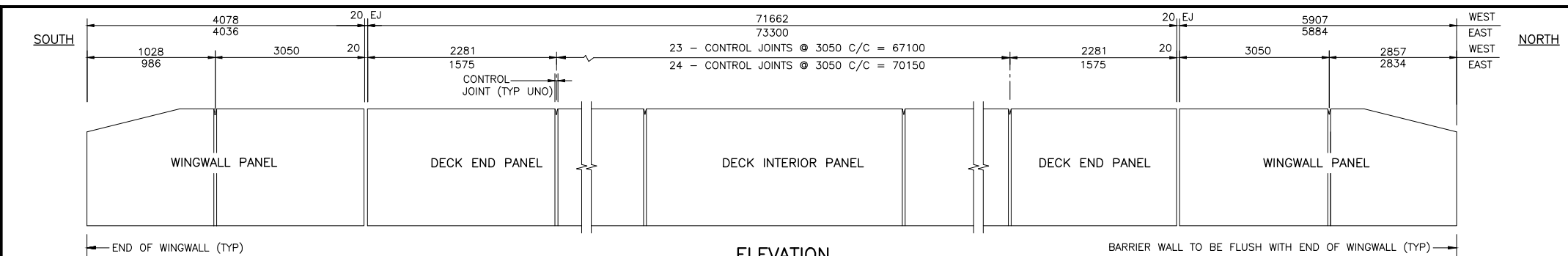
DATE	REVISIONS	BY	CHK	LEAD DISC.	PROJ. MAN.
C 18/03/16	90% SUBMISSION TO CA				
B 18/01/09	90% SUBMISSION TO CA				
A 17/10/31	90% SUBMISSION TO CA				

SCALE :
AS NOTED

DESIGNED	SHELLEY HUANG
DRAWN	TOM ZHAO
CHECKED	TATIANA OJALA
APPROVED LEAD ENG.	TATIANA OJALA
APPROVED PROJ. MANAGER	
NAME (PRINT)	INT. DATE



HWY 427 EXPANSION HWY 427 / HUMBER RIVER BRIDGES REHABILITATION R2 SITE 37-633/1&2 MEDIAN BARRIER WALLS							
PROJECT ID.	STAGE IDENTIFIER	DESIGN PACKAGE NUMBER	DISCIPLINE	STRUCTURE NUMBER	DOCUMENT TYPE	DRAWING NUMBER	REVISION NUMBER
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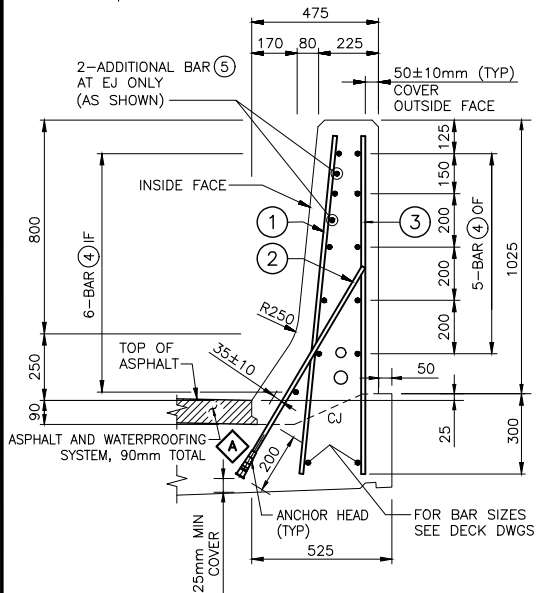


ELEVATION

- NOTES:**
1. SYSTEM CONFIGURATION MEETS THE REQUIREMENTS OF NCHRP 350.
 2. CONCRETE COVER TO REINFORCING BAR 60±10mm EXCEPT AS NOTED.
 3. REINFORCING SHALL BE GRADE III (GIII) GLASS FIBRE REINFORCED POLYMER (GFRP) SUPPLIED AS COMBAR BY SCHÖCK OR AS V-ROD HEADED BAR BY PULTRALL.
 4. SIZE IN THE BAR SCHEDULE INDICATES DESIGNATED BAR DIAMETER AND SHALL HAVE A NOMINAL CROSS SECTIONAL AREA ACCORDING TO CAN/CSA S-807.
 5. ANCHOR HEAD OF GFRP REBAR SHALL HAVE A MINIMUM GUARANTEED PULL OUT STRENGTH (Fp) AS FOLLOWS:

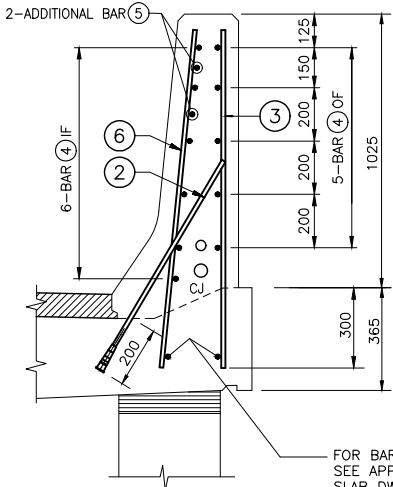
SIZE	Fp (kN)
GIII-15M WITH HEAD	100

6. BAR LAP SPLICE FOR HORIZONTAL REINFORCEMENT MUST NOT LAP THROUGH CONTROL JOINT.
7. MINIMUM BAR LAP SPLICE TO BE 640mm, UNLESS OTHERWISE SHOWN.
8. LENGTH OF HORIZONTAL BAR TO SUIT CONTRACTOR'S OPERATIONS. BAR LENGTHS NEED NOT MATCH DISTANCE BETWEEN CONTROL JOINTS.
9. CONTROL JOINT TO BE FORMED.
10. SAWCUTS NOT PERMITTED.
11. CONTROL JOINT FORM HARDWARE NOT TO BE LEFT IN PLACE.
12. CHASE REQUIRED ON HIGH AND LOW SIDE OF CROSSFALL.
13. LEGEND: EF - DENOTES EACH FACE
IF - DENOTES INSIDE FACE
OF - DENOTES OUTSIDE FACE
CJ - CONSTRUCTION JOINT
EJ - EXPANSION JOINT



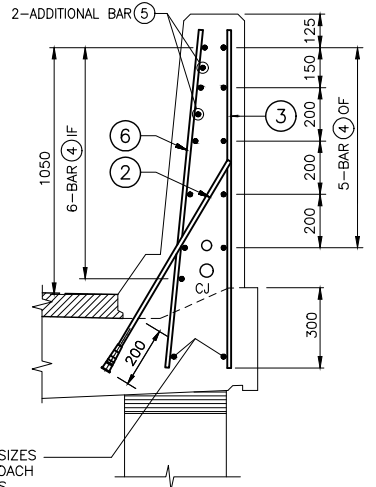
1

BARRIER WALL ON DECK
TYPICAL DIMENSIONS

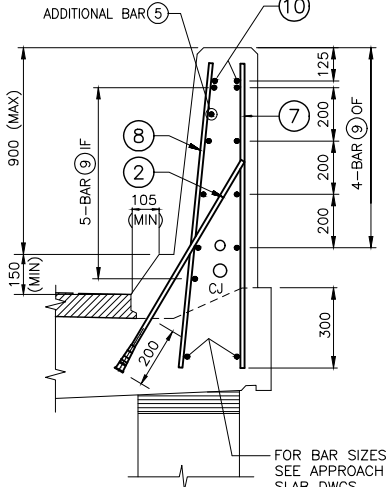


2

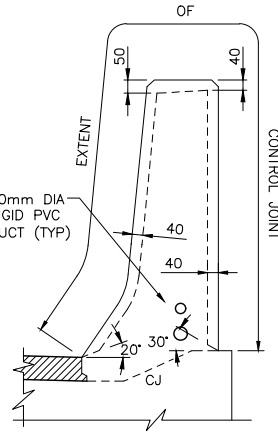
BARRIER WALL ON WINGWALL
TYPICAL REINFORCING



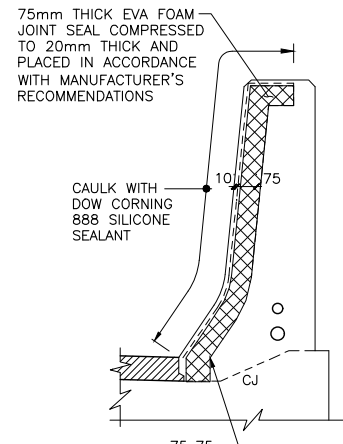
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4

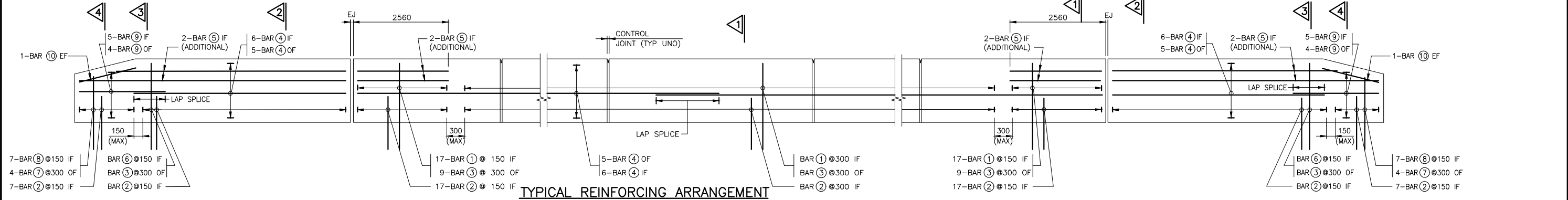


EXTENT OF CONTROL JOINT IN BARRIER WALL

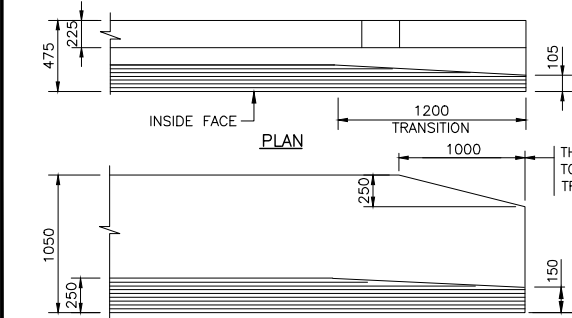


EXTENT OF EXPANSION JOINT IN BARRIER WALL

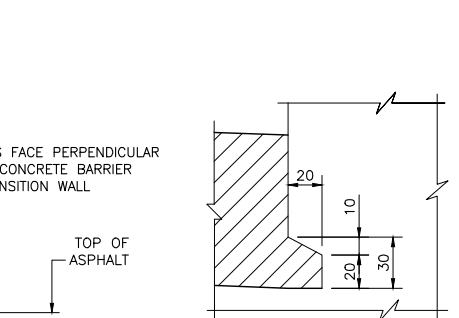
BAR MARK	SIZE	SHAPE
1	GIII-15M	STRAIGHT
2	GIII-15M WITH ANCHOR HEAD	910 STRAIGHT
3	GIII-13M	STRAIGHT
4	GIII-15M	STRAIGHT
5	GIII-15M	STRAIGHT
6	GIII-15M	STRAIGHT
7	GIII-13M	STRAIGHT LENGTH VARIES
8	GIII-15M	STRAIGHT LENGTH VARIES
9	GIII-13M	STRAIGHT
10	GIII-15M	STRAIGHT



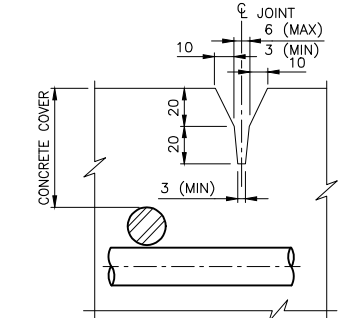
TYPICAL REINFORCING ARRANGEMENT



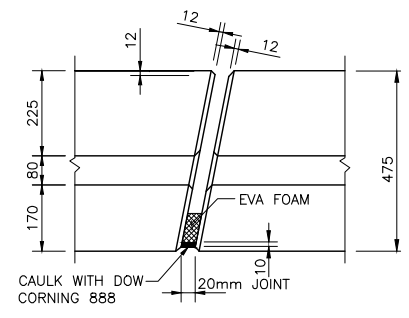
ELEVATION OF BARRIER WALL ON WINGWALL



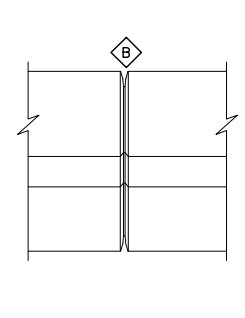
A CHASE DETAIL



B CONTROL JOINT DETAIL



TYPICAL EXPANSION JOINT



TYPICAL CONTROL JOINT

MODIFIED	
STANDARD DRAWING SEPTEMBER 2016	SS110-92
BARRIER WALL WITHOUT RAILING, TL-5 (GFRP REBAR WITH ANCHOR HEAD)	

CAD FILE LOCATION AND NAME: C:\projectwise\wsp-co\wsp-co\feipang\dmdb252\H427-D-N-9A-STR-803-LWC-608BW.dwg
 MODIFIED: 3/19/2018 9:51:49 AM BY: PANG
 DATE PLOTTED: 3/19/2018 11:21:10 AM BY: PANG

DATE	REVISIONS	BY	CHK	LEAD DISC.	PROJ. MAN.
C 18/03/16	90% SUBMISSION TO CA				
B 18/01/09	90% SUBMISSION TO CA				
A 17/10/31	90% SUBMISSION TO CA				

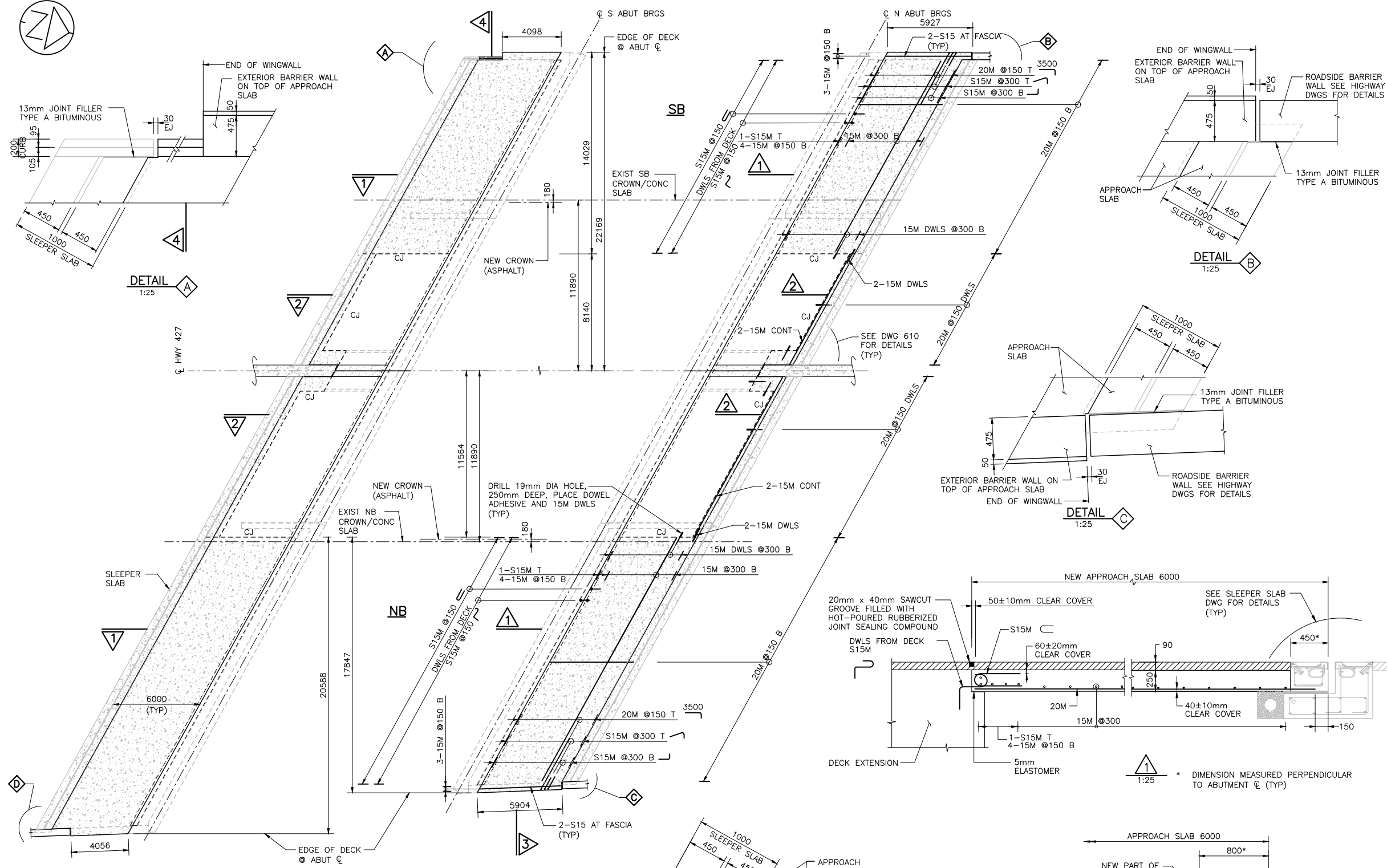
SCALE :
AS NOTED

DESIGNED	SHELLEY HUANG
DRAWN	TOM ZHAO
CHECKED	TATIANA QJALA
APPROVED LEAD ENG.	TATIANA QJALA
APPROVED PROJ. MANAGER	

CONSULTANT	
NAME (PRINT)	
INT.	
DATE	



HWY 427 EXPANSION HWY 427 / HUMBER RIVER BRIDGES REHABILITATION R2 SITE 37-633/1&2 EXTERIOR BARRIER WALLS						
PROJECT ID.	STAGE IDENTIFIER	DESIGN PACKAGE NUMBER	DISCIPLINE	STRUCTURE NUMBER	DOCUMENT TYPE	DRAWING NUMBER
H427-D	N	9A	STR	B03	DWG	608
						C



DIMENSION

REINFORCEMENT

PLAN
1:150

NOTE: DECK NOT SHOWN FOR CLARITY

NOTES:

1. THIS DRAWING TO BE READ IN CONJUNCTION WITH DWGS 607, 608, 610 AND 611.
2. CLEAR COVER TO REINFORCING STEEL 70 ± 20 mm EXCEPT AS NOTED.
3. TOP OF APPROACH SLAB ELEVATION TO MATCH EXISTING.
4. WATERPROOFING FOR BRIDGES WITHOUT EXPANSION JOINTS (RIGID FRAMES AND INTEGRAL ABUTMENTS) TO BE IN ACCORDANCE WITH OPSD-3370.1010.

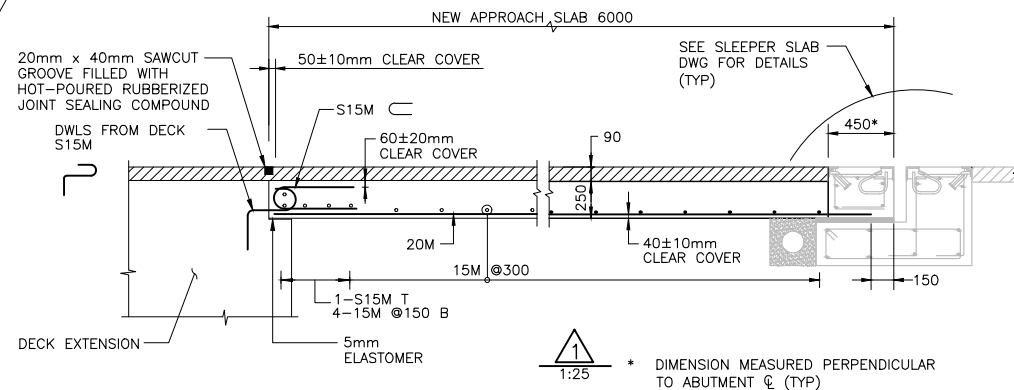
APPLICABLE STANDARD DRAWINGS:

- OPSD-3370.100 DECK, WATERPROOFING HOT APPLIED ASPHALT MEMBRANE WITH PROTECTION BOARD
- OPSD-3370.101 DECK, WATERPROOFING HOT APPLIED ASPHALT MEMBRANE AT ACTIVE CRACKS GREATER THAN 2mm WIDE AND CONSTRUCTION JOINTS
- OPSD-3950.100 JOINT - CONCRETE AND CONSTRUCTION ON STRUCTURE

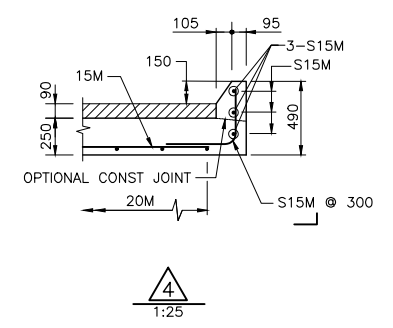
LEGEND:

- EXIST TO REMAIN
- EXIST ASPHALT
- NEW ASPHALT
- NEW CONCRETE

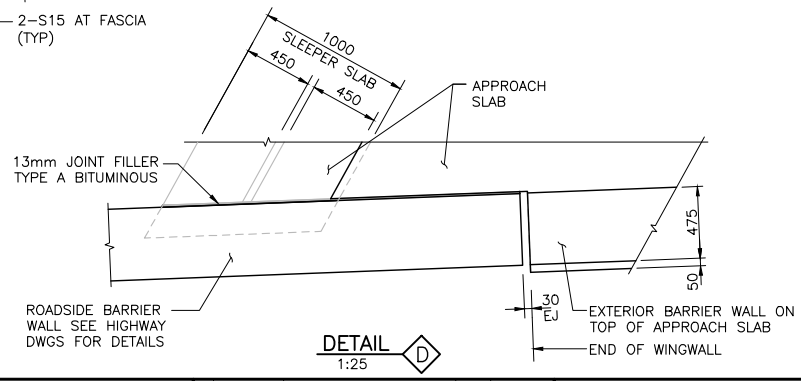
MODIFIED	
STANDARD DRAWING MARCH 2016	SS116-1
6000 mm APPROACH SLAB	



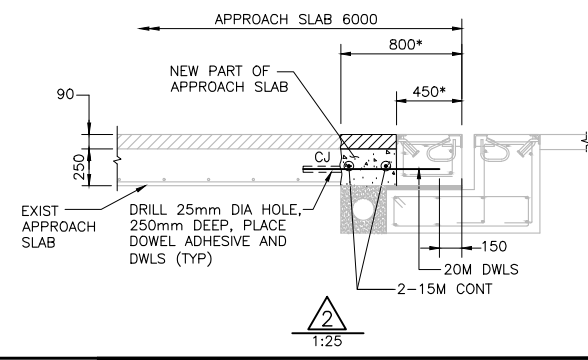
1:25 * DIMENSION MEASURED PERPENDICULAR TO ABUTMENT CL (TYP)



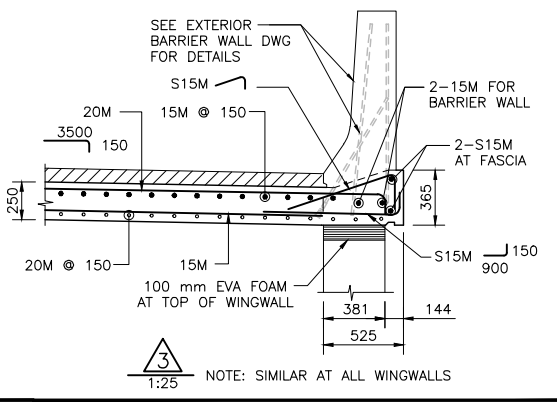
1:25



DETAIL C
1:25



1:25



1:25

NOTE: SIMILAR AT ALL WINGWALLS

CAD FILE LOCATION AND NAME: C:\projectwise\wsp-co\wsp-co\projectwise\wsp-co\H427-D-N-9A-STR-803-LWG-609AP.dwg
 MODIFIED: 3/19/2018 9:51:54 AM BY: PANGF
 DATE PLOTTED: 3/19/2018 11:21:14 AM BY: PANGF

DATE	REVISIONS	BY	CHK	LEAD DISC.	PROJ. MAN.
C 18/03/16	90% SUBMISSION TO CA				
B 18/01/09	90% SUBMISSION TO CA				
A 17/10/31	90% SUBMISSION TO CA				

SCALE :
AS NOTED

DESIGNED	SHELLEY HUANG	
DRAWN	TOM ZHAO	
CHECKED	TATIANA OJALA	
APPROVED LEAD ENG.	TATIANA OJALA	
APPROVED PROJ. MANAGER		
NAME (PRINT)	INT.	DATE



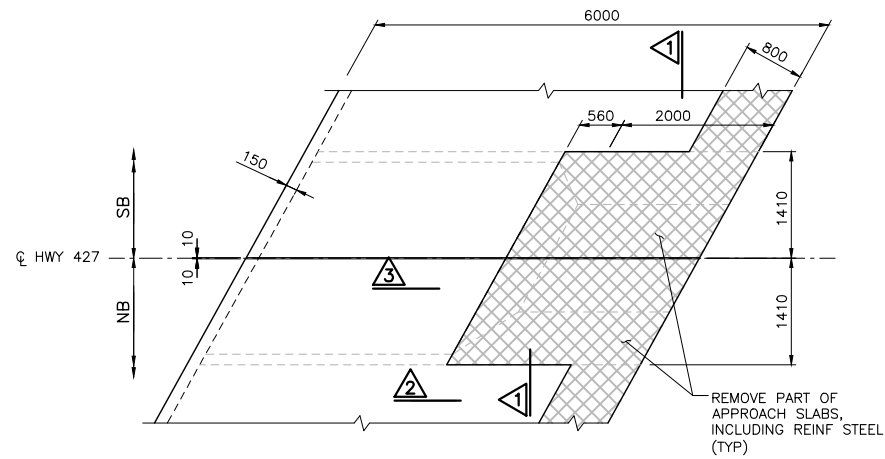
TITLE						
HWY 427 EXPANSION HWY 427 / HUMBER RIVER BRIDGES REHABILITATION R2 SITE 37-633/1&2 6000mm APPROACH SLABS I						
PROJECT ID.	STAGE IDENTIFIER	DESIGN PACKAGE NUMBER	DISCIPLINE	STRUCTURE NUMBER	DOCUMENT TYPE	DRAWING NUMBER
H427-D	N	9A	STR	B03	DWG	609
						C

NOTE:

1. THIS DRAWING TO BE READ WITH DWGS 601 AND 609.
2. ROUGHEN SURFACE AT CJ.

LEGEND:

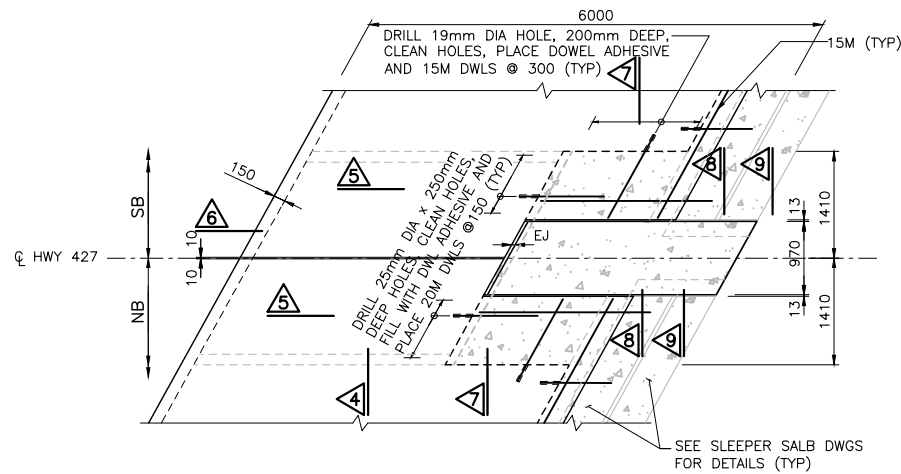
- EXIST TO REMAIN
- REMOVALS
- NEW CONCRETE
- EXIST ASPHALT
- NEW ASPHALT



PART PLAN - APPROACH SLABS AT MEDIAN REMOVALS

1:50

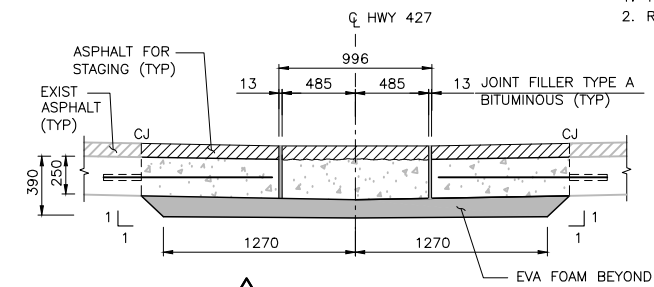
NORTH APPROACH SLAB SHOWN, SOUTH APPROACH SLAB SIMILAR



PART PLAN - APPROACH SLABS AT MEDIAN RECONSTRUCTIONS (TOP OF CONCRETE)

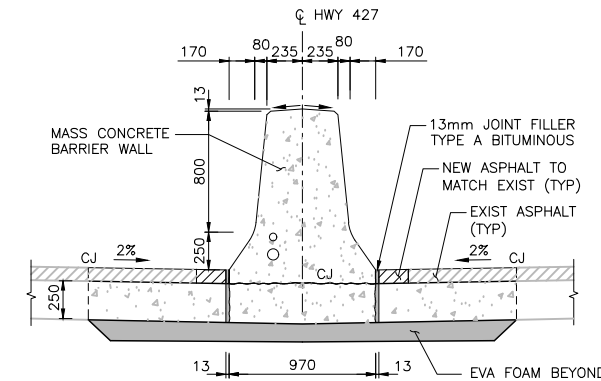
1:50

NOTE: NORTH APPROACH SLAB SHOWN, SOUTH APPROACH SLAB SIMILAR. MEDIAN BARRIER WALLS NOT SHOWN FOR CLARITY.



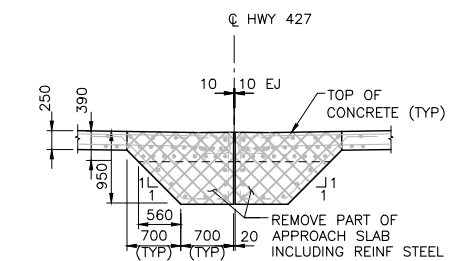
7 CONSTRUCTION STAGE

1:25



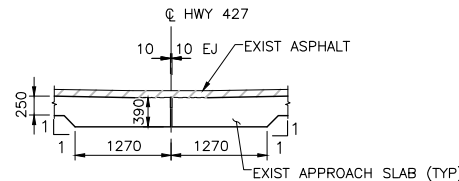
7 FINAL

1:25



1

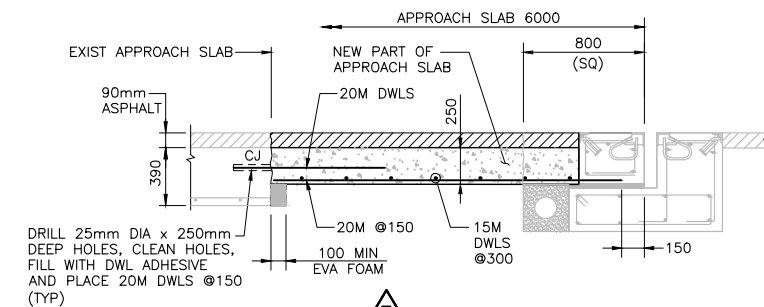
1:50



4 CONSTRUCTION STAGES

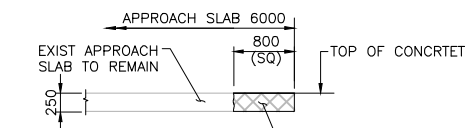
1, 2A & 2B

1:50



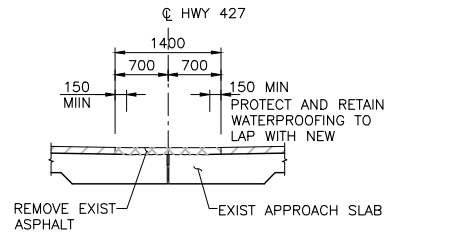
5

1:25



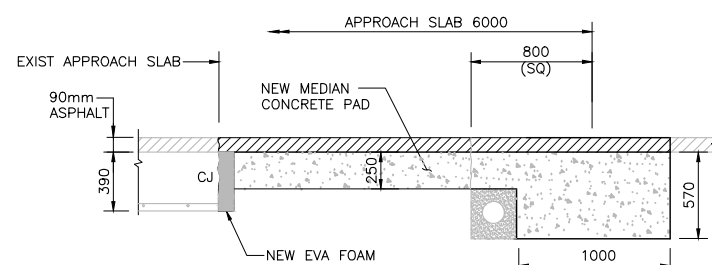
2

1:50



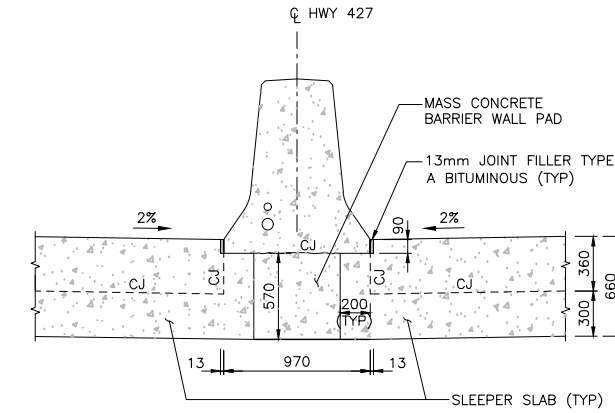
4 CONSTRUCTION STAGE 3

1:50



6 CONSTRUCTION STAGE

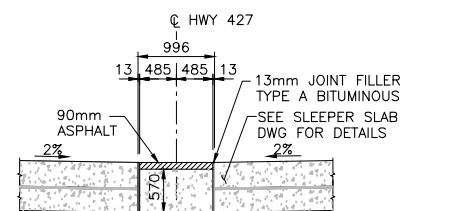
1:25



9 FINAL

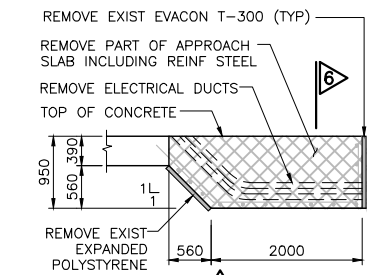
1:25

NOTE: DETAILS SAME AS 8 UNO



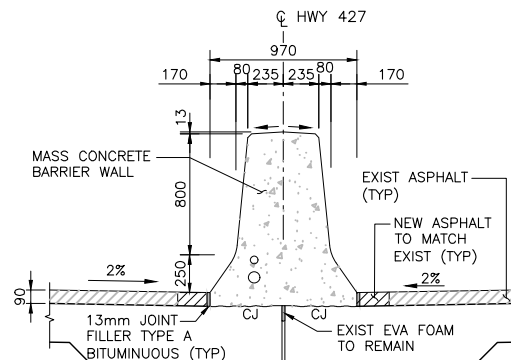
8 CONSTRUCTION STAGE

1:50



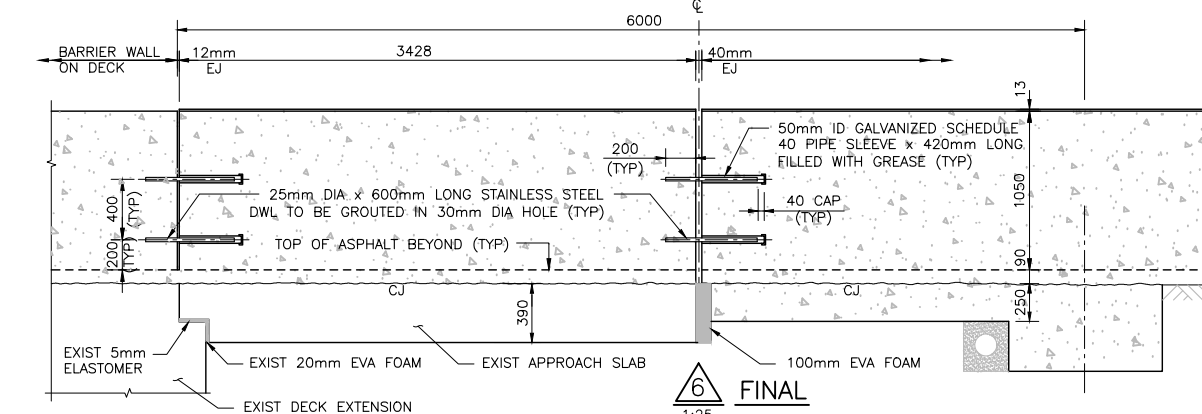
3

1:50



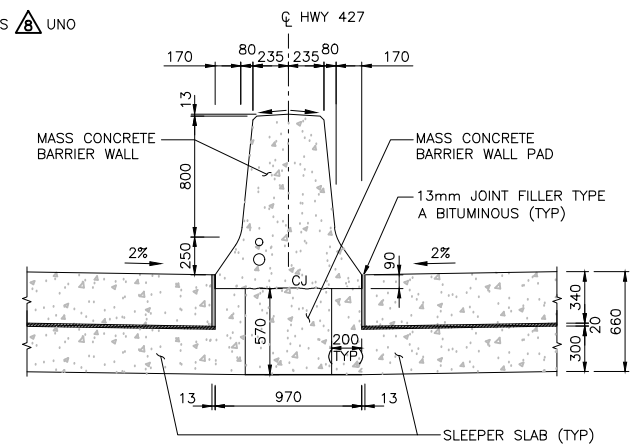
4 FINAL

1:25



6 FINAL

1:25



8 FINAL

1:25

CAD FILE LOCATION AND NAME: C:\project\wise\wsp-ca\project\wise\wsp-ca\project\wise\H427-D-N-9A-STR-803-LWG-610AP.dwg
 MODIFIED: 3/19/2018 9:51:09 AM BY: PANGF
 DATE PLOTTED: 3/19/2018 11:21:18 AM BY: PANGF

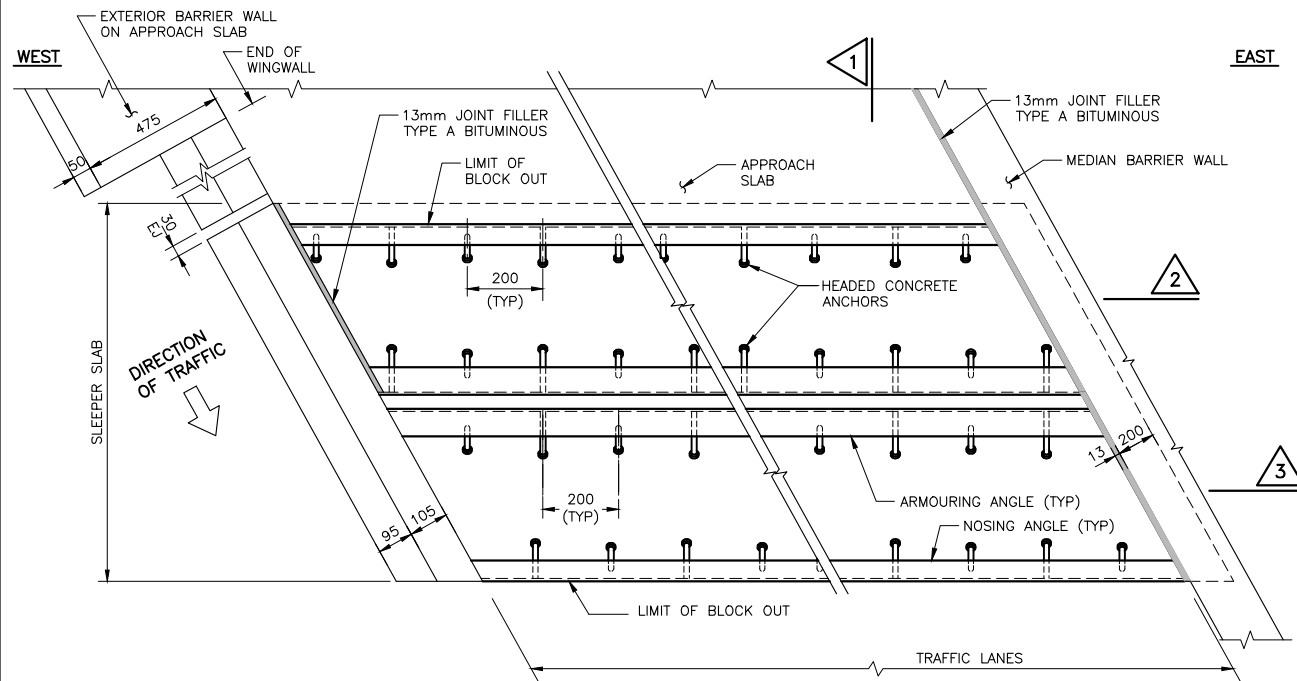
SCALE :

AS NOTED

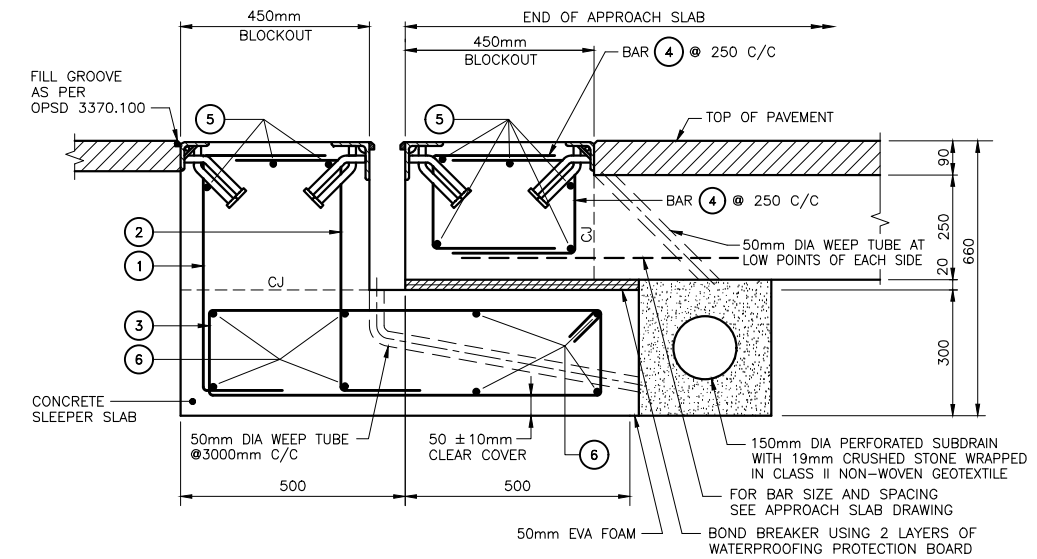
DESIGNED	SHELLEY HUANG
DRAWN	TOM ZHAO
CHECKED	TATIANA OJALA
APPROVED LEAD ENG.	TATIANA OJALA
APPROVED PROJ. MANAGER	
CONSULTANT	
NAME (PRINT)	INT. DATE



<p>HWY 427 EXPANSION HWY 427 / HUMBER RIVER BRIDGES REHABILITATION R2 SITE 37-633/1&2 6000mm APPROACH SLABS II</p>							
PROJECT ID.	STAGE IDENTIFIER	DESIGN PACKAGE NUMBER	DISCIPLINE	STRUCTURE NUMBER	DOCUMENT TYPE	DRAWING NUMBER	REVISION NUMBER
H427-D	N	9A	STR	B03	DWG	610	C



PLAN
(FOR EJ AND ASSEMBLY DETAILS, SEE SS113-19)
NOTE: SW SHOWN
NE, SE & NW SIMILAR



1 SECTION
(EXPANSION JOINT SEAL NOT SHOWN)

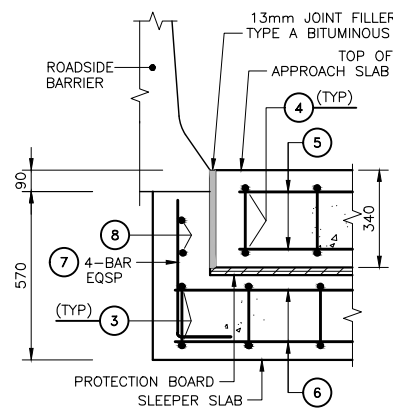
NOTES:

- THIS DRAWING TO BE READ IN CONJUNCTION WITH DRAWING SS113-19.
- CLASS OF CONCRETE TO BE 30MPa.
- REINFORCEMENT STEEL SHALL BE GRADE 400W. STAINLESS STEEL SHALL BE TYPE 316 LN OR DUPLEX 2205 WITH A MINIMUM YIELD STRENGTH OF 500 MPA. BARS MARKED WITH PREFIX S DENOTE STAINLESS STEEL BARS.
- COVER TO REINFORCING STEEL 70 ± 20mm EXCEPT AS NOTED.
- FOR SKEWED STRUCTURE, WORKING DRAWING SHALL BE DETAILED TO SUIT GEOMETRY OF STRUCTURE.

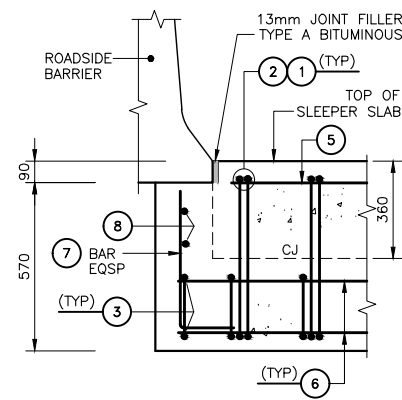
LEGEND:

- [] - DENOTED FASTENER SIZE IN INCHES
- EJ - DENOTED EXPANSION JOINT
- CJ - DENOTED CONSTRUCTION JOINT
- EQSP - DENOTED EQUALLY SPACE

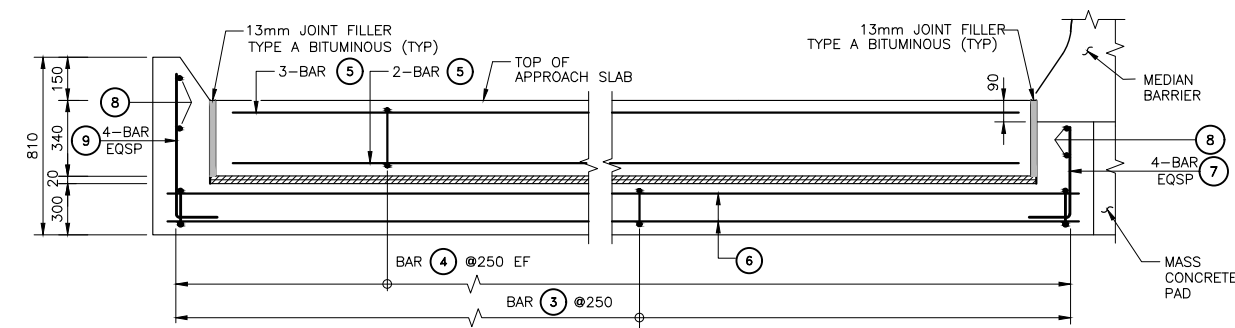
BAR MARK	SIZE	SHAPE
1	S15M	310 520 180
2	S15M	300 520 180
3	15M	160 860
4	S15M	200 310
5	S15M	STRAIGHT
6	15M	STRAIGHT
7	S15M	180 430
8	S15M	STRAIGHT
9	S15M	180 670



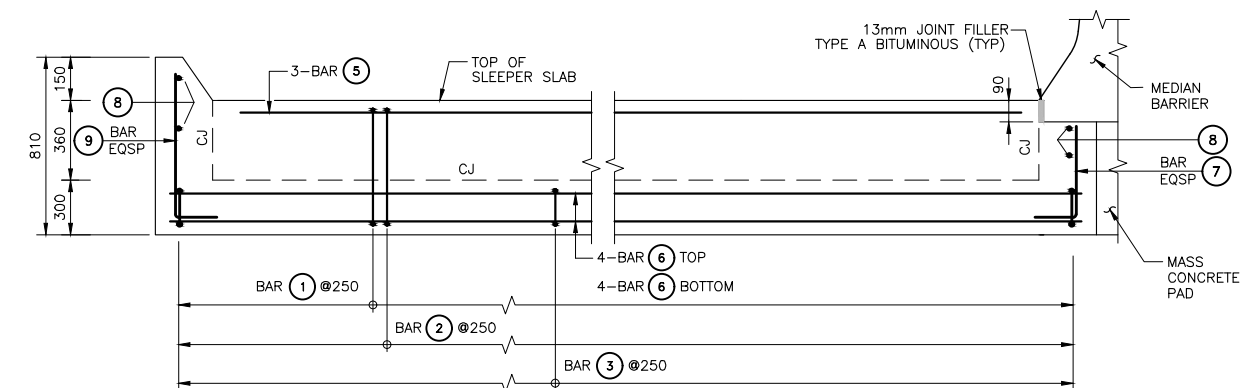
WITH ROADSIDE BARRIER
(NE, SE, NW)



WITH ROADSIDE BARRIER
(NE, SE, NW)



2 SECTION
(ARMORING DETAIL NOT SHOWN FOR CLARITY)



3 SECTION
(ARMORING DETAIL NOT SHOWN FOR CLARITY)

MODIFIED	
STANDARD DRAWING SEPTEMBER 2016	SS113-37
EXPANSION JOINT AND SLEEPER SLAB FOR INTEGRAL AND SEMI-INTEGRAL ABUTMENT BRIDGES (10mm < MOVEMENT < 40mm)	

CAD FILE LOCATION AND NAME: C:\projects\ss113-37\ss113-37.dwg
 MODIFIED: 3/19/2018 9:51:15 AM BY: PANGF
 DATE PLOTTED: 3/19/2018 11:21:21 AM BY: PANGF

DATE	REVISIONS	BY	CHK	LEAD DISC.	PROJ. MAN.
C 18/03/16	90% SUBMISSION TO CA				
B 18/01/09	90% SUBMISSION TO CA				
A 17/10/31	90% SUBMISSION TO CA				

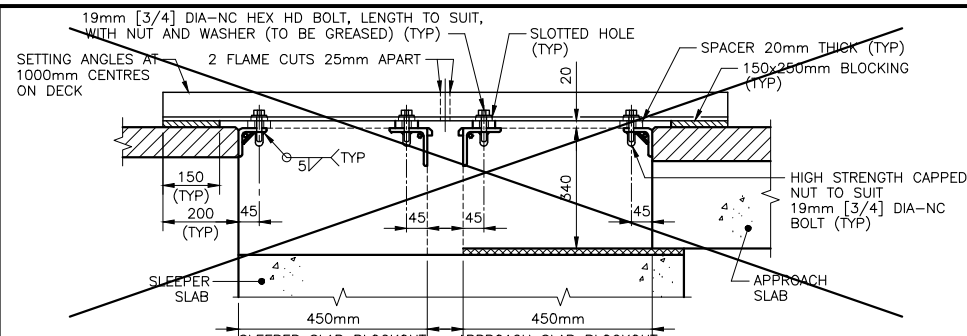
SCALE :

AS NOTED

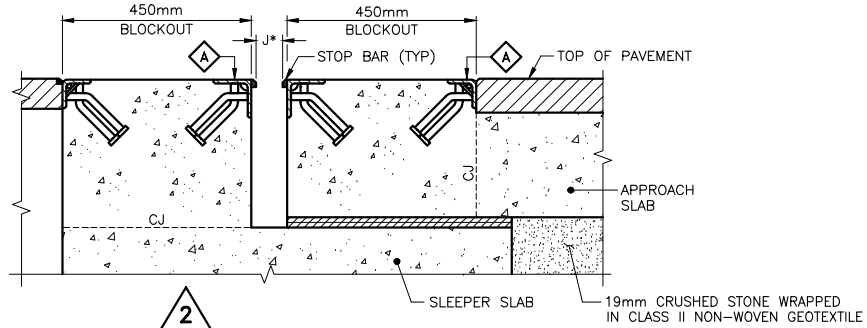
DESIGNED	SHELLEY HUANG
DRAWN	TOM ZHAO
CHECKED	TATIANA OJALA
APPROVED LEAD ENG.	TATIANA OJALA
APPROVED PROJ. MANAGER	
NAME (PRINT)	INT.
	DATE



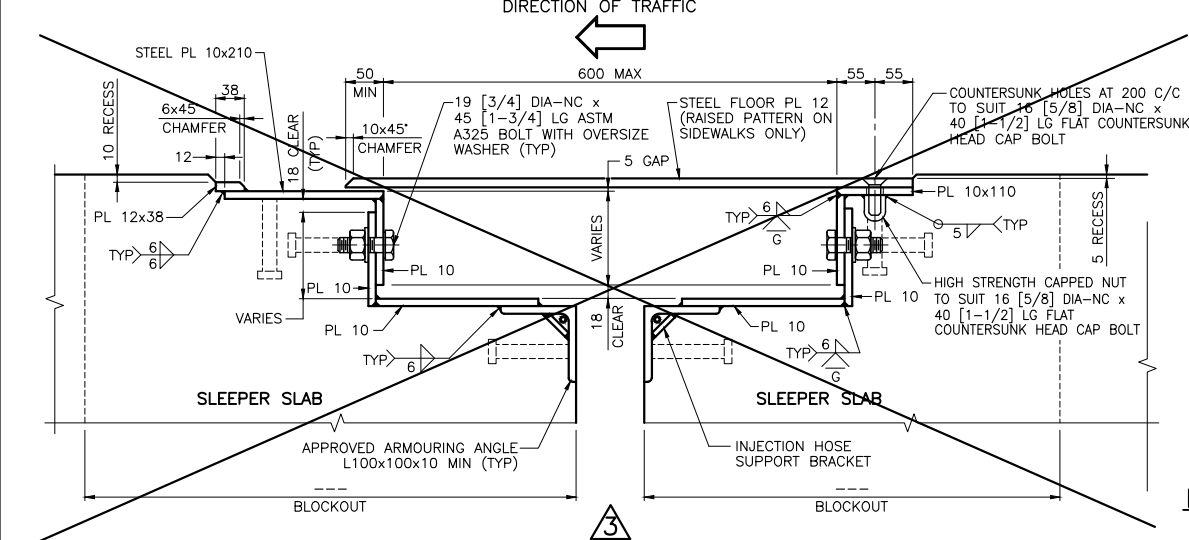
HWY 427 EXPANSION HWY 427 / HUMBER RIVER BRIDGES REHABILITATION R2 SITE 37-633/1&2 EXPANSION JOINT AND SLEEPER SLAB							
PROJECT ID.	STAGE IDENTIFIER	DESIGN PACKAGE NUMBER	DISCIPLINE	STRUCTURE NUMBER	DOCUMENT TYPE	DRAWING NUMBER	REVISION NUMBER
H427-D	N	9A	STR	B03	DWG	611	C



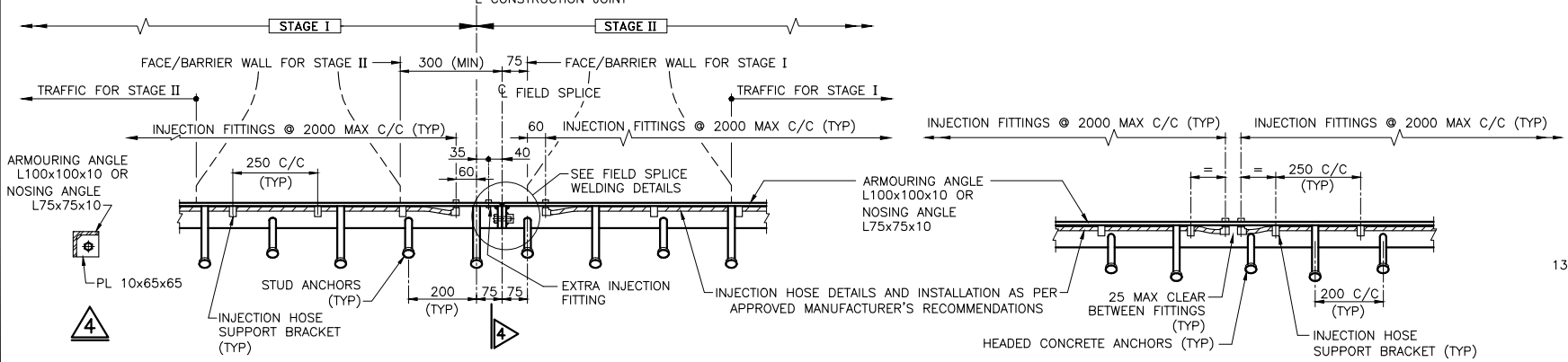
SETTING DEVICE AND BLOCKOUTS



(EXPANSION JOINT SEAL NOT SHOWN)

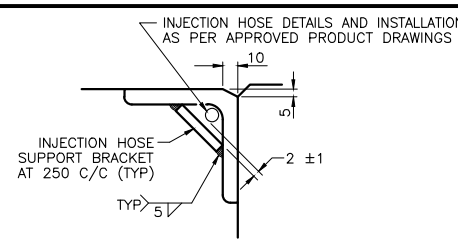


(STOP BARS AND RETAINER PLATES NOT SHOWN FOR CLARITY)

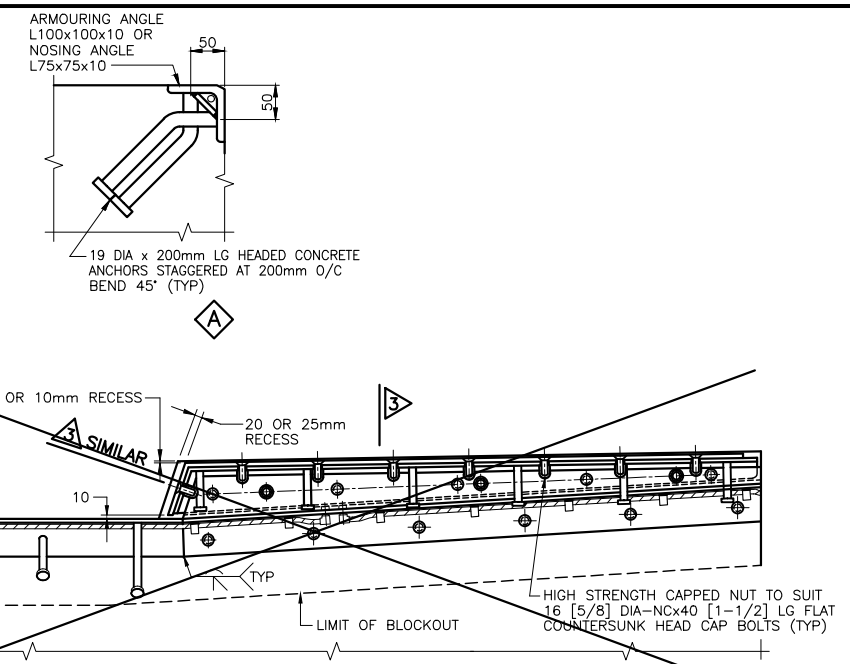


FIELD SPICE DETAILS AT STAGED CONSTRUCTION FOR ARMOURING AND NOSING ANGLES

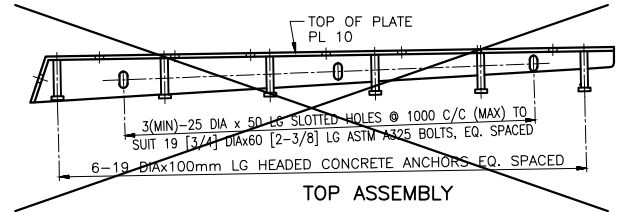
DETAILS OF HEADED CONCRETE ANCHORS AND INJECTION HOSE FOR ARMOURING AND NOSING ANGLES



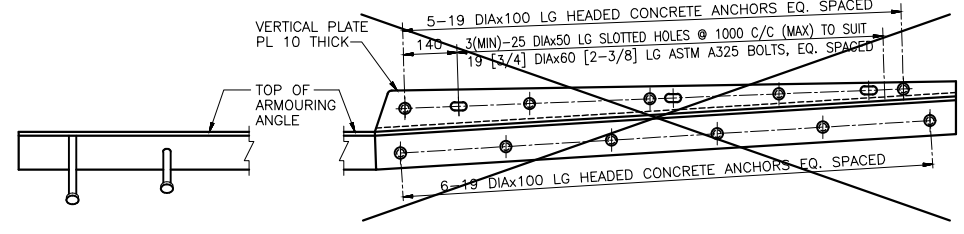
INJECTION HOSE SUPPORT BRACKET DETAIL



SECTION AT EXPANSION JOINT



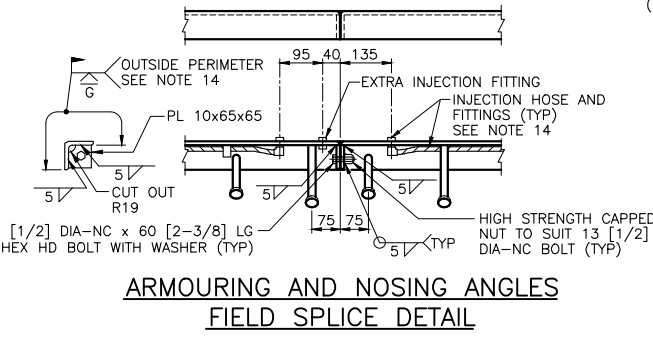
TOP ASSEMBLY



BOTTOM ASSEMBLY

DETAIL OF ARMOURING WITHOUT SIDEWALK

DETAIL OF ARMOURING AT SIDEWALK



ARMOURING AND NOSING ANGLES FIELD SPICE DETAIL

- NOTES:**
- THIS DRAWING SHOWS EXPANSION JOINT AND SLEEPER SLAB AT THE END OF APPROACH SLAB OF INTEGRAL AND SEMI-INTEGRAL ABUTMENT BRIDGES WITH A MOVEMENT BETWEEN 10 AND 40MM.
 - EXPANSION JOINT TO BE SUPPLIED BY MANUFACTURERS LISTED IN DSM 9.40.27 FOR THE SUPPLY OF TYPE 'C' STRIP SEAL EXPANSION JOINT.
 - EXPANSION JOINT ASSEMBLY CONSTRUCTION AND MATERIAL SHALL BE ACCORDING TO OPSS 920 AND OPSS 1210, AND AS SPECIFIED IN THE CONTRACT DOCUMENTS.
 - JOINT ASSEMBLY SHALL BE COMPLETELY SHOP ASSEMBLED (EXCEPT FOR SEALS) AND PRESET TO DIMENSION 'J' FOR 15°C AND ADJUSTED IN THE FIELD TO SUIT INSTALLATION TEMPERATURE.
 - JOINT ASSEMBLY INSTALLATION TEMPERATURE SHALL BE TAKEN AS MEAN SHADE AIR TEMPERATURE AT STRUCTURE PRIOR TO JOINT INSTALLATION AS FOLLOWS: - FOR CONCRETE STRUCTURES - 48 HOURS
 - FIELD SPLICES IN JOINT ASSEMBLY ARE ONLY PERMITTED AT STAGED CONSTRUCTION, AND/OR AS SHOWN ON THE CONTRACT DRAWINGS.
 - IF THE JOINT ARMOURING FOR A SKEW STRUCTURE IS SPLICED AT A CROWN, THE SPLICE SHALL BE DETAILED PARALLEL TO THE CENTRELINE OF THE TRAFFIC LANE.
 - SETTING ANGLES SHALL BE FLAME CUT ACCORDING TO OPSS 920, BUT IN NO CASE PRIOR TO CONCRETE REACHING INITIAL SET.
 - AFTER CURING OF THE CONCRETE HAS BEEN COMPLETED, THE SETTING DEVICES MAY BE REMOVED. THE Voids UNDER THE ARMOURING ANGLE AND NOSING ANGLE SHALL THEN BE PRESSURE INJECTED.
 - PREFORMED SEALS SHALL HAVE MINIMUM THICKNESS OF 5mm OR AS PER DSM.
 - ALL STEEL RETAINER SURFACES COMING IN CONTACT WITH PREFORMED SEAL SHALL BE CLEANED PRIOR TO INSTALLATION OF THE SEAL.
 - PREFORMED SEALS SHALL BE INSTALLED AFTER JOINT ASSEMBLY HAS BEEN CAST, STYROFOAM OR FILLER BETWEEN APPROACH SLAB AND SLEEPER SLAB REMOVED, AND EXPANSION GAP CLEARED OF ANY DEBRIS.
 - PROTECT INJECTION HOSE AND FITTINGS ADJACENT TO FIELD SPICE DURING WELDING AND REMOVE PROTECTION PRIOR TO PLACING OF CONCRETE IN BLOCKOUT.
 - ALL JOINT ANCHORAGES SHALL BE DETAILED ON WORKING DRAWINGS PERPENDICULAR TO THE EXPANSION JOINT ON BOTH THE APPROACH SLAB SIDE AND THE SLEEPER SLAB SIDE EXCEPT STRUCTURE SKEWED FROM OVER 15° AND UP TO 45° SHALL HAVE ANCHORAGES DETAILED 30° OFFSET FROM THE PERPENDICULAR TO THE EXPANSION JOINT ON THE APPROACH SLAB SIDE.
 - LEGEND: [] DENOTED FASTENER SIZE IN INCHES
EJ - DENOTES EXPANSION JOINT

- ADDITIONAL NOTES FOR BOLTS:**
- 19 [3/4] DIAMETER BOLTS SHALL BE IN ACCORDANCE WITH WITH ASTM A325. ALL BOLTS USED IN 25 DIA x 50 LONG SLOTTED HOLES SHALL BE INSTALLED WITH OVERSIZE WASHERS.
 - 16 [5/8] DIAMETER FLAT COUNTERSUNK HEAD CAP BOLTS SHALL BE IN ACCORDANCE WITH ASTM F835.
 - ALL BOLTS SHALL BE INSTALLED USING MOLY50 LUBRICANT.
 - ALL BOLTS SHALL BE TENSIONED USING THE TURN-OF-NUT TIGHTENING METHOD IN ACCORDANCE WITH CAN/CSA S6-14.

TABLE OF DESIGN REQUIREMENTS (TO BE FULLY COMPLETED BY DESIGNER)

EXP. JOINT LOCATION	MTO GAP ** RATING (mm)		DESIGN *** MOVEMENT	* "J" AT INSTALLATION TEMPERATURE (C) (mm)							
	MIN	MAX		-5°	0°	5°	10°	15°	20°	25°	30°
NORTH END	35	100	24	63	61	59	57	55	53	51	49
SOUTH END	35	100	24	63	61	59	57	55	53	51	49

* DIMENSION 'J' MEASURED PERPENDICULAR TO CENTRELINE OF EXPANSION JOINT. WHERE MIN. AND MAX. FOR JOINT SUPPLIED DIFFER FROM THOSE SHOWN IN TABLE, 'J' DIMENSIONS SHALL BE REVISED BY CONTRACTOR AND SHOWN ON SHOP DRAWINGS. FOR STAGED CONSTRUCTION ON STRUCTURES OTHER THAN POST-TENSIONED, THE CONTRACTOR SHALL USE THE FIRST STAGE OBSERVED 'J' GAP TO INSTALL THE SECOND STAGE.

** MTO GAP, MEASURED BETWEEN PROJECTING FACES OF STEEL CLAMPING BAR, IS TAKEN FROM DSM 9.40.27, TYPE 'C'.

*** CALCULATED TOTAL MOVEMENT AT SLS OCCURRING AFTER TIME OF JOINT INSTALLATION. (MEASURED PARALLEL TO CENTRELINE OF STRUCTURE)

MODIFIED	
STANDARD DRAWING SEPTEMBER 2016	SS113-19
STRIP SEAL EXPANSION JOINT FOR SLEEPER SLAB	

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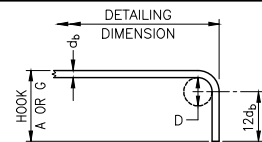
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A 17/10/31	90% SUBMISSION TO CA				

SCALE : AS NOTED

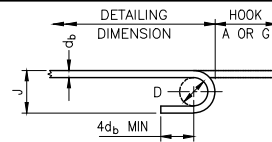
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DRAWN	TOM ZHAO	
CHECKED	TATIANA OJALA	
APPROVED LEAD ENG.	TATIANA OJALA	
APPROVED PROJ. MANAGER		
NAME (PRINT)	INT.	DATE



HWY 427 EXPANSION HWY 427 / HUMBER RIVER BRIDGES REHABILITATION R2 SITE 37-633/1&2 STRIP SEAL EXPANSION JOINT FOR SLEEPER SLAB							
PROJECT ID.	STAGE IDENTIFIER	DESIGN PACKAGE NUMBER	DISCIPLINE	STRUCTURE NUMBER	DOCUMENT TYPE	DRAWING NUMBER	REVISION NUMBER
H427-D	N	9A	STR	B03	DWG	612	C



STANDARD 90° HOOK



STANDARD 180° HOOK

MINIMUM BENDING PIN DIAMETER, D, mm

BAR SIZE	STEEL GRADE	
	400R (2)	400W
10M	70	60
15M	100	90
20M	120	100
25M	150	150
30M	250	200
35M	300	250
45M	450 (1)	400
55M	600 (1)	550

- (1) Special fabrication is required for bends exceeding 90° for bars of these sizes and grade.
- (2) For stainless steel, with $F_y = 500$, use the same D as for 400R.

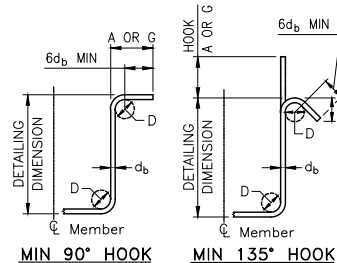
STANDARD HOOK DIMENSIONS

BAR SIZE	90° HOOKS		180° HOOKS			
	A OR G (mm)		A OR G (mm)		J (mm)	
	400R	400W	400R	400W	400R	400W
10M	180	180	140	130	90	80
15M	260	250	180	170	130	120
20M	310	300	220	200	160	140
25M	400	400	280	280	200	200
30M	510	490	400	350	310	260
35M	610	590	480	430	370	320
45M	790	770	680	630	540	490
55M	1030	1010	900	850	710	660

NOTE: All Hook Dimensions are according to the CHBDC-2014.

MINIMUM STIRRUP AND TIE HOOK DIMENSIONS

BAR SIZE	BAR DIAM. d_b (mm)	PIN DIAM. D (mm)	90°		135°	
			A OR G (mm)	A OR G (mm)	H (approx.) (mm)	
10M	11.3	45	100	100	70	
15M	16.0	65	140	140	100	
20M	19.5	80	180	175	115	
25M	25.2	100	230			

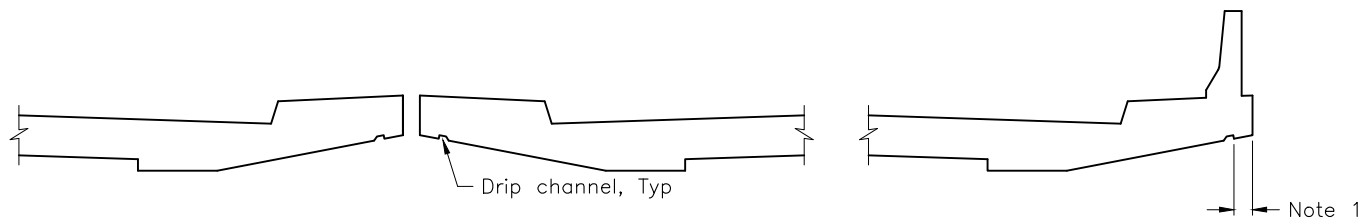


MIN 90° HOOK MIN 135° HOOK

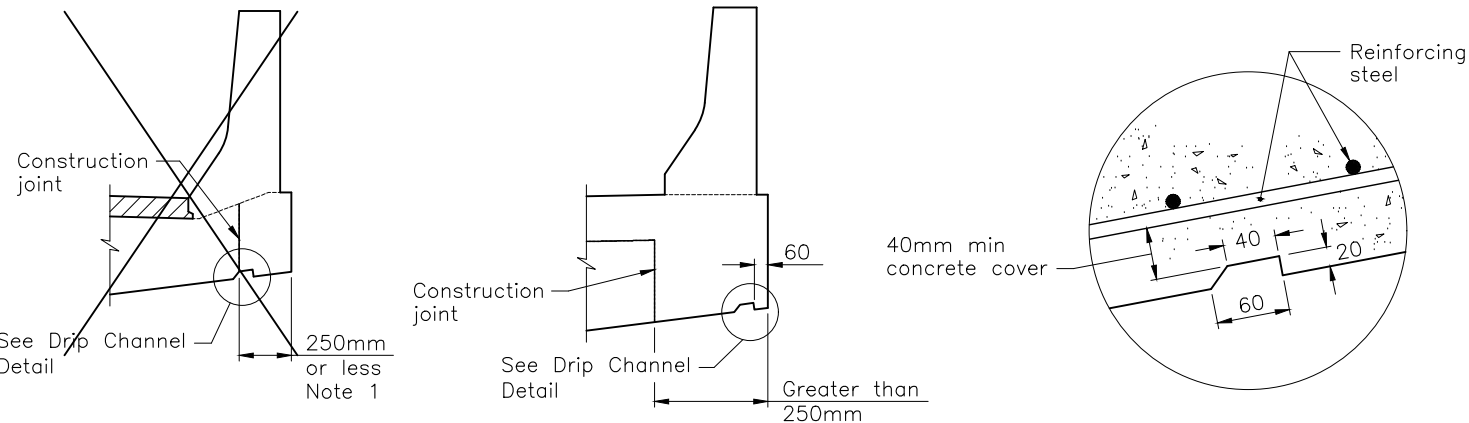
HOOK DIMENSIONS FOR REINFORCING STEEL BARS

Date: Sept. 2016 Rev: 0

SS12-1



SECTION



LOCATION OF DRIP CHANNEL WITH CONSTRUCTION JOINT

DRIP CHANNEL DETAIL

NOTES:

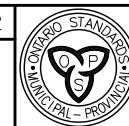
- 1 This dimension shall be 60mm, unless a vertical construction joint is within 250mm of the edge of structure, as shown.
- A Drip channel detail applies to all types of concrete deck slabs.
- B Drip channel shall be continuous along soffit.
- C All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING

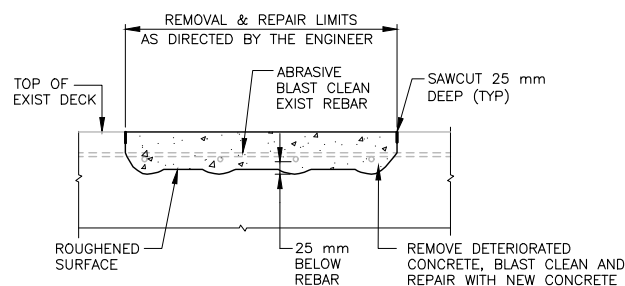
DECK DRIP CHANNEL

MODIFIED

Nov 2012 Rev 2

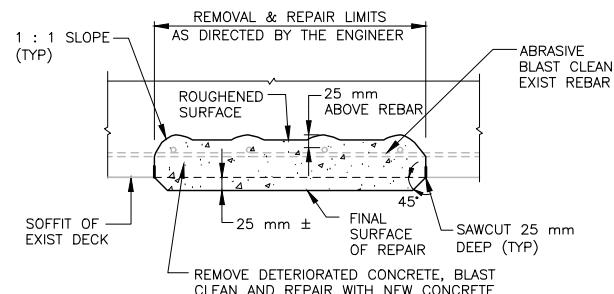


OPSD 3390.100



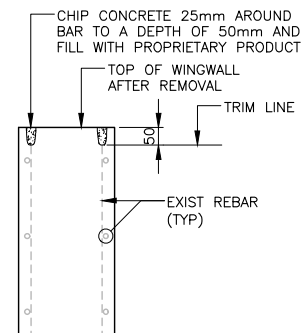
DECK SURFACE LOCAL CONCRETE REPAIR DETAILS

NTS



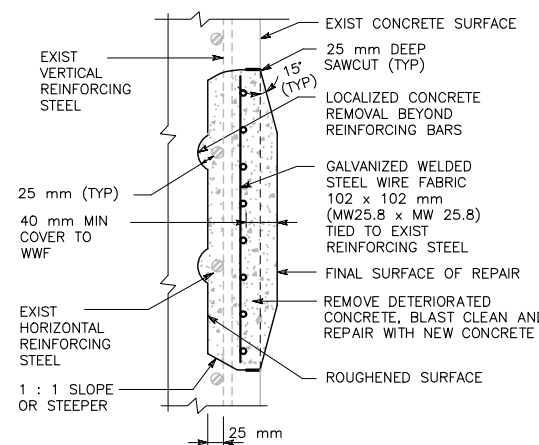
DECK SOFFIT LOCAL CONCRETE REPAIR DETAIL

NTS



TOP OF WINGWALL PATCH DETAIL

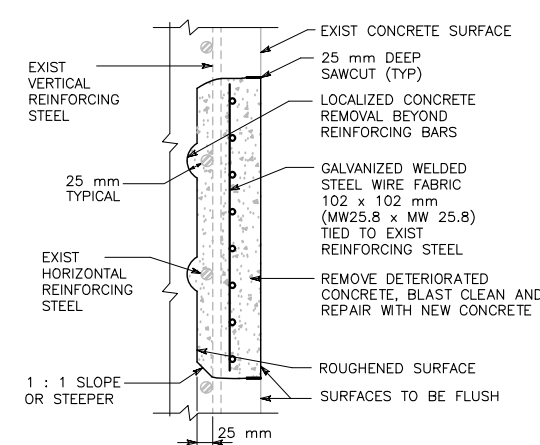
NTS



FOR EXIST CONCRETE COVER < 50 mm

VERTICAL SURFACE LOCAL CONCRETE REPAIR DETAILS

NTS



FOR EXIST CONCRETE COVER >= 50 mm

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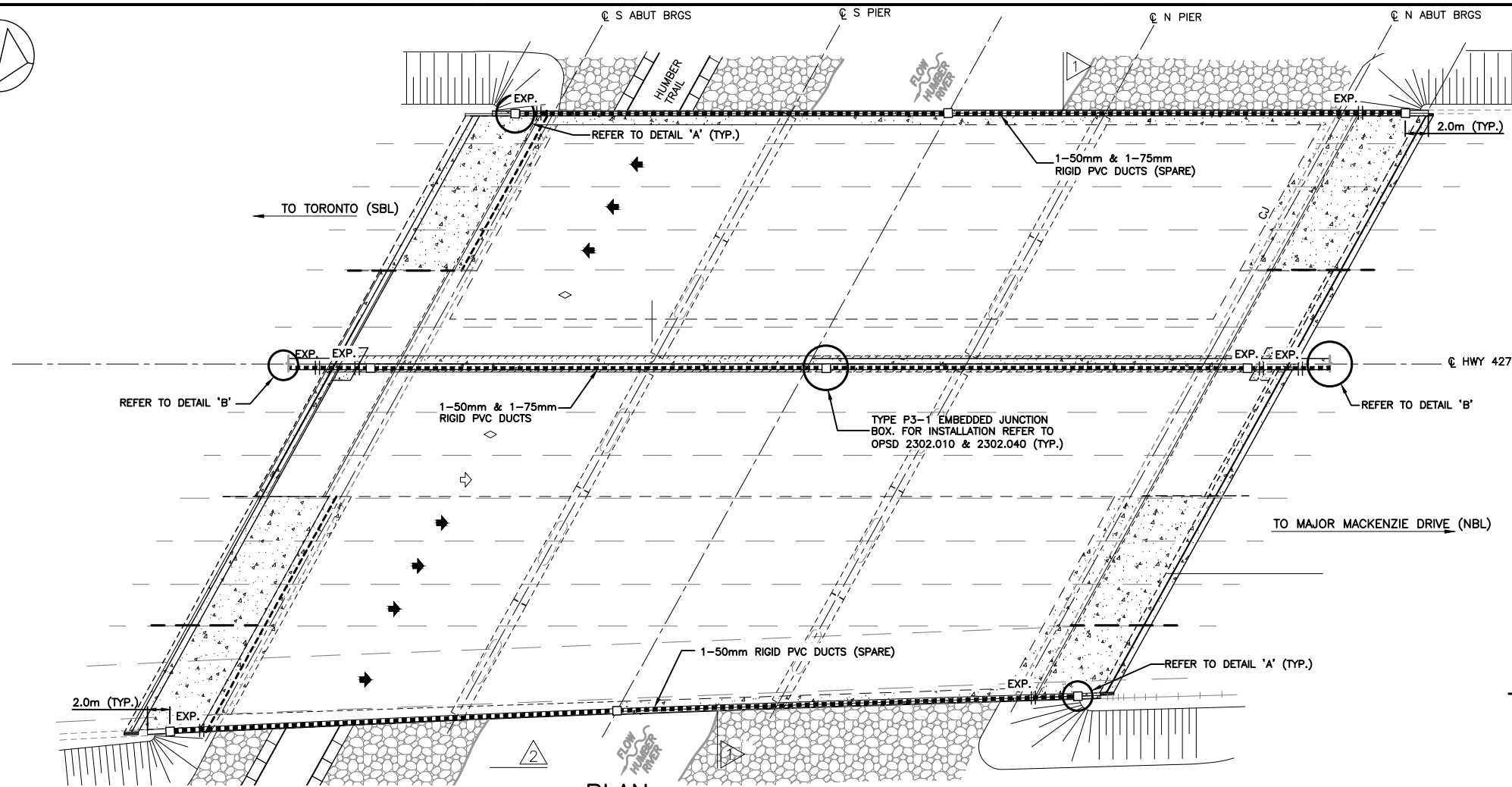
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A 17/10/31	90% SUBMISSION TO CA				

SCALE : AS NOTED

DESIGNED	SHELLEY HUANG	
DRAWN	TOM ZHAO	
CHECKED	TATIANA OJALA	
APPROVED LEAD ENG.	TATIANA OJALA	
APPROVED PROJ. MANAGER		
NAME (PRINT)	INT.	DATE

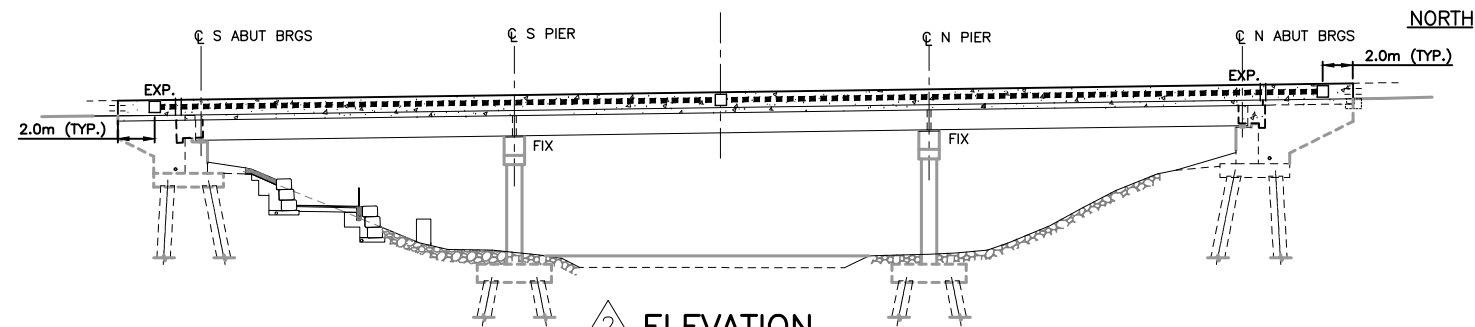


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H427-D	N	9A	STR	B03	DWG	613	C



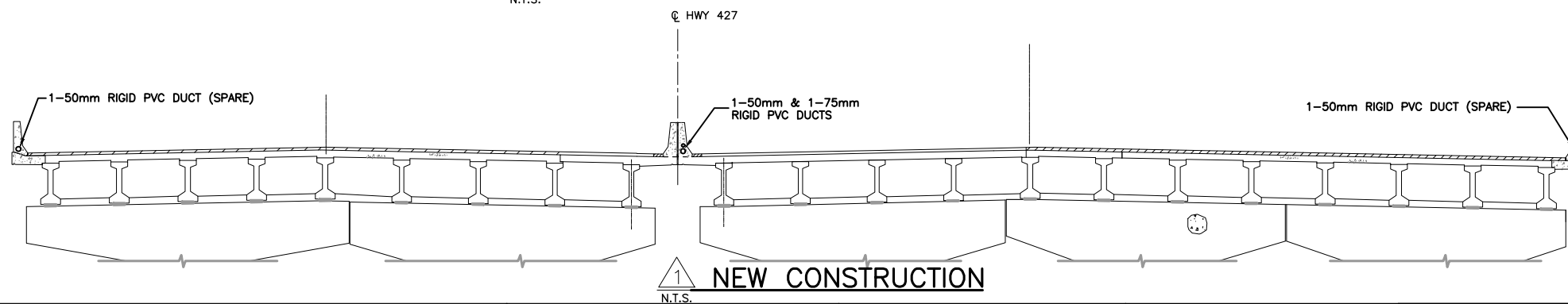
PLAN
N.T.S.

SOUTH



ELEVATION
N.T.S.

WEST



NEW CONSTRUCTION
N.T.S.

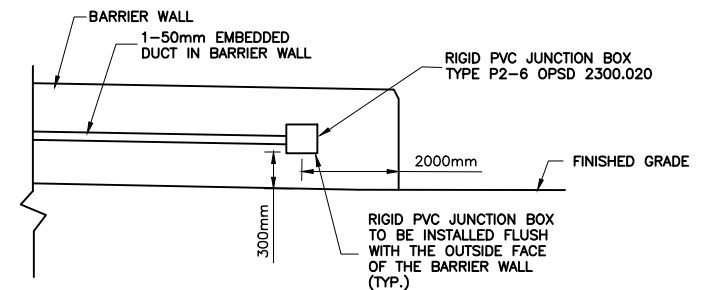
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APPLICABLE STANDARD DRAWINGS:

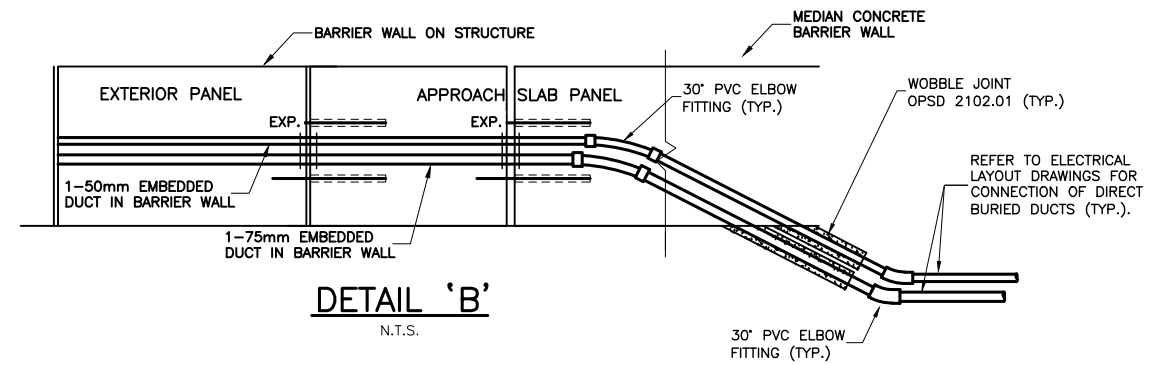
- OPSD 2011.101 - GENERAL SYMBOLS
- OPSD 2011.201 - GENERAL SYMBOLS
- OPSD 2102.010 - UNDERGROUND RIGID DUCT CONNECTION AT CONCRETE STRUCTURE
- OPSD 2302.010 - EMBEDDED WORK DETAIL
- OPSD 2302.020 - EXPANSION AND DEFLECTION FITTING ASSEMBLY
- OPSD 2302.040 - EMBEDDED WORK IN STRUCTURE

SUPPLEMENTARY LEGEND:

- RIGID JUNCTION BOX EMBEDDED
TYPE P2-6 OPSD 2300.020
C/W GALVANIZED STEEL COVER
- EXP. || EXPANSION AND DEFLECTION FITTING
ASSEMBLY PER OPSD 2302.02



DETAIL 'A' - TERMINATION OF EMBEDDED DUCT
N.T.S.



DETAIL 'B'
N.T.S.

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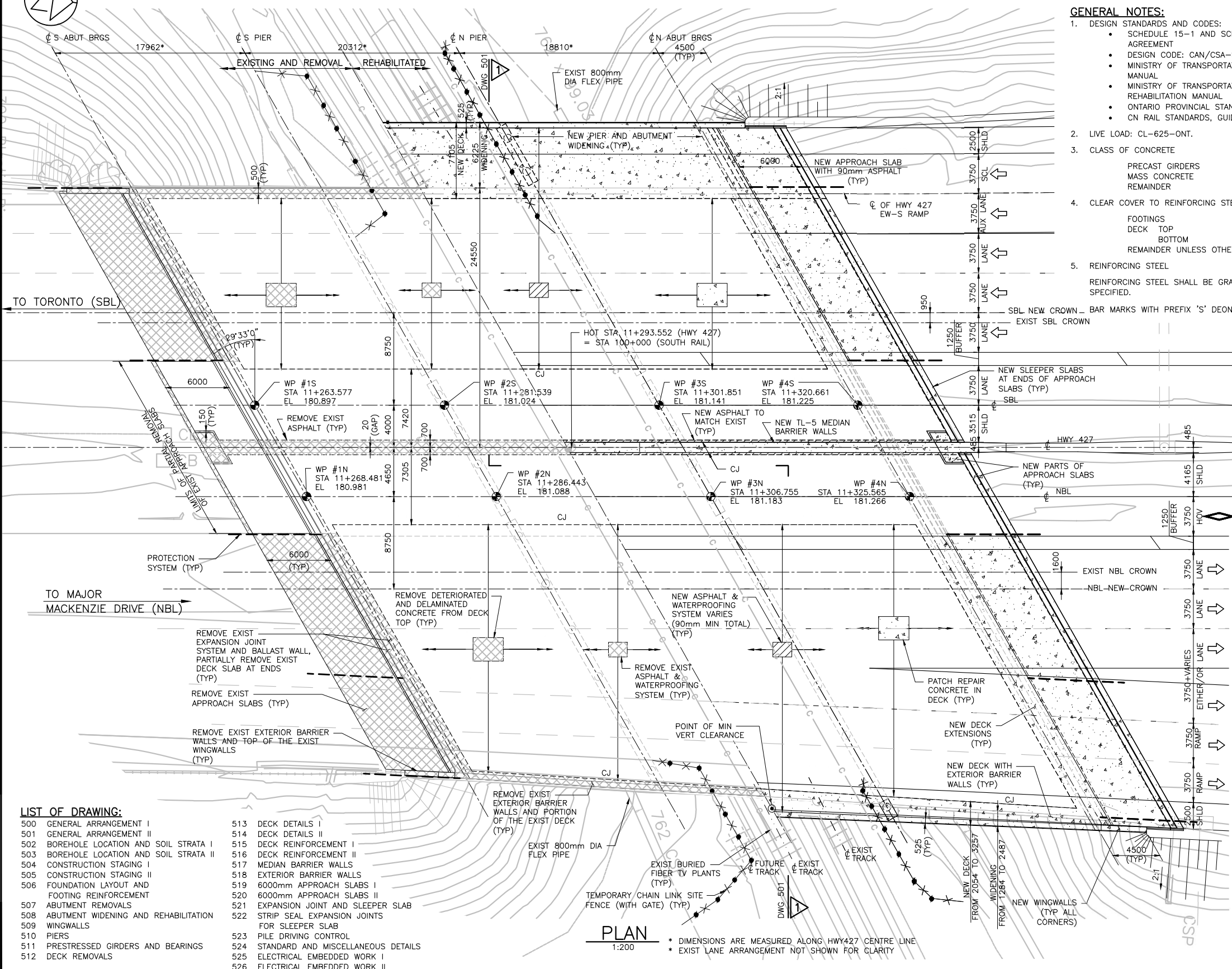
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B 18/01/09	90% SUBMISSION TO CA				
A 17/10/31	90% SUBMISSION TO CA				

SCALE :
N.T.S.

DESIGNED	MANPREET PANESAR	M.P.
DRAWN	KARAJIT GILL	K.G.
CHECKED	NATALIA MAHABIR	N.M.
APPROVED LEAD ENG.	MARIO TEDESCO	M.T.
APPROVED PROJ. MANAGER		
NAME (PRINT)		INT. DATE



TITLE							
HWY 427 / HUMBER RIVER BRIDGES REHABILITATION R2							
SITE 37-633/1&2							
ELECTRICAL EMBEDDED WORK							
PROJECT ID.	STAGE IDENTIFIER	DESIGN PACKAGE NUMBER	DISCIPLINE	STRUCTURE NUMBER	DOCUMENT TYPE	DRAWING NUMBER	REVISION NUMBER
H427-D	N	9A	STR	B03	DWG	614	C



NOTE:
 1. READ THIS DRAWING IN CONJUNCTION WITH GENERAL ARRANGEMENT II DWG 501.

GENERAL NOTES:
 1. DESIGN STANDARDS AND CODES:
 • SCHEDULE 15-1 AND SCHEDULE 15-2: PROJECT AGREEMENT
 • DESIGN CODE: CAN/CSA-S6-14
 • MINISTRY OF TRANSPORTATION OF ONTARIO STRUCTURAL MANUAL
 • MINISTRY OF TRANSPORTATION OF ONTARIO STRUCTURE REHABILITATION MANUAL
 • ONTARIO PROVINCIAL STANDARD SPECIFICATIONS (OPSS)
 • CN RAIL STANDARDS, GUIDELINES AND POLICY

2. LIVE LOAD: CL-625-ONT.
 3. CLASS OF CONCRETE
 PRECAST GIRDERS 50 MPa
 MASS CONCRETE 20 MPa
 REMAINDER 30 MPa

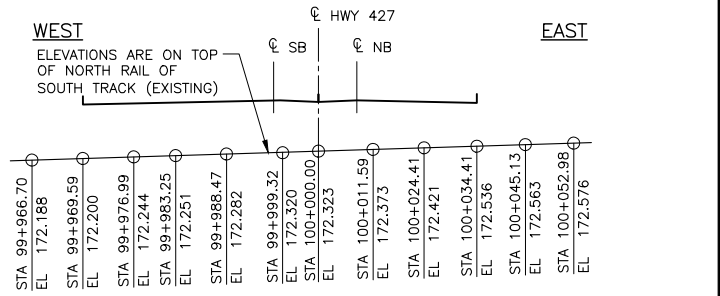
4. CLEAR COVER TO REINFORCING STEEL
 FOOTINGS 100±25
 DECK TOP 70±20
 BOTTOM 40±10
 REMAINDER UNLESS OTHERWISE NOTED 70±20

5. REINFORCING STEEL
 REINFORCING STEEL SHALL BE GRADE 400W UNLESS OTHERWISE SPECIFIED.
 SBL NEW CROWN - BAR MARKS WITH PREFIX 'S' DEONTE STAINLESS STEEL BARS
 EXIST SBL CROWN

6. TENSION LAP SPLICES SHALL BE CLASS B. UNLESS SHOWN OTHERWISE.
 BAR HOOKS SHALL HAVE STANDARD HOOK DIMENSIONS USING MINIMUM BEND DIAMETERS, WHILE STIRRUPS AND TIES SHALL HAVE MINIMUM HOOK DIMENSIONS ALL HOOKS SHALL BE IN ACCORDANCE WITH THE STRUCTURAL STANDARD DRAWING SS12-1 UNLESS INDICATED OTHERWISE.
 6. GLASS FIBRE REINFORCED POLYMER (GFRP)
 GLASS FIBRE REINFORCED POLYMER (GFRP) REINFORCING BARS SHALL BE GRADE III AS SPECIFIED IN THE CONTRACT DOCUMENTS
 THE NOMINAL DIAMETER, TENSILE MODULUS OF ELASTICITY AND GUARANTEED MINIMUM TENSILE STRENGTH SHALL BE AS SPECIFIED IN THE CONTRACT DOCUMENTS
 BAR MARKS WITH THE PREFIX GIII DENOTE GRADE III GFRP BARS

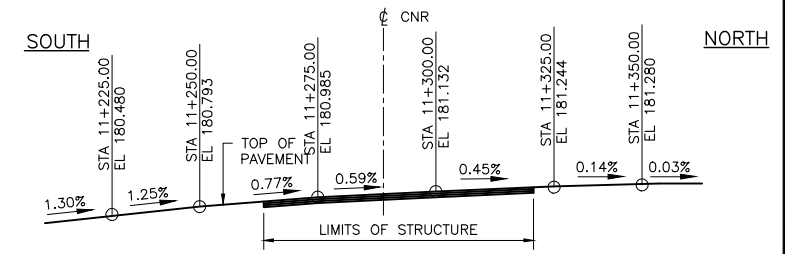
7. ROADWAY CLASSIFICATION: UFD 120.
 8. PROTECTION SYSTEM SHALL CONFORM TO PERFORMANCE LEVEL 2.
 9. ALL DIMENSIONS ARE IN MILLIMETERS ALL STATIONS AND ELEVATIONS ARE IN METERS UNLESS OTHERWISE SHOWN.

LEGEND:
 [Symbol] EXISTING TO REMAIN
 [Symbol] REMOVAL
 [Symbol] NEW CONCRETE
 [Symbol] NEW ASPHALT

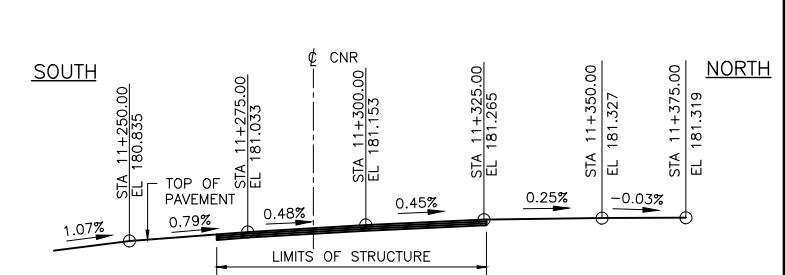


PROFILE OF CNR

NOTE: THE PROFILE OF CNR IS FROM SURVEY DATA BY LINK 427



PROFILE OF HWY 427 SB



PROFILE OF HWY 427 NB

LIST OF DRAWING:

- | | |
|---|--|
| 500 GENERAL ARRANGEMENT I | 513 DECK DETAILS I |
| 501 GENERAL ARRANGEMENT II | 514 DECK DETAILS II |
| 502 BOREHOLE LOCATION AND SOIL STRATA I | 515 DECK REINFORCEMENT I |
| 503 BOREHOLE LOCATION AND SOIL STRATA II | 516 DECK REINFORCEMENT II |
| 504 CONSTRUCTION STAGING I | 517 MEDIAN BARRIER WALLS |
| 505 CONSTRUCTION STAGING II | 518 EXTERIOR BARRIER WALLS |
| 506 FOUNDATION LAYOUT AND FOOTING REINFORCEMENT | 519 6000mm APPROACH SLABS I |
| 507 ABUTMENT REMOVALS | 520 6000mm APPROACH SLABS II |
| 508 ABUTMENT WIDENING AND REHABILITATION | 521 EXPANSION JOINT AND SLEEPER SLAB |
| 509 WINGWALLS | 522 STRIP SEAL EXPANSION JOINTS FOR SLEEPER SLAB |
| 510 PIERS | 523 PILE DRIVING CONTROL |
| 511 PRESTRESSED GIRDERS AND BEARINGS | 524 STANDARD AND MISCELLANEOUS DETAILS |
| 512 DECK REMOVALS | 525 ELECTRICAL EMBEDDED WORK I |
| | 526 ELECTRICAL EMBEDDED WORK II |

PLAN
 1:200
 * DIMENSIONS ARE MEASURED ALONG HWY427 CENTRE LINE
 * EXIST LANE ARRANGEMENT NOT SHOWN FOR CLARITY

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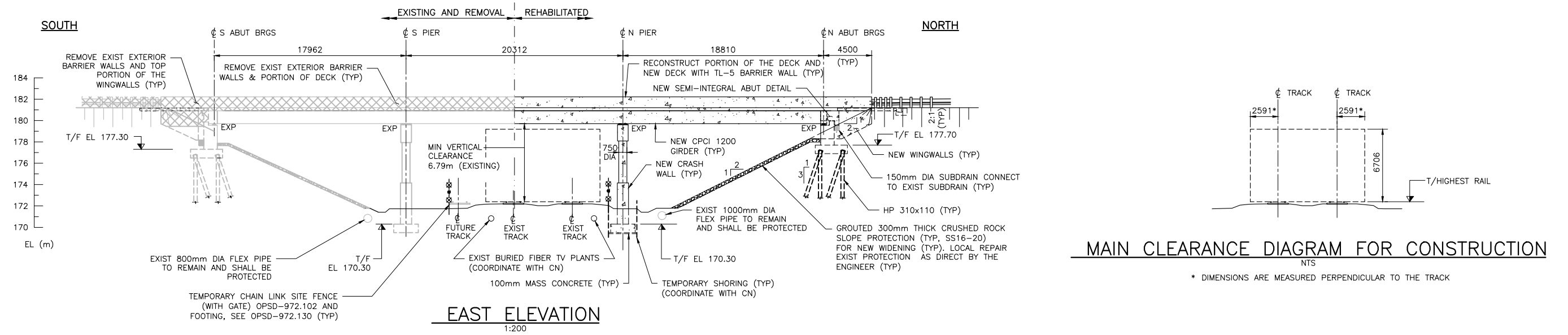
SCALE : AS NOTED

DESIGNED	SHELLEY HUANG
DRAWN	TOM ZHAO
CHECKED	TATIANA OJALA
APPROVED LEAD ENG.	TATIANA OJALA
APPROVED PROJ. MANAGER	



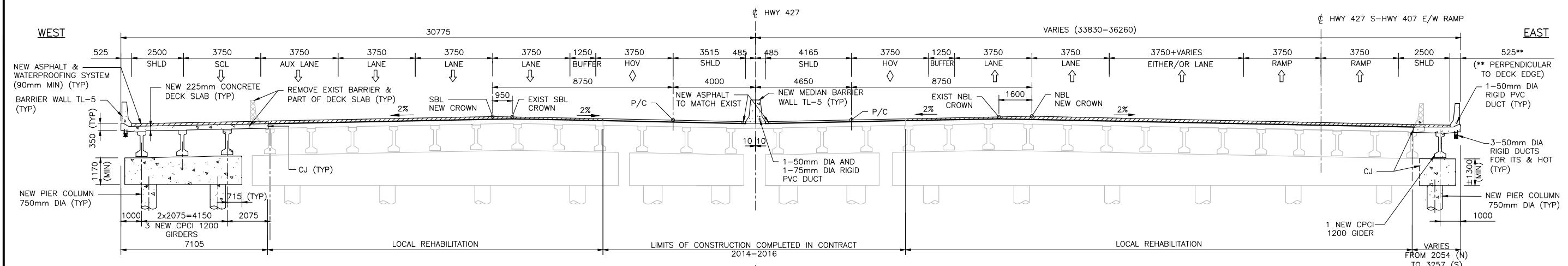
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 HWY 427 EXPANSION
 HWY 427 NBL & SBL / CNR OVERHEAD REHABILITATION AND WIDENING
 SITE 37-1109
 GENERAL ARRANGEMENT I

PROJECT ID.	STAGE IDENTIFIER	DESIGN PACKAGE NUMBER	DISCIPLINE	STRUCTURE NUMBER	DOCUMENT TYPE	DRAWING NUMBER	REVISION NUMBER
H427-D	N	9	STR	B04	DWG	500	B



MAIN CLEARANCE DIAGRAM FOR CONSTRUCTION

* DIMENSIONS ARE MEASURED PERPENDICULAR TO THE TRACK



(FOR STAGING REFER TO HIGHWAY STAGING DRAWINGS)
NOTE: LANE ARRANGEMENT SHOWN ARE LOCATED AT NORTH ABUTMENT, REFER TO HIGHWAY DRAWINGS FOR OTHER DETAILS

NOTE:

1. READ THIS DRAWING IN CONJUNCTION WITH GENERAL ARRANGEMENT I DWG 500.

CONSTRUCTION NOTES:

1. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS, DETAILS AND ELEVATIONS OF EXISTING STRUCTURE THAT ARE RELEVANT TO THE WORK SHOWN ON THE DRAWINGS PRIOR TO COMMENCEMENT OF WORK. ANY DISCREPANCIES SHALL BE REPORTED TO THE ENGINEER AND THE PROPOSED ADJUSTMENT OF THE WORK REQUIRED TO MATCH THE EXISTING STRUCTURE SHALL BE SUBMITTED FOR APPROVAL.
2. THE CONTRACTOR SHALL ESTABLISH THE BEARING SEAT ELEVATIONS BY DEDUCTING THE ACTUAL BEARING THICKNESSES FROM THE TOP OF BEARING ELEVATIONS IF THE ACTUAL BEARING THICKNESSES ARE DIFFERENT FROM THOSE GIVEN WITH THE BEARING DESIGN DATA, THE CONTRACTOR SHALL ADJUST THE REINFORCING STEEL TO SUIT.
3. BACKFILL SHALL NOT BE PLACED BEHIND THE SUPERSTRUCTURE UNTIL THE DECK SLAB IS IN PLACE AND HAS REACHED 70% OF ITS DESIGN STRENGTH.
4. BACKFILL SHALL BE PLACED SIMULTANEOUSLY BEHIND BOTH END OF SUPERSTRUCTURE KEEPING THE HEIGHT OF BACKFILL APPROXIMATELY THE SAME. AT NO TIME SHALL THE DIFFERENCE IN ELEVATION BE GREATER THAN 500mm.

5. THE CONTRACTOR IS FULLY RESPONSIBLE FOR LOCATIONS AND ADEQUATE PROTECTION OF ALL UTILITIES, SERVICES, STRUCTURES, ROADWAYS ETC. DURING CONSTRUCTION OPERATION. CONTRACTOR'S METHODS OF PROTECTION TO BE SUBMITTED TO THE ENGINEER PRIOR TO COMMENCEMENT OF WORK.
6. THE CONTRACTOR SHALL PROVIDE PLATFORMS AND OTHER NECESSARY CONTAINMENT MEASURES TO PREVENT CONCRETE AND CONSTRUCTION DEBRIS FROM FALLING ONTO THE CN TRACKS DURING CONSTRUCTION. PLATFORMS SHALL NOT EXTEND BELOW THE CONSTRUCTION CLEARANCE ENVELOPE. CN MUST REVIEW THE PLATFORM DESIGNS AND FORM WORK IN THE VICINITY OF THE TRACK BEFORE INSTALLATION.
7. CONTRACTOR HAS TO ARRANGE PROTECTION FOR WORKING IN CN'S ROW AND PROTECTION TO BE ARRANGED WITH CN TO EXPOSE AND PROTECT THE BURIED FIBER.
8. CONTRACTOR SHALL ENSURE THAT THE DRAINAGE IS DIRECTED AWAY FROM RAILWAY GRADE DURING AND AFTER CONSTRUCTION.
9. CONCRETE SHALL NOT BE PLACED FOR PIER FOOTING UNTIL THE DEPTH AND CHARACTER OF THE FOUNDATION HAVE BEEN INSPECTED AND APPROVED BY THE FOUNDATION ENGINEER.
10. ALL EXPOSED EDGES TO RECEIVE A 20x20 CHAMFER.
11. REINFORCING STEEL IN CONCRETE REMOVAL AREAS WITH MORE THAN 10% SECTION LOSS IN ANY LOCAL AREA SHALL BE PLACED OR LAPPED WITH NEW REINFORCING STEEL OF SIMILAR DIAMETER.

SCOPE OF WORK:

- RECONSTRUCT PORTION OF EXIST DECKS AND WIDENING PARTS OF THE DECKS
- CONSTRUCT NEW ABUTMENTS, PIER COLUMNS, CRASH WALLS AND FOOTINGS AT WIDENING PORTION
- CONSTRUCT NEW EXTERIOR BARRIER WALLS AND MEDIAN BARRIER WALLS
- RECONSTRUCT EXIST DECK ENDS AND ABUTMENTS TO ACCOMMODATE SEMI-INTEGRAL CONFIGURATION
- CONSTRUCT NEW WINGWALLS
- CONSTRUCT NEW ROCK SLOPE PROTECTION AT WIDENING PORTIONS TO MATCH EXISTING
- PARTIALLY CONSTRUCT NEW APPROACH SLABS WITH SLEEPER SLABS
- PARTIALLY REPLACE EXISTING ASPHALT AND WATERPROOFING SYSTEM WITH NEW
- LOCAL REPAIR EXISTING CONCRETE STRUCTURES
- LOCAL REPAIR EXISTING SLOPE PROTECTION

APPLICABLE STANDARD DRAWINGS:

- OPSD 911.381 GUIDE RAIL SYSTEM, CONCRETE BARRIER PERMANENT TRANSITION INSTALLATION CONCRETE BARRIER TO STRUCTURE
- OPSD 3101.150 WALLS - ABUTMENT, BACKFILL MINIMUM GRANULAR REQUIREMENTS
- OPSD 3370.100 DECK, WATERPROOFING HOT APPLIED ASPHALT MEMBRANE WITH PROTECTION BOARD
- OPSD 3370.101 DECK, WATERPROOFING HOT APPLIED ASPHALT MEMBRANE AT ACTIVE CRACKS GREATER THAN 2mm WIDE AND CONSTRUCTION JOINTS
- OPSD 3390.100 DECK DRIP CHANNEL
- OPSD 3941.200 FIGURES IN CONCRETE - SITE NUMBER AND DATE LAYOUT
- OPSD 3950.100 JOINTS - CONCRETE AND CONSTRUCTION ON STRUCTURE

LIST OF ABBREVIATIONS:

- PVI POINT OF VERTICAL INTERSECTION
- P/C PROFILE CONTROL
- T/F TOP OF FOOTING
- WP WORKING POINT

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B 18/03/16	90% SUBMISSION TO CA				
A 18/01/12	90% SUBMISSION TO CA				

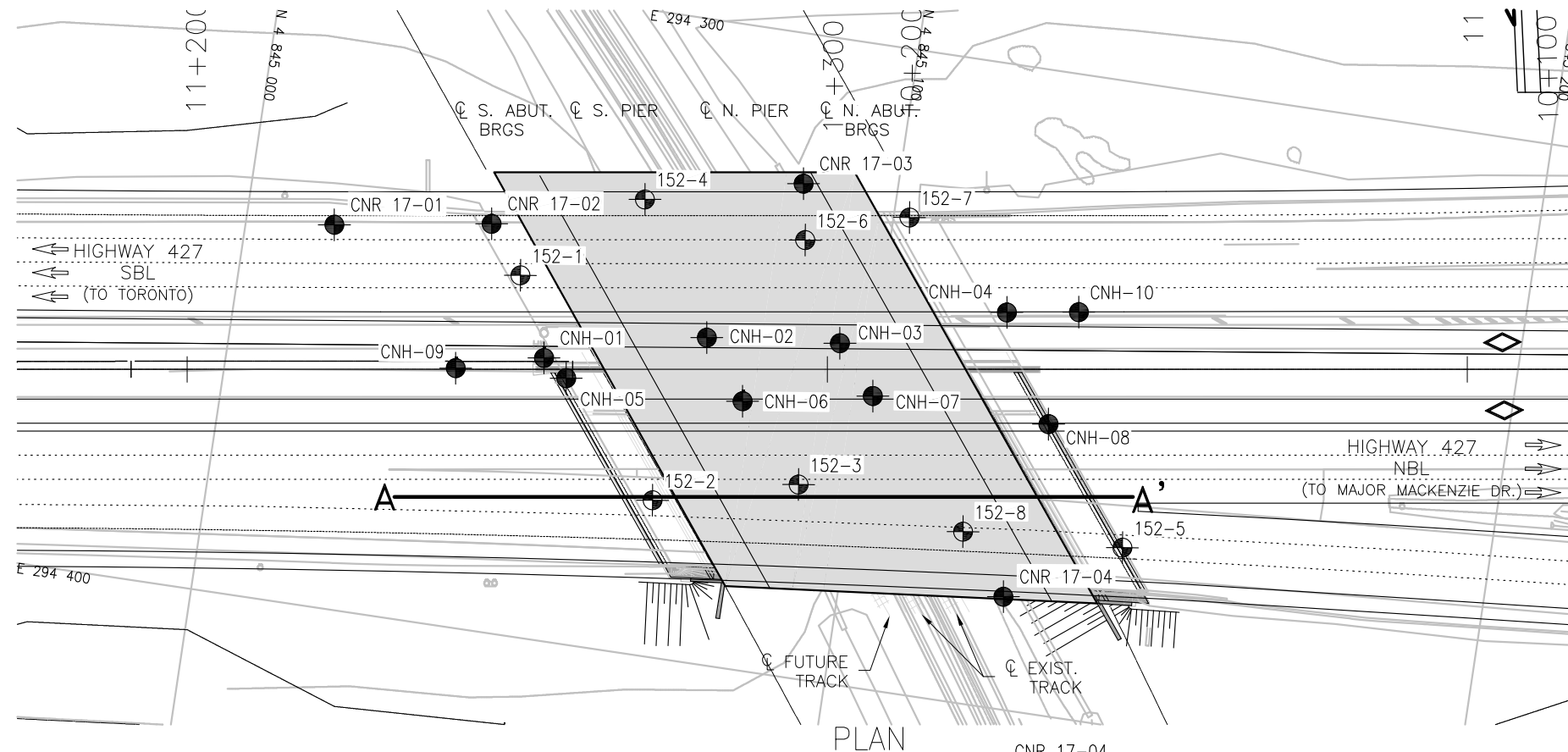
SCALE :
AS NOTED

DESIGNED	SHELLEY HUANG
DRAWN	TOM ZHAO
CHECKED	TATIANA QJALA
APPROVED LEAD ENG.	TATIANA QJALA
APPROVED PROJ. MANAGER	PETER BAWFORTH

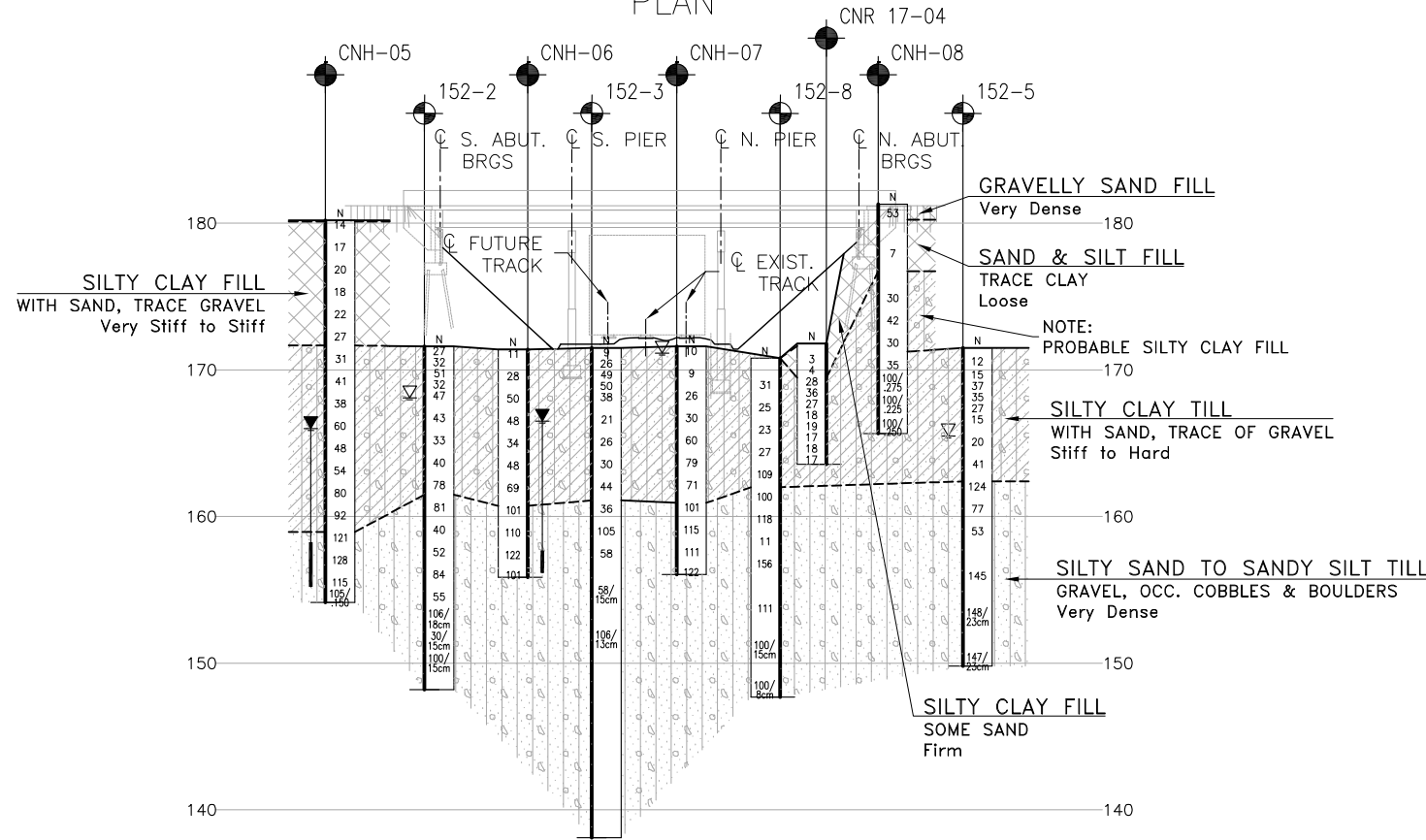
NAME (PRINT)	INIT.	DATE



<p>HWY 427 EXPANSION HWY 427 NBL & SBL / CNR OVERHEAD REHABILITATION AND WIDENING SITE 37-1109 GENERAL ARRANGEMENT II</p>							
PROJECT ID.	STAGE IDENTIFIER	DESIGN PACKAGE NUMBER	DISCIPLINE	STRUCTURE NUMBER	DOCUMENT TYPE	DRAWING NUMBER	REVISION NUMBER
H427-D	N	9	STR	B04	DWG	501	B

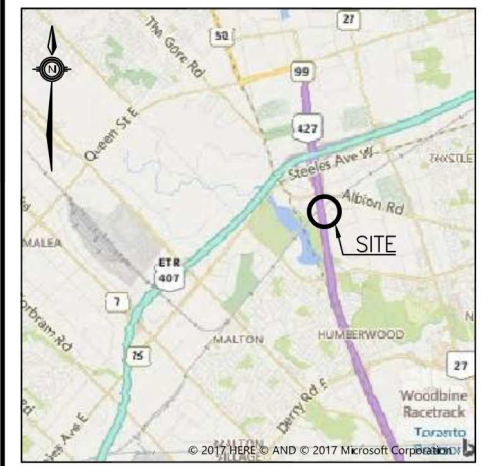


PLAN



SECTION A-A'

METRIC
DIMENSIONS ARE IN METRES
AND/OR MILLIMETRES
UNLESS OTHERWISE SHOWN



KEYPLAN

LEGEND

	Borehole (By Thurber)
	Borehole (By Others)
N	Blows /0.3m (Std Pen Test, 475J/blow)
CONE	Blows /0.3m (60' Cone, 475J/blow)
	Water Level
	Head Artesian Water
	Piezometer
90%	Rock Quality Designation (RQD)
A/R	Auger Refusal

NO	ELEVATION	NORTHING	EASTING
152-1	171.9	4 845 043.7	294 344.0
152-2	171.6	4 845 069.3	294 375.7
152-3	171.5	4 845 091.5	294 369.9
152-4	171.4	4 845 061.2	294 329.4
152-5	171.5	4 845 143.0	294 372.2
152-6	170.6	4 845 086.9	294 332.0
152-7	171.7	4 845 102.5	294 326.1
152-8	170.8	4 845 118.0	294 373.4
CNH-01	180.3	4 845 049.2	294 356.2
CNH-02	171.1	4 845 073.9	294 349.3
CNH-03	171.6	4 845 094.6	294 347.1
CNH-04	181.3	4 845 119.7	294 338.5
CNH-05	180.2	4 845 053.1	294 358.8
CNH-06	171.4	4 845 080.9	294 358.3
CNH-07	171.6	4 845 100.9	294 354.5
CNH-08	181.3	4 845 128.7	294 354.8
CNH-09	179.8	4 845 035.8	294 359.8
CNH-10	181.3	4 845 130.8	294 336.8
CNR 17-01	181.2	4 845 013.7	294 340.4
CNR 17-02	181.2	4 845 038.0	294 336.7
CNR 17-03	172.0	4 845 085.3	294 323.3
CNR 17-04	171.8	4 845 125.7	294 382.5

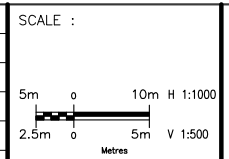
-NOTES-

- The boundaries between soil strata have been established only at Borehole locations. Between Boreholes the boundaries are assumed from geological evidence.
- This drawing is for subsurface information only. Surface details and features are for conceptual illustration.

GEOCREs No.

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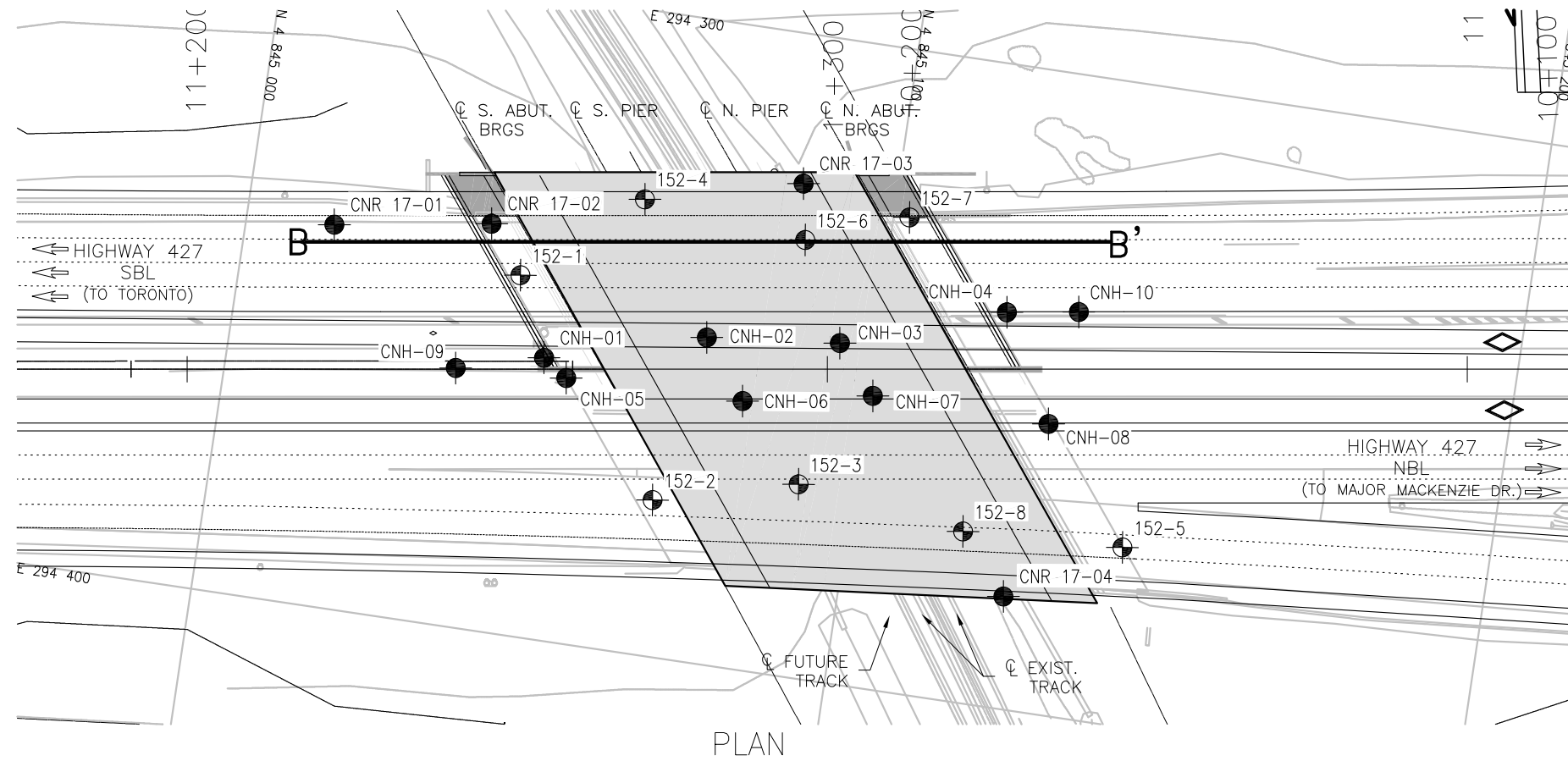
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C	18/03/16	90% SUBMISSION TO CA	AN	KS	JL	JL
B	18/02/01	90% SUBMISSION TO CA	AN	KS	JL	JL



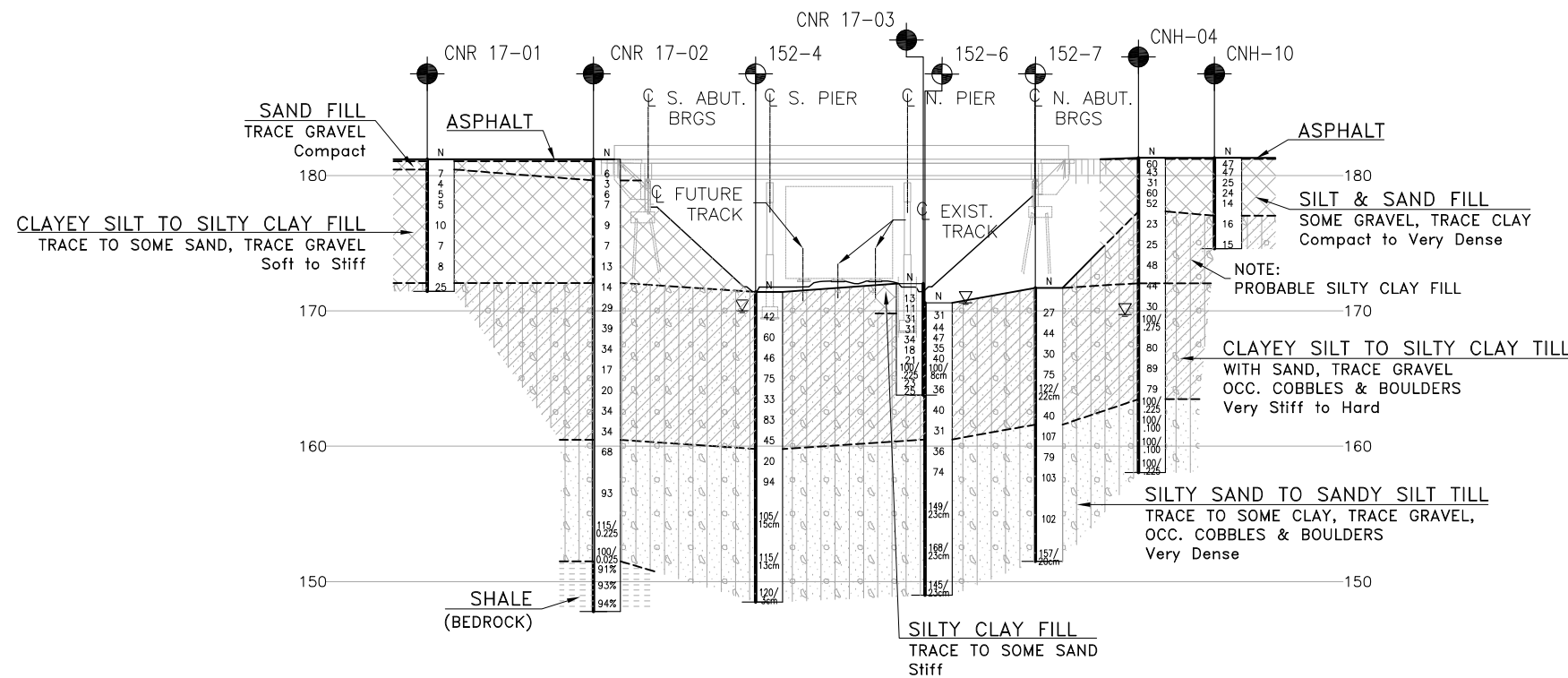
DESIGNED	A. PIASCK	AP	18/03/16
DRAWN	A. NOOR	AN	18/03/16
CHECKED	K. SHI	KS	18/03/16
APPROVED LEAD ENGINEER	J. LEE	JL	18/03/16
APPROVED PROJ. MANAGER	J. LEE	JL	18/03/16



TITLE							
HWY 427 EXPANSION HWY 427 NBL CNR OVERHEAD REHABILITATION AND WIDENING							
BOREHOLE LOCATIONS AND SOIL STRATA							
PROJECT ID.	STAGE IDENTIFIER	DESIGN PACKAGE NUMBER	DISCIPLINE	STRUCTURE NUMBER	DOCUMENT TYPE	DRAWING NUMBER	REVISION NUMBER
H427-D	N	9	STR	B04	DWG	502	C

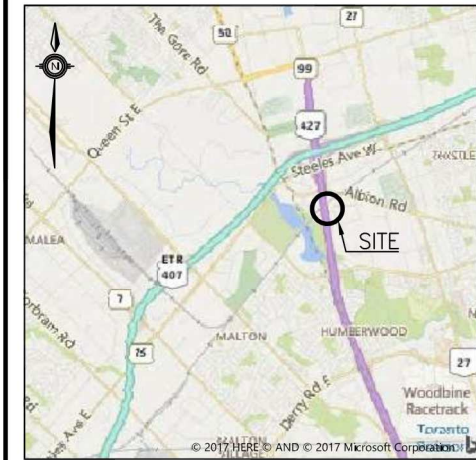


PLAN



SECTION B-B'

METRIC
DIMENSIONS ARE IN METRES
AND/OR MILLIMETRES
UNLESS OTHERWISE SHOWN



KEYPLAN

LEGEND

- Borehole (By Thurber)
- Borehole (By Others)
- N Blows /0.3m (Std Pen Test, 475J/blow)
- CONE Blows /0.3m (60' Cone, 475J/blow)
- Water Level
- Head Artesian Water
- Piezometer
- 90% Rock Quality Designation (RQD)
- A/R Auger Refusal

NO	ELEVATION	NORTHING	EASTING
152-1	171.9	4 845 043.7	294 344.0
152-2	171.6	4 845 069.3	294 375.7
152-3	171.5	4 845 091.5	294 369.9
152-4	171.4	4 845 061.2	294 329.4
152-5	171.5	4 845 143.0	294 372.2
152-6	170.6	4 845 086.9	294 332.0
152-7	171.7	4 845 102.5	294 326.1
152-8	170.8	4 845 118.0	294 373.4
CNH-01	180.3	4 845 049.2	294 356.2
CNH-02	171.1	4 845 073.9	294 349.3
CNH-03	171.6	4 845 094.6	294 347.1
CNH-04	181.3	4 845 119.7	294 338.5
CNH-05	180.2	4 845 053.1	294 358.8
CNH-06	171.4	4 845 080.9	294 358.3
CNH-07	171.6	4 845 100.9	294 354.5
CNH-08	181.3	4 845 128.7	294 354.8
CNH-09	179.8	4 845 035.8	294 359.8
CNH-10	181.3	4 845 130.8	294 336.8
CNR 17-01	181.2	4 845 013.7	294 340.4
CNR 17-02	181.2	4 845 038.0	294 336.7
CNR 17-03	172.0	4 845 085.3	294 323.3
CNR 17-04	171.8	4 845 125.7	294 382.5

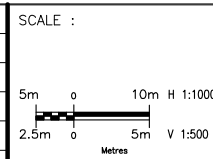
-NOTES-

- 1) The boundaries between soil strata have been established only at Borehole locations. Between Boreholes the boundaries are assumed from geological evidence.
- 2) This drawing is for subsurface information only. Surface details and features are for conceptual illustration.

GEOCRES No.

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NO.	DATE	REVISIONS	BY	CHK	LEO. DES.	PROJ. MGR.
C	18/03/16	90% SUBMISSION TO CA	AN	KS	JL	JL
B	18/02/01	90% SUBMISSION TO CA	AN	KS	JL	JL



DESIGNED	A. PIASCK	AP	18/03/16
DRAWN	A. NOOR	AN	18/03/16
CHECKED	K. SHI	KS	18/03/16
APPROVED LEAD ENGINEER	J. LEE	JL	18/03/16
APPROVED PROJ. MANAGER	J. LEE	JL	18/03/16
NAME (PRINT)	INIT.	DATE	



TITLE						
HWY 427 EXPANSION HWY 427 SBL CNR OVERHEAD REHABILITATION AND WIDENING						
BOREHOLE LOCATIONS AND SOIL STRATA						
PROJECT ID.	STAGE IDENTIFIER	DESIGN PACKAGE NUMBER	DISCIPLINE	STRUCTURE NUMBER	DOCUMENT TYPE	DRAWING NUMBER
H427-D	N	9	STR	B04	DWG	503
						C

ABBREVIATIONS:
TCB - TEMPORARY CONCRETE BARRIER

LEGEND:

 EXIST TO REMAIN
 NEW CONCRETE
 NEW ASPHALT

NOTE:
1. READ THIS DRAWING IN CONJUNCTION WITH DWGS 500, 501, 505 AND HIGHWAY STAGING DRAWINGS.

SEQUENCE OF WORK AND STAGING
EXISTING/PRE-STAGE
1. RECONSTRUCT MEDIAN APPROACH SLABS AS INDICATED ON DWG 520 AND CONSTRUCT NEW PART OF SLEEPER SLABS.

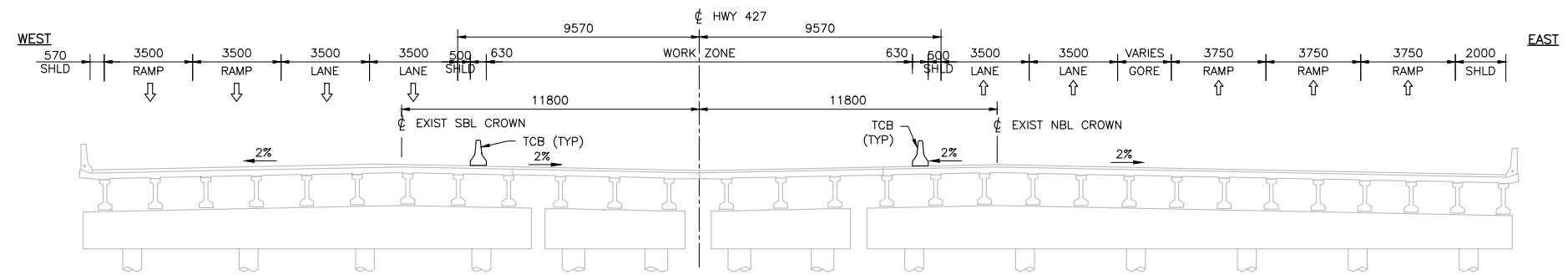
STAGE 1A
1. REPOSITION THE ASSOCIATED TCB AND SHIFT THE SB TRAFFIC EASTERLY ACROSS THE NEW MEDIAN.
2. REMOVE ASPHALT, WATERPROOFING AND APPROACH SLABS FROM EXISTING SB BRIDGE.
3. INSTALL PROTECTION SYSTEM.
4. EXCAVATE AND REMOVE EXISTING BALLAST WALLS & EXPANSION JOINTS.
5. REMOVE DETERIORATED CONCRETE FROM TOP OF DECK AND REPAIR WITH CONCRETE AS DIRECTED BY THE ENGINEER.
6. REMOVE PORTION OF END DECK SLABS INCLUDING ABUTMENT DIAPHRAGMS.
7. CONSTRUCT NEW BALLAST WALLS AND SHEAR KEYS AT EXISTING ABUTMENTS.
8. CONSTRUCT NEW DECK EXTENSIONS, BACKFILL AND CONSTRUCT NEW SLEEPER SLABS AND APPROACH SLABS.
9. PLACE WATERPROOFING AND ASPHALT.

STAGE 1B/1C
1. REPOSITION THE ASSOCIATED TCB AND SHIFT THE SB TRAFFIC EASTERLY TOWARDS THE NEW MEDIAN TO FACILITATE REHABILITATION OF THE REMAINING WEST PART OF SB BRIDGE.
2. REMOVE ASPHALT, WATERPROOFING AND WEST BARRIER WALL & APPROACH SLABS FROM EXISTING BRIDGE.
3. EXCAVATE AND REMOVE EXISTING TOP PORTION OF WINGWALL, BALLAST WALLS AND EXPANSION JOINTS.
4. REMOVE DETERIORATED CONCRETE FROM TOP OF DECK AND REPAIR WITH CONCRETE AS DIRECTED BY THE ENGINEER.
5. REMOVE PORTION OF END DECK SLABS INCLUDING ABUTMENT DIAPHRAGMS.
6. CONSTRUCT NEW BALLAST WALLS AT EXISTING ABUTMENTS AND RECONSTRUCT TOP PORTION OF EXTERIOR WINGWALL AS SHOWN.
7. CONSTRUCT NEW DECK EXTENSIONS, BACKFILL AND CONSTRUCT NEW APPROACH SLAB, & RECONSTRUCT BARRIER WALL.
8. PLACE WATERPROOFING AND ASPHALT.

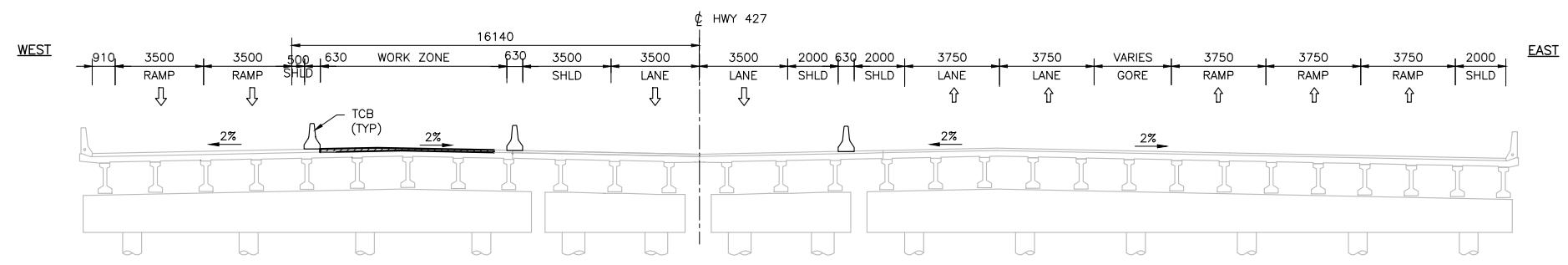
STAGE 2A
1. SHIFT THE SB & NB TRAFFIC LANES AND TCB TO THE WEST SIDE OF THE BRIDGE, AS SHOWN.
2. REPEAT STEPS 2 TO 9 FROM STAGE 1A FOR NB BRIDGE.

STAGE 2B
1. SHIFT THE NB RAMP TRAFFIC LANES AND TCB FURTHER WEST, AS SHOWN.
2. REPEAT STEPS 2 TO 8 STAGE 1B FOR NB BRIDGE.

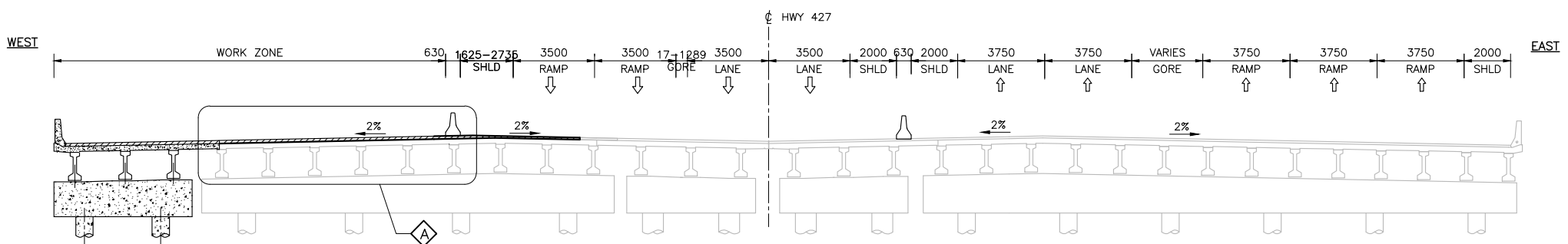
STAGE 2C/WINTER SHUTDOWN
1. SHIFT SB & NB LANES BACK TO THE EXISTING ORIGINAL TRAFFIC CONFIGURATION.
2. REMOVE ASPHALT 700mm EACH SIDE OF LONGITUDINAL JOINT AND WATERPROOFING AT NEW BARRIER LOCATIONS & CLEAN DECK SURFACE.
3. INSTALL DOWELS & CONSTRUCT CONCRETE BARRIER WALLS IN MEDIAN.
4. PLACE WATERPROOFING AND ASPHALT.



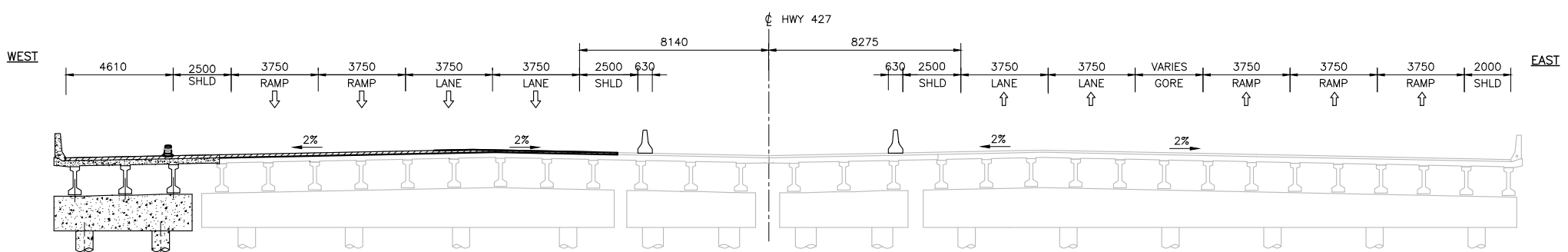
EXISTING/PRE-STAGE



STAGE 1A



STAGE 1B/1C



WINTER SHUTDOWN

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 DATE PLOTTED: 3/20/2018 11:16:35 AM BY: PANG, FEI

DATE	REVISIONS	BY	CHK	LEAD	PROJ
18/03/16	90% SUBMISSION TO CA				
18/01/12	90% SUBMISSION TO CA				

SCALE :

AS NOTED

DESIGNED	SHELLEY HUANG	
DRAWN	TOM ZHAO	
CHECKED	TATIANA QJALA	
APPROVED LEAD ENG.	TATIANA QJALA	
APPROVED PROJ. MANAGER		
NAME (PRINT)	INIT.	DATE

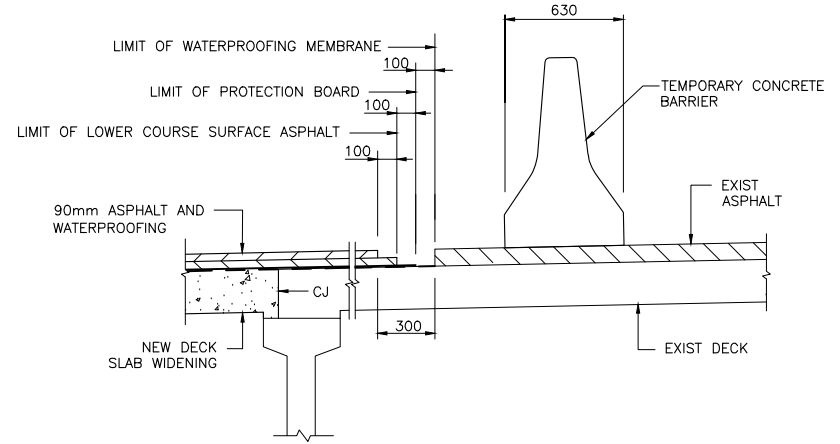


HWY 427 EXPANSION HWY 427 NBL & SBL / CNR OVERHEAD REHABILITATION AND WIDENING SITE 37-1109 CONSTRUCTION STAGING I							
PROJECT ID.	STAGE IDENTIFIER	DESIGN PACKAGE NUMBER	DISCIPLINE	STRUCTURE NUMBER	DOCUMENT TYPE	DRAWING NUMBER	REVISION NUMBER
H427-D	N	9	STR	B04	DWG	504	B

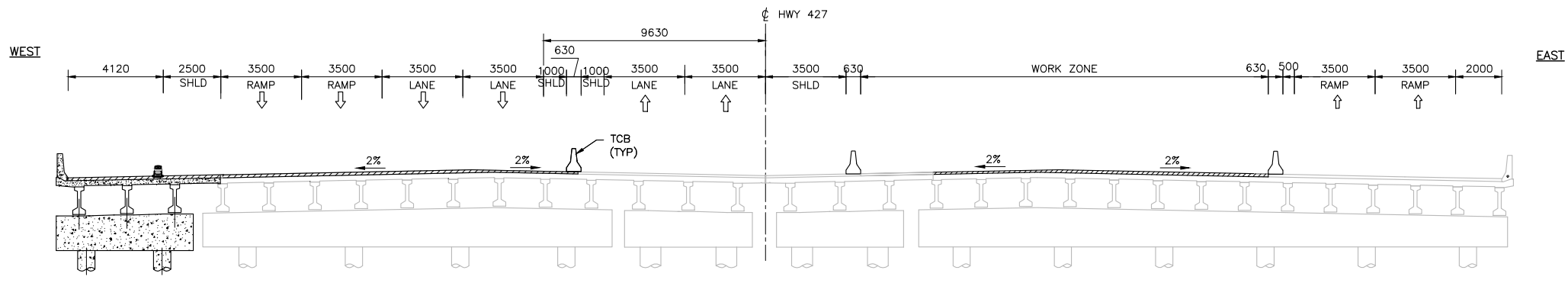
NOTE:
1. READ THIS DRAWING IN CONJUNCTION WITH DWGS 500, 501, 504 AND HIGHWAY STAGING DRAWINGS.

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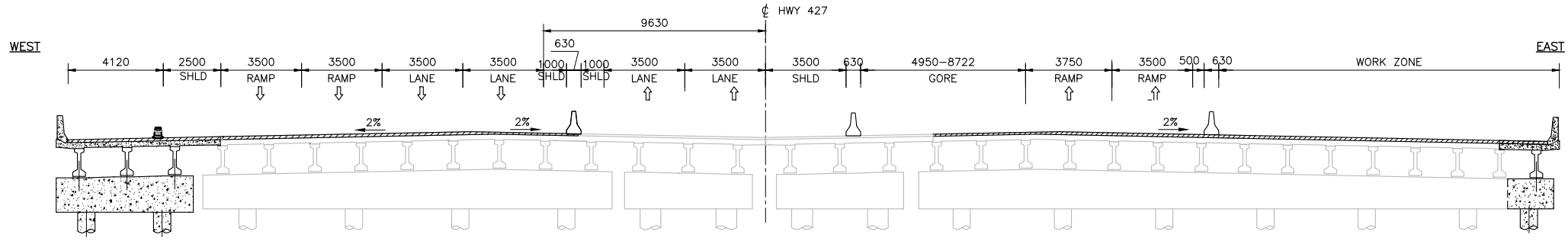
 EXIST TO REMAIN
 NEW CONCRETE
 NEW ASPHALT



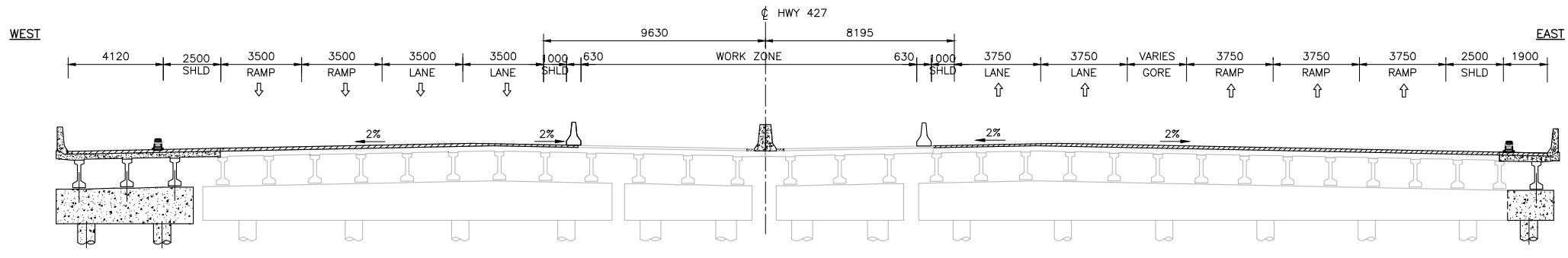
DETAIL A
NTS



STAGE 2A

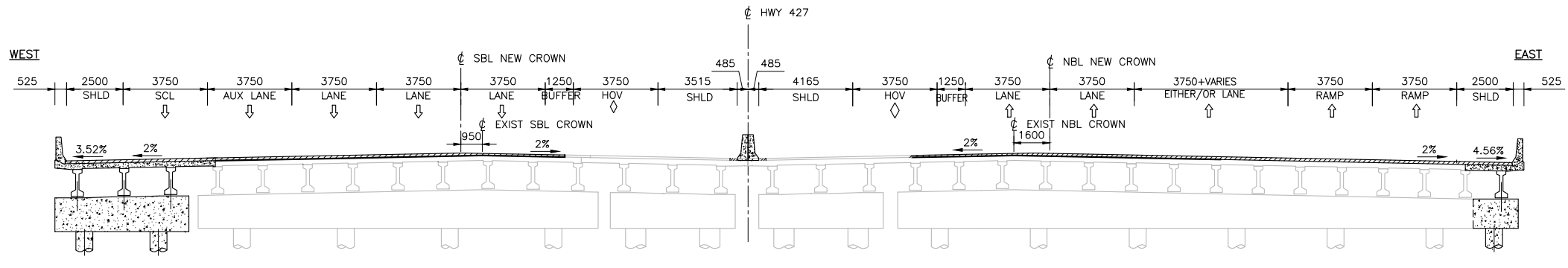


STAGE 2B



STAGE 2C/WINTER SHUTDOWN

NOTE: FOR WINTER SHUTDOWN SHOULDERS TO BE MODIFIED AS PER HIGHWAY STAGING DRAWING



FINAL

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 DATE PLOTTED: 3/20/2018 11:16:39 AM BY: PANG, FEI

DATE	REVISIONS	BY	CHK	LEAD	PROJ.
B 18/03/16	90% SUBMISSION TO CA				
A 18/01/12	90% SUBMISSION TO CA				

SCALE :

AS NOTED

DESIGNED	SHELLEY HUANG
DRAWN	TOM ZHAO
CHECKED	TATIANA QJALA
APPROVED LEAD ENG.	TATIANA QJALA
APPROVED PROJ. MANAGER	PETER BAMFORTH
NAME (PRINT)	INIT. DATE

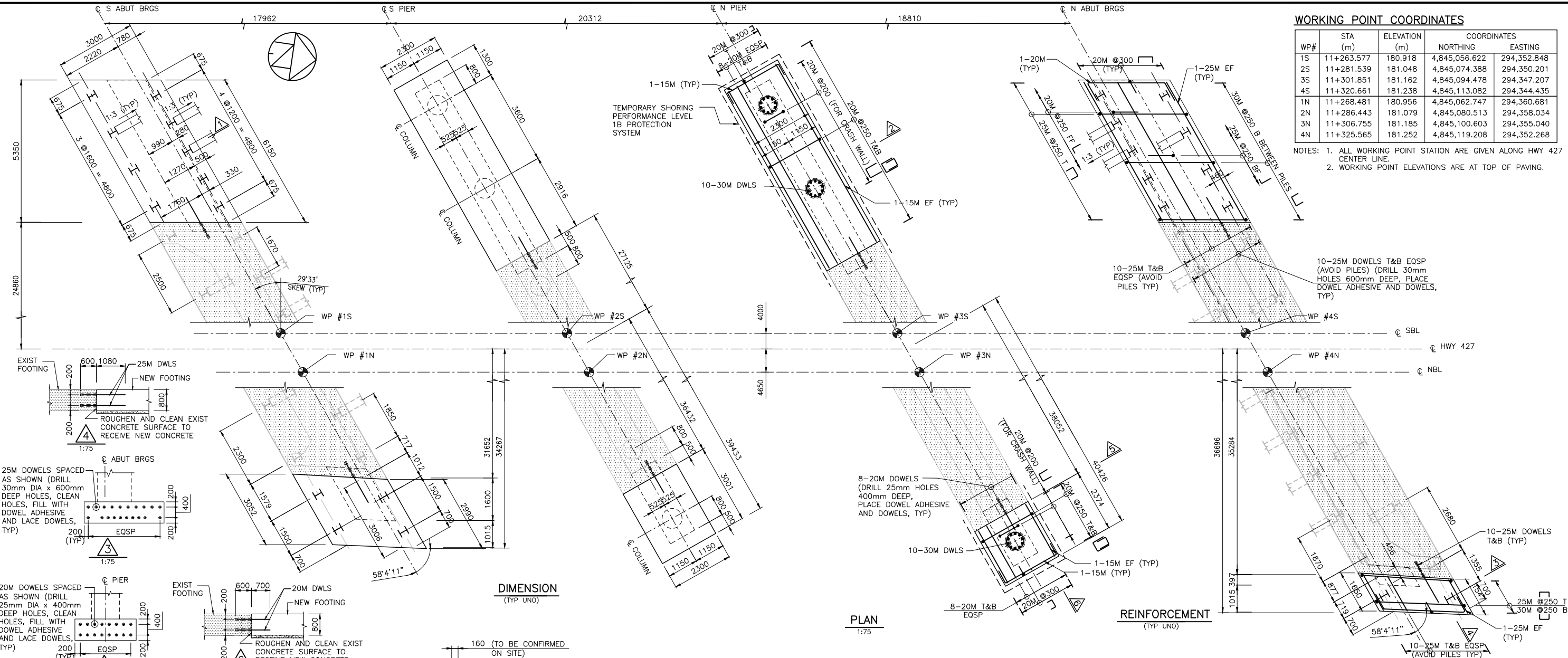


HWY 427 EXPANSION HWY 427 NBL & SBL / CNR OVERHEAD REHABILITATION AND WIDENING SITE 37-1109 CONSTRUCTION STAGING II							
PROJECT ID.	STAGE IDENTIFIER	DESIGN PACKAGE NUMBER	DISCIPLINE	STRUCTURE NUMBER	DOCUMENT TYPE	DRAWING NUMBER	REVISION NUMBER
H427-D	N	9	STR	B04	DWG	505	B

WORKING POINT COORDINATES

WP#	STA (m)	ELEVATION (m)	COORDINATES	
			NORTHING	EASTING
1S	11+263.577	180.918	4,845,056.622	294,352.848
2S	11+281.539	181.048	4,845,074.388	294,350.201
3S	11+301.851	181.162	4,845,094.478	294,347.207
4S	11+320.661	181.238	4,845,113.082	294,344.435
1N	11+268.481	180.956	4,845,062.747	294,360.681
2N	11+286.443	181.079	4,845,080.513	294,358.034
3N	11+306.755	181.185	4,845,100.603	294,355.040
4N	11+325.565	181.252	4,845,119.208	294,352.268

NOTES: 1. ALL WORKING POINT STATION ARE GIVEN ALONG HWY 427 CENTER LINE.
2. WORKING POINT ELEVATIONS ARE AT TOP OF PAVING.



DIMENSION (TYP UNO)

PLAN 1:75

REINFORCEMENT (TYP UNO)

TABLE No. 2

PILE DESIGN CAPACITY DATA:		KN/PILE
SLS		1200
ULS		1400

TABLE No. 1

LOCATION	QTY	PILE DATA		ELEVATION		
		APPROX. LENGTH (m)	BATTER	APPROX. PILE TIP	PILE CUT-OFF	T/F
S ABUT (SBL)		22.8	VERT	154.000	176.80	177.30
		24.033	1:3			
N ABUT (SBL)		23.2	VERT	154.000	177.20	177.70
		24.455	1:3			
S ABUT (NBL)		22.8	VERT	154.000	176.80	177.30
N ABUT (NBL)		23.2	VERT	154.000	177.20	177.70

TABLE No. 3

SOIL BEARING CAPACITY FOR PIER FOOTINGS		KPa
SLS		300
ULS		450

APPLICABLE STANDARD DRAWINGS:

- OPSD-3000.100 FOUNDATION PILES, STEEL H-PILE DRIVING SHOE
- OPSD-3000.150 FOUNDATION PILES, STEEL H-PILE SPLICE
- OPSD-3101.150 WALLS ABUTMENT, BACKFILL MINIMUM GRANULAR REQUIREMENT
- OPSD-3102.100 WALLS ABUTMENT BACKFILL DRAIN
- OPSD-3950.100 JOINTS CONCRETE EXPANSION AND CONSTRUCTION ON STRUCTURE

LIST OF ABBREVIATIONS

- T/F TOP OF FOOTING
- WP WORKING POINT
- EQSP EQUAL SPACE

LEGEND:

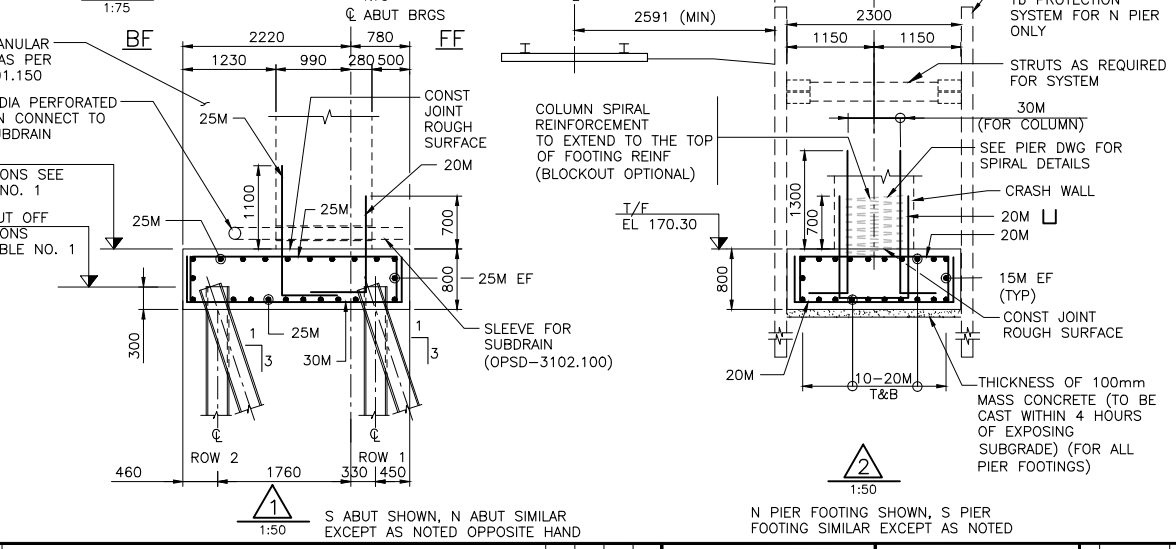
- EXIST TO REMAIN
- NEW CONCRETE

PILE NOTES:

- ALL PILES TO BE HP 310x110.
- SPACING OF PILES TO BE MEASURED AT UNDERSIDE OF FOOTING.
- PILE LENGTHS SHOWN IN TABLE NO. 1 ARE THE THEORETICAL LENGTHS BELOW CUT-OFF ELEVATIONS
- WELDING SHALL CONFORM TO CSA STANDARD W59 AND SHALL BE DONE BY A WELDER QUALIFIED UNDER CSA STANDARD W47.
- THE TIP OF ALL PILES SHALL BE FITTED WITH STEEL, H-SECTION PILE POINTS FROM AN APPROVED MANUFACTURER SUCH AS TITUS STEEL (STANDARD H-POINT) OR APPROVED EQUIVALENT.
- PILE INSTALLATION SHALL BE IN ACCORDANCE WITH OPSS 903.
- ALL PILES SHALL BE DRIVEN IN ACCORDANCE WITH STANDARD SS103-11 TO ACHIEVE AN ULTIMATE CAPACITY OF 2800KN PER PILE. THE FINAL PILE TIP ELEVATION OF ALL PILES WILL BE DETERMINED ON SITE AFTER THE ULTIMATE CAPACITY IS ACHIEVED AND ACCEPTED BY THE GEOTECHNICAL ENGINEER.
- PILE RETAPPING SHALL FOLLOW THE REQUIREMENTS OF OPSS 903.
- READ THIS DRAWING IN CONJUNCTION WITH THE CORRESPONDING FOUNDATION REPORT PREPARED BY THURBER ENGINEERING LTD.
- A PRE-CONDITION SURVEY OF EXIST ABUTMENT FOOTING ELEVATIONS AND MONITORING OF PILE DRIVING IS REQUIRED.
- 600mm DIA. PRE-AUGERING HOLE TO BE CARRIED OUT AT NEW PILE LOCATION TO A DEPTH OF 3m BELOW THE BOTTOM ELEVATION OF EXIST PILE CAP. THE PRE-AUGERED HOLES SHALL BE BACKFILLED WITH LEAN 2MPa CONCRETE UPON COMPLETION OF PILE DRIVING.

* MATCH EXISTING

CAD FILE LOCATION AND NAME: C:\projects\hwy427\dwg\hwy427-d-n-9-str-b04-dwg-506fd.dwg
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 DATE PLOTTED: 3/20/2018 11:16:43 AM BY: PANGF



DATE	REVISIONS	BY	CHK	LEAD	PROJ. MGR.
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A 18/01/12	90% SUBMISSION TO CA				

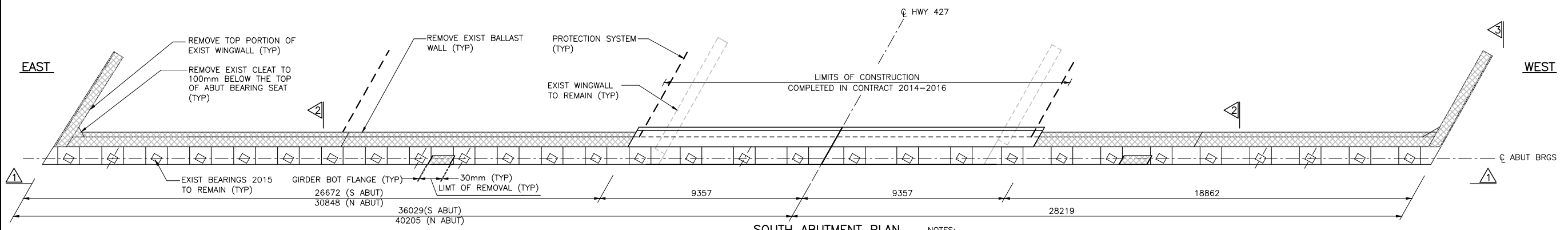
SCALE : AS NOTED

DESIGNED	SHELLEY HUANG
DRAWN	TOM ZHAO
CHECKED	TATIANA QJALA
APPROVED LEAD ENG.	TATIANA QJALA
APPROVED PROJ. MANAGER	



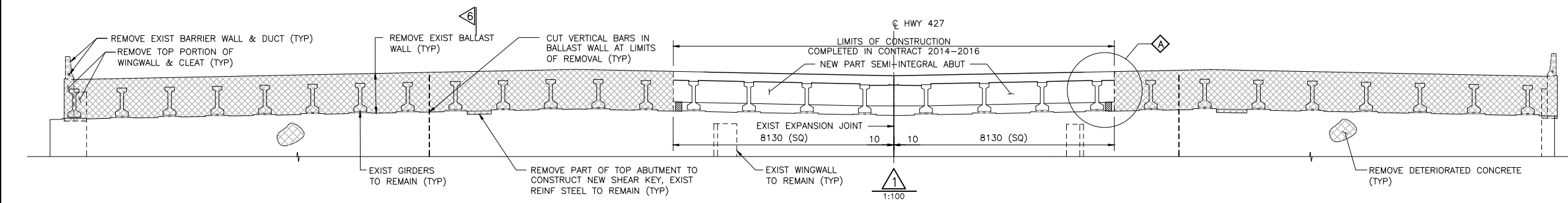
**HWY 427 EXPANSION
 HWY 427 NBL & SBL / CNR OVERHEAD
 REHABILITATION AND WIDENING
 SITE 37-1109
 FOUNDATION LAYOUT AND FOOTING REINFORCEMENT**

PROJECT ID.	STAGE IDENTIFIER	DESIGN PACKAGE NUMBER	DISCIPLINE	STRUCTURE NUMBER	DOCUMENT TYPE	DRAWING NUMBER	REVISION NUMBER
H427-D	N	9	STR	B04	DWG	506	B

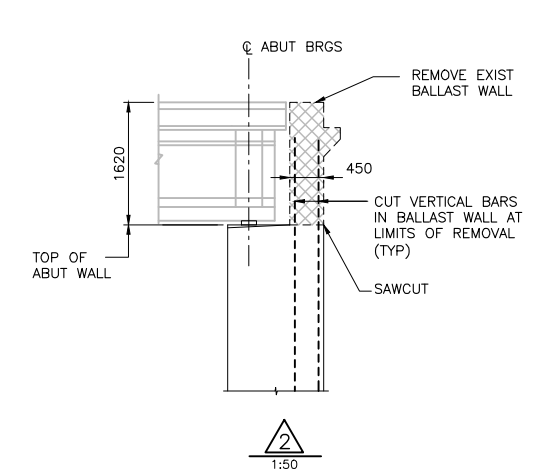


SOUTH ABUTMENT PLAN
1:100

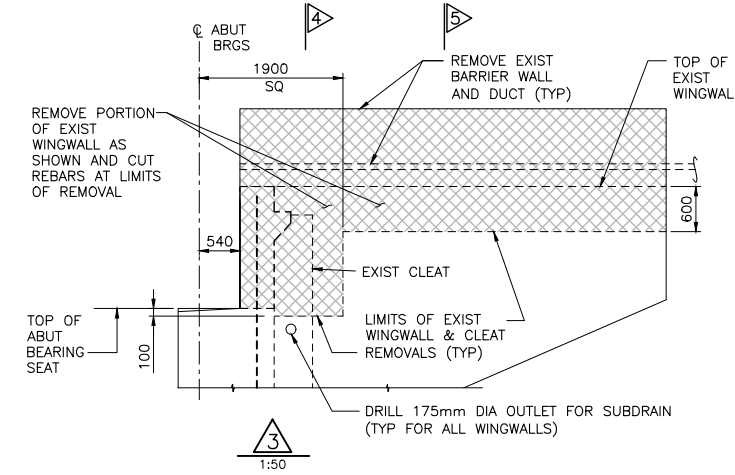
NOTES:
1. SOUTH ABUTMENT SHOWN, NORTH ABUTMENT SIMILAR EXCEPT AS NOTED.
2. GIRDERS AND DECK NOT SHOWN FOR CLARITY.



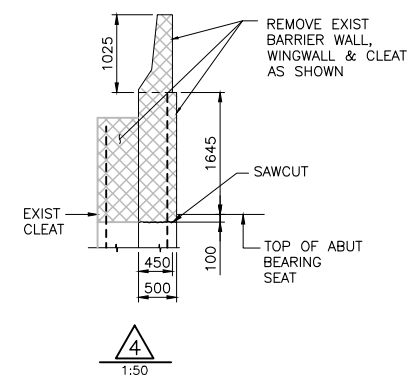
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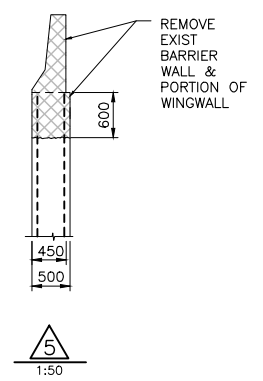
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1:50



3
1:50



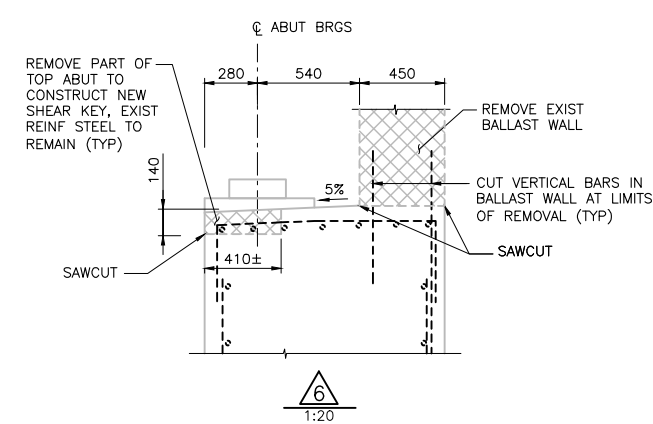
4
1:50



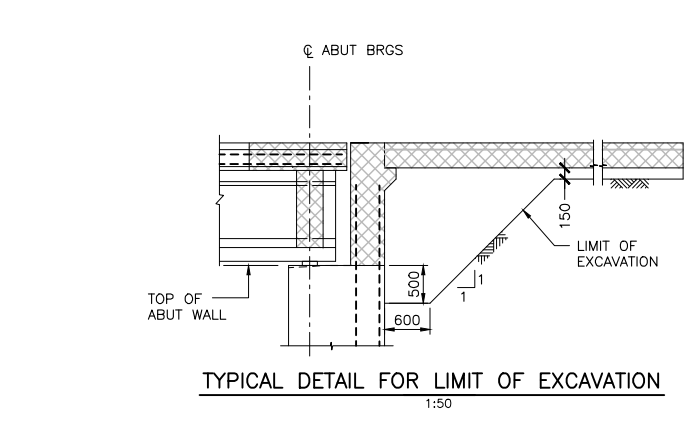
5
1:50

NOTES:
1. THIS DRAWING TO BE READ IN CONJUNCTION WITH DWGS 504, 505 AND 508.
2. EXISTING REINFORCING STEEL TO REMAIN SHALL BE ABRASIVE BLAST CLEANED.
3. SAWCUTS IN CONCRETE, WHERE DESIGNATED, SHALL BE 25mm DEEP OR TO THE FIRST LAYER OF REINFORCING STEEL, WHICHEVER IS LESS.

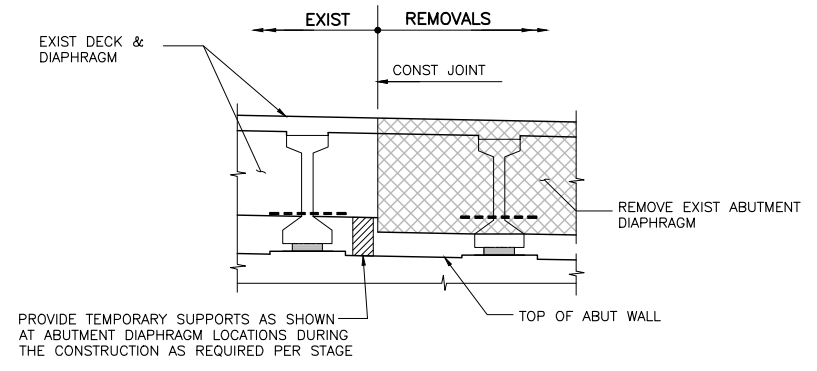
LEGEND:
[Hatched Box] EXISTING TO REMAIN
[Cross-hatched Box] REMOVAL



6
1:20



TYPICAL DETAIL FOR LIMIT OF EXCAVATION
1:50



DETAILS A TEMPORARY SUPPORTS AT ABUT DIAPHRAGMS
NTS

CAD FILE LOCATION AND NAME: C:\projects\hwy427\hwy427-d-n-9-str-b04-dwg-507ab.dwg
MODIFIED: 3/20/2018 10:33:01 AM BY: PANGF
DATE PLOTTED: 3/20/2018 11:16:46 AM BY: PANGF

DATE	REVISIONS	BY	CHK	LEAD DISC.	PROJ. MAN.
B 18/03/16	90% SUBMISSION TO CA				
A 18/01/12	90% SUBMISSION TO CA				

SCALE :
AS NOTED

DESIGNED	SHELLEY HUANG	
DRAWN	TOM ZHAO	
CHECKED	TATIANA OJALA	
APPROVED LEAD ENG.	TATIANA OJALA	
APPROVED PROJ. MANAGER		
NAME (PRINT)	INT.	DATE



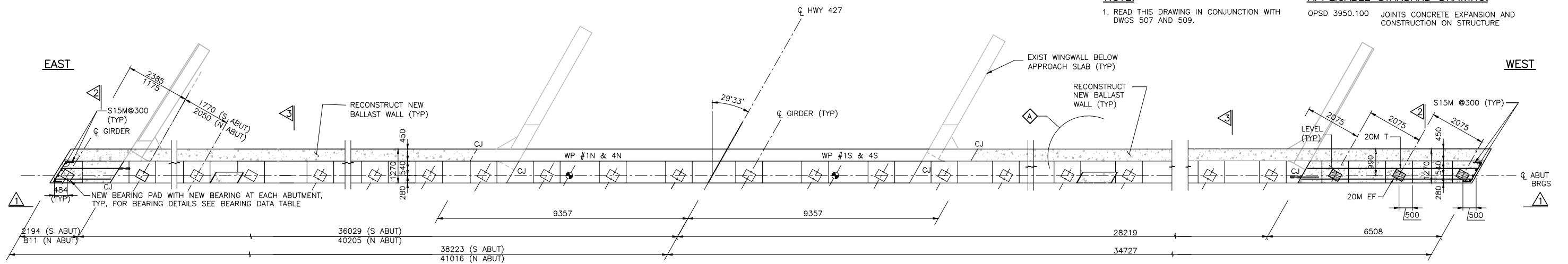
HWY 427 EXPANSION HWY 427 NBL & SBL / CNR OVERHEAD REHABILITATION AND WIDENING SITE 37-1109 ABUTMENT REMOVALS							
PROJECT ID.	STAGE IDENTIFIER	DESIGN PACKAGE NUMBER	DISCIPLINE	STRUCTURE NUMBER	DOCUMENT TYPE	DRAWING NUMBER	REVISION NUMBER
H427-D	N	9	STR	B04	DWG	507	B

NOTE:

1. READ THIS DRAWING IN CONJUNCTION WITH DWGS 507 AND 509.

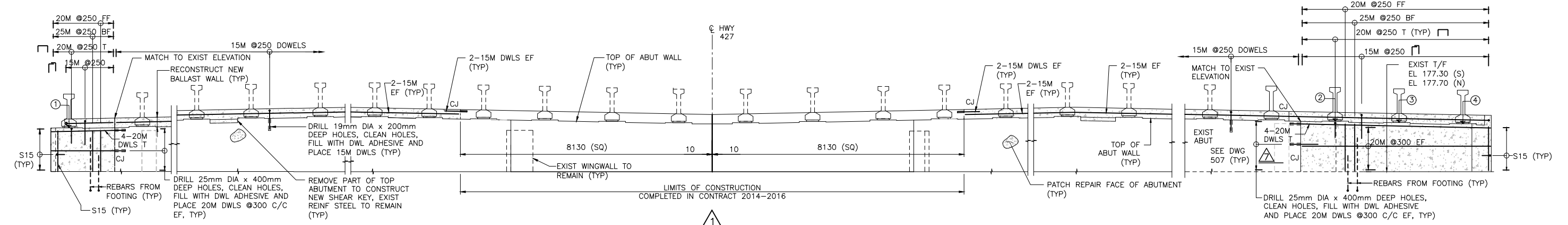
APPLICABLE STANDARD DRAWING:

OPSD 3950.100 JOINTS CONCRETE EXPANSION AND CONSTRUCTION ON STRUCTURE

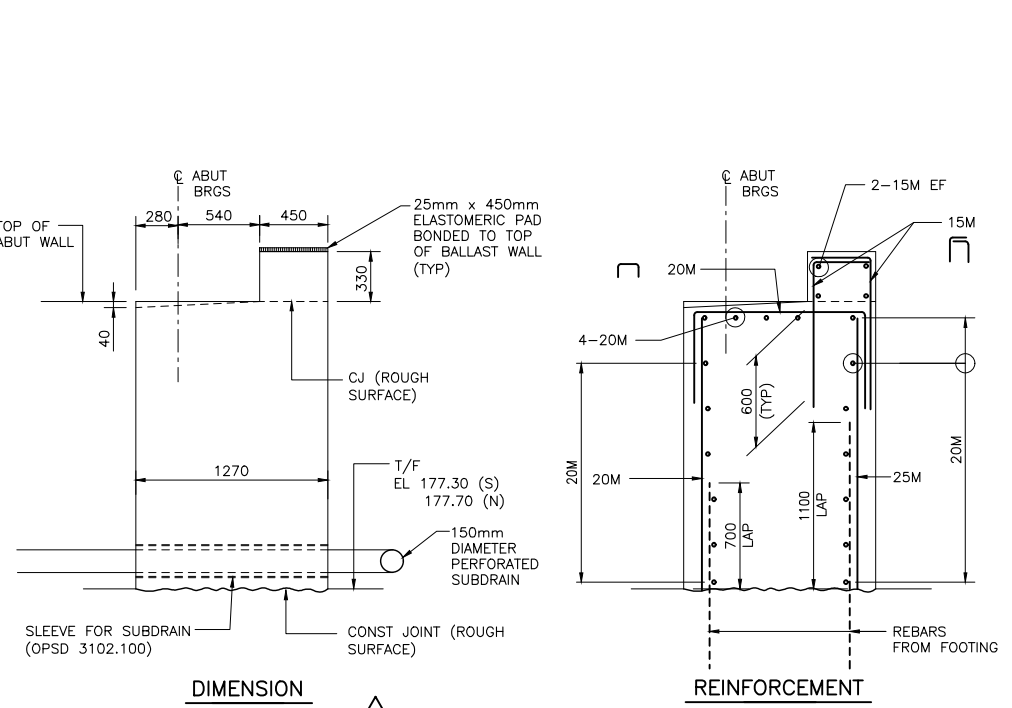


SOUTH ABUTMENT PLAN
1:75

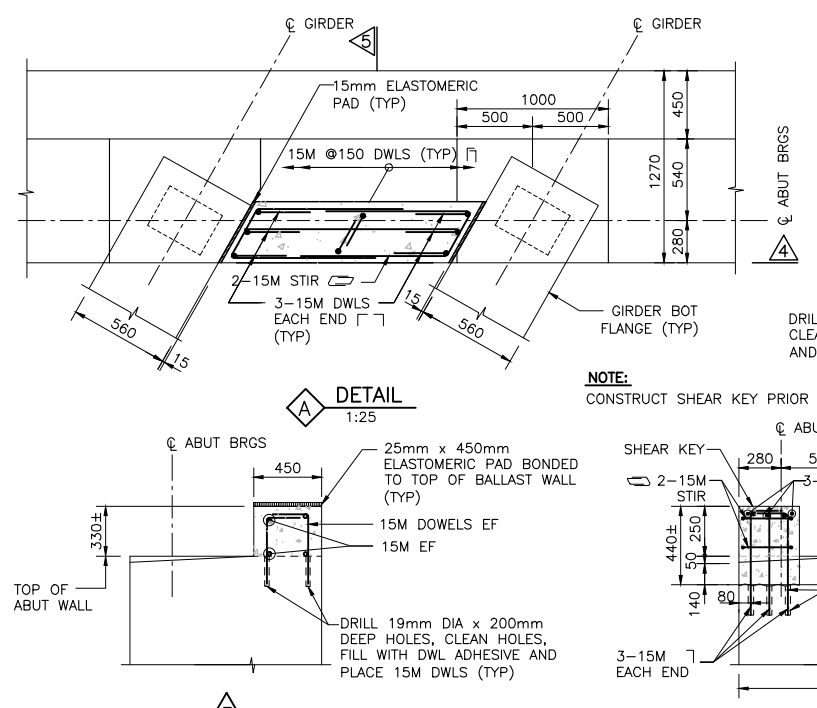
NOTES:
1. SOUTH ABUTMENT SHOWN, NORTH ABUTMENT SIMILAR EXCEPT AS NOTED.
2. GIRDERS AND DECK NOT SHOWN FOR CLARITY.



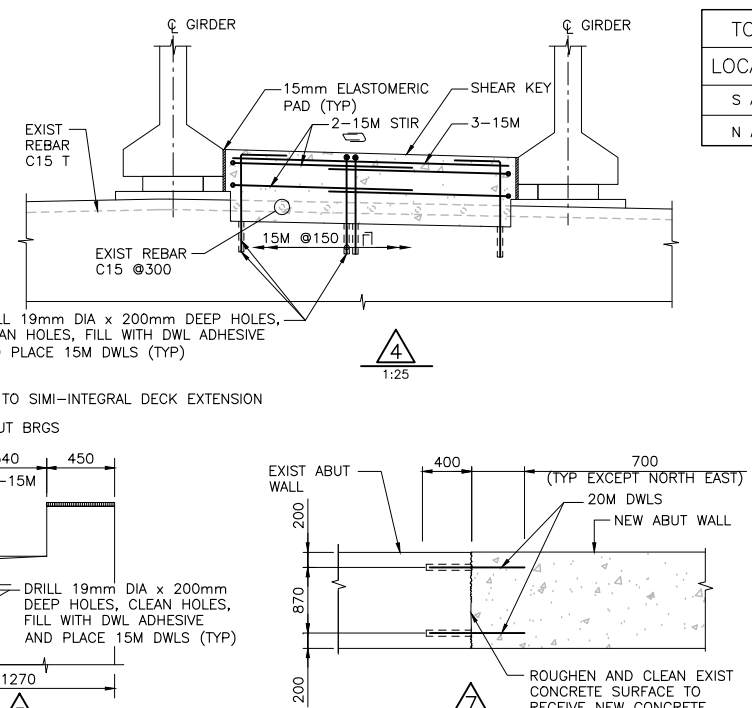
1
1:75



2
1:25
NEW ABUT WIDENING



A
1:25
DETAIL



4
1:25

7
1:25

TOP OF BEARING PAD ELEVATIONS				
LOCATION	①	②	③	④
S ABUT	179.245	179.128	179.077	179.022
N ABUT	179.428	179.495	179.447	179.401

LEGEND:
 EXIST TO REMAIN
 NEW CONCRETE

CAD FILE LOCATION AND NAME: C:\projects\hwy427\hwy427-d-n-9-str-b04-dwg-508ab.dwg
 MODIFIED: 3/20/2018 11:03:20 AM BY: PANGF
 DATE PLOTTED: 3/20/2018 11:17:50 AM BY: PANGF

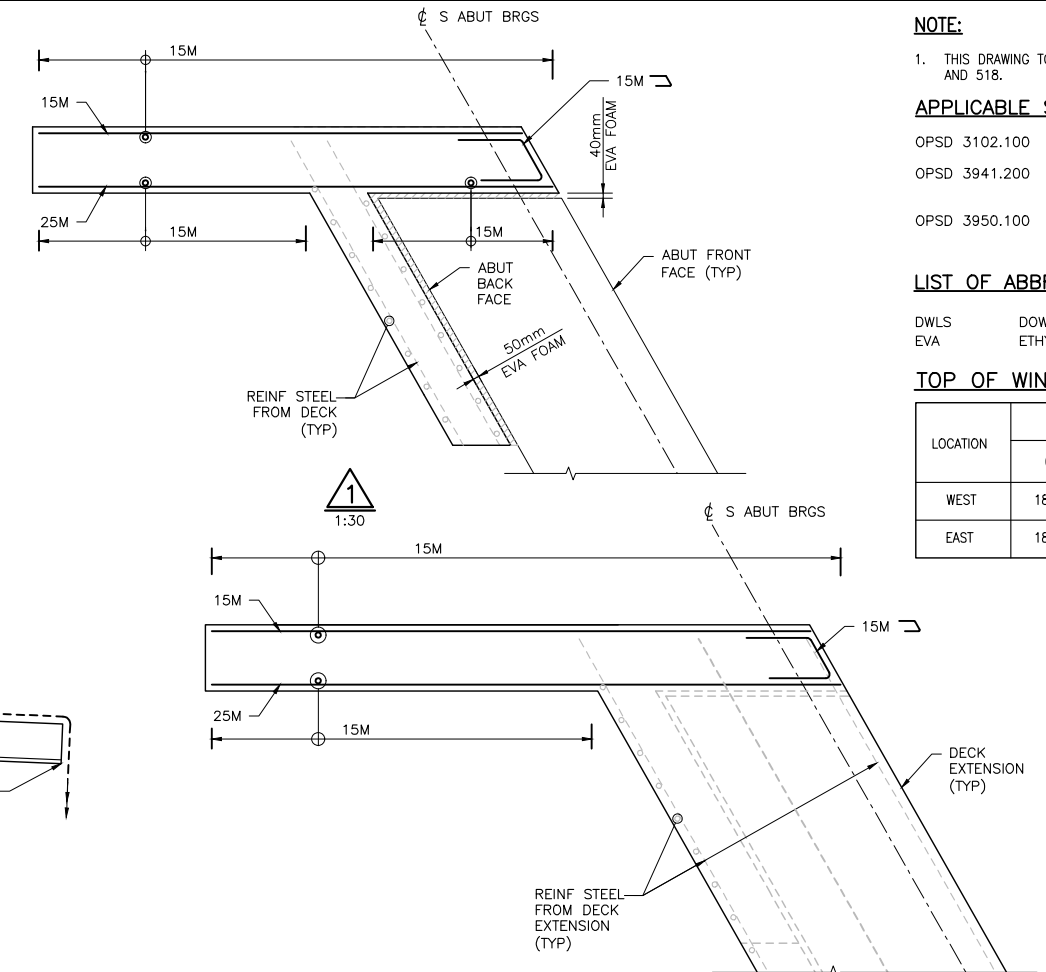
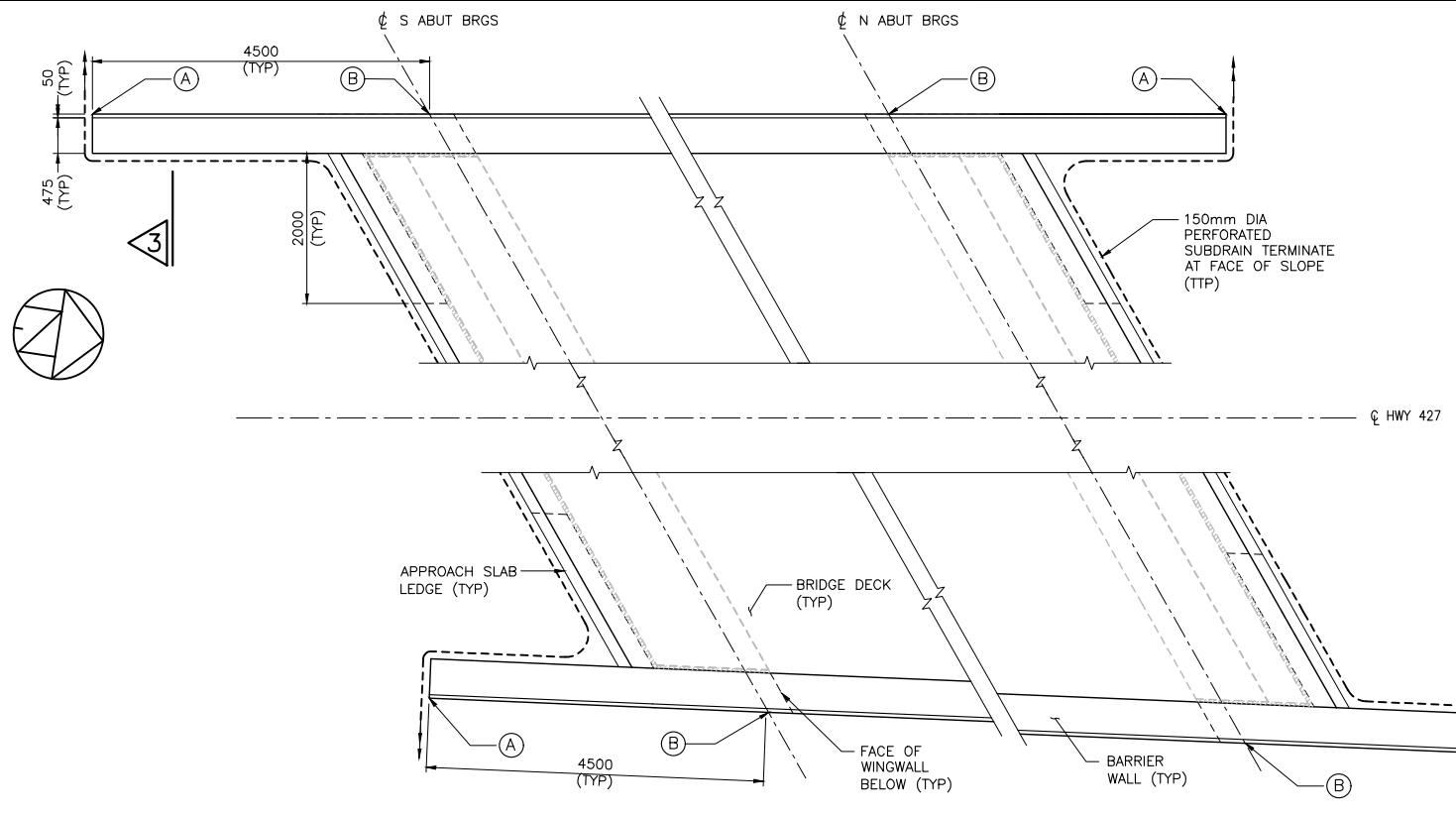
DATE	REVISIONS	BY	CHK	LEAD DISC.	PROJ. MAN.
B 18/03/16	90% SUBMISSION TO CA				
A 18/01/12	90% SUBMISSION TO CA				

SCALE :
AS NOTED

DESIGNED	SHELLEY HUANG	
DRAWN	TOM ZHAO	
CHECKED	TATIANA OJALA	
APPROVED LEAD ENG.	TATIANA OJALA	
APPROVED PROJ. MANAGER	PETER BAMFORTH	
NAME (PRINT)	INT.	DATE



TITLE							
HWY 427 EXPANSION HWY 427 NBL & SBL / CNR OVERHEAD REHABILITATION AND WIDENING SITE 37-1109 ABUTMENT WIDENING AND REHABILITATION							
PROJECT ID.	STAGE IDENTIFIER	DESIGN PACKAGE NUMBER	DISCIPLINE	STRUCTURE NUMBER	DOCUMENT TYPE	DRAWING NUMBER	REVISION NUMBER
H427-D	N	9	STR	B04	DWG	508	B



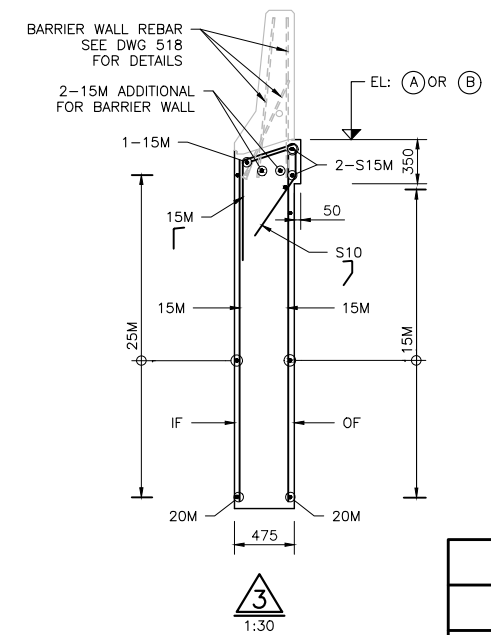
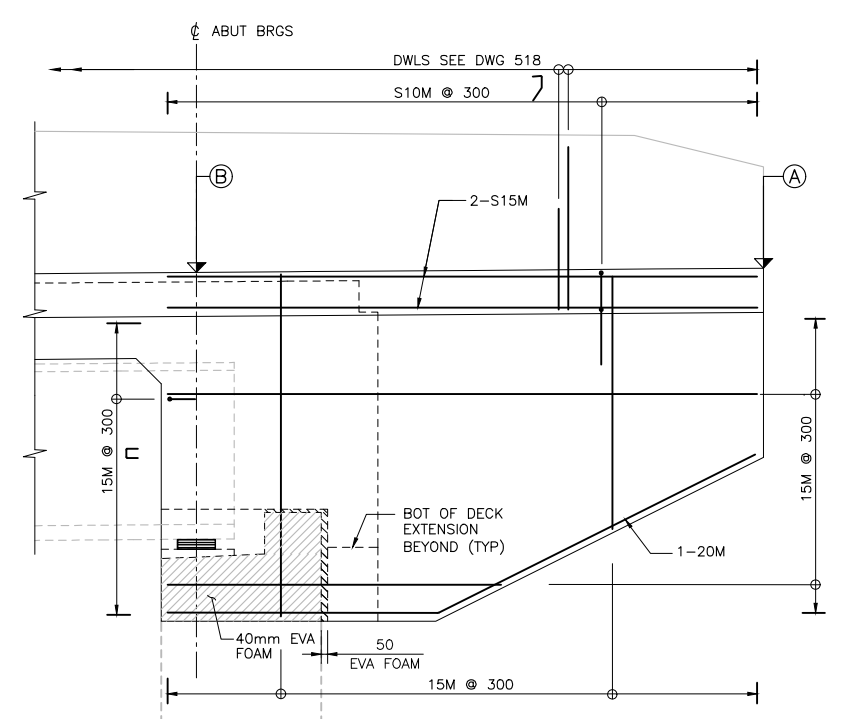
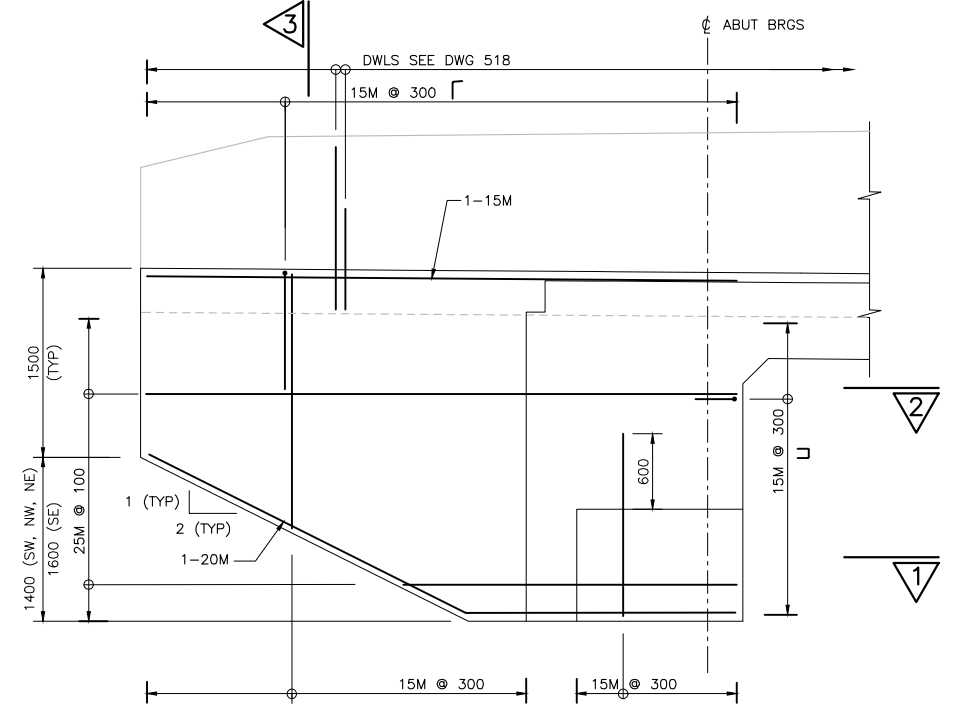
NOTE:
1. THIS DRAWING TO BE READ IN CONJUNCTION WITH DWGS 515, 516 AND 518.

APPLICABLE STANDARD DRAWINGS:
OPSD 3102.100 WALLS, ABUTMENT, BACKFILL, DRAIN
OPSD 3941.200 FIGURES IN CONCRETE, SITE NUMBER AND DATE, LAYOUT
OPSD 3950.100 JOINTS, CONCRETE EXPANSION AND CONSTRUCTION ON STRUCTURE

LIST OF ABBREVIATIONS:
DWLS DOWELS
EVA ETHYLENE VINYL ACETATE

TOP OF WINGWALL CONCRETE ELEVATIONS:

LOCATION	SOUTH		NORTH	
	(A)	(B)	(B)	(A)
WEST	180.529	180.585	180.969	180.989
EAST	180.802	180.819	181.000	181.008



MODIFIED	
STANDARD DRAWING JAN 2013	SS105-2
WINGWALL DETAILS FOR BRIDGES	

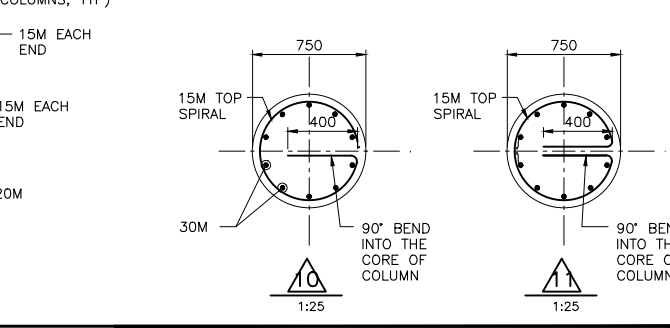
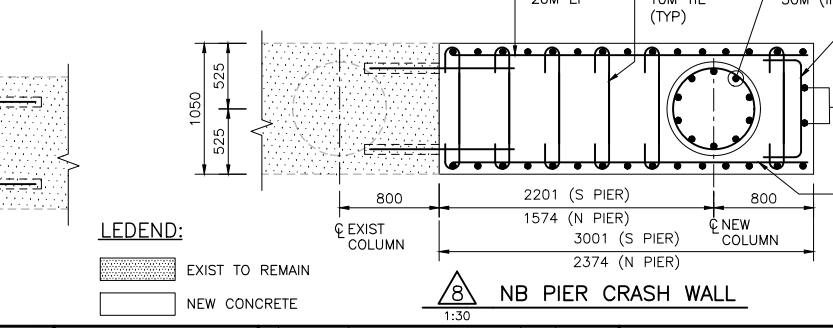
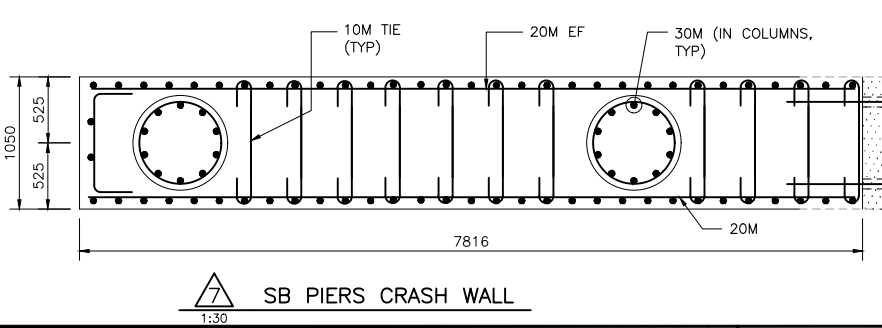
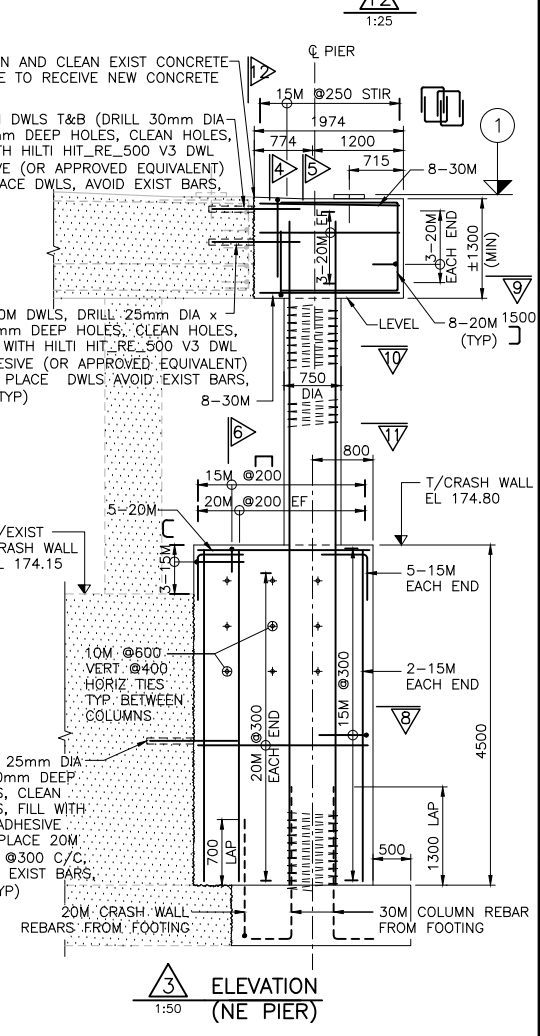
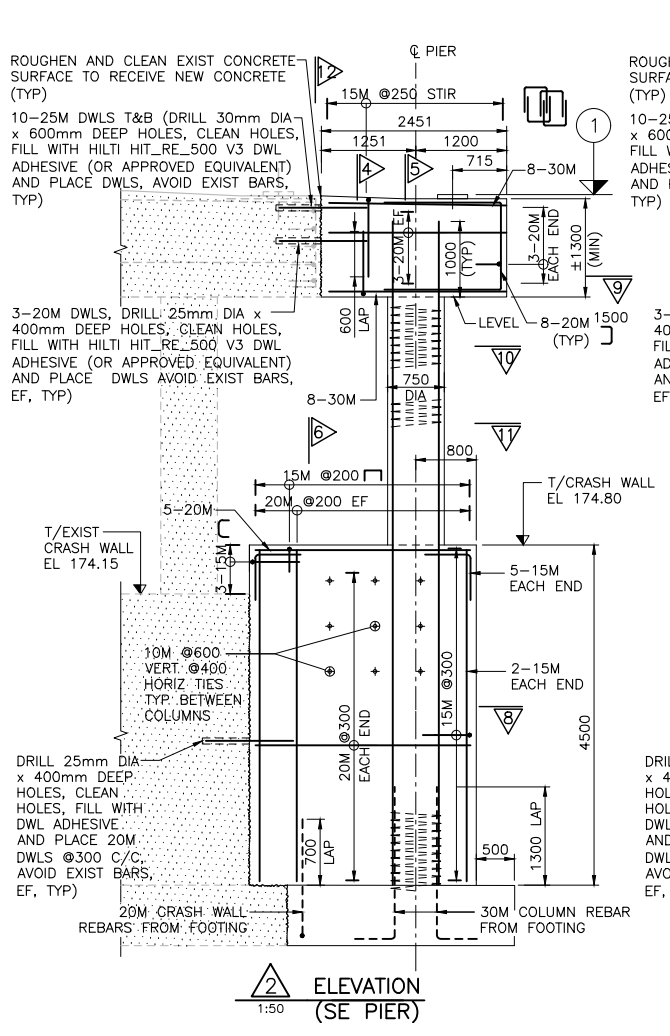
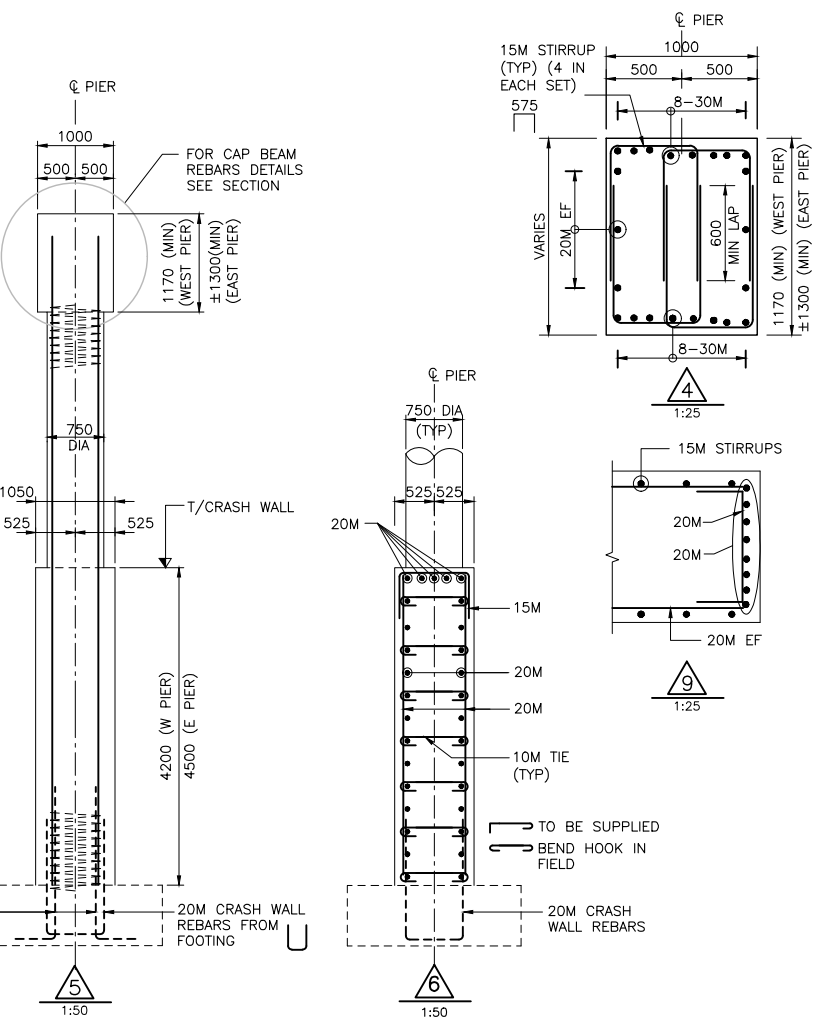
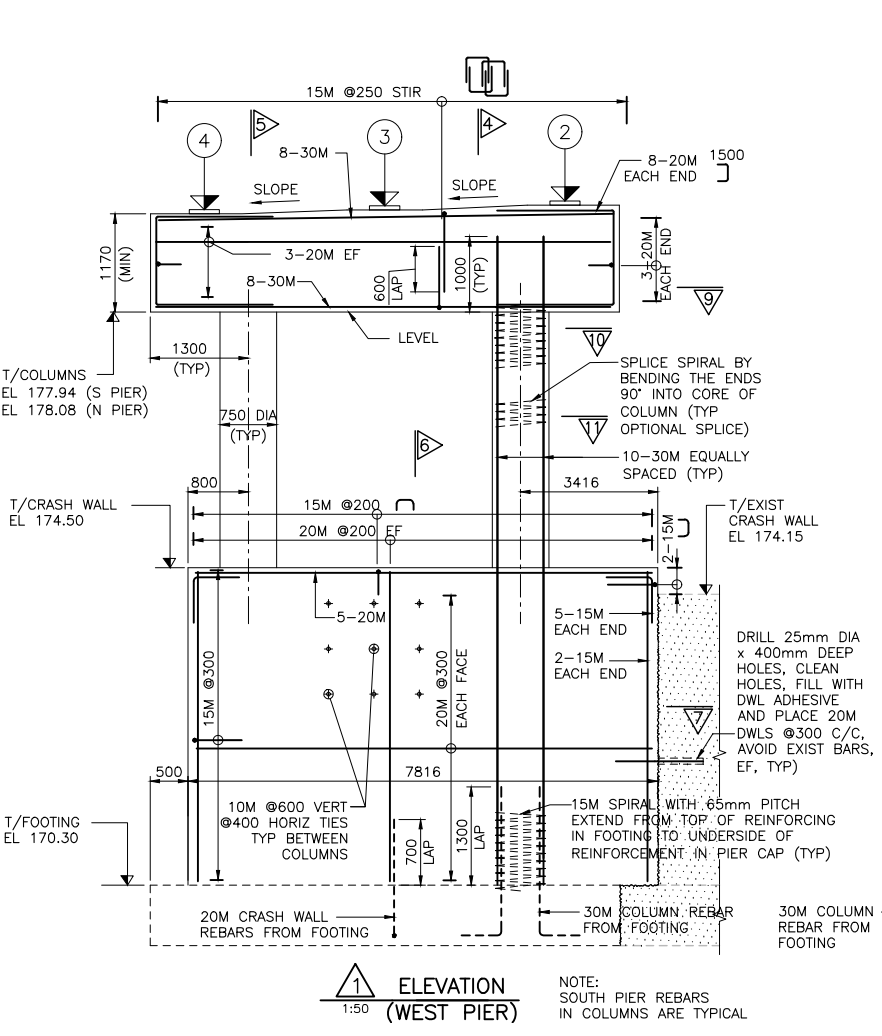
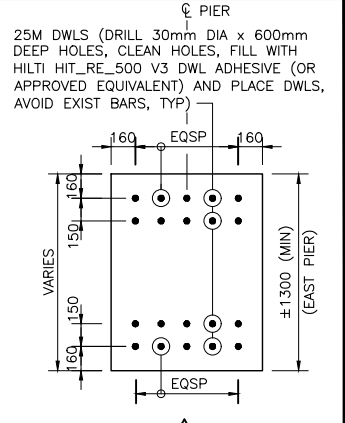
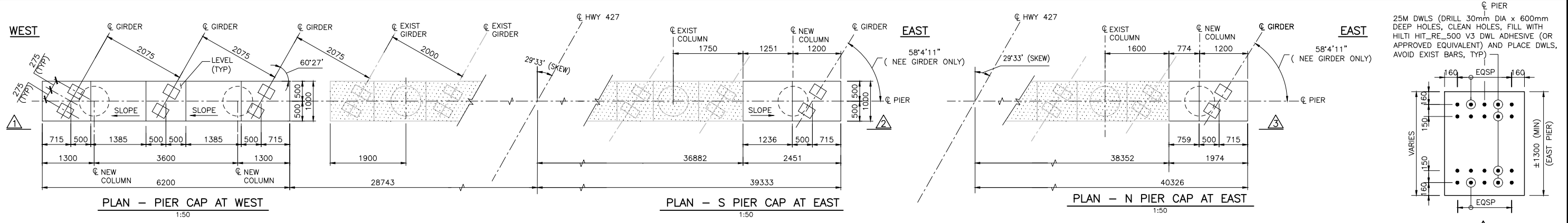
CAD FILE LOCATION AND NAME: C:\projects\hwy427\dwgs\SS105-2\SS105-2.dwg
 MODIFIED: 3/20/2018 10:33:09 AM BY: PANG
 DATE PLOTTED: 3/20/2018 11:17:54 AM BY: PANG

DATE	REVISIONS	BY	CHK	LEAD DISC.	PROJ. MAN.
18/03/16	90% SUBMISSION TO CA				
18/01/12	90% SUBMISSION TO CA				

DESIGNED	SHELLEY HUANG
DRAWN	TOM ZHAO
CHECKED	TATIANA OJALA
APPROVED LEAD ENG.	TATIANA OJALA
APPROVED PROJ. MANAGER	
NAME (PRINT)	INT. DATE



HWY 427 EXPANSION HWY 427 NBL & SBL / CNR OVERHEAD REHABILITATION AND WIDENING SITE 37-1109 WINGWALLS							
PROJECT ID.	STAGE IDENTIFIER	DESIGN PACKAGE NUMBER	DISCIPLINE	STRUCTURE NUMBER	DOCUMENT TYPE	DRAWING NUMBER	REVISION NUMBER
H427-D	N	9	STR	B04	DWG	509	B



TOP OF BEARING PAD ELEVATIONS				
LOCATION	① E	②	③	④ W
S PIER	179.318	179.266	179.215	179.165
N PIER	179.394	179.396	179.347	179.299

LEGEND:
 EXIST TO REMAIN
 NEW CONCRETE

CAD FILE LOCATION AND NAME: C:\projects\hwy427-d-n-9-str-b04-dwg-510pr.dwg
 MODIFIED: 3/20/2018 10:33:14 AM BY: PANG
 DATE PLOTTED: 3/20/2018 11:47:09 AM BY: PANG

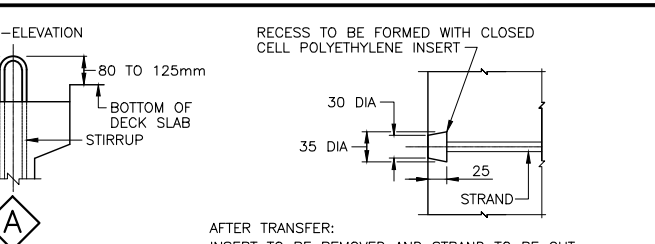
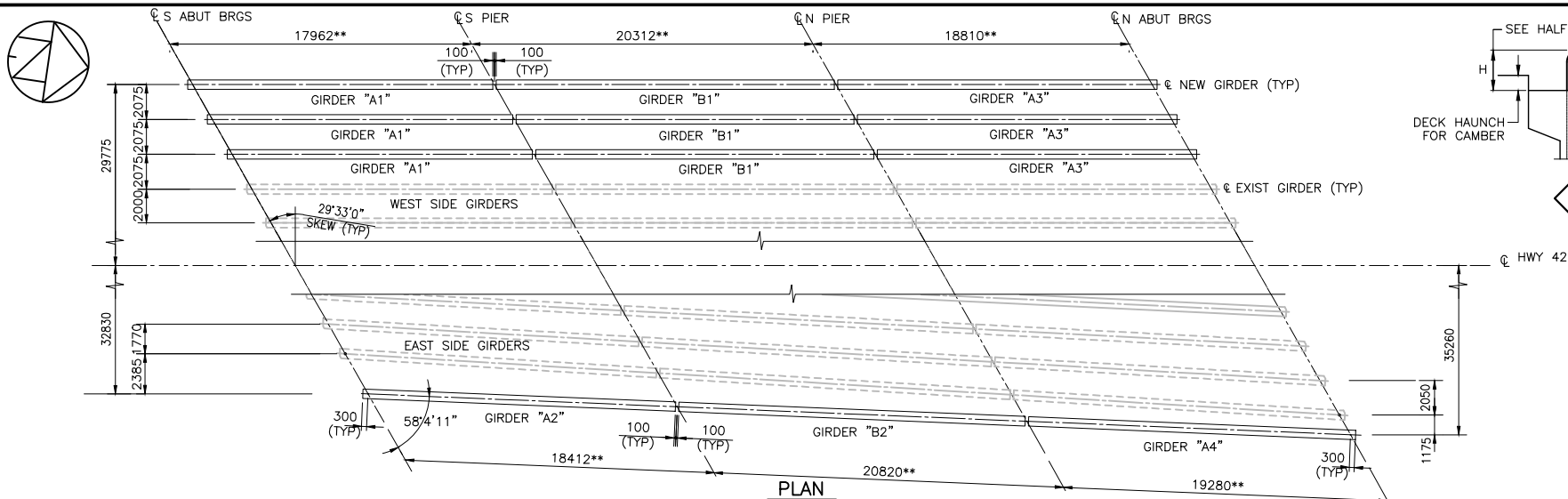
DATE	REVISIONS	BY	CHK	LEAD DISC.	PROJ. MAN.
B 18/03/16	90% SUBMISSION TO CA				
A 18/01/12	90% SUBMISSION TO CA				

SCALE :
AS NOTED

DESIGNED	SHELLEY HUANG	
DRAWN	TOM ZHAO	
CHECKED	TATIANA OJALA	
APPROVED LEAD ENG.	TATIANA OJALA	
APPROVED PROJ. MANAGER		
NAME (PRINT)	INT.	DATE

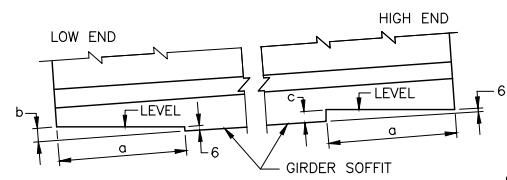


TITLE							
HWY 427 EXPANSION HWY 427 NBL & SBL / CNR OVERHEAD REHABILITATION AND WIDENING SITE 37-1109 PIERS							
PROJECT ID.	STAGE IDENTIFIER	DESIGN PACKAGE NUMBER	DISCIPLINE	STRUCTURE NUMBER	DOCUMENT TYPE	DRAWING NUMBER	REVISION NUMBER
H427-D	N	9	STR	B04	DWG	510	B



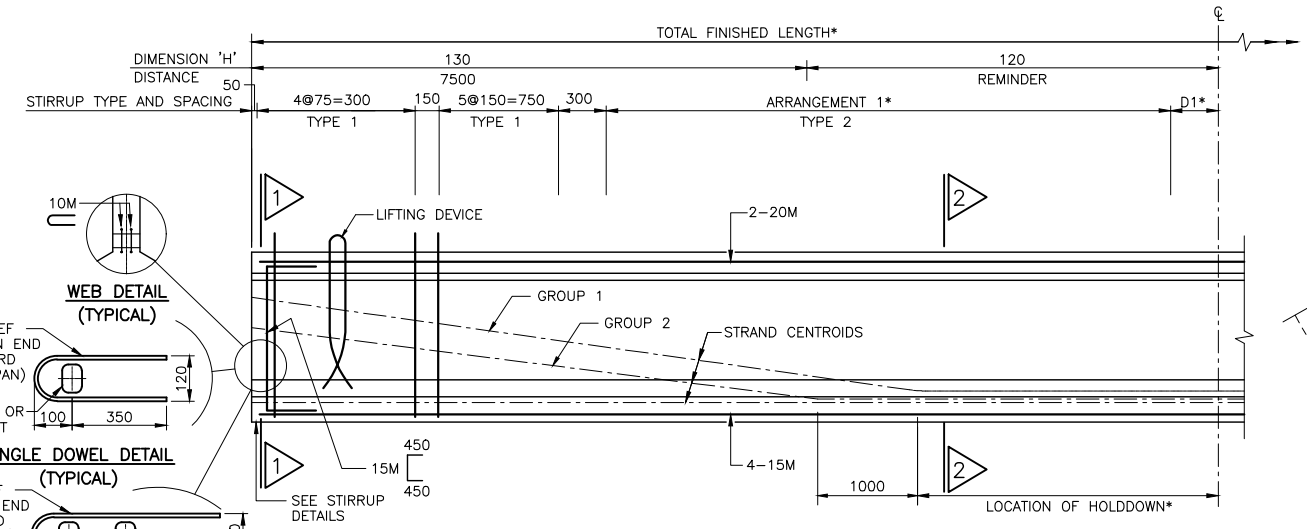
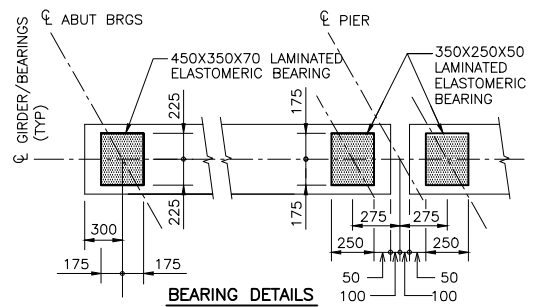
AFTER TRANSFER:
INSERT TO BE REMOVED AND STRAND TO BE CUT BACK FROM END OF GIRDER USING AN OXYGEN FED HOLLOW STEMMED THERMIC LANCE. RECESS TO BE CLEANED AND FILLED WITH NON-SHRINK GROUT.

STRAND TREATMENT FOR EXPOSED GIRDER ENDS AT ABUTMENTS

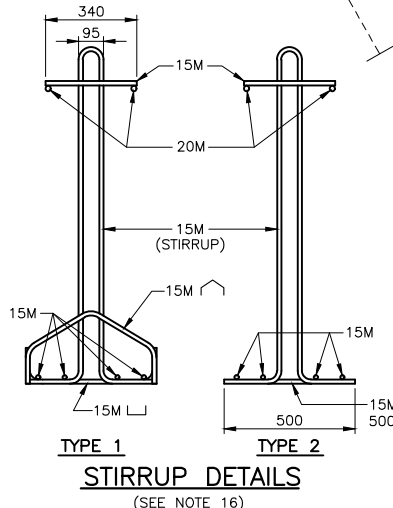
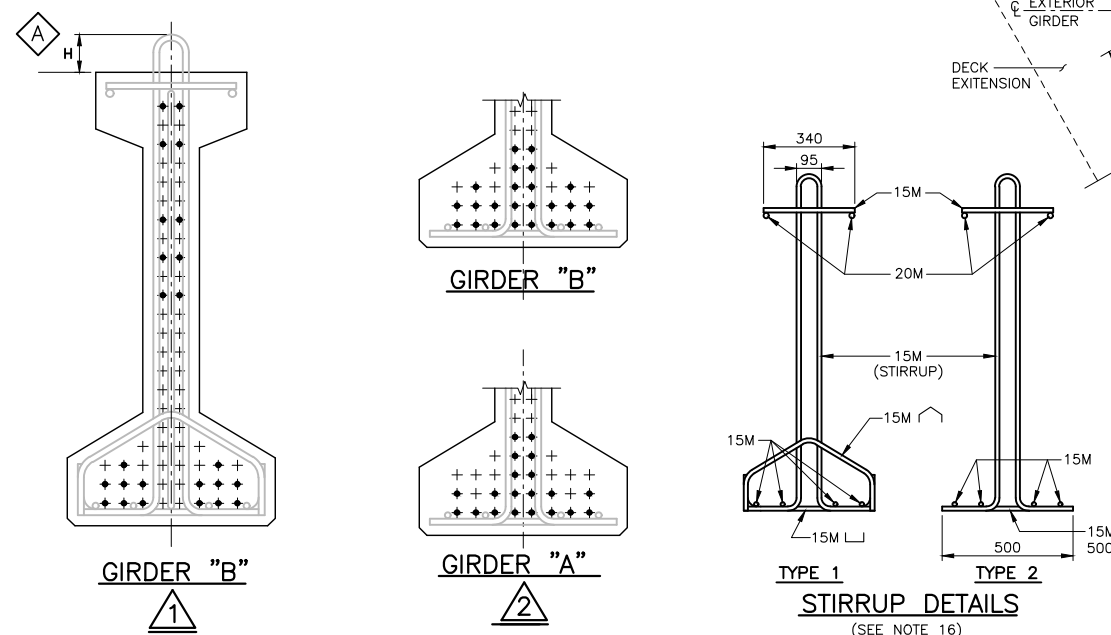
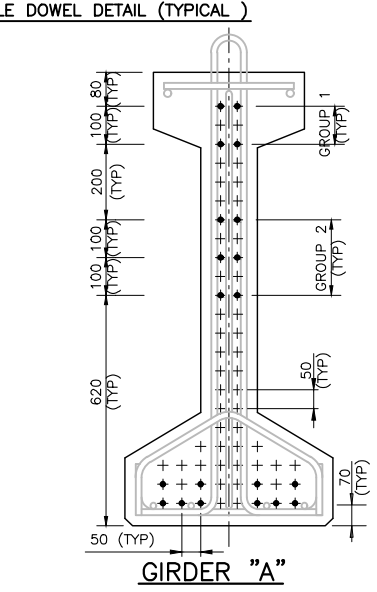


GIRDER TYPE	a	b	c
A1	660	15	9
B1	660	15	6
A3	660	12	6
A2	660	12	9
B2	660	15	6
A4	660	12	6

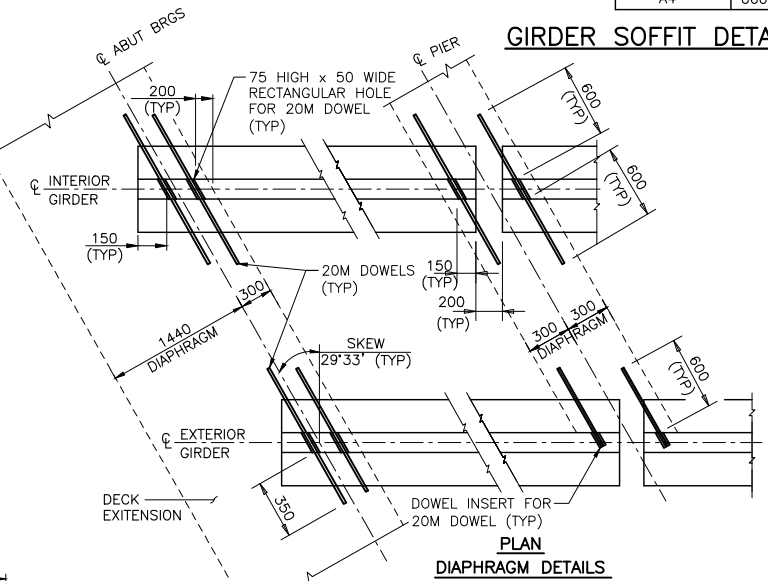
- NOTES:**
- PRESTRESSING STEEL SHALL BE LOW-RELAXATION SEVEN WIRE STRANDS, SIZE DESIGNATION 13, GRADE 1860.
 - MINIMUM BREAKING STRENGTH OF STRAND 183.7 kN.
 - JACKING FORCE PER STRAND 137.8 kN.
 - FORCE PER STRAND AFTER ALL LOSSES SEE GIRDER TABLE.
 - THE ELAPSED TIME INTERVAL BETWEEN JACKING OF STRANDS AND TRANSFER SHALL NOT BE LESS THAN 15 HOURS.
 - PRESTRESSING STRANDS SHALL BE SPACED VERTICALLY AT A MINIMUM OF 150mm IN THE VICINITY OF RECTANGULAR HOLES OR INSERTS FOR 20M DOWELS.
 - CLASS OF CONCRETE:
PRECAST GIRDER 50 MPa.
 - MIN CONCRETE STRENGTH AT TRANSFER 30 MPa.
 - REINFORCING STEEL SHALL BE GRADE 400W.
 - CLEAR COVER TO REINFORCING STEEL:
SOFFIT OF BEAM (EXCEPT UNDERCUT) 48 +15mm/-5mm
UNDERCUT AND ELSEWHERE 30 +15mm/-5mm
 - DOWEL INSERTS SHALL BE ZINC PLATED OR GALVANIZED.
 - DOWEL INSERTS SHALL BE CAPABLE OF DEVELOPING A FORCE IN TENSION OF 20 kN AT SERVICEABILITY LIMIT STATES LOADING.
 - FOR THE DIAPHRAGMS, THE PRECASTER WILL SUPPLY THE THREADED INSERTS AND THE MATCHING DIAPHRAGM DOWELS FOR THE EXTERIOR GIRDERS ONLY.
 - 20M DEFORMED BAR DOWELS FOR EXTERIOR GIRDERS SHALL BE THREADED AT ONE END TO MATCH INSERTS.
 - FOR DETAILS OF POSITIVE MOMENT CONNECTION APPLICABLE TO CONTINUOUS GIRDER SEE OPSD 3310.150.
 - NO WELDING SHALL BE PERMITTED UNLESS APPROVED BY THE OWNER.



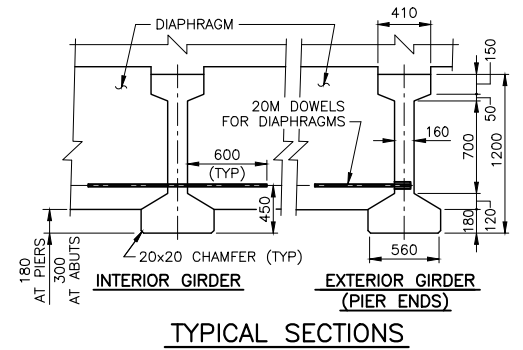
HALF ELEVATION
* SEE GIRDER TABLE (TYP)



STIRRUP DETAILS
(SEE NOTE 16)



DIAPHRAGM DETAILS



TYPICAL SECTIONS

GIRDER TABLE

GIRDERS	NO.	TOTAL FINISHED LENGTH (mm)	FORCE PER STRAND AFTER ALL LOSSES (kN)	NO. OF STRANDS	NO. STRAIGHT STRANDS	NO. DEFLECTED STRANDS	LOCATION OF HOLD DOWN (mm)	ARRANGEMENT # OF SPACING (mm)	D1 (mm)
SPAN 1 GIRDER "A"	A1	18,160	111.1	20	10	10	1,800	24@300	330
	A2	18,610	112.2	20	10	10	2,000	25@300	255
SPAN 2 GIRDER "B"	B1	20,110	107.4	24	14	10	2,800	28@300	105
	B2	20,620	108.6	24	14	10	3,000	28@300	360
SPAN 3 GIRDER "A"	A3	19,010	111.6	20	10	10	2,300	26@300	155
	A4	19,480	112.1	20	10	10	2,500	26@300	390

BEARING DATA TABLE

SERVICEABILITY LIMIT STATES	LOCATION	ABUTMENTS	PIERS
	TYPE	LAMINATED	NATURAL RUBBER
	SIZE (mm)	450x350x70	350x250x50
	NUMBER REQUIRED	8	16
ULTIMATE LIMIT STATES	DEAD LOAD (kN)	560	370
	TOTAL LOAD (kN)	910	580
	MOVEMENT (mm)	+/- 22	+/- 13
	ROTATION (radian)	0.0039	0.0017
	MAX. SHEAR RATE (kN/mm)	3.44	2.76
ULTIMATE LIMIT STATES	DEAD LOAD (kN)	680	460
	TOTAL LOAD (kN)	1340	874

NOTE: MAX SHEAR IS RATED AT -25°C FOR DUROMETRE HARDNESS 55±5

MODIFIED
STANDARD DRAWING SEPTEMBER 2016 | **SS107-2**
PRESTRESSED GIRDERS AND BEARINGS (CPCI 1200)

DRAWING NOT TO BE SCALED
100mm ON ORIGINAL DRAWING

CAD FILE LOCATION AND NAME: C:\projects\hwy427\dwg\hwy427-d-n-9-str-b04-dwg-511gr.dwg
MODIFIED: 3/20/2018 10:33:20 AM BY: PANGF
DATE PLOTTED: 3/20/2018 11:47:14 AM BY: PANGF

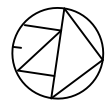
DATE	REVISIONS	BY	CHK	LEAD	PROJ.
B 18/03/16	90% SUBMISSION TO CA				
A 18/01/12	90% SUBMISSION TO CA				

SCALE :
AS NOTED

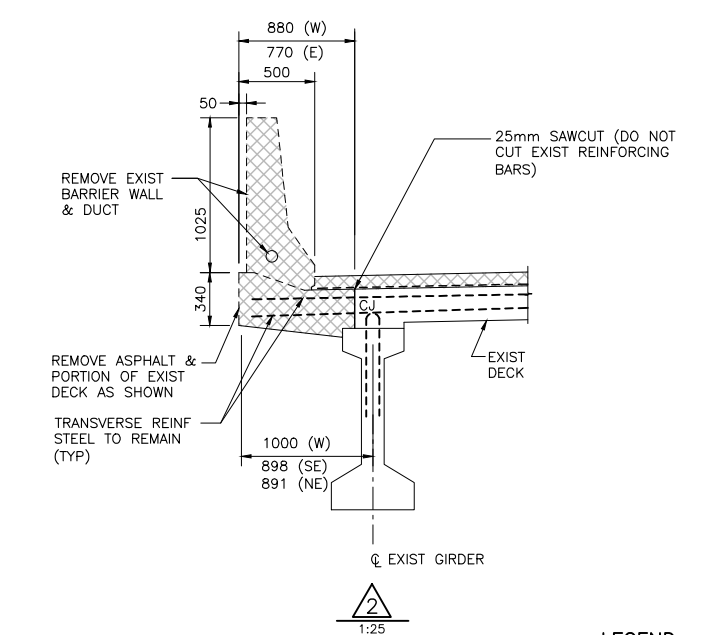
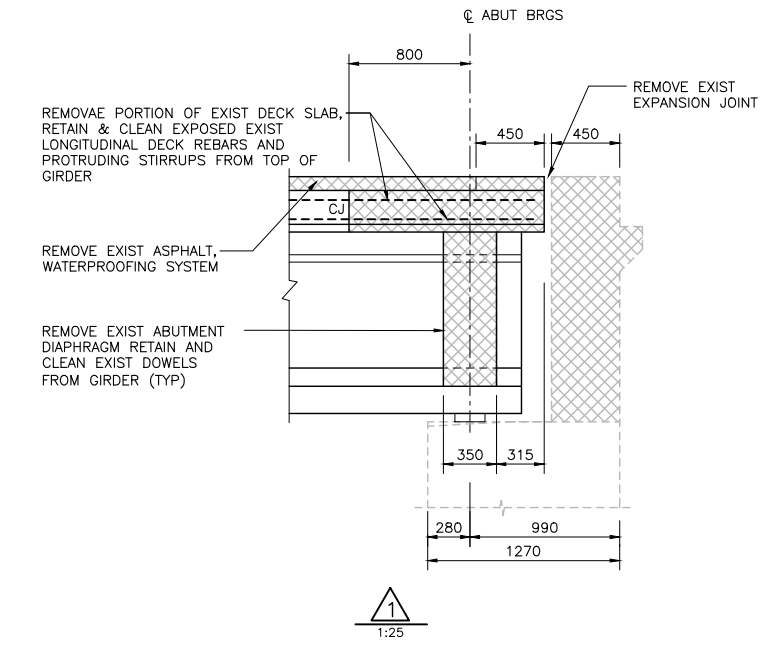
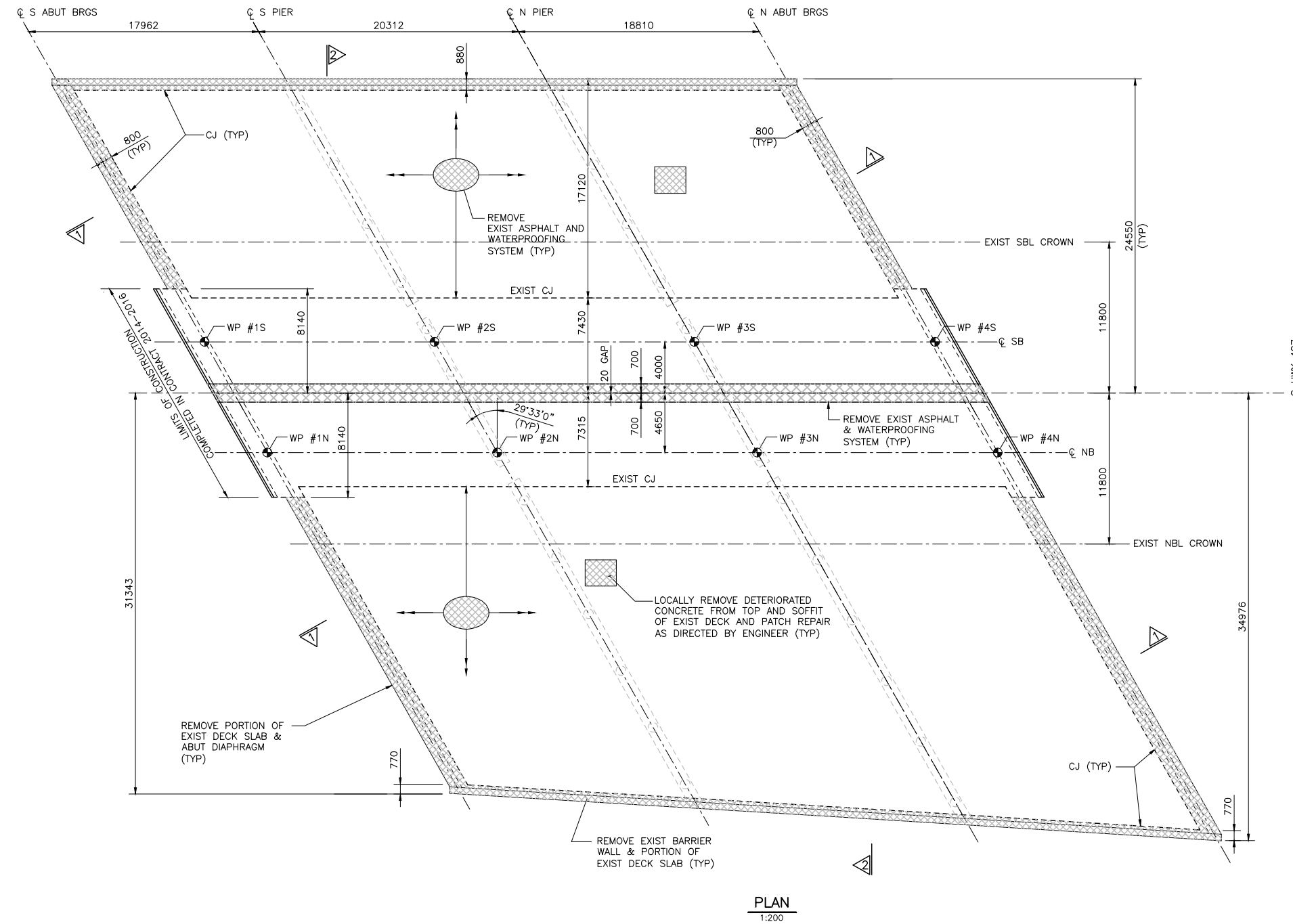
DESIGNED	SHELLEY HUANG	
DRAWN	TOM ZHAO	
CHECKED	TATIANA QJALA	
APPROVED LEAD ENG.	TATIANA QJALA	
APPROVED PROJ. MANAGER		
NAME (PRINT)	INIT.	DATE



TITLE						
HWY 427 EXPANSION HWY 427 NBL & SBL / CNR OVERHEAD REHABILITATION AND WIDENING SITE 37-1109 PRESTRESSED GIRDERS AND BEARINGS						
PROJECT ID.	STAGE IDENTIFIER	DESIGN PACKAGE NUMBER	DISCIPLINE	STRUCTURE NUMBER	DOCUMENT TYPE	DRAWING NUMBER
H427-D	N	9	STR	B04	DWG	511 B



- NOTES:**
1. READ THIS DRAWING IN CONJUNCTION WITH DRAWINGS 504, 505, 513 TO 516.
 2. ROUGH SURFACE AT CJ.



LEGEND:

	EXISTING TO REMAIN
	REMOVAL

PLAN
1:200

CAD FILE LOCATION AND NAME: C:\projects\hwy427\hwy427-d-n-9-str-b04-dwg-512.dwg
 MODIFIED: 3/20/2018 10:33:27 AM BY: PANGF
 DATE PLOTTED: 3/20/2018 11:47:17 AM BY: PANGF

DATE	REVISIONS	BY	CHK	LEAD DISC.	PROJ. MAN.
B 18/03/16	90% SUBMISSION TO CA				
A 18/01/12	90% SUBMISSION TO CA				

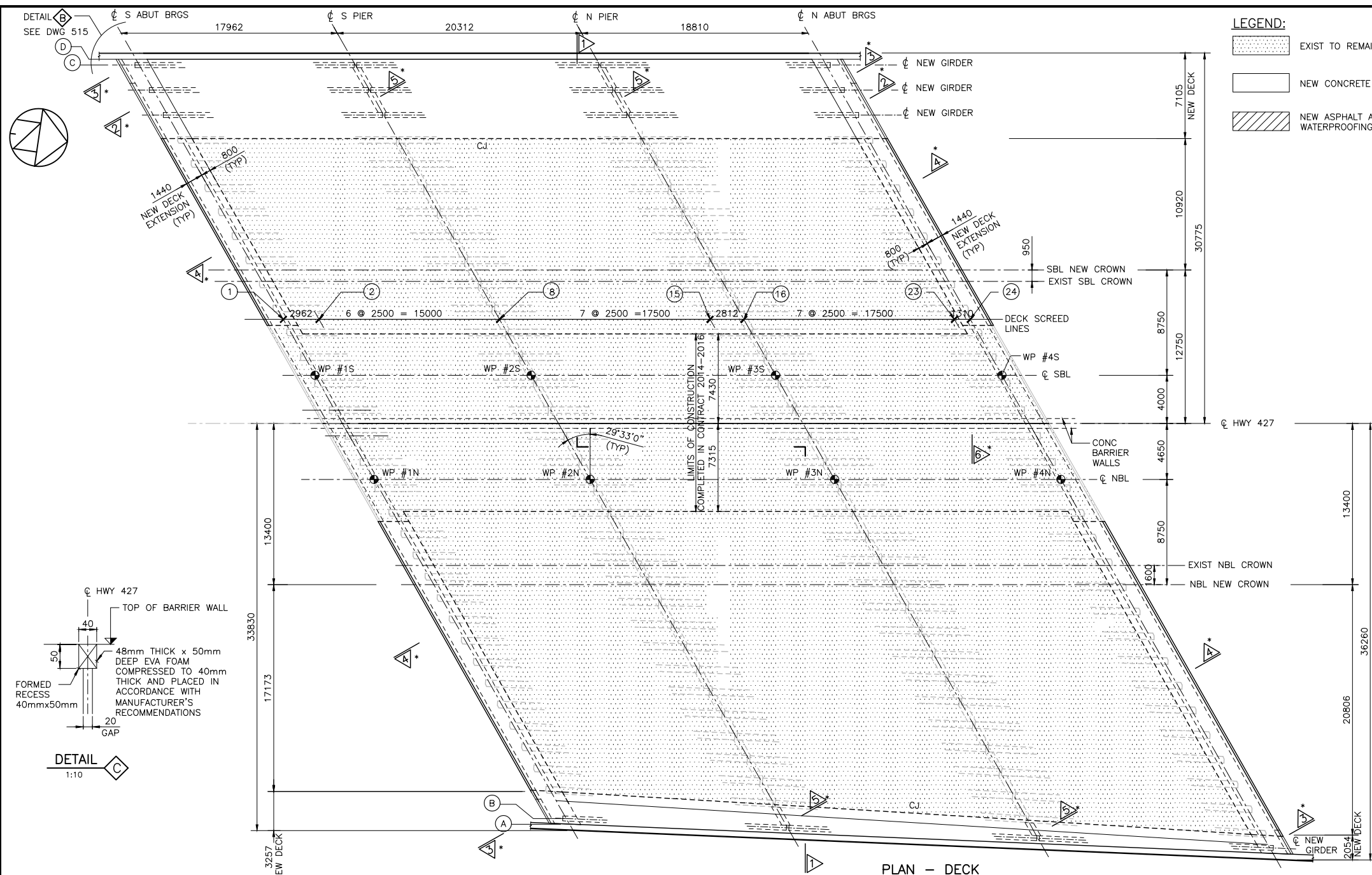
SCALE :

AS NOTED

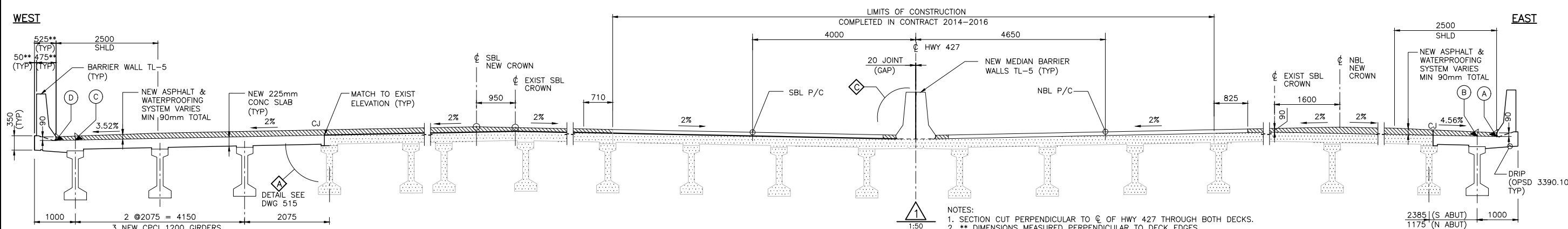
DESIGNED	SHELLEY HUANG	
DRAWN	TOM ZHAO	
CHECKED	TATIANA OJALA	
APPROVED LEAD ENG.	TATIANA OJALA	
APPROVED PROJ. MANAGER	PETER BAMFORTH	
NAME (PRINT)	INT.	DATE



TITLE HWY 427 EXPANSION HWY 427 NBL & SBL / CNR OVERHEAD REHABILITATION AND WIDENING SITE 37-1109 DECK REMOVALS							
PROJECT ID.	STAGE IDENTIFIER	DESIGN PACKAGE NUMBER	DISCIPLINE	STRUCTURE NUMBER	DOCUMENT TYPE	DRAWING NUMBER	REVISION NUMBER
H427-D	N	9	STR	B04	DWG	512	B

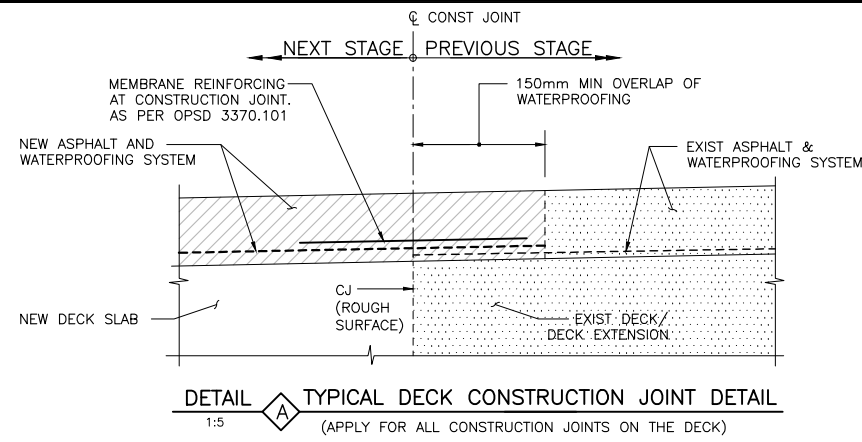


SCREED ELEVATIONS AT TOP OF CONCRETE					
SCREED LINE	(A)	(B)	(C)	(D)	OTHERS
1	180.703	180.710	180.487	180.474	S ABUT
2	180.721	180.729	180.520	180.509	
3	180.736	180.743	180.543	180.531	
4	180.748	180.756	180.564	180.552	
5	180.757	180.766	180.582	180.571	
6	180.765	180.773	180.600	180.589	
7	180.771	180.779	180.615	180.604	
8	180.775	180.783	180.630	180.618	S PIER
9	180.791	180.799	180.656	180.644	
10	180.807	180.815	180.680	180.669	
11	180.820	180.828	180.704	180.693	
12	180.831	180.839	180.721	180.710	
13	180.839	180.847	180.734	180.723	
14	180.845	180.853	180.746	180.734	
15	180.848	180.856	180.754	180.744	
16	180.850	180.859	180.764	180.752	N PIER
17	180.862	180.871	180.784	180.773	
18	180.870	180.879	180.803	180.792	
19	180.877	180.886	180.820	180.809	
20	180.882	180.891	180.836	180.824	
21	180.885	180.893	180.848	180.838	
22	180.885	180.895	180.857	180.846	
23	180.885	180.894	180.863	180.852	
24	180.884	180.893	180.866	180.855	N ABUT

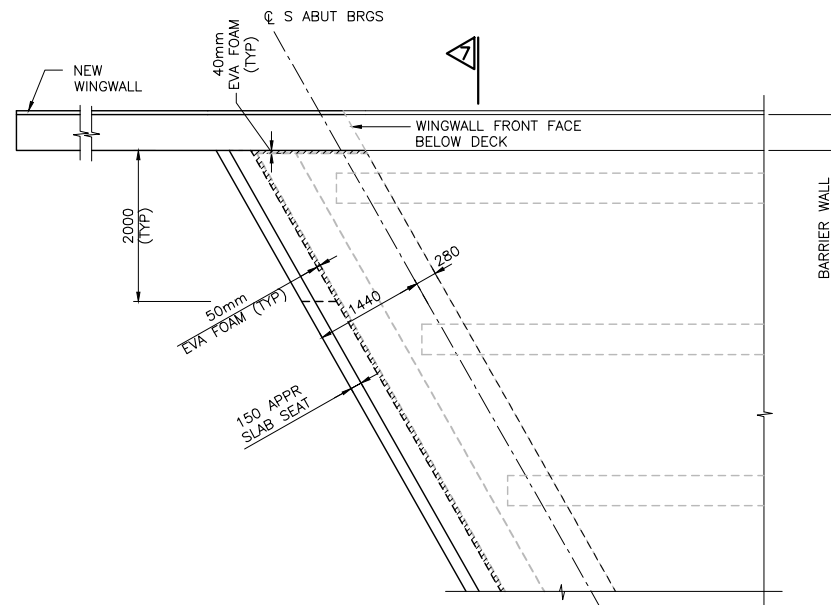


SCALE : AS NOTED		DESIGNED: SHELLEY HUANG				TITLE: HWY 427 EXPANSION REHABILITATION AND WIDENING SITE 37-1109 DECK DETAILS I			
DRAWN: TOM ZHAO		CHECKED: TATIANA OJALA				PROJECT ID: H427-D	STAGE IDENTIFIER: N	DESIGN PACKAGE NUMBER: 9	DISCIPLINE: STR
APPROVED LEAD ENG: TATIANA OJALA		APPROVED PROJ. MANAGER:				STRUCTURE NUMBER: B04	DOCUMENT TYPE: DWG	DRAWING NUMBER: 513	REVISION NUMBER: B
DATE: 18/03/16		90% SUBMISSION TO CA							
DATE: 18/01/12		90% SUBMISSION TO CA							
DATE: _____		REVISIONS							

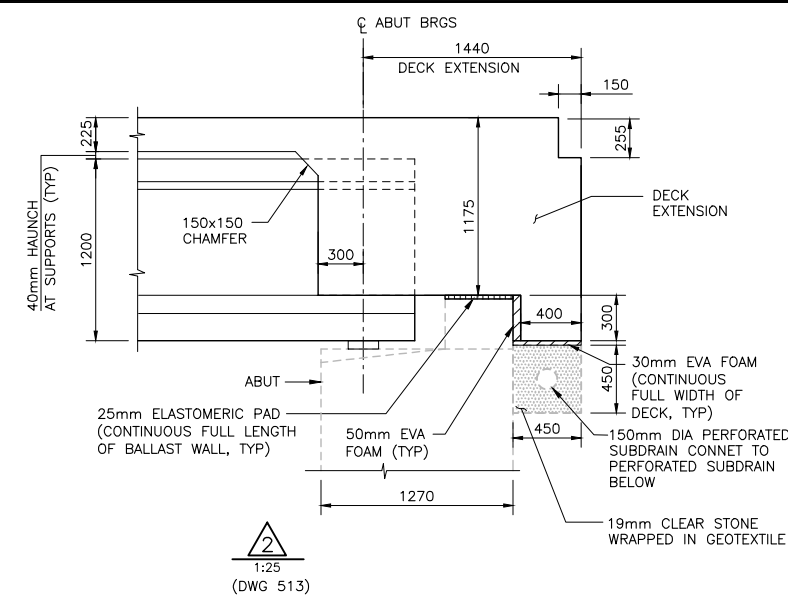
CAD FILE LOCATION AND NAME: C:\projects\hwy427\hwy427-d-n-9-str-b04-dwg-513.dwg
 MODIFIED: 3/20/2018 10:33:31 AM BY: PANG
 DATE PLOTTED: 3/20/2018 11:47:21 AM BY: PANG



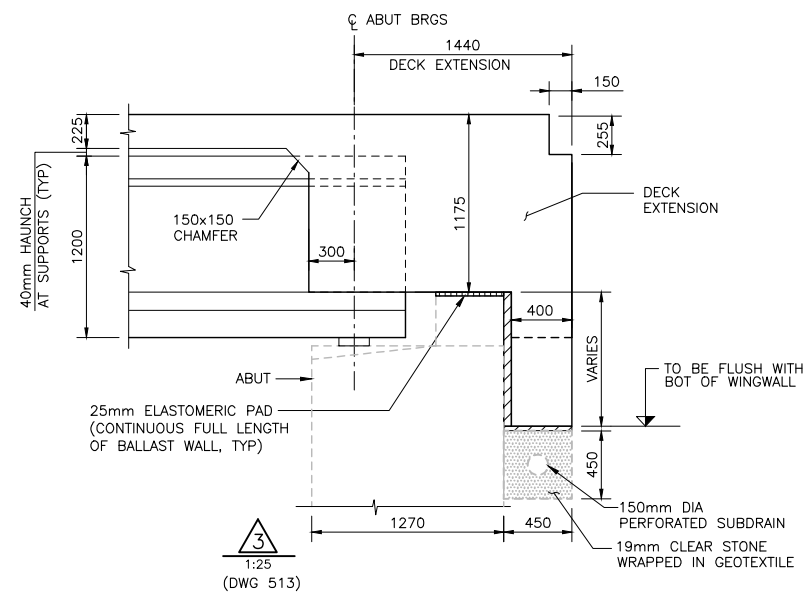
DETAIL A TYPICAL DECK CONSTRUCTION JOINT DETAIL
1:5 (APPLY FOR ALL CONSTRUCTION JOINTS ON THE DECK)



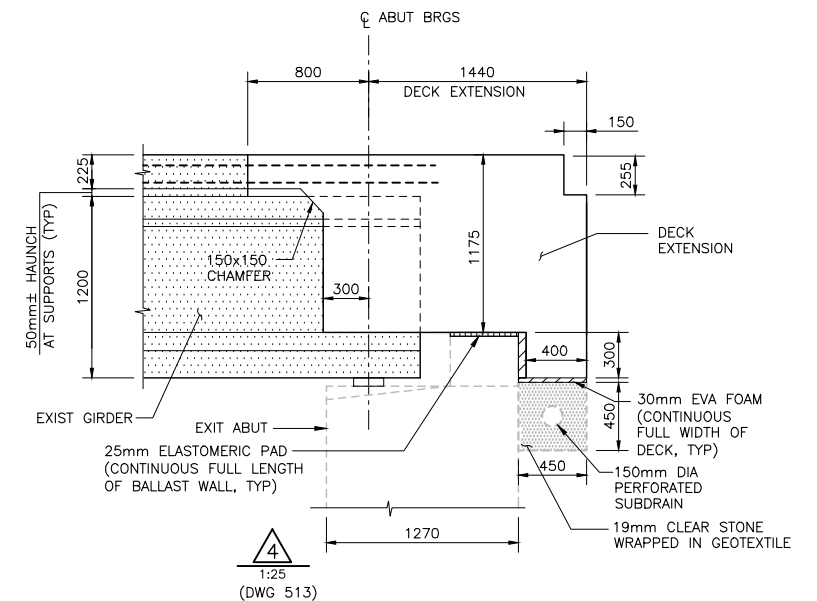
DETAIL B NOTE: SB SW CORNER SHOWN, SB NW, NB SE & NE CORNERS SIMILAR.
1:50 DWG 513



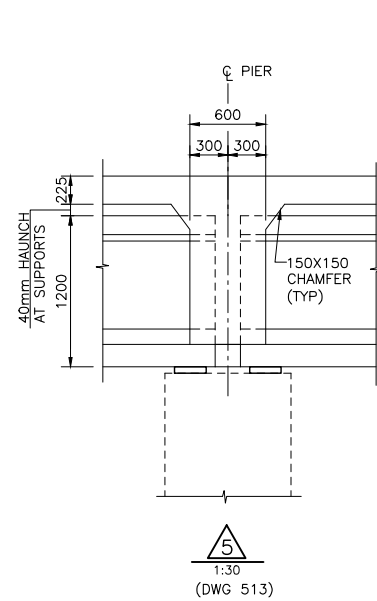
2 1:25 (DWG 513)



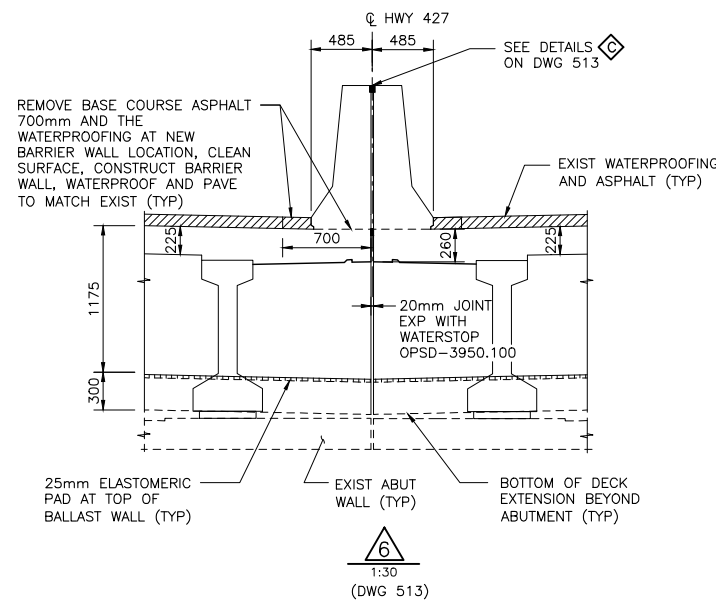
3 1:25 (DWG 513)



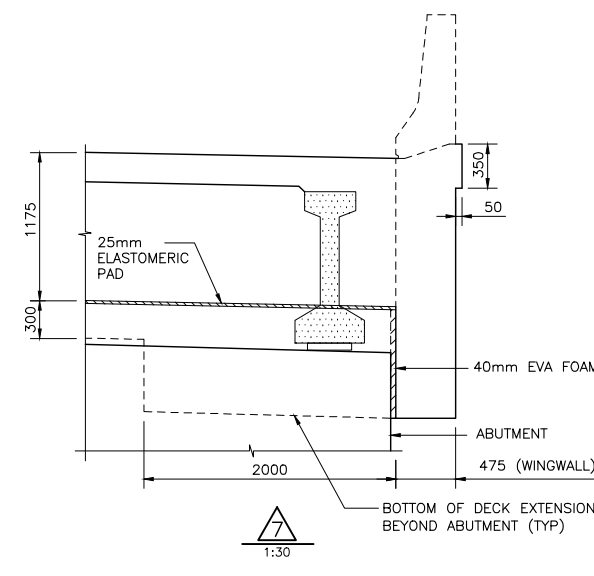
4 1:25 (DWG 513)



5 1:30 (DWG 513)



6 1:30 (DWG 513)



7 1:30

NOTE:
1. READ THIS DRAWING IN CONJUNCTION WITH DWG 513, 515 AND 516.

LEGEND:

CAD FILE LOCATION AND NAME: C:\projects\wise\wsp-co\wsp-co\proj\pang\dwgs\0265\H427-D-N-9-STR-B04-DWG-514DK.dwg
 MODIFIED: 3/20/2018 10:33:33 AM BY: PANG
 DATE PLOTTED: 3/20/2018 11:47:24 AM BY: PANG

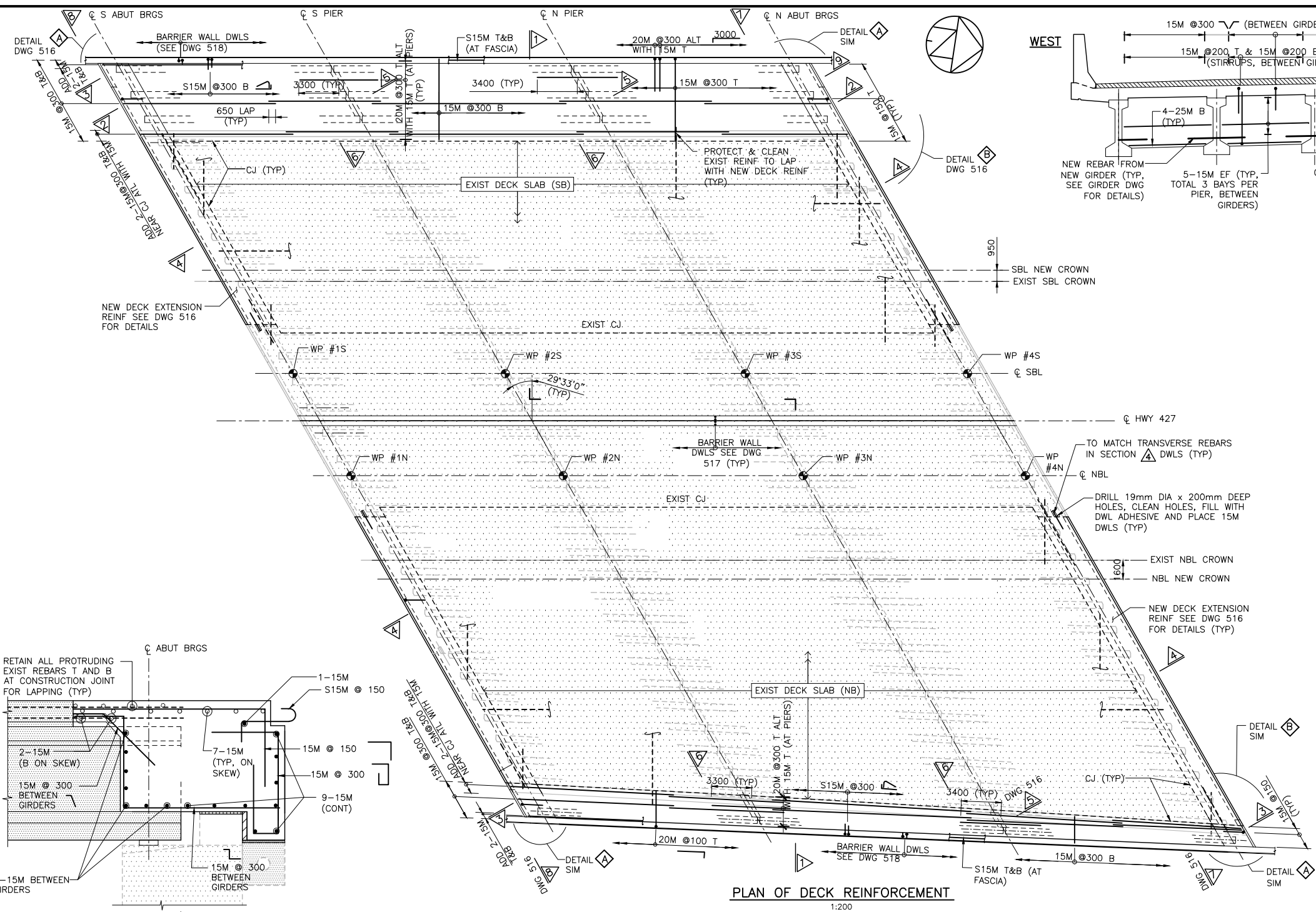
DATE	REVISIONS	BY	CHK	LEAD DISC.	PROJ. MAN.
B 18/03/16	90% SUBMISSION TO CA				
A 18/01/12	90% SUBMISSION TO CA				

SCALE :
AS NOTED

DESIGNED	SHELLEY HUANG
DRAWN	TOM ZHAO
CHECKED	TATIANA OJALA
APPROVED LEAD ENG.	TATIANA OJALA
APPROVED PROJ. MANAGER	
NAME (PRINT)	INT. DATE



TITLE HWY 427 EXPANSION HWY 427 NBL & SBL / CNR OVERHEAD REHABILITATION AND WIDENING SITE 37-1109 DECK DETAILS II							
PROJECT ID.	STAGE IDENTIFIER	DESIGN PACKAGE NUMBER	DISCIPLINE	STRUCTURE NUMBER	DOCUMENT TYPE	DRAWING NUMBER	REVISION NUMBER
H427-D	N	9	STR	B04	DWG	514	B



APPLICABLE STANDARD DRAWINGS:
 OPSD 3329.100 DECK, REINFORCEMENT SUPPORTS FOR REINFORCING STEEL FOR SLAB DEPTHS 300mm OR LESS
 OPSD 3329.101 DECK, REINFORCEMENT SUPPORTS FOR REINFORCING STEEL FOR SLAB DEPTHS GREATER THAN 300mm

LEGEND:

 ■ EXISTING TO REMAIN
 ■ NEW CONCRETE
 ■ NEW ASPHALT

CAD FILE LOCATION AND NAME: C:\projects\hwy427\hwy427-d-n-9-str-b04-dwg-515.dwg
 MODIFIED: 3/20/2018 10:33:41 AM BY: PANG
 DATE PLOTTED: 3/20/2018 11:47:30 AM BY: PANG

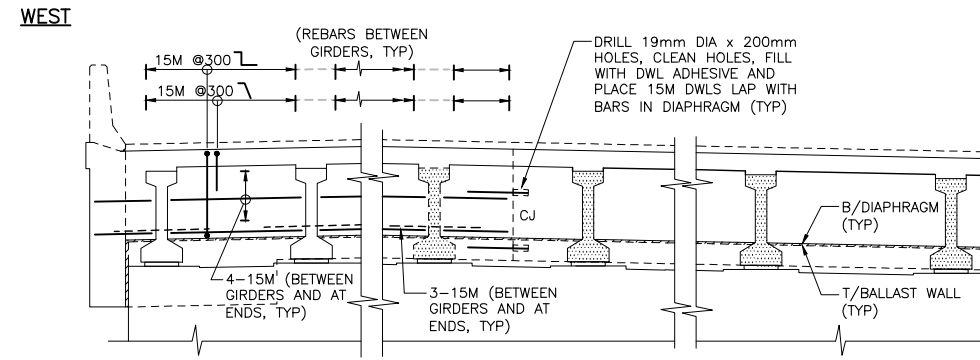
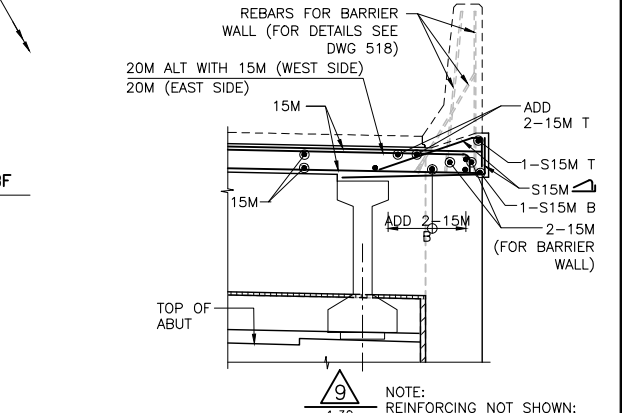
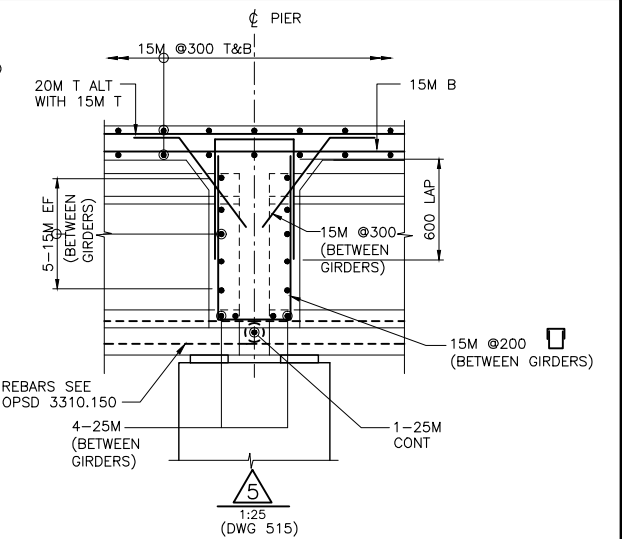
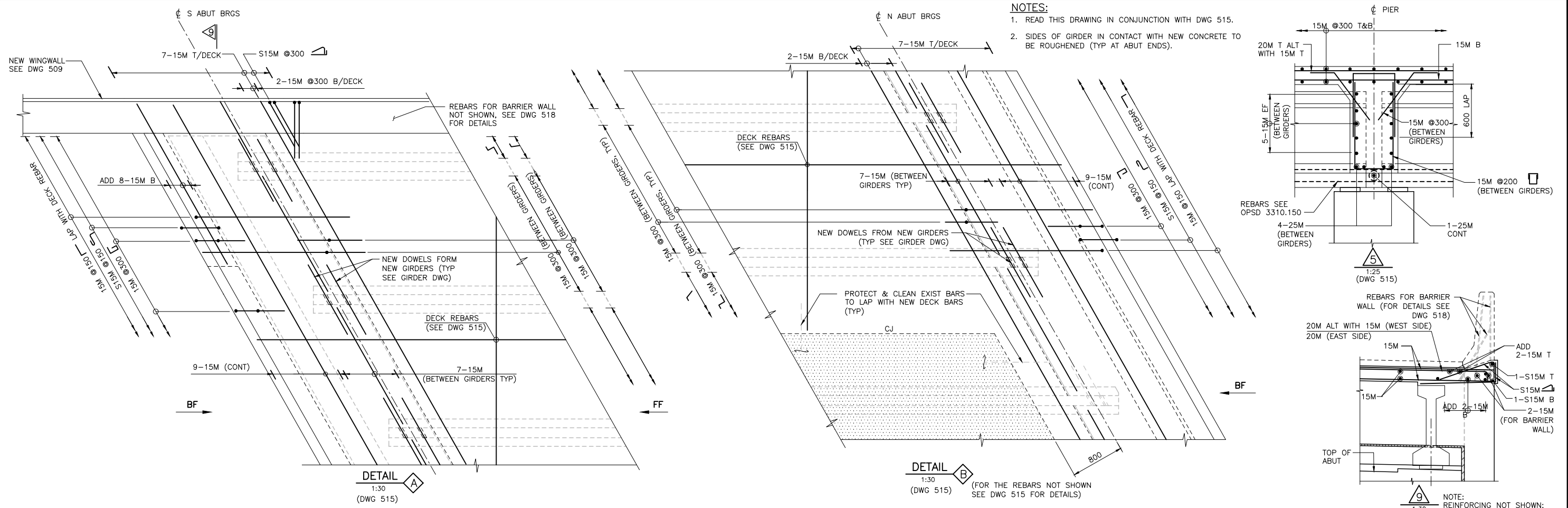
DATE	REVISIONS	BY	CHK	LEAD DISC	PROJ MAN
B 18/03/16	90% SUBMISSION TO CA				
A 18/01/12	90% SUBMISSION TO CA				

DESIGNED	SHELLEY HUANG
DRAWN	TOM ZHAO
CHECKED	TATIANA OJALA
APPROVED LEAD ENG.	TATIANA OJALA
APPROVED PROJ. MANAGER	
NAME (PRINT)	INT. DATE

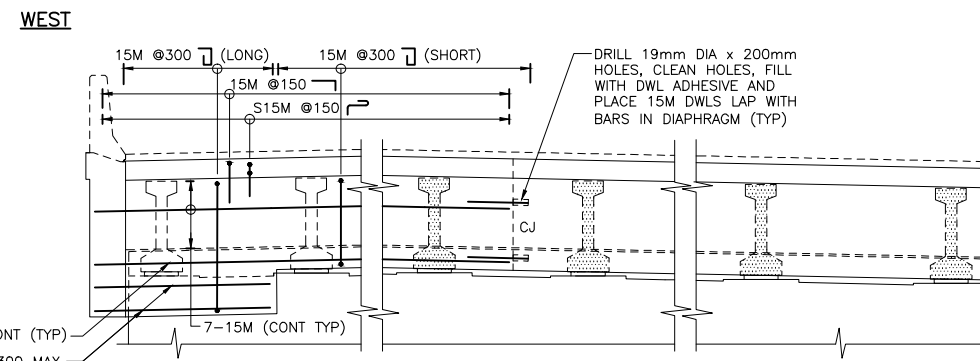
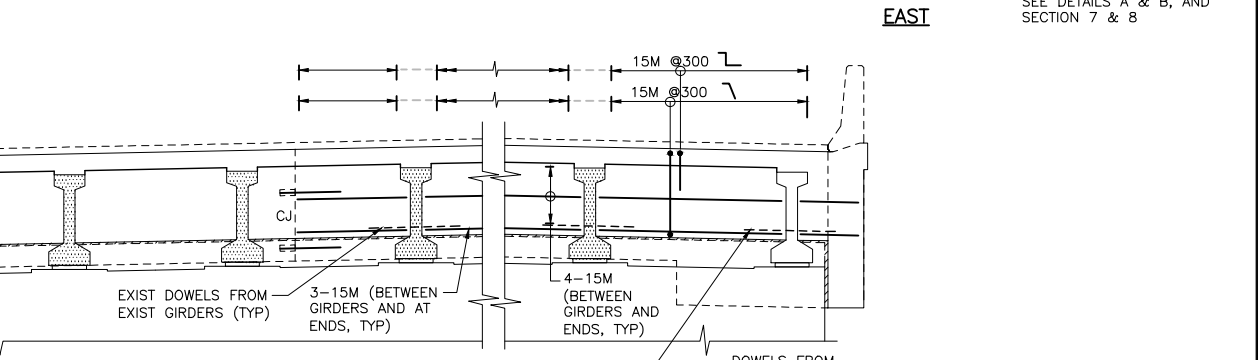


TITLE HWY 427 EXPANSION HWY 427 NBL & SBL / CNR OVERHEAD REHABILITATION AND WIDENING SITE 37-1109 DECK REINFORCEMENT I							
PROJECT ID.	STAGE IDENTIFIER	DESIGN PACKAGE NUMBER	DISCIPLINE	STRUCTURE NUMBER	DOCUMENT TYPE	DRAWING NUMBER	REVISION NUMBER
H427-D	N	9	STR	B04	DWG	515	B

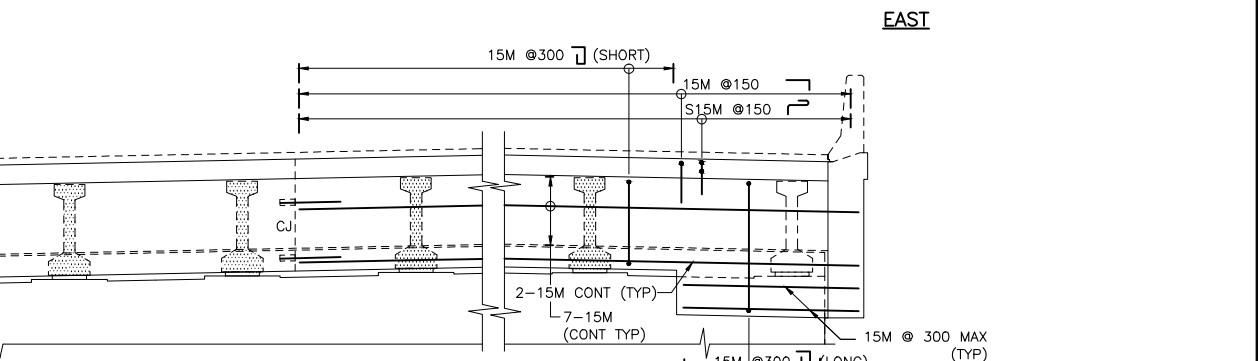
NOTES:
 1. READ THIS DRAWING IN CONJUNCTION WITH DWG 515.
 2. SIDES OF GIRDER IN CONTACT WITH NEW CONCRETE TO BE ROUGHENED (TYP AT ABUT ENDS).



7 ELEVATION OF ABUTMENT DIAPHRAGM (FRONT FACE)
 1:50 (DWG 515) (S & N ABUT DIAPHRAGMS ARE SIMILAR)



8 ELEVATION OF ABUTMENT DIAPHRAGM (BACK FACE)
 1:50 (DWG 515) (S & N ABUT DIAPHRAGMS ARE SIMILAR)



SCALE : AS NOTED

DATE	REVISIONS	BY	CHK	LEAD DISC.	PROJ. MAN.
B 18/03/16	90% SUBMISSION TO CA				
A 18/01/12	90% SUBMISSION TO CA				

DESIGNED	SHELLEY HUANG
DRAWN	TOM ZHAO
CHECKED	TATIANA OJALA
APPROVED LEAD ENG.	TATIANA OJALA
APPROVED PROJ. MANAGER	

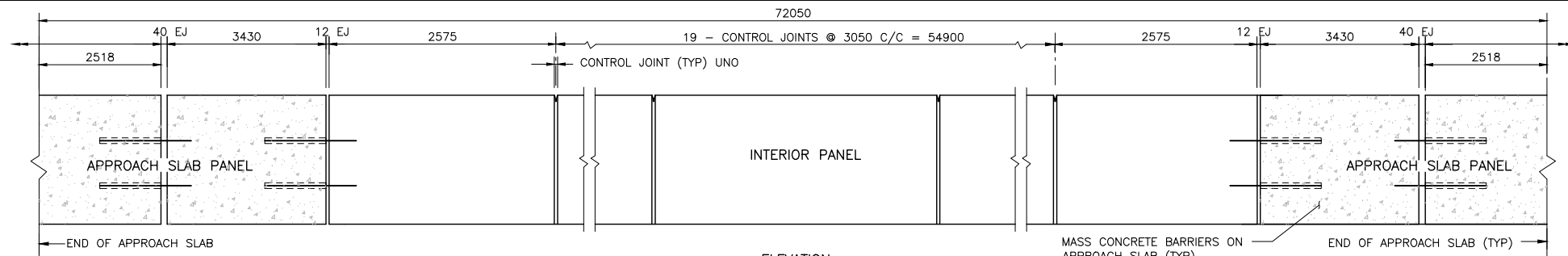
NAME (PRINT)	INT.	DATE



TITLE
 HWY 427 EXPANSION
 HWY 427 NBL & SBL / CNR OVERHEAD
 REHABILITATION AND WIDENING
 SITE 37-1109
 DECK REINFORCEMENT II

PROJECT ID.	STAGE IDENTIFIER	DESIGN PACKAGE NUMBER	DISCIPLINE	STRUCTURE NUMBER	DOCUMENT TYPE	DRAWING NUMBER	REVISION NUMBER
H427-D	N	9	STR	B04	DWG	516	B

CAD FILE LOCATION AND NAME: C:\projects\hwy427-d-n-9-str-b04-dwg-516dk.dwg
 MODIFIED: 3/20/2018 10:33:43 AM BY: PANG
 DATE PLOTTED: 3/20/2018 11:47:32 AM BY: PANG

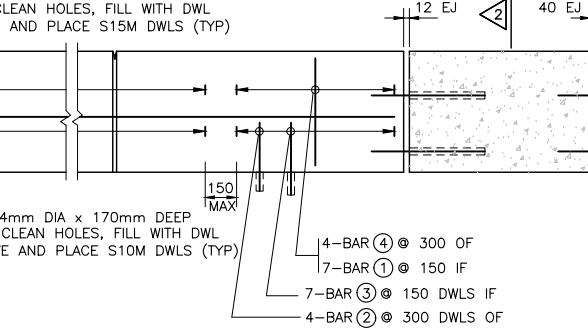
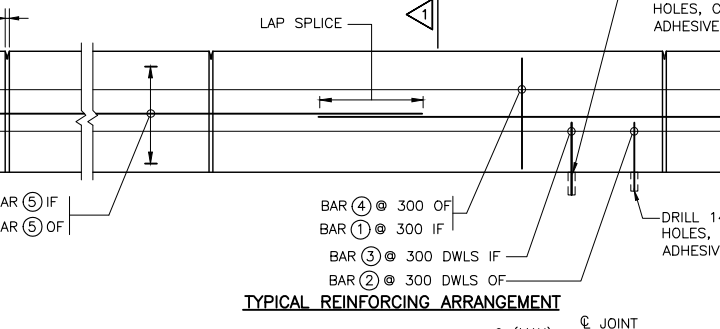
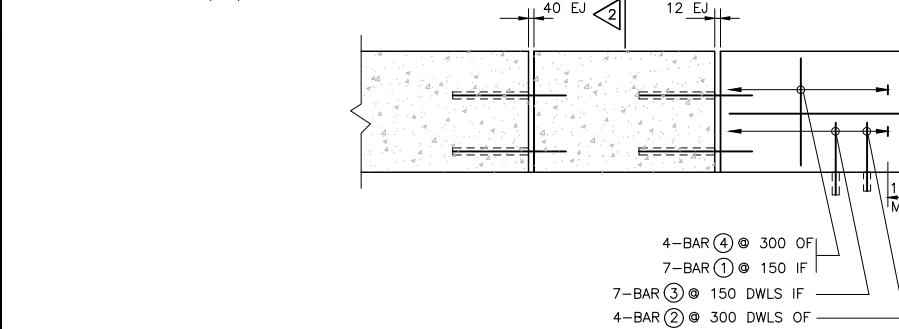
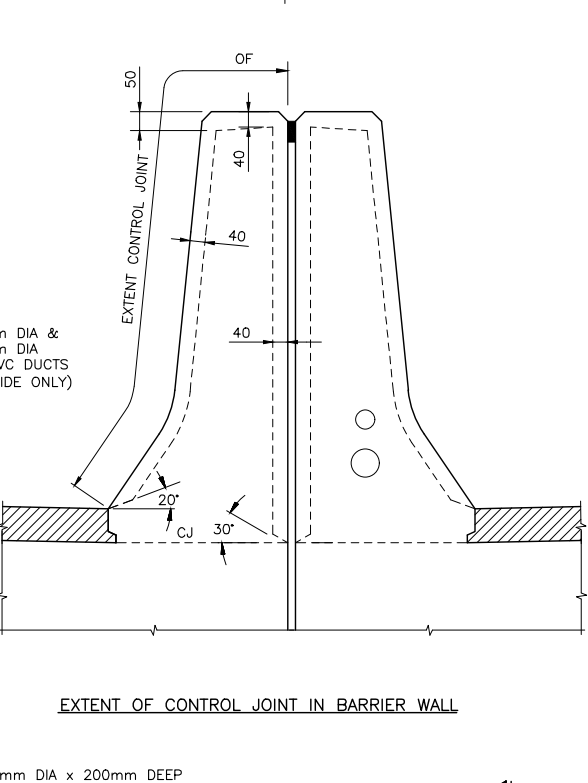
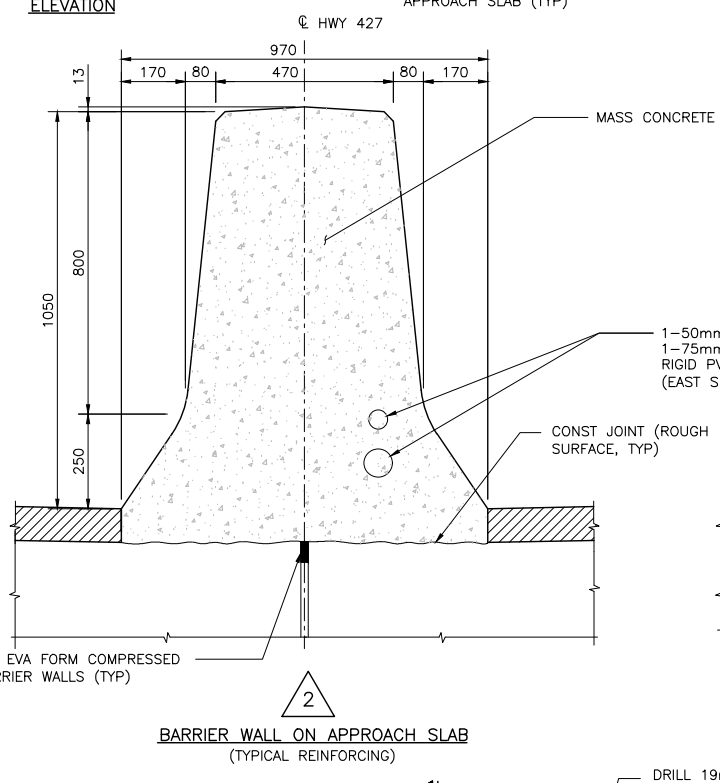
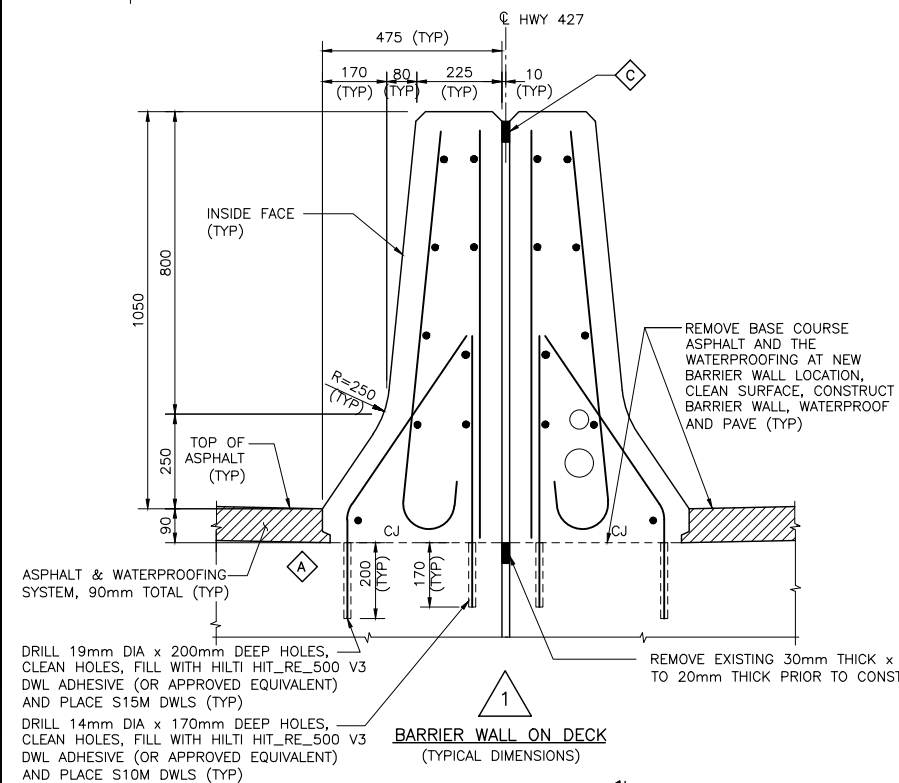


- NOTES:**
- CHASE REQUIRED ON HIGH AND LOW SIDE OF CROSSFALL.
 - CONCRETE COVER TO REINFORCING STEEL 60±10mm EXCEPT AS NOTED.
 - REINFORCING STEEL SHALL BE STAINLESS TYPE 316LN OR DUPLEX 2205 WITH A MINIMUM YIELD STRENGTH OF 500 MPa.
 - BAR LAP SPLICE FOR HORIZONTAL REINFORCEMENT MUST NOT LAP THROUGH CONTROL JOINT.
 - MINIMUM BAR LAP SPLICE TO BE 550mm, UNLESS OTHERWISE SHOWN.
 - LENGTH OF HORIZONTAL BAR TO SUIT CONTRACTOR'S OPERATIONS. BAR LENGTHS NEED NOT MATCH DISTANCE BETWEEN CONTROL JOINTS.
 - CONTROL JOINT TO BE FORMED.
 - SAWCUTS NOT PERMITTED.
 - CONTROL JOINT FORM HARDWARE NOT TO BE LEFT IN PLACE.
 - LEGEND
 - EJ DENOTES EACH FACE
 - EJ EXPANSION JOINT
 - IF DENOTES INSIDE FACE
 - OF DENOTES OUTSIDE FACE
 - REMOVE PLASTIC CAPS AND CLEAN MECHANICAL CONNECTIONS BEFORE INSTALL BAR ② AND ③.
 - READ THIS DRAWING IN CONJUNCTION WITH GRADING DWGS.

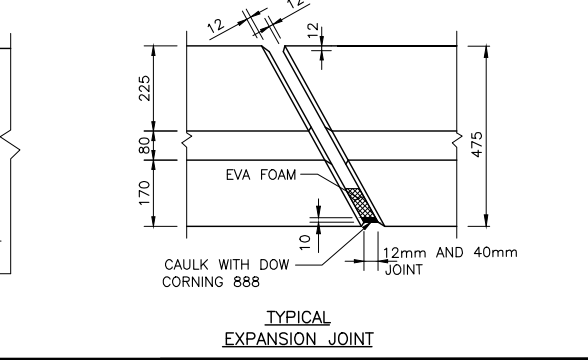
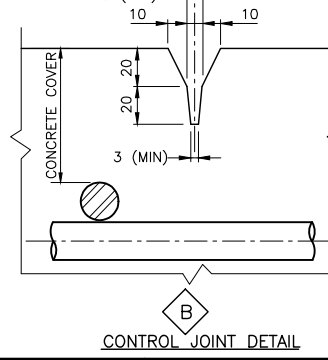
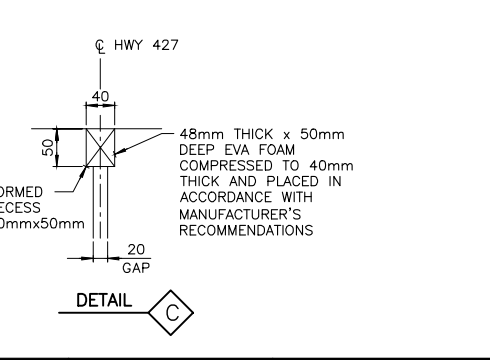
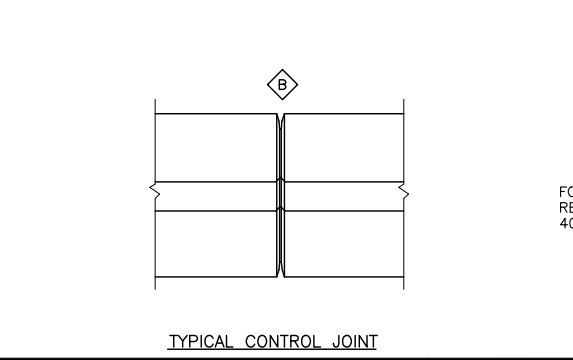
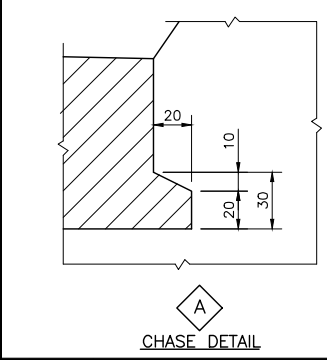
LEGEND:

MASS CONCRETE

BAR MARK	SIZE	SHAPE
①	S15M	
②	S10M DWLS	
③	S15M DWLS	
④	S10M	STRAIGHT
⑤	S15M	STRAIGHT



MODIFIED	
STANDARD DRAWING SEPTEMBER 2016	SS110-61
BARRIER WALL WITHOUT RAILING - TL-5 STAINLESS STEEL REBAR	



DATE	REVISIONS	BY	CHK	LEAD DISC.	PROJ. MAN.
18/03/16	90% SUBMISSION TO CA				
18/01/12	90% SUBMISSION TO CA				

SCALE : AS NOTED

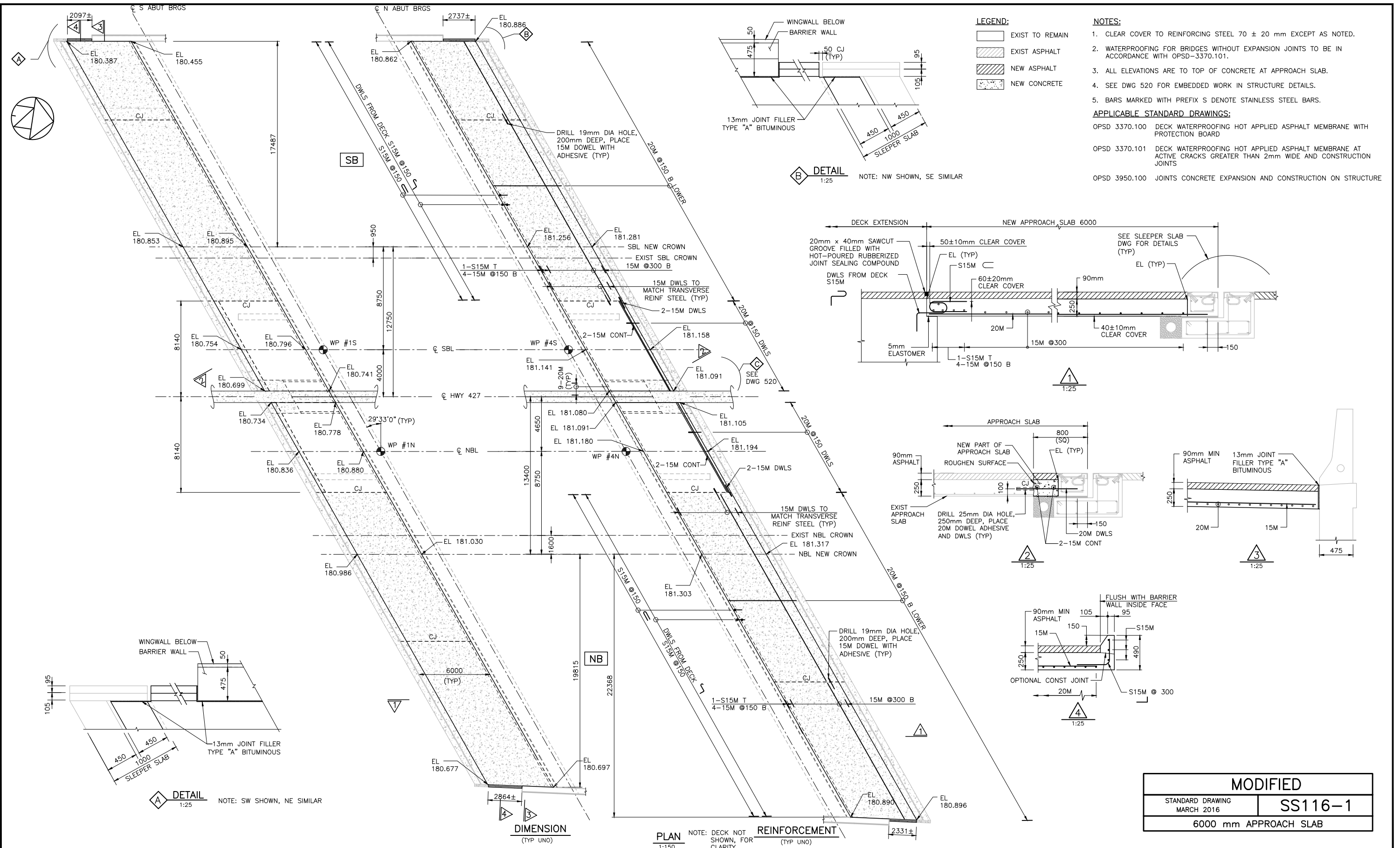
2018-03-16

DESIGNED	SHELLEY HUANG	
DRAWN	TOM ZHAO	
CHECKED	TATIANA OJALA	
APPROVED LEAD ENG.	TATIANA OJALA	
APPROVED PROJ. MANAGER		
NAME (PRINT)	INT.	DATE



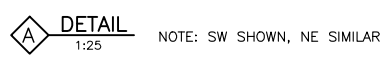
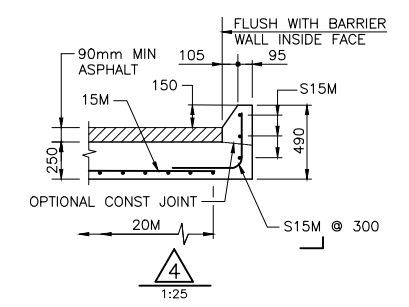
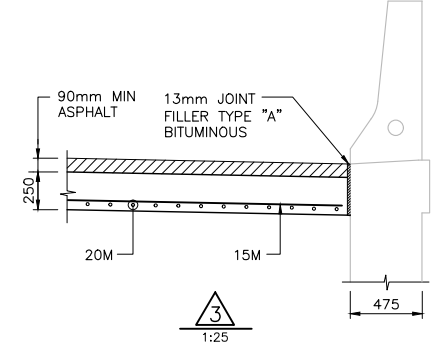
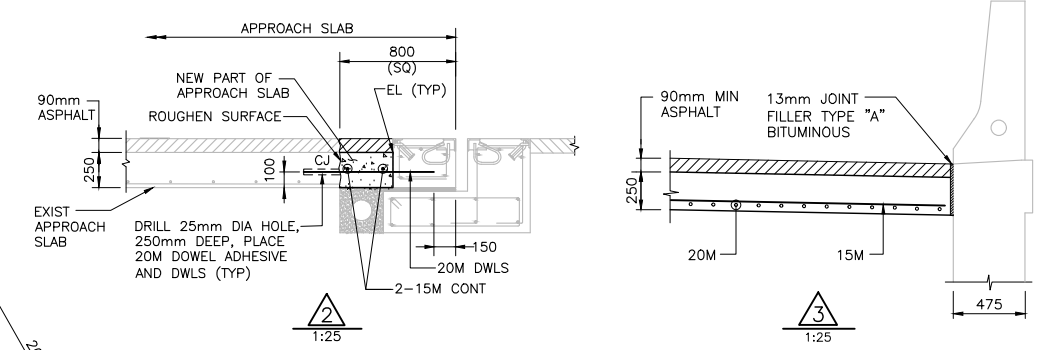
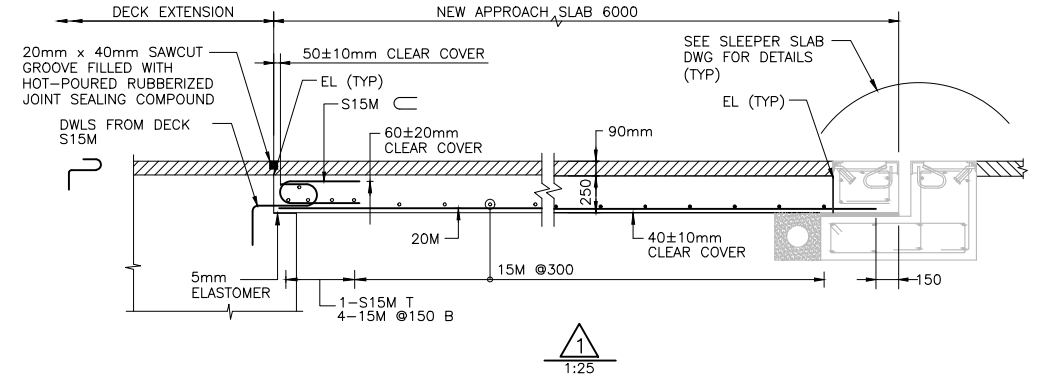
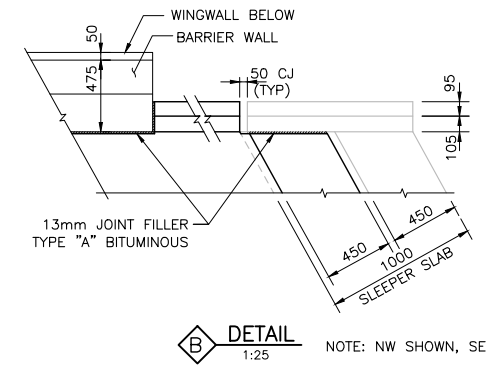
TITLE							
HWY 427 EXPANSION HWY 427 NBL & SBL / CNR OVERHEAD REHABILITATION AND WIDENING SITE 37-1109 MEDIAN BARRIER WALLS							
PROJECT ID.	STAGE IDENTIFIER	DESIGN PACKAGE NUMBER	DISCIPLINE	STRUCTURE NUMBER	DOCUMENT TYPE	DRAWING NUMBER	REVISION NUMBER
H427-D	N	9	STR	B04	DWG	517	B

CAD FILE LOCATION AND NAME: C:\projects\hwy427\hwy427-d-n-9-str-b04-dwg-517bw.dwg
 MODIFIED: 3/20/2018 10:33:45 AM BY: PANGF
 DATE PLOTTED: 3/20/2018 11:47:35 AM BY: PANGF



- LEGEND:**
- EXIST TO REMAIN
 - EXIST ASPHALT
 - NEW ASPHALT
 - NEW CONCRETE

- NOTES:**
1. CLEAR COVER TO REINFORCING STEEL 70 ± 20 mm EXCEPT AS NOTED.
 2. WATERPROOFING FOR BRIDGES WITHOUT EXPANSION JOINTS TO BE IN ACCORDANCE WITH OPSD-3370.101.
 3. ALL ELEVATIONS ARE TO TOP OF CONCRETE AT APPROACH SLAB.
 4. SEE DWG 520 FOR EMBEDDED WORK IN STRUCTURE DETAILS.
 5. BARS MARKED WITH PREFIX S DENOTE STAINLESS STEEL BARS.
- APPLICABLE STANDARD DRAWINGS:**
- OPSD 3370.100 DECK WATERPROOFING HOT APPLIED ASPHALT MEMBRANE WITH PROTECTION BOARD
 - OPSD 3370.101 DECK WATERPROOFING HOT APPLIED ASPHALT MEMBRANE AT ACTIVE CRACKS GREATER THAN 2mm WIDE AND CONSTRUCTION JOINTS
 - OPSD 3950.100 JOINTS CONCRETE EXPANSION AND CONSTRUCTION ON STRUCTURE



DIMENSION
(TYP UNO)

PLAN
1:150

REINFORCEMENT
(TYP UNO)

NOTE: DECK NOT SHOWN, FOR CLARITY

MODIFIED	
STANDARD DRAWING MARCH 2016	SS116-1
6000 mm APPROACH SLAB	

CAD FILE LOCATION AND NAME: C:\projects\hwy427\hwy427-d-n-9-str-b04-dwg-519ap.dwg
 MODIFIED: 3/20/2018 10:33:50 AM BY: PANGF
 DATE PLOTTED: 3/20/2018 11:47:42 AM BY: PANGF

DATE	REVISIONS	BY	CHK	LEAD DISC.	PROJ. MAN.
B 18/03/16	90% SUBMISSION TO CA				
A 18/01/12	90% SUBMISSION TO CA				

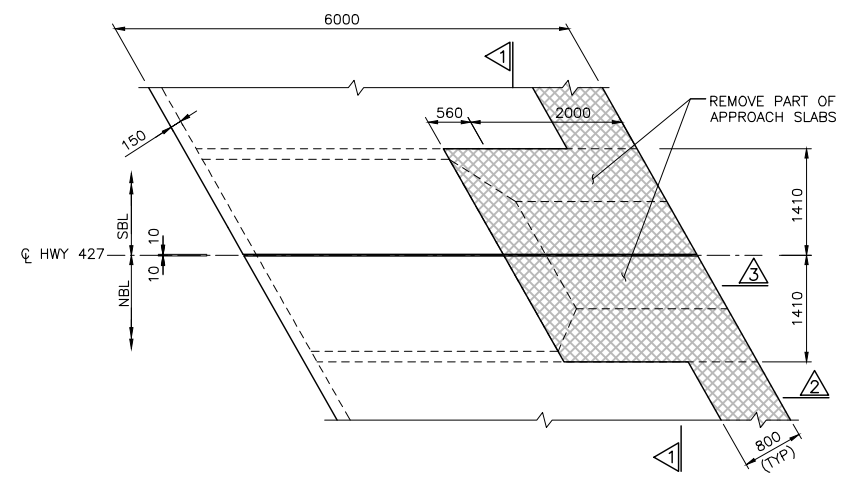
SCALE :

AS NOTED

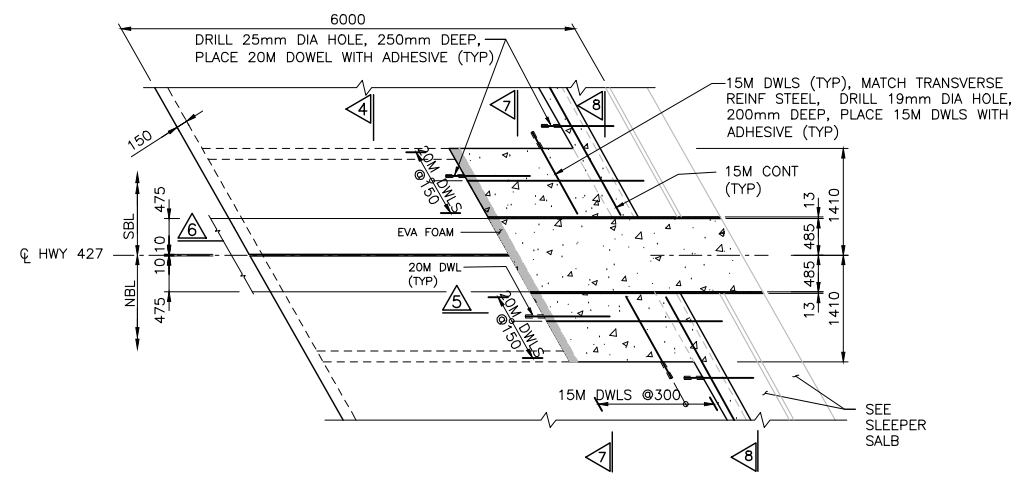
DESIGNED	SHELLEY HUANG
DRAWN	TOM ZHAO
CHECKED	TATIANA OJALA
APPROVED LEAD ENG.	TATIANA OJALA
APPROVED PROJ. MANAGER	



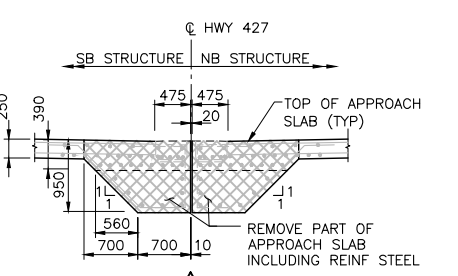
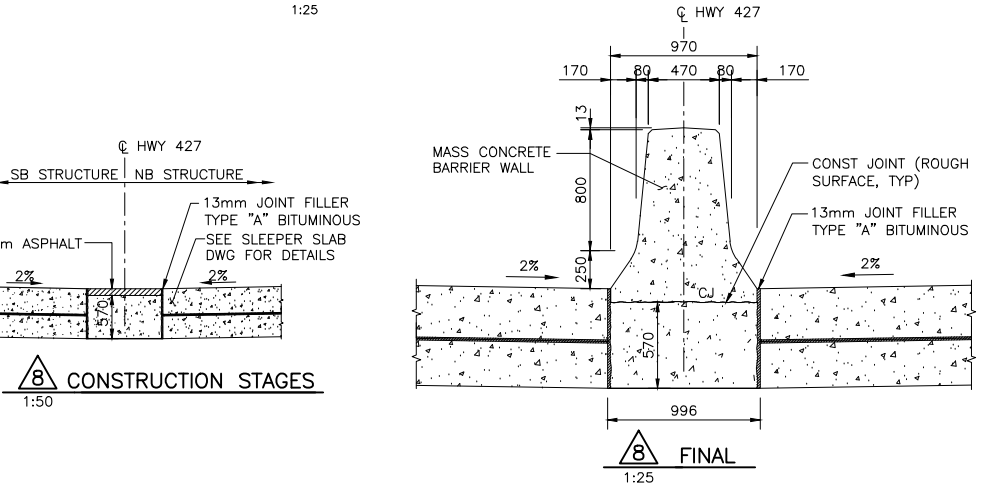
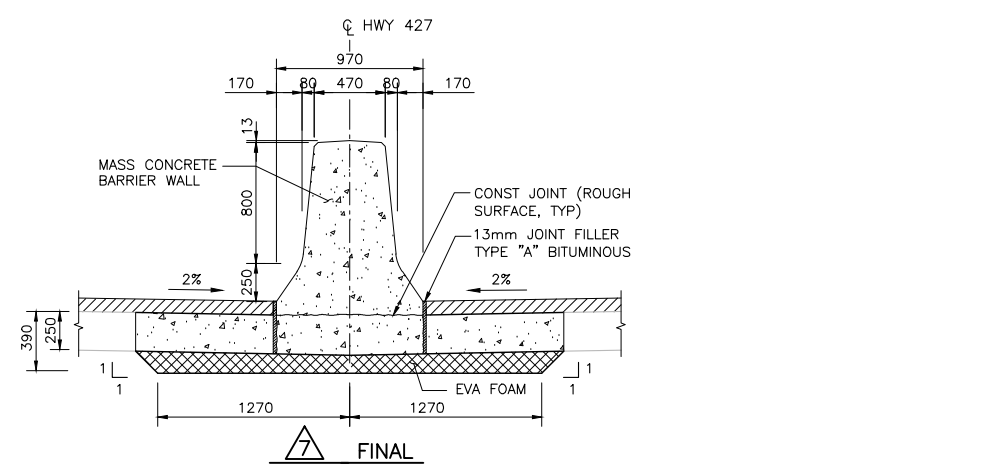
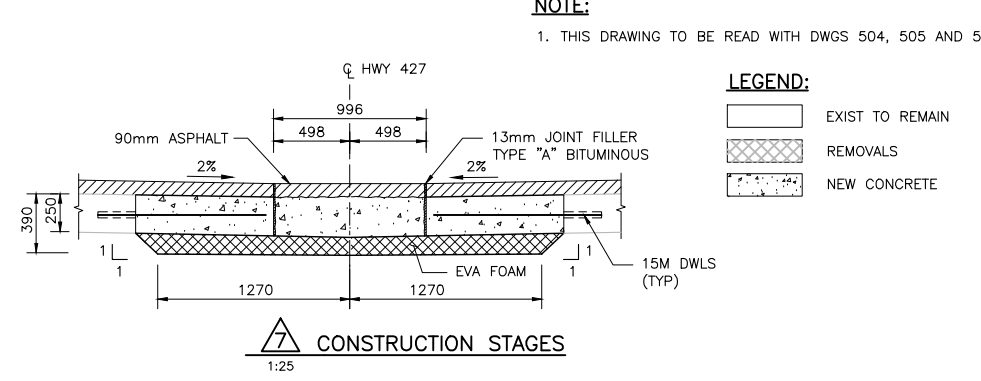
HWY 427 EXPANSION HWY 427 NBL & SBL / CNR OVERHEAD REHABILITATION AND WIDENING SITE 37-1109 6000mm APPROACH SLAB I							
PROJECT ID.	STAGE IDENTIFIER	DESIGN PACKAGE NUMBER	DISCIPLINE	STRUCTURE NUMBER	DOCUMENT TYPE	DRAWING NUMBER	REVISION NUMBER
H427-D	N	9	STR	B04	DWG	519	B



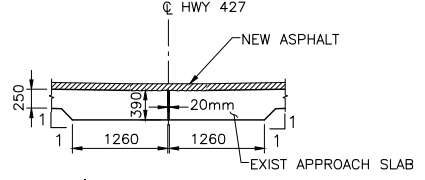
C PART PLAN - APPROACH SLABS AT MEDIAN REMOVALS
1:50
NORTH APPROACH SLAB SHOWN, SOUTH APPROACH SLAB SIMILAR
(DWG 519)



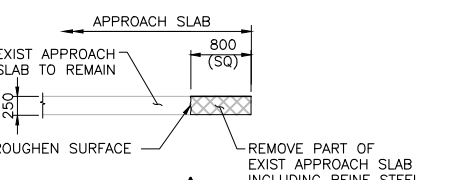
C PART PLAN - APPROACH SLABS AT MEDIAN REINFORCING (TOP OF CONCRETE)
1:50
NORTH APPROACH SLAB SHOWN, SOUTH APPROACH SLAB SIMILAR
(DWG 519)



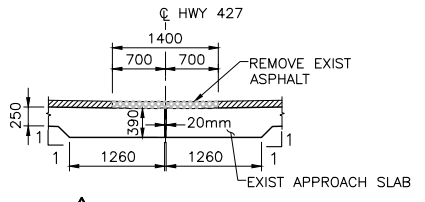
1 CONSTRUCTION STAGES
1:50



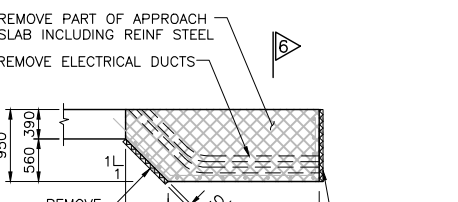
2A & 2B CONSTRUCTION STAGES
1:50



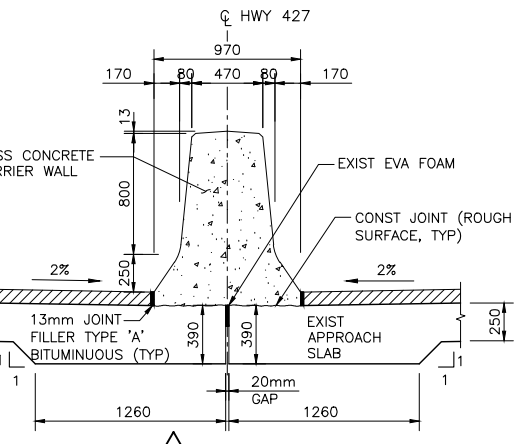
2C CONSTRUCTION STAGES
1:50



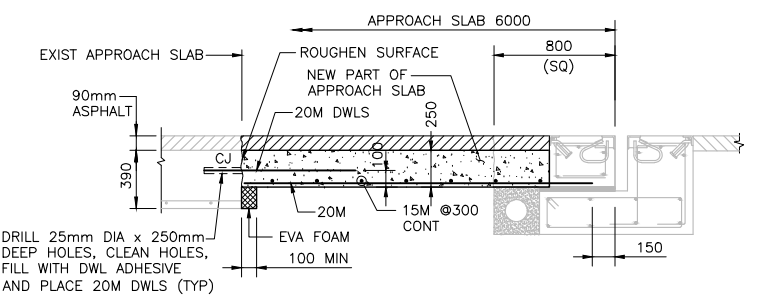
3 CONSTRUCTION STAGES
1:50



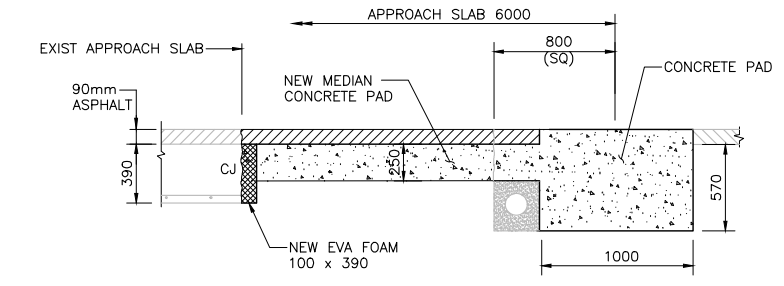
4 CONSTRUCTION STAGES
1:50



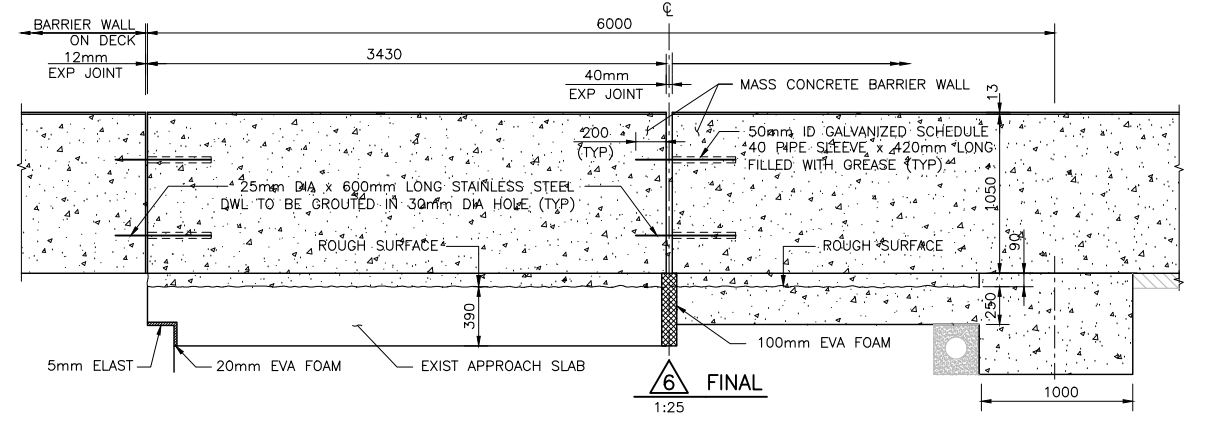
4 FINAL
1:25



5 CONSTRUCTION STAGES
1:25



6 CONSTRUCTION STAGES
1:25



6 FINAL
1:25

NOTE:
1. THIS DRAWING TO BE READ WITH DWGS 504, 505 AND 519.

LEGEND:
EXIST TO REMAIN
REMOVALS
NEW CONCRETE

CAD FILE LOCATION AND NAME: C:\projects\hwy427-d-n-9-str-b04-dwg-520.dwg
MODIFIED: 3/20/2018 10:33:52 AM BY: PANGF
DATE PLOTTED: 3/20/2018 12:05:52 PM BY: PANGF

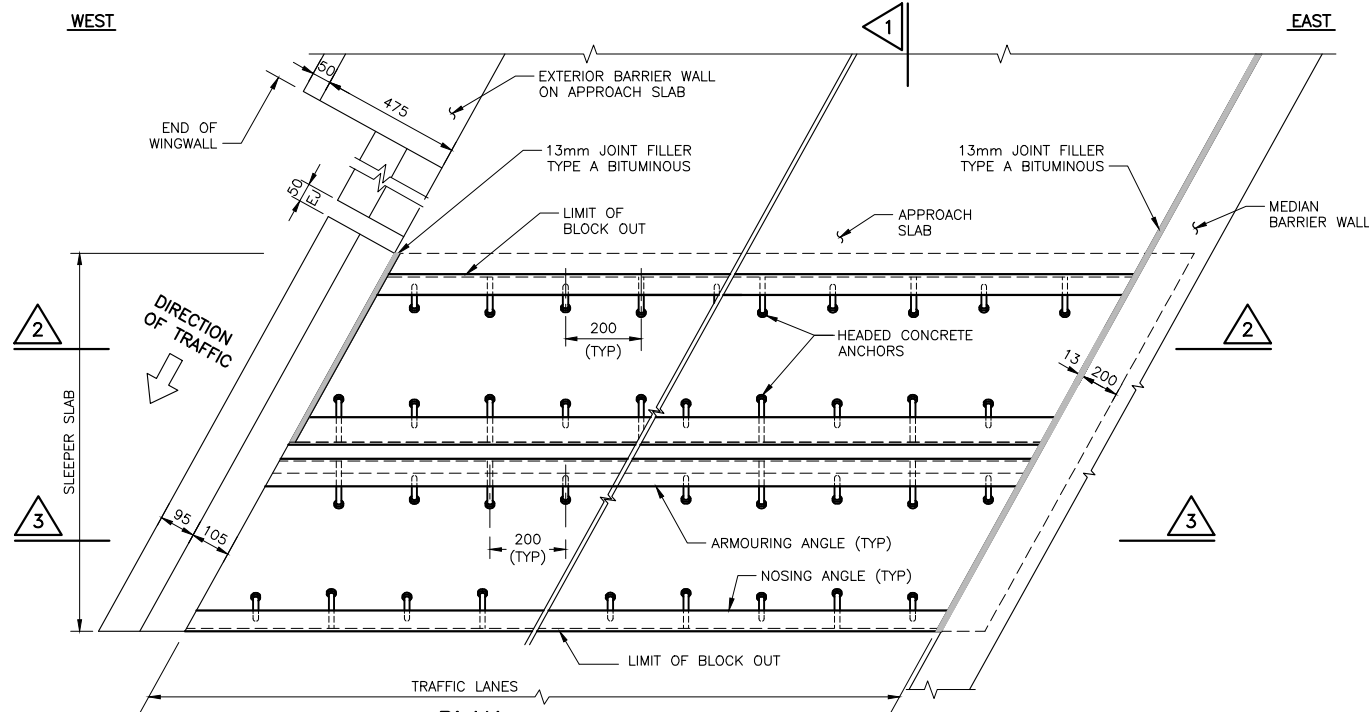
DATE	REVISIONS	BY	CHK	LEAD DISC.	PROJ. MAN.
B 18/03/16	90% SUBMISSION TO CA				
A 18/01/12	90% SUBMISSION TO CA				

SCALE :
AS NOTED

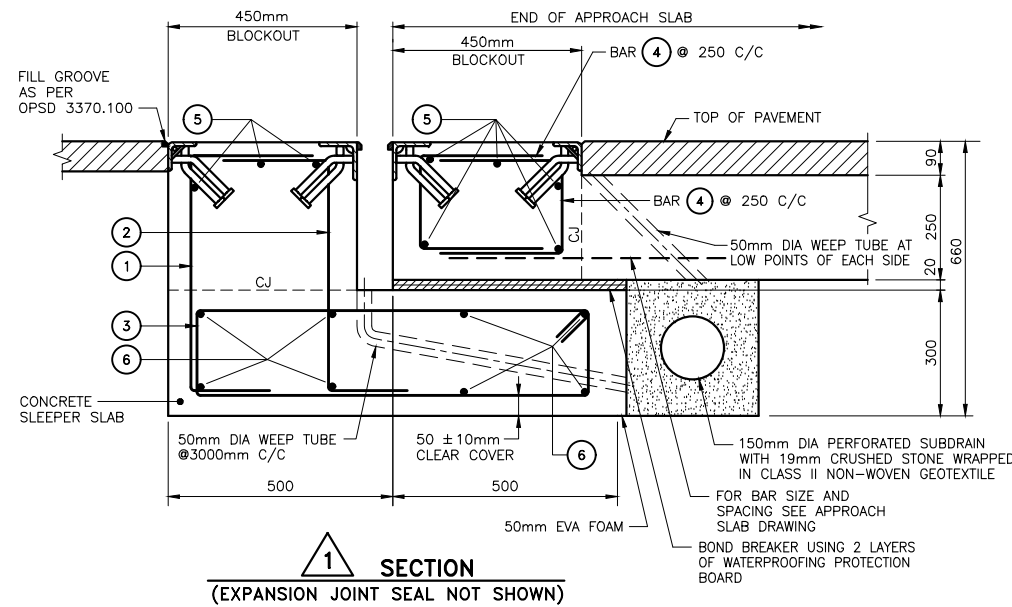
DESIGNED	SHELLEY HUANG	
DRAWN	TOM ZHAO	
CHECKED	TATIANA OJALA	
APPROVED LEAD ENG.	TATIANA OJALA	
APPROVED PROJ. MANAGER		
NAME (PRINT)	INT.	DATE



TITLE						
HWY 427 EXPANSION HWY 427 NBL & SBL / CNR OVERHEAD REHABILITATION AND WIDENING SITE 37-1109 6000mm APPROACH SLAB II						
PROJECT ID.	STAGE IDENTIFIER	DESIGN PACKAGE NUMBER	DISCIPLINE	STRUCTURE NUMBER	DOCUMENT TYPE	DRAWING NUMBER
H427-D	N	9	STR	B04	DWG	520
						B



PLAN
(FOR EJ AND ASSEMBLY DETAILS, SEE SS113-19)
NOTE: SW SHOWN, NE, SE & NW SIMILAR

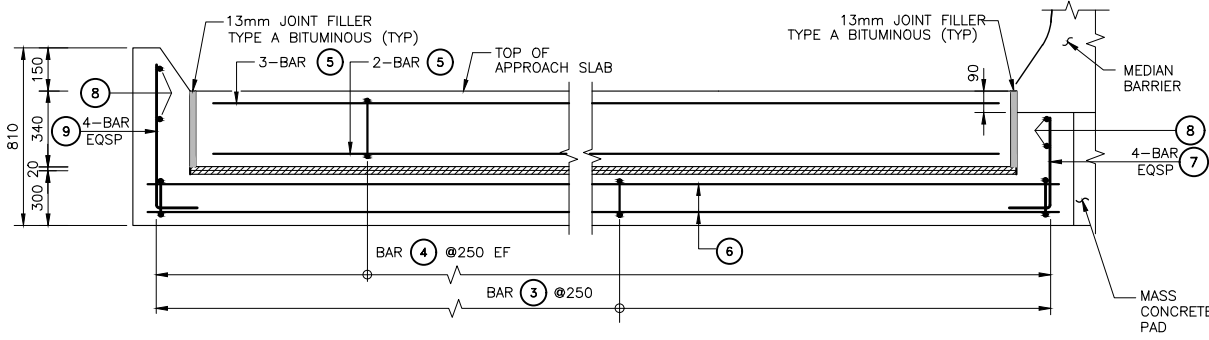


SECTION 1
(EXPANSION JOINT SEAL NOT SHOWN)

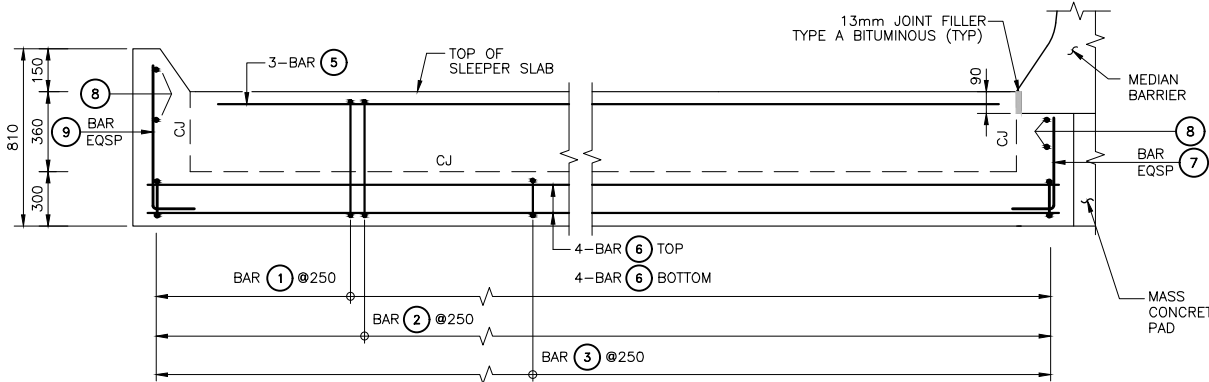
- NOTES:**
- THIS DRAWING TO BE READ IN CONJUNCTION WITH DRAWING SS113-19.
 - CLASS OF CONCRETE TO BE 30MPa.
 - REINFORCEMENT STEEL SHALL BE GRADE 400W. STAINLESS STEEL SHALL BE TYPE 316 LN OR DUPLEX 2205 WITH A MINIMUM YIELD STRENGTH OF 500 MPA. BARS MARKED WITH PREFIX S DENOTE STAINLESS STEEL BARS.
 - COVER TO REINFORCING STEEL 70 ± 20mm EXCEPT AS NOTED.
 - WORKING DRAWING SHALL BE DETAILED TO SUIT GEOMETRY OF STRUCTURE.

- LEGEND:**
- [] - DENOTES FASTENER SIZE IN INCHES
 - EJ - DENOTES EXPANSION JOINT
 - CJ - DENOTES CONSTRUCTION JOINT
 - EQSP - DENOTES EQUALLY SPACE

BAR MARK	SIZE	SHAPE
1	S15M	310 520 180
2	S15M	300 520 180
3	15M	160 860
4	S15M	200 310
5	S15M	STRAIGHT
6	15M	STRAIGHT
7	S15M	180 430
8	S15M	STRAIGHT
9	S15M	180 670



SECTION 2
(ARMORING DETAIL NOT SHOWN FOR CLARITY)



SECTION 3
(ARMORING DETAIL NOT SHOWN FOR CLARITY)

MODIFIED	
STANDARD DRAWING SEPTEMBER 2016	SS113-37
EXPANSION JOINT AND SLEEPER SLAB FOR INTEGRAL AND SEMI-INTEGRAL ABUTMENT BRIDGES (10mm < MOVEMENT < 40mm)	

CAD FILE LOCATION AND NAME: C:\projects\hwy427\hwy427-d-n-9-str-b04-dwg-521.dwg
 MODIFIED: 3/20/2018 10:33:57 AM BY: PANGF
 DATE PLOTTED: 3/20/2018 12:05:55 PM BY: PANGF

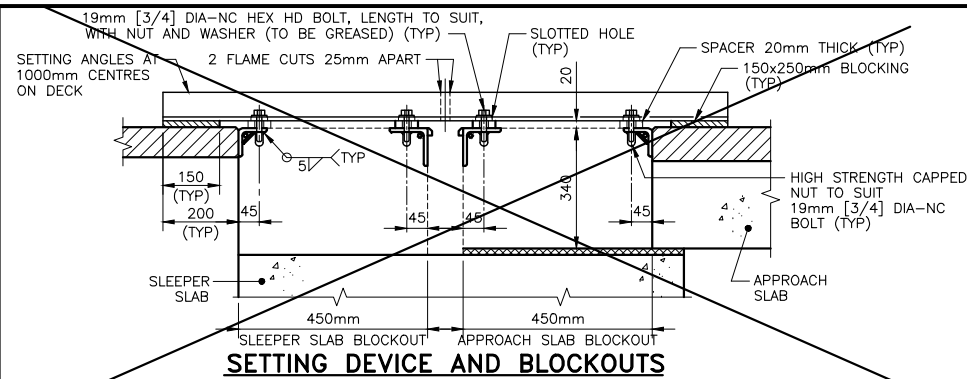
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18/03/16	90% SUBMISSION TO CA				
18/01/12	90% SUBMISSION TO CA				

SCALE : AS NOTED

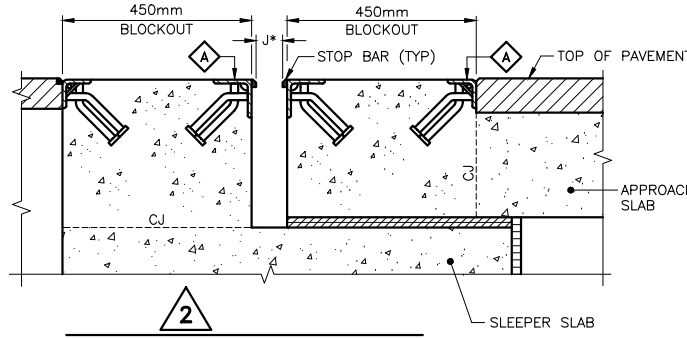
DESIGNED	SHELLEY HUANG		
DRAWN	TOM ZHAO		
CHECKED	TATIANA QJALA		
APPROVED LEAD ENGR.	TATIANA QJALA		
APPROVED PROJ. MANAGER			



HWY 427 EXPANSION HWY 427 NBL & SBL / CNR OVERHEAD REHABILITATION AND WIDENING SITE 37-1109 EXPANSION JOINT AND SLEEPER SLAB							
PROJECT ID.	STAGE IDENTIFIER	DESIGN PACKAGE NUMBER	DISCIPLINE	STRUCTURE NUMBER	DOCUMENT TYPE	DRAWING NUMBER	REVISION NUMBER
H427-D	N	9	STR	B04	DWG	521	B

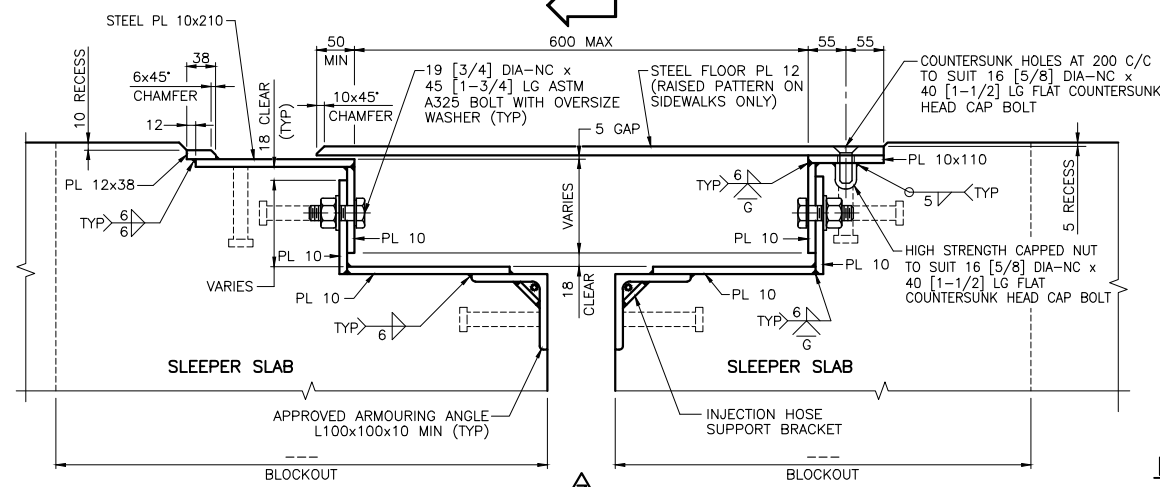


SETTING DEVICE AND BLOCKOUTS

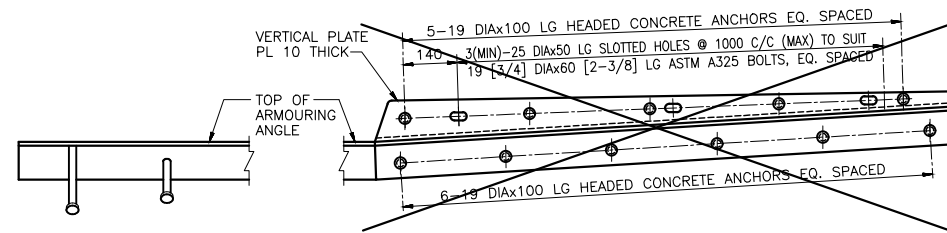


(EXPANSION JOINT SEAL NOT SHOWN)

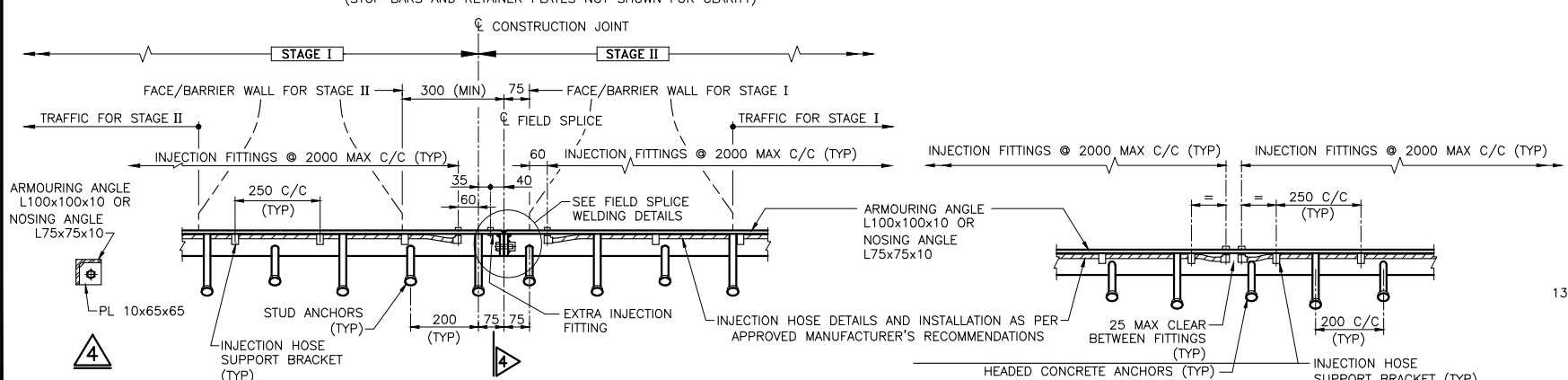
DIRECTION OF TRAFFIC



DETAIL OF ARMOURING WITHOUT SIDEWALK

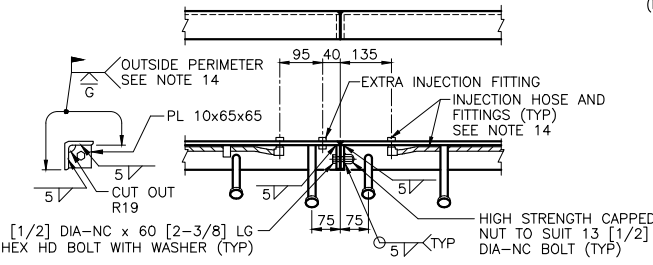


DETAIL OF ARMOURING AT SIDEWALK

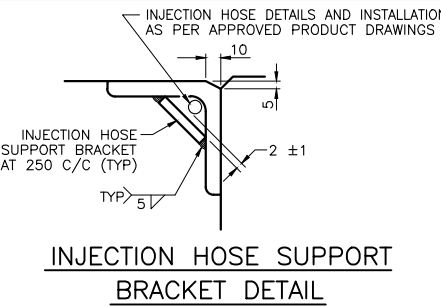


FIELD SPICE DETAILS AT STAGED CONSTRUCTION FOR ARMOURING AND NOSING ANGLES

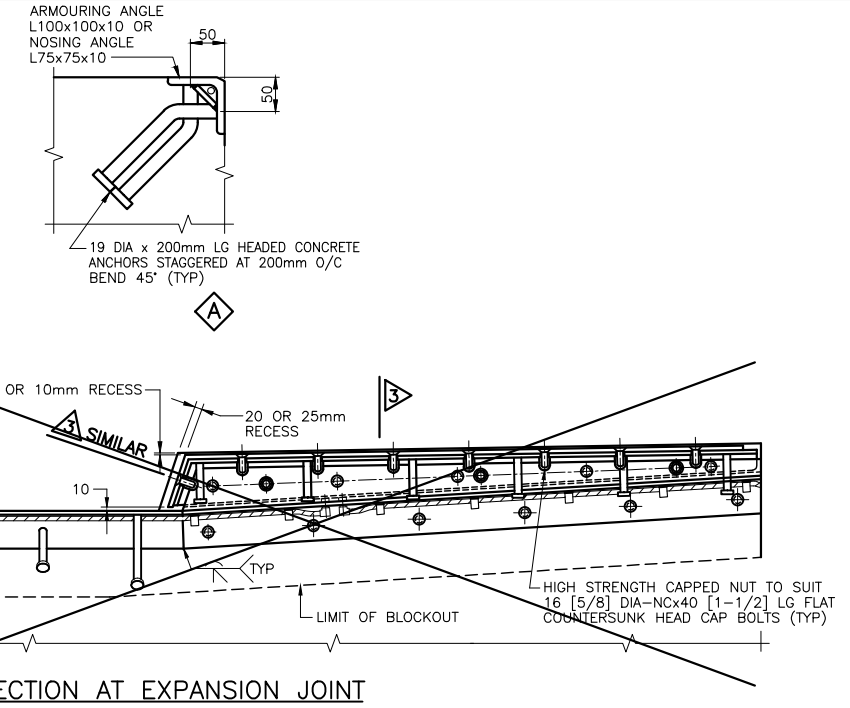
DETAILS OF HEADED CONCRETE ANCHORS AND INJECTION HOSE FOR ARMOURING AND NOSING ANGLES



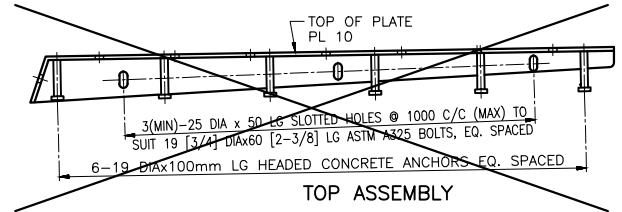
ARMOURING AND NOSING ANGLES FIELD SPICE DETAIL



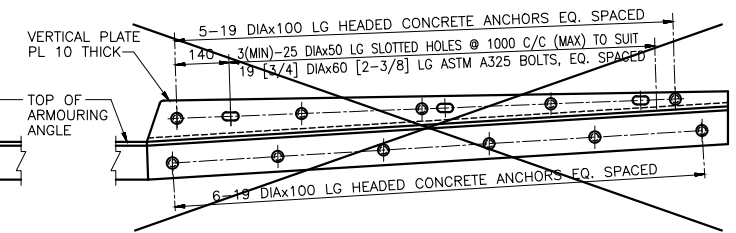
INJECTION HOSE SUPPORT BRACKET DETAIL



SECTION AT EXPANSION JOINT



TOP ASSEMBLY



BOTTOM ASSEMBLY

NOTES:

- THIS DRAWING SHOWS EXPANSION JOINT AND SLEEPER SLAB AT THE END OF APPROACH SLAB OF INTEGRAL AND SEMI-INTEGRAL ABUTMENT BRIDGES WITH A MOVEMENT BETWEEN 10 AND 40MM.
- EXPANSION JOINT TO BE SUPPLIED BY MANUFACTURERS LISTED IN DSM 9.40.27 FOR THE SUPPLY OF TYPE 'C' STRIP SEAL EXPANSION JOINT.
- EXPANSION JOINT ASSEMBLY CONSTRUCTION AND MATERIAL SHALL BE ACCORDING TO OPSS 920 AND OPSS 1210, AND AS SPECIFIED IN THE CONTRACT DOCUMENTS.
- JOINT ASSEMBLY SHALL BE COMPLETELY SHOP ASSEMBLED (EXCEPT FOR SEALS) AND PRESET TO DIMENSION 'J' FOR 15°C AND ADJUSTED IN THE FIELD TO SUIT INSTALLATION TEMPERATURE.
- JOINT ASSEMBLY INSTALLATION TEMPERATURE SHALL BE TAKEN AS MEAN SHADE AIR TEMPERATURE AT STRUCTURE PRIOR TO JOINT INSTALLATION AS FOLLOWS:
 - FOR CONCRETE STRUCTURES - 48 HOURS
 - FOR STEEL STRUCTURES - 24 HOURS
- FIELD SPLICES IN JOINT ASSEMBLY ARE ONLY PERMITTED AT STAGED CONSTRUCTION, AND/OR AS SHOWN ON THE CONTRACT DRAWINGS.
- IF THE JOINT ARMOURING FOR A SKEW STRUCTURE IS SPLICED AT A CROWN, THE SPLICE SHALL BE DETAILED PARALLEL TO THE CENTRELINE OF THE TRAFFIC LANE.
- SETTING ANGLES SHALL BE FLAME CUT ACCORDING TO OPSS 920, BUT IN NO CASE PRIOR TO CONCRETE REACHING INITIAL SET.
- AFTER CURING OF THE CONCRETE HAS BEEN COMPLETED, THE SETTING DEVICES MAY BE REMOVED. THE Voids UNDER THE ARMOURING ANGLE AND NOSING ANGLE SHALL THEN BE PRESSURE INJECTED.
- PREFORMED SEALS SHALL HAVE MINIMUM THICKNESS OF 5mm OR AS PER DSM.
- ALL STEEL RETAINER SURFACES COMING IN CONTACT WITH PREFORMED SEAL SHALL BE CLEANED PRIOR TO INSTALLATION OF THE SEAL.
- PREFORMED SEALS SHALL BE INSTALLED AFTER JOINT ASSEMBLY HAS BEEN CAST, STYROFOAM OR FILLER BETWEEN APPROACH SLAB AND SLEEPER SLAB REMOVED, AND EXPANSION GAP CLEARED OF ANY DEBRIS.
- PROTECT INJECTION HOSE AND FITTINGS ADJACENT TO FIELD SPLICE DURING WELDING AND REMOVE PROTECTION PRIOR TO PLACING OF CONCRETE IN BLOCKOUT.
- ALL JOINT ANCHORAGES SHALL BE DETAILED ON WORKING DRAWINGS PERPENDICULAR TO THE EXPANSION JOINT ON BOTH THE APPROACH SLAB SIDE AND THE SLEEPER SLAB SIDE EXCEPT STRUCTURE SKEWED FROM OVER 15° AND UP TO 45° SHALL HAVE ANCHORAGES DETAILED 30° OFFSET FROM THE PERPENDICULAR TO THE EXPANSION JOINT ON THE APPROACH SLAB SIDE.
- LEGEND: [] DENOTED FASTENER SIZE IN INCHES
EJ - DENOTES EXPANSION JOINT

ADDITIONAL NOTES FOR BOLTS:

- 19 [3/4] DIAMETER BOLTS SHALL BE IN ACCORDANCE WITH WITH ASTM A325. ALL BOLTS USED IN 25 DIA x 50 LONG SLOTTED HOLES SHALL BE INSTALLED WITH OVERSIZE WASHERS.
- 16 [5/8] DIAMETER FLAT COUNTERSUNK HEAD CAP BOLTS SHALL BE IN ACCORDANCE WITH ASTM F835.
- ALL BOLTS SHALL BE INSTALLED USING MOLY50 LUBRICANT.
- ALL BOLTS SHALL BE TENSIONED USING THE TURN-OF-NUT TIGHTENING METHOD IN ACCORDANCE WITH CAN/CSA S6-14.

TABLE OF DESIGN REQUIREMENTS (TO BE FULLY COMPLETED BY DESIGNER)

EXP. JOINT LOCATION	MTO GAP RATING (mm)	DESIGN MOVEMENT ***	* "J" AT INSTALLATION TEMPERATURE (C) (mm)								
			-5'	0'	5'	10'	15'	20'	25'	30'	
NORTH	40	100	22	63	61	59	57	55	53	51	49
SOUTH	40	100	22	63	61	59	57	55	53	51	49

* DIMENSION 'J' MEASURED PERPENDICULAR TO CENTRELINE OF EXPANSION JOINT. WHERE MIN. AND MAX. FOR JOINT SUPPLIED DIFFER FROM THOSE SHOWN IN TABLE, 'J' DIMENSIONS SHALL BE REVISED BY CONTRACTOR AND SHOWN ON SHOP DRAWINGS. FOR STAGED CONSTRUCTION ON STRUCTURES OTHER THAN POST-TENSIONED, THE CONTRACTOR SHALL USE THE FIRST STAGE OBSERVED 'J' GAP TO INSTALL THE SECOND STAGE.
 ** MTO GAP, MEASURED BETWEEN PROJECTING FACES OF STEEL CLAMPING BAR, IS TAKEN FROM DSM 9.40.27, TYPE 'C'.
 *** CALCULATED TOTAL MOVEMENT AT SLS OCCURRING AFTER TIME OF JOINT INSTALLATION. (MEASURED PARALLEL TO CENTRELINE OF STRUCTURE)

MODIFIED	
STANDARD DRAWING SEPTEMBER 2016	SS113-19
STRIP SEAL EXPANSION JOINT FOR SLEEPER SLAB	

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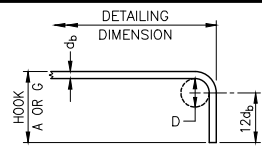
DATE	REVISIONS	BY	CHK	LEAD DISC.	PROJ. MAN.
B 18/03/16	90% SUBMISSION TO CA				
A 18/01/12	90% SUBMISSION TO CA				

SCALE : AS NOTED

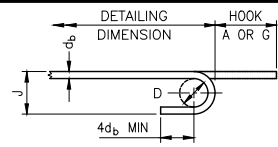
DESIGNED	SHELLEY HUANG
DRAWN	TOM ZHAO
CHECKED	TATIANA OJALA
APPROVED LEAD ENG.	TATIANA OJALA
APPROVED PROJ. MANAGER	



TITLE							
HWY 427 EXPANSION HWY 427 NBL & SBL / CNR OVERHEAD REHABILITATION AND WIDENING SITE 37-1109 STRIP SEAL EXPANSION JOINT FOR SLEEPER SLAB							
PROJECT ID.	STAGE IDENTIFIER	DESIGN PACKAGE NUMBER	DISCIPLINE	STRUCTURE NUMBER	DOCUMENT TYPE	DRAWING NUMBER	REVISION NUMBER
H427-D	N	9	STR	B04	DWG	522	B



STANDARD 90° HOOK



STANDARD 180° HOOK

MINIMUM BENDING PIN DIAMETER, D, mm

BAR SIZE	STEEL GRADE	
	400R (2)	400W
10M	70	60
15M	100	90
20M	120	100
25M	150	150
30M	250	200
35M	300	250
45M	450 (1)	400
55M	600 (1)	550

- (1) Special fabrication is required for bends exceeding 90° for bars of these sizes and grade.
- (2) For stainless steel, with $F_y = 500$, use the same D as for 400R.

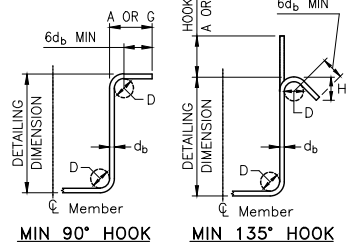
STANDARD HOOK DIMENSIONS

BAR SIZE	90° HOOKS		180° HOOKS			
	A OR G (mm)		A OR G (mm)		J (mm)	
	400R	400W	400R	400W	400R	400W
10M	180	180	140	130	90	80
15M	260	250	180	170	130	120
20M	310	300	220	200	160	140
25M	400	400	280	280	200	200
30M	510	490	400	350	310	260
35M	610	590	480	430	370	320
45M	790	770	680	630	540	490
55M	1030	1010	900	850	710	660

NOTE: All Hook Dimensions are according to the CHBDC-2014.

MINIMUM STIRRUP AND TIE HOOK DIMENSIONS

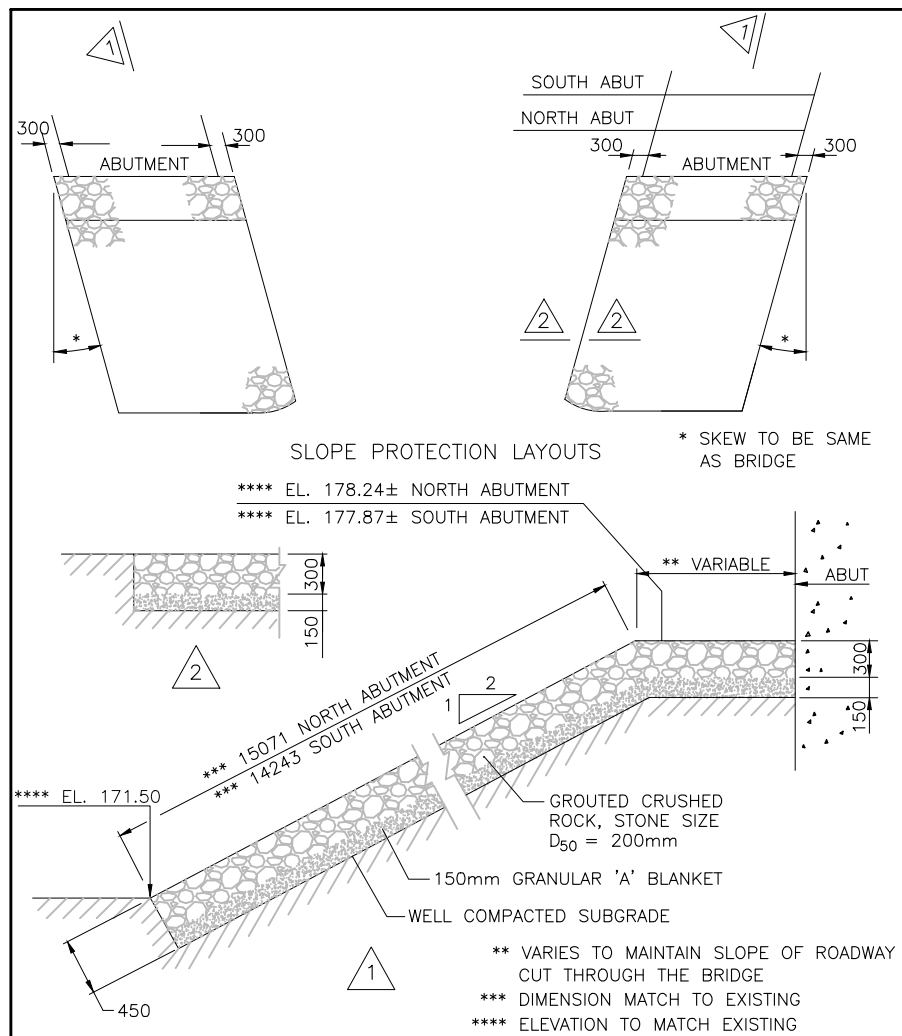
BAR SIZE	BAR DIAM. d_b (mm)	PIN DIAM. D (mm)	90°		135°	
			A OR G (mm)	A OR G (mm)	H (approx.) (mm)	H (approx.) (mm)
10M	11.3	45	100	100	70	70
15M	16.0	65	140	140	100	100
20M	19.5	80	180	175	115	115
25M	25.2	100	230			



MIN 90° HOOK MIN 135° HOOK

HOOK DIMENSIONS FOR REINFORCING STEEL BARS

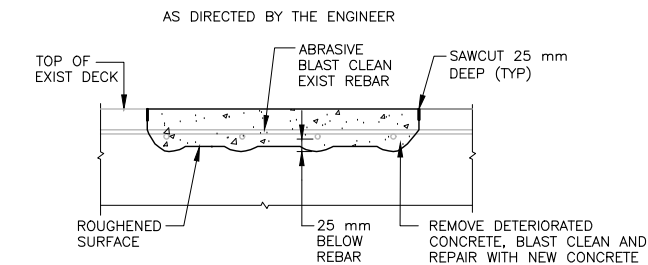
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SS12-1			



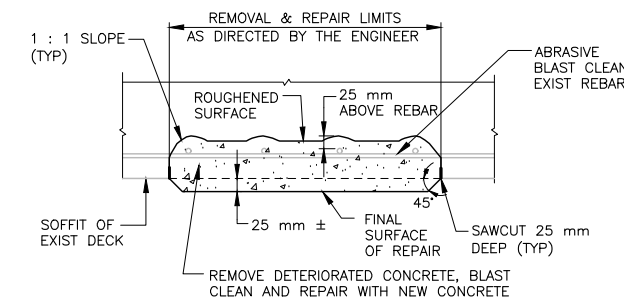
NOTES:
1 All dimensions are in millimetres or metres unless otherwise shown.

ROCK SLOPE PROTECTION WITH BERM

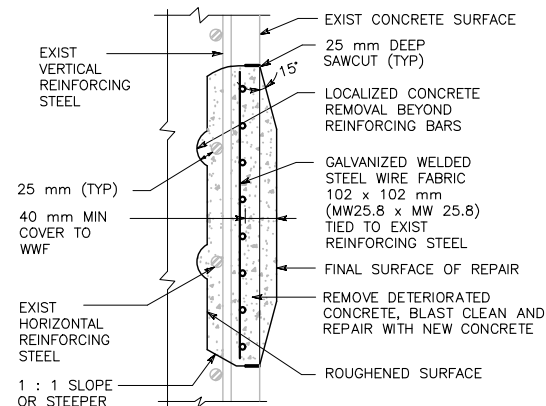
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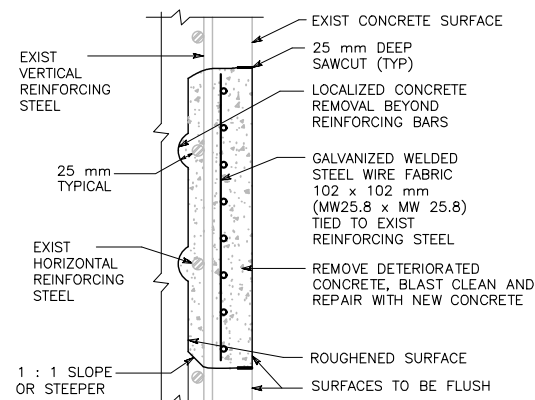
DECK SURFACE LOCAL CONCRETE REPAIR DETAILS



DECK SOFFIT LOCAL CONCRETE REPAIR DETAIL



FOR EXIST CONCRETE COVER < 50 mm VERTICAL SURFACE LOCAL CONCRETE REPAIR DETAILS



FOR EXIST CONCRETE COVER >= 50 mm VERTICAL SURFACE LOCAL CONCRETE REPAIR DETAILS

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DATE	REVISIONS	BY	CHK	LEAD	PROJ. MGR.
18/03/16	90% SUBMISSION TO CA				
18/01/12	90% SUBMISSION TO CA				

SCALE :
AS NOTED

DESIGNED	SHELLEY HUANG
DRAWN	TOM ZHAO
CHECKED	TATIANA QJALA
APPROVED LEAD ENG.	TATIANA QJALA
APPROVED PROJ. MANAGER	PETER BAWFORTH



<p>TITLE</p> <p>HWY 427 EXPANSION</p> <p>HWY 427 NBL & SBL / CNR OVERHEAD</p> <p>REHABILITATION AND WIDENING</p> <p>SITE 37-1109</p> <p>STANDARD AND MISCELLANEOUS DETAILS</p>							
PROJECT ID.	STAGE IDENTIFIER	DESIGN PACKAGE NUMBER	DISCIPLINE	STRUCTURE NUMBER	DOCUMENT TYPE	DRAWING NUMBER	REVISION NUMBER
H427-D	N	9	STR	B04	DWG	524	B

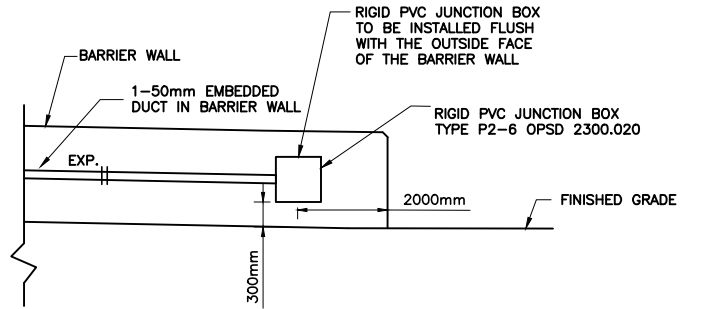


APPLICABLE STANDARD DRAWINGS:

- OPSD 2011.101 - GENERAL SYMBOLS
- OPSD 2011.201 - GENERAL SYMBOLS
- OPSD 2102.010 - UNDERGROUND RIGID DUCT CONNECTION AT CONCRETE STRUCTURE
- OPSD 2302.010 - EMBEDDED WORK DETAIL
- OPSD 2302.020 - EXPANSION AND DEFLECTION FITTING ASSEMBLY
- OPSD 2302.040 - EMBEDDED WORK IN STRUCTURE

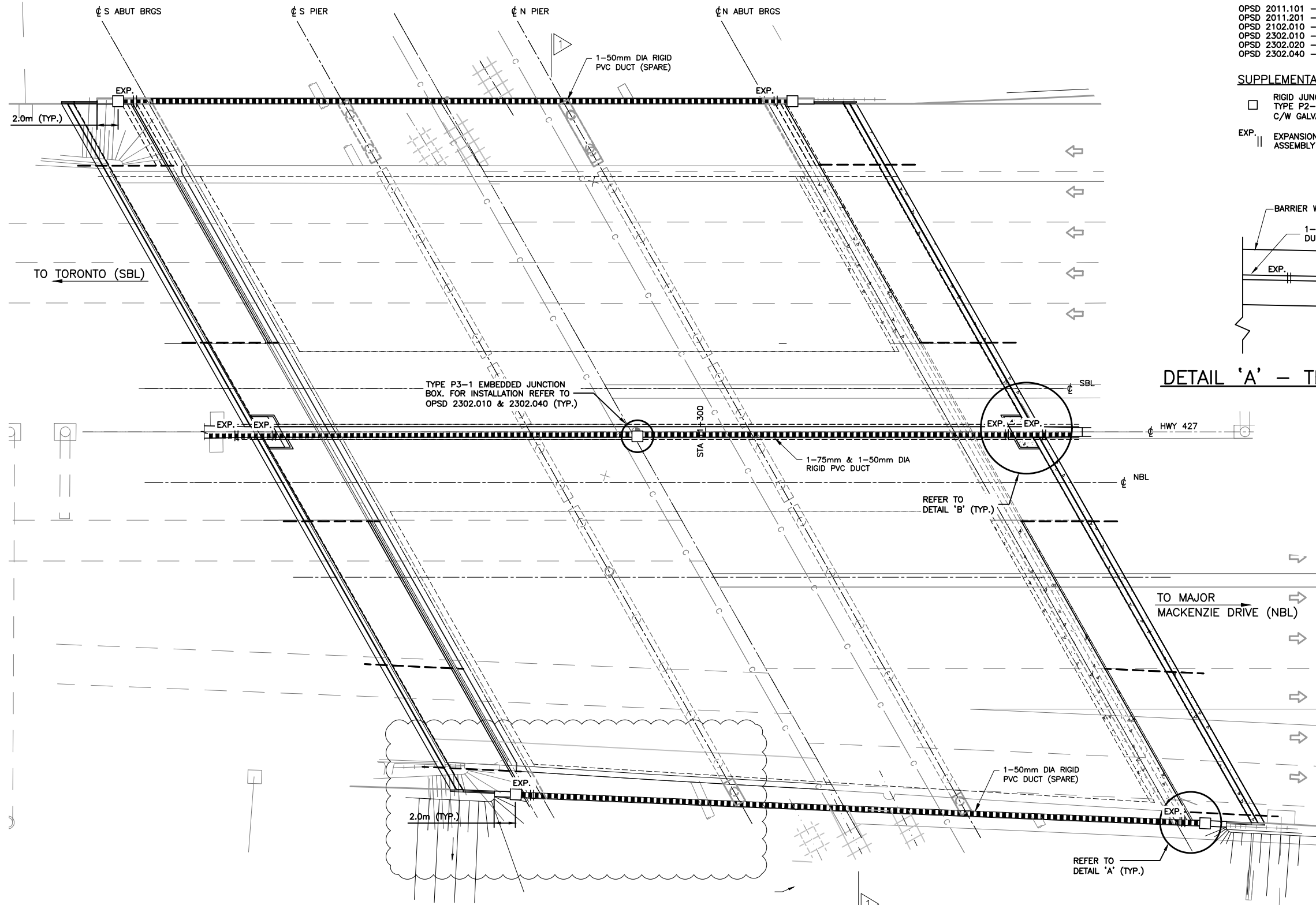
SUPPLEMENTARY LEGEND:

- RIGID JUNCTION BOX EMBEDDED TYPE P2-6 OPSD 2300.020 C/W GALVANIZED STEEL COVER
- EXP. EXPANSION AND DEFLECTION FITTING ASSEMBLY PER OPSD 2302.02



DETAIL 'A' - TERMINATION OF EMBEDDED DUCT

N.T.S.



PLAN
N206.

CAD FILE LOCATION AND NAME: C:\projects\wsp-co\mmmm_larmjil\gill\mm0623A\4427-D-9-STR-B04-DWG-525.dwg
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DATE	REVISIONS
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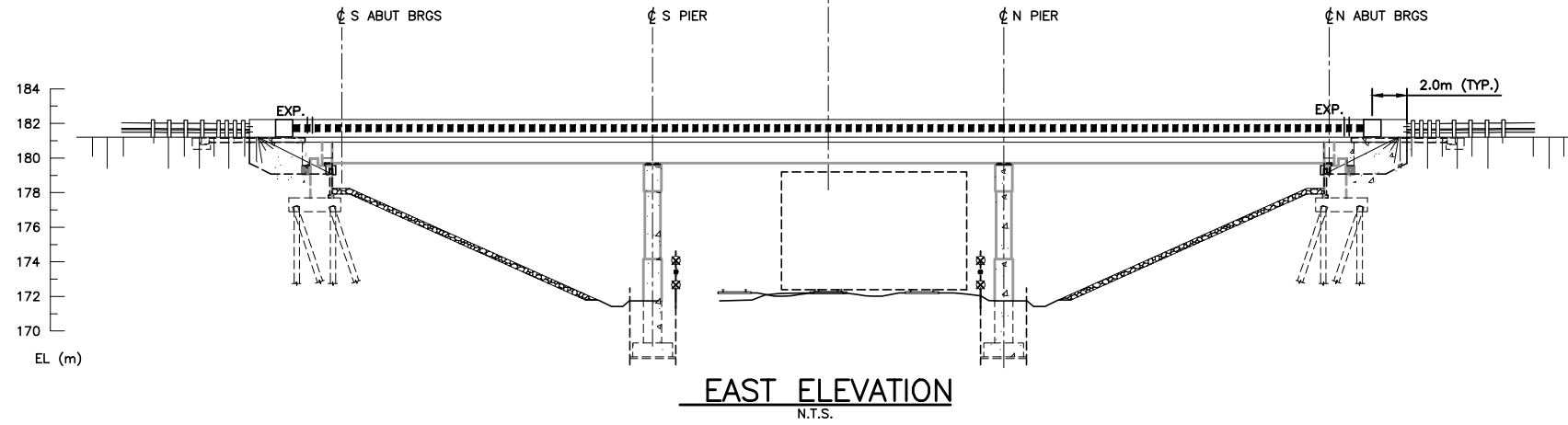
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BY	CHK	LEAD DISC.	PROJ. MAN.

DESIGNED	MANPREET PANESAR	M.P.
DRAWN	KARMIJIT GILL	K.G.
CHECKED	LENNOX LUE	L.L.
APPROVED LEAD ENG.	MARIO TEDESCO	M.T.
APPROVED PROJ. MANAGER		

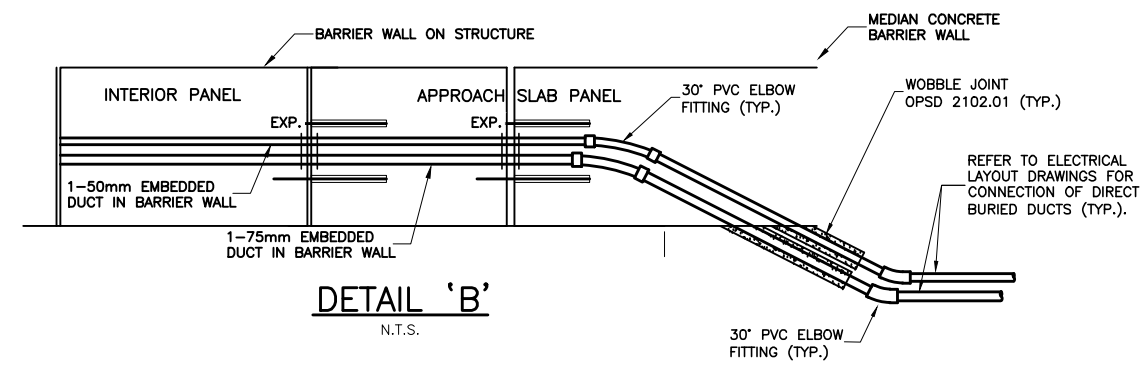
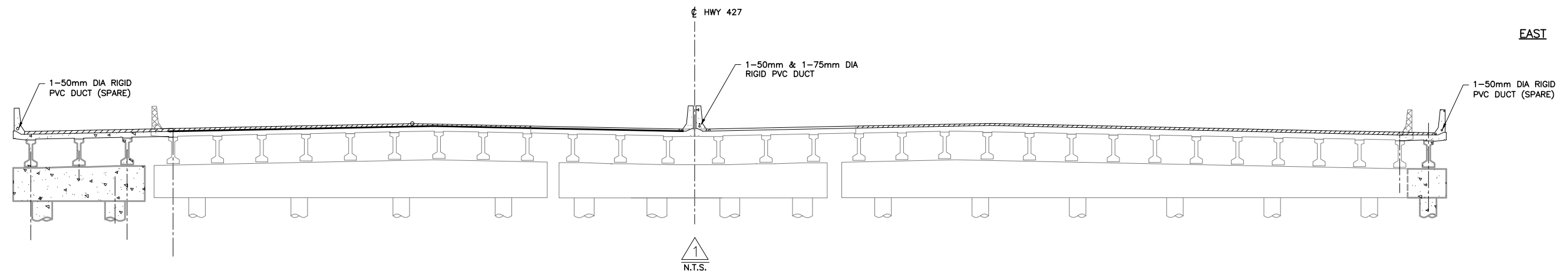


TITLE							
HWY 427 EXPANSION HWY 427 NBL & SBL / CNR OVERHEAD REHABILITATION AND WIDENING SITE 37-1109							
ELECTRICAL EMBEDDED WORK I							
PROJECT ID.	STAGE IDENTIFIER	DESIGN PACKAGE NUMBER	DISCIPLINE	STRUCTURE NUMBER	DOCUMENT TYPE	DRAWING NUMBER	REVISION NUMBER
H427-D	N	9	STR	B04	DWG	525	B



WEST

EAST



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A 18/01/12	90% SUBMISSION TO CA				

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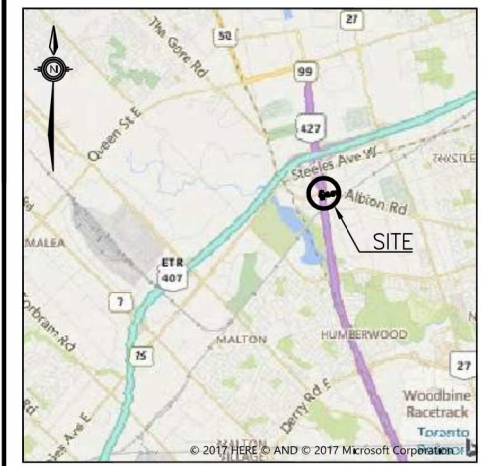
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DRAWN	KARAJIT GILL	K.G.
CHECKED	LENNOX LUE	L.L.
APPROVED LEAD ENG.	MARIO TEDESCO	M.T.
APPROVED PROJ. MANAGER		
	NAME (PRINT)	INT. DATE



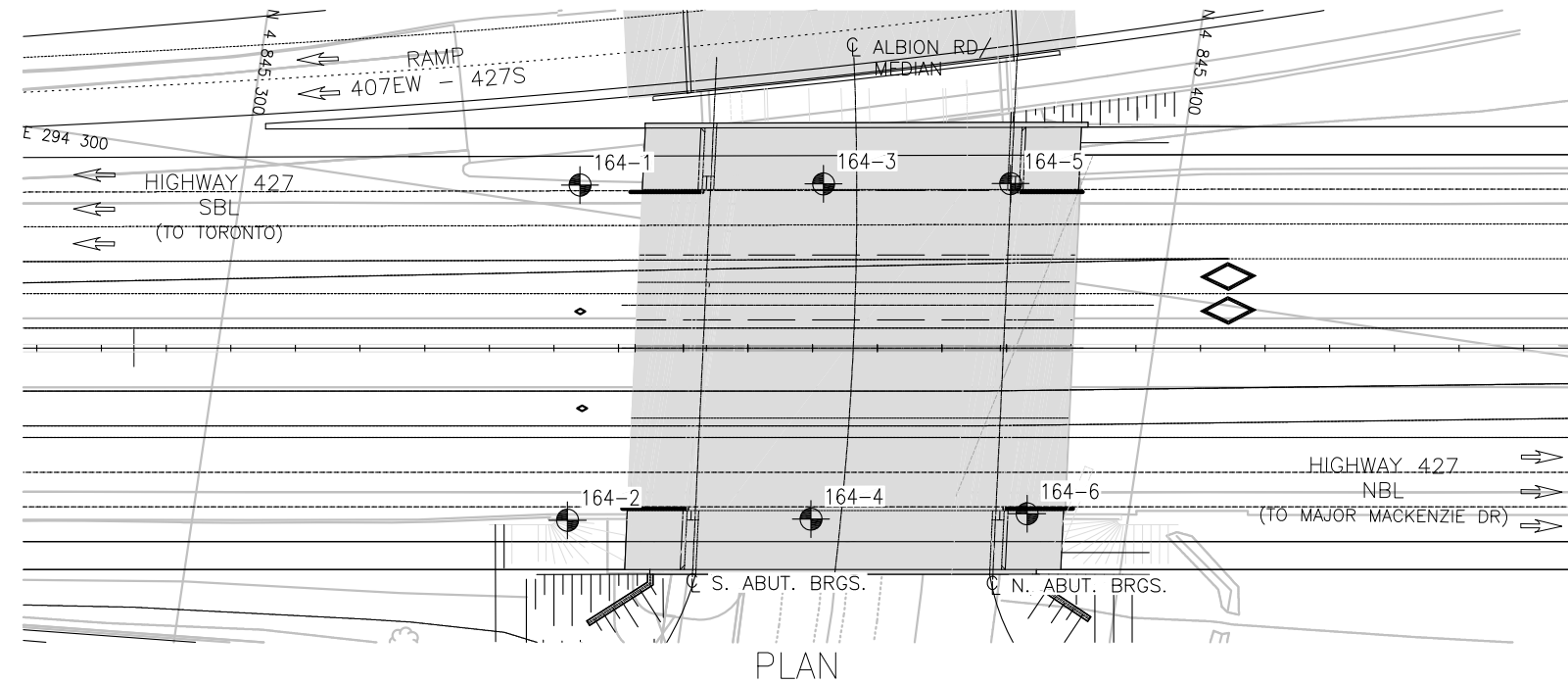
HWY 427 EXPANSION HWY 427 NBL & SBL / CNR OVERHEAD REHABILITATION AND WIDENING SITE 37-1109						
ELECTRICAL EMBEDDED WORK II						
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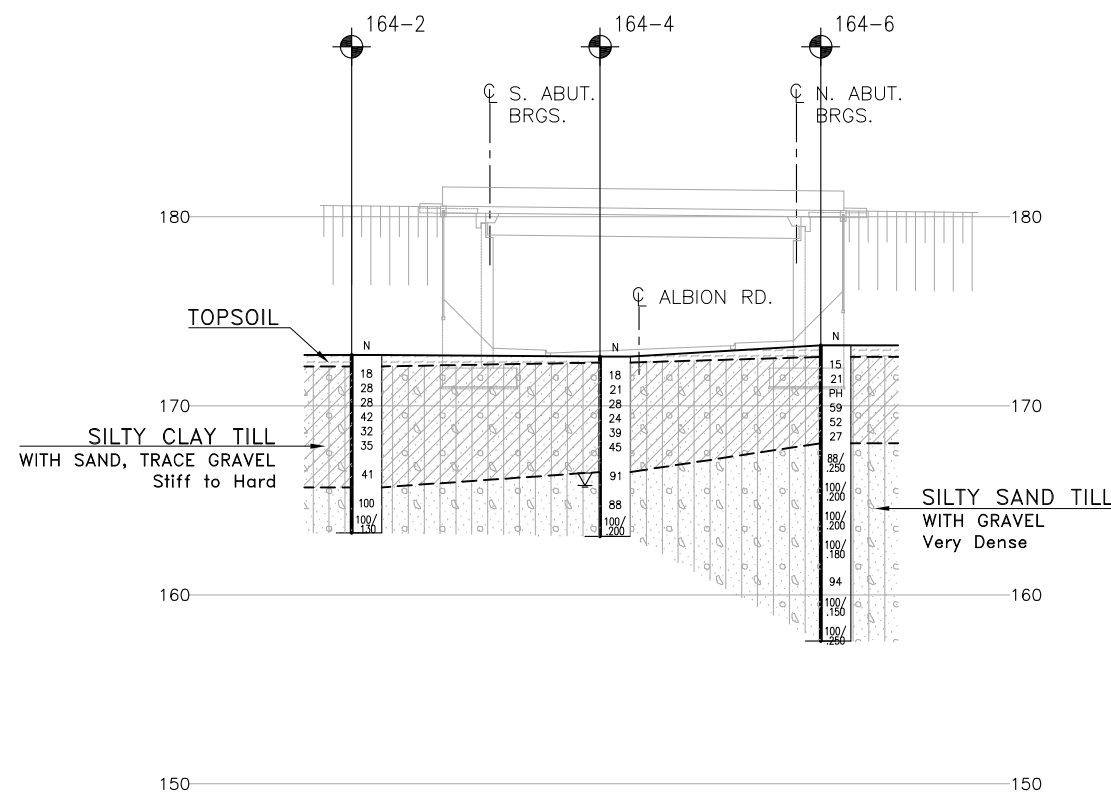
METRIC
DIMENSIONS ARE IN METRES
AND/OR MILLIMETRES
UNLESS OTHERWISE SHOWN



KEYPLAN



PLAN



PROFILE ALONG HWY 427 NBL

LEGEND

- Borehole (By Thurber)
- Borehole (By Others)
- N Blows /0.3m (Std Pen Test, 475J/blow)
- CONE Blows /0.3m (60' Cone, 475J/blow)
- PH Pressure, Hydraulic
- Water Level
- Head Artesian Water
- Piezometer
- 90% Rock Quality Designation (RQD)
- A/R Auger Refusal

NO	ELEVATION	NORTHING	EASTING
164-1	172.3	4 845 336.1	294 297.4
164-2	172.7	4 845 340.1	294 333.4
164-3	172.6	4 845 362.1	294 293.4
164-4	172.6	4 845 366.1	294 329.4
164-5	172.9	4 845 382.1	294 290.4
164-6	1732.2	4 845 389.1	294 325.4

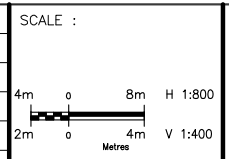
-NOTES-

- 1) The boundaries between soil strata have been established only at Borehole locations. Between Boreholes the boundaries are assumed from geological evidence.
- 2) This drawing is for subsurface information only. Surface details and features are for conceptual illustration.

GEOCRIS No.

FILENAME: H:\Drafting\19000\19484\1ED19484-PLFR-HWY 427 Albion Rd Overpass.dwg PLOTDATE: 3/20/2018 9:29 AM

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A	18/01/12	90% SUBMISSION TO CA	AN	KS	JL	JL



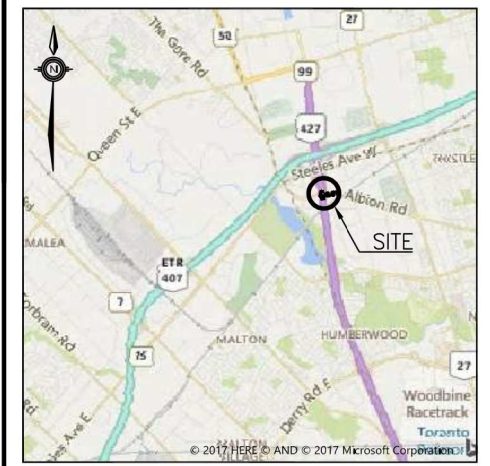
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DRAWN	A. NOOR	AN	18/03/16
CHECKED	K. SHI	KS	18/03/16
APPROVED LEAD ENGINEER	J. LEE	JL	18/03/16
APPROVED PROJ. MANAGER	J. LEE	JL	18/03/16
NAME (PRINT)	INIT.	DATE	



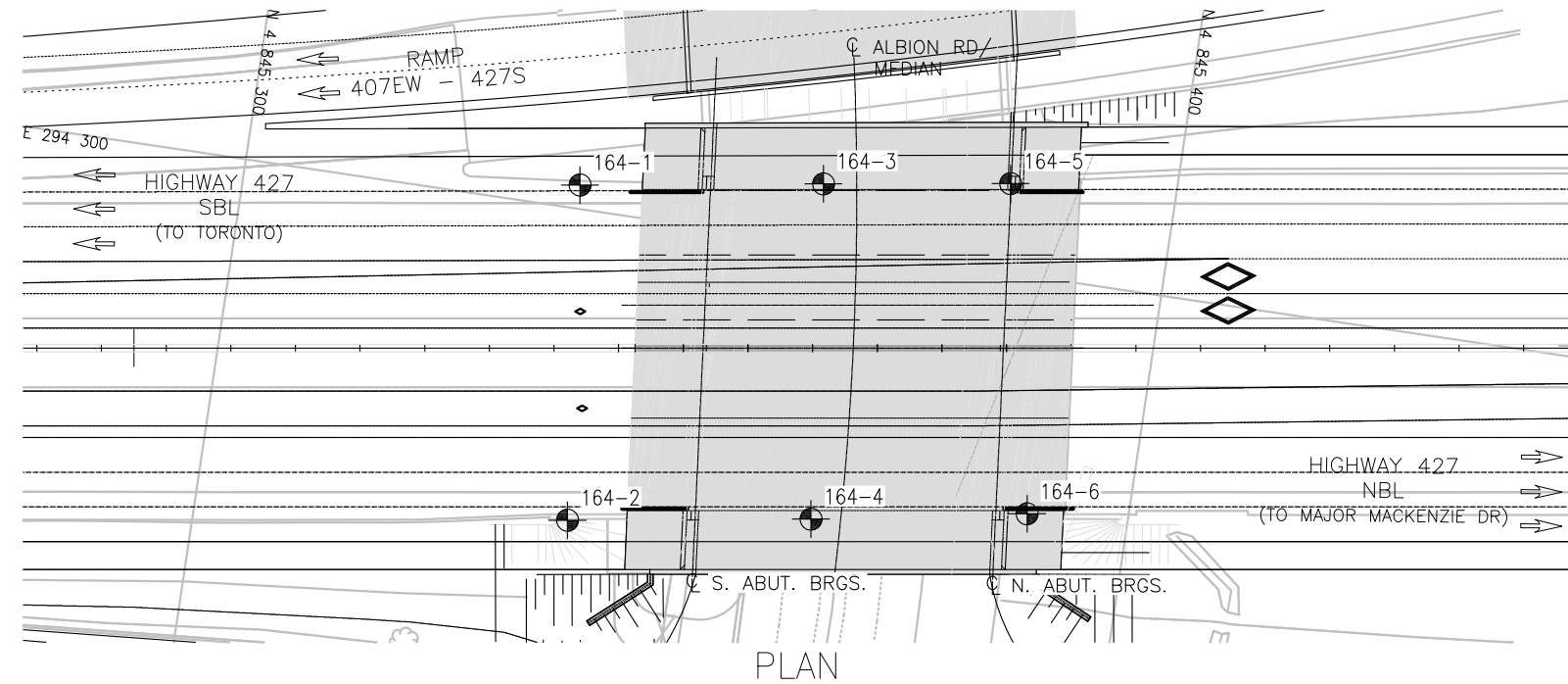
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HWY 427 EXPANSION HWY 427 / ALBION ROAD OVERPASS NORTH BOUND LANE REHABILITATION AND WIDENING BOREHOLE LOCATIONS AND SOIL STRATA I							
PROJECT ID.	STAGE IDENTIFIER	DESIGN PACKAGE NUMBER	DISCIPLINE	STRUCTURE NUMBER	DOCUMENT TYPE	DRAWING NUMBER	REVISION NUMBER
H427-D	N	9	STR	B05	DWG	701	B



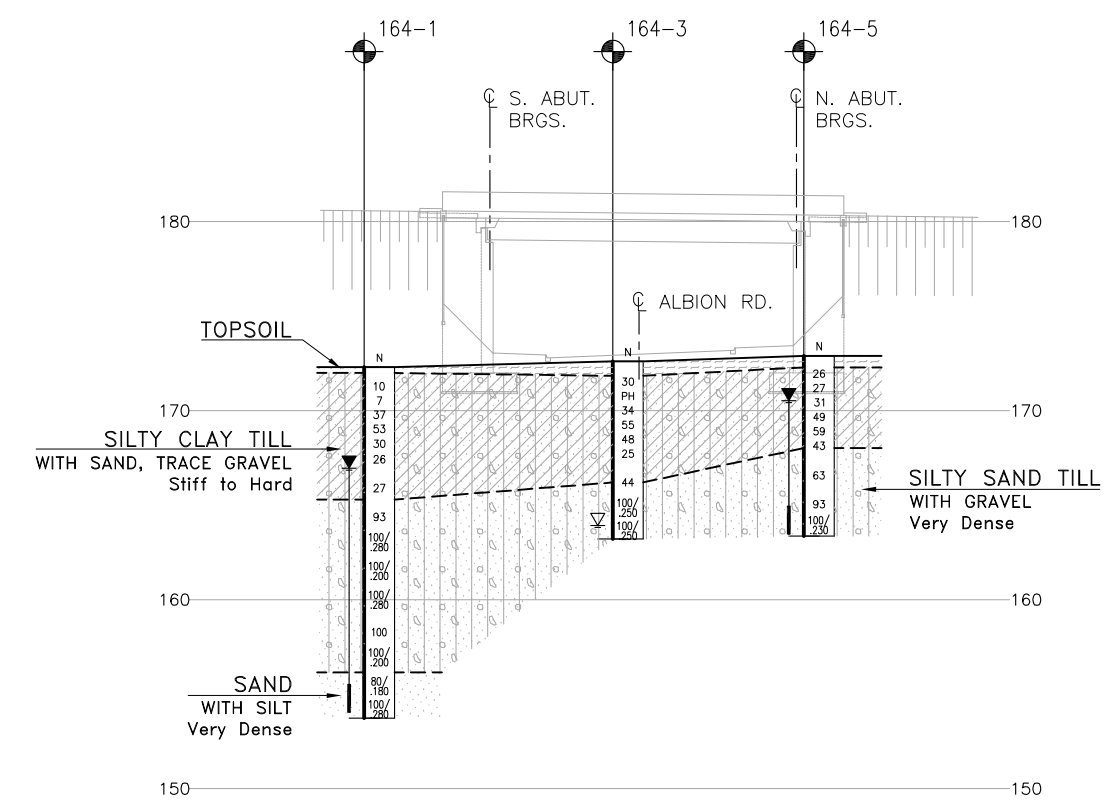
METRIC
DIMENSIONS ARE IN METRES
AND/OR MILLIMETRES
UNLESS OTHERWISE SHOWN



KEYPLAN



PLAN



PROFILE ALONG HWY 427 SBL

LEGEND

- Borehole (By Thurber)
- Borehole (By Others)
- N Blows /0.3m (Std Pen Test, 475J/blow)
- CONE Blows /0.3m (60' Cone, 475J/blow)
- PH Pressure, Hydraulic
- Water Level
- Head Artesian Water
- Piezometer
- 90% Rock Quality Designation (RQD)
- A/R Auger Refusal

NO	ELEVATION	NORTHING	EASTING
164-1	172.3	4 845 336.1	294 297.4
164-2	172.7	4 845 340.1	294 333.4
164-3	172.6	4 845 362.1	294 293.4
164-4	172.6	4 845 366.1	294 329.4
164-5	172.9	4 845 382.1	294 290.4
164-6	1732.2	4 845 389.1	294 325.4

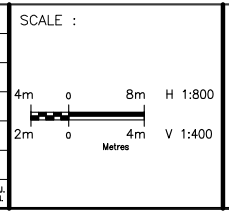
-NOTES-

- 1) The boundaries between soil strata have been established only at Borehole locations. Between Boreholes the boundaries are assumed from geological evidence.
- 2) This drawing is for subsurface information only. Surface details and features are for conceptual illustration.

GEOGRES No.

FILENAME: H:\Drafting\19000\19484\1ED19484-PLFR-HWY 427 Albion Rd Overpass.dwg
PLOTDATE: 3/20/2018 9:30 AM

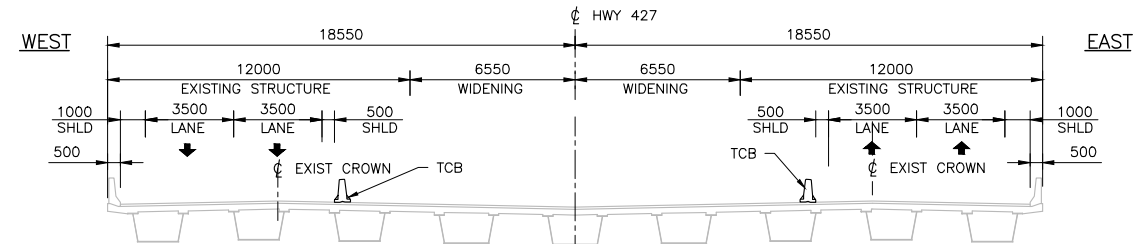
NO.	DATE	REVISIONS	BY	CHK	LEAD. ENG.	PROJ. MGR.
B	18/03/16	90% SUBMISSION TO CA	AN	KS	JL	JL
A	18/01/12	90% SUBMISSION TO CA	AN	KS	JL	JL



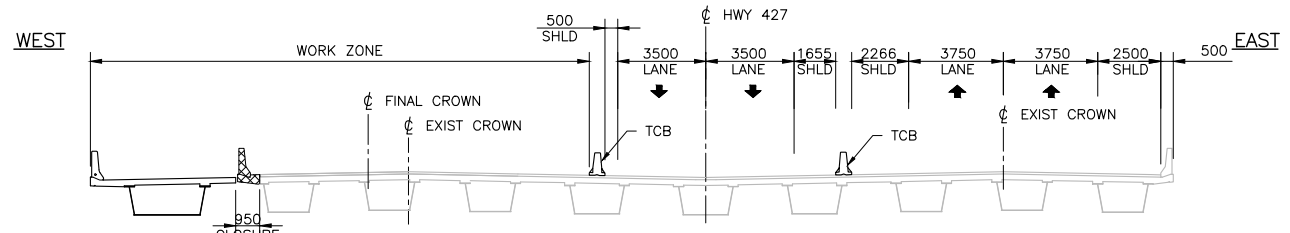
DESIGNED	A. PIASIK	AP	18/03/16
DRAWN	A. NOOR	AN	18/03/16
CHECKED	K. SHI	KS	18/03/16
APPROVED LEAD ENGINEER	J. LEE	JL	18/03/16
APPROVED PROJ. MANAGER	J. LEE	JL	18/03/16
NAME (PRINT)	INIT.	DATE	



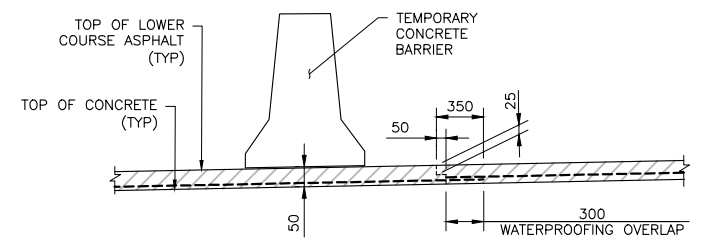
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HWY 427 EXPANSION HWY 427 / ALBION ROAD OVERPASS SOUTH BOUND LANE REHABILITATION AND WIDENING BOREHOLE LOCATIONS AND SOIL STRATA II							
PROJECT ID.	STAGE IDENTIFIER	DESIGN PACKAGE NUMBER	DISCIPLINE	STRUCTURE NUMBER	DOCUMENT TYPE	DRAWING NUMBER	REVISION NUMBER
H427-D	N	9	STR	B05	DWG	702	B



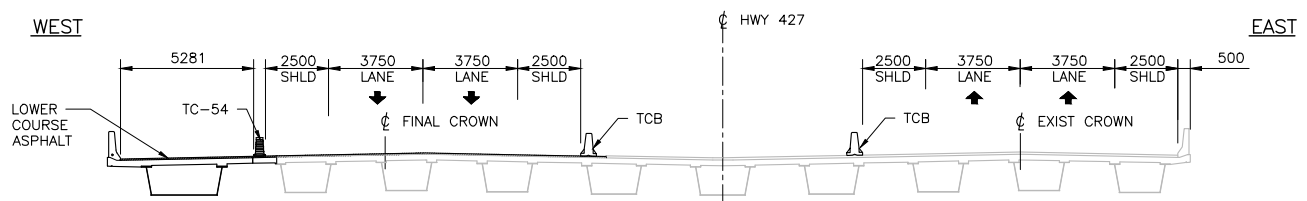
EXISTING/PRE-STAGE
1:150



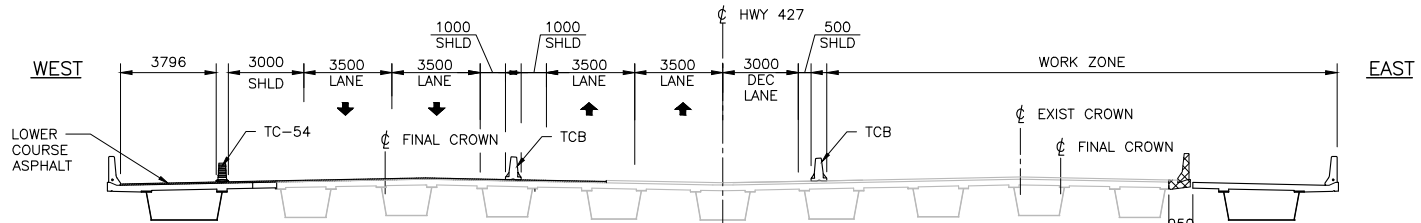
STAGE 1A-1B-1C
1:150



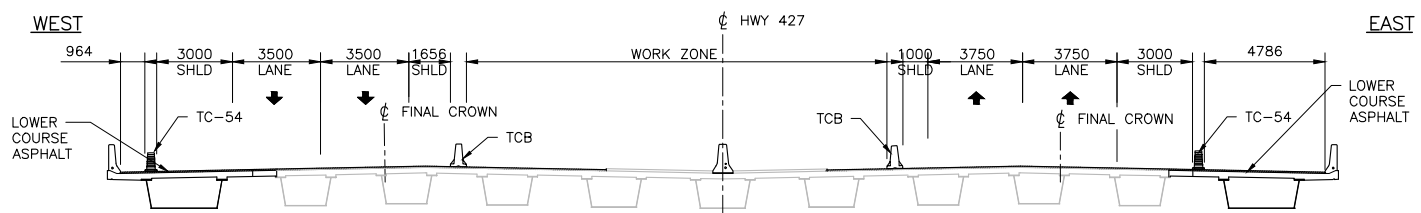
WATERPROOFING OVERLAP DETAIL
NTS



WINTER SHUTDOWN
1:150

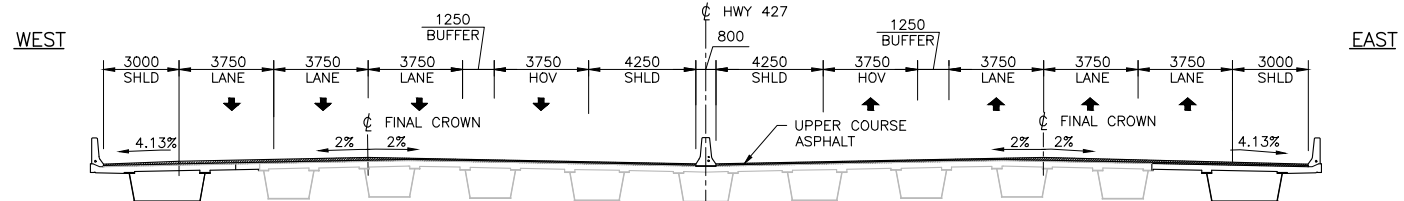


STAGE 2A-2B
1:150



STAGE 2C / WINTER SHUTDOWN
1:150

NOTE: FOR WINTER SHUTDOWN SHOULDERS TO BE MODIFIED AS PER HIGHWAY STAGING DRAWING



FINAL
1:150

NOTES:

1. THIS DRAWING TO BE READ IN CONJUNCTION WITH GENERAL ARRANGEMENT AND HIGHWAY STAGING DRAWINGS.

SCOPE OF REHABILITATION WORK AND STAGING

EXISTING/PRE-STAGE:

1. RECONSTRUCT MEDIAN APPROACH SLABS AS INDICATED ON DWG 719.

STAGE 1A-1B-1C:

- SHIFT TRAFFIC TO EAST SIDE OF THE EXISTING BRIDGE AND INSTALL TEMPORARY TRAFFIC BARRIERS.
- INSTALL PROTECTION SYSTEM.
- CONSTRUCT EXTENSION OF FOOTINGS AND ABUTMENT WALLS TO THE WEST.
- PLACE NEW BEARINGS AND ERECT NEW STEEL BOX GIRDER.
- REMOVE ASPHALT, WATERPROOFING, DETERIORATED AND DELAMINATED CONCRETE FROM EXISTING DECK SURFACE. REMOVE PART OF EXPANSION JOINT ASSEMBLIES, PART OF APPROACH SLABS, BARRIER WALL, DECK CANTILEVERS, BALLAST WALL AND PART OF WINGWALLS.
- REMOVE PART OF EXISTING DECK ENDS TO FACILITATE CONSTRUCTION OF SEMI-INTEGRAL EXTENSION.
- INSTALL STEEL DIAPHRAGMS BETWEEN EXISTING AND NEW GIRDERS AT ABUTMENTS ONLY.
- PATCH REPAIR EXISTING DECK AND POUR PART OF CONCRETE DECK OVER NEW GIRDERS AND SEMI-INTEGRAL EXTENSION WITHIN THE WORK ZONE.
- INSTALL REMAINING STEEL BRACINGS BETWEEN EXISTING AND NEW GIRDERS AFTER THE CONCRETE IN ADJACENT DECK HAS REACHED 30MPa STRENGTH. DO NOT TIGHTEN THE BOLTS.
- POUR CLOSURE STRIP WHEN CONCRETE IN DECK SLAB AND SEMI-INTEGRAL EXTENSION HAS REACHED 30 MPA STRENGTH.
- CONSTRUCT PART OF APPROACH SLABS.
- WATERPROOF AND PAVE LOWER COURSE ASPHALT. ADDITIONAL LAYER OF 300mm WATERPROOFING PROTECTION BOARD TO BE ADDED AT CONSTRUCTION JOINT.
- TIGHTEN THE BOLTS OF STEEL BRACINGS.

WINTER SHUTDOWN:

1. INSTALL TEMPORARY TRAFFIC BARRIERS TO REINSTATE LANE CONFIGURATION AS SHOWN FOR SBL AND NBL.

STAGE 2A-2B:

- SHIFT TRAFFIC TO THE WEST SIDE OF BRIDGE AND INSTALL TEMPORARY TRAFFIC BARRIERS.
- ADJUST PROTECTION SYSTEM.
- CONSTRUCT EXTENSION OF FOOTINGS AND ABUTMENT WALLS TO THE EAST.
- REPEAT STEPS 4 TO 13 FROM STAGE 1A-1B-1C.

STAGE 2C:

- SHIFT TRAFFIC TO CREATE WORK ZONE IN THE MEDIAN.
- REMOVE ASPHALT AND WATERPROOFING FROM PART OF DECK IN THE MEDIAN.
- CONSTRUCT MEDIAN BARRIER WALL.
- REMOVE 350mm OF LOWER COURSE ASPHALT AND 300mm PROTECTION BOARD ADDED AT CONSTRUCTION JOINT FROM STAGE 1A-1B-1C AND STAGE 2A-2B.
- WATERPROOF AND PAVE LOWER COURSE ASPHALT.

POST STAGE 2C:

- REMOVE TEMPORARY CONCRETE BARRIERS.
- PAVE UPPER COURSE ASPHALT ON BRIDGE DECK AND APPROACH SLABS.

LEGEND:

REMOVALS

CAD FILE LOCATION AND NAME: C:\projects\hwy427\hwy427-d-f-9-str-b05-dwg-703st.dwg
 MODIFIED: 3/19/2018 3:33:34 PM BY: PANGF
 DATE PLOTTED: 3/19/2018 3:49:51 PM BY: PANGF

DATE	REVISIONS	BY	CHK	LEAD DISC.	PROJ. MAN.
B 18/03/16	90% SUBMISSION TO CA				
A 18/01/12	90% SUBMISSION TO CA				

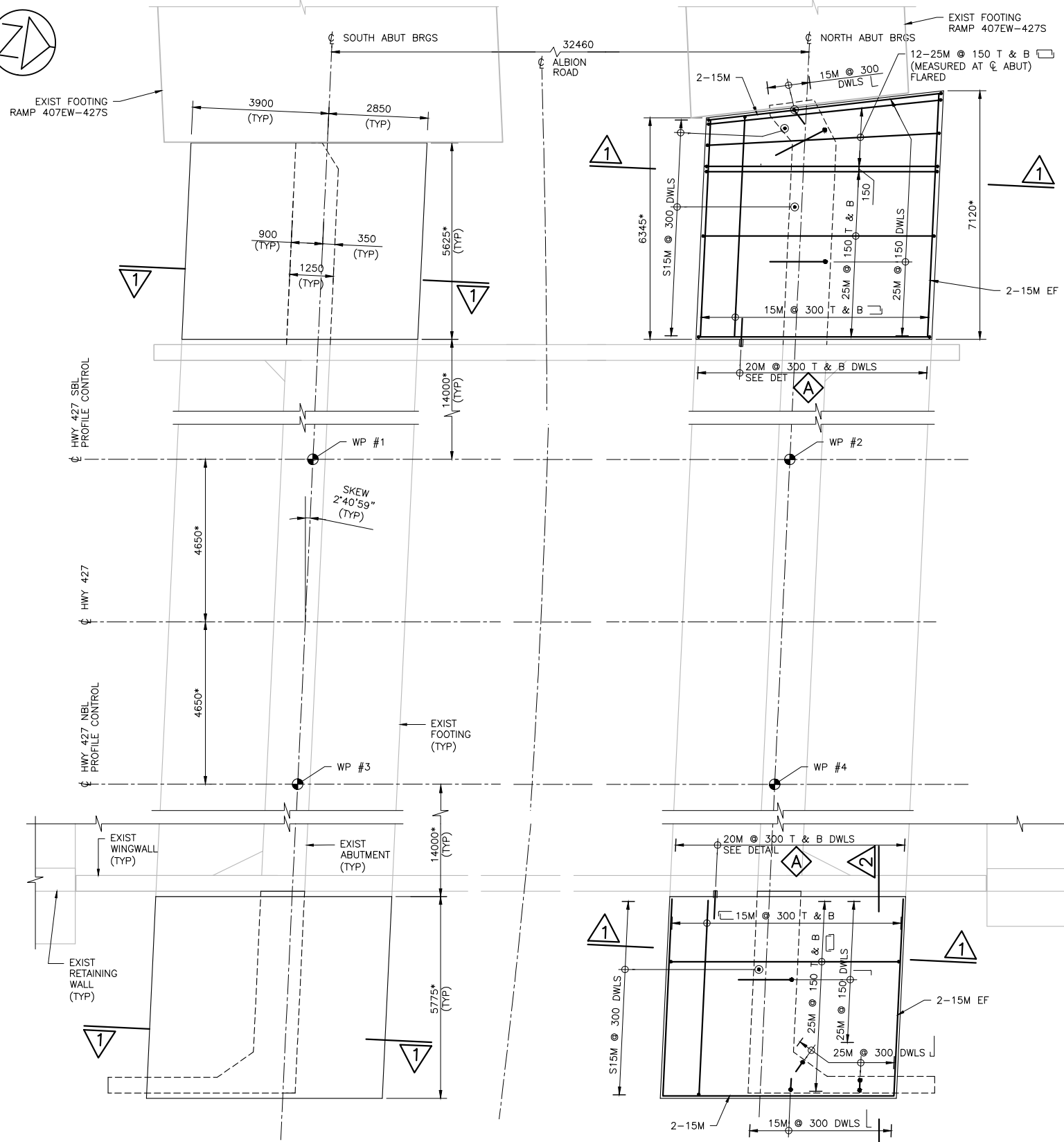
SCALE :
AS NOTED

DESIGNED	NIMA MAHMOUDI
DRAWN	SOPHIA MILLS
CHECKED	SUBOOHI OBAID
APPROVED LEAD ENG.	TATIANA OJALA
APPROVED PROJ. MANAGER	

CONSULTANT	
NAME (PRINT)	
INT.	
DATE	

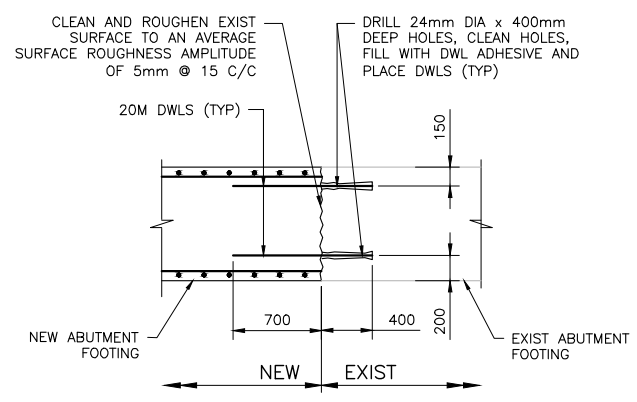


HWY 427 EXPANSION HWY 427 / ALBION ROAD OVERPASS REHABILITATION AND WIDENING R1 SITE 37-1110 CONSTRUCTION STAGING							
PROJECT ID.	STAGE IDENTIFIER	DESIGN PACKAGE NUMBER	DISCIPLINE	STRUCTURE NUMBER	DOCUMENT TYPE	DRAWING NUMBER	REVISION NUMBER
H427-D	N	9	STR	B05	DWG	703	B

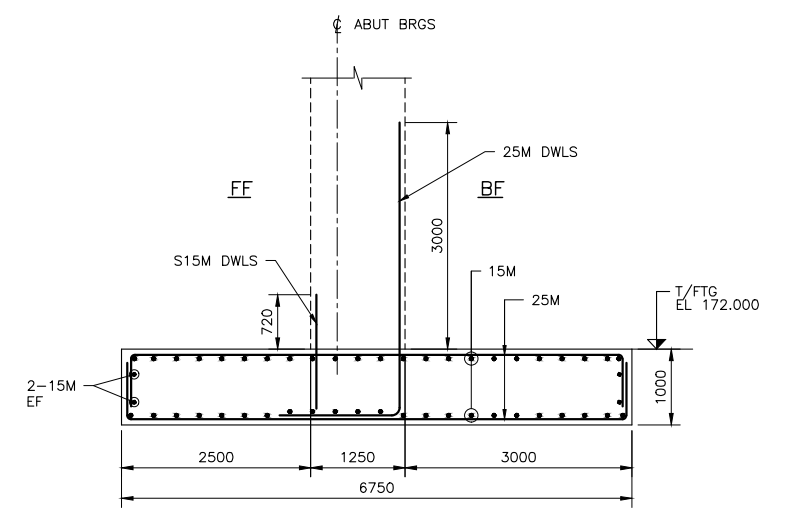


PLAN
1:75

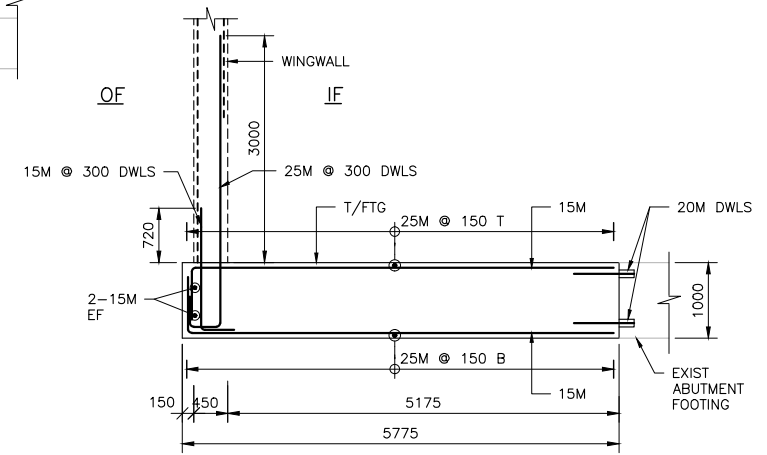
* DIMENSIONS MEASURE PERPENDICULAR TO CONTROL LINE
DIMENSIONS FOR SOUTH ABUT FOOTING SHOWN, DIMENSIONS FOR NORTH ABUT FOOTING SIMILAR UNO
REINFORCEMENT FOR NORTH ABUT FOOTING SHOWN, REINFORCEMENT FOR SOUTH ABUT FOOTING SIMILAR UNO



TYPICAL ABUTMENT FOOTING CONNECTION DETAIL
1:30



1
1:50



2
1:50

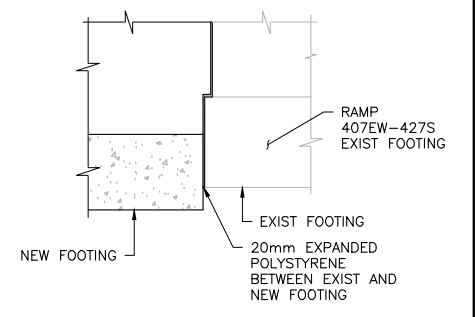
- NOTES:**
- THIS DRAWING TO BE READ IN CONJUNCTION WITH DRAWINGS 700, 703 AND 706.
 - SUBGRADE PREPARATION FOR ABUTMENT FOOTING WIDENING SHALL BE AS PER GEO-TECHNICAL RECOMMENDATIONS.
 - 100mm THICK PROTECTIVE COVER OF MASS CONCRETE SHOULD BE PLACED TO PROTECT THE SUBGRADE.

SOIL BEARING CAPACITY FOR ABUTMENT FOOTINGS:

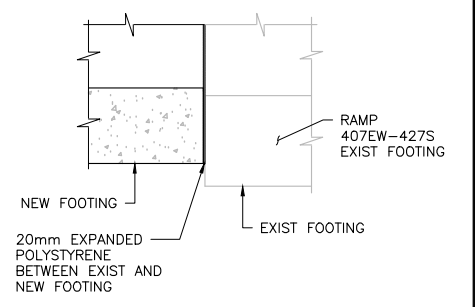
CAPACITY AT SLS: 300 KPa
CAPACITY AT ULS: 450 KPa

LIST OF ABBREVIATIONS:

WP WORKING POINT



NORTH ABUTMENT
1:50



SOUTH ABUTMENT
1:50

CAD FILE LOCATION AND NAME: C:\projects\hwy427\hwy427-d-f-9-str-b05-dwg-704fd.dwg
MODIFIED: 3/19/2018 3:33:41 PM BY: PANGF
DATE PLOTTED: 3/19/2018 3:49:57 PM BY: PANGF

DATE	REVISIONS	BY	CHK	LEAD DISC.	PROJ. MAN.
B 18/03/16	90% SUBMISSION TO CA				
A 18/01/12	90% SUBMISSION TO CA				

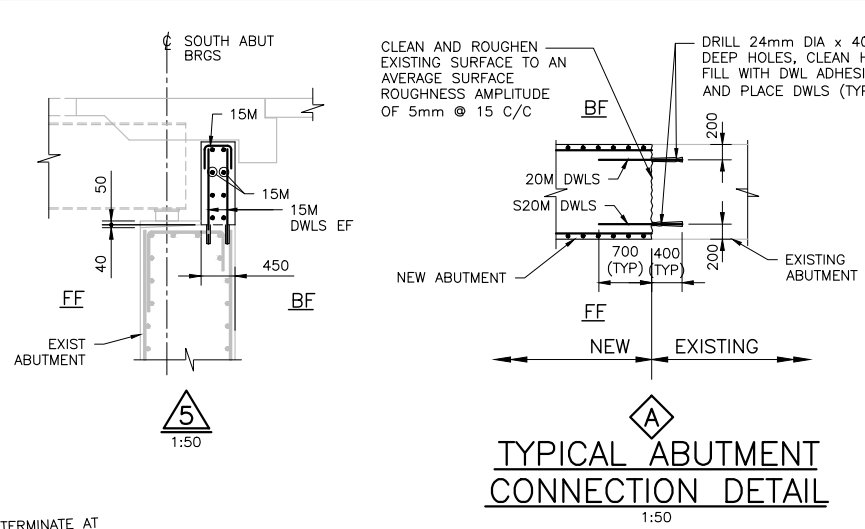
SCALE :

AS NOTED

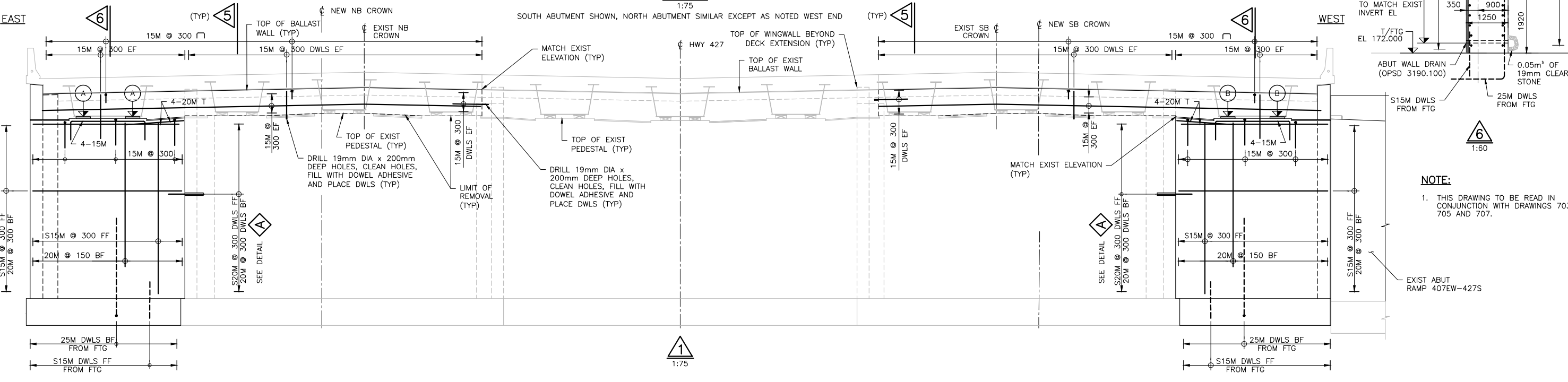
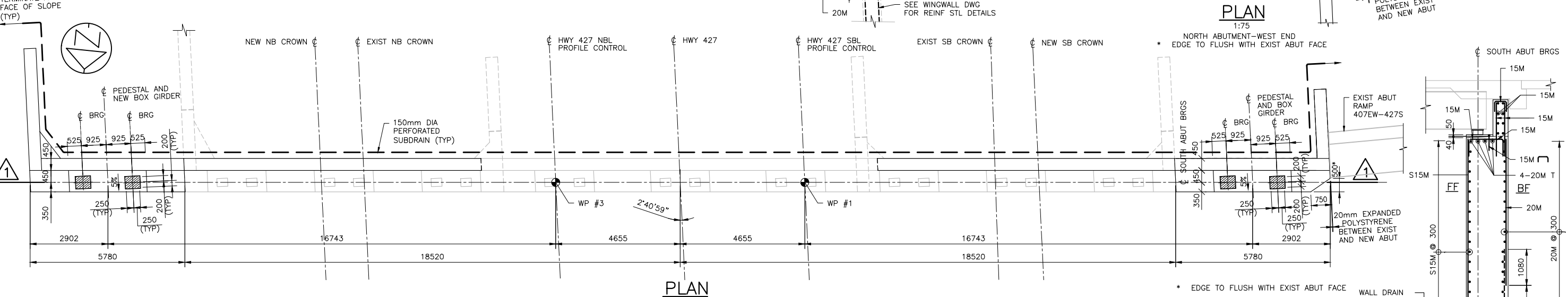
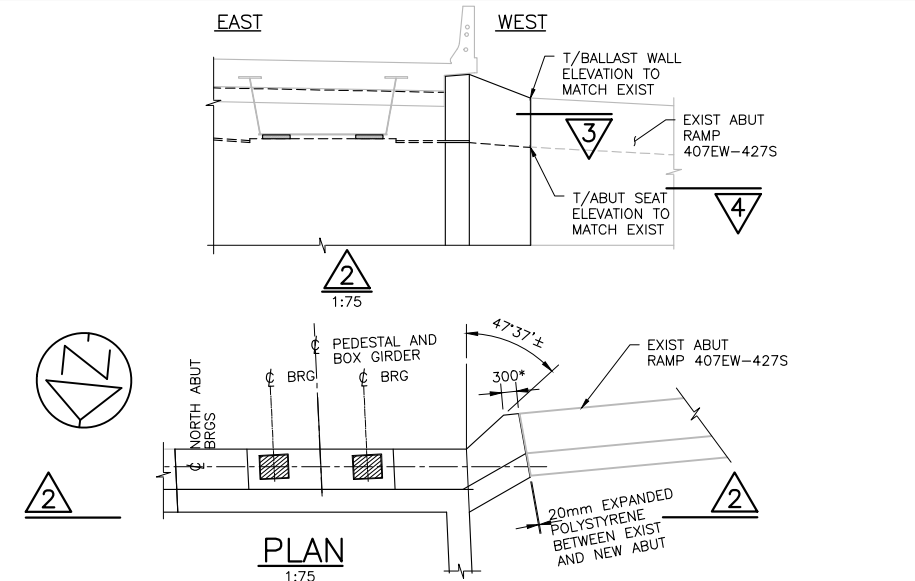
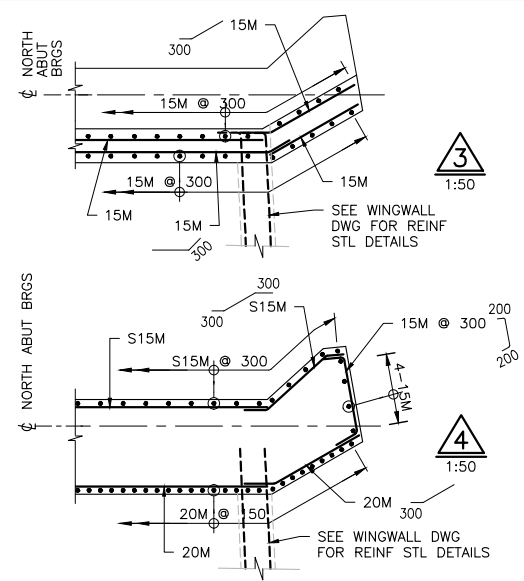
DESIGNED	NIMA MAHMOUDI	
DRAWN	SOPHIA MILLS	
CHECKED	SUBOOHI OBAID	
APPROVED LEAD ENG.	TATIANA OJALA	
APPROVED PROJ. MANAGER		
NAME (PRINT)	INT.	DATE



TITLE							
HWY 427 EXPANSION HWY 427 / ALBION ROAD OVERPASS REHABILITATION AND WIDENING R1 SITE 37-1110 FOUNDATION LAYOUT AND DETAILS							
PROJECT ID.	STAGE IDENTIFIER	DESIGN PACKAGE NUMBER	DISCIPLINE	STRUCTURE NUMBER	DOCUMENT TYPE	DRAWING NUMBER	REVISION NUMBER
H427-D	N	9	STR	B05	DWG	704	B



TOP OF BEARING ELEVATIONS		
	POINTS	ELEVATIONS
SOUTH ABUTMENT	(A)	178.859
	(B)	178.832
NORTH ABUTMENT	(A)	178.693
	(B)	178.695



NOTE:
1. THIS DRAWING TO BE READ IN CONJUNCTION WITH DRAWINGS 703, 705 AND 707.

CAD FILE LOCATION AND NAME: C:\projects\hwy427\hwy427-d-f-9-str-b05-706ab.dwg
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 DATE PLOTTED: 3/19/2018 3:50:11 PM BY: PANGF

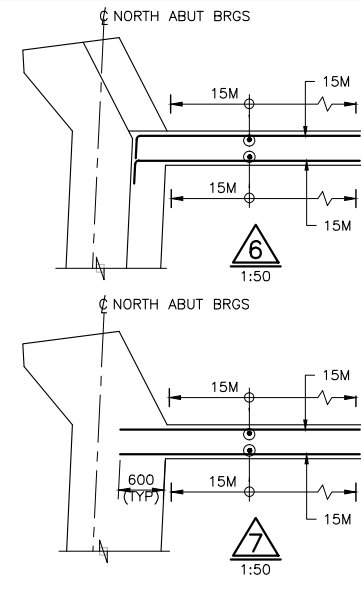
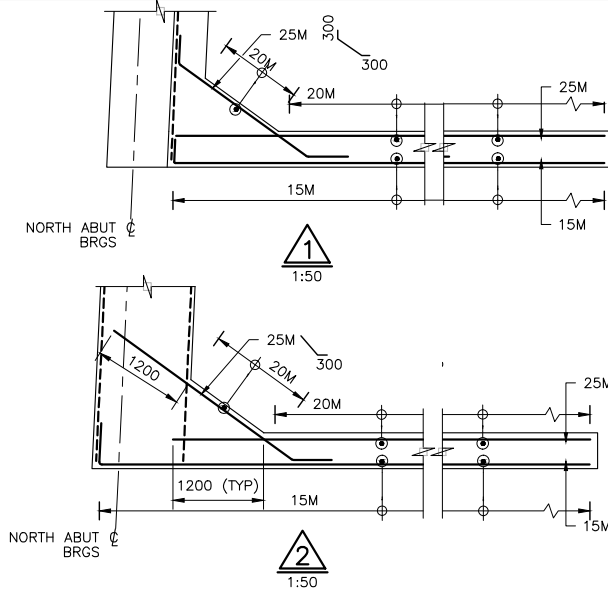
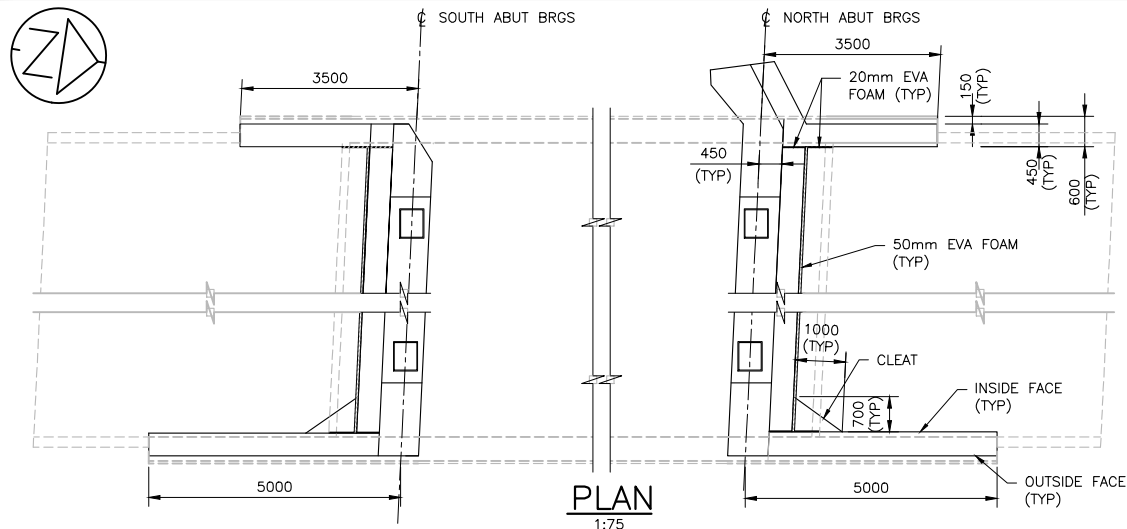
DATE	REVISIONS	BY	CHK	LEAD DISC.	PROJ. MAN.
B 18/03/16	90% SUBMISSION TO CA				
A 18/01/12	90% SUBMISSION TO CA				

SCALE : AS NOTED

DESIGNED	NIMA MAHMOUDI
DRAWN	SOPHIA MILLS
CHECKED	SUBOOHI OBAID
APPROVED LEAD ENG.	TATIANA QJALA
APPROVED PROJ. MANAGER	
NAME (PRINT)	INT.
	DATE



HWY 427 EXPANSION HWY 427 / ALBION ROAD OVERPASS REHABILITATION AND WIDENING R1 SITE 37-1110 ABUTMENTS							
PROJECT ID.	STAGE IDENTIFIER	DESIGN PACKAGE NUMBER	DISCIPLINE	STRUCTURE NUMBER	DOCUMENT TYPE	DRAWING NUMBER	REVISION NUMBER
H427-D	N	9	STR	B05	DWG	706	B



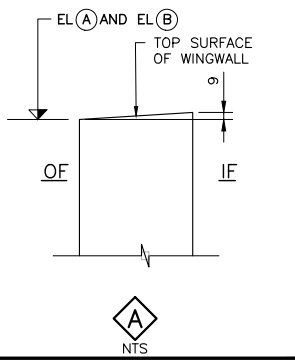
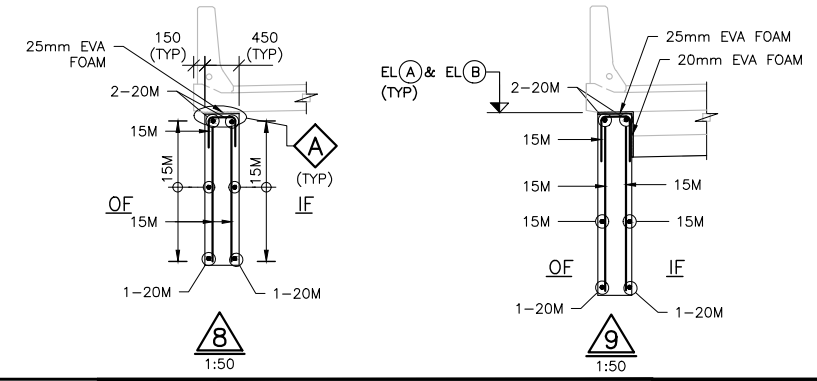
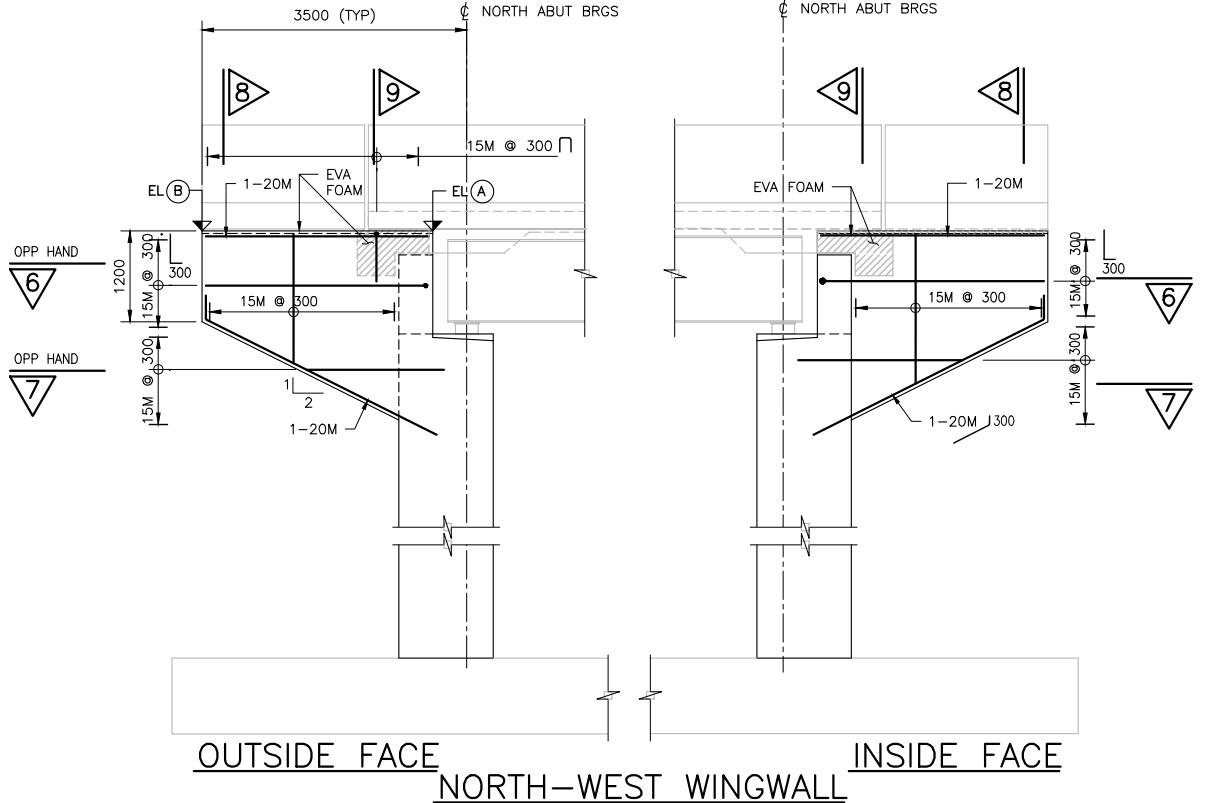
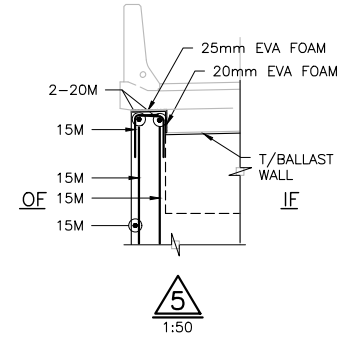
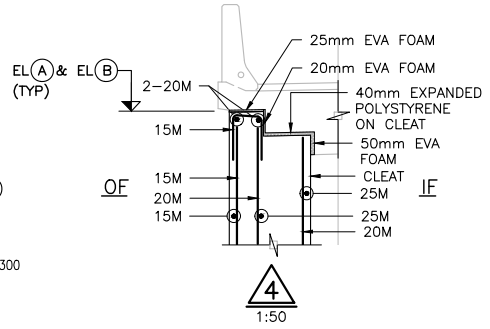
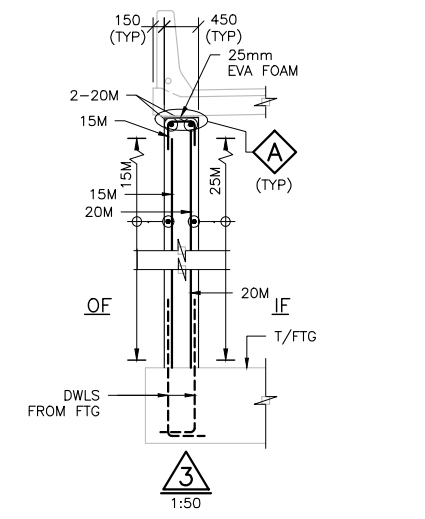
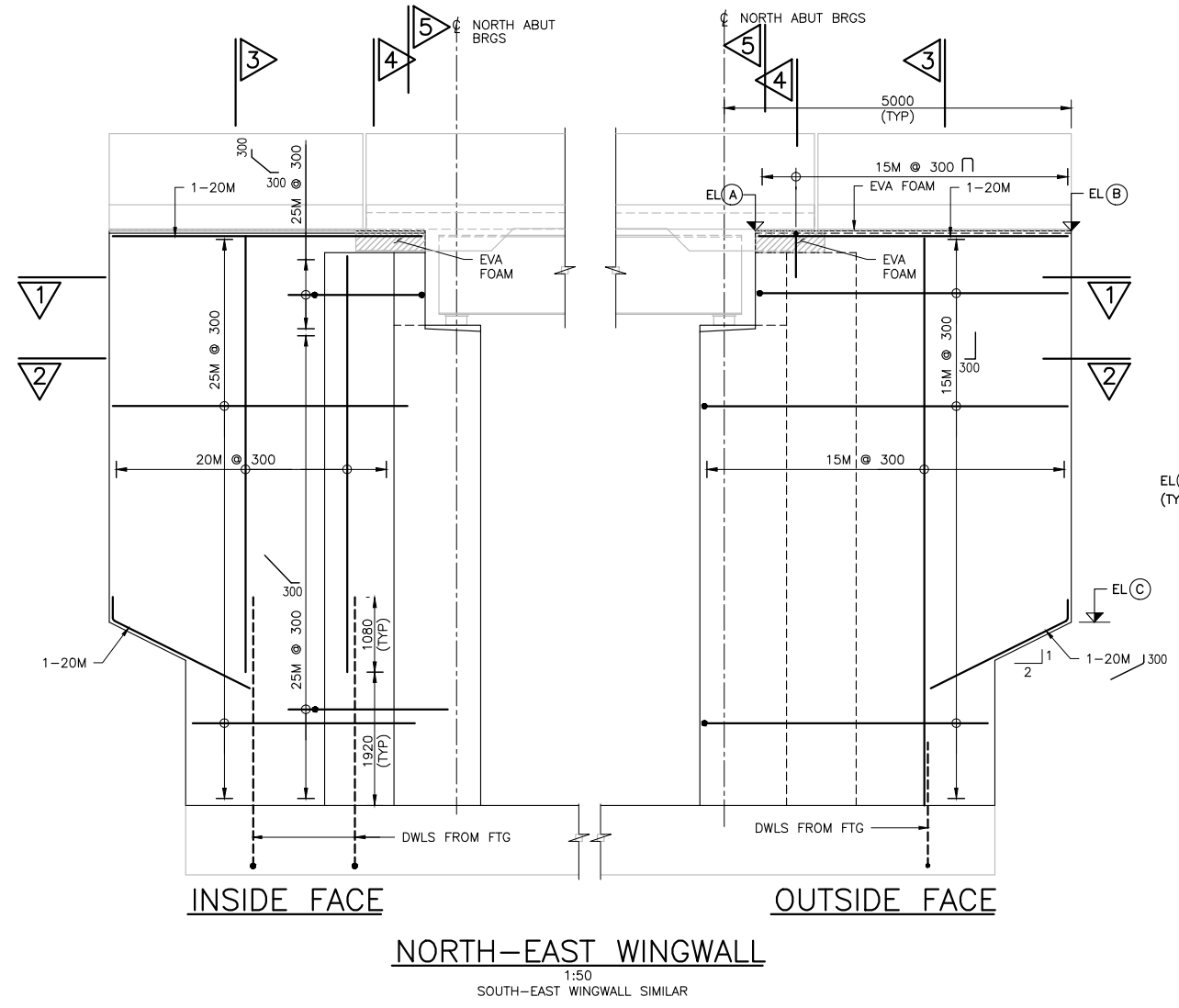
APPLICABLE STANDARD DRAWINGS:
 OPSD 3102.100 WALLS, ABUTMENT, BACKFILL, DRAIN
 OPSD 3941.200 FIGURES IN CONCRETE, SITE NUMBER AND DATE, LAYOUT
 OPSD 3950.100 JOINTS, CONCRETE EXPANSION AND CONSTRUCTION ON STRUCTURE

NOTES:
 1. THIS DRAWING TO BE READ IN CONJUNCTION WITH DRAWINGS 700, 704 AND 706.
 2. TOP OF CLEAT TO BE CAST 35mm BELOW SOFFIT OF DECK DIAPHRAGM.

LIST OF ABBREVIATIONS:
 DWLS DOWELS
 EVA ETHYLENE VINYL ACETATE
 REINF STL REINFORCING STEEL

WINGWALLS ELEVATIONS			
LOCATION	ELEVATION (A)	ELEVATION (B)	ELEVATION (C)
NORTH-WEST WINGWALL	179.810	179.796	-
SOUTH-WEST WINGWALL	179.947	179.963	-
NORTH-EAST WINGWALL	179.809	179.784	174.545
SOUTH-EAST WINGWALL	179.975	180.002	174.175

MODIFIED	
STANDARD DRAWING JAN 2013	SS105-2
WINGWALL DETAILS FOR BRIDGES	



CAD FILE LOCATION AND NAME: C:\projectwise\wsp-ca\wsp-ca\projectwise\wsp-ca\STR-B05-DWG-707\W.dwg
 MODIFIED: 3/19/2018 3:33:50 PM BY: PANGF
 DATE PLOTTED: 3/19/2018 3:50:19 PM BY: PANGF

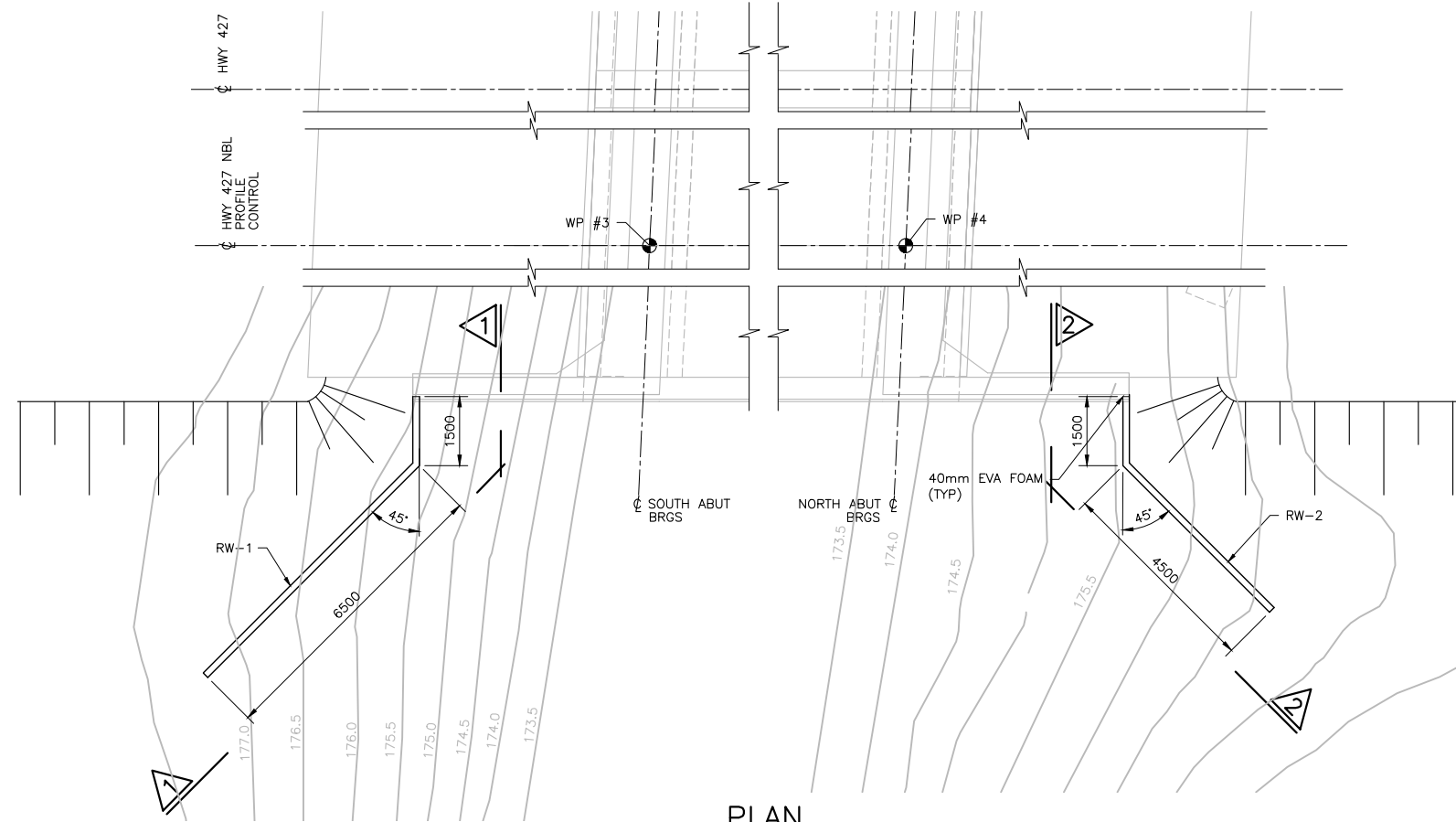
DATE	REVISIONS	BY	CHK	LEAD DISC.	PROJ. MAN.
B 18/03/16	90% SUBMISSION TO CA				
A 18/01/12	90% SUBMISSION TO CA				

SCALE :
AS NOTED

DESIGNED	NIMA MAHMOUDI
DRAWN	SOPHIA MILLS
CHECKED	SUBOOHI OBAID
APPROVED LEAD ENG.	TATIANA OJALA
APPROVED PROJ. MANAGER	
NAME (PRINT)	INT. DATE



HWY 427 EXPANSION HWY 427 / ALBION ROAD OVERPASS REHABILITATION AND WIDENING R1 SITE 37-1110 WINGWALLS							
PROJECT ID.	STAGE IDENTIFIER	DESIGN PACKAGE NUMBER	DISCIPLINE	STRUCTURE NUMBER	DOCUMENT TYPE	DRAWING NUMBER	REVISION NUMBER
H427-D	N	9	STR	B05	DWG	707	B



PLAN
1:75

NOTES:

- THIS DRAWING TO BE READ IN CONJUNCTION WITH DRAWING 700.
- RETAINED SOIL SYSTEM (RSS) SHALL HAVE THE FOLLOWING ATTRIBUTES:

APPLICATION:	WALL/SLOPE
PERFORMANCE:	HIGH
APPEARANCE:	HIGH
- RSS WALL GRANULAR PAD:

WHERE RSS WALL GRANULAR PAD IS TO BE PLACED ANY TOPSOIL AND SOFT/LOOSE FILL OR NATIVE MATERIAL SHOULD BE STRIPPED FROM THE FOOTPRINT PRIOR TO PLACEMENT OF FILL.

ALL DISTURBED AND NEW EMBANKMENT FILL MUST BE COMPACTED IN ACCORDANCE WITH OPSS 501.

500mm THICK LAYER OF BEDDING MATERIAL CONFORMING TO OPSS GRANULAR 'A' REQUIREMENT SHOULD BE PROVIDED UNDER THE RSS MASS TO PROVIDE A UNIFORM SUBGRADE CONDITION.

GRANULAR 'A' SHOULD BE COMPACTED TO 100% OR STANDARD PROCTOR MAXIMUM DRY DENSITY AT A MOISTURE CONTENT WITHIN 2% OF OPTIMUM.

ENGINEERED FILL PAD MUST EXTEND AT LEAST 500mm BEYOND THE LIMITS OF THE RSS MASS AND LEVELLING STRIP.

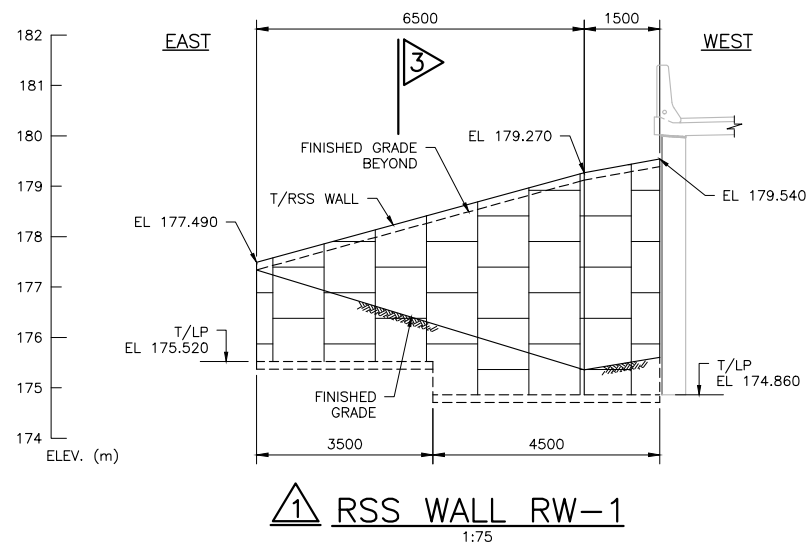
REFER TO GRADING DRAWINGS FOR DETAILS.
- RSS WALL SUPPLIER SHALL PROVIDE PERMANENT PROTECTION TO CSP 300mm PIPES BEHIND THE WALL SURFACE AND SHALL BE INTEGRATED WITH THE RSS SOIL MASS.

LIST OF ABBREVIATIONS:

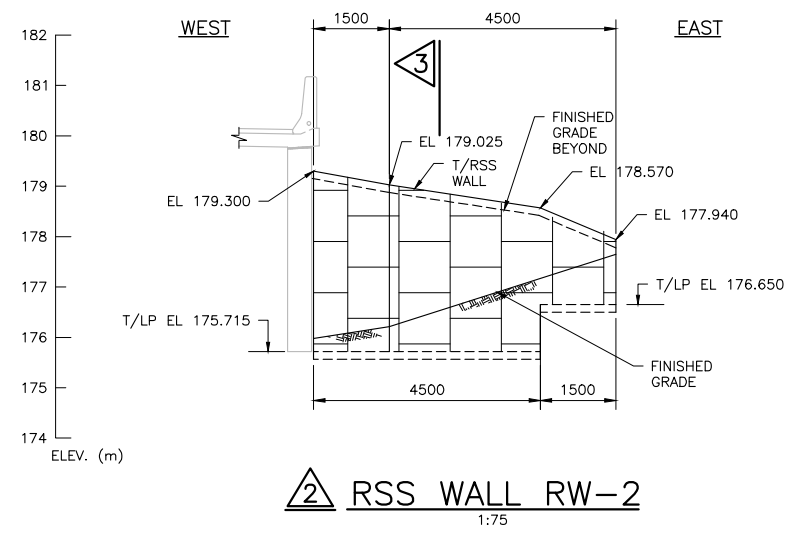
LP LEVELING PAD
WP WORK POINT

SOIL BEARING CAPACITY FOR RSS WALL FOUNDATION:

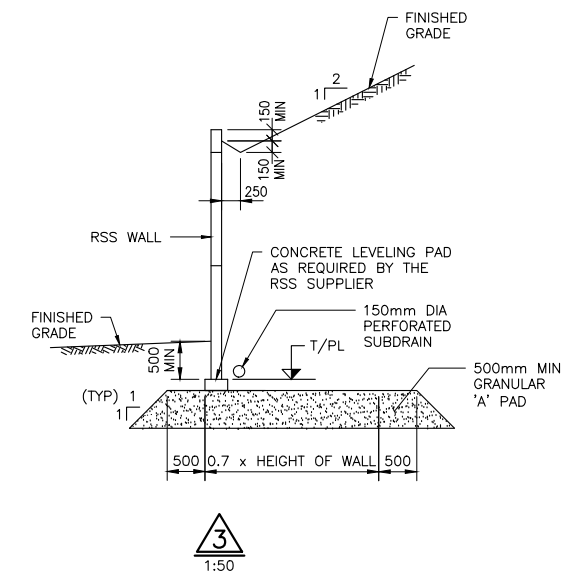
CAPACITY AT SLS: 200KPa
CAPACITY AT ULS: 300KPa



1 RSS WALL RW-1
1:75



2 RSS WALL RW-2
1:75



3
1:50

CAD FILE LOCATION AND NAME: C:\projectwise\wsp-ca\projectwise\wsp-ca\HW427-D-F-9-STR-B05-DWG-708RW.dwg
 MODIFIED: 3/19/2018 3:33:54 PM BY: PANG
 DATE PLOTTED: 3/19/2018 3:50:25 PM BY: PANG

DATE	REVISIONS	BY	CHK	LEAD DISC.	PROJ. MAN.
B 18/03/16	90% SUBMISSION TO CA				
A 18/01/12	90% SUBMISSION TO CA				

SCALE :

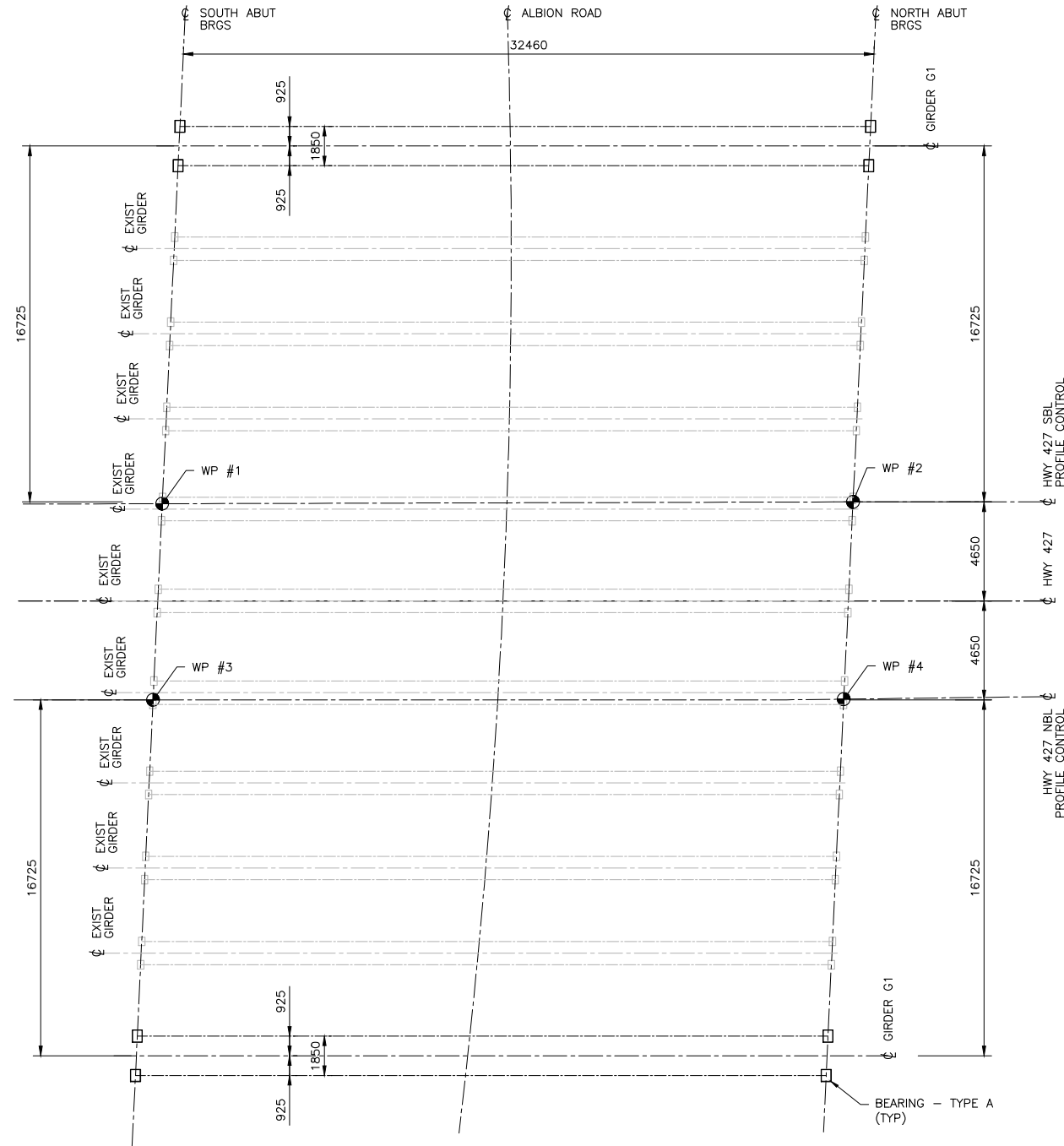
AS NOTED

DESIGNED	NIMA MAHMOUDI
DRAWN	SOPHIA MILLS
CHECKED	SUBOOHI OBAID
APPROVED LEAD ENG.	TATIANA OJALA
APPROVED PROJ. MANAGER	

NAME (PRINT)	INT.	DATE



TITLE							
HWY 427 EXPANSION HWY 427 / ALBION ROAD OVERPASS REHABILITATION AND WIDENING R1 SITE 37-1110 RETAINING SOIL SYSTEM WALLS							
PROJECT ID.	STAGE IDENTIFIER	DESIGN PACKAGE NUMBER	DISCIPLINE	STRUCTURE NUMBER	DOCUMENT TYPE	DRAWING NUMBER	REVISION NUMBER
H427-D	N	9	STR	B05	DWG	708	B



PLAN
1:150

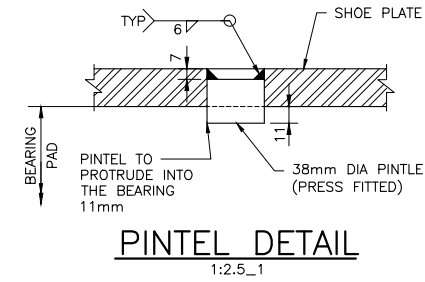
BEARING DATA	REQUIREMENTS AT SERVICEABILITY LIMIT STATES LOADING
	BEARING TYPE A
DEAD LOAD (kN)	800
TOTAL LOAD (kN)	1250
MOVEMENT (mm)	±15
MAXIMUM SHEAR RATE	2.93
BEARING SIZE - TYPE A (mm)	500x400x100
NUMBER REQUIRED	SOUTH ABUTMENT: 4 NORTH ABUTMENT: 4
BEARING TYPE	LAMINATED ELASTOMERIC BEARING

NOTE:

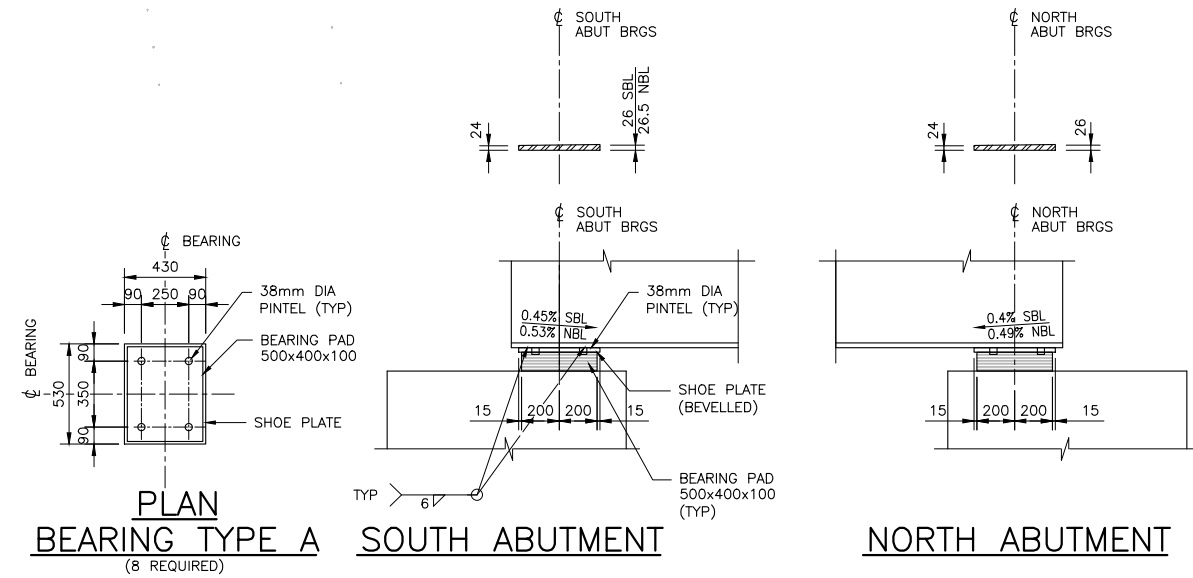
1. THIS DRAWING TO BE READ IN CONJUNCTION WITH DRAWINGS 700, 703, 711 AND 712.

LIST OF ABBREVIATION:

WP WORKING POINT



PINTEL DETAIL
1:2.5_1



PLAN BEARING TYPE A
(8 REQUIRED)

SOUTH ABUTMENT

NORTH ABUTMENT

BEARING DETAILS AT NEW GIRDER G1
1:20

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 DATE PLOTTED: 3/19/2018 3:50:29 PM BY: PANGF

DATE	REVISIONS	BY	CHK	LEAD DISC.	PROJ. MAN.
B 18/03/16	90% SUBMISSION TO CA				
A 18/01/12	90% SUBMISSION TO CA				

SCALE :

AS NOTED

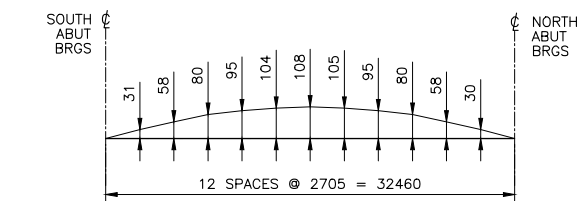
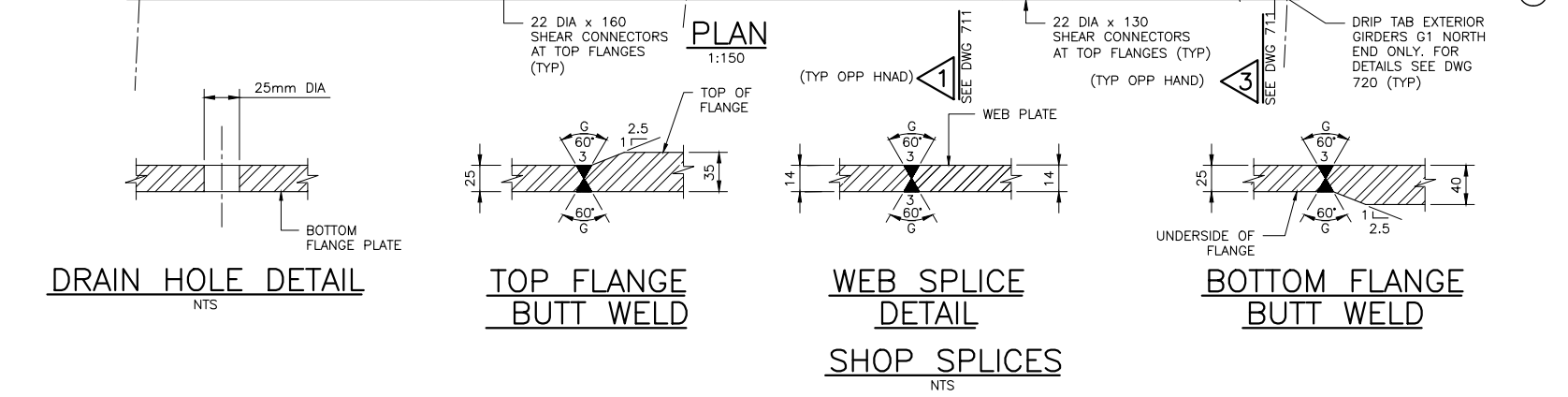
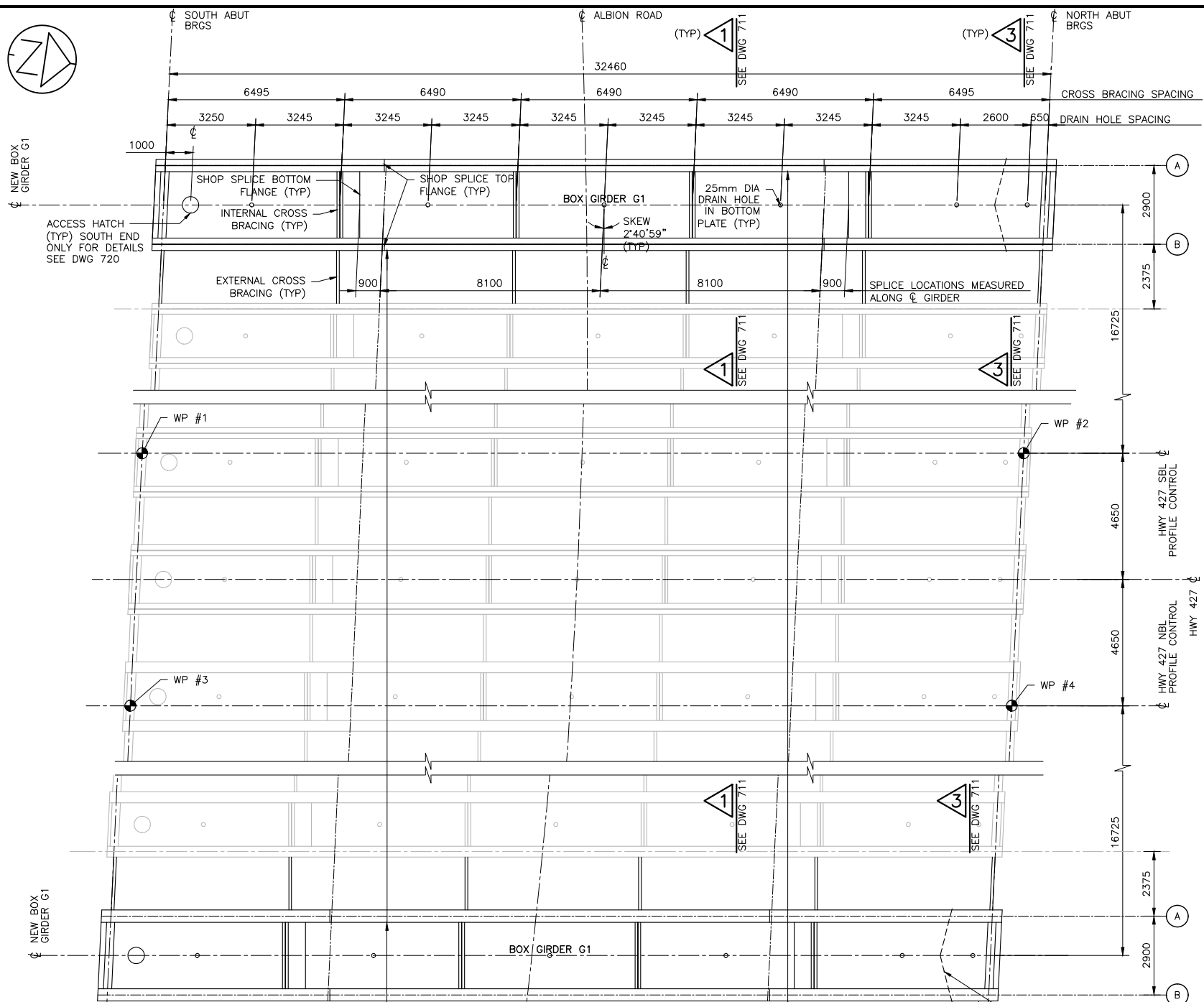
CONSULTANT	DESIGNED	DATE
	NIMA MAHMOUDI	
	DRAWN	SOPHIA MILLS
	CHECKED	SUBOOHI OBAID
	APPROVED LEAD ENG.	TATIANA OJALA
	APPROVED PROJ. MANAGER	
	NAME (PRINT)	INIT. DATE



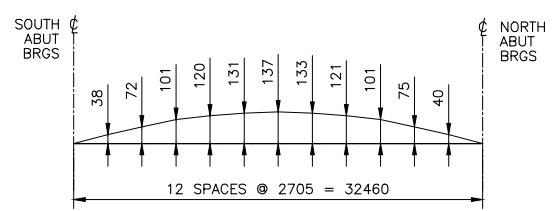
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HWY 427 EXPANSION HWY 427 / ALBION ROAD OVERPASS REHABILITATION AND WIDENING R1 SITE 37-1110 BEARINGS							
PROJECT ID.	STAGE IDENTIFIER	DESIGN PACKAGE NUMBER	DISCIPLINE	STRUCTURE NUMBER	DOCUMENT TYPE	DRAWING NUMBER	REVISION NUMBER
H427-D	N	9	STR	B05	DWG	709	B



NEW BOX GIRDER G1



RELAXED CAMBER DIAGRAM - INTERIOR WEB



RELAXED CAMBER DIAGRAM - EXTERIOR WEB



SELF-WEIGHT DEFLECTION OF GIRDER

EXTERIOR GIRDER G1
NTS

- NOTE:**
- THIS DRAWING TO BE READ IN CONJUNCTION WITH DRAWINGS 700, 703, 711 AND 712.
- STRUCTURAL STEEL NOTES:**
- ALL STRUCTURAL STEEL SHALL CONFORM TO CSA STANDARD CAN/CSA-G40.20-04/G40.21-04 GRADE 350AT. THE CHАРPY IMPACT ENERGY REQUIREMENTS SHALL BE 27 JOULES AND THE TEST TEMPERATURE SHALL BE -20°C. ROLLED SECTIONS SHALL CONFORM TO CSA STANDARD CAN/CSA-G40.20-04/G40.21-04 OR ASTM SPECIFICATION A588.
 - BOLTS ON ATMOSPHERIC CORROSION RESISTANT STEEL SHALL BE ASTM A325 TYPE 3, M22. BOLTS ON COATED STEEL SHALL BE GALVANIZED ASTM A325M TYPE 1, M22. BOLT THREADS SHALL BE EXCLUDED FROM THE SHEAR PLANES.
 - STUD SHEAR CONNECTORS SHALL BE 22mm DIA., AND CONFORM TO ASTM STANDARD A108 AND CSA W59.
 - ALL LENGTHS SHOWN ARE IN THE HORIZONTAL PLANE AND MEASURED AT 20°C.
 - GIRDER SHALL BE CAMBERED TO VALUES SHOWN IN THE RELAXED CAMBER DIAGRAM.
 - RELAXED CAMBER ORDINATES INCLUDE AN ALLOWANCE FOR GIRDER SELF WEIGHT, CONCRETE DECK, SUPERIMPOSED DEAD LOADS AND PROFILE OF HIGHWAY.
 - THE ENDS OF GIRDERS, AND BEARING STIFFENERS SHALL BE TRULY VERTICAL UNDER FULL DEAD LOAD.
 - ALL BUTT WELDS IN FLANGE AND WEB SHOP SPLICES SHALL BE FINISHED FLUSH BY GRINDING WHERE NECESSARY IN THE DIRECTION OF APPLIED STRESSES. IF RELOCATION OR ADDITIONAL SHOP SPLICES ARE REQUIRED, THEIR LOCATION SHALL BE APPROVED BY THE ENGINEER.
 - UNLESS OTHERWISE NOTED THE MINIMUM FILLET WELD SHALL BE AS FOLLOWS:

MATERIAL THICKNESS OF THICKER PART JOINED (mm)	MINIMUM SIZE OF SINGLE PASS FILLET WELD (mm)
TO 12 INCLUSIVE	5
OVER 12 TO 20	6
OVER 20 TO 40	8
OVER 40 TO 60	10

- THE CONTRACTOR SHALL ENSURE THE STABILITY OF ALL COMPONENTS DURING HANDLING, TRANSPORTATION AND ERECTION AND UNTIL STRUCTURAL STEEL IS IN ITS FINAL LOCATION WITH ALL PERMANENT BRACING, CONNECTIONS AND SUPPORTS IN PLACE AND THE CONCRETE IN THE DECK HAS REACHED 75% OF ITS SPECIFIED STRENGTH.
- ALL STRUCTURAL STEEL SURFACES, EXCEPT DIAPHRAGMS, SHALL BE COATED AS FOLLOWS: FROM ENDS OF THE GIRDERS TO 600mm BEYOND THE FRONT FACE OF THE ABUTMENT. THE COLOUR OF THE TOPCOAT SHALL BE 504-217 BROWN (1-GP-12C).
- COATING OF NEW STRUCTURAL STEEL SHALL BE A THREE COAT EPOXY-ZINC, EPOXY, POLYURETHANE SYSTEM IN ACCORDANCE WITH CONTRACT DOCUMENTS.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE DESIGN OF THE GIRDER ERECTION PROCEDURES AND METHODOLOGY, AND SHALL ENSURE THE TOTAL LOADS INCLUDING ANY ADDITIONAL LOADINGS RESULTING FROM THE GIRDER ERECTION OPERATION/METHODOLOGY WILL NOT EXCEED THE CAPACITIES OF THE EXISTING BRIDGE MEMBERS/COMPONENTS AS PER THE CHBDC REQUIREMENTS.

- LIST OF ABBREVIATIONS:**
- SYMM SYMMETRICAL
WP WORKING POINT

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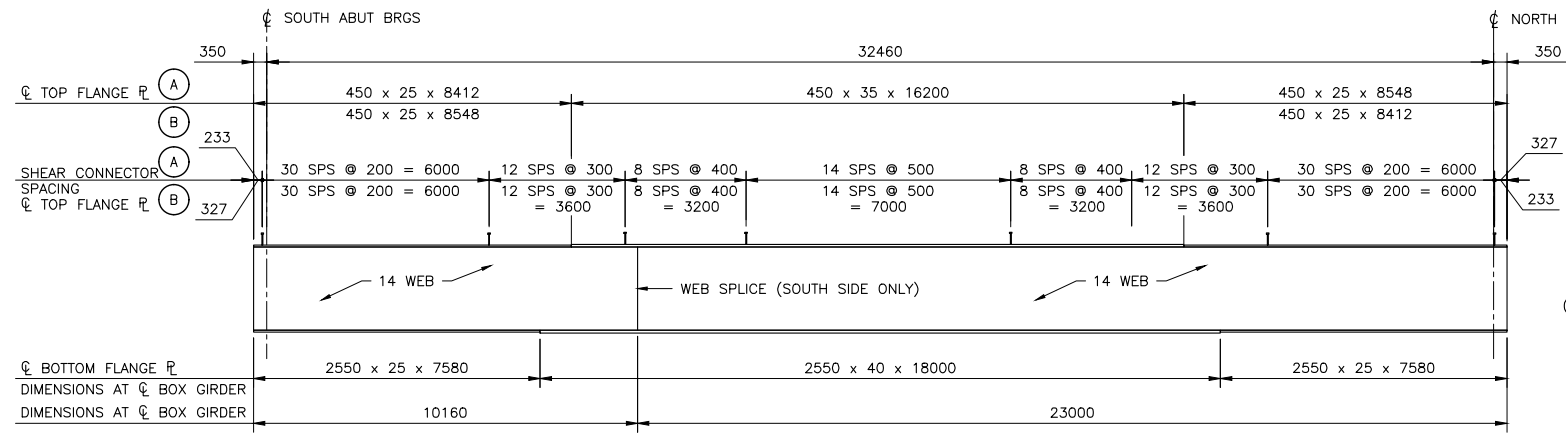
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A 18/01/12	90% SUBMISSION TO CA				

SCALE :
AS NOTED

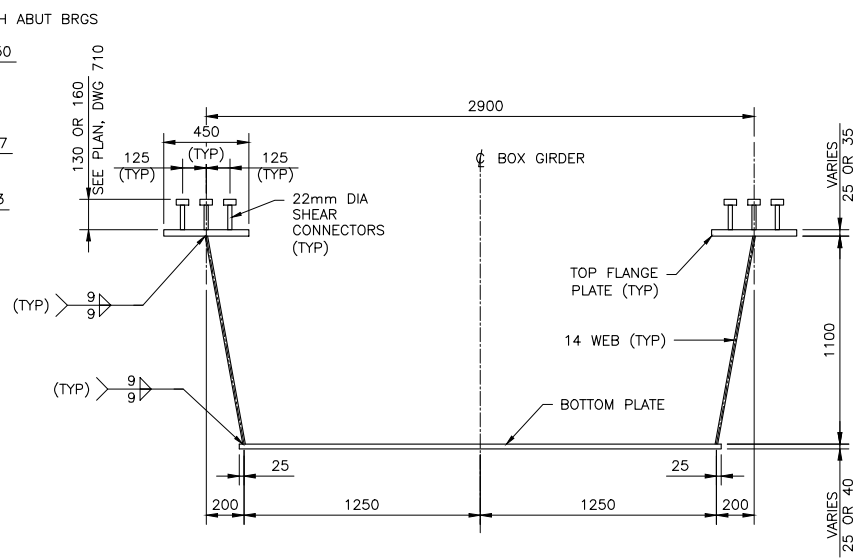
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DRAWN	SOPHIA MILLS	
CHECKED	SUBOOHI OBAID	
APPROVED LEAD ENG.	TATIANA OJALA	
APPROVED PROJ. MANAGER		
NAME (PRINT)	INT.	DATE



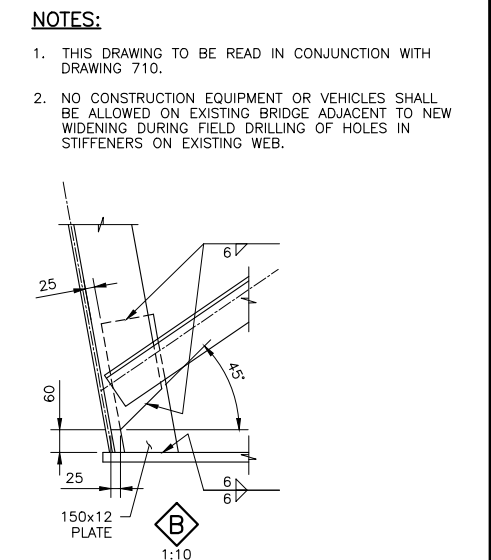
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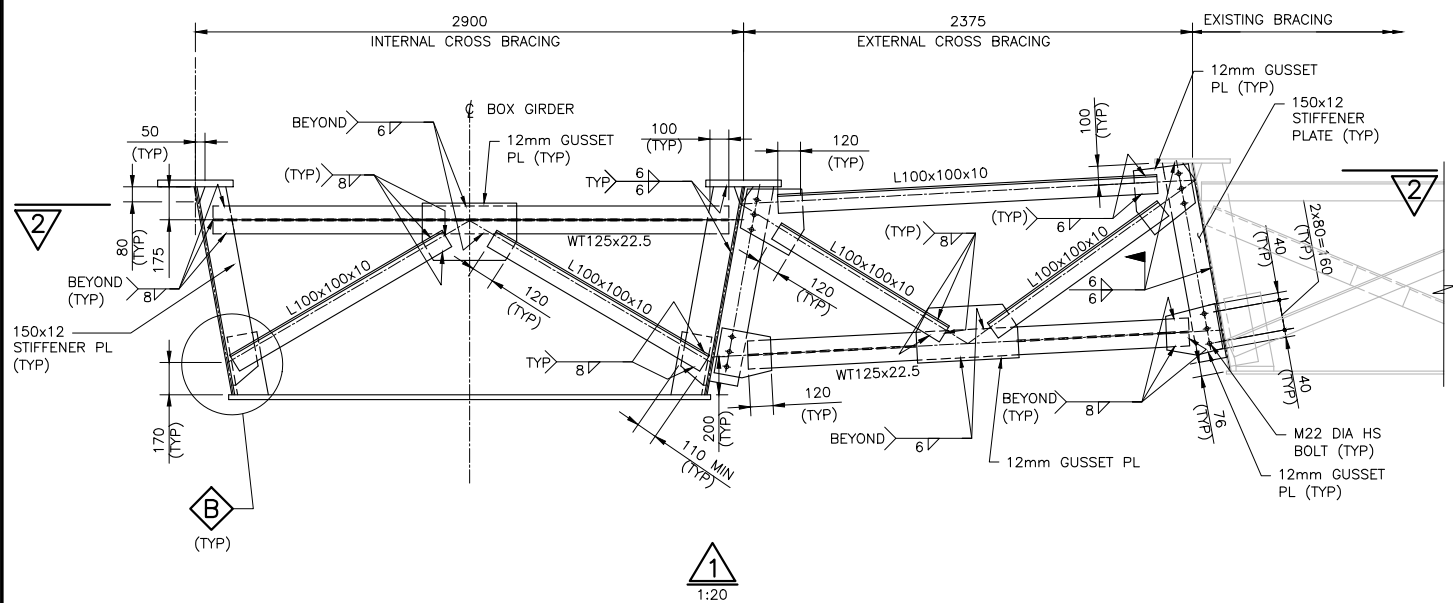
NOTE: WEB VERTICAL STIFFENERS, NOT SHOWN FOR CLARITY.
BOX GIRDER G1 ELEVATION
 HORIZ 1:100
 VERT 1:50



TYPICAL G1 BOX GIRDER SECTION
 1:20



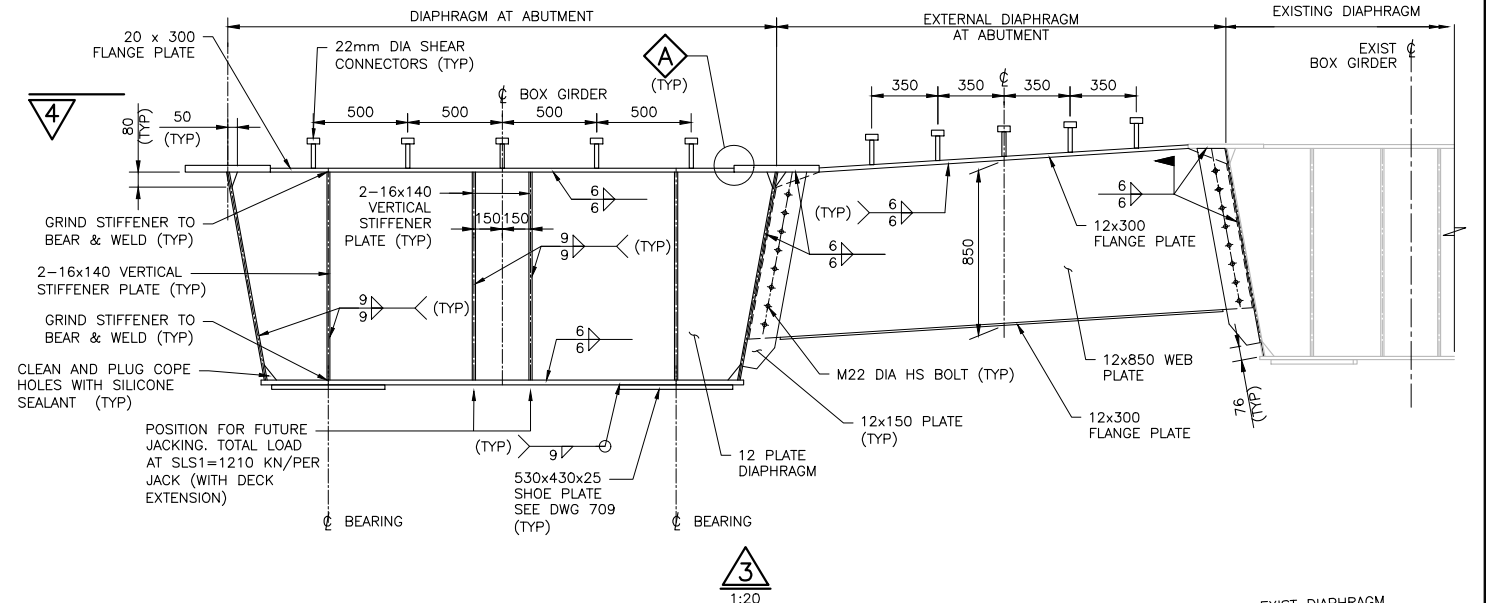
TRANSVERSE STIFFENER DETAIL
 1:10



1
1:20

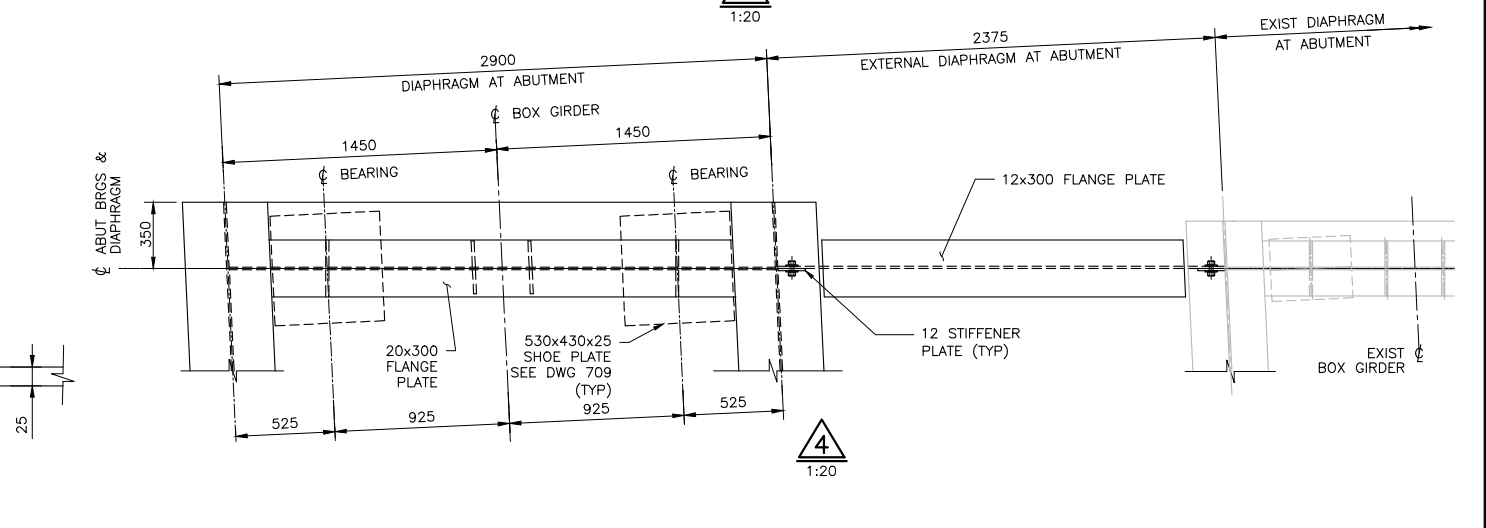
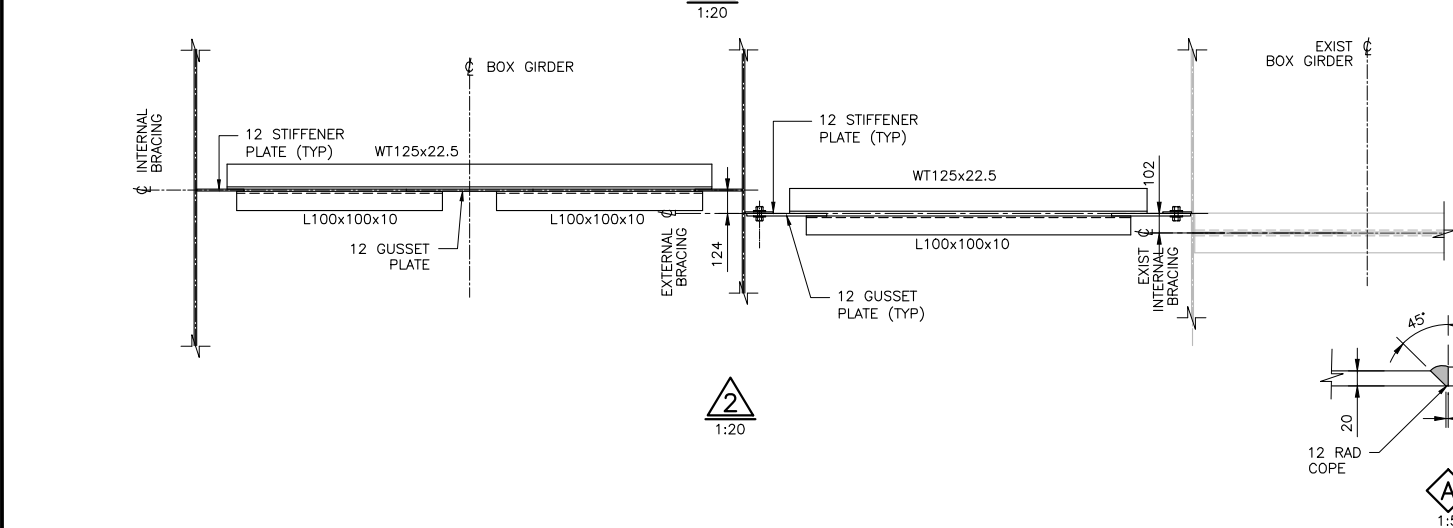
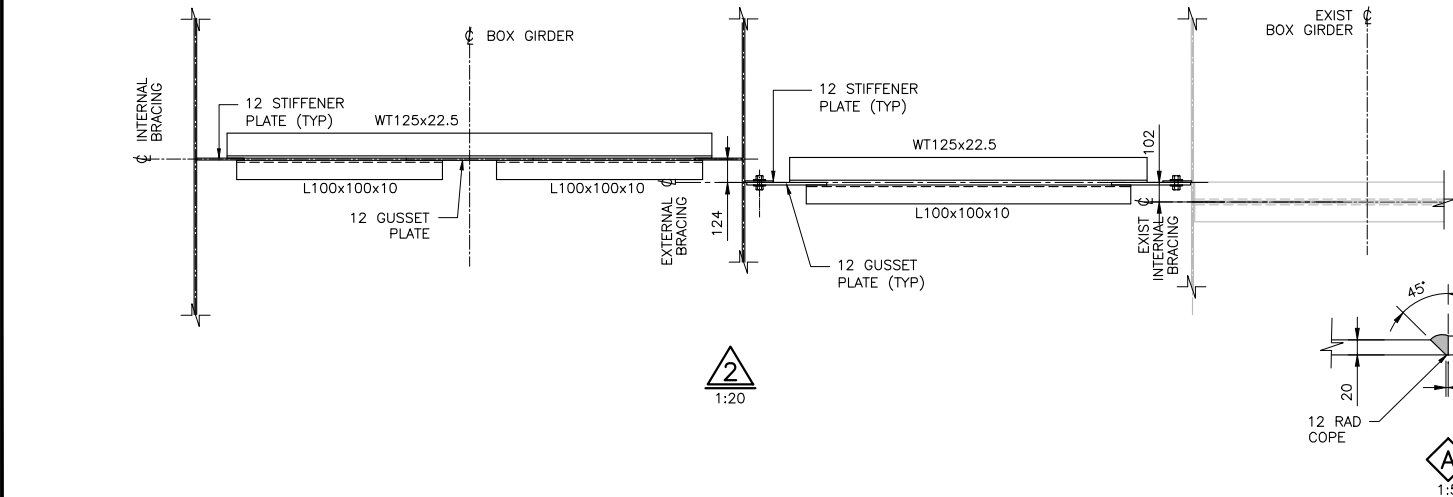
2
1:20

A
1:5



3
1:20

4
1:20



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A 18/01/12	90% SUBMISSION TO CA				

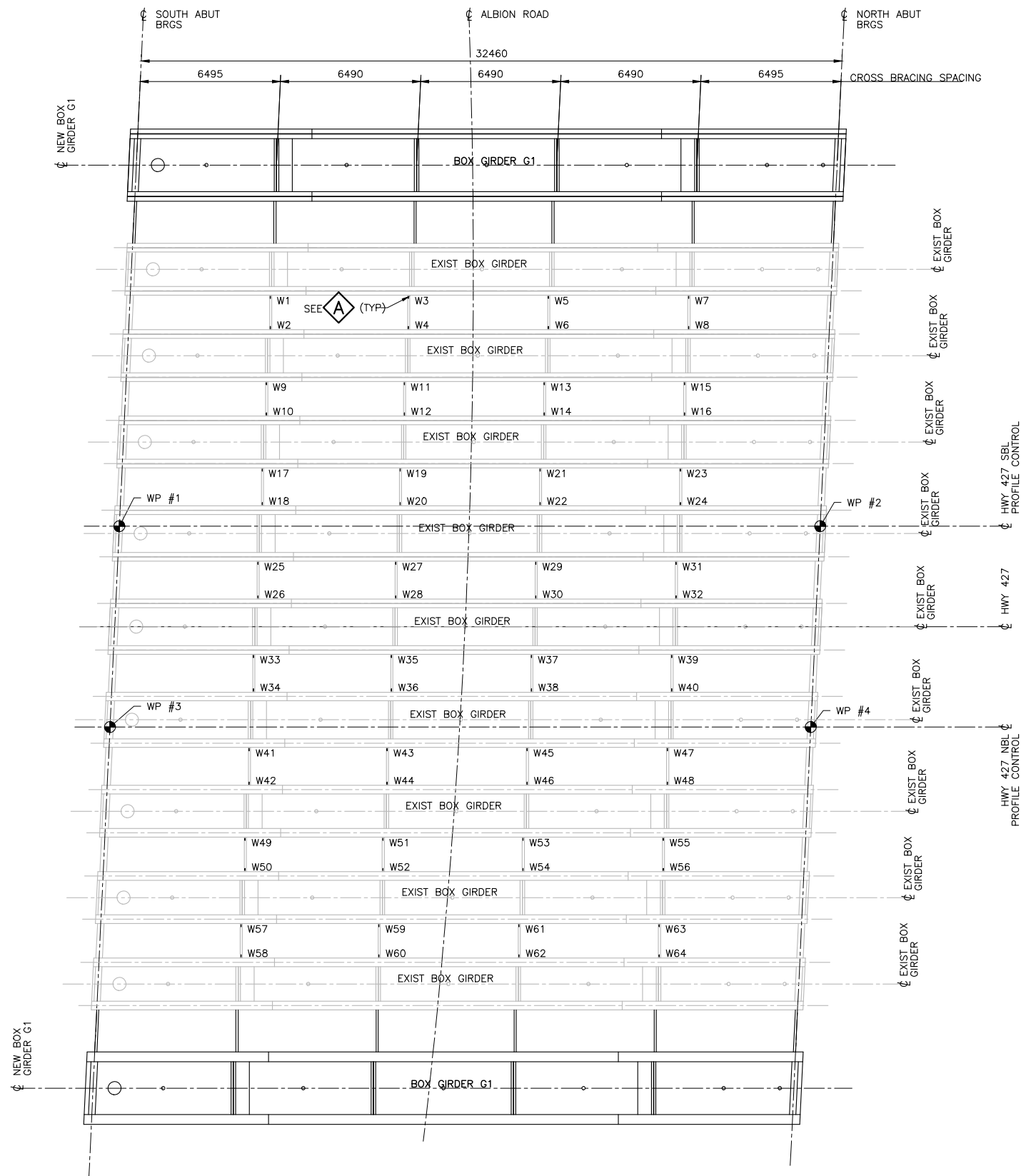
SCALE :
 AS NOTED

DESIGNED	NIMA MAHMOUDI
DRAWN	SOPHIA MILLS
CHECKED	SUBOOHI OBAID
APPROVED LEAD ENG.	TATIANA QJALA
APPROVED PROJ. MANAGER	

CONSULTANT	
NAME (PRINT)	INT. DATE



HWY 427 EXPANSION HWY 427 / ALBION ROAD OVERPASS REHABILITATION AND WIDENING R1 SITE 37-1110 STRUCTURAL STEEL II							
PROJECT ID.	STAGE IDENTIFIER	DESIGN PACKAGE NUMBER	DISCIPLINE	STRUCTURE NUMBER	DOCUMENT TYPE	DRAWING NUMBER	REVISION NUMBER
H427-D	N	9	STR	B05	DWG	711	B



GIRDER LAYOUT
1:125

NOTE:

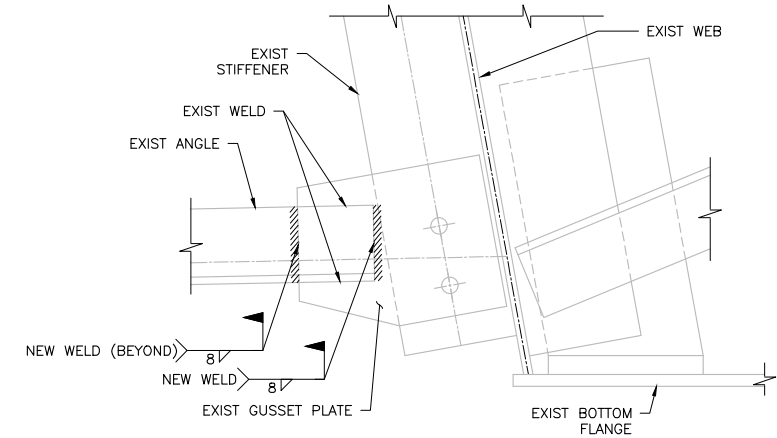
- W1 TO W64 REPRESENT BOTTOM CHORD TO GUSSET PLATE WELD LOCATIONS.

NOTE:

- THIS DRAWING TO BE READ IN CONJUNCTION WITH DRAWINGS 703 AND 710.

CONSTRUCTION NOTE:

- RETROFIT BOTTOM CHORD CONNECTION AT EXTERNAL CROSS BRACINGS (64 CONNECTIONS TOTAL).



EXISTING BOTTOM CHORD CONNECTION RETROFIT DETAIL AT EXTERNAL CROSS BRACING
1:5

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A 18/01/12	90% SUBMISSION TO CA				

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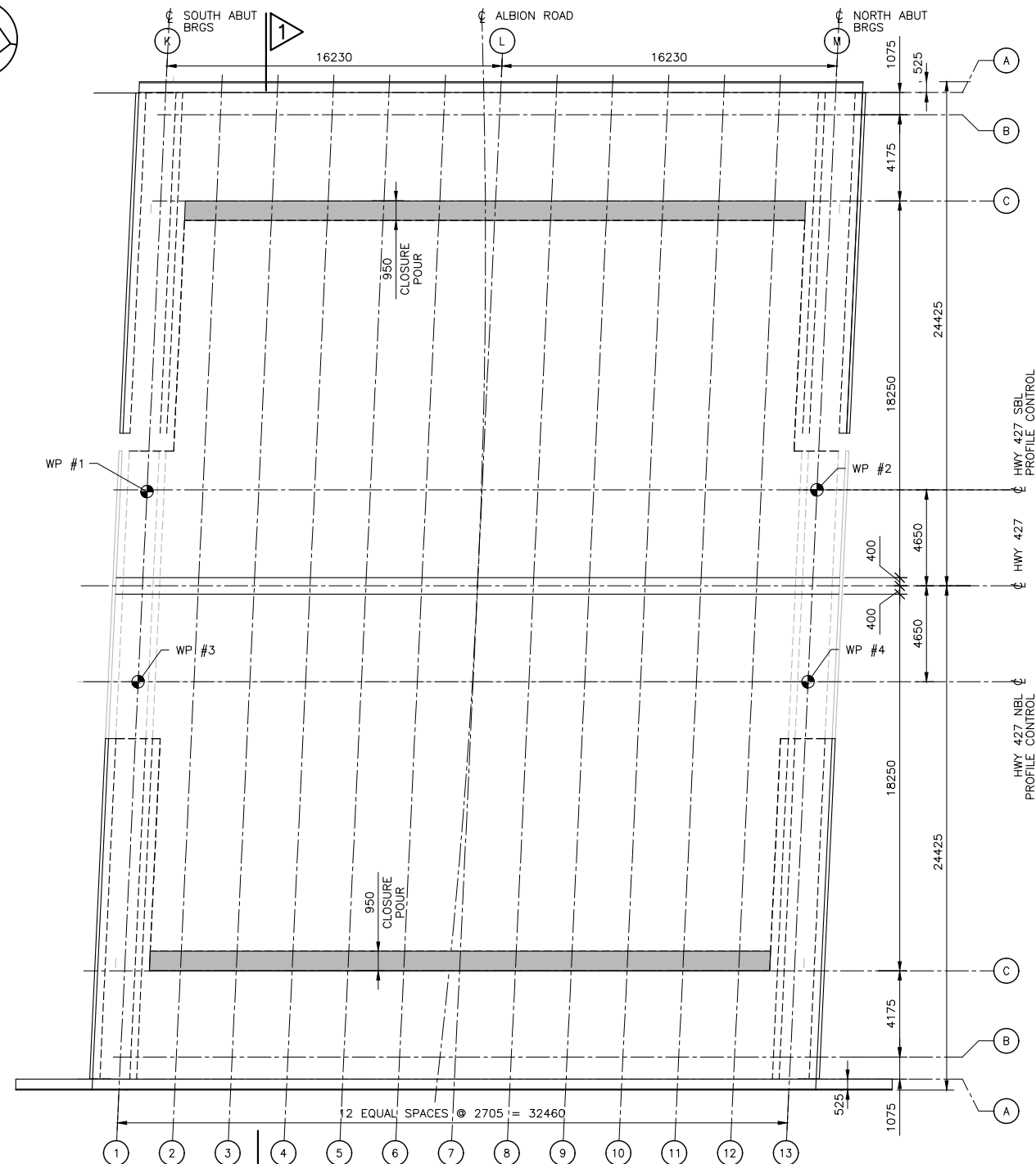
AS NOTED

DESIGNED	NIMA MAHMOUDI
DRAWN	SOPHIA MILLS
CHECKED	SUBOOHI OBAID
APPROVED LEAD ENG.	TATIANA OJALA
APPROVED PROJ. MANAGER	

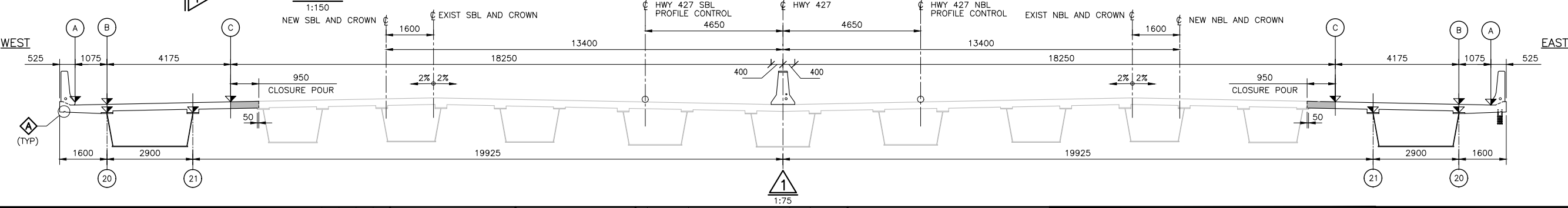
CONSULTANT	
NAME (PRINT)	
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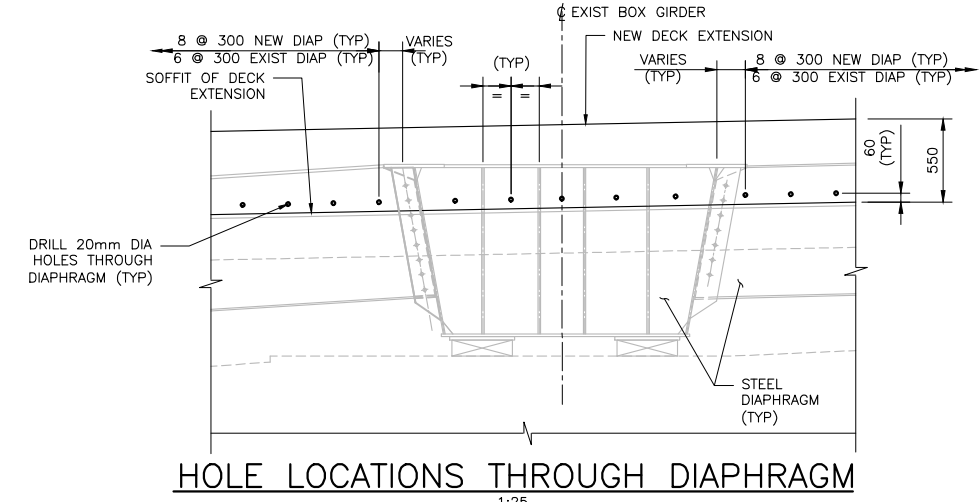
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PLAN
1:150

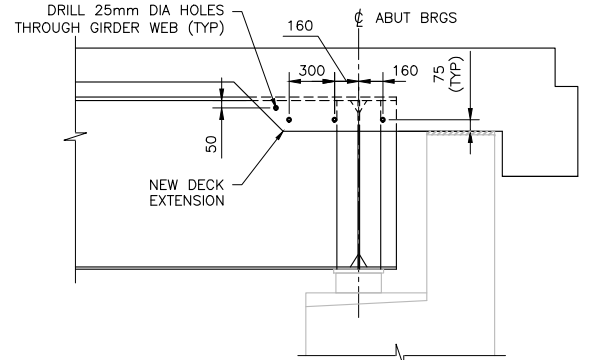


1:75



HOLE LOCATIONS THROUGH DIAPHRAGM
1:25

(DRILL HOLES THROUGH THE EXISTING DIAPHRAGMS AND PREPARE HOLES IN SHOP FOR NEW DIAPHRAGMS TO FACILITATE THE CONSTRUCTION OF NEW DECK EXTENSION. HOLE LOCATIONS AS SHOWN (ALONG THE ENTIRE LENGTH OF STEEL DIAPHRAGM AT SOUTH & NORTH ABUTS TYP)



HOLE LOCATIONS THROUGH GIRDER WEB
1:25

(DRILL HOLES IN FIELD FOR EXISTING GIRDERS, PREPARE HOLES IN SHOP FOR NEW GIRDERS, AS SHOWN)

SCREED ELEVATIONS - SOUTHBOUND LANE

GRID	①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪	⑫	⑬
(A)	180.230	180.253	180.272	180.285	180.290	180.290	180.283	180.269	180.247	180.218	180.183	180.141	180.093
(B)	180.252	180.272	180.288	180.299	180.303	180.302	180.294	180.280	180.259	180.232	180.199	180.159	180.115
(C)	180.336	180.346	180.352	180.353	180.352	180.346	180.338	180.324	180.306	180.285	180.259	180.230	180.199

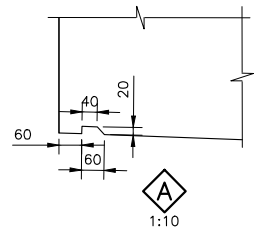
SCREED ELEVATIONS - NORTHBOUND LANE

GRID	①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪	⑫	⑬
(A)	180.258	180.279	180.295	180.307	180.310	180.307	180.297	180.280	180.256	180.224	180.187	180.143	180.092
(B)	180.279	180.297	180.311	180.320	180.322	180.318	180.308	180.291	180.267	180.238	180.202	180.160	180.113
(C)	180.362	180.370	180.373	180.372	180.369	180.361	180.349	180.333	180.313	180.289	180.260	180.229	180.196

NOTE:
1. THIS DRAWING TO BE READ IN CONJUNCTION WITH DRAWINGS 700 AND 703.

LIST OF ABBREVIATION:
DIAP DIAPHRAGM
WP WORKING POINT

APPLICABLE STANDARD DRAWINGS:
OPSD 3310.100 DECK, GIRDERS, CONCRETE, METHOD OF OBTAINING SCREED ELEVATIONS
OPSD 3370.100 DECK, WATERPROOFING HOT APPLIED ASPHALT MEMBRANE WITH PROTECTION BOARD
OPSD 3370.101 DECK, WATERPROOFING HOT APPLIED ASPHALT MEMBRANE AT ACTIVE CRACKS GREATER THAN 2mm WIDE AND CONSTRUCTION JOINTS
OPSD 3390.100 DECK, DRIP CHANNEL
OPSD 3950.100 JOINTS, CONCRETE EXPANSION AND CONSTRUCTION ON STRUCTURE



ELEVATIONS ON TOP OF STEEL GIRDER - SOUTHBOUND LANE

GRID	②0	②1
(K)	180.007	180.008
(L)	180.049	180.021
(M)	179.870	179.870

ELEVATIONS ON TOP OF STEEL GIRDER - NORTHBOUND LANE

GRID	②0	②1
(K)	180.034	180.034
(L)	180.063	180.033
(M)	179.868	179.867

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DATE PLOTTED: 3/19/2018 4:07:48 PM BY: PANGF

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A 18/01/12	90% SUBMISSION TO CA				

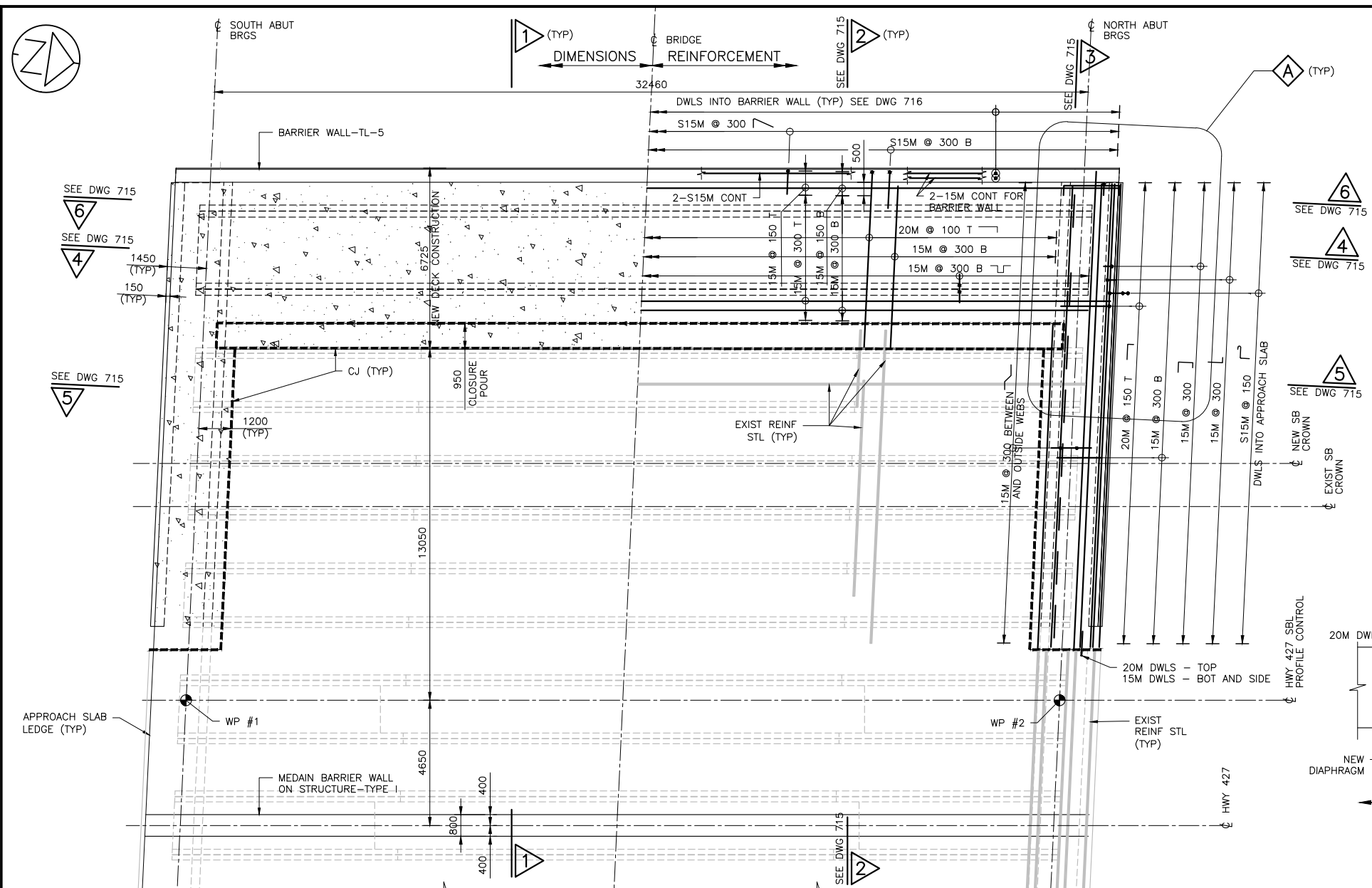
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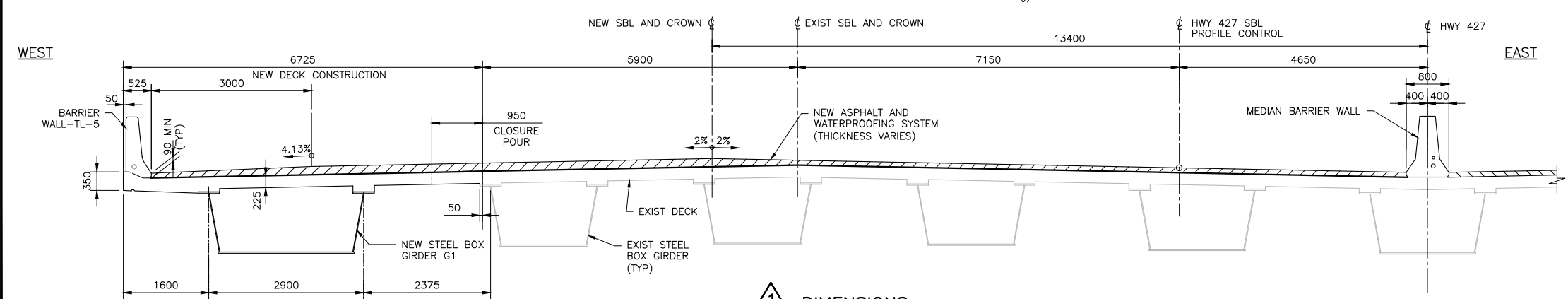
DESIGNED	NIMA MAHMOUDI	
DRAWN	SOPHIA MILLS	
CHECKED	SUBOOHI OBAID	
APPROVED LEAD ENG.	TATIANA OJALA	
APPROVED PROJ. MANAGER	PETER BAMFORTH	
NAME (PRINT)	INT.	DATE



PROJECT ID.	STAGE IDENTIFIER	DESIGN PACKAGE NUMBER	DISCIPLINE	STRUCTURE NUMBER	DOCUMENT TYPE	DRAWING NUMBER	REVISION NUMBER
H427-D	N	9	STR	B05	DWG	713	B



PLAN
1:100
SOUTHBOUND LANE SHOWN,
NORTHBOUND LANE SIMILAR

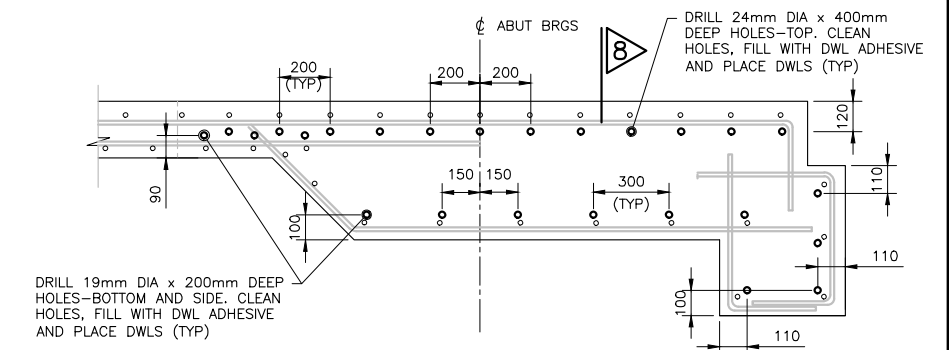


1 DIMENSIONS
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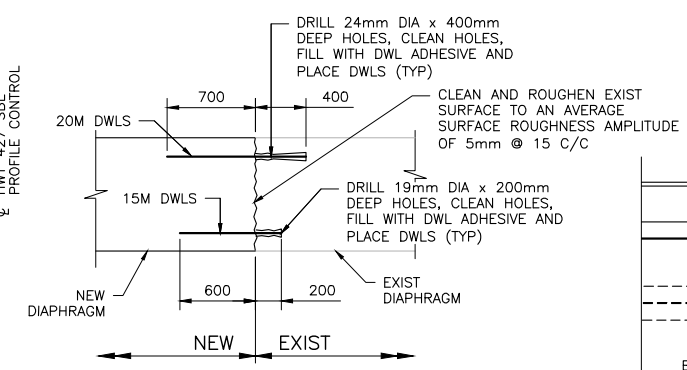
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NOTES:
1. THIS DRAWING TO BE READ IN CONJUNCTION WITH DRAWINGS 700, 703 AND 713.
2. MECHANICAL CONNECTORS SIZE AND TYPE TO MATCH REINFORCING STEEL TO BE SPliced.

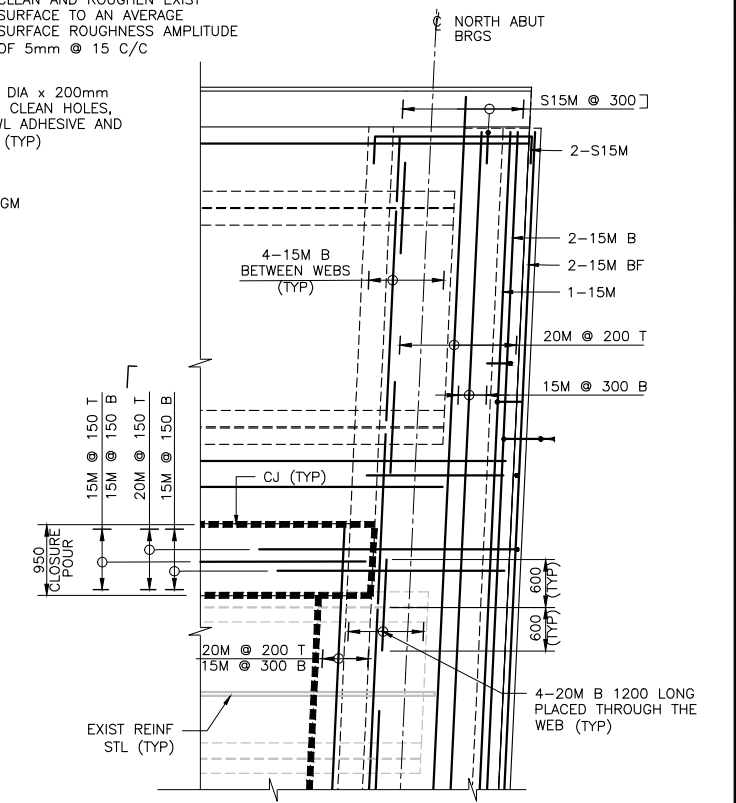
APPLICABLE STANDARD DRAWINGS:
OPSD 3329.100 DECK, REINFORCEMENT - SUPPORTS FOR REINFORCING STEEL FOR SLAB DEPTHS 300mm OR LESS
OPSD 3329.101 DECK, REINFORCEMENT - SUPPORTS FOR REINFORCING STEEL FOR SLAB DEPTHS GREATER THAN 300mm



TYPICAL DIAPHRAGM CONNECTION DETAILS
NTS



8
NTS



CLOSURE STRIP TYPICAL DETAIL
1:50

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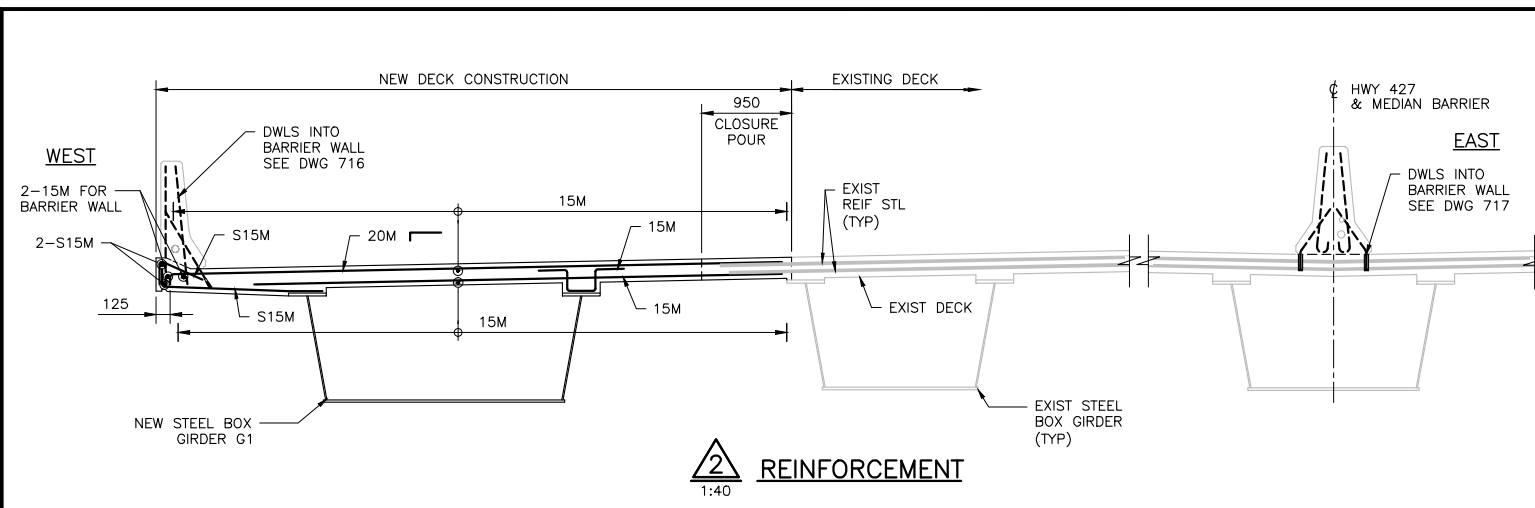
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B 18/03/16	90% SUBMISSION TO CA				
A 18/01/12	90% SUBMISSION TO CA				

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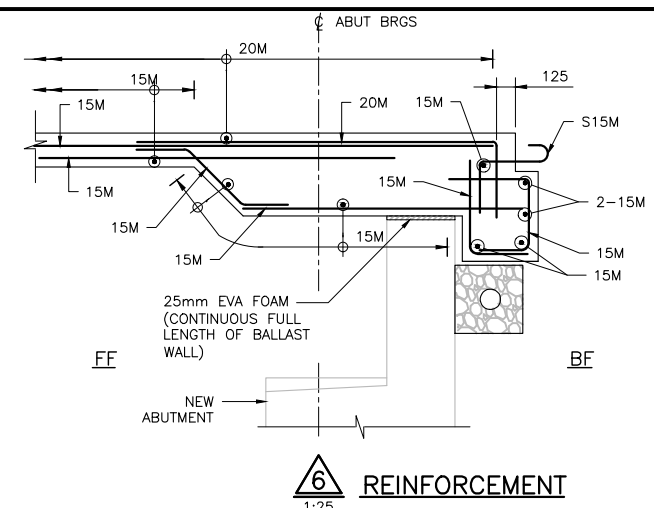
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DRAWN	SOPHIA MILLS	
CHECKED	SUBOOHI OBAID	
APPROVED LEAD ENG.	TATIANA OJALA	
APPROVED PROJ. MANAGER		
NAME (PRINT)	INT.	DATE



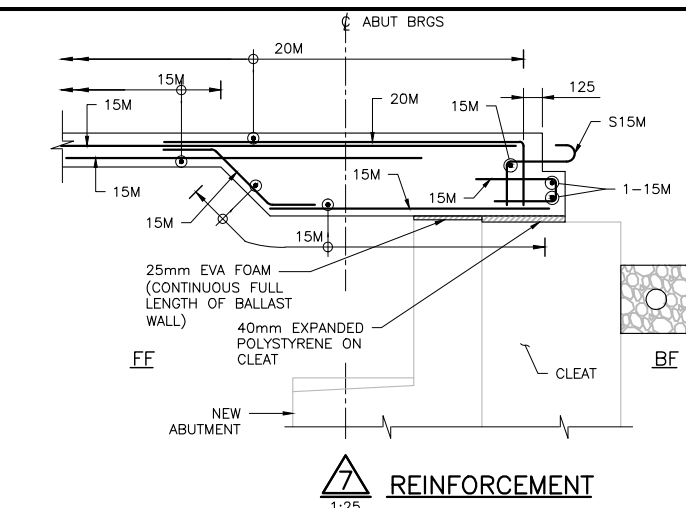
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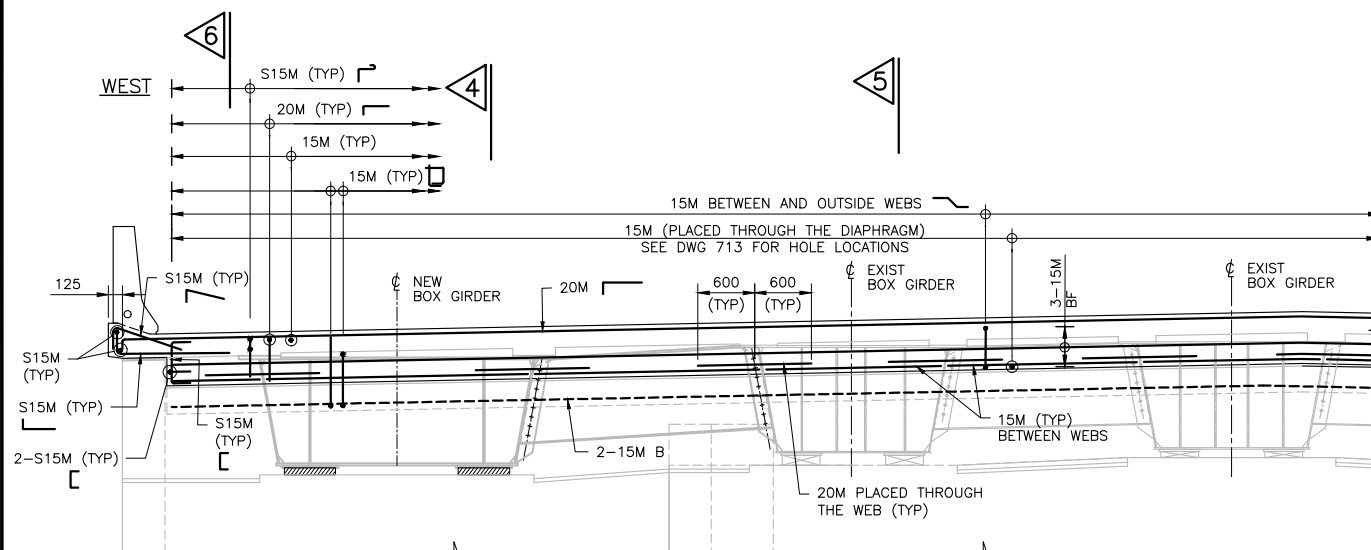
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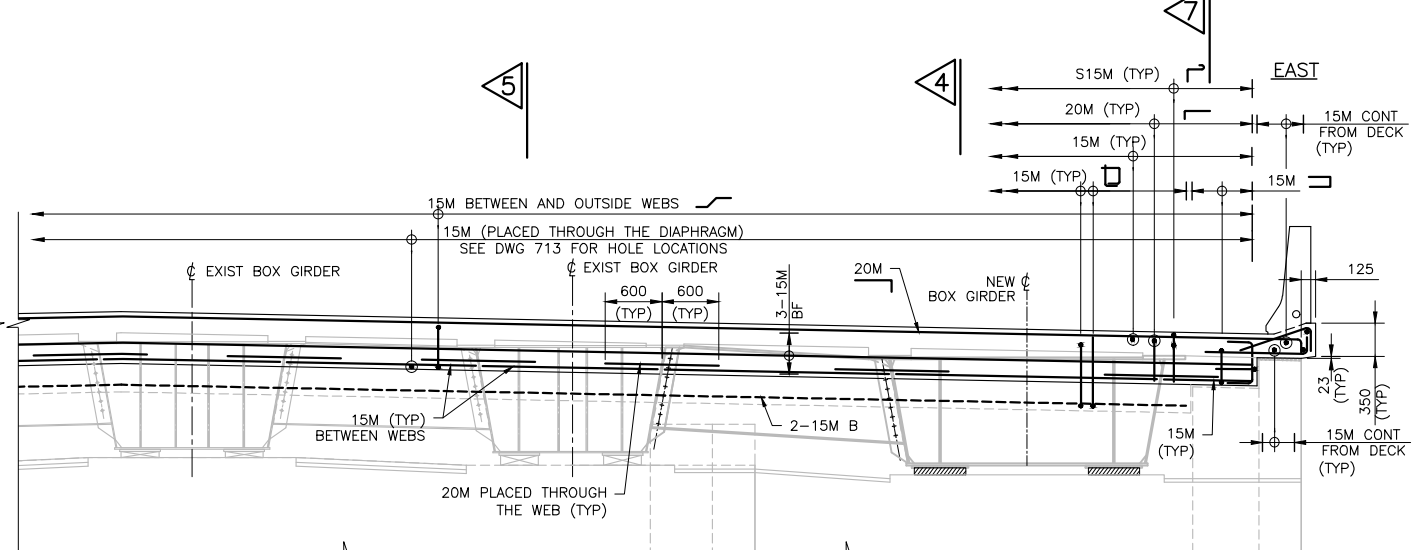
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7 REINFORCEMENT
1:25

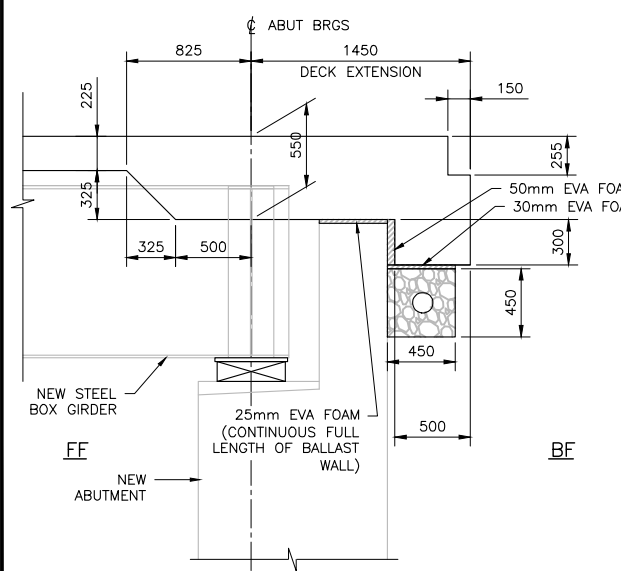


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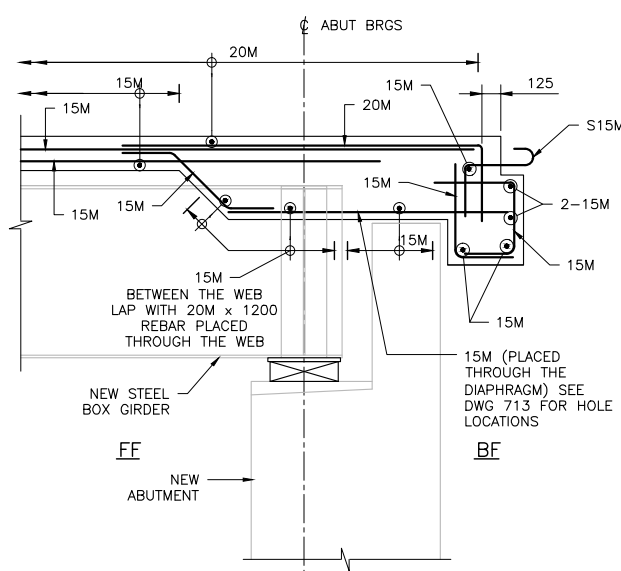


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1. THIS DRAWING TO BE READ IN CONJUNCTION WITH DRAWING 713 AND 714.

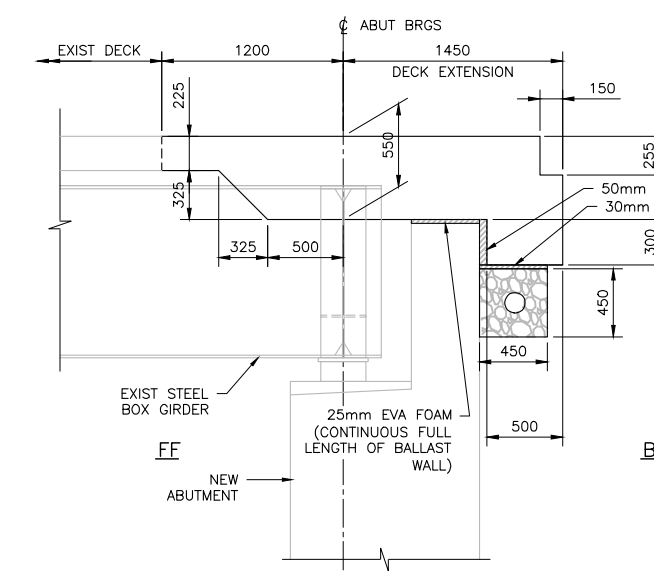
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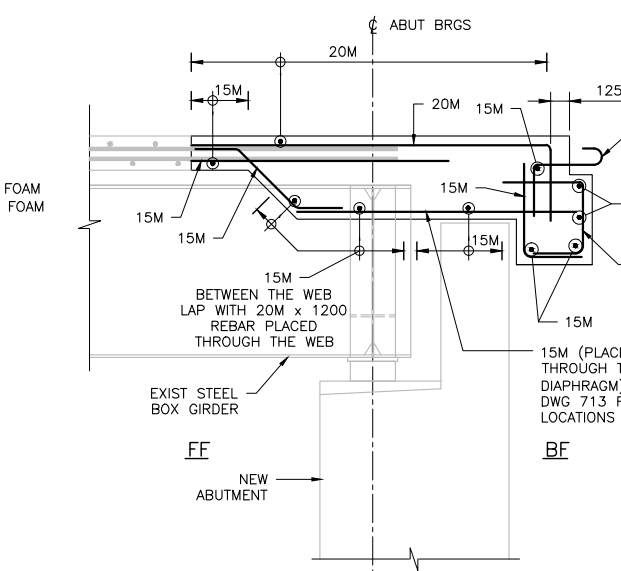
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1:25



4 REINFORCEMENT
1:25



5 DIMENSIONS
1:25



5 REINFORCEMENT
1:25

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 DATE PLOTTED: 3/19/2018 4:08:00 PM BY: PANGF

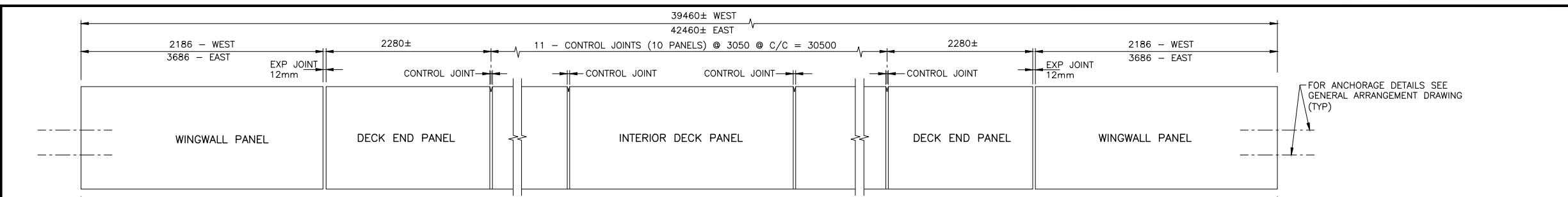
DATE	REVISIONS	BY	CHK	LEAD	PROJ. MAN.
B 18/03/16	90% SUBMISSION TO CA				
A 18/01/12	90% SUBMISSION TO CA				

SCALE :
AS NOTED

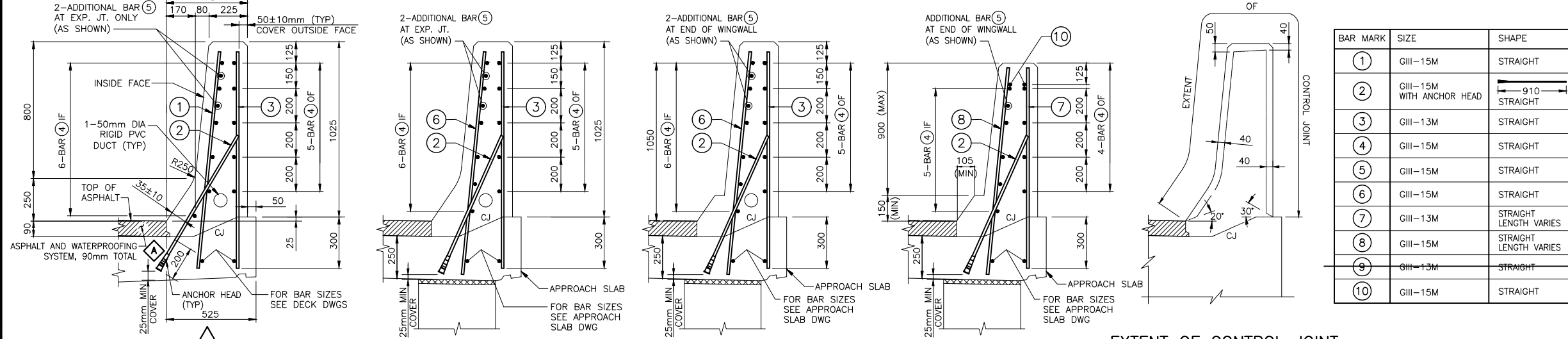
DESIGNED	NIMA MAHMOUDI
DRAWN	SOPHIA MILLS
CHECKED	SUBOOHI OBAID
APPROVED LEAD ENG.	TATIANA OJALA
APPROVED PROJ. MANAGER	



TITLE HWY 427 EXPANSION HWY 427 / ALBION ROAD OVERPASS REHABILITATION AND WIDENING R1 DECK DETAILS III						
PROJECT ID.	STAGE IDENTIFIER	DESIGN PACKAGE NUMBER	DISCIPLINE	STRUCTURE NUMBER	DOCUMENT TYPE	DRAWING NUMBER
H427-D	N	9	STR	B05	DWG	715
						REVISION NUMBER
						B



ELEVATION

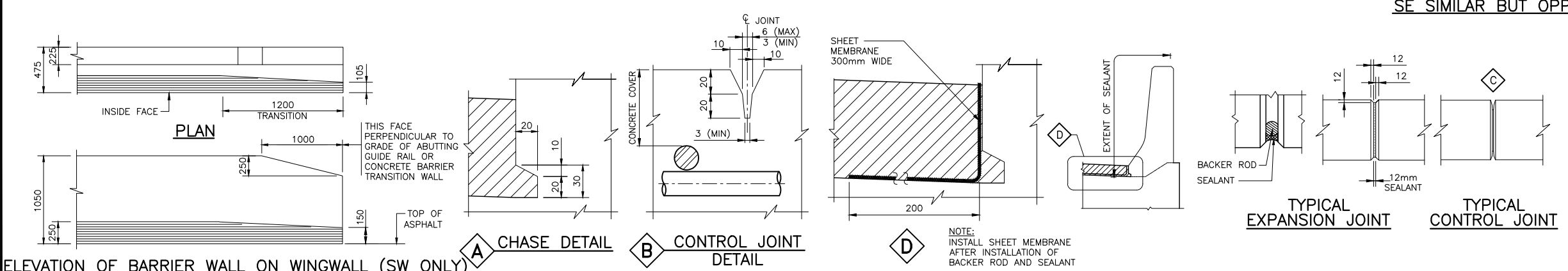
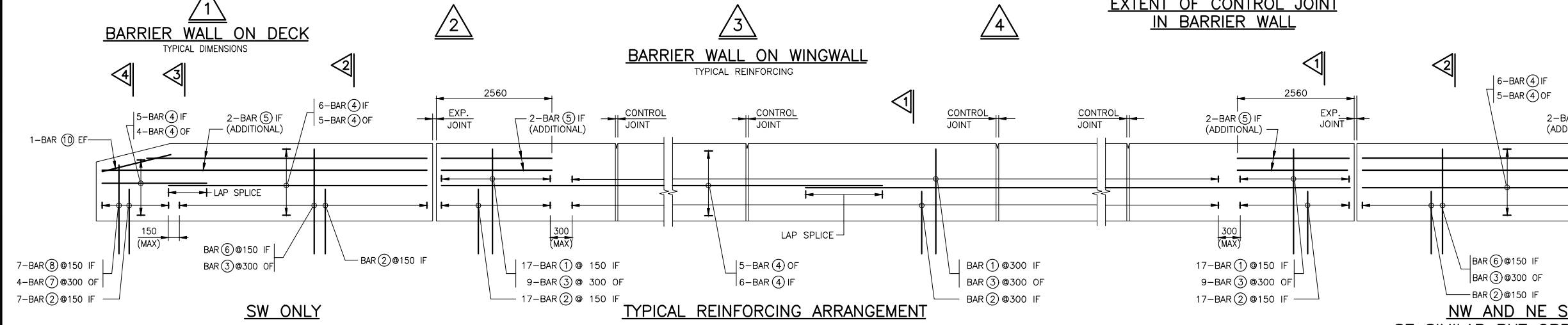
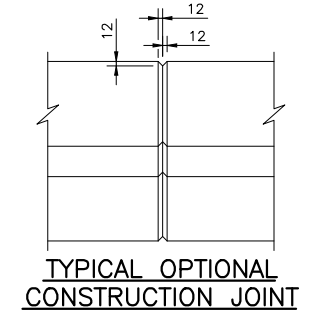


BAR MARK	SIZE	SHAPE
①	GIII-15M	STRAIGHT
②	GIII-15M WITH ANCHOR HEAD	STRAIGHT
③	GIII-13M	STRAIGHT
④	GIII-15M	STRAIGHT
⑤	GIII-15M	STRAIGHT
⑥	GIII-15M	STRAIGHT
⑦	GIII-13M	STRAIGHT LENGTH VARIES
⑧	GIII-15M	STRAIGHT LENGTH VARIES
⑨	GIII-13M	STRAIGHT
⑩	GIII-15M	STRAIGHT

- NOTES:**
1. SYSTEM CONFIGURATION MEETS THE REQUIREMENTS OF NCHRP 350.
 2. CONCRETE COVER TO REINFORCING BAR 60±10mm EXCEPT AS NOTED.
 3. REINFORCING SHALL BE GRADE III (GIII) GLASS FIBRE REINFORCED POLYMER (GFRP) SUPPLIED AS COMBAR BY SCHÖCK OR AS V-ROD HEADED BAR BY PULTRALL.
 4. SIZE IN THE BAR SCHEDULE INDICATES DESIGNATED BAR DIAMETER AND SHALL HAVE A NOMINAL CROSS SECTIONAL AREA ACCORDING TO CAN/CSA S-807.
 5. ANCHOR HEAD OF GFRP REBAR SHALL HAVE A MINIMUM GUARANTEED PULL OUT STRENGTH (Fp) AS FOLLOWS:

SIZE	Fp (kN)
GIII-15M WITH HEAD	100

6. BAR LAP SPLICE FOR HORIZONTAL REINFORCEMENT MUST NOT LAP THROUGH CONTROL JOINT.
7. MINIMUM BAR LAP SPLICE TO BE 640mm, UNLESS OTHERWISE SHOWN.
8. LENGTH OF HORIZONTAL BAR TO SUIT CONTRACTOR'S OPERATIONS. BAR LENGTHS NEED NOT MATCH DISTANCE BETWEEN CONTROL JOINTS.
9. CONTROL JOINT TO BE FORMED.
10. SAWCUTS NOT PERMITTED.
11. CONTROL JOINT FORM HARDWARE NOT TO BE LEFT IN PLACE.
12. OPTIONAL CONSTRUCTION JOINTS TO BE LOCATED WITHIN LIMITS OF CONCRETE DAMS ON DECK OR BALLAST WALL.
13. CHASE REQUIRED ON HIGH AND LOW SIDE OF CROSSFALL.
14. LEGEND: EF - DENOTES EACH FACE
IF - DENOTES INSIDE FACE
OF - DENOTES OUTSIDE FACE
CJ - CONSTRUCTION JOINT



MODIFIED	
STANDARD DRAWING SEPTEMBER 2016	SS110-92
BARRIER WALL WITHOUT RAILING, TL-5 (GFRP REBAR WITH ANCHOR HEAD)	

ELEVATION OF BARRIER WALL ON WINGWALL (SW ONLY)

DATE	REVISIONS	BY	CHK	LEAD DISC.	PROJ. MAN.
B 18/03/16	90% SUBMISSION TO CA				
A 18/01/12	90% SUBMISSION TO CA				

SCALE : AS NOTED

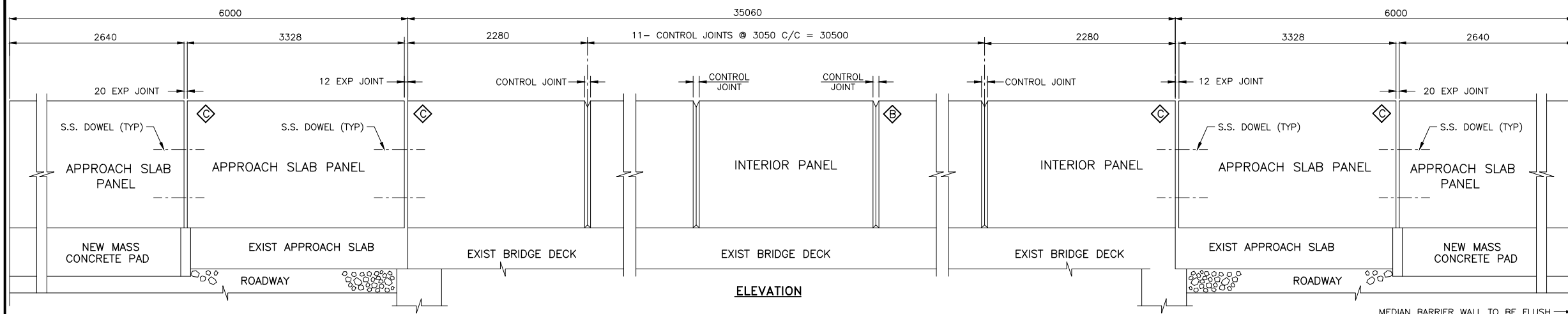
DESIGNED	NMA MAHMOUDI	
DRAWN	SOPHA MILLS	
CHECKED	SUBOOH OBAID	
APPROVED LEAD ENG.	TATIANA GJALA	
APPROVED PROJ. MANAGER		
NAME (PRINT)	INT.	DATE

DRAWING NOT TO BE SCALED
100 mm ON ORIGINAL DRAWING

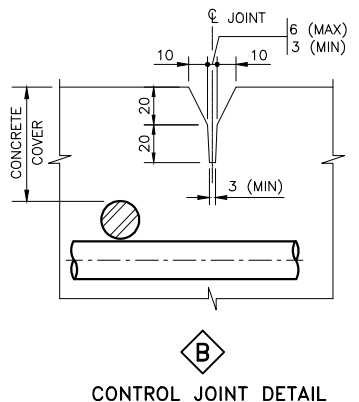
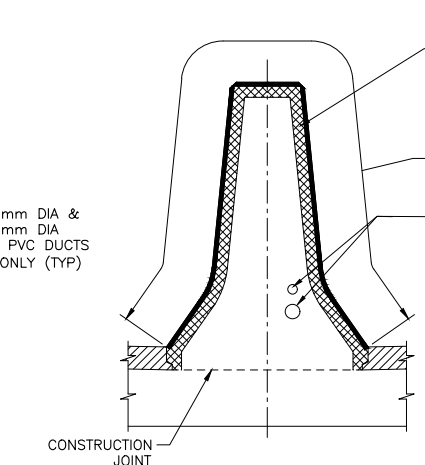
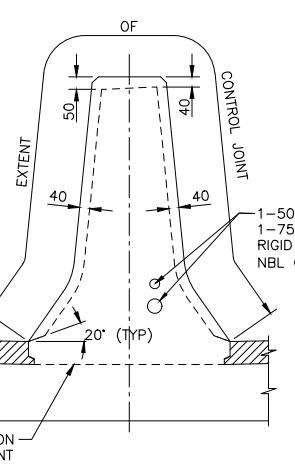
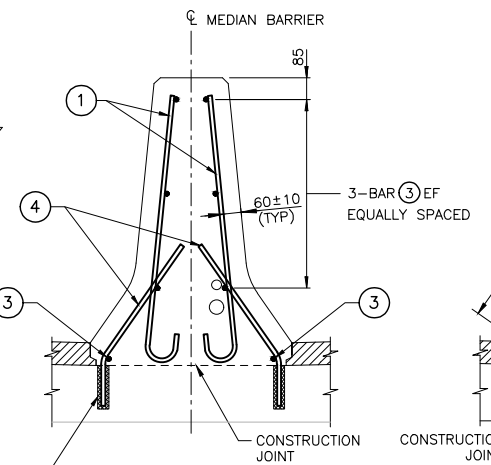
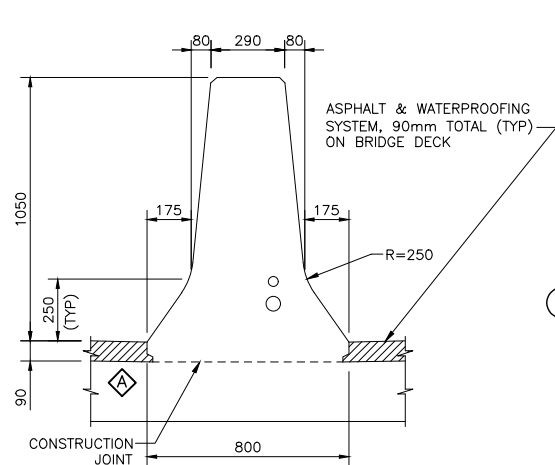
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H427-D	N	9	STR	B05	DWG	716	B

**HWY 427 EXPANSION
HWY 427 / ALBION ROAD OVERPASS
REHABILITATION AND WIDENING R1
SITE 37-1110
EXTERIOR BARRIER WALL**

CAD FILE LOCATION AND NAME: C:\projectwise\wsp-ca\wsp-ca\projectwise\wsp-ca\H427-D-F-9-STR-B05-DWG-716BW.dwg
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 DATE PLOTTED: 3/19/2018 4:08:03 PM BY: PANGF

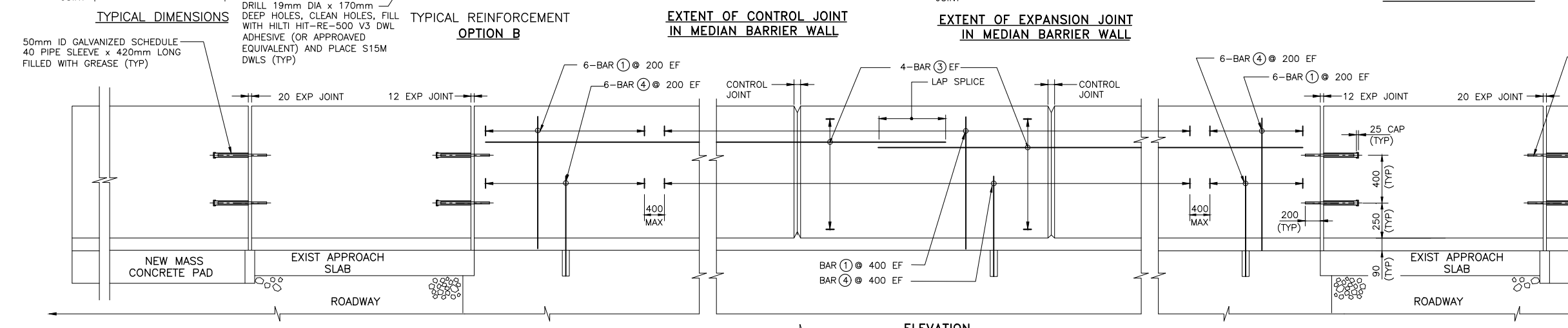


- NOTES:**
- SLIPFORMING OF MEDIAN BARRIER WALL IN STRUCTURE IS NOT PERMITTED.
 - MEDIAN BARRIER PANEL LENGTHS SHALL NOT EXCEED 6000mm.
 - CONCRETE COVER TO REINFORCING STEEL 60±10mm EXCEPT AS NOTED.
 - CONTROL JOINTS TO BE FORMED.
 - SAWCUTS NOT PERMITTED.
 - CONTROL JOINT FORM HARDWARE NOT TO BE LEFT IN PLACE.
 - REINFORCING STEEL SHALL BE STAINLESS TYPE 316LN OR DUPLEX 2205 WITH A MINIMUM YIELD STRENGTH OF 500MPa.
 - BAR MARKS WITH PREFIX 'S' DENOTE STAINLESS STEEL BARS.
 - BAR LAP SPLICE FOR HORIZONTAL REINFORCEMENT MUST NOT LAP THROUGH CONTROL JOINT.
 - MINIMUM BAR LAP SPLICE TO BE 700mm.
 - LENGTH OF HORIZONTAL BAR TO SUIT CONTRACTOR'S OPERATIONS.
 - LEGEND: EF - DENOTES EACH FACE



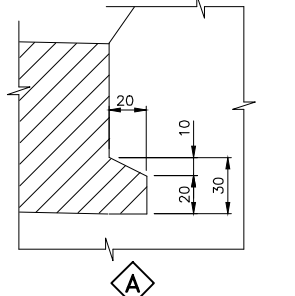
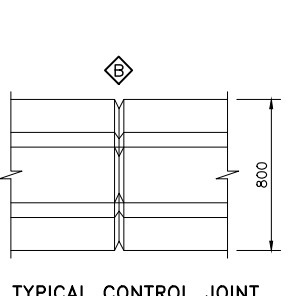
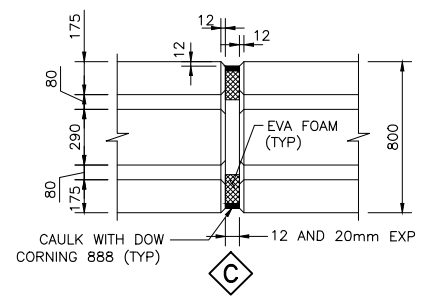
BAR MARK	SIZE	SHAPE
①	S15M	
②	S15M	
③	S15M	STRAIGHT
④	S15M	

APPLICABLE STANDARD DRAWINGS
 OPSD 3370.100 DECK, WATERPROOFING HOT APPLIED ASPHALT MEMBRANE WITH PROTECTION BOARD



50mm ID GALVANIZED SCHEDULE 40 PIPE SLEEVE x 420mm LONG FILLED WITH GREASE (TYP)

DRILL 19mm DIA x 170mm DEEP HOLES, CLEAN HOLES, FILL WITH HILTI HIT-RE-500 V3 DWL ADHESIVE (OR APPROVED EQUIVALENT) AND PLACE S15M DWLS (TYP)



DRAWING NOT TO BE SCALED
 100 mm ON ORIGINAL DRAWING

MODIFIED	
STANDARD DRAWING SEPTEMBER 2016	SS110-62
REINFORCED CONCRETE MEDIAN BARRIER WALL ON STRUCTURES - TYPE I	

CAD FILE LOCATION AND NAME: C:\projects\wise\wsp-ca\wsp-ca\project\wise\wsp-ca\wsp-ca\H427-D-F-9-STR-B05-DWG-717BW.dwg
 MODIFIED: 3/19/2018 3:34:26 PM BY: PANG
 DATE PLOTTED: 3/19/2018 4:08:06 PM BY: PANG

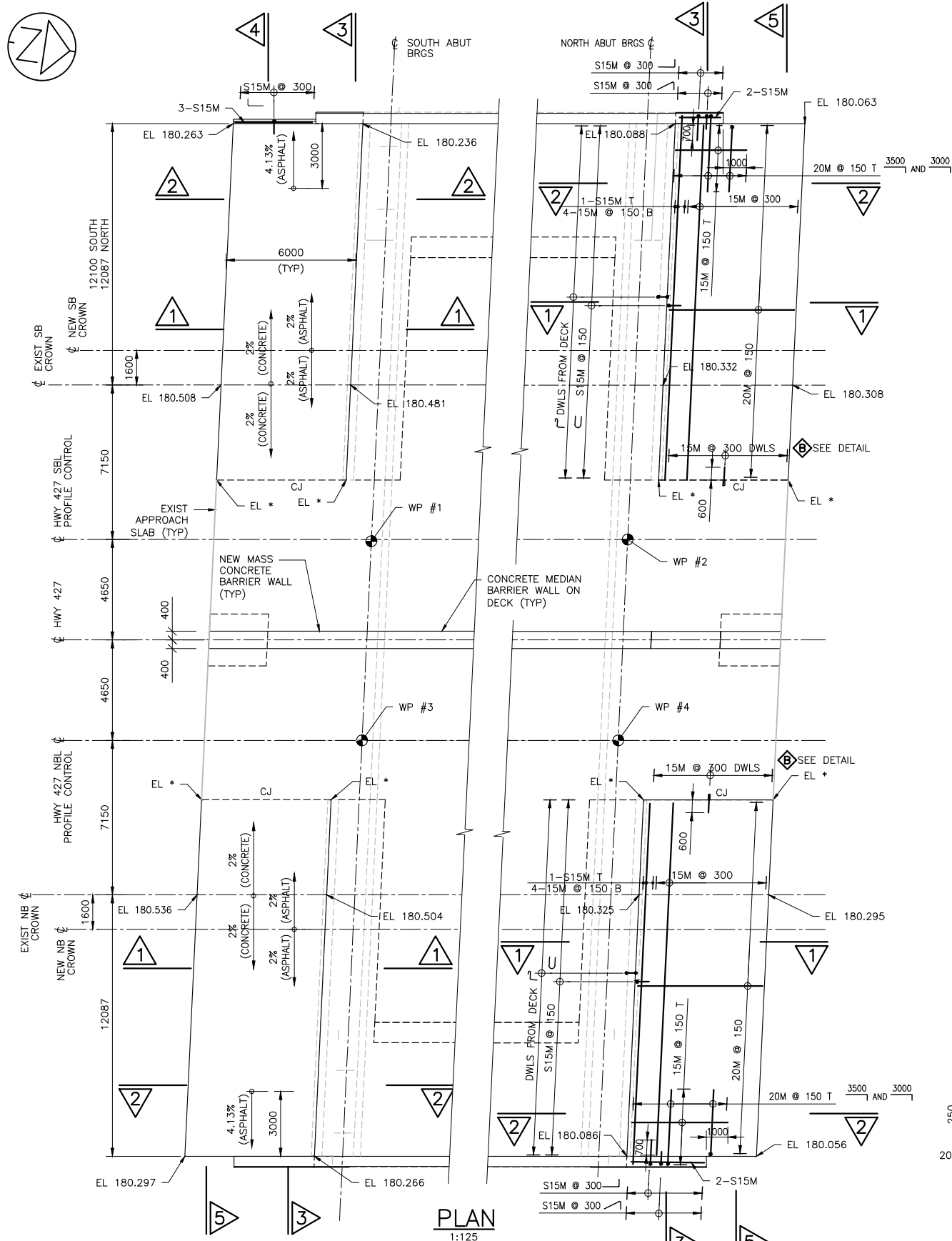
DATE	REVISIONS	BY	CHK	LEAD DISC.	PROJ. MAN.
B 18/03/16	90% SUBMISSION TO CA				
A 18/01/12	90% SUBMISSION TO CA				

SCALE :
 AS NOTED

DESIGNED	NINA MAHMOUDI
DRAWN	SOPHA MILLS
CHECKED	SUBOOH OBAID
APPROVED LEAD ENG.	TATIANA OJALA
APPROVED PROJ. MANAGER	
NAME (PRINT)	INT. DATE



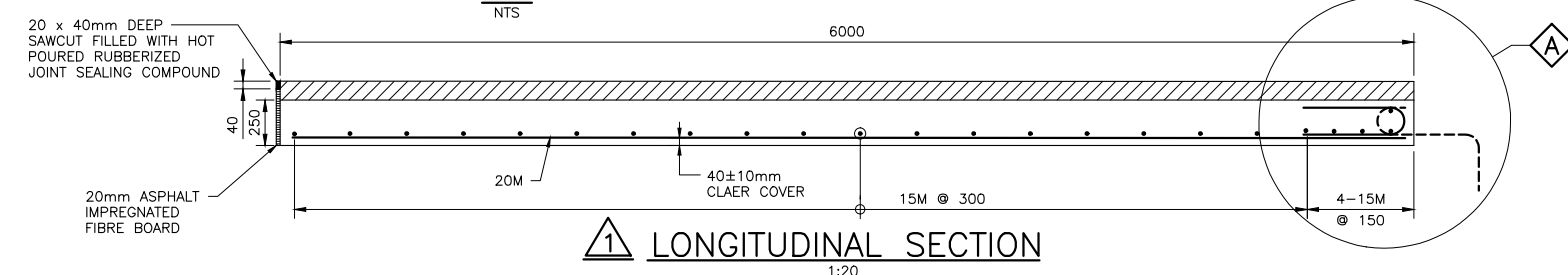
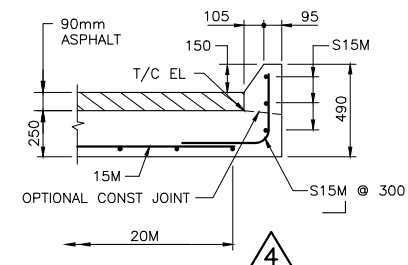
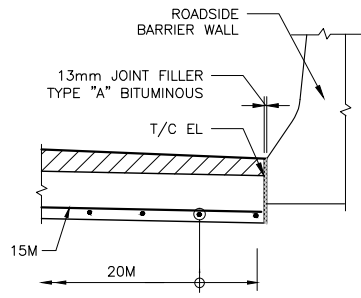
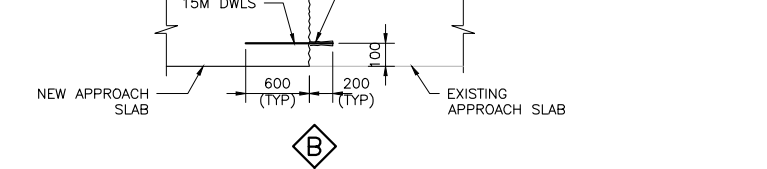
HWY 427 EXPANSION HWY 427 / ALBION ROAD OVERPASS REHABILITATION AND WIDENING R1 SITE 37-1110 INTERIOR BARRIER WALL							
PROJECT ID.	STAGE IDENTIFIER	DESIGN PACKAGE NUMBER	DISCIPLINE	STRUCTURE NUMBER	DOCUMENT TYPE	DRAWING NUMBER	REVISION NUMBER
H427-D	N	9	STR	B05	DWG	717	B



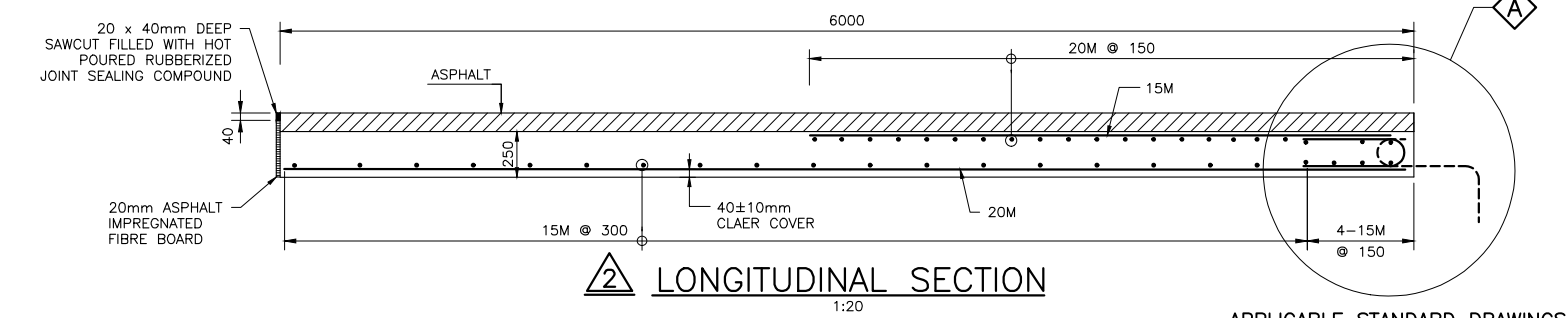
PLAN
1:125

* ELEVATIONS TO MATCH EXISTING T/C ELEVATIONS
DIMENSIONS SHOWN FOR SOUTH APPROACH SLAB; DIMENSIONS FOR NORTH APPROACH SLAB SIMILAR UNO
REINFORCEMENT SHOWN FOR NORTH APPROACH SLAB; REINFORCEMENT FOR SOUTH APPROACH SLAB SIMILAR UNO

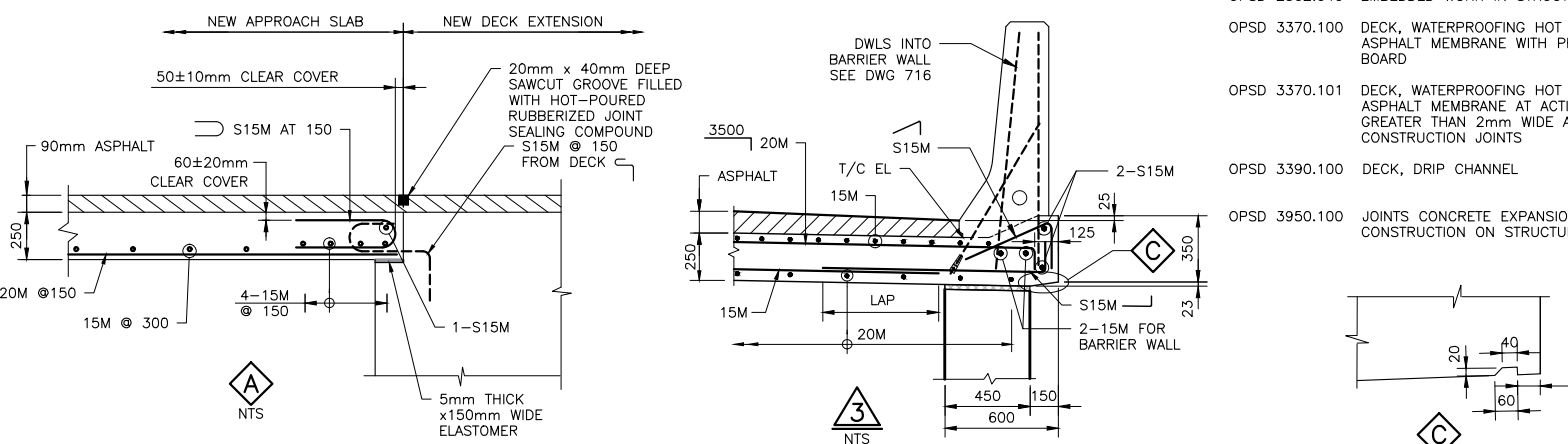
CLEAN AND ROUGHEN EXIST SURFACE TO AN AVERAGE SURFACE ROUGHNESS AMPLITUDE OF 5mm @ 15 C/C



1 LONGITUDINAL SECTION
1:20

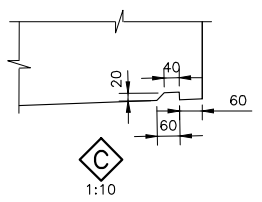


2 LONGITUDINAL SECTION
1:20



A
NTS

3
NTS



C
1:10

- NOTES:**
- CLEAR COVER TO REINFORCING STEEL 70 ± 20 mm EXCEPT AS NOTED.
 - LAYOUT OF REINFORCING STEEL WILL BE SIMILAR FOR LEFT HAND AND ZERO DEGREE SKEW.
 - STAINLESS STEEL BARS SHALL BE TYPE 316 LN OR DUPLEX 2205 WITH A MINIMUM YIELD STRENGTH OF 500MPa. REINFORCING STEEL SHALL BE GRADE 40W.
 - WATERPROOFING AT JOINT BETWEEN BRIDGE AND APPROACH SLAB TO BE IN ACCORDANCE WITH OPSD-3370.100.
 - WATERPROOFING FOR BRIDGES WITHOUT EXPANSION JOINTS (RIGID FRAMES AND INTEGRAL ABUTMENTS) TO BE IN ACCORDANCE WITH OPSD 3370.101.
 - BARS MARKED WITH PREFIX S DENOTE STAINLESS STEEL BARS.
 - THIS DRAWING TO BE READ IN CONJUNCTION WITH DRAWINGS 703 AND 716.

APPLICABLE STANDARD DRAWINGS:

- OPSD 2302.040 EMBEDDED WORK IN STRUCTURE
- OPSD 3370.100 DECK, WATERPROOFING HOT APPLIED ASPHALT MEMBRANE WITH PROTECTION BOARD
- OPSD 3370.101 DECK, WATERPROOFING HOT APPLIED ASPHALT MEMBRANE AT ACTIVE CRACKS GREATER THAN 2mm WIDE AND CONSTRUCTION JOINTS
- OPSD 3390.100 DECK, DRIP CHANNEL
- OPSD 3950.100 JOINTS CONCRETE EXPANSION AND CONSTRUCTION ON STRUCTURE

CAD FILE LOCATION AND NAME: C:\projects\hwy427\hwy427-d-f-9-str-b05-dwg-718ap.dwg
MODIFIED: 3/19/2018 3:34:30 PM BY: PANG
DATE PLOTTED: 3/19/2018 4:08:11 PM BY: PANG

DATE	REVISIONS	BY	CHK	LEAD DISC.	PROJ. MAN.
B 18/03/16	90% SUBMISSION TO CA				
A 18/01/12	90% SUBMISSION TO CA				

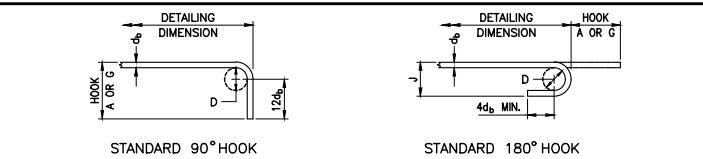
SCALE :

AS NOTED

DESIGNED	NIMA MAHMOUDI	
DRAWN	SOPHIA MILLS	
CHECKED	SUBOOHI OBAID	
APPROVED LEAD ENG.	TATIANA OJALA	
APPROVED PROJ. MANAGER		
NAME (PRINT)	INT.	DATE



HWY 427 EXPANSION HWY 427 / ALBION ROAD OVERPASS REHABILITATION AND WIDENING R1 SITE 37-1110 6000mm APPROACH SLAB I							
PROJECT ID.	STAGE IDENTIFIER	DESIGN PACKAGE NUMBER	DISCIPLINE	STRUCTURE NUMBER	DOCUMENT TYPE	DRAWING NUMBER	REVISION NUMBER
H427-D	N	9	STR	B05	DWG	718	B



STANDARD 90° HOOK

STANDARD 180° HOOK

MINIMUM BENDING PIN DIAMETER, D, mm

BAR SIZE	STEEL GRADE	400R (2)	400W
10M		70	60
15M		100	90
20M		120	100
25M		150	150
30M		250	200
35M		300	250
45M		450 (1)	400
55M		600 (1)	550

(1) Special fabrication is required for bends exceeding 90° for bars of these sizes and grade.
 (2) For stainless steel, with $F_y = 420$, use the same D as for 400R.

STANDARD HOOK DIMENSIONS

BAR SIZE	90° HOOKS		180° HOOKS			
	A OR G (mm)	400R	400W	400R	400W	J (mm)
10M	180	180	140	130	90	80
15M	260	250	180	170	130	120
20M	310	300	220	200	160	140
25M	400	400	280	280	200	200
30M	510	490	400	350	310	260
35M	610	590	480	430	370	320
45M	790	770	680	630	540	490
55M	1030	1010	900	850	710	660

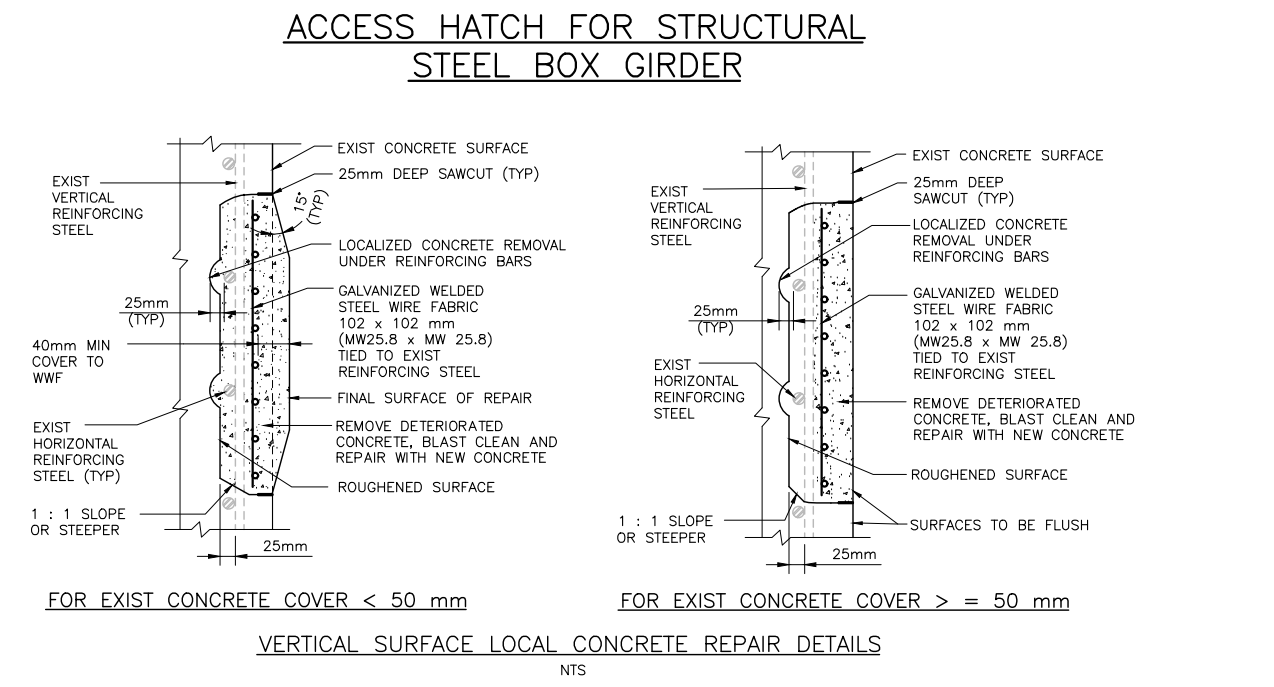
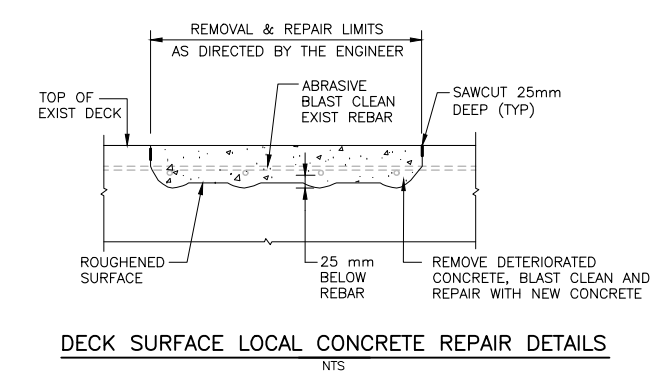
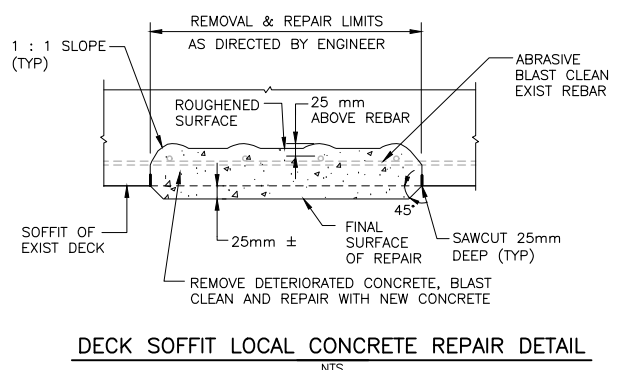
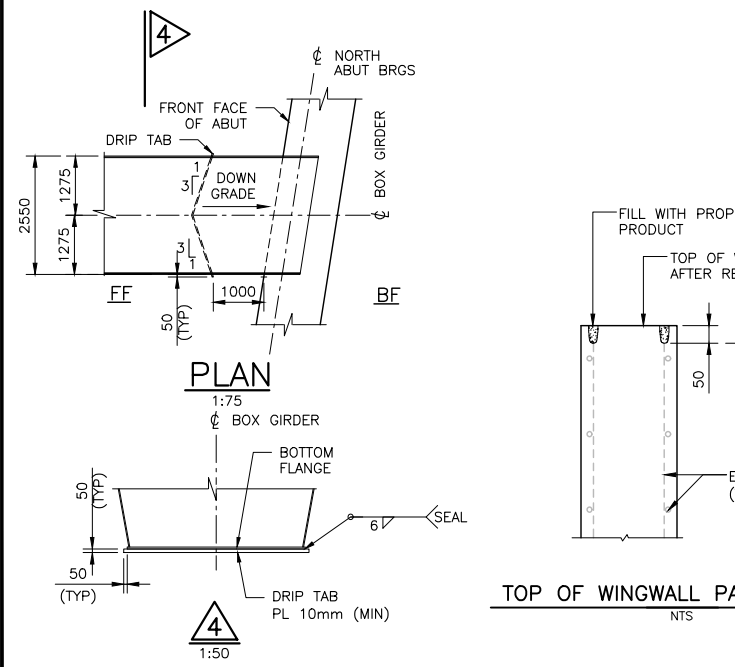
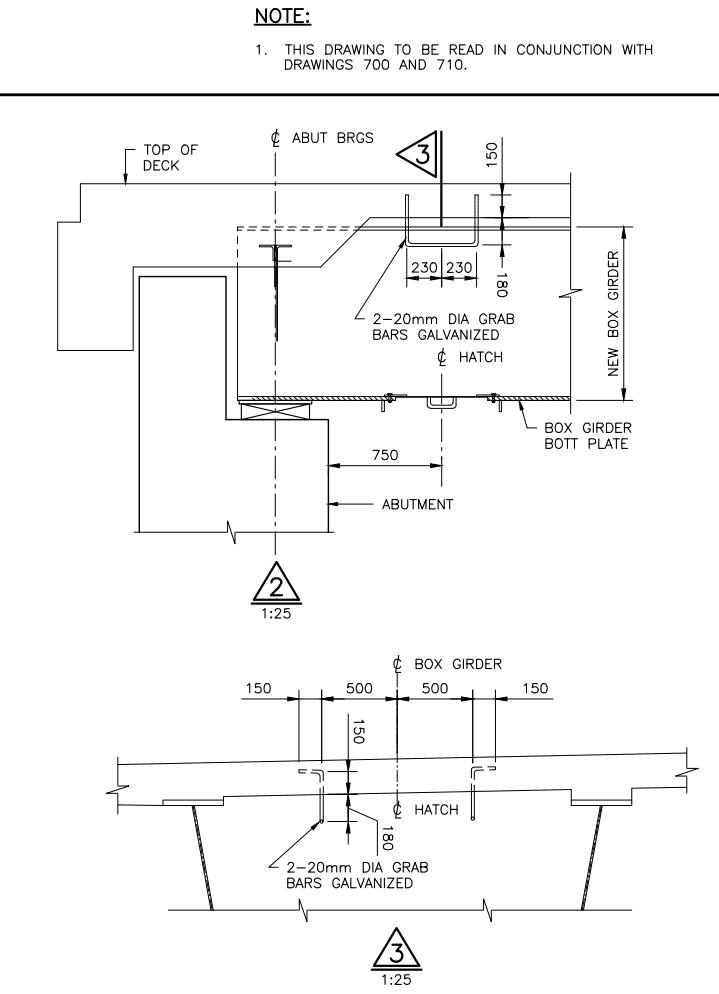
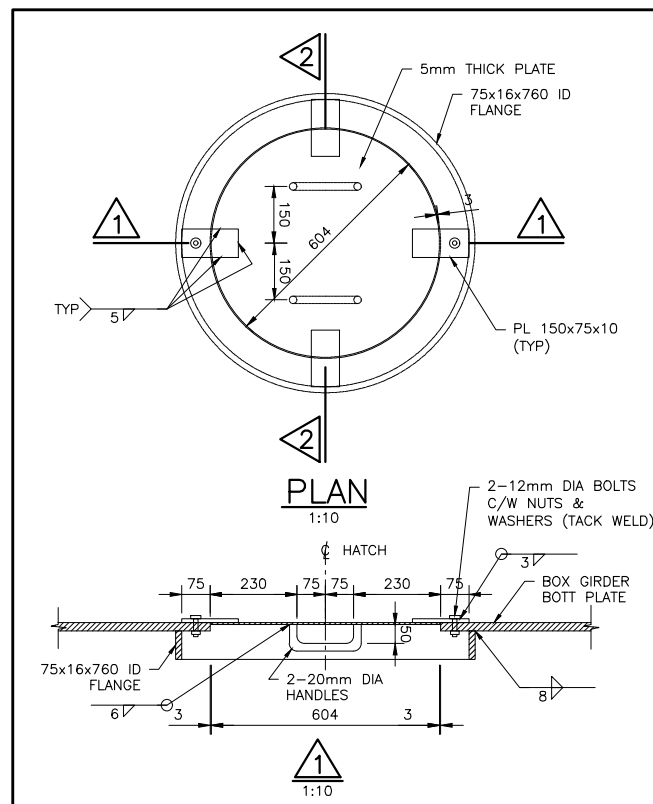
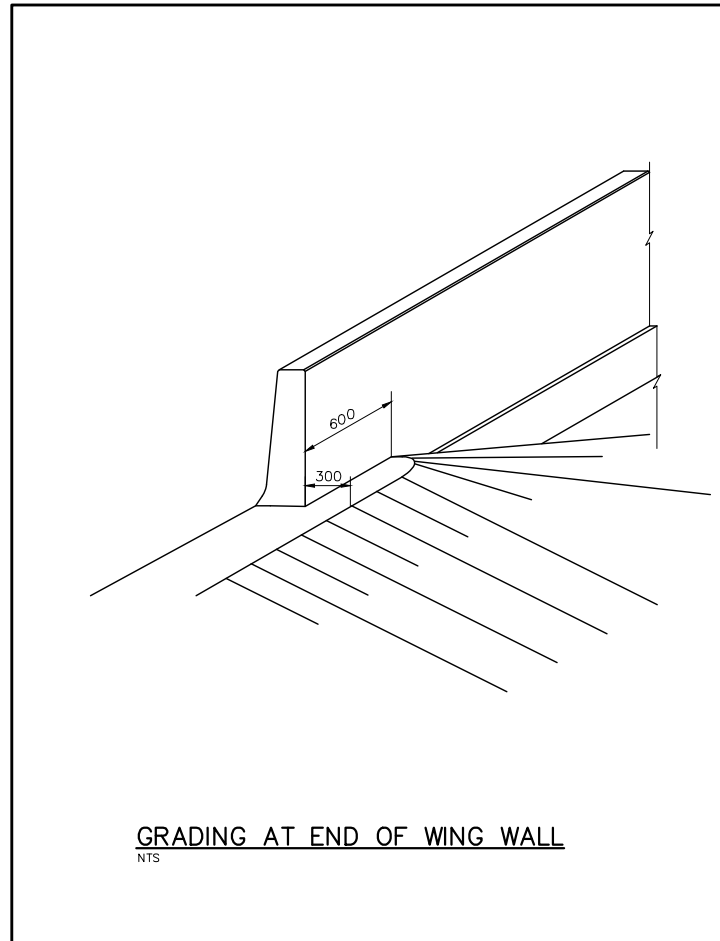
NOTE: All Hook Dimensions are according to the CHBDC-2014.

MINIMUM STIRRUP AND TIE HOOK DIMENSIONS

BAR SIZE	BAR DIAM. d_b (mm)	PIN DIAM. D (mm)	90°		135°	
			A OR G (mm)	H (approx.) (mm)	A OR G (mm)	H (approx.) (mm)
10M	11.3	45	100	70	100	70
15M	16.0	65	140	100	140	100
20M	19.5	80	180	175	175	115
25M	25.2	100	230			

HOOK DIMENSIONS FOR REINFORCING STEEL BARS

Date: SEP 2016 Rev: SS12-1



CAD FILE LOCATION AND NAME: C:\projects\hwy427\hwy427-d-f-9-str-b05-dwg-72050.dwg
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 DATE PLOTTED: 3/19/2018 4:08:18 PM BY: PANG

DATE	REVISIONS	BY	CHK	LEAD DISC.	PROJ. MAN.
B 18/03/16	90% SUBMISSION TO CA				
A 18/01/12	90% SUBMISSION TO CA				

SCALE : AS NOTED

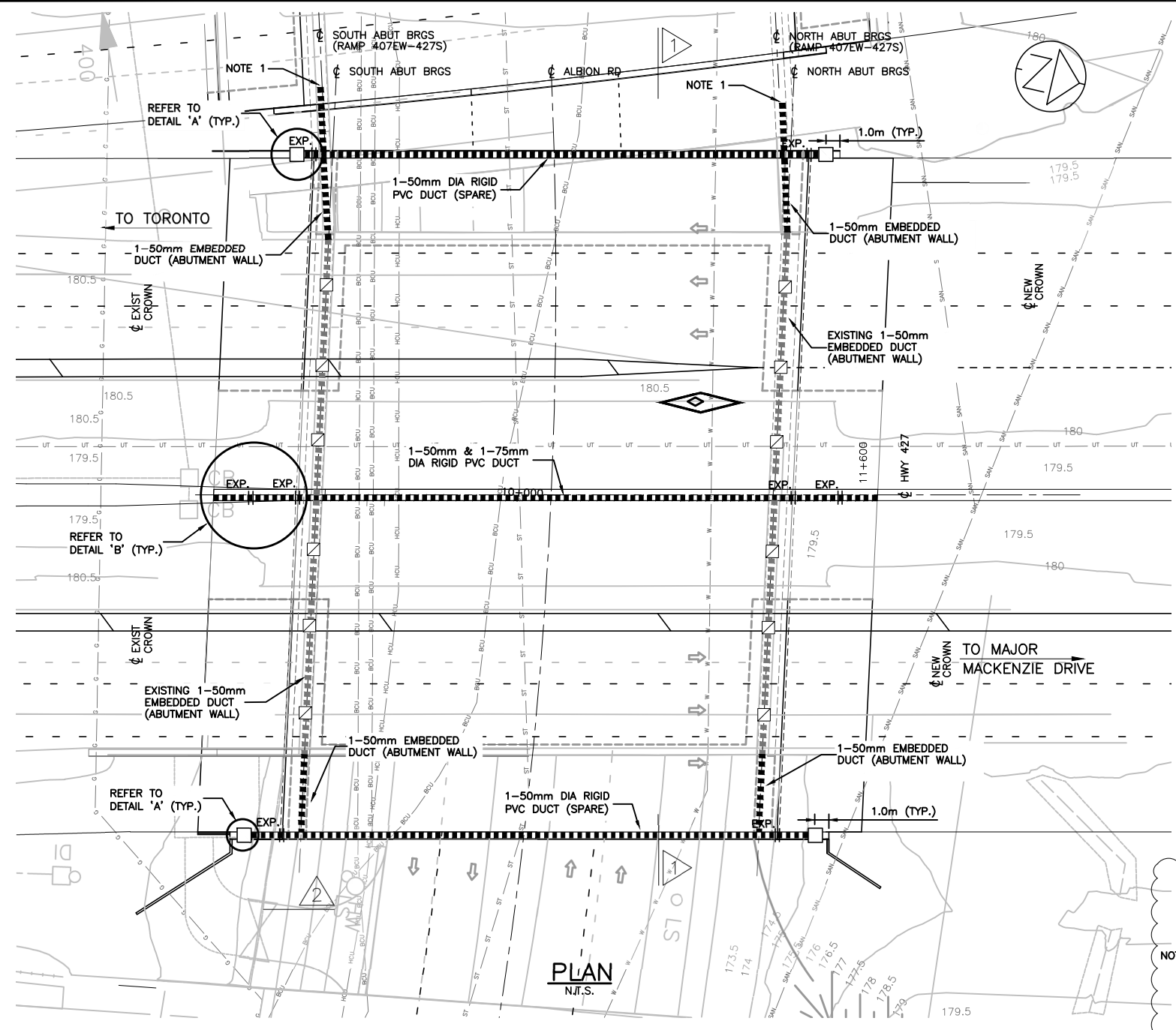
DESIGNED	NINA MAHMOUDI
DRAWN	SOPHIA MILLS
CHECKED	SUBOOH OBAID
APPROVED LEAD ENG.	TATIANA GJALA
APPROVED PROJ. MANAGER	



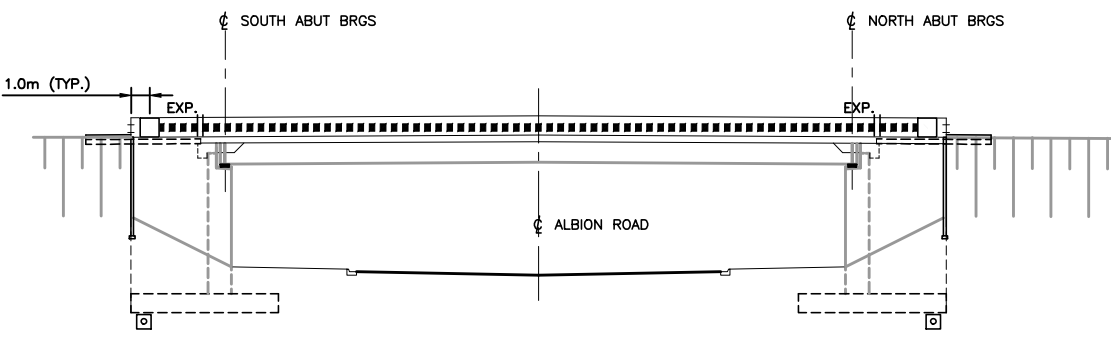
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PROJECT ID.	STAGE IDENTIFIER	DESIGN PACKAGE NUMBER	DISCIPLINE	STRUCTURE NUMBER	DOCUMENT TYPE	DRAWING NUMBER	REVISION NUMBER
H427-D	N	9	STR	B05	DWG	720	B

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 MODIFIED: 3/19/2018 3:39:27 PM BY: GLLK
 DATE PLOTTED: 3/19/2018 3:40:39 PM BY:



PLAN
N.T.S.



ELEVATION
N.T.S.

APPLICABLE STANDARD DRAWINGS:

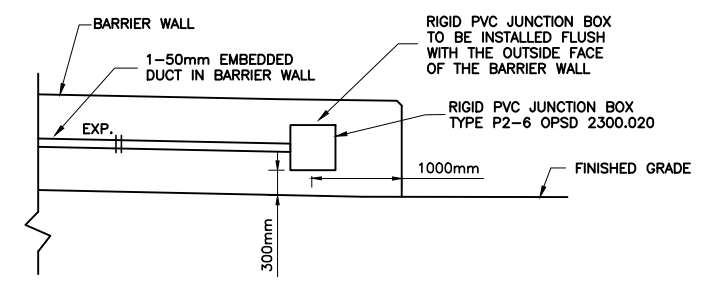
- OPSD 2011.101 - GENERAL SYMBOLS
- OPSD 2011.201 - GENERAL SYMBOLS
- OPSD 2102.010 - UNDERGROUND RIGID DUCT CONNECTION AT CONCRETE STRUCTURE
- OPSD 2302.010 - EMBEDDED WORK DETAIL
- OPSD 2302.020 - EXPANSION AND DEFLECTION FITTING ASSEMBLY
- OPSD 2302.040 - EMBEDDED WORK IN STRUCTURE

SUPPLEMENTARY LEGEND:

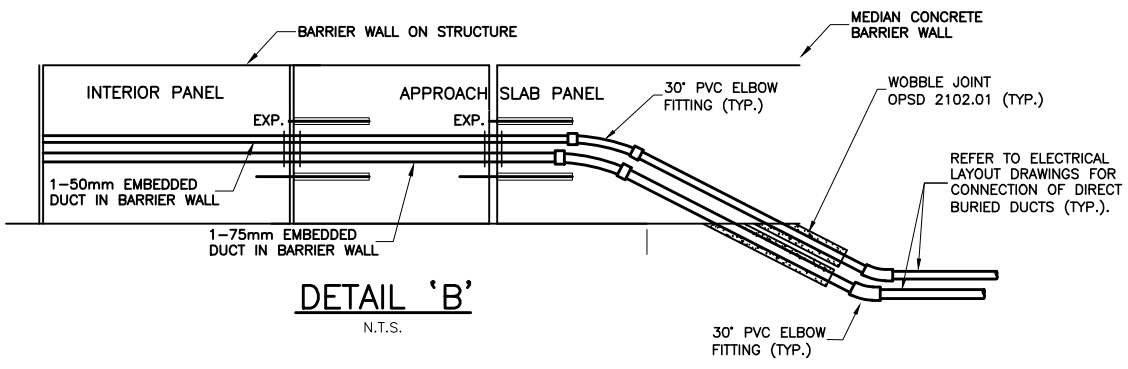
- RIGID JUNCTION BOX EMBEDDED TYPE P2-6 OPSD 2300.020
- EXP. || EXPANSION AND DEFLECTION FITTING ASSEMBLY PER OPSD 2302.02
- EXISTING RIGID JUNCTION BOX EMBEDDED

GENERAL NOTES:

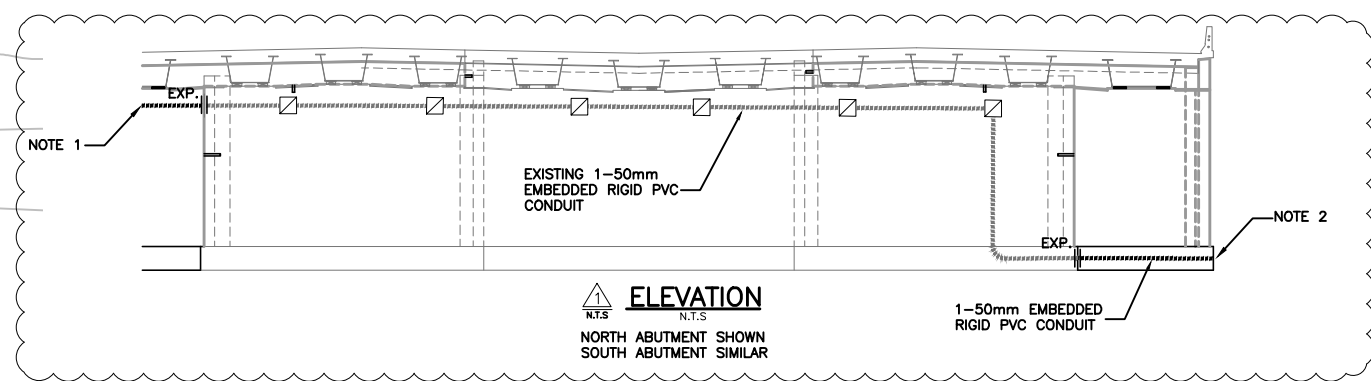
- A. FOR UNDERPASS LUMINAIRES REFER TO UNDERPASS LAYOUT DRAWINGS IN PACKAGE 9.
- NOTES:**
1. FOR CONTINUATION OF EMBEDDED DUCTS IN ABUTMENT WALL REFER TO HWY427 RAMP 407EW-427S (STRUCTURE B06) STRUCTURAL DRAWINGS.
 2. FOR UNDERGROUND DUCT REFER TO UNDERPASS LAYOUT DRAWINGS IN PACKAGE 9



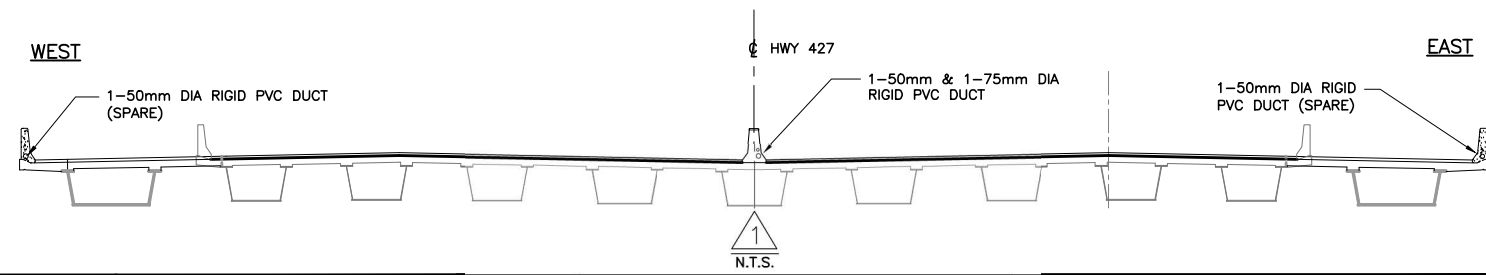
DETAIL 'A' - TERMINATION OF EMBEDDED DUCT
N.T.S.



DETAIL 'B'
N.T.S.



ELEVATION
N.T.S.
NORTH ABUTMENT SHOWN
SOUTH ABUTMENT SIMILAR



DATE	REVISIONS	BY	CHK	LEAD DISC.	PROJ. MAN.
B 18/03/21	90% SUBMISSION TO CA				
A 18/01/12	90% SUBMISSION TO CA				

SCALE : N.T.S.

DESIGNED	MANPREET PANESAR	M.P.
DRAWN	LENNOX LUE	K.G.
CHECKED	KARAJIT GILL	L.L.
APPROVED (CIVIL ENGR.)	MARIO TEDESCO	M.T.
APPROVED (PROJ. MANAGER)		



TITLE						
HWY 427 EXPANSION HWY 427 / ALBION ROAD OVERPASS REHABILITATION AND WIDENING SITE 37-1110 ELECTRICAL EMBEDDED WORK						
PROJECT ID.	STAGE IDENTIFIER	DESIGN PACKAGE NUMBER	DISCIPLINE	STRUCTURE NUMBER	DOCUMENT TYPE	REVISION NUMBER
H427-D	N	9	STR	B05	DWG	721 B