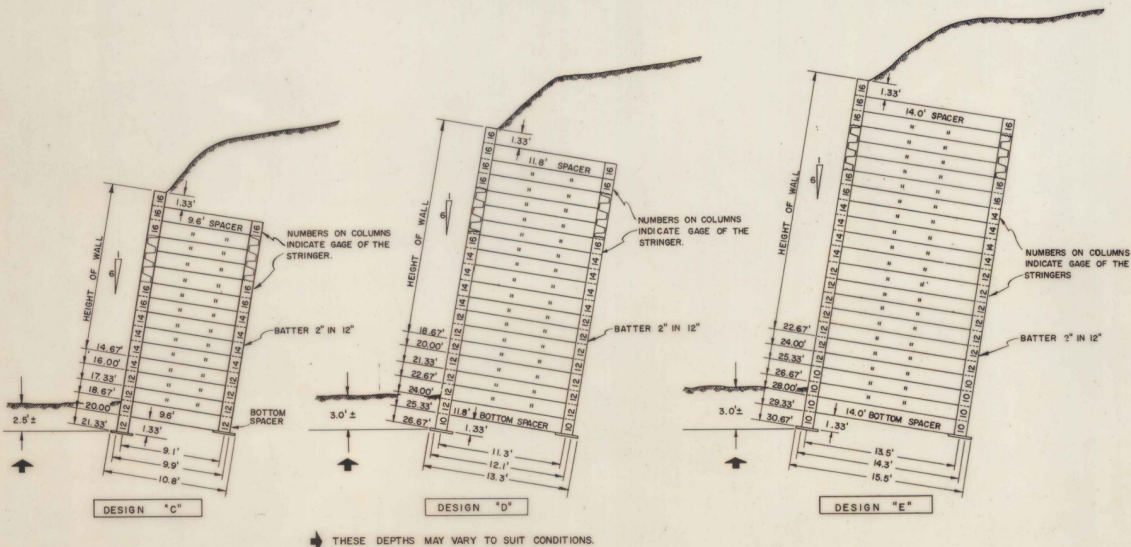
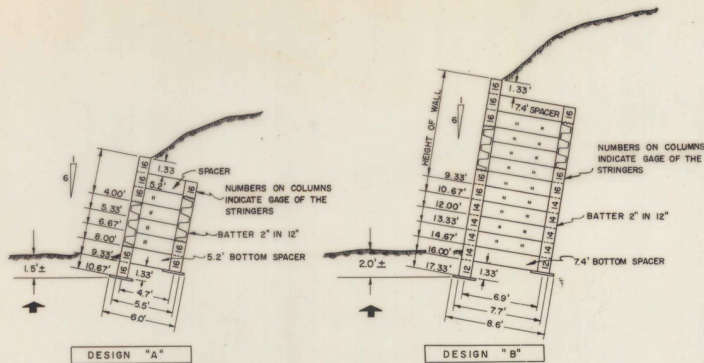
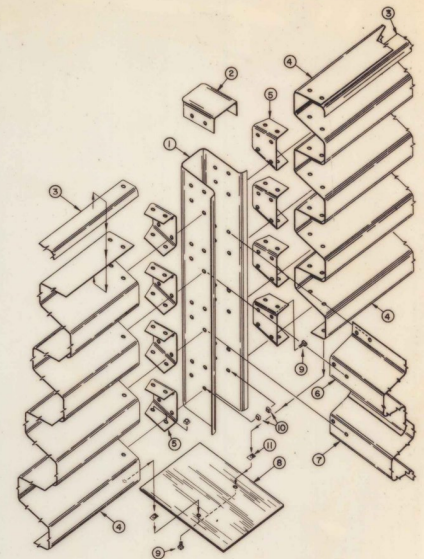


SELECTION OF DESIGN

GENERALLY, WALLS WITH LEVEL SURCHARGE SHOULD HAVE A BASE WIDTH EQUAL TO 45% OF THE HEIGHT WALLS WITH A SLIGHT SURCHARGE BUT WITH SUPER-IMPOSED TRAFFIC LOADS NEAR THE WALL SHOULD HAVE A BASE WIDTH EQUAL TO 50% OF THE HEIGHT. WALLS WITH INFINITE SURCHARGE SHOULD HAVE A BASE WIDTH EQUAL TO 55% OF THE HEIGHT. WHERE WALL HEIGHT VARIES RAPIDLY IT MAY BE MORE ECONOMICAL TO USE THE SAME WIDTH THROUGHOUT. FOR EXAMPLE, ON A SHORT WALL THAT VARIES FROM 8 TO 16 FEET IN HEIGHT, DESIGN "B" IS SUGGESTED EVEN THOUGH DESIGN "A" MIGHT BE SATISFACTORY FOR PART OF THE WALL.



↑ THESE DEPTHS MAY VARY TO SUIT CONDITIONS.



ASSEMBLY DIAGRAM

LIST AND DESCRIPTION OF UNITS

UNIT NO.	NAME	DESCRIPTION
1	COLUMN	VERTICAL MEMBER CONNECTING ALL OTHER UNITS
2	COLUMN CAP	COVER FOR FRONT COLUMN
3	STRINGER STIFFENER	TOP FLANGE PROTECTOR
4	STRINGER	HORIZONTAL LONGITUDINAL MEMBERS IN FRONT AND REAR WALLS
5	CONNECTING CHANNEL	CONNECTOR FOR ATTACHING STRINGERS TO COLUMNS
6	SPACER	TRANSVERSE MEMBERS THAT SEPARATE THE FRONT AND THE REAR COLUMNS
7	BOTTOM SPACER	SPECIAL BOTTOM TRANSVERSE MEMBER
8	BASE PLATE	INSTALLATION PLATE ON WHICH THE COLUMN RESTS
9	1/4" X 5/8" BOLTS	
10	5/8" NUTS	
11	5/8" SPRING NUTS	

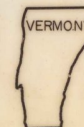
REVISIONS AND CORRECTIONS
MAR. 8, 1966. REVISED TO MEET THE 1964 SPECIFICATIONS

APPROVED DATE MARCH 10, 1965

A.B. Bishop
CHIEF ENGINEER
G.M. Lane
HIGHWAY ENGINEER
E.H. Hickman
CONSTRUCTION ENGINEER

DRAWN: J.R.P.
TRACED: A.A.

METAL BIN-TYPE RETAINING WALL, ITEM 578

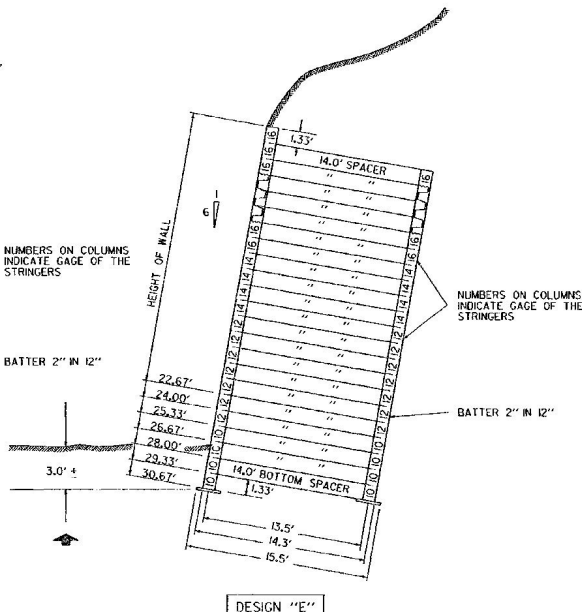
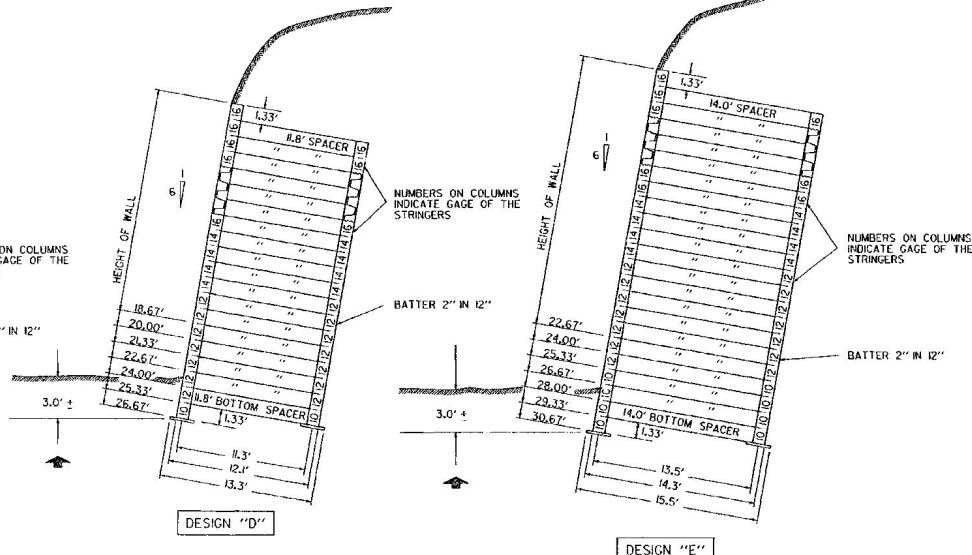
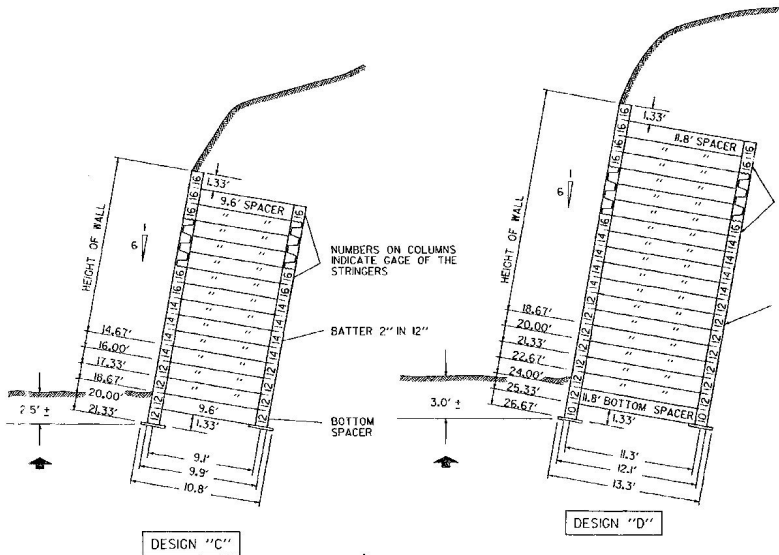
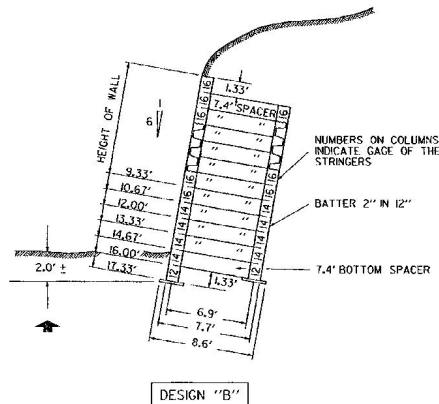
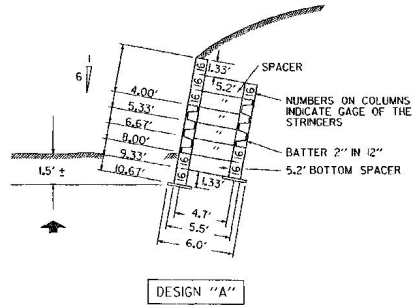


DEPARTMENT OF HIGHWAYS
STANDARD

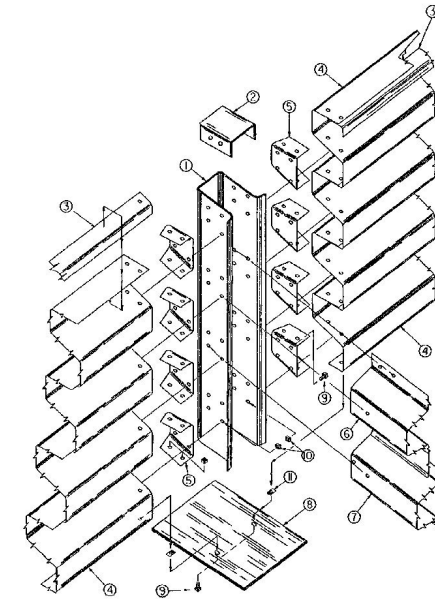
H-1a

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THESE DEPTHS MAY VARY TO SUIT CONDITIONS



LIST AND DESCRIPTION OF UNITS

UNIT NO.	NAME	DESCRIPTION
1	COLUMN	VERTICAL MEMBER CONNECTING ALL OTHER UNITS
2	COLUMN CAP	COVER FOR FRONT COLUMN
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7	BOTTOM SPACER	SPECIAL BOTTOM TRANSVERSE MEMBER
8	BASE PLATE	INSTALLATION PLATE ON WHICH THE COLUMN RESTS
9	1 1/4" x 3/8" BOLTS	
10	3/8" NUTS	
11	3/8" SPRING NUTS	

REVISIONS AND CORRECTIONS

DEC. 14, 1971 - ORIGINAL APPROVAL
JUNE 1, 1994 - REISSUED, WITHOUT CHANGE,
UNDER NEW SIGNATURES.

APPROVED

APPROVED FOR THIS PROJECT
AND/OR DESIGN IMPLEMENTATION
FOR FINAL APPROVAL PERSONS

Stephen J. MacNeil, P.E.
DIRECTOR OF ENGINEERING

Adam M. [Signature]
DESIGN ENGINEER

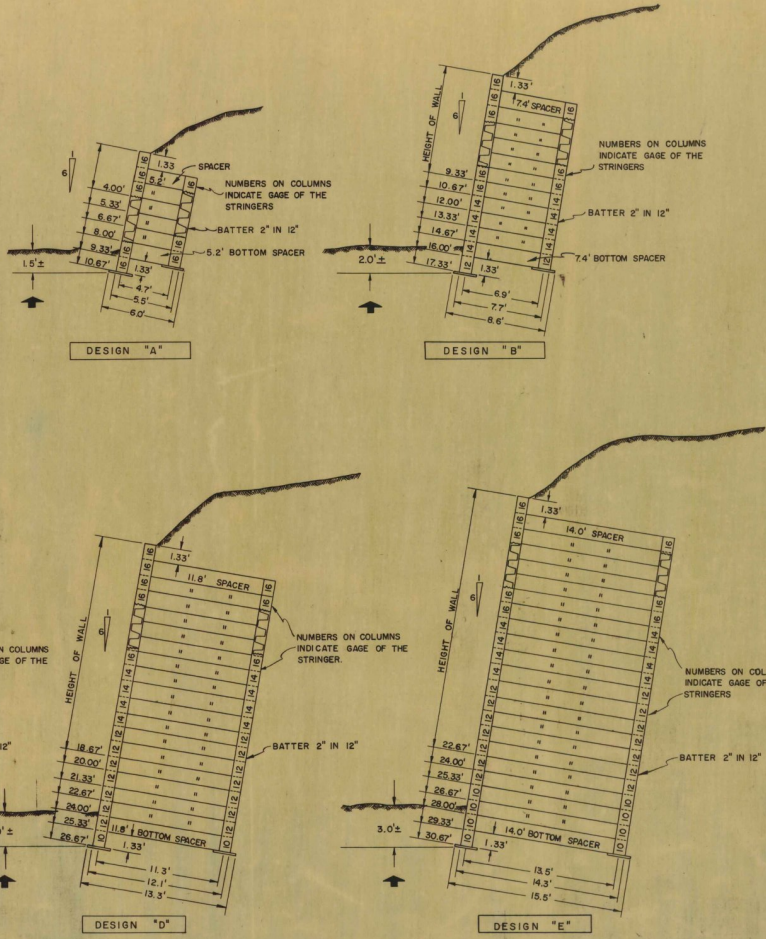
METAL BIN-TYPE RETAINING WALL



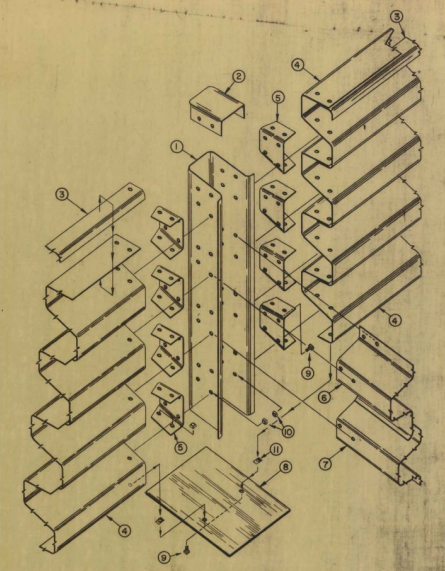
STANDARD
H-1a

SELECTION OF DESIGN

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THESE DEPTHS MAY VARY TO SUIT CONDITIONS.



ASSEMBLY DIAGRAM

LIST AND DESCRIPTION OF UNITS

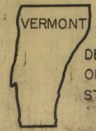
UNIT NO.	NAME	DESCRIPTION
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8	BASE PLATE	INSTALLATION PLATE ON WHICH THE COLUMN RESTS
9	1 1/4" X 5/8" BOLTS	
10	5/8" NUTS	
11	5/8" SPRING NUTS	

REVISIONS AND CORRECTIONS

APPROVED DATE OCT 9, 1958

H. C. Sauguet
CHIEF ENGINEER
G. M. Lane
HIGHWAY ENGINEER
A. J. ...
CONSTRUCTION ENGINEER

METAL BIN-TYPE RETAINING WALL, ITEM 592



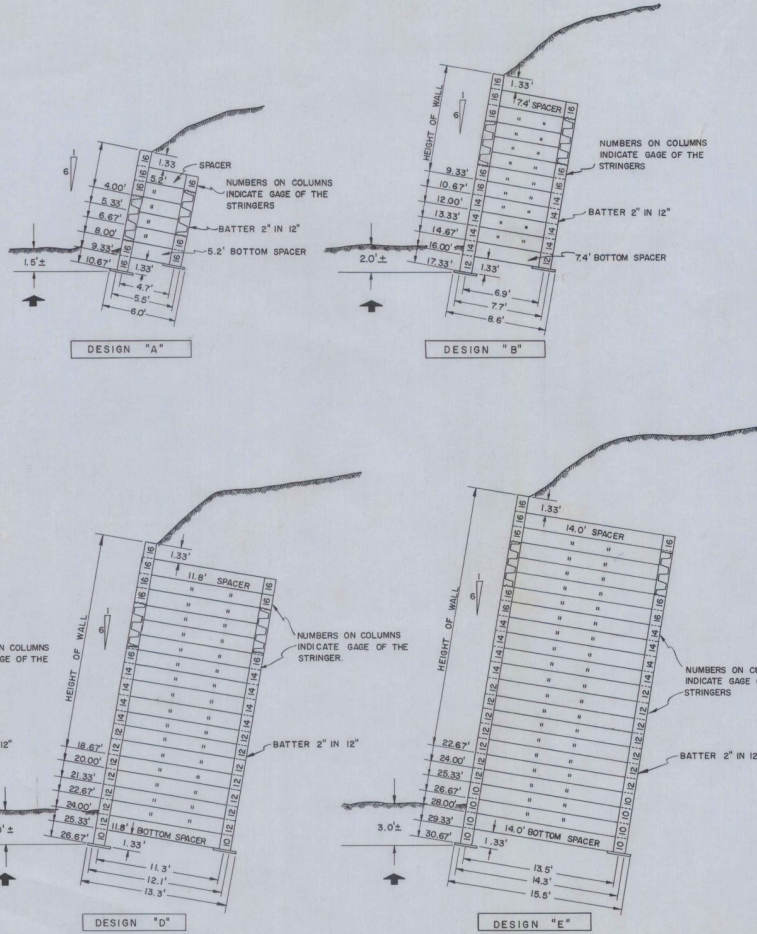
DEPARTMENT OF HIGHWAYS STANDARD

H-1a

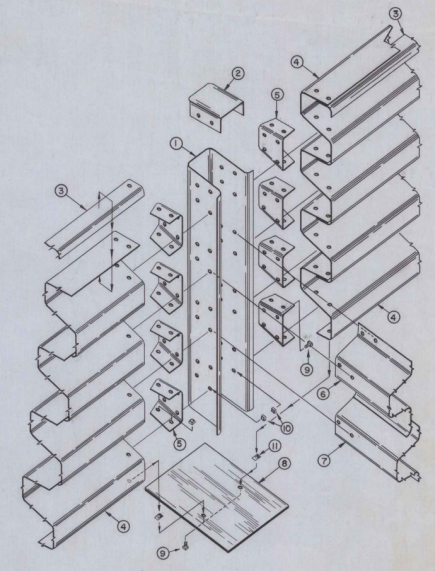
DRAWN: J.B.R.
TRACED: A.A.

SELECTION OF DESIGN

GENERALLY, WALLS WITH LEVEL SURCHARGE SHOULD HAVE A BASE WIDTH EQUAL TO 45% OF THE HEIGHT. WALLS WITH A SLIGHT SURCHARGE BUT WITH SUPER-IMPOSED TRAFFIC LOADS NEAR THE WALL SHOULD HAVE A BASE WIDTH EQUAL TO 50% OF THE HEIGHT. WALLS WITH INFINITE SURCHARGE SHOULD HAVE A BASE WIDTH EQUAL TO 55% OF THE HEIGHT. WHERE WALL HEIGHT VARIES RAPIDLY IT MAY BE MORE ECONOMICAL TO USE THE SAME WIDTH THROUGHOUT. FOR EXAMPLE, ON A SHORT WALL THAT VARIES FROM 8 TO 16 FEET IN HEIGHT, DESIGN "B" IS SUGGESTED EVEN THOUGH DESIGN "A" MIGHT BE SATISFACTORY FOR PART OF THE WALL.



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ASSEMBLY DIAGRAM

LIST AND DESCRIPTION OF UNITS

UNIT NO.	NAME	DESCRIPTION
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7	BOTTOM SPACER	SPECIAL BOTTOM TRANSVERSE MEMBER
8	BASE PLATE	INSTALLATION PLATE ON WHICH THE COLUMN RESTS
9	1 1/4" X 5/8" BOLTS	
10	5/8" NUTS	
11	5/8" SPRING NUTS	

06/12-10-71

REVISIONS AND CORRECTIONS

APPROVED DATE Dec. 14, 1971

R.N. Condit
CHIEF ENGINEER
E.B. Stehney
ASST. CHIEF ENGINEER
L.M. Law
HIGHWAY ENGINEER

DRAWN: J.R.R.
TRACED: A.J.A.

METAL BIN-TYPE RETAINING WALL ITEM 578



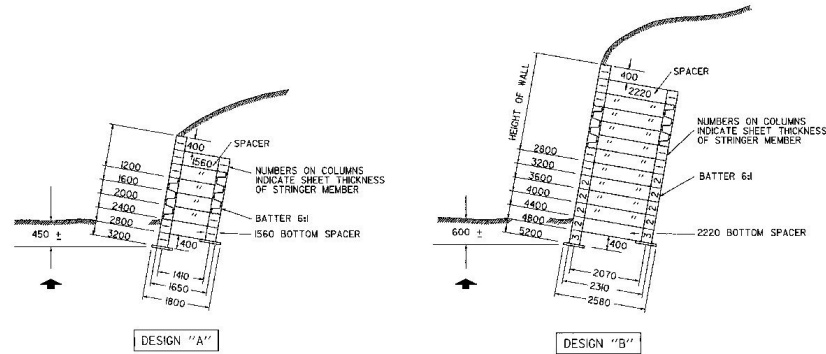
STANDARD

H-1a

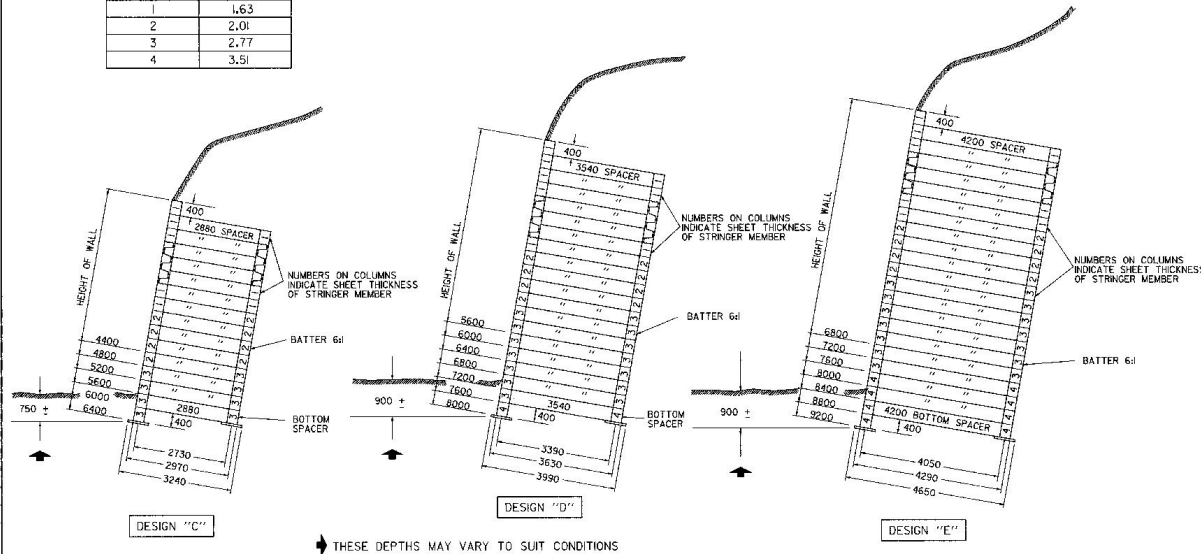
SELECTION OF DESIGN

GENERALLY, WALLS WITH LEVEL SURCHARGE SHOULD HAVE A BASE WIDTH EQUAL TO 45% OF THE HEIGHT. WALLS WITH A SLIGHT SURCHARGE BUT WITH SUPERIMPOSED TRAFFIC LOADS NEAR THE WALL SHOULD HAVE A BASE WIDTH EQUAL TO 50% OF THE HEIGHT. WALLS WITH INFINITE SURCHARGE SHOULD HAVE A BASE

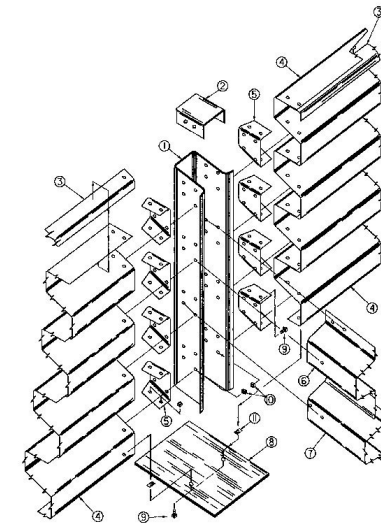
FOR EXAMPLE, ON A SHORT WALL THAT VARIES FROM 24 TO 4.5 m IN HEIGHT, DESIGN "D" IS SUGGESTED EVEN THOUGH DESIGN "A" MIGHT BE SATISFACTORY FOR PART OF THE WALL.



SHEET THICKNESS REQUIRED FOR WALL MEMBERS	
MEMBER TYPE	THICKNESS
1	1.63
2	2.01
3	2.77
4	3.51



THESE DEPTHS MAY VARY TO SUIT CONDITIONS



ASSEMBLY DIAGRAM

LIST AND DESCRIPTION OF UNITS

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7	BOTTOM SPACER	SPECIAL BOTTOM TRANSVERSE MEMBER
8	BASE PLATE	INSTALLATION PLATE ON WHICH THE COLUMN RESTS
9	M16 x 2 x 35 BOLTS	
10	M16 NUTS	
11	M16 SPRING NUTS	

NOTE: ALL DIMENSIONS ARE IN MILLIMETERS (mm) EXCEPT WHERE NOTED.

REVISIONS AND CORRECTIONS
- ORIGINAL APPROVAL DATE

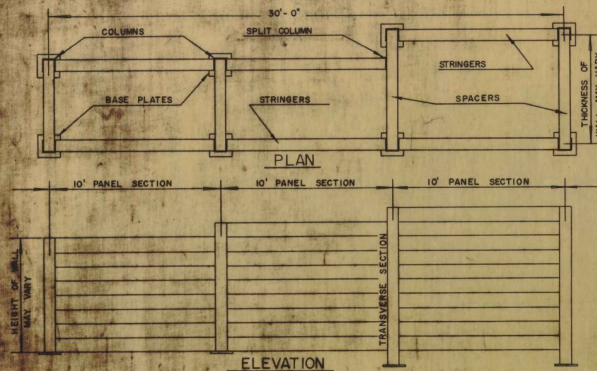
APPROVED

DIRECTOR OF ENGINEERING
STRUCTURES ENGINEER

METAL BIN-TYPE RETAINING WALL



Metric STANDARD H-1aM



PLAN AND ELEVATION OF TYPICAL WALL

UNITS REQUIRED FOR PANEL SECTIONS

WALL HEIGHT FEET	WALL HEIGHT FEET-IN.	STRINGERS 9'-6" GAGE				STRINGER STIFFENER 9'-6"
		16	14	12	10	
4.00	4'-0"	4				
5.33	5'-4"	6				
6.67	6'-8"	8				
8.00	8'-0"	10				
9.33	9'-4"	12				
10.67	10'-8"	14				
12.00	12'-0"	14	2			
13.33	13'-4"	14	4			
14.67	14'-8"	14	6			
16.00	16'-0"	14	8			
17.33	17'-4"	14	8	2		
18.67	18'-8"	14	8	4		
20.00	20'-0"	14	8	6		
21.33	21'-4"	14	8	8		
22.67	22'-8"	14	8	10		
24.00	24'-0"	14	8	12		
25.33	25'-4"	14	8	14		
26.67	26'-8"	14	8	14	2	
28.00	28'-0"	14	8	14	4	
29.33	29'-4"	14	8	14	6	
30.67	30'-8"	14	8	14	8	

NOTE: THIS TABLE APPLIES ONLY TO STANDARD PANEL SECTIONS AND INCLUDES UNITS FOR BOTH FRONT AND REAR OF A 10 FOOT ELEMENT OF WALL.

UNITS REQUIRED FOR SHORT PANEL SECTIONS

WALL HEIGHT FEET	SHORT STRINGERS IN FRONT OF WALL						SHORT STRINGER STIFFENER	SHORT STRINGERS IN REAR OF WALL						STANDARD STRINGER STIFFENER
	16 GAGE		12 GAGE		10 GAGE			16 GAGE		12 GAGE		10 GAGE		
	STD	SHORT	STD	SHORT	STD	SHORT		STD	SHORT	STD	SHORT	STD	SHORT	
4.00	1	3												
5.33	2	4												
6.67	3	5												
8.00	4	6												
9.33	5	7												
10.67	6	8												
12.00	6	8	1	1										
13.33	6	8	2	2										
14.67	6	8	3	3										
16.00	6	8	4	4										
17.33	6	8	4	4	1	1								
18.67	6	8	4	4	2	2								
20.00	6	8	4	4	3	3								
21.33	6	8	4	4	4	4								
22.67	6	8	4	4	5	5								
24.00	6	8	4	4	6	6								
25.33	6	8	4	4	7	7								
26.67	6	8	4	4	7	7	1	1						
28.00	6	8	4	4	7	7	2	2						
29.33	6	8	4	4	7	7	3	3						
30.67	6	8	4	4	7	7	4	4						

NOTE: THIS TABLE APPLIES ONLY TO SHORT PANEL SECTIONS FOR CURVED WALLS AND INCLUDES UNITS FOR BOTH FRONT AND REAR OF A 9.5 FOOT ELEMENT OF WALL.

UNITS REQUIRED FOR TRANSVERSE SECTIONS

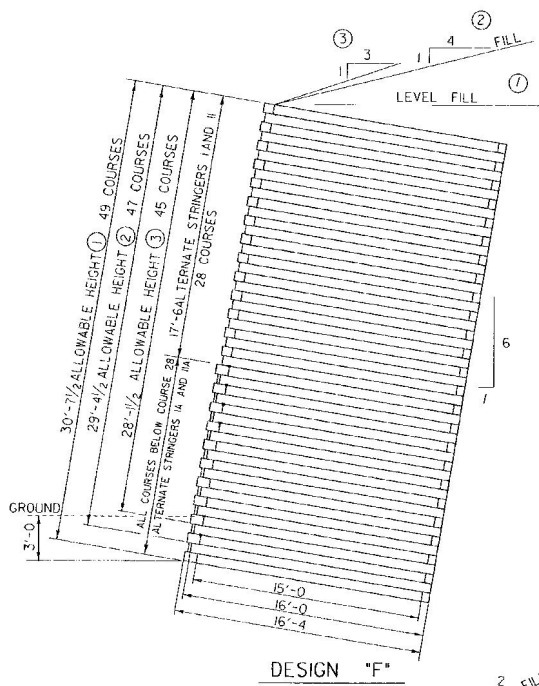
DESIGN	WALL HEIGHT FEET	WALL HEIGHT FEET IN.	FRONT COLUMN HEIGHT IN FEET				REAR COLUMN HEIGHT IN FEET				TOTAL COLUMN LENGTH IN FEET	SPACERS GAGE AND LENGTH				BOTTOM SPACERS GAGE AND LENGTH				WALL HEIGHT FEET	DESIGN		
			16" LIFT	24" LIFT	36" LIFT	TOTAL	16" LIFT	24" LIFT	36" LIFT	TOTAL		5.2	16	16	14	12	12	10	16			14	12
A	4.00	4'-0"	2	4.00		4.00	1.33	5.33	1.33	5.33	1	1	1	1	1	1	1	1	1	1	1	4.00	A
	5.33	5'-4"	2	5.33		5.33	2.67	8.00	2.67	8.00	1	1	1	1	1	1	1	1	1	1	1	5.33	
	6.67	6'-8"	2	6.67		6.67	4.00	10.67	4.00	10.67	1	1	1	1	1	1	1	1	1	1	1	6.67	
	8.00	8'-0"	2	8.00		8.00	5.33	13.33	5.33	13.33	1	1	1	1	1	1	1	1	1	1	1	8.00	
	9.33	9'-4"	2	9.33		9.33	6.67	16.00	6.67	16.00	1	1	1	1	1	1	1	1	1	1	1	9.33	
	10.67	10'-8"	2	10.67		10.67	8.00	18.67	8.00	18.67	1	1	1	1	1	1	1	1	1	1	1	10.67	
B	9.33	9'-4"	2	9.33		9.33	6.67	16.00	6.67	16.00	1	4										9.33	B
	10.67	10'-8"	2	10.67		10.67	8.00	18.67	8.00	18.67	1	5										10.67	
	12.00	12'-0"	2	12.00		12.00	9.33	21.33	9.33	21.33	1	6										12.00	
	13.33	13'-4"	2	13.33		13.33	10.67	24.00	10.67	24.00	1	7										13.33	
	14.67	14'-8"	2	14.67		14.67	12.00	26.67	12.00	26.67	1	8										14.67	
	16.00	16'-0"	2	16.00		16.00	13.33	29.33	13.33	29.33	2	9										16.00	
	17.33	17'-4"	2	17.33		17.33	14.67	32.00	14.67	32.00	2	10										17.33	
C	14.67	14'-8"	2	14.67		14.67	12.00	26.67	12.00	26.67	1	8										14.67	C
	16.00	16'-0"	2	16.00		16.00	13.33	29.33	13.33	29.33	2	9										16.00	
	17.33	17'-4"	2	17.33		17.33	14.67	32.00	14.67	32.00	2	10										17.33	
	18.67	18'-8"	2	18.67		18.67	16.00	34.67	16.00	34.67	2	11										18.67	
	20.00	20'-0"	2	20.00		20.00	17.33	37.33	17.33	37.33	2	12										20.00	
	21.33	21'-4"	2	21.33		21.33	18.67	40.00	18.67	40.00	2	13										21.33	
D	18.67	18'-8"	2	18.67		18.67	16.00	34.67	16.00	34.67	2	11										18.67	D
	20.00	20'-0"	2	20.00		20.00	17.33	37.33	17.33	37.33	2	12										20.00	
	21.33	21'-4"	2	21.33		21.33	18.67	40.00	18.67	40.00	2	13										21.33	
	22.67	22'-8"	2	22.67		22.67	19.33	42.67	19.33	42.67	2	14										22.67	
	24.00	24'-0"	2	24.00		24.00	20.00	45.33	20.00	45.33	2	15										24.00	
	25.33	25'-4"	2	25.33		25.33	20.67	48.00	20.67	48.00	3	16										25.33	
	26.67	26'-8"	2	26.67		26.67	21.33	50.67	21.33	50.67	3	17										26.67	
E	22.67	22'-8"	2	22.67		22.67	19.33	42.67	19.33	42.67	2	14										22.67	E
	24.00	24'-0"	2	24.00		24.00	20.00	45.33	20.00	45.33	2	15										24.00	
	25.33	25'-4"	2	25.33		25.33	20.67	48.00	20.67	48.00	3	16										25.33	
	26.67	26'-8"	2	26.67		26.67	21.33	50.67	21.33	50.67	3	17										26.67	
	28.00	28'-0"	2	28.00		28.00	22.00	53.33	22.00	53.33	4	18										28.00	
	29.33	29'-4"	2	29.33		29.33	22.67	56.00	22.67	56.00	4	19										29.33	
	30.67	30'-8"	2	30.67		30.67	23.33	58.67	23.33	58.67	4	20										30.67	

BEARING PLATES 16" X 22"

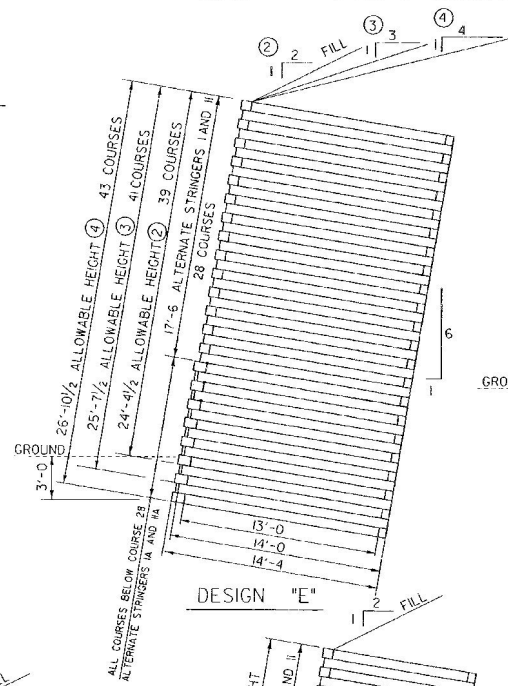
NOTE: SPLIT COLUMNS ARE USED WHERE CHANGES IN THICKNESS OF WALL ARE MADE TO CONNECT REAR STRINGERS OF THINNER WALL TO TRANSVERSE SECTION OF THICKER WALL. THEY ARE THE SAME HEIGHT AS THE REAR STRINGERS FOR THE THINNER WALL.

CURVE DATA FOR BIN-TYPE RETAINING WALLS

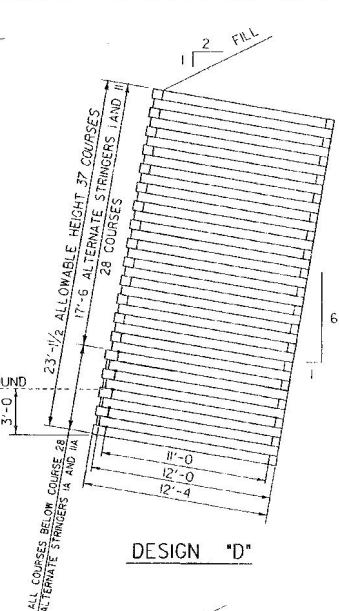
DESIGN	WALL HEIGHT IN FEET	DEGREE OF CURVE																																					
		RADIUS OF CURVE																																					
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36		
		8720	8845	8970	9100	9230	9360	9500	9640	9780	9920	10060	10200	10340	10480	10620	10760	10900	11040	11180	11320	11460	11600	11740	11880	12020	12160	12300	12440	12580	12720	12860	13000	13140	13280	13420	13560	13700	
A	4.00	61	31	20	15	12	10	9	8	7	6	6	5	5	4	4	4	4	4	3	3	3	3	3	3	3	3	2	2	2	2	2	2	2	2	2	2	2	2
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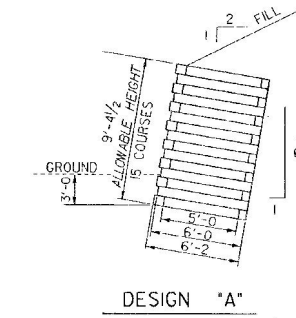
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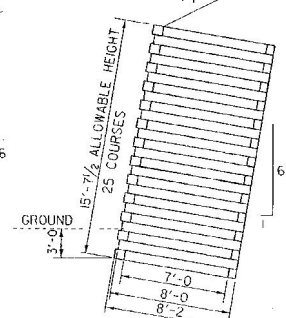
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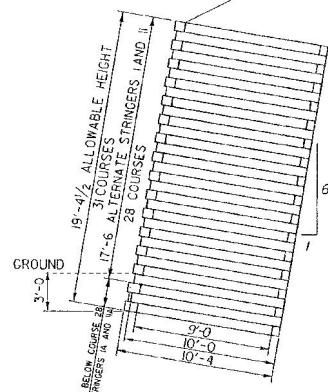
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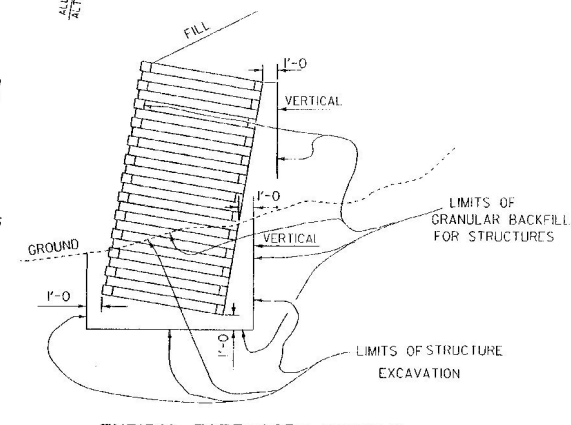
DESIGN "A"



DESIGN "B"



DESIGN "C"



TYPICAL EARTHWORK DETAILS

NOTES

1. THE "ALLOWABLE HEIGHT" SHOWN IS A GUIDE FOR RECOMMENDED DESIGN HEIGHT OF WALL AND MAY BE CHANGED IN ACCORDANCE WITH SITE CONDITIONS OR OTHER ACCEPTABLE DESIGN CONSIDERATIONS SUCH AS A SURCHARGE FOR LIVE LOAD.
2. FOR MORE INFORMATION ON TIMBER AND TIMBER TREATMENT REQUIREMENTS REFER TO STANDARD SPECIFICATIONS FOR BIN-TYPE RETAINING WALLS.
3. CONNECTION PLATES, WASHERS AND THREADED RODS SHALL BE FABRICATED FROM ASTM A36 STEEL. BOLTS SHALL BE ASTM A-507, NUTS SHALL BE ASTM A563.
4. ALL STEEL SHALL BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH AASHTO M-88 OR M-232.
5. THREADED RODS SHALL HAVE A MINIMUM OF 4" OF THREAD.
6. ALL TIMBER SHALL BE FABRICATED PRIOR TO TREATMENT. ANY FIELD TREATMENT SHALL BE DONE IN ACCORDANCE WITH AWPAC M-4 AS DIRECTED BY THE ENGINEER.
7. BOTTOM NUTS SHALL BE TACK WELDED TO RODS AND PLATES.
8. ALL NUTS SHALL BE HEAVY HEX TYPE. AFTER ACCEPTANCE BY THE ENGINEER, THE TOP NUTS SHALL BE TACK WELDED IN PLACE.
9. TACK WELDS SHALL BE CLEANED AND PAINTED WITH TWO COATS OF ZINC RICH COATING PER SUBSECTION 708.02(d).

REVISIONS AND CORRECTIONS

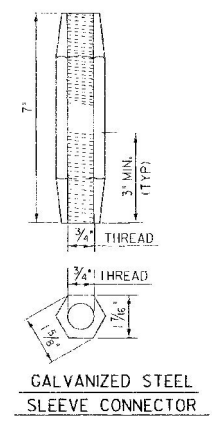
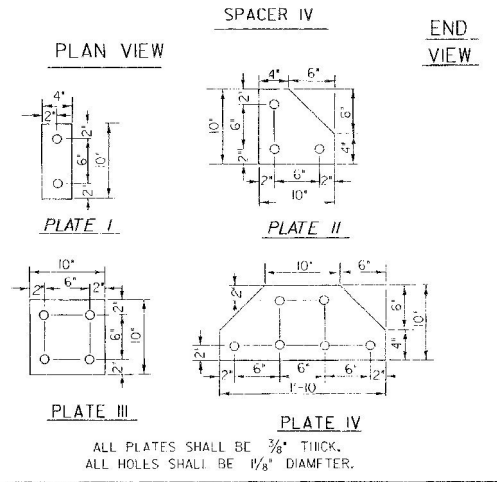
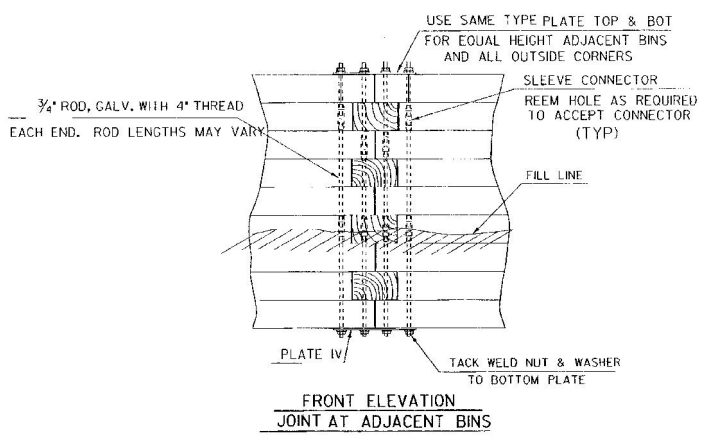
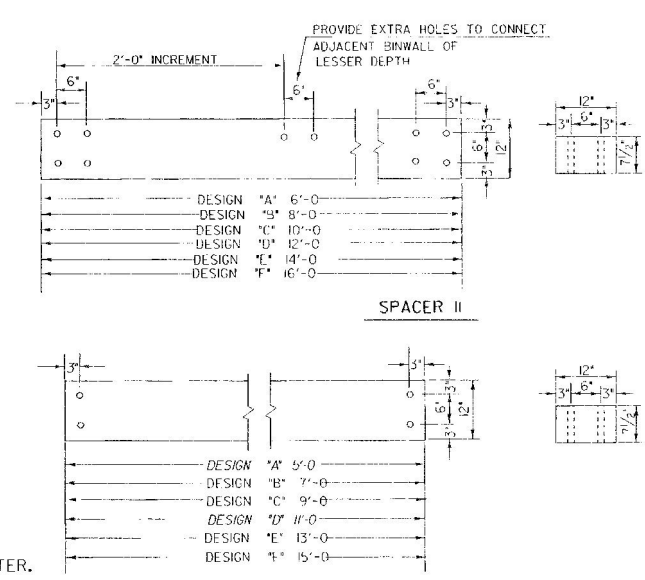
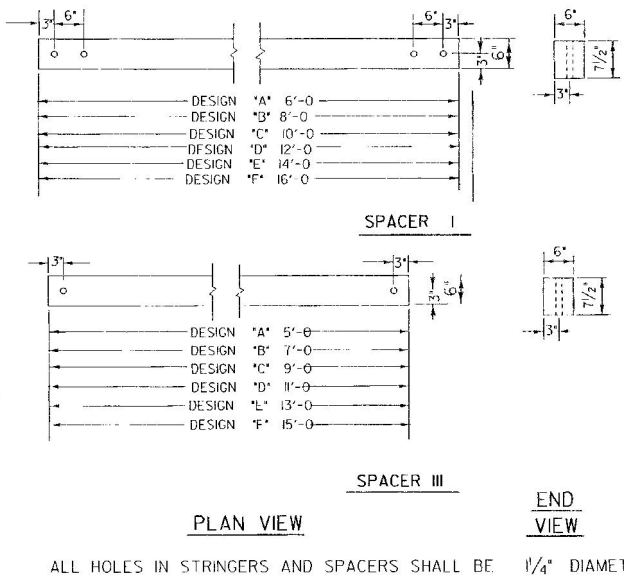
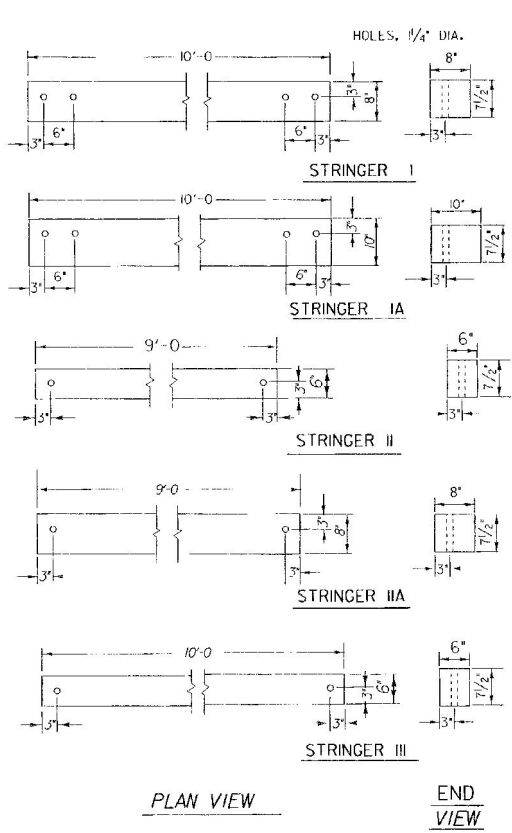
APPROVED _____
 DATE _____
 DIRECTOR OF CONSTRUCTION AND MAINTENANCE
 DIRECTOR OF PLANNING AND PRECONSTRUCTION
 STRUCTURES ENGINEER

10 FOOT TIMBER BINWALLS



STANDARD

H-2



REVISIONS AND CORRECTIONS

APPROVED _____ DATE _____

DIRECTOR OF CONSTRUCTION AND MAINTENANCE

DIRECTOR OF PLANNING AND PRECONSTRUCTION

STRUCTURES ENGINEER

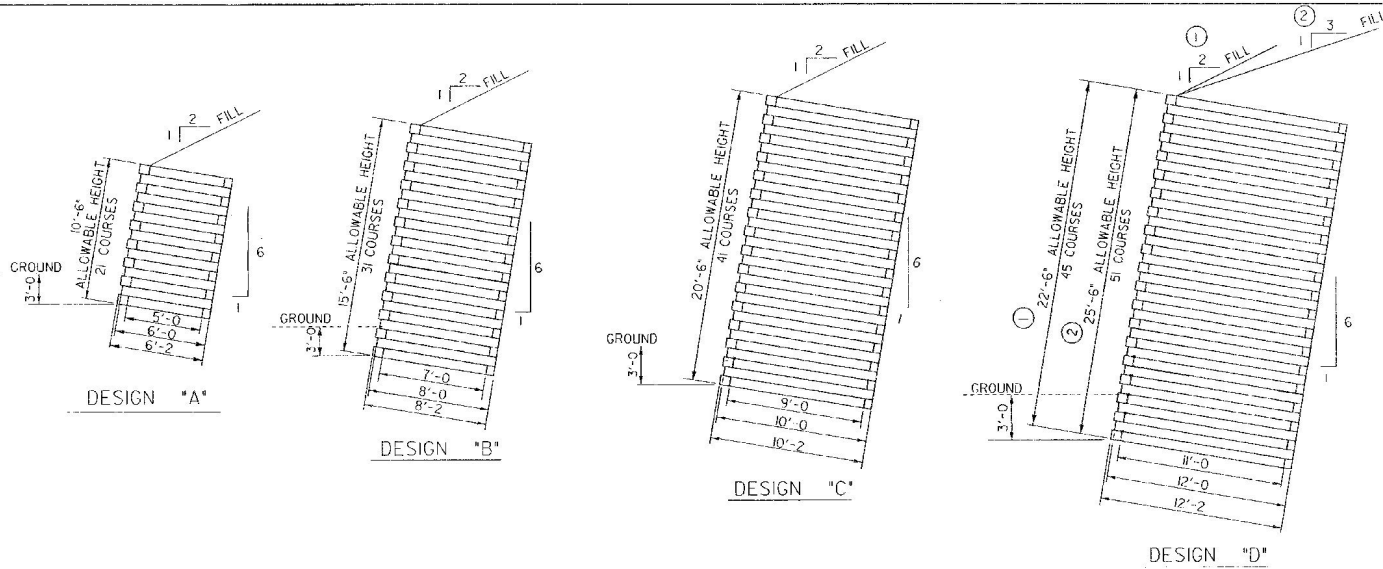
10 FOOT TIMBER BINWALLS



STANDARD

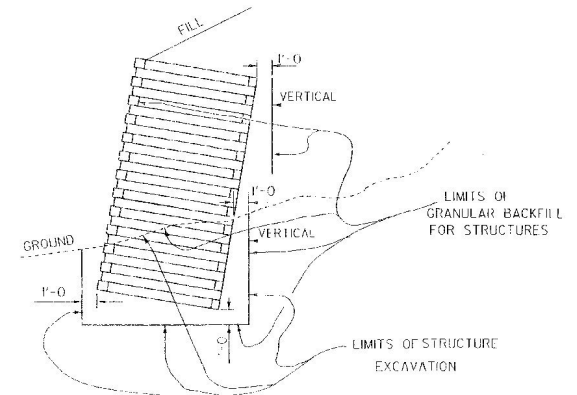
H-2

SHEET 2 OF 3



NOTES

1. THE "ALLOWABLE HEIGHT" SHOWN IS A GUIDE FOR RECOMMENDED DESIGN HEIGHT OF WALL AND MAY BE CHANGED IN ACCORDANCE WITH SITE CONDITIONS OR OTHER ACCEPTABLE DESIGN CONSIDERATIONS SUCH AS A SURCHARGE FOR LIVE LOAD.
2. FOR MORE INFORMATION ON TIMBER AND TIMBER TREATMENT REQUIREMENTS REFER TO STANDARD SPECIFICATIONS FOR BIN-TYPE RETAINING WALLS.
3. CONNECTION PLATES, WASHERS AND THREADED RODS SHALL BE FABRICATED FROM ASTM A56 STEEL. BOLTS SHALL BE ASTM A-307. NUTS SHALL BE ASTM A563.
4. ALL STEEL SHALL BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH AASHTO M-11 OR M-232.
5. THREADED RODS SHALL HAVE A MINIMUM OF 4" OF THREAD.
6. ALL TIMBER SHALL BE FABRICATED PRIOR TO TREATMENT. ANY FIELD TREATMENT SHALL BE DONE IN ACCORDANCE WITH ANPA M-4 AS DIRECTED BY THE ENGINEER.
7. BOTTOM NUTS SHALL BE TACK WELDED TO RODS AND PLATES.
8. ALL NUTS SHALL BE HEAVY HEX TYPE. AFTER ACCEPTANCE BY THE ENGINEER, THE TOP NUTS SHALL BE TACK WELDED IN PLACE.
9. TACK WELDS SHALL BE CLEANED AND PAINTED WITH TWO COATS OF ZINC RICH COATING PER SUBSECTION 708.02(c).
10. ALL STRINGERS SHALL HAVE A MINIMUM DESIGN VALUE FOR EXTREME FIBER IN BENDING (F_b) FOR SINGLE MEMBER USE AND 19% MOISTURE CONTENT OF 800 PSI.
11. ALL SPACERS SHALL HAVE A MINIMUM DESIGN VALUE FOR TENSION PARALLEL TO GRAIN (F_t) FOR 19% MOISTURE CONTENT OF 250 PSI.



REVISIONS AND CORRECTIONS

APPROVED

DATE

DIRECTOR OF CONSTRUCTION AND MAINTENANCE

DIRECTOR OF PLANNING AND PRECONSTRUCTION

STRUCTURES ENGINEER

6 FOOT TIMBER BINWALLS

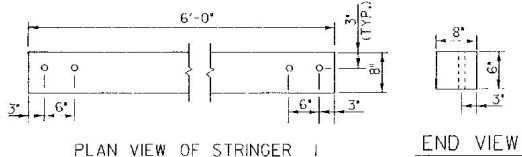


STANDARD
H-2A

SHEET 1 OF 3

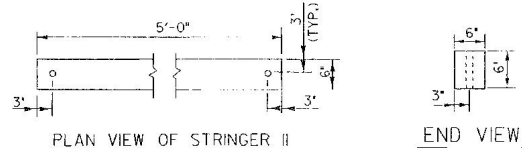
STRINGER DETAILS

(STRINGERS ARE THE STRUCTURAL MEMBERS THAT RUN ACROSS THE FRONT OR BACK OF THE BIN)



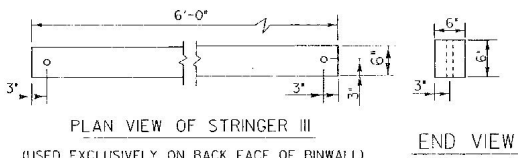
PLAN VIEW OF STRINGER I

(ALTERNATE WITH STRINGER II ON FRONT FACE OF BINWALL)



PLAN VIEW OF STRINGER II

(ALTERNATE WITH STRINGER I ON FRONT FACE OF BINWALL)



PLAN VIEW OF STRINGER III

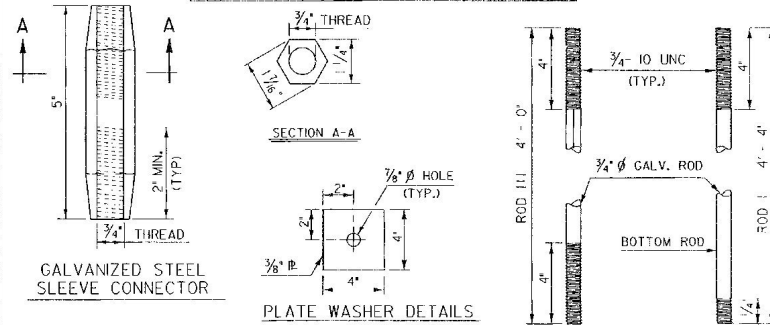
(USED EXCLUSIVELY ON BACK FACE OF BINWALL)

END VIEW

END VIEW

END VIEW

MISCELLANEOUS DETAILS



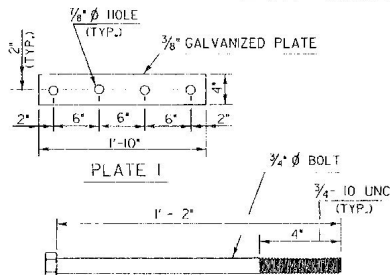
GALVANIZED STEEL SLEEVE CONNECTOR

SECTION A-A

PLATE WASHER DETAILS

THREADED ROD DETAILS

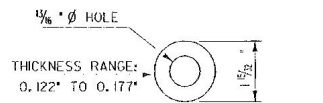
(RODS USED VERTICALLY IN CONSTRUCTION OF BINS)



CONNECTING BOLT DETAILS

(BOLTS USED HORIZONTALLY TO TIE ADJACENT BINS TOGETHER)

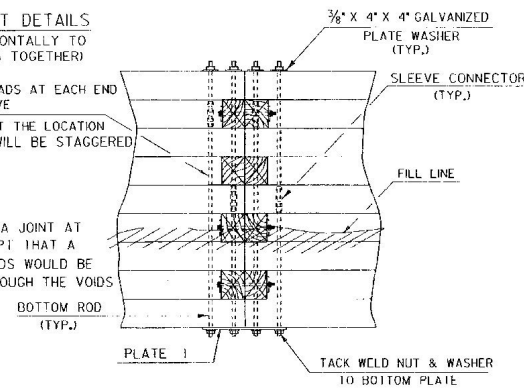
3/8" GALVANIZED ROD WITH THREADS AT EACH END SEE DETAILS ABOVE
ROD LENGTHS VARY SO THAT THE LOCATION OF THE SLEEVE CONNECTORS WILL BE STAGGERED (TYP.)



CIRCULAR WASHER DETAILS

(TO BE USED UNDERNEATH ALL SLEEVE CONNECTORS TO FACILITATE TIGHTENING)

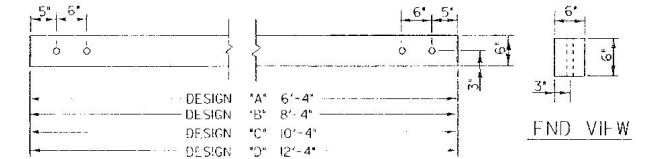
NOTE: THE REAR ELEVATION OF A JOINT AT ADJACENT BINS IS SIMILAR EXCEPT THAT A PORTION OF THE GALVANIZED RODS WOULD BE EXPOSED WHERE THEY PASS THROUGH THE VOIDS



FRONT ELEVATION SHOWING JOINT AT ADJACENT BINS

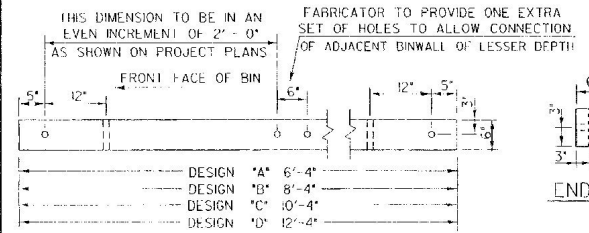
SPACER DETAILS

(SPACERS ARE THE STRUCTURAL MEMBERS THAT RUN FROM FRONT TO BACK OF THE BIN)



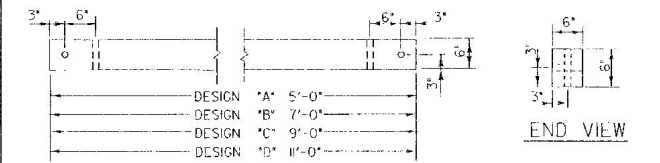
PLAN VIEW OF SPACER I

(TO BE USED ON THE ENDS OF THE END BAYS)



PLAN VIEW OF SPACER II

(TO BE USED IN ALL INTERIOR BAYS)



PLAN VIEW OF SPACER III

(TO BE USED ON THE ENDS OF THE END BAYS IN CONJUNCTION WITH SPACER I AND/OR WHERE THE HEIGHT OF THE WALL CHANGES)

REVISIONS AND CORRECTIONS

APPROVED

DATE

DIRECTOR OF CONSTRUCTION AND MAINTENANCE

DIRECTOR OF PLANNING AND PRECONSTRUCTION

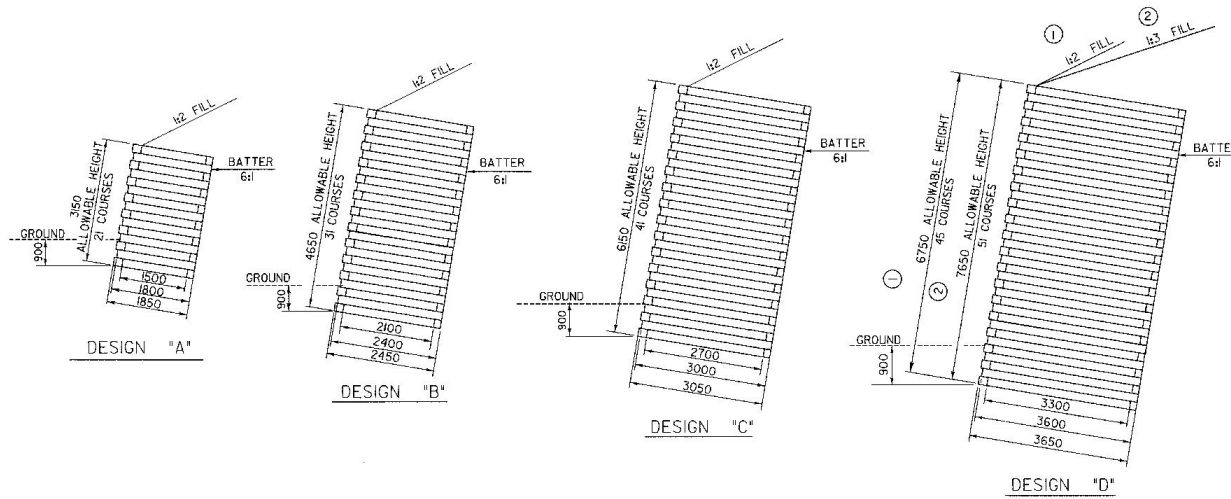
STRUCTURES ENGINEER

6 FOOT TIMBER BINWALLS



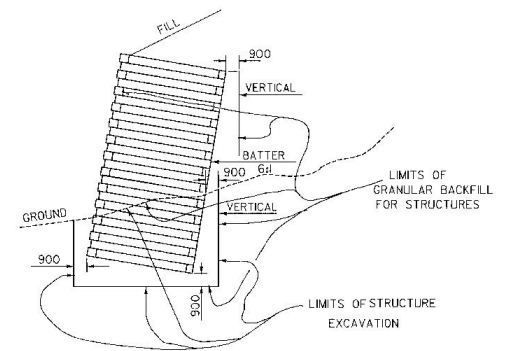
STANDARD
H-2A

SHEET 2 OF 3



NOTES

1. THE "ALLOWABLE HEIGHT" SHOWN IS A GUIDE FOR RECOMMENDED DESIGN HEIGHT OF WALL AND MAY BE CHANGED IN ACCORDANCE WITH SITE CONDITIONS OR OTHER ACCEPTABLE DESIGN CONSIDERATIONS SUCH AS A SURCHARGE FOR LIVE LOAD.
2. FOR MORE INFORMATION ON TIMBER AND TIMBER TREATMENT REQUIREMENTS REFER TO VADT STANDARD SPECIFICATIONS FOR CONSTRUCTION FOR BIN-TYPE RETAINING WALLS.
3. CONNECTION PLATES, WASHERS AND THREADED RODS SHALL BE FABRICATED FROM AASHTO M 163M/M 163 STEEL. BOLTS SHALL BE ASTM F 568M, PROPERTY CLASS 4.6. NUTS SHALL BE ASTM A 963M.
4. ALL STEEL SHALL BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH AASHTO M 111 OR AASHTO M 232.
5. THREADED RODS SHALL HAVE A MINIMUM OF 100 mm OF THREAD.
6. ALL TIMBER SHALL BE FABRICATED PRIOR TO TREATMENT. ANY FIELD TREATMENT SHALL BE DONE IN ACCORDANCE WITH ANPA M-4 AS DIRECTED BY THE ENGINEER.
7. BOTTOM NUTS SHALL BE TACK WELDED TO RODS AND PLATES.
8. ALL NUTS SHALL BE HEAVY HEX TYPE. AFTER ACCEPTANCE BY THE ENGINEER, THE TOP NUTS SHALL BE TACK WELDED IN PLACE.
9. TACK WELDS SHALL BE CLEANED AND PAINTED WITH TWO COATS OF AN APPROVED SEALANT.
10. ALL STRINGERS SHALL HAVE A MINIMUM DESIGN VALUE FOR EXTREME FIBER IN BENDING (F_b) FOR SINGLE MEMBER USE AND 19% MOISTURE CONTENT OF 5.5 MPa.
11. ALL SPACERS SHALL HAVE A MINIMUM DESIGN VALUE FOR TENSION PARALLEL TO GRAIN (F_t) FOR 19% MOISTURE CONTENT OF 1.8 MPa.
12. TIMBERS SHALL BE FULL SAWN WITHIN 3 mm OF VERTICAL NOMINAL DIMENSIONS SHOWN ON SHEET 2 OF 3.



TYPICAL EARTHWORK DETAILS

NOTE: ALL DIMENSIONS ARE IN MILLIMETERS (mm) EXCEPT WHERE NOTED.

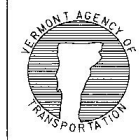
REVISIONS AND CORRECTIONS
- ORIGINAL APPROVAL DATE

APPROVED

DIRECTOR OF ENGINEERING

STRUCTURES ENGINEER

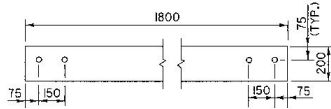
1.8-m TIMBER BINWALLS



Metric
STANDARD
H-2AM
SHEET 1 OF 3

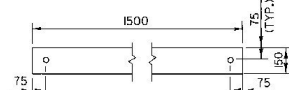
STRINGER DETAILS

(STRINGERS ARE THE STRUCTURAL MEMBERS THAT RUN ACROSS THE FRONT OR BACK OF THE BIN)



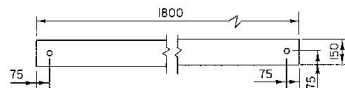
PLAN VIEW OF STRINGER I
(ALTERNATE WITH STRINGER II ON FRONT FACE OF BINWALL)

END VIEW



PLAN VIEW OF STRINGER II
(ALTERNATE WITH STRINGER I ON FRONT FACE OF BINWALL)

END VIEW

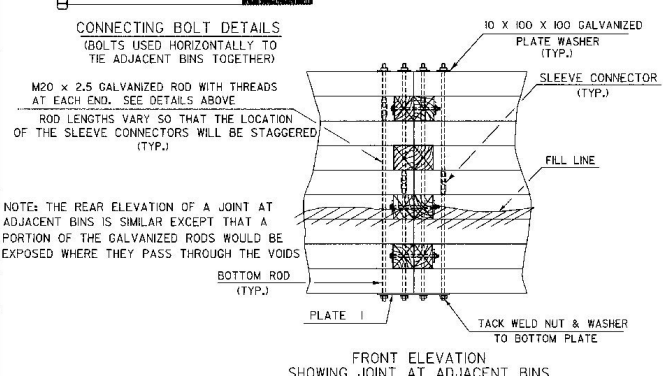
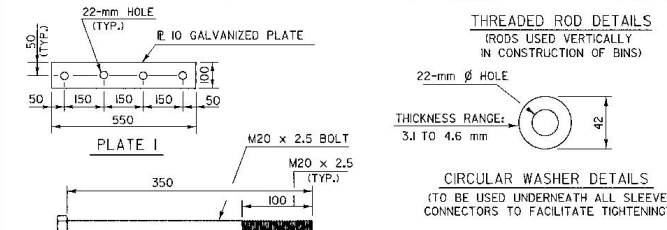
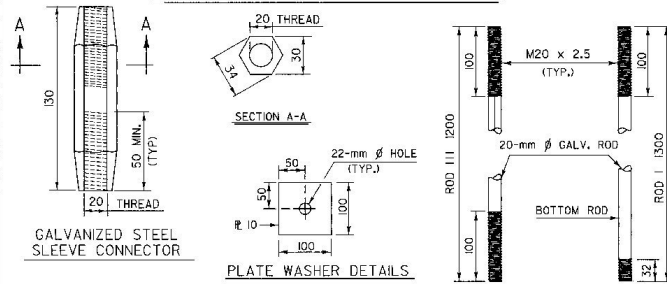


PLAN VIEW OF STRINGER III
(USED EXCLUSIVELY ON BACK FACE OF BINWALL)

END VIEW

ALL HOLES IN STRINGERS AND SPACERS SHALL BE 24 mm DIAM. EXCEPT HOLES TO ACCOMODATE SLEEVE CONNECTORS IN STRINGERS AND SPACERS SHALL BE 39 mm IN DIAMETER.

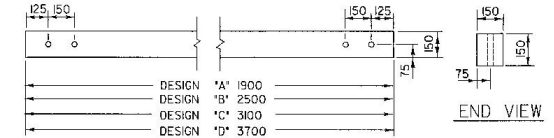
MISCELLANEOUS DETAILS



NOTE: THE REAR ELEVATION OF A JOINT AT ADJACENT BINS IS SIMILAR EXCEPT THAT A PORTION OF THE GALVANIZED RODS WOULD BE EXPOSED WHERE THEY PASS THROUGH THE VOIDS

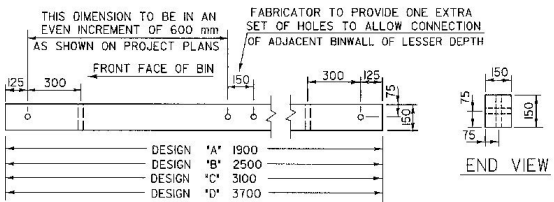
SPACER DETAILS

(SPACERS ARE THE STRUCTURAL MEMBERS THAT RUN FROM FRONT TO BACK OF THE BIN)



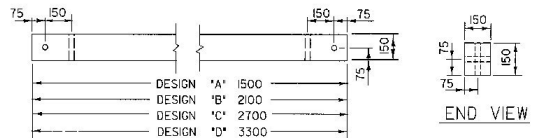
PLAN VIEW OF SPACER I
(TO BE USED ON THE ENDS OF THE END BAYS)

END VIEW



PLAN VIEW OF SPACER II
(TO BE USED IN ALL INTERIOR BAYS)

END VIEW



PLAN VIEW OF SPACER III
(TO BE USED ON THE ENDS OF THE END BAYS IN CONJUNCTION WITH SPACER I AND/OR WHERE THE HEIGHT OF THE WALL CHANGES)

END VIEW

NOTE: ALL DIMENSIONS ARE IN MILLIMETERS (mm) EXCEPT WHERE NOTED.

REVISIONS AND CORRECTIONS
-ORIGINAL APPROVAL DATE

APPROVED

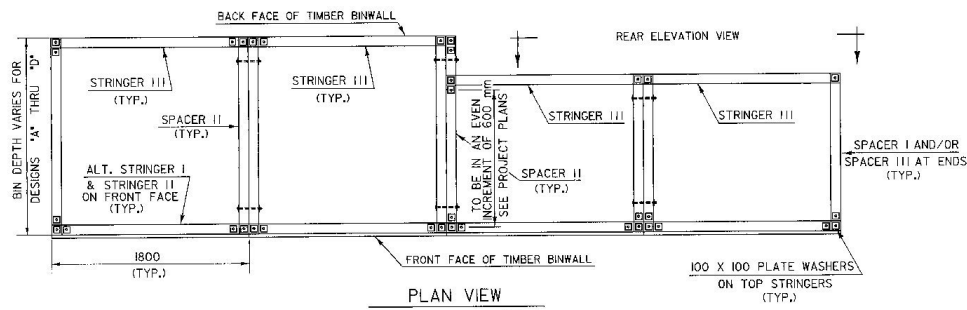
DIRECTOR OF ENGINEERING

STRUCTURES ENGINEER

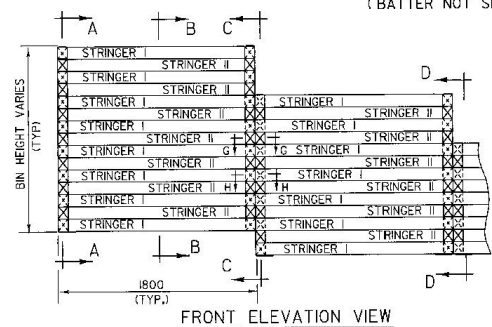
1.8-m TIMBER BINWALLS



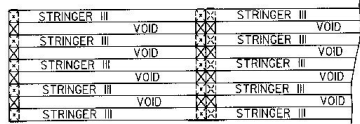
Metric
STANDARD
H-2AM
SHEET 2 OF 3



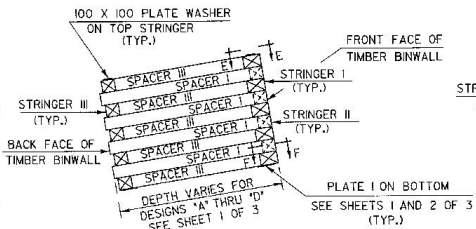
PLAN VIEW
(BATTER NOT SHOWN)



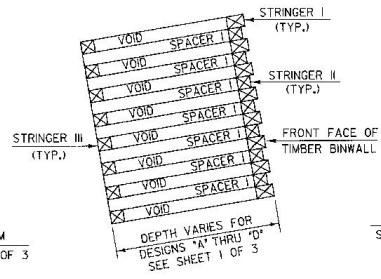
FRONT ELEVATION VIEW



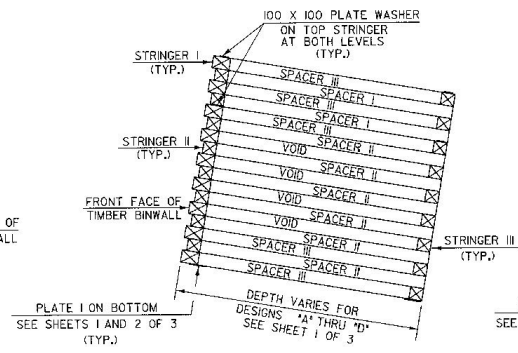
REAR ELEVATION VIEW



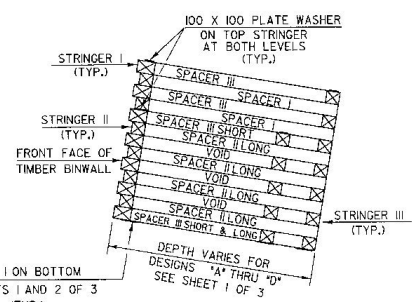
SECTION A - A



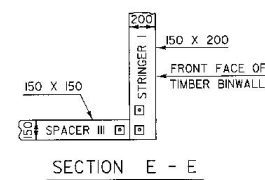
SECTION B - B



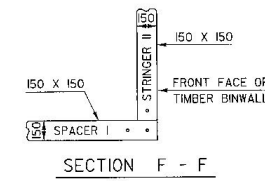
SECTION C - C
(SHOWING CONNECTING BINS OF EQUAL DEPTHS)



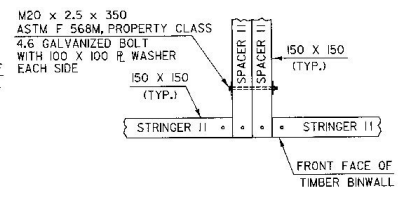
SECTION D - D
(SHOWING CONNECTING BINS OF DIFFERENT DEPTHS)



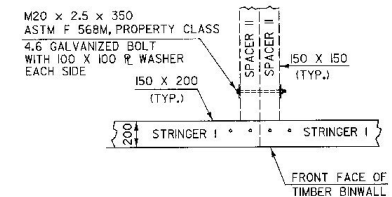
SECTION E - E



SECTION F - F



SECTION G - G



SECTION H - H

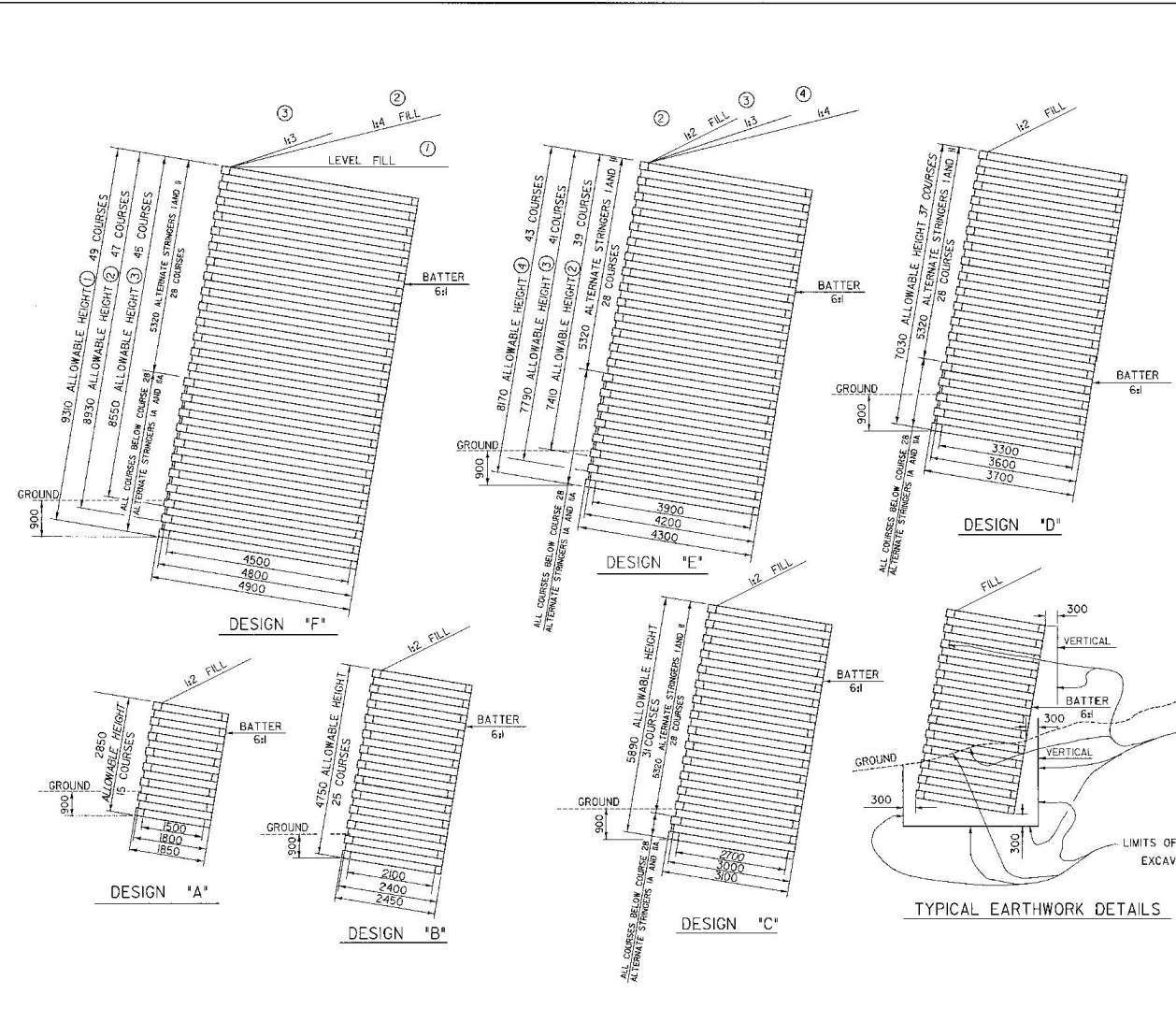
NOTE: ALL DIMENSIONS ARE IN MILLIMETERS (mm) EXCEPT WHERE NOTED.

REVISIONS AND CORRECTIONS -ORIGINAL APPROVAL DATE	APPROVED _____
	_____ DIRECTOR OF ENGINEERING
	_____ STRUCTURES ENGINEER

1.8-m TIMBER BINWALLS



Metric
STANDARD
H-2AM
SHEET 3 OF 3



NOTES

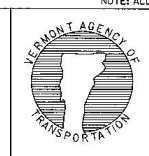
1. THE 'ALLOWABLE HEIGHT' SHOWN IS A GUIDE FOR RECOMMENDED DESIGN HEIGHT OF WALL AND MAY BE CHANGED IN ACCORDANCE WITH SITE CONDITIONS OR OTHER ACCEPTABLE DESIGN CONSIDERATIONS SUCH AS A SURCHARGE FOR LIVE LOAD.
2. FOR MORE INFORMATION ON TIMBER AND TIMBER TREATMENT REQUIREMENTS REFER TO VAOIT STANDARD SPECIFICATIONS FOR CONSTRUCTION FOR BIN-TYPE RETAINING WALLS.
3. CONNECTION PLATES, WASHERS AND THREADED RODS SHALL BE FABRICATED FROM AASHTO M 183M/M 183 STEEL. BOLTS SHALL BE ASTM F 568M, PROPERTY CLASS 4.6. NUTS SHALL BE ASTM A 563M.
4. ALL STEEL SHALL BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH AASHTO M 111 OR ASHTO M 232.
5. THREADED RODS SHALL HAVE A MINIMUM OF 100 mm OF THREAD.
6. ALL TIMBER SHALL BE FABRICATED PRIOR TO TREATMENT. ANY FIELD TREATMENT SHALL BE DONE IN ACCORDANCE WITH AWPA M-4 AS DIRECTED BY THE ENGINEER.
7. BOTTOM NUTS SHALL BE TACK WELDED TO RODS AND PLATES.
8. ALL NUTS SHALL BE HEAVY HEX TYPE. AFTER ACCEPTANCE BY THE ENGINEER, THE TOP NUTS SHALL BE TACK WELDED IN PLACE.
9. TACK WELDS SHALL BE CLEANED AND PAINTED WITH TWO COATS OF AN APPROVED SEALANT.

NOTE: ALL DIMENSIONS ARE IN MILLIMETERS (mm) EXCEPT WHERE NOTED.

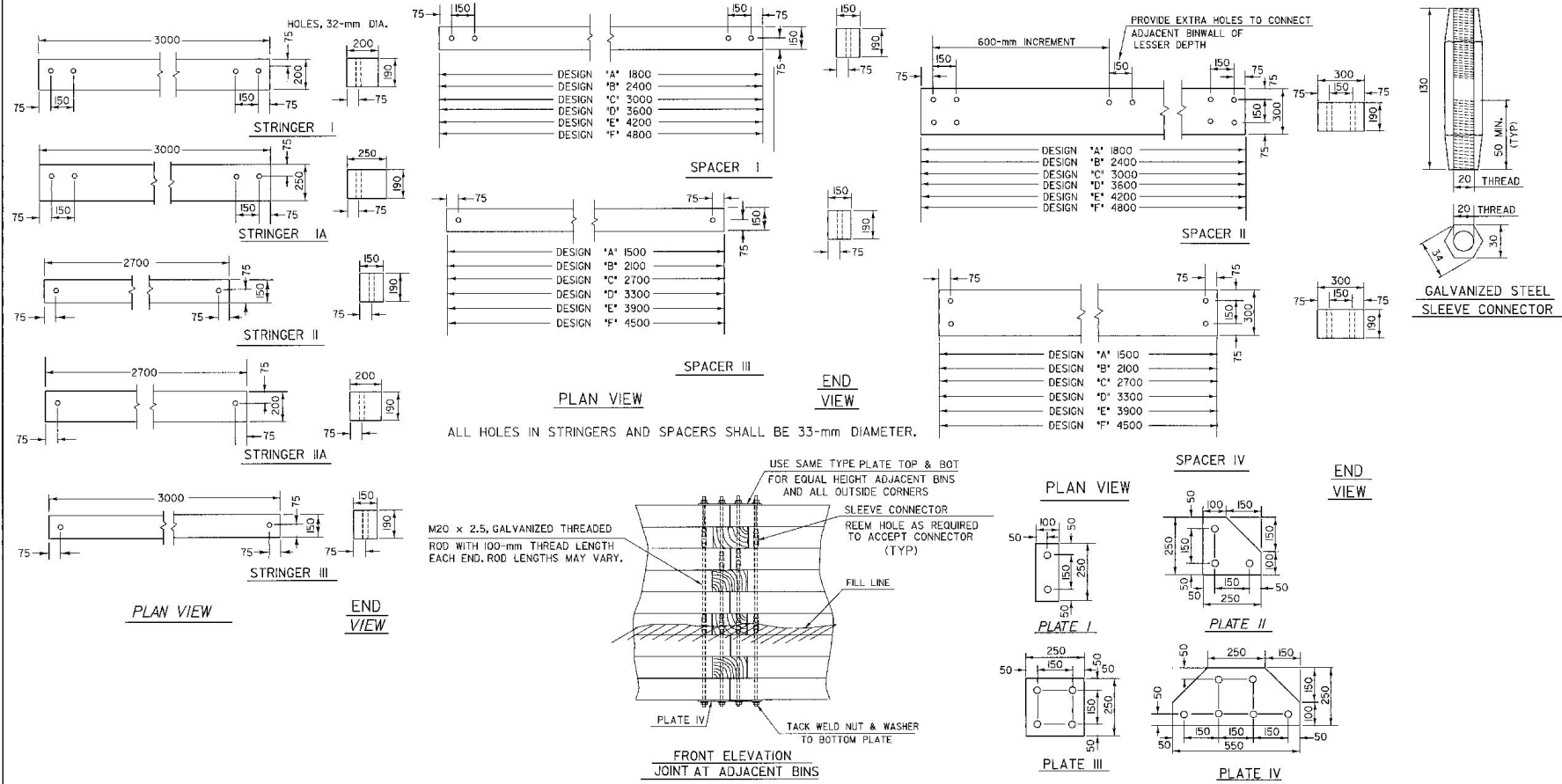
REVISIONS AND CORRECTIONS -ORIGINAL APPROVAL DATE
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APPROVED _____ DIRECTOR OF ENGINEERING _____ STRUCTURES ENGINEER
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3-m TIMBER BINWALLS



Metric
STANDARD
H-2M
 SHEET 1 OF 3



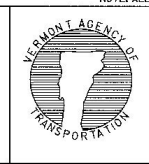
REVISIONS AND CORRECTIONS
 -ORIGINAL APPROVAL DATE

APPROVED

 DIRECTOR OF ENGINEERING

 STRUCTURES ENGINEER

3-m TIMBER BINWALLS



Metric STANDARD H-2M

SHEET 2 OF 3

NOTE: ALL DIMENSIONS ARE IN MILLIMETERS (mm) EXCEPT WHERE NOTED.

