



Parcs  
Canada

Parks  
Canada

# HIGHWAY 430 NORTH (KMS 39.9 TO 88.5) RECAPITALIZATION GROS MORNE NATIONAL PARK ROCKY HARBOUR, NL

PCA PROJECT NO. 1350

## DRAWING LIST

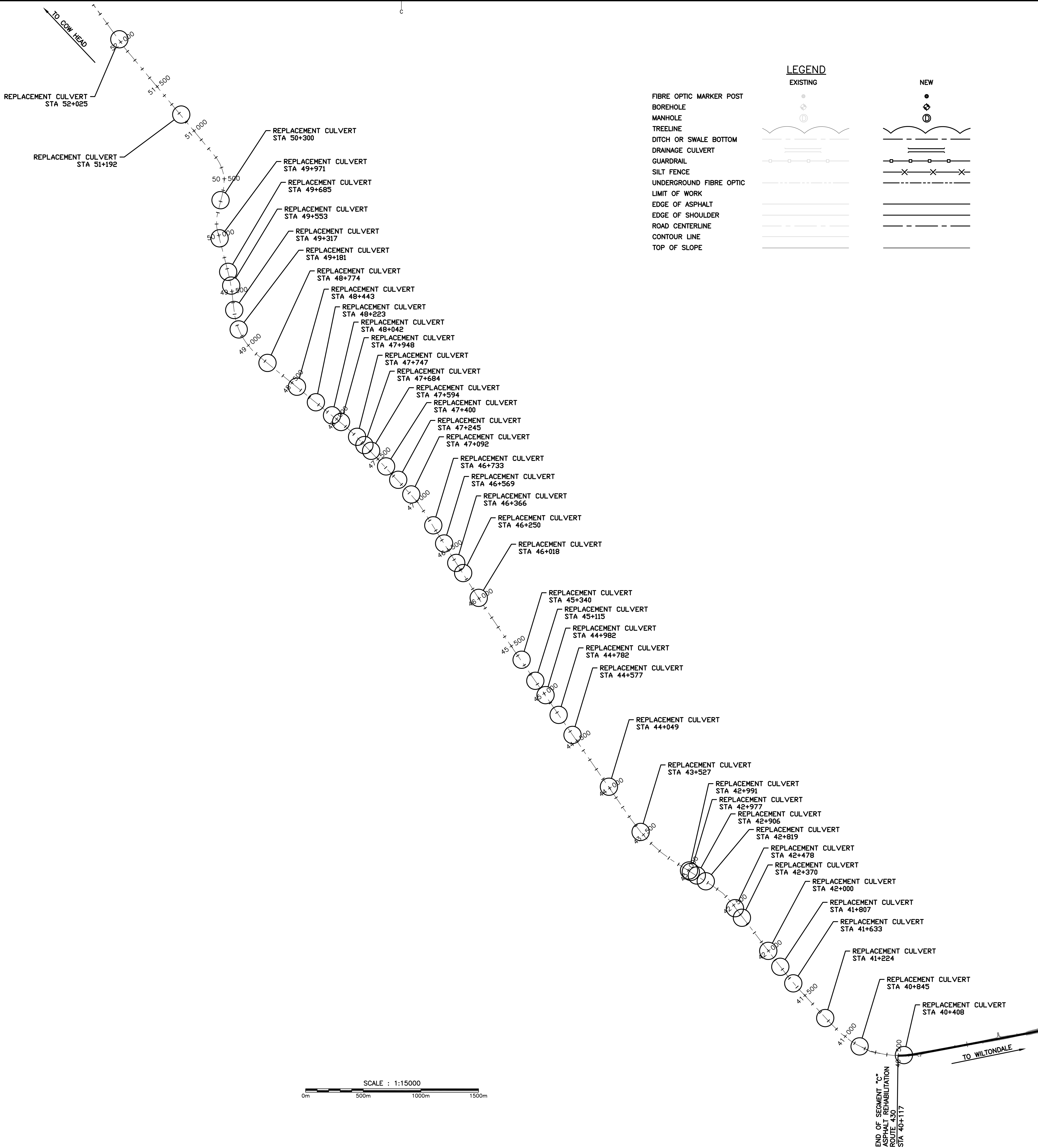
### CIVIL / CULVERT UPGRADES

C01	REPLACEMENT CULVERT LOCATION PLAN STA. 40+408 TO 52+025
C02	REPLACEMENT CULVERT LOCATION PLAN STA. 52+220 TO 62+290
C03	REPLACEMENT CULVERT LOCATION PLAN STA. 63+320 TO 67+900
C04	REPLACEMENT CULVERT LOCATION PLAN STA. 82+446 TO 88+515
C05	CULVERT PROFILE AND SECTION VIEW STA. 42+000
C06	CULVERT SECTIONS STA. 40+408 TO 42+478
C07	CULVERT SECTIONS STA. 42+819 TO 44+782
C08	CULVERT SECTIONS STA. 44+982 TO 46+733
C09	CULVERT SECTIONS STA. 47+092 TO 48+042
C10	CULVERT SECTIONS STA. 48+223 TO 49+971
C11	CULVERT SECTIONS STA. 50+300 TO 58+281
C12	CULVERT SECTIONS STA. 58+432 TO 60+830
C13	CULVERT SECTIONS STA. 61+016 TO 63+530
C14	CULVERT SECTIONS STA. 63+700 TO 67+900
C15	CULVERT SECTIONS STA. 82+446 TO 85+400
C16	CULVERT SECTIONS STA. 85+525 TO 88+515
C17	CULVERT DETAILS AND CROSS SECTIONS

### STRUCTURAL DRAWINGS

S01	CULVERT AT STA 42+000 FOUNDATION PLAN SECTIONS AND DETAILS
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Canada

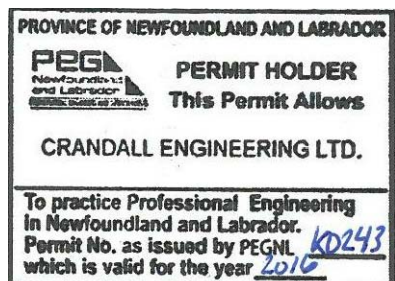


**LEGEND**

EXISTING	NEW
FIBRE OPTIC MARKER POST	
BOREHOLE	
MANHOLE	
TREELINE	
DITCH OR SWALE BOTTOM	
DRAINAGE CULVERT	
GUARDRAIL	
SILT FENCE	
UNDERGROUND FIBRE OPTIC	
LIMIT OF WORK	
EDGE OF ASPHALT	
EDGE OF SHOULDER	
ROAD CENTERLINE	
CONTOUR LINE	
TOP OF SLOPE	



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revisions		date

project project

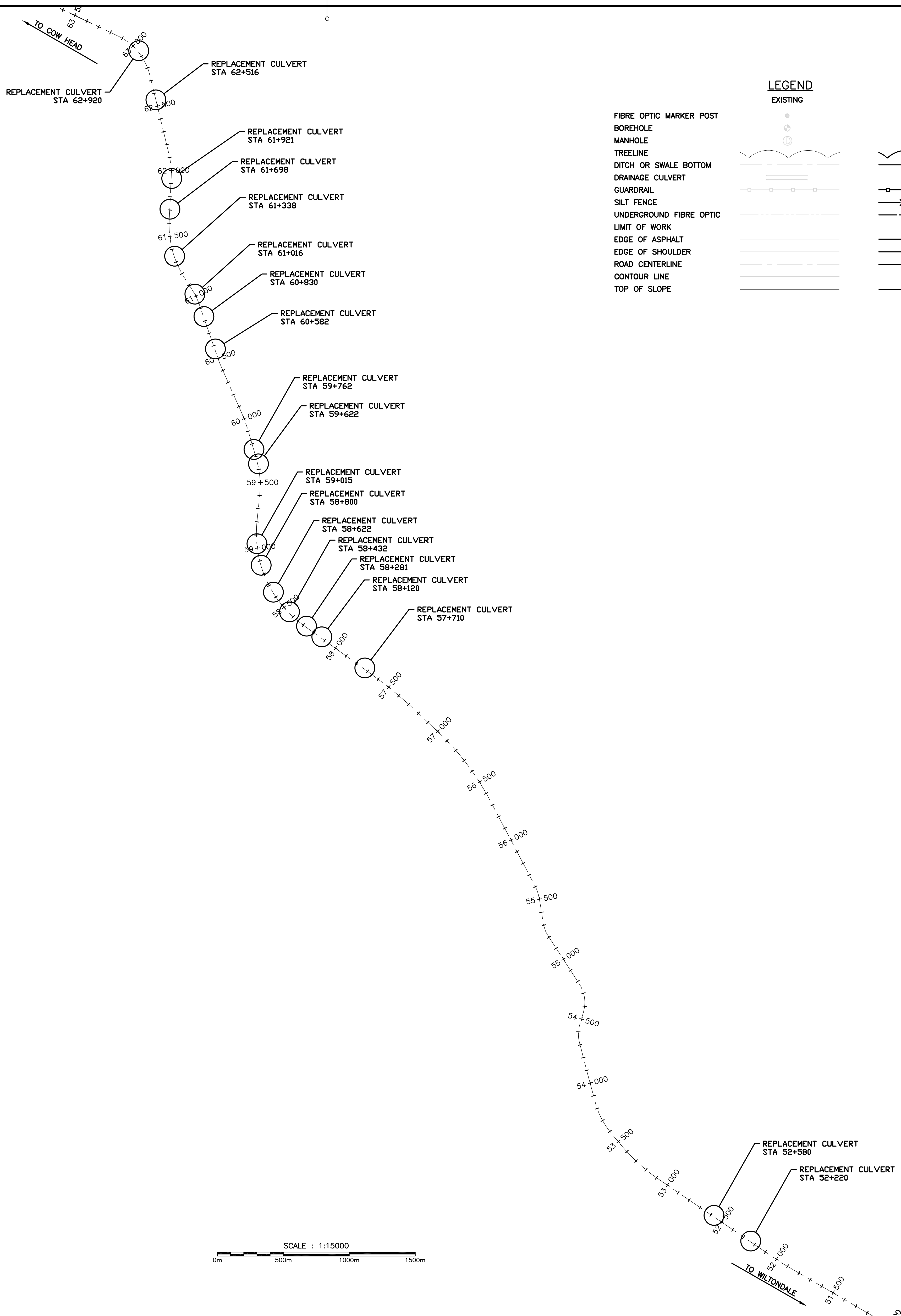
HIGHWAY 430 NORTH  
(KMS 39.9 TO 88.5)  
RECAPITALIZATION

drawing dessin

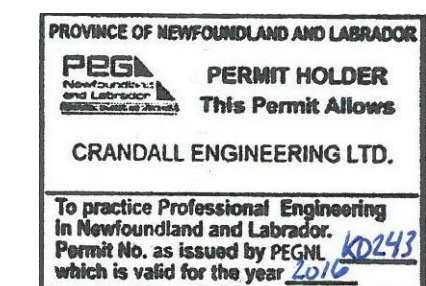
CULVERT REPLACEMENT  
LOCATION PLAN  
40+408 TO 52+025

designed G. FLANAGAN	conçu
date OCTOBER 23, 2015	
drawn A.CALDWELL	dessiné
date OCTOBER 23, 2015	
approved J.BABIN	approuvé
date OCTOBER 23, 2015	
Tender	Soumission
PCA Project Manager	Administrateur de projets APC
project number	no. du projet
PCA NO.: 1350	
drawing no.	no. du dessin
C01	





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project projet

HIGHWAY 430 NORTH  
(KMS 39.9 TO 88.5)  
RECAPITALIZATION

drawing dessin

CULVERT REPLACEMENT  
LOCATION PLAN  
52+220 TO 62+920

designed G. FLANAGAN conçu

date OCTOBER 23, 2015

drawn A.CALDWELL dessiné

date OCTOBER 23, 2015

approved J.BABIN approuvé

date OCTOBER 23, 2015

Tender Soumission

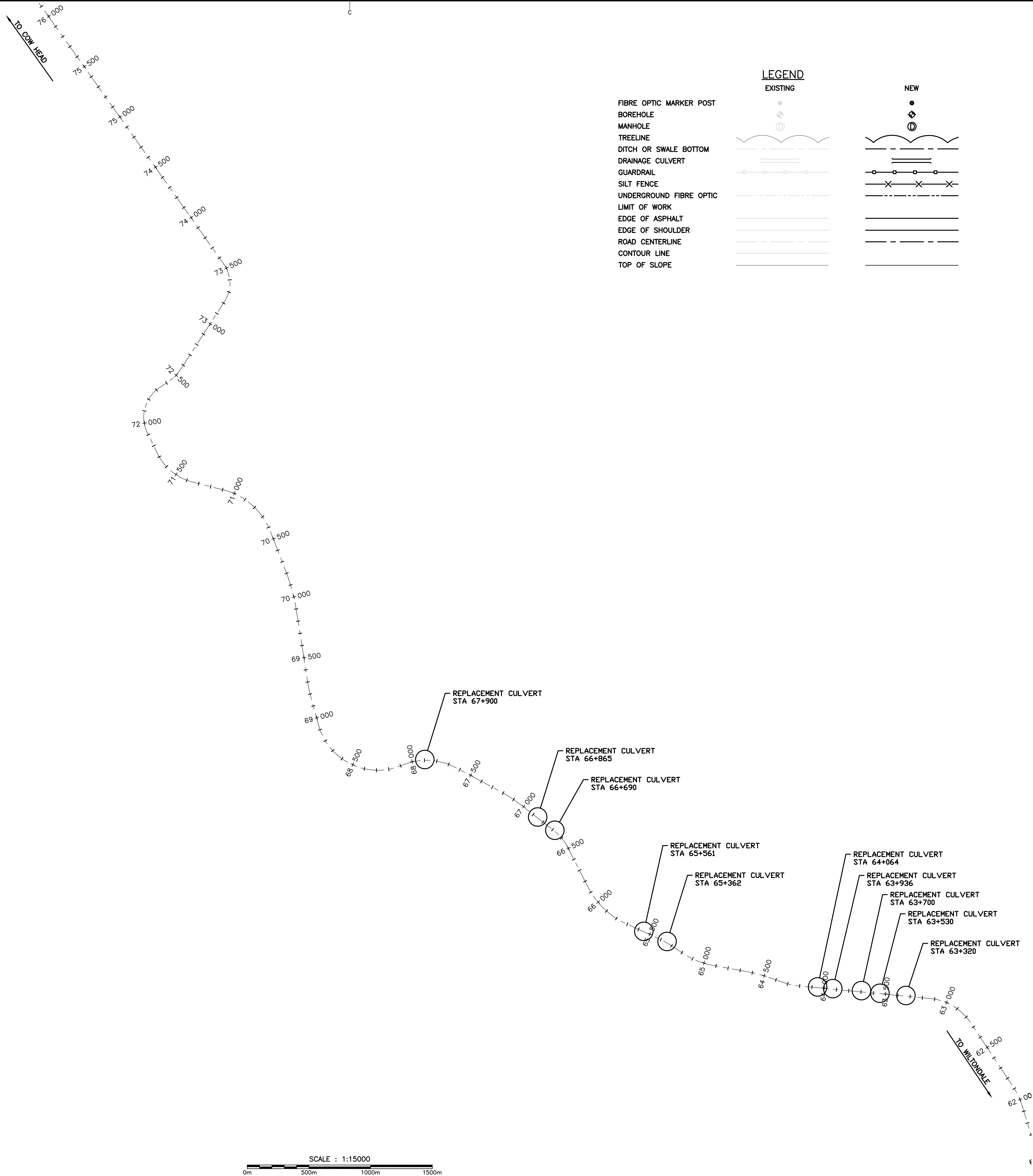
PCA Project Manager Administrateur de projets APC

project number no. du projet

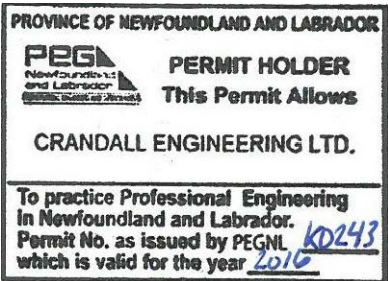
PCA NO.: 1350

drawing no. no. du dessin

C02



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HIGHWAY 430 NORTH  
(KMS 39.9 TO 88.5)  
RECAPITALIZATION

drawing dessin

CULVERT REPLACEMENT  
LOCATION PLAN  
63+320 TO 67+900

designed G. FLANAGAN conçu

date OCTOBER 23, 2015

drawn A.CALDWELL dessiné

date OCTOBER 23, 2015

approved J.BABIN approuvé

date OCTOBER 23, 2015

Tender Soumission

PCA Project Manager Administrateur de projets APC

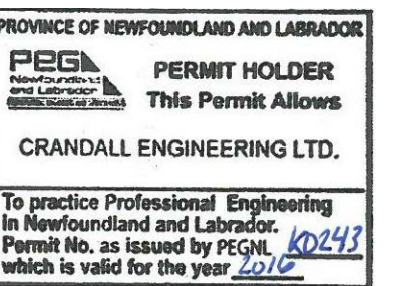
PCA NO.: 1350

drawing no. no. du dessin

C03







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revisions		date

project	projet
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HIGHWAY 430 NORTH  
(KMS 39.9 TO 88.5)  
RECAPITALIZATION

drawing	dessin
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CULVERT PROFILE AND  
SECTION VIEW  
STA. 42+000

designed G. FLANAGAN conçu

date DECEMBER 04, 2015

drawn	G. GALLANT	dessiné
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date DECEMBER 04, 2015

approved J.BABIN	approuvé
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date DECEMBER 04, 2015

Tender		Soumission
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PCA Project Manager      Administrateur de projets APC

project number no. du projet

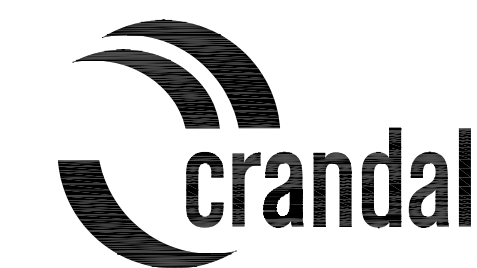
**PCA NO 1350**

PCA NO.: 1350

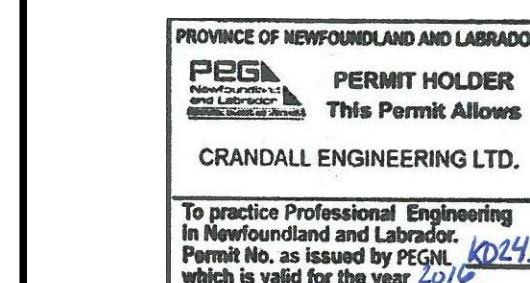
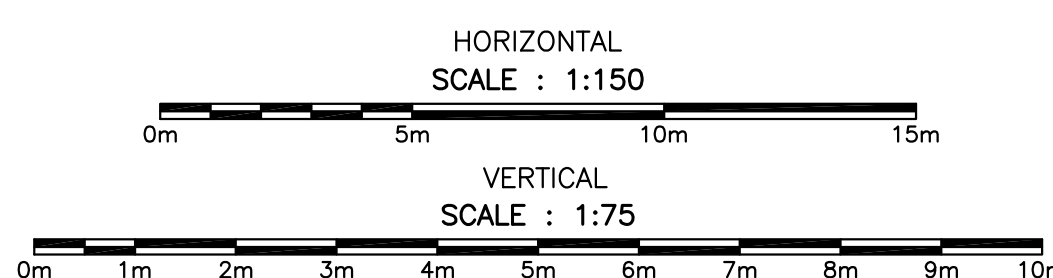
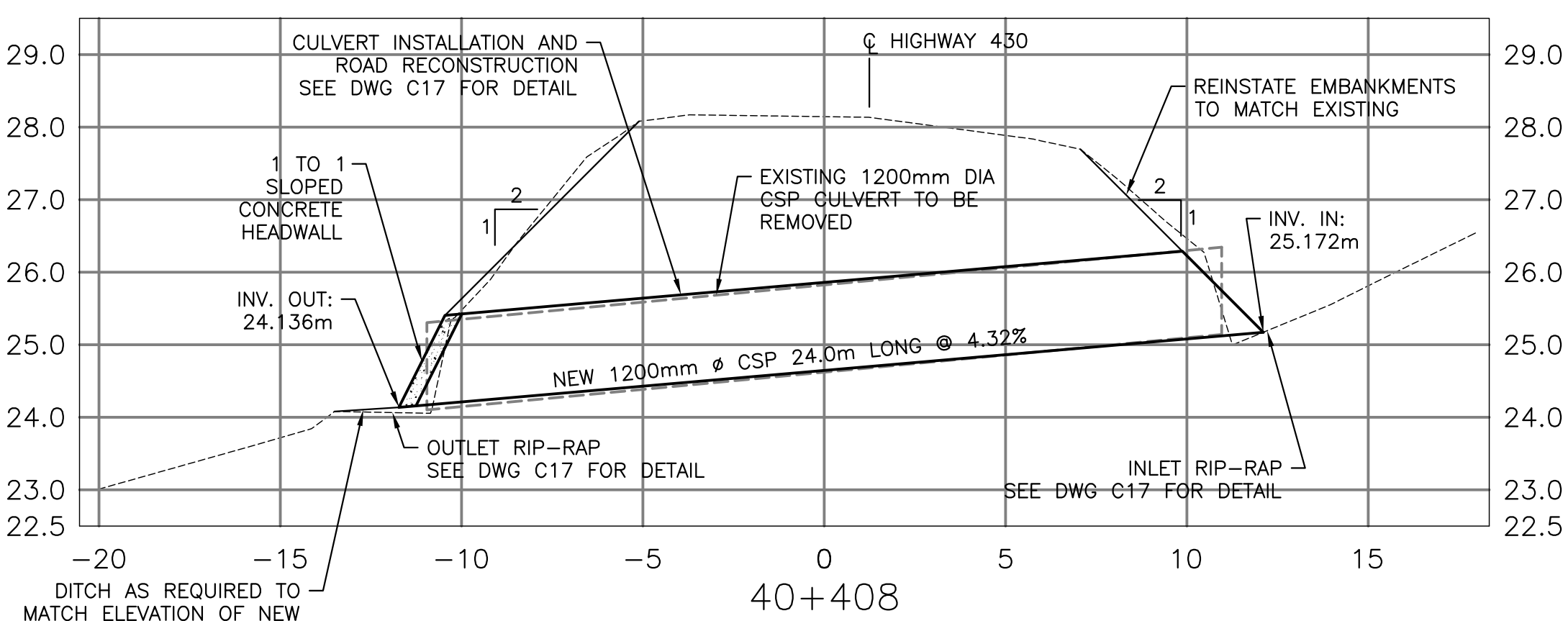
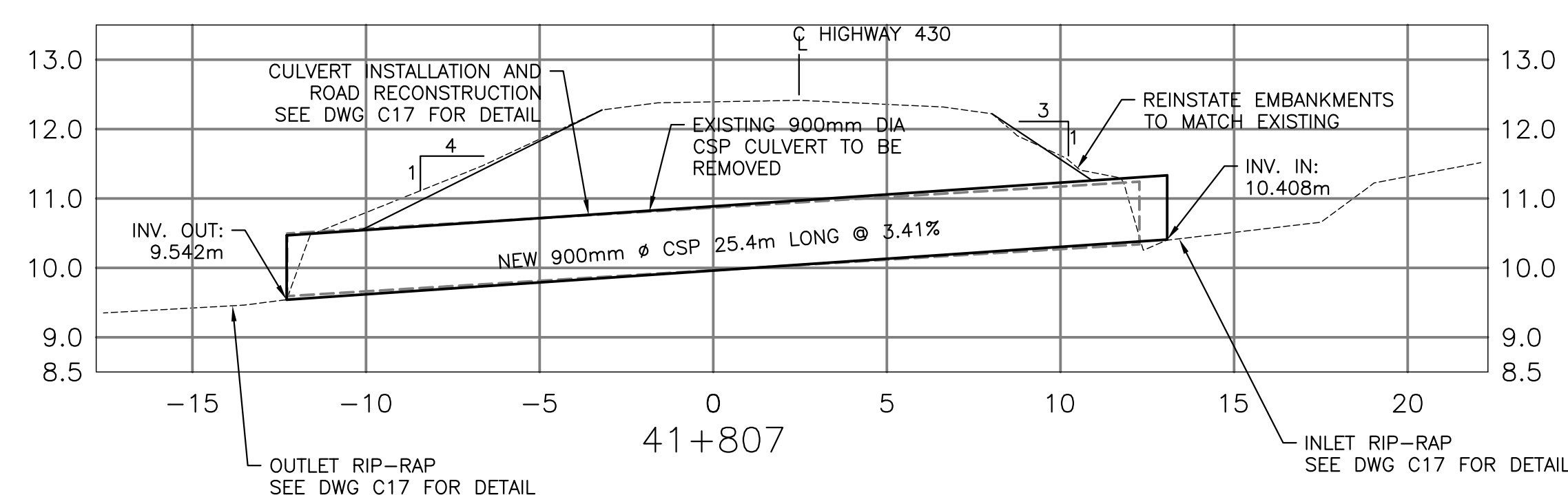
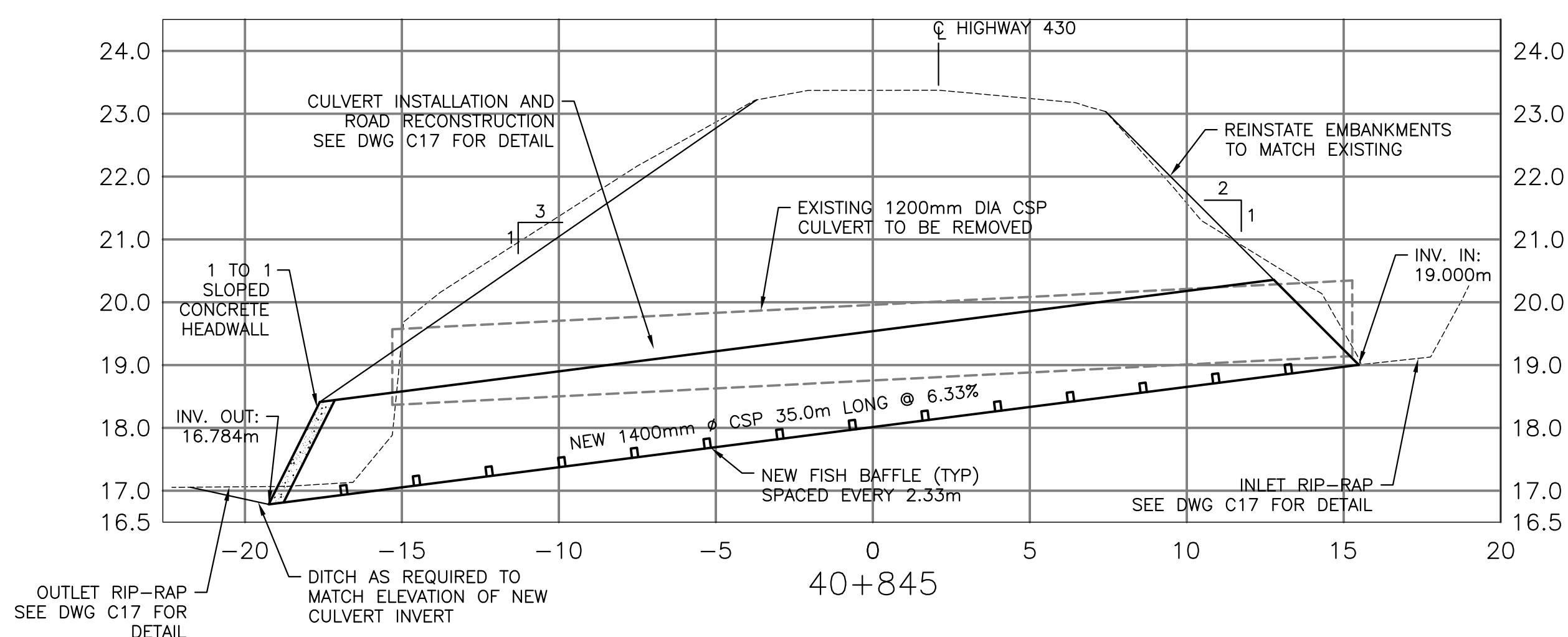
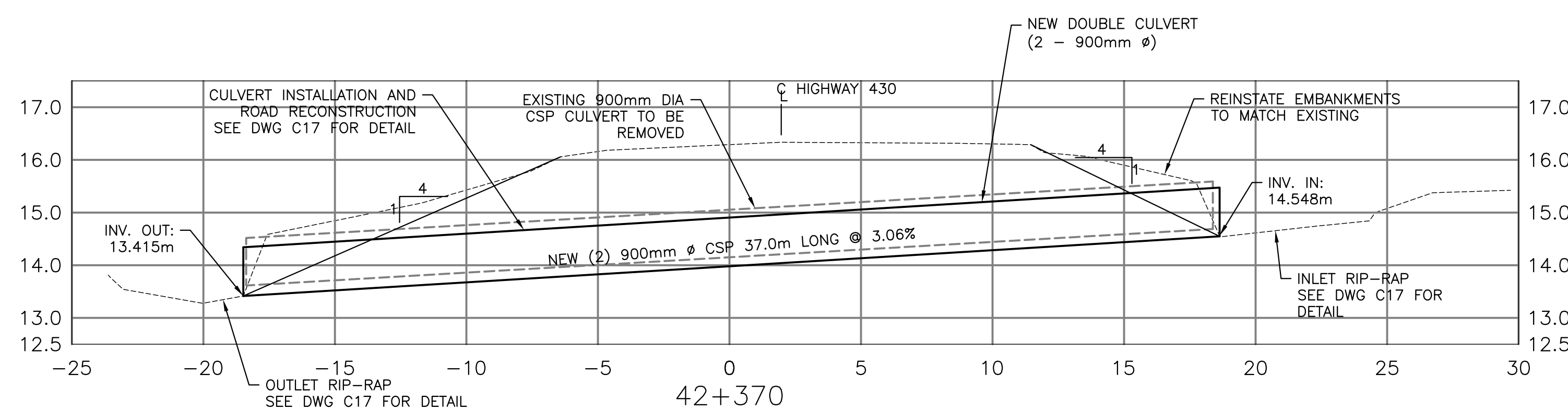
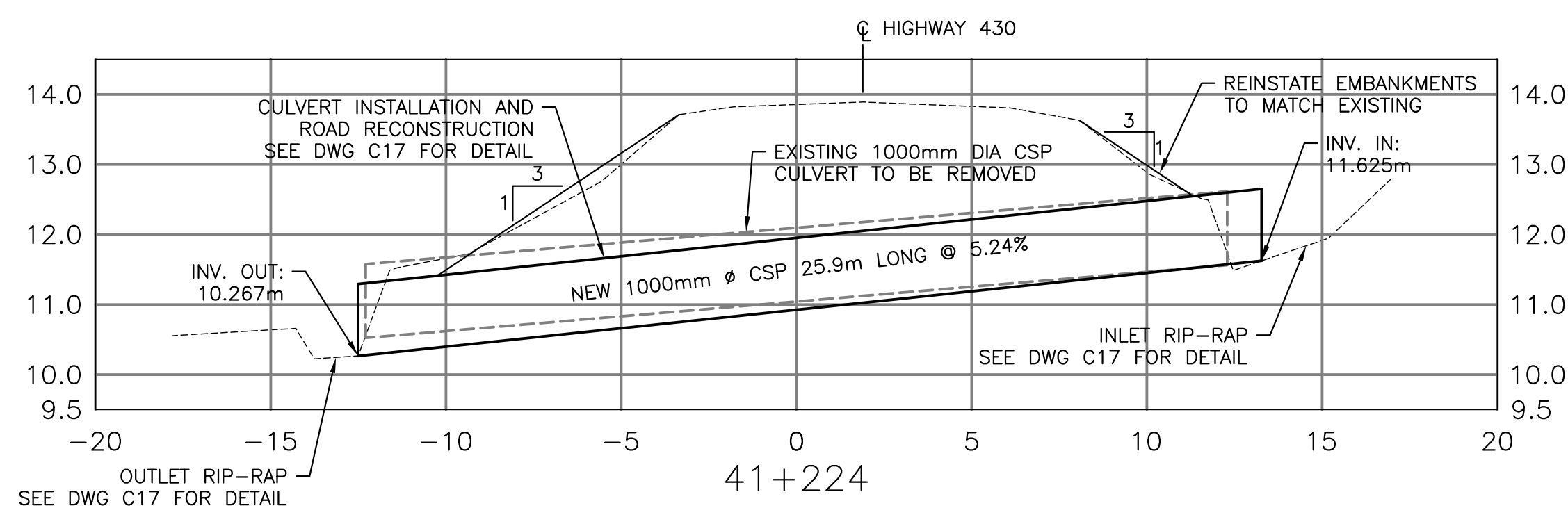
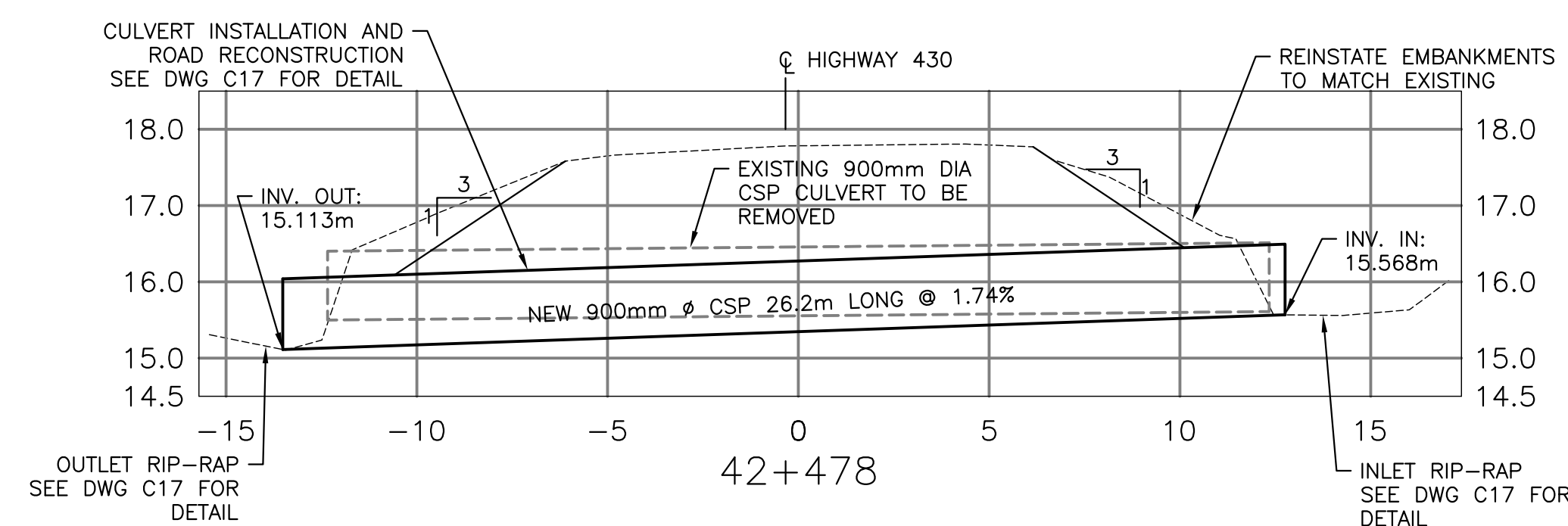
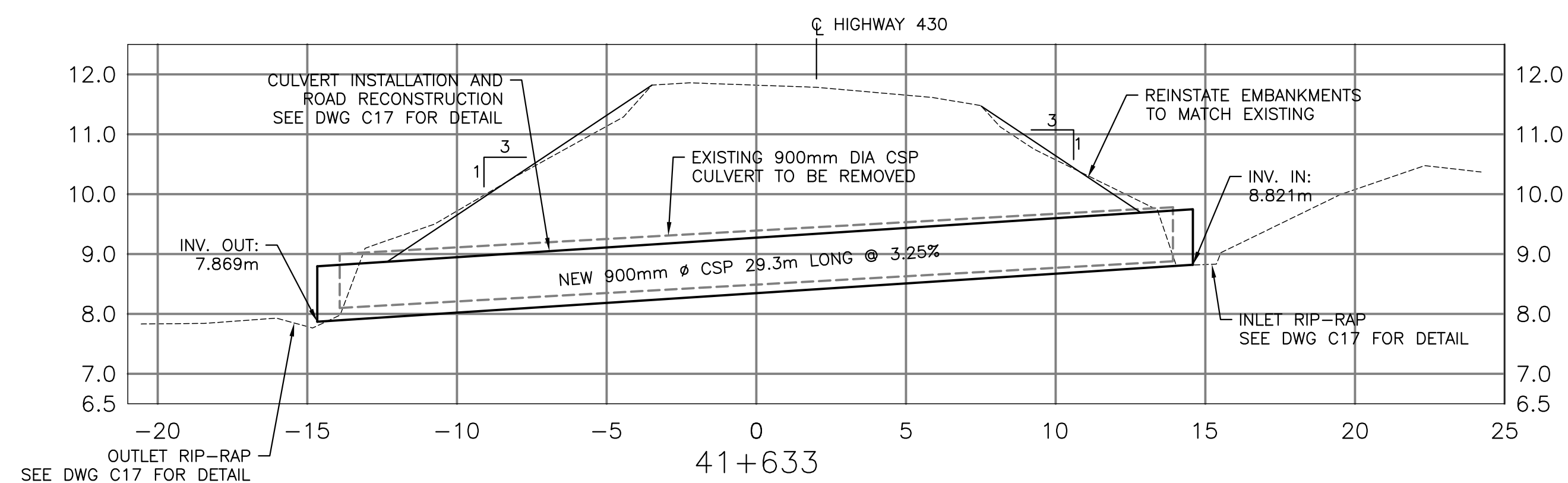
drawing no.	no. du dessin
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C05





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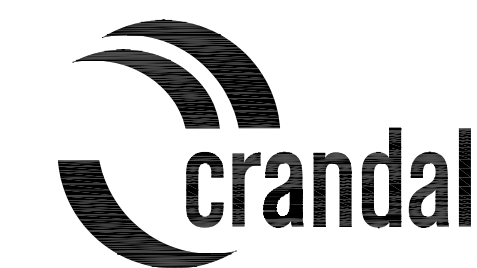
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drawing dessin

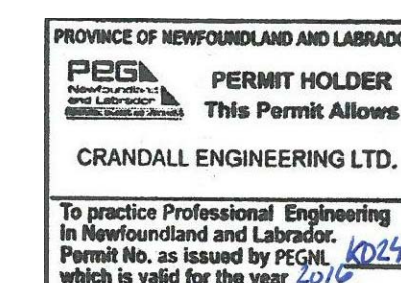
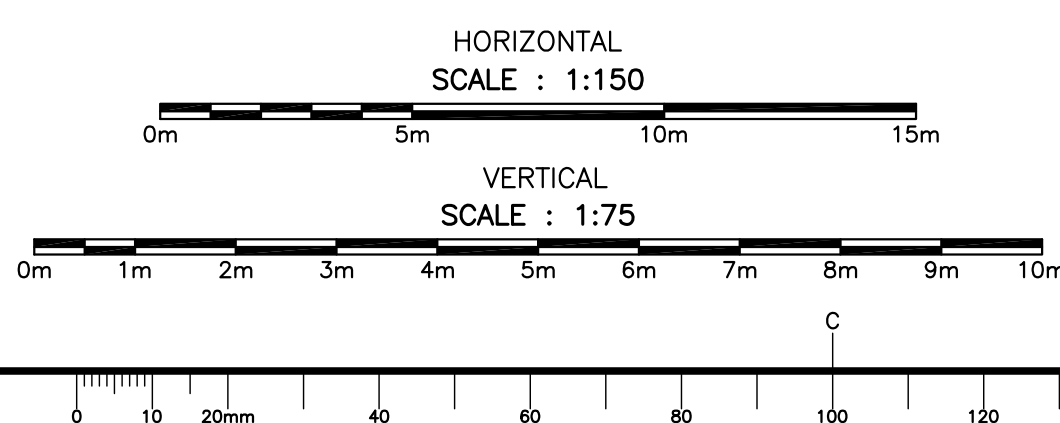
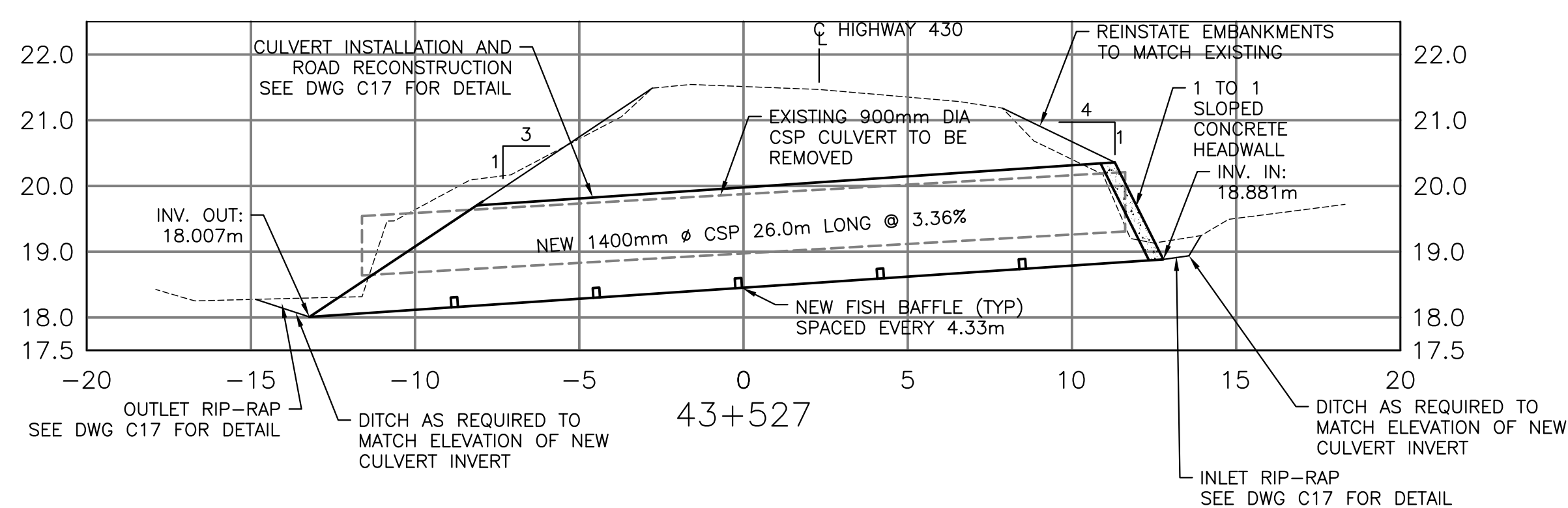
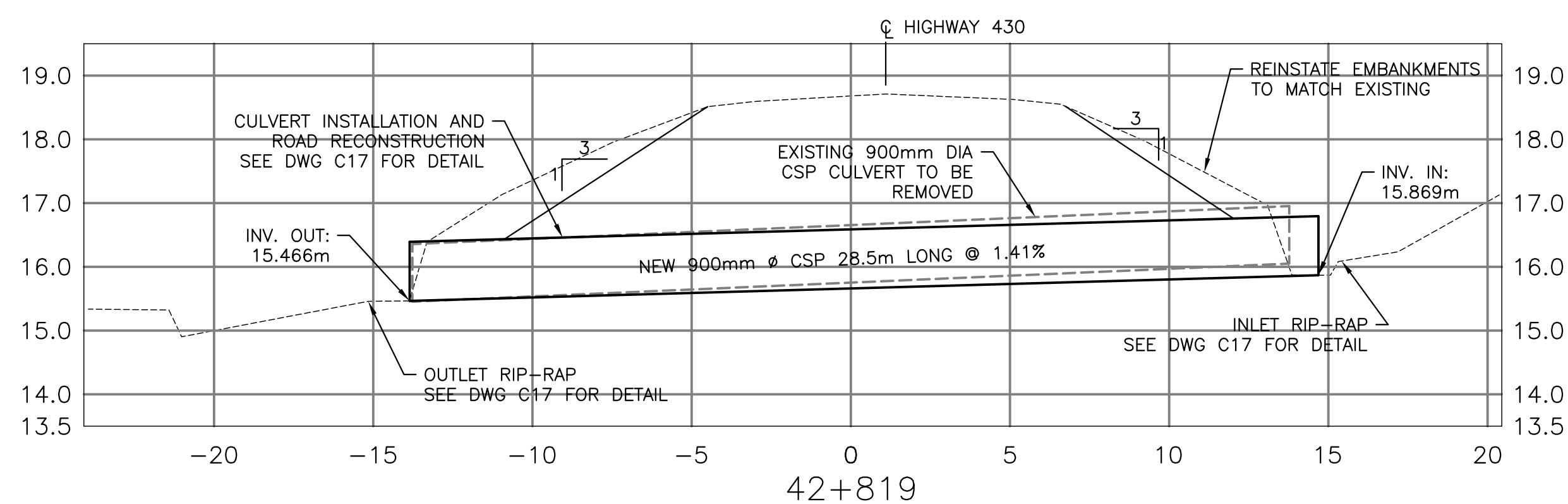
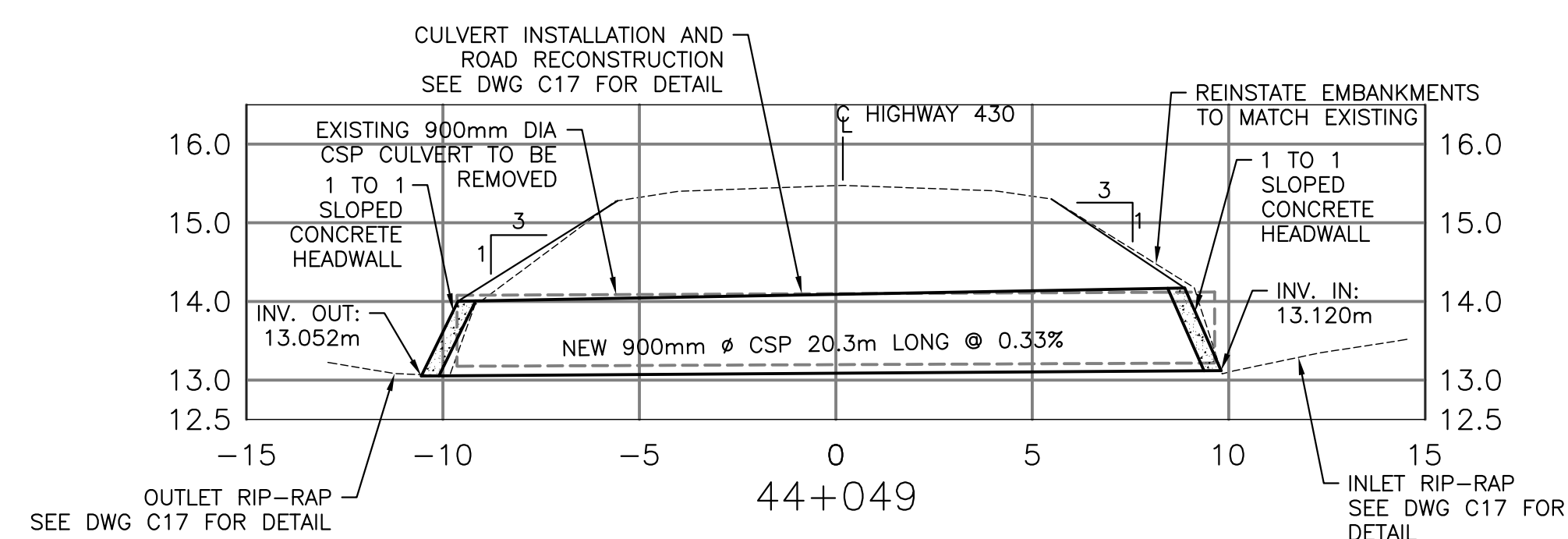
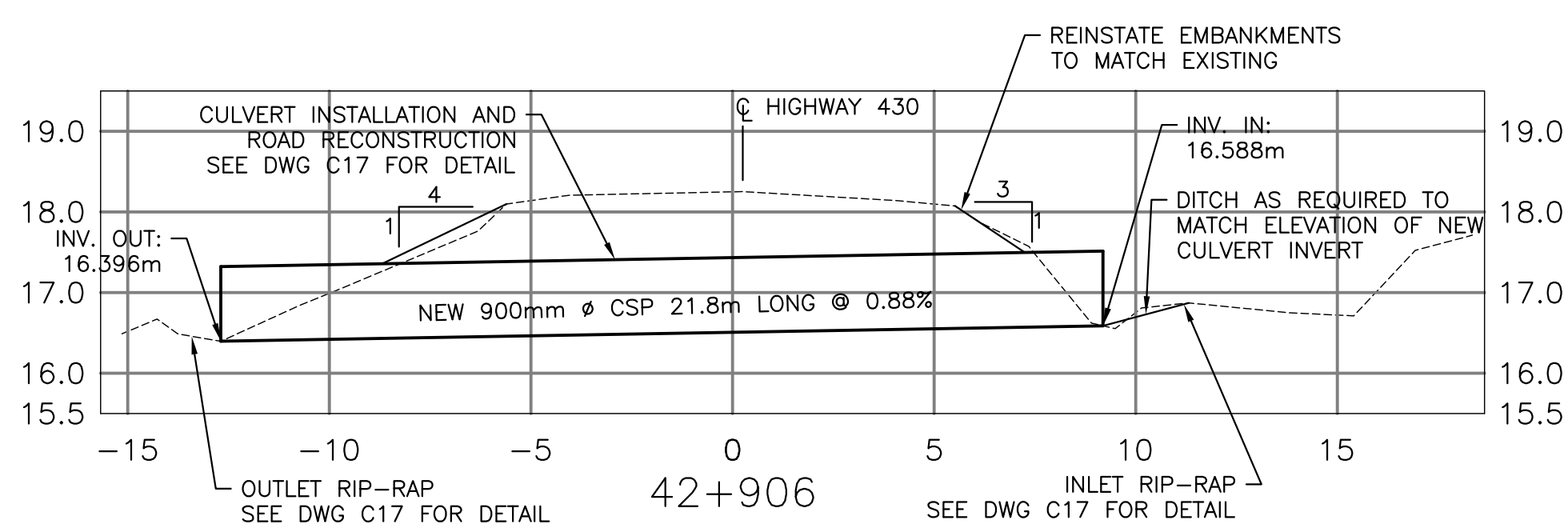
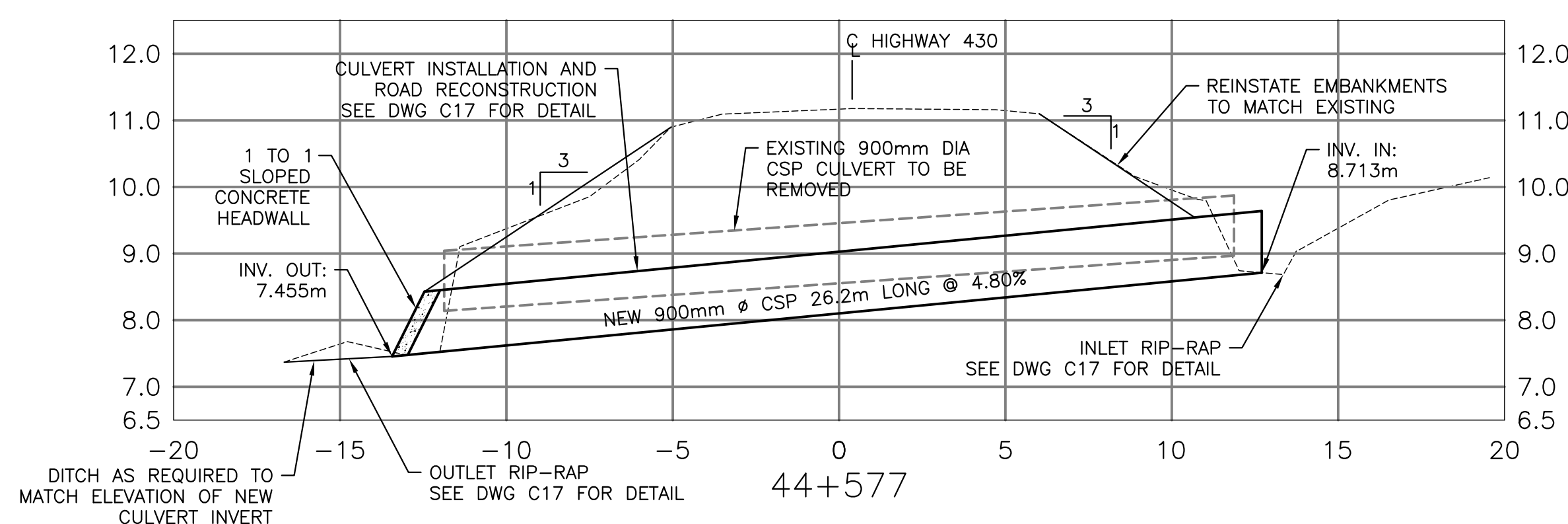
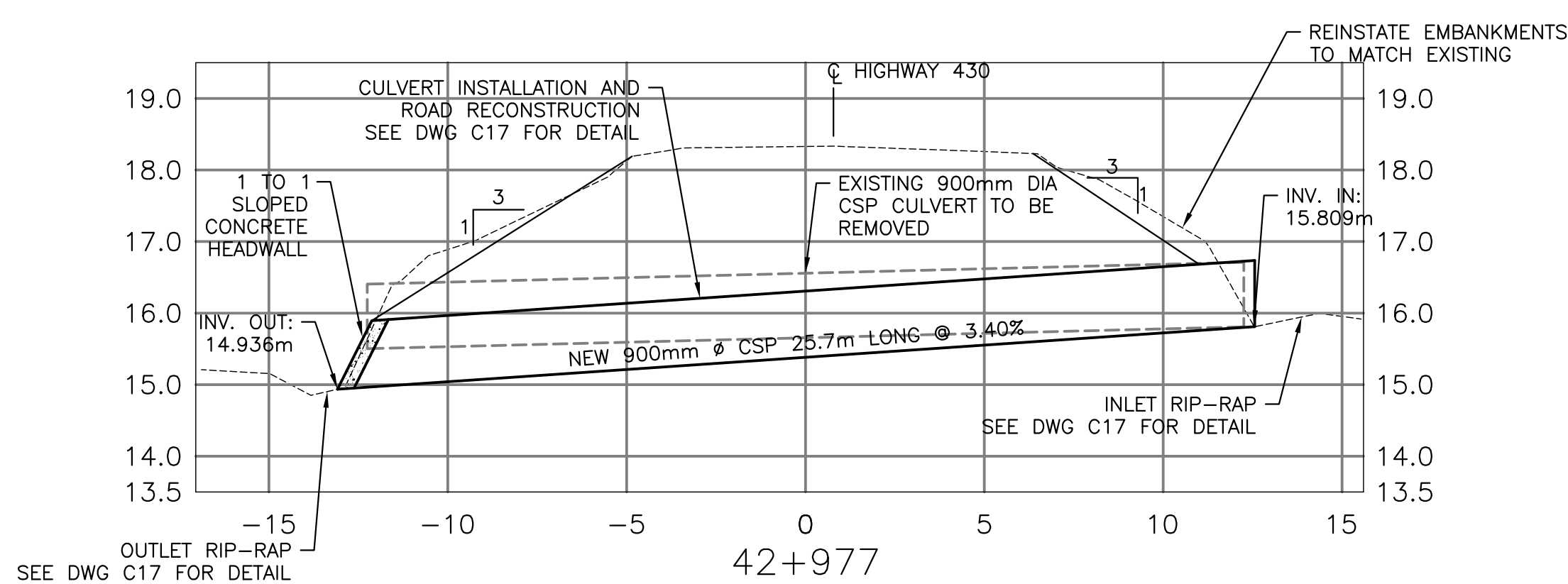
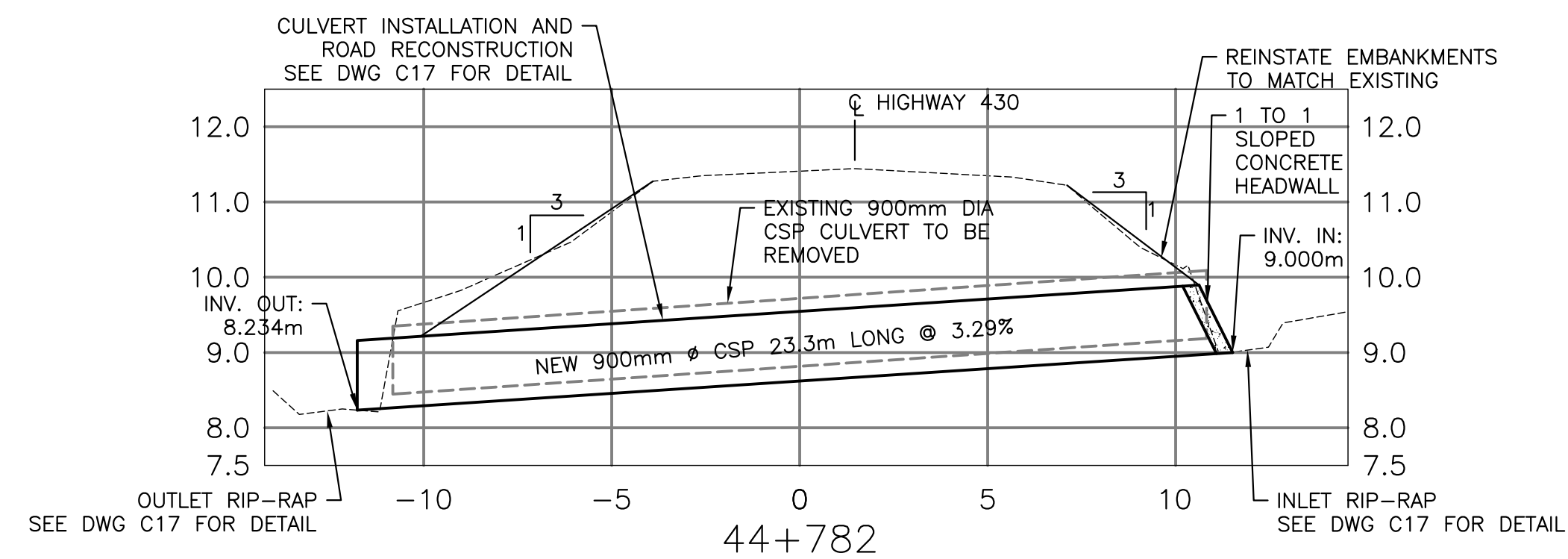
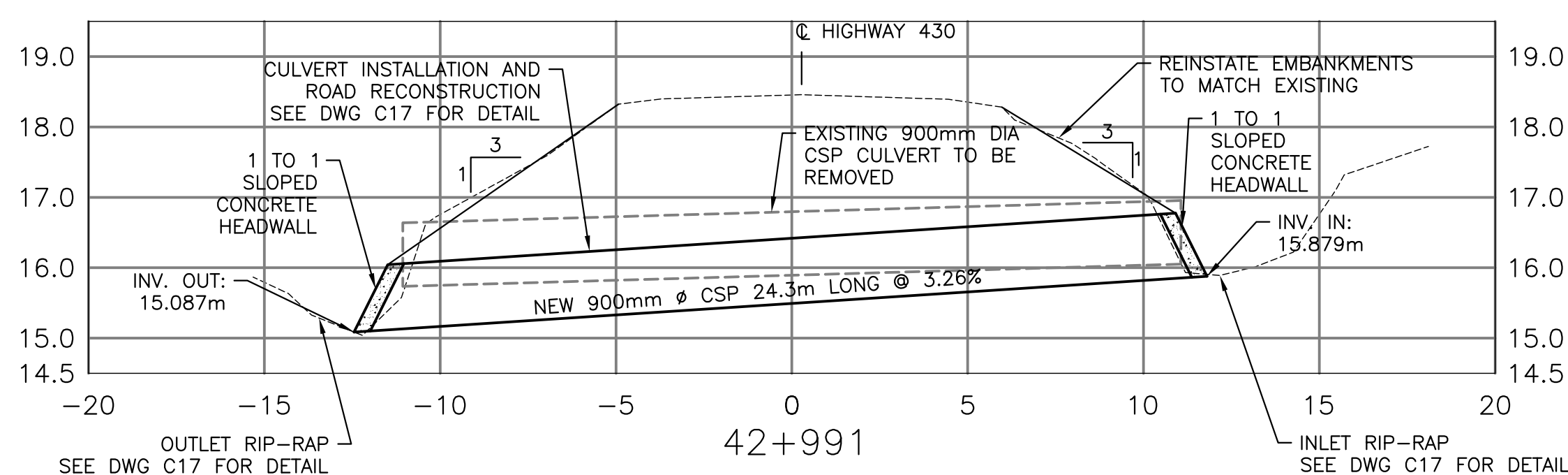
## CULVERT SECTIONS STA. 40+408 TO 42+478

designed G. FLANAGAN	conçu
date DECEMBER 04, 2015	
drawn G. GALLANT	dessiné
date DECEMBER 04, 2015	
approved J.BABIN	approuvé
date DECEMBER 04, 2015	
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PCA Project Manager	Administrateur de projets APC
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C06	





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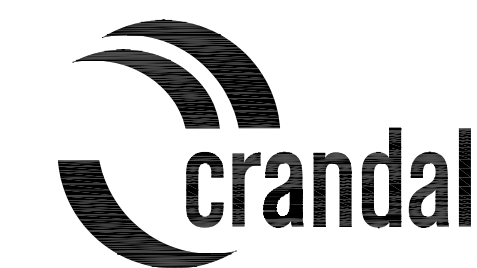
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drawing design

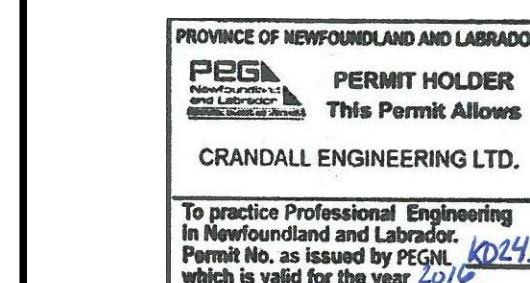
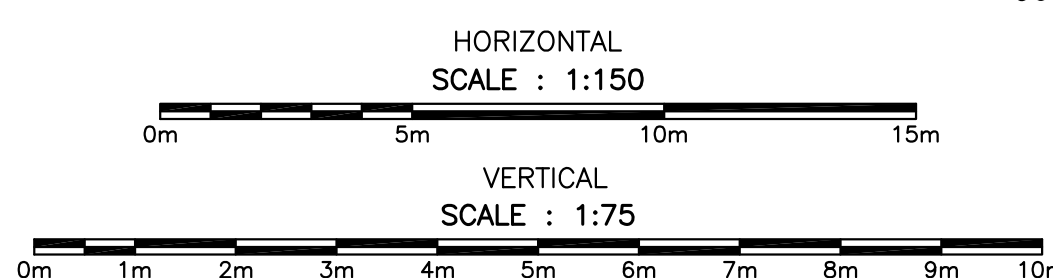
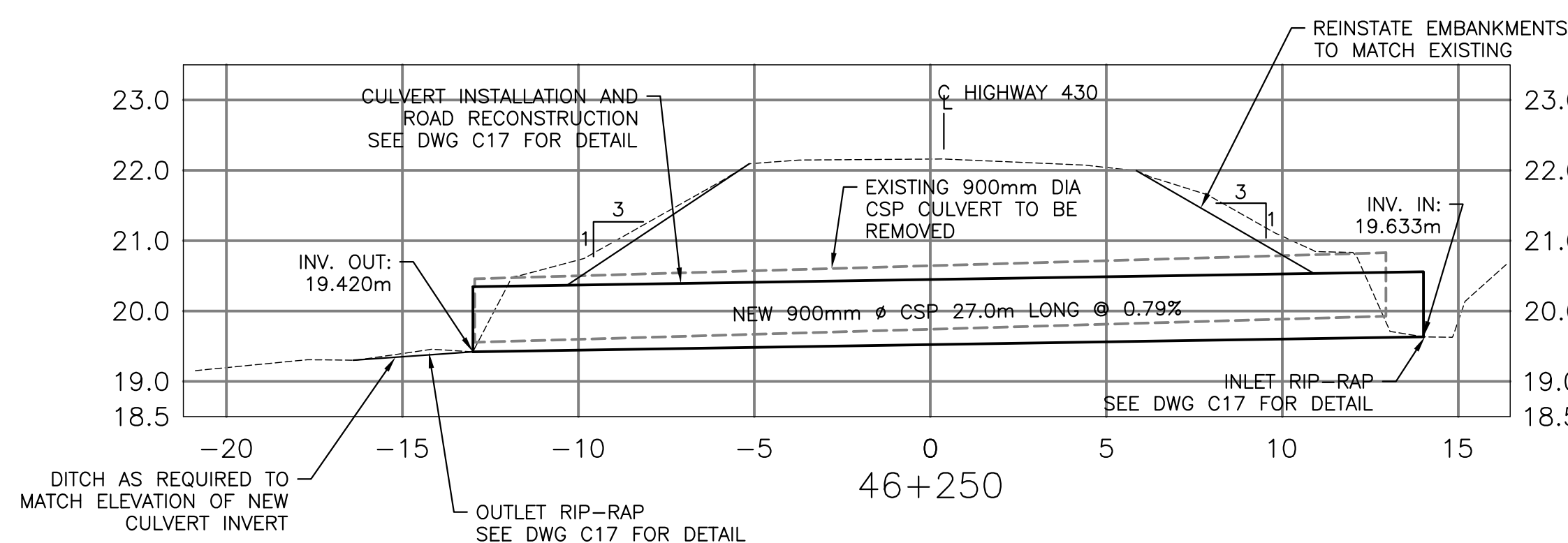
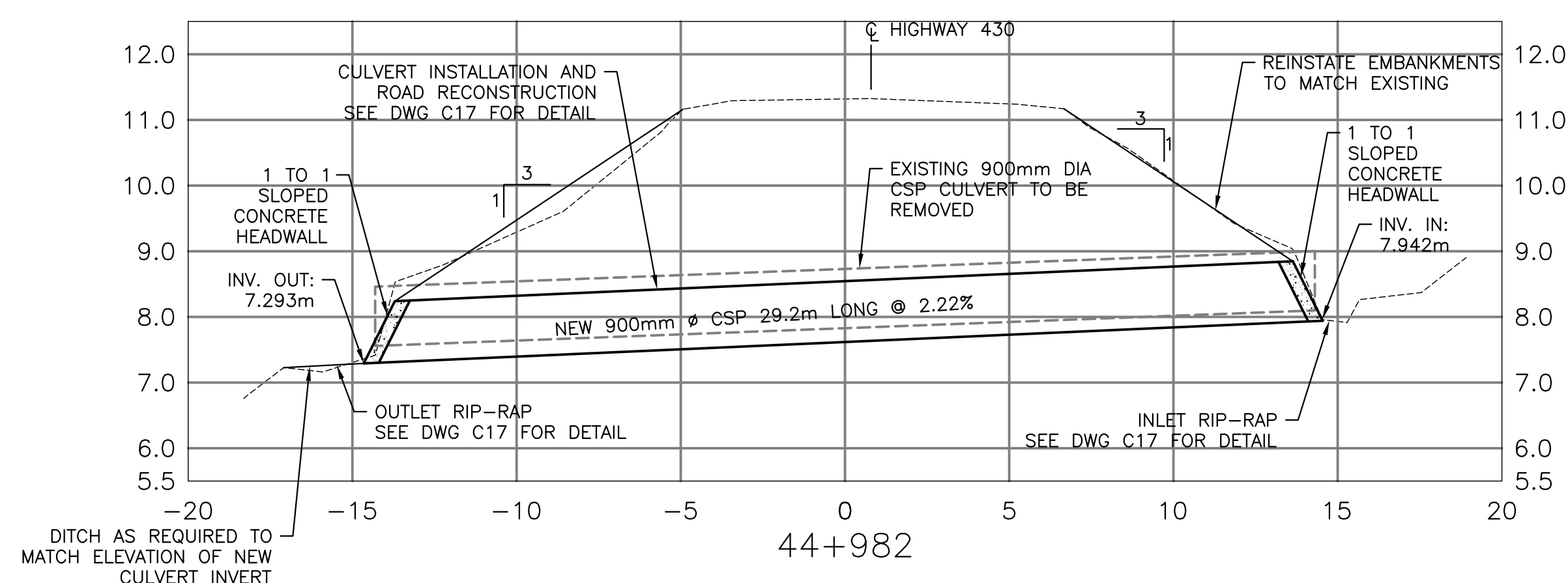
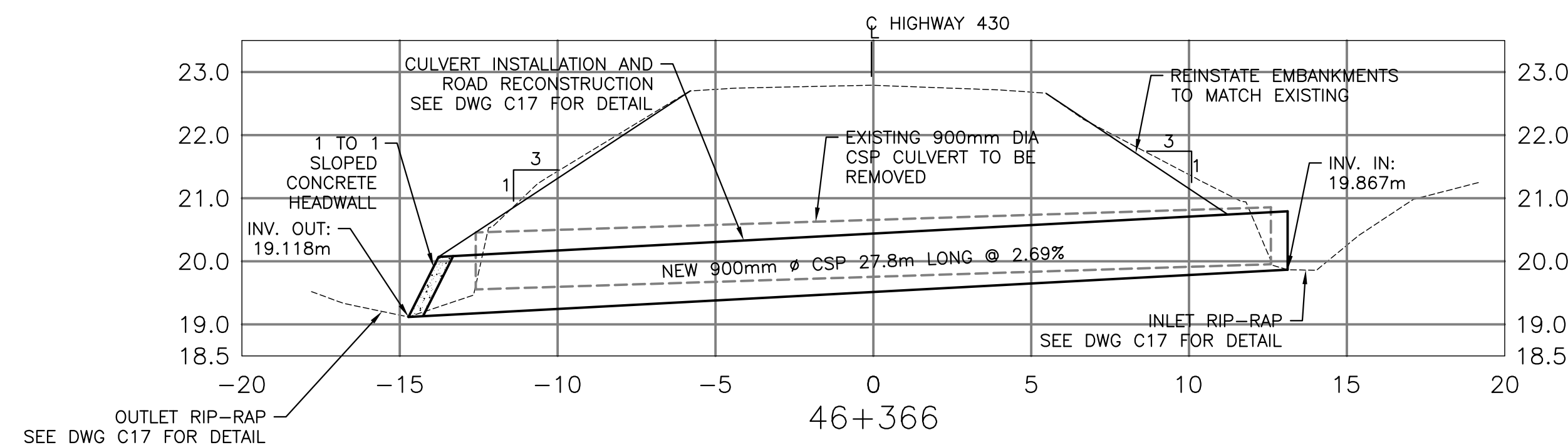
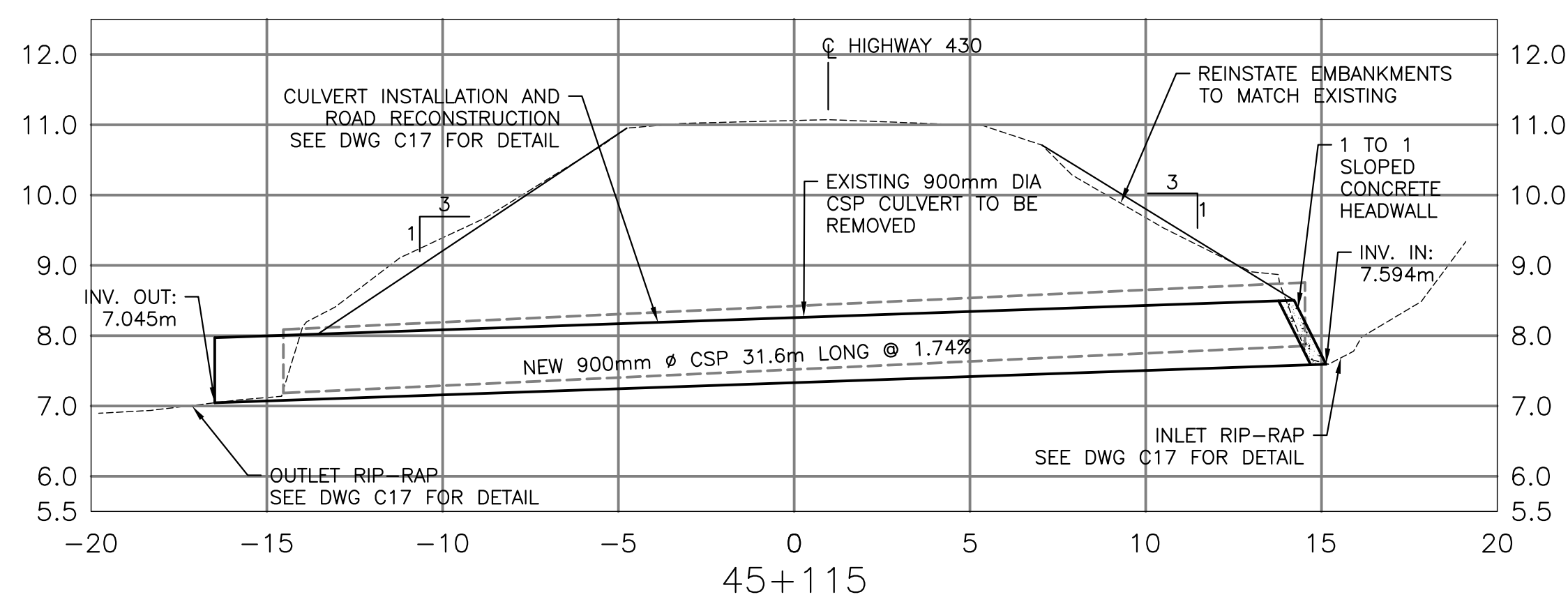
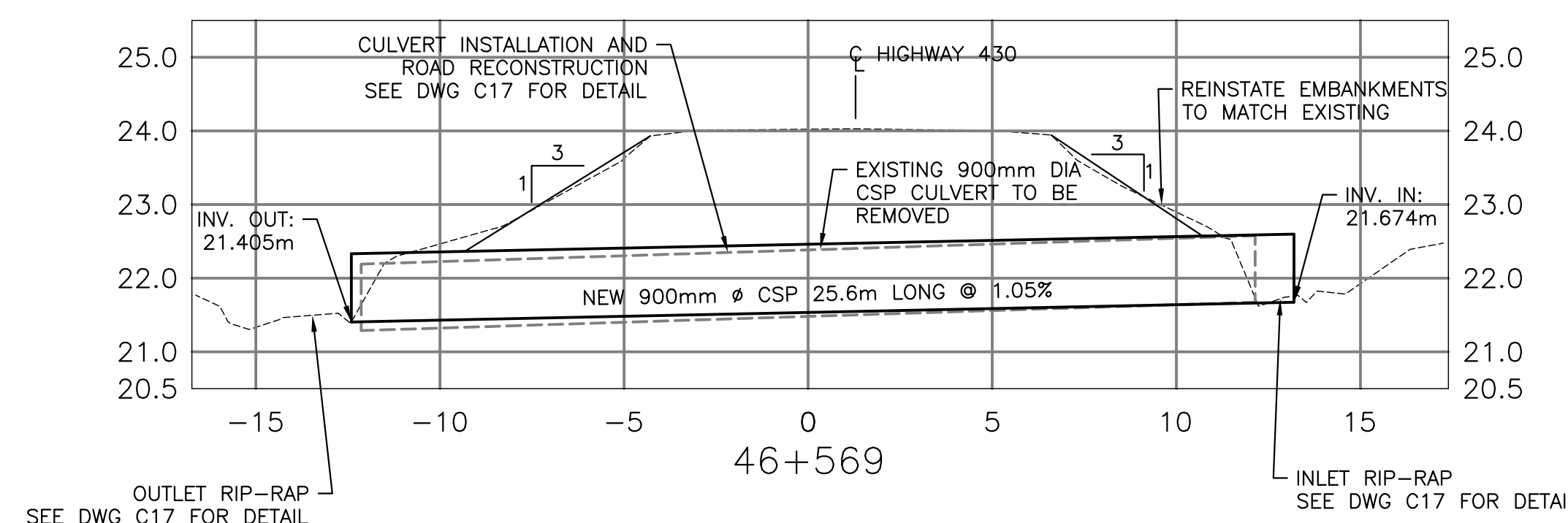
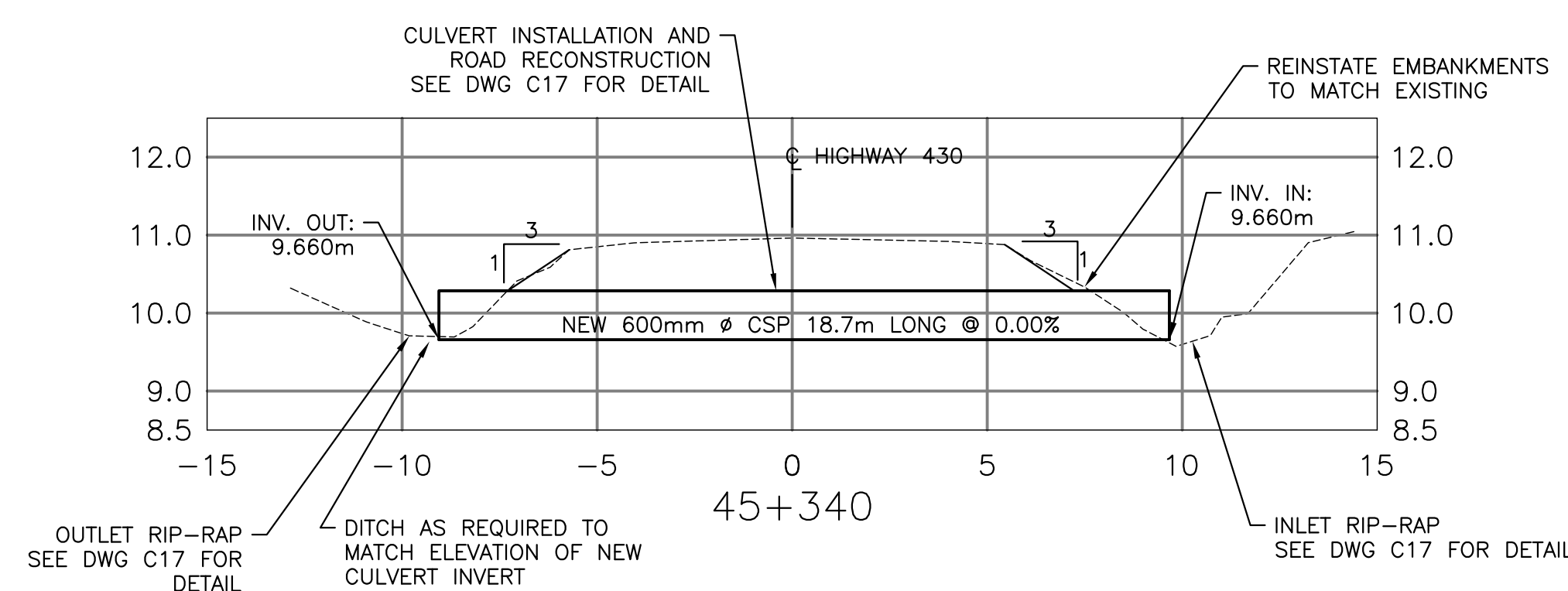
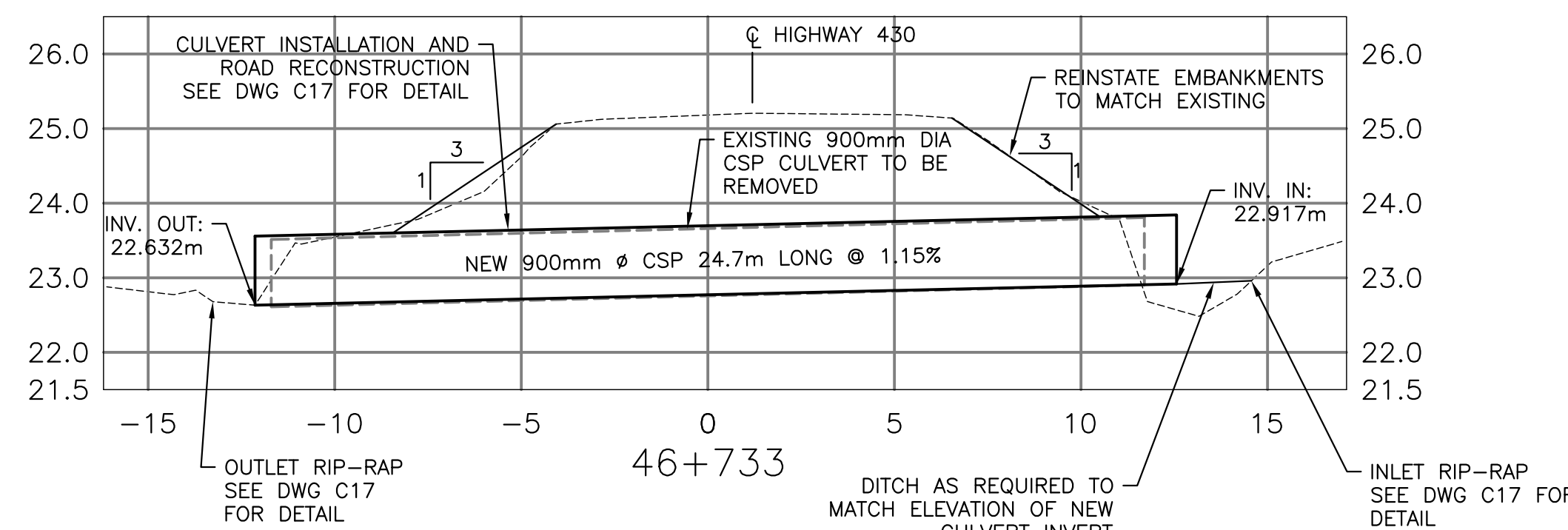
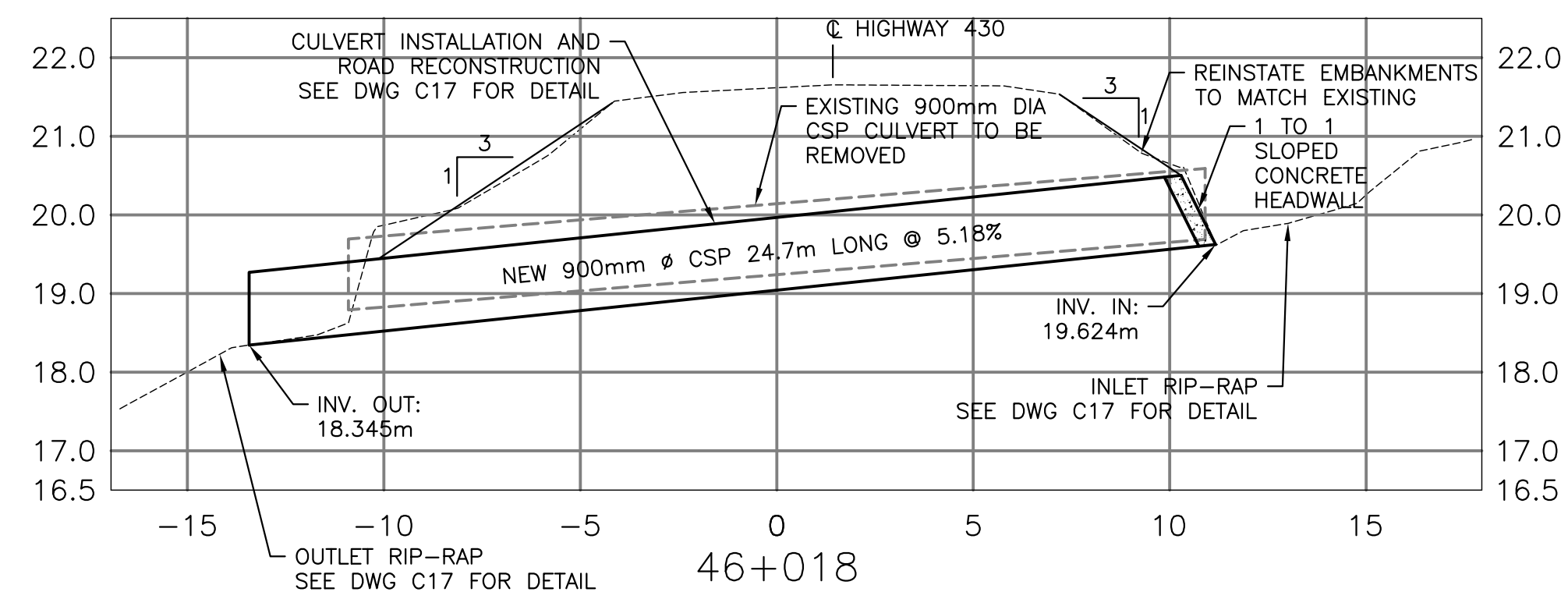
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designed G. FLANAGAN	conçu
date DECEMBER 04, 2015	
drawn G. GALLANT	dessiné
date DECEMBER 04, 2015	
approved J. BABIN	approuvé
date DECEMBER 04, 2015	
Tender	Soumission
PCA Project Manager	Administrateur de projets APC
project number	no. du projet
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drawing no.	no. du dessin
C07	





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project

## HIGHWAY 430 NORTH (KMS 39.9 TO 88.5) RECAPITALIZATION

drawing

## CULVERT SECTIONS STA. 44+982 TO 46+733

designed G. FLANAGAN

date DECEMBER 04, 2015

drawn G. GALLANT

date DECEMBER 04, 2015

approved J. BABIN

date DECEMBER 04, 2015

Tender

PCA Project Manager

Administrateur de projets APC

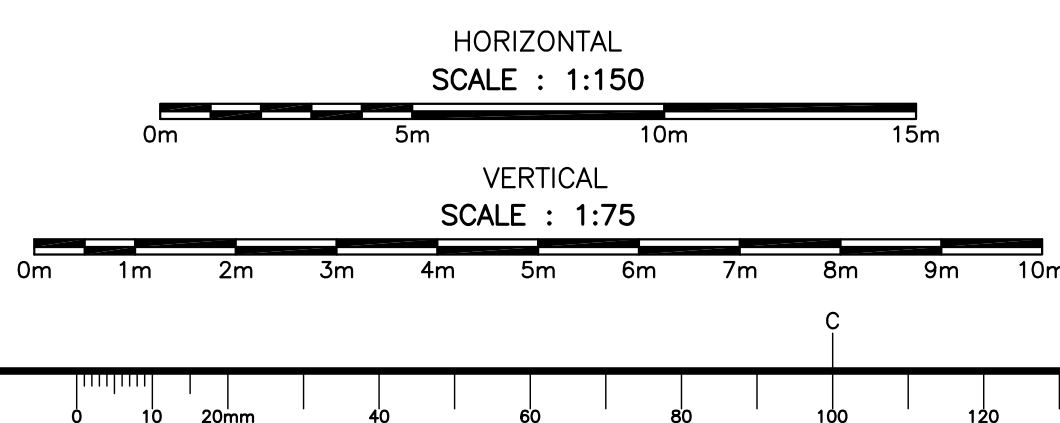
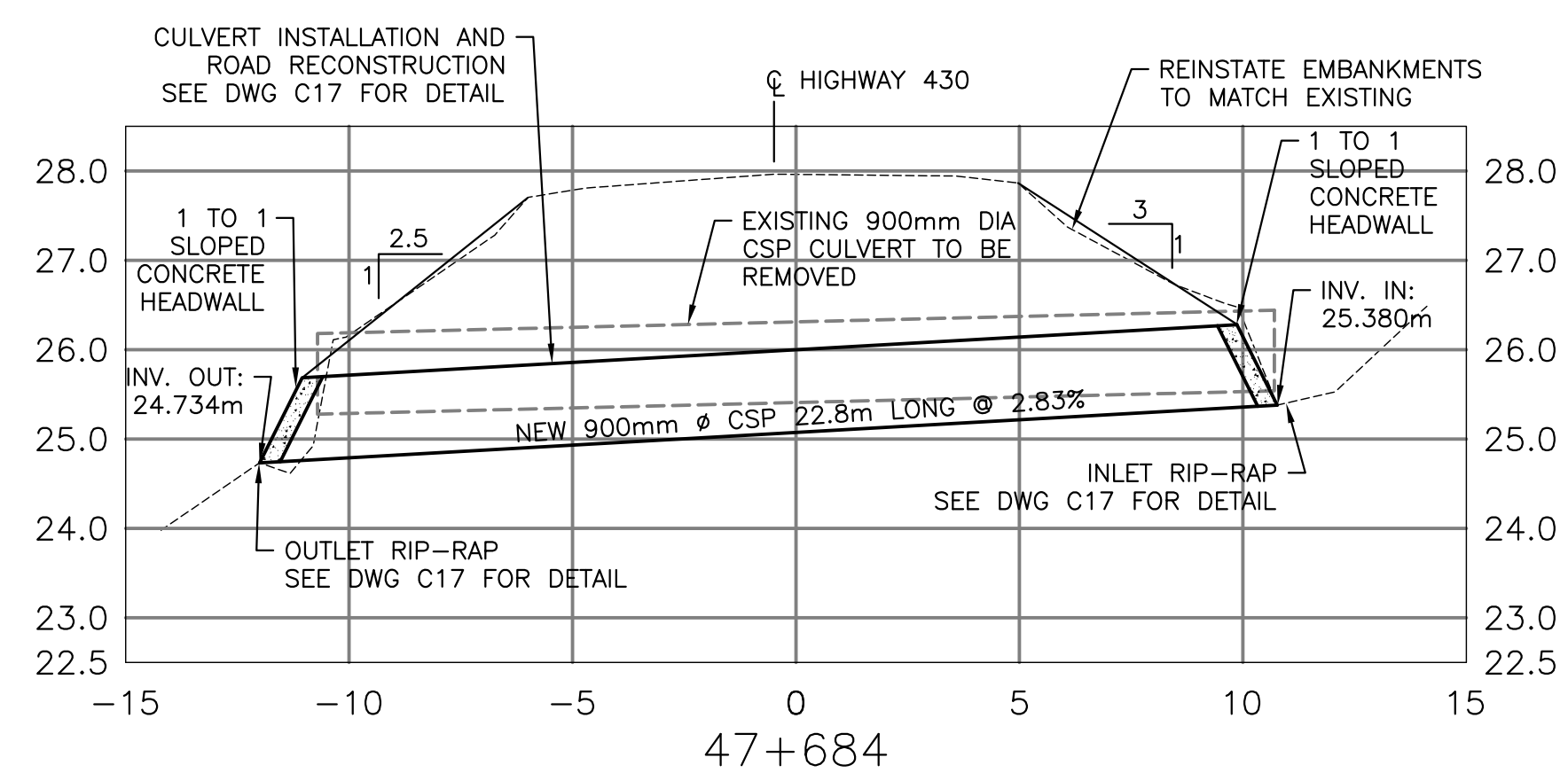
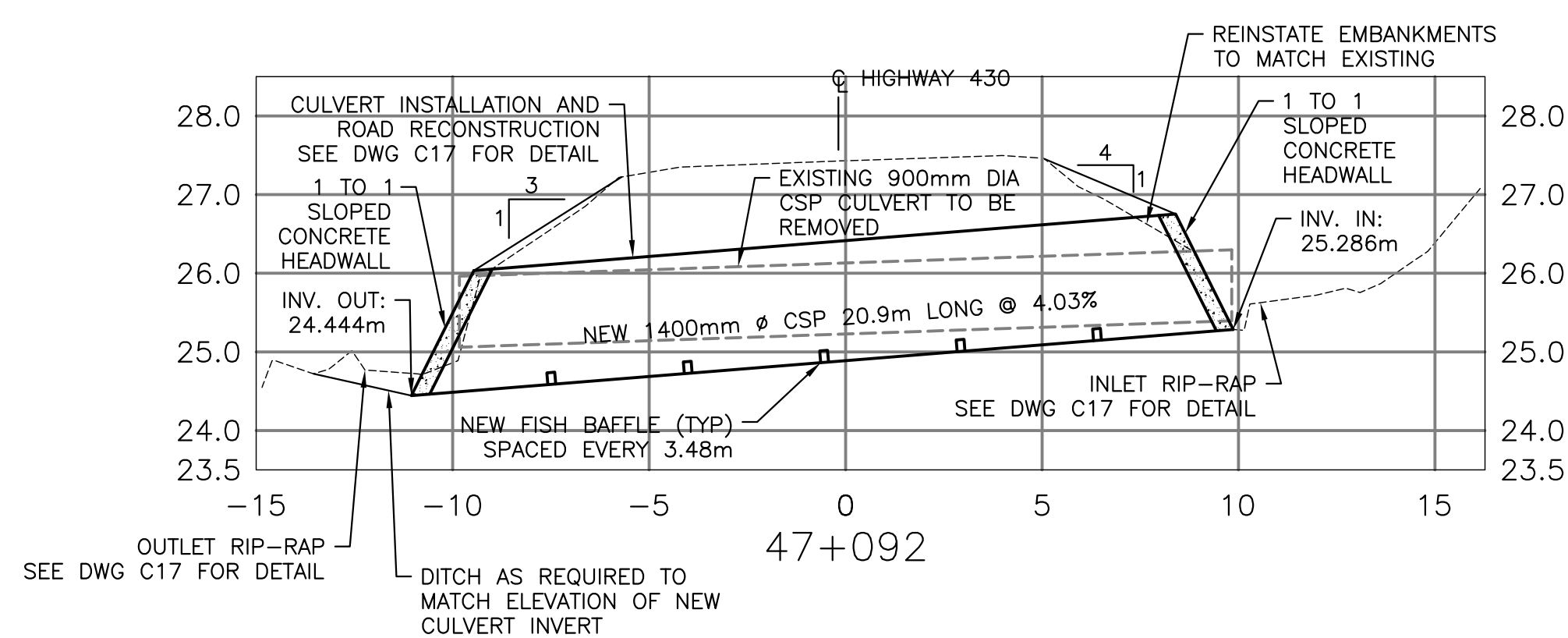
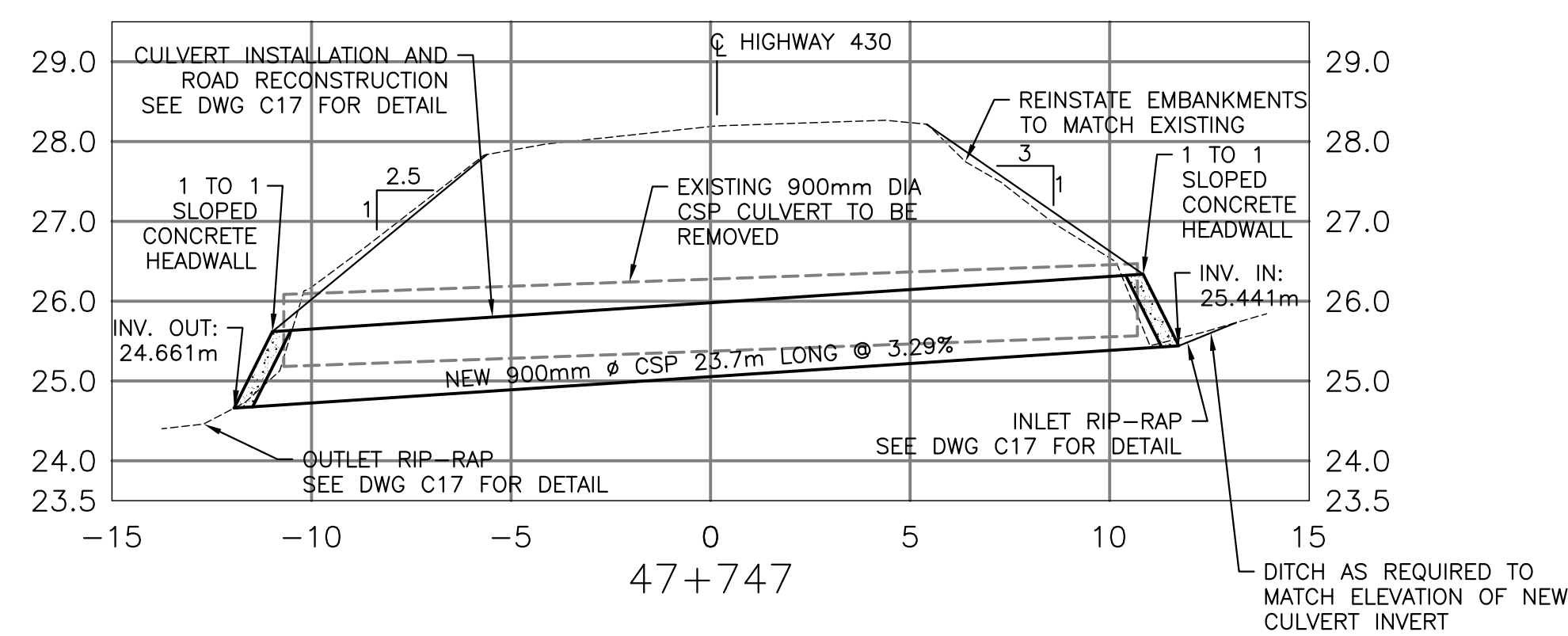
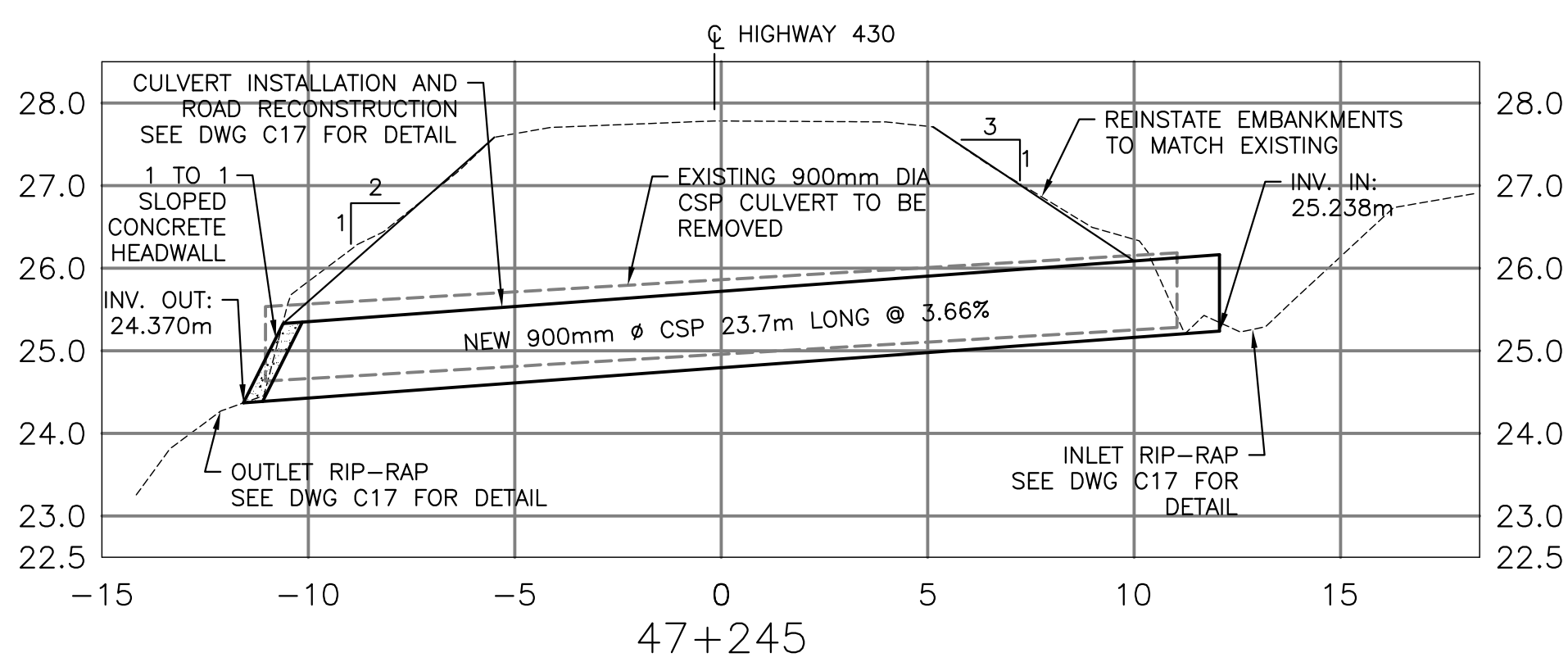
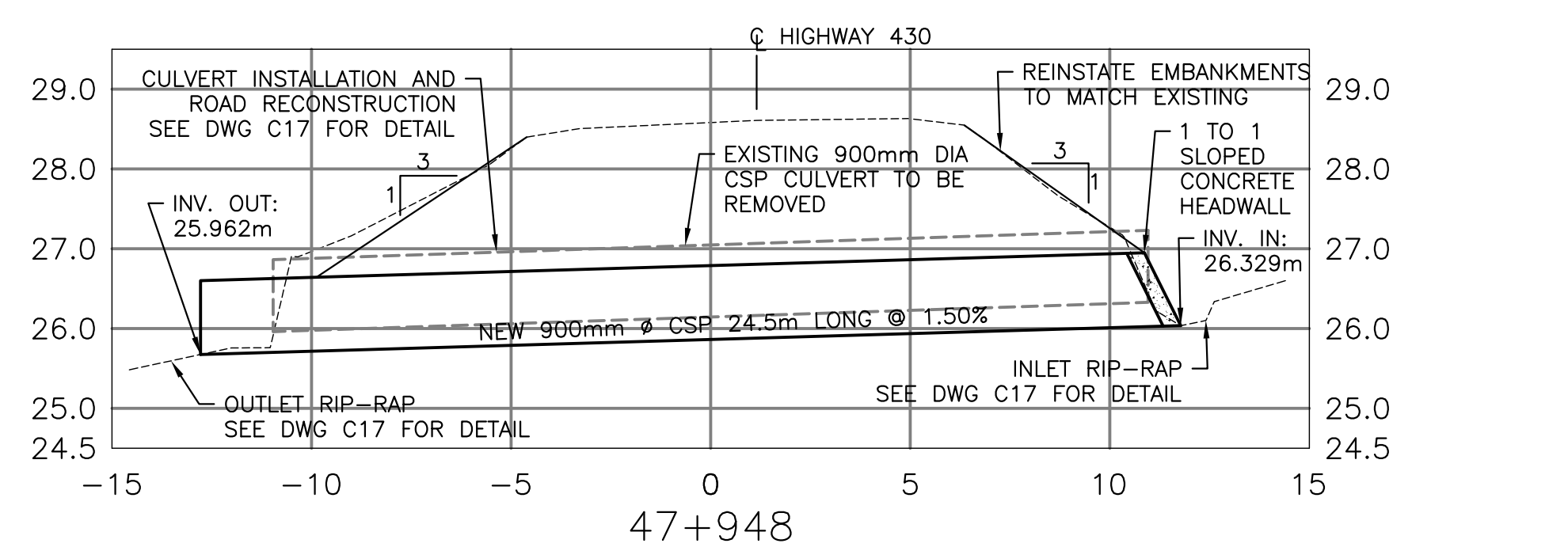
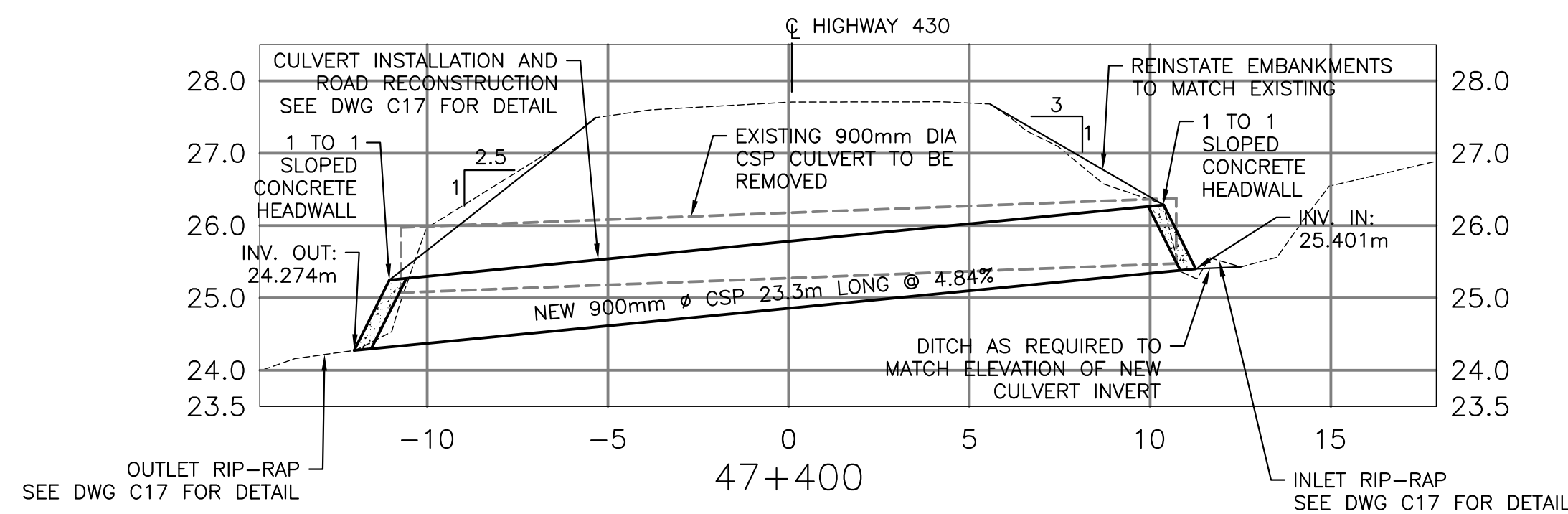
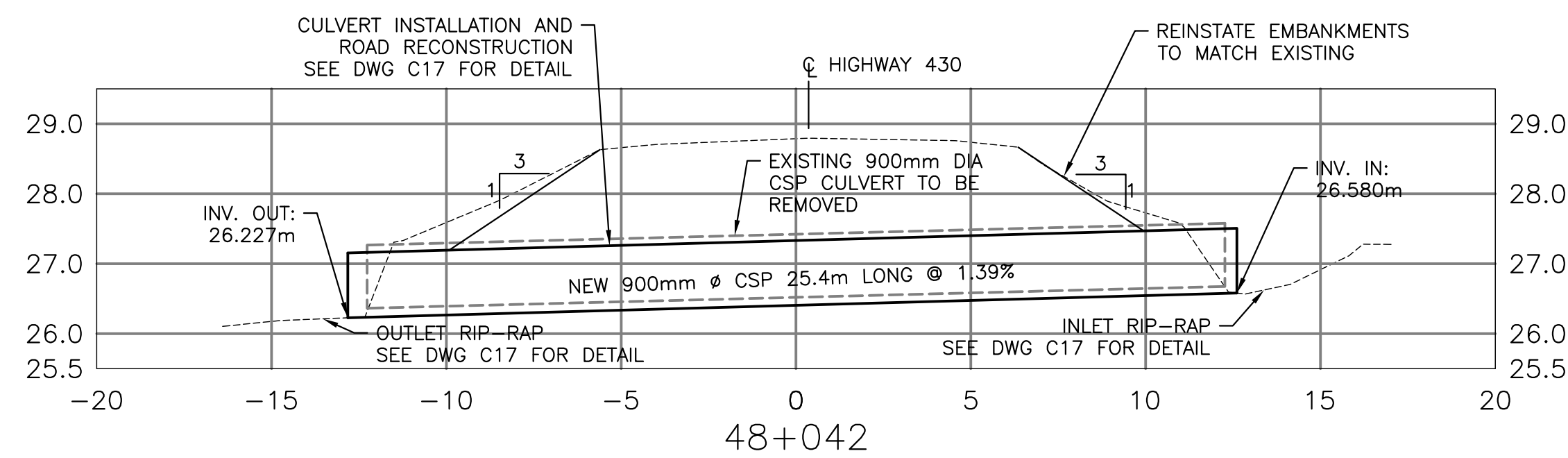
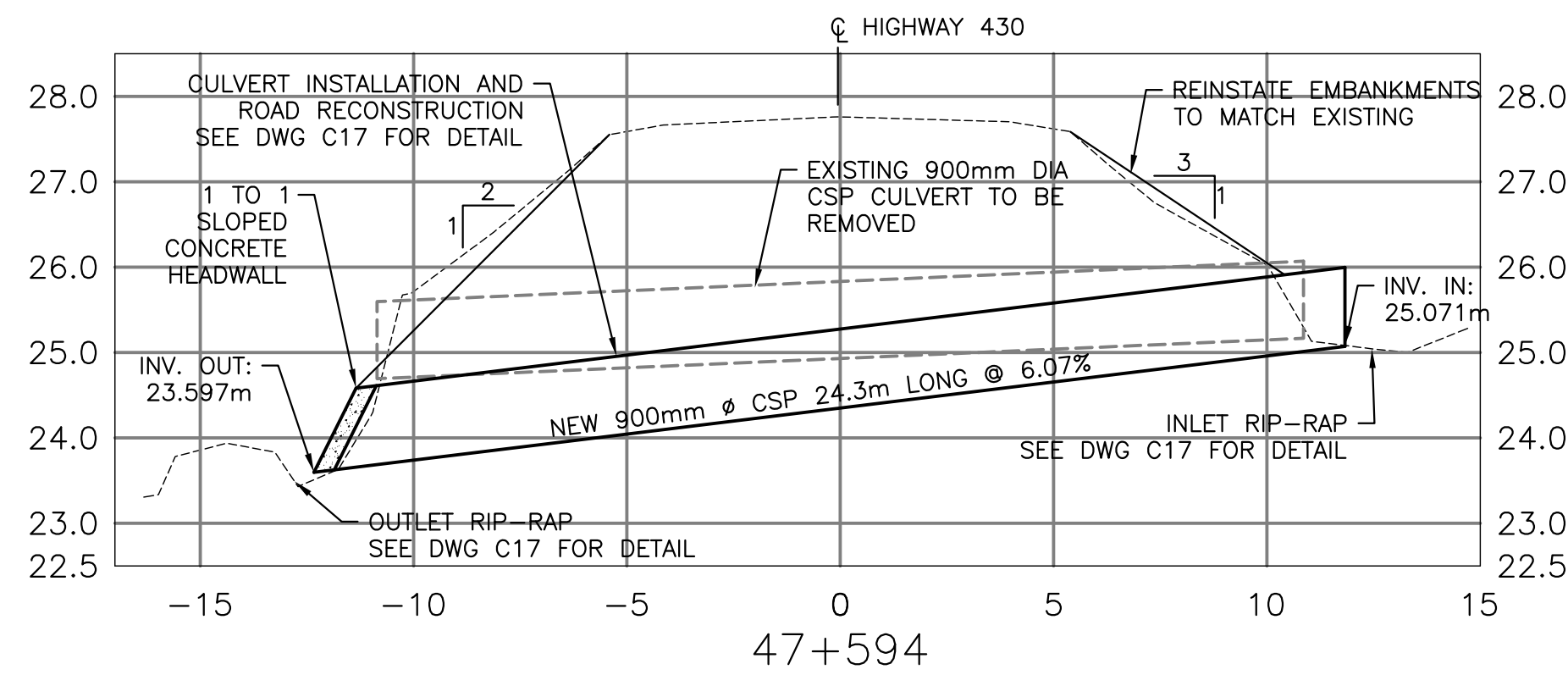
project number

PCA NO.: 1350

drawing no.

C08





MONCTON 1077 King St. George Blvd. 133 Prince William Street 344 702 344 702  
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project

## HIGHWAY 430 NORTH (KMS 39.9 TO 88.5) RECAPITALIZATION

drawing

### CULVERT SECTIONS STA. 47+092 TO 48+042

designed G. FLANAGAN

date DECEMBER 04, 2015

drawn G. GALLANT

date DECEMBER 04, 2015

approved J.BABIN

date DECEMBER 04, 2015

Tender

PCA Project Manager

Administrateur de projets APC

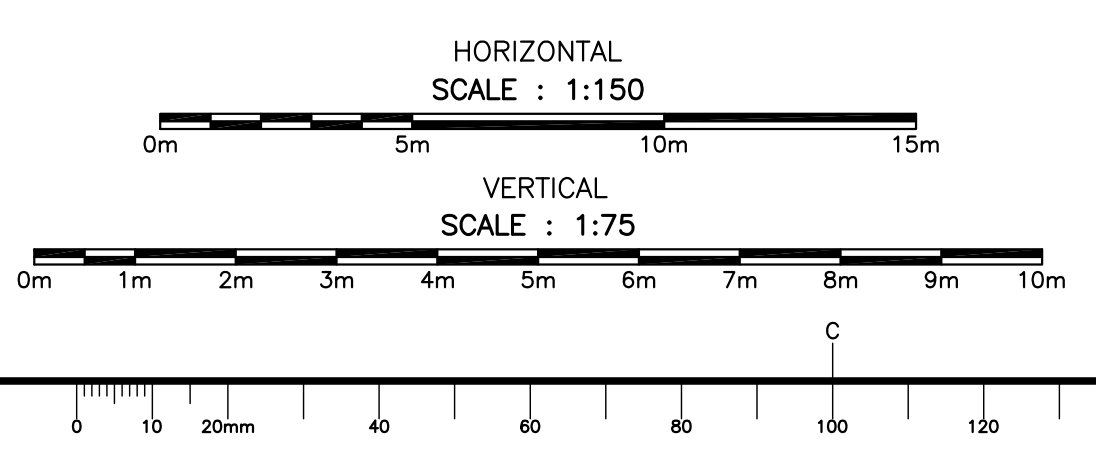
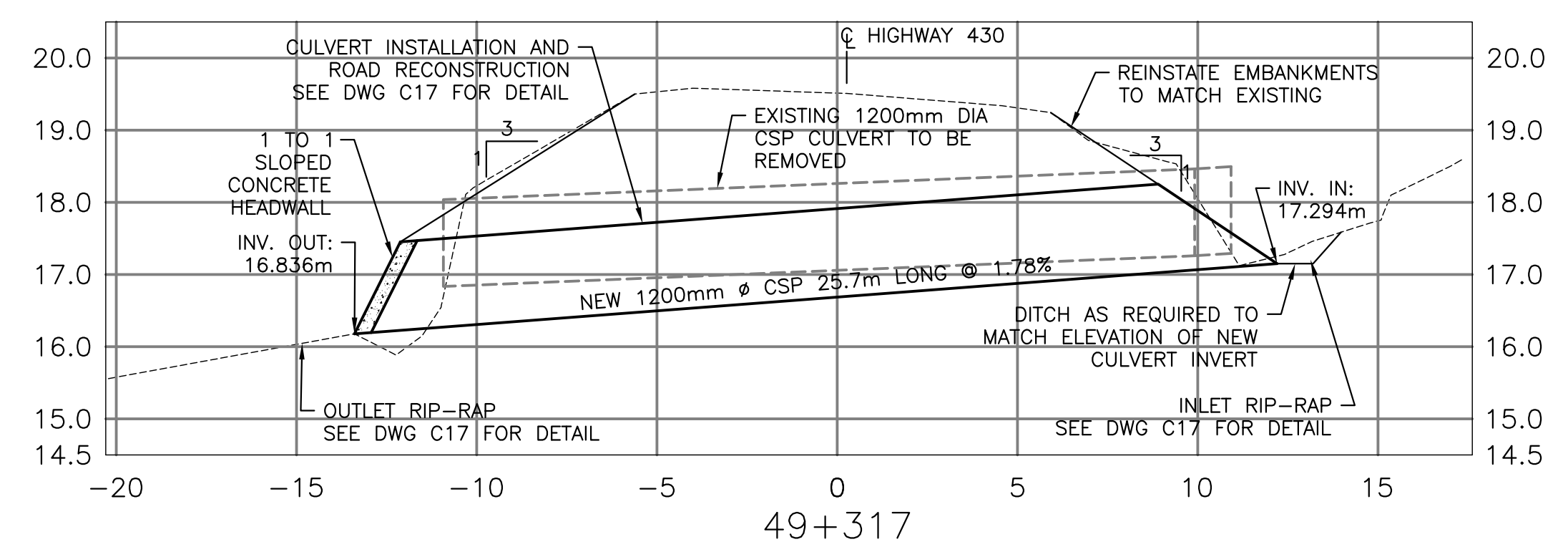
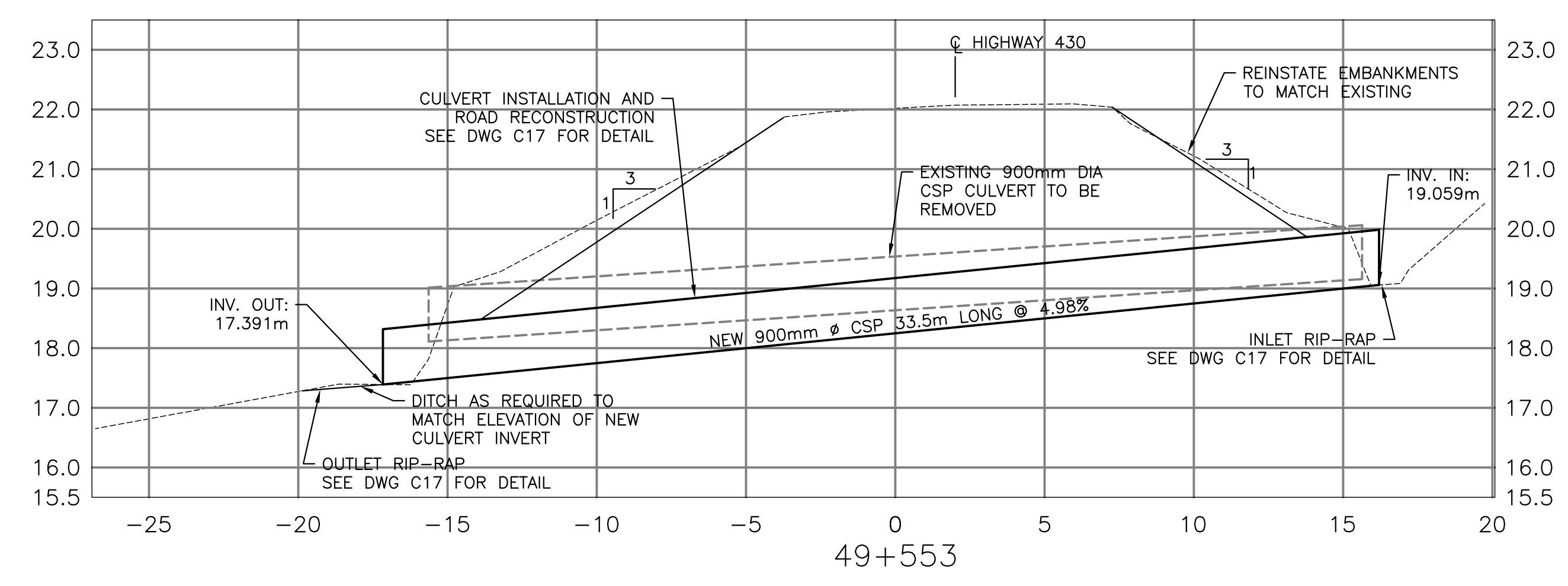
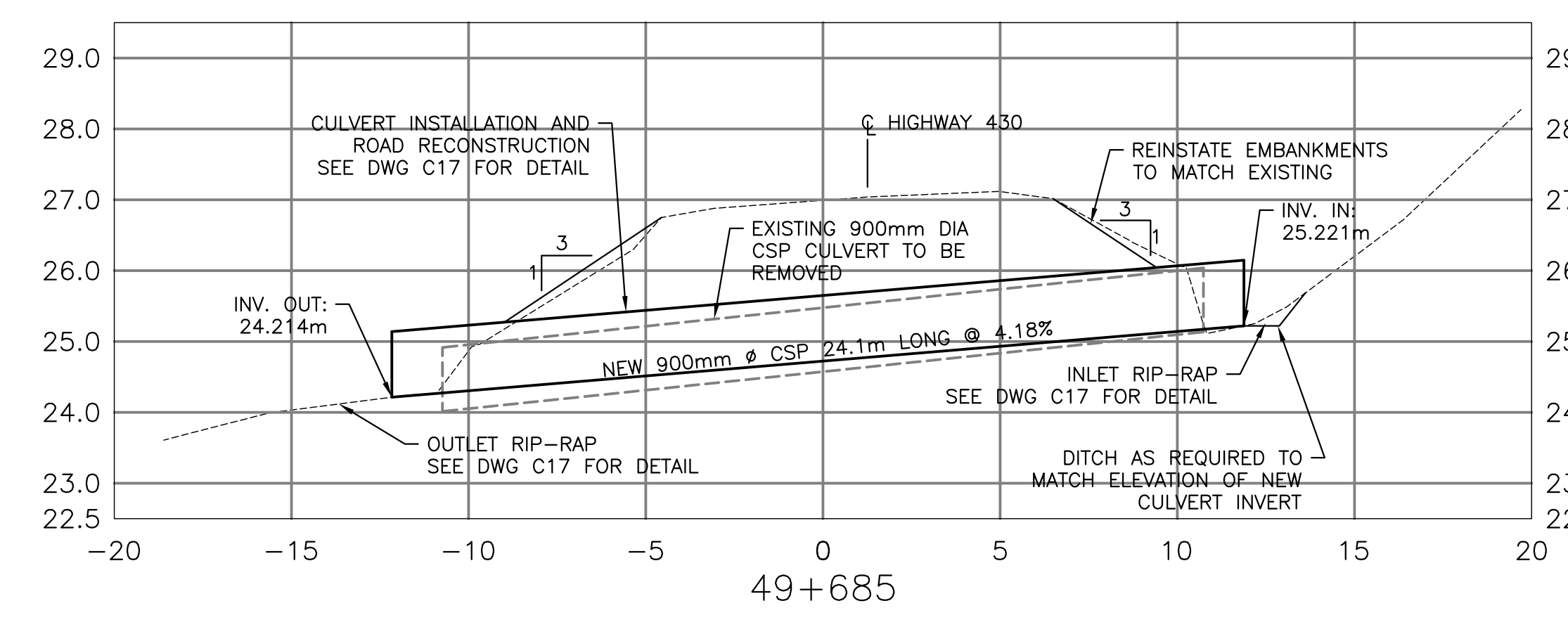
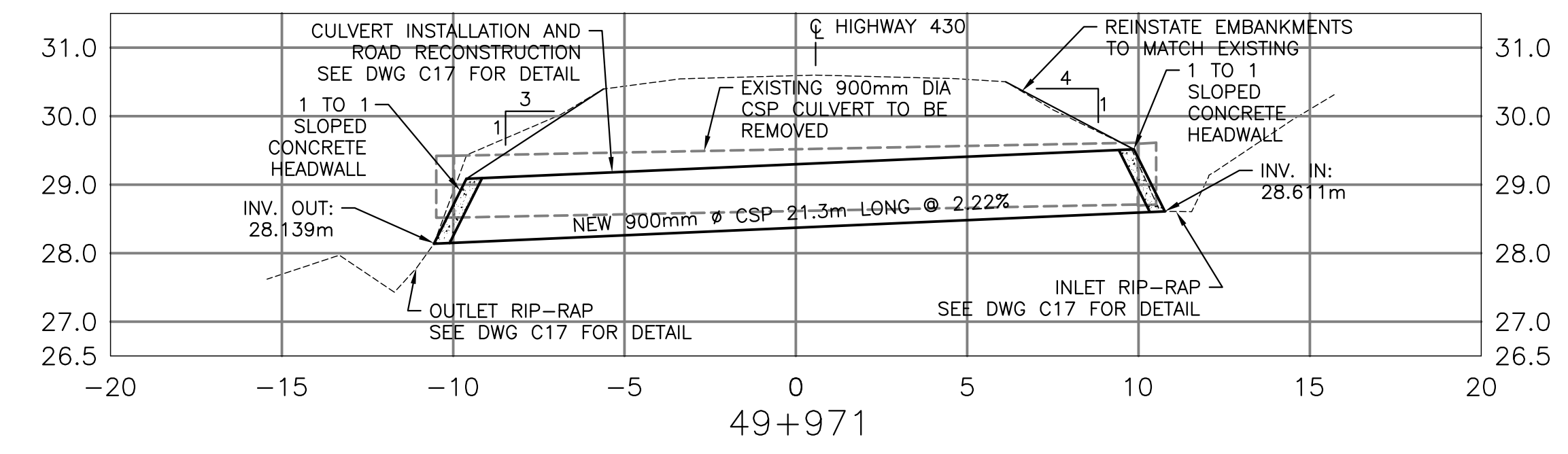
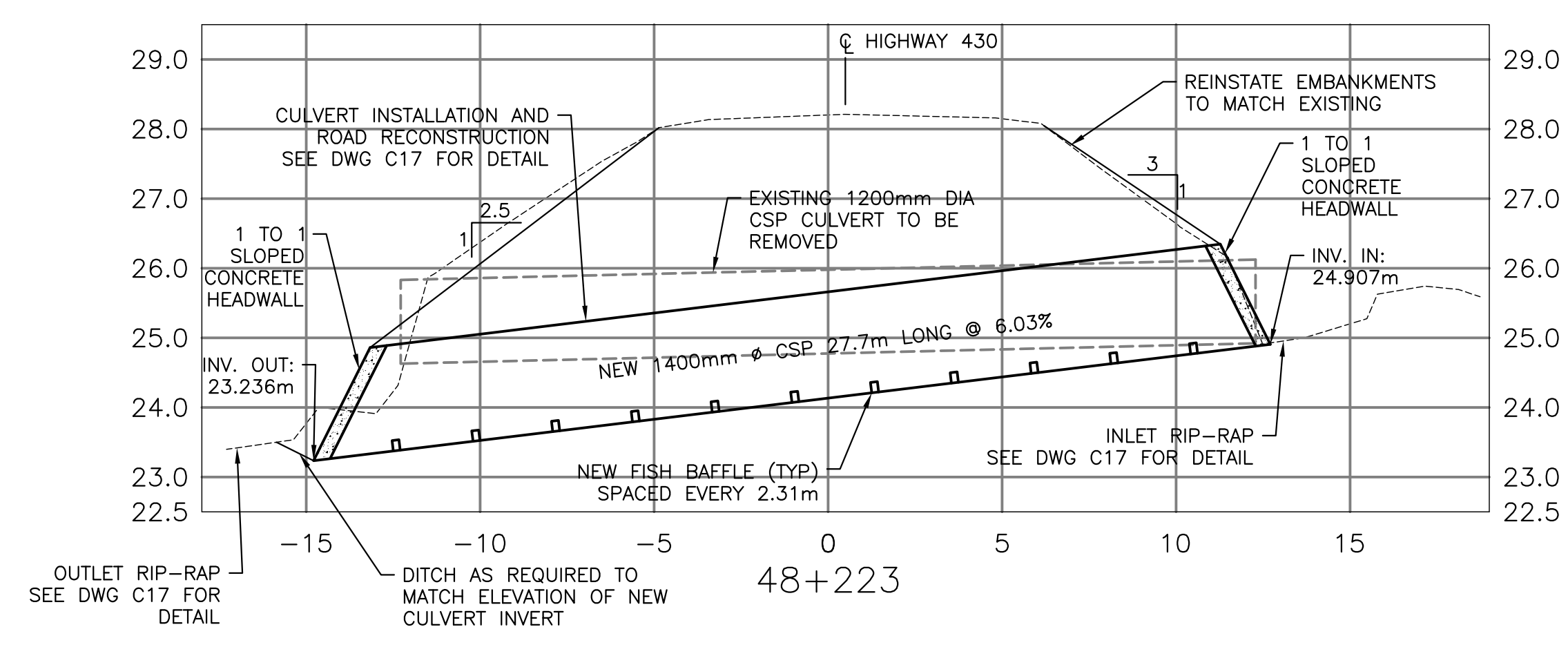
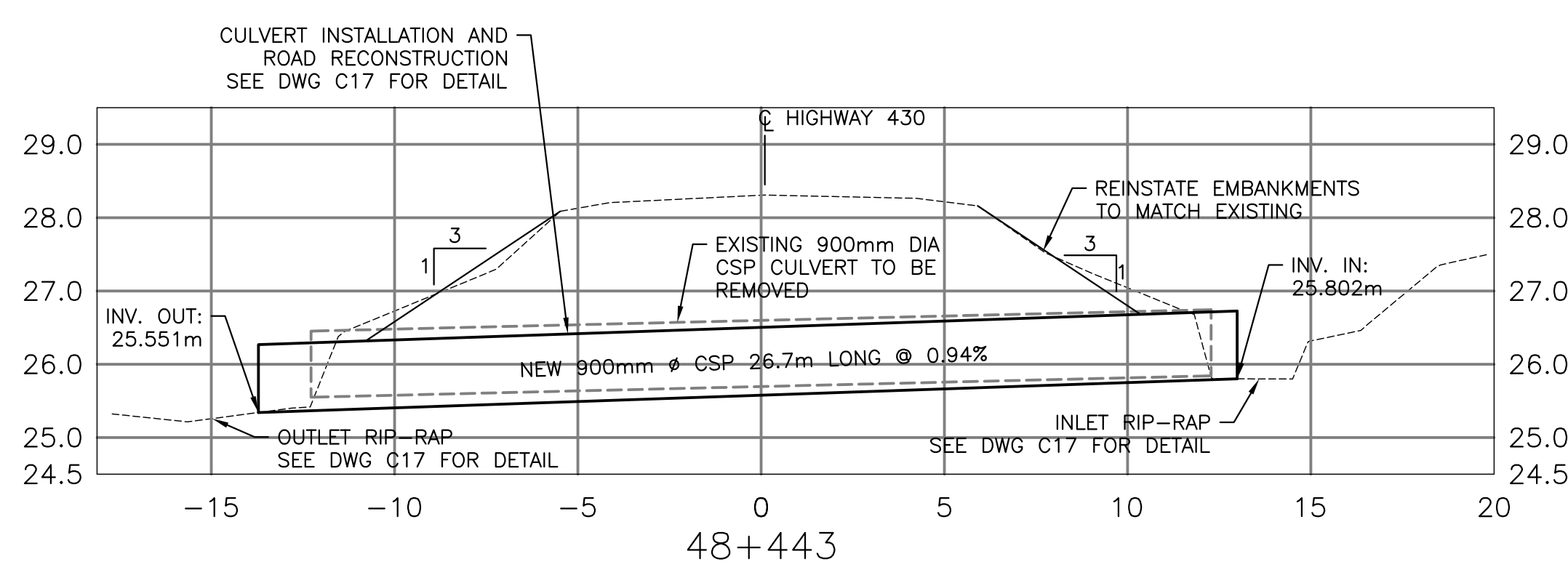
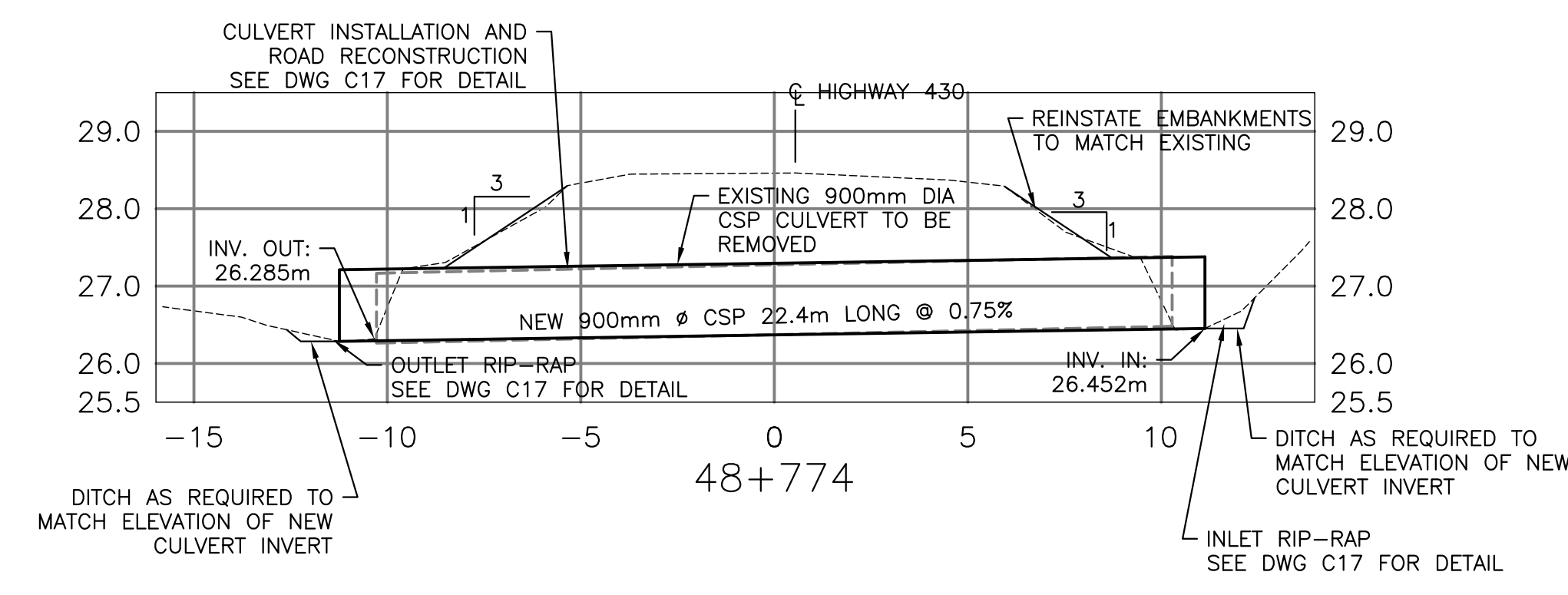
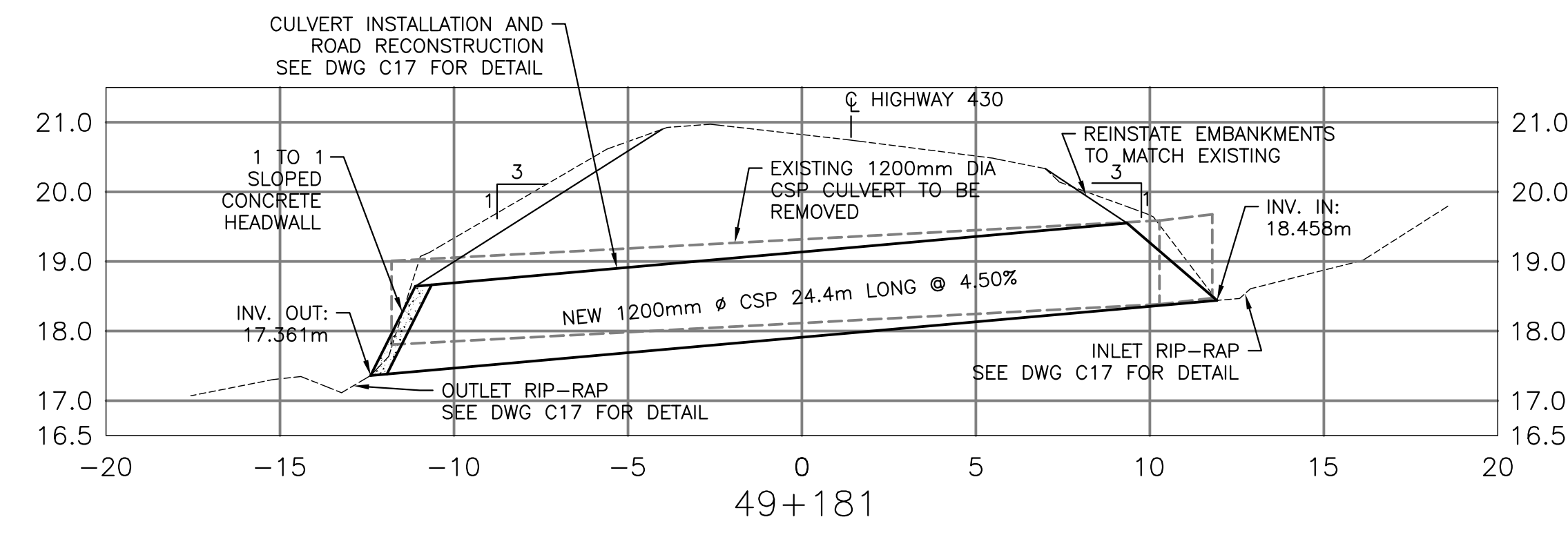
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drawing no.

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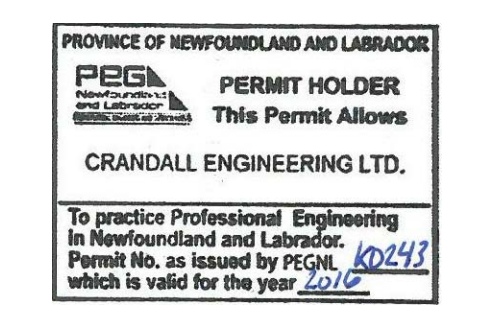




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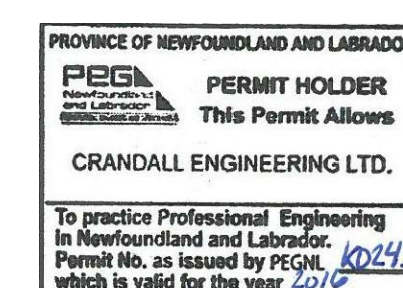
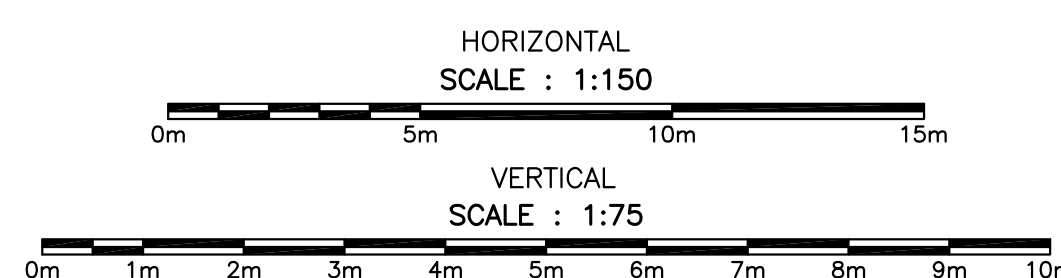
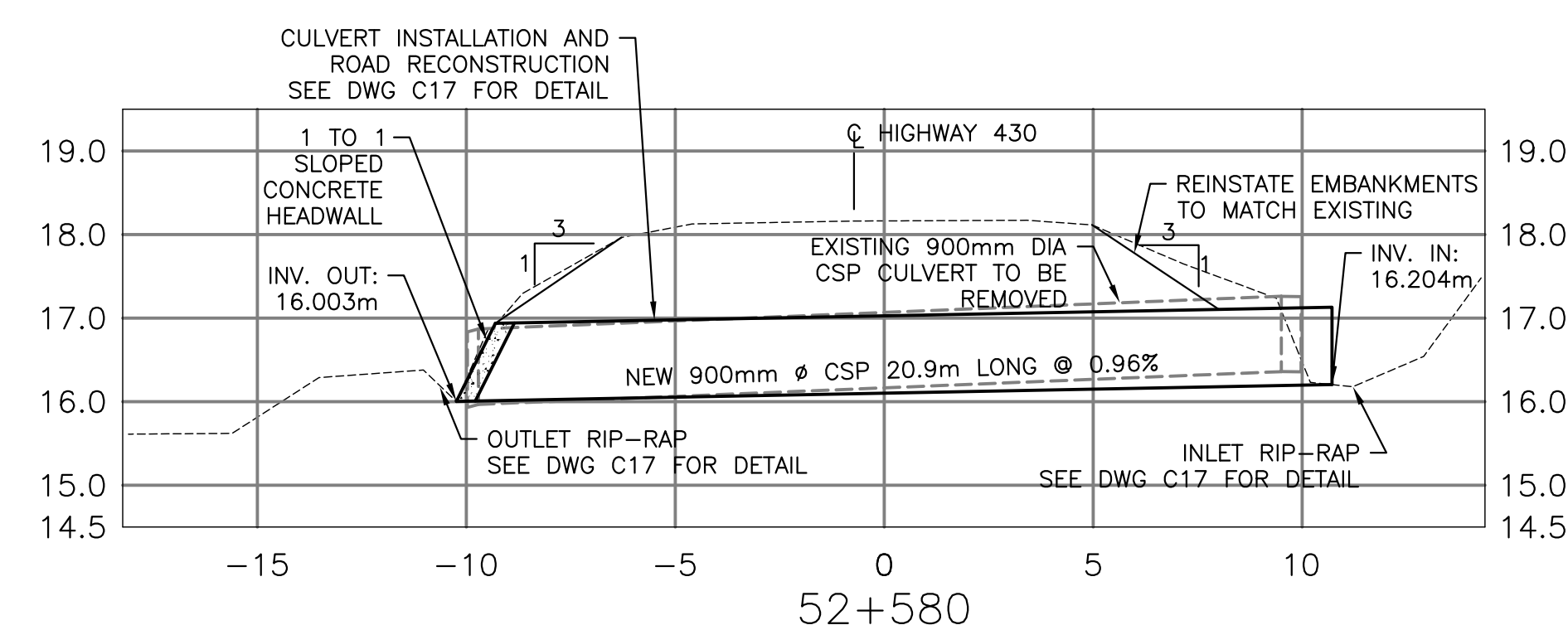
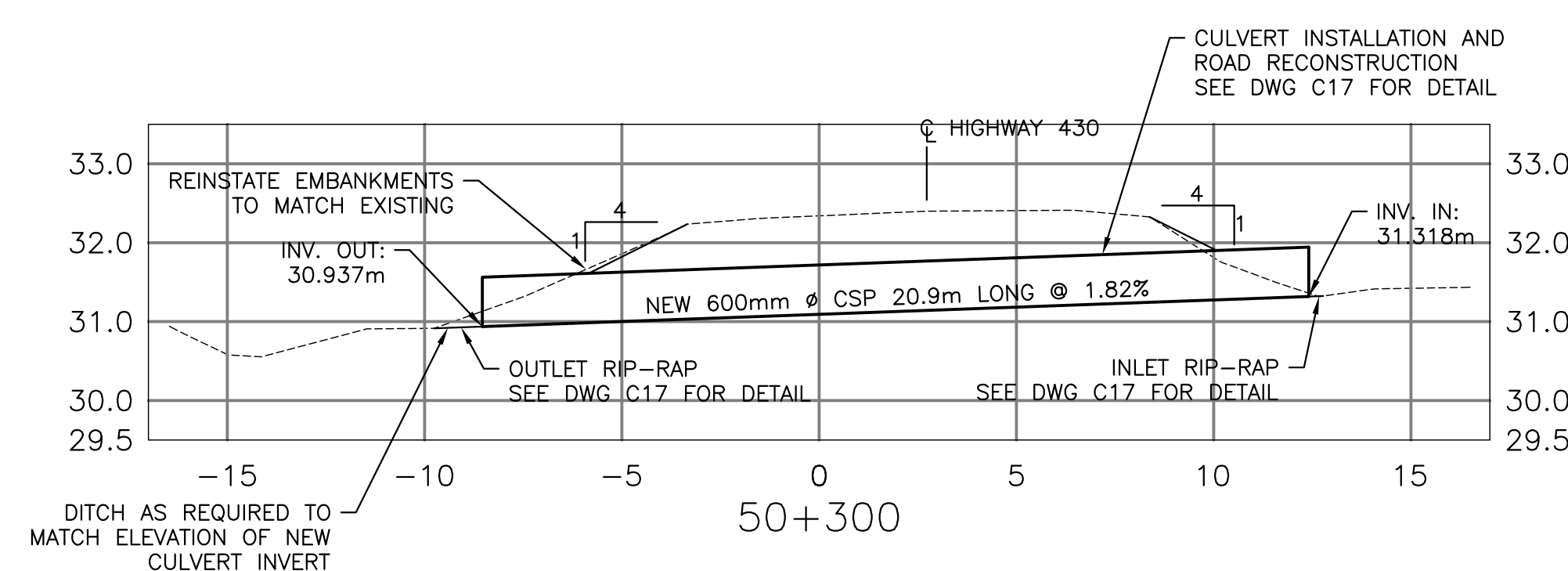
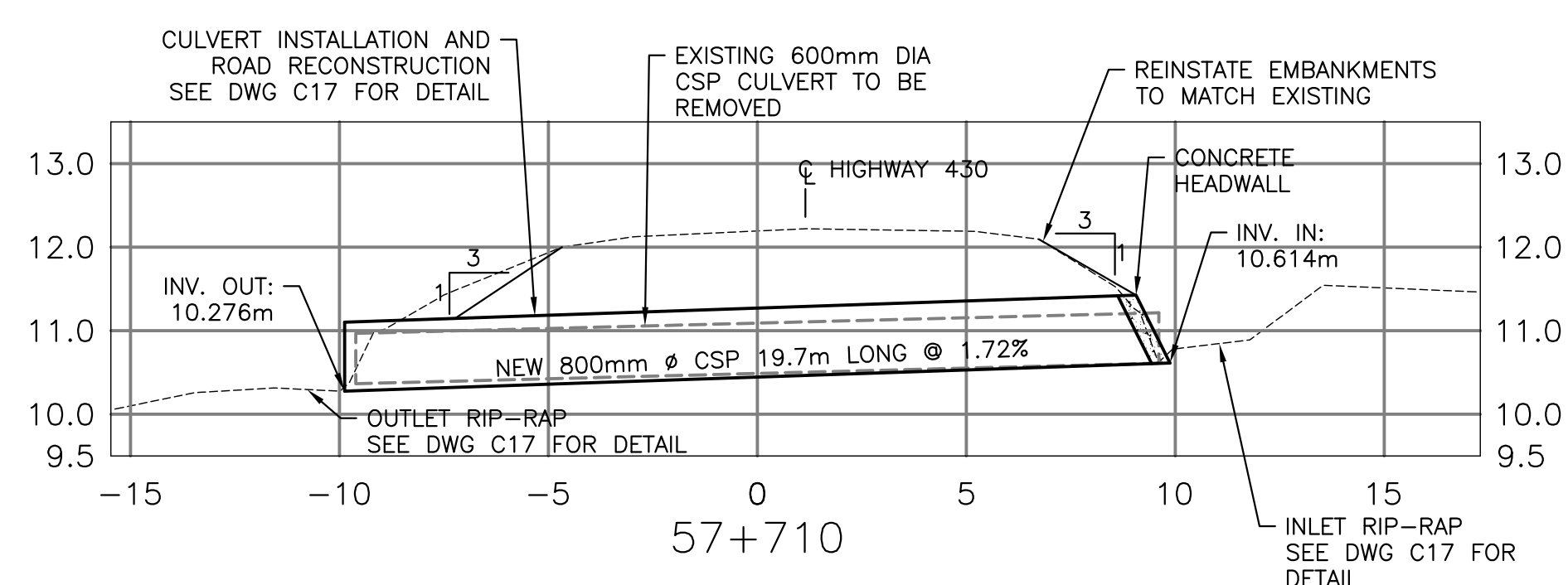
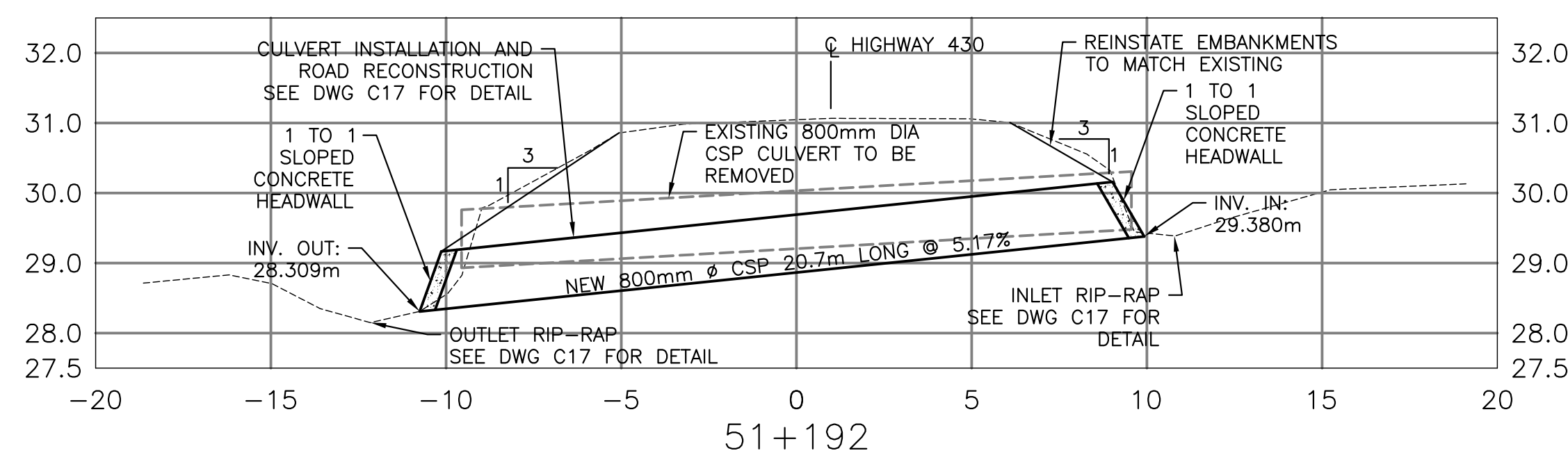
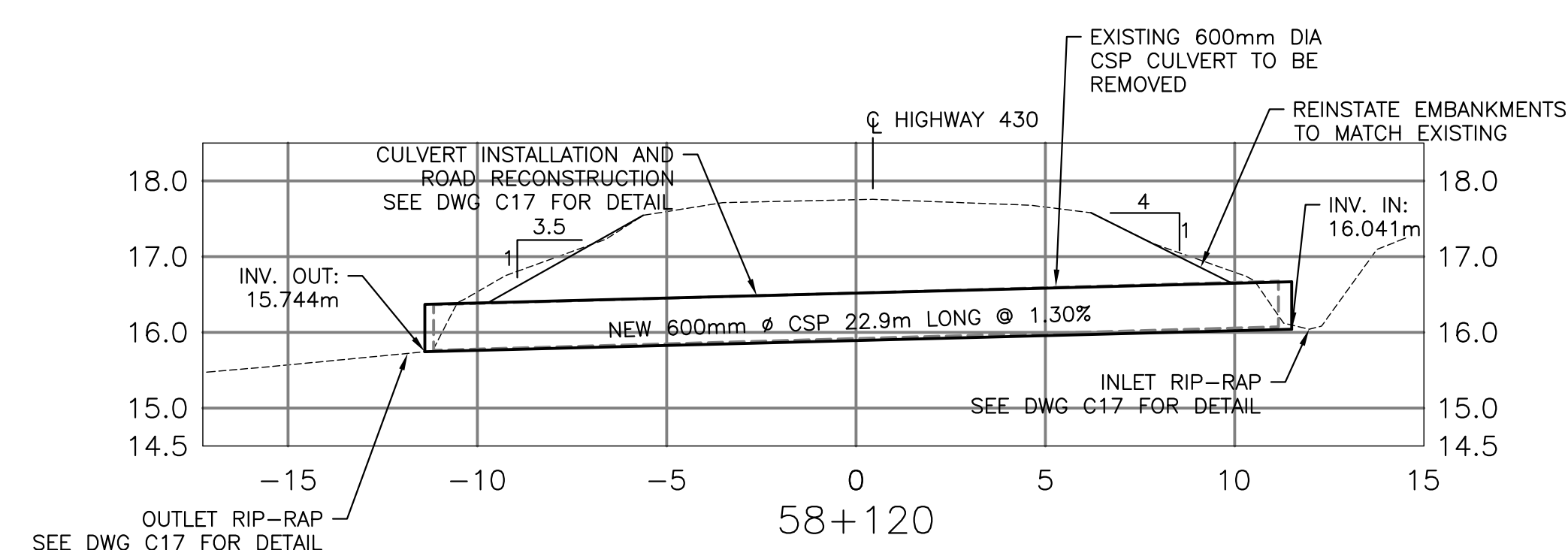
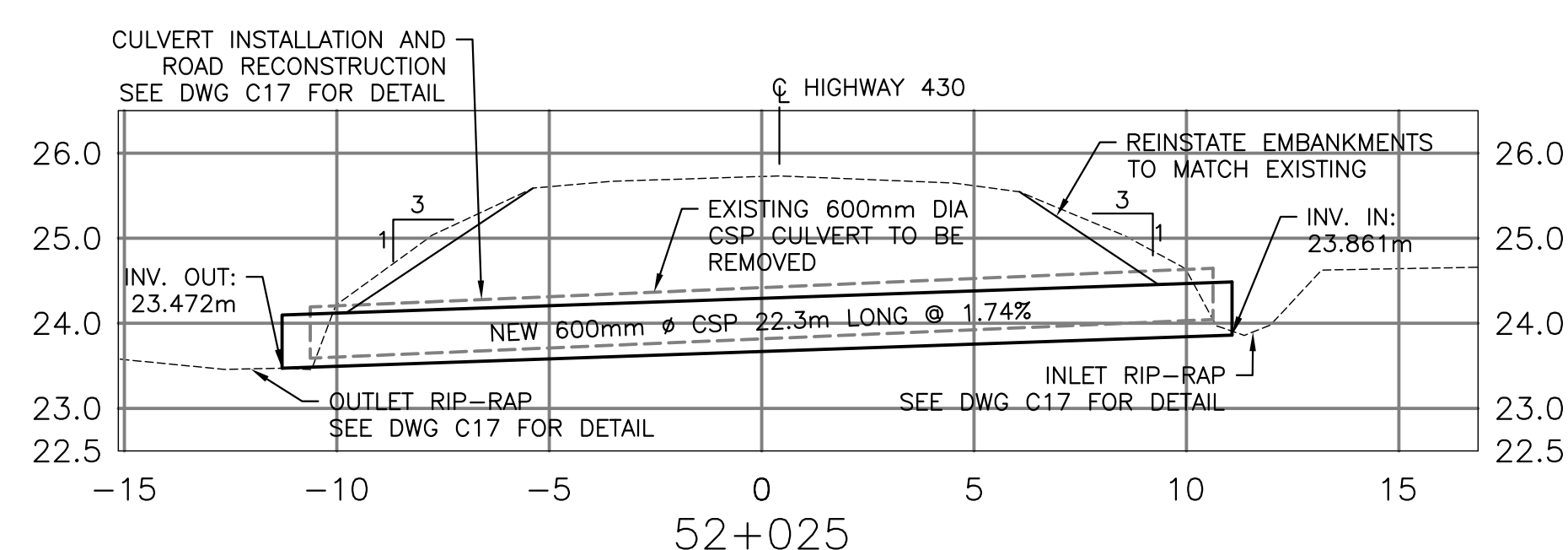
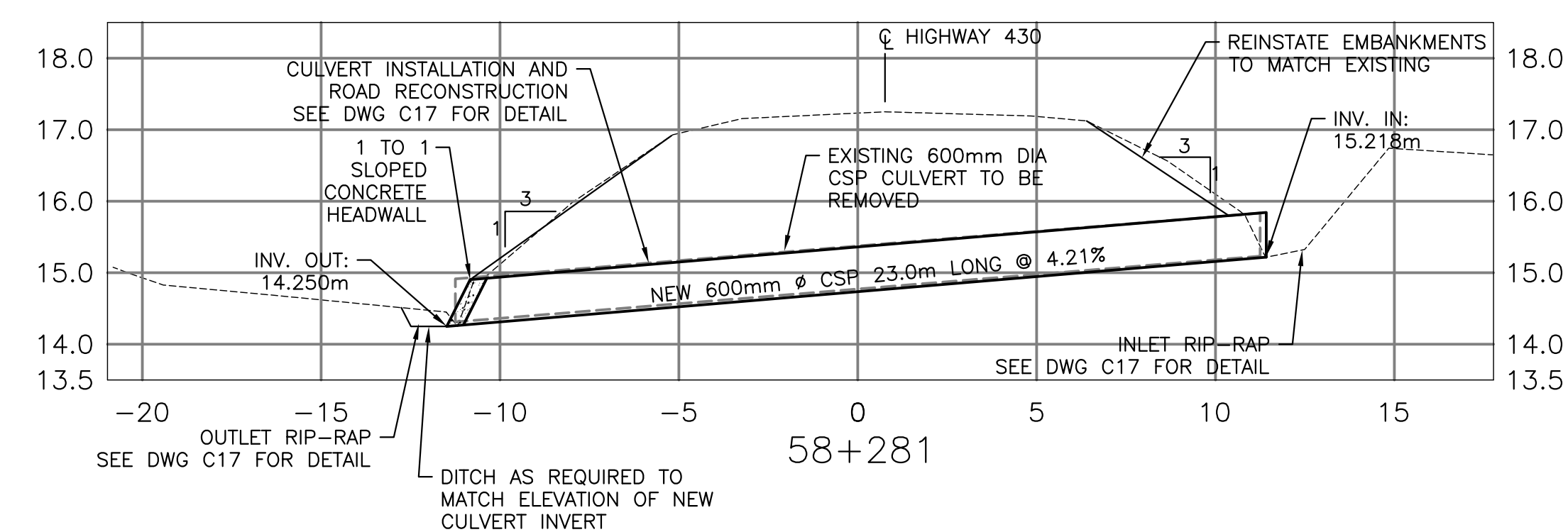
1	ISSUED FOR TENDER	19/02/2016
revisions		date
project		project

# HIGHWAY 430 NORTH (KMS 39.9 TO 88.5) RECAPITALIZATION

## CULVERT SECTIONS STA. 48+223 TO 49+971

designed G. FLANAGAN	conçu
date DECEMBER 04, 2015	
drawn G. GALLANT	dessiné
date DECEMBER 04, 2015	
approved J. BABIN	approuvé
date DECEMBER 04, 2015	
Tender	Soumission
PCA Project Manager	Administrateur de projets APC
project number	no. du projet
PCA NO.: 1350	
drawing no.	no. du dessin
C10	






1	ISSUED FOR TENDER	19/0 2016
revisions		date
project		proj

HIGHWAY 430 NORTH  
(KMS 39.9 TO 88.5)  
RECAPITALIZATION

drawing dessin

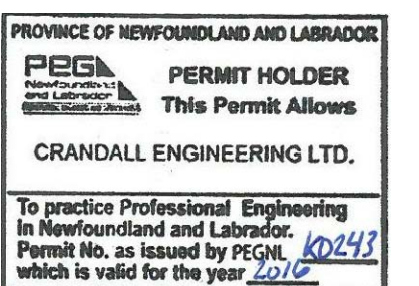
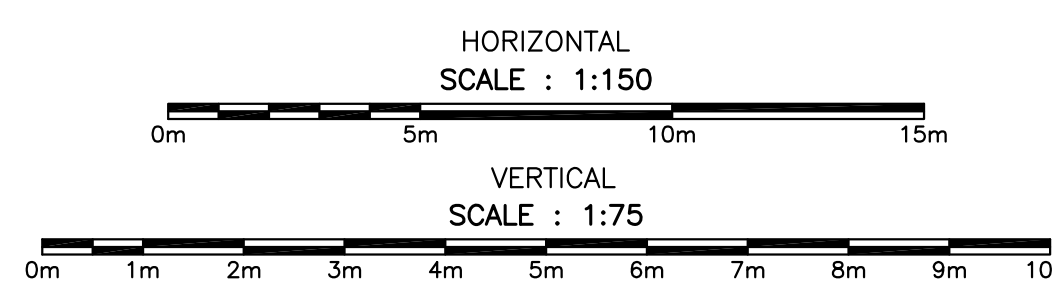
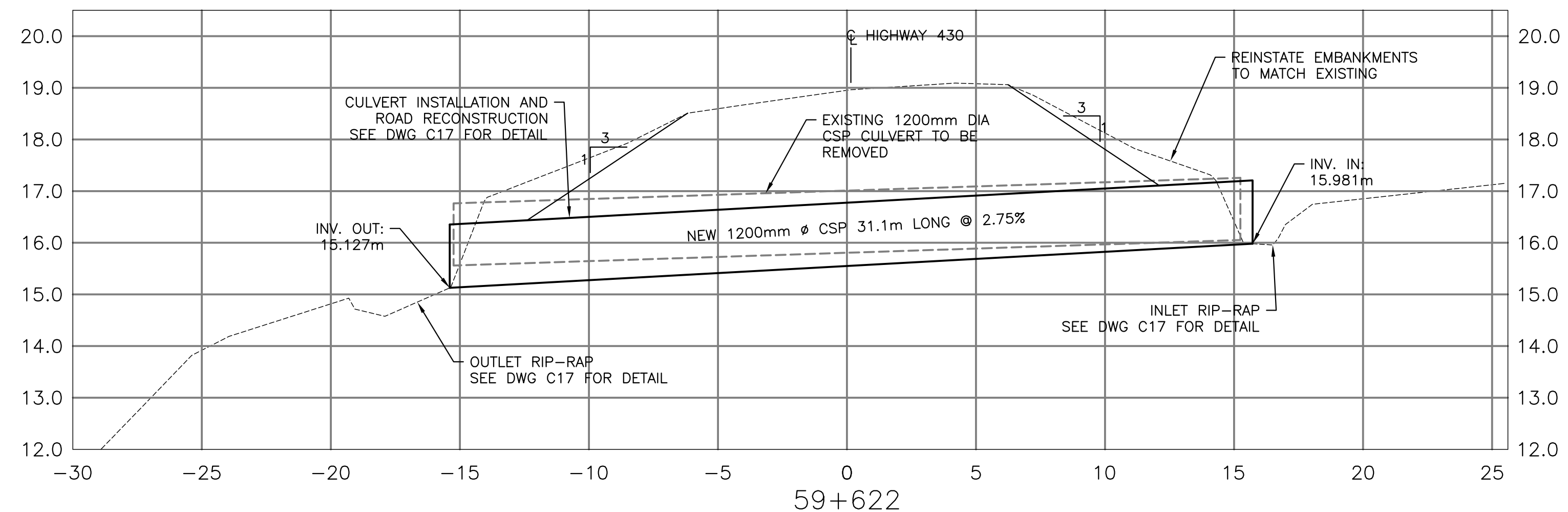
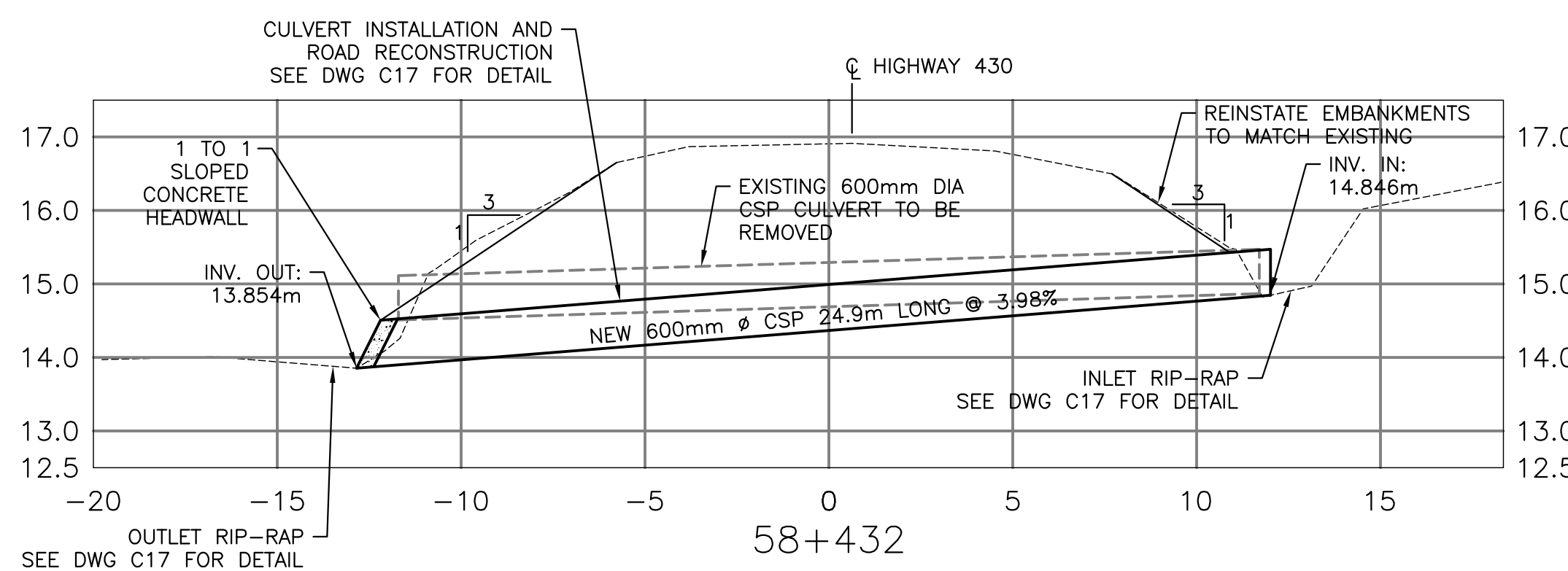
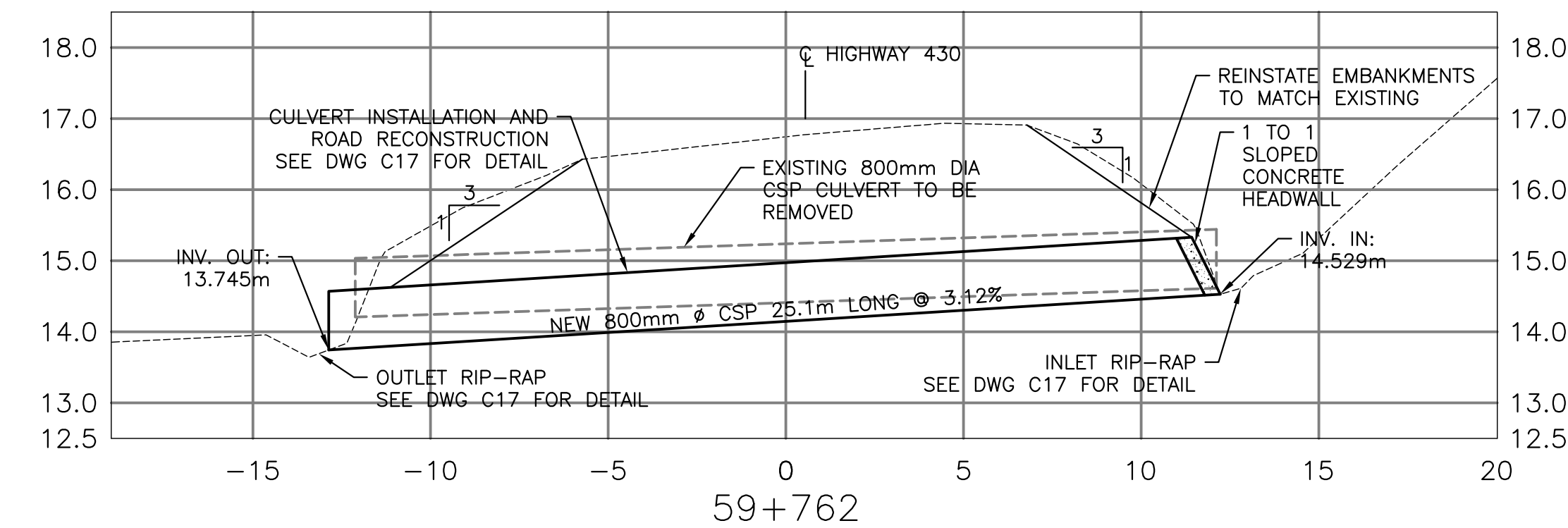
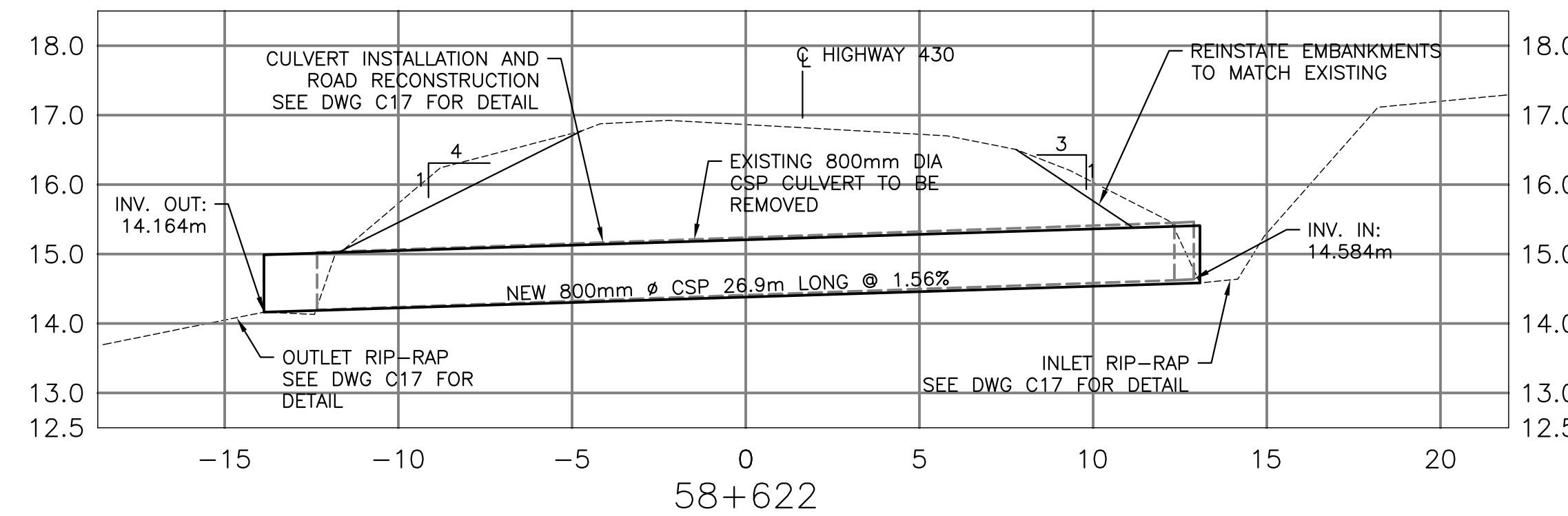
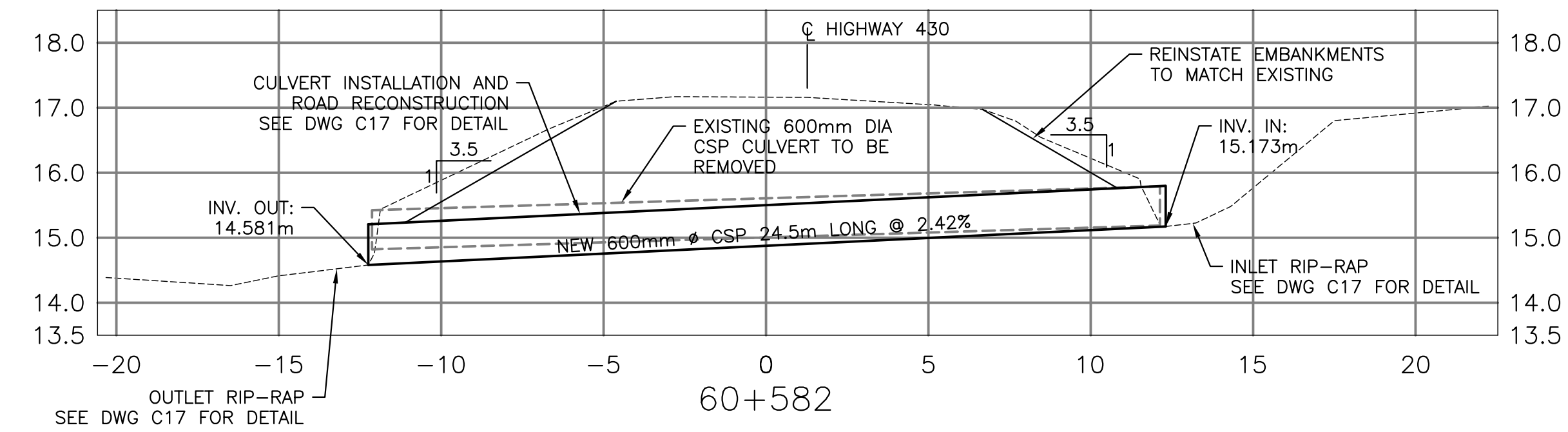
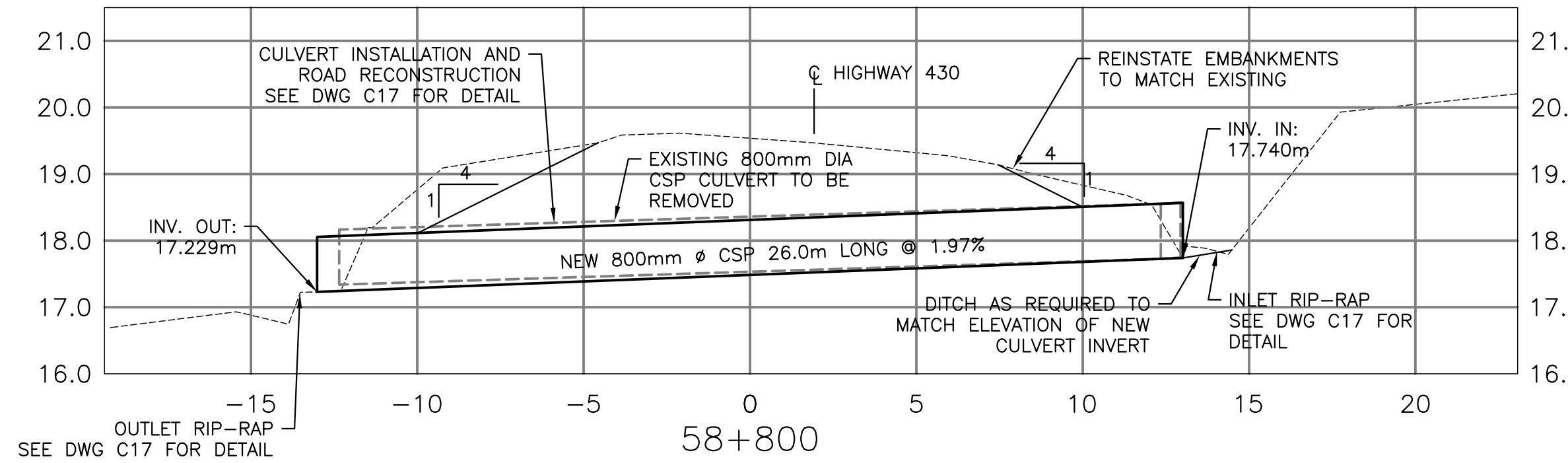
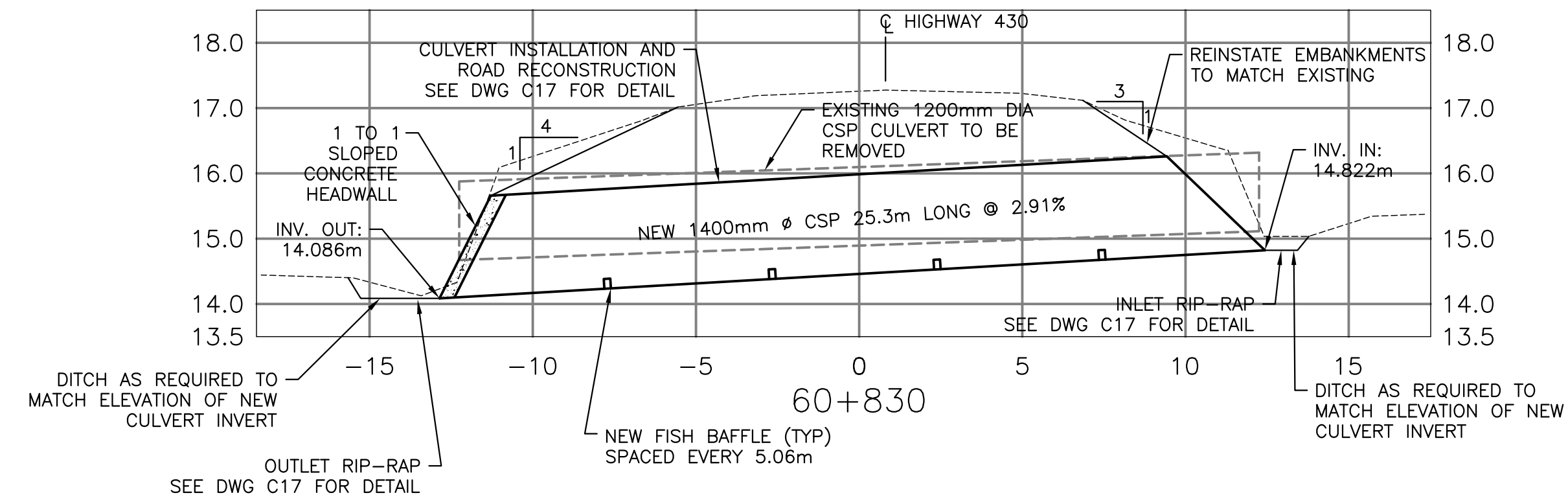
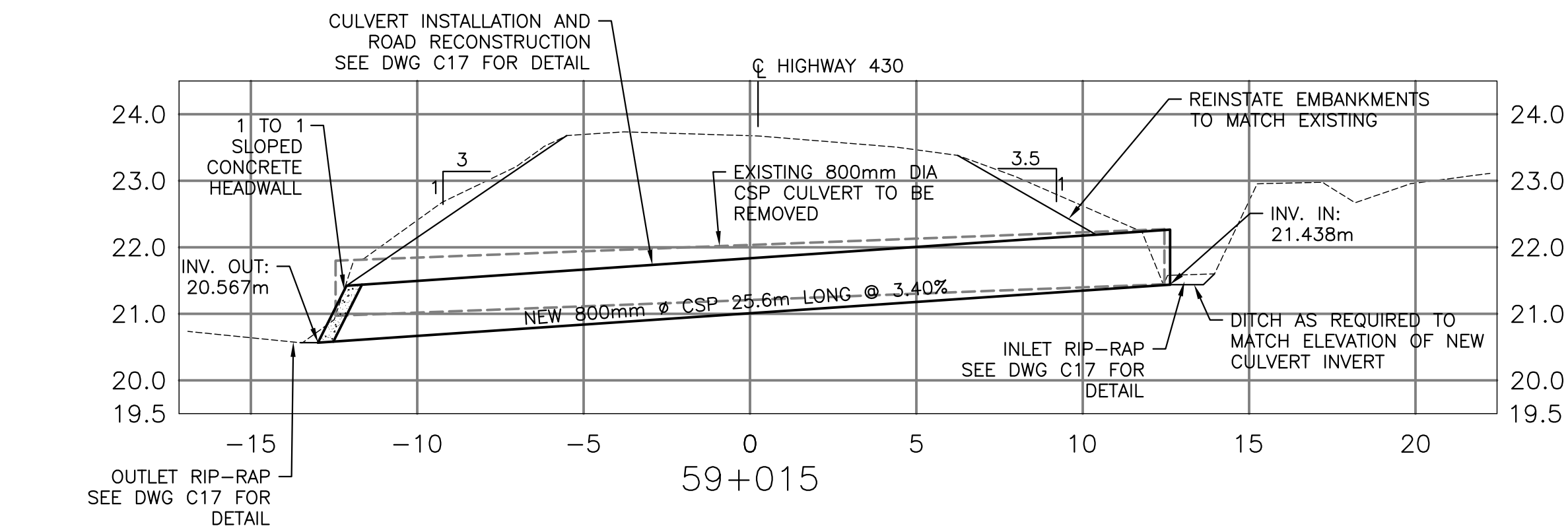
**CULVERT SECTIONS**  
**STA. 50+300 TO 58+281**

designed	G. FLANAGAN	conçu
date	DECEMBER 04, 2015	
drawn	G. GALLANT	dessiné
date	DECEMBER 04, 2015	
approved	J.BABIN	approuvé
date	DECEMBER 04, 2015	
Tender		Soumission
PCA Project Manager	Administrateur de projets APC	
project number		no. du projet
PCA NO.: 1350		
drawing no.		no. du dessin





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project

HIGHWAY 430 NORTH (KMS 39.9 TO 88.5) RECAPITALIZATION

drawing

CULVERT SECTIONS STA. 58+432 TO 60+830

designed G. FLANAGAN

date DECEMBER 04, 2015

drawn G. GALLANT

date DECEMBER 04, 2015

approved J. BABIN

date DECEMBER 04, 2015

Tender

PCA Project Manager

Administrateur de projets APC

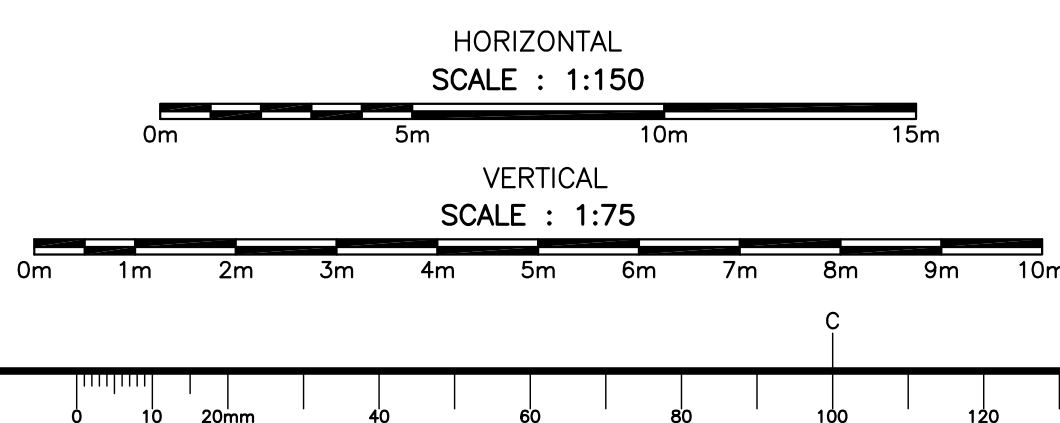
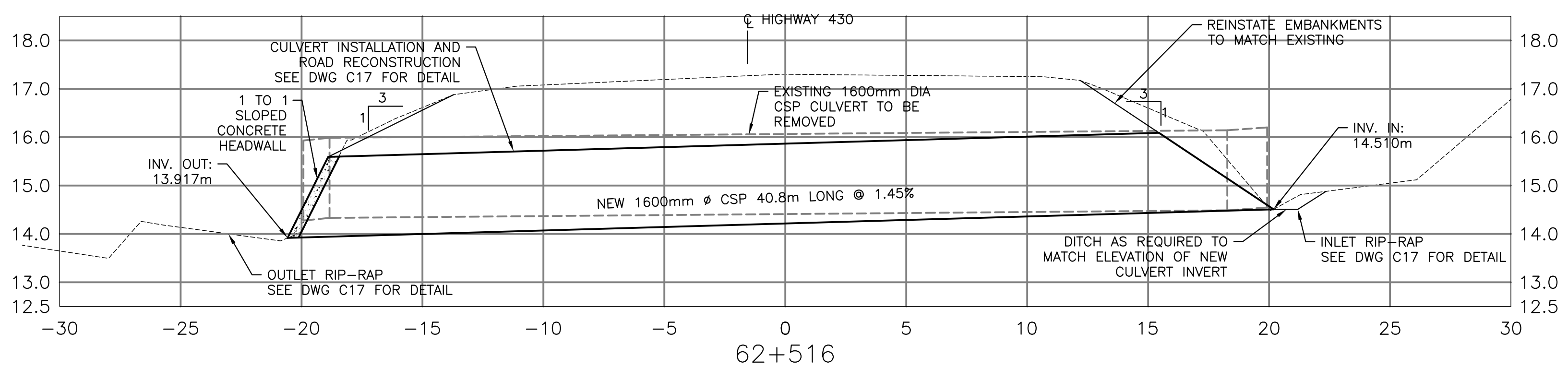
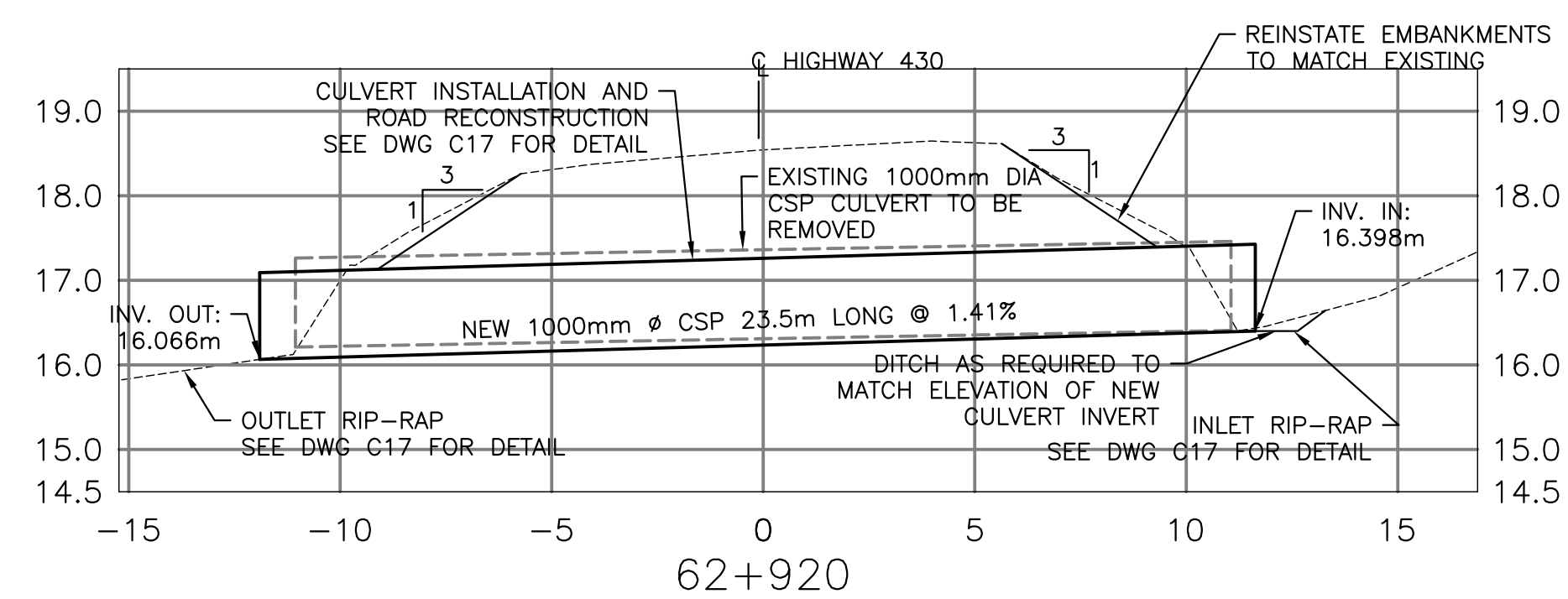
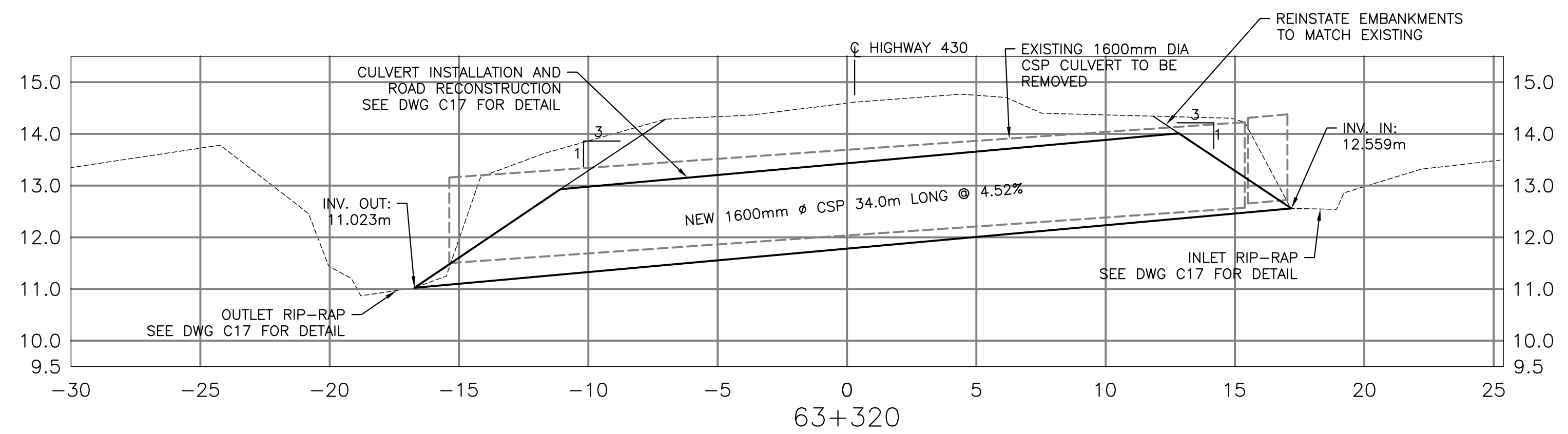
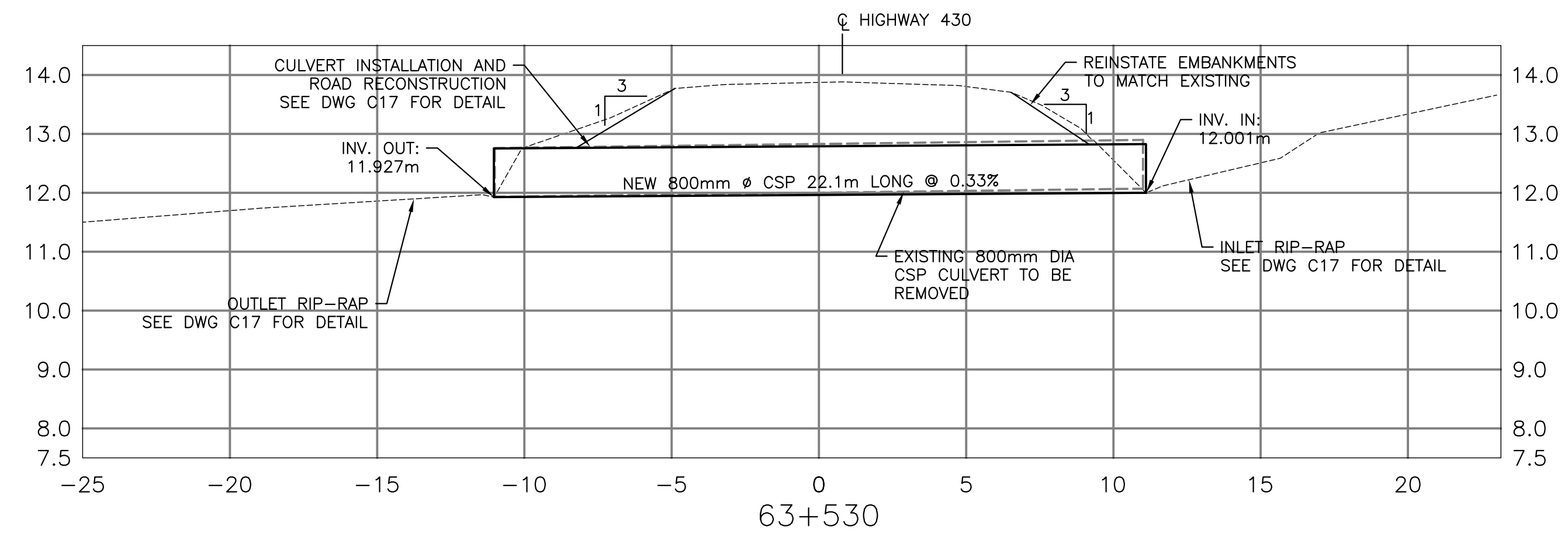
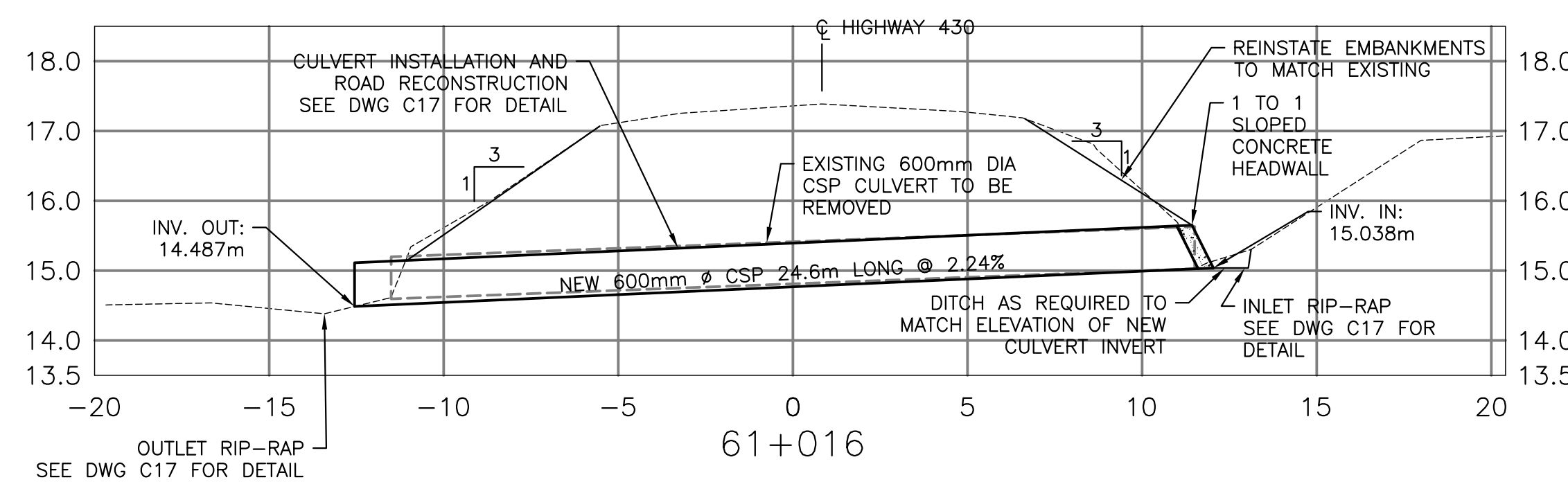
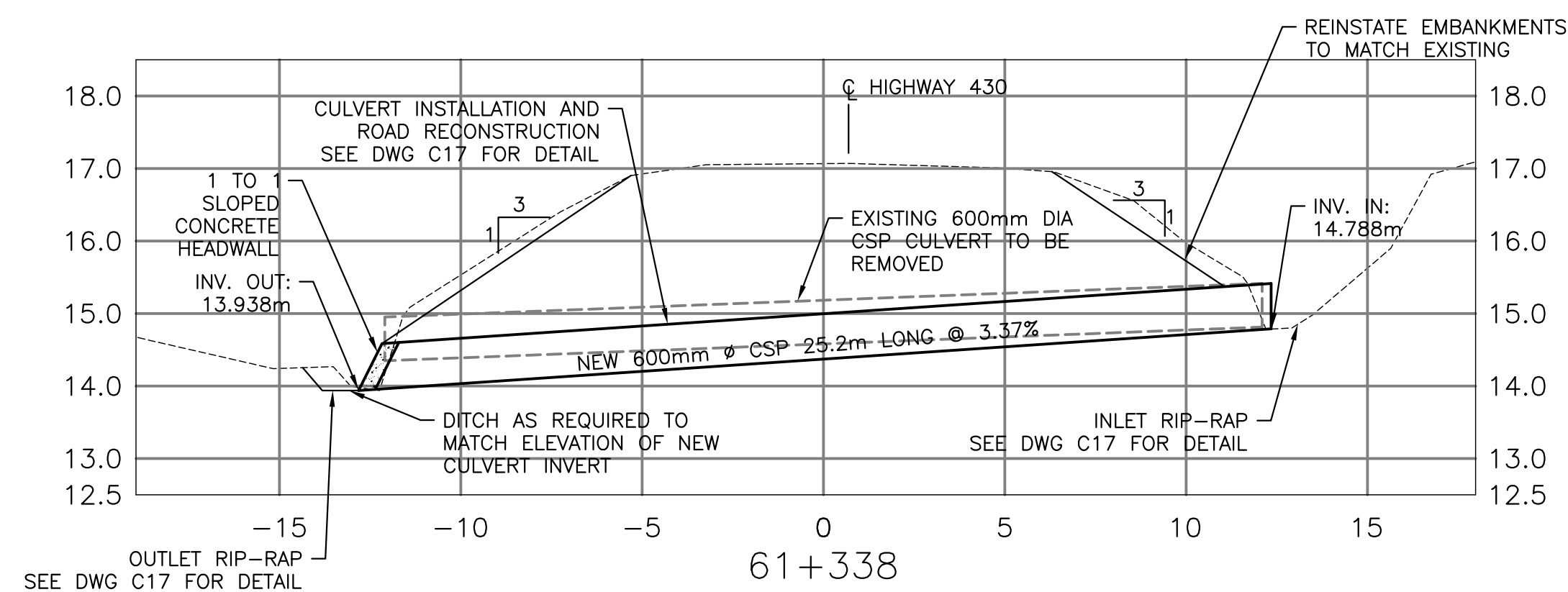
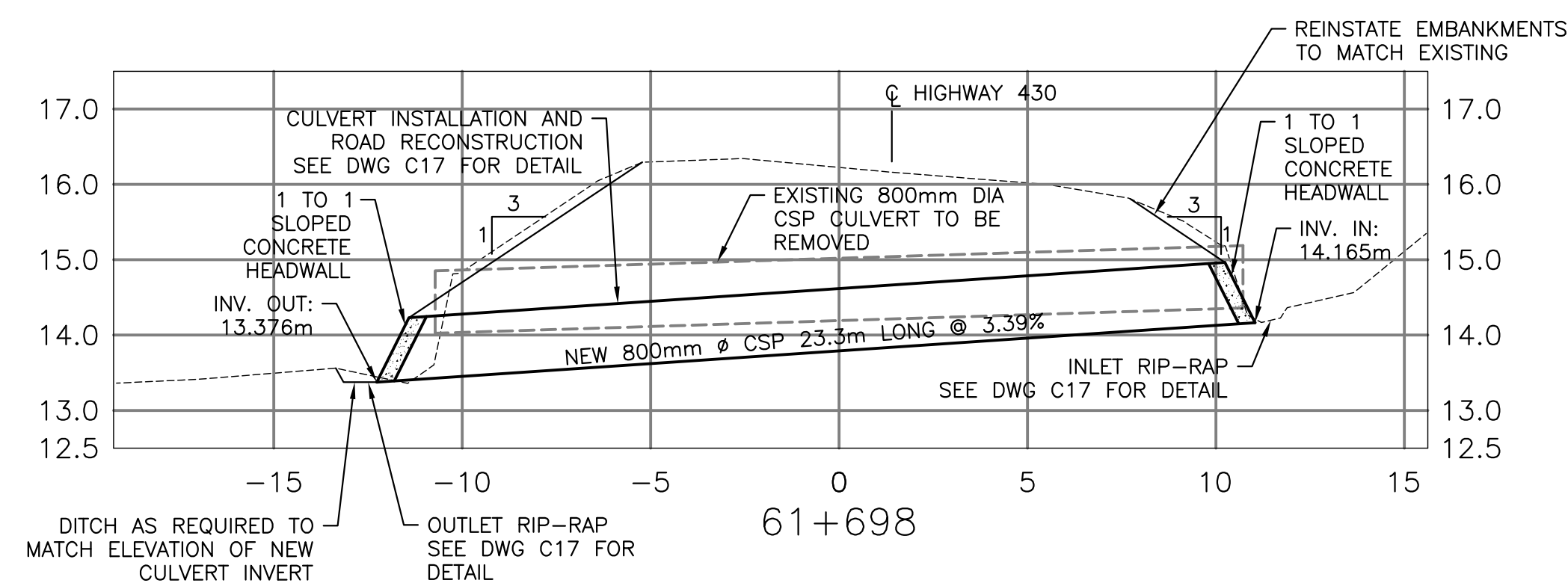
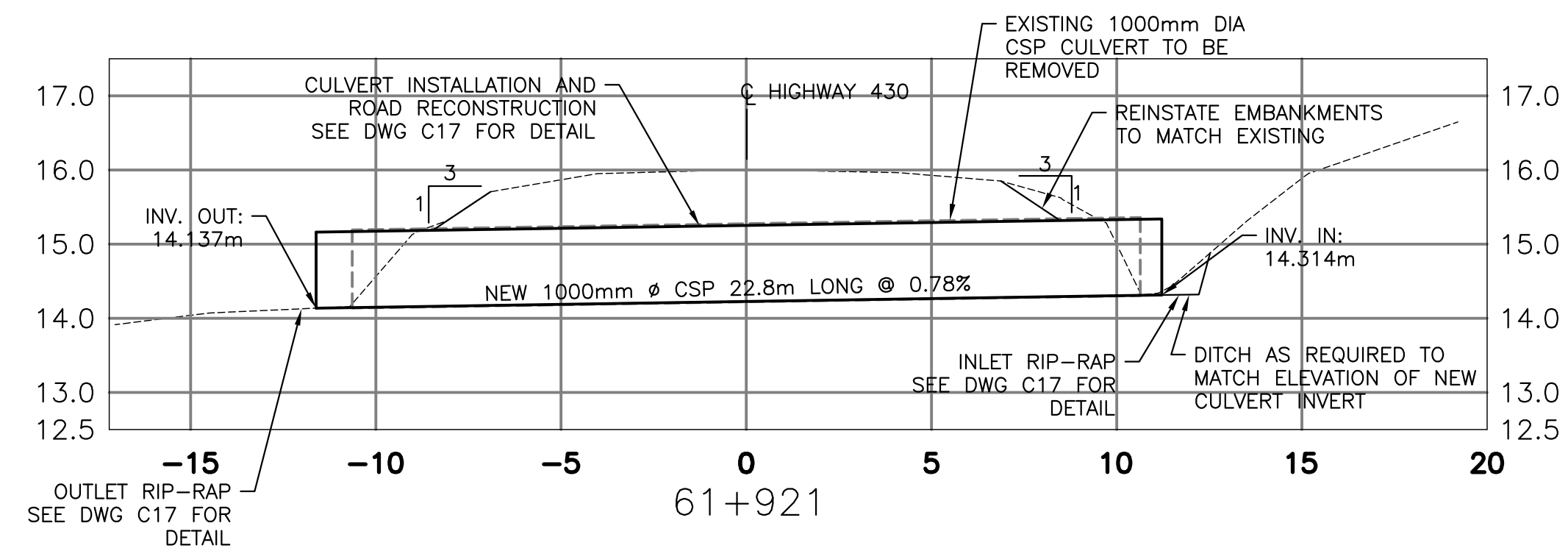
project number

PCA NO.: 1350

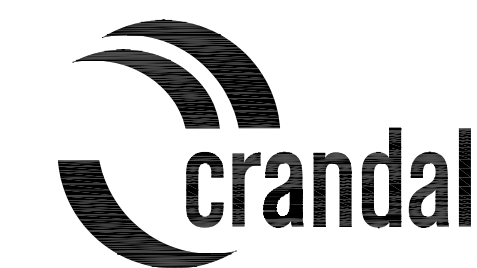
drawing no.

C12









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 CRANDALLENGINEERING.CA

PROVINCE OF NEWFOUNDLAND AND LABRADOR  
**P.E.N.** PERMIT HOLDER  
 This Permit Allows  
 CRANDALL ENGINEERING LTD.  
 To practice Professional Engineering  
 in Newfoundland and Labrador.  
 Permit No. as issued by P.E.N. 10241  
 which is valid for the year 2016



1	ISSUED FOR TENDER	19/02/2016
revisions		date

project project

## HIGHWAY 430 NORTH (KMS 39.9 TO 88.5) RECAPITALIZATION

drawing dessin

### CULVERT SECTIONS STA. 63+700 TO 67+900

designed G. FLANAGAN conçu

date DECEMBER 04, 2015

drawn G. GALLANT dessiné

date DECEMBER 04, 2015

approved J. BABIN approuvé

date DECEMBER 04, 2015

Tender Soumission

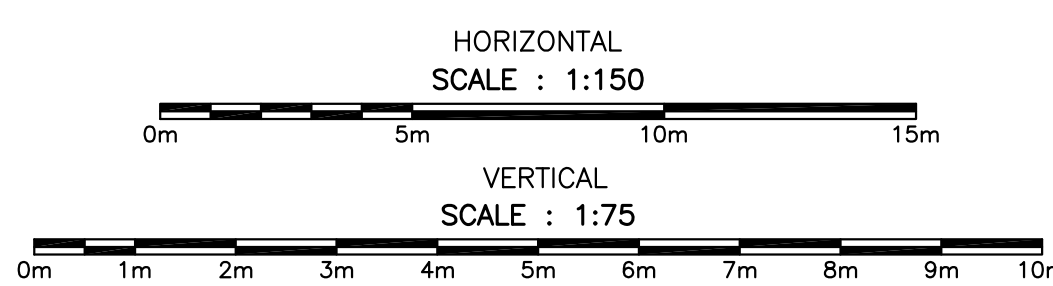
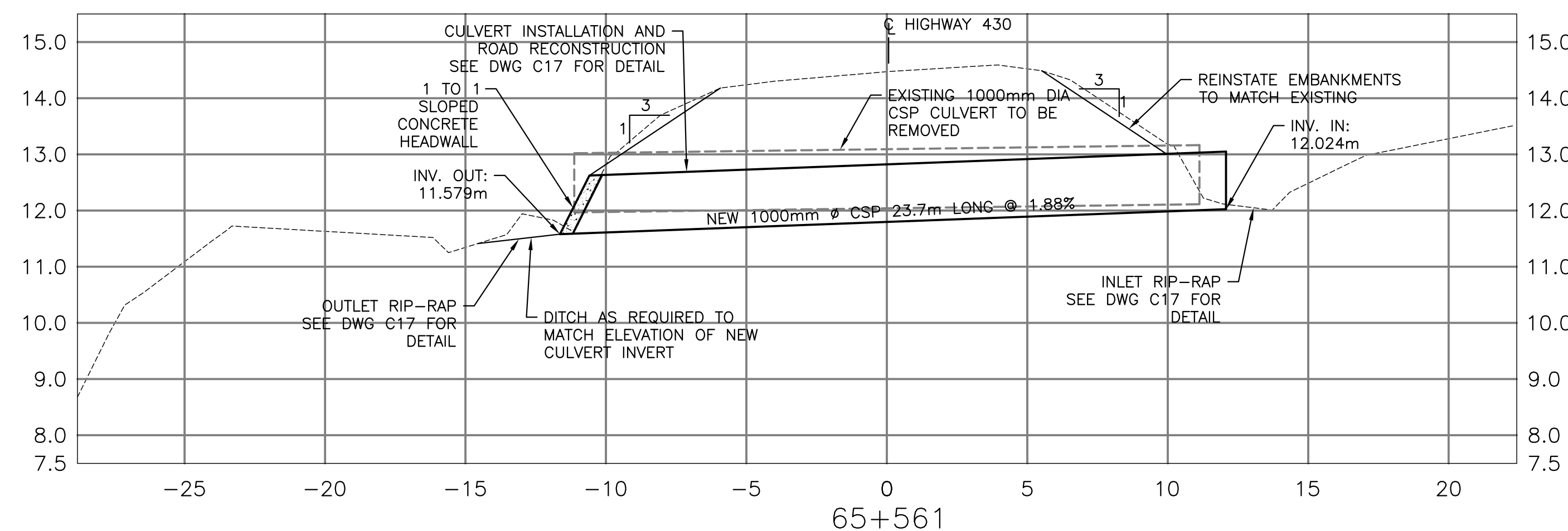
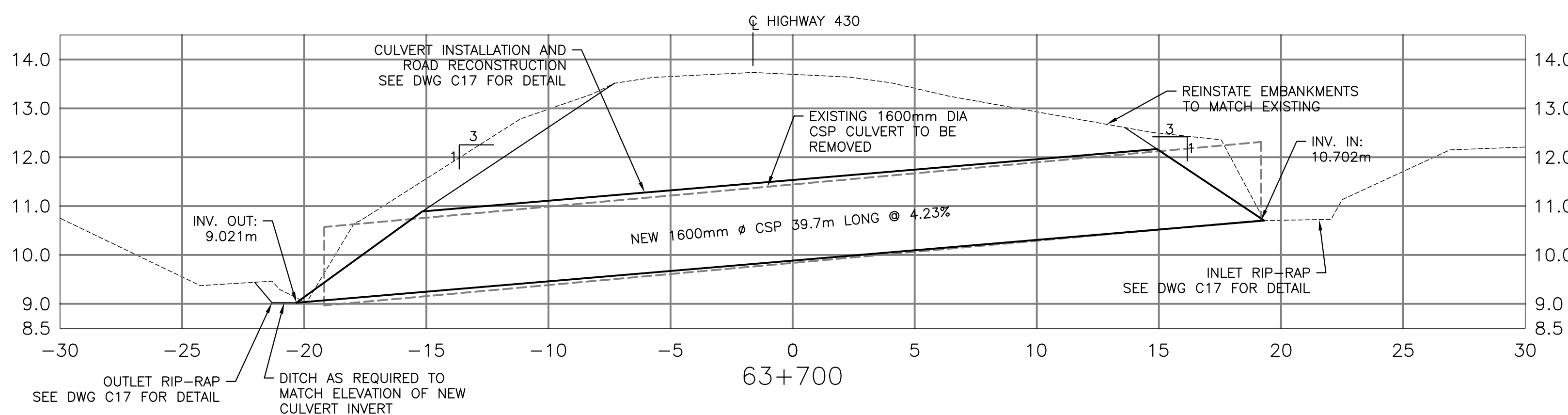
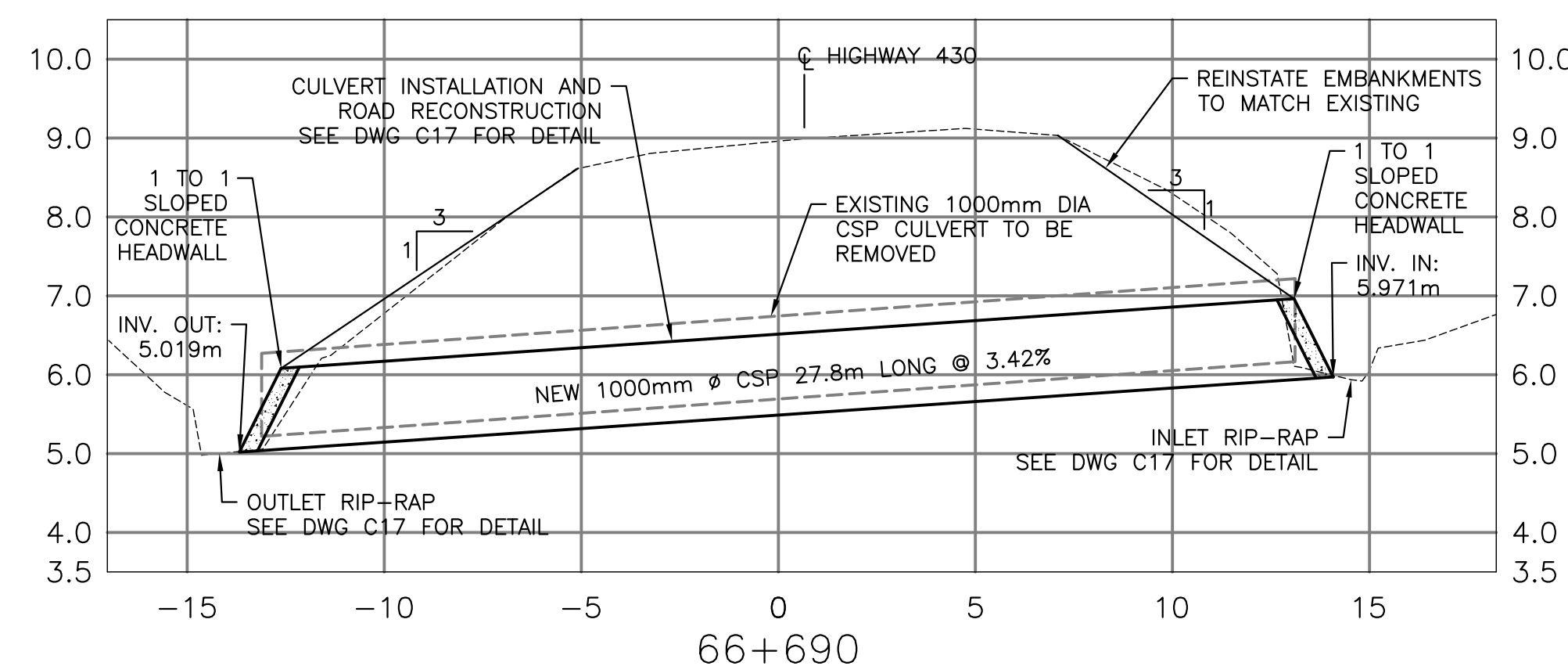
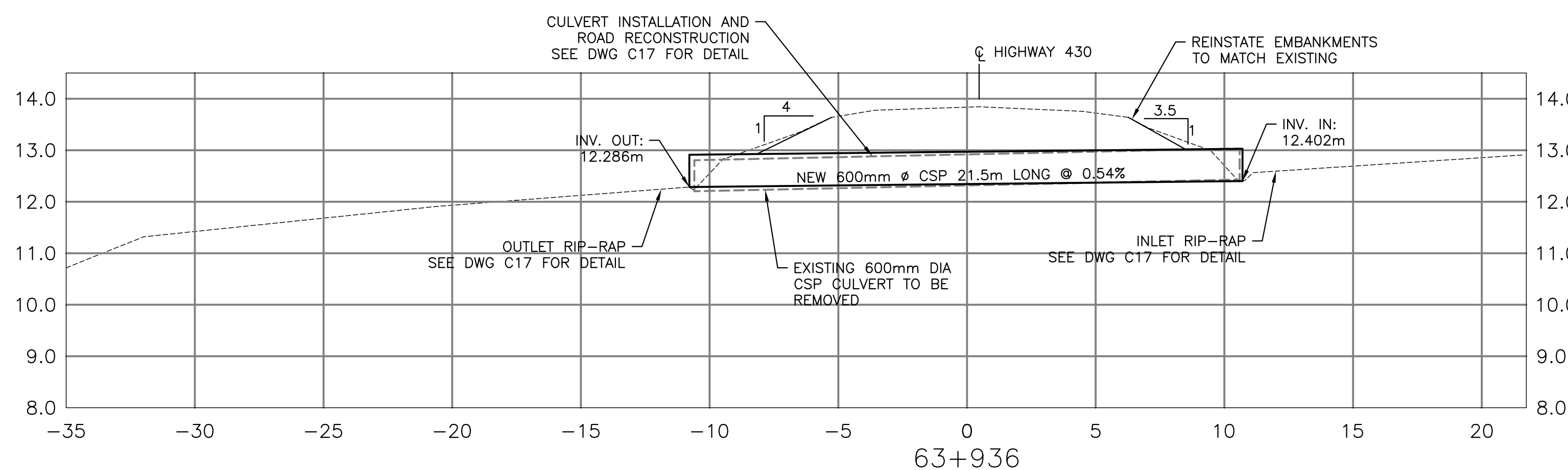
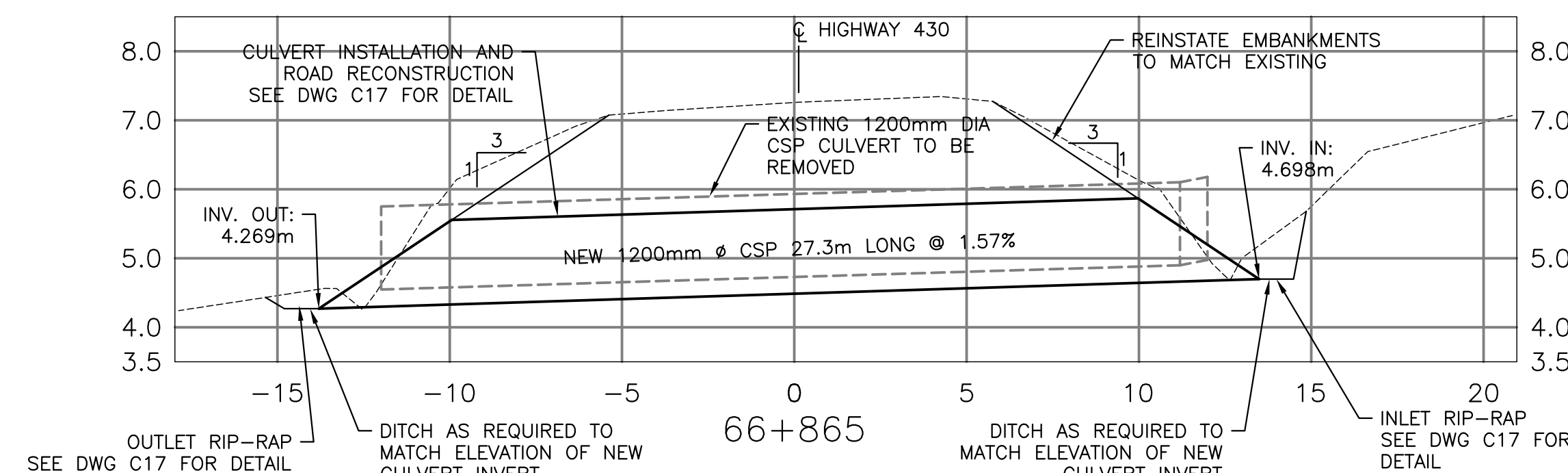
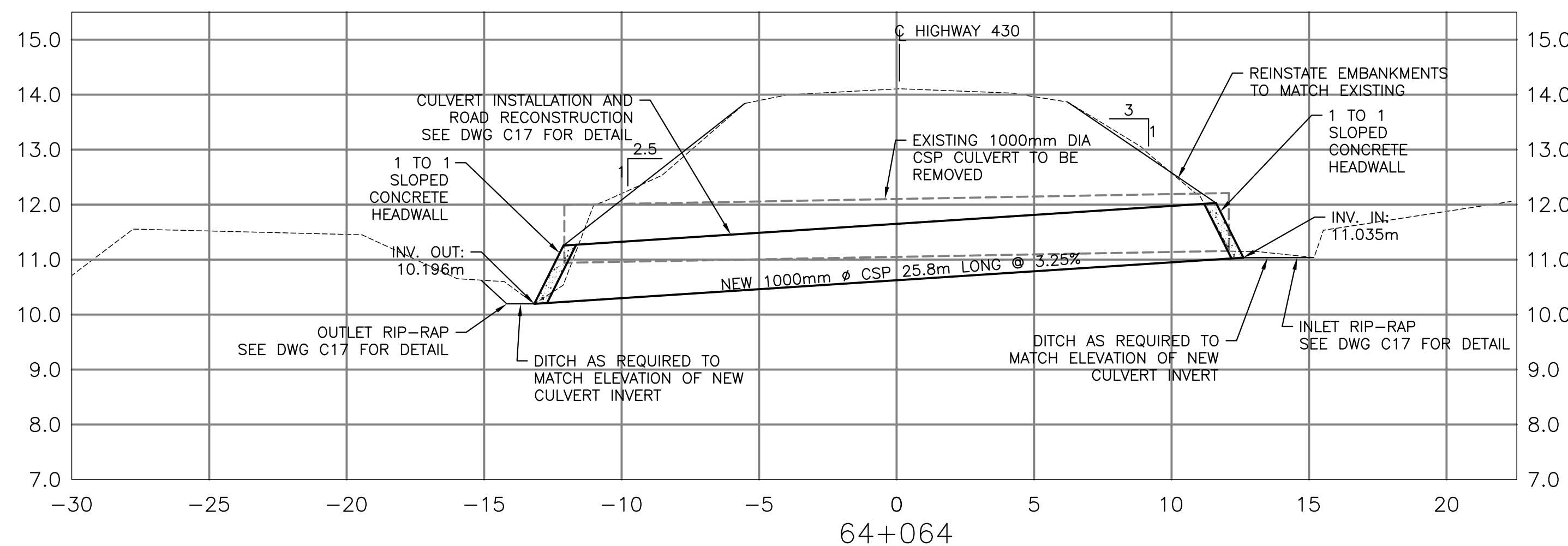
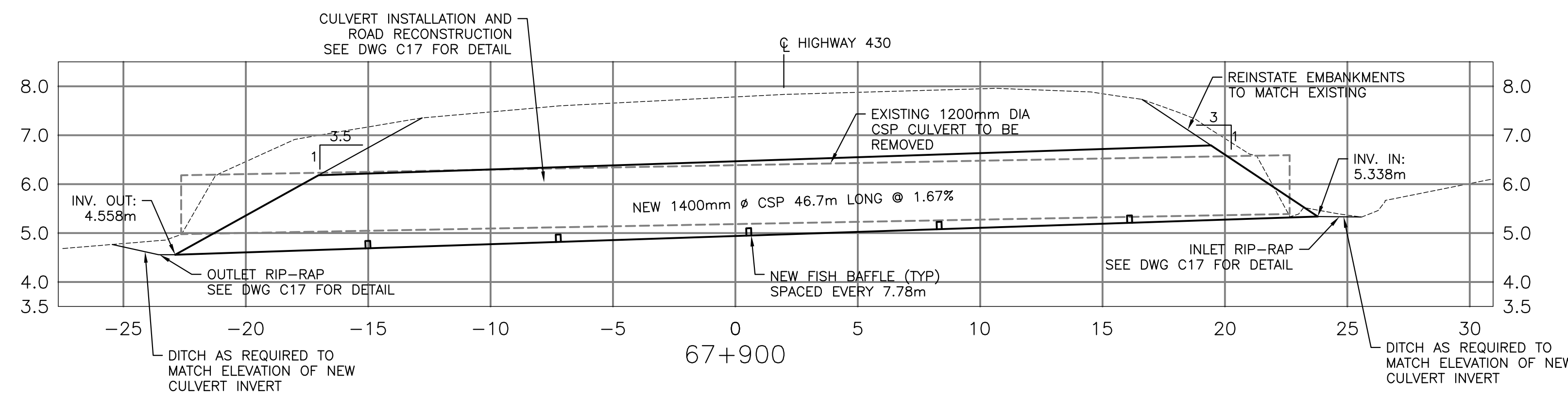
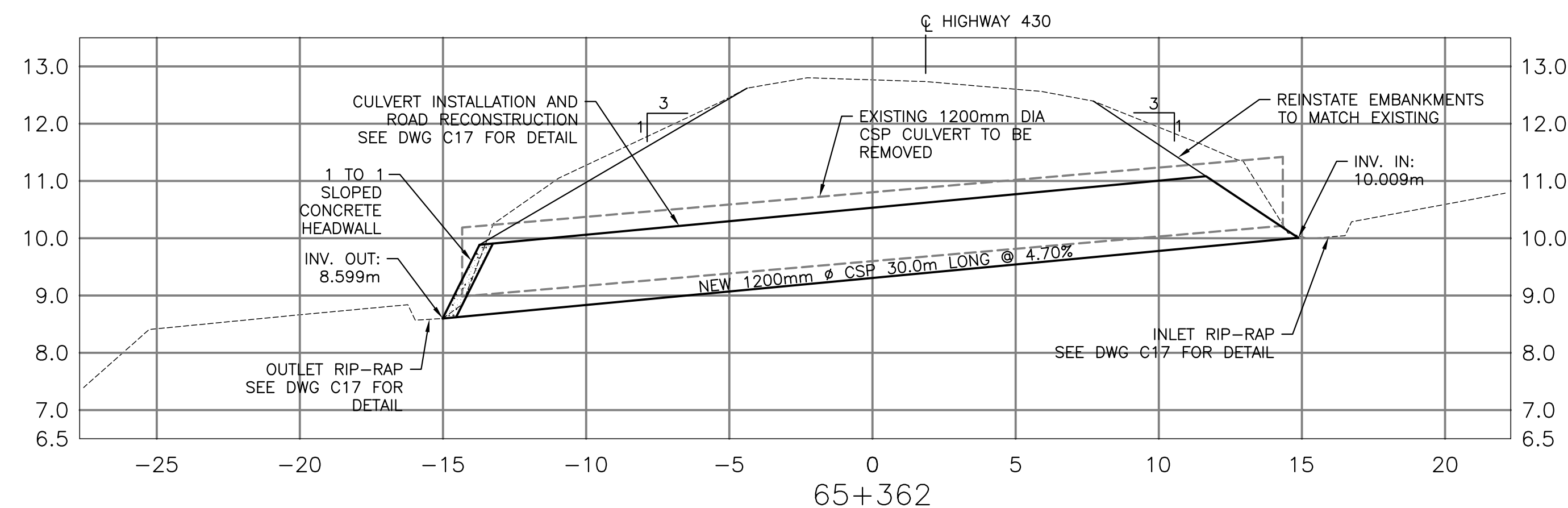
PCA Project Manager Administrateur de projets APC

project number no. du projet

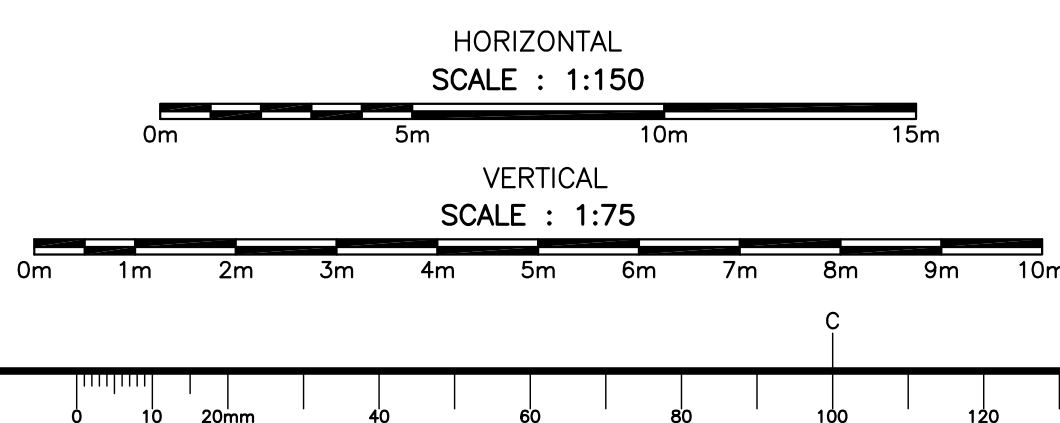
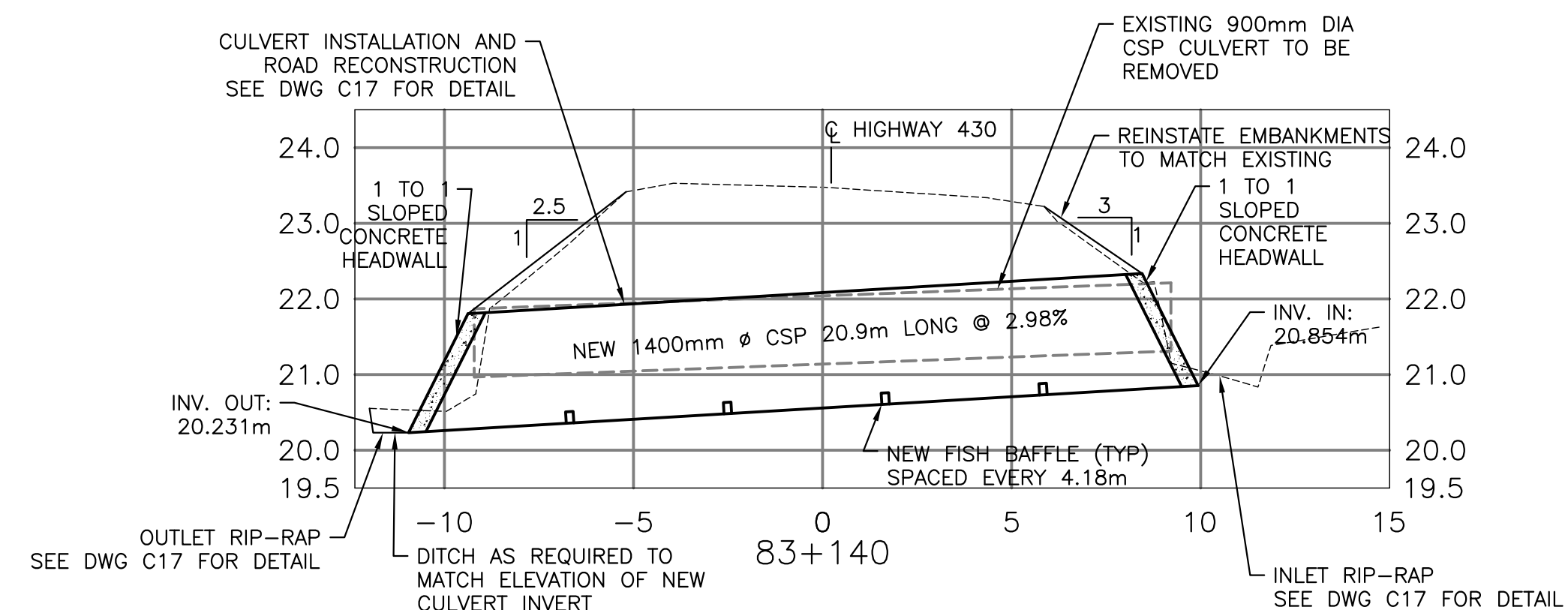
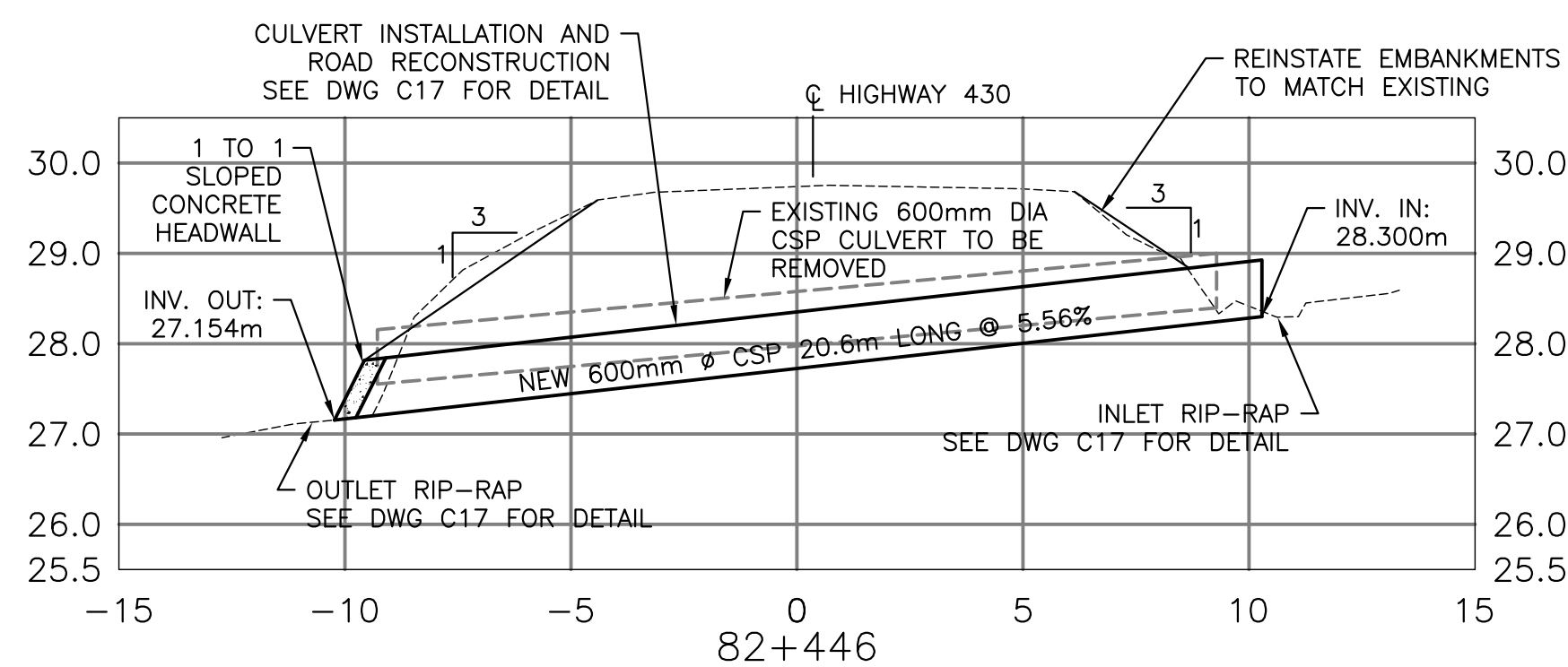
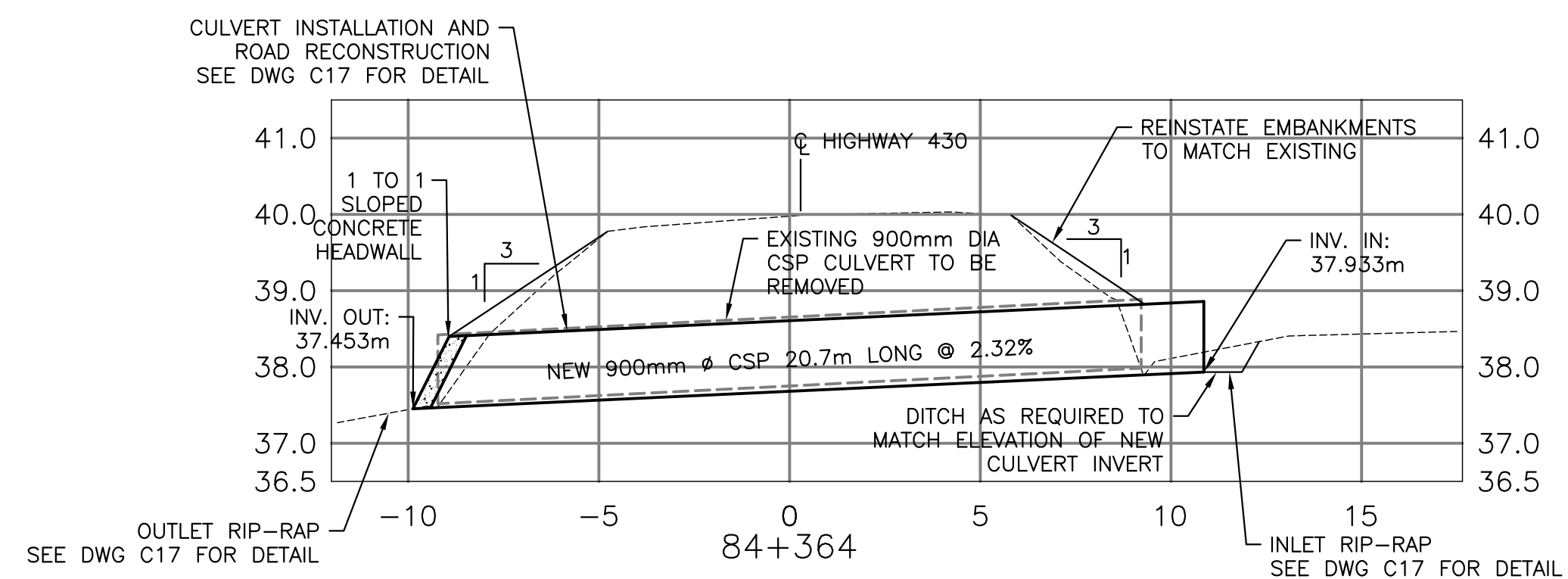
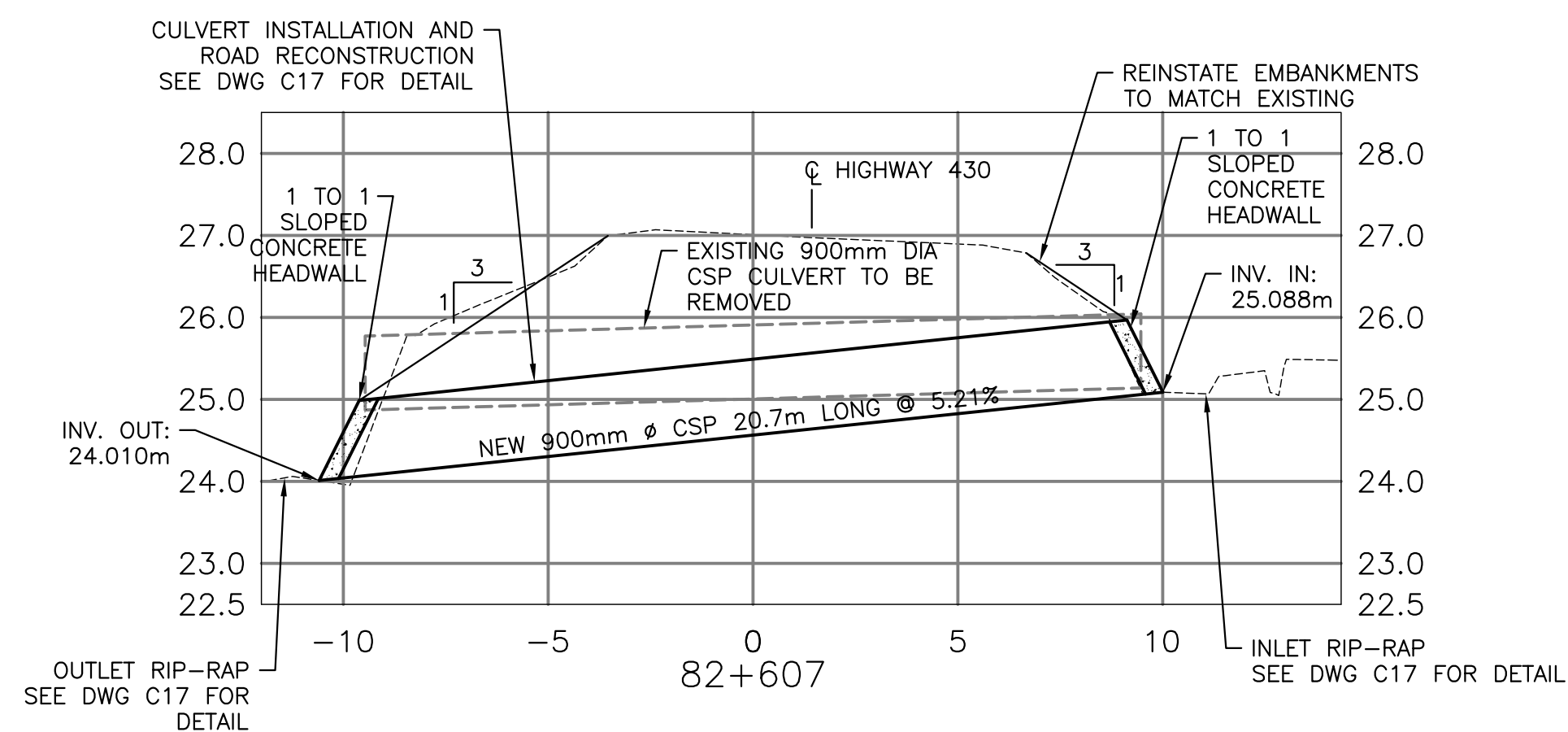
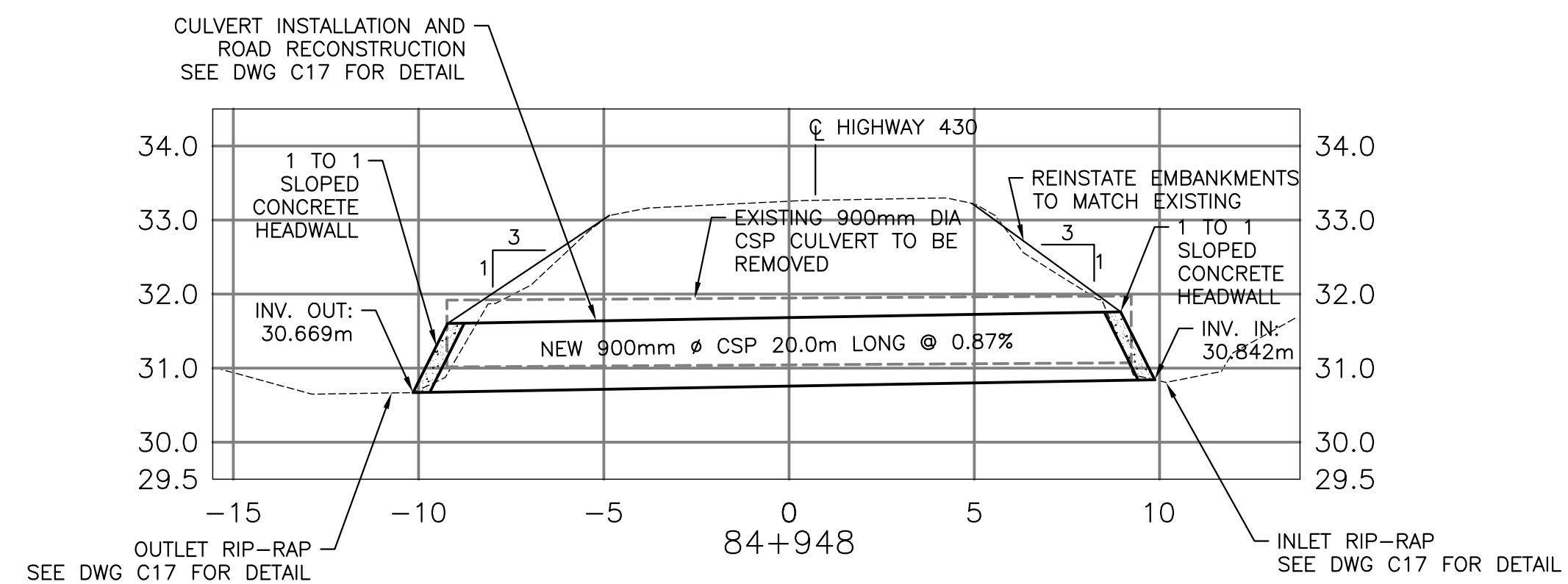
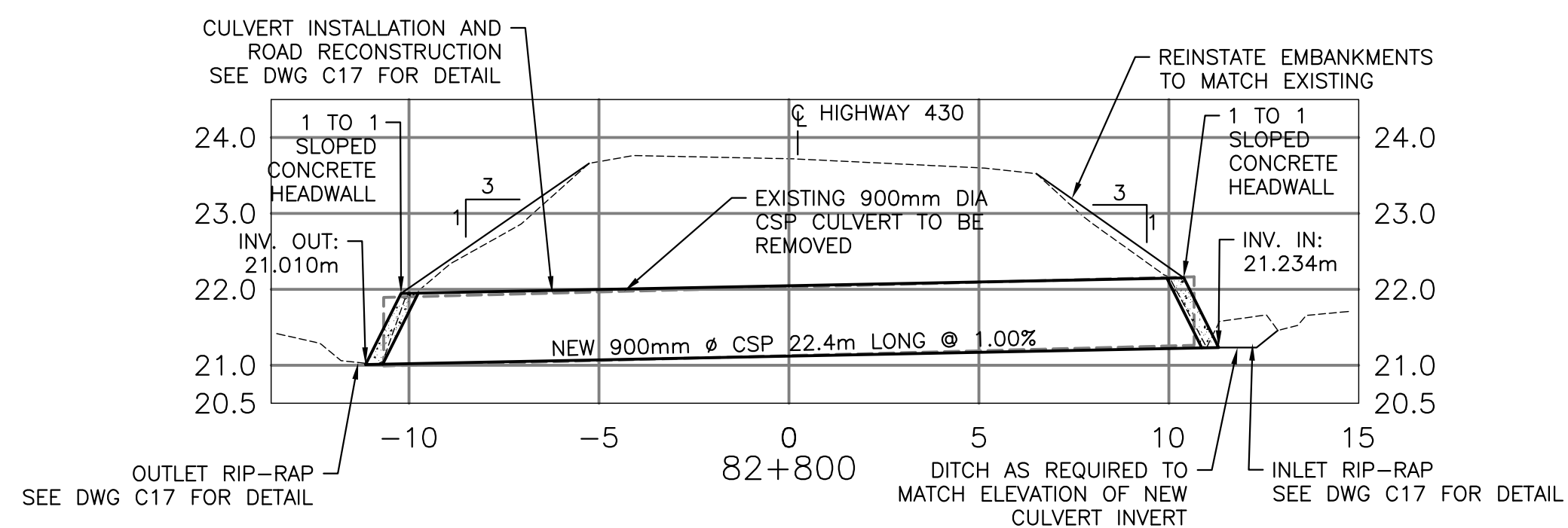
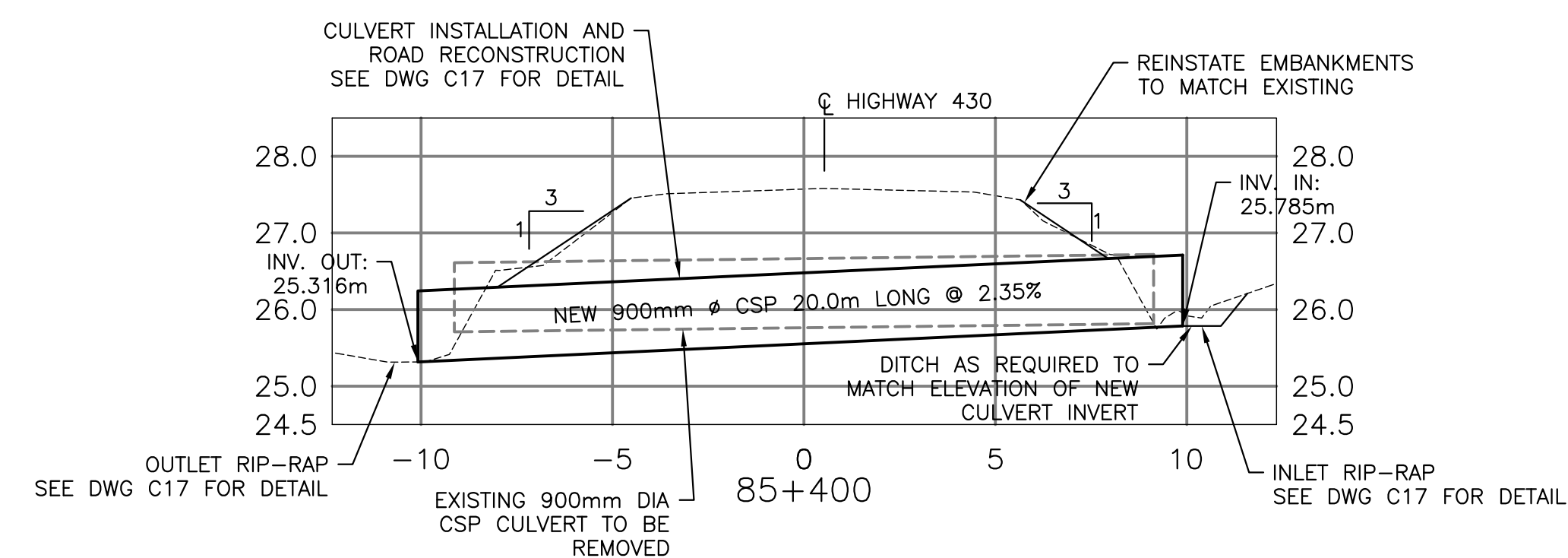
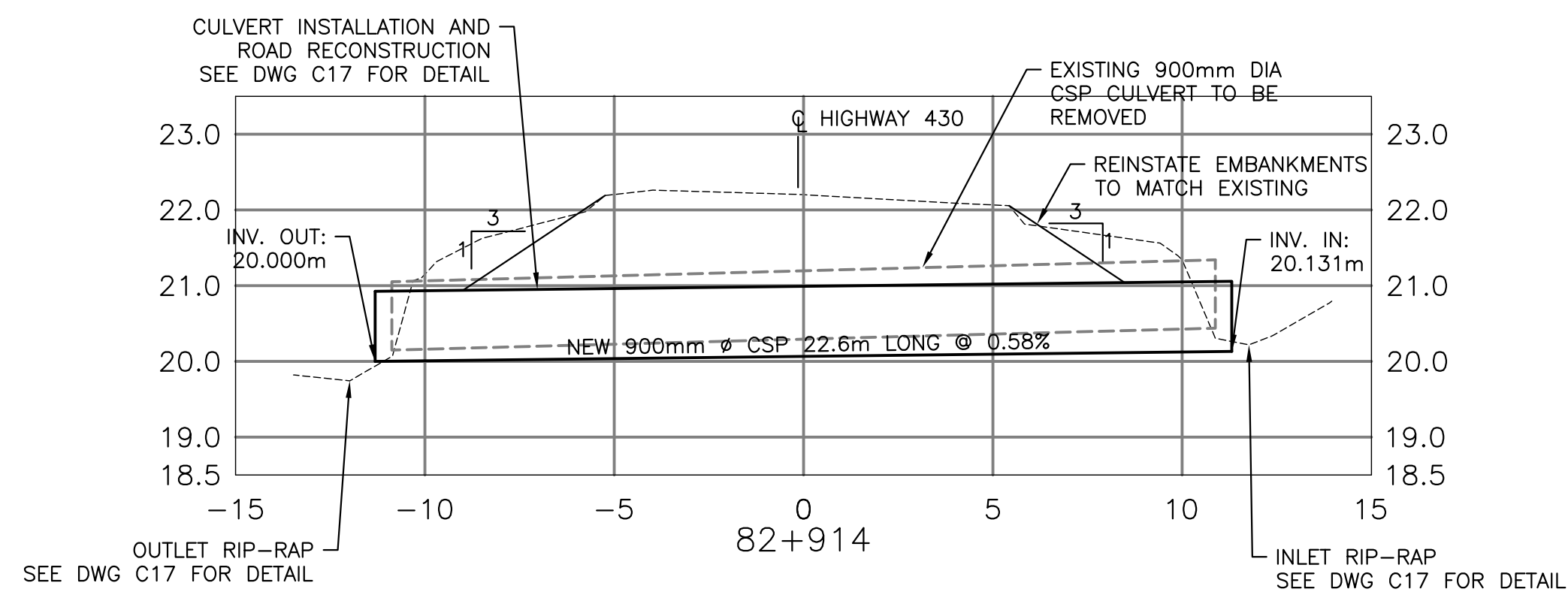
PCA NO.: 1350

drawing no. no. du dessin

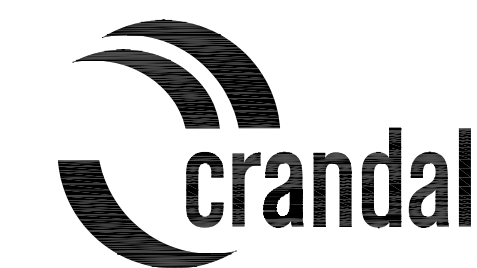
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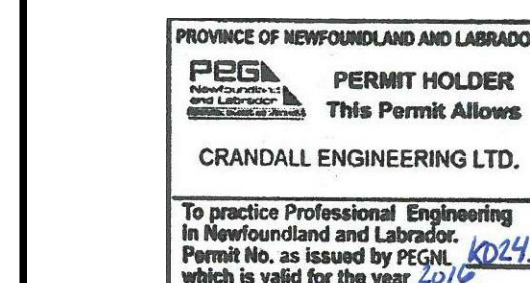
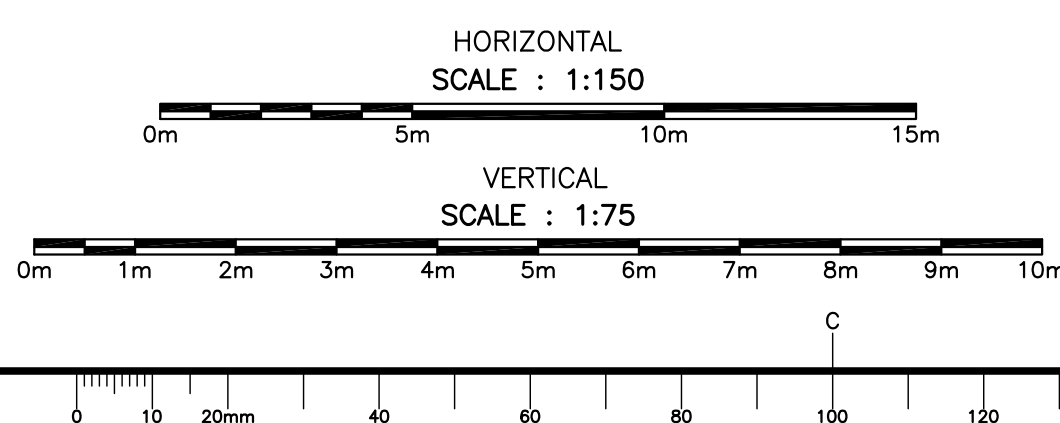
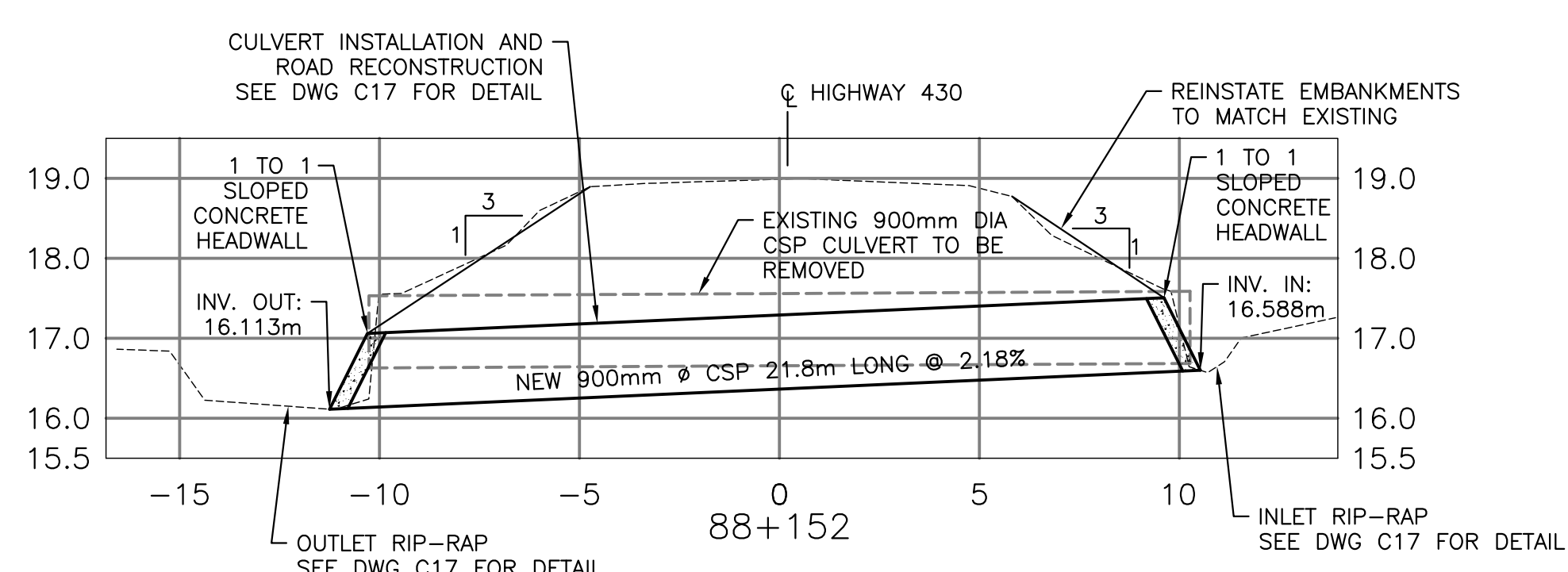
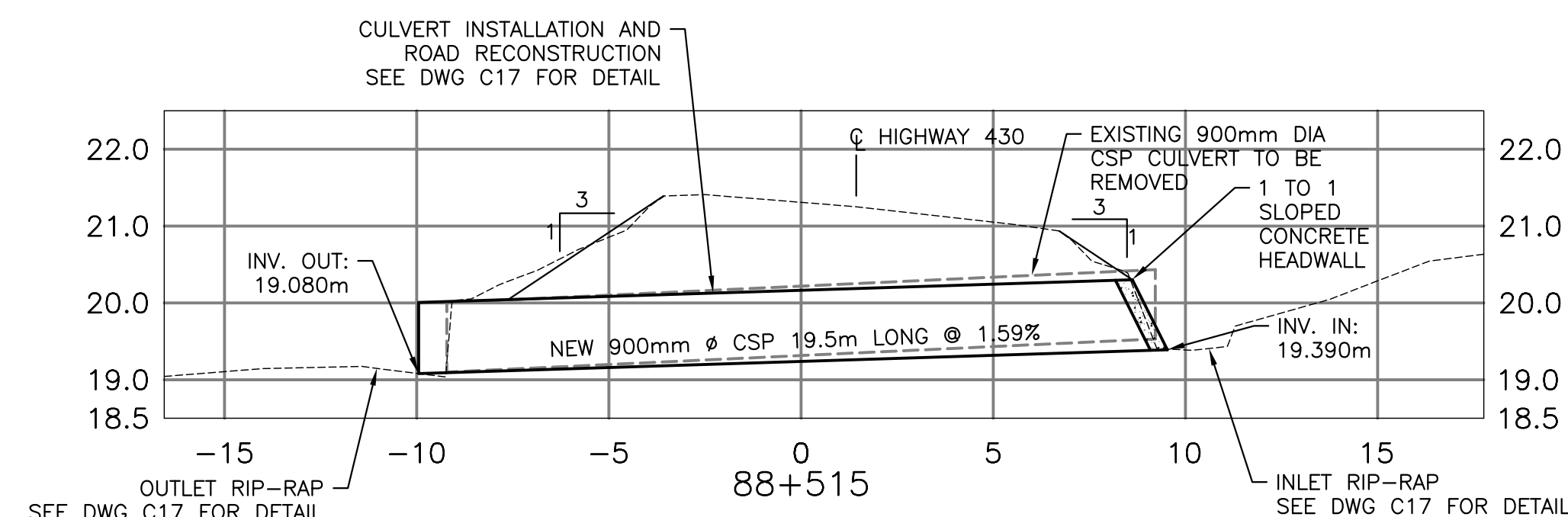
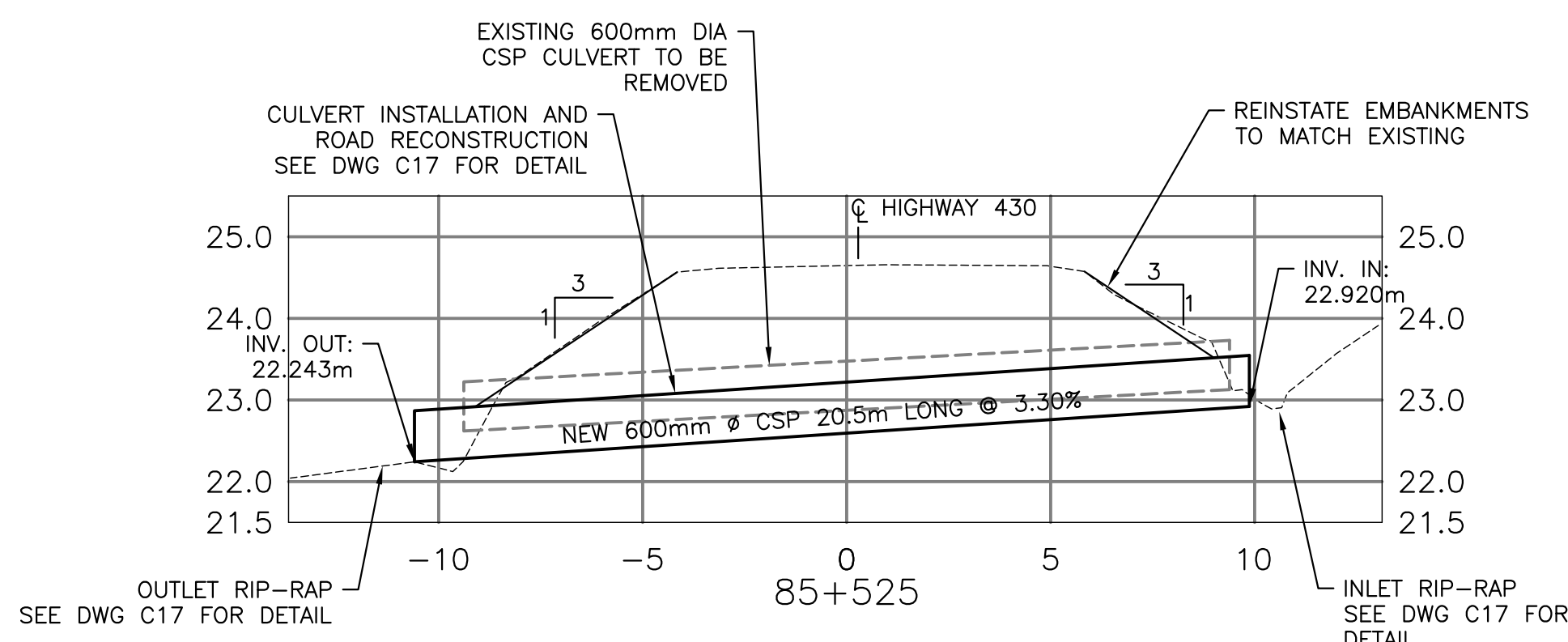
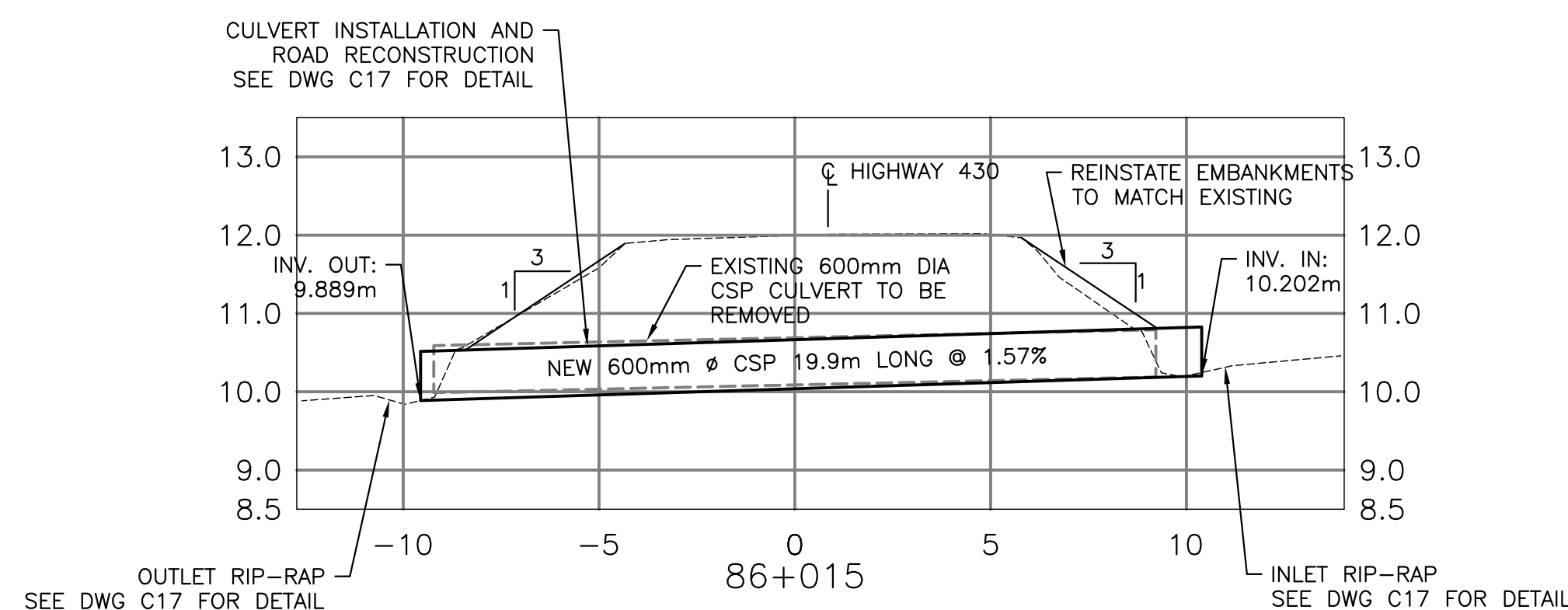
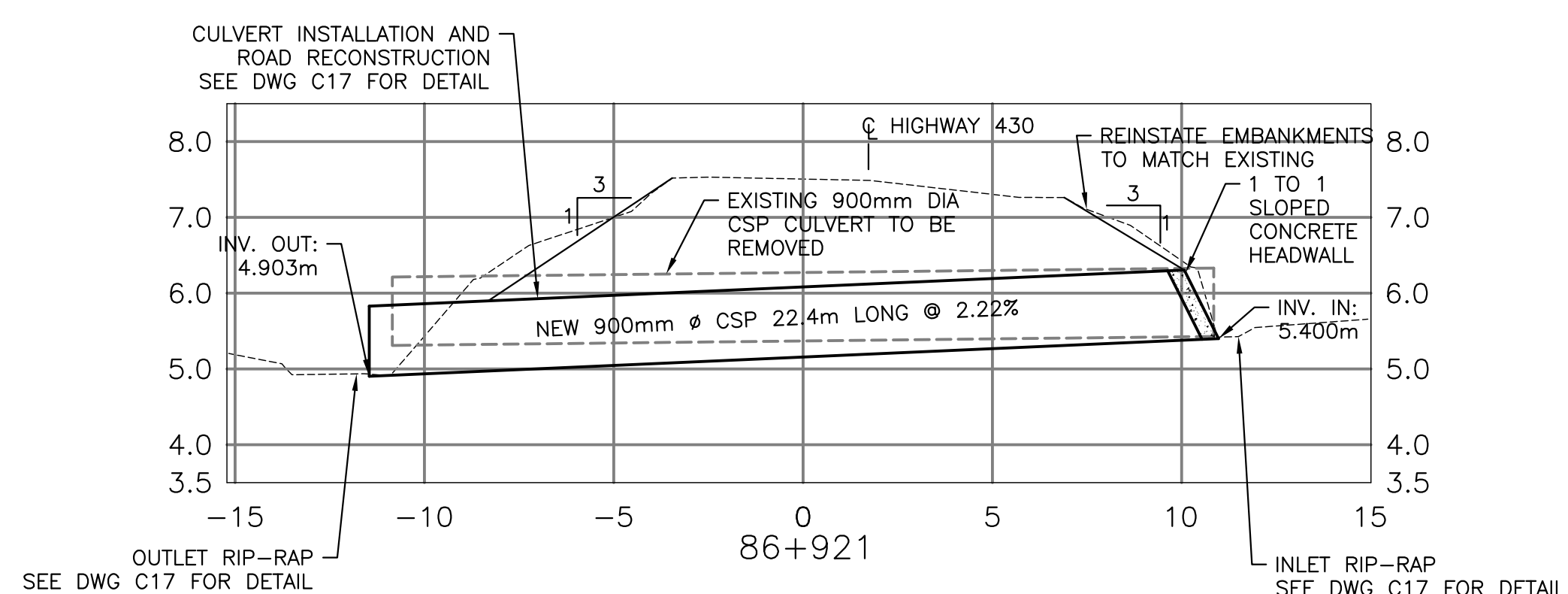
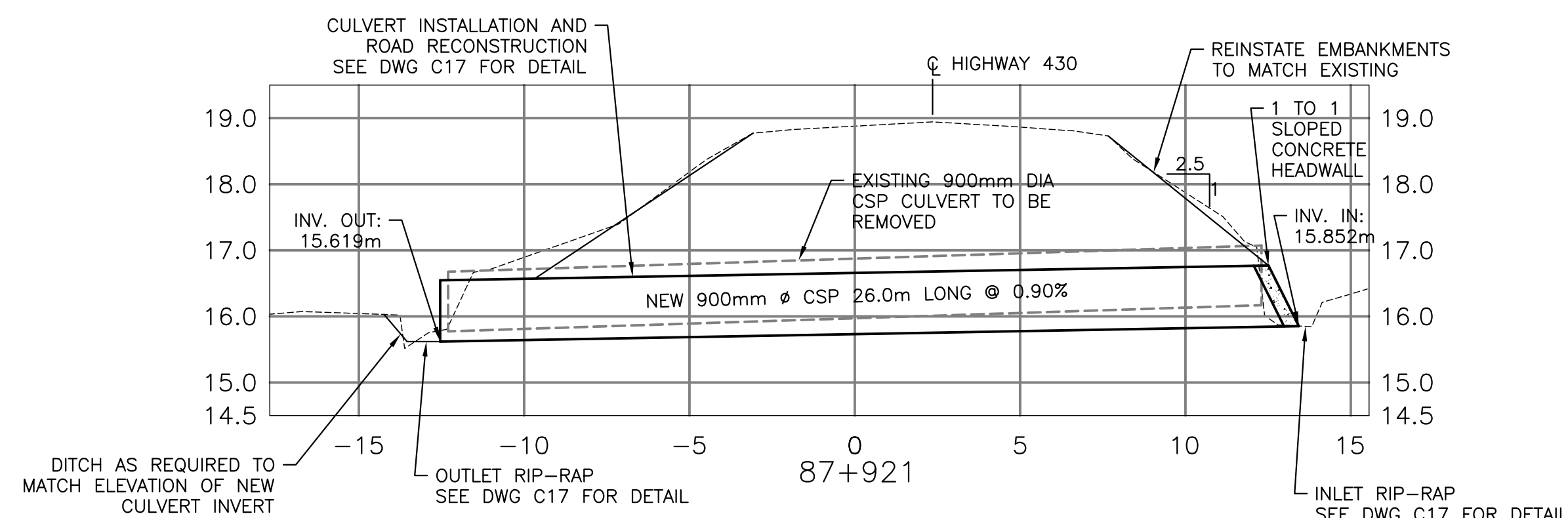








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1	ISSUED FOR TENDER	19/02/2016
revisions		date

project

HIGHWAY 430 NORTH  
(KMS 39.9 TO 88.5)  
RECAPITALIZATION

drawing

CULVERT SECTIONS  
STA. 85+525 TO 88+515

designed G. FLANAGAN

date DECEMBER 04, 2015

drawn G. GALLANT

date DECEMBER 04, 2015

approved J. BABIN

date DECEMBER 04, 2015

Tender

PCA Project Manager

project number

PCA NO.: 1350

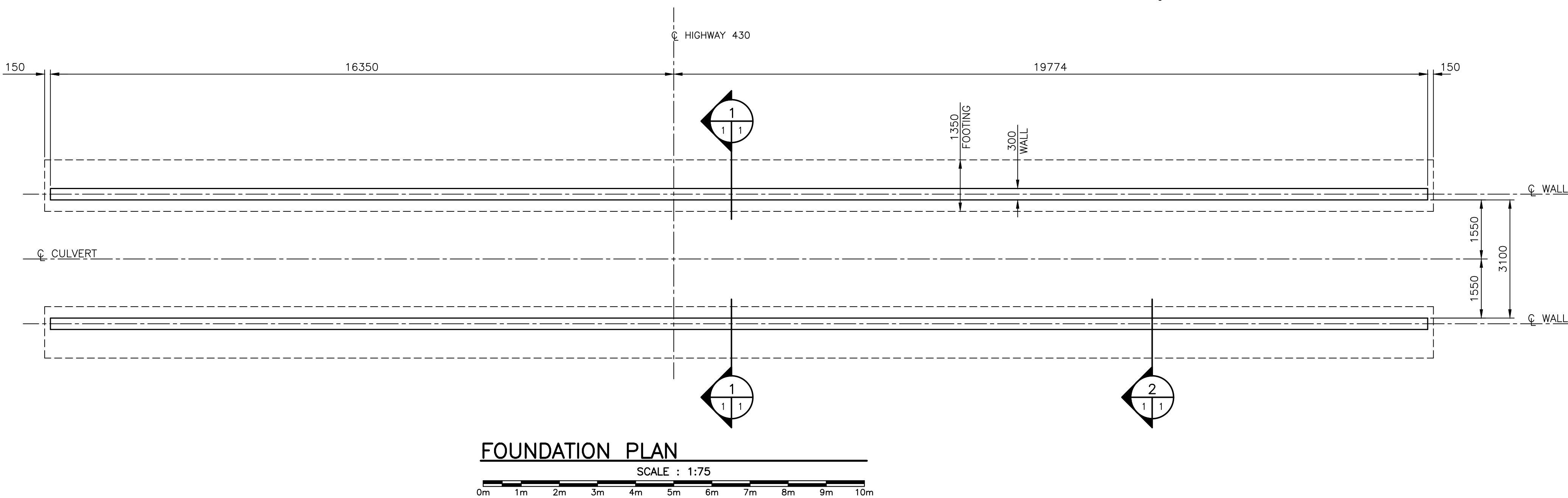
drawing no.

C16





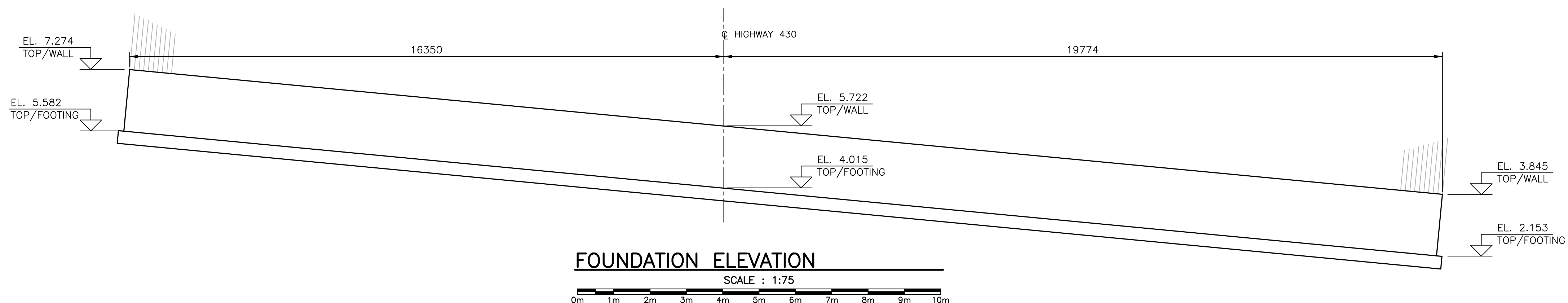




FOUNDATION PLAN

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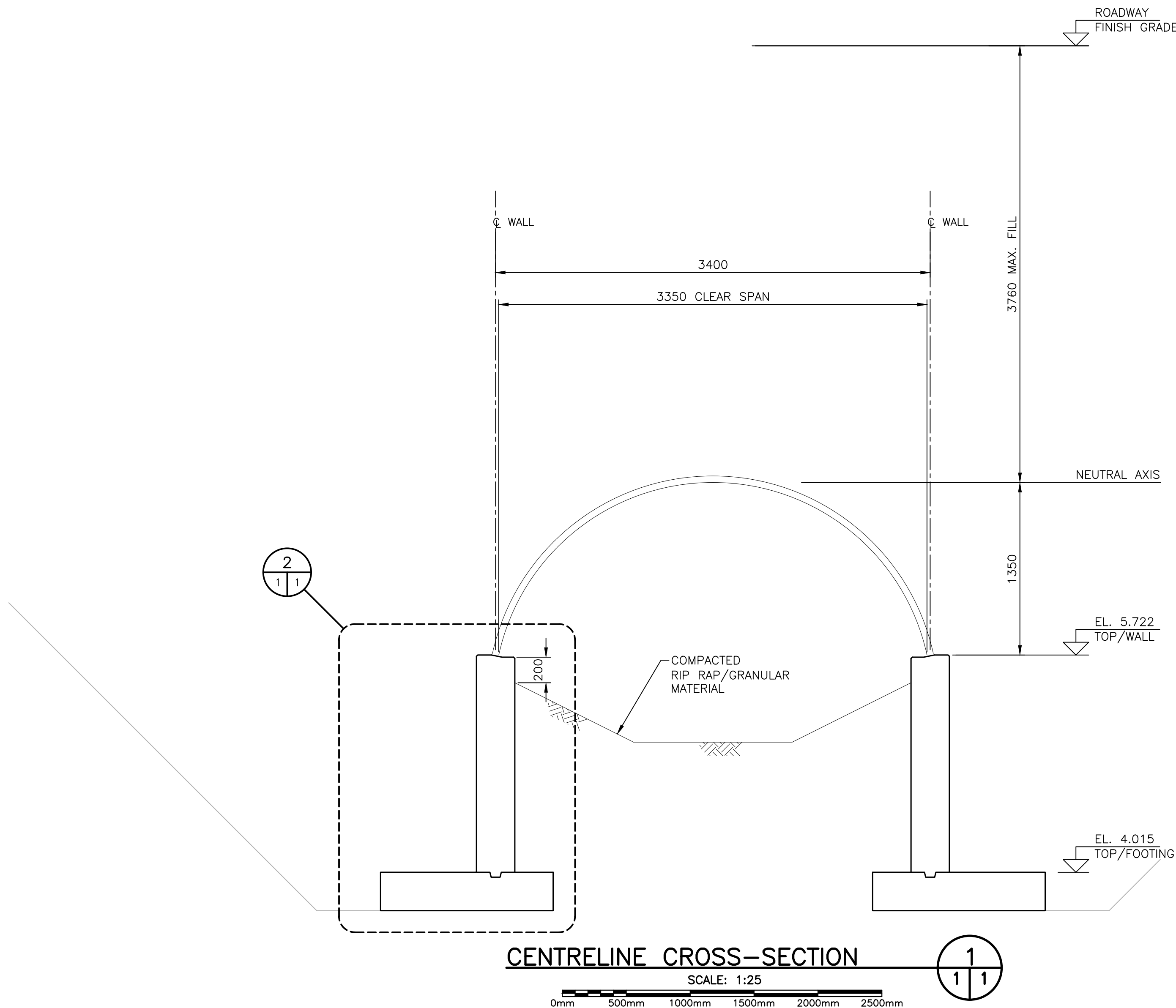
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FOUNDATION ELEVATION

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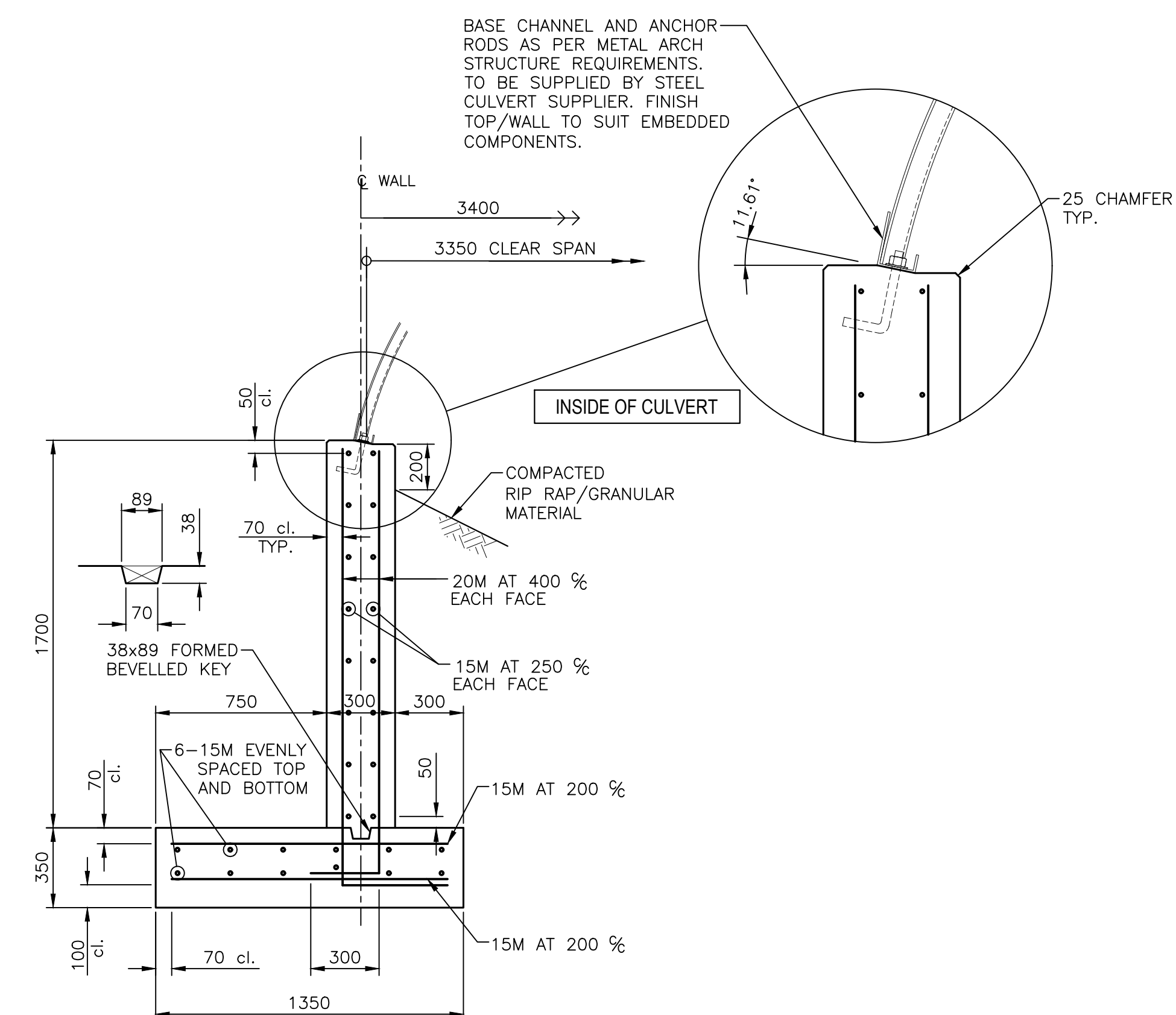
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CENTRELINE CROSS-SECTION

SCALE: 1:25

0mm 500mm 1000mm 1500mm 2000mm 2500mm



TYPICAL WALL SECTION

SCALE : 1:20

0mm 500mm 1000mm 1500mm 2000mm 2500mm

## NOTES:

FOUNDATION DESIGN BASED ON INFORMATION SUPPLIED BY AIL FOR BOLT-A-PLATE STRUCTURE 19A OPEN BOTTOM CSP ARCH CULVERT (3.350 m WIDE x 1.350 m HIGH x 36.124 m LONG) AND MAY VARY IF SUPPLIED BY OTHER MANUFACTURERS.

CONCRETE FOOTING HAS BEEN DESIGNED FOR THE FOLLOWING LOADS APPLIED TO THE TOP OF THE FOUNDATION WALL.

LOAD kN/m	COVER m	DEAD LOAD $F_d$	$F_p$	LIVE LOAD $F_v$	$F_r$
UNFACTORED	4.0	193.95	38.85	8.82	1.81
FACTORED	4.0	242.43	49.81	12.35	2.53

SOIL PRESSURE ON FOUNDATION STRUCTURE WAS BASED ON A SOIL DENSITY OF 22.0 kN/m<sup>3</sup> AND A  $K_a=0.26$ .

THE FOOTING DESIGN WAS BASED ON SLS MINIMUM SOIL BEARING CAPACITY OF 225 kPa. A COEFFICIENT OF FRICTION OF 0.50 WAS USED TO ENSURE RESISTANCE OF FOUNDATION STRUCTURE FROM SLIDING UNDER HORIZONTAL LOADS.

ANY DEVIATION FROM THE ABOVE LOADINGS ON THE CULVERT FOUNDATION WILL REQUIRE VERIFICATION BY A QUALIFIED ENGINEER REGISTERED OR LICENSED IN THE PROVINCE OF NEWFOUNDLAND AND LABRADOR. ADDITIONAL COST FOR ENGINEERING AND MODIFICATIONS TO FOUNDATION STRUCTURE WILL BE ASSUMED BY CONTRACTOR.

CONTRACTOR IS TO CONFIRM IN WRITING THAT THE SOIL BELOW FOUNDATION WAS CHECKED FOR SETTLEMENT IN ACCORDANCE WITH ARCH SUPPLIER'S DESIGN CRITERIA PRIOR TO INSTALLATION OF ARCH.

BACKFILLING AROUND INSTALLATIONS:

DO NOT BACKFILL AROUND OR OVER CAST-IN-PLACE CONCRETE WITHIN 24 HOURS AFTER PLACING OF CONCRETE.

PLACE LAYERS SIMULTANEOUSLY ON BOTH SIDES OF INSTALLED WORK TO EQUALIZE LOADING. DIFFERENCE IN HEIGHT NOT TO EXCEED 200mm.

FOUNDATION CONSTRUCTION IS NOT TO PROCEED UNTIL CONTRACTOR HAS SUBMITTED AND CSP CULVERT ENGINEER-STAMPED DRAWINGS COMPLETE WITH REACTIONS HAS BEEN REVIEWED BY DEPARTMENTAL REPRESENTATIVE.



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Canada

Parks  
Canada



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Project No. 16026

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PROVINCE OF NEWFOUNDLAND

PERMIT HOLDER

This Permit Allows

Valron Engineers Inc.

To practice Professional Engineering

in Newfoundland and Labrador.

Permit No. as issued by APECON 20000

which is valid for this year 2016

2016/02/15

J.M. CHEVARE

2016/02/15

2016/02/15

2016/02/15

2016/02/15

2016/02/15

2016/02/15

2016/02/15

2016/02/15

2016/02/15

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