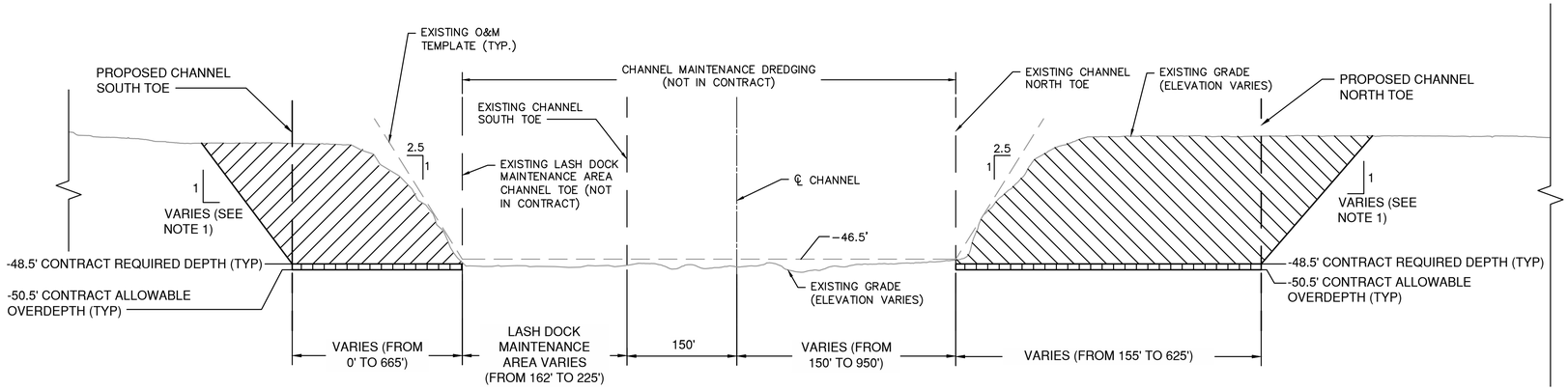
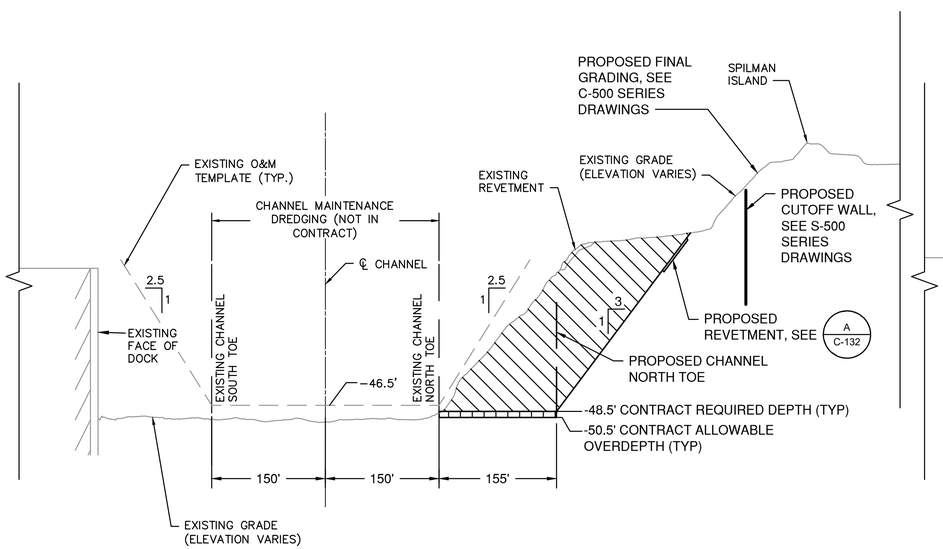


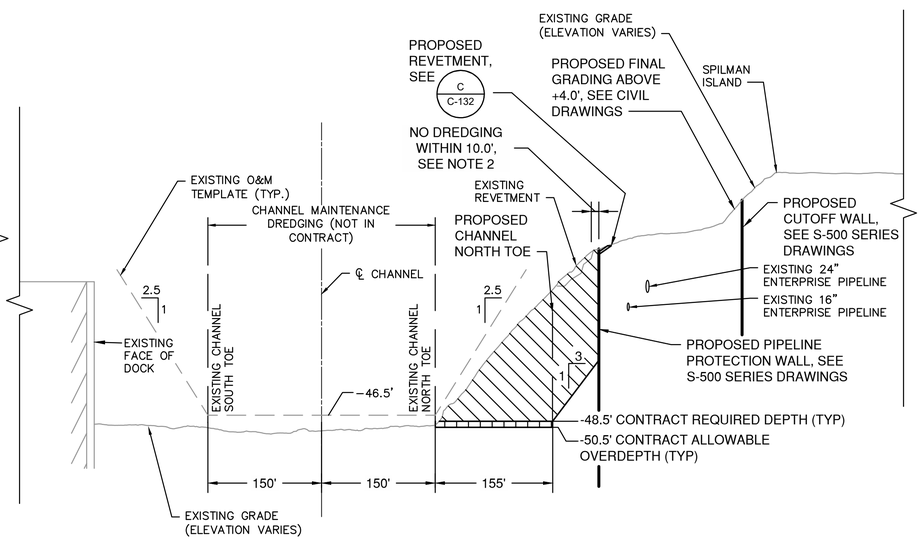
A TYPICAL SECTION - BARBOURS CUT CHANNEL

SCALE: NTS



B TYPICAL SECTION - BARBOURS CUT CHANNEL

SCALE: NTS



C TYPICAL SECTION - BARBOURS CUT CHANNEL

SCALE: NTS

GENERAL NOTES

1. SLOPE "VARIES" INDICATES CROSS-SECTION SLOPE OF 1V:3H IS NOT PERPENDICULAR TO CHANNEL CENTERLINE. ALL SIDE SLOPES ARE 1V:3H FROM TOE OF DREDGE CUT.
2. CONTRACTOR SHALL NOT USE DREDGE EQUIPMENT WITHIN 10 FEET OF EXISTING WALL STRUCTURE.

PORT OF HOUSTON AUTHORITY

CONSULTANT:

DESIGN PREPARED BY:

HDR Engineering, INC
TBPELS Firm
Registration No. F-754

SEAL:

This Document Is Released For The Purpose Of Interim Review Under The Authority Of M. CAMERON PERRY, P.E., 94056 12/08/20. It Is Not To Be Used For Construction, Bidding, Or Permit Purposes.

95% REVIEW

APPROVED: DATE

PORT CONTRACT REPRESENTATIVE
MANAGING DIRECTOR – ENGINEERING DESIGN & SUPPORT

PROJECT TITLE:

HOUSTON SHIP CHANNEL (HSC) EXPANSION CHANNEL IMPROVEMENT PROJECT (ECIP)

PROJECT 11 PACKAGE #7 SEGMENT 3

SHEET TITLE:

TYPICAL SECTIONS-DREDGE TEMPLATE

REV	DATE	DESCRIPTION
A	08/14/20	65% SUBMITTAL
B	12/08/20	95% SUBMITTAL

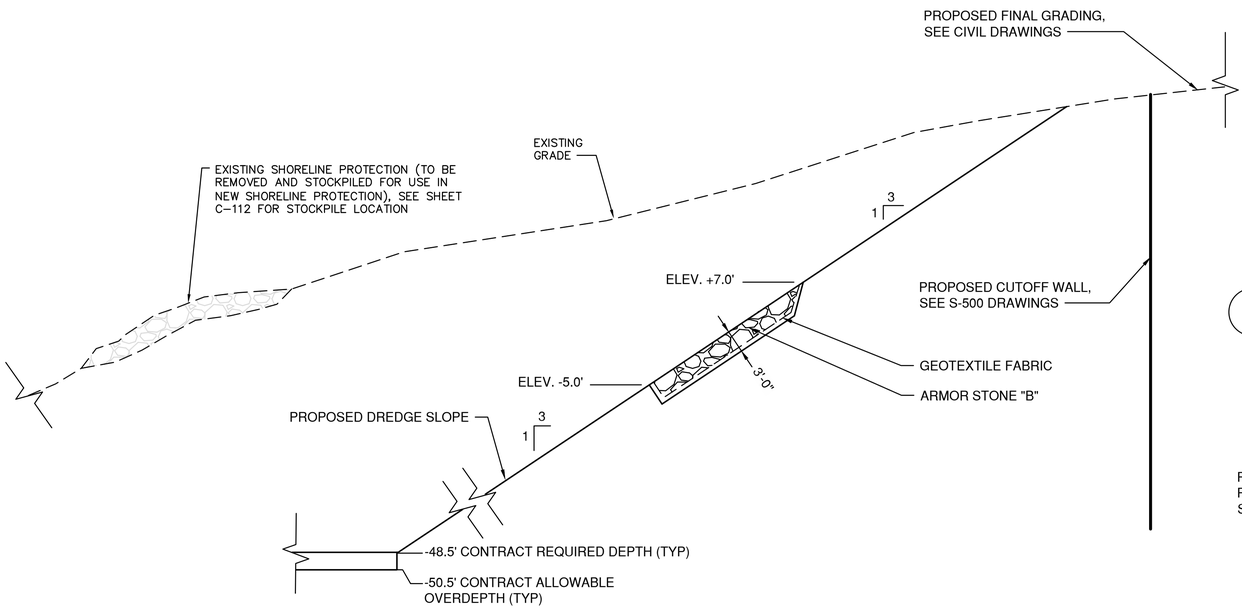
DESIGNER:	C. PERRY
CADD:	J. HELM
CHECKER:	R. McPHERSON
DATE:	12/08/2020
SCALE:	AS NOTED

DRAWING NO. C90-D13-P11-007

SHEET NO. C-131 REV. NO. A

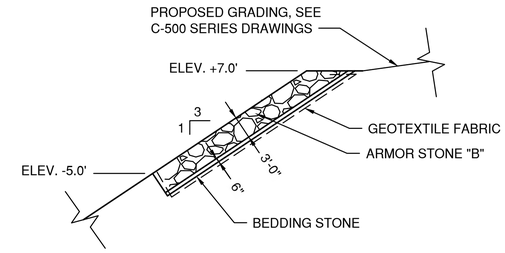
95% REVIEW

TIME: 12-08-20 – 11:08am User: OSALAS DWG: C:\pwworking\central01\d1711938\C90-D13-P11-007_C-131.dwg



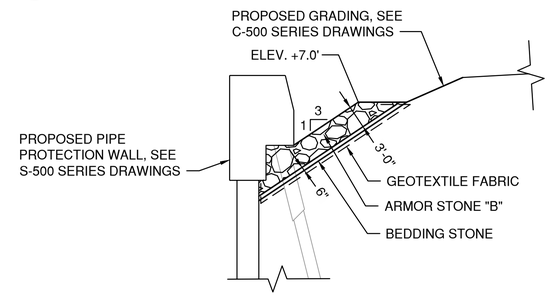
A TYPICAL SECTION - BARBOURS CUT CHANNEL SHORELINE PROTECTION

SCALE: NTS



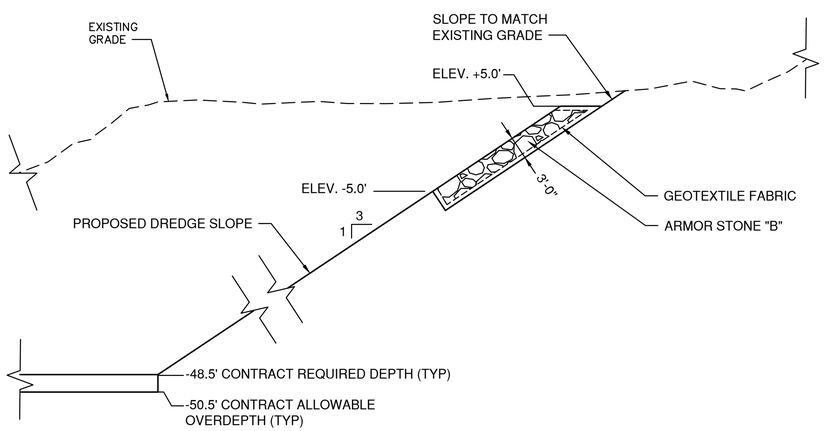
B TYPICAL SECTION - SHORELINE PROTECTION AT PIPE PROTECTION WALL

SCALE: NTS



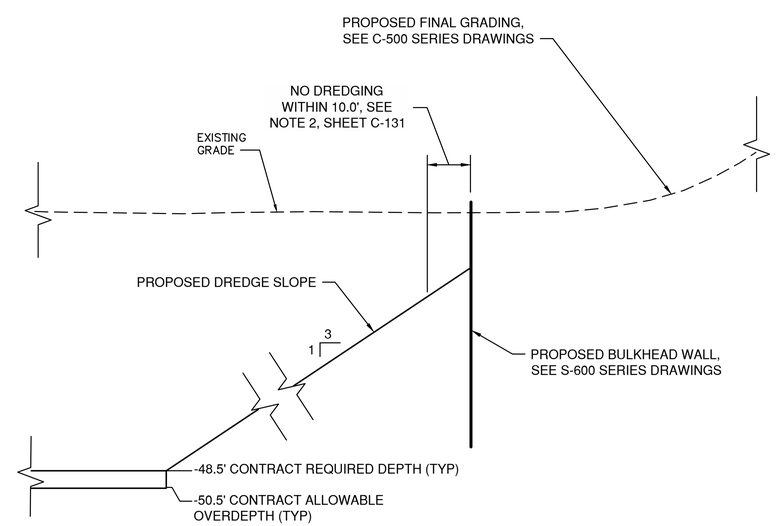
C TYPICAL SECTION - SHORELINE PROTECTION AT PIPE PROTECTION WALL

SCALE: NTS



D TYPICAL SECTION - MORGAN'S POINT SHORELINE PROTECTION

SCALE: NTS



E TYPICAL SECTION - MORGAN'S POINT / SOUTH FLARE

SCALE: NTS

GENERAL NOTES

TABLE 1

ARMOR STONE - GRADED STONE "B" THICKNESS = 3.0'	
% LESS (BY WEIGHT)	WEIGHT(POUNDS)
0	<55
15	200-520
50	500-760
100	1000-1500

PORT OF HOUSTON AUTHORITY

CONSULTANT:

DESIGN PREPARED BY:

HDR Engineering, INC
TBPELS Firm
Registration No. F-754

SEAL:

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95% REVIEW

APPROVED: DATE

PORT CONTRACT REPRESENTATIVE
MANAGING DIRECTOR – ENGINEERING DESIGN & SUPPORT

PROJECT TITLE:

HOUSTON SHIP CHANNEL (HSC) EXPANSION CHANNEL IMPROVEMENT PROJECT (ECIP)

PROJECT 11 PACKAGE #7 SEGMENT 3

SHEET TITLE:

TYPICAL SECTION - REVETMENT

REV	DATE	DESCRIPTION
A	08/14/20	65% SUBMITTAL
B	12/08/20	95% SUBMITTAL

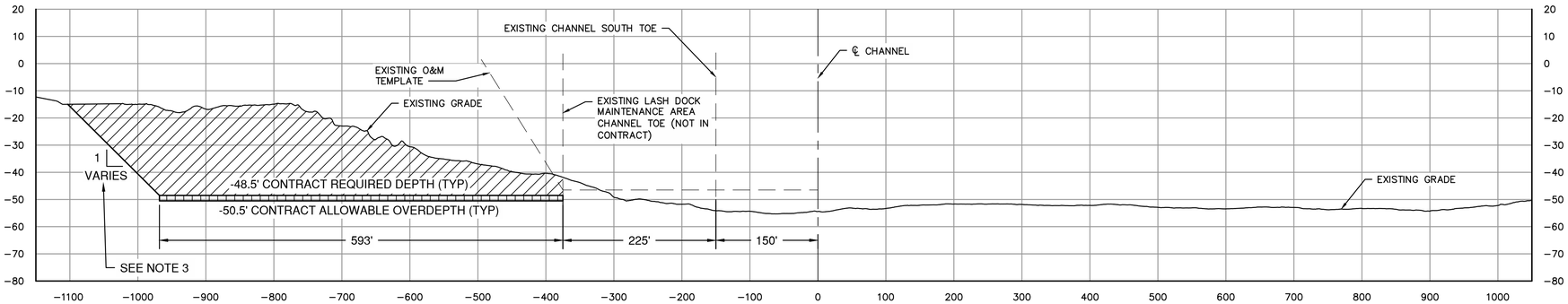
DESIGNER:	C. PERRY
CADD:	J. HELM
CHECKER:	R. McPHERSON
DATE:	12/08/2020
SCALE:	AS NOTED

DRAWING NO. C90-D13-P11-007

SHEET NO. C-132 | REV. NO. A

95% REVIEW

TIME: 12-08-20 – 11:08am User: OSALAS DWG: C:\pwworking\central01\d1711938\C90-D13-P11-007_C-132.dwg



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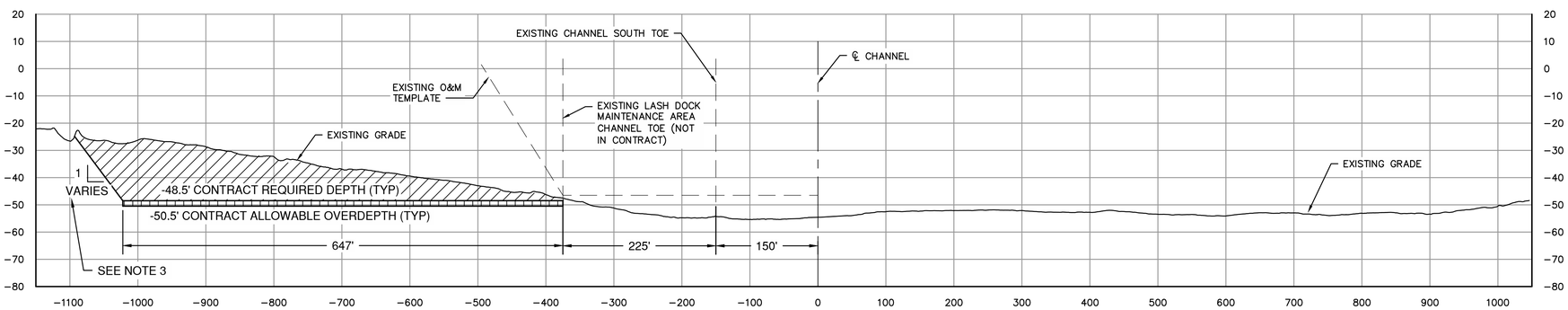
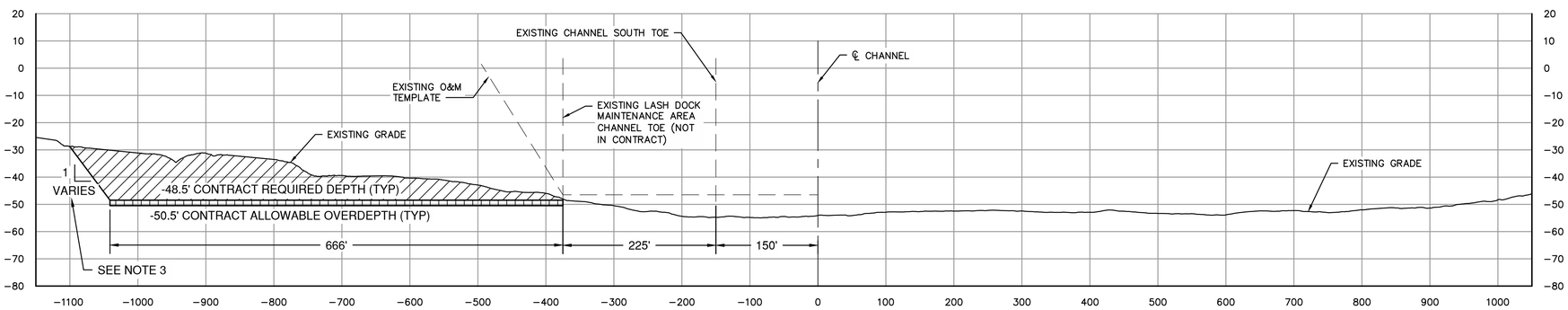


9+84



9+63

GENERAL NOTES

1. ALL ELEVATIONS SHOWN IN FEET TO MEAN LOWER LOW WATER (MLLW).
2. CROSS SECTIONS CUT FACING UP STATION.
3. SLOPE "VARIES" INDICATES CROSS-SECTION SLOPE OF 1V:3H IS NOT PERPENDICULAR TO CHANNEL CENTERLINE. ALL SIDE SLOPES ARE 1V:3H FROM TOE OF DREDGE CUT.

GRAPHIC SCALES

HORIZONTAL 1"=100'

100 50 0 100 200

VERTICAL 1"=4'

4 2 0 4 8

PORT OF HOUSTON AUTHORITY

CONSULTANT:

DESIGN PREPARED BY:

HDR Engineering, INC
TBPELS Firm
Registration No. F-754

SEAL:

This Document Is Released For The Purpose Of Interim Review Under The Authority Of M. CAMERON PERRY, P.E., 94056 12/08/20. It Is Not To Be Used For Construction, Bidding, Or Permit Purposes.

95% REVIEW

APPROVED: DATE

PORT CONTRACT REPRESENTATIVE
MANAGING DIRECTOR – ENGINEERING DESIGN & SUPPORT

PROJECT TITLE:

HOUSTON SHIP CHANNEL (HSC) EXPANSION CHANNEL IMPROVEMENT PROJECT (ECIP)

PROJECT 11 PACKAGE #7 SEGMENT 3

SHEET TITLE:

CROSS SECTIONS (1 OF 9)

REV	DATE	DESCRIPTION
A	08/14/20	65% SUBMITTAL
B	12/08/20	95% SUBMITTAL

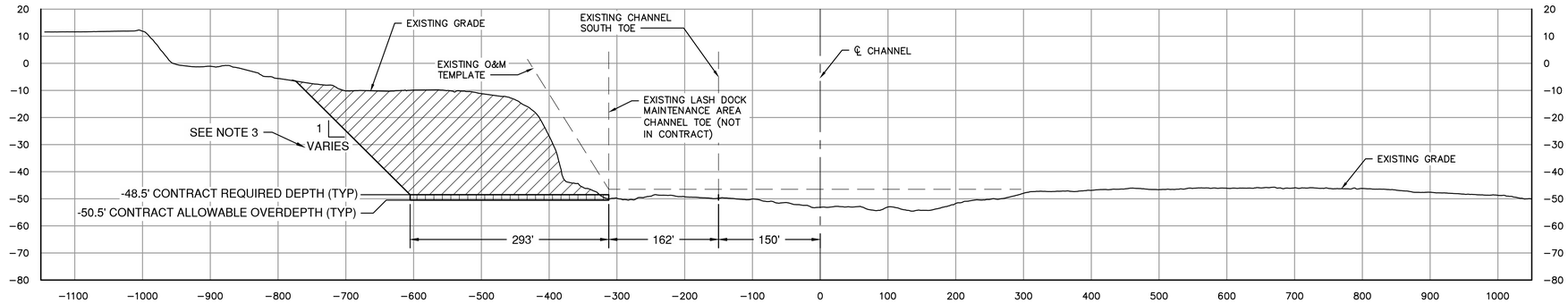
DESIGNER:	C. PERRY
CADD:	J. HELM
CHECKER:	R. McPHERSON
DATE:	12/08/2020
SCALE:	AS NOTED

DRAWING NO. C90-D13-P11-007

SHEET NO. C-133 REV. NO. A

95% REVIEW

TIME: 12-08-20 – 11:08am User: OSALAS DWG: C:\pwworking\central01\d1711938\C90-D13-P11-007_C-133.dwg



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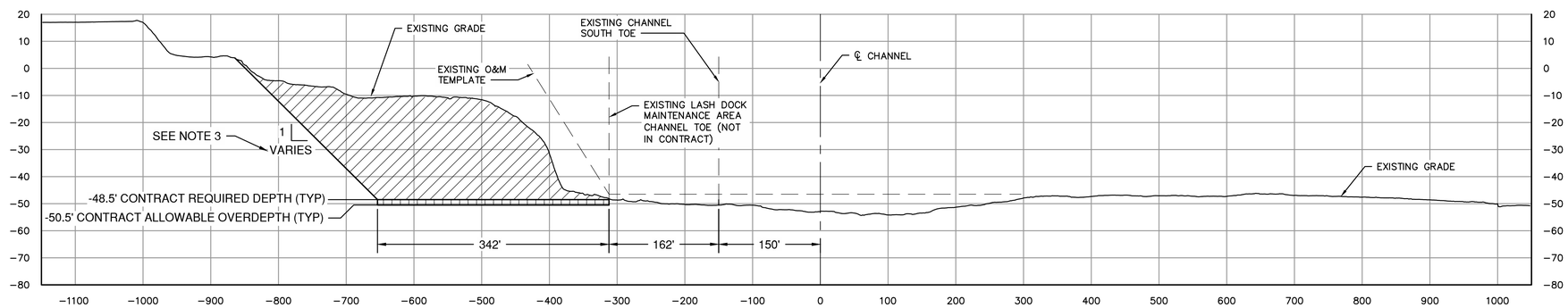

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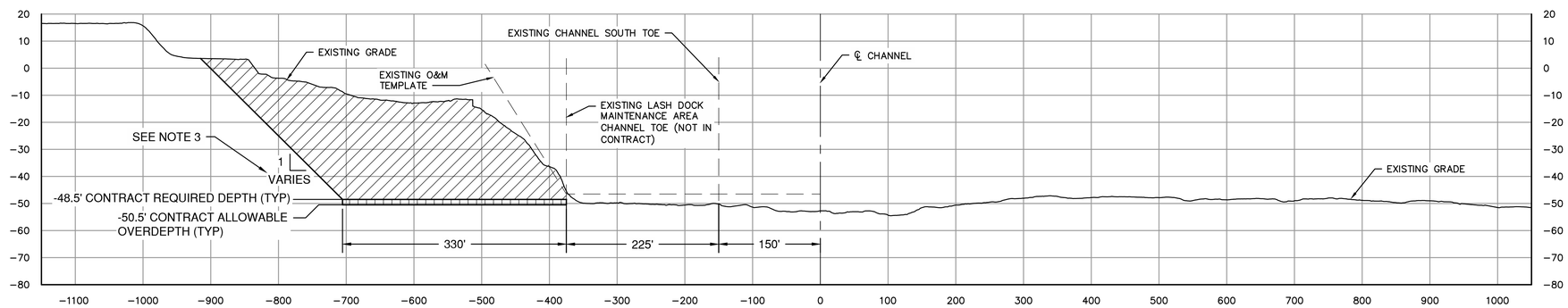

13+39

GENERAL NOTES

1. ALL ELEVATIONS SHOWN IN FEET TO MEAN LOWER LOW WATER (MLLW).
2. CROSS SECTIONS CUT FACING UP STATION.
3. SLOPE "VARIES" INDICATES CROSS-SECTION SLOPE OF 1V:3H IS NOT PERPENDICULAR TO CHANNEL CENTERLINE. ALL SIDE SLOPES ARE 1V:3H FROM TOE OF DREDGE CUT.

GRAPHIC SCALES

HORIZONTAL 1"=100'

100 50 0 100 200

VERTICAL 1"=4'

4 2 0 4 8

PORT OF HOUSTON AUTHORITY

CONSULTANT:

DESIGN PREPARED BY:

HDR Engineering, INC
TBPELS Firm
Registration No. F-754

SEAL:

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95% REVIEW

APPROVED: DATE

PORT CONTRACT REPRESENTATIVE
MANAGING DIRECTOR – ENGINEERING DESIGN & SUPPORT

PROJECT TITLE:

HOUSTON SHIP CHANNEL (HSC) EXPANSION CHANNEL IMPROVEMENT PROJECT (ECIP)

PROJECT 11 PACKAGE #7 SEGMENT 3

SHEET TITLE:

CROSS SECTIONS (2 OF 9)

REV	DATE	DESCRIPTION
A	08/14/20	65% SUBMITTAL
B	12/08/20	95% SUBMITTAL

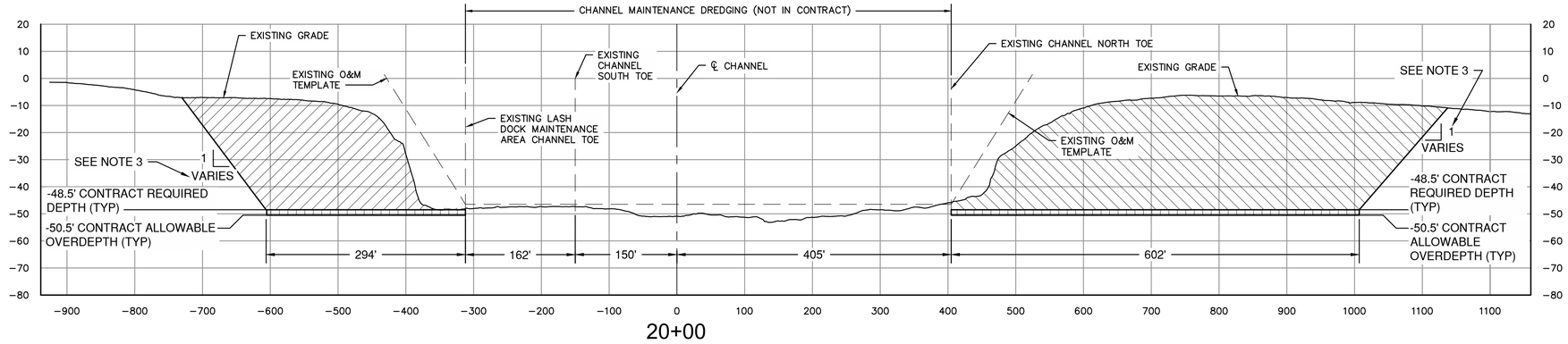
DESIGNER:	C. PERRY
CADD:	J. HELM
CHECKER:	R. McPHERSON
DATE:	12/08/2020
SCALE:	AS NOTED

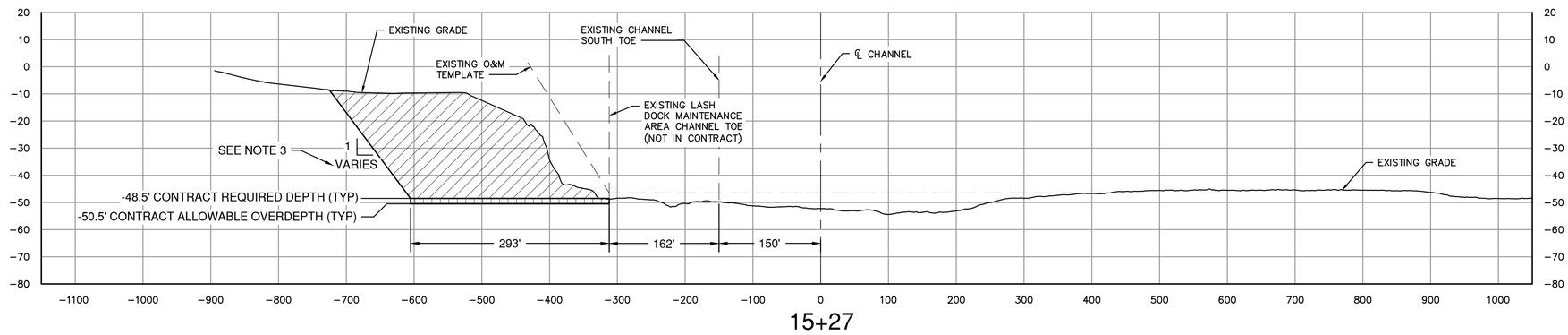
DRAWING NO. C90-D13-P11-007

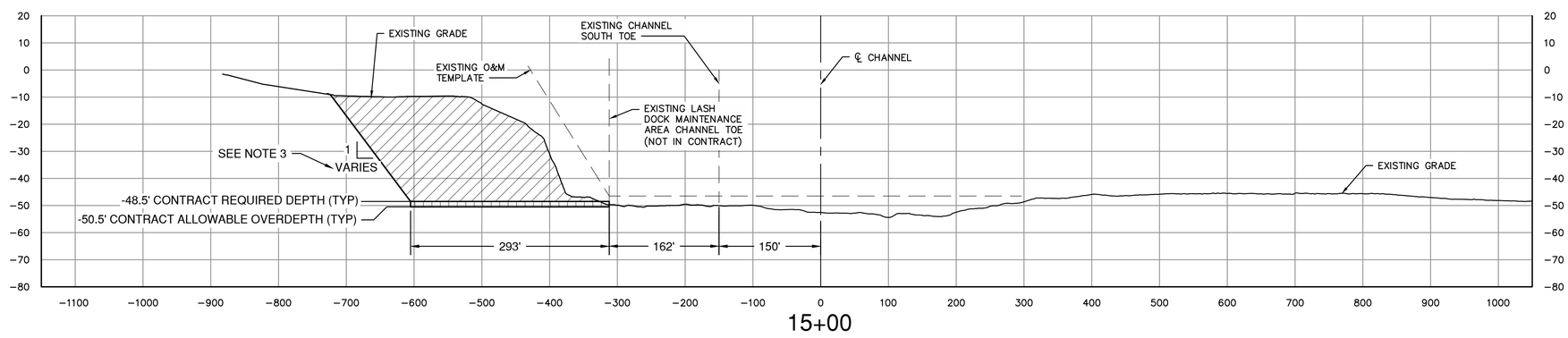
SHEET NO. C-134 REV. NO. A

95% REVIEW

TIME: 12-08-20 – 11:08am User: OSALAS DWG: C:\pwworking\central01\d1711938\C90-D13-P11-007_C-134.dwg







GENERAL NOTES

1. ALL ELEVATIONS SHOWN IN FEET TO MEAN LOWER LOW WATER (MLLW).
2. CROSS SECTIONS CUT FACING UP STATION.
3. SLOPE "VARIES" INDICATES CROSS-SECTION SLOPE OF 1V:3H IS NOT PERPENDICULAR TO CHANNEL CENTERLINE. ALL SIDE SLOPES ARE 1V:3H FROM TOE OF DREDGE CUT.

GRAPHIC SCALES

HORIZONTAL 1"=100'

100 50 0 100 200

VERTICAL 1"=4'

4 2 0 4 8

PORT OF HOUSTON AUTHORITY

CONSULTANT:

DESIGN PREPARED BY:

HDR Engineering, INC
TBPELS Firm
Registration No. F-754

SEAL:

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95% REVIEW

APPROVED:

DATE

PORT CONTRACT REPRESENTATIVE
MANAGING DIRECTOR – ENGINEERING DESIGN & SUPPORT

PROJECT TITLE:

HOUSTON SHIP CHANNEL (HSC) EXPANSION CHANNEL IMPROVEMENT PROJECT (ECIP)

PROJECT 11 PACKAGE #7 SEGMENT 3

SHEET TITLE:

CROSS SECTIONS (3 OF 9)

REV	DATE	DESCRIPTION
A	08/14/20	65% SUBMITTAL
B	12/08/20	95% SUBMITTAL

DESIGNER:	C. PERRY
CADD:	J. HELM
CHECKER:	R. McPHERSON
DATE:	12/08/2020
SCALE:	AS NOTED

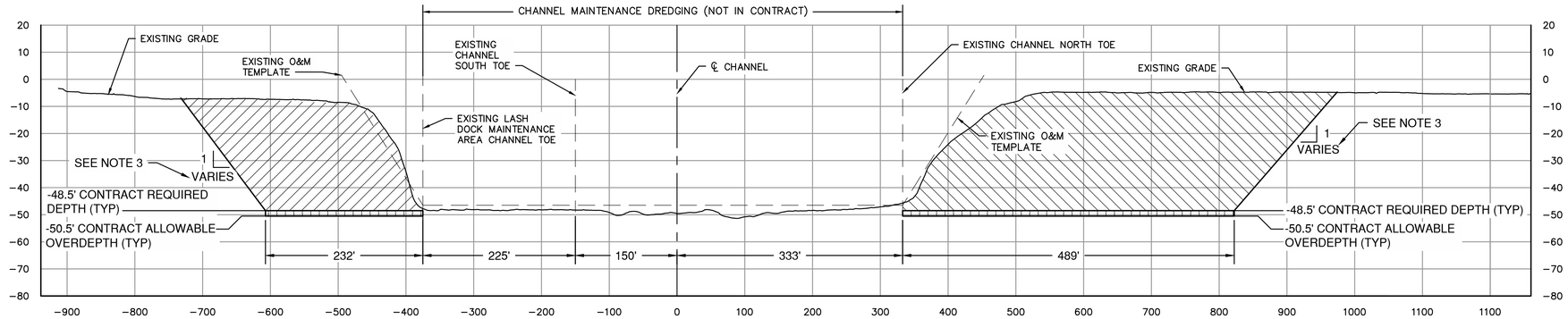
DRAWING NO. C90-D13-P11-007

SHEET NO. C-135

REV. NO. A

95% REVIEW

TIME: 12-08-20 – 11:09am User: OSALAS DWG: C:\pwworking\central01\d1711938\C90-D13-P11-007_C-135.dwg



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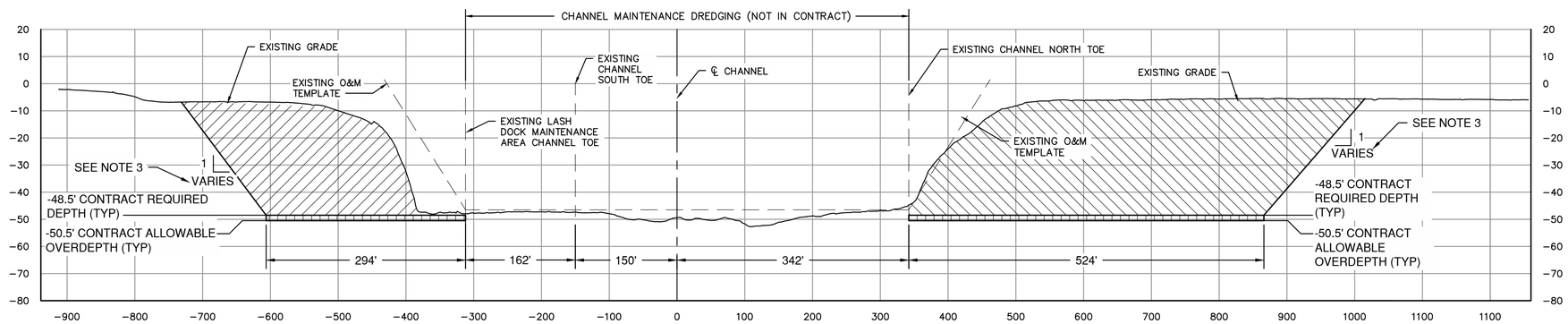

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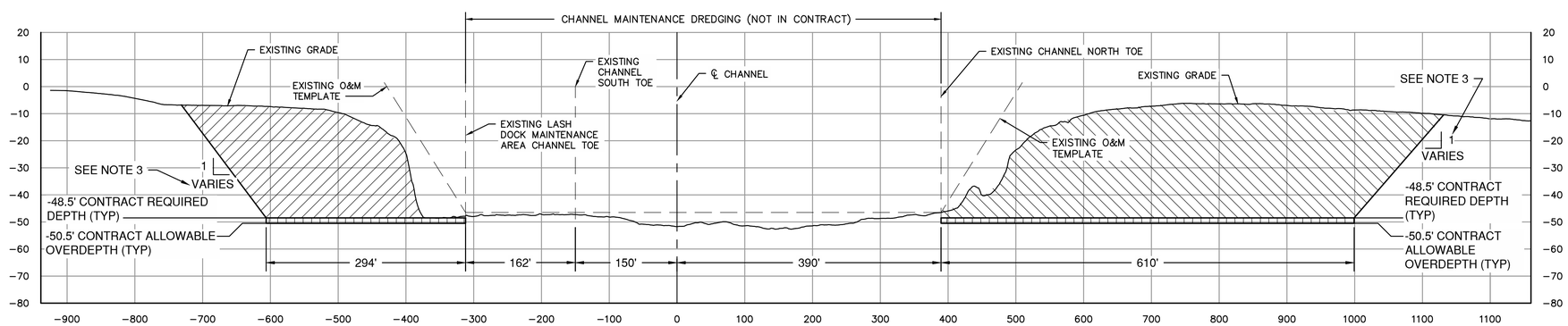

20+13

GENERAL NOTES

1. ALL ELEVATIONS SHOWN IN FEET TO MEAN LOWER LOW WATER (MLLW).
2. CROSS SECTIONS CUT FACING UP STATION.
3. SLOPE "VARIES" INDICATES CROSS-SECTION SLOPE OF 1V:3H IS NOT PERPENDICULAR TO CHANNEL CENTERLINE. ALL SIDE SLOPES ARE 1V:3H FROM TOE OF DREDGE CUT.

GRAPHIC SCALES

HORIZONTAL 1"=100'

100 50 0 100 200

VERTICAL 1"=4'

4 2 0 4 8

PORT OF HOUSTON AUTHORITY

CONSULTANT:

DESIGN PREPARED BY:

HDR Engineering, INC
TBPELS Firm
Registration No. F-754

SEAL:

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95% REVIEW

APPROVED: DATE

PORT CONTRACT REPRESENTATIVE
MANAGING DIRECTOR – ENGINEERING DESIGN & SUPPORT

PROJECT TITLE:

HOUSTON SHIP CHANNEL (HSC) EXPANSION CHANNEL IMPROVEMENT PROJECT (ECIP)

PROJECT 11 PACKAGE #7 SEGMENT 3

SHEET TITLE:

CROSS SECTIONS (4 OF 9)

REV	DATE	DESCRIPTION
A	08/14/20	65% SUBMITTAL
B	12/08/20	95% SUBMITTAL

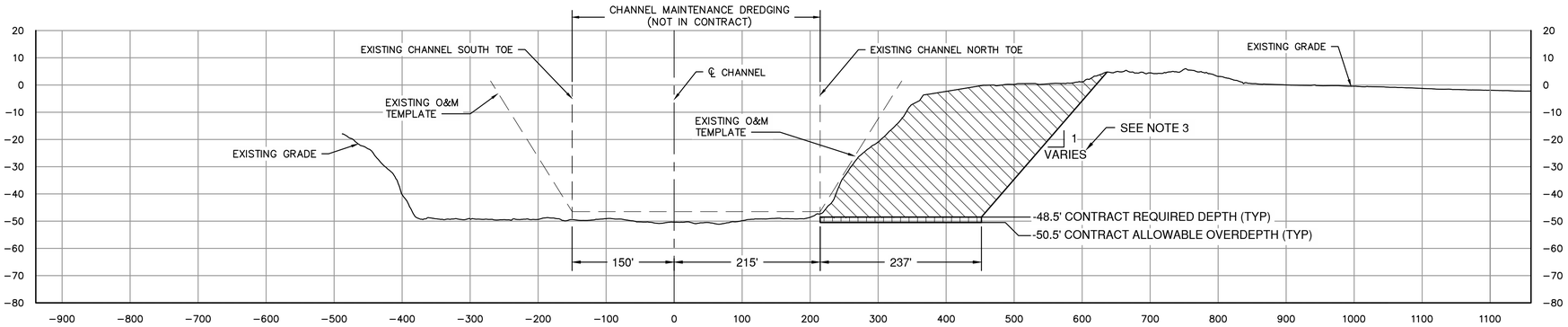
DESIGNER:	C. PERRY
CADD:	J. HELM
CHECKER:	R. McPHERSON
DATE:	12/08/2020
SCALE:	AS NOTED

DRAWING NO. C90-D13-P11-007

SHEET NO. C-136 | REV. NO. A

95% REVIEW

TIME: 12-08-20 – 11:09am User: OSALAS DWG: C:\pwworking\central01\d1711938\C90-D13-P11-007_C-136.dwg



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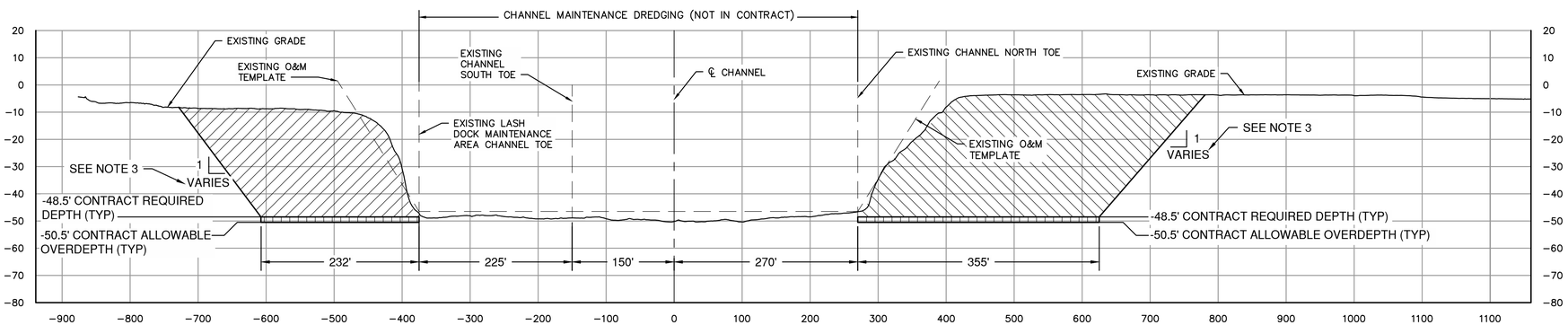

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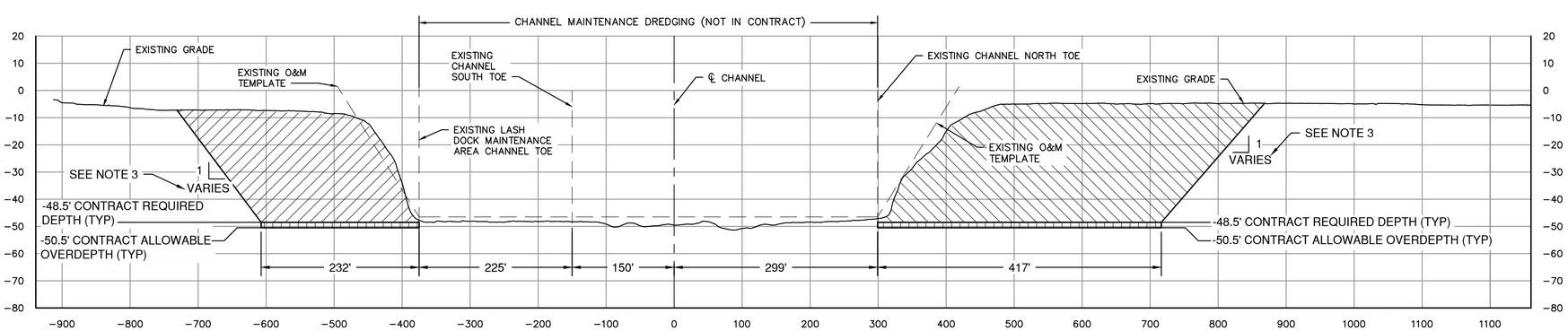

25+00

GENERAL NOTES

1. ALL ELEVATIONS SHOWN IN FEET TO MEAN LOWER LOW WATER (MLLW).
2. CROSS SECTIONS CUT FACING UP STATION.
3. SLOPE "VARIES" INDICATES CROSS-SECTION SLOPE OF 1V:3H IS NOT PERPENDICULAR TO CHANNEL CENTERLINE. ALL SIDE SLOPES ARE 1V:3H FROM TOE OF DREDGE CUT.

GRAPHIC SCALES

HORIZONTAL 1"=100'

100 50 0 100 200

VERTICAL 1"=4'

4 2 0 4 8

PORT OF HOUSTON AUTHORITY

CONSULTANT:

DESIGN PREPARED BY:

HDR Engineering, INC
TBPELS Firm
Registration No. F-754

SEAL:

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95% REVIEW

APPROVED:

DATE

PORT CONTRACT REPRESENTATIVE
MANAGING DIRECTOR – ENGINEERING DESIGN & SUPPORT

PROJECT TITLE:

HOUSTON SHIP CHANNEL (HSC) EXPANSION CHANNEL IMPROVEMENT PROJECT (ECIP)

PROJECT 11 PACKAGE #7 SEGMENT 3

SHEET TITLE:

CROSS SECTIONS (5 OF 9)

REV	DATE	DESCRIPTION
A	08/14/20	65% SUBMITTAL
B	12/08/20	95% SUBMITTAL

DESIGNER:	C. PERRY
CADD:	J. HELM
CHECKER:	R. McPHERSON
DATE:	12/08/2020
SCALE:	AS NOTED

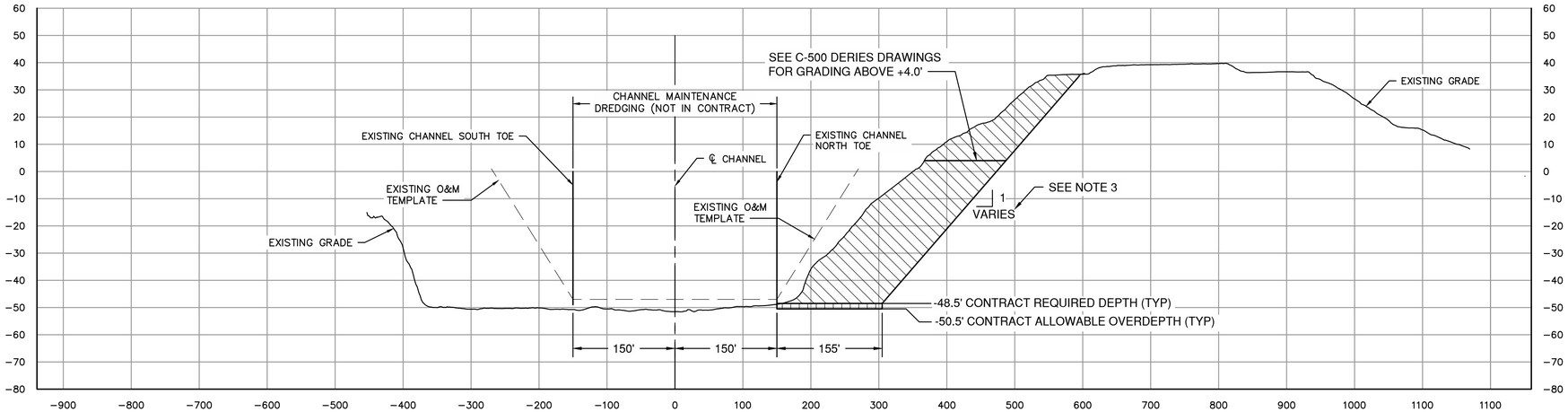
DRAWING NO.
C90-D13-P11-007

SHEET NO. C-137

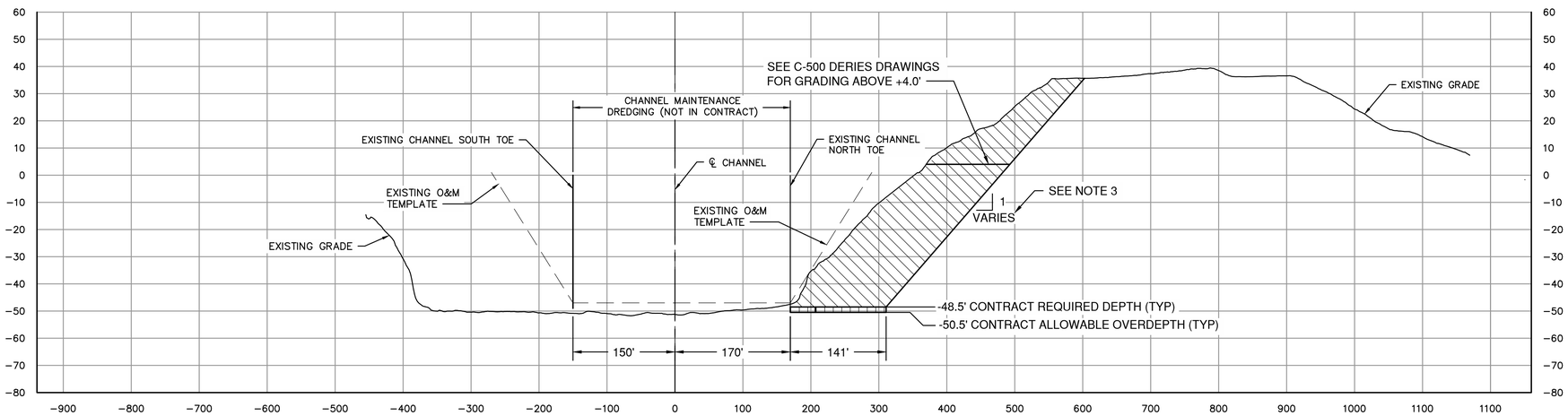
REV. NO. A

95% REVIEW

TIME: 12-08-20 – 11:09am User: OSALAS DWG: C:\pwworking\central01\d1711938\C90-D13-P11-007_C-137.dwg



32+08



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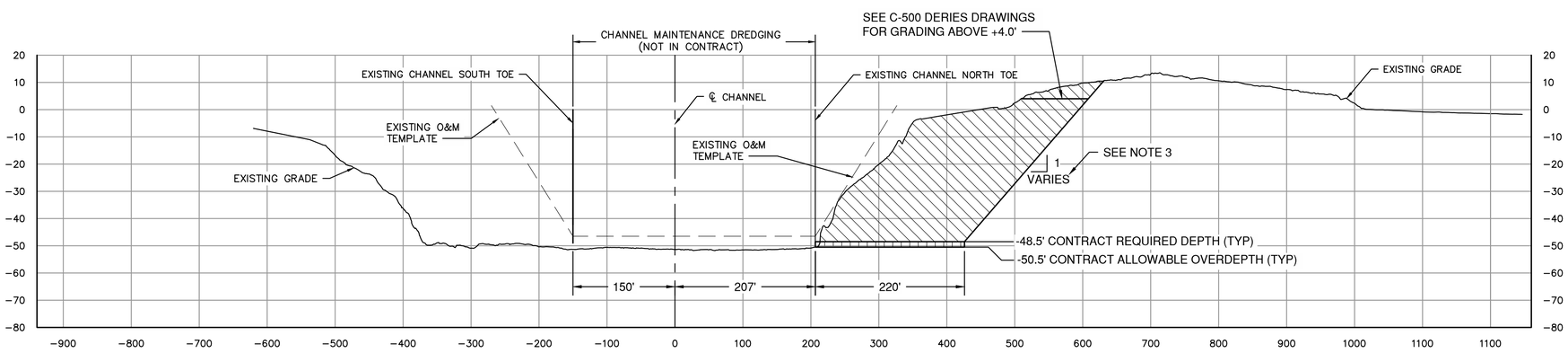

30+00

GENERAL NOTES

1. ALL ELEVATIONS SHOWN IN FEET TO MEAN LOWER LOW WATER (MLLW).
2. CROSS SECTIONS CUT FACING UP STATION.

GRAPHIC SCALES

HORIZONTAL 1"=100'

100 50 0 100 200

VERTICAL 1"=4'

4 2 0 4 8

PORT OF HOUSTON AUTHORITY

CONSULTANT:

DESIGN PREPARED BY:

HDR Engineering, INC
TBPELS Firm
Registration No. F-754

SEAL:

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95% REVIEW

APPROVED: DATE

PORT CONTRACT REPRESENTATIVE
MANAGING DIRECTOR – ENGINEERING DESIGN & SUPPORT

PROJECT TITLE:

HOUSTON SHIP CHANNEL (HSC) EXPANSION CHANNEL IMPROVEMENT PROJECT (ECIP)

PROJECT 11 PACKAGE #7 SEGMENT 3

SHEET TITLE:

CROSS SECTIONS (6 OF 9)

REV	DATE	DESCRIPTION
A	08/14/20	65% SUBMITTAL
B	12/08/20	95% SUBMITTAL

DESIGNER:	C. PERRY
CADD:	J. HELM
CHECKER:	R. McPHERSON
DATE:	12/08/2020
SCALE:	AS NOTED

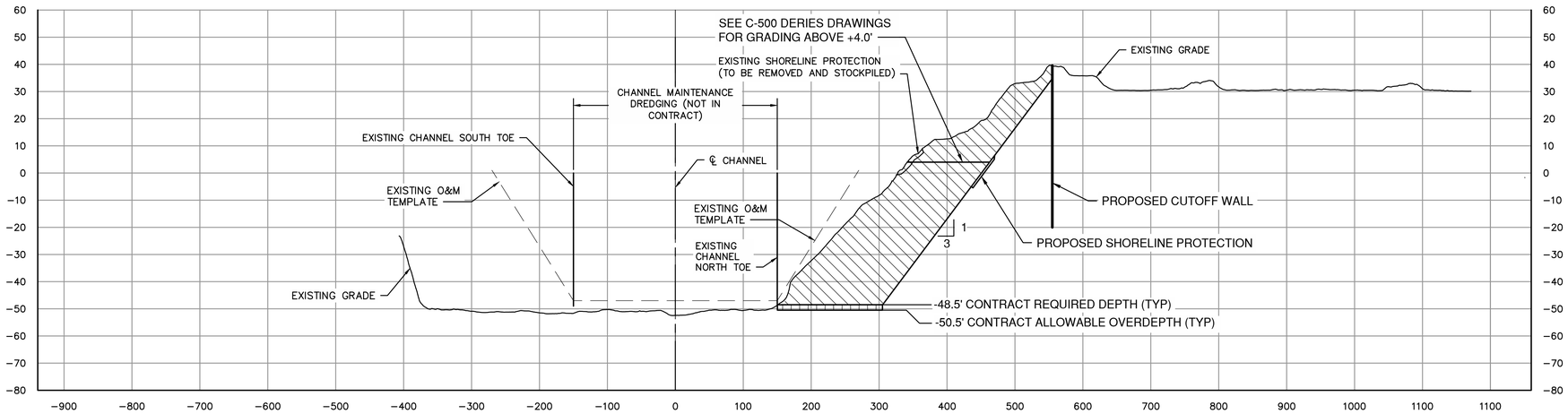
DRAWING NO. C90-D13-P11-007

SHEET NO. C-138

REV. NO. A

95% REVIEW

TIME: 12-08-20 – 11:09am User: OSALAS DWG: C:\pwworking\central01\d1711938\C90-D13-P11-007_C-138.dwg



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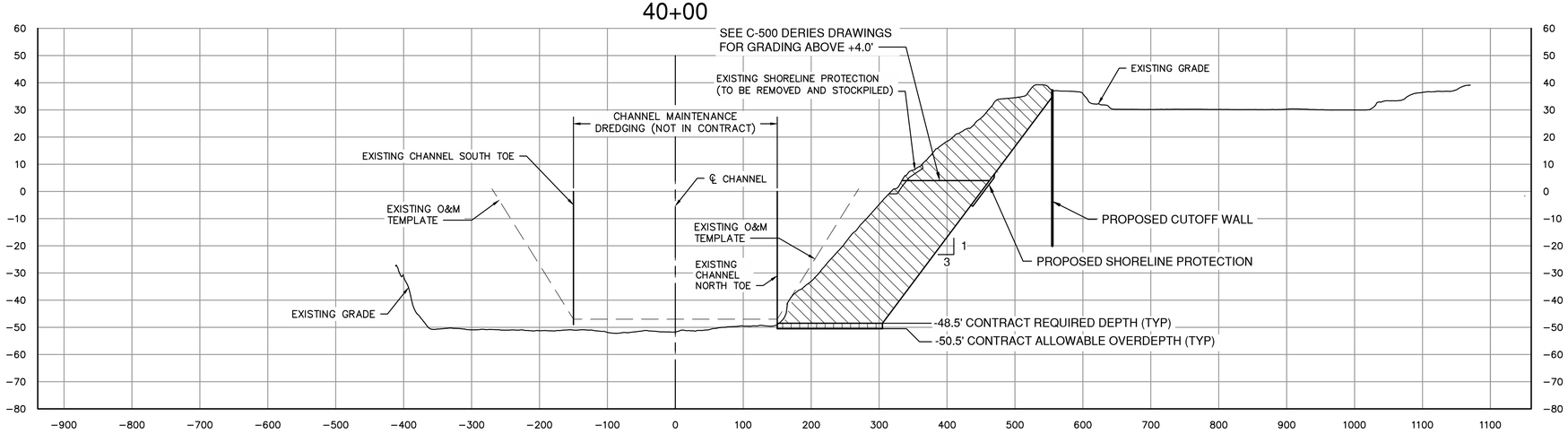

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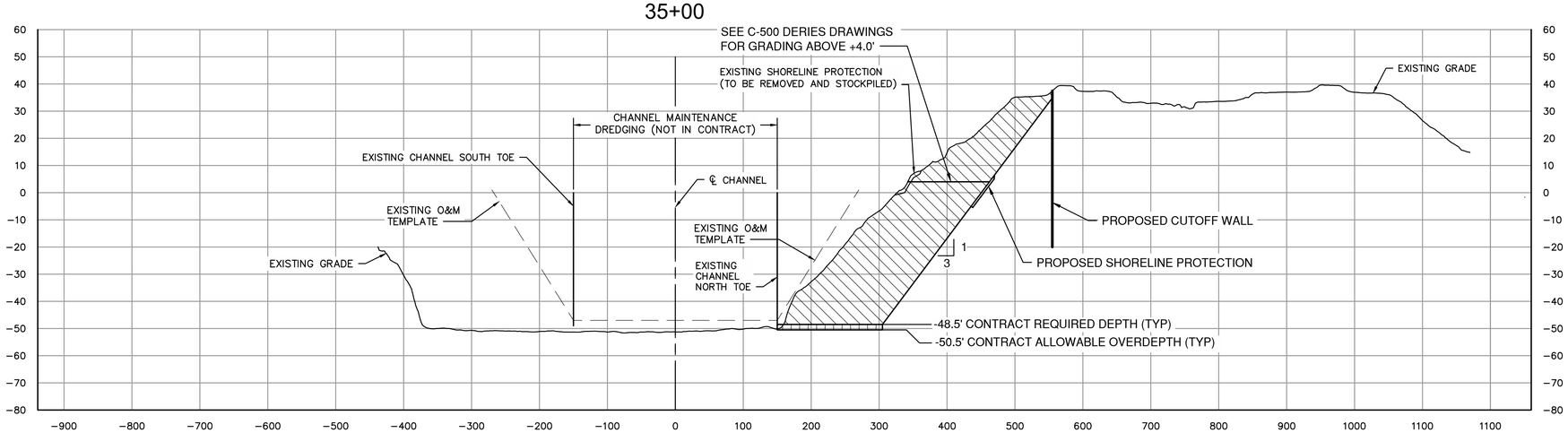


33+05

GENERAL NOTES

1. ALL ELEVATIONS SHOWN IN FEET TO MEAN LOWER LOW WATER (MLLW).
2. CROSS SECTIONS CUT FACING UP STATION.

GRAPHIC SCALES

HORIZONTAL 1"=100'

100 50 0 100 200

VERTICAL 1"=4'

4 2 0 4 8

PORT OF HOUSTON AUTHORITY

CONSULTANT:

DESIGN PREPARED BY:

HDR Engineering, INC
TBPELS Firm
Registration No. F-754

SEAL:

This Document Is Released For The Purpose Of Interim Review Under The Authority Of M. CAMERON PERRY, P.E., 94056 12/08/20. It Is Not To Be Used For Construction, Bidding, Or Permit Purposes.

95% REVIEW

APPROVED: DATE

PORT CONTRACT REPRESENTATIVE
MANAGING DIRECTOR – ENGINEERING DESIGN & SUPPORT

PROJECT TITLE:

HOUSTON SHIP CHANNEL (HSC) EXPANSION CHANNEL IMPROVEMENT PROJECT (ECIP)

PROJECT 11 PACKAGE #7 SEGMENT 3

SHEET TITLE:

CROSS SECTIONS (7 OF 9)

REV	DATE	DESCRIPTION
A	08/14/20	65% SUBMITTAL
B	12/08/20	95% SUBMITTAL

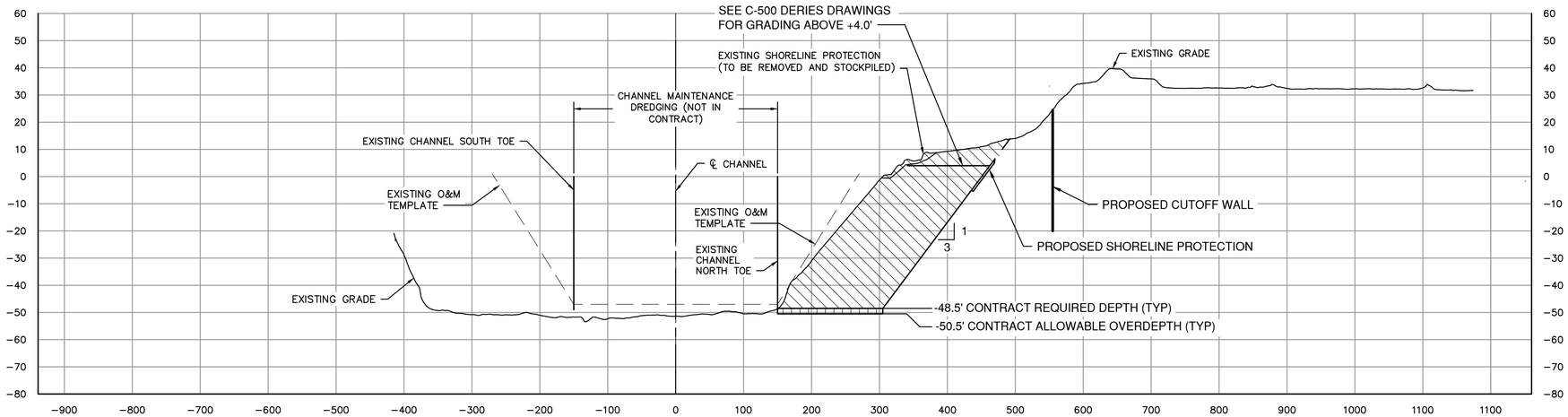
DESIGNER:	C. PERRY
CADD:	J. HELM
CHECKER:	R. McPHERSON
DATE:	12/08/2020
SCALE:	AS NOTED

DRAWING NO. C90-D13-P11-007

SHEET NO. C-139 REV. NO. A

95% REVIEW

TIME: 12-08-20 – 11:09am User: OSALAS DWG: C:\pwworking\central01\d1711938\C90-D13-P11-007_C-139.dwg



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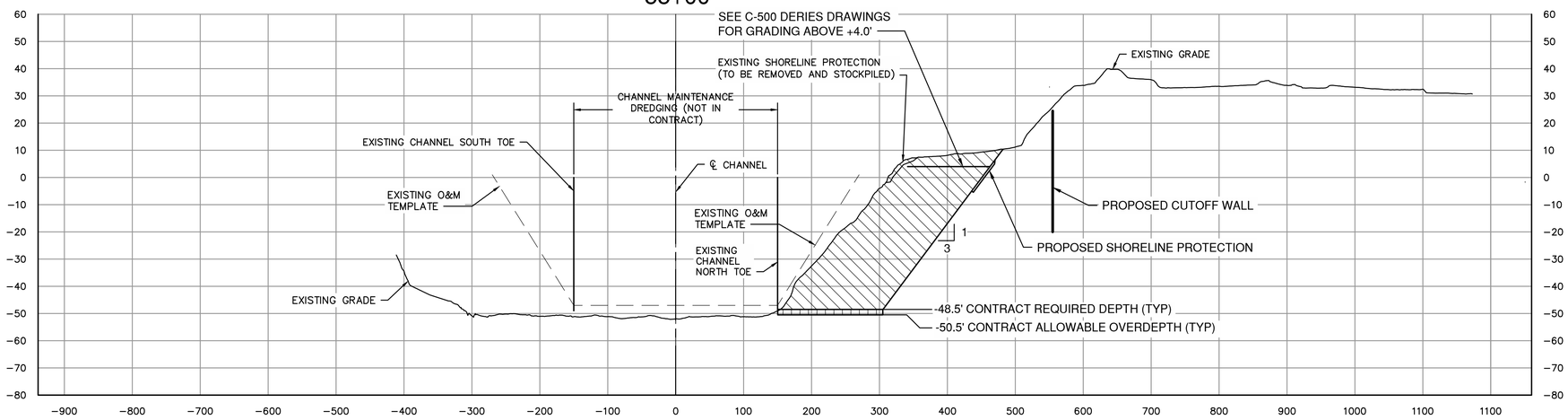

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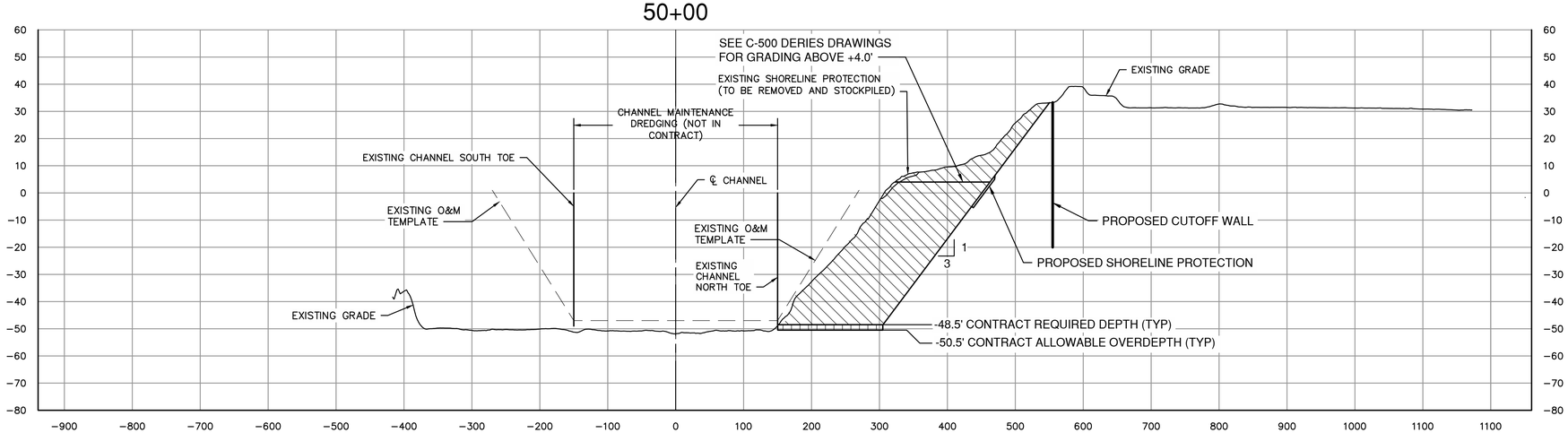

45+00

GENERAL NOTES

1. ALL ELEVATIONS SHOWN IN FEET TO MEAN LOWER LOW WATER (MLLW).
2. CROSS SECTIONS CUT FACING UP STATION.

GRAPHIC SCALES

HORIZONTAL 1"=100'

100 50 0 100 200

VERTICAL 1"=4'

4 2 0 4 8

PORT OF HOUSTON AUTHORITY

CONSULTANT:

DESIGN PREPARED BY:

HDR Engineering, INC
TBPELS Firm
Registration No. F-754

SEAL:

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95% REVIEW

APPROVED:

DATE

PORT CONTRACT REPRESENTATIVE
MANAGING DIRECTOR – ENGINEERING DESIGN & SUPPORT

PROJECT TITLE:

HOUSTON SHIP CHANNEL (HSC) EXPANSION CHANNEL IMPROVEMENT PROJECT (ECIP)

PROJECT 11 PACKAGE #7 SEGMENT 3

SHEET TITLE:

CROSS SECTIONS (8 OF 9)

REV	DATE	DESCRIPTION
A	08/14/20	65% SUBMITTAL
B	12/08/20	95% SUBMITTAL

DESIGNER:	C. PERRY
CADD:	J. HELM
CHECKER:	R. McPHERSON
DATE:	12/08/2020
SCALE:	AS NOTED

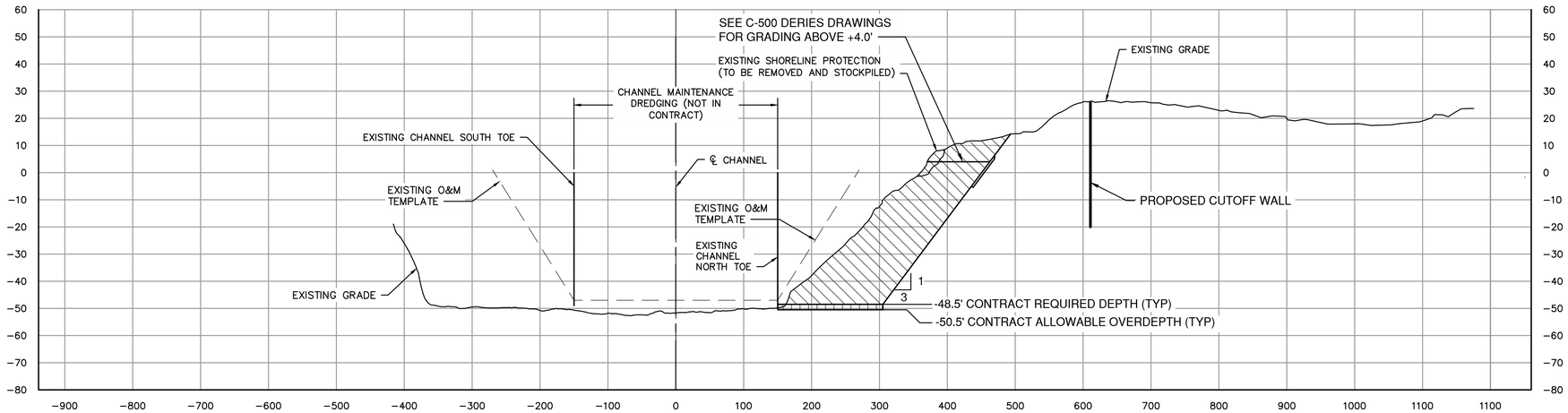
DRAWING NO. C90-D13-P11-007

SHEET NO. C-140

REV. NO. A

95% REVIEW

TIME: 12-08-20 – 11:09am User: OSALAS DWG: C:\pwworking\central01\d1711938\C90-D13-P11-007_C-140.dwg



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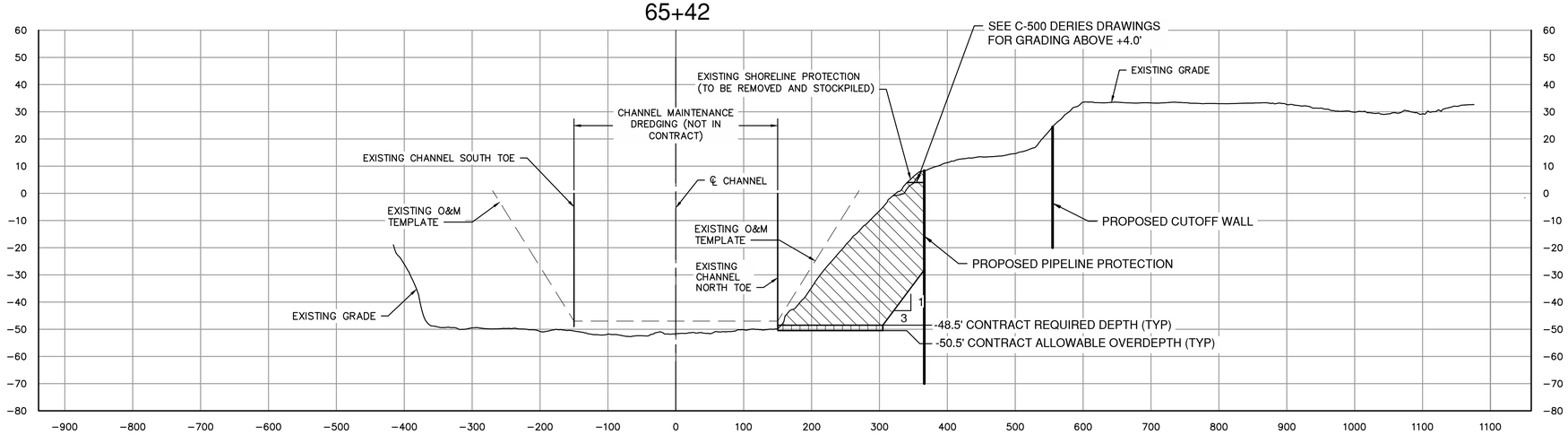

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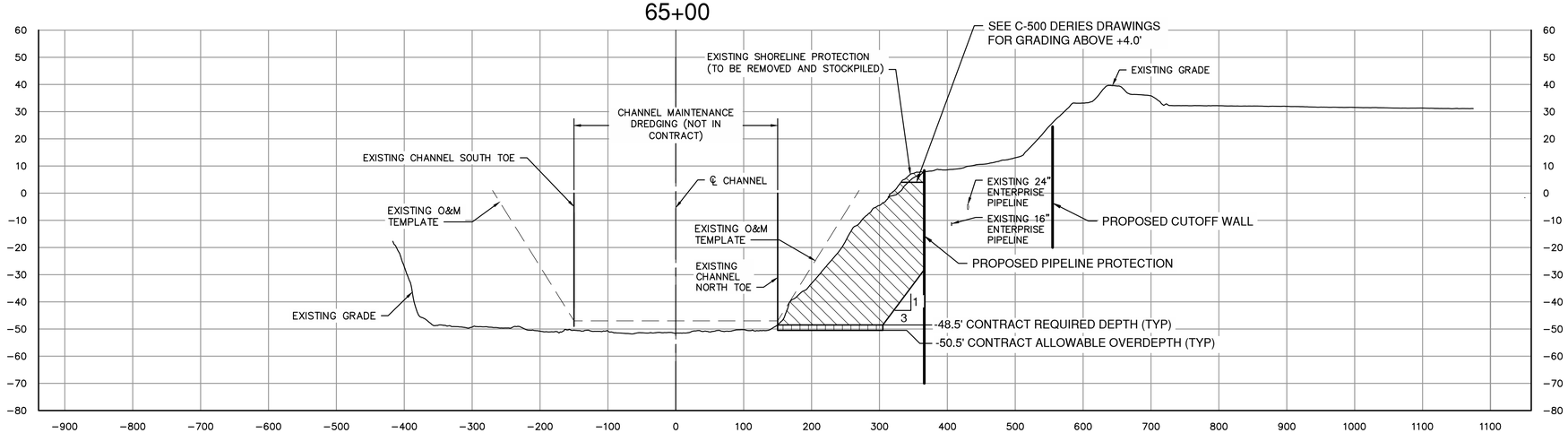

60+00

GENERAL NOTES

1. ALL ELEVATIONS SHOWN IN FEET TO MEAN LOWER LOW WATER (MLLW).
2. CROSS SECTIONS CUT FACING UP STATION.

GRAPHIC SCALES

HORIZONTAL 1"=100'

100 50 0 100 200

VERTICAL 1"=4'

4 2 0 4 8

PORT OF HOUSTON AUTHORITY

CONSULTANT:

DESIGN PREPARED BY:

HDR Engineering, INC
TBPELS Firm
Registration No. F-754

SEAL:

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95% REVIEW

APPROVED: DATE

PORT CONTRACT REPRESENTATIVE
MANAGING DIRECTOR – ENGINEERING DESIGN & SUPPORT

PROJECT TITLE:

HOUSTON SHIP CHANNEL (HSC) EXPANSION CHANNEL IMPROVEMENT PROJECT (ECIP)

PROJECT 11 PACKAGE #7 SEGMENT 3

SHEET TITLE:

CROSS SECTIONS (9 OF 9)

REV	DATE	DESCRIPTION
A	08/14/20	65% SUBMITTAL
B	12/08/20	95% SUBMITTAL

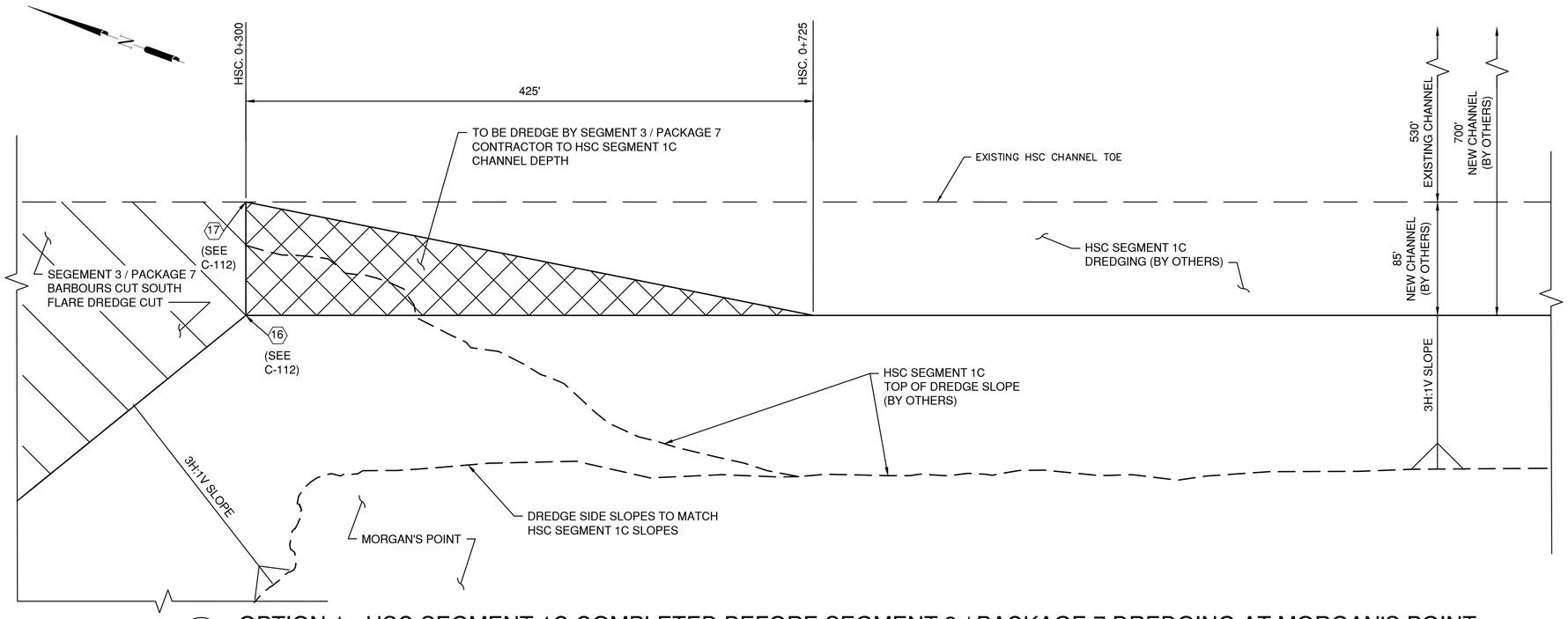
DESIGNER:	C. PERRY
CADD:	J. HELM
CHECKER:	R. McPHERSON
DATE:	12/08/2020
SCALE:	AS NOTED

DRAWING NO. C90-D13-P11-007

SHEET NO. C-141 REV. NO. A

95% REVIEW

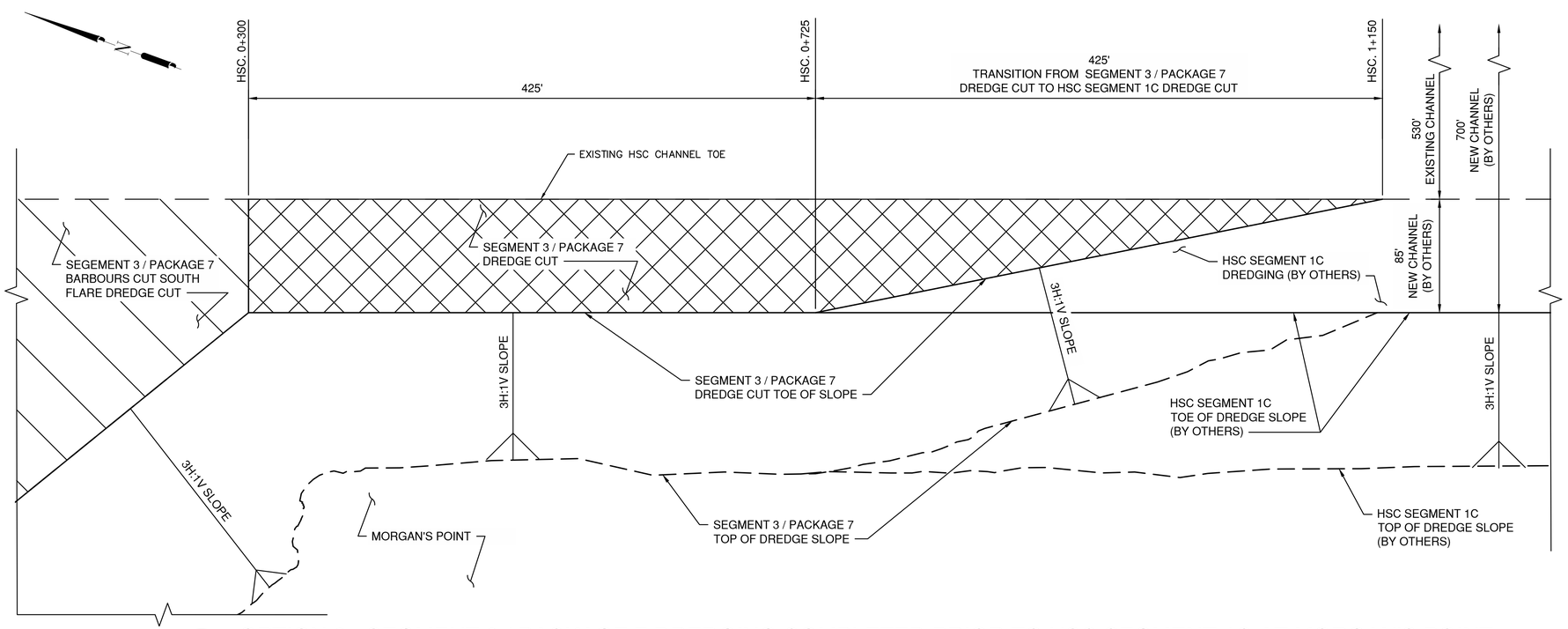
TIME: 12-08-20 – 11:10am User: OSALAS DWG: C:\pwworking\central01\d1711938\C90-D13-P11-007_C-141.dwg



A OPTION 1 - HSC SEGMENT 1C COMPLETED BEFORE SEGMENT 3 / PACKAGE 7 DREDGING AT MORGAN'S POINT

SCALE: 1"=50'

50 25 0 50 100



B OPTION 2 - SEGMENT 3 / PACKAGE 7 DREDGING COMPLETED PRIOR TO HSC SEGMENT 1C AT MORGAN'S POINT

SCALE: 1"=50'

50 25 0 50 100

GENERAL NOTES

PORT OF HOUSTON AUTHORITY

CONSULTANT:

DESIGN PREPARED BY:

HDR Engineering, INC
TBPELS Firm
Registration No. F-754

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95% REVIEW

APPROVED: DATE

PORT CONTRACT REPRESENTATIVE
MANAGING DIRECTOR – ENGINEERING DESIGN & SUPPORT

PROJECT TITLE:

HOUSTON SHIP CHANNEL (HSC) EXPANSION CHANNEL IMPROVEMENT PROJECT (ECIP)

PROJECT 11 PACKAGE #7 SEGMENT 3

SHEET TITLE:

HOUSTON SHIP CHANNEL DREDGE TRANSITION

REV	DATE	DESCRIPTION
A	08/14/20	65% SUBMITTAL
B	12/08/20	95% SUBMITTAL

DESIGNER:	C. PERRY
CADD:	J. HELM
CHECKER:	R. McPHERSON
DATE:	12/08/2020
SCALE:	AS NOTED

DRAWING NO. C90-D13-P11-007

SHEET NO. C-142 REV. NO. A

95% REVIEW

TIME: 12-08-20 – 11:10am User: OSALAS DWG: C:\pwworking\central01\d1711938\C90-D13-P11-007_C-142.dwg