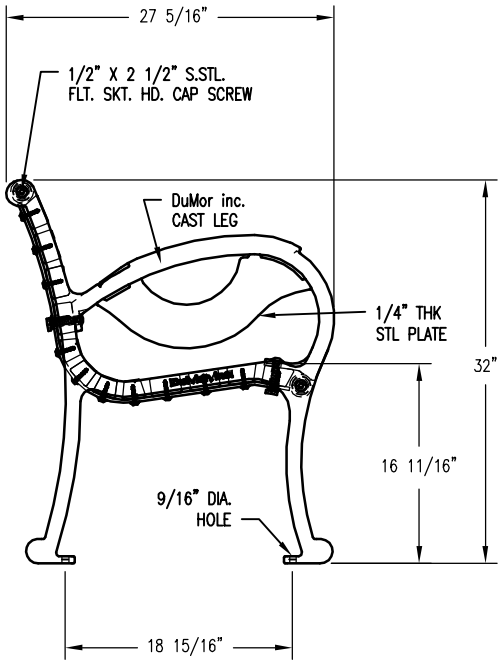
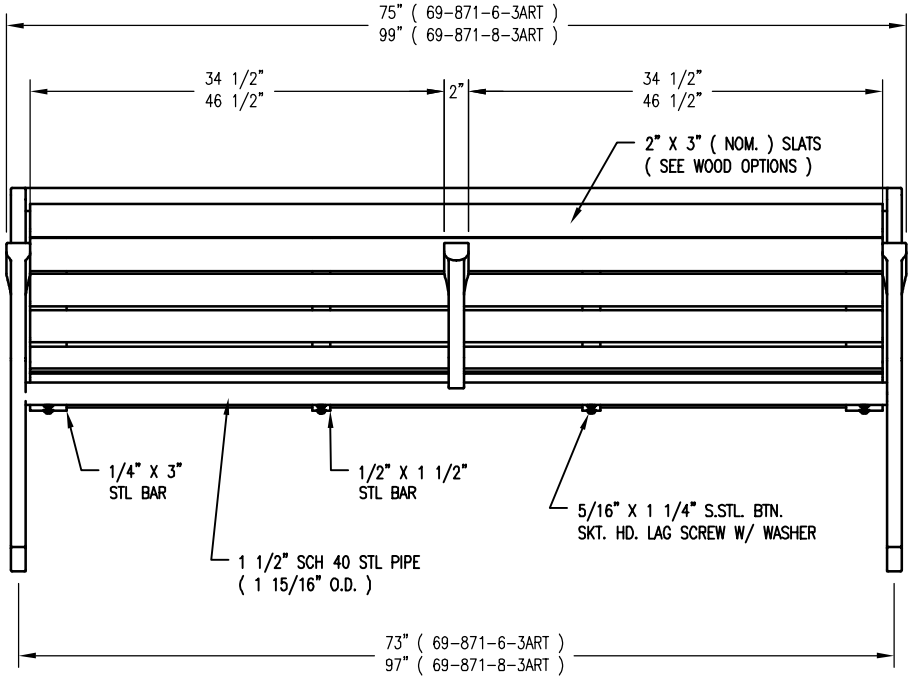
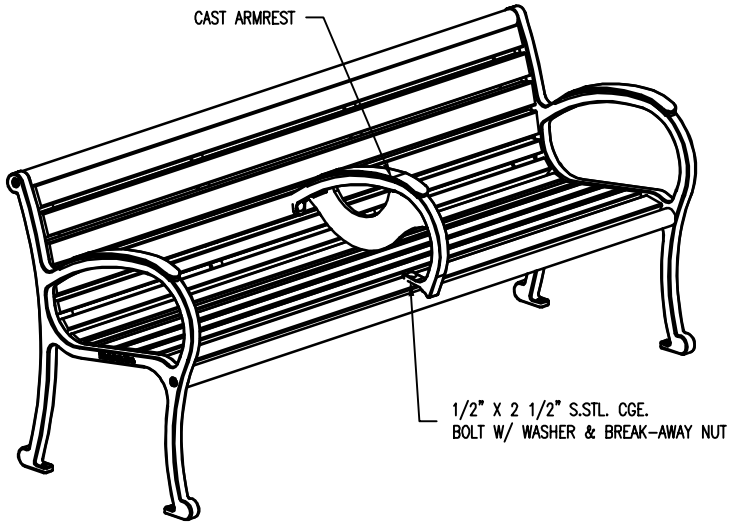






LENGTH OPTIONS

- ☐ 6' BENCH
- ☐ 8' BENCH

WOOD OPTIONS

- ☐ 'C' & BTR. DOUGLAS FIR KD S4S EE
- ☐ IPE S4S EE
- ☐ OTHER _____

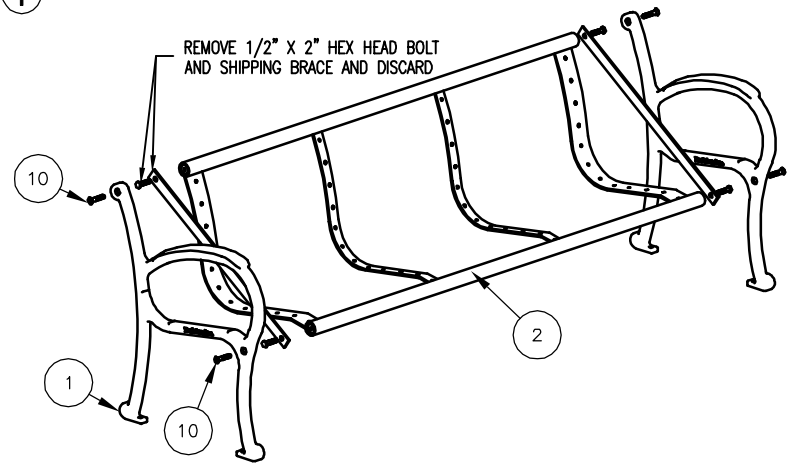
NOTES

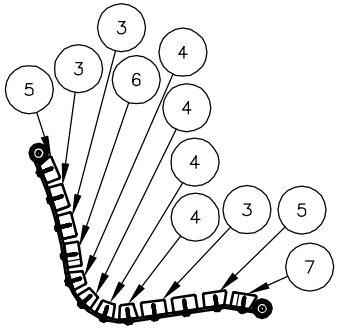
1.) ALL STL. MEMBERS COATED W/ ZINC RICH EPOXY THEN FINISHED W/ POLYESTER POWDER COATING.

2.) 1/2" X 3 3/4" EXPANSION ANCHOR BOLTS PROVIDED.

DuMor, inc.	BENCH	DATE DRAWN : 02/15/17 DRAWN BY : RDH DATE REV. : REV. BY :	REV. A	DRAWING NUMBER 69-871-3ART	SHEET 1 OF 2

1 ATTACH SEAT FRAME TO SUPPORTS.





SLAT LAYOUT

PARTS LIST

ITEM	QTY	PART NO	DESCRIPTION
1	2	0-160-00-01	CAST IRON BENCH SUPPORT FOR BACKREST
2	1	0-165-60-01	6' SEAT FRAME
3	4	0-165-60-02	2" X 3" X 71" SLAT, WOOD
4	4	0-165-60-03	71" TRAP SLAT, WOOD
5	2	0-165-60-04	71" WOOD PROFILE SLAT
6	1	0-165-60-32	2" X 3" X 71" WOOD INT'R SLAT FOR CTR ARM
7	1	0-165-60-34	71" WOOD PROFILE SLAT FOR CTR ARM
8	1	0-9860-01	CAST IRON ARM REST W/ DECORATIVE
9	2	1-11-045	1/2" X 2 1/2" SS CGE BOLT
10	4	1-12-065	1/2" X 2 1/2" FLT SKT HD CAP SCR
11	48	1-13-023	5/16" X 1 1/4" SS BTN SKT HD LAG
12	2	1-21-034	1/2" SS BREAK AWAY HEX NUT (TANNER 50CNBAWS)
13	2	1-22-015	1/2" SS FLAT WASHER
14	48	1-22-017	5/16" SS FLAT WASHER

KITS PROVIDED

ITEM	QTY	PART NO	DESCRIPTION
15	1	K-ANC0860-4	1/2" X 3 3/4" SS ANCHOR KIT (4PC)
16	2	K-BL0524-24	5/16" LAG HARDWARE KIT (24PC)
17	1	K-CG0840-2TB	1/2" CGE BOLT HARDWARE KIT (2PC)
18	1	K-FC0840-4	1/2" CAP HARDWARE KIT (4 PCS)

1A

PLACE SEAT ASSEMBLY ON WORK SURFACE ALLOWING ACCESS TO ENDS. PLACE RATCHET STRAP AROUND SEAT ASSEMBLY AS SHOWN ABOVE.

1B

TIGHTEN STRAP UNTIL SHIPPING BRACKET BECOMES LOOSE. THEN REMOVE AND DISCARD BOLTS & SHIPPING BRACKET.

NOTES:

1.) DURING ASSEMBLY PROCEDURE; DO NOT COMPLETELY TIGHTEN HARDWARE.
2.) THE ACTUAL PARTS WILL NOT BE NUMBERED. NUMBERS ONLY APPLY TO DRAWING.
3.) UPON COMPLETION OF ASSEMBLY SQUARE ALL COMPONENTS THEN TIGHTEN ALL HARDWARE.
4.) MOUNT AND ANCHOR AS SPECIFIED.

TOOLS REQ'D

3/4" WRENCH
5/16" ALLEN WRENCH
1/4" ALLEN WRENCH
1/2" MASONRY DRILL BIT
DRILL
RATCHET STRAP (PROVIDED)

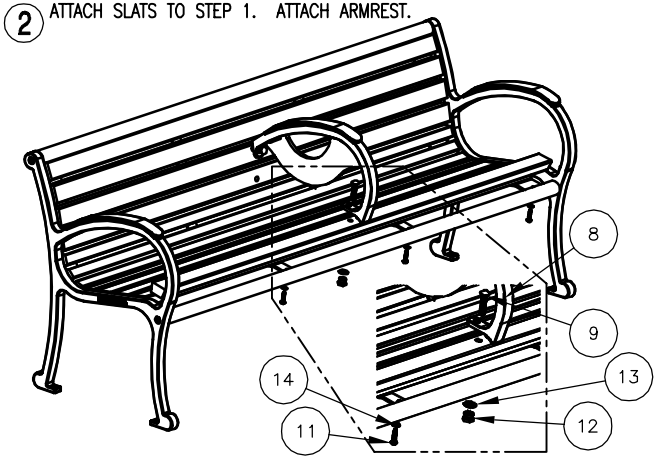
1C

ATTACH CAST SUPPORT TO SEAT ASSEMBLY. IF HOLES IN CASTING DO NOT ALIGN WITH THE SEAT ASSEMBLY, ADJUST BY USING THE RATCHET STRAP.

1D

TIGHTEN HARDWARE THEN REMOVE RATCHET STRAP AND REPEAT THIS PROCEDURE ON THE OTHER END OF BENCH.

2 ATTACH SLATS TO STEP 1. ATTACH ARMREST.

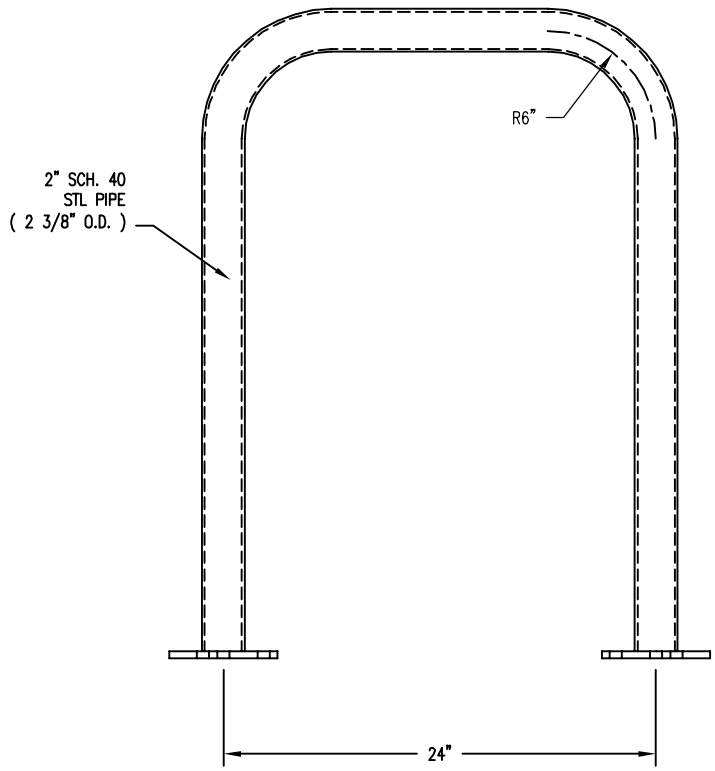


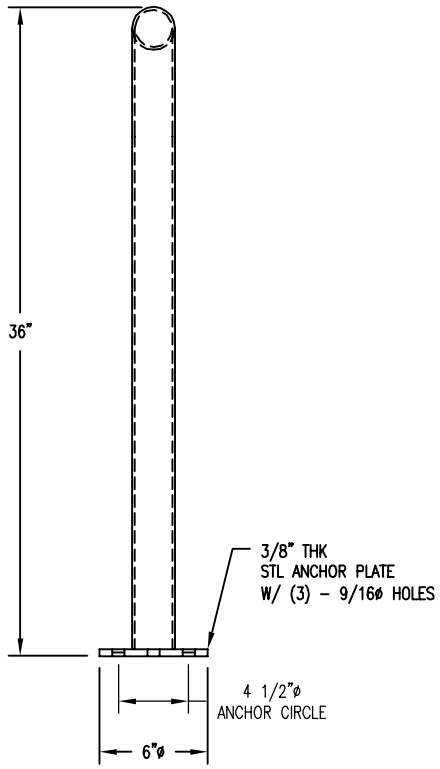
DuMor, inc.

ASSEMBLY INSTRUCTIONS

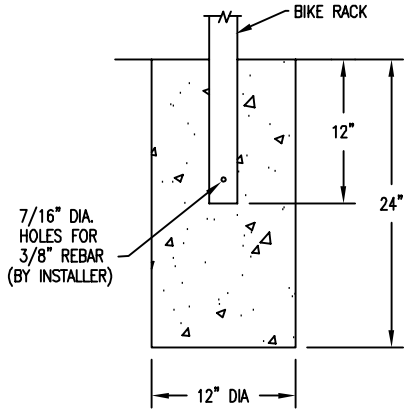
DATE DRAWN : 10/05/17	REV.
DRAWN BY : ESS	A
DATE REV. : 00/00/00	
REV. BY : XXX	

DRAWING NUMBER: 69-871-3ART

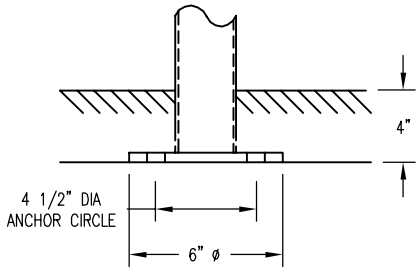




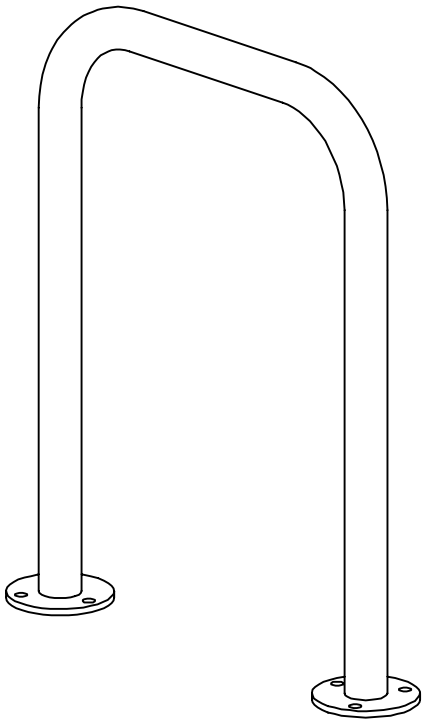
☐ S-2 SURFACE MOUNT



☐ S-1 EMBEDMENT



☐ S-4 SUB FLOOR



FINISH OPTIONS

☐ HOT DIPPED GALVANIZED (VISIBLE VENT HOLES)

☐ COATED W/ ZINC RICH EPOXY THEN FINISHED W/ POLYESTER POWDER COATING.

NOTES:

1.) 1/2" X 3 3/4" EXPANSION ANCHOR BOLTS PROVIDED FOR OPTION S-2 & S-4.

2.) PLUGS PROVIDED FOR VISIBLE VENT HOLES. (HOT DIPPED GALV. ONLY)

DuMor, inc.	BIKE RACK	DATE DRAWN : 01/21/15 DRAWN BY : RDH DATE REV. : 11/3/15 REV. BY : JSB	REV. B	DRAWING NUMBER 290 SERIES	SHEET 1 OF 2

NOTES:

1.) MOUNT AND ANCHOR AS SPECIFIED.

TOOLS REQ'D

3/4" WRENCH
1/2" MASONRY DRILL BIT
DRILL

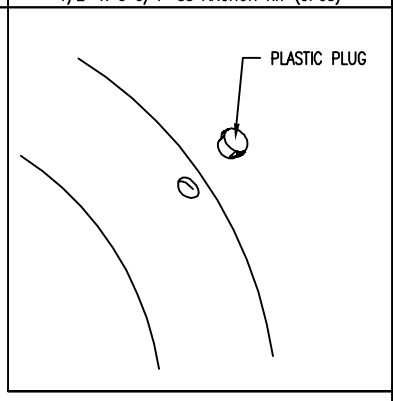
PARTS LIST FOR S-2

ITEM	QTY	PART NO	DESCRIPTION
1	1	0-290-00-01/S-2	36" LOOP BIKE RACK, 26 3/8" WIDE, PLATES

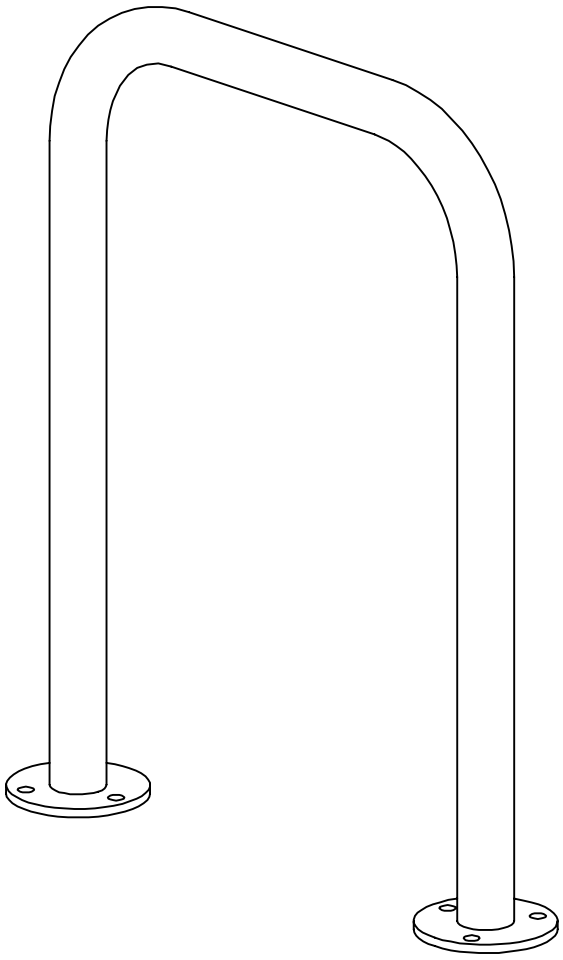
KITS PROVIDED FOR S-2

ITEM	QTY	PART NO	DESCRIPTION
2	2	K-ANC0860-3	1/2" X 3 3/4" SS ANCHOR KIT (3PCS)

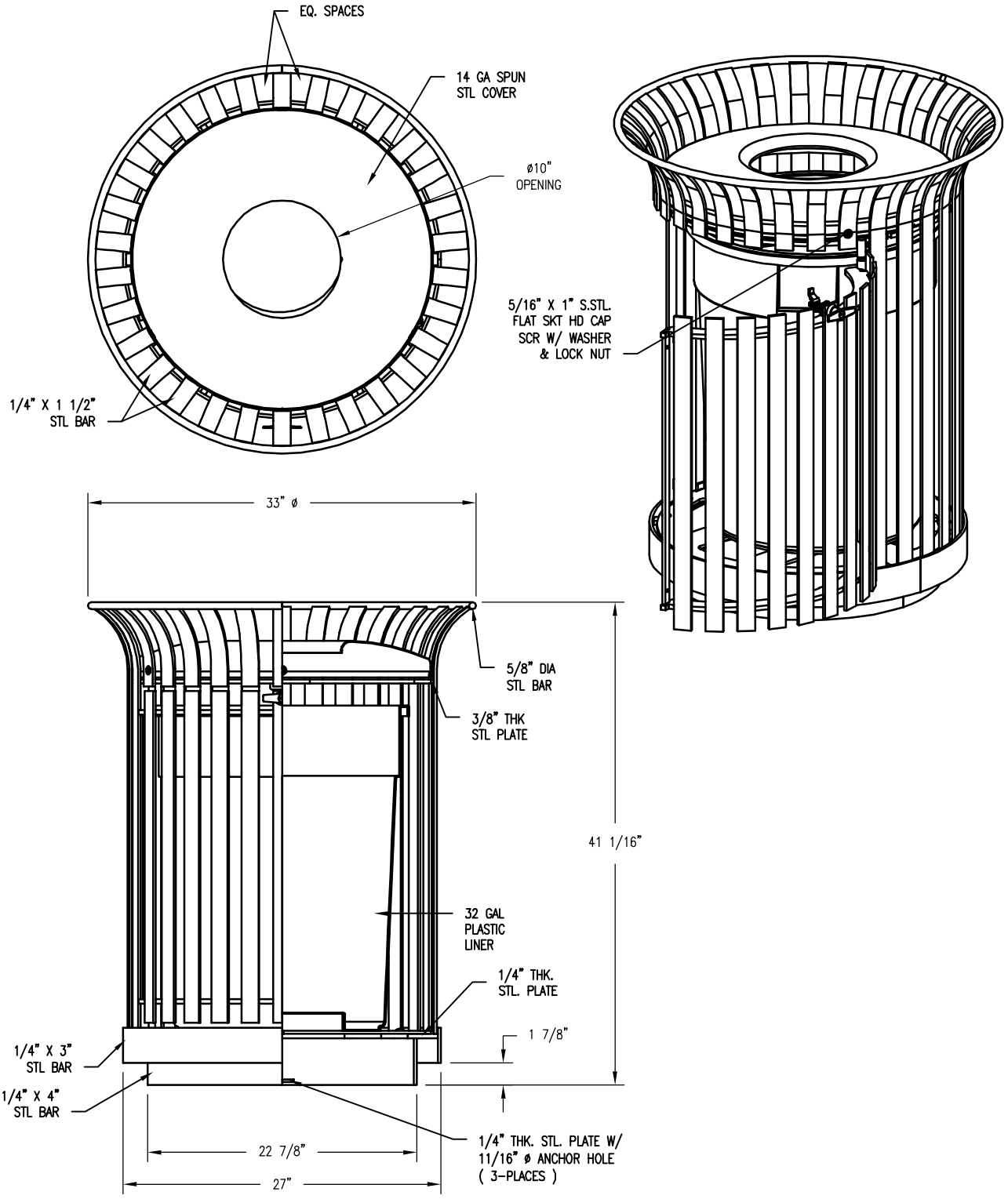
(1)



HOT-DIPPED GALV. BIKE RACK ONLY



DuMor, inc.	ASSEMBLY INSTRUCTIONS	DATE DRAWN : 01/21/15 DRAWN BY : RDH DATE REV. : 11/3/15 REV. BY : JSB	REV. B	DRAWING NUMBER 290 SERIES	SHEET 2 OF 2



NOTES:

1.) ALL STL. MEMBERS COATED W/ ZINC RICH EPOXY THEN FINISHED W/ POLYESTER POWDER COATING.

2.) 1/2" X 3 3/4" EXPANSION ANCHOR BOLTS PROVIDED.

3.) LATCH PROVIDED W/ KEY, USE OF KEY OPTIONAL.

DuMor, inc.	RECEPTACLE	DATE DRAWN : 01/03/13 DRAWN BY : JSB DATE REV. : 00/00/00 REV. BY : XXX	REV. A	DRAWING NUMBER 157-32 W/ CVB-30-FTO	SHEET 1 OF 2

NOTES:

1.) DURING ASSEMBLY PROCEDURE; DO NOT COMPLETELY TIGHTEN HARDWARE.
2.) THE ACTUAL PARTS WILL NOT BE NUMBERED. NUMBERS ONLY APPLY TO DRAWING.
3.) UPON COMPLETION OF ASSEMBLY SQUARE ALL COMPONENTS THEN TIGHTEN ALL HARDWARE.
4.) MOUNT AND ANCHOR AS SPECIFIED.

TOOLS REQ'D

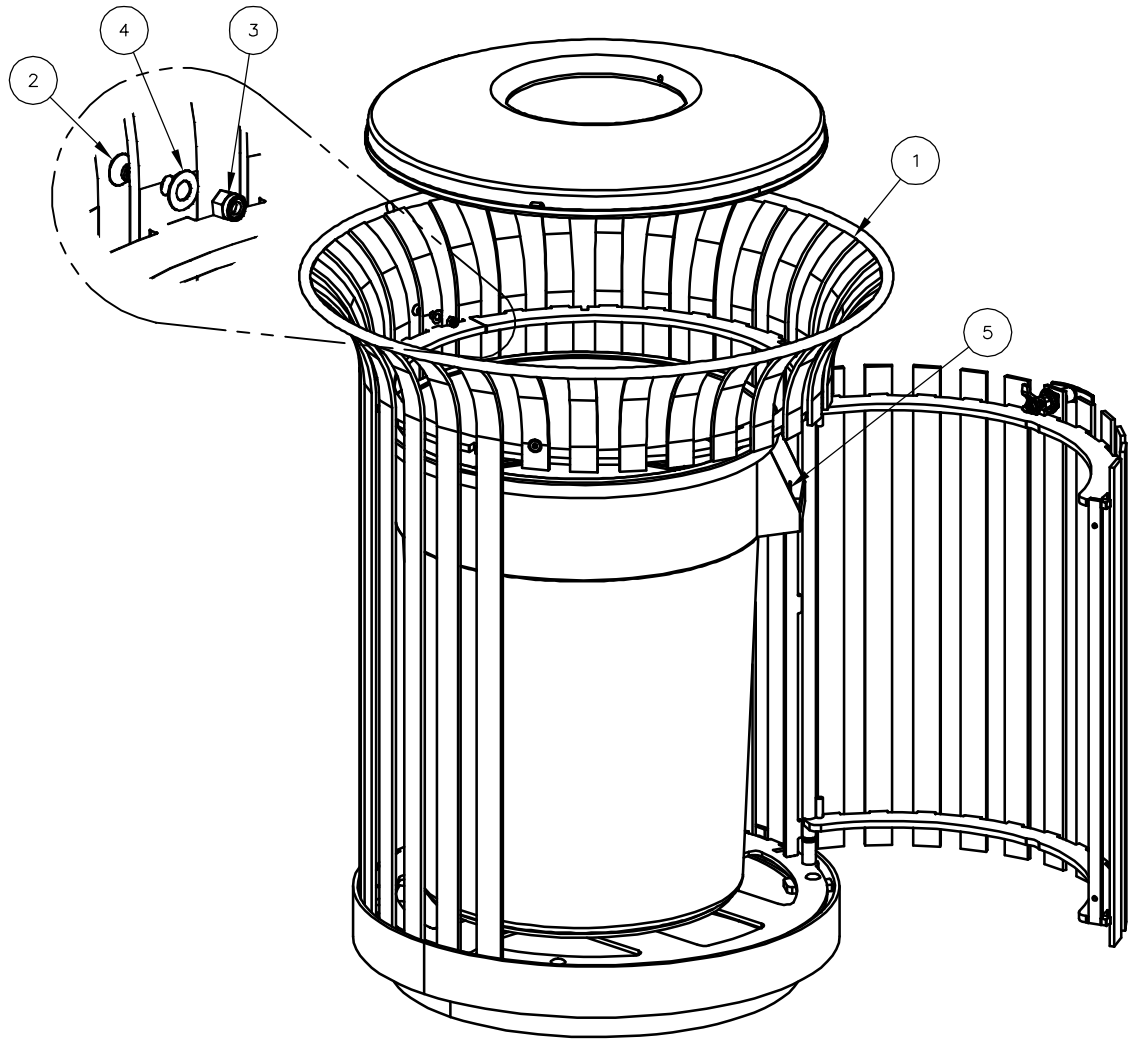
3/4" WRENCH
1/2" WRENCH
3/16" ALLEN WRENCH
1/2" MASONRY DRILL BIT
DRILL

PARTS LIST

ITEM	QTY	PART NO	DESCRIPTION
1	1	0-157-30	30 GAL RECEPTACLE ASSEMBLY
2	3	1-12-023	5/16" X 1" SS FLT SKT HD CAP SCR
3	3	1-20-016	5/16" SS NYLON LOCKNUT
4	3	1-22-017	5/16" SS FLAT WASHER
5	1	49-32	32 GAL PL LINER W/ HANDLE, BLK

KITS PROVIDED

ITEM	QTY	PART NO	DESCRIPTION
7	1	K-ANC0860-3	1/2" X 3 3/4" SS ANCHOR KIT (3PCS)
8	1	K-FC0516-3L	5/16" CAP HARDWARE KIT (3 PCS)



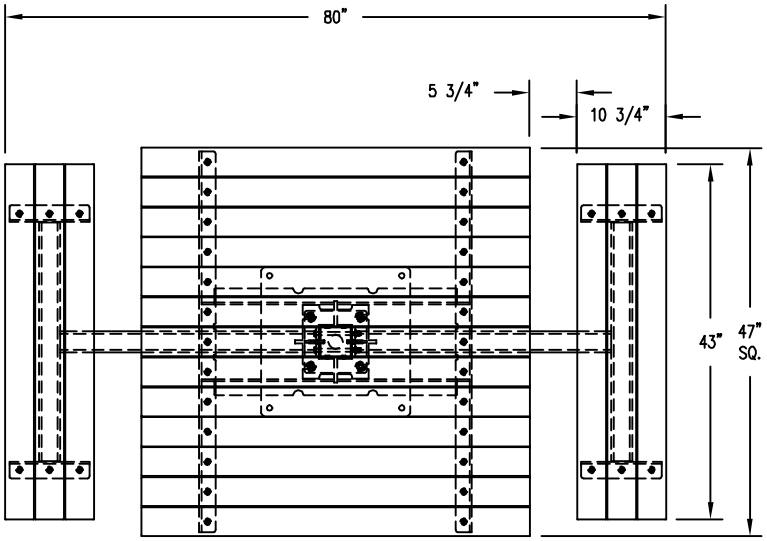
DuMor, inc.

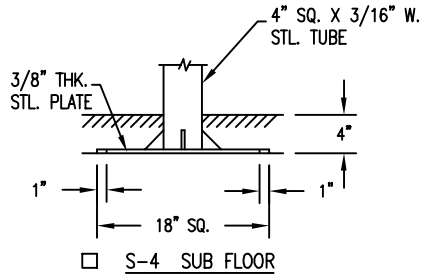
ASSEMBLY INSTRUCTIONS

DATE DRAWN :	01/03/13
DRAWN BY :	JSB
DATE REV. :	00/00/00
REV. BY :	XXX

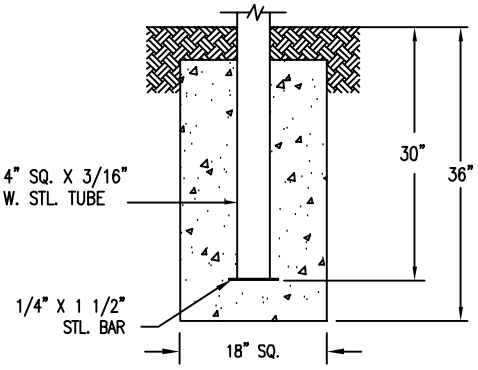
REV. A

DRAWING NUMBER 157-32 W/ CVB-30-FTO

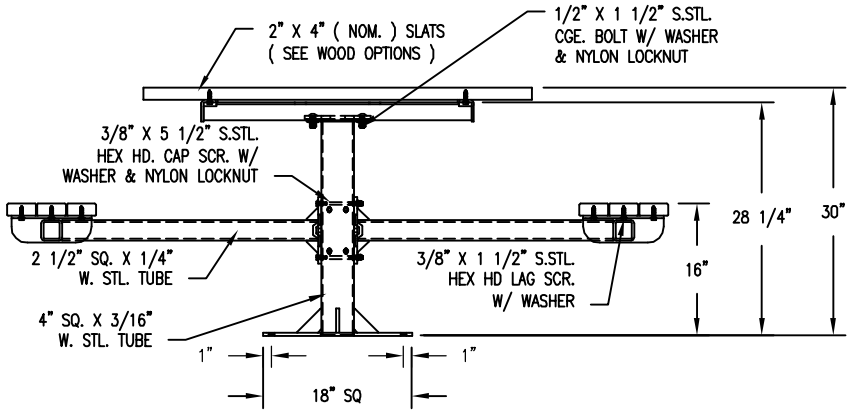




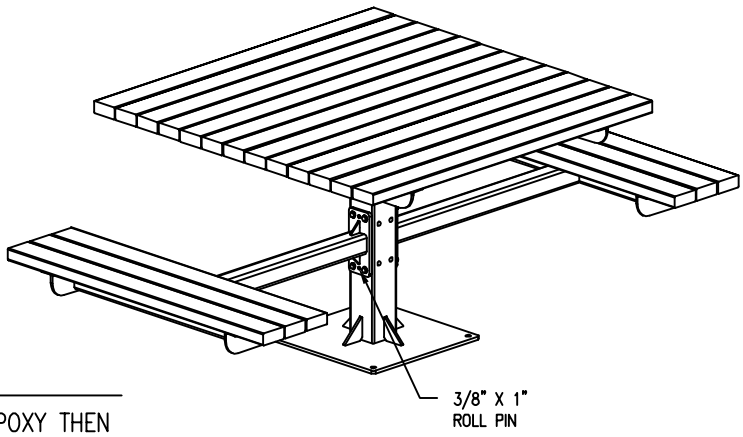
☐ S-4 SUB FLOOR



☐ S-1 EMBEDMENT



☐ S-2 SURFACE MT



WOOD OPTIONS

- ☐ 'C' & BTR. DOUGLAS FIR KD S4S EE
- ☐ IPE S4S EE
- ☐ THERMALLY MODIFIED RED OAK S4S EE
- ☐ OTHER _____

NOTES

1.) ALL STL. MEMBERS COATED W/ ZINC RICH EPOXY THEN FINISHED W/ POLYESTER POWDER COATING.

2.) 1/2" X 3 3/4" EXPANSION ANCHOR BOLTS PROVIDED FOR OPTIONS S-2 AND S-4.

DuMor, inc.	PEDESTAL TABLE	DATE DRAWN : 08/15/24 DRAWN BY : ESS DATE REV. : 00/00/00 REV. BY : XXX	REV. A	DRAWING NUMBER 76-22	SHEET 1 OF 2

NOTES:

1.) DURING ASSEMBLY PROCEDURE; DO NOT COMPLETELY TIGHTEN HARDWARE.
2.) THE ACTUAL PARTS WILL NOT BE NUMBERED. NUMBERS ONLY APPLY TO DRAWING.
3.) UPON COMPLETION OF ASSEMBLY SQUARE ALL COMPONENTS THEN TIGHTEN ALL HARDWARE.
4.) MOUNT AND ANCHOR AS SPECIFIED.

TOOLS REQ'D

3/4" WRENCH
9/16" WRENCH
3/8" DRILL BIT
1/2" MASONRY DRILL BIT
DRILL

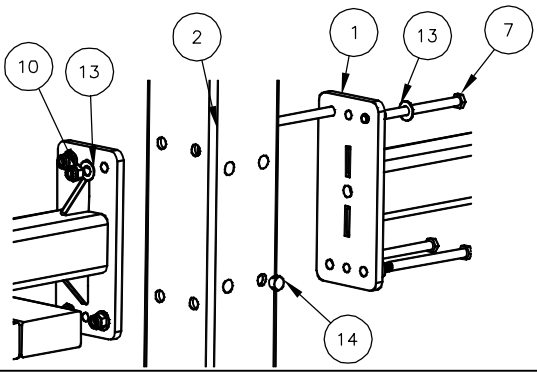
PARTS LIST FOR S-2

ITEM	QTY	PART NO	DESCRIPTION
1	2	0-76-00-05	SEAT SUPPORT ARM W/8" PLATE
2	1	0-76-00-06/S-2	CTR POST FOR SURFACE MOUNT
3	1	0-76-00-07	STL TABLE TOP FRAME
4	13	0-76-20-01	2" X 4" X 47" SLAT, WOOD
5	6	0-76-20-02	2" X 4" X 43" SLAT, WOOD
6	4	1-11-042	1/2" X 1 1/2" SS CGE BOLT
7	4	1-12-039	3/8" X 5 1/2" SS HEX HD CAP SCR
8	38	1-13-028	3/8" X 1 1/2" SS HEX HD LAG SCR
9	4	1-14-003	3/8" X 1" S.STL. ROLL PIN
10	4	1-20-007	3/8" SS NYLON LOCKNUT
11	4	1-20-015	1/2" SS NYLON LOCKNUT
12	4	1-22-015	1/2" SS FLAT WASHER
13	46	1-22-024	3/8" SS FLAT WASHER
14	8	5-48-059	BLACK PLASTIC PLUG

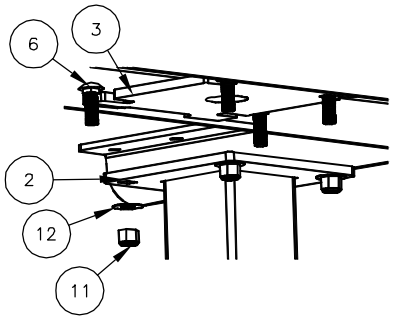
KITS PROVIDED FOR S-2

ITEM	QTY	PART NO	DESCRIPTION
15	1	K-ANC0860-4	1/2" X 3 3/4" SS ANCHOR KIT (4PC)
16	1	K-CG0824-4L	1/2" CGE BOLT HARDWARE KIT (4)
17	1	K-HC0688-4	3/8" CAP HARDWARE KIT (4PC)
18	1	K-HL0624-38	3/8" LAG HARDWARE KIT (38PC)
19	1	K-PLUG08-8	1/2" BLACK PLASTIC PLUG
20	1	K-RP0616-6	3/8" X 1" ROLL PIN KIT (6PC)

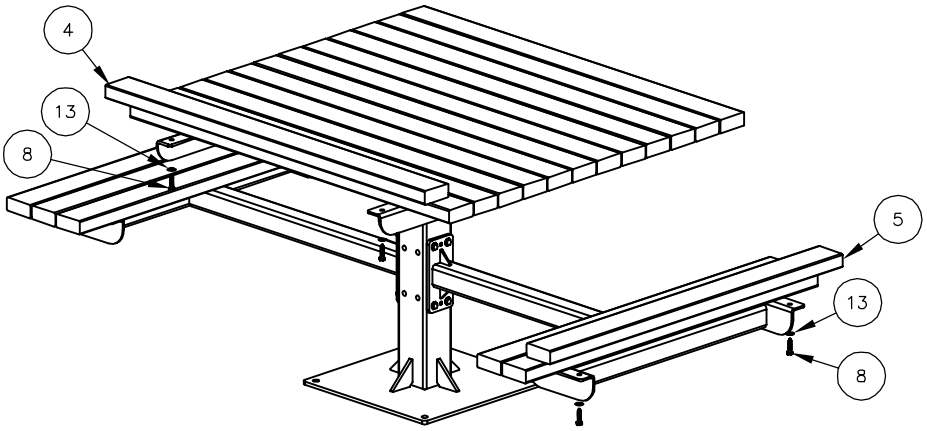
(1) ATTACH SEAT SUPPORT ARMS TO CTR POST FOR SURF MT.



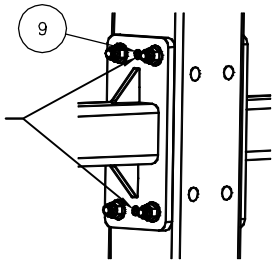
(2) ATTACH STL TABLE TOP FRAME TO STEP 1.



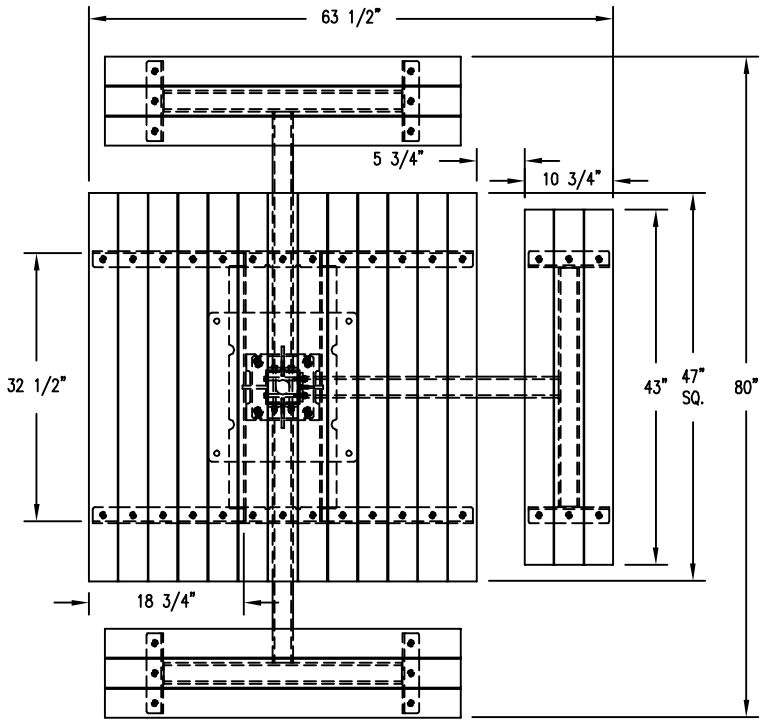
(3) ATTACH SLATS TO STEP 2.

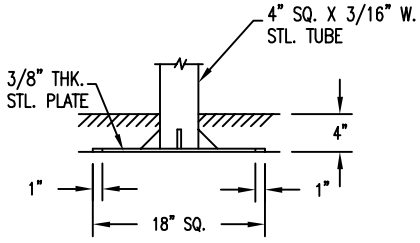


FIELD DRILL 3/8" ø THRU HOLE AT THESE HOLE LOCATIONS FOR 3/8" X 1" ROLL PINS (BEFORE INSERTING ROLL PINS TOUCH UP HOLE W/ PAINT PROVIDED)

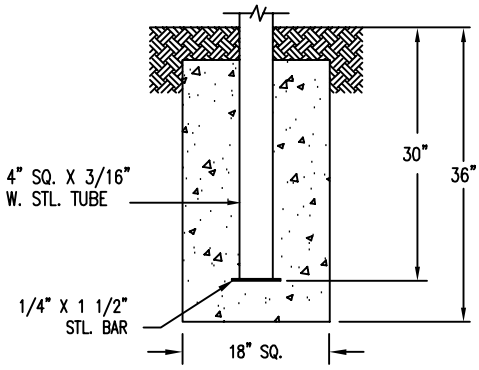


DuMor, inc.	ASSEMBLY INSTRUCTIONS	DATE DRAWN : 08/15/24 DRAWN BY : ESS DATE REV. : 00/00/00 REV. BY : XXX	REV. A	DRAWING NUMBER 76-22	SHEET 2 OF 2

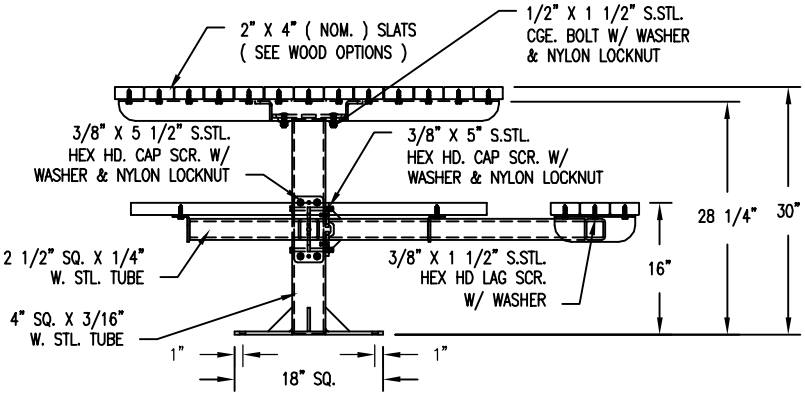




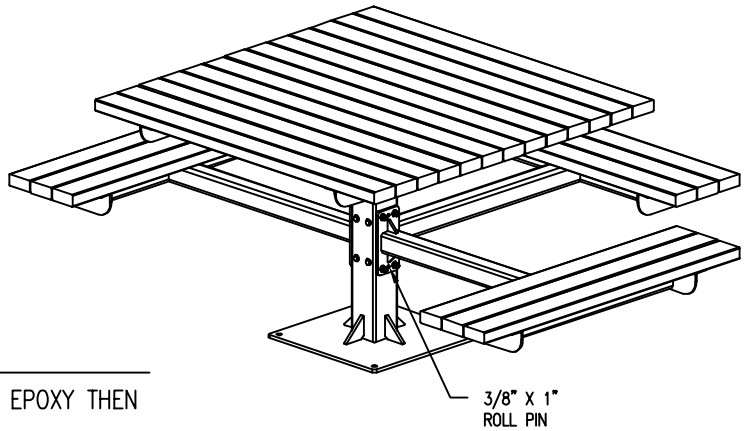
☐ S-4 SUB FLOOR



☐ S-1 EMBEDMENT



☐ S-2 SURFACE MT



WOOD OPTIONS

- ☐ 'C' & BTR. DOUGLAS FIR KD S4S EE
- ☐ IPE S4S EE
- ☐ THERMALLY MODIFIED RED OAK S4S EE
- ☐ OTHER _____

NOTES

1.) ALL STL. MEMBERS COATED W/ ZINC RICH EPOXY THEN FINISHED W/ POLYESTER POWDER COATING.
2.) 1/2" X 3 3/4" EXPANSION ANCHOR BOLTS PROVIDED FOR OPTIONS S-2 AND S-4.

DuMor, inc.	PEDESTAL TABLE	DATE DRAWN : 08/15/24 DRAWN BY : ESS DATE REV. : 00/00/00 REV. BY : XXX	REV. A	DRAWING NUMBER 76-23	SHEET 1 OF 2

NOTES:

1.) DURING ASSEMBLY PROCEDURE; DO NOT COMPLETELY TIGHTEN HARDWARE.
2.) THE ACTUAL PARTS WILL NOT BE NUMBERED. NUMBERS ONLY APPLY TO DRAWING.
3.) UPON COMPLETION OF ASSEMBLY SQUARE ALL COMPONENTS THEN TIGHTEN ALL HARDWARE.
4.) MOUNT AND ANCHOR AS SPECIFIED.

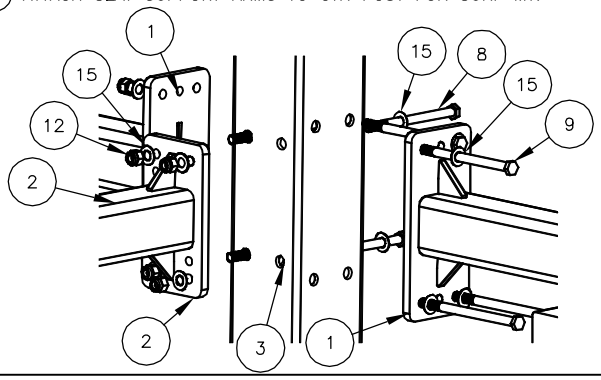
TOOLS REQ'D

3/4" WRENCH
9/16" WRENCH
3/8" DRILL BIT
1/2" MASONRY DRILL BIT DRILL

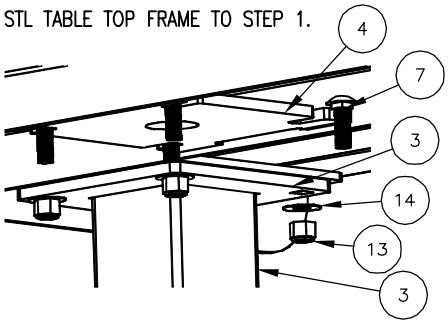
PARTS LIST FOR S-2

ITEM	QTY	PART NO	DESCRIPTION
1	2	0-76-00-05	SEAT SUPPORT ARM W/8" PLATE
2	1	0-76-00-05A	SEAT SUPPORT ARM W/6 1/2" PLATE
3	1	0-76-00-06/S-2	CTR POST FOR SURFACE MOUNT
4	1	0-76-00-07	STL TABLE TOP FRAME
5	13	0-76-20-01	2" X 4" X 47" SLAT, WOOD
6	9	0-76-20-02	2" X 4" X 43" SLAT, WOOD
7	4	1-11-042	1/2" X 1 1/2" SS CGE BOLT
8	4	1-12-008	3/8" X 5" SS HEX HD CAP SCR
9	4	1-12-039	3/8" X 5 1/2" SS HEX HD CAP SCR
10	44	1-13-028	3/8" X 1 1/2" SS HEX HD LAG SCR
11	6	1-14-003	3/8" X 1" S.STL. ROLL PIN
12	8	1-20-007	3/8" SS NYLON LOCKNUT
13	4	1-20-015	1/2" SS NYLON LOCKNUT
14	4	1-22-015	1/2" SS FLAT WASHER
15	60	1-22-024	3/8" SS FLAT WASHER

(1) ATTACH SEAT SUPPORT ARMS TO CTR POST FOR SURF MT.



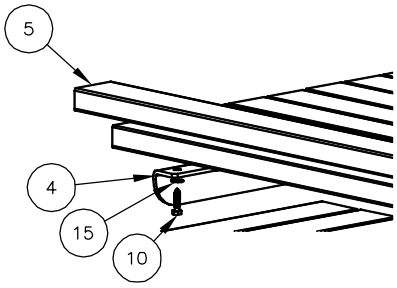
(2) ATTACH STL TABLE TOP FRAME TO STEP 1.



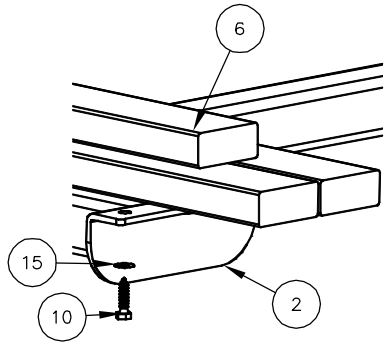
KITS PROVIDED FOR S-2

ITEM	QTY	PART NO	DESCRIPTION
16	1	K-ANC0860-4	1/2" X 3 3/4" SS ANCHOR KIT (4PC)
17	1	K-CG0824-4L	1/2" CGE BOLT HARDWARE KIT (4)
18	1	K-HC0680-4	3/8" CAP HARDWARE KIT (4PC)
19	1	K-HC0688-4	3/8" CAP HARDWARE KIT (4PC)
20	1	K-HL0624-44	3/8" LAG HARDWARE KIT (44PC)
21	1	K-RP0616-6	3/8" X 1" ROLL PIN KIT (6PC)

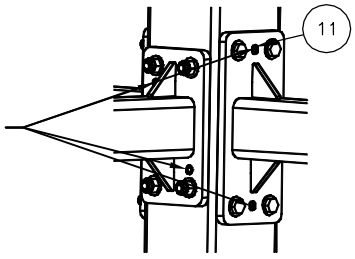
(3) ATTACH TABLE SLATS TO STEP 2.



(4) ATTACH SEAT SLATS TO STEP 2.

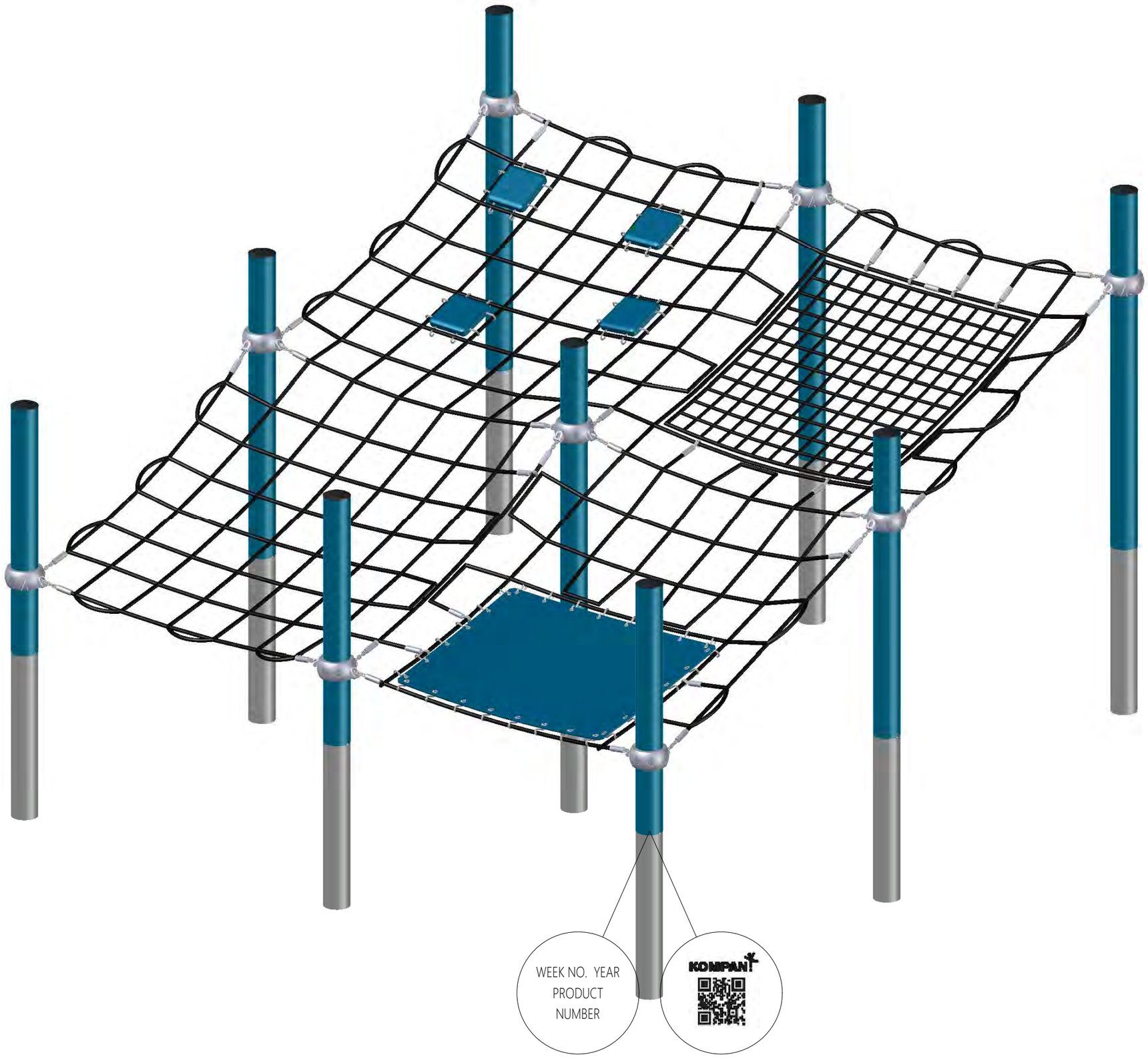


FIELD DRILL 3/8" ø THRU HOLE AT THESE HOLE LOCATIONS FOR 3/8" X 1" ROLL PINS (BEFORE INSERTING ROLL PINS TOUCH UP HOLE W/ PAINT PROVIDED)



DuMor, inc.	ASSEMBLY INSTRUCTIONS	DATE DRAWN : 08/15/24 DRAWN BY : ESS DATE REV. : 00/00/00 REV. BY : XXX	REV. A	DRAWING NUMBER 76-23	SHEET 2 OF 2

Overview



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CRP-TRAILS-CUSTOM

ID 871109

JaStre

2025-07-25

Footings:	90 cm inground
Placed on embankment	Yes
Include Spec Parts:	Yes, custom net
Color:	Posts: Powder coated RAL5012 glossy (-07) Rope: Black (-06) Membrane: Blue (-139) EPDM: Blue (-139)

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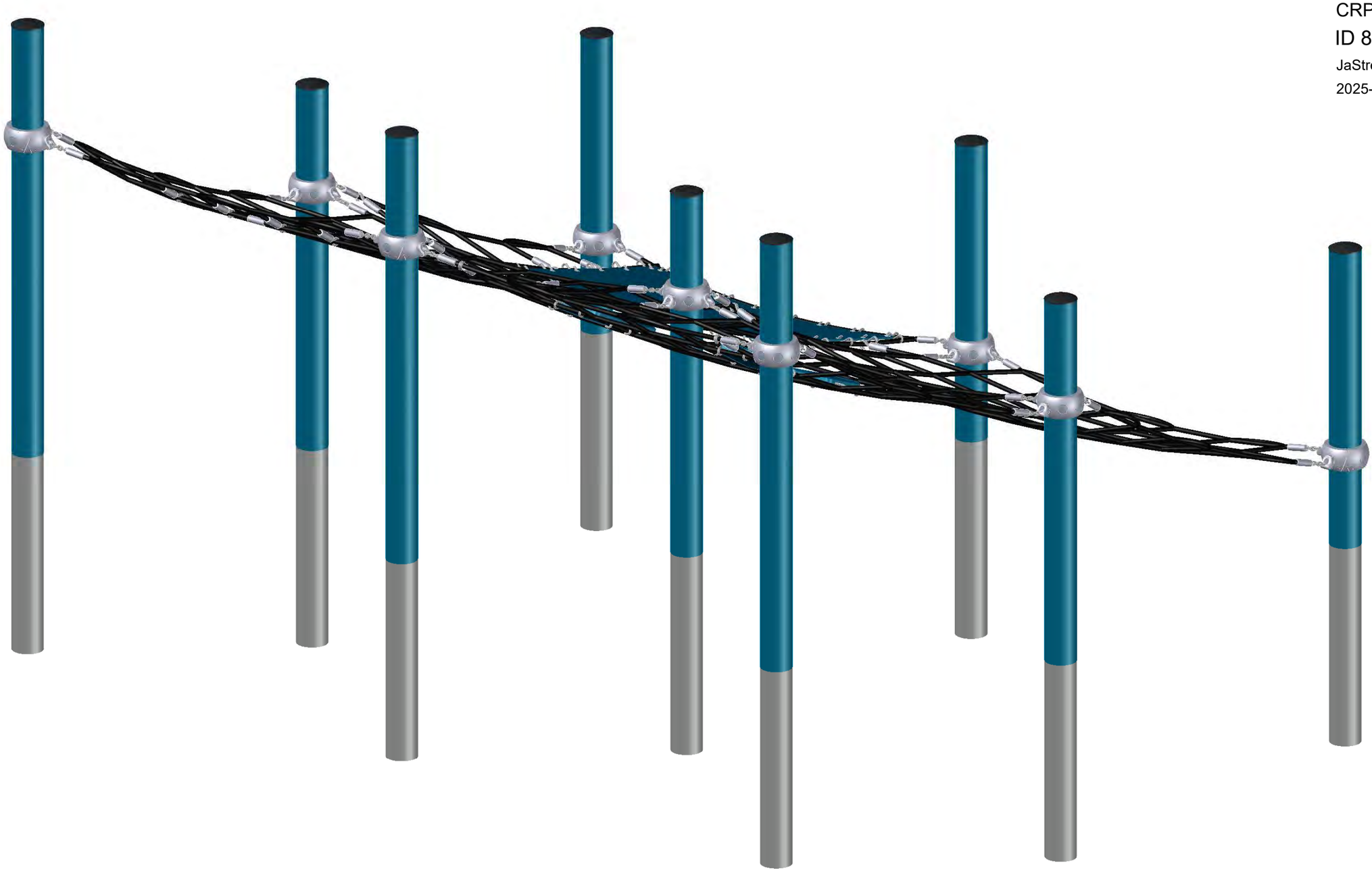
CRP-TRAILS-CUSTOM

ID 871109

JaStre

2025-07-25



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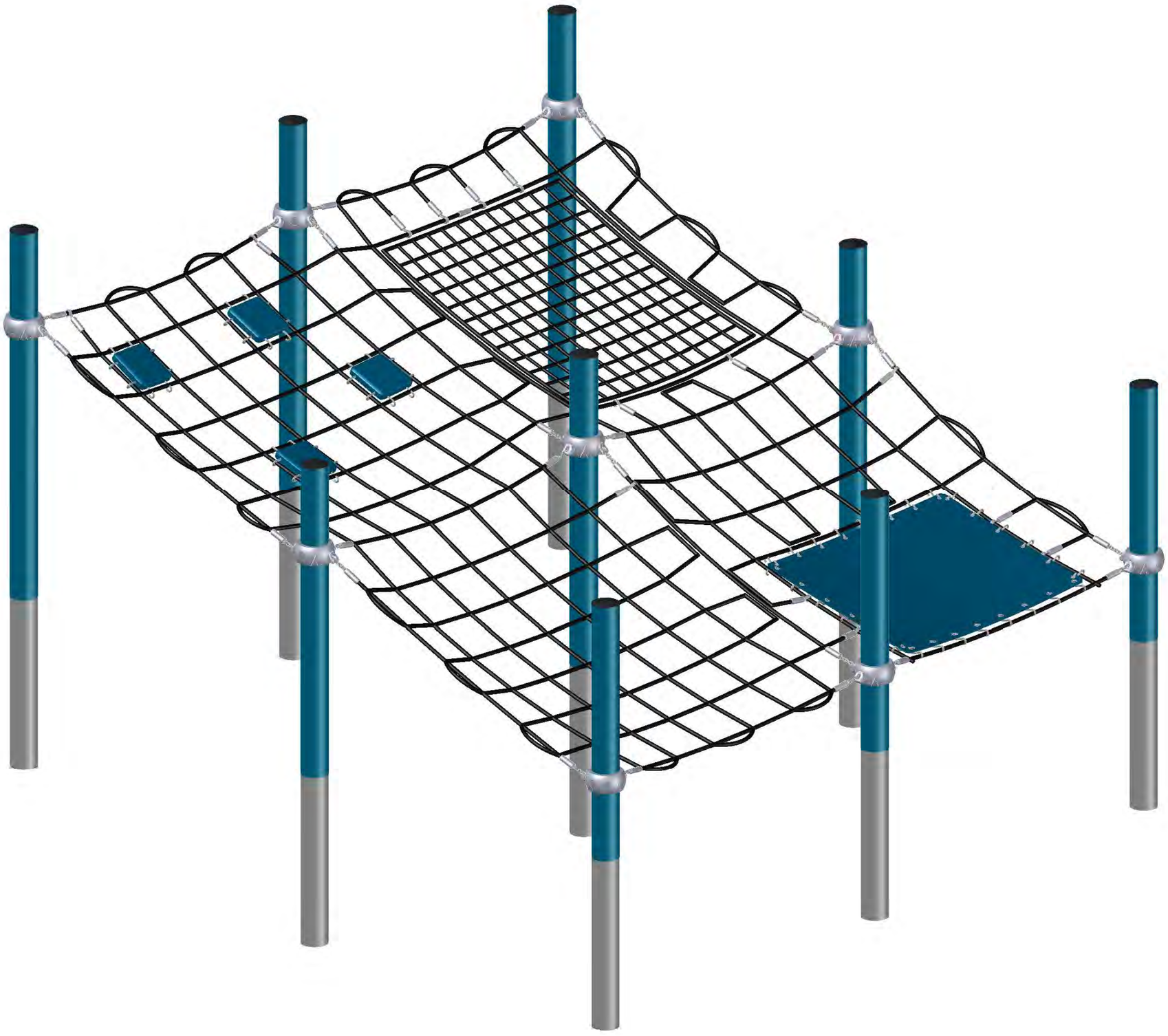
CRP-TRAILS-CUSTOM

ID 871109

JaStre

2025-07-25



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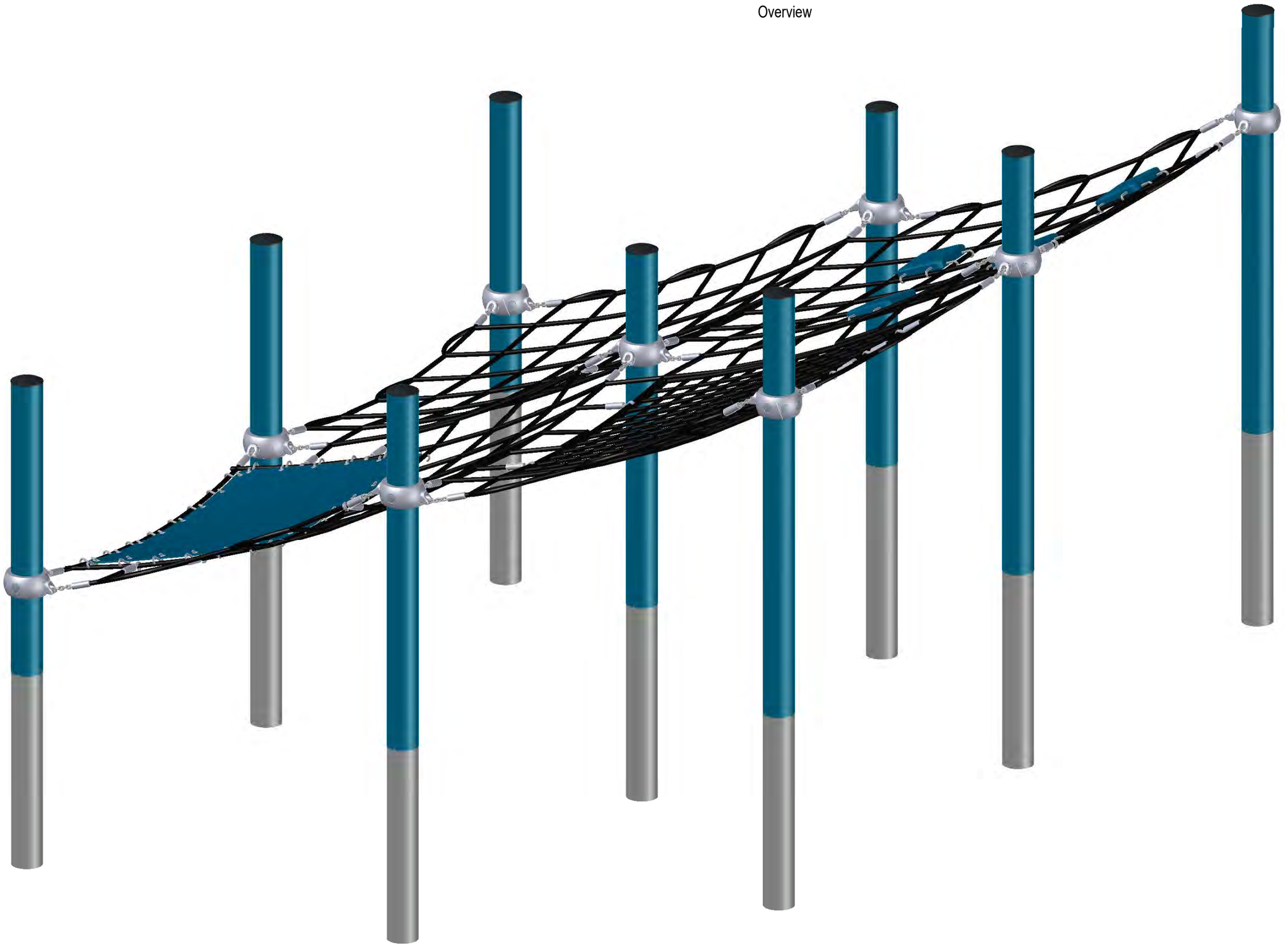
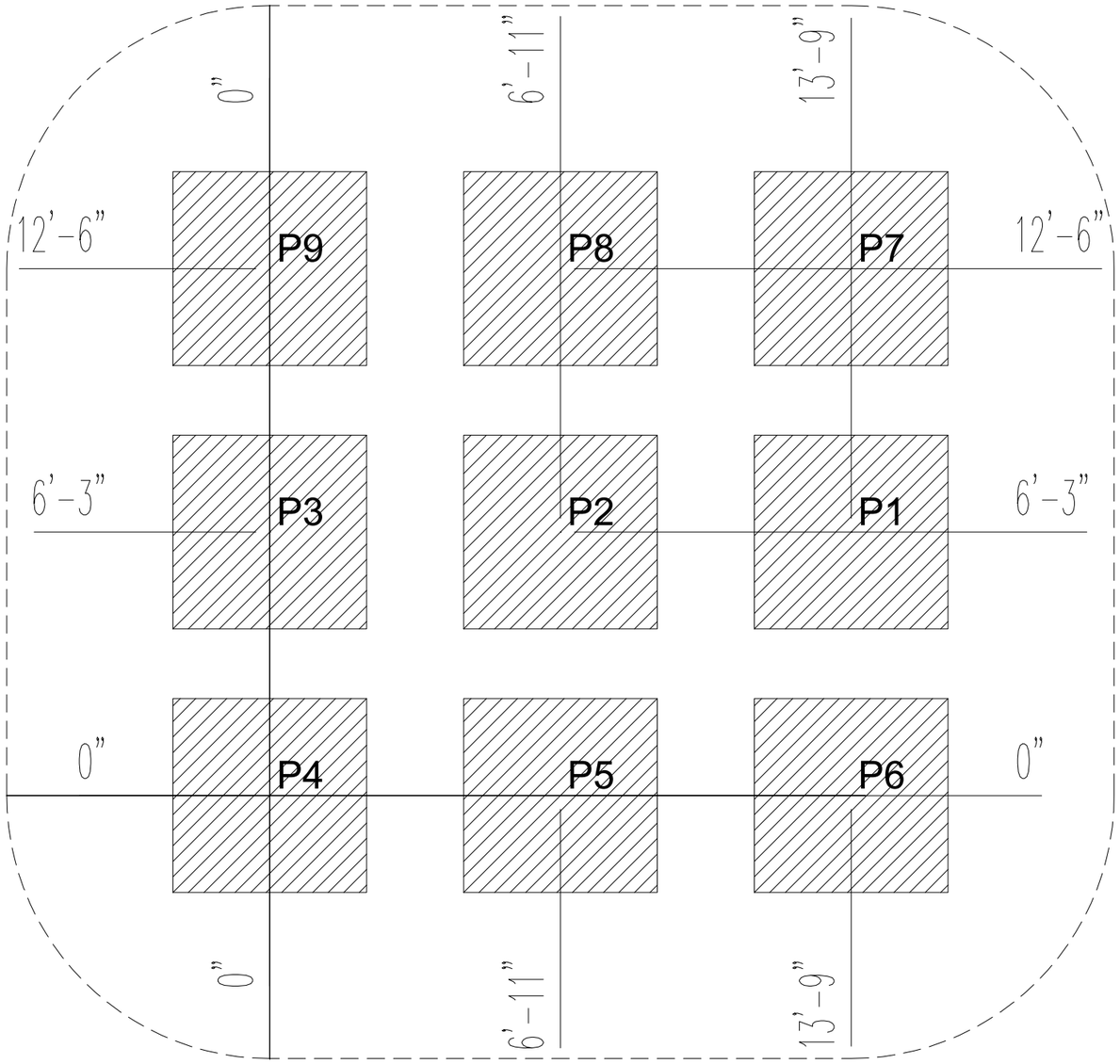
CRP-TRAILS-CUSTOM

ID 871109

JaStre

2025-07-25





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CRP-TRAILS-CUSTOM

ID 871109

JaStre

2025-07-25

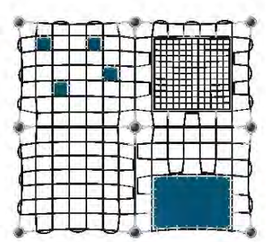
Scale: MAX
Units: inch

Safety zone
- Norm: ASTM F1487
- Perimeter: 0 ft
- Area: 0 ft²

Concrete
- Volume: 311.476 CU.FT.

C25/30 (B25)
$f_{ck,cube}$ = 30 N/mm²

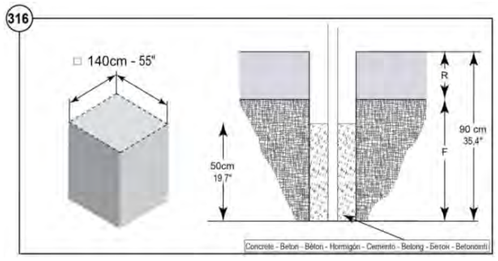
Use the specified quality of concrete in accordance with all specifications from the concrete supplier taking the nature of the product to be installed into account.



Overview of used Digging Holes and Footings

Foundation			
Pos.	Hole Type	Profile [cm]	Depth [cm]
P1-P9	316	140x140	90

Footing for Posts / Modules					
Pos.	Module No.	Profile [mm]	Length [cm]	Footing module	Post cap
P1-P3	RP13-2550-07	ø139,7x4,0	255	RP120300-05	RP130101-07
P4-P6	RP13-2250-07	ø139,7x4,0	225	RP120300-05	RP130101-07
P7-P9	RP13-2850-07	ø139,7x4,0	285	RP120300-05	RP130101-07



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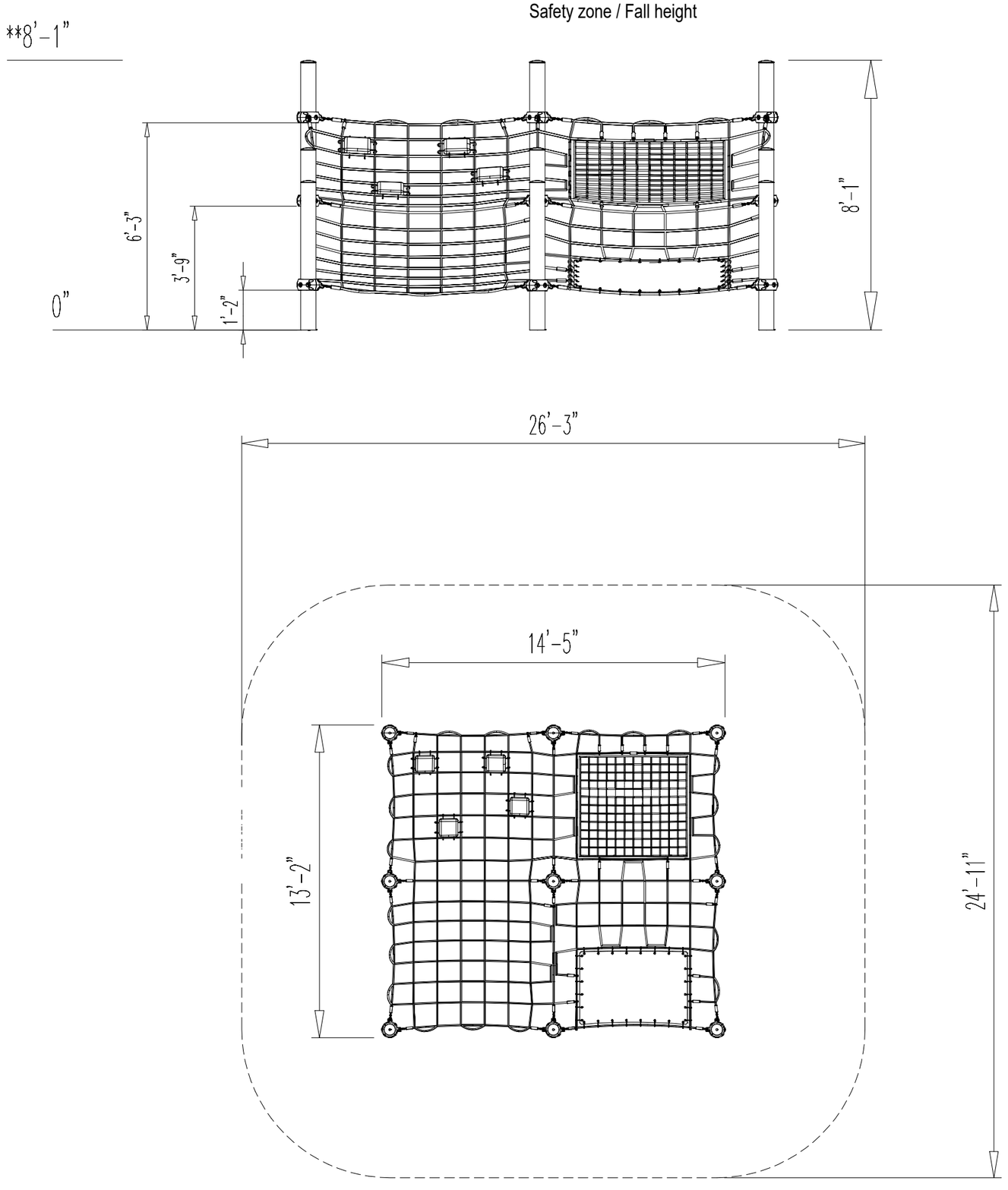
CRP-TRAILS-CUSTOM

ID 871109

JaStre

2025-07-25

Safety zone / Fall height



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ID 871109

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Scale: MAX
Units: inch

ASTM F1487

* Fall height
** Total height

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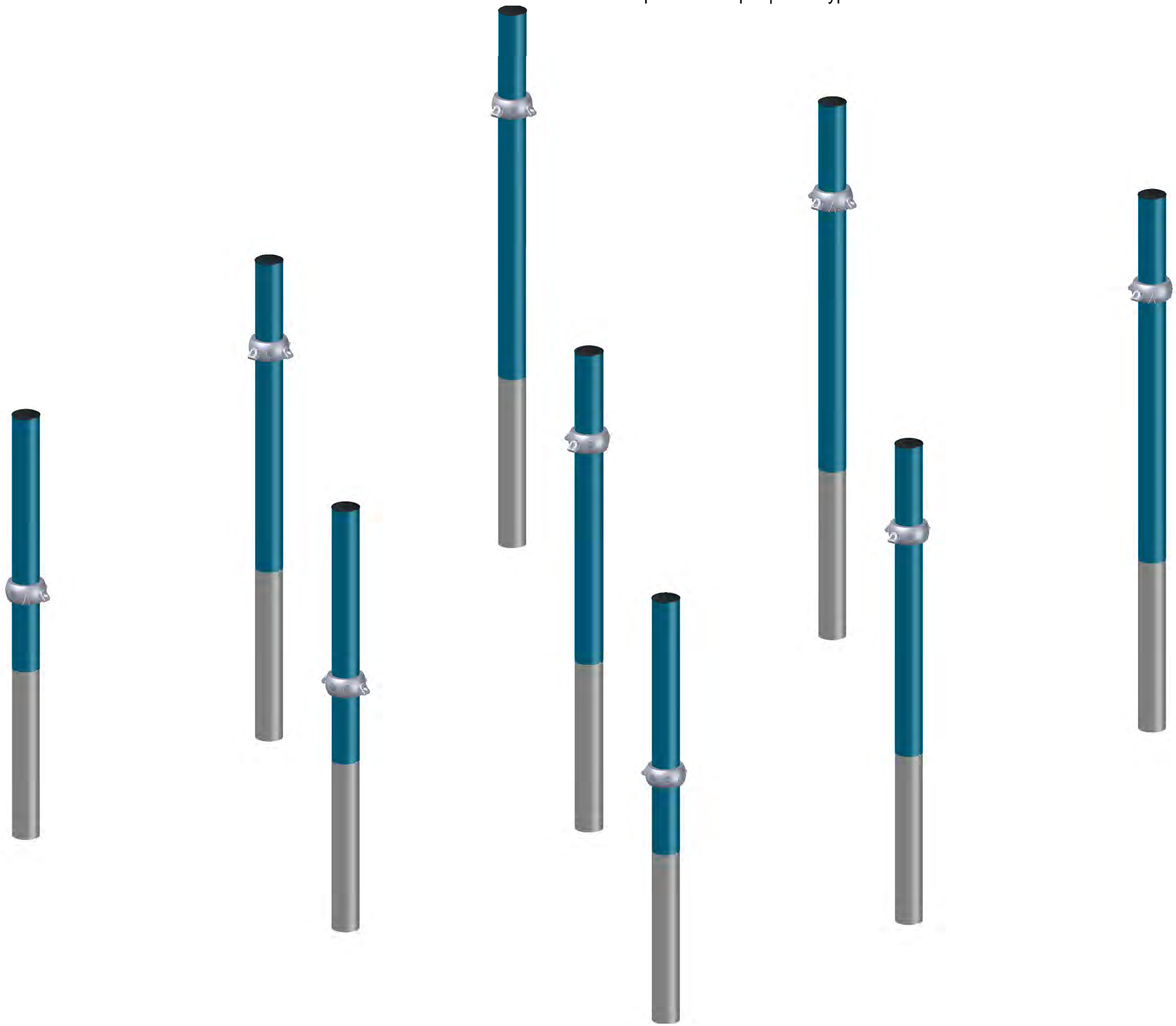
CRP-TRAILS-CUSTOM

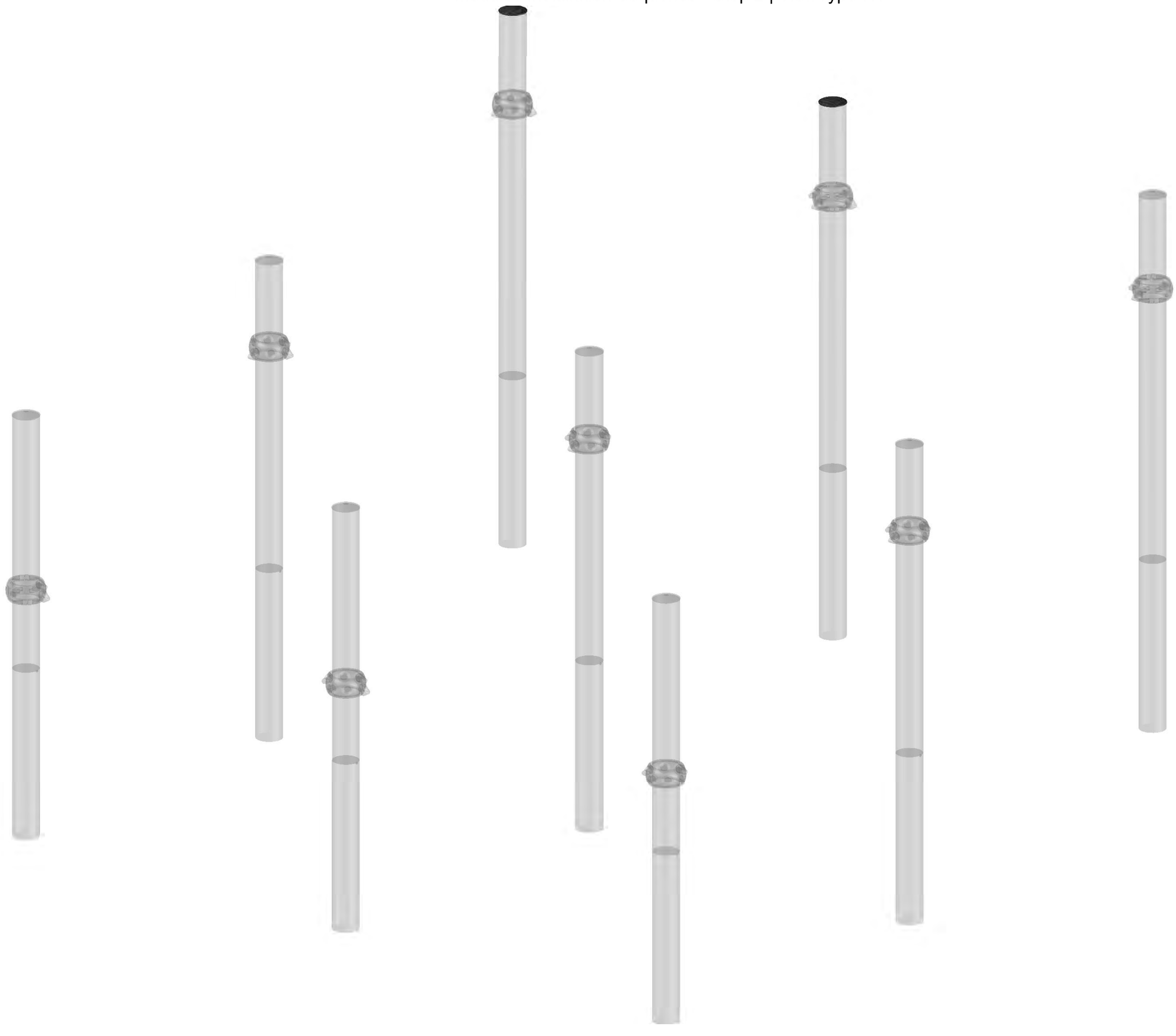
ID 871109

JaStre

2025-07-25



- 23x RP144100-12
- 9x RP150200-12
- 3x RP13-2550-07
- 3x RP13-2250-07
- 3x RP13-2850-07



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CRP-TRAILS-CUSTOM

ID 871109

JaStre

2025-07-25

11x RP130101-07

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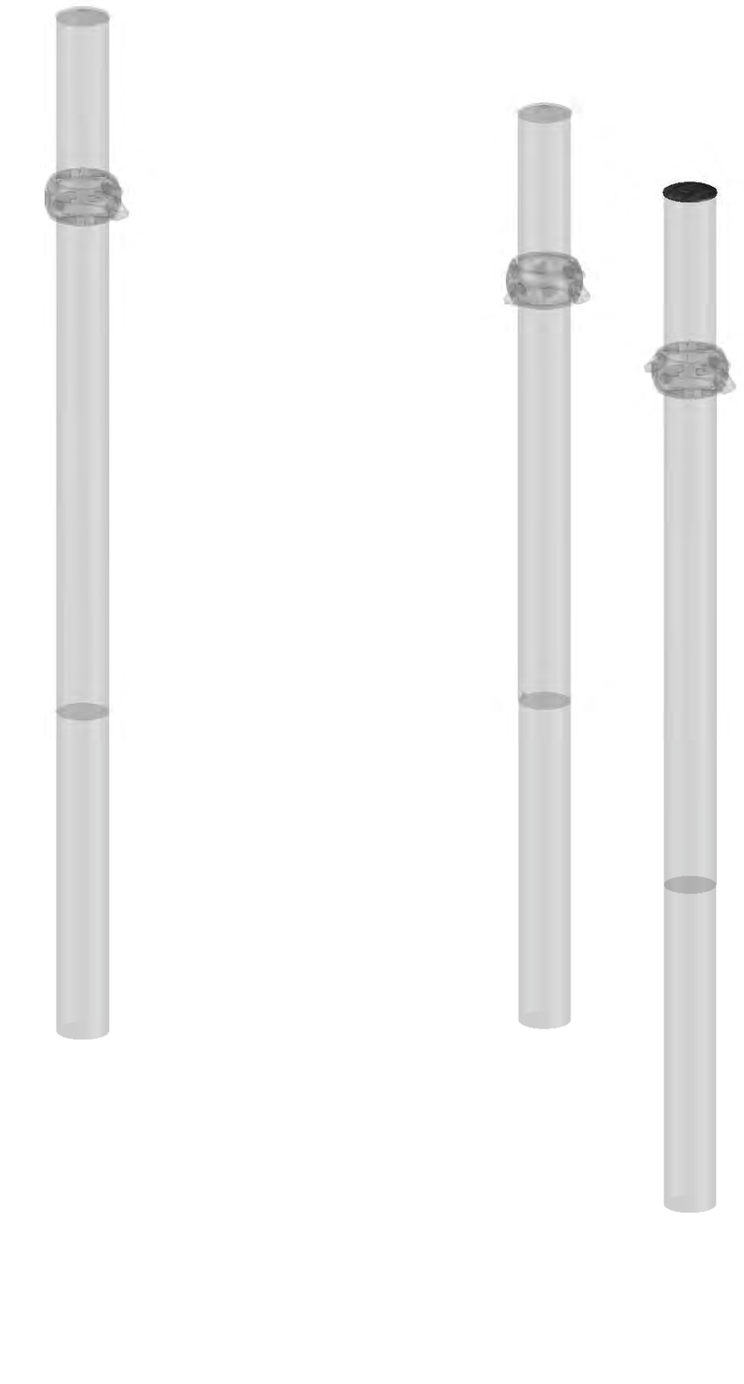
CRP-TRAILS-CUSTOM

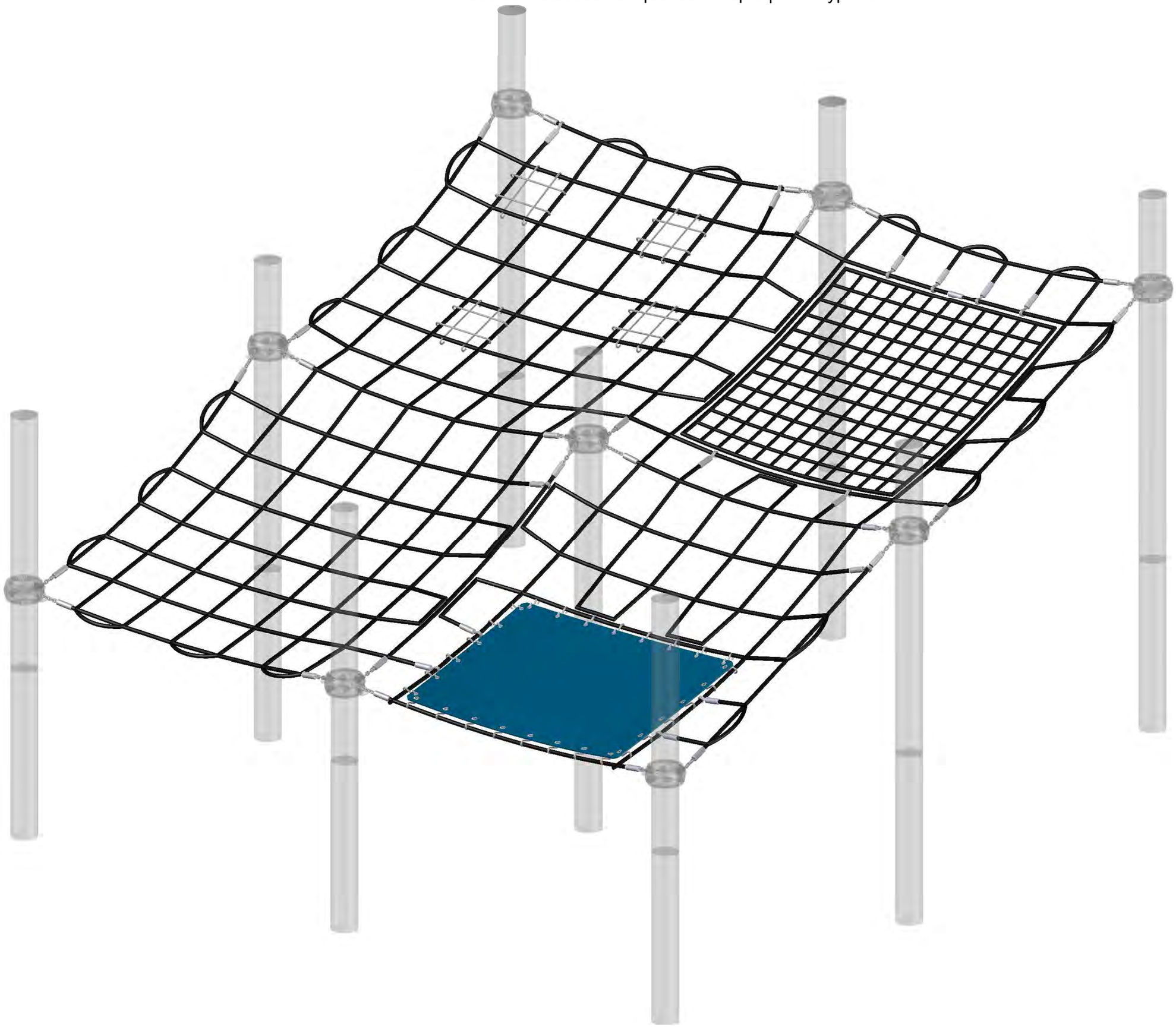
ID 871109

JaStre

2025-07-25



11x RP130101-07



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CRP-TRAILS-CUSTOM

ID 871109

JaStre

2025-07-25

1x YN5463901-147

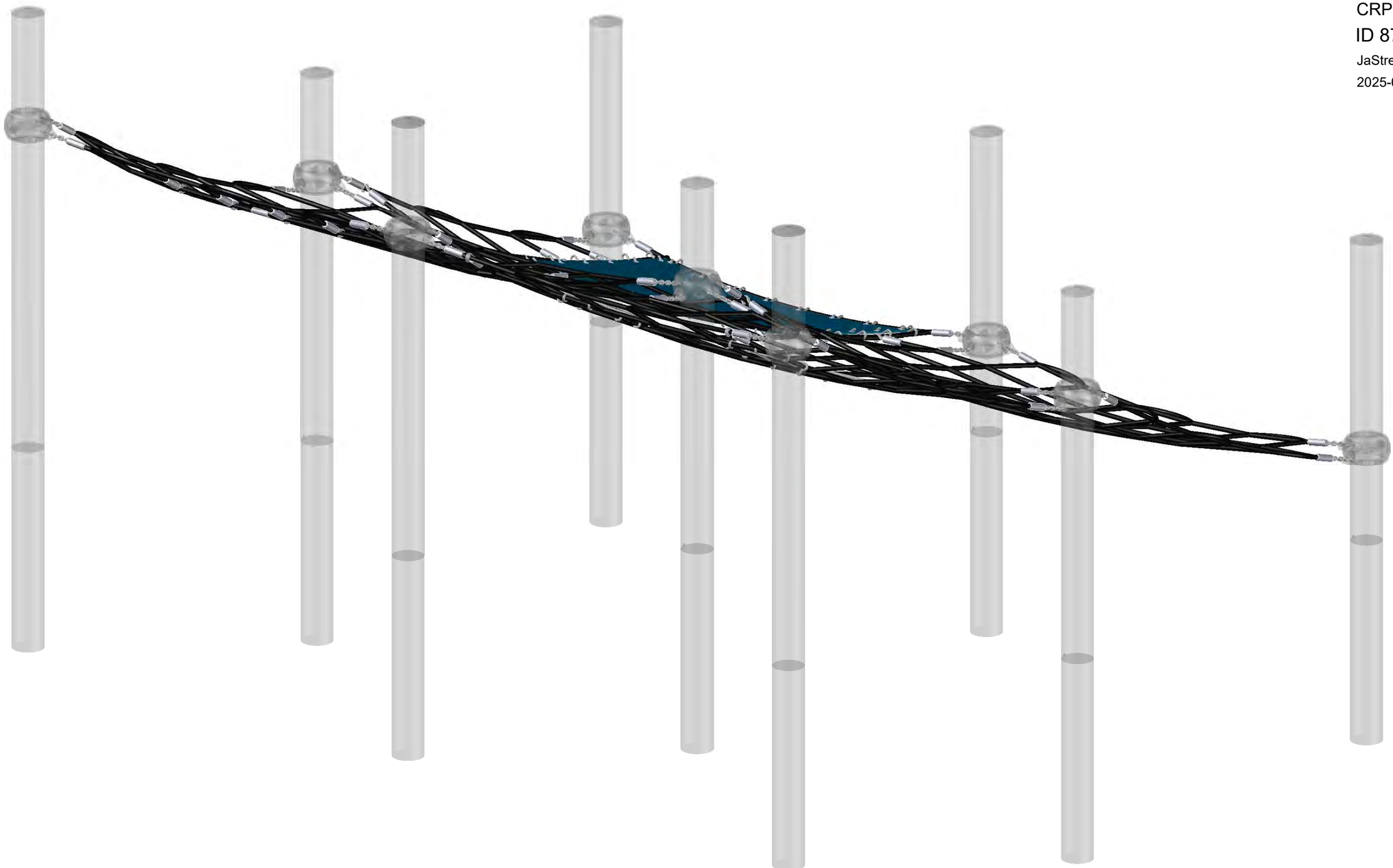
KOMPAN

CRP-TRAILS-CUSTOM

ID 871109

JaStre

2025-07-25



1x YN5463901-147

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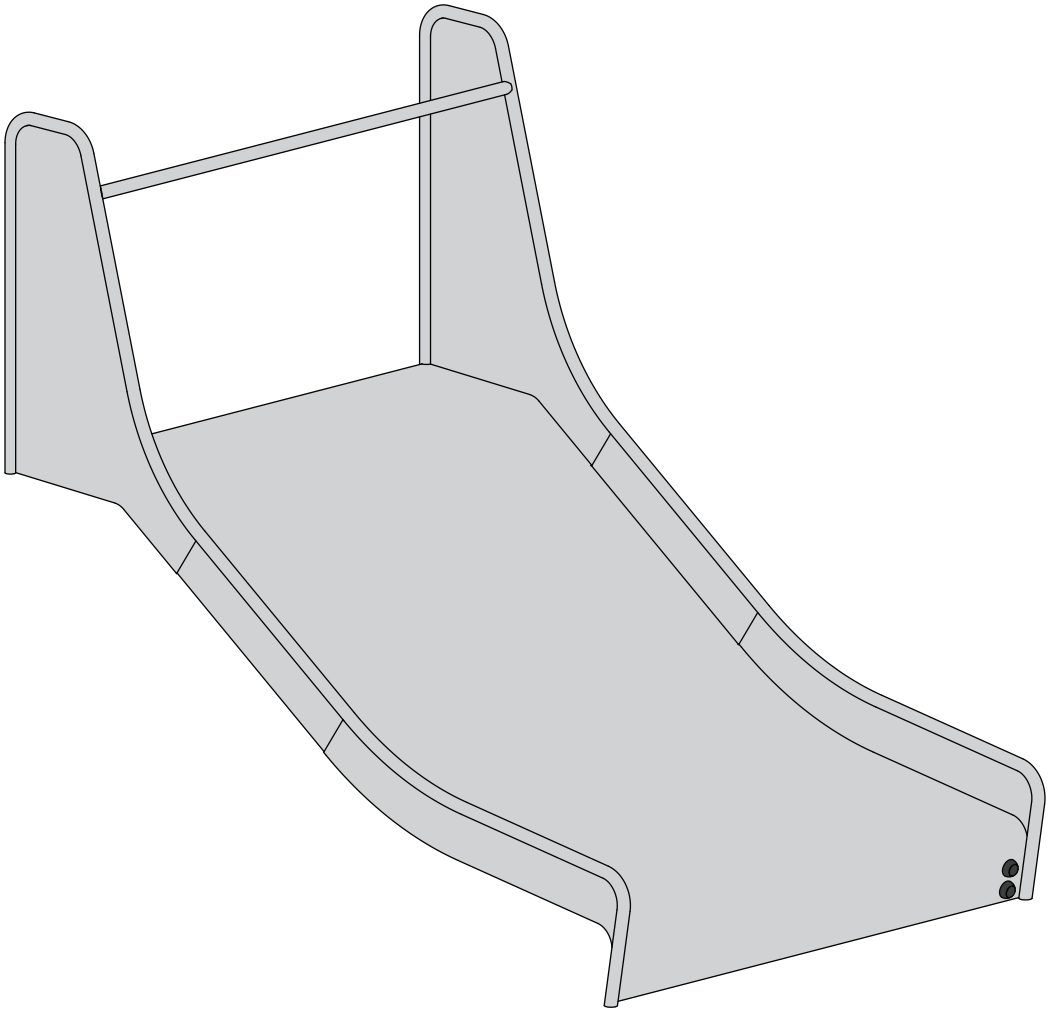
KSL30103-XXXX



VKSL30103XXXX 20240408 PetSta

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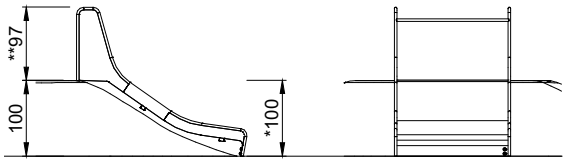
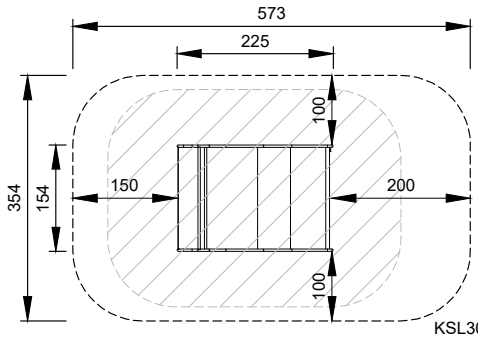
Safety zone in accordance with EN 1176/AS4685
Sicherheitsabstand gemäß EN 1176/AS4685
Espace d'évolution selon EN 1176/AS4685
Zona de seguridad según EN 1176/AS4685
Distanze di sicurezza in conformità con lo standard EN 1176/AS4685
Veiligheidsgebied in overeenstemming met EN 1176/AS4685
Säkerhetsområde enl EN 1176/AS4685
Sikkerhedsareal iht. EN 1176/AS4685
Зона безопасности в соответствии с EN 1176/AS4685
EN1176/AS4685-normin mukainen turva-alue



KSL30103
1:100



KSL30103
*100cm
**197cm
***19.4m²

* Free height of fall
Freie Fallhöhe
Hauteur de chute libre
Altura de caída libre
Altezza di caduta libera
Vrije valhoogte
Fri fallhöjd
Fri faldhøjde
Высота свободного падения
Vapaa putoamiskorkeus

All measurements are in cm
Alle Maßangaben in cm
Toutes les dimensions sont indiquées en cm
Todas las medidas están indicadas en cm
Tutte le misure sono in cm
Alle afmetingen zijn in cm
Alla mått är angivna i cm
Alle mål er angivet i cm
Все измерения в см.
Kaikki ohjeessa mainitut mitat ovat senttimetrejä.

Please note: The safety zone shown on this drawing is in accordance with EN 1176/AS4685. There may be some locations where a larger safety zone is required. If in doubt, please contact your play consultant.

Achtung: Der angegebene Sicherheitsabstand entspricht EN 1176/AS4685. Bestimmte Länder schreiben größere Sicherheitsabstände vor. Bitte wenden Sie sich in Zweifelsfällen an Ihren Berater.

Attention : l'espace d'évolution montré est conforme à EN 1176/AS4685. Dans certains pays, un espace d'évolution plus grand peut être exigé. Prière de contacter notre conseiller en cas de doute.

Observe: La zona de seguridad demostrada en este dibujo cumple con EN 1176/AS4685. En algunos sitios puede ser necesaria una zona de seguridad más grande. En caso de tener alguna duda, por favor póngase en contacto con nuestro consultor.

Attenzione: la distanza di sicurezza specificata è conforme ai requisiti EN 1176/AS4685. In alcuni paesi, le norme locali possono richiedere distanze di sicurezza maggiori. In caso di dubbi, contattare il nostro consulente.

N.B.: het getoonde veiligheidsgebied is in overeenstemming met EN 1176/AS4685. In sommige landen kan een groter veiligheidsgebied vereist zijn. In geval van twijfel onze adviseur raadplegen.

Obs: Det markerade säkerhetsområdet följer EN 1176/AS4685. I vissa länder kan det finnas krav på större säkerhetsområde. Kontakta vänligen vår konsulent om du är osäker.

Obs.: Det viste sikkerhedsareal er i overensstemmelse med EN 1176/AS4685. I nogle lande kan der være krav om større sikkerhedsareal. Kontakt venligst vores konsulent ved tvivlsspørgsmål.

Внимание: Зона безопасности указана в соответствии с EN 1176/AS4685. Возможны случаи, когда требуется увеличение зоны безопасности. В затруднительных случаях обращайтесь к Вашему консультанту.

Huom: Tämän piirustuksen turva-alue on EN1176/AS4685-normin mukainen. Joissain sijoituspaikoissa saatetaan edellyttää suurempaa turva-aluetta. Jos olet epävarma, otathan yhteyttä KOMPANiin.

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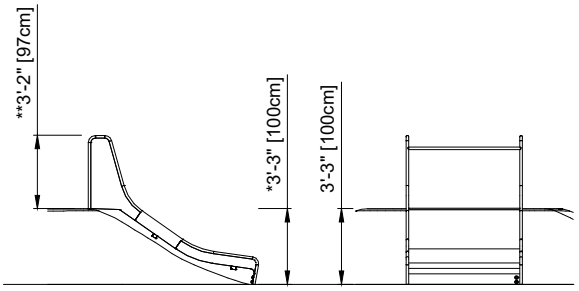
VKSL30103XXXX 20240408 PetSta

Safety zone in accordance with ASTM 1487/CSA Z614
Sicherheitsabstand gemäß ASTM 1487/CSA Z614
Espace d'évolution selon ASTM 1487/CSA Z614
Zona de seguridad según ASTM 1487/CSA Z614
Distanze di sicurezza in conformità con lo standard ASTM 1487/CSA Z614
Veiligheidsgebied in overeenstemming met ASTM 1487/CSA Z614
Säkerhetsområde enl ASTM 1487/CSA Z614
Sikkerhedsareal iht. ASTM 1487/CSA Z614
Зона безопасности в соответствии с ASTM 1487/CSA Z614
ASTM 1487/CSA Z614-normin mukainen turva-alue



KSL30103
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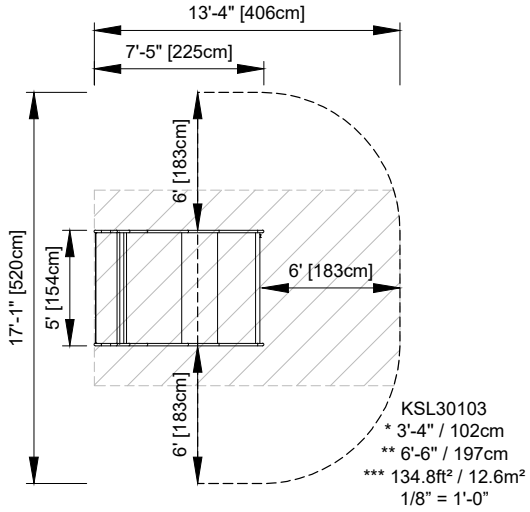

KSL30103
* 3'-4" / 102cm
** 6'-6" / 197cm
*** 134.8ft² / 12.6m²
1/8" = 1'-0"

* Free height of fall
Freie Fallhöhe
Hauteur de chute libre
Altura de caída libre
Altezza di caduta libera
Vrije valhoogte
Fri fallhöjd
Fri faldhøjde
Высота свободного падения
Vapaa putoamiskorkeus

Please note: The safety zone shown on this drawing is in accordance with ASTM 1487/CSA Z614. There may be some locations where a larger safety zone is required. If in doubt, please contact your play consultant.

Achtung: Der angegebene Sicherheitsabstand entspricht ASTM 1487/CSA Z614. Bestimmte Länder schreiben größere Sicherheitsabstände vor. Bitte wenden Sie sich in Zweifelsfällen an Ihren Berater.

Attention : l'espace d'évolution montré est conforme à ASTM 1487/CSA Z614. Dans certains pays, un espace d'évolution plus grand peut être exigé. Prière de contacter notre conseiller en cas de doute.

Observe: La zona de seguridad demostrada en este dibujo cumple con ASTM 1487/CSA Z614. En algunos sitios puede ser necesaria una zona de seguridad más grande. En caso de tener alguna duda, por favor póngase en contacto con nuestro consultor.

Attenzione: la distanza di sicurezza specificata è conforme ai requisiti ASTM 1487/CSA Z614. In alcuni paesi, le norme locali possono richiedere distanze di sicurezza maggiori. In caso di dubbi, contattare il nostro consulente.

N.B.: het getoonde veiligheidsgebied is in overeenstemming met ASTM 1487/CSA Z614. In sommige landen kan een groter veiligheidsgebied vereist zijn. In geval van twijfel onze adviseur raadplegen.

Obs: Det markerade säkerhetsområdet följer ASTM 1487/CSA Z614. I vissa länder kan det finnas krav på större säkerhetsområde. Kontakta vänligen vår konsulent om du är osäker.

Obs.: Det viste sikkerhedsareal er i overensstemmelse med ASTM 1487/CSA Z614. I nogle lande kan der være krav om større sikkerhedsareal. Kontakt venligst vores konsulent ved tvivlsspørgsmål.

Внимание: Зона безопасности указана в соответствии с ASTM 1487/CSA Z614. Возможны случаи, когда требуется увеличение зоны безопасности. В затруднительных случаях обращайтесь к Вашему консультанту.

Huom: Tämän piirustuksen turva-alue on ASTM 1487/CSA Z614-normin mukainen. Joissain sijoituspaikoissa saatetaan edellyttää suurempaa turva-aluetta. Jos olet epävarma, otathan yhteyttä KOMPANiin.

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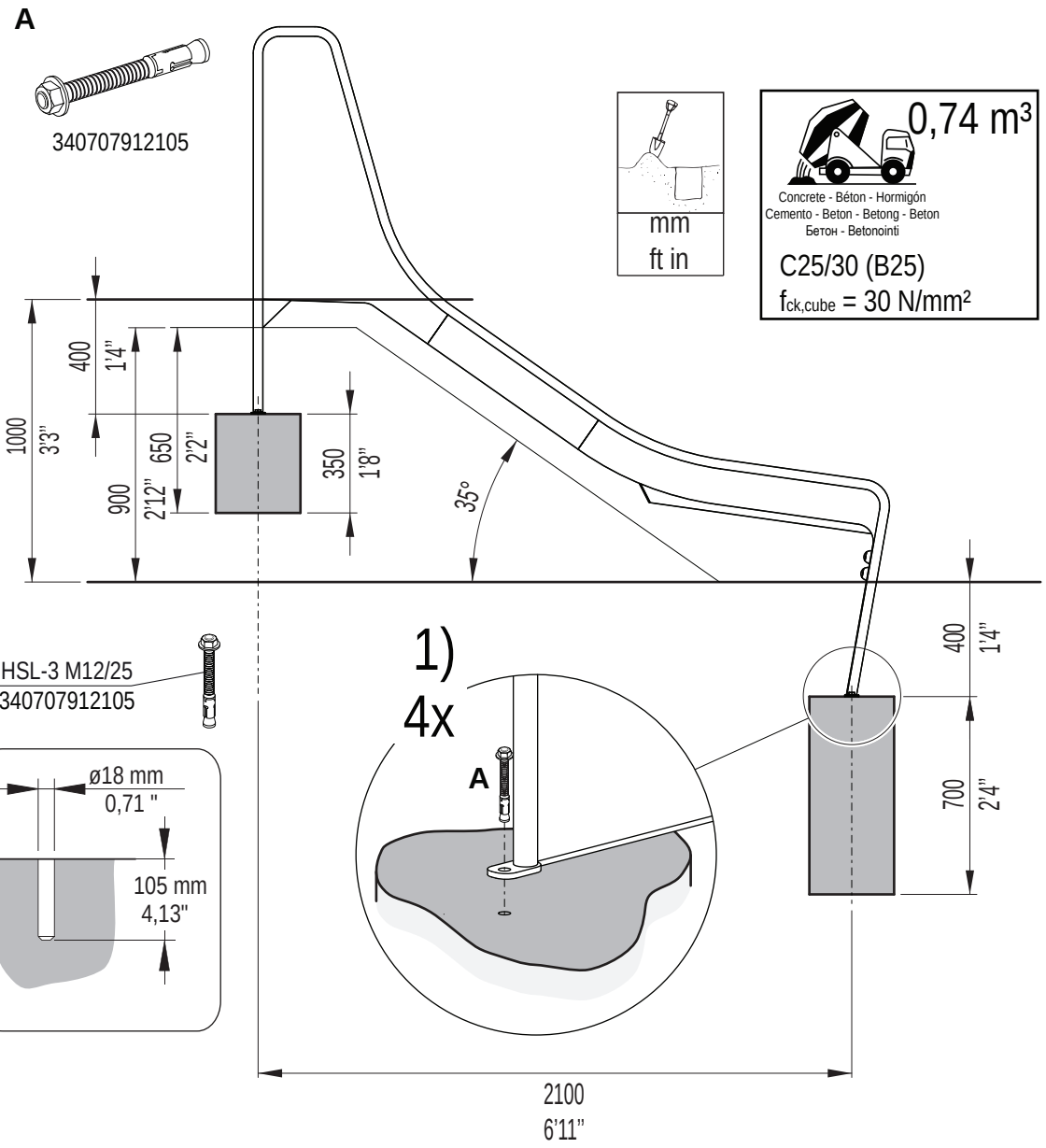

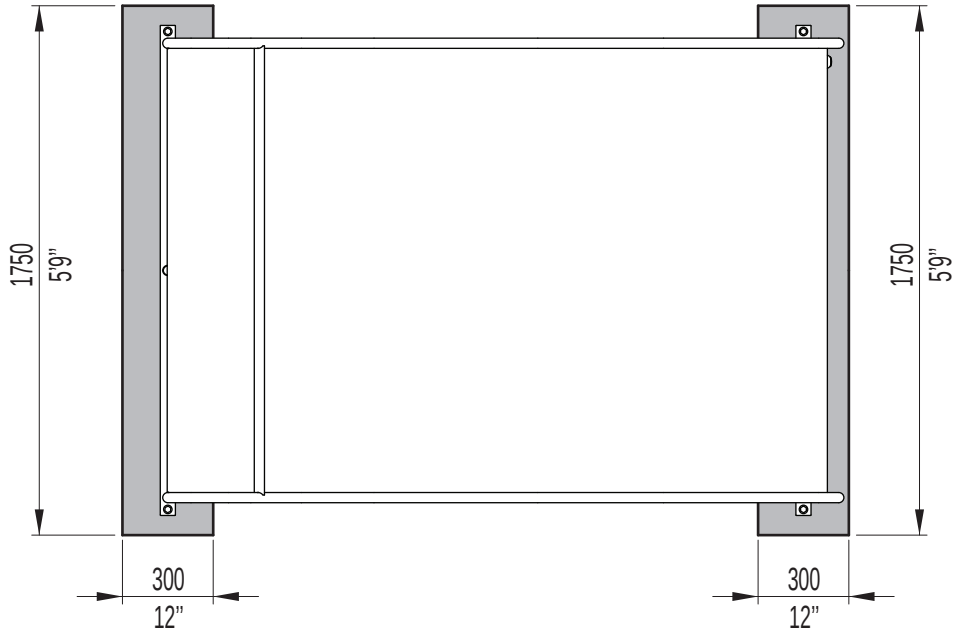

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A	B	C	D	E	F
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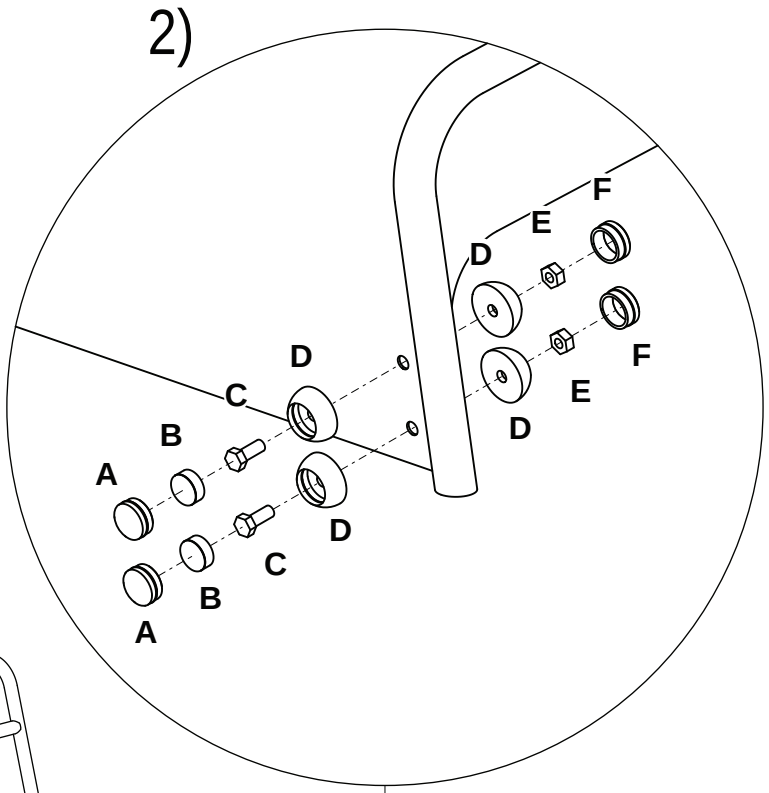

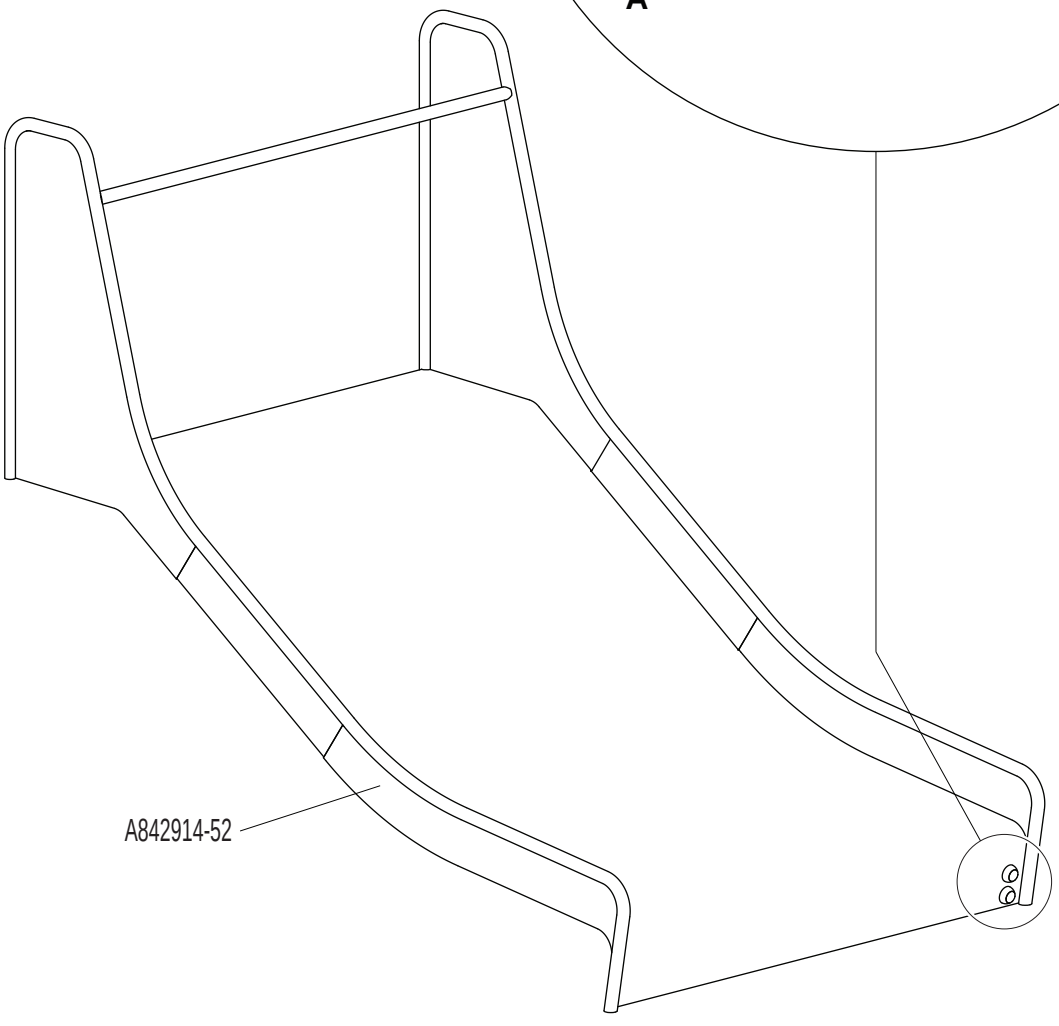

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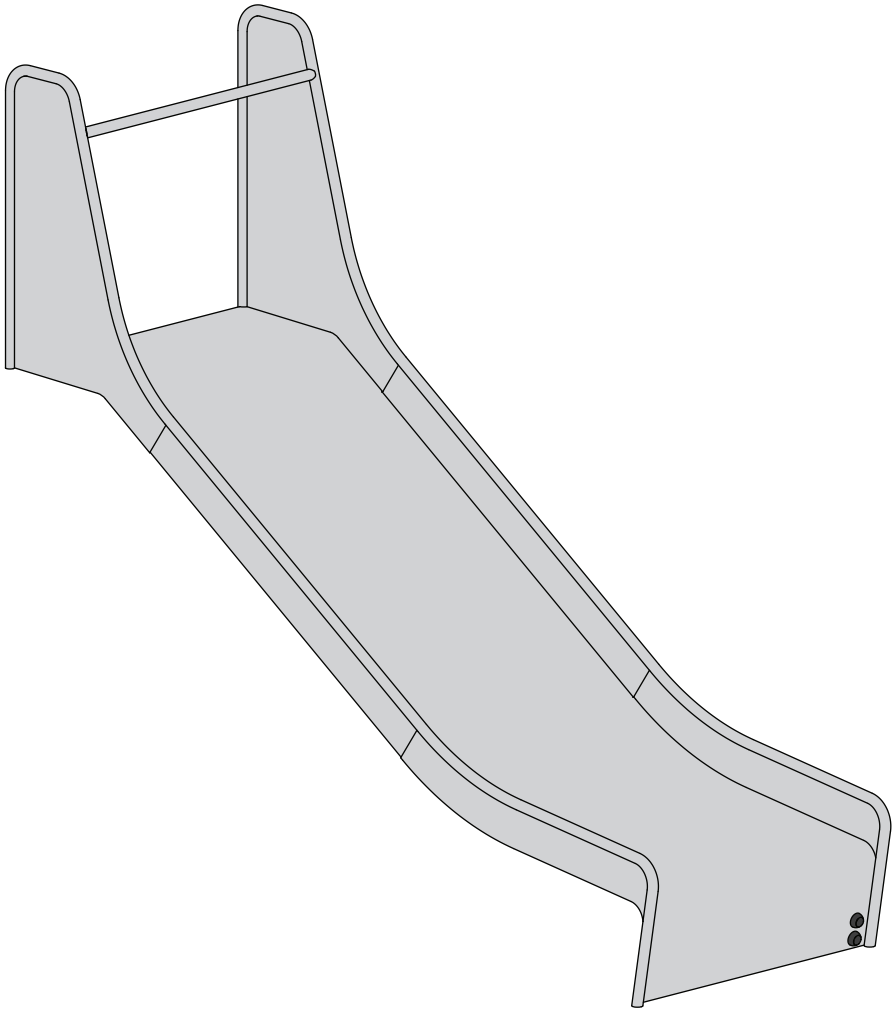
KSL30302-XXXX



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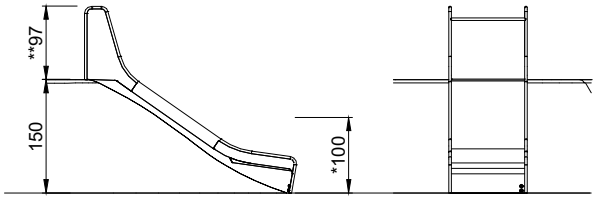
Safety zone in accordance with EN 1176/AS4685
Sicherheitsabstand gemäß EN 1176/AS4685
Espace d'évolution selon EN 1176/AS4685
Zona de seguridad según EN 1176/AS4685
Área de segurança de acordo com a EN1176/AS4685
Distanze di sicurezza in conformità con lo standard EN 1176/AS4685
Veiligheidsgebied in overeenstemming met EN 1176/AS4685
Säkerhetsområde enl EN 1176/AS4685
Sikkerhedsareal iht. EN 1176/AS4685
Зона безопасности в соответствии с EN 1176/AS4685
EN1176/AS4685-normin mukainen turva-alue



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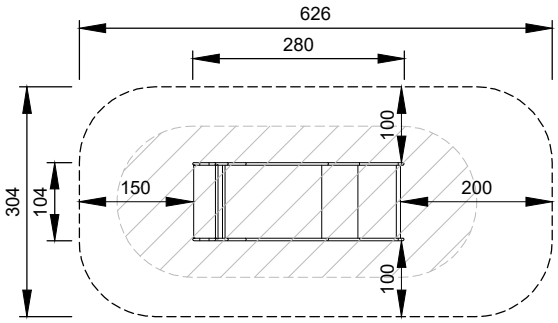
* Free height of fall
Freie Fallhöhe
Hauteur de chute libre
Altura de caída libre
Altura de queda livre
Altezza di caduta libera
Vrije valhoogte
Fri fallhöjd
Fri faldhøjde
Высота свободного падения
Vapaa putoamiskorkeus



KSL30302
*100cm
**247cm
***18.2m²
1:100

All measurements are in cm
Alle Maßangaben in cm
Toutes les dimensions sont indiquées en cm
Todas las medidas están indicadas en cm
Todas as medidas estão em cm
Tutte le misure sono in cm
Alle afmetingen zijn in cm
Alla mått är angivna i cm
Alle mål er angivet i cm
Все измерения в см.
Kaikki ohjeessa mainitut mitat ovat senttimetrejä.

Please note: The safety zone shown on this drawing is in accordance with EN 1176. There may be some locations where a larger safety zone is required. If in doubt, please contact your play consultant.

Achtung: Der angegebene Sicherheitsabstand entspricht EN 1176. Bestimmte Länder schreiben größere Sicherheitsabstände vor. Bitte wenden Sie sich in Zweifelsfällen an Ihren Berater.

Attention : l'espace d'évolution montré est conforme à EN 1176. Dans certains pays, un espace d'évolution plus grand peut être exigé. Prière de contacter notre conseiller en cas de doute.

Observe: La zona de seguridad demostrada en este dibujo cumple con EN 1176. En algunos sitios puede ser necesaria una zona de seguridadmás grande. En caso de tener alguna duda, por favor póngase en contacto con nuestro consultor.

Nota: A área de segurança ilustrada neste desenho está de acordo com a EN1176. Podem existir alguns territórios onde seja exigida uma área de segurança maior. Na dúvida, por favor contacte o seu consultor local da KOMPAN.

Attenzione: la distanza di sicurezza specificata è conforme ai requisiti EN 1176. In alcuni paesi, le norme locali possono richiedere distanze di sicurezza maggiori. In caso di dubbi, contattare il nostro consulente.

N.B.: het getoonde veiligheidsgebied is in overeenstemming met EN 1176. In sommige landen kan een groter veiligheidsgebied vereist zijn. In geval van twijfel onze adviseur raadplegen.

Obs: Det markerade säkerhetsområdet följer EN 1176. I vissa länder kan det finnas krav på större säkerhetsområde. Kontakta vänligen vår konsulent om du är osäker.

Obs.: Det viste sikkerhedsareal er i overensstemmelse med EN 1176. I nogle lande kan der være krav om større sikkerhedsareal. Kontakt venligst vores konsulent ved tvivlsspørgsmål.

Внимание: Зона безопасности указана в соответствии с EN 1176. Возможны случаи, когда требуется увеличение зоны безопасности. В затруднительных случаях обращайтесь к Вашему консультанту.

Huom: Tämän piirustuksen turva-alue on EN1176-normin mukainen. Joissain sijoituspaikoissa saatetaan edellyttää suurempaa turva-aluetta. Jos olet epävarma, otathan yhteyttä KOMPANiin.

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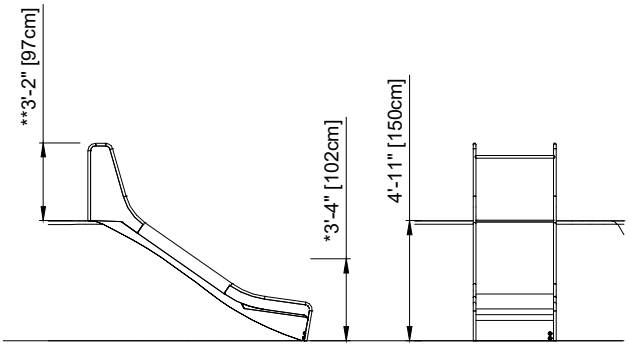
Safety zone in accordance with ASTM 1487/CSA Z614
Sicherheitsabstand gemäß ASTM 1487/CSA Z614
Espace d'évolution selon ASTM 1487/CSA Z614
Zona de seguridad según ASTM 1487/CSA Z614
Distanze di sicurezza in conformità con lo standard ASTM 1487/CSA Z614
Veiligheidsgebied in overeenstemming met ASTM 1487/CSA Z614
Säkerhetsområde enl ASTM 1487/CSA Z614
Sikkerhedsareal iht. ASTM 1487/CSA Z614
Зона безопасности в соответствии с ASTM 1487/CSA Z614
ASTM 1487/CSA Z614-normin mukainen turva-alue



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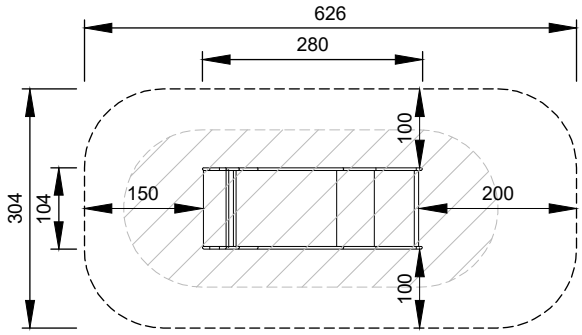

KSL30302
*100cm
**247cm
***18.2m²
1:100

* Free height of fall
Freie Fallhöhe
Hauteur de chute libre
Altura de caída libre
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Vapaa putoamiskorkeus

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Achtung: Der angegebene Sicherheitsabstand entspricht ASTM 1487/CSA Z614. Bestimmte Länder schreiben größere Sicherheitsabstände vor. Bitte wenden Sie sich in Zweifelsfällen an Ihren Berater.

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N.B.: het getoonde veiligheidsgebied is in overeenstemming met ASTM 1487/CSA Z614. In sommige landen kan een groter veiligheidsgebied vereist zijn. In geval van twijfel onze adviseur raadplegen.

Obs: Det markerade säkerhetsområdet följer ASTM 1487/CSA Z614. I vissa länder kan det finnas krav på större säkerhetsområde. Kontakta vänligen vår konsulent om du är osäker.

Obs.: Det viste sikkerhedsareal er i overensstemmelse med ASTM 1487/CSA Z614. I nogle lande kan der være krav om større sikkerhedsareal. Kontakt venligst vores konsulent ved tvivlsspørgsmål.

Внимание: Зона безопасности указана в соответствии с ASTM 1487/CSA Z614. Возможны случаи, когда требуется увеличение зоны безопасности. В затруднительных случаях обращайтесь к Вашему консультанту.

Huom: Tämän piirustuksen turva-alue on ASTM 1487/CSA Z614-normin mukainen. Joissain sijoituspaikoissa saatetaan edellyttää suurempaa turva-aluetta. Jos olet epävarma, otathan yhteyttä KOMPANiin.

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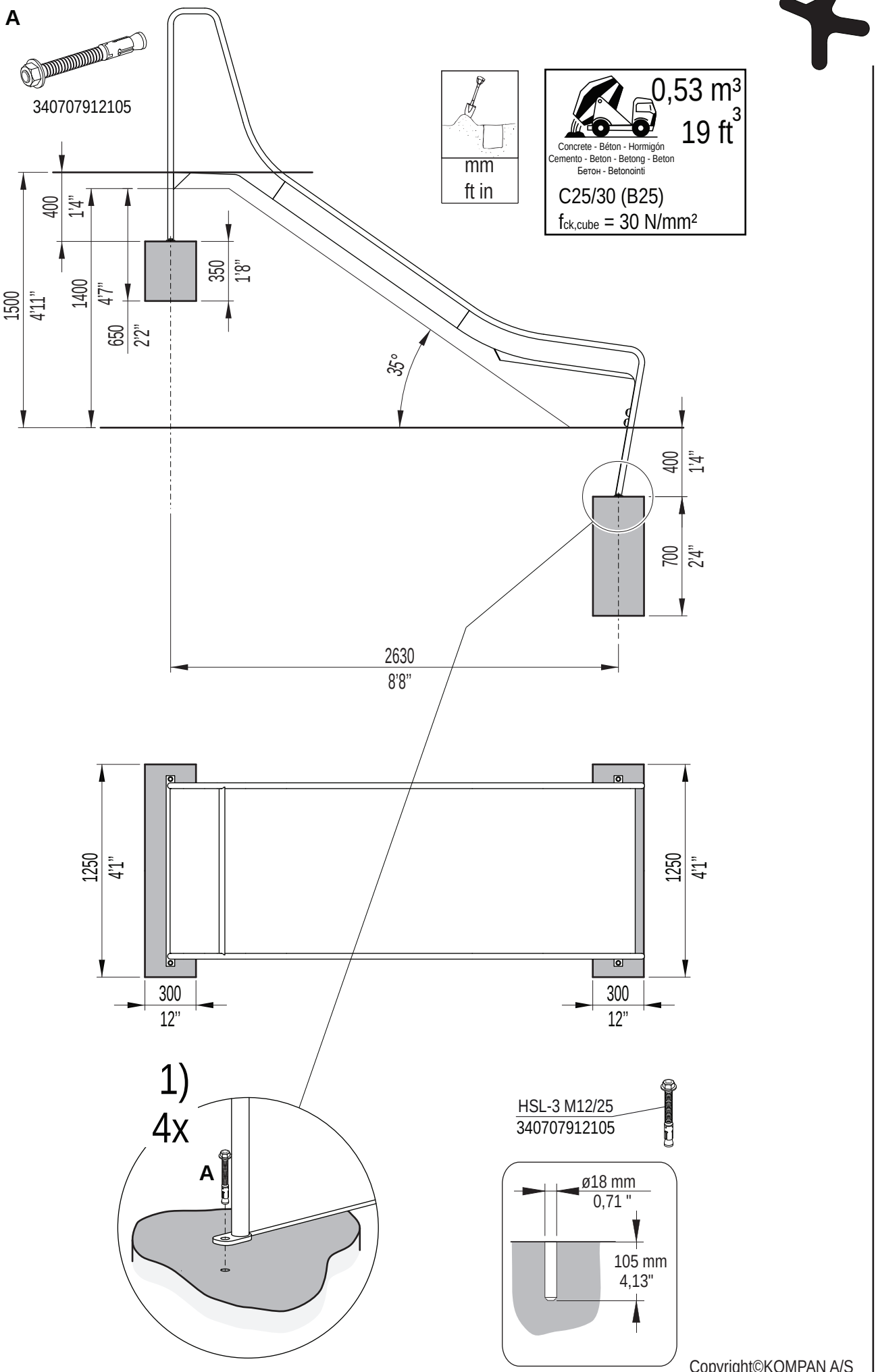

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A	B	C	D	E	F
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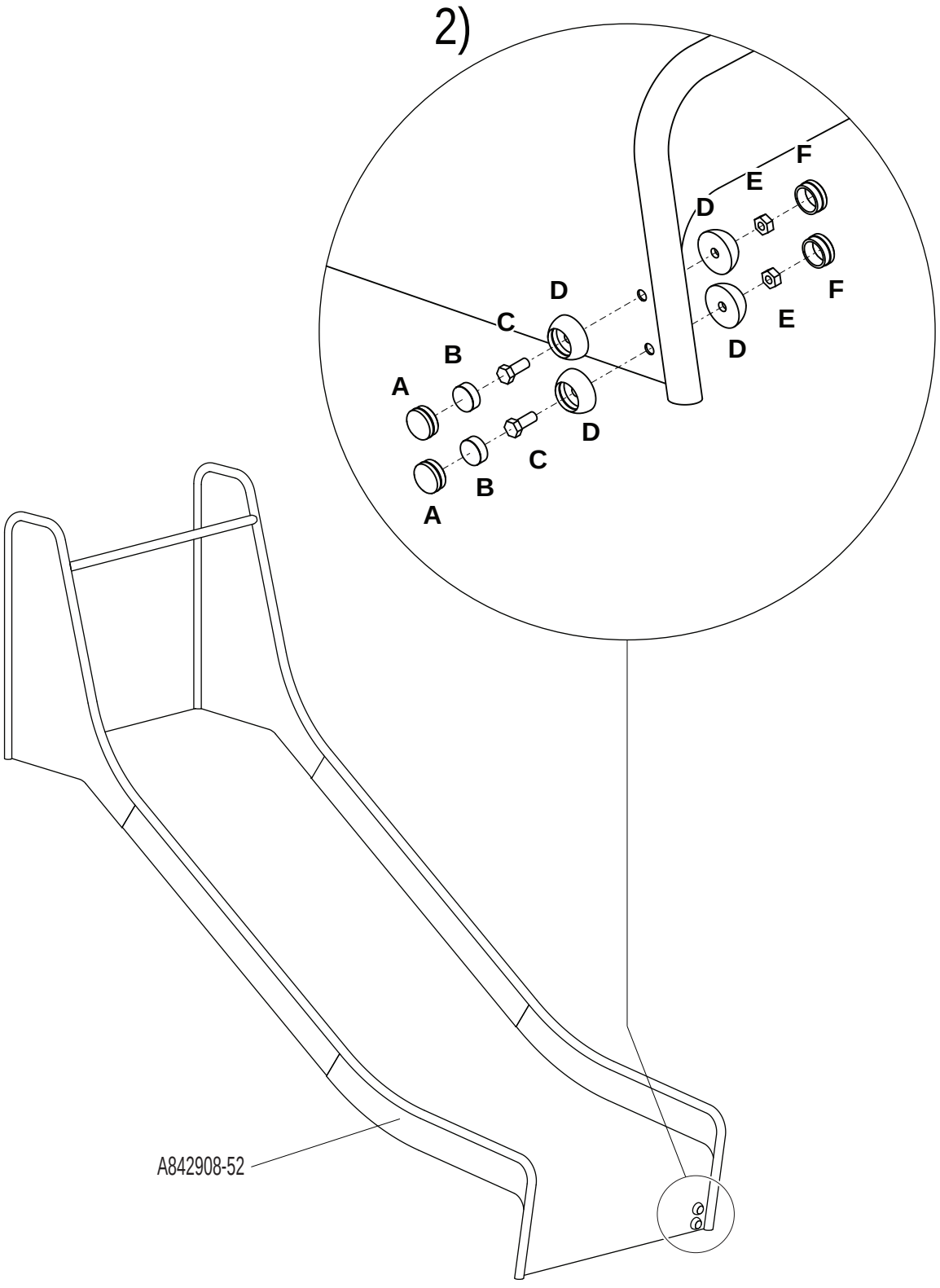

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NRO936460

2026.02.02 JanSta

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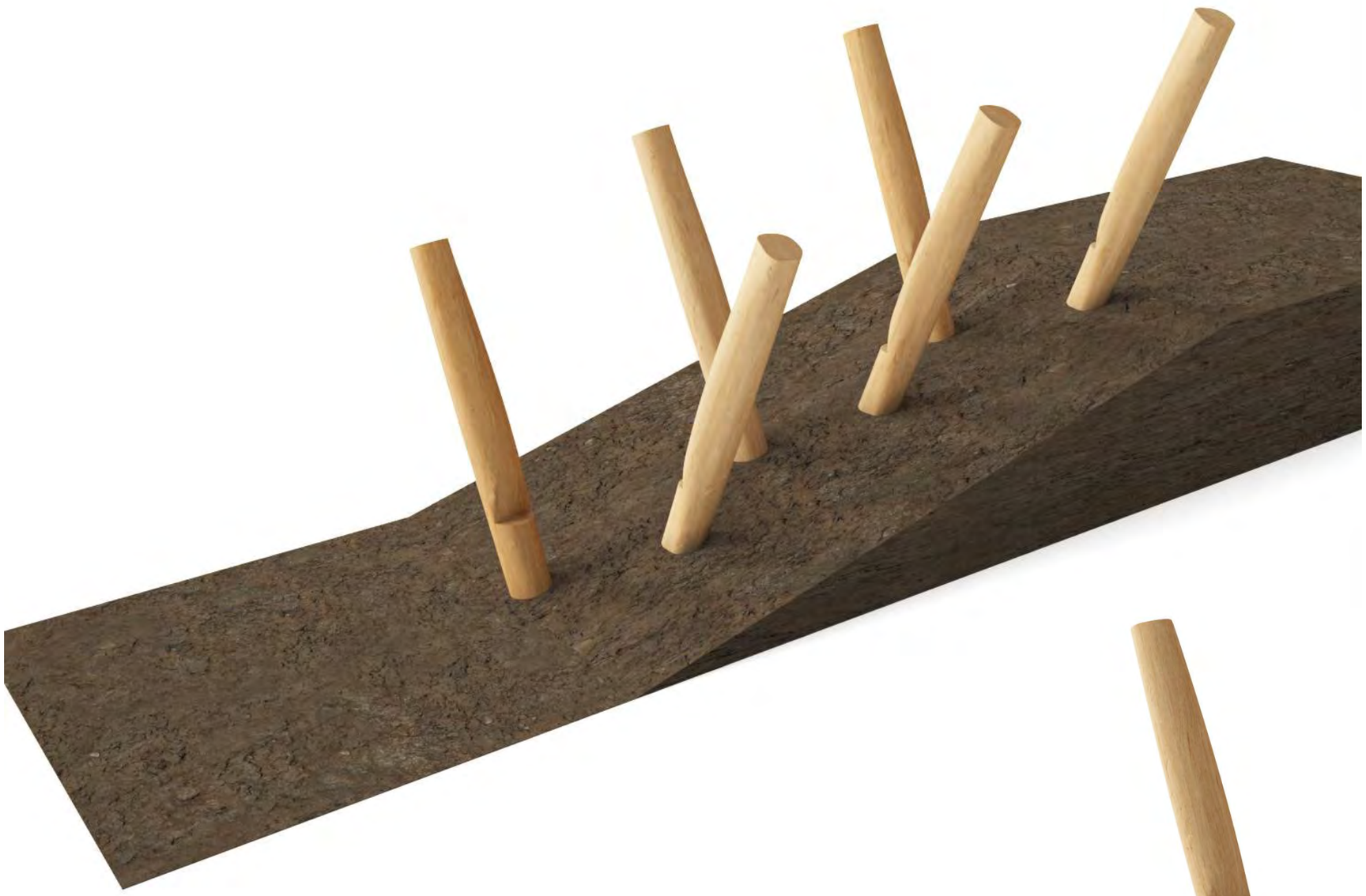
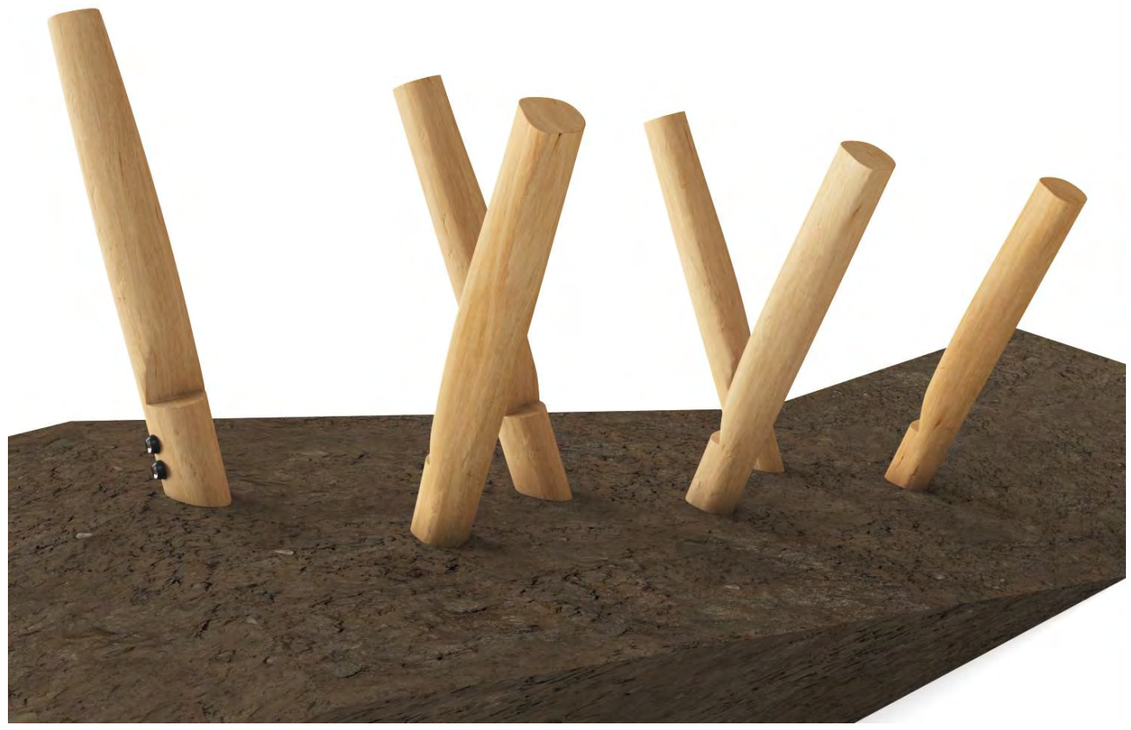
Variant: NRO806*
Footing: STEEL 100 cm
Version: NATURAL





***Installation on a hill:**
The design of the physical environment must fit the variant

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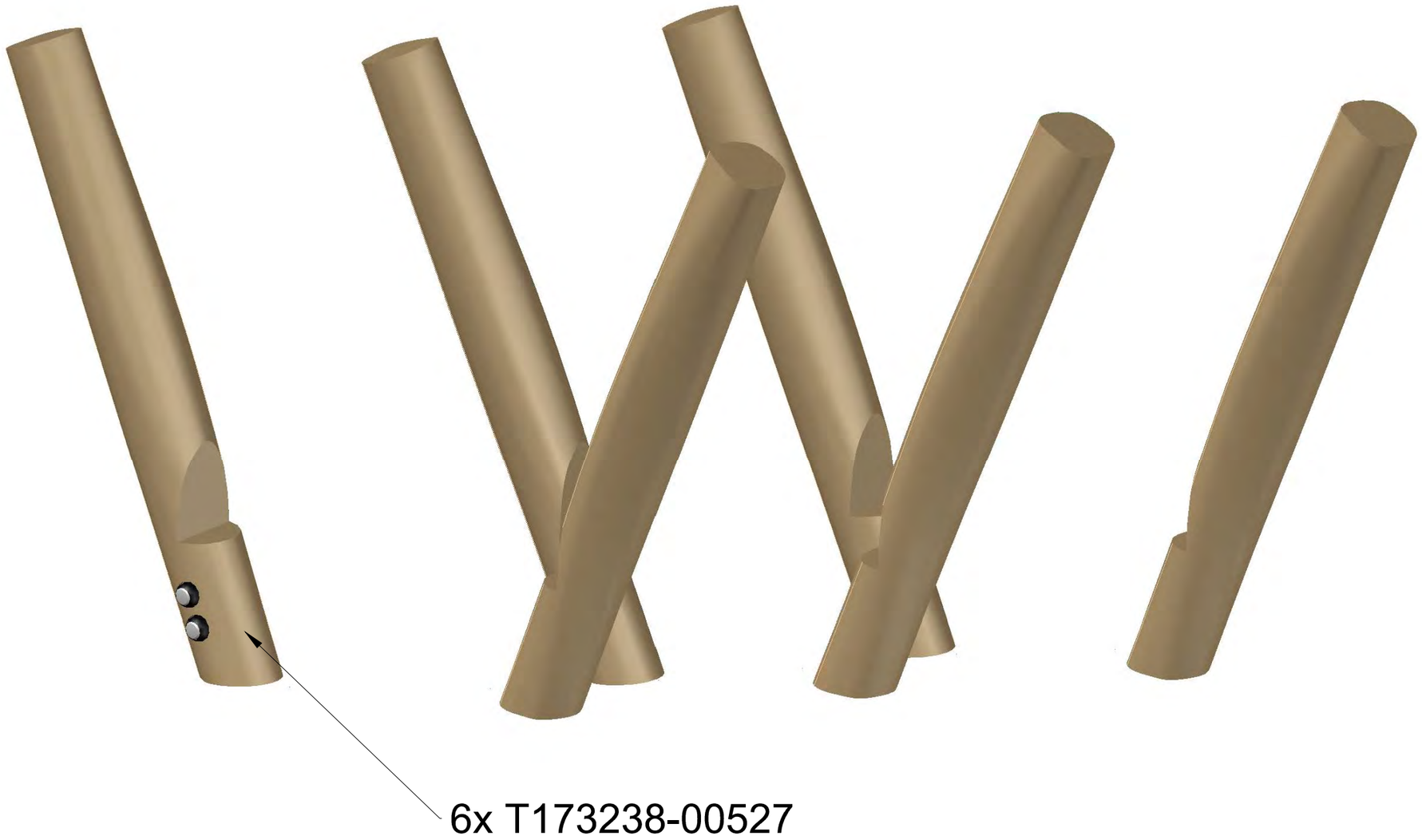
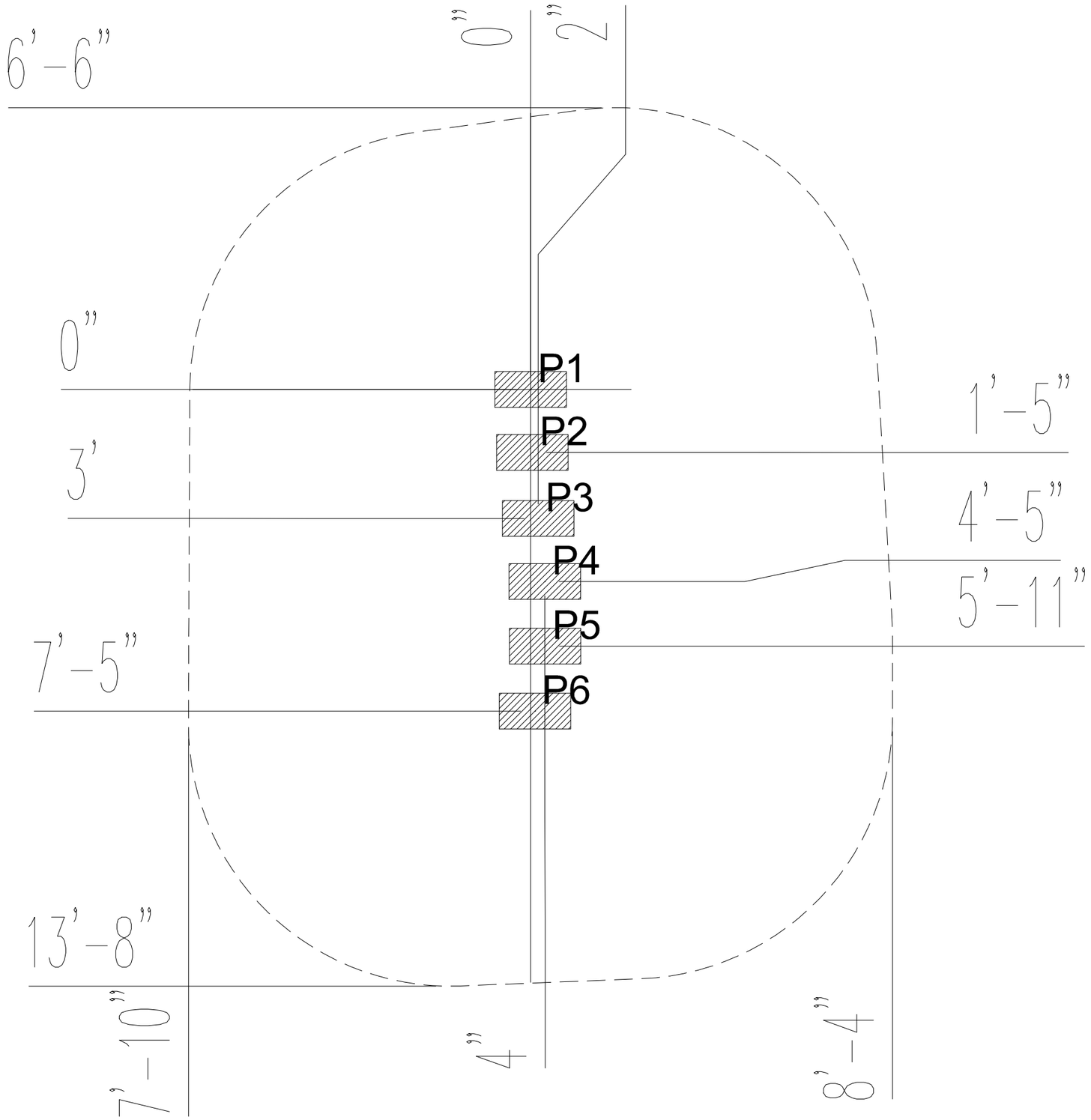
2026-02-02



ASTM F1487

Overview - Layout



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ID 936460

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2026-02-02

Scale: ###
Units: inch

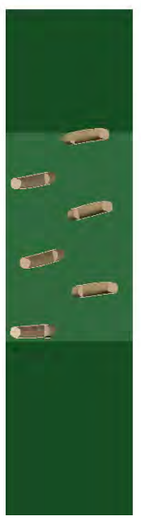
Safety zone
- Norm: ASTM F1487
- Perimeter: 0 ft
- Area: 0 ft²

Concrete
- Volume: 8.052 CU.FT.

Concrete - Béton - Hormigón
Cemento - Beton - Betong - Beton
Бетон - Betoniranje - Betão

C25/30 (B25)
$f_{ck,cube}$ = 30 N/mm²

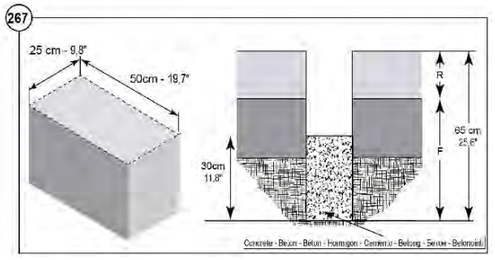
Use the specified quality of concrete in accordance with all specifications from the concrete supplier taking the nature of the product to be installed into account.



Overview of used Digging Holes and Footings

Foundation			
Pos.	Hole Type	Profile [cm]	Depth [cm]
P1-P6	267	25x50	65

Footing for Posts / Modules					
Pos.	Module No.	Profile [mm]	Length [cm]	Footing module	Post cap
P1-P6	Point-Dighole-267	-	-	-	-



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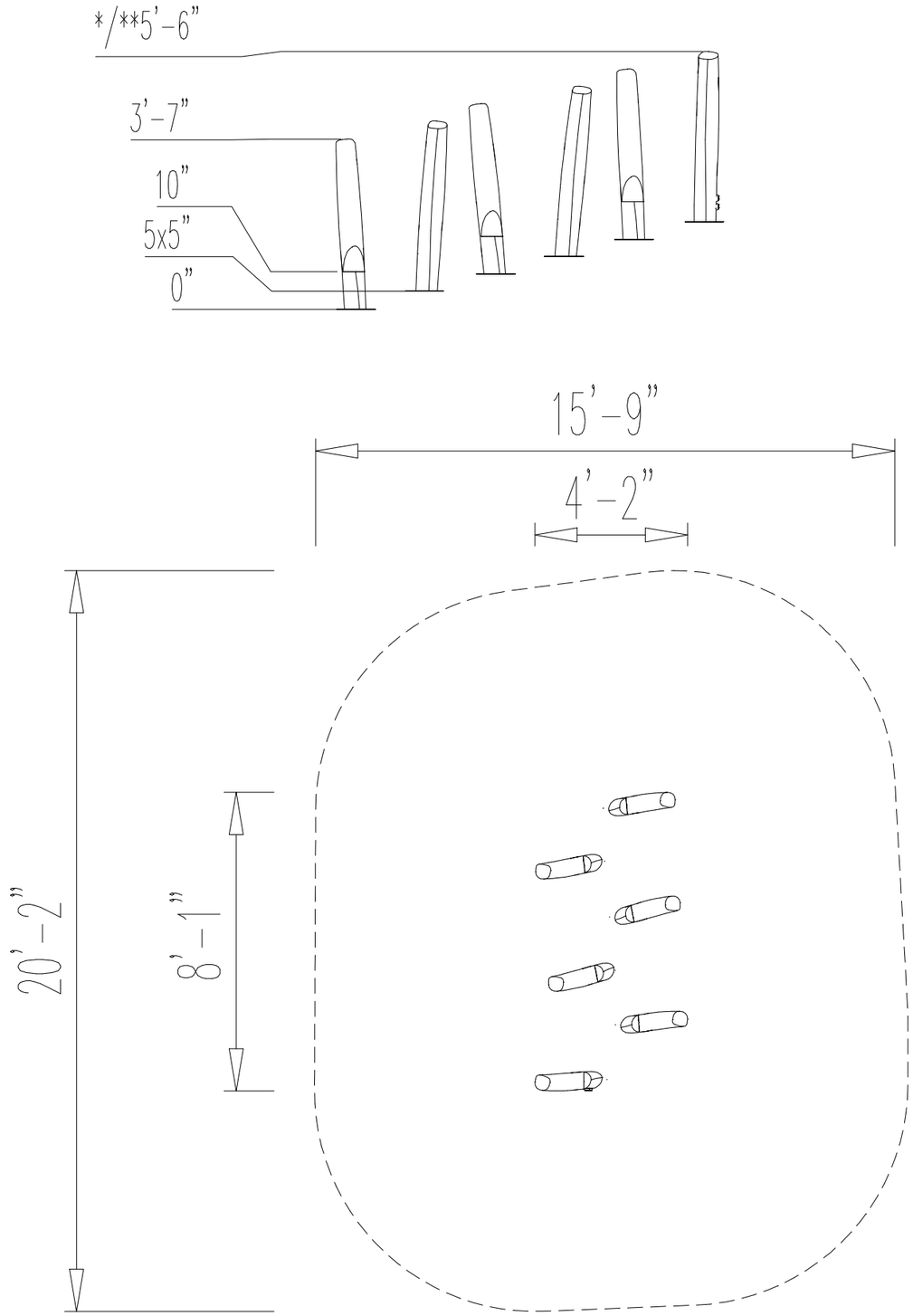
2026-02-02

Safety zone / Fall height



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ID 936460

JanSta

2026-02-02

Scale: ###
Units: inch

ASTM F1487

* Fall height
** Total height

MARVEL

145 Hudson Street,
New York, NY 10013

LEMON HILL PLAYRGOUND

TECHNICAL SPECIFICATIONS
100%CD CONFORMANCE SUBMISSION

March 13, 2026

OWNER:
CITY OF PHILADELPHIA, DEPARTMENT OF PARKS & RECREATION

PROJECT STREET ADDRESS
39 STATE RTE 3007 STREET

Project Manual – Technical Specifications

DIVISION 01 GENERAL REQUIREMENTS

011100 Summary of the Work
012100 Allowances
012200 Unit Prices
012500 Substitution Procedures
012600 Contract Modification Procedures
012900 Payment Procedures
013113 Project Coordination
013119 Project Meetings
013216 Construction Scheduling
013226 Progress Reports
013233 Construction Photographs
013330 Submittals
014516 Contractor's Quality Control
015000 Temporary Facilities and Controls
015800 Project ID & Signs
016001 Products and Materials
017419 Construction Waste Management and Disposal
017423 Cleaning
017700 Closeout Procedures
017823 Operation and Maintenance Manuals
017839 Project Record Documents

DIVISION 02 EXISTING CONDITIONS

024113 Selective Site Demolition

DIVISION 03 CONCRETE

033000 Cast-In-Place Concrete

DIVISION 05 METALS

055213 Metal Railing

DIVISION 11 EQUIPMENT

116800 Play Equipment and Structures

DIVISION 12 FURNISHINGS

129300 Landscape Site Furnishings

DIVISION 31 EARTHWORK

311010 Site Preparation

312000 Earth Moving

312500 Erosion and Sediment Control

DIVISION 32 EXTERIOR IMPROVEMENTS

321313 Plain Cement Concrete Paving

321343 Pervious Concrete Paving

321816 Playground Protective Surfacing

323353 Landscape Boulders and Blocks

329200 Turf Grass

329300 Landscape Planting

SECTION 011100

SUMMARY OF THE WORK

PART 1 GENERAL

1.1 DESCRIPTION OF WORK

A. This Section summarizes construction operations required by the Contract Documents, defines aspects of Prime Contractor's relationship with City and lists special City requirements.

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. Applicable provisions of Bidding Requirements, Contract Requirements in Division 0 and all applicable Division 1 sections.

1.3 PROJECT DESCRIPTION

A. The Work covers the construction of the new playground with modification to the site. The work consists but is not limited to : selective demolition, concrete work, planting, grading, paving, playground equipment installation at the site location Lemon Hill Park, 39 State Rte, 3007, PA 19130.

1.4 CONTRACTS

A. Construct Work under a single prime contractor. The scope of Work for each Contract shall be as indicated below.

1. Incidental Work provided by a one Prime Contractor but specified in a Division mainly the responsibility of a different Prime Contractor shall conform to the applicable specifications (i.e. earthwork required for Plumbing Work shall comply with the requirements of Division 2).

B. General Construction Work: Provide all the Work of the Contract, no matter where the information is located, except as specifically indicated to be performed by one of the other Prime Contractors.

1. Selective demolition and new construction as required for new Playground Work but only if indicated on the Demolition or Architectural Drawings. Cutting and patching required by the other Prime Contractors and not specifically indicated on the drawings are the responsibility of the respective Prime.

2. Provide a dumpster for the use of all Contractors.

3. Provide periodic and final cleaning of the site.

4. Provide control lines and elevation benchmarks at central locations for the extension by other Prime Contractors.

5. Provide temporary site perimeter fence and sidewalk cover if required.

6. Provide temporary toilet facilities for all Contractors.

7. Provide painting of all surfaces and equipment exposed to view in the finished Work, regardless of which Prime Contractor provided the surface or equipment.

1.5 WORK BY OTHERS

A. General: Cooperate fully with separate contractors so work on those contracts may be carried out smoothly, without interfering with or delaying Work under this Contract or other contracts. Coordinate the Work of this Contract with work performed under separate contracts.

B. Concurrent Work: Owner may elect to award separate contract(s) for additional construction operations at the Project site, simultaneously or subsequent to the work on this contract.

1.6 PRE-PURCHASED PRODUCTS

A. Products pre-purchased by the City, refer the sections below for details:

1. Landscape Structures, Play Equipment, Section 116813

2. Landscape Structures, Exercise equipment, Section 116613

3. Kompan, Playground Equipment, Section N/A

4. Dumor, Landscape Furniture, Section N/A

B. City's Responsibilities

1. Advise Contractor of delivery date.

2. Arrange guarantees and warranties and training.

C. Contractor's Responsibilities

1. Coordinate delivery date.

2. Inspect delivered products for damaged or defective items. Failure to notify the City of damage at time of receipt constitutes Contractor’s acceptance of pre-purchased item.

3. Unload and handle at site, including uncrating and storage.

4. Protect from exposure to elements and from damage.

5. Repair or replace items damaged as a result of Contractor's operations.

6. Install and connect finish products.

1.7 FUTURE WORK

B. Ensure that Work is clear of encroachment into areas required for future work.

1.9 CONTRACTOR'S USE OF PREMISES

A. Prime Contractors shall limit use of the premises for Work and for storage to allow:

1. Work by others

2. Owner occupancy

3. Public use

C. Coordinate use of premises with Project Coordinator

D. Protect products stored on-site

E. Store products to avoid interference with operations of City or other Prime Contractors

F. Secure and pay for additional storage and work areas if required by Contractor.

G. Do not overload structure with stored materials.

1.10 CITY OCCUPANCY

A. Schedule early completion of designated areas for City's use prior to completion of the entire project.

B. Provide for City's use:

1. Access for employees.

2. Operation of necessary utilities.

C. Prior to occupancy by City, execute Certificate of Substantial Completion for the area of occupancy.

D. For the area of partial occupancy the City will provide security and custodial services.

PART 2 PRODUCTS Not Used

PART 3 EXECUTION Not Used

- END -

SECTION 012100

ALLOWANCES

PART 1 GENERAL

1.1 DESCRIPTION OF WORK

A. This Section specifies each Prime Contractor's administrative and procedural requirements governing handling and processing allowances

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. Applicable provisions of Bidding Requirements, Contract Requirements in Division 0 and all applicable Division 1 sections.

B. Each section of the specifications including an allowance.

1.3 COORDINATION

A. Designate required selection and delivery dates for products under each allowance in the Contractor's Construction Schedule.

B. Designate each allowance with extensions based on estimated quantities for unit price allowances on Contractor's Schedule of Values.

1.4 DEFINITIONS

A. Refer to Section "Standard Contract Requirements".

1.5 ALLOWANCES

A. Include in Total Base Bid Amount, an amount equal to Two Percent (2%) of the base bid amount for payment of permit fees -This is a direct cost; no mark-ups will be permitted.

B. In addition to amounts of allowances (excluding 1.5.A above), include in the base bid amount, the Contractor's cost for:

1. Assisting in selection and obtaining proposals from suppliers and subcontractors.
2. Processing submittals.
3. Handling at site, including unloading, uncrating and storage.
4. Protection from elements and from damage.
5. Labor, installation and finishing.
6. Other expenses required to complete installation.
7. Overhead and profit.

1.6 SELECTION OF PRODUCTS

A. Design Professional shall issue by Change Order a full specification for the final selected product.

B. Contractor's Duties

1. Notify Design Professional of deadlines for specification of final products, allowing for Contractor's required submissions as required to meet Date of Completion.

2. Provide cost proposals for products being considered when requested by Design Professional.

3. Notify Design Professional of any effect anticipated by selection of product or supplier under consideration as it relates to:

   a. Construction Schedule.

   b. Contract Sum.

   c. On notification of selection, enter into purchase agreement with designated supplier.

1.7 INSTALLATION

A. Comply with requirements of applicable specification section, including warranties/guarantees.

1.8 ADJUSTMENT OF COSTS

A. Should actual purchase cost be more or less than specified amount of allowance, Contract Sum shall be adjusted by Change Order equal to amount of difference. A percentage to cover Contractor's overhead and profit, as stated in Standard Contract Requirements, will be applied to difference in cost.

B. For products specified under unit cost allowance unit cost applies to quantity required to complete the Work as determined by the Contractor.

   1. Submit invoices or other data to substantiate quantity actually used.

C. Submit request for other costs, claimed for additional work caused by increase over amount of allowance, prior to required submission for product.

PART 2 PRODUCTS Not Used

PART 3 EXECUTION Not Used

- END -

SECTION 012200
UNIT PRICES

*Unit Prices submitted with this bid will be utilized by the City for **additional work (change orders)** not otherwise specified in this bid due to unforeseen conditions not know at the time of contract award. The City reserves the right to negotiate or otherwise bid additional work items in the event the Unit Prices submitted with this bid are not competitive. Unit Prices shall include all associated costs such as material, delivery, installation, applicable permit fees, taxes, bonds, overhead and/or profit, etc.*

PART 1 GENERAL

1.1 DESCRIPTION OF WORK

A. This Section identifies Unit Prices and describes the method of pricing the change in quantity of the item of work for which the price is stated. Unit prices may be used to price additions and subtractions to the contract amount.

1.2 RELATED REQUIREMENTS SPECIFIED ELSEWHERE

A. Applicable provisions of Bidding Requirements, Contract Requirements in Division 0 and all applicable Division 1 sections.

B. Field Engineering - Division 1.

C. Referenced Section of Specifications stipulate pertinent requirements for products and methods to achieve the work required for each Unit Price.

1.3 SUBMITTALS

A. Submit completed Schedule of Unit Prices not later than 15 days after the Notice to Proceed.

1.4 SCHEDULE OF UNIT PRICES

A. Payment for additional work and credit for deductions in work caused by modifications to the Contract, shall be computed in accordance with the following Schedule of Unit Prices, which schedule shall remain in effect until all Work of the Contract has been completed and accepted.

B. The Unit Prices shall be firm lump sums all-inclusive cost of the materials, work, layout, drafting, balancing, testing, tools, sundries, scaffolding, trucking, transportation, cleaning, supervision, overhead, profit, and any and all other costs for each of the items listed.

C. The calculations for determining the number of units of work shall be of actual surface, volume, length, hours or number of individual items listed for the class of work, complete in place and accepted or omitted. No allowance for waste, loss, breakage, damage, or difficulties shall be made.

D. Determination of number of units of work for work performed under Division 2 specification sections is specified in Field Engineering.

E. Number of units of work for all other work will be determined by Contractor. The City reserves the right to independently verify units of Work.

1.4 UNIT PRICE SCHEDULE

	PRODUCT	UNIT OF MEASURE	UNIT PRICE
1.			$

-END-

SECTION 012500

SUBSTITUTION PROCEDURES

PART 1 GENERAL

1.1 DESCRIPTION OF WORK

A. This Section specifies each Prime Contractor's administrative and procedural requirements for handling requests for substitutions made after award of the Contract. Procedural requirements governing the Contractor's selection of products and product options are included under Section 016001 "Products and Materials".

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. Applicable provisions of Bidding Requirements, Contract Requirements in Division 0 and all applicable Division 1 sections.

1.3 DEFINITIONS

A. Definitions used in this Article are not intended to change or modify the meaning of other terms used in the Contract Documents.

B. Substitutions - Requests for changes in products, materials, equipment, and construction required by Contract Documents proposed by the Contractor after award of the Contract are considered requests for "substitutions". The following shall not be considered substitutions:

1. Substitutions requested by Bidders during the bidding period, and accepted in Addenda prior to award of Contract.

2. Revisions to Contract Documents requested by the City or Design Professional.

3. Specified options of products and construction methods included in Contract Documents.

4. The Contractor's determination of and compliance with governing regulations and orders issued by governing authorities.

C. "Or equal", "or equivalent", "approved equal", "approved equivalent", "equivalent substitution" and all other similar terms shall be interpreted as "substitution" as defined above.

1.4 SUBMITTALS

A. Submit three (3) copies of each request for substitution. Submit requests with the form attached at the end of this Section and in accordance with procedures required for Change Order proposals. Attach all other data and certification.

B. Identify the product, or the fabrication or installation method to be replaced in each request. Include related Specification Section and Drawing numbers. Provide complete documentation showing compliance with the requirements for substitutions, and the following information, as appropriate.

C. Product Data, including Drawings and descriptions of products, fabrication and installation procedures.

D. Samples, where applicable or requested.

E. A detailed comparison of salient features and qualities of the proposed substitution with those of the Work specified. Salient features and qualities may include elements such as size, weight, durability, performance and visual effect as determined by the Design Professional. Submit documentation of salient features and qualities from independent testing agencies performing industry recognized tests. The manufacturer's claims of performance may or may not be used in evaluation of substitutions at the discretion of the Design Professional.

F. Coordination information, including a list of changes or modifications needed to other parts of the Work and to construction performed by the City and separate Contractors, that will become necessary to accommodate the proposed substitution.

G. A statement indicating the substitution's effect on the Contractor's Construction Schedule compared to the schedule without approval of the substitution. Indicate the effect of the proposed substitution on overall Contract Time.

H. Cost information, including a proposal of the net change, if any in the Contract Sum. The Contractor shall certify that the cost data presented is complete and includes all related costs under this Contract, but excludes the Design Professional's redesign costs.

I. Certification by the Contractor that the substitution proposed is equal-to or better in every significant respect to that required by the Contract Documents, and that it will perform adequately in the application indicated. Include the Contractor's waiver of rights to additional payment or time, that may subsequently become necessary because of the failure of the substitution to perform adequately.

J. Certification that the Contractor will reimburse the City for all costs for additional services by the Design Professional and/or the Department of Public Property relating to any substitution that necessitates a design change and related documentation.

K. Design Professional's Action - The Design Professional will notify the Contractor of acceptance or rejection of the proposed substitution. The Design Professional will be the sole judge of the acceptability of the proposed substitution. Acceptance will be in the form of a Change Order. The Change Order will include a deduction from the Contract Sum for additional costs incurred by the City because of the substitution including, but not limited to, Design Professional's fees.

PART 2 PRODUCTS

2.1 SUBSTITUTIONS

A. Conditions - The Contractor's substitution request will be received and considered by the Design Professional when one or more of the following conditions are satisfied, as determined by the Design Professional; otherwise requests will be returned without action except to record noncompliance with these requirements.

1. Extensive revisions to Contract Documents are not required.

2. Proposed changes are in keeping with the general intent of Contract Documents.

3. The request is timely, fully documented and properly submitted.

4. The request is directly related to an "or approved substitution" clause or similar language in the Contract Documents.

5. The specified product or method of construction cannot be provided within the Contract Time. The request will not be considered if the product or method cannot be provided as a result of failure to pursue the Work promptly or coordinate activities properly.

6. The specified product or method of construction cannot receive necessary approval by a governing authority, and the requested substitution can be approved.

7. A substantial advantage is offered the City, in terms of cost, time, energy conservation or other considerations of merit, after deducting offsetting responsibilities the City may be required to bear. Additional responsibilities for the City may include additional compensation to the Design Professional for redesign and evaluation services, increased cost of other construction by the City or separate Contractors, and similar considerations.

B. The specified product or construction cannot be provided in a manner that is compatible with other materials, and where the Contractor certifies that the substitution will overcome the incompatibility.

C. The specified product or construction cannot be coordinated with other materials, and where the Contractor certifies that the proposed substitution can be coordinated.

D. The specified product or method of construction cannot provide a warranty required by the Contract Documents and where the Contractor certifies that the proposed substitution provide the required warranty.

E. Where a proposed substitution involves more than one Prime Contractor, each Contractor shall cooperate with the other Contractors involved to coordinate the Work, provide uniformity and consistency, and to assure compatibility of products.

F. The Contractor's submittal and Design Professional acceptance of Shop Drawings, Product Data or Samples that relate to construction activities not complying with the Contract Documents does not constitute an acceptable or valid request for substitution, nor does it constitute approval.

PART 3 EXECUTION Not Applicable

Attachment - Substitution Request Form (4 pages)

- END -

CITY OF PHILADELPHIA SUBSTITUTION REQUEST FORM

INSTRUCTIONS:

A. This request must be submitted and signed by the Prime Contractor.

B. A request for each substitution must be exactly in this form, including all items. (One (1) item of substitution per form).

C. Attach complete information on changes to Drawings and Specifications that proposed substitution will require for its proper installation.

D. Submit with request, all necessary samples and substantiating data to prove quality and performance is equal to that which is specified. Clearly mark manufacturer's literature to indicate equality in performance

CONTRACT AWARD DATE: _____DATE OF REQUEST:_____

CONTRACTOR:_____

PROJECT:_____

We hereby submit for your consideration the following substitution in lieu of the specified item for the above project:

SPEC. SECTION NO.:_____PARAGRAPH:_____SPECIFIED ITEM:_____

PROPOSED
SUBSTITUTION:_____

REASON
FOR
REQUEST:_____

_____

ITEMIZED COMPARISON OF SPECIFIED ITEM WITH THE PROPOSED SUBSTITUTION:

PERFORMANCE:_____

_____

APPEARANCE:_____

_____

REFERENCED
STANDARDS:_____

DEDUCT CHANGE ORDER OFFERED FOR PROPOSED SUBSTITUTION:_____

MANUFACTURER'S WARRANTIES OF THE PROPOSED AND SPECIFIED ITEMS:

LENGTH OF WARRANTY: AS SPECIFIED [ ]. PROPOSED [ ]

MATERIALS COVERED:AS SPECIFIED [ ]. PROPOSED [ ]

LABOR COVERED:AS SPECIFIED [ ]. PROPOSED [ ]

OTHER TERMS: AS SPECIFIED:_____

PROPOSED SUBSTITUTION:_____

DESIGNATION OF MAINTENANCE SERVICES AND SOURCES:_____

_____

DOES SUBSTITUTION AFFECT DIMENSIONS OR CLEARANCES SHOWN ON THE DRAWINGS? YES [ ] NO [ ].

IF YES, CLEARLY INDICATE CHANGES:_____

_____

WILL THE UNDERSIGNED PAY FOR CHANGES TO THE BUILDING DESIGN, INCLUDING ENGINEERING AND DETAILING COSTS CAUSED BY THE REQUESTED SUBSTITUTION? YES [ ] NO [ ].

IF NO, FULLY EXPLAIN:_____ _____

_____

WHAT EFFECT DOES SUBSTITUTION HAVE ON OTHER CONTRACTS OR TRADES?__

_____

WHAT EFFECT DOES SUBSTITUTION HAVE ON CONSTRUCTION SCHEDULE?_____

_____

CONTRACTORS CERTIFICATION OF EQUAL PERFORMANCE

The undersigned certifies that:

He/she has investigated the proposed substitution and has determined that it is equal to or better than the product specified.

He/she will guarantee the substitution in the same manner as the product specified.

He/she will coordinate and make other changes as required in the Work as a result of the substitution.

He/she waives all claims for additional costs as a result of the substitution, with the exception of those identified above under "cost data".

He/she will reimburse the City for all costs for design change resulting from the substitution.

Submitted by:

Signature _____

Name:_____Title:_____

Firm:_____Date:_____

Street:_____

City_____State_____Zip Code_____

Telephone:_____

Signature shall be by person having authority to legally bind his firm to the above terms. Failure to provide legally binding signature will result in rejection without further review by Design Professional.

Design Professional's Action

Accepted [ ]

Accepted as noted [ ]

Not accepted [ ]

Received too late [ ]

Signature:_____

-END-

SECTION 012900

PAYMENT PROCEDURES

PART 1 GENERAL

1.1 DESCRIPTION OF WORK

A. This Section specifies administrative and procedural requirements governing each Prime Contractor's submission of invoices for Payment. These may also be referred to as "Current Estimates" in the "Standard Contract Requirements".

B. Coordinate the Contractor's Construction Schedule, List of Subcontracts, and Submittal Schedule with the Standard Cost Breakdown.

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. Applicable provisions of Bidding Requirements, Contract Requirements and other Division 1 sections including Articles 4.14 through 4.18 of the "Standard Contract Requirements".

1.3 GENERAL REQUIREMENTS

A. Each invoice for payment shall be consistent with previous applications and payments.

B. The initial submission of the Standard Cost Breakdown at time of Substantial Completion, and the final Standard Cost Breakdown involve additional requirements.

C. Withholding Payment - Any payment may be withheld in accordance with the Contract Documents

1. Any payment may be withheld if the procedural requirements including submittal of current administrative items listed including Certificates of Insurance are incomplete or outdated.

2. Portions of payment requested for Work installed without approved submittals may be withheld.

D. Use Department of CPO, "Standard Cost Breakdown".

E. Standard Cost Breakdown Preparation - Complete every entry on the Standard Cost Breakdown:

1. Contractor (name and address)

2. Contract number (from Notice to Proceed);

3. Requisition No. (sequential number);

4. Date Prepared;

5. Project (title of project);

6. Project No. (project number).

7. STANDARD COST BREAKDOWN

a. No. (sequentially numbering);

b. Item (phases of scope of work);

c. Unit (each, sq. ft., etc.);

d. Material;

e. Labor;

f. Unit Cost;

g. Total (total of Material and Labor).

8. PAYMENT APPLICATION

a. Previous Billing (as billed previous application);

b. Percent Complete (completed to date);

c. Total Completed (Total column under COST BREAKDOWN multiplied by Percent Complete column under PAYMENT APPLICATION.)

Incomplete Standard Cost Breakdowns will be returned without action.

F. Entries shall match data on the Contractor's Construction Schedule. Use updated schedules if revisions have been made.

G. Include amounts of Change Orders issued prior to the last day of the construction period covered by the Standard Cost Breakdown.

H. Submit original plus 2 copies of each Standard Cost Breakdown to the Project Coordinator, Capital Program Office, Contracts Management, 1400 John F. Kennedy Blvd, 7th Floor, Philadelphia, PA 19107.

1.4 INITIAL STANDARD COST BREAKDOWN

A. Actions and submittals that shall precede or coincide with submittal of the first Standard Cost Breakdown include the following:

1. List of subcontractors.

2. List of principal suppliers and fabricators.

3. Schedule of Values.

4. Contractor's Construction Schedule (preliminary if not final).

5. Schedule of unit prices.

6. Submittal Schedule (preliminary if not final).

7. List of Contractor's staff assignments.

8. List of Contractor's principal consultants.

9. Copies of building permits.

10. Copies of authorizations and licenses from governing authorities for performance of the Work.

11. Report of pre-construction meeting.

12. Certificates of insurance.

13. Performance and payment bonds.

14. Complete Submittals for each product or system included in the Application.

15. Initial settlement survey and damage report.

16. Reference Point Survey.

17. Current Daily and Monthly Reports.

18. Initial Construction Photographs and/or videos.

1.5 STANDARD COST BREAKDOWN AT SUBSTANTIAL COMPLETION

A. This Standard Cost Breakdown shall reflect any Certificates of Partial Substantial Completion issued previously for City occupancy of designated portions of the Work.

B. Actions and submittals which shall proceed or coincide with this Standard Cost Breakdown include:

1. Occupancy permits and similar approvals.

2. Warranties (guarantees) and maintenance agreements.

3. Test/adjust/balance records.

4. Maintenance instructions.

5. Utility meter readings.

6. Start-up performance reports.

7. Certified improvement survey.

8. Change-over information related to City's occupancy, use, operation and maintenance.

9. Final cleaning.

10. Final progress photographs.

11. List of incomplete Work (punchlist), recognized as exceptions to Certificate of Substantial Completion.

12. Record Documents.

1.6 FINAL STANDARD COST BREAKDOWN

A. Actions and submittals which shall precede or coincide with submittal of the final Standard Cost Breakdown include the following:

1. Project Closeout Form fully executed (signed).

2. Completion of items specified for completion after Substantial Completion (punchlist).

3. Assurance that unsettled claims will be settled.

4. Assurance that Work not complete and accepted will be completed without undue delay.

5. Transmittal of required Project construction records to City.

6. Proof that taxes, fees and similar obligations have been paid.

7. Removal of temporary facilities and services.

8. Removal of surplus materials, rubbish and similar elements.

9. Change of door locks to City's access.

- END -

SECTION 013113

PROJECT COORDINATION

PART 1 GENERAL

1.1 DESCRIPTION OF WORK

A. This Section describes Prime Contractor's responsibilities to coordinate the work and related administrative procedures.

1.2 RELATED REQUIREMENTS SPECIFIED ELSEWHERE

A. Applicable provisions of Bidding Requirements, Contract Requirements in Division 0 and all applicable Division 1 sections.

1.3 SUBMITTALS

A. Submit the following prior to or coincidental with the initial application for payment.

1. List of contractor's staff assigned to the project and responsibilities including personnel on and off-site. Include mailing address, delivery address, phone, fax, mobile phone, etc. For at least three (3) staff, list phones where personnel can be reached during non-work hours for emergencies.

2. List of contractor's consultants and sub-contractors with similar requirements as above.

3. List of principal suppliers and fabricators with similar requirements as above. No emergency phone number required.

1.4 OBSERVATION OF WORK BY OTHERS

A. Observation of the Work by the City, Design Professional, Inspection and Testing Agencies or any other party shall not be interpreted as relieving the Contractor from responsibility for coordination of all Work, superintendence of the Work, and scheduling and direction of the Work or any other requirement of the Contract.

1.5 GENERAL CONTRACTOR'S RESPONSIBILITIES

A. Coordinate construction activities to assure efficient and orderly installation of each part of the Work. Coordinate construction operations included under different Contracts that are dependent upon each other for proper installation, connection, and operation.

B. Where installation of one part of the Work is dependent on installation of other components by other sub contractors, either before or after its own installation, schedule construction activities in the sequence required to obtain the best results.

C. Where availability of space is limited, coordinate installation of different components to assure maximum accessibility for required maintenance, service and repair.

D. Make adequate provisions to accommodate items scheduled for later installation.

E. Where necessary, prepare memoranda for distribution outlining special procedures required for coordination. Include such items as required notices, reports, and attendance at meetings. Copy memoranda to City and Design Professional.

F. Coordinate compatibility of products furnished. Refer to Section 016001 Products and Materials, Division 1.

G. Administrative Procedures - Coordinate scheduling and timing of each sub Contractor's required administrative procedures with other construction activities to avoid conflicts and ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:

1. Preparation of Contractors Construction Schedules and Schedules of submittals.
2. Installation and removal of temporary facilities.
3. Delivery and processing of submittals.
4. Progress meetings.
5. Project Closeout activities.

1.6 CONTRACTOR'S RESPONSIBILITIES (including the General Contractor)

A. Cooperate with the General Contractor's coordination efforts for orderly progress of the Work without delay or covering work which needs to be accessible to other Primes.

B. Coordinate the Work of associated sub-contractors.

C. Establish a Contractor's Construction Schedule and coordinate with General Contractor.

D. Maintain on the job-site at all times during the performance of the Work, a competent, English speaking superintendent.

E. Coordinate construction activities included under various Sections of these Specifications to assure efficient and orderly installation of each part of the work. Coordinate construction operations included under different Sections of the Specifications that are dependent upon each other for proper installation, connection, and operation.

F. Where availability of space is limited, coordinate installation of different components to assure maximum accessibility for required maintenance, service and repair.

G. Make adequate provisions to accommodate items scheduled for later installation.

H. When necessary, prepare memoranda for distribution to each party involved outlining special procedures required for coordination. Include such items as required notices, reports, and attendance at meetings. Copy memoranda to City and Design Professional.

I. Coordinate compatibility of products. Refer to Products and Materials, Division 1.

J. Administrative Procedures - Coordinate scheduling and timing of required administrative procedures with other construction activities to avoid conflicts and ensure orderly progress of the work. Such administrative activities include, but are not limited to, the following:

1. Preparation of schedules.
2. Installation and removal of temporary facilities.
3. Delivery and processing of submittals.
4. Progress meetings.
5. Project Closeout activities.

1.7 LACK OF COOPERATION BETWEEN CONTRACTORS

A. Delays attributable to lack of cooperation between the separate Prime Contractors and their sub-contractors shall not be recognized as a claim for delay. Claims by a contractor for costs due to such delays shall not be paid by the City.

B. Delays, including delays caused by lack of cooperation, shall result in penalties by the City as stipulated under article 3.7.7 of the “Standard Contract Requirements”.

1.8 SUBCONTRACTOR'S RESPONSIBILITIES

A. Comply with the direction of the Prime Contractor in coordination efforts listed above.

PART 2 PRODUCTS Not Used

PART 3 EXECUTION Not Used

- END -

SECTION 013119

PROJECT MEETINGS

PART 1 GENERAL

1.1 DESCRIPTION OF WORK

A. This Section specifies each Prime Contractor's administrative and procedural requirements for project meetings. Requirements contained herein in no way limit each Prime Contractor's responsibility to effectively communicate with parties involved in order to meet the requirements of the Contract.

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. Applicable provisions of Bidding Requirements, Contract Requirements in Division 0 and all applicable Division 1 sections.

B. Project Coordination: Division 1.

C. Construction Scheduling: Division 1.

1.3 ADMINISTRATION

A. The Design Professional will schedule and administer the pre-construction meetings, periodic project meetings, pre-installation, coordination and other specially called meetings throughout the progress of the work. She/he will also:

1. Prepare agenda for meetings.

2. Distribute written notice of each meeting four (4) days in advance of meeting date.

3. Make physical arrangements for meetings.

4. Preside at meetings.

B. During the course of the pre-construction meetings, periodic project meetings, pre-installation, coordination and other specially called meetings throughout the progress of the work, the Design Professional will:

1. Record the minutes, including all significant proceedings and decisions.

2. Reproduce and distribute copies of minutes within three (3) days after each meeting to: all participants in the meeting; and all parties affected by decisions made at the meeting.

C. Representatives of Contractors, subcontractors and suppliers attending the meetings shall be qualified and authorized to act on behalf of the entity each represents.

1.4 PRE-CONSTRUCTION MEETING

A. Attendance

1. Project Coordinator.

2. Design Professional's Representative.

3. Prime Contractor's Representatives.

4. Major subcontractors.

B. Suggested Agenda

1. Discussion of coordination of Prime Contracts.
2. Discussion on major subcontracts and suppliers and projected construction schedules.
3. Critical work sequencing.
4. Major equipment deliveries and priorities.
5. Project Coordination and designation of responsible personnel.
6. Procedures and processing of field decisions, proposal requests, submittals, change orders and applications for payment.
7. Procedures for maintaining Record Documents.
8. Use of premises, office, work and storage areas, and City's requirements.
9. Construction facilities.
10. Temporary utilities.
11. Housekeeping procedures.
12. Dispute resolution.

1.5 PROGRESS, PRE-INSTALLATION AND COORDINATION MEETINGS

A. Schedule regular and special meetings, as required by progress of the Work.

B. Location of the Meetings - The Project field office of the Contractor [or as otherwise directed].

C. Attendance

1. Project Coordinator.
2. Design Professional's Representative.
3. Contractor's Representatives.
4. Subcontractors as appropriate to the agenda.
5. Suppliers as appropriate to the agenda.
6. Others as appropriate.

D. Suggested Agenda

1. Review and approval of minutes of previous meeting.
2. Review of work progress since previous meeting.
3. Field observations, problems, conflicts.
4. Problems which impede Construction Schedule.
5. Coordination issues between Prime Contractors.
6. Review of off-site fabrication, delivery schedules.
7. Corrective measures and procedures to regain projected schedule.
8. Revisions to Construction Schedule.
9. Plan progress, schedule, during succeeding work period.
10. Coordination of schedules.
11. Review submittal schedules; expedite as required.

12. Maintenance of quality standards.

13. Review proposed changes for:

    a. Effect on Construction Schedule and on completion date.

    b. Effect on other contracts of the Project.

14. Review record drawings.

15. Other business.

PART 2 PRODUCTS Not Used

PART 3 - EXECUTION Not Used

- END -

SECTION 013216

CONSTRUCTION SCHEDULING

PART 1 GENERAL

1.1 DESCRIPTION OF WORK

A. This Section specifies administrative and procedural requirements for schedules prepared by each Prime Contractor.

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. Applicable provisions of Bidding Requirements, Contract Requirements in Division 0 and all applicable Division 1 sections.

1.3 CONSTRUCTION SCHEDULE

A. Each Prime Contractor shall prepare a Contractor's Construction Schedule including all phases of work as follows:

1. Initial Construction Schedule –to be provided at Notice to Proceed, Break down at least by 16 Division Specification format for General Construction and into at least 12 operations for Electrical, Plumbing, or Mechanical Construction. This schedule must be in agreement with the time frame stated in the Bid Proposal. Coordinate schedule with the following:

a. Prepurchase products.

b. Allowances.

c. Application for Payments.

d. Mock-ups.

e. Schedule of Submittals.

f. Schedule of Values.

2. Final Construction Schedule - Within 14 calendar days after Notice to Proceed, submit a complete detailed construction schedule showing each activity having impact upon the timely completion of the Project. Activities shall be broken down generally similar to the individual specification sections but not less than 20 separate operations. The schedule shall include, but not be limited to the following:

a. Schedule each activity with a time limit per activity not to exceed ten (10) working days.

b. Time frames for testing of materials.

c. Time frames for shop fabrication and delivery of all parts of the work. Identify by specification section number and title. Coordinate with Schedule of Submittals. Allow time for reviews, resubmissions and approval.

d. Decision dates for selection of finishes and colors.

e. Decision dates for selection of products specified by allowances.

f. Deadlines for submissions of substitutions.

g. Identification for work of mock-ups, separate floors, separate buildings, separate phases or other logically grouped activities.

h. Separate network for each trade or operation.

1.4 FORMAT

A. Initial Construction Schedule - Horizontal bar chart form divided vertically by weeks.

B. Final Construction Schedule - Horizontal bar chart form showing each trade or operation And

C . Final Construction Schedule - Critical Path Method (CPM).

1.5 SCHEDULE OF SUBMITTALS

A. Submit a preliminary Schedule of Submittals within 30 days after the Notice to Proceed. Submit the final schedule with the final Contractor's Construction Schedule.

B. Coordinate submittal schedule with the list of subcontracts, schedule of values, submittal register and the Contractor's construction schedule.

C. Coordinate scheduling of interrelated submissions to allow for review of required data and to avoid delays in reviewing submittals caused by lack of coordinated submission.

D. Coordinate scheduling of submission to allow for approval of products prior to construction of mock-up.

E. Contractor shall estimate number of resubmissions required for each submittal based on complexity. However, the submittal schedule in no way binds the City to approve a submittal to meet the submittal schedule or construction schedule. It is the contractor's sole responsibility to prepare acceptable submissions in a timely fashion in order to maintain schedule.

F. Allow for City's and Design Professional's review of each submission and resubmission.

G. Prepare the schedule in chronological order. Provide the following information:

1. Related Section number.

2. Submittal category.

3. Name of subcontractor.

4. Description of the part of the Work covered.

5. Scheduled date for the first submittal.

6. Scheduled date for resubmittal or resubmittals.

7. Scheduled date the City's final release or approval.

H. Distribution - Following response to initial submittal, print and distribute copies to the City, subcontractors, and other parties required to comply with submittal dates indicated. Post copies in the Project meeting room and field office.

I. When revisions are made, distribute to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in construction activities.

1.6 COORDINATION

A. All Prime Contractors shall submit their schedules to the General Contractor.

B. The General Contractor shall prepare an overall schedule including all trades and contracts.

C. The City will resolve conflicts among schedules of various Prime Contractors.

D. The General Contractor shall distribute copies of the approved final Construction Schedule to other Prime Contractors involved.

1.7 UPDATING

A. Updating of the final Construction Schedule and Schedule of Submittals shall be required on a monthly basis.

B. Show all changes occurring since previous submission of updated schedules.

C. Indicate progress of each activity, show completion dates.

D. Include major changes in scope, activities modified since previous updating, revised projections due to changes and other identifiable changes.

1.8 DISTRIBUTION

A. Distribute copies of revised schedules to:

1. Project Coordinator.
2. Design Professional.
3. Other Prime Contractors.
4. Subcontractors.
5. Other Concerned Parties (surety, insurance, etc.).
6. Instruct recipients to report any inability to comply, and provide detailed explanation, with suggested remedies.

PART 2 PRODUCTS Not Used

PART 3 EXECUTION Not Used

- END -

SECTION 013226

PROGRESS REPORTS

PART 1 GENERAL

1.1 DESCRIPTION OF WORK

A. This Section specifies administrative and procedural requirements for progress reports prepared by each Prime Contractor.

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. Applicable provisions of Bidding Requirements, Contract Requirements in Division 0 and all applicable Division 1 sections.

1.3 DAILY REPORT

A. Each Prime Contractor shall prepare a Daily Report including:

1. Name of project.
2. City Project number.
3. Date of report.
4. Weather conditions.
5. Overtime worked, and planned.
6. Work progress.
7. Environmental problems and corrections.
8. Other information, such as special events or occurrences, accidents, recommendations, suggestions, visitors, major equipment or materials received, tests, inspections, equipment start-up and check out, occupancy.

B. Submit copies of reports weekly to Project Coordinator and Design Professional.

1.4 MONTHLY REPORT

A. Each Prime Contractor shall prepare a synopsis of the previous month's activities, including:

1. Name of project.
2. City Project number.
3. Date of report.
4. Weather conditions for the month compared to normal.
5. Work progress from previous month.
6. Copies of all previous month’s schedules.
7. Updated schedules with explanations of deviation from previous.
8. Milestone schedule events for the upcoming month.
9. Corrective measures and procedures to regain projected construction schedule.

10. Review of status of submittals.

11. Review of status of Change Orders and/or requested Change Orders.

12. Other information of importance from previous month or forecasted for upcoming month.

13. Bind in submission of Construction Photographs.

14. Bind in submission of monthly settlement survey.

B. Submit copies of reports monthly to Project Coordinator and Design Professional.

PART 2 PRODUCTS Not Used

PART 3 EXECUTION Not Used

- END -

SECTION 013233
CONSTRUCTION PHOTOGRAPHS

PART 1 GENERAL

1.1 DESCRIPTION OF WORK

A. This Section describes photographic services provided by the General Contractor required to record the progress of the work of all Prime Contractors.

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. Applicable provisions of Bidding Requirements, Contract Requirements in Division 0 and all applicable Division 1 sections.

1.3 SUBMITTALS

A. Digital images. Forward copies to City and Design Professional and retain for Contractor's files.

B. Videos – Take necessary video's and forward each to City and Design Professional and retain one (1) for Contractor's files.

C. Submit digital images and/videos with Standard Cost Breakdown/ monthly progress report.

PART 2 PRODUCTS

2.1 DIGITAL IMAGES

A. color

B. Identify each image listing:

1. Name of project.

2. Orientation of view.

3. Date and time recorded.

PART 3 EXECUTION

3.1 DIGITAL IMAGES (HARDCOPY)

A. Take 72 initial photographs and 20 photographs once monthly, for the length of the Contract. First photographs shall be taken prior to start of construction.

B. Video tape progress of job once monthly. Contractor's superintendent shall accompany photographer and from off-camera location, describe for audio recording, what is being recorded on video. Before start of construction record existing site conditions emphasizing recording of condition of elements to remain which are adjacent to new construction. Monthly progress recording shall give an overview of progress and emphasize recording of utilities and services that shall be concealed by future work. Include a surveyor rod or other similar large readable measuring device in recording to indicate actual size.

- END -

SECTION 013330

SUBMITTALS

PART 1 GENERAL

1.1 DESCRIPTION OF WORK

A. This Section describes each Prime Contractor's administrative and procedural requirements for submission of shop drawings, product data, samples and other required information.

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. Applicable provisions of Bidding Requirements, Contract Requirements in Division 0 and all applicable Division 1 sections.

B. Submittal Schedule specified in Construction Scheduling, Section 013216.

1.3 WORK WITHOUT APPROVED SUBMITTALS

A. City may withhold payment for the value of Work installed without first obtaining approved submittals, when submittal is required by individual specification sections. Refer to section 012900 "Payment Procedures".

1.4 SHOP DRAWINGS

A. Shop drawings are Contractor's or subcontractor's Drawings made specifically for this Project, for use in fabrication and installation.

B. Shop drawings must show sufficient data including layout, fabrication and erection details to establish evidence of conformance with design concept and compliance with the Contract Documents. Shop drawings must show relationships with adjacent construction.

C. Do not use reproductions of Contract Drawings as Shop Drawings unless specifically permitted in the Contract Documents.

D. Identify details by reference to sheet and detail numbers shown on Contract Drawings and by reference to paragraphs and specification section.

E. Orient Shop Drawings in same manner as drawings.

F. Manufacturer's Standard Schematic Drawings

1. Modify drawings to delete information that is not applicable to Project. Drawings showing information which is not applicable or unaltered standard drawings shall be returned without review.

2. Add supplemental information applicable to Project.

1.5 PRODUCT DATA

A. Manufacturer's Catalog Sheets, Brochures, Diagrams, Schedules, Performance Charts, Illustrations and Other Standard Descriptive Data.

B. Clearly mark each copy to identify materials, products or models applicable to this Project. Submittals not marked shall be returned without review.

C. Show colors when required for evaluation, record or other purpose. Where product data is printed in color, submit all copies in original colors as published.

D. Show dimensions and clearances required.

E. Show performance, characteristics and capacities.

F. Show wiring and piping diagrams, and controls.

G. Show by reference to paragraphs and specification section.

1.6 SAMPLES

A. Samples: Actual samples of products proposed for use. Samples must be of sufficient size and quantity to clearly illustrate:

1. Functional characteristics of product or material, with integrally related parts and attachment devices.

2. Full range of color, texture and patterns.

1.7 FIELD SAMPLES AND MOCKUPS

A. Erect at project site in location as directed.

B. Construct each sample or mock-up complete, including work of all trades required in the finished work.

C. Remove mockup at conclusion of work or when directed by City.

1.8 COORDINATION

A. Coordinate preparation and processing of submittals with performance of construction activities. Transmit each submittal sufficiently in advance of performance of related construction activities to avoid delay.

B. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals and related activities that require sequential activity.

C. Coordinate transmittal of different types of submittals for related elements of the Work so processing will not be delayed by the need to review submittals concurrently for coordination.

D. The City reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.

E. When mock-ups are required, submittals for all products used in mock-up shall be coordinated with schedule for mock-up construction.

1.9 SUBMISSION REQUIREMENTS

A. Comply with Schedule of Submittals.

B. Accompany each submission with a transmittal indicating project name, location, City's project number, referenced specification number, submission number, date, item submitted, Contractor's name, Sub-contractor, supplier or manufacturer.

1. Transmittal shall include Contractors certification that information complies with Contract Documents.

2. Indicate on transmittal or on submittal deviations from Contract Documents requirements.

C. Copies

1. Submit one (1) reproducible transparency and two (2) prints of each shop drawing. Transparency will be returned to Contractor.

2. Submit five (5) copies of product data. One (1) copy will be retained by Design Professional.

3. For sample selections, submit one (1) set. For sample approval, submit three (3) sets. The Design Professional will retain one (1) set.

D. Where product data is printed in color and requires color for evaluation, record, or other purpose, all copies submitted shall be in original colors as published.

E. In addition to information required on the transmittal, submittals shall include:

1. Relation to adjacent structure or materials.

2. Field dimensions, clearly identified as such.

3. Finishes.

4. Shipping and operating weights

5. Gauges, fastenings, reinforcements, welding details.

6. Applicable standards, such as ASTM or Federal Specification numbers.

7. A blank space, 3 inches by l0 inches for action stamp.

F. Contractor's Review:

1. Contractor shall review each submittal and indicate approval with a stamp, dated, initialed and/or signed. Review shall include but not be limited to; verification of field measurements, coordination with all trades involved and compliance with Contract Documents. The Contractor shall not be relieved of responsibility for any deviation from the requirements of the Contract Documents by the City's or Design Professional's action on submittals unless the Contractor has given specific notice of deviation at the time of submission and written approval of the specific deviation is given. The Contractor shall not be relieved from responsibility for errors or omissions in submittals by the City's or Design Professional's approval thereof.

2. If Contractor does not review submittals and provide the signed approval stamp before sending them to the Design Professional, they will be returned unchecked.

1.10 SUBMISSION ROUTING

A. Forward submittal direct to Design Professional and fax copy of transmittal letter to Project Coordinator.

B. Design Professional will forward Submittals marked as "Approved" or Approved as Noted to Project Coordinator.

C. Design Professional will forward Submittals marked as "Revise and Resubmit" or "Rejected" back to Contractor and will fax copy of transmittal to Project Coordinator.

D. Project Coordinator will forward Submittals back to Contractor and will fax copy of transmittal to Design Professional.

1.11 DESIGN PROFESSIONAL'S DUTIES

A. Review submittals within 10 working days of receipt.

B. Review for conformance to design concept of Project and for compliance with information given in Contract Documents. Review of separate item does not constitute review of an assembly in which item functions.

C. Affix stamp and initials or signature certifying to review of submittal.

D. Design Professional's action on submittals will result in the making of one of the following notations with related meanings:

1. APPROVED: The work involved may proceed, and no further submission is required.

2. APPROVED AS NOTED: The work involved may proceed incorporating comments. Annotations do not authorize changes to Contract Sum.

3. REVISE AND RESUBMIT: The work involved may not proceed. Submittal must be corrected and resubmitted.

4. REJECTED: The submittal is not in accordance with the Contract Documents, and a completely new submittal is required.

E. In the event any comment made to the Submittal results in a claim for a change in the Contract, the Project Coordinator shall be notified immediately and fabrication may not be undertaken until contract modification procedures are completed.

1.12. CITY'S RESPONSIBILITY

A. Review submittals within 5 working days of receipt.

B. Review for compliance Contract Documents. Review of separate item does not constitute review of an assembly in which item functions.

C. Affix stamp and initials or signature certifying to review of submittal.

D. City's action on submittals will result in the making of one of the following notations with related meanings:

1. APPROVED FOR CONSTRUCTION: The work involved may proceed, and no further submission is required.

2. APPROVED AS NOTED: The work involved may proceed incorporating comments. Annotations do not authorize changes to Contract Sum.

3. REVISE AND RESUBMIT: The work involved may not proceed. Submittal must be corrected and resubmitted.

1.13 RESUBMISSION REQUIREMENTS

A. Identification of Changes - Clearly identify changes made from the initial submittal other than those requested by the Design Professional. The Design Professional will review only those changes requested and those identified by the Contractor.

1.14 DISTRIBUTION OF APPROVED SUBMITTALS

A. Contractor shall reproduce and distribute copies of submittals having the Design Professional's and City's stamp ("Approved" or "Approved as Noted") as required to coordinate and complete the Work and to records documents file.

1.15 SUBSTITUTIONS

A. Substitutions submitted as a shop drawing, product data or sample will be returned without action.

PART 2 PRODUCTS Not Used

PART 3 EXECUTION Not Used

- END -

SECTION 014516

CONTRACTOR'S QUALITY CONTROL

PART 1 – GENERAL

1.1 DESCRIPTION OF WORK

A. This section describes each Prime Contractor's requirements for quality assurance including:

1. Control of installation
2. Tolerances
3. Mockups
4. Inspection and Testing services
5. Manufacturer's field services

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. Applicable provisions of Bidding Requirements, Contract Requirements in Division 0 and all applicable Division 1 sections.

B. Each technical section required for materials and products in mockup

C. Each technical section requiring independent inspection and testing.

1.3 QUALITY ASSURANCE – CONTROL OF INSTALLATION

A. Each Prime Contractor is responsible to deliver Work of quality specified regardless Contractor's sub-contracting or purchasing arrangements.

B. Monitor quality control over suppliers, manufacturer's products, services, site conditions and workmanship to produce Work of specified quality.

C. Comply with manufacturers written instructions, including preparation and each step in sequence.

1. Should manufacturer instructions differ from Contract Documents, request clarification but assume the more stringent will apply.

D. Comply with specified standards as minimum quality for the Work except where more stringent tolerances, codes or specified requirements indicate higher standards or more precise workmanship.

E. Perform work by persons qualified to produce workmanship of specified quality.

1.4 TOLERANCES

A. Monitor tolerance control of installed products to produce acceptable Work. Do not allow tolerances to accumulate.

B. Comply with manufacturers written tolerances.

1. Should manufacturer tolerances differ from Contract Documents, request clarification but assume the more stringent will apply.

C. Adjust products to appropriate dimensions; position before securing products in place.

1.5 MOCK-UPS

A. Construct mock-up to meet all indicated requirements, identical to proposed final Work.

B. Locate mock-up [on-site [at location indicated] [at location directed]] [off-site at independent testing agencies facilities]

C. Mock-up [may be incorporated into final Work after acceptance by City.] [shall be constructed separate from final Work and shall be removed prior to Substantial Completion. Provide temporary structure to support mock-up]

D. Extent of mock-up shall be [one structural bay wide by one story high] [as indicated on drawings] [approximately 10 feet long plus a corner and a 4 feet long return leg by one story high] [as indicated on drawings]

E. Obtain approval of mock-up before performing construction involving products and systems included in mock-up.

F. Approved mock-up shall establish the required quality of final Work, notwithstanding other requirements of the specifications.

G. Maintain approved mock-up until all work included in the mock-up has been completed and accepted.

1.6 INSPECTION AND TESTING SERVICES

A. Each Prime Contractor shall retain independent inspection and testing services when required by individual specification sections or by building code authority.

B. The independent agency shall perform inspection and testing services on and off site as required by individual specification sections and as required to comply with requirements of the building code authority.

C. Independent agency shall submit reports to Prime Contractor and direct to City indicating compliance or non-compliance. Notify City the same day of non-compliance.

D. Cooperate with independent agency; furnish samples, mix designs, equipment, tools, storage, safe access, and assistance by incidental labor.

E. Inspection and testing does not relieve Contractor to perform Work to contract requirements.

F. Retesting required because of non-conformance to specified requirements shall be performed by the original agency at no additional cost to City.

1.7 MANUFACTURERS FIELD SERVICES

A. When specified in individual specification sections, require manufacturer to provide qualified technical staff personnel to observe site conditions, quality of workmanship, start-up or training of City personnel as specified.

B. Technical staff shall not be the local sales staff or independent manufacturers sales representatives.

C. Manufacturers technical representative shall submit written reports of findings to Contractor and direct to City. Notify City the same day of non-compliance

PART 2 PRODUCTS Not Used

PART 3 EXECUTION Not Used

END

SECTION 015000

TEMPORARY FACILITIES AND CONTROLS

PART 1 GENERAL

1.1 DESCRIPTION OF WORK

A. This Section describes each Prime Contractor's construction facilities and services required for performance of the Work but not a permanent part of the finished construction. Included are temporary utilities, temporary construction and support facilities and security and protection services.

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. Applicable provisions of Bidding Requirements, Contract Requirements in Division 0 and all applicable Division 1 sections.

B. Environmental Controls: Division 1.

1.3 SUBMITTALS

A. Submit reports of tests, inspection, meter readings and similar procedures performed on temporary utilities.

1.4 INSPECTION

A. Arrange for authorities having jurisdiction to inspect and test each temporary utility before use. Obtain required certificates and permits.

PART 2 PRODUCTS

2.1 TEMPORARY MATERIALS

A. Materials may be new or used, but must be adequate in capacity for the required usage and must not violate requirements of applicable codes and standards. Generally, temporary materials shall comply with related specification sections for materials to be incorporated into final work.

PART 3 EXECUTION

3.1 TEMPORARY UTILITIES

A. Provide temporary utilities including water, drainage, electrical power, communications, lighting, and steam where applicable.

B. Contractor shall pay all costs associated with temporary utilities.

3.2 TEMPORARY ELECTRICITY

A. Provide electrical service adequate for work of all trades, and terminate in fused safety switch and circuit breaker distribution panels.

B. For welding at site or electrical requirements beyond the capacity of temporary system, supply generator, fuel, maintenance, and other incidentals required.

3.3 TEMPORARY LIGHTING

A. Provide temporary lighting required for construction operations

B. Provide temporary lighting for exterior staging and storage areas for security purposes.

C. Provide temporary lighting in interior work areas after dark for security purposes.

D. Provide lighting at each landing of each stair or ladder run.

E. Permanent building lighting may [not] be utilized during construction.

3.4 HEATING AND VENTILATING

A. Provide temporary heat as required for construction operations. Temporary sources of heat shall be direct vented and thermostatically controlled. Open flame devices or solid fuels are not allowed.

B. Provide forced ventilation by portions of the permanent system or by portable units, to cure materials, to disperse humidity, and to prevent accumulations of dust, fumes, vapors, or gases. Provide ductwork with temporary filters to prevent the broadcasting of dust and debris.

C. In occupied facilities, while performing operations that generate fumes or dust, provide both fresh air intake and fan powered ventilation to control spread of fumes or dust to occupied areas of the building.

3.5 TEMPORARY TELEPHONE

A. Provide telephone service and a facsimile machine on-site for Contractor's, City's and Design Professional's use. Contractor shall pay cost service.

B. City telephones on-site may not be used by Contractors.

3.6 TEMPORARY WATER SUPPLY

A. Provide temporary water service of adequate size as required for fire protection and construction operations.

B. Provide drinking water, paper cups, and waste receptacles for personnel.

3.7 SANITARY FACILITIES

A. Provide sanitary facilities according to law at locations approved by the City. Provide privacy enclosures, toilet paper, waste receptacles, and periodic janitorial services.

B. Enforce use of sanitary facilities. Evidence to the contrary shall require removal, disinfecting, and reconstruction of defaced work.

C. The use of the Owner's toilet facilities by construction personnel will not be permitted.

3.8 FIRE PROTECTION

A. Provide temporary fire protection and portable fire extinguishers according to law.

3.9 CONSTRUCTION AIDS

A. Provide construction aids required for execution of the work, including scaffolds, staging, ladders, stairs, ramps, runways, platforms, railings, hoists, cranes, chutes, and other facilities and equipment.

B. Provide and operate drainage and pumping equipment; maintain excavations and site free of standing water except designated ponds. Coordinate with Division 2.

3.11 BARRIERS

A. Provide barriers to prevent unauthorized entry to construction areas [to allow for City's use of site,] and to protect existing facilities and adjacent properties from damage from construction operations [and demolition].

B. Construct using scaffold or shoring framing, waterproofed wood plank overhead decking, protective plywood enclosure walls, handrails, barricades, warning signs, lights, safe and well-drained walkways and similar provisions for protection and safe passage. Extend the backwall beyond to complete the enclosure fence. Paint with colors approved by City.

C. Protect non-owned vehicular traffic, stored materials, site, and structures from damage.

3.12 FENCING

A. Construction - Contractor's option- Commercial grade chain link fence. Solid wood fence, painted.

B. Provide a minimum of 6 feet high fence around construction site; equip with vehicular and pedestrian gates with locks.

3.13 EXTERIOR ENCLOSURES

A. Provide temporary weather tight closure of exterior openings to accommodate acceptable working conditions and protection for Products, to allow for temporary heating and maintenance of required ambient temperatures identified in individual specification sections, and to prevent entry of unauthorized persons. Provide access doors with self-closing hardware and locks.

B. Provide temporary tarps or other protection to roofs made open to weather by construction operations.

3.14 INTERIOR ENCLOSURES

A. Provide temporary partitions [and ceilings] to separate work areas from City occupied areas, to prevent penetration of dust and moisture into City occupied areas, to prevent damage to existing materials and equipment and as indicated.

B. Construction - Steel stud framing and gypsum board with closed joints and sealed edges at intersections with existing surfaces.

3.15 PROTECTION OF INSTALLED WORK

A. Protect installed Work and provide special protection where specified in individual specification sections.

B. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings.

C. Protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by covering with durable sheet materials.

D. Prohibit traffic or storage upon waterproofed or roofed surfaces. If traffic or activity is necessary, obtain recommendations for protection from waterproofing or roofing material manufacturer.

E. Prohibit traffic from landscaped areas.

3.16 SITE SECURITY

A. The City assumes no responsibility for loss, theft, or damage to the work, tools, equipment, and construction. In the instance of any such loss, theft, or damage, the Contractor shall be responsible to renew, restore, or remedy the work, tools, equipment, and construction in accordance with requirements of the Contract Documents without additional cost to the City.

B. The Contractor, at his own cost, may provide watchman services, and other means of site security.

C. Site parked equipment, operable machinery, and hazardous parts of the new construction subject to mischief and accidental operation, shall be inaccessible, locked, or otherwise made inoperable when left unattended.

D. Liability - The City is not responsible for damage, liability, theft, casualty, or other hazard to the automobiles or other vehicles, nor to injury including death to occupants of automobiles or other vehicles on the City's property. Provide signs to this effect in the designated parking area.

3.17 ACCESS ROADS AND PARKING AREAS

A. Access Roads

1. Use existing roads on Site for access. Protect roads from damage from extra heavy loading by use of timbers or other approved means.

2. Provide access roads as a portion of the permanent road system on the Site. Construct roads in accordance with applicable paving specifications, including compaction of subgrade [and placing of base course]. [Before the binder and wearing courses are placed, restore the base course to a condition suitable to receive subsequent work.] [Do not install binder and wearing course until immediately before Substantial Completion.]

B. Parking Areas

1. Construct parking areas of compacted stone ballast of sufficient thickness to stay reasonably rut and mud free.

3.18 PROJECT SIGN

A. Provide project identification sign, and temporary information and direction signs as required and approved. See Specification section 015800 for requirements.

3.19 FIELD OFFICE

A. Contractor shall provide a field office on the site where indicated, as required to complete the Work.

3.20 TERMINATION AND REMOVAL

A. Remove each temporary facility when the need has ended, or when replaced by authorized use of a permanent facility, but no later than Substantial Completion. Complete or restore permanent construction that may have been delayed because of interference with the temporary facility. Repair damaged Work, clean exposed surfaces and replace construction that cannot be satisfactorily repaired.

B. Materials and facilities that constitute temporary facilities are property of the Contractor

C. Remove temporary paving that is not intended for or acceptable for integration into permanent paving. Where the area is intended for landscape development, remove soil and aggregate fill that does not comply with requirements for fill or subsoil in the area. Remove materials contaminated with road oil, asphalt and other petrochemical compounds, and other substances which might impair growth of plant materials or lawns. Repair or replace street paving, curbs and sidewalks at the temporary entrances, as required by the governing authority.

- END -

SECTION 015800
PROJECT IDENTIFICATION AND SIGNS

PART 1 GENERAL

1.1 DESCRIPTION OF WORK

Requirements include the following which shall be provided by the Contractor for General Construction:

A. Furnish, install and maintain project identification sign.

B. Provide temporary on-site information signs to identify Owner's temporary relocation.

C. Remove signs on completion of construction.

D. Allow no other signs to be displayed without approval of owner.

1.2 RELATED REQUIREMENTS

A. Section 011100 – Summary of Work
B. Section 015000 – Temporary Facilities and Controls
C. Section 0151719 – Environmental Controls

1.3 PROJECT IDENTIFICATION SIGN

A. Two (2) digitally printed signs, not less than 4 feet x 8 feet, with graphic content as shown on sample exhibit (1) on the next page of this section.

B. Erect/Fasten on the site at location shown on drawing or as directed by the owner.

1.4 INFORMATIONAL SIGNS

A. Provide at all public entrances, stairways and temporary gates with digitally printed signs providing information about relocated services, if applicable, or other relevant information as determined by the CPO project team. Each sign to be 3 feet by 3 feet and up to 100 letters, with graphic content as shown on sample exhibit (2) on the next page of this section. Allow for a total of eight [8] signs.

B. Erect/Install at appropriate locations to provide required information. Coordinate location with owner/owner's representative.

1.5 QUALITY ASSURANCE

A. Digital Sign Printer: Professional experience in type of work required.

B. Finishes: Adequate to resist weathering and fading for scheduled construction period.

PART 2 PRODUCTS

2.1 SIGN MATERIALS

A. Structure and framing: May be new or used, wood or metal, in sound condition, structurally adequate to work, and suitable for specified finish.

B. Sign surfaces: Exterior softwood plywood with medium-density overlay, in standard large sizes to minimize joints.

1. Thickness: As required by standards to span framing members (not less than ¾ inch thick), to provide even, smooth surface without knots, waves or buckles.

C. Rough hardware: Galvanized.

D. Paint: Manufacturer's Best Exterior quality as approved by architect.
1. Use exhibit for colors and graphics.

PART 3 EXECUTION

3.1 PROJECT IDENTIFICATION SIGN

A. Sign should be printed/manufactured with style, sizes and colors shown on exhibit attached on page 3 of this section.

3.2 INFORMATION SIGNS

A. Signs should be printed/manufactured in style, sizes and colors as shown in Exhibit 2

B. Install at a height for optimum visibility, on ground-mounted poles or attached to temporary structural surfaces.

3.3 MAINTENANCE

A. Maintain signs, fasteners, and hardware in a neat, clean condition; repair damaged sign if needed.

B. Relocate informational signs as required by progress of work.

3.4 REMOVAL

A. Remove signs, supports, fasteners at completion of project.

END OF SECTION

Sample – Exhibit 1 - PROJECT IDENTIFICATION SIGN

Note for Sample – Construction Sign w/ Render for a Rebuild Program Site –

City of Philadelphia, Capital Program Office and City Council logos are on ALL signs.

Social Media Copy

- For Rebuild project sites include the following copy beneath any grant language, "Follow us @RebuildPHL, or email questions to rebuild@phila.gov"
- For all other projects use the following copy, "Follow us @CPO.PHL, or email questions to cpo@phila.gov"

Names

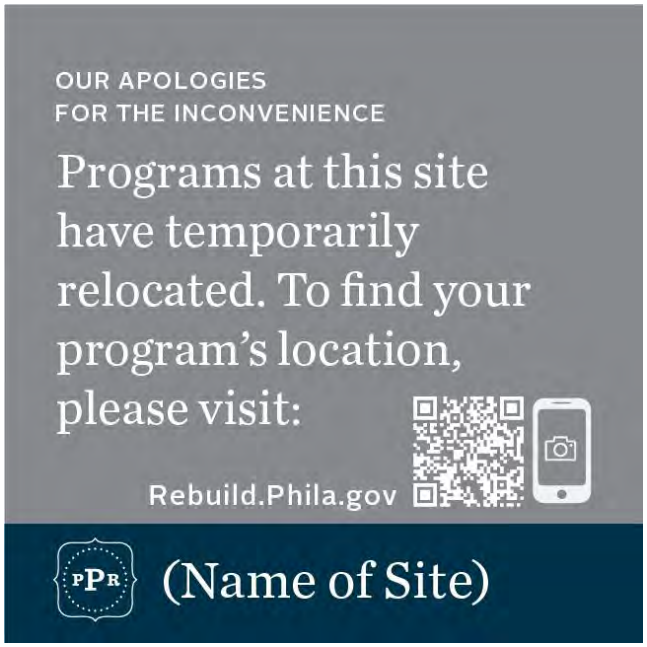
- All construction signs must include the following positions in the following order;
  - Mayor
  - City Councilmember
  - State Elected Officials
  - Managing Director
  - Capital Program Office Director
  - Client Department Executive

The following logos are dependent on project delivery and owner (see below).

- PPR - only when site is a PPR site.
- FLP - only when site is a FLP site.
- Rebuild – only when site is a Rebuild site.
- William Penn Foundation – only when site is a Rebuild site.
- PPR/FLP - need to show both when a co-located site exists.
- Funders – It may be required for funder logos to be included on the project sign. This will be at the direction of the Capital Program Office.

Note for Sample - Exhibit 1 w/o Render for Rebuild Program Site –

Sample – Exhibit 2 - INFORMATION SIGNS (PPR & FLP)



Note for Sample - Exhibit 2

- PPR Info Sign - QR code to direct to the Rebuild.Phila.gov website
- FLP Info Sign – QR code to direct to the freelibrary.org website

SECTION 016001

PRODUCTS AND MATERIALS

PART 1 GENERAL

1.1 DESCRIPTION OF WORK

A. This Section describes administrative procedures regarding each Prime Contractor's selection of products, materials, and equipment required for the completion of the Work. Requirements for handling, storing and installing products are also included.

1.2 RELATED REQUIREMENTS SPECIFIED ELSEWHERE

A. Applicable provisions of Bidding Requirements, Contract Requirements in Division 0 and all applicable Division 1 sections.

1.3 DEFINITIONS

A. Definitions used in this Article are not intended to change the meaning of other terms used in the Contract Documents, such as "specialties", "structure", "finishes", "accessories", and similar terms. Such terms are self-explanatory and have well recognized meanings in the construction industry.

B. "Products" are items purchased for incorporation in the Work, whether purchased for the Project or taken from previously purchased stock. The term "product" includes the terms "material", "equipment", "system", and terms of similar intent.

C. "Named Products" are items identified by manufacturer's product name, including make or model designation, indicated in the manufacturer's published product literature.

D. "Materials" are products that are substantially shaped, cut, worked, mixed, finished, refined or otherwise fabricated, processed, or installed to form a part of the Work.

E. "Equipment" is a product with operational parts, whether motorized or manually operated, that require service connections such as wiring or piping.

F. "System" is an integrated assembly of materials and/or equipment which when combined form an integral whole to serve a function.

1.4 QUALITY ASSURANCE

A. Source Limitations - To the fullest extent possible, provide products of the same kind, from a single source.

B. Compatibility of Options - When the Contractor is given the option of selecting between two or more products for use on the Project, the product selected shall be compatible with products previously selected, even if previously selected products were also options.

C. Each Prime Contractor is responsible for providing products and construction methods that are compatible with products and construction methods of other prime or separate Contractors.

D. If a dispute arises between prime Contractors over concurrently selectable, but incompatible products, the Design Professional will determine which products shall be retained and which are incompatible and must be replaced.

E. Nameplates - Except for required labels and operating data, do not attach or imprint manufacturer's or producer's nameplates or trademarks on exposed surfaces of products which will be exposed to view in occupied spaces or on the exterior.

F. Labels - Locate required product labels and stamps on a concealed surface or, where required for observation after installation, on an accessible surface that is not conspicuous.

G. Equipment Nameplates - Provide a permanent nameplate on each item of service-connected or power-operated equipment. Locate on an easily accessible surface that is inconspicuous in occupied spaces. The nameplate shall contain the following information and other essential operating data:

1. Name of product and manufacturer.
2. Model and serial number.
3. Capacity.
4. Speed.
5. Ratings.

1.5 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Deliver, store and handle products in accordance with the manufacturer's recommendations, using means and methods that will prevent damage, deterioration and loss, including theft.

B. Schedule delivery in accordance with the Construction Schedule and to minimize long-term storage at the site and to prevent overcrowding of construction spaces.

C. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damages, or sensitive to deterioration, theft and other losses.

D. Deliver products to the site in the manufacturer's original sealed container or other packaging system, complete with legible labels and instructions for handling, storing, unpacking, protecting and installing.

E. Inspect products upon delivery to ensure compliance with the Contract Documents, and to ensure that products are undamaged and properly protected.

F. Store products at the site in a manner that will facilitate inspection and measurement of quantity of counting of units.

G. Store heavy materials away from the Project structure in a manner that will not endanger the supporting construction.

H. Store product subject to damage by the elements above ground, under cover in a weathertight enclosure, with ventilation adequate to prevent condensation. Maintain temperature and humidity within range required by manufacturer's instructions.

1.6 OPERATION, MAINTENANCE, TRAINING AND CALIBRATION

A. Furnish manuals and services specified and as required to start-up, operate and maintain all equipment and systems.

PART 2 PRODUCTS

2.1 GENERAL PRODUCT REQUIREMENTS

A. Provide products that comply with the Contract Documents, that are undamaged and, unless otherwise indicated, unused at the time of installation. All products shall be certified asbestos-free.

B. Provide products complete with all accessories, trim, finish, safety guards and other devices and details needed for a complete installation and for the intended use and effect.

C. Where the work requires testing for assurance of performance, that portion of the work shall not proceed until such testing has been completed and written test report has been approved.

D. Do not use material or equipment for any purpose other than for which it is designed or specified.

E. Certification of Compatibility: If indicated, the material and equipment manufacturers shall certify in writing that:

1. Other manufacturer's materials or equipment coming into contact with their product are compatible with their product in every way and that the intended performance of the system in which their product is incorporated will not be affected as a result of such contact. Also, physical breakdown of their product by chemical reaction or otherwise will not occur as a result of such contact.

2. The combination of products by one (1) manufacturer to make up the manufacturer's specified system, will contribute to the performance of the system as intended, and will remain operational, reliable and durable. The manufacturer will be the source of routine maintenance and replacement parts.

F. Reuse of Existing Material

1. Except where indicated or otherwise approved in writing, materials and equipment removed from an existing structure shall not be used in the work.

2. Where use of existing material is indicated or approved, use special care in removing, handling, storing, and reinstallation to assure proper function in the completed work.

2.2 PRODUCT SELECTION PROCEDURES

A. Product selection is governed by the Contract Documents and governing regulations, not by previous Project experience. Procedures governing product selection include the following:

B. Where products or manufacturers are specified by name, description, or performance accompanied by the term "or equivalent substitution", "or approved substitution", "or approved equal" or similar terms comply with the Contract Document provisions concerning "substitutions" to obtain approval for use of an unnamed product.

C. Proprietary Specification Requirements - Where products or manufacturers are named, provide the product indicated or submit a substitution request.

D. Descriptive Specification Requirements - Where Specifications describe a product or assembly, listing exact characteristics required, without use of a brand or trade name, provide a product or assembly that provides the characteristics and otherwise complies with Contract requirements. If descriptive specification also includes manufacturers or products, provide product indicated of submit a substitution request.

E. Performance Specification Requirements - Where Specifications require compliance with performance requirements, provide products that comply with these requirements, and are recommended by the manufacturer for the application indicated. Compliance shall be certified by independent testing agencies furnished by manufacturer. General overall performance of a product is implied where the product is specified for a specific application.

F. Manufacturer's recommendations may be contained in published product literature, or by the manufacturer's certification of performance.

G. Compliance with Standards, Codes and Regulations - Where the Specifications require compliance with an imposed code, standard or regulation, select a product that complies with the standards, codes or regulations specified. Compliance shall be certified by independent testing agencies furnished by manufacturer.

H. Visual Matching - Where Specifications require matching an established sample or existing construction, the Design Professional's decision will be final on whether a proposed product matches satisfactorily.

I. Visual Selection - Where specified product requirements include the phrase "...as selected from manufacturer's standard colors, patterns, textures..." or a similar phrase, select a product and manufacturer that complies with other specified requirements. The Design Professional will select the color, pattern and texture from the product line selected.

J. Allowances - Refer to individual Specification Sections and "Allowance" provisions in Division 1 for allowances that control product selection, and for procedures required for processing such selections.

PART 3 EXECUTION

3.1 ACCEPTABLE INSTALLERS

A. Installers shall be familiar with products and experienced in their installation. Comply with more stringent requirements of individual sections for installer qualifications.

3.2 EXAMINATION OF SUBSTRATE

A. Each installer shall examine substrate onto which the product will be installed. Inspect for any condition which would in any way reduce the quality, performance or durability of the product including but not limited to; dimensional or location tolerances, dampness, dryness, installation not meeting specified criteria for substrate, poor workmanship, etc. Do not proceed with installation over unacceptable substrates. Notify Contractor to have substrate repaired. Work installed over unacceptable substrates shall be redone after substrate is repaired at no cost to the City.

3.3 PREPARATION

A. Protect adjacent work from possible damage which installation could cause including but not limited to staining, overspray, denting, gouging, displacement, etc.

B. Clean and prepare substrates to receive products with primers, bonding agents, barrier coats, etc. as per manufacturer's instructions.

3.4 PASSAGE OF MATERIALS AND EQUIPMENT

A. Establish passage clearances required to deliver and install materials and equipment.

B. Where there will be insufficient clearance for passage of materials and equipment, deliver and protect such equipment before confining construction is installed.

C. If existing structures, equipment and systems must be altered to provide passage of new materials and equipment, engage those skilled in the respective trade to restore structures, equipment, and systems to their original condition at no additional cost. Do not alter structure, equipment, or systems without written approval.

D. In lieu of altering structures to provide passage of materials and equipment, provide materials and equipment that can be disassembled, brought into the building, and reassembled.

E. If exterior windows or doors must be removed to provide passage of materials and equipment into the building, store and protect removed work at the site and reinstall as soon as possible. If any damage occurs to the work during their removal, transit, storage or reinstallation, replace or repair the work to like new condition at no cost to Owner.

3.5 INSTALLATION

A. Comply with manufacturer's instructions and recommendations and requirements of individual specification sections in the applications indicated. If manufacturer's instructions and specifications indicate differing installation techniques, request clarification from Design Professional but generally comply with more stringent requirement.

B. Anchor each product securely in place accurately located and aligned with other Work.

C. Coordinate installation with surrounding Work to allow for optimum end product.

3.6 FIELD QUALITY CONTROL

A. Have manufacturer's technical representative on-site to observe crucial installation steps as required by individual specification sections or as required to meet manufacturer's warranty or to meet other indicated criteria.

3.7 ADJUSTING

A. Adjust installed products for proper operation and fit.

- END -

SECTION 017419
CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART 1 - GENERAL

1.01 SUMMARY

A. This Section includes administrative and procedural requirements for the following:

1. Salvaging nonhazardous demolition and construction waste.

2. Recycling nonhazardous demolition and construction waste.

3. Disposing of nonhazardous demolition and construction waste.

1.02 DEFINITIONS

A. Construction Waste: Building and site improvement materials and other solid waste resulting from construction, remodeling, renovation, or repair operations. Construction waste includes packaging.

B. Demolition Waste: Building and site improvement materials resulting from demolition or selective demolition operations.

C. Disposal: Removal off-site of demolition and construction waste and subsequent sale, recycling, reuse, or deposit in landfill or incinerator acceptable to authorities having jurisdiction.

D. Recycle: Recovery of demolition and construction waste for subsequent processing in preparation for reuse.

E. Salvage: Recovery of demolition and construction waste and subsequent sale or reuse in another facility.

F. Salvage and Reuse: Recovery of demolition and construction waste and subsequent incorporation into the Work.

1.03 PERFORMANCE REQUIREMENTS

A. General: Develop waste management plan that results in end-of-Project minimum rates for salvage/recycling of 75 percent by weight of total waste generated by the Work.

1. Identify materials targeted for salvage and recycling.

1.04 SUBMITTALS

A. Waste Management Plan: Submit via e-Builder within 7 days of date established for the Notice to Proceed.

1. Plan shall identify the diversion goals of the project, relevant construction debris

and materials diverted, implementation protocols, and parties responsible for implementation

B. Waste Reduction Progress Reports: Concurrent with each Application for Payment, submit via e-Builder. Include separate reports for demolition and construction waste. Include the following information:

1. Material category.

2. Generation point of waste.

3. Total quantity of waste in tons.

4. Quantity of waste salvaged, both estimated and actual in tons.

5. Quantity of waste recycled, both estimated and actual in tons.

6. Total quantity of waste recovered (salvaged plus recycled) in tons.

7. Total quantity of waste recovered (salvaged plus recycled) as a percentage of total waste.

C. Waste Reduction Calculations: Before request for Substantial Completion, submit 3 copies of calculated end-of-Project rates for salvage, recycling, and disposal as a percentage of total waste generated by the Work.

D. Records of Donations: Indicate receipt and acceptance of salvageable waste donated to individuals and organizations. Indicate whether organization is tax exempt.

E. Records of Sales: Indicate receipt and acceptance of salvageable waste sold to individuals and organizations. Indicate whether organization is tax exempt.

F. Recycling and Processing Facility Records: Indicate receipt and acceptance of recyclable waste by recycling and processing facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.

G. Landfill and Incinerator Disposal Records: Indicate receipt and acceptance of waste by landfills and incinerator facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.

H. LEED Submittals:

1. Construction Waste Management Plan as outlined above.

   a. Included LEED requirements for Credit MR 2 as defined in the LEED 2009 BD+C Reference Manual.

2. For commingled waste, provide documentation verifying the diversion rate of the waste. Documentation can be either a project-specific diversion rate provided by the sorting facility or the average annual recycling rate for the sorting facility

provided by the regulating local or state government authority.

3. Complete LEED letter template on LEED Online for Credit MR 2, tabulating total waste material, quantities diverted and means by which it is diverted. Upon request submit a statement that requirements for the LEED Credit have been met.

   a. Land clearing debris such as soil, vegetation and rocks are to be excluded from the calculations.
   b. Hazardous materials are the responsibility of the Owner and are to be excluded from calculations.
   c. Units to be consistent for all calculations (either tons or cubic yards).

I. Qualification Data: For refrigerant recovery technician.

J. Statement of Refrigerant Recovery: Signed by refrigerant recovery technician responsible for recovering refrigerant, stating that all refrigerant that was present was recovered and that recovery was performed according to EPA regulations. Include name and address of technician and date refrigerant was recovered.

1.05 QUALITY ASSURANCE

A. Refrigerant Recovery Technician Qualifications: Certified by EPA-approved certification program.

B. Regulatory Requirements: Comply with hauling and disposal regulations of authorities having jurisdiction.

C. Waste Management Conference: Conduct conference at Project site to comply with requirements in Division 01 Section "Project Management and Coordination." Review methods and procedures related to waste management.

1.06 WASTE MANAGEMENT PLAN

A. General: Develop plan consisting of waste identification, waste reduction work plan, and cost/revenue analysis. Indicate quantities by weight or volume, but use same units of measure throughout waste management plan.

1. Include separate sections in plan for demolition and construction waste.

B. Waste Identification: Indicate anticipated types and quantities of demolition and construction waste generated by the Work. Include estimated quantities and assumptions for estimates.

C. Waste Reduction Work Plan: List each type of waste and whether it will be salvaged, recycled, or disposed of in landfill or incinerator. Include points of waste generation, total quantity of each type of waste, quantity for each means of recovery, and handling and transportation procedures.

1. Salvaged Materials for Reuse: For materials that will be salvaged and reused in this Project, describe methods for preparing salvaged materials before

incorporation into the Work.

2. Salvaged Materials for Sale: For materials that will be sold to individuals and organizations, include list of their names, addresses, and telephone numbers.

3. Salvaged Materials for Donation: For materials that will be donated to individuals and organizations, include list of their names, addresses, and telephone numbers.

4. Recycled Materials: Include list of local receivers and processors and type of recycled materials each will accept. Include names, addresses, and telephone numbers.

5. Disposed Materials: Indicate how and where materials will be disposed of. Include name, address, and telephone number of each landfill and incinerator facility.

6. Handling and Transportation Procedures: Include method that will be used for separating recyclable waste including sizes of containers, container labeling, and designated location on Project site where materials separation will be located.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.01 PLAN IMPLEMENTATION

A. General: Implement waste management plan as approved by Owner. Provide handling, containers, storage, signage, transportation, and other items as required to implement waste management plan during the entire duration of the Contract.

B. Waste Management Coordinator: Engage a waste management coordinator to be responsible for implementing, monitoring, and reporting status of waste management work plan. Coordinator shall be present at Project site full time for duration of Project.

C. Training: Train workers, subcontractors, and suppliers on proper waste management procedures, as appropriate for the Work occurring at Project site.

1. Distribute waste management plan to everyone concerned within three days of submittal return.

2. Distribute waste management plan to entities when they first begin work on-site. Review plan procedures and locations established for salvage, recycling, and disposal.

D. Site Access and Temporary Controls: Conduct waste management operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.

1. Designate and label specific areas on Project site necessary for separating materials that are to be salvaged, recycled, reused, donated, and sold.

2. Comply with Division 01 Section "Temporary Facilities and Controls" for controlling dust and dirt, environmental protection, and noise control.

3.02 SALVAGING DEMOLITION WASTE

A. Salvaged Items for Reuse in the Work:

1. Clean salvaged items.

2. Pack or crate items after cleaning. Identify contents of containers.

3. Store items in a secure area until installation.

4. Protect items from damage during transport and storage.

5. Install salvaged items to comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make items functional for use indicated.

B. Salvaged Items for Sale and Donation: Not permitted on Project site.

C. Salvaged Items for Owner's Use:

1. Clean salvaged items.

2. Pack or crate items after cleaning. Identify contents of containers.

3. Store items in a secure area until delivery to Owner.

4. Transport items to Owner's storage area designated by Owner.

5. Protect items from damage during transport and storage.

3.03 RECYCLING DEMOLITION AND CONSTRUCTION WASTE, GENERAL

A. General: Recycle paper and beverage containers used by on-site workers.

B. Recycling Incentives: Revenues, savings, rebates, tax credits, and other incentives received for recycling waste materials shall accrue to Contractor.

C. Procedures: Separate recyclable waste from other waste materials, trash, and debris. Separate recyclable waste by type at Project site to the maximum extent practical.

1. Provide appropriately marked containers or bins for controlling recyclable waste until they are removed from Project site. Include list of acceptable and unacceptable materials at each container and bin.

a. Inspect containers and bins for contamination and remove contaminated

materials if found.

2. Stockpile processed materials on-site without intermixing with other materials. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.

3. Stockpile materials away from construction area. Do not store within drip line of remaining trees.

4. Store components off the ground and protect from the weather.

5. Remove recyclable waste off Owner's property and transport to recycling receiver or processor.

3.04 RECYCLING DEMOLITION WASTE

A. Asphaltic Concrete Paving: Break up and transport paving to asphalt-recycling facility.

B. Concrete: Remove reinforcement and other metals from concrete and sort with other metals.

C. Masonry: Remove metal reinforcement, anchors, and ties from masonry and sort with other metals.

1. Clean and stack undamaged, whole masonry units on wood pallets.

D. Wood Materials: Sort and stack members according to size, type, and length. Separate lumber, engineered wood products, panel products, and treated wood materials.

E. Metals: Separate metals by type.

1. Structural Steel: Stack members according to size, type of member, and length.

2. Remove and dispose of bolts, nuts, washers, and other rough hardware.

F. Asphalt Shingle Roofing: Separate organic and glass-fiber asphalt shingles and felts. Remove and dispose of nails, staples, and accessories.

G. Gypsum Board: Stack large clean pieces on wood pallets and store in a dry location. Remove edge trim and sort with other metals. Remove and dispose of fasteners.

H. Acoustical Ceiling Panels and Tile: Stack large clean pieces on wood pallets and store in a dry location.

1. Separate suspension system, trim, and other metals from panels and tile and sort with other metals.

I. Carpet and Pad: Roll large pieces tightly after removing debris, trash, adhesive, and tack strips.

1. Store clean, dry carpet and pad (if present) in a closed container or trailer provided by Carpet Reclamation Agency or carpet recycler.

J. Equipment: Drain tanks, piping, and fixtures. Seal openings with caps or plugs. Protect equipment from exposure to weather.

K. Plumbing Fixtures: Separate by type and size.

L. Piping: Reduce piping to straight lengths and store by type and size. Separate supports, hangers, valves, sprinklers, and other components by type and size.

M. Lighting Fixtures: Separate lamps by type and protect from breakage.

N. Electrical Devices: Separate switches, receptacles, switchgear, transformers, meters, panelboards, circuit breakers, and other devices by type.

O. Conduit: Reduce conduit to straight lengths and store by type and size.

3.05 RECYCLING CONSTRUCTION WASTE

A. Packaging:

1. Cardboard and Boxes: Break down packaging into flat sheets. Bundle and store in a dry location.

2. Polystyrene Packaging: Separate and bag materials.

3. Pallets: As much as possible, require deliveries using pallets to remove pallets from Project site. For pallets that remain on-site, break down pallets into component wood pieces and comply with requirements for recycling wood.

4. Crates: Break down crates into component wood pieces and comply with requirements for recycling wood.

B. Site-Clearing Wastes: Chip brush, branches, and trees on-site or at landfill facility. Do not include land clearing debris such as soil, vegetation and rocks in LEED calculations.

C. Wood Materials:

1. Clean Cut-Offs of Lumber: Grind or chip into small pieces.

2. Clean Sawdust: Bag sawdust that does not contain painted or treated wood.

D. Gypsum Board: Stack large clean pieces on wood pallets and store in a dry location.

3.06 DISPOSAL OF WASTE

A. General: Except for items or materials to be salvaged, recycled, or otherwise reused, remove waste materials from Project site and legally dispose of them in a landfill or incinerator acceptable to authorities having jurisdiction.

1. Except as otherwise specified, do not allow waste materials that are to be disposed of accumulate on-site.

2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.

B. Burning: Do not burn waste materials.

C. Disposal: Transport waste materials off Owner's property and legally dispose of them.

- END -

SECTION 017423

CLEANING

PART 1 GENERAL

1.1 DESCRIPTION OF WORK

A. This Section specifies each Prime Contractor's cleaning of the Work during construction and before completion.

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. Applicable provisions of Bidding Requirements, Contract Requirements in Division 0 and all applicable Division 1 sections.

B. Additional cleaning is specified under the technical sections for that work.

PART 2 PRODUCTS

2.1 MATERIALS

A. Use only cleaning materials recommended by manufacturer of surface to be cleaned.

B. Use cleaning materials only on surfaces recommended by cleaning material manufacturer.

PART 3 EXECUTION

3.1 PERIODIC CLEANING

A. Maintain areas free of waste materials, debris, and rubbish. Maintain site in a clean and orderly condition.

B. Broom clean paved surfaces. Rake clean other surfaces of grounds. Remove snow and ice from access to building.

C. Remove debris and rubbish from pipe chases, plenums, attics, crawl spaces, and other closed or remote spaces, prior to enclosing the space.

D. Broom and vacuum clean interior areas prior to start of surface finishing, and continue cleaning to eliminate dust.

E. Collect and remove waste materials, debris, and rubbish from site periodically and dispose of legally off-site.

F. Open free-fall chutes not permitted. Terminate closed chutes into appropriate containers with lids.

G. Clean mechanical equipment, ductwork and replace filters as specified under Division 23.

H. Clean electrical work including lighting fixtures as specified under Division 26.

I. Maintain cleaning until Project or portion thereof is accepted by Certificate of Substantial Completion. If minor work is required after Substantial Completion, clean affected areas afterwards.

3.2 FINAL CLEANING

A. Immediately before observation of the Work for Substantial Completion, clean all sight-exposed surfaces. Clean all ledges and other horizontal or near horizontal surfaces that may not be sight-exposed but are contiguous to finished spaces.

B. At Substantial Completion, clean and renovate permanent facilities that have been used during the construction period, including but not limited to:

1. Replace air filters and clean inside of ductwork and housings.

2. Replace significantly worn parts and parts that have been subject to unusual operating conditions.

3. Replace lamps that are burned out or noticeably dimmed by substantial hours of use.

- END -

SECTION 017700

CLOSEOUT PROCEDURES

PART 1 GENERAL

1.1 DESCRIPTION OF WORK

A. This Section specifies each Prime Contractor's administrative and procedural requirements for project closeout.

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. Applicable provisions of Bidding Requirements, Contract Requirements in Division 0 and all applicable Division 1 sections.

1.3 SUBSTANTIAL COMPLETION

A. When the work is considered substantially complete, submit a written notice to Project Coordinator that the Work, or a designated portion thereof, is substantially complete. Include a list of all items that require completion or correction.

B. Within a reasonable time after receipt of such notice, an inspection by the City will be made to determine the status of completion.

C. If the Work is not considered substantially complete; the Contractor will be notified in writing, giving the reasons therefore.

D. Contractor shall remedy the deficiencies in the Work, and send a second written notice of substantial completion. This notice shall include a statement of action taken on each item noted as requiring correction or completion to achieve "Substantial Completion" status.

E. The Work will be inspected a second time and if not considered substantially complete, the two steps in paragraphs A and B above will be repeated.

F. When the Project Coordinator concurs that the Work is substantially complete, he/she will:

1. Prepare a Certificate of Substantial Completion on City form, accompanied by Contractor's list of items to be completed or corrected, as verified and amended by the Project Coordinator.

2. Submit the Certificate to Contractor for written notice of the responsibilities assigned in the Certificate.

G. Contractor shall prepare Application for Payment at Substantial Completion and complete administrative and submittal requirements per Section 012900 Payment Procedures.

1.4 FINAL OBSERVATION

A. When the Work is considered complete, submit written certification that:

1. Contract Documents have been reviewed.

2. Work has been inspected by the Contractor and has been completed in compliance with Contract Documents.

3. Equipment and systems have been tested in the presence of the Project Coordinator and are operational.

4. Work is ready for final observation.

B. Inspection by the City will be made to verify the status of completion with reasonable promptness after receipt of such certification.

C. If the Work is not considered complete; the Contractor will be notified in writing, listing the incomplete or defective Work.

D. Contractor shall take immediate steps to remedy the stated deficiencies, and, after correcting deficiencies, he shall send a second written certification that the Work is complete. This certification shall itemize each deficiency noted and a statement of action taken to remedy or complete the Work.

E. The Work will be observed a second time and if not considered substantially complete, the two steps in paragraphs A and B above will be repeated.

F. When the Work is acceptable under the Contract Documents, the Contractor shall be requested to make closeout submittals.

1.5 ADDITIONAL OBSERVATION FEES

A. Should more than two observations at substantial or final completion and/or for required mock ups be required due to failure of the Work to comply with the claims of status of completion made by the Contractor:

1. City will compensate the Design Professional for such additional services.

2. City will deduct the amount of such compensation from the final payment to the Contractor.

1.6 CLOSEOUT SUBMITTALS

A. When the Work is complete submit the following:

1. Evidence of compliance with requirement of governing authorities as follows:

a. Certificate of Occupancy.

b. Certificates of Inspection for Work requiring Certificate of Inspection by governing authority.

c. Certificate and Reports of Inspection, Testing and Approval.

2. Project Record Documents as specified under Division 1.

3. Operation and Maintenance Manuals as specified under Division 1.

4. Warranties as specified under Division 1.

5. Keys and Keying Schedule as specified under Finish Hardware - Division 8.

6. Spare Parts and Maintenance Materials as specified.

7. Evidence of Payment and Release of Liens to the requirements of General and Supplementary Conditions.

8. Requirements for Final Payment Application per Section 012900 Payment Procedures, Division 1.

9. Consent of Surety.

1.7 SPARE PARTS AND MAINTENANCE MATERIALS

A. Furnish spare parts and maintenance materials as specified under various Sections of the Specifications.

B. Package and label parts and materials as directed and store in area of the building where directed by the Project Coordinator.

1.8 FINAL ADJUSTMENT OF ACCOUNTS

A. Submit a final statement of accounting.

B. Statement shall reflect all adjustments to the Contract Sum:

1. The original Contract Sum.

2. Additions and deductions resulting from:

a. Previous Change Orders.

b. Change Orders caused by substitutions including deductions for review.

3. Deductions for uncorrected Work.

4. Deductions for re-inspection payments.

5. Other adjustments.

6. Total Contract Sum, as adjusted.

7. Previous payments.

8. Sum remaining due.

C. The Project Coordinator will prepare a final Change Order, reflecting approved adjustments to the Contract Sum which were not previously made by Change Orders.

1.9 FINAL APPLICATION FOR PAYMENT

A. Submit the final Application for Payment in accordance with procedures and requirements stated herein.

PART 2 PRODUCTS Not Used

PART 3 EXECUTION

3.1 Sample Certificate of Substantial Completion Form, see Project Coordinator for actual form.

CERTIFICATE OF SUBSTANTIAL COMPLETION	CITY OF PHILADELPHIA **CAPITAL PROGRAM OFFICE** 1515 ARCH STREET, 10TH FLOOR PHILADELPHIA, PA 19102

Architect/Engineer:
[Design Consultant
Street Address
City, State, Zip Code]

Owner:
City of Philadelphia
CAPITAL PROGRAM OFFICE
City Hall / 1400 John F Kennedy Blvd
Philadelphia, PA 19107

Location:
[Using Agency Name
Name of Facility
Address of Facility
Philadelphia, PA Zip Code]

Inspection Date: [Date]
DPP Project Number: [00-00-0000-00]
Contract Number: [00-0000]
Purchase Order Number: [POXX00000000]

Contractor:
[Name of Company
Address of Company
City, State, Zip Code]

Contract Description (Project Title):

The Work performed under this contract or designated portion of the contract has been observed by the Architect/ Engineer and to the best of his/her knowledge, information and belief the Work is hereby found to be substantially completed on the above date in accordance to the contract documents.

This certificate does not denote final acceptance. The date of Substantial Completion is the date of the start of the warranty and guarantee periods required by the contract documents, except as listed below:
[Enter Information or None]

The list of items to be completed or corrected is attached as exhibit "A". All items listed are to be completed no later than [00/00/00.] The completion of these items on the proposed date constitutes the effective warranty date for said items.

A list of items to be completed or corrected, commonly known as a punch list, is attached hereto. This list may not be exhaustive, and the failure to include an item on it does not alter the responsibility of the Contractor to complete all of the work in accordance with the contract documents.

[Design Consultant
Street Address
City, State, Zip Code]

_____ _____
Authorized Representative Date

The Contractor accepts this Certificate of Substantial Completion and agrees to complete and/or correct the items on the list by [00/00/00].

[Name of Contractor
Address of Company
City, State, Zip Code]

_____ _____
Authorized Representative Date

The Owner accepts the Work as substantially complete and will assume full possession of the building on the date of [00/00/00]. The Owner accepts responsibility for utilities, security and insurance hereafter. All applicable warranties required by the contract documents become effective on the above date.

City of Philadelphia
CAPITAL PROGRAM OFFICE
Philadelphia City Hall
1400 John F Kennedy Blvd
Philadelphia, PA 19107

_____ _____
Authorized Representative(Project Coordinator) Date

Definition of Substantial Completion

The date of substantial completion of a project or specified area of a project is the date when the contract is sufficiently completed, in accordance with the contract documents, as modified by any change orders agreed to by the parties, so that the Owner can occupy or utilize the project or specified area of the project for the use for which it was intended.

cc. Jason Stevens-Project Director QA/PC, File-Project # Sect. 4.18

– END –

SECTION 017823

OPERATION AND MAINTENANCE MANUALS

PART 1 GENERAL

1.1 DESCRIPTION OF WORK

A. This Section describes each Prime Contractor's procedural requirements for compiling and submitting operation and maintenance data.

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. Applicable provisions of Bidding Requirements, Contract Requirements in Division 0 and all applicable Division 1 sections.

B. Individual Specifications Sections: Specific requirements for operation and maintenance data.

1.3 QUALITY ASSURANCE

A. Prepare instructions and data by personnel experienced in maintenance and operation of described products.

1.4 FORMAT

A. Prepare data in the form of an instructional manual.

B. Binders: Commercial quality, 8-1/2 by 11 inch three ring binders with plastic covers. When multiple binders are used, correlate data into related consistent groupings.

C. Cover: Identify each binder with typed or printed title OPERATION AND MAINTENANCE INSTRUCTIONS; identify title of Project; identify subject matter of contents.

D. Provide tabbed flyleaf, indexed for each separate product and system, with typed description of product and major component parts of equipment.

E. Text: Manufacturer's printed data or typewritten data.

F. Drawings: Provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages.

G. Contents: Prepare a Table of Contents for each volume, with each Product or system description identified, in three parts as follows:

1. Part 1: Directory, listing names, addresses, and telephone numbers of Design Professional, Contractor, Subcontractors, and major equipment suppliers.

2. Part 2: Operation and maintenance instructions, arranged by process flow and subdivided by specification section 0111000 . For each category, identify names, addresses and telephone numbers of Subcontractors and suppliers. Identify the following:

   a. Significant design criteria.

   b. List of equipment.

   c. Parts list for each component.

d. Operating instructions.

e. Maintenance equipment for equipment and systems.

f. Maintenance instructions for [special] finishes, including recommended cleaning methods and materials, and special precautions identifying detrimental agents.

3. Part 3 - Project documents and certificates, including the following:

a. Shop drawings and product data.

b. Air and water balance reports.

c. Certificates.

d. Photocopies of warranties and bonds.

H. Data

1. For Each Product or System - List names, addresses and telephone numbers of Subcontractors and suppliers, including local source of supplies and replacement parts.

2. Product Data - Mark each sheet to clearly identify specific products and component parts, and data applicable to installation. Delete inapplicable information.

3. Drawings - Supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams. Do not use Project Record Documents as maintenance drawing.

1.5 MANUAL FOR MATERIALS AND FINISHES

A. Building Products, Applied Materials, and Finishes: Include product data, with catalog number, size, composition, and color and texture designations. Provide information for re-ordering custom manufactured products.

B. Instructions for Care and Maintenance: Include manufacturer's recommendations for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.

C. Moisture Protection and Weather Exposed Products: Include product data listing applicable reference standards, chemical composition, and details of installation. Provide recommendations for inspections, maintenance, and repair.

D. Additional Requirements: As specified in individual Product Specification sections.

1.6 MANUAL FOR EQUIPMENT AND SYSTEMS

A. Each Item of Equipment and Each System: Include description of unit or system, and component parts. Identify function, normal operating characteristics, and limiting conditions. Include performance curves, with engineering data and tests, and complete nomenclature and model number of replaceable parts.

B. Panelboard Circuit Directories - Provide electrical service characteristics, controls, and communications.

C. Include color-coded wiring diagrams as installed.

D. Operating Procedures - Include start-up, break-in, and routine normal operating instructions and sequences. Include regulation, control, stopping, shutdown and emergency instructions. Include summer, winter, and any special operating instructions.

E. Maintenance Requirements: Include routine procedures and guide for disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.

F. Troubleshooting: Include step-by-step chart listing common problems with appropriate repairs.

G. Provide servicing and lubrication schedule, and list of lubricants required.

H. Include manufacturer's printed operation and maintenance instructions.

I. Include sequences of operation by controls manufacturer.

J. Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.

K. Provide control diagrams by controls manufacturer as installed.

L. Provide charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams.

M. Provide list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.

N. Include test and balancing reports as specified.

O. Additional Requirements - As specified in individual Product specification sections.

P. Where the complexity of machinery is such that regular maintenance by a specialty service company is normal, or may be required by law, give notice thereof in writing.

1.7 INSTRUCTION OF CITY PERSONNEL

A. Before final inspection, instruct City's designated personnel in operation, adjustment, and maintenance of products, equipment, and systems, at agreed upon times.

B. For equipment requiring seasonal operation, perform instructions for other seasons within 6 months.

C. Use operation and maintenance manuals as basis for instruction. Review contents of manual with personnel in detail to explain all aspects of operation and maintenance.

D. Prepare and insert additional data in Operation and Maintenance Manual when need for such data becomes apparent during instruction.

1.8 SUBMITTALS

A. For equipment, or component parts of equipment put into service during construction and operated by City, submit documents within ten days after acceptance.

B. Submit 2 copies of completed volumes 15 days prior to final inspection. This copy will be reviewed and returned after final observation, with comments. Revise content of all document sets as required prior to final submission.

C. Submit 3 sets of revised final volumes in final form prior to or coincidental with Final Application for Payment.

PART 2 - PRODUCTS Not Used

PART 3 - EXECUTION Not Used

- END -

SECTION 017839

PROJECT RECORD DOCUMENTS

PART 1 GENERAL

1.1 DESCRIPTION OF WORK

A. This Section describes each Prime Contractor's administrative and procedural requirements for recording final product and material selections, changes to the Contract, and recording Work concealed by subsequent construction.

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. Applicable provisions of Bidding Requirements, Contract Requirements in Division 0 and all applicable Division 1 sections.

1.3 MAINTENANCE OF DOCUMENTS

A. Maintain at job site, one (1) copy of record documents including Drawings, Specifications, Addenda, Change Orders and other modifications, Shop Drawings, product data and samples.

B. In addition, maintain one (1) copy of field orders or written instructions, field test records, testing and inspection reports, progress reports, meeting minutes and construction photographs.

C. Maintain documents in a clean, dry, legible condition and in good order.

D. Make documents available at all times for inspection.

E. Review documents at progress meetings.

1.4 RECORDING

A. Neatly label each document and binder with "Project Record" and project name and location.

B. Record information concurrently with construction progress.

C. Do not conceal any work until required information is recorded.

D. Record Construction Drawings and Shop Drawings: Mark the set to show the actual installation where the installation varies substantially from the Work as originally shown. Mark whichever drawing is most capable of showing conditions fully and accurately; where Shop Drawings are used, record a cross-reference at the corresponding location on the Contract Drawings. Give particular attention to concealed elements that would be difficult to measure and record at a later date.

1. Note horizontal and vertical locations of concealed elements, referenced to permanent, visible features.

2. Note field changes of dimension and detail.

3. Note details not on original Contract Drawings.

E. Record Project Manual: Mark to show substantial variations in actual Work performed in comparison with the text of the original. Give particular attention to substitutions, selection of options and similar information on elements that are concealed or cannot otherwise be readily discerned later by direct observation. Note related record drawing information and Product Data.

F. Record Product Data: Maintain one copy of each Product Data submittal. Mark documents to show significant variations in actual Work performed in comparison with information submitted. Give particular attention to concealed products and portions of the Work that cannot otherwise be readily discerned later by direct observation. Note related Change Orders and mark-up of record drawings and Specifications.

1.5 SUBMITTALS

A. Preceding or coincidental with the final pay application, submit the following:

B. Record Construction Drawings: [One (1) set] of reproducible mylar transparencies showing all notations specified above. Transparencies of the Design Professional's drawings may be used for this purpose upon reimbursement of the printing costs to the Design Professional.

C. Record Shop Drawings: One (1) copy of any shop drawings.

D. Record Project Manual: One (1) copy bound in 3 ring binders.

E. Record Product Data: One (1) copy organized by CSI format bound in 3 ring binders.

F. If review of Record Documents reveals noncompliance with Contract Documents, Contractor shall correct deficiencies and resubmit.

PART 2 PRODUCTS Not Used

PART 3 EXECUTION Not Used

- END -

SECTION 024113

SELECTIVE SITE DEMOLITION

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:

1. Demolition of designated curbs, sidewalks, pavement and aggregate bases, and other site improvements shown to be removed

2. Abandoning in place or removing below-grade construction.

3. Disconnecting, capping or sealing, and abandoning in place or removing site utilities.

4. Saw-cutting pavement.

5. Disposal and/or recycling of demolished materials.

B. This section does not include demolition of buildings or other above-grade structures.

1.3 REFERENCES

A. The most current version of the publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

B. City of Philadelphia Building Code.

C. Philadelphia Water Department: Standard Details and Specifications for Sewers.

D. AMERICAN NATIONAL STANDARDS INSTITUTE

1. ANSI A10.6: Safety Requirements for Demolition Operations.

E. NATIONAL FIRE PROTECTION ASSOCIATION

1. NFPA 241: Standard for Safeguarding Construction, Alteration, and Demolition Operations.

F. The Contractor is required to have one copy of the latest edition of each of the following publications available for review in the job-site construction office at all times while performing the work described in this Section. The Contractor is to comply with each of the following unless more stringent requirements are indicated or specified.

1. City of Philadelphia, Department of Streets: Standard Construction Items, except that measurement and payment sections do not apply.

1.4 RELATED WORK

A. Section 312000, Earth moving.

1.5 SUBMITTALS

A. Pre-demolition Photographs, 35 mm or digital or Videotape/DVD: Show existing conditions of adjoining construction and site improvements, including finish surfaces, that might be misconstrued as damage caused by demolition operations. Submit before Work begins.

B. Schedule of Demolition Activities to be submitted before work begins: Indicate the following:

1. Detailed sequence of demolition and removal work, methods, and equipment required for demolition and disposal, with starting and ending dates for each activity.

2. Coordination for shutoff, and capping of utility services.

C. Evidence of disposal and recycling contracts (for information only)

D. Record drawings of removed and abandoned utilities, indicating locations, sizes, materials, and elevations. Drawings shall be legible, drawn to scale, and contain sufficient information to locate abandoned utilities after excavations are backfilled.

1.6 QUALITY ASSURANCE

A. Regulatory Requirements: Comply with governing local, State, and Federal notification regulations before beginning demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.

B. Standards: Comply with ANSI A10.6.

1.7 DEFINITIONS

A. Remove: Detach items from existing construction and legally dispose of them off-site unless indicated to be removed and salvaged or recycled.

B. Existing to Remain: Existing items of construction that are not to be removed and that are not otherwise indicated to be removed, removed and salvaged, or recycled.

1.8 MATERIALS OWNERSHIP

A. Unless otherwise noted, all cleared or demolished materials shall become Contractor's property and shall be promptly removed from the site.

1.9 PROJECT CONDITIONS

A. Work on the site under other contracts may be concurrent with this contract. The Contractor shall coordinate the demolition sequence with all other contractors. The Contractor shall

provide all temporary bracing, shoring, and supports that may be required to ensure the safety of personnel in areas of the site adjacent to the demolition area.

B. Owner assumes no responsibility for site features to be demolished.

C. Conditions existing at time of inspection for bidding purposes will be maintained by Owner as far as practicable.

D. Storage or sale of removed items or materials on-site is not permitted.

1.10 COORDINATION

A. Arrange demolition schedule so as not to interfere with other contractor's on-site operations.

B. Contact utility owners to arrange for shutoff of utilities prior to removal.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 EXAMINATION

A. Survey existing conditions and correlate with requirements indicated to determine extent of site demolition required.

B. Review Project Record Documents of existing construction available by Owner. Owner does not guarantee that existing conditions are the same as those indicated in Project Record Documents.

C. When unanticipated elements are encountered, investigate and measure the nature and extent of the element. Promptly submit a written report to the Owner.

3.2 PREPARATION

A. Notify the Pennsylvania One-Call System at 1-800-242-1776 in accordance with Pennsylvania Act 287 and all amendments. Retain the services of a utility locator for identification of underground utilities on private property.

B. Predemolition Conference: Conduct conference at Project site with Owner to discuss the following:

1. Inspect and discuss condition of construction to be demolished.

2. Review and finalize demolition schedule and verify availability of demolition personnel, equipment, and facilities needed to make progress and avoid delays.

3. Notify owner of procedures which may affect property, of potential noise, utility outage, or disruption. Coordinate with Owner.

C. Review and finalize protection requirements.

D. Arrange to discontinue utility service with utility companies and other agencies:

E. Obtain all required permits and post all required notifications prior to beginning the work.

F. Existing Utilities: Do not start demolition work until utility disconnection/de-energization have been completed and verified in writing.

G. Temporary Shoring: Provide and maintain interior and exterior shoring, bracing, or structural support to preserve stability and prevent unexpected movement or collapse of construction being demolished.

H. Strengthen or add new supports when required during progress of demolition.

3.3 SAW CUTTING

A. Saw-cut pavement at limits of removal where remaining pavement is to be incorporated into new work.

B. Footway: In accordance with Philadelphia Streets Department Standard Construction Item No. 7-0050.

C. Street Pavement: Full depth saw cuts will be required where cutting utility trenches in the street and at the limits of full depth pavement removal. Full depth saw cuts shall be in accordance with Philadelphia Streets Department Standard Construction Item No. 7-0050 except as follows:

1. Saw-cut pavement at limits of removal where remaining pavement is to be incorporated into new work. Saw cuts shall be neat, straight, and a minimum of 1” in depth. Full depth saw cuts will be required where cutting utility trenches in the street.

3.4 PROTECTION

A. Existing Facilities: Protect adjacent walkways, bike trails, building entries, and other building facilities during demolition operations.

B. Temporary Protection: Erect temporary protection, such as walks, fences, barriers, railings, and security devices where required by authorities having jurisdiction or as indicated.

C. Protect existing site appurtenances and landscaping which are to remain.

D. Protect existing site items which are not indicated to be removed.

E. Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities which are to remain.

F. Provide protection to ensure safe passage of people and vehicles around demolition areas, and to and from occupied portions of adjacent buildings and structures.

3.5 GENERAL DEMOLITION

A. General: Demolish indicated site improvements completely. Use methods required to complete the Work within limitations of governing regulations.

B. Engineering Surveys: Perform regular engineering surveys of the entire work area as the Work progresses to detect hazards that may result from demolition activities. Maintain a written log of survey times, dates, and findings.

C. Site Access and Temporary Controls: Conduct demolition and debris-removal operations to ensure minimum interference with roads, streets, sidewalks, walkways, and other adjacent occupied and used facilities.

1. Do not close or obstruct streets, walks, walkways, bike trails, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by authorities having jurisdiction.

2. Use water mist, dust control palliatives, and other suitable methods to limit spread of dust and dirt. Comply with governing environmental-protection regulations. Do not use water when it may damage adjacent construction or create hazardous or objectionable conditions, such as ice, flooding, contaminated runoff, and pollution.

D. Cease operations immediately if adjacent structure appears to be in danger. Notify Engineer.

3.6 EXPLOSIVE DEMOLITION

A. Explosives: Use of explosives is not permitted.

3.7 TREE REMOVAL

1. No trees shall be removed except as specifically directed by the Professional and indicated on the plans.

3.8 RESTORATION

A. Below-Grade Areas: Fill below-grade areas and voids resulting from utility demolition operations with satisfactory soil materials. Refer to Division 31, Earth Moving Section for soil materials and compaction.

3.9 REPAIRS

A. General: Promptly repair damage to adjacent construction.

B. Where repairs to existing surfaces are required, patch to produce surfaces suitable for new materials.

C. Restore exposed finishes of patched areas and extend restoration into adjoining construction in a manner that eliminates evidence of patching and refinishing.

3.10 RECYCLING DEMOLISHED MATERIALS

A. Recycling Incentives: Revenues for recycling demolition materials shall accrue to the contractor unless otherwise noted in the Project Documents.

3.11 DISPOSAL OF DEMOLISHED MATERIALS

A. General: Except for items or materials planned to be recycled, salvaged, reused, or otherwise indicated to remain Owner's property, remove demolished materials from Project site and legally dispose of them in a permitted, regulated disposal facility.

1. Do not allow demolished materials to accumulate on-site.

2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.

B. Burning or burial: Do not burn or bury demolished materials unless otherwise specified.

C. Disposal: Transport demolished materials off Owner's property and legally dispose of them.

3.12 CLEANING

A. Clean adjacent structures, streets, sidewalks, and other pavement surfaces to remain free of dust, dirt, and debris caused by demolition operations. Return adjacent areas to condition existing before demolition operations began.

- END -

SECTION 033000

LANDSCAPE CAST-IN-PLACE CONRETE

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes cast-in-place concrete, including but not limited to formwork, reinforcement, concrete materials, mixture design, placement procedures, and finishes of the following:

1. Flushed Concrete Curbs
2. Concrete Bases, Foundations & Footings
3. Miscellaneous Concrete Work

B. Related Sections:

1. Section 05 52 13 - Metal Railings.
2. Section 12 93 00 - Site Furnishings.
3. Section 31 20 00 - Earth Moving.
4. Section 32 13 13 - Plain Cement Concrete Paving.
5. Section 32 13 43 - Pervious Concrete Paving.

1.2 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Design Mixtures: For each concrete mixture.

C. Steel Reinforcement Shop Drawings: Placing drawings that detail fabrication, bending, and placement.

D. Welding certificates.

E. Material certificates.

F. Material test reports.

G. Floor surface flatness and levelness measurements.

1.3 QUALITY ASSURANCE

A. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94M requirements for production facilities and equipment.

1. Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities."

B. Testing Agency Qualifications: An independent agency, qualified according to ASTM C 1077 and ASTM E 329 for testing indicated.

C. ACI Publications: Comply with the following unless modified by requirements in the Contract Documents:

1. ACI 117 – Specification for Tolerances for. Concrete Construction and Materials,
2. ACI 301 – Specification for Structural Concrete.
3. ACI 318 – Building Code Requirements for Structural Concrete.

D. Concrete Testing Service: Contractor is responsible for all concrete testing (strength, slump, and air content).

E. Design of type and size of footing and foundation system will be based on soil bearing capacity as established by geotechnical test borings and geotechnical report foundation recommendations.

PART 2 - PRODUCTS

2.1 FORM-FACING MATERIALS

A. Rough-Formed Finished Concrete: Plywood, lumber, metal, or another approved material. Provide lumber dressed on at least two edges and one side for tight fit.

2.2 STEEL REINFORCEMENT

A. Steel Reinforcement (epoxy-coated when required), Fabricate according to CRSI, "Manual of Standard Practice.":

1. Reinforcing Bars: ASTM A 615/A 615M, Grade 60, deformed.
2. Plain-Steel Wire: ASTM A 82, galvanized.
3. Galvanized-Steel Welded Wire Reinforcement: ASTM A 185, plain, fabricated from galvanized steel wire into flat sheets.

B. Reinforcement Accessories:

1. Zinc Repair Material: ASTM A 780, zinc-based solder, paint containing zinc dust, or sprayed zinc.
2. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting and fastening reinforcing bars and welded wire reinforcement in place. Manufacture bar supports from steel wire, plastic, or precast concrete according to CRSI's "Manual of Standard Practice., of greater compressive strength than concrete and as follows:

a. For zinc-coated reinforcement, use galvanized wire or dielectric-polymer-coated wire bar supports.

2.3 CONCRETE MATERIALS

A. Cementitious Material: Use the following cementitious materials, of the same type, brand, and source, throughout Project:

1. Portland Cement: ASTM C 150, Type I

a. Fly Ash: ASTM C 618, Class F.
b. Ground Granulated Blast-Furnace Slag: ASTM C 989, Grade 100 or 120.
c. Gray color.

B. Normal-Weight Aggregates: ASTM C 33, Coarse Aggregate, graded, from of single source.

1. Maximum Coarse-Aggregate Size: 3/4 inch nominal.
2. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.

C. Water: ASTM C 94/C 94M and potable.

2.4 ADMIXTURES

A. Air-Entraining Admixture: ASTM C 260.

B. Chemical Admixtures: Provide admixtures certified by manufacturer to be compatible with other admixtures and that will not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride.

1. Water-Reducing Admixture: ASTM C 494/C 494M, Type A.
2. Retarding Admixture: ASTM C 494/C 494M, Type B.

2.5 CURING MATERIALS

A. Evaporation Retarder: Plastic Vapor Retarder: ASTM E1745, Class A or B, 10 mils thick. Include manufacturer's recommended adhesive or pressure-sensitive tape.

B. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. when dry.

C. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.

D. Water: Potable.

E. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B, dissipating.

2.6 RELATED MATERIALS

A. Expansion- and Isolation-Joint-Filler Strips: ASTM D 1751, asphalt-saturated cellulosic fiber.

2.7 CONCRETE MIXTURES

A. Prepare design mixtures for each type and strength of concrete, proportioned based on laboratory trial mixture or field test data, or both, according to ACI 301.

B. Cementitious Materials: Use fly ash, pozzolan, ground granulated blast-furnace slag, and silica fume as needed to reduce the total amount of Portland cement, which would otherwise be used, by not less than 40 percent.

C. Proportion normal-weight concrete mixture as follows:

1. Minimum Compressive Strength: 4000 psi at 28 days.
2. Maximum Water-Cementitious Materials Ratio: 0.45
3. Slump Limit: 4 inches before adding high-range water-reducing admixture or plasticizing admixture.
4. Air Content: 5.5 percent, plus or minus 1.5 percent at point of delivery for 1-1/2-inch nominal maximum aggregate size.
5. Contractor is responsible for providing the mix design.

PART 3 - EXECUTION

3.1 FORMWORK

A. Design, erect, shore, brace, and maintain formwork, according to ACI 301, to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until structure can support such loads.

B. Construct formwork so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117.

3.2 EMBEDDED ITEMS

A. Place and secure anchorage devices and other embedded items required for adjoining work that is attached to or supported by cast-in-place concrete. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.

3.3 STEEL REINFORCEMENT

A. General: Comply with CRSI's "Manual of Standard Practice" for placing reinforcement.

1. Do not cut or puncture vapor retarder. Repair damage and reseal vapor retarder before placing concrete.

3.4 JOINTS

A. General: Construct joints true to line with faces perpendicular to surface plane of concrete.

B. Construction Joints: Install so strength and appearance of concrete are not impaired, at locations indicated or as approved by Landscape Architect.

C. Contraction Joints / Control Joints in Slabs-on-Grade: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Provide contraction joints / control joints at a spacing as required to prevent cracking.

1. Grooved Joints: Form contraction joints after initial floating by grooving and finishing each edge of joint to a radius of 1/8 inch. Repeat grooving of contraction joints after applying surface finishes. Eliminate groover tool marks on concrete surfaces.

D. Isolation Joints in Slabs-on-Grade: After removing formwork, install joint-filler strips at slab junctions with vertical surfaces, such as column pedestals, foundation walls, grade beams, and other locations, as indicated.

3.5 CONCRETE PLACEMENT

A. Before placing concrete, verify that installation of formwork, reinforcement, and embedded items is complete and that required inspections have been performed.

B. Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete will be placed on concrete that has hardened enough to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as indicated. Deposit concrete to avoid segregation.

1. Consolidate placed concrete with mechanical vibrating equipment according to ACI 301.

C. Cold-Weather Placement:

1. Discontinue concrete placement when air temperature reaches 40º F and is falling.
2. Do not resume until air temperature reaches 35º F and is rising.
3. Furnish and install covers for maintaining concrete at a temperature of at least 50º F for not less than 72 hours after placing.

D. Hot-Weather Placement: During periods of hot weather when the maximum daily air temperature is likely to exceed 85º F.

1. Sprinkle forms and/or underlying material with water immediately before concrete is placed.
2. Place concrete at coolest temperature practicable, but in no case will the temperature of concrete when placed exceed 90º F.
3. Cool aggregates and/or mix with water as necessary.
4. Chipped ice in mixing water may be required to cool concrete, subject to approval of the Landscape Architect.
5. Place concrete continuously and rapidly at a rate of not less than 100 feet of paving lane per hour.
6. Keep finished surface of newly laid pavement damp by applying a water fog or

mist with approved spraying equipment.

3.2 FINISHING FORMED SURFACES

A. Rough-Formed Finish: As-cast concrete texture imparted by form-facing material with tie holes and defects repaired and patched. Remove fins and other projections that exceed specified limits on formed-surface irregularities.

1. Apply to concrete surfaces not exposed to public view.

3.3 FINISHING SLABS

A. General: Comply with ACI 302.1R recommendations for screeding, re-straightening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.

B. Float Finish: Consolidate surface with power-driven floats or by hand floating if area is small or inaccessible to power driven floats. Restraighten, cut down high spots, and fill low spots. Repeat float passes and re-straightening until surface is left with a uniform, smooth, granular texture.

3.4 CONCRETE PROTECTING AND CURING

A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and ACI 301 for hot-weather protection during curing.

B. Evaporation Retarder: Apply evaporation retarder to unformed concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.

C. Cure concrete according to ACI 308.1, by one or a combination of the following methods:

1. Moisture Curing: Keep surfaces continuously moist for not less than seven days.
2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches, and sealed by waterproof tape or adhesive. Cure for not less than seven days. Immediately repair any holes or tears during curing period using cover material and waterproof tape.
3. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating and repair damage during curing period.

3.5 CONCRETE SURFACE REPAIRS

A. Defective Concrete: Repair and patch defective areas when approved by Architect. Remove and replace concrete that cannot be repaired and patched to Architect's

approval.

3.6 FIELD QUALITY CONTROL

A. Testing and Inspecting: An Inspection Agency must be present for all concrete deliveries and must get tickets for each truck.
B. Philadelphia Parks & Recreation's project inspector must be notified prior to every concrete pour.

- END -

SECTION 055213
METAL RAILINGS

PART 1 GENERAL

1.1 SUMMARY

A. Section includes the following items:

1. Landscape/site railing and guardrail assemblies.
2. Free-standing railings at exterior steps

1.2 RELATED REQUIREMENTS

A. 033000 - Landscape Cast-In-Place Concrete

1.3 REFERENCE STANDARDS

A. ADA Standards - 2010 ADA Standards for Accessible Design 2010.

B. ASTM A36/A36M - Standard Specification for Carbon Structural Steel 2019.

C. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless 2022.

D. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware 2016a.

E. ASTM A276/A276M - Standard Specification for Stainless Steel Bars and Shapes 2017.

F. ASTM A307 - Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength 2021.

G. ASTM A501/A501M - Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing 2021.

H. ASTM A554 - Standard Specification for Welded Stainless Steel Mechanical Tubing 2021.

I. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process 2020.

J. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar 2015.

K. ASTM E935 - Standard Test Methods for Performance of Permanent Metal Railing Systems and Rails for Buildings 2021.

L. ASTM F3125/F3125M - Standard Specification for High Strength Structural Bolts and Assemblies, Steel and Alloy Steel, Heat Treated, Inch Dimensions 120 ksi and 150 ksi Minimum Tensile Strength, and Metric Dimensions 830 MPa and 1040 MPa Minimum Tensile Strength 2022.

M. AWS B2.1/B2.1M - Specification for Welding Procedure and Performance Qualification 2021.

N. AWS C3.4M/C3.4 - Specification for Torch Brazing 2016.

O. AWS C3.5M/C3.5 - Specification for Induction Brazing 2016, with Amendment (2017).

P. AWS C3.9M/C3.9 - Specification for Resistance Brazing 2020.

Q. AWS D1.1/D1.1M - Structural Welding Code - Steel 2020, with Errata (2022).

R. AWS D1.6/D1.6M - Structural Welding Code - Stainless Steel 2017, with Amendment (2021).

S. SSPC-Paint 20 - Zinc-Rich Coating (Type I - Inorganic, and Type II - Organic) 2019.

1.4 ADMINISTRATIVE REQUIREMENTS

A. Pre-Installation Meeting: Schedule and conduct a preinstallation meeting one week before starting work of this section. Attendees shall include, but not be limited to:

1. Contractor.
2. Architect.
3. Owner's representative.
4. Other subcontractors of adjacent work.

1.5 SUBMITTALS

A. Product Data: Submit manufacturer's product data, including description of materials, components, finishes, fabrication details, glass, anchors, and accessories.

B. Shop Drawings: Indicate railing system elevations and sections, details of profile, dimensions, sizes, connection attachments, anchorage, size and type of fasteners, and accessories. Indicate anchor and joint locations, brazed connections, transitions, and terminations.

C. Samples: Submit one (1) of each item below for each type and condition shown.

1. Railing: 12-inch-long section of handrail illustrating color, finish, and connection detail.
2. See mock-up requirements.

D. Test Reports: Submit test reports from an independent testing agency showing compliance with specified design and performance requirements.

E. Maintenance Data: Manufacturer's instructions for care and cleaning.

F. Welders' qualification statement: Welders' certificates in accordance with AWS B2.1/B2.1M and dated no more than 12 months before start of scheduled welding work.

G. Warranty: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

1.06 QUALITY ASSURANCE

A. The requirements for the assemblies shown on the Contract Drawings establish basis dimensions, profiles, and sightlines. Within the limitations established by design intent as shown in drawings and specifications, the Contractor is responsible for the design and engineering of the railing system including anchorage to structure. The system must be capable of meeting all specified performance requirements.

1. Provide test data which indicates the system(s) meets the specified performance requirements.
2. Verify with calculations from an engineer licensed in the State of Massachusetts railings, guards, and fencing serving as railings for fall protection or security of pool or other spaces are designed to resist the simultaneous application of the greater of the specified loads or code-required loads.

1.7 MOCK-UPS

A. Provide mock-up of Guardrail system, minimum 10 feet long by width of rail wide, illustrating each type of material, cladding, and finish.

B. Provide mock-up of Tree Pit Rail system, minimum 10 feet long by width of rail wide, illustrating each type of material, cladding, and finish.

C. Provide mock-up of Handrail system, minimum 10 feet long by width of rail wide, illustrating each type of material, cladding, and finish.

D. Locate where directed.

E. Approved mock-up may remain as part of the work.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials in factory-provided protective coverings and packaging.

B. Protect materials against damage during transit, delivery, storage, and installation at site.

C. Inspect materials upon delivery for damage. Repair damage to be indistinguishable from undamaged areas; if damage cannot be repaired to be indistinguishable from undamaged parts and finishes, replace damaged items.

D. Prior to installation, store materials and components under cover in a dry location.

1.9 WARRANTY

A. Warranty: Manufacturer's standard one year warranty against defects in materials, fabrication, finishes, and installation commencing on Date of Substantial Completion.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Custom metal railings per the drawings.

1. Approved by Landscape Architect.

2.2 RAILING SYSTEMS

A. Railing Systems - General: Shop-fabricated in design indicated, to suit specific project conditions, and for proper connection to building structure, and in largest practical sizes for delivery to site.

1. Performance Requirements: Design and fabricate railings and anchorages to resist the following loads without failure, damage, or permanent set: loads need to be applied simultaneously.

a. Lateral Force: 75 lb minimum, at any point, when tested in accordance with ASTM E935.
b. Distributed Load: 50 lb/ft minimum, applied in any direction at the top of the handrail, when tested in accordance with ASTM E935.
c. Concentrated Loads on Intermediate Rails: 50 psf, minimum.
d. Concentrated Load: 200 lbs minimum, applied in any direction at any point along the handrail system, when tested in accordance with ASTM E935.
e. Handrails: Comply with applicable accessibility requirements of ADA Standards.

2. Assembly: To achieve details in the drawings:

a. Shop fabricate and shop weld to the longest lengths possible.
b. Join lengths, seal open ends, and conceal exposed mounting bolts and nuts using slip-on non-weld mechanical fittings, flanges, escutcheons, and wall brackets.

3. Joints: Tightly fitted and secured, machined smooth with hairline seams.

4. Field Connections: Minimize field connections.

a. Field-weld connections unless otherwise noted.
b. Provide sleeves to accommodate site assembly and installation where indicated in the details.

5. Welded and Brazed Joints: Make visible joints butt tight, flush, and hairline; use methods that avoid discoloration and damage of finish; grind smooth, polish, and restore to required finish.

a. Ease exposed edges to a small uniform radius.

b. Welded Joints:

1) Carbon Steel: Perform welding in accordance with AWS D1.1/D1.1M.
2) Stainless Steel: Perform welding in accordance with AWS D1.6/D1.6M.

c. Brass/Bronze Brazed Joints:

1) Perform torch brazing in accordance with AWS C3.4M/C3.4.
2) Perform induction brazing in accordance with AWS C3.5M/C 3.5.
3) Perform resistance brazing in accordance with AWS C3.9M/C3.9.

2.3 MATERIALS

A. Steel Components:

1. Sections, Shapes, Plate and Bar: ASTM A36/A36M.
2. Tubing: ASTM A501/A501M structural tubing, round and shapes as indicated.
3. All steel for landscape/exterior use to be galvanized unless otherwise noted.
4. Galvanized Steel Sheet: ASTM A653/A653M, Structural Steel (SS) Grade 33/230 with G40/Z120 coating.
5. Bolts, Nuts, and Washers: ASTM F3125/F3125M, Type 1, and galvanized to ASTM A153/A153M where connecting galvanized components.
6. Welding Materials: AWS D1.1/D1.1M; type required for materials being welded.

2.4 ACCESSORIES

A. Welding Fittings: Factory- or shop-welded from matching pipe or tube; joints and seams ground smooth.

B. Anchors and Fasteners: Provide anchors and other materials as required to attach to structure, made of same materials as railing components unless otherwise indicated; where exposed fasteners are unavoidable provide flush countersunk fasteners.

1. For concrete anchorage, provide inserts to be cast into concrete for bolt anchors. Per details provide continuous steel angle embed where indicated.
2. For anchorage to masonry, provide brackets to be embedded in masonry for bolt anchors.
3. For anchorage to stud walls, provide backing plates for bolt anchors.
4. Exposed Fasteners: No exposed bolts or screws.

C. Carbon Steel Bolts and Nuts: ASTM A307.

D. Sealant: Silicone; color selected by the Architect. Coordinate with Section 07 92 00 - Joint Sealants.

E. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20 Type I - Inorganic, complying with VOC limitations of authorities having jurisdiction.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that substrate and site conditions are acceptable and ready to receive work.

B. Verify field dimensions of locations and areas to receive work.

C. Notify Landscape Architect immediately of conditions that would prevent satisfactory installation.

D. Do not proceed with work until detrimental conditions have been corrected.

E. Furnish components to be installed in other work to installer of that other work, including but not limited to blocking, sleeves, inserts, anchor bolts, embedded plates, and supports for attachment of anchors.

3.2 PREPARATION

A. Protect existing work.

B. Review installation drawings before beginning installation. Coordinate diagrams, templates, instructions, and directions for installation of anchorages and fasteners.

C. Clean surfaces to receive units. Remove materials and substances detrimental to the installation.

3.3 INSTALLATION

A. Comply with manufacturer's drawings and written instructions.

B. Install components plumb and level, accurately fitted, free from distortion or defects, and with tight joints, except where necessary for expansion.

C. Anchor securely to structure.

D. Conceal anchor bolts and screws whenever possible. Where not concealed, use flush countersunk fastenings.

E. Isolate dissimilar materials with bituminous coating, bushings, grommets, or washers to prevent electrolytic corrosion.

3.4 TOLERANCES

A. Maximum Variation From Plumb: 1/4 inch per floor level, non-cumulative.

B. Maximum Offset From True Alignment: 1/4 inch.

C. Maximum Out-of-Position: 1/4 inch.

3.5 CLEANING

A. Remove protective film from exposed metal surfaces.

B. Metal: Clean exposed metal finishes with potable water and mild detergent, in accordance with manufacturer recommendations; do not use abrasive materials or chemicals, detergents, or other substances that may damage the material or finish.

3.6 PROTECTION

A. Protect installed components and finishes from damage after installation.

B. Repair damage to exposed finishes to be indistinguishable from undamaged areas.

1. If damage to finishes and components cannot be repaired to be indistinguishable from undamaged finishes and components, replace damaged items.

- END -

SECTION 116800
PLAY EQUIPMENT AND STRUCTURES

PART 1 - GENERAL

1.1 SUMMARY

A. Work includes:

1. Composite playground equipment.

1.2 DEFINITIONS

A. Definitions in ASTM F1487 apply to Work of this Section.

B. IPEMA: International Play Equipment Manufacturers Association.

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: Submit no later than (4) four months prior to the scheduled installation.

1. Include plans, elevations, sections, and attachment details.
2. Include fall heights, use zones, footings layout, and compliance with ADA requirements including access details and the ratio of elevated versus ground level events for playground equipment, coordinated with the critical-height values of protective surfacing specified in Section 321816 - Protective Playground Surfacing and Section 321817 - Corkeen. Include the distance in linear feet from outside edge of the protective surfacing to a minimum of three (3) closest adjacent fixed outside structures such as curbs, fences, benches or trees.

C. Samples for Initial Selection: For each type of exposed finish.

1. Manufacturer's color charts.
2. Include Samples of accessories involving color selection.

D. Samples for Verification: For each type of exposed finish on the following products:

1. Include Samples of accessories to verify color and finish selection.
2. Posts and Rails: Minimum 6 inches long.
3. Molded Plastic: Minimum 3 inches square.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

B. Product Certificates: For each play structure.

C. Material Certificates: For the following items:

1. Shop finishes.

D. Field quality-control reports.

E. Document of Acceptance: Prepared by manufacturer’s representative stating that a field inspection of the composite playground equipment was conducted, and the installation is accepted by the manufacturer’s representative.

F. Sample Warranty: For manufacturer's special warranties.

1.6 CLOSEOUT SUBMITTALS

A. Insurance Certificate: Manufacturer’s Certificate of Product Liability Insurance for one (1) million dollars.

B. Guarantee: Original guarantee for replacement of any items or components found to be defective during the manufacturers’ guarantee period. The Contractor shall submit the original guarantee certificate to the Owner at the completion of the project. The Contractor shall furnish the original and 4 (four) copies of the manufacturers’ guarantee.

C. Document of Acceptance: An authorized representative of the play equipment manufacturer must inspect and approve the completed installation. Submit a Document of Acceptance signed by the authorized Manufacturers’ representative.

D. Maintenance Data: For play structures and finishes to include in maintenance manuals.

1.7 QUALITY ASSURANCE

A. Manufacturer Qualifications:

1. Member of the International Play Equipment Manufacturers Association (IPEMA), a third-party certification inspection organization which continually validates a manufacturer’s compliance with ASTM F1487-Latest Rev.
2. A firm whose play structures components have been certified by IPEMA's third-party product certification service.

B. Installer Qualifications: Installer to be CPSI certified and approved by the play equipment manufacturer with proof of 3 years’ experience on play equipment installation.

1.8 PRE-INSTALLATION MEETINGS

A. Convene minimum two weeks prior to starting work of this section.

1.9 PROJECT CONDITIONS

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturers for optimum results. Do not install products under environmental conditions outside manufacturer's recommended limits.

1.10 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace components of play structures that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Structural failures.
b. Deterioration of metals, metal finishes, and other materials beyond normal weathering and use.

2. Warranty Period: Minimum five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Source Limitations: Obtain play structures from single source from single manufacturer.

B. Play structures and components shall have the IPEMA Certification Seal.

C. Manufacturer:

1. Landscape Structures Inc., 601 7th Street, Delano, MN 55328, Phone: 763-972-5200 Web: www.playlsi.com
2. Kompan, 821 Grand Avenue Parkway, Pflugerville, TN 78660, Phone: 800-426-9788 Web: www.kompan.us

2.2 PERFORMANCE REQUIREMENTS

A. Safety Standards:

1. Provide play structures that meet or exceed the requirements as published in the Handbook for Public Playground Safety issued by the U.S. Consumer Product Safety Commission, the Consumer Product Safety Improvement Act (CPSIA) of 2008.

2. Provide play structures according to ASTM F1487-Latest Rev.

B. Accessibility Standards:

1. “Guide to ADA Accessibility Guidelines for Play Areas”, Final Ruling (ADA).

2.3 COMPOSITE PLAYGROUND EQUIPMENT

A. Steel Members:

1. Posts: Schedule 40 pipe or structural steel tubing pipe or tubing with a minimum thickness of 0.120" (11 gauge); Galvanized.

   a. Color: As indicated in Contract Drawings and as selected by Landscape Architect from manufacturer's full range.

2. Railings and Fixtures: Schedule 40 pipe or structural tubing of such thickness that the railings shall not sag or bend during use.
3. Tubular Steel: Structural tubing of the sizes and shapes shown in the approved shop drawings. Steel shall meet ASTM A500, Grade B which has a minimum tensile strength of 58,000 psi (for round and shaped) and a minimum yield point of 42,000 psi for round structural tubing and a minimum yield point of 46,000 psi for shaped structural tubing. Material shall be load-tested under ASTM 1487-Latest Rev., after fabrication.
4. Pipe: Pipe for climbers, ladders, shall be Schedule 40 or structural tubing steel pipe conforming to the requirements of ASTM A53 and shall be of the same sizes, indicated on the plans. Steel pipes shall be load tested under ASTM F1487-Latest Rev., requirements after fabrication. The outside diameter of all hand gripping components including rungs on horizontal ladders, climbing bars, handrails, etc. shall comply with the anthropometric dimensions as listed in the ASTM 1487-Latest Rev. standards.
5. Pipe Caps: All exposed ends of steel members shall be plugged with metal caps riveted in place with self-sealing rivets or spot welded.

B. Fittings and Clamps:

1. All fittings and clamps shall be as indicated on the approved shop drawings and as may be required to complete the installation.
2. All fittings shall be of the best quality malleable iron, drop-forged steel or steel plate as indicated.
3. Clamp fittings shall be cast aluminum or 12 gauge drawn quality or better steel and finished to match vertical components and shall be smoothly constructed with no projections or sharp edges.
4. All clamps shall have tamper resistant fasteners. Clamps used on component subjected to vertical loads shall be pinned to prevent slipping and twisting.

C. Fasteners:

1. All fasteners including, but not limited to, bolts, lag screws, tie rods, threaded rods, nuts, and washers, shall be of the sizes indicated on the approved shop drawings.

2. Fasteners shall be either stainless steel per ASTM F879 or carbon steel treated with a corrosion resistant coating per applicable ASTM plating specifications.
3. All threaded fasteners shall include a locking patch-type material that will meet the minimum torque requirements of Industrial Fastener's Institute (IFI)-125 "Test Procedure for the Locking Ability Performance of Chemical Coated Lock Screws".
4. The play equipment Manufacturer shall provide special tools for pinned tamperproof fasteners.
5. All protruding bolts, screws and other threaded connectors shall be cut off to within two threads of nut, washer, etc., then satisfactorily peened to prevent removal by unscrewing, and filed completely smooth to remove all sharp edges.

D. Plastic Lumber: Plastic lumber shall be made from UV stabilized recycled high-density polyethylene.

1. Recycled lumber shall be protected during transportation.
2. Recycled plastic lumber may not be used on spans greater than two (2') feet unless additional structural support is provided. An engineering analysis of structural integrity based on ASTM F1487 shall be submitted upon request.
3. Plastic Lumber shall be smooth on all sides and ends. Plastic Lumber shall be free from all but minor marks, blemishes, discolorations, warp, wane, twist, quirk or other imperfections. The intersection of all planes of faces, edges and ends shall be eased to one-eighth (1/8") inch radius.

E. Rotationally Molded Polyethylene:

1. Parts shall be rotationally molded from color-compounded, first quality, linear low-density polyethylene with a tensile strength of 2,500 psi per ASTM D638 and with color and UV-stabilizing additives. Dry-blended or molded-in resins are not acceptable.
2. Polyethylene shall be ultraviolet stabilized to UV-8 and have anti-static additives.
3. Wall thickness shall vary by component and as shown on the approved shop drawings.

F. Sheet Plastic Parts:

1. Sheet plastic parts shall be manufactured from three-quarter (3/4") inch high-density polyethylene that has been specially formulated for optimum UV stability and color retention.
2. Products shall have a minimum density of 0.933 G/cc in accordance with ASTM D1505 and a minimum tensile strength of 2,400 psi in accordance with ASTM D638.
3. All edges shall be free of burrs, sharp edges, and points.

2.4 STEEL FABRICATION

A. All steel components to be welded shall be welded in complete accordance with the standards of the American Welding Society. All welds shall be continuous around the entire perimeter. All welds shall be ground smooth. NO TACK WELDING AND NO FIELD WELDING SHALL BE PERMITTED.

B. Corrosion Resistant Treatment:

1. All fabrication and welding shall be completed prior to application of the corrosion resistant coating; metal pieces shall be cleaned of all weld spatter, mill scale, varnish, rust, grease, and the like and the surface mechanically and chemically prepared to receive the coating.
2. This corrosion resistant coating shall a thermal spray zinc coating or electrostatic applied primer with a minimum thickness of 3 mils. All metal pieces, including welds, shall receive the coating.

C. Polyester Powder Coating:

1. A surface coat shall be applied to the thermal zinc coated metal pieces in such a manner that the coating will not peel off. The manufacturer shall perform all processes required to achieve a smooth material bond.
2. An epoxy or acrylic polymer primer shall be applied prior to application of powdercoating. The surface coat shall be an electrostatically sprayed, lead-free, super durable TGIC (triglycidyl isocyanurate) polyester powder coating applied to a minimum of five (5) mil thickness which shall be oven cured. The TGIC polyester powder coating shall comply with the ASTM standards below:
3. Colors shall be as shown on the drawings. Material manufacturer's directions for storage and use shall be adhered to. Material surfaces shall be protected during shipment so as to arrive mar and scratch free in the field.

D. Platforms and Steps:

1. Products shall have a minimum density of 0.933 G/cc in accordance with ASTM D1505 and a minimum tensile strength of 2,400 psi in accordance with ASTM D638.
2. All edges shall be free of burrs, sharp edges, and points.
3. Completely factory assembled in a configuration that is ready for attachment to the frame on site.

E. Roofs: Designed to discourage and minimize climbing by users.

1. Fabricated from metal.

F. Age-Appropriate Signage: Manufacturer's standard sign panels, fabricated from two-color sheet plastic, located in clearly conspicuous place at entry point attached to freestanding, upright support posts and/or directly to playground equipment as indicated on shop drawings.

1. Text: As appropriate for play structure.

    a. "This play equipment is designed for Preschool Children Ages 2 to 5 years. Adult supervision is recommended".
    b. "This play equipment is designed for School Age Children ages 5 to 12 years. Adult supervision is recommended".

G. Manufacturer Identification Sticker: Placed in an inconspicuous place on the equipment for M & O reference. (For example, under a slide bed at the lowest point). The sticker shall identify the manufacturer's address and a toll-free phone number.

2.5 CAST-IN-PLACE CONCRET

A. Concrete Materials and Properties: Comply with requirements in Section 033000 Landscape Cast-in-Place Concrete ACI 301 for normal-weight, air-entrained concrete with minimum 28-day compressive strength of 3200 psi, 3-inch slump, and 1-inch- maximum-size aggregate.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for earthwork, subgrade elevations, surface and subgrade drainage, and other conditions affecting performance of the Work.

1. Do not begin installation before final grading required for placing play structures and protective surfacing is completed.

B. Final installation of play structures (concrete footings) shall not proceed until the Contractor has demonstrated to the satisfaction of Owner’s Representative that the use zones comply with ASTM F1487-Latest Rev. and CPSC guidelines.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Comply with manufacturer's written installation instructions for each play structure type unless more stringent requirements are indicated. Anchor play structures securely, positioned at locations and elevations indicated.

1. Maximum Play Structure Height: Coordinate installed fall heights of play structures with finished elevations and critical-height values of protective surfacing. Set play structures so fall heights and elevation requirements for age group use and accessibility are within required limits. Verify that play structures’ elevations comply with requirements for each type and component of play structure.

B. Post and Footing Excavation: Excavate holes for posts and footings as indicated in firm, undisturbed or compacted subgrade soil.

C. Post Set with Concrete Footing: Comply with Section 033000 "Cast-in-Place Concrete" for measuring, batching, mixing, transporting, forming, and placing concrete.

1. Set equipment posts in and on concrete footing as shown on approved shop drawings. Protect portion of posts above footing from concrete splatter. Verify that posts are set plumb or at the correct angle, alignment, height, and spacing. Place concrete around posts and vibrate or tamp for consolidation. Hold posts in position during placement and finishing operations until concrete is sufficiently cured.
2. Embedded Items: Follow equipment manufacturer's written instructions and drawings to ensure correct installation of anchorages for equipment.

3. Finishing Footings: Smooth top, and shape to shed water.

D. Assemble play structures to configuration as shown on the approved shop drawings.

E. Fastenings:

1. As shown on drawings and securely tightened with an impact and/or torque wrench (as per manufacturer's specification).
2. Take precautions while trimming bolt projections, if necessary, to prevent metallic contamination (rust bloom) of the corrosion resistant bolts to the satisfaction of the Owner's Representative. Precautions include use of previously unused grinding wheels and applying zinc rich paint on trimmed galvanized bolts. No hazardous projections or rust bloom shall be left in the finished work.

3.3 FIELD QUALITY CONTROL

A. Perform the following tests and inspections with the assistance of an authorized manufacturer's representative, who is not the qualified installer.

1. Perform inspection and testing for each type of installed play structure according to ASTM F1487-Latest Rev. and certify that play structures were correctly installed in accordance with the manufacturer's written instructions, all fastenings are securely installed meeting the manufacturers' maximum torque value.

B. Playground equipment items will be considered defective if they do not pass tests and inspections.

C. Prepare test and inspection reports.

D. Notify Owner's Representative 48 hours in advance of date(s) and time(s) of testing and inspection.

3.4 EXTRA MATERIALS

A. Furnish and deliver to Owner's Representative additional new materials obtained from the play structures manufacturer.

B. Graffiti Remover for Polyester Powdercoated Steel Surfaces: (192) ounces in spray bottles: six (6) thirty-two (32) ounce spray bottles; or twelve (12) sixteen (16) ounce spray bottles; Go-Away graffiti remover, manufactured by Nexgen, North Hollywood, CA; Erase Graffiti Cleaner as manufactured by Landscape Structures, Delano, MN; or Gametime Graffiti Remover as manufactured by Gametime, Fort Payne, AL, or approved equal. Each container Clearly label each container using a minimum of 1/4-inch high lettering: "For Play Structures".

- END -

SECTION 129300
SITE FURNISHINGS

PART 1 - GENERAL

1.1 SUMMARY

A. Work Included: Provide labor, materials, and equipment necessary to complete the work of this Section, including but not limited to the following:

1. Benches
2. Picnic Tables
3. Litter Receptacles
4. Bike Racks
5. Skate Deterrents

B. Related Work: The following items are not included in this Section and are specified under the designated Sections:

1. Section 033000 - Landscape Cast-In-Place Concrete.
2. Section 321313 - Plain Cement Concrete Paving.
3. Section 321343 - Pervious Concrete Paving
4. Section 321816 - Protective Playground Surfacing

1.2 SUBMITTALS

A. Product Data: For all products specified; including color chips for initial selection.

B. Samples for Verification: Provide samples for verification for the following materials:

1. Benches – (1) material sample of metal slat topper
2. Picnic Tables – (1) material sample of wood slat toppers
3. Litter Receptacle – (1) material sample
4. Bike Racks – (1) material sample

C. Shop Drawings: Provide complete shop drawings detailing fabrication and installation of all specified site furnishings. Indicate locations, plans, elevations, dimensions, shapes, and cross sections of each unit.

1.3 QUALITY ASSURANCE

A. Source Limitations: Obtain each type of site furnishing(s) through one source from a single manufacturer.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Steel and Iron: Free of surface blemishes and complying with the following:

1. Plates, Shapes, and Bars: ASTM A 36/A 36M.
2. Steel Pipe: Standard-weight steel pipe complying with ASTM A 53, or electric-resistance- welded pipe complying with ASTM A 135.
3. Tubing: Cold-formed steel tubing complying with ASTM A 500.
4. Mechanical Tubing: Cold-rolled, electric-resistance-welded carbon or alloy steel tubing complying with ASTM A 513, or steel tubing fabricated from steel complying with ASTM A 1011/A 1011M and complying with dimensional tolerances in ASTM A 500; zinc coated internally and externally.
5. Sheet: Commercial steel sheet complying with ASTM A 1011/A 1011M.

B. Stainless Steel: Free of surface blemishes and complying with the following:

1. Sheet, Strip, Plate, and Flat Bars: ASTM A 666.
2. Pipe: Schedule 40 steel pipe complying with ASTM A 312/A 312M.
3. Tubing: ASTM A 554.

C. Wood: Surfaced smoothly on four sides with eased edges; kiln dried, free of knots, solid stock of species indicated.

1. Wood Species: Manufacturer's standard.
2. Finish: Manufacturer's standard stain and transparent sealer.

D. Anchors, Fasteners, Fittings, and Hardware: Stainless steel or Manufacturer's standard, corrosion-resistant-coated or noncorrodible materials.

E. Nonshrink, Nonmetallic Grout: Premixed, factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107; recommended in writing by manufacturer, for exterior applications.

2.2 BENCHES

A. Manufacturers: Subject to compliance with requirements, provide products by the following:

1. Dumor, Inc. - P.O. Box 142, Mifflintown, PA, 17059, Phone: 800-598-4018, Website: https://www.dumor.com/

a. Bench 165, 3 Arms
Product Number: 69-871-61-3ART
Dimensions: 6’ length
Color and finish: Painted steel, black
Surface Material: IPE wood

2.3 PICNIC TABLES

A. Manufacturers: Subject to compliance with requirements, provide products by the following:

1. Dumor, Inc. - P.O. Box 142, Mifflintown, PA, 17059, Phone: 800-598-4018, Website: https://www.dumor.com/

   a. 76 Table, 3 Seats
      Product Number: 76-231
      Color and finish: Painted steel, black
      Surface Material: IPE wood

   b. 76 Table, 2 Seats
      Product Number: 76-221
      Color and finish: Painted steel, black
      Surface Material: IPE wood

2.4 LITTER RECEPTACLES

A. Manufacturers: Subject to compliance with requirements, provide products by the following:

1. Dumor, Inc. - P.O. Box 142, Mifflintown, PA, 17059, Phone: 800-598-4018, Website: https://www.dumor.com/

   a. Receptacle 157, Single Stream 32 Gal, Standard Cover
      Product Number: 157-32
      Color and finish: Painted steel, black

   b. Receptacle 157, Single Stream 32 Gal, RC Cover
      Product Number: 157-32
      Color and finish: Painted steel, blue

2.5 BIKE RACKS

A. Manufacturers: Subject to compliance with requirements, provide products by the following:

1. Dumor, Inc. - P.O. Box 142, Mifflintown, PA, 17059, Phone: 800-598-4018, Website: https://www.dumor.com/

   a. Bike Rack 290
      Product Number: 290-00/S-1
      Color and finish: Painted steel, black
      Mounting: Surface mounting

2.6 SKATE DETERRENTS

A. Manufacturers: Subject to compliance with requirements, provide products by the following:

1. SkateStoppers, Inc. – 1547 N Cuyamaca St, El Cajon, CA, 92020, Phone: 619-447-6374, Website: https://www.skatestoppers.com/

a. Gorilla R0.5
Color and finish: Aluminum finish includes Type II Clear Anodize or Hard Anodize
Mounting: Surface mounting with two concealed G PIN anchors.

b. Equal approved by Philadelphia Parks and Recreation and landscape architects.

2.7 FINISHES, GENERAL

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

B. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

2.8 STEEL AND GALVANIZED STEEL FINISHES

A. Baked-Enamel, Powder-Coat Finish: Manufacturer's standard, baked, polyester, powder-coat finish complying with finish manufacturer's written instructions for surface preparation, including pretreatment, application, baking, and minimum dry film thickness.

2.9 STAINLESS-STEEL FINISHES

A. Remove tool and die marks and stretch lines or blend into finish.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas and conditions, with Installer present, for compliance with requirements for correct and level finished grade, mounting surfaces, installation tolerances, and other conditions affecting performance.

1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

A. Comply with manufacturer's written installation instructions unless more stringent requirements are indicated. Complete field assembly of site furnishings where required.

B. Unless otherwise indicated, install site furnishings after landscaping and paving have been completed.

C. Install site furnishings level, plumb, true, and securely anchored or positioned at locations indicated on Drawings.

D. Post Setting: Set cast-in support posts in concrete footing with smooth top, shaped to shed water. Protect portion of posts above footing from concrete splatter. Verify that posts are set plumb or at correct angle and are aligned and at correct height and spacing. Hold posts in position during placement and finishing operations until concrete is sufficiently cured.

E. Posts Set into Voids in Concrete: Form or core-drill holes for installing posts in concrete to depth recommended in writing by manufacturer of site furnishings and 3/4 inch (19 mm) larger than OD of post. Clean holes of loose material, insert posts, and fill annular space between post and concrete with nonshrink, nonmetallic grout] [or] [anchoring cement], mixed and placed to comply with anchoring material manufacturer's written instructions, with top smoothed and shaped to shed water.

3.3 CLEANING

A. After completing site furnishing installation, inspect components. Remove spots, dirt, and debris. Repair damaged finishes to match original finish or replace component.

- END -

SECTION 311010

SITE PREPARATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Protecting buildings, walls, pavements, utilities, existing vegetation, site improvements, miscellaneous structures, equipment to remain.
   a. Protecting site from construction traffic including guarding areas of planting and lawn work from over compaction, adhering to load limitations, and as otherwise directed by the Engineer.
2. Providing staging areas, project signs, and other preparatory work.
3. Temporary erosion and sedimentation control measures.
4. Removal and salvage of existing fences.

B. RELATED SECTIONS

1. Section 312000 Earth Moving.
2. Section 312500 Erosion and Sediment Control.
3. Section 024113 Selective Site Demolition

1.3 DEFINITIONS AND ABBREVIATIONS

A. Subsoil: All soil beneath the topsoil layer of the soil profile, and typified by the lack of organic matter and soil organisms.

B. Surface Soil: Soil that is present at the top layer of the existing soil profile at the Project site. In undisturbed areas, the surface soil is typically topsoil; but in disturbed areas such as urban environments, the surface soil can be subsoil.

C. Topsoil: Top layer of the soil profile consisting of existing native surface topsoil or existing in-place surface soil and is the zone where plant roots grow.

D. Plant-Protection Zone: Area surrounding individual trees, groups of trees, shrubs, or other vegetation to be protected during construction, and indicated on Drawings.

E. Tree-Protection Zone: Area surrounding individual trees or groups of trees to be protected during construction, and indicated on Drawings.

F. Vegetation: Trees, shrubs, groundcovers, grass, and other plants.

1.4 REFERENCES

A. The most current version of the publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

1. Standards for Soil Erosion and Sediment Control in New Jersey

1.5 ACTION SUBMITTALS

A. General:

1. Make submittal in compliance with all provisions of Division 01 pertaining to submittals and quality assurance.

2. Render submittals and receive approval prior to delivery of installation.

3. Approval in writing by the Engineer of submitted products, samples, test reports, and certificates, does not constitute final acceptance.

B. Schedule: Submit proposed methods and sequence of site preparation work to the Engineer for review prior to start of Work.

1.6 INFORMATIONAL SUBMITTALS

A. None.

1.7 QUALITY ASSURANCE

A. Preconstruction meeting: Arrange a preconstruction meeting between the Owner's representative, the Landscape Architect, Engineer, and the General Contractor. Review items including the proposed schedule, areas and structures to be salvaged stored, and protected, limits of Work, and soil stockpiling.

B. REGULATORY REQUIREMENTS

1. Comply with all rules, regulations, laws and ordinances of local, state and federal authorities having jurisdiction. Provide labor, materials, equipment and services necessary to make Work comply with such requirements without additional cost to Owner.

2. Investigate the conditions of public thoroughfares and roads as to availability, clearances, loads, limits, restrictions, and other limitations affecting transportation to and ingress and egress at the site. Conform to all governmental regulations regarding the transportation of materials.

3. Procure and pay for permits and licenses required for Work.

PART 2 - PRODUCTS

2.1 SIGNS

A. Project Signs - as established in conjunction with the Owner's requirements.

2.2 MISCELLANEOUS

A. Earth Fill- For use in preparations, protections, and temporary conditions of fill: Provide controlled fill material as specified in Section 312000, Earth Moving.

2.3 TREE PROTECTION FENCING

A. 4' high Extruded Orange Barrier Fence by Hanes Geo Components or Engineer approved equal.

PART 3 - EXECUTION

3.1 VERIFICATIONS

A. Obtain limits of excavation and filling work, sequencing, limits of work, and verify areas of load limitations.

B. Utility Locator Service: Notify utility locator service for area where Project is located before site clearing.

3.2 PROTECTIVE MEASURES

A. Use every precaution to prevent damage to, and provide protection as necessary of, areas outside of the contract limit line and existing features, improvements, and utilities indicated to remain within the contract limit line. Repair or replace to original condition, as acceptable to the Engineer and at no cost to the Owner, any material or Work damaged or destroyed while performing Work.

B. Prior to the start of any site disturbance, including Demolition and Site Preparation, install protective fencing and silt fence. Do not commence site clearing operations until temporary erosion- and sedimentation-control measures are in place. Engineer to approve layout before any work shall begin.

C. Preservation of Property From Damage: Existing structures, site improvements, adjacent property, utilities, walls, gates, curbs, statues and other facilities; and trees that are not to be removed shall be protected from injury or damage.

1. Provide protection of existing curbs and sidewalks at locations with crossing construction traffic. Use materials that are suitable for details of installation and that protect surface finishes and resist imposed loads, as approved by Engineer.
2. Exercise extreme care in demolition or excavation atop underground structures.
3. The surface of the required excavations or grading work may expose soft grades during the course of the Work. The Contractor shall take whatever actions necessary to allow the progress of the Work to continue and to make the site accessible to its equipment. These actions may require the furnishing and temporary placement of rock, crushed stone, or other materials. Conditioning of the site shall be at the Contractor's expense with no additional cost to Owner.

D. Barricades

1. In addition to existing controls or protection items installed as specified herein, provide barricades, other protections, and signs to exclude persons, except those connected with work, from entering the work area. Do not interfere with the use of adjacent sidewalks and crosswalks, and maintain free and safe passage.
2. Coordinate on-site traffic as required. Establish traffic routes on-site clearly marked with construction safety fence and the like to avoid compaction in areas of future plant bed areas and lawns. Use future pavement areas wherever possible.

E. Dust Palliation

1. Dust resulting from demolition, removal, and other construction operations shall be controlled to avoid creation of a nuisance or damage to the surrounding areas. Use approved dust control methods to prevent excessive dust accumulation on foliage of trees to be preserved.

2. Excessive use of water for dust control will not be permitted when it will result in, or create, hazardous or objectionable conditions such as flooding or pollution.

3.3 TEMPORARY EROSION AND SEDIMENTATION CONTROL

A. Provide temporary erosion- and sedimentation-control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to erosion- and sedimentation-control Drawings and requirements of authorities having jurisdiction.

C. Inspect, maintain, and repair erosion- and sedimentation-control measures during construction until permanent vegetation has been established.

D. Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

3.4 EXISTING UTILITY SECTION

A. Owner will arrange for disconnecting and sealing indicated utilities that serve existing structures before site clearing, when requested by Contractor.

1. Verify that utilities have been disconnected and capped before proceeding with site clearing.

B. Locate, identify, disconnect, and seal or cap utilities indicated to be removed or abandoned in place.

1. Arrange with Owner and utility companies to shut off indicated utilities.

C. Interrupting Existing Utilities: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated:

1. Notify Engineer not less than two days in advance of proposed utility interruptions.
2. Do not proceed with utility interruptions without Owner's written permission.

3.5 SELECTIVE TREE REMOVAL

A. All existing trees are to remain and be protected.

B. All depressions excavated below the original ground surface, or caused by the removal of stumps and roots, shall be refilled with suitable material compacted to the density, grade, and contour of the surrounding earth as specified in Section 312000 – Earth Moving.

3.6 SHRUB, GROUNDCOVER AND TURF REMOVAL

A. Prior to starting removal operations, stake out limits of all areas to be removed and receive approval of Landscape Architect before any work is to begin.

B. Remove selected shrubs, groundcover, turf, roots, logs, stones, boulders and other organic matter at or above the existing ground level as indicated on Drawings.

C. All depressions excavated below the original ground surface, or caused by the removal of stumps and roots, shall be refilled with suitable material compacted to the density, grade, and contour of the surrounding earth as specified in Section 312000 – Earth Moving.

3.7 STRIPPING AND STOCKPILING TOPSOIL

A. Prior to starting general excavation, remove all topsoil within the limits of work, as indicated on the Drawings. Topsoil shall be stripped to its entire natural depth.

1. Remove sod and grass before stripping topsoil.
2. Prevent intermingling with subsoil or other waste materials.
3. Remove subsoil and non-soil materials from topsoil including clay lumps, gravel, and other objects more than 2 inches in diameters including trash, debris, weeds, roots and other waste material.

B. Do no stripping without clear understanding of existing soil, planting, and site conditions to be preserved.

C. Topsoil stripped from site may be used for lawn and planting areas provided that it meets the requirements of new off-site topsoil.

D. All topsoil shall be stockpiled on the site within the work limit lines. Stockpile area for topsoil shall be approved by Landscape Architect. Should the topsoil be stockpiled in any area without prior approval of the Landscape Architect, the Contractor may be directed to relocate such stockpile to another portion of the site, and the Contractor shall do so at no additional cost to the Owner.

E. Stockpile topsoil no higher than 3 feet (3') high, and shape stockpiles to drain. Should site constraints dictate that the soil must be piled higher than 3 feet (3'), Contractor shall provide aeration piles within the topsoil pile to prevent the soil from becoming anaerobic. (Cover to prevent windblown dust and erosion by water).

F. No stockpiles to occur within the driplines of existing trees to remain.

G. Perform soil stripping, handling, and stockpiling only when the topsoil is dry or slightly moist.

- END -

SECTION 312000

EARTH MOVING

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. The Work in this Section includes furnishing all materials, labor, supervision, tools, equipment, tools, and performing all operations and incidentals necessary for earthwork. Earthwork activities include but are not limited to subgrade preparation, excavating, backfilling, and compaction for structures and foundations, pavements, sidewalks, landscape areas, and utilities. The Contractor shall pay for and coordinate the services of a geotechnical engineer and testing agency to perform quality control of the earthworks.

1.3 REFERENCES

A. The most current version of the publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

1. AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

    a. C 33 Concrete Aggregates
    b. D 1556 Density and Unit Weight of Soil in Place by the Sand-Cone Method
    c. D 1557 Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft^3 (2,700 kN-m/m^3.))
    d. D 2167 Density and Unit Weight of Soil in Place by the Rubber Balloon Method
    e. D 2216 Laboratory Determination of Water (Moisture) Content of Soil, and Rock
    f. D 2487 Classification of Soils for Engineering Purposes (Unified Soil Classification System)
    g. D 2922 Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth)
    h. D 2937 Density of Soil in Place by the Drive-Cylinder Method ASTM D 3017 Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth)
    i. D 3740 Standard Practice for Minimum Requirements for Agencies Engaged in the Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction
    j. D 4318 Liquid Limit, Plastic Limit, and Plasticity Index of Soils
    k. D 4254 Minimum Index Density and Unit Weight of Soils and Calculation of Relative Density.

2. Commonwealth of Pennsylvania, Department of Transportation, Specifications, Publication 408, (PENNDOT 408), except that measurement and payment sections do not apply.

B. The Contractor is required to have one copy of the latest edition of each of the following publications available for review in the job-site construction office at all times while performing the work described in this Section. The Contractor is to comply with each of the following unless more stringent requirements are indicated on the Drawings or within these specifications.

1. PECO Energy, Requirements for Developer Trenching.

2. 2003 International Building Code as amended by The Philadelphia Code Title 4 Subcode B.

3. City of Philadelphia Streets Department, Standard Construction Items.

1.4 RELATED WORK

A. Section 033000 –CAST IN PLACE CONCRETE

1.5 SUBMITTALS

A. Testing Agency Qualifications: Provide a statement of qualifications of the geotechnical engineer and testing agency that will perform the quality control tasks required in Paragraph 3.188.

1. The geotechnical engineer shall be an experienced inspector working under the direction of a professional engineer licensed to practice in the Commonwealth of Pennsylvania who is experienced in providing engineering services related to earthworks.

2. The testing agency shall be an independent laboratory having a minimum of 3 years experience in conducting the testing indicated herein.

3. The testing laboratory shall meet the requirements of ASTM D 3740.

B. Material Test Reports: Shall be provided from the testing agency indicating and interpreting test results for compliance on the following:

1. Classification according to ASTM D 2487 of each on-site or borrow soil material proposed for fill and backfill.

2. Laboratory compaction curve according to ASTM D 1557 for each on-site or borrow soil material proposed for fill and backfill; provide for each material type and for every 5,000 cubic yards of each material.

3. Material Gradation Tests.

1.6 QUALITY ASSURANCE

A. The Contractor shall engage the services of a geotechnical engineer and testing agency to perform quality control of the earthworks.

1.7 DEFINITIONS

A. Backfill: Soil materials used to fill an excavation.

B. Structural fill: Imported material consisting of well graded sand or gravel that meets the specifications of this section here in.

C. Base Course: Layer placed between the subgrade and paving.

D. Bedding Course: Layer placed over the excavated subgrade in a trench before laying pipe.

E. Borrow: Approved soil materials imported from off-site for use as fill or backfill.

F. Classification: All material shall be classified as either Regular, Hard Material, or Rock.

G. Degree of Compaction: Degree of compaction required is expressed as a percentage of the maximum density obtained by the test procedure presented in ASTM D 1557 abbreviated hereinafter as percent laboratory maximum density. For granular material, relative density is determined in accordance with ASTM D 4254.

H. Excavation: Removal of material encountered down to subgrade elevations:

1. Bulk Excavation: Excavation more than 10 feet in width.

2. Over-excavation: Excavation of existing unsuitable material beyond limits shown on the Drawings for replacement with structural fill as directed by the Owner.

3. Unauthorized Excavation: Excavation below subgrade elevations or beyond limits shown on the Drawings without direction by the Owner.

I. Hard Material: Weathered rock, dense consolidated deposits, or buried construction debris (i.e., demolished brick walls, concrete, etc.) which are not included in the definition of "rock" but which usually require the use of heavy excavation equipment, ripper teeth, or jack hammers for removal.

J. Rock: Rock material in beds, ledges, unstratified masses, and conglomerate deposits and boulders of rock material exceeding 1 cubic yard. for bulk excavation or 3/4 cubic yard. for footing, trench, and pit excavation that cannot be removed by rock excavating equipment without systematic drilling, ram hammering, ripping, or blasting, when permitted

K. Subgrade: Surface or elevation remaining after completing excavation, or top surface of a fill or backfill immediately below base or topsoil materials.

L. Subbase: Material between the pavement base and subgrade.

M. Utilities: On-site underground pipes, conduits, ducts, and cables, as well as underground services within buildings.

1.8 REGULATORY COMPLIANCE

A. Codes and Standards: Perform earthwork complying with federal, state, and local regulations including the Occupational Safety and Health Act of 1970 as amended.

B. Conform with Pennsylvania Act 287 and all amendments and other applicable regulations regarding notification of utility companies.

C. Any pumped water shall be discharged from the Site in accordance with federal, state and local codes and regulations. Comply with all Philadelphia Water Department permit requirements.

1.9 PROJECT CONDITIONS

A. Utility Identification: Notify PA One-Call System at 1-800-242-1776 at least 3 days prior to excavation.

B. Existing Utilities: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted in writing by Owner and then only after arranging to provide temporary utility services according to requirements indicated:

1. Notify the Owner not less than 72 hours in advance of proposed utility interruptions.

2. Do not proceed with utility interruptions without the Owner's written permission.

C. Demolish and completely remove from site existing underground utilities indicated to be removed. Coordinate with utility companies to shut off services if lines are active.

D. Existing improvements, adjacent property, and other facilities and trees and plants that are not to be removed shall be protected from injury or damage, which may result from Contractor's operation.

E. Existing roads, sidewalks, and curbs not indicated to be removed, that are damaged during the project work shall be repaired or replaced to at least the condition that existed at the start of operations.

PART 2 PRODUCTS

2.1 SOIL MATERIALS

A. General: Provide borrow soil materials when sufficient satisfactory soil or suitable backfill materials are not available from excavations.

B. Satisfactory Soil Materials: ASTM D 2487 soil classification groups GW, GP, GM, SP, SM, SW, SC, GC, SC, ML and CL or a combination of these group symbols.

1. Low plasticity (plasticity index less than 10).

2. Less than 15 percent, by weight, of particles larger than 2 inches in greater dimension.

3. Less than 2 percent deviation from optimum moisture content.

C. Unsatisfactory Soil Materials: ASTM D 2487 soil classification groups MH, CH, OL, OH, and PT, or a combination of these group symbols, or materials not conforming to the requirements for satisfactory soils, including:

1. Unsatisfactory soils also include satisfactory soils not maintained within 2 percent of optimum moisture content at time of compaction.

2. Debris, waste, frozen materials, vegetation and other deleterious matter.

3. Otherwise not meeting the requirements for satisfactory soil materials.

4. Materials containing excessive amounts of deleterious materials including construction debris, wood, glass, ash, or organic material as determined by Owner.

D. Backfill and Fill Materials: Satisfactory soil materials.

1. Class B backfill shall be granular, well graded friable soil; free of rubbish, ice, snow, tree stumps, roots, clay and organic matter; with 30% or less passing the No. 200 sieve; no stone greater than two-third (2/3) loose lift thickness, or six inches, whichever is smaller.

2. Select backfill shall be granular, well graded friable soil, free of rubbish, ice snow, tree stumps, roots, clay and organic matter, and other deleterious or organic material; graded within the following limits:

Sieve Size	Percent Finer by Weight
3"	100
No. 10	30-95
No. 40	10-70
No. 200	0-10

E. Structural Fill: Structural fill shall be utilized for mound/berm construction within safety surface areas, as shown in the Contract Drawings.

1. Soils placed as structural fill material should consist of well graded sand or gravel with a maximum particle size of three inches in diameter and less than 15 percent of material passing the number 200 sieve. These materials should be free of objectionable debris (clay clumps, organic and/or deleterious material, etc.) and within moisture contents suitable for compaction. Alternative soil types with higher percentages of silt and clay may be considered, provided that the contractor is able to achieve proper compaction and maintain suitable subgrade once the material is placed. Fine-grained soils and/or granular soils with higher percentages of silt and clay are extremely moisture sensitive and will only be suitable for reuse as structural fill material during ideal weather conditions. Materials wetted beyond the optimum moisture content; contain oversized rock or debris; and/or contain increased amounts of objectionable debris will not be suitable for reuse as structural fill material without special handling. As such, the contractor should be responsible for importing structural fill material and/or processing on-site soils as required so that these materials are suitable for structural fill placement.

2. Cobbles/boulders, rock fragments, and/or oversized debris greater than three inches in diameter will need to be separated from soils to be placed as structural fill. Approved material between three to 12 inches in diameter may be crushed or individually placed in fill layers deeper than two feet below proposed subgrade levels. Care must be taken to individually seat any large particles and to compact soil around large particles with hand operated equipment to minimize the risk of void formation. The larger material should not be placed near areas of the proposed utility or planned excavation. Imported rock fragments and boulders larger than approximately 12 inches are not expected to be adequate for use as fill or backfill and should be removed from the site or crushed to an adequate size.

3. Approved off-site fill and on-site fill meeting the following gradation requirements:

Sieve Size	Percent Passing
4 inches	100
¾ inch	70 – 100
No. 4	30 – 80
No. 50	10 – 35
No. 200	5 – 15

F. Dense Graded Aggregate Base Course: 2A coarse aggregate, Type C or better, as specified in PENNDOT 408. Recycled crushed concrete will not be allowed.

G. Bedding: No. 8 (AASHTO) coarse aggregate as specified in PENNDOT 408 or as specified herein.

H. Planting soils: Refer to landscape specifications.

I. Choker Course/No. 57 Stone Base: No. 57, clean washed, uniformly graded, crushed, clean-washed stone. Refer to drawings for additional requirements.

J. Open-Graded Subbase: No. 2 (AASHTO) coarse aggregate.

2.2 ACCESSORIES

A. Detectable Warning Identification Tape: Acid-and-alkali-resistant polyethylene film warning tape manufactured for marking and identifying underground utilities. Warning tape shall be a minimum 6 inches wide, 6 mils thick, have a minimum tensile strength 7,500 lbs/in^2, continuously inscribed with a description of the utility in permanent printing with caution striping, with metallic core encased in a protective jacket for corrosion protection, detectable by metal detector when tape is buried up to 30 inches deep; APWA color-coded as follows:

1. Red: Electric

2. Yellow: Gas, oil, steam, and dangerous materials.

3. Orange: Telephone and other communications.

4. Blue: Water systems.

5. Green: Sewer systems.

2.3 GEOTEXTILES

A. General: Provide geotextiles in areas and extents as indicated in the Contract Drawings.

B. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that me incorporated into the work include the following or approved equal:

1. Mirafi 180N, non-woven.

2. Amoco ProPex 4553, non-woven.

C. Refer to contract drawings for minimum requirements.

PART 3 EXECUTION

3.1 PREPARATION

A. Protect existing utilities, sidewalks, structures, pavements, and other facilities to remain free from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earthwork operations.

B. Provide erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways in accordance with the Drawings.

C. Clear, grub, and excavate to the design subgrade elevation, stripping topsoil, deleterious debris and unsuitable material from the site.

D. Smooth grade and compact the soils using appropriate compaction equipment. Very soft soils (CBR < 0.5) may be difficult to compact. In these instances, create a surface that is as uniformly smooth as possible.

3.2 DRAINAGE AND DEWATERING

A. Prevent surface water and subsurface or groundwater from entering or flowing into excavations, from ponding on prepared subgrades, and from flooding the project site and surrounding area.

B. Protect subgrades from softening, undermining, washout, and damage by rain or water accumulation.

C. Reroute surface water runoff away from excavated areas. Do not allow water to accumulate in excavations. Do not use excavated trenches as temporary drainage ditches.

D. Provide pumping to remove any water encountered in accordance with Paragraph 1.5.

3.3 EXPLOSIVES

A. Explosives: The use of explosives are prohibited on this Project.

3.4 FROST PROTECTION AND SNOW REMOVAL

A. Keep earthwork operations clear and free of accumulations of snow as required to carry out the work.

B. Protect the subgrade beneath structures and pipes from frost penetration when freezing temperatures are expected.

3.5 GENERAL EXCAVATION

A. Excavate to depths and limits shown on the Drawings. Compact subgrade surface in accordance with Contract Drawings.

B. In all excavation areas, strip the surficial topsoil layer and underlying subsoil layer separate from underlying soils. In paved areas, first cut pavement as specified in paragraph 3.6 A of this specification, strip pavement and pavement subbase separately from underlying soils.

C. All excavated materials shall be stockpiled separately from each other within the limits of work.

D. Any soft or unstable material as characterized in the geotechnical report or by visual inspection of the geotechnical engineer shall be overexcavated and replaced by the contractor with compacted load bearing fill. Any areas of instability shall be overexcavated to a depth of at least 2 feet and replaced with structural fill in accordance with this section.

E. Provide shoring and bracing necessary to comply with Paragraph 1.5.

F. All footing excavation surfaces should be protected until the concrete and backfill is placed. Footing bearing surfaces should be cleaned of all material loosened by the excavation process and be recompacted using hand-operated compaction equipment prior to concrete placement. Should loose or soft materials be encountered or if the bearing materials become disturbed or softened, the disturbed materials should be removed and the footing should be lowered to undisturbed bearing materials or the undercut zone should be filled with lean concrete or compacted structural fill.

G. If the Contractor encounters an area with discolored, stained, and/or ordered soils or any other evidence of contamination during excavation work, the Contractor must immediately notify the Owner, cease work in the aforementioned area, and secure area with fencing, tape, stakes or other suitable means to prevent entry by personnel or equipment. Construction response to address the contamination shall be in accordance with pertinent regulatory requirements.

3.6 EXCAVATION FOR UTILITY TRENCHES

A. Prior to excavation, trenches in pavement shall be the traveled way surface cut in a straight line by concrete saw or equivalent method, to the full depth of pavement. Excavation shall only between these cuts. Excavation support shall be provided as required to avoid undermining of pavement. Cutting operations shall not be done by ripping equipment.

B. Perform all dewatering requirements specified in paragraph 3.2 before performing trench excavations.

C. Trenches shall be excavated to such depths as will permit pipe to be laid at the elevations, slopes, and depths of cover indicated on the Drawings. Trench widths shall be as shown on the drawings or as specified.

D. Excavate trenches to uniform widths to provide a working clearance on each side of pipe or conduit. Excavate trench walls vertically from trench bottom to 12 inches higher than top of pipe or conduit, unless otherwise indicated.

E. Pipe trenches shall be made as narrow as practicable and shall not be widened by scraping or loosening materials from the sides. Every effort shall be made to keep the sides of the trenches firm and undisturbed until backfilling has been completed.

F. Clearance: 12 inches on each side of pipe or conduit or as indicated.

G. Trench Bottoms: Excavate and shape trench bottoms to provide uniform bearing and support of pipes and conduit. Remove projecting stones and sharp objects along trench subgrade.

1. Provide bedding depth as indicated on the drawings.

2. Shape bedding to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits.

3. For pipes and conduit less than 6 inches in nominal diameter and flat-bottom, multiple-duct conduit units, hand-excavate trench bottom to accurate elevations and support pipe and conduit on an undisturbed subgrade.

4. For pipes and conduit 6 inches or larger in normal diameter, shape bottom of trench to support bottom 90 degrees of pipe circumference. Fill depressions with bedding material. At each pipe joint, dig bellholes to relieve pipe bell of loads and to ensure continuous bearing of pipe barrel on bearing surface.

3.7 EXCAVATION FOR FOUNDATIONS

A. Excavations shall not be wider than required to set, brace, and remove forms for concrete, or perform other necessary work.

B. After the excavation has been made, and before forms are set for footings, mats, slabs, or other structures, and before reinforcing is placed, all loose or disturbed material shall be removed from the subgrade. The bearing surface shall then be compacted to meet the requirements of this specification.

C. If, in the opinion of the Engineer, the existing material at subgrade elevation is unsuitable for structural support; excavate and dispose of the unsuitable material to the required width and depth as directed by the Engineer. If, in the opinion of the Engineer, filter fabric is required; place filter fabric as approved by the Engineer and per the manufacturer's recommendations. Structural fill shall then be placed in lifts and compacted to required densities. Backfill shall be placed to the bottom of the proposed excavation.

3.8 EXCAVATION NEAR EXISTING STRUCTURES

A. Attention is directed to the fact that there are pipes, manholes, drains, and other utilities in certain locations. An attempt has been made to locate all utilities on the drawings, but the completeness or accuracy of the given information is not guaranteed.

B. As the excavation approaches pipes, conduits, or other underground structures, digging by machinery shall be discontinued and excavation shall be done by means of hand tools, as required. Such manual excavation, when incidental to normal excavation, shall be included in the work to be done under items involving normal excavation.

C. Where determination of the exact location of a pipe or other underground structure is necessary for properly performing the work, the Contractor shall excavate test pits to determine the locations.

3.9 UNAUTHORIZED EXCAVATION

A. Unauthorized excavations shall be filled with satisfactory fill materials and compacted in accordance with the relevant paragraphs of this Section.

B. The Contractor is responsible for furnishing all materials, labor, supervision, tools, and equipment associated with unauthorized excavations without additional compensation.

3.10 STORAGE OF SOIL MATERIALS

A. Stockpile borrow materials and excavated satisfactory materials sufficiently far away from the edge of excavations to preclude excavation instability. Stockpile soil materials without intermixing. Cover to prevent windblown dust.

B. Install erosion control measures around stockpiles as required to comply with Paragraph 1.8.

3.11 GENERAL BACKFILL

A. Backfill shall not be placed on a subgrade which contains frozen material, or which has been subjected to freeze-thaw action. This prohibition encompasses all subgrade types, including the natural ground, all prepared subgrades (whether in an excavation or in a trench) and all layers of previously placed and compacted earth fill which become the subgrade for successive layers of earth fill. All material that freezes or has been subjected to freeze-thaw action during the construction work, or during periods of temporary shutdowns, such as, but not limited to, nights, holidays, weekends, winter shutdowns, or earthwork operations, shall be removed to a depth that is acceptable to the Owner and replaced with new material. Alternatively, the material will be thawed, dried, reworked, and recompacted to the specified criteria before additional material is placed. The geotechnical engineer will determine when placement of fill shall cease due to cold weather.

B. Prior to backfilling, compact the exposed natural subgrade to the densities as specified herein.

C. Place and compact backfill in excavations promptly, but not before completing the following:

1. Construction below finish grade including, where applicable, dampproofing, waterproofing, and perimeter insulation.

2. Surveying locations of underground utilities for record documents.

3. Inspecting and testing underground utilities.

4. Removing concrete formwork.

5. Removing temporary shoring, bracing, and sheeting unless directed to remain.

6. Removing trash and debris.

7. Place and compact materials to the specified density in continuous horizontal layers. The degree of compaction shall be based on maximum dry density as determined by ASTM Test D1557, Method C. The minimum degree of compaction for fill placed shall be as follows:

LOCATION	PERCENT OF MAXIMUM DENSITY
BELOW PIPE CENTERLINE	95
ABOVE PIPE CENTERLINE	92
BELOW PAVEMENT (UPPER 3 FT.)	95
EMBANKMENTS	95
BELOW PIPE IN EMBANKMENTS	95
ADJACENT TO STRUCTURES	92
BELOW STRUCTURES	95

D. The Engineer reserves the right to test backfill for conformance to the specification and the Contractor shall assist as required to obtain the information. Compaction testing will be performed by the Engineer or by an inspection laboratory designated or approved by the Engineer, engaged and paid for by the Contractor. If test results indicate work does not conform to specification requirements, the Contractor shall remove or correct the defective Work be recompacting where appropriate or replacing as necessary and approved by the Engineer, to bring the work into compliance, at no additional cost to the Owner. All backfilled materials under structures and buildings shall be field tested for compliance with the requirements of this specification.

E. Where horizontal layers meet a rising slope, the Contractor shall key each layer by benching into the slope.

F. If the material removed from the excavation is suitable for backfill with the exception that it contains stones larger than permitted, the Contractor has the option to remove the oversized stones and use the material for backfill or to provide replacement backfill at no additional cost to the Owner.

G. The Contractor shall remove loam and topsoil, loose vegetation, stumps, large roots, etc., from areas upon which embankments will be built or areas where material will be placed for grading. The subgrade shall be shaped as indicated on the Drawings and shall be prepared by forking, furrowing, or plowing so that the first layer of the fill material placed on the subgrade will be well bonded to the subgrade.

3.12 UTILITY TRENCH BACKFILL

A. Place and compact bedding course on trench bottoms where indicated. Shape bedding course to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies or ducts.

B. Place and compact bedding material by hand shovel in 6-inch lifts to a height of 12 inches above and below the top of utility pipe or conduit. This area of backfill is considered the zone around the pipe and shall be thoroughly compacted before the remainder of the trench is backfilled.

1. Carefully compact material under pipe haunches and bring backfill up evenly on both sides and along the full length of utility piping or conduit to avoid damage or displacement of utility system.

2. Place and compact materials to the specified density in continuous horizontal layers. The degree of compaction shall be based on maximum dry density as determined by ASTM Test D1557, Method C.

C. Coordinate backfilling with utilities testing.

D. Fill voids with approved backfill or satisfactory soil materials as shoring, sheeting and bracing is removed. Place and compact final backfill of satisfactory soil material to final subgrade.

E. Install warning and identification tape directly above utilities, 12 inches below finished grade, except 6 inches below subgrade under pavements and slabs.

3.13 BACKFILLING ADJACENT TO STRUCTURES

A. The Contractor shall not place backfill against or on structures until they have attained sufficient strength to support the loads to which they will be subjected. Excavated material approved by the Engineer may be used in backfilling around structures. Backfill material shall be thoroughly compacted to meet the requirements of this specification.

B. Contractor shall use extra care when compacting adjacent to pipes and drainage structures. Backfill and compaction shall proceed along sides of drainage structures so that the difference in top of fill level on any side of the structure shall not exceed two feet (2') at any stage of construction.

C. Where backfill is to be placed on only one side of a structural wall, only hand-operated roller or plate compactors shall be used within a lateral distance of five feet (5') of the wall for walls less than fifteen feet (15') high and within ten feet (10') of the wall for walls more than fifteen feet (15') high.

3.14 STRUCTURAL FILL PLACEMENT FOR BERM

A. Structural fill and backfill should be placed in maximum 8 inch loose lifts and compacted to 95 percent of the maximum dry density within a targeted two percent of the optimum moisture content as determined by ASTM D 1557 (Modified Proctor). Fill material compacted with relatively light hand held equipment may need to be placed in thinner lifts. Variations in moisture content may be acceptable subject to Engineer’s approval if the contractor is able to achieve the necessary compaction. Hand operated vibratory jumping jacks and plate compactors should be used in confined excavations for foundations or utilities. Fill material compacted with relatively light weight equipment or in the static mode may require additional passes and/or the material may need to be placed in thinner, loose lifts.

B. Before filling operations begin, Contractor to provide test results of imported fill material to determine the maximum dry density, optimum moisture content, natural moisture content, gradation, and plasticity of the soil. The placement of all fill and backfill should be monitored by to ensure that the specified material and lift thicknesses are properly installed. A sufficient number of in-place density tests should be performed during fill placement to ensure that the specified compaction is achieved throughout the height of the fill or backfill.

C. Vegetative berm slopes shall not exceed 3H:1V slope. Slopes with poured in place rubber surfacing shall not exceed 1H:1V.

D. Contractor to schedule berm inspection with Engineer prior to pouring ramp concrete or rubber surfacing.

E. Contractor shall use erosion control matting and other slope stabilization methods, as appropriate, to maintain shape and elevations of berm throughout construction.

3.15 MOISTURE CONTROL

A. Uniformly moisten or aerate subgrade and each subsequent fill or backfill layer before compaction to within 2 percent of optimum moisture content.

1. Do not place backfill or fill material on surfaces that are muddy, frozen, or contain frost or ice.

2. Remove and replace, or scarify and air-dry satisfactory soil material that exceed optimum moisture content by 2 percent and is too wet to compact to specified dry unit weight.

3. Construction during wet weather may also create unnecessary delays and undercutting of subgrades due to disturbance by construction traffic.

3.16 GRADING

A. General: Uniformly grade areas to a smooth surface, free from irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated.

1. Provide a smooth transition between adjacent existing grades and new grades.

2. Cut out soft spots, fill low spots, and trim high spots to comply with the required grading surface tolerances.

B. Rough grade area sufficiently high to require cutting by fine grading:

1. Slope grades to direct water away from buildings and prevent ponding. Where paved, finish grades shall slope away from the building by a minimum 1/4” per foot for a distance of 8 feet unless otherwise indicated. In unpaved areas, finish grades shall slope away from the building by a minimum ½” per foot for a distance of 10 feet, unless otherwise indicated.

2. Grade area for bituminous surfacing and other paving to the indicated grades, equal to the section of the indicated base and pavement.

3. Slope banks to required finish grades as cut progresses or leave cuts full and finish grade by mechanical equipment to provide grades and soil densities indicated on the Drawings.

4. Rough grade, fill and compact banks beyond indicated finish grades. Finish grade banks and slopes to indicated grades and specified soil densities.

5. Grade Only Areas: In areas not indicated to receive pavement, rough grade to approximate finish grades and then scarify, moisten and roll to obtain required density and indicated finish grades.

6. Tolerances: Finish grades shall be within a tolerance of 0.05 inch per foot above or below grades indicated. Provide an average grade as indicated.

C. Finish subgrades to required elevations within the following tolerances:

1. Lawn or unpaved areas: Plus or minus 1 inch.

2. Pavements: Plus or minus ½ inch.

3. Tolerance of completed grades of base or subgrade shall not vary more than 0.03 inch per foot from grades indicated. Provide an average grade as indicated.

D. Where indicated on drawing, final grading shall meet ADA slope requirements.

3.17 SUBBASE AND BASE COURSES

A. Under pavements and walks outside the right-of-way, place base course on prepared subgrade and as follows:

1. Place base course material over prepared subgrade.

2. Compact base course at optimum moisture content to required grades, lines, cross sections, and thickness to not less than 95 percent of maximum dry unit density according to ASTM D 1557 or to a relative density exceed 75 percent as determined in accordance with ASTM D 4254, as applicable.

3. Shape base to required crown elevations and cross slope grades.

4. When thickness of compacted base course is 6 inches or less, place materials in a single layer.

5. When thickness of compacted base course exceeds 6 inches, place materials in equal layers, with no layer more than 6 inches thick or less than 3 inches thick when compacted.

B. Under street pavements, place subbase material in accordance with City of Philadelphia Streets Department Standard Construction Items, Division 10-0020.

3.18 GEOSYNTHETIC INSTALLATION

A. Geosynthetic shall be laid at the proper elevation and orientation as shown on the Contract Drawings or as directed by the Engineer. Correct orientation of the geosynthetic shall be verified by Contractor.

B. Geosynthetic may be temporarily secured in-place with staples, pins, sand bags or backfill as required by fill properties, fill placement procedure or weather condition, or as directed by the Engineer.

C. Unroll the geosynthetic in the direction of travel so that the long axis of the roll is parallel with channelized traffic patterns. For very soft subgrades (CBR < 0.5), unrolling geogrid transversely or perpendicular to the roadway embankment alignment, may be preferred, particularly if lateral spreading and separation of overlaps is a concern.

D. Overlap geosynthetics in accordance with manufacturer's recommendations.

E. Cut and overlap geogrid to accommodate curves. Cutting may be done with sharp shears, a knife-like implement or handheld power (i.e., "cutoff") saws. Cut grid to conform to manhole covers and other immovable protrusions.

F. Geomembranes to conform to protrusions per details provided in the Contract Drawings.

G. Place geosynthetics in daily work sections so that proper alignment is maintained.

H. Backfill material shall be placed in lifts and compacted as directed under project specifications. Backfill shall be placed, spread and compacted in such a manner as to minimize the development of wrinkles in and/or movement of the geosynthetic. A minimum fill thickness of 6 inches is required prior to the operation of tracked vehicles over the geosynthetic. Follow manufacturer's recommendations.

I. Turning of tracked vehicles should be kept to minimum to prevent tracks from displacing the fill and damaging the geosynthetic. Rubber tired equipment may pass over the geosynthetic reinforcement at low speeds, less than 10 mph. Sudden braking and sharp turns shall be avoided. Any geosynthetic damaged during installation shall be replaced by the Contractor at no additional cost to the Owner.

3.19 FIELD QUALITY CONTROL

A. The contractor shall coordinate all earthwork with the testing agency and geotechnical engineer to allow for inspection and testing. The geotechnical engineer shall provide full-time observation and testing of the compaction operations and provide documentation to the Owner.

B. Allow geotechnical engineer to inspect and test each subgrade and each fill or backfill layer. Proceed with subsequent earthwork only after test results for previously completed work comply with requirements.

C. The geotechnical engineer shall test compaction of soils in place according to ASTM D 1556, ASTM D 1557, ASTM D 2167, ASTM D 2922, ASTM D 2937, and ASTM D 4254 as applicable. Tests shall be performed at the following locations and frequencies:

1. Paved Areas: At subgrade and at each compacted fill and backfill layer, at least one test for every 2200 sq. ft. or less of paved areas or building slab, but in no case fewer than three tests.

2. Trench Backfill: At each compacted initial and final backfill layer, at least one test for each 150 feet or less of trench, but no fewer than two tests.

3. Structural Backfill: At each compacted initial and final backfill layer, at least one test for each 150 feet or less of trench, but no fewer than two tests.

D. When the geotechnical engineer reports that subgrades, fills or backfills have not achieved degree of compaction specified, recompact and retest until specified compaction is obtained.

3.20 PROTECTION

A. Protect newly graded areas from traffic, freezing, and erosion. Keep free of trash and debris.

B. Repair and re-establish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled or where they lose compaction due to subsequent construction operations or weather conditions.

1. Scarify or remove and replace soil material to depth as directed by the Owner or the geotechnical engineer; reshape and recompact to the required density, at no additional cost to the Owner.

C. Where settling occurs before the project correction period elapses, remove finished surfacing, backfill with additional approved material, compact, and reconstruct.

1. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to the greatest extent possible at no additional cost to the Owner.

D. Provide temporary underpinning, bracing, sheeting, and/or shoring as required to maintain the conditions of existing utilities or structures adjacent to excavation work. Prepare shop drawings of design details sealed by a professional engineer.

E. Provide fencing, barricades, and/or protective barriers for all excavation.

3.21 SHORING

A. Provide shoring as necessary to properly and safely support earth sides of excavations, and existing curbs, sidewalks, gutter, drives and stairs, against movement and collapse.

B. Design and Calculations: Provide in accordance with requirement of OSHA.

C. Remove shoring upon completion of the Work of this section or when no longer needed unless required otherwise by authorities having jurisdiction.

3.22 DISPOSAL OF SURPLUS AND WASTE MATERIALS

A. Disposal: Remove surplus satisfactory soil and waste material, including unsatisfactory soil, trash, and debris, and legally dispose of it off site to a regulated and permitted facility. Provide two copies of load manifest and permit from owner of the property where material is deposited.

B. All soil must be handled and disposed of per state and local applicable regulations.

- END -

SECTION 312500

EROSION AND SEDIMENT CONTROL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this section.

1.2 SUMMARY

A. Section Includes:

1. Control of runoff and pollutants from the site during construction activities.

B. Related Sections:

1. Division 01 – General Requirements.
2. The Contract Documents.

1.3 DEFINITIONS AND ABREVIATIONS

A. BMP Best Management Practice.

B. CA Corrective Action.

C. CGP NPDES General Permit for Stormwater Discharge Associates with Construction Activities.

D. PWD Philadelphia Water Department

E. PADEP Pennsylvania Department of Environmental Protection

F. NPDES National Pollutant Discharge Elimination System.

G. E&S Erosion & Sediment Control.

1.4 REFERENCES

A. The most current version of the publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

1. PWD Erosion and Sediment Control Standards.

2. PADEP Erosion and Sediment Pollution Control Program Manual.

1.5 ACTION SUBMITTALS

A. General:

1. Make submittal in compliance with all provisions of Division 01 pertaining to submittals and quality assurance.

2. Render submittals and receive approval prior to delivery of installation.

3. Approval in writing by the Engineer of submitted products, samples, test reports, and certificates, does not constitute final acceptance.

B. Product Data: For the following:

1. Compost Filter Sock.
2. Stabilized Construction Entrance.
3. Inlet Filter Protection.
4. Erosion Contral Matting.

C. Samples for Verification: For each of the following:

1. Compost Filter Sock: 2 foot length.

1.6 INFORMATION SUBMITTALS

A. Qualification Data: For qualified Installer. Include list of similar projects completed by Installer demonstrating Installer's capabilities and experience. Include project names, addresses, and year completed, and include names and addresses of Owners' contact persons.

1.7 QUALITY ASSURANCE

A. National Pollutant Discharge Elimination System (NPDES) General Permit for Storm Water Discharges Associated with Construction and Lands Disturbance Activities.

B. Regulations of the Commonwealth of Pennsylvania and PADEP, and Philadelphia City Ordinances.

C. PWD Erosion and Sediment Control Standards.

D. PADEP Erosion and Sediment Pollution Control Program Manual.

1.8 DELIVERY STORAGE AND HANDLING

A. Provide proper storage of materials and equipment to prevent rain and storm water runoff to come in contact with pollutants, such as soil stabilizers, paint or fluids from vehicles.

1.9 PROJECT CONDITIONS

A. Existing Conditions

1. Carefully examine the site before submitting a bid. Be informed as to the nature and location of the Work, general and local conditions including climate, adjacent properties and utilities, conformation of the ground, the nature of subsurface conditions, the character of equipment and facilities needed prior to and during execution of the Work.

2. Should the Contractor, in the course of Work, find any discrepancies between Drawings and physical conditions or any omissions or errors in Drawings, or in layout as furnished by the Engineer, it will be his duty to inform the Engineer immediately in writing for clarification. Work done after such discovery, unless authorized by the Engineer, shall be done at the Contractor's risk.

B. Contractor Shall:

1. Coordinate with PWD and perform all required activities.

2. Implement Good Site Management "Housekeeping".

3. Install and maintain BMPs. Insure that BMPs are designed to protect all exposed portions of the site, including:

a. Erosion, Sediment, Tracking, and Wind Erosion Control BMPs.
b. Non-storm Water Control BMPs.
c. Waste Management BMPs.

4. Incorporate BMP activities into the Project Schedule.

5. Inform CONTRACTOR and Subcontractors personnel on the BMP procedures to prevent pollutants from entering the storm drain system, before the start of construction activities. Keep personnel informed of the BMP implementation process and of changes to the procedures. Provide record to OWNER of Storm Water Topics discussed.

6. Pay fines and penalties from regulatory agencies against OWNER due to CONTRACTOR'S non-compliance with storm water regulations. OWNER shall recover costs of fines and penalties by appropriate OWNER assessment. Review of the BMPs by OWNER shall not relieve CONTRACTOR from liabilities arising from non-compliance of storm water pollution regulations.

C. Project Inspector and DISTRICT Inspector will conduct inspection and examination of site storm water regulation compliance.

PART 2 - PRODUCTS

2.1 COMPOST FILTER SOCKS

A. Compost filter sock shall be provided in accordance with PennDOT Publication 408.

B. Description: Fabric Sock filled with organic compost designed to filter sediment.

C. Sock Structure: 5 mil photodegradable HDPE, 12"-24" diameter with 3/8" mesh opening. Product shall conform to the requirements outlined in Table 4.1, Compost Sock Fabric Minimum Specifications, of the PADEP Erosion and Sediment Pollution Control Program Manual.

1. Tensile Strength: 26 psi.

2. Ultraviolet Stability (ASTM G-155): 23% at 1,000 hr.

3. Minimum Functional Longevity: 9 months.

D. Compost: should be a well decomposed, weed-free organic matter derived from agriculture, food, stump grindings, and yard or wood/bark organic matter sources. Compost shall conform to the compost standards outlined in Table 4.2, Compost Standards, of the PADEP Erosion and Sediment Pollution Control Program Manual, as outlined below.

1. Organic Matter Content: 80% - 100% (dry weight)

2. Organic Portion: Fibrous and elongated

3. pH: 5.5-8.0

4. Moisture Content: 30% - 60%

5. Particle Size: 90% pass through 1” sieve

6. Soluble Salt Concentration: 5.0 dS/m (mmhos/cm) Maximum

2.2 STABILIZED CONSTRUCTION ENTRANCE

A. Refer to contract drawings

2.3 INLET FILTER PROTECTION

A. Filter protection shall be provided in accordance with PennDOT Publication 408, Section 860.

B. Filter protection shall be manufactured to fit the opening of the catch basin or drop inlet.

C. City inlet (and curb opening portion of open-mouth grate inlet) protection shall be a synthetic filter manufactured from recycled synthetic fibers listed in PennDOT Bulletin 15 or approved equal.

D. Refer to contract drawings.

2.4 EROSION CONTROL MATTING

A. Erosion control matting shall be in accordance with PennDOT Pub. 408 Section 806, and from an approved supplier named in Bulletin 15

B. Erosion control matting shall be biodegradable.

PART 3 - EXECUTION

3.1 PREPARATION

A. Install perimeter controls prior to starting Work at the Project site.

B. Implement BMP plan to contain on-site storm water on the Project site. Provide storm drain inlet protection. Do not drain on-site water directly into the storm drain without proper BMP in place.

C. Prevent pollutant discharges into the storm drain system. Prevent storm water from coming into contact with pollutants, such as sediment, material spills, or leakage from storage tanks, waste containers or transfer areas. In the event contamination is found CONTRACTOR shall immediately notify OWNER.

D. Protect exposed dirt, such as stockpiles, landscaping areas, and hillsides.

E. Properly manage non-storm water discharges such as ground water and broken utility lines.

F. Adjust BMP's locations and layouts in accordance to construction progress to assure compliance to regulations.

G. Conduct inspections of pollution prevention controls and provide Site Monitoring Report to OWNER immediately if pollutants are discharged into the site runoff. CONTRACTOR shall remediate contaminated water.

H. Upon Substantial Completion: Maintain and leave post-construction storm water pollution prevention controls in place and remove those that are not needed as determined by the OWNER.

3.2 CLOSEOUT

A. Verify the following prior to Sub Completion:

1. Final stabilization of site has been demonstrated.

2. There is no potential for construction related storm water pollutants to be discharged into site runoff.

3. Construction related equipment and temporary BMP have been removed from site.

4. Rubbish, debris, and waste materials have been removed and legally disposed of off the Project site.

5. PWD items have been closed and signed-off.

- END -

SECTION 321313

PLAIN CEMENT CONCRETE PAVING

PART 1 - GENERAL

1.1 SUMMARY

A. Work Included: Provide labor, materials and equipment necessary to complete the work of this Section, including but not limited to the following:

1. Concrete paving with exposed aggregates

B. Related Work: The following items are not included in this Section and are specified under the designated Sections:

1. Section 03 30 00 - Landscape Cast-In-Place Concrete.
2. Section 12 93 00 - Site Furnishings.
3. Section 31 20 00 - Earth Moving.

1.2 REFERENCES

A. American Concrete Institute (ACI):

1. Sp66-(88) - ACI Detailing Manual.

B. American Society for Testing and Materials (ASTM)

1. A185 - Standard Specification for Steel Welded Wire, Fabric, Plain for Concrete Reinforcement.
2. C31 - Standard Methods of Making and Curing Concrete Test Specimens in the Field.
3. C33 - Standard Specification for Concrete Aggregates.
4. C78 - Standard Test Method for Flexural Strength of Concrete (Using Simple Beam with Third-Point Loading).
5. C94 - Standard Specification for Ready-Mixed Concrete.
6. C150 - Standard Specification for Portland Cement.
7. C173 - Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method.
8. C494 - Standard Specification for Chemical Admixtures for Concrete.

C. Concrete Reinforcing Steel Institute (CRSI)

1. MSP - Manual Of Standard Practice.

1.3 SUBMITTALS

A. Qualification Data for Installer, manufacturer, and testing agency.

B. Welding certificates.

C. Material Certificates: Submit at least 15 days prior to installation of materials, material data and certificates signed by manufacturer and contractor, certifying that materials comply with, or exceed, specified requirements.

1. Cementitious materials.
2. Admixtures.
3. Steel reinforcement and accessories.
4. Curing compounds.
5. Joint filler material & backer rod
6. Sealant

D. Material Test Reports: For the following, from a qualified testing agency, indicating compliance with requirements

E. Concrete Mix Reports: Submit at least 15 days before placing concrete, reports for each concrete mix type that contains the information specified herein.

F. Laboratory Reports: Submit results of tests performed within one working day after tests are performed.

G. Concrete Repairs: Submit repair procedures, including materials and methods to the Landscape Architect for approval.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: A qualified installer who employs on Project personnel qualified as ACI- certified Flatwork Technician and Finisher and a supervisor who is an ACI-certified Concrete Flatwork Technician. Prior to award of the contract, the placing contractor shall furnish the Construction Manager a statement attesting to qualifications and experience and the following: A minimum of 3 completed projects within the last 5 years, including a total square footage to exceed 10,000 sf, submitted with addresses and owner’s contact information.

B. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94M requirements for production facilities and equipment.

1. Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities."

C. Testing Agency Qualifications: An independent agency, acceptable to authorities having jurisdiction, qualified according to ASTM C 1077 and ASTM E 329 for testing indicated.

D. Source Limitations: Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant, obtain aggregate from single source, and obtain admixtures from single source from single manufacturer.

E. Welding Qualifications: Qualify procedures and personnel according to AWS D1.4/D 1.4M, "Structural Welding Code - Reinforcing Steel."

F. Standards Compliance: Comply with the following unless modified by requirements in the Contract Documents:

1. ACI 117 – Specifications for Tolerances for Concrete Construction and Materials."
2. ACI 318 – Building Code Requirements for Reinforced Concrete
3. PennDOT 408 – Construction Specifications
4. PennDOT RC-67M – Curb Ramp and Sidewalk Construction Details

G. Concrete Testing Service: Engage a qualified independent testing agency to perform material evaluation tests and to design concrete mixtures.

H. The Contractor shall conform to the requirements of Specification 031000 –Concrete Forming and Accessories and Specification 033000 – Cast-In-Place Concrete.

I. Contractor to perform Field Tests as per paragraph 3.7 Field Test Specimens herein.

J. Mockups: Cast mockups of full-size sections of concrete pavement to demonstrate typical joints, surface finish, texture, color, and standard of workmanship.

1. Build a 10’ x 10’ mockup on site. If location not indicated, as directed by Owner’s representative.
2. Notify Owner’s representative seven days in advance of dates and times when mockups will be constructed.
3. Obtain approval from Owner’s representative before starting mockup construction.
4. Maintain approved mockups during construction in an undisturbed condition as a standard for judging the completed pavement.
5. Approved mockup may not become part of finished work. Demolish and remove approved mockups from the site when directed by Owner’s representative.

PART 2 - PRODUCTS

2.1 REINFORCING MATERIALS

A. Welded Wire, Fabric: ASTM A185, sheet type only. Ensure that sheets are free from loose flaky rust, loose scale, oil, grease, mud, or other coatings that might reduce the bond with concrete.

B. Dowels: Furnish epoxy coated steel bars conforming to ASTM A615, Grade 60. Fabricate dowels or cut to length at the shop or mill prior to delivery to the site. Ensure that dowels are free of loose flaky rust and scale, clean and straight. Before delivery, paint a minimum of two thirds the length of each dowel with one coat of epoxy paint. Shear dowels to length provided that the deformation from true shape caused by shearing does not exceed 0.04 inch on the diameter of the dowel and does not extend more than 0.04 inch from the end of the dowel.

C. Support for Reinforcement: Conform to recommendations by CRSI: Manual Of Standard Practice.

2.2 CONCRETE MATERIALS

A. Portland Cement: Gray Cement - Lehigh Portland/Type I/II ASTM C150. Do not use air entraining cement.

B. Aggregates: ASTM C33

C. Joints

1. Sawed Control Joints, as per the drawings and this specification, see Execution herein.

2. Expansion and Isolation Joints: Pre-molded bituminous fiber joint filler system, with a bond breaker and sealant.

   a. Expansion and Isolation Joint Filler Strips: ASTM D 1752, Closed cell flexible foam expansion joint filler, compatible with sealants, shall be installed as recommended by manufacturer.
   b. Bond Breaker: Joint bond breaker, polyethylene tape or expanded closed cell polyethylene foam backer rod, shall be installed as recommended by manufacturer.
   c. Sealant: Prepared expansion and Isolation joints shall be coated with a primer followed by installation of a bond breaker and a self-leveling two-component polyurethane-based elastoneric sealant. Color of sealant shall match color of adjacent paving, as approved by the Landscape Architect.

D. Water: Fresh and free from injurious amounts of oil, acid, salt, alkali, organic matter, or other deleterious substances.

2.3 COMPACTED AGGREGATE SUBBASE

A. Compacted Aggregate Subbase: Broken stone, NYCDOT, Bureau of Highway Operations Standard Specifications, Section 2.02, Aggregate-Coarse, Type 1, Grade B, Sizes No. 1, No. 2 and No. 4. Provide bottom course consisting of a uniform mixture of broken stone, Size Nos. 1 and 2, and add No. 4 as a filler after the coarser mixture has been rolled and compacted.

2.4 PROPORTIONING AND DESIGN OF MIXES

A. Mix design criteria:

1. Mix shall include a Medium Range Water Reducing admixture with a final slump of 5” +/- ½”.
2. Air Entraining Admixture: shall be in all concrete exposed to weather conditions in the finished work.
3. Air Content: 6% +/- 1% at point of delivery for 3/8” nominal maximum aggregate size.
4. Coarse aggregate shall be 3/4” with a designation of 4S per ASTM C33.
5. Compressive Strength (28 days): 4,000 PSI strength minimum.
6. Submit mix design to the owner's representative for approval. The owner's representative may reject design mix for non-compliance.

2.5 CONCRETE MIXING

A. Refer to Specification Section 033000, Cast in Place Concrete.

2.6 EQUIPMENT, APPROVAL AND MAINTENANCE

A. Furnish dependable equipment appropriate and adequate to meet approved plan and schedule of work. Assemble equipment sufficiently early before start of paving to permit thorough inspection, calibration of weighing and measuring devices, and adjustment of parts. Equipment shall be subject to the approval of the Landscape Architect. Maintain equipment in good working condition at all times.

B. Furnish and maintain at the jobsite, in good condition, one 12-foot straightedge for each paving spread in testing hardened Portland cement concrete surfaces. Straightedges constructed of aluminum or magnesium alloy must have blades of box or box-girder cross section with flat bottom, adequately reinforced to ensure rigidity and accuracy. The straightedges must have handles for operation on the pavement.

PART 3 - EXECUTION

3.1 GRADE CONTROL

A. Establish and maintain lines and grades shown, by means of line and grade stakes placed at the jobsite.

3.2 PREPARATION

A. Proof-roll prepared subbase surface to check for unstable areas and to verify need for additional compaction. Proceed with pavement work only after non-complying conditions have been corrected and subgrade is ready to receive pavement.

3.3 FORMWORK

A. Design, erect, shore, brace, and maintain formwork, according to ACI 301, to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until structure can support such loads.

B. Construct formwork so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117.

C. Construct forms tight enough to prevent loss of concrete mortar.

D. Fabricate forms for easy removal without hammering or prying against concrete surfaces. Provide crush or wrecking plates where stripping may damage cast concrete surfaces. Provide top forms for inclined surfaces steeper than 1.5 horizontal to 1 vertical.

1. Install keyways, reglets, recesses, and the like, for easy removal.
2. Do not use rust-stained steel form-facing material.

E. Set edge forms, bulkheads, and intermediate screed strips for slabs to achieve required elevations and slopes in finished concrete surfaces. Provide and secure units to support screed strips; use strike-off templates or compacting-type screeds.

F. Clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, and other debris just before placing concrete.

G. Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.

H. Coat contact surfaces of forms with form-release agent, according to manufacturer's written instructions, before placing reinforcement.

3.4 FIELD TEST SPECIMENS

A. General: Prepare concrete samples in the field to determine slump, air content, and strength of concrete. Make test specimens to determine conformance with strength requirements and, when required, to determine the time at which pavements may be placed in service. Determine air content in conformance with ASTM C173. Mold test specimens and cure in conformance with ASTM C31.

B. Specimens for Strength Tests: Make a group of test specimens for every 400 square yards of pavement placed. As a minimum, however, make a set of test specimens each shift that concrete is placed. Mold each group of test specimens from the same batch of concrete. A group of specimen consist of four (4) beams to be tested as follows: One specimen at 7 days of age, two at 28 days, and one as a spare. Perform strength tests in accordance with ASTM C78, flexural tests from concrete beams.

3.5 JOINTS

A. General: Construct joints and tool edges true to line with faces perpendicular to surface plane of concrete. Construct transverse joints at right angles to centerline, unless otherwise indicated on the drawings.

B. Construction Joints: Set construction joints at side and end terminus of pavement and at locations where pavement operations are stopped for more than one-half hour, unless pavement terminates at a planned joint. When concrete placement cannot be continued, install the transverse construction joint within the slab unit but not less than 10 feet from a planned transverse joint. Dowel transverse construction joints as shown. When the construction joint is located at planned transverse joints, plant ½ of each dowel and oil to permit movement at the joint. Edge joints and saw to obtain a groove at the top conforming to the details and dimensions indicated. When concrete placing is resumed, use planned joint spacing beginning with the first regularly scheduled transverse joint.

1. Continue reinforcement across construction joints, unless otherwise indicated. Do not continue reinforcement through sides of strip pavements, unless otherwise indicted.

2. Install dowels, keys or keys with tie bars in the longitudinal construction joints as specified herein.

C. Isolation and Expansion Joints:

1. Form isolation joints of preformed joint filler strips abutting concrete curbs, catch basins, manholes, inlets, walks, walls other fixed objects, and where indicated.
2. Locate expansion joints at intervals of 20 feet unless otherwise indicated.
3. Extend filler joints full width and depth of joint, terminating flush with finished concrete surface, unless otherwise indicated.
4. Furnish joint fillers in one-piece lengths for full width being placed where possible. Where more than one length is required, lace or clip joint-filler sections together.
5. Protect top edge of joint filler during concrete placement with metal, plastic, or other temporary preformed cap. Remove protective cap after concrete has been placed on both sides of joint.
6. Install Bond Breaker, expanded closed cell polyethylene foam backer rod or polyethylene tape, as recommended by manufacturer.
7. Install approved Sealant as recommended by the manufacturer. Sealant shall be applied cleanly without deviating more than 1/8" from the joint or from the terminations. Any sealant on adjacent paving shall be removed carefully without damaging the adjacent surface.

D. Contraction Joints / Control Joints: Sawed transverse and longitudinal contraction joints shall be of the weakened-plane or dummy-groove type. Construct transverse contraction joint, as specified herein.

1. Construct sawed joints by sawing a groove in the hardened concrete with a $^{1}/_{8}$ inch thick blade to the full depth as indicated on the drawings and specified herein.

    a. After expiration of curing period, widen upper portion of groove by sawing to width and depth indicate on the drawings.
    b. Vary time of sawing depending on existing and anticipated weather conditions, so as to prevent uncontrolled cracking of pavement.
    c. Commence sawing of joints as soon as concrete has hardened sufficiently to permit cutting concrete without chipping, spalling, or tearing.
    d. Inspect sawed faces of joints for undercutting or washing of the concrete due to early sawing.
    e. Delay sawing if undercutting or washing is sufficiently deep to cause structural weakness or excessive roughness in the joint.
    f. Saw joints at required spacing consecutively in sequence of concrete placement. Use a chalk line or other suitable guide to mark alignment of joint.
    g. The saw cut shall not vary more than ½ inch from the true joint alignment.
    h. Before sawing a joint, examine concrete closely for cracks.
    i. Saw joint if a crack has occurred near the joint location.
    j. Discontinue sawing when a crack develops ahead of the saw cut.
    k. Workmen and inspectors must wear clean, rubber-soled footwear.
    l. Limit number of persons walking on the pavement to those actually

performing the sawing operation. Immediately after joint is sawed, thoroughly flush saw cut and adjacent concrete surface with water until all waste from sawing is removed from the joint.

m. Respray membrane-cured surface damaged during the sawing operations as soon as surface become dry.

E. Dowels and Tie Bars - Fixed Form Installation

1. Use bonded-in-place method.
2. Place tie bars and dowels across joints where indicated on the drawings.
3. Correctly align and securely hold in proper horizontal and vertical position during placing and finishing operations.
4. Install tie bar in front of paver along longitudinal contraction joints, by insertion into the unconsolidated concrete.
5. Do not install by removing and replacing dowels in preformed holes.
6. Hold dowel assemblies securely in proper location by means of suitable pins or anchors.
7. Furnish an approved template for checking the position of dowels.
8. Paint the portion of each dowel intended to move within the concrete or expansion cap with one coat of red-lead or blue-lead paint.
9. Wipe clean the painted portion and coat with a thin even film of lubricating oil before concrete is placed.

3.6 CONCRETE PLACEMENT

A. General: Do not place steel or concrete until tests on underlying courses are completed and the courses approved by the Landscape Architect.

B. Placing Welded Wire Fabric: Furnish and install the wire fabric shown on the drawings. Position wire fabric on suitable metal chairs prior to concrete placement. Lap one spacing of wire fabric pattern with transverse reinforcing members touching and wire together.

C. Placing Concrete

1. Deposit concrete as close as possible to its final position in pavement cross section.
2. Place concrete continuously and at a uniform rate without unscheduled stops except for equipment failure or other emergencies.
3. Do not drop concrete freely more than 3 feet.
4. Do not allow workmen with foreign material on their footwear or construction equipment that might deposit foreign material to walk or operate in or on the concrete during placement and finishing operations.
5. Do not use re-tempered concrete or concrete which is non-plastic and unworkable, or does not meet the specified mix properties, or which is contaminated by foreign materials.

D. Vibration

1. Consolidate concrete with mechanical vibrating equipment during spreading.
2. Supplement consolidation by hand-spading, rodding, or tamping to

maintain concrete members free of honeycomb, rock pockets and voids.
3. Do not insert vibrators into lower layers of concrete that have begun to set.
4. Do not allow vibrators to touch forms, tie bars, dowels, or other embedded items.
5. Bring pavement surfaces to correct elevation and strike off.
6. Use bull float, darby or highway straightedge to level surface free of lumps or hollows.

E. Cold-Weather Placement:

1. Discontinue concrete placement when air temperature reaches 40º F and is falling.
2. Do not resume until air temperature reaches 35º F and is rising.
3. Furnish and install covers for maintaining concrete at a temperature of at least 50º F for not less than 72 hours after placing.

F. Hot-Weather Placement: During periods of hot weather when the maximum daily air temperature is likely to exceed 85º F.

1. Sprinkle forms and/or underlying material with water immediately before concrete is placed.
2. Place concrete at coolest temperature practicable, but in no case will the temperature of concrete when placed exceed 90º F.
3. Cool aggregates and/or mix with water as necessary.
4. Chipped ice in mixing water may be required to cool concrete, subject to approval of the Landscape Architect.
5. Place concrete continuously and rapidly at a rate of not less than 100 feet of paving lane per hour.
6. Keep finished surface of newly laid pavement damp by applying a water fog or mist with approved spraying equipment.

3.7 FINISHING OPERATIONS

A. Machine or Hand Finish: The sequence of operations is as follows: finishing, floating, straight- edging, texturing, and edging of joints.

B. Finishing and Floating:

1. As soon as placed and vibrated, strike-off concrete and screed to crown and cross section and to such elevation above grade that, when consolidated and finished, surface of pavement will be at the required elevation.
2. Tamp surface until required compaction and reduction of internal and surface voids are accomplished.
3. Immediately following final tamping of surface, float pavement longitudinally from bridges resting on side forms and spanning but not touching concrete.
4. If necessary, place and screed additional concrete, and then float until a satisfactory surface is produced.
5. Advance floating operation not more than half the length of float, and continue floating over new and previously floated surfaces.

C. Surface Correction and Testing:

1. After finishing and floating, but while concrete is still plastic, eliminate minor irregularities and score marks in pavement surface by means of straightedges.
2. Operate straightedges from sides of pavement or from bridges.
3. Test surface for trueness with a 12-foot straightedge held in successive positions parallel and at right angles to centerline of pavement.
4. Cover whole area as necessary to detect variations.
5. Advance straightedge along pavement in successive stages of not more than one-half the length of the straightedge.
6. Fill depressions with freshly mixed concrete, strike off, consolidate, and refinish.
7. Strike-off projections above required elevations and refinish.
8. Continue straightedge testing and finishing, until entire surface of the concrete is free from observable departure and conforms to surface requirements specified herein.

D. Finish: Light Broom, non-slip finish perpendicular to direction of pedestrian flow.

E. Edging: After texturing with light broom, carefully finish edge of pavement along forms and at joints, where indicated or directed by the Landscape Architect, with an edging tool to form a smooth rounded surface of the required radius. Eliminate tool marks and smooth edges true to line.

3.8 CURING AND PROTECTION

A. General: Protect concrete against loss of moisture and rapid temperature changes for at least seven (7) days from the beginning of curing operation. Protect unhardened concrete from rain, flowing water and wind. Furnish and install covers as necessary to prevent cracking of the pavement due to temperature changes. If any selected method of curing does not afford the proper curing and protection against concrete cracking and pavement is damaged, remove and replace damaged payment and employ another method of curing as directed by the Landscape Architect.

B. Curing Methods: Cure concrete for at least seven days by one or more of the following methods:

1. Keep concrete surface continuously wet by covering with water. Cover concrete surface with specified mat, saturated and continuously wet. Ensure that mat covers concrete surfaces and edges, with 6-inches lap over adjacent mat. Moist cure all concrete work and commence moist curing as soon as finishes will not be marred. Insulating blankets waterproofed kraft paper, or polyethylene film as per ASTM C171 shall be used to keep the concrete continuously moist during the curing process.
2. Apply water-fog spray continuously to concrete surface.

3.9 PLAN GRADE AND SURFACE-SMOOTHNESS REQUIREMENTS

A. Ensure that finished surfaces of pavements, when tested as specified herein, conform to grade line and elevations shown and surface-smoothness requirements specified herein.

B. Plan Grade: Ensure that finished surfaces of pavements do not vary more than ½ inch above or below plan grade line or elevation established and approved at jobsite.

Finished surfaces of new abutting pavements will coincide at their juncture.

C. Surface Smoothness: Ensure that finished surfaces of pavements have no abrupt change of 1/8 inch or more and do not deviate from the testing edge of an approved 12-foot straightedge more than 1/4 inch.

3.10 SURFACE TEST, DEFICIENCIES AND CORRECTIONS

A. Test finished surface for conformance with plan grade and surface smoothness requirements.

B. Grade Conformance Tests: Check pavement for conformance with plan grade requirements. Test finished surface of each approved pavement area by running lines of levels at intervals of 25 feet or less longitudinally and transversely to determine elevation of completed pavement. Furnish level surveys to Landscape Architect as surveys are completed. Within 30 days after receipt of level surveys the Landscape Architect will inform this Contractor in writing of areas defective in plan-grade requirements.

C. Drainage: Pavements shall have positive drainage off of the surface. Provide a minimum cross pitch of 1.0% and a maximum cross pitch of 2.0%.

D. Surface-Smoothness Determinations: After concrete has hardened sufficiently to permit walking thereon, but not later than 36 hours after placement, test surface of pavement with a straightedge 12-foot. Test across longitudinal construction joints within 48 hours after the end of the curing period of the concrete placed in the adjacent lane. Inform Landscape Architect when straightedge testing is planned. Operate straightedge in such manner as to reveal surface irregularities exceeding tolerances specified herein. Test entire area of pavement in both longitudinal and transverse direction on parallel lines 10 feet or less apart. Hold straightedge in contact with surface and move ahead one-half the length of the straightedge for each successive measurement. Carry lines of straight edging continuously across joints.

3.11 PAVEMENT TOLERANCES

A. Comply with the following tolerances:

1. Elevation: 1/8 inch.
2. Horizontal Perpendicular Alignments: 1/8 inch.
3. Thickness: Plus 3/8 inch, minus 1/8 inch.
4. Pavements in longitudinal direction, the gap below a 10 ft unleveled straightedge resting on high spots shall not exceed 1/8 inch.
5. Pavements in transverse direction, the gap below a 10 ft unleveled straightedge resting on high spots shall not exceed 1/4 inch.
6. Ramps, sidewalks, and intersections, in any direction, the gap below a 10 ft unleveled straightedge resting on high spots shall not exceed 1/4 inch.
7. Lateral Alignment and Space of Dowels: 1 inch.
8. Vertical Alignment of Dowels: 1/4 inch.
9. Alignment of Dowel-Bar End Relative to Line Perpendicular to Pavement Edge: Length of dowel 1/4 inch per 12 inches.
10. Joint Spacing: 1 inch

11. Contraction Joint Depth: Plus 1/4 inch, no minus.
12. Joint Width: Plus 1/8 inch, no minus.
13. No honeycombs at finish surface concrete will be accepted.
14. In no case shall grades on any pavements either designated or intended to be accessible per the Americans with Disabilities Act (ADA) exceed the grade maximums noted in the ADA or ADA Accessibility Guidelines (ADAAG).

3.12 REMOVAL AND REPLACEMENT OF DEFECTIVE PAVEMENT AREAS

A. Remove defective pavement areas and replace as specified herein with pavements of thickness and quality required by these specifications.

B. In no case will the removal and replacement of concrete result in a slab less than the full paving width or a joint less than 10 feet from a regularly scheduled transverse joint.

C. Remove defective pavement carefully so that adjacent pavement is not damaged and existing keys or dowels at the joint are left intact.

D. When a portion of an un-fractured slab is replaced, make a saw cut 2 inches deep transversely across the slab in the required location.

E. Remove concrete and provide an essentially vertical face in the remaining portion of the slab.

F. Prior to placement of fresh concrete, clean face of slab of debris and loose concrete, and then thoroughly coat with a thixotropic epoxy-resin grout manufactured specifically for bonding fresh Portland cement concrete to existing hardened concrete.

G. Apply epoxy resin coating approximately 1/16 inch thick, by scrubbing a thin coat of epoxy grout into the surface with a stiff-bristle brush followed by a second application.

H. Place strips of polyethylene sheeting on vertical joint faces of adjacent slabs at juncture with slab to be patched as a bond-breaking medium.

I. Place fresh dry packed Portland cement concrete while the epoxy resin is still tacky and in such a manner that grout coating will not be removed.

J. Construct longitudinal and transverse joints of the replaced slab or portion thereof as indicated on the drawings.

K. No payment will be made for the defective pavements removed and replaced nor for the cost of removing the defective pavements.

3.13 PAVEMENT PROTECTION

A. Protect pavement against damage prior to final acceptance by the Landscape Architect. Repair any damage to pavement before final acceptance at no cost to the Owner. Do not permit construction traffic on concrete pavement. Protect against spillage of any deleterious materials.

- END -

SECTION 321343
PERVIOUS CONCRETE PAVING

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes furnish and place non-reinforced pervious Portland cement concrete in accordance with the plans and specifications. Common applications include, but not limited to the following:

1. Pervious concrete paving with coarse aggregates

B. Related Sections:

1. Section 03 30 00 - Landscape Cast-In-Place Concrete.
2. Section 12 93 00 - Landscape Site Furnishings.
3. Section 31 20 00 - Earth Moving.
4. Section 32 13 13 - Plain Cement Concrete Paving.

1.2 REFERENCES

A. American Concrete Institute (ACI):

1. Sp66-(88) - ACI Detailing Manual.

B. American Society for Testing and Materials (ASTM)

1. A185 - Standard Specification for Steel Welded Wire, Fabric, Plain for Concrete Reinforcement.
2. C31 - Standard Methods of Making and Curing Concrete Test Specimens in the Field.
3. C33 - Standard Specification for Concrete Aggregates.
4. C78 - Standard Test Method for Flexural Strength of Concrete (Using Simple Beam with Third-Point Loading).
5. C94 - Standard Specification for Ready-Mixed Concrete.
6. C150 - Standard Specification for Portland Cement.
7. C173 - Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method.
8. C494 - Standard Specification for Chemical Admixtures for Concrete.

1.3 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Design Mixtures Report: Submit mix design report at least 15 days before placing concrete, reports for each concrete mix type that contains the Proposed mix design batch weights (including design unit weight), and the other information specified herein.

C. Material certificates: Submit at least 15 days prior to installation of materials, material data and certificates signed by manufacturer and contractor, certifying that materials comply with, or exceed, specified requirements.

1. Cementitious materials.
2. Admixtures.
3. Joint filler material & backer rod
4. Sealant

D. Material test reports: For the following, from a qualified testing agency, indicating compliance with requirements.

E. Laboratory Reports: Submit results of tests performed within one working day after tests are performed.

F. Concrete Repairs: Submit repair procedures, including materials and methods to the Landscape Architect for approval.

G. Proposed production facility and location.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: Prior to award of the contract, the placing contractor shall furnish with the Construction Manager a statement attesting to qualifications and experience and the following:

1. Installer must have a minimum of 5 similar jobs completed and a minimum of 5 years prior experience installing decorative/colored concrete.
2. The Contractor shall provide a minimum of one National Ready Mix Concrete Association (NRMCA) Certified Pervious Concrete Technician at the placement site.

B. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94M requirements for production facilities and equipment.

1. Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities."

C. Materials Requirements: Pervious Portland cement concrete shall be manufactured in accordance with the requirements of §501-2, with the following modifications:

2. Design a pervious Portland cement concrete mixture as specified in this document. Produce a homogeneous mixture of cement, pozzolan (fly ash or GGBFS), coarse aggregate, set retarding water reducing admixture, water reducing admixture, viscosity modifying admixture (VMA) and water.

D. Testing Agency Qualifications: An independent agency, qualified according to ASTM C 1077 and ASTM E 329 for testing indicated.

E. Standards Compliance: Comply with the following unless modified by requirements in the Contract Documents:

1. ACI 117 - Specification for Tolerances for Concrete Construction and Materials.
2. ACI 318 - Building Code Requirements for Structural Concrete.
3. PennDOT 408 - Construction Specifications.
4. PennDOT RC-67M - Curb Ramp and Sidewalk Construction Details.

F. Concrete Testing Service: Engage a qualified independent testing agency to perform material evaluation tests and to design concrete mixtures.

G. The Contractor shall conform to the requirements of Specification 031000 –Concrete Forming and Accessories and Specification 033000 – Cast-In-Place Concrete

H. Contractor to perform Field Tests and Field Test Panels as per paragraph 3.12 Field Quality Control herein.

PART 2 - PRODUCTS

2.1 FORM-FACING MATERIALS

A. Rough-Formed Finished Concrete: Plywood, lumber, metal, or another approved material. Provide lumber dressed on at least two edges and one side for tight fit.

2.2 CONCRETE MATERIALS

A. Pervious Concrete Pavement, see landscape plans for location:

1. Pervious Portland Cement:

a. Use Type I, II or I/II cement. Cementitious content shall be a minimum of 520 lb/yd³ for size 1 aggregate, and a minimum of 580 lb/ yd³ for size 1A aggregate Cement.
b. Water/cementitious ratio shall be in the range of 0.27 – 0.34.
c. Color: Standard gray

2. Normal-Weight Coarse Aggregates:

a. Coarse gradation shall meet the requirements of size 1 or 1A in table 703-4 of the Department of Transportation's Standard Specifications, Section 703-AGGREGATES.
b. Aggregate/cement ratio shall be in the range of 4:1 to 4.5:1.

3. Water: Fresh and free from injurious amounts of oil, acid, salt, alkali, organic matter, or other deleterious substances.

B. Pigmented/colored Pervious Concrete Pavement, see landscape plans for location:

1. Concrete coloring Agent:

a. Use mix-ready pigments or admixture for color conditioned concrete
b. Colored concrete admixtures shall comply with ASTM C 979
c. Selected colors for colored concrete shall be from manufacturer's standard color lines. Custom or specialized colors are not preferred.
d. Color: Standard color TBD (We are still waiting for the physical samples from the manufacturer)

2. Pervious Portland Cement:

a. Use Type I, II or I/II cement. Cementitious content shall be a minimum of 520 lb/yd³ for size 1 aggregate, and a minimum of 580 lb/ yd³ for size 1A aggregate Cement.
b. Water/cementitious ratio shall be in the range of 0.27 – 0.34.
c. Lakeside Brown 6804, or equal approved by Landscape Architect.

3. Normal-Weight Coarse Aggregates:

a. Coarse gradation shall meet the requirements of size 1 or 1A in table 703-4 of the Department of Transportation's Standard Specifications, Section 703-AGGREGATES.
b. Aggregate/cement ratio shall be in the range of 4:1 to 4.5:1.

4. Water: Fresh and free from injurious amounts of oil, acid, salt, alkali, organic matter, or other deleterious substances.

2.3 CONCRETE COLORING AGENT MANUFACTURERS

A. Approved concrete coloring agent manufacturers:

1. Davis Colors – 3700 East Olympic Blvd., Los Angeles, CA 90023, Phone: (844) 341-4680, Web: www.daviscolors. com

a. MIX-READY Pigments.

2. Sika Scofield – 4155 Scofield Road., Douglasville, GA 30134, Phone: (800) 800-9900, Web: www.scofield.com

a. CHROMIX Admixture for color conditioned concrete.

3. Equal approved by Landscape Architect and Philadelphia Parks and Recreation.

2.4 CURING MATERIALS

A. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.

B. Water: Potable.

2.5 EQUIPMENT, APPROVAL AND MAINTENANCE

A. Furnish dependable equipment appropriate and adequate to meet approved plan and schedule of work. Assemble equipment sufficiently early before start of paving to permit thorough inspection, calibration of weighing and measuring devices, and adjustment of parts. Equipment shall be subject to the approval of the Landscape Architect. Maintain equipment in good working condition at all times.

B. Furnish and maintain at the jobsite, in good condition, one 12-foot straightedge for each paving spread in testing hardened Portland cement concrete surfaces. Straightedges constructed of aluminum or magnesium alloy must have blades of box or box-girder cross section with flat bottom, adequately reinforced to ensure rigidity and accuracy. The straightedges must have handles for operation on the pavement.

PART 3 - EXECUTION

3.1 GRADE CONTROL

A. Establish and maintain lines and grades shown, by means of line and grade stakes placed at the jobsite.

3.2 PREPARATION

A. Mix the concrete in approved transit mix trucks. Load trucks to a maximum of 80% of the rated mixer capacity.

B. All colored concrete should be integrally colored with coloring agent(s) combined as an admixture into the concrete mix prior to pouring. Color shall be through the entire slab thickness and not added on top.

C. Proof-roll prepared subbase surface to check for unstable areas and to verify need for additional compaction. Proceed with pavement work only after non-complying conditions have been corrected and subgrade is ready to receive pavement.

3.3 FORMWORK

A. Refer to specification Section 32 13 13 – Plain Cement Concrete Paving.

3.4 JOINTS

A. General: Construct joints true to line with faces perpendicular to surface plane of concrete. Construct transverse joints at right angles to centerline, unless otherwise indicated on the drawings.

B. Construction Joints: Set construction joints at side and end terminus of pavement and at locations where pavement operations are stopped for more than one-half hour, unless pavement terminates at a planned joint. Transverse construction joints shall be installed whenever placing is suspended a sufficient length of time that concrete may begin to harden. In order to assure aggregate bond at construction joints, a bonding agent suitable for bonding fresh concrete shall be brushed, rolled, or sprayed on the existing pavement surface edge.

C. Contraction Joints / Control Joints: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Provide contraction joints / control joints at a spacing as required to prevent cracking.

1. Contraction joints / control joints shall be installed at maximum 20-foot intervals. They shall be installed at a depth of least 1/4 the thickness of the pavement.
2. It is recommended that these joints be installed in the plastic concrete with a rolling joint tool.
3. Saw cut joints, if used, should be installed as soon as the pavement has hardened sufficiently to prevent raveling and uncontrolled cracking (normally immediately after curing).

D. Isolation Joints / Expansion Joints: Refer to specification Section 32 13 13 – Plain Cement Concrete Paving. Will not be used except when pavement is abutting slabs or other adjoining structures.

3.5 CONCRETE PLACEMENT

A. General: Do not place concrete until tests on underlying courses are completed and the courses approved by the Landscape Architect.

B. Thoroughly wet the entire subbase surface for a minimum of 2 hours immediately prior to placement. Remove all standing water prior to placement.

C. The NRMCA Certified Technician shall check each truck for uniformity during discharge. Mix water shall be such that the cement paste displays a “wet metallic sheen” without causing the paste to flow from the aggregate. Additions of water to the mix, as directed by the Certified Technician, shall be followed by 20 mixing revolutions.

D. Deposit concrete as close to its final position as practicable and such that fresh concrete enters the mass of previously placed concrete. The practice of discharging onto subbase and pulling or shoveling to final placement is not allowed. Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete will be placed on concrete that has hardened enough to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as indicated. Deposit concrete to avoid segregation.

1. Consolidate placed concrete with mechanical vibrating equipment according to ACI 301.

E. Unless otherwise approved by the Landscape Architect in writing, the Contractor shall provide mechanical equipment of either slipform or form riding with a following compactive unit that will provide a minimum of 10 psi vertical force. The pervious concrete pavement will be placed to the required cross section and shall not deviate more than +/- ¼ inch in 10 feet from profile grade.

F. Preferred method of strike off and compaction is the use of a form riding roller screed (i.e. NRMCA “One step method”). If allowed by the Engineer, the NRMCA “two step method” may be employed. If the two step method is used, strike off the concrete to

approximately 3/8 in. to ¾ in. above the forms to allow for compaction. After strike off, compact the concrete to the height of the forms. Compaction shall be accomplished by rolling over the concrete with a steel roller, compacting the concrete to the height of the forms. Concrete shall be covered with minimum 6 mil plastic prior to rolling to prevent aggregate pull outs. Compaction shall be completed within 15 minutes of placement. Edges near forms shall be compacted using a 1 ft. by 1 ft. steel tamp, a float, or other similar device to prevent raveling of the edges. If vibration, internal or surface applied, is used, it shall be shut immediately when forward progress is halted for any reason.

G. After mechanical or other approved strike-off and compaction operation, no other finishing operation will be allowed.

H. The Contractor will be restricted to pavement placement widths of a maximum of fifteen (15') feet unless the Contractor can demonstrate competence to provide pavement placement widths greater than the maximum specified, to the satisfaction of the Landscape Architect.

I. Cold-Weather Placement:

1. Discontinue concrete placement when air temperature reaches 40º F and is falling.
2. Do not resume until air temperature reaches 35º F and is rising.
3. Furnish and install covers for maintaining concrete at a temperature of at least 50º F for not less than 72 hours after placing.

J. Hot-Weather Placement: During periods of hot weather when the maximum daily air temperature is likely to exceed 85º F.

1. Sprinkle forms and/or underlying material with water immediately before concrete is placed.
2. Place concrete at coolest temperature practicable, but in no case will the temperature of concrete when placed exceed 90º F.
3. Cool aggregates and/or mix with water as necessary.
4. Chipped ice in mixing water may be required to cool concrete, subject to approval of the Landscape Architect.
5. Place concrete continuously and rapidly at a rate of not less than 100 feet of paving lane per hour.
6. Keep finished surface of newly laid pavement damp by applying a water fog or mist with approved spraying equipment.

3.6 FINISHING OPERATIONS

A. Refer to Section 32 13 13 – Plain Cement Concrete Paving.

3.7 CONCRETE CURING AND PROTECTION

A. General: Protect concrete against loss of moisture and rapid temperature changes for at least seven (7) days from the beginning of curing operation. Protect unhardened concrete from rain, flowing water and wind. Furnish and install covers as necessary to prevent cracking of the pavement due to temperature changes. If any selected method of curing does not afford the proper curing and protection against concrete cracking and

pavement is damaged, remove and replace damaged payment and employ another method of curing as directed by the Landscape Architect.

B. Cure concrete according to ACI 308.1, by one or a combination of the following methods:

1. Prior to covering, a fog or light mist shall be sprayed above the surface.
2. Curing procedures shall begin within 15 minutes after placement.
3. The pavement surface shall be covered with polyethylene curing covers or other pre-approved covering material. Overlap curing covers a minimum of 18 inches. The cover shall overlap all exposed edges and shall be fully secured throughout the curing period (without using dirt) to prevent dislocation due to winds or adjacent traffic conditions. The polyethylene covering shall remain on the surface for the full duration of the cure time.
4. Supply form insulating materials when the air temperature is expected to fall below 40ºF at any time during the curing period.

C. Cure Time:

1. Minimum of 7 days.
2. No truck traffic shall be allowed for 10 days (no passenger car/light trucks for 7 days).

3.8 PLAN GRADE AND SURFACE-SMOOTHNESS REQUIREMENTS

A. Refer to Section 32 13 13 – Plain Cement Concrete Paving.

3.9 SURFACE TEST, DEFICIENCIES AND CORRECTIONS

A. Refer to Section 32 13 13 – Plain Cement Concrete Paving.

3.10 PAVEMENT TOLERANCES

A. Refer to Section 32 13 13 – Plain Cement Concrete Paving.

3.11 REMOVAL AND REPLACEMENT OF DEFECTIVE PAVEMENT AREAS

A. Refer to Section 32 13 13 – Plain Cement Concrete Paving.

3.12 FIELD QUALITY CONTROL

A. Test panel(s): At least one week prior to use, the Contractor shall place, joint, and cure a test panel, a minimum of 100 sq. ft. at the required project thickness, designed in-place unit weight, and finish. The test panel will be constructed at a location designated by the Landscape Architect and will remain in place for the duration of the project to be used as a reference for acceptance of the pavement surface.

1. Satisfactory performance of the test panels will be determined by:

a. Void Structure: 15% minimum; 25% maximum as per ASTM C1688.

b. Unit weight (Density): Unit weight shall be within 5 lb/ft³ of the design unit weight as per ASTM C1688.
c. Infiltration Rate: Infiltration rate shall be a minimum of 100 in./hr as per ASTM C1701. Perform this test after 7-day cure.
d. Compacted Thickness: Core the test panel at a minimum of 7 days and determine the compacted thickness as per ASTM C42. Compacted thickness shall be within ¼" of the specified thickness.
e. Minimum Strength: 4,000 psi at 28 days.

2. If the test panel does not meet performance criteria, it shall be removed and redone at the Contractor's expense, and the failed test panel disposed of in an appropriate manner.

3. The test panel will not be incorporated into the work, and will be removed when ordered by the Landscape Architect.

B. Testing:

1. During production, the following shall be conducted at the Contractor's expense:

a. A minimum of one test for each day's placement of pervious concrete in accordance with ASTM C 1688 to verify unit weight and percent void content. Unit weight shall be within 5 lb/ft³ of the design unit weight.
b. In a slipform paving operation, determine plastic thickness according to §502-3.08. Perform this test at the frequency indicated in the §502-3.08, but at a minimum of twice per day. Fixed form thickness shall be determined by measuring from grade to top of forms prior to paving. Thickness shall be within ¼" of the specified thickness.
c. Infiltration Rate: Test as per ASTM C1701 after 7 day cure at a minimum of three locations chosen by the Engineer. Infiltration rate shall be a minimum of 100 in./hr.

2. Should any of these test results fall outside of the specified limits, the concrete shall be removed, replaced, and retested at no additional cost.

3.13 PAVEMENT PROTECTION

A. Protect pavement against damage prior to final acceptance by the Landscape Architect. Repair any damage to pavement before final acceptance at no cost to the Owner. Do not permit construction traffic on concrete pavement. Protect against spillage of any deleterious materials.

- END –

SECTION 321816

PLAYGROUND PROTECTIVE SURFACING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Unitary synthetic poured-in-place rubber seamless surface.

B. Related Sections:

1. Section 03 30 00 - Landscape Cast-In-Place Concrete
2. Section 11 68 00 - Play Equipment and Structures
3. Section 31 20 00 - Earth Moving
4. Section 32 13 13 - Plain Cement Concrete Paving
5. Section 32 13 43 - Pervious Concrete Paving

1.2 DEFINITIONS

A. Critical Height: Standard measure of shock attenuation. According to CPSC No. 325, this means "the fall height below which a life-threatening head injury would not be expected to occur."

B. SBR: Styrene-butadiene rubber.

1.3 PERFORMANCE REQUIREMENTS

A. Protective playground surfacing shall meet or exceed the following standards (current version):

1. The Americans with Disabilities Act (ADA) and the Americans with Disabilities Act Accessibility Guidelines (ADAAG).

2. ASTM F1951 - Determination of Accessibility of Surface Systems under and Around Playground Equipment.

3. U.S. Consumer Product Safety Commission - Public Playground Safety Handbook Publication No. 325.

4. ASTM F1292 - Standard Specification for Impact Attenuation of Surfacing Materials Within the Use Zone of Playground Equipment.

a. Impact attenuation of 200 G’s or less from the actual fall height and test results shall meet or exceed HIC (Head Injury Criteria) test results shall be less than 1000 at this fall height. At initial installation surface shall be a

minimum of 25% below required G's (150 or less) or HIC (750 or less) ratings to allow for compaction of the surface over time.

b. Installed playground area shall be impact/drop tested per the requirements of ASTM F1292 to show conformance with the G-Max and HIC criteria listed above. Per ASTM F1292 the impact/drop test shall be performed at the most adverse location on the playground. The impact/drop test shall be conducted by a Certified Playground Safety Inspector (CPSI) who will prepare a certification report of the results. If the surface fails to meet the stated criteria the surface shall be corrected/removed and reinstalled.

5. ASTM F2479 - Standard Guide for Specification, Purchase, Installation and Maintenance of Poured-In-Place Playground Surfacing.

6. ASTM F2223 - Standard Guide for ASTM Standards on Playground Surfacing.

1.4 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings: For each playground surface system, include materials, plans, cross sections, drainage, installation and edge termination. Include patterns made by varying colors of surfacing. Include details of graphics.

C. Samples for Initial Selection: For each type of playground surface system indicated.

1. Include similar Samples of playground surface system and accessories involving color selection.

D. Samples for Verification: For each type of playground surface system indicated.

1. Minimum 6-by-6-inch (150-by-150-mm) Sample of synthetic rubber seamless surface.

E. Qualification Data: For qualified Installer.

F. Material Certificates: For each type of loose-fill playground surface system, from manufacturer.

G. Material Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for each loose-fill playground surface system.

H. Product Certificates: For each type of unitary synthetic playground surface system, from manufacturer.

I. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for each unitary synthetic playground surface system.

J. Maintenance Data: For playground surface system to include in maintenance manuals.

K. Warranty: Sample of special warranty.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: An employer of workers trained and approved by manufacturer.

B. Source Limitations: Obtain playground surface system materials, including primers and binders, from single source from single manufacturer.

C. Standards and Guidelines: Comply with CPSC No. 325, "Handbook for Public Playground Safety"; ASTM F 1292; and ASTM F 1487.

1.6 PROJECT CONDITIONS

A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit playground surface system installation to be performed according to manufacturers' written instructions and warranty requirements.

1.7 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of playground surface system that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Reduction in impact attenuation.
b. Deterioration of surface and other materials beyond normal weathering.

2. Warranty Period:10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 UNITARY SYNTHETIC DUAL-DENSITY SEAMLESS SURFACE

A. Surface System: Poured-in-place, two-layer system with wearing course over cushion course. Provide manufacturer's standard thickness for each layer as required for overall thickness indicated, tested for impact attenuation according to ASTM F 1292 and for accessibility according to ASTM F 1951.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. No Fault Sport Group, LLC; Safety Surface.
b. Surface America Incorporated; Play Bound Poured-in-Place.
c. Equal approved Philadelphia Parks and Recreation.

2. Wearing Course: Formulation of EPDM rubber particles, with minimum of 20 percent and maximum of 26 percent of ethylene propylene-diene-saturated polymethylene main chain along with other organic and inorganic components.

a. Thickness: ½ inch minimum. Thicken to ¾ inch under swings, ends of slides, play equipment entrances/exits, and areas where there will be increased foot traffic such as around spinning play equipment. Provide a ¼" minimum radius on edges when abutting concrete.

3. Cushion Course: Manufacturer's standard formulation of SBR particles and polyurethane, site mixed and applied. SBR recycled crumb rubber shall be free of contaminates and metals. All cushion course depths shall meet ASTM-F1487-11 for fall heights as dictated by the specified play and/or fitness equipment.

4. Binder: Weather-resistant, UV-stabilized, flexible, nonhardening, 100 percent solids polyurethane complying with requirements of authorities having jurisdiction for nontoxic and low VOC content. Binders shall be aromatic. Aliphatic binders shall only be used with the approval of Philadelphia Parks and Recreation. The following are approved binder manufacturers:

   a. VORAMER by DOW Chemical Company
   b. STOBIELAST by Stockmeier Urethanes USA, Inc.
   c. FLEXILON by Rosehill
   d. Equal approved Philadelphia Parks and Recreation.

5. Lacquer Top Coat: Manufacturer's standard polyurethane-based formulation.

6. Critical Height: 6 feet (1.8 m)

7. Overall Thickness: Not less than as required for critical height indicated.

8. Slope: Wearing and Cushion Coarses shall be suitable for use on slopes up to 2:1

9. Primer/Adhesive: Manufacturer's standard primer and weather-resistant, moisture-cured polyurethane adhesive suitable for unit, substrate, and location indicated.

10. Wearing Course Colors: As selected by Landscape Architect from manufacturer's full range.

    a. Color and Pattern: As indicated on Drawings.

B. Approved Poured-In-Place (PIP) Rubber Safety Surfacing Manufacturers:

1. Safety Turf, Inc. – 201 N. 4th Ave., Royersford, PA 19468, Phone: (800) 804-4595, Web: www.safetyturf.com

2. Surface America, Inc. - 45 Earhart Drive, Suite 102-A, Williamsville, NY 14221, Phone: 716-632-8413, Web: www.surfaceamerica.com

3. Equal approved Philadelphia Parks and Recreation.

C. Base Requirements: Poured-In-Place (PIP) Rubber Safety Surfacing shall be installed on a stable and compacted crushed aggregate base or a paved (asphalt or concrete) base. The paved base may be existing pavement as long as it is in good condition.

1. Compacted Crushed Aggregate Base: Minimum 6 inches thick of compacted crushed aggregate (PennDOT 2A modified, 2B Clean Aggregate, AASHTO No. 57 Stone, or equivalent) placed on a compacted un-yielding subgrade compacted to 95% minimum per ASTM D698 Standard Proctor.

D. Leveling and Patching Material: Portland cement-based grout or epoxy- or polyurethane-based formulation suitable for exterior use and approved by playground surface system manufacturer.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with Installer present, for compliance with requirements for maximum moisture content, subgrade and substrate conditions, drainage, and other conditions affecting performance of the Work.

1. Concrete Substrates: Verify that substrates are dry, free from surface defects, and free of laitance, glaze, efflorescence, curing compounds, form-release agents, hardeners, dust, dirt, loose particles, grease, oil, and other contaminants incompatible with playground surface system or that may interfere with adhesive bond. Determine adhesion, dryness, and acidity characteristics by performing procedures recommended in writing by playground surface system manufacturer.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. General: Prepare substrates to receive surfacing products according to playground surface system manufacturer's written instructions. Verify that substrates are sound and without high spots, ridges, holes, and depressions.

3.3 INSTALLATION, GENERAL

A. General: Comply with playground surface system manufacturer's written installation instructions. Install playground surface system over area and in thickness indicated.

3.4 INSTALLATION OF SEAMLESS PLAYGROUND SURFACE SYSTEMS

A. Seamless Surface: Mix and apply components of playground surface system according to manufacturer's written instructions to produce a uniform, monolithic wearing surface and impact-attenuating system of total thickness indicated.

1. Substrate Primer: Apply over prepared substrate at manufacturer's standard spreading rate for type of substrate.

SECTION 323353
LANDSCAPE BOULDERS AND BLOCKS

PART 1 – GENERAL

1.1 SUMMARY

A. This Section includes the following:

1. Site Boulders

B. Related Sections include, but are not limited to, the following:

1. Section 31 20 00 - Earthwork.
2. Section 32 93 00 - Landscape Planting.

1.2 PERFORMANCE REQUIREMENTS:

A. General: Provide to the site and hand set large boulders in conformance with the Drawings and under the direction of the Consultant.

1.3 SUBMITTALS

A. General: Refer to and comply with Division 1 Section 013300 "Submittal Procedures," for procedures and other submittal criteria.

B. Submit Samples for selection and verification purposes of Site Boulders:

1. Submit digital photographs for each boulder. Images shall be at least 3" x 5" at 300 dpi and shall be .jpg format. Clearly indicate the measured overall dimensions of each boulder within the photograph or in the file name.
2. Submit stone samples that match boulder form, color, grade, finish, type, and variety. Sample shall consist of stones not less than 6 inches square. Include 2 or more stones in each set of samples showing the full range of variations in appearance characteristics to be expected in the completed work.

C. Submit shop drawings of specifically identified and approved Site Boulders that show approximate layout plan, elevations indicating approximate elevation heights.

1.4 QUALITY ASSURANCE:

A. Single-Source Responsibility for Stone: Obtain stone from a single quarry with resources to provide materials of consistent quality in appearance and physical properties, including the capacity to cut and finish the material without delaying the progress of the work.

B. Safety Requirements for Stone: All stone surfaces and edges within reach of users shall be naturally weathered or tooled to avoid any sharp edges, points, knife-like corners capable of causing injury.

1.5 DELIVERY, STORAGE AND HANDLING:

A. Deliver materials to the project site in undamaged condition.

B. Store and handle the boulders and related materials to prevent their deterioration or damage due to moisture, temperature changes, contaminants, corrosion, breakage, chipping, or other causes.

C. Do not use pinch or wrecking bars.

D. Lift with wide-belt-type slings where possible; do not use wire rope or ropes containing tar or other substances that might cause staining.

PART 2 - PRODUCTS

2.1 SITE BOULDERS

A. SOURCE

1. Varieties and Source: Subject to compliance with requirements, provide stone of the following variety and from the following source:

a. Granite Source: Wissahickon Stone Quarry LLC
Address: 1A Waverly Rd, Glenside, PA 19038
Contact: Corey Miller, Manager
Office: (215) 887-3330
Email: wissstonequarry@gmail.com

2. Equal approved by Landscape Architect and Philadelphia Parks and Recreation.

B. MATERIAL

1. Finish: Natural stone boulder, Wissahickon Schist, with a minimum of 20 percent brown tint coverage.

2. Dimensions: Small (3’L x 2'W x 1.5’H), Medium (4’L x 3'W x 1.75’ H), Large (5’L x 4'W x 2’H), with allowable dimensional variation not to exceed ±0.25’.

a. Or similar, to be approved by Landscape Architect.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine the surfaces to receive the boulders, and the conditions under which they will be installed, with the Installer present, for compliance with the requirements for installation and other conditions affecting the performance of the stonework.

B. Landscape Architect to be present for sitting of Site Boulders and Granite Block Seating, to very facing, rotation, and placement.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Use all means necessary to protect materials of this Section before, during and after installation and to protect the installed work and materials of all other trades.

B. Clean boulder surfaces that have become dirty and stained prior to setting. Remove soil, stains, and foreign materials. Clean stones by thoroughly scrubbing stones with fiber brushes followed by a thorough drenching with clear water. Use only mild cleaning compounds that contain no caustic or harsh filler or abrasives.

C. For Boulders to be installed on a concrete base, roughen surface.

3.3 SETTING BOULDERS & BLOCKS, GENERAL

A. Set the boulders and blocks to comply with the requirements indicated on the Contract Drawings and the final shop drawings.

B. Shim and adjust supports and accessories to set the boulders accurately and plumb in the locations noted on the drawings and in the field.

C. Do not place any boulder within fall zones of any play element.

D. Layouts shall be approved by the Landscape Architect before installation.

E. Broken, chipped, stained, or otherwise damaged boulders, blocks, and stones shall be replaced until the methods and results are acceptable to the Landscape Architect.

F. Clean the boulders and blocks not less than 2 days after completion of the work, using clean water and stiff-bristle fiber brushes. Do not use wire brushes, acid-type cleaning agents, cleaning compounds with caustic or harsh fillers, or other materials or methods that could damage the stone.

- END -

2. Poured Cushion Course: Spread evenly over primed substrate to form a uniform layer applied at manufacturer's standard spreading rate in one continuous operation, with a minimum of cold joints.

3. Intercoat Primer: Over cured cushion course, apply primer at manufacturer's standard spreading rate.

4. Wearing Course: Spread over primed base course to form a uniform layer applied at manufacturer's standard spreading rate in one continuous operation and, except where color changes, with no cold joints. Finish surface to produce manufacturer's standard wearing-surface texture.

    a. Where colored pattern is indicated, place adjacent colored material as soon as placed colored material is sufficiently cured, using primer or adhesive if required by manufacturer's written instructions. Joints shall be back-cut and receive a heavy coat of polyurethane to ensure firm connection between colored areas and joints.

3.5 FIELD QUALITY CONTROL

A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.

B. Testing Services: Testing and inspecting of completed applications of playground surface system shall take place according to ASTM F 1292.

C. Remove and replace applications of playground surface system where test results indicate that it does not comply with requirements.

D. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with requirements.

3.6 PROTECTION

A. Seamless Systems: Prevent traffic over system for not less than 48 hours after installation.

- END -

SECTION 329210

TURF GRASS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Provide seed, sod and related items. Seeding shall be where indicated and at a time allowed by environmental conditions, by adjacent construction operations, and as specified.
2. Review of conditions and materials affecting seed installations.
3. Maintenance of seeded or sodded areas.

B. Related Sections:

1. Applicable Sections: Division 1
2. Section 31 20 00 – Earth Moving
3. Section 32 93 00 – Landscape Planting

1.2 SUBMITTALS

A. Notices and Scheduling:

1. Submit a schedule itemizing lawn and meadow work to be performed. This schedule shall be in addition to Project Contract Schedule(s) required by General Conditions and shall be submitted within 45 calendar days after Contract Notice to Proceed.

    a. Include in this schedule anticipated dates for commencement and sequencing of lawn and meadow seeding, including but not limited to seed bed fertilizer and water applications, seeding, sodding and commencement of maintenance period.
    b. Schedule shall also include, and relate to, work specified in other sections, such as subgrade preparations; landscape soil placements and grading; utility installations paving and site wall installations; and other elements of site. Obtain related scheduling information from General Contractor.

2. Prior to seed and sod installation, submit confirmation of understanding that the following elements of work have been inspected and approved prior to start of any work of this Section:

    a. Complete placement of planting soil mix including verification of acceptability of grades, quality of soil mixes, and quality of material placement.
    b. Confirm, also, that no construction access will be required across lawn or meadow areas.

B. Product Data:

1. Submit manufacturers or supplier's literature or tear sheets giving name of product, manufacturers or supplier's name and evidence of compliance with Contract Documents.
2. Commercial fertilizer.
3. Herbicides, pesticides and fungicides.
4. Mulch(s).

C. Certificates:

1. Submit certified analysis for each treatment, amendment, and fertilizer material specified and as used. Include guaranteed analysis and weight for packaged material.
2. Prior to the use on site of any chemical weed control materials, submit a list of the weed control materials and quantities per acre intended for use in controlling the weed types expected on the site. Submittal shall include data demonstrating the compatibility of the weed control materials and methods of installation or application with the intended planting and seed or sod varieties.

D. Test Reports: Submit written reports of each grass and meadow seed mixture or sod composition. Each report shall include the following as a minimum and such other information required specific to material tested:

1. Date issued.
2. Project Title and names of Contractor and supplier.
3. Testing laboratory name, address and telephone number, and name(s), as applicable, of each field and laboratory inspector.
4. Date, place, and time of sampling and test.
5. Location of material source.
6. Type of test.
7. Recommendations for soil additives, mix proportions, and methods of preparation, as applicable, for optimum lawn and meadow conditions.
8. Test for purity, proportion by weight, weed seed content and germination percentage of seed mixtures proposed for use.
9. No seed shall be delivered until the test reports are approved. Seed shall be tested within six months immediately proceeding date of sowing. Owner reserves the right to have seed tested independently.

E. Samples:

1. Mulch: Two-pound bag of each type, with manufacture's recommendations on application rate for Hydro mulch.

F. Statement(s) of Qualifications: Submit to confirm qualifications as specified in Article 1.4, herein.

G. Maintenance Program: Submit a program for continued maintenance of lawn and meadow areas after Substantial Completion. Program shall include a report of conditions unique to site that has been identified during Contractor's maintenance of lawn and meadow work (Article 3.6, herein). Refer also to Article 1.4, herein.

1.3 QUALITY ASSURANCE

A. Qualifications:

1. Installation and maintenance foreman on the job shall be competent English-speaking supervisor(s), experienced in landscape installation and maintenance. Perform work with personnel totally familiar with lawn and meadow preparations and installations under the supervision of an experienced landscape foreman.
2. Exhibit and identify a record of at least three (3) lawn and meadow installations of similar scope or size to this Project.

B. Pre-installation Review of Related Work: Within 45 calendar days after Contract Notice to Proceed for seeding work or such later date as approved by Owner's Representative, but prior to first Pre-installation Conference, obtain data as necessary and review plant mix materials and soil amendments to be used for lawn and meadow areas of this Project. Become familiar with proposed plant mixes and on-site grading conditions. Reference Section 02920, Soil Preparation and Mixes, and design drawings.

1. Submit a report of acceptance of soil mixes as being appropriate for seed and sod installation and, if deemed necessary, recommendations for possible SOC adjustment of amendments.
2. Review conditions and coordinate findings of report at Pre-installation Conference.

C. Pre-installation Conference: Prior to commencement of any of the work of this section, Contractor shall arrange a conference at the site of this Project with the Owner's Representative, Construction Manager, and Landscape Architect. At least five-(5) working days notice shall be given prior to the conference.

1. Conference attendance will include the Contractor, the foreman appointed to oversee the work of this Section, the foreman responsible for soil preparation and mixes and soil placement (Section 02920), other representatives of Owner, and other persons as deemed appropriate for coordination of work and quality control.
2. At the conference, review lawn and meadow installation and sequence schedules, specification criteria and installation, procedures, outstanding submittals and approvals, and such other subjects necessary for coordination of Work.
3. Establish follow up meeting(s) as necessary including but not limited to a final pre-installation review of lawn and meadow area plant mix soil placement.

D. Inspection for Substantial Completion

1. Maintain all lawn and meadow areas until Substantial Completion. Maintenance will be in accordance with requirements specified in Article 3.6 of this Section.

2. The Landscape Architect will make an inspection for Substantial Completion of the work of this Section at the time of Substantial Completion of the entire Contract. The Contractor shall submit a full and complete written program for maintenance of the lawns and meadows for review by the Landscape Architect and Owner's Representative at the time of the request for substantial completion.

    a. Submit a written request for inspection at least 14 calendar days prior to the day on which the inspection is requested.

b. Contractor shall prepare a list with status of items to be completed or corrected for review by the Landscape Architect, prior to inspection.
c. At time of the Landscape Architect's inspection, all lawns and meadows shall show a uniform, thick, well-developed stand of plants. If the stand is unsatisfactory, as determined by the Landscape Architect, the Contractor's maintenance responsibility shall continue until an acceptable stand of plants is achieved.
d. Upon completion of the inspection, the Landscape Architect will amend Contractor's list of items to be completed or corrected as determined necessary and will indicate the anticipated time period for their completion or correction.

3. Lawns and meadows will not be accepted until all items of lawn and meadow work have been completed or corrected. The Landscape Architect, after Contractor's completion of outstanding work, will recommend to the Owner, in writing, the Substantial Completion of the lawn and grasses work of this Section.

    a. The Contractor's responsibility for maintenance, however, shall terminate only upon issuance of acceptance by Owner for Substantial Completion.

1.4 REFERENCES

A. SPN: "Standardized Plant Names," latest edition, by the American Joint Committee on Horticultural Nomenclature.

B. Association of Official Agricultural Chemists.

C. ASTM: American Society for Testing and Materials using test criteria as specified or required by other references.

D. AASHTO: American Association of State Highway and Transportation Officials.

1.5 REGULATORY REQUIREMENTS

A. Comply with all rules, regulations, laws and ordinances of local, state and federal authorities having jurisdiction. Provide labor, materials, equipment and services necessary to make Work comply with such requirements without additional cost to Owner.

B. Procure and pay for permits and licenses required for work of this section.

1.6 PROJECT/SITE CONDITIONS

A. Acquaintance With Existing Site Conditions:

1. Through study of all Contract Documents, and by careful examination of the site, become informed as to the nature and location of the Work, the nature of surface and subsurface soil conditions, the character, quality and quantity of the materials to be encountered, the character of equipment and facilities needed preliminary to and during the prosecution of the Work, the general and local conditions, and all other matters which can in any way affect the Work.

2. Investigate the conditions of public thoroughfares and roads as to availability, clearances, loads, limits, restrictions, and other limitations affecting transportation to, ingress and egress of this work site. Conform to all governmental regulations in regard to the transportation of materials to, from, and at the job site, and secure in advance such permits as may be necessary.

B. Should the Contractor, in the course of Work, find any discrepancies between Contract Drawings and physical conditions or any omissions or errors in Drawings, or in layout as furnished by the Owner, it will be Contractors duty to inform the Landscape Architect (Design Consultant) immediately in writing for clarification. Work done after such discovery, unless authorized by the Landscape Architect, shall be done at the Contractor's risk.

C. Sequencing and Scheduling:

1. Adjust, relate together, and otherwise coordinate work of this Section with Work of Project and all other Sections of Specification.
2. Seed installations shall not begin until all other constructions, including installation of all utilities and placement of planting soil mixes, are complete and possibility from damage caused by operations does not exist.

D. Environmental Requirements:

1. Perform soil work only during suitable weather conditions. Do not disc, rototill, or work soil when frozen, excessively wet, or in otherwise unsatisfactory condition.

2. Place grass seed or sod only at seasonal times within appropriate temperature range and wind conditions for plant development as approved by Landscape Architect:

a. Acceptable Seeding Seasons/Times:

1) Spring: April 1st - June 15th
2) Fall: September 1st - October 15th

b. Seeding or sodding at any time other than within the above seasons shall be allowed only when the Contractor submits a written request for permission to do so and permission is granted in writing by the Owner. Newly seeded or sodded areas, if installed out of season, must be continuously watered according to best recommended and Landscape Architect approved practice. Contractor shall be responsible for providing an acceptable stand of grass as specified.

1.7 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Packaged Materials: Deliver packaged materials in unopened bags or containers, each clearly bearing the name, guarantee, and trademark of the producer, material composition, manufacturers' certified analysis, and the weight of the material.

B. Bulk Materials:

1. Deliver bulk materials with each individual shipment accompanied by an affidavit from the vendor (supplier), countersigned by the Contractor upon receipt, identifying the material

type, composition, analysis, and weight and certifying that the material furnished complies with specification requirements of this Project.

2. Affidavits shall be furnished in duplicate with one copy submitted to Construction Manager at the end of day of shipment receipt at the Project site and the second copy retained with material or on file with Contractor.

C. Mulch, amendment materials, or soil stored on site temporarily in stockpiles prior to placement shall be protected from intrusion of contaminants, erosion and from mechanical or environmental damage.

PART 2 - PRODUCTS

2.1 TEMPORARY TURF

A. Temporary turf seed mix shall be as specified on the Erosion Control Plans, Notes, and Details.

2.2 PERMANENT TURF

A. Permanent turf seed mix shall be the following:

Seed Type	Proportion by Weight	Minimum Purity	Minimum Germination
1. Turf-Type Tall Fescue	60%	95%	80%
2. Perennial Rye Grass	30%	95%	85%
3. Kentucky Blue Grass	10%	90%	80%

2.3 SOD

A. Nursery-grown and cultivated from certified seed containing seed mix as specified for Permanent Turf. Sod shall be from 11 to 36 months in age before lifting, uniform in density, natural green color, free of noxious weeds. Cut sod to a 3/4 inch depth. 1/8 inch tolerance plus or minus, with grass height at 1 1/2 inches to 2 inches, wetted before cutting. Obtain approval of sod and certify its grass types and percentages before cutting or delivery to Project Site.

2.4 TOPSOIL

A. Existing topsoil stripped from the project site, disturbed areas only, may be used for lawns, planting and transplanting work. Contractor shall verify if available project site topsoil is sufficient in quantity to perform the required work. If project site topsoil is insufficient the contractor shall provide topsoil from an approved off project site source(s) as required to complete work.

B. Topsoil to be imported to the project site shall be a sandy loam topsoil (as defined in USDA Soil Texture Classification) and be fertile, friable, well-drained, pH range of 6.0 to 6.5, free of subsoil, toxic substances harmful to plant growth, without clay lumps, stones, roots or debris. The imported topsoil shall have a mechanical analysis as follows:

1. Sand: 35 percent to 40 percent.
2. Clay: 15 percent to 20 percent.
3. Organic Matter: 2.5 percent.
4. Silt: Balance.

2.5 FERTILIZER

A. Conforming to standards of Association of Official Analytical Chemists, delivered to Project Site in sealed and labeled bags, or in bulk with certification as to quality and analysis. Nitrogen source shall be at least 33 percent water insoluble. Fertilizer shall have the following formulations:

1. Basic Fertilizer: 10-10-10 or 10-6- 4 analysis.
2. Starter Fertilizer: 5-10-10 or 10-20-20 analysis.

B. Fertilizer shall be delivered to the site, mixed as specified, in the original unopened standard size bags showing weight, analysis and name of manufacturer. Containers shall bear the manufacturer's guaranteed statement of analysis or a manufacturer's certificate of compliance covering analysis shall be furnished to the Landscape Architect. Store fertilizer in a weatherproof place and in such a manner that it shall be kept dry and its effectiveness shall not be impaired.

2.6 LIMESTONE

A. Ground agricultural dolomitic limestone, 90 percent calcium carbonate equivalent, conforming to standards of Association of Official Analytical Chemists and applicable State and Federal Regulations. Material shall have a total of 100% passing the 10 mesh sieve, minimum of 90% passing the 20 mesh sieve, and a minimum of 60% passing the 100 mesh sieve.

2.7 SOIL-STABILIZING AGENT

A. For use in hydroseed mix only. Material shall be one (1) of the following:

1. "Verdyol Complex": Weyerhaeuser Company,
2. "Curasol": Wolbert Master Associates,
3. "Terra-Tack": Grass Growers, Inc,
4. "J-Tac": Reclamare Company,
5. Approved Equal.

2.8 MULCH MATERIALS

A. General Use: Straw, salt marsh hay, or a combination of both. Material shall be:

1. Reasonably weed free, not brittle or overly decomposed.
2. Cured to less than 20% moisture content by weight.
3. Contain no stems of tobacco, soybeans, or other coarse or woody material.

2.9 HYDROSEEDING MATERIALS

A. Fiber mulch shall be biodegradable, non-toxic green dyed-wood cellulose-fiber mulch; nontoxic; free of plant-growth or germination inhibitors; with maximum mixture content of 15 percent and a pH range of 4.5 to 6.5.

B. Nonasphaltic tactifier shall be a colloidal tactifier recommended by the fiber-mulch manufacturer for slurry application; nontoxic and free of plant-growth or germination inhibitors. Material shall be one (1) of the following:

1. "Verdyol Complex": Weyerhaeuser Company,
2. "Curasol": Wolbert Master Associates,
3. "Terra-Tack": Grass Growers, Inc,
4. "J-Tac": Reclamare Company,
5. Approved Equal.

2.10 EROSION CONTROL BLANKET/FABRIC NETTING

A. Contractor shall provide and install where indicated on civil drawings “Curlex” blankets: by American Excelsior Company; “Polyjute” Style465 CT: by Synthetic Industries or approved equal.

B. The area to be covered shall be properly prepared, fertilized, and seeded before blanket is applied. When blanket is unrolled, the netting shall be on top and the fibers in contact with the soil over the entire area. In ditches, the blanket shall be applied in the direction of the flow of water, butted snugly at ends and side and stapled. On slopes, the blankets shall be applied either horizontally or vertically to the slope. Ends and sides shall be butted snugly and stapled. Staple to manufacturer’s recommendations.

2.11 WATER

A. Potable, clean, fresh and free from harmful material. Water shall be furnished by Owner as necessary for lawn installation and maintenance. Include all hoses and other irrigation equipment required for correct use of water without waste.

2.12 ACCESSORY MATERIALS

A. Herbicides: For possible use if there is seed germination in lawn areas after plant soil mix placement and prior to seed installation. Herbicides shall be approved before use for type and rate of application by the Landscape Architect and by local and state agencies with jurisdiction.

1. Post-emergent shall be Roundup, as manufactured by Monsanto Agricultural Products Company, C3NJ, St. Louis, MO 63166, or an approved equal.

B. Sod Stables: 11 Gauge steel wire staples, one (1) inch wide and six (6) inches long for securing sod to slopes 4:1 (25%) or greater.

C. Lawn areas shall have fertilizer applied in two (2) applications with a thorough watering immediately following application. The first application shall be one (1) week before the seeding at the rate of 35 pounds per 1,000 square feet harrowed into the top two inches (2”) of

seedbed. The second application shall be done at the rate of 25 pounds per 1,000 square feet, immediately following the second mowing.

D. Commercial fertilizer for temporary turf seed areas shall be a 10-10-10-grade fertilizer (600lbs/acre).

PART 3 - EXECUTION

3.1 VERIFICATIONS

A. Prior to construction of lawn and meadow areas, ascertain the location of all electric cables, conduits, underdrainage systems and utility lines. Take proper precautions so as not to disturb or damage sub-surface elements. Contractor failing to take these precautions shall be responsible for making requisite repairs to damaged utilities at Contractors own expense.

B. Verify that required underground utilities are available, in proper location and ready for use. Coordinate with other trades.

C. Verify that all final grades blend with adjacent grades and that area(s) to be seeded is free from depressions and abrupt changes in slope and that all grades as placed have been approved by, and remain satisfactory to Landscape Architect.

D. Verify that all tree planting in lawn areas and all shrub beds adjacent to lawn areas have been installed, will remain as approved, and no further construction work will occur which will or may require access through lawns and meadows.

3.2 SUBSOIL PREPARATION

A. Inspect rough grade subsoil. Eliminate uneven areas and low spots. Remove, for example, debris, roots, branches and stones in excess of 2 inches in size. Remove subsoil which has been contaminated with petroleum, concrete spills, and toxic substances.

B. Bring subsoil to required levels, profiles and contours. Cut out areas to receive topsoil specified in this Section, and otherwise to subgrade elevations as specified in Section 02200 – Earthwork.

C. Cultivate subgrade to a depth of 6 inches where topsoil is to be placed. Repeat cultivation in areas where equipment, used for hauling and spreading topsoil, has compacted subsoil.

D. Maintain during grading operations the specified compaction, restore previously compacted areas and test soil compaction according to Section 02200 - Earthwork.

3.3 TOPSOIL PLACEMENT AND LAWN BED PREPARATION

A. Inspect subsoil prior to placing topsoil to confirm subsoil conditions meet the requirements of this specification. If subsoil conditions do not meet the requirements repeat subsoil preparation work as specified under this Section.

B. Place topsoil in areas where seeding, sodding and planting are to be performed. Place to the following minimum depths, up to finished grade elevations: Six (6) Inches for seeded and sodded areas.

C. Incorporate the following materials uniformly throughout entire depth of topsoil:

1. Limestone: 100 pounds per 1,000 square feet or as determined by agricultural soil test reports.
2. Basic Fertilizer: 3 pounds per 1,000 square feet or as determined by agricultural soil test reports.

D. Use topsoil in relatively dry state. Place during dry weather. Do not spread wet or clumpy topsoil.

E. Fine grade topsoil to the required levels, profiles and contours. Eliminate rough and low areas to ensure positive drainage. Establish proper flowline gradients and profiles for swales and other storm management features. Drag smooth and hand rake topsoil to final grade elevations. Roll if necessary to stabilize in order to commence seeding. Remove all ruts, mounds, and ridges on surface of topsoil. Remove all stones greater than 1 inch, roots, weeds, or other debris visible on soil surface. Resulting holes shall be filled with specified topsoil, leaving a uniform planar surface. Grade uniformly so soil surface does not have low spots which may collect water. Finish grades shall be within ¼ inch +/- tolerance of finish grades indicated on the plans.

F. Manually spread topsoil around trees, plants, and other construction to prevent possible damage by grading equipment.

G. Blend topsoil smoothly into undisturbed areas. Do not place topsoil on existing vegetation in undisturbed areas. Maintain required depth of topsoil at limit of grading line.

H. Lightly compact and roll placed topsoil.

I. Clean all paved and building surfaces and remove soil to maintain quality of finished surface.

J. Allow for and verify that planting soils of lawn and meadow areas, completed in placement with deficiencies corrected as necessary, to settle for a minimum fourteen (14) days prior to beginning of lawn and meadow installation.

K. Coordinated sequencing of work shall allow immediate seed and sod installation after completion of verifications and preparations.

3.4 ADDITIONAL SEED AND SOIL AMENDMENTS

A. Starter fertilizer: Add starter fertilizer at the following rates to surface of seed bed or include as an ingredient in hydroseed mix: 40 pounds per 1,000 square feet.

3.5 SEEDING

A. Seeding shall be done between the following dates:

1. Permanent Seeding:

    a. Spring Seeding: April 1 to June 15.
    b. Fall Seeding: August 15 to November 1.

2. Temporary (Non-Permanent) Seeding:

    a. January 1 to December 31.

B. Prior to seeding contractor shall inspect surface soil bed conditions to assure they meet the requirements for receiveing seed. At minimum the soil bed surface shall be roughened to break-up large clods and surface crust, to scarify and fine rake to remove irregularities that will hold water.

C. Manual or mechanical sowing of seed may be by the following optional methods:

1. Mechanical Power-Drawn Seeder: Combination grass planter and land packer or pulverizer. Plant seed not deeper than [1/4 inch] {6 mm}. Keep seeding operation as close as possible to contours and not up and down slopes. After seeding, compact with land roller, such as a cultipacker. With proper equipment, sowing seed and cultipacking in one (1) operation is satisfactory.
2. Hopper Type Spreader: Manually-propelled or power-drawn hopper devices. Uniformly distribute seed by sowing half seed in one (1) direction and remainder at right angles to direction of first sowing. Cover seed an average depth of [1/4 inch] {6 mm} by means of chain harrow, cultipacker, or other approved method.

D. Hydroseeding: Mix specified seed, fertilizer and fiber mulch in water using clean, washed equipment specifically designed for hydroseed application. Continue mixing until uniformly blended into a homogenous slurry suitable for hydraulic application. Hydraulic broadcasting of prepared material.

1. Hydroseed at the following rates per acre:

    a. Water: As specified.
    b. 1,500 pounds of wood cellulose, plus 15 percent for slopes 5 percent and steeper.
    c. Fertilizer: As specified for starter fertilizer. Starter fertilizer may be added to surface of seed bed.
    d. Soil stabilizer of type and at rate recommended in writing by manufacturer.
    e. Seed Mix: As specified.
    f. For a 3,000 gallon tank, multiply specified quantities by 0.75. Mix and agitate all materials, except wood cellulose, in 2,200 gallons of water; then add wood cellulose, fill tank with water and continue agitation. Seed promptly, under constant agitation of mix, beginning when complete mix is a uniform slurry. Limit coverage for 3,000 gallon tank to 0.75 acre.
    g. Take precautions against overspray onto roads, curbs, sidewalks, building walls, and other surfaces except ground areas. Contractor shall promptly clean all areas of overspray to satisfaction of Owner’s Representative and Landscape Architect.

3.6 SODDING

A. Provide sod as indicated on Drawings.

B. Place sod on topsoil bed prepared as indicated for seeded areas, including lime, basic fertilizer and starter fertilizer applied to bed surface. At time sod is placed, topsoil shall be in a damp, friable, loose condition, with no surface crust.

C. Retain sod on slopes equal to or steeper than four (4) horizontal to one (1) vertical and in drainage swales, using sod staples driven into sod until top is flush with sod.

D. In placing sod, keep rows parallel with contour lines. Keep Work true to finished grade, and tamp or roll to establish firm contact with topsoil bed. Butt pads tightly and stagger ends with those in adjacent rows. If sod separates less than [1/2 inch] {13 mm}, backfill with topsoil flush with sod and overseed. If sod separates [1/2 inch] {13 mm} or greater, overlay with sod and spade cut to fit.

3.7 MULCHING

A. Except hydroseeded areas, seeded areas sloped four (4) horizontal to one (1) vertical or greater, and areas where lawn would be difficult to establish, shall be mulched at rate of 1.5 tons per acre.

B. Use wood fiber mulch or soil stabilizing agents, hydraulically applied in water at rate of 1,500 pounds of wood fiber per acre, plus l5 percent on slopes greater than four (4) to one (1).

C. For dry-mulched areas, spray with soil-stabilizing agent/tackifier material immediately after spreading straw or salt marsh hay or both, at rate of 200 gallons of asphalt per acre, in a method to bind mulch to soil and inhibit wind loss of mulch. Do not apply soil-stabilizing agent/tackifier material within when ambient temperature is below 55 degrees F. Clean off misplaced spray from building walks, paving, light standards and bases, and other surfaces to satisfaction of Owner’s Representative or Landscape Architect.

3.8 WATERING

A. Keep newly sodded areas moistened until grass becomes well established and have shown signs of knitting with topsoil.

B. In event of insufficient rainfall, moisten areas every two (2) or three (3) days until sod becomes established. Thereafter, water in absence of rain every seven (7) to ten (10) days. When watering sod, make sure that water soaks through sod into topsoil bed below.

3.9 PROTECTIVE WORK

A. Provide materials and Work necessary to protect Work from damage. Prevent damage to Owner's property and Work specified in other Sections during these operations.

B. Protective Work shall include wire line and stakes along walkways with cloth strips at 4 feet intervals as evidence of wire and also "KEEP OFF" signs.

C. Defer Work when continuation of construction Work must occur over certain lawn areas.

3.10 MAINTENANCE PRIOR TO ACCEPTANCE

A. Maintain all sodded areas by properly mowing, watering, weeding, and similar care to keep Work in a clean and neat condition at all times. Advise Owner's Representative, in writing, when Work is in condition to meet acceptance.

3.11 CONDITIONS OF ACCEPTANCE

A. Fine Lawns shall be approved to begin one (1) year Maintenance and Guarantee Period based on the following requirements:

1. Bare spots, not greater than 1 square foot, shall be permitted up to a maximum of 3 percent of Fine Lawn Area.

B. Sod Areas shall be approved to begin one (1) year Maintenance and Guarantee Period based on the following requirements:

1. Sodded areas shall have been mowed at least twice since time of installation.
2. Sod shall have shown signs of knitting with topsoil layer and adjoining sod pads. Open joints between sod pads nor sod slippage on slopes shall not be accepted.
3. Sod shall be in a thriving and vigorous condition exhibiting a healthy green color. Bare spots or brown spots shall not be accepted.

C. During one (1) year Maintenance and Guarantee Period, Owner shall do no Maintenance Work, watering or cutting of lawns provided under this Contract.

D. Contractor may use existing underground irrigation systems if available.

E. When Work meets conditions specified above, Date of Acceptance shall be Date that Guarantee Period commences. Design Professional shall notify Contractor in writing of said Date.

3.12 MAINTENANCE AND GUARANTEE OF LAWN AREAS AND SODDED AREAS

A. Provide all Maintenance Work throughout Guarantee Period, which shall be one (1) year from Date of Acceptance.

B. Guarantee Work to be in vigorous and thriving condition by end of Guarantee Period, free of objectionable quantities of weeds and other undesirable growth. Maximum percentage allowed for scattered bare spots shall not exceed 3 percent of fine lawn area. Each bare spot shall not be larger than 1 square foot.

C. Maintenance Work shall include watering, remedial Work such as repair of eroded areas, and resodding if required. Provide general cleanup of stakes, strings, temporary signs, and sweeping of paving and sidewalks. Cut grass a minimum of 26 cuttings a year. Include other Work as maintenance as necessary, for example, lawn feeding, grub control and weeding,

broadleaf weed control as deemed required by Contractor in support of Guarantee, or as may be brought to his/her attention during Guarantee Period.

D. Additional fertilization and limestone shall be required. Spread one (1) additional application of 10-6-4 fertilizer evenly over fine lawn area at rate of 25 pounds per 1,000 square feet and spread one (1) additional application of limestone at rate of 100 pounds per 1,000 square feet. Complete applications in fall season of year approaching termination of Maintenance and Guarantee Period.

E. Cutting of fine lawn areas shall occur when grass is dry and to maintain a height of about 2 inches. Cut grass a maximum of 1/3 of total grass blade height. Maintain a neatly-trimmed edge condition throughout at all times.

F. During one (1) year Maintenance and Guarantee Period, Owner shall do no Maintenance Work, watering or cutting of lawns provided under this Contract.

3.13 FINAL INSPECTION AND ACCEPTANCE

A. Toward end of Maintenance and Guarantee Period, give notice in writing to Owner's Representative stating desired Date for Final Inspection.

B. At time of Final Inspection, lawn Work shall be in condition required by Maintenance and Guarantee Work indicated.

C. If Work is accepted at time of Final Inspection, Guarantee shall be considered fulfilled and terminated. Should any Work need replacement at time of Final Inspection, continue Guarantee Period until such replacements are made and deemed acceptable.

D. Design Professional shall notify Contractor in writing of Date of Final Acceptance.

END OF SECTION

SECTION 329300
LANDSCAPE PLANTING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Plants.
2. Planting soils.

B. Related Sections:

1. Section 31 20 00 - Earth Moving.
2. Section 32 92 00 - Turf Grass.

1.2 DEFINITIONS

A. Backfill: The earth used to replace or the act of replacing earth in an excavation.

B. Balled and Burlapped Stock: Plants dug with firm, natural balls of earth in which they were grown, with ball size not less than diameter and depth recommended by ANSI Z60.1 for type and size of plant required; wrapped with burlap, tied, rigidly supported, and drum laced with twine with the root flare visible at the surface of the ball as recommended by ANSI Z60.1.

C. Balled and Potted Stock: Plants dug with firm, natural balls of earth in which they are grown and placed, unbroken, in a container. Ball size is not less than diameter and depth recommended by ANSI Z60.1 for type and size of plant required.

D. Container-Grown Stock: Healthy, vigorous, well-rooted plants grown in a container, with a well-established root system reaching sides of container and maintaining a firm ball when removed from container. Container shall be rigid enough to hold ball shape and protect root mass during shipping and be sized according to ANSI Z60.1 for type and size of plant required.

E. Finish Grade: Elevation of finished surface of planting soil.

F. Manufactured Topsoil: Soil produced off-site by homogeneously blending mineral soils or sand with stabilized organic soil amendments to produce topsoil or planting soil.

G. Pests: Living organisms that occur where they are not desired, or that cause damage to plants, animals, or people. These include insects, mites, grubs, mollusks (snails and slugs), rodents (gophers, moles, and mice), unwanted plants (weeds), fungi, bacteria, and viruses.

H. Planting Area: Areas to be planted.

I. Planting Soil: Standardized topsoil; existing, native surface topsoil; existing, in-place surface soil; imported topsoil; or manufactured topsoil that is modified with soil amendments and perhaps fertilizers to produce a soil mixture best for plant growth.

J. Plant; Plants; Plant Material: These terms refer to vegetation in general, including trees, shrubs, vines, ground covers, ornamental grasses, bulbs, corms, tubers, or herbaceous vegetation.

K. Root Flare: Also called "trunk flare." The area at the base of the plant's stem or trunk where the stem or trunk broadens to form roots; the area of transition between the root system and the stem or trunk.

L. Stem Girdling Roots: Roots that encircle the stems (trunks) of trees below the soil surface.

M. Subgrade: Surface or elevation of subsoil remaining after excavation is complete, or the top surface of a fill or backfill before planting soil is placed.

N. Subsoil: All soil beneath the topsoil layer of the soil profile, and typified by the lack of organic matter and soil organisms.

O. Surface Soil: Soil that is present at the top layer of the existing soil profile at the Project site. In undisturbed areas, the surface soil is typically topsoil; but in disturbed areas such as urban environments, the surface soil can be subsoil.

1.3 SUBMITTALS

A. Product Data: For each type of product indicated, including soils.

1. Plant Materials: Include quantities, sizes, quality, and sources for plant materials.

B. Samples for Verification: For each of the following:

1. Organic Mulch: volume of each organic mulch required; in sealed plastic bags labeled with composition of materials by percentage of weight and source of mulch. Each Sample shall be typical of the lot of material to be furnished; provide an accurate representation of color, texture, and organic makeup.
2. Mineral Mulch: of each mineral mulch required, in sealed plastic bags labeled with source of mulch. Sample shall be typical of the lot of material to be delivered and installed on the site; provide an accurate indication of color, texture, and makeup of the material.
3. Edging Materials and Accessories: Manufacturer's standard size, to verify color selected.

C. Qualification Data: For qualified landscape Installer. Include list of similar projects completed by Installer demonstrating Installer's capabilities and experience. Include

project names, addresses, and year completed, and include names and addresses of owners' contact persons.

D. Product Certificates: For each type of manufactured product, from manufacturer, and complying with the following:

1. Manufacturer's certified analysis of standard products.
2. Analysis of other materials by a recognized laboratory made according to methods established by the Association of Official Analytical Chemists, where applicable.

E. Material Test Reports: For imported or manufactured topsoil.

F. Maintenance Instructions: Recommended procedures to be established by Owner for maintenance of plants during a calendar year. Submit before start of required maintenance periods.

G. Warranty: Sample of special warranty.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: A qualified landscape Installer whose work has resulted in successful establishment of plants.

1. Professional Membership: Installer shall be a member in good standing of either the Professional Landcare Network or the American Nursery and Landscape Association.

2. Experience: Five years' experience in landscape installation in addition to requirements in Division 01 Section "Quality Requirements."

3. Installer's Field Supervision: Require Installer to maintain an experienced full-time supervisor on Project site when work is in progress.

4. Personnel Certifications: Installer's field supervisor shall have certification in all of the following categories from the Professional Landcare Network:

a. Certified Landscape Technician - Exterior, with installation specialty area, designated CLT-Exterior.
b. Certified Ornamental Landscape Professional, designated COLP.

B. Soil-Testing Laboratory Qualifications: An independent or university laboratory, recognized by the State Department of Agriculture, with the experience and capability to conduct the testing indicated and that specializes in types of tests to be performed.

C. Provide quality, size, genus, species, and variety of plants indicated, complying with applicable requirements in ANSI Z60.1.

1. Tree caliper to be 3.5-4”.

D. Measurements: Measure according to ANSI Z60.1. Do not prune to obtain required sizes.

1. Trees and Shrubs: Measure with branches and trunks or canes in their normal position. Take height measurements from or near the top of the root flare for field-grown stock and container grown stock. Measure main body of tree or shrub for height and spread; do not measure branches or roots tip to tip. Take caliper measurements 6 inches (150 mm) above the root flare for trees up to 4-inch (100-mm) caliper size, and 12 inches (300 mm) above the root flare for larger sizes.
2. Other Plants: Measure with stems, petioles, and foliage in their normal position.

E. Plant Material Observation: Architect shall observe plant material either at place of growth before planting for compliance with requirements for genus, species, variety, cultivar, size, and quality. Architect retains right to observe trees and shrubs further for size and condition of balls and root systems, pests, disease symptoms, injuries, and latent defects and to reject unsatisfactory or defective material at any time during progress of work. Remove rejected trees or shrubs immediately from Project site.

1. Notify Architect of sources of planting materials 14 days in advance of delivery to site.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Packaged Materials: Deliver packaged materials in original, unopened containers showing weight, certified analysis, name and address of manufacturer, and indication of conformance with state and federal laws if applicable.

B. Bulk Materials:

1. Do not dump or store bulk materials near structures, utilities, walkways and pavements, or on existing turf areas or plants.
2. Provide erosion-control measures to prevent erosion or displacement of bulk materials, discharge of soil-bearing water runoff, and airborne dust reaching adjacent properties, water conveyance systems, or walkways.
3. Accompany each delivery of bulk fertilizers, lime, and soil amendments with appropriate certificates.

C. Deliver bare-root stock plants freshly dug. Immediately after digging up bare-root stock, pack root system in wet straw, hay, or other suitable material to keep root system moist until planting.

D. Do not prune trees and shrubs before delivery. Protect bark, branches, and root systems from sun scald, drying, wind burn, sweating, whipping, and other handling and tying damage. Do not bend or bind-tie trees or shrubs in such a manner as to destroy their natural shape. Provide protective covering of plants during shipping and delivery. Do not drop plants during delivery and handling.

E. Handle planting stock by root ball.

F. Deliver plants after preparations for planting have been completed, and install immediately. If planting is delayed more than six hours after delivery, set plants and trees in their appropriate aspect (sun, filtered sun, or shade), protect from weather and mechanical damage, and keep roots moist.

1. Set balled stock on ground and cover ball with soil, peat moss, sawdust, or other acceptable material.
2. Do not remove container-grown stock from containers before time of planting.
3. Water root systems of plants stored on-site deeply and thoroughly with a fine-mist spray. Water as often as necessary to maintain root systems in a moist, but not overly-wet condition.

1.6 PROJECT CONDITIONS

A. Field Measurements: Verify actual grade elevations, service and utility locations, irrigation system components, and dimensions of plantings and construction contiguous with new plantings by field measurements before proceeding with planting work.

B. Interruption of Existing Services or Utilities: Do not interrupt services or utilities to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary services or utilities according to requirements indicated:

1. Notify Owner no fewer than 10 days in advance of proposed interruption of each service or utility.
2. Do not proceed with interruption of services or utilities without Owner's written permission.

C. Planting Restrictions: Plant during one of the following periods. Coordinate planting periods with maintenance periods to provide required maintenance from date of Substantial Completion.

1. Spring Planting: Feb 15 to May 15 (Trees, Shrubs, Ornamental Grasses and Perennials)
2. Fall Planting: October 15 until ground is frozen. (Trees and shrubs ONLY – Trees must be completely dormant before digging)

D. Weather Limitations: Proceed with planting only when existing and forecasted weather conditions permit planting to be performed when beneficial and optimum results may be obtained. Apply products during favorable weather conditions according to manufacturer's written instructions and warranty requirements.

E. Coordination with Turf Areas (Lawns): Plant trees, shrubs, and other plants after finish grades are established and before planting turf areas unless otherwise indicated.

1. When planting trees, shrubs, and other plants after planting turf areas, protect turf areas, and promptly repair damage caused by planting operations.

1.7 WARRANTY

A. Special Warranty: Installer agrees to repair or replace plantings and accessories that fail in materials, workmanship, or growth within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Death and unsatisfactory growth, except for defects resulting from abuse, lack of adequate maintenance, or neglect by Owner, or incidents that are beyond Contractor's control.
b. Structural failures including plantings falling or blowing over.
c. Faulty performance of tree stabilization and edgings.
d. Deterioration of metals, metal finishes, and other materials beyond normal weathering.

2. Warranty Periods from Date of Substantial Completion
a. Trees, Shrubs, Vines, and Ornamental Grasses: 12 months.
b. Ground Covers, Biennials, Perennials, and Other Plants: 12 months.

3. Include the following remedial actions as a minimum:

a. Immediately remove dead plants and replace unless required to plant in the succeeding planting season.
b. Replace plants that are more than 25 percent dead or in an unhealthy condition at end of warranty period.
c. A limit of one replacement of each plant will be required except for losses or replacements due to failure to comply with requirements.
d. Provide extended warranty for period equal to original warranty period, for replaced plant material.

1.8 MAINTENANCE SERVICE

A. Initial Maintenance Service for Trees and Shrubs: Provide maintenance by skilled employees of landscape Installer. Maintain as required in Part 3. Begin maintenance immediately after plants are installed and continue until plantings are acceptably healthy and well established but for not less than maintenance period below.

1. Maintenance Period: 12 months from date of Substantial Completion.

B. Initial Maintenance Service for Ground Cover and Other Plants: Provide maintenance by skilled employees of landscape Installer. Maintain as required in Part 3. Begin maintenance immediately after plants are installed and continue until plantings are acceptably healthy and well established but for not less than maintenance period below.
1. Maintenance Period: 12 months from date of Substantial Completion
2. Retain paragraph below if needed. Revise starting date if required.

PART 2 - PRODUCTS

2.1 PLANT MATERIAL

A. General: Furnish nursery-grown plants true to genus, species, variety, cultivar, stem form, shearing, and other features indicated in Plant Schedule or Plant Legend shown on Drawings and complying with ANSI Z60.1; and with healthy root systems developed by transplanting or root pruning. Provide well-shaped, fully branched, healthy, vigorous stock, densely foliated when in leaf and free of disease, pests, eggs, larvae, and defects such as knots, sun scald, injuries, abrasions, and disfigurement.

1. Trees with damaged, crooked, or multiple leaders; tight vertical branches where bark is squeezed between two branches or between branch and trunk ("included bark"); crossing trunks; cut-off limbs more than 3/4 inch (19 mm) in diameter; or with stem girdling roots will be rejected.
2. Collected Stock: Do not use plants harvested from the wild, from native stands, from an established landscape planting, or not grown in a nursery unless otherwise indicated.

B. Provide plants of sizes, grades, and ball or container sizes complying with ANSI Z60.1 for types and form of plants required. Plants of a larger size may be used if acceptable to Architect, with a proportionate increase in size of roots or balls.

C. Root-Ball Depth: Furnish trees and shrubs with root balls measured from top of root ball, which shall begin at root flare according to ANSI Z60.1. Root flare shall be visible before planting.

2.2 INORGANIC SOIL AMENDMENTS

A. Lime: ASTM C 602, agricultural liming material containing a minimum of 80 percent calcium carbonate equivalent and as follows:

1. Class: T, with a minimum of 99 percent passing through No. 8 (2.36-mm) sieve and a minimum of 75 percent passing through No. 60 (0.25-mm) sieve.
2. Provide lime in form of ground dolomitic limestone.

B. Aluminum Sulfate: Commercial grade, unadulterated.

2.3 ORGANIC SOIL AMENDMENTS

A. Compost: Well-composted, stable, and weed-free organic matter, pH range of 5.5 to 8; moisture content 35 to 55 percent by weight; 100 percent passing through 1/2-inch (13-mm) sieve; soluble salt content of 5 to 10 decisiemens/m; not exceeding 0.5 percent inert contaminants and free of substances toxic to plantings.

B. Sphagnum Peat: Partially decomposed sphagnum peat moss, finely divided or granular texture, with a pH range of 3.4 to 4.8.

C. Manure: Well-rotted, unleached, stable or cattle manure containing not more than 25 percent by volume of straw, sawdust, or other bedding materials; free of toxic substances, stones, sticks, soil, weed seed, debris, and material harmful to plant growth.

2.4 FERTILIZERS

A. Commercial Fertilizer: Commercial-grade complete fertilizer of neutral character, consisting of fast- and slow-release nitrogen, 50 percent derived from natural organic sources of urea formaldehyde, phosphorous, and potassium in the following composition:

1. Composition: 1 lb/1000 sq. ft. (0.45 kg/92.9 sq. m) of actual nitrogen, 4 percent phosphorous, and 2 percent potassium, by weight.
2. Composition: Nitrogen, phosphorous, and potassium in amounts recommended in soil reports from a qualified soil-testing laboratory.

B. Chelated Iron: Commercial-grade FeEDDHA for dicots and woody plants, and commercial-grade FeDTPA for ornamental grasses and monocots.

2.5 PLANTING SOILS

A. Planting Soil Mix Type 1: Sandy Loam (USDA Soil Texture Triangle) ASTM D 5268 topsoil, with pH range of 5.5 to 7, a minimum of 4 percent organic material content; free of stones 1 inch (25 mm) or larger in any dimension and other extraneous materials harmful to plant growth.

2.6 MULCHES

A. Organic Mulch: Free from deleterious materials and suitable as a top dressing of trees and shrubs, consisting of one of the following:

1. Type: Shredded hardwood
2. Size Range: 2 inches (50 mm) maximum, 1/2 inch (13 mm) minimum.
3. Color: Natural.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas to receive plants for compliance with requirements and conditions affecting installation and performance.

1. Verify that no foreign or deleterious material or liquid such as paint, paint washout, concrete slurry, concrete layers or chunks, cement, plaster, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, or acid has been deposited in soil within a planting area.

2. Do not mix or place soils and soil amendments in frozen, wet, or muddy conditions.
3. Suspend soil spreading, grading, and tilling operations during periods of excessive soil moisture until the moisture content reaches acceptable levels to attain the required results.
4. Uniformly moisten excessively dry soil that is not workable and which is too dusty.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

C. If contamination by foreign or deleterious material or liquid is present in soil within a planting area, remove the soil and contamination as directed by Architect and replace with new planting soil.

3.2 PREPARATION

A. Protect structures, utilities, sidewalks, pavements, and other facilities and turf areas and existing plants from damage caused by planting operations.

B. Install erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.

C. Lay out individual tree and shrub locations and areas for multiple plantings. Stake locations, outline areas, adjust locations when requested, and obtain Architect's acceptance of layout before excavating or planting. Make minor adjustments as required.

D. Wrap trees and shrubs with burlap fabric over trunks, branches, stems, twigs, and foliage to protect from wind and other damage during digging, handling, and transportation.

3.3 PLANTING AREA ESTABLISHMENT

A. Loosen subgrade of planting areas to a minimum depth as shown on plans. Remove stones larger than 1 inch (25 mm) in any dimension and sticks, roots, rubbish, and other extraneous matter and legally dispose of them off Owner's property.

1. Thoroughly blend planting soil off-site before spreading.

    a. Delay mixing fertilizer with planting soil if planting will not proceed within a few days.
    b. Mix lime with dry soil before mixing fertilizer.

B. Finish Grading: Grade planting areas to a smooth, uniform surface plane with loose, uniformly fine texture. Roll and rake, remove ridges, and fill depressions to meet finish grades.

C. Before planting, obtain Architect's acceptance of finish grading; restore planting areas if eroded or otherwise disturbed after finish grading.

3.4 EXCAVATION FOR TREES AND SHRUBS

A. Planting Pits and Trenches: Excavate circular planting pits with sides sloping inward at a 45-degree angle. Excavations with vertical sides are not acceptable. Trim perimeter of bottom leaving center area of bottom raised slightly to support root ball and assist in drainage away from center. Do not further disturb base. Ensure that root ball will sit on undisturbed base soil to prevent settling. Scarify sides of planting pit smeared or smoothed during excavation.

1. Excavate at least 12 inches (300 mm) wider than root spread and deep enough to accommodate vertical roots for bare-root stock or as shown on plans and details.
2. Do not excavate deeper than depth of the root ball, measured from the root flare to the bottom of the root ball.
3. If area under the plant was initially dug too deep, add soil to raise it to the correct level and thoroughly tamp the added soil to prevent settling.
4. Maintain required angles of repose of adjacent materials as shown on the Drawings. Do not excavate subgrades of adjacent paving, structures, hardscapes, or other new or existing improvements.
5. Maintain supervision of excavations during working hours.
6. Keep excavations covered or otherwise protected overnight.

B. Obstructions: Notify Architect if unexpected rock or obstructions detrimental to trees or shrubs are encountered in excavations.

C. Drainage: Notify Architect if subsoil conditions evidence unexpected water seepage or retention in tree or shrub planting pits.

D. Fill excavations with water and allow to percolate away before positioning trees and shrubs.

3.5 TREE, SHRUB, AND VINE PLANTING

A. Before planting, verify that root flare is visible at top of root ball according to ANSI Z60.1. If root flare is not visible, remove soil in a level manner from the root ball to where the top-most root emerges from the trunk. After soil removal to expose the root flare, verify that root ball still meets size requirements.

B. Remove stem girdling roots and kinked roots. Remove injured roots by cutting cleanly; do not break.

C. Set balled and burlapped stock plumb and in center of planting pit or trench with root flare 1 inch (25 mm) above adjacent finish grades.

1. After placing some backfill around root ball to stabilize plant, carefully cut and remove burlap, rope, and wire baskets from tops of root balls and from sides, but do not remove from under root balls. Remove pallets, if any, before setting. Do

not use planting stock if root ball is cracked or broken before or during planting operation.

2. Backfill around root ball in layers, tamping to settle soil and eliminate voids and air pockets. When planting pit is approximately one-half filled, water thoroughly before placing remainder of backfill. Repeat watering until no more water is absorbed.
3. Place planting tablets in each planting pit when pit is approximately one-half filled; in amounts recommended in soil reports from soil-testing laboratory. Place tablets beside the root ball about 1 inch (25 mm) from root tips; do not place tablets in bottom of the hole.
4. Continue backfilling process. Water again after placing and tamping final layer of soil.

D. Set container-grown stock plumb and in center of planting pit or trench with root flare 1 inch (25 mm) above adjacent finish grades.

1. Carefully remove root ball from container without damaging root ball or plant.
2. Backfill around root ball in layers, tamping to settle soil and eliminate voids and air pockets. When planting pit is approximately one-half filled, water thoroughly before placing remainder of backfill. Repeat watering until no more water is absorbed.
3. Place planting tablets in each planting pit when pit is approximately one-half filled; in amounts recommended in soil reports from soil-testing laboratory. Place tablets beside the root ball about 1 inch (25 mm) from root tips; do not place tablets in bottom of the hole.
4. Continue backfilling process. Water again after placing and tamping final layer of soil.

3.6 GROUND COVER AND GRASS PLANTING

A. Dig holes large enough to allow spreading of roots.

B. For rooted cutting plants supplied in flats, plant each in a manner that will minimally disturb the root system but to a depth not less than two nodes.

C. Work soil around roots to eliminate air pockets and leave a slight saucer indentation around plants to hold water.

D. Water thoroughly after planting, taking care not to cover plant crowns with wet soil.

E. Protect plants from hot sun and wind; remove protection if plants show evidence of recovery from transplanting shock.

3.7 PLANTING AREA MULCHING

A. Mulch backfilled surfaces of planting areas and other areas indicated.

1. Organic Mulch in Planting Areas: Apply 2-inch (50-mm) over whole surface of planting area, and finish level with adjacent finish grades.

3.8 PLANT MAINTENANCE

A. Maintain plantings by pruning, cultivating, watering, weeding, fertilizing, mulching, restoring planting saucers, adjusting and repairing tree-stabilization devices, resetting to proper grades or vertical position, and performing other operations as required to establish healthy, viable plantings. Spray or treat as required to keep trees and shrubs free of insects and disease.

B. Fill in as necessary soil subsidence that may occur because of settling or other processes. Replace mulch materials damaged or lost in areas of subsidence.

C. Apply treatments as required to keep plant materials, planted areas, and soils free of pests and pathogens or disease. Use integrated past management practices whenever possible to minimize the use of pesticides and reduce hazards. Treatments include physical controls such as hosing off foliage, mechanical controls such as traps, and biological control agents.

3.9 CLEANUP AND PROTECTION

A. During planting, keep adjacent paving and construction clean and work area in an orderly condition.

B. Protect plants from damage due to landscape operations and operations of other contractors and trades. Maintain protection during installation and maintenance periods. Treat, repair, or replace damaged plantings.

C. After installation and before Substantial Completion, remove nursery tags, nursery stakes, tie tape, labels, wire, burlap, and other debris from plant material, planting areas, and Project site.

3.10 DISPOSAL

A. Remove surplus soil and waste material including excess subsoil, unsuitable soil, trash, and debris and legally dispose of them off Owner's property.

- END -

MODEL NUMBERS NOT FOUND

003631
045935
045936
004765A
111404E
111404C
008382
046326
023289
017073
047721
047722
111403D
111403A
111403U
2691
0611
207607A

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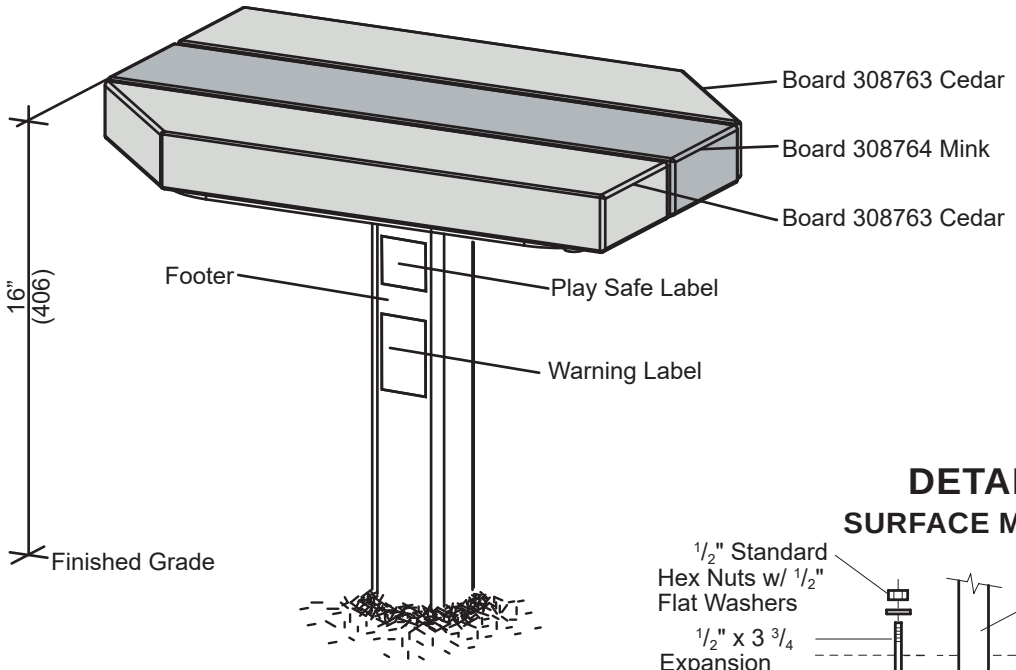
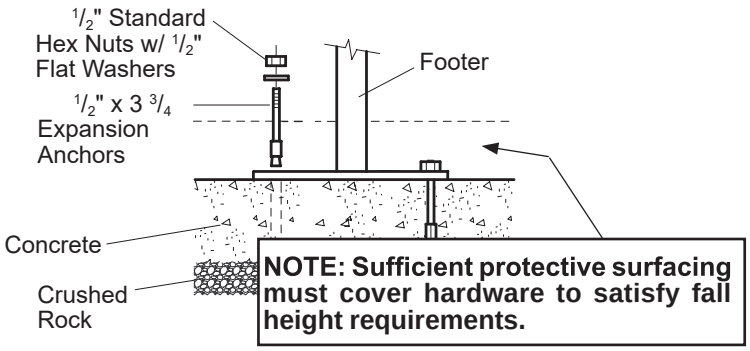
ISO 9001 Certified

SAFETY NOTE
Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. ASTM F1487.)

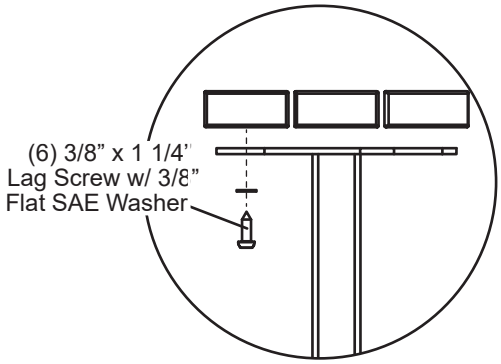
NOTE: Refer to the site Plan for footing location



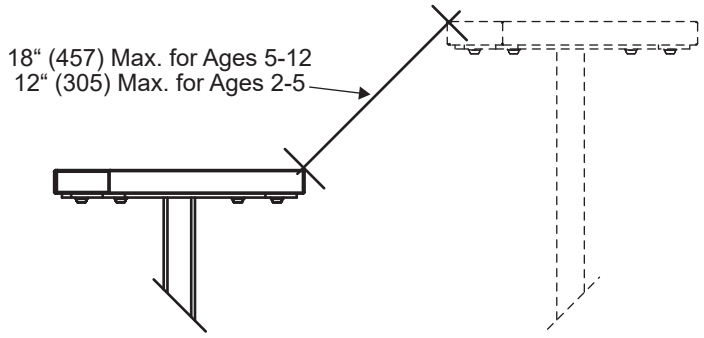
DETAIL
SURFACE MOUNT



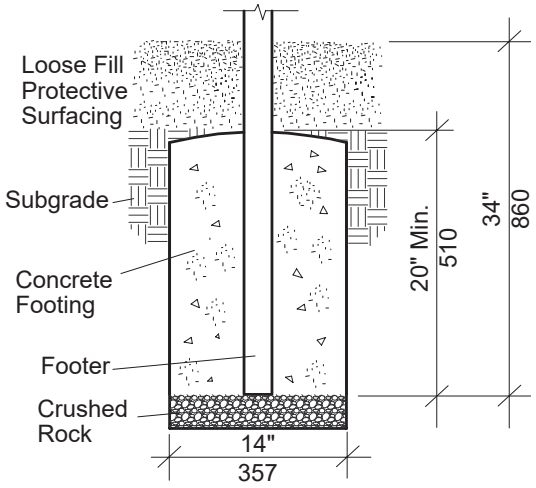
DETAIL
BOARD CONNECTION



STEPPER DISTANCE
(LAYOUT VARIES - SEE YOUR PLAN)



DETAIL
DIRECT BURY



Forma™

307433 Footprint® Stepper 16”

601 7TH STREET SOUTH, DELANO, MINNESOTA 55328-8605 888-574-4678 LSI Install Help 888-438-6574 LSI Direct 763-972-5200 Int. FAX (763) 972-3185

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Document #31569900

Forma™ 307433 Footprint® Stepper 16”

Parts List

Part#	Description	Qty.
308763	RPL ANGLED STEPPER BRD 3.5X16, Cedar	2
308764	RPL STR STEPPER BRD 3.5X16, Mink	1
311251	RPL STEPPER SPRT 16i (SM), Specify Color	1
308998	RPL STEPPER SPRT 16i (DB), Specify Color	1
314702	HDW PKG FOOTPRINT™ STEPPER	1
100365	WASHER FLAT SAE 3/8i SST	6
205152	LAG SCR BH 6LP 3/8x1-1/4i SST	6
183388	HDW PKG 4-HOLE SM 1/2-13	1
176046	EXP ANCHOR 1/2x3-3/4i ZP	4
100322	NUT HEX STD 1/2-13 SST	4
100363	WASHER FLAT 1/2i SST	4
319895	HDW PKG LABELS 2-5 & 5-12 YRS	1
115176	LABEL HD SRF WARNING ASTM	1
156847	LABEL PLAY SAFE 5-12 YRS	1
182212	LABEL ENTANGLEMENTWARNING	1
182213	LABEL HOT SURFACE WARNING	1
156845	LABEL PLAY SAFE 2-5 YRS	1

DB = Direct Bury
SM = Surface Mount

Specifications

Fasteners:	Primary fasteners shall be socketed and pinned tamper-proof in design, stainless steel (SST) per ASTM F 879 unless otherwise indicated (see specific product installation/specifications).
Support:	Weldment comprised of 1.900” (48,26 mm) O.D. RS-20 (.090” - .100”) (2,28 mm-2,54 mm) 1.315” (33,40 mm) O.D. RS-20 (.080” - 090”) (2,03 mm-2,28 mm) and 3/16” x 5” (4,75 mm x 127 mm) diameter plate. Finish: ProShield, color specified.
Boards:	Recycled high-density polyethylene, cedar and mink in color.
Installation Time:	DB - Approx. 1 person hour
	SM - Approx. 1 person hour
Concrete Req.:	DB - Approx. 1.8 cu. ft.
Weight:	DB - 30 lbs.
	SM - 27 lbs.
Fall Height:	16” (0,40)

Installation Instructions

1) (Direct Bury) Dig footing as shown, see your plan view.

2) Attach recycled plastic lumber using lag screws with SAE flat washers as shown. Refer to Board Connection Detail.

3) (Direct Bury) Position footer in footing hole and pour concrete footing. With footer plumb, prop footer to hold in position. Allow concrete footer to cure a minimum of 72 hours before users are allowed to play on the structure.

   (Surface Mount) Mark anchor bolt locations on concrete slab through holes in support plate. Remove the footer. Drill 4” deep holes on marks into concrete slab using hammer drill and 1/2” masonry bit. Tap expansion anchors into holes and secure disc climber using 1/2” standard hex nuts with 1/2” flat washers.”

4) Apply labels as shown.

5) Install protective surfacing before users are allowed to play on the structure.

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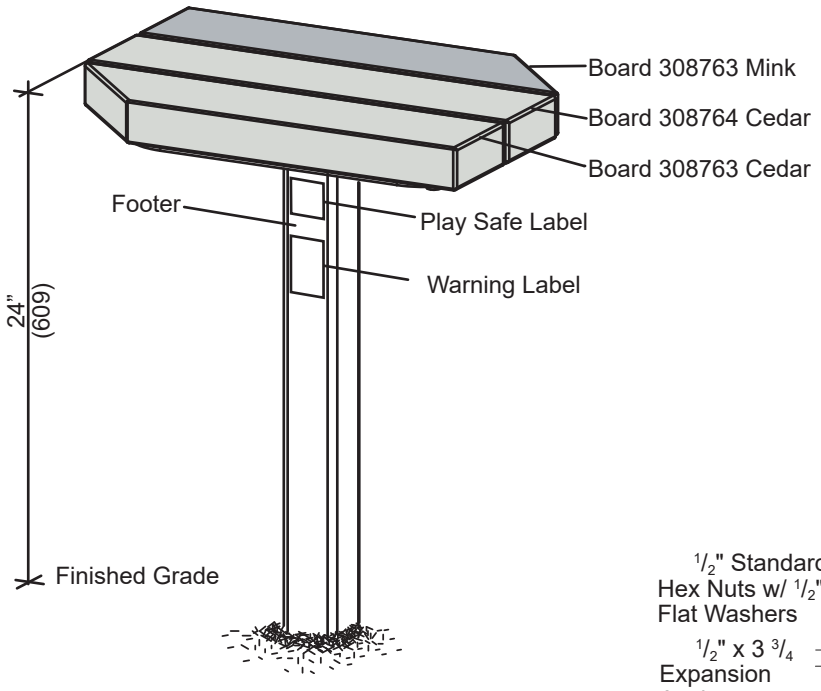
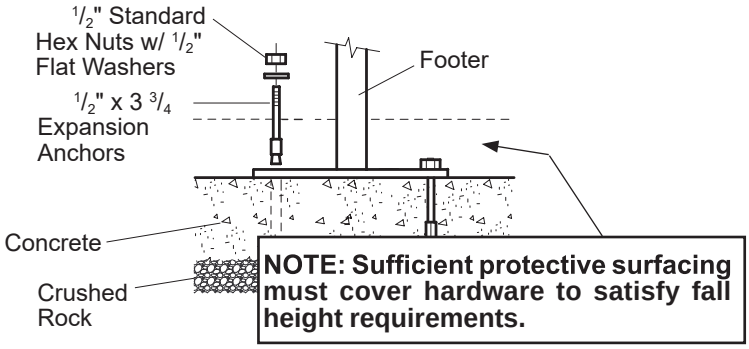
ISO 9001 Certified

SAFETY NOTE
Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. ASTM F1487.)

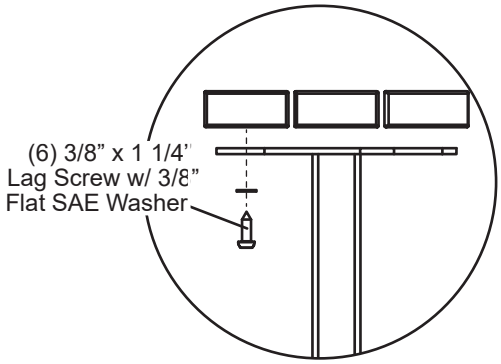
NOTE: Refer to the site Plan for footing location



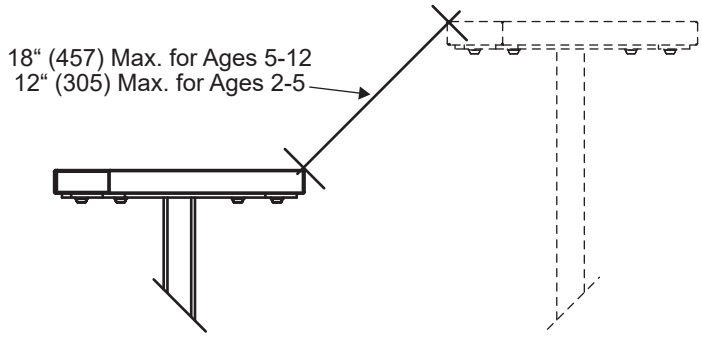
DETAIL
SURFACE MOUNT



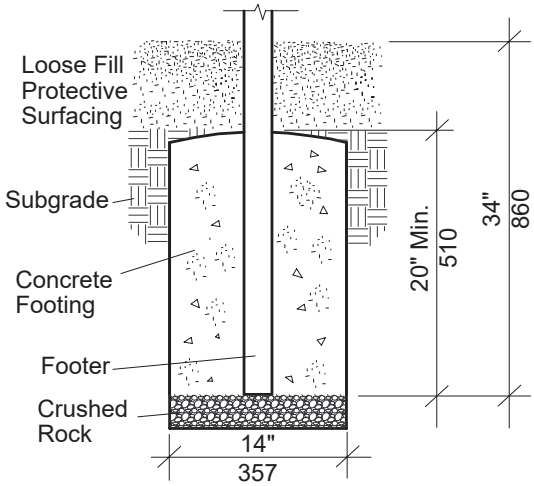
DETAIL
BOARD CONNECTION



STEPPER DISTANCE
(LAYOUT VARIES - SEE YOUR PLAN)



DETAIL
DIRECT BURY



Forma™

307434 Footprint® Stepper 24”

601 7TH STREET SOUTH, DELANO, MINNESOTA 55328-8605 888-574-4678 LSI Install Help 888-438-6574 LSI Direct 763-972-5200 Int. FAX (763) 972-3185

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Document #31570000

Forma™ 307434 Footprint® Stepper 24”

Parts List

Part#	Description	Qty.
308763	RPL ANGLED STEPPER BRD 3.5X16, Cedar	1
308763	RPL ANGLED STEPPER BRD 3.5X16, Mink	1
308764	RPL STR STEPPER BRD 3.5X16, Cedar	1
308999	RPL STEPPER SPRT 24i (DB), Specify Color	1
311252	RPL STEPPER SPRT 24i (SM), Specify Color	1
314702	HDW PKG FOOTPRINT™ STEPPER	1
100365	WASHER FLAT SAE 3/8i SST	6
205152	LAG SCR BH 6LP 3/8x1-1/4i SST	6
183388	HDW PKG 4-HOLE SM 1/2-13	1
176046	EXP ANCHOR 1/2x3-3/4i ZP	4
100322	NUT HEX STD 1/2-13 SST	4
100363	WASHER FLAT 1/2i SST	4
182693	HDW PKG LABELS 5-12 YRS	1
115176	LABEL HD SRF WARNING ASTM	1
156847	LABEL PLAY SAFE 5-12 YRS	1
182212	LABEL ENTANGLEMENTWARNING	1
182213	LABEL HOT SURFACE WARNING	1

DB = Direct Bury
SM = Surface Mount

Specifications

Fasteners:	Primary fasteners shall be socketed and pinned tamper-proof in design, stainless steel (SST) per ASTM F 879 unless otherwise indicated (see specific product installation/specifications).
Support:	Weldment comprised of 1.900” (48,26 mm) O.D. RS-20 (.090” - .100”) (2,28 mm-2,54 mm) 1.315” (33,40 mm) O.D. RS-20 (.080” - 090”) (2,03 mm-2,28 mm) and 3/16” x 5” (4,75 mm x 127 mm) diameter plate. Finish: ProShield, color specified.
Boards:	Recycled high-density polyethylene, cedar and mink in color.
Installation Time:	DB - Approx. 1 person hour
	SM - Approx. 1 person hour
Concrete Req.:	DB - Approx. 1.8 cu. ft.
Weight:	DB - 32 lbs.
	SM - 30 lbs.
Fall Height:	24” (0,60)

Installation Instructions

1) (Direct Bury) Dig footing as shown, see your plan view.

2) Attach recycled plastic lumber using lag screws with SAE flat washers as shown. Refer to Board Connection Detail.

3) (Direct Bury) Position footer in footing hole and pour concrete footing. With footer plumb, prop footer to hold in position. Allow concrete footer to cure a minimum of 72 hours before users are allowed to play on the structure.

   (Surface Mount) Mark anchor bolt locations on concrete slab through holes in support plate. Remove the footer. Drill 4” deep holes on marks into concrete slab using hammer drill and 1/2” masonry bit. Tap expansion anchors into holes and secure disc climber using 1/2” standard hex nuts with 1/2” flat washers.”

4) Apply labels as shown.

5) Install protective surfacing before users are allowed to play on the structure.

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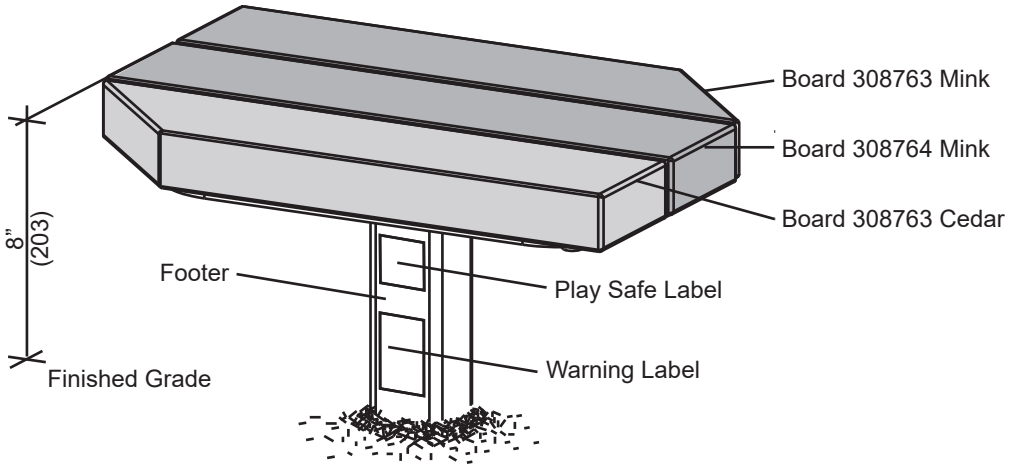
ISO 14001 CERTIFIED

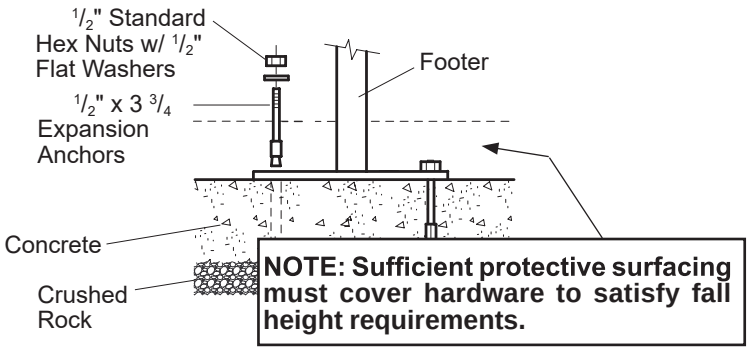
ISO 9001 Certified

SAFETY NOTE
Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. ASTM F1487.)



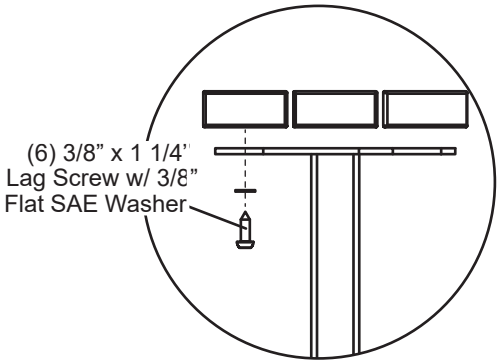
NOTE: Refer to the site Plan for footing location

DETAIL
SURFACE MOUNT

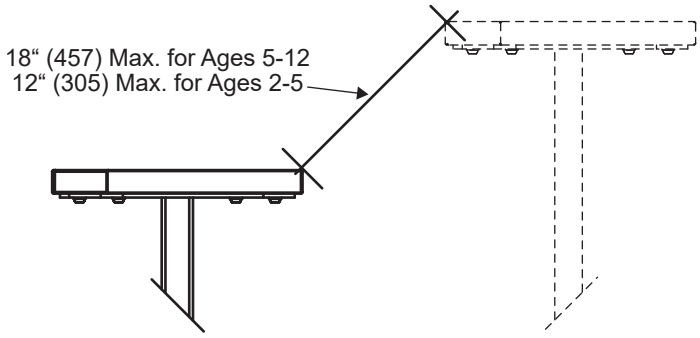


NOTE: Sufficient protective surfacing must cover hardware to satisfy fall height requirements.

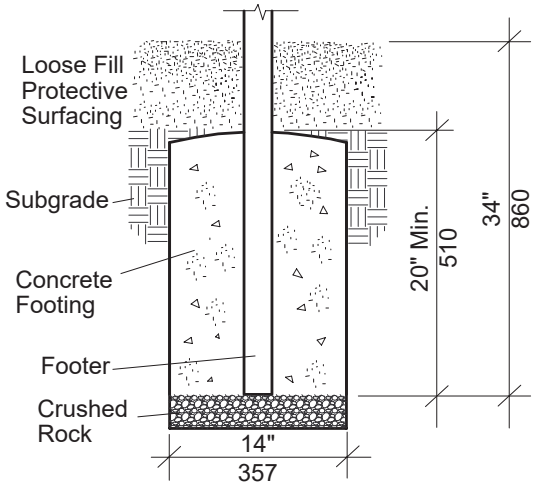
DETAIL
BOARD CONNECTION



STEPPER DISTANCE
(LAYOUT VARIES - SEE YOUR PLAN)



DETAIL
DIRECT BURY



Forma™

307432 Footprint® Stepper 8”

601 7TH STREET SOUTH, DELANO, MINNESOTA 55328-8605 888-574-4678 LSI Install Help 888-438-6574 LSI Direct 763-972-5200 Int. FAX (763) 972-3185

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Document #31569800

Forma™ 307432 Footprint® Stepper 8”

Parts List

Part#	Description	Qty.
308763	RPL ANGLED STEPPER BRD 3.5X16, Cedar	1
308763	RPL ANGLED STEPPER BRD 3.5X16, Mink	1
308764	RPL STR STEPPER BRD 3.5X16, Mink	1
308943	RPL STEPPER SPRT 8i (DB), Specify Color	1
311250	RPL STEPPER SPRT 8i (SM), Specify Color	1
314702	HDW PKG FOOTPRINT™ STEPPER	1
100365	WASHER FLAT SAE 3/8i SST	6
205152	LAG SCR BH 6LP 3/8x1-1/4i SST	6
183388	HDW PKG 4-HOLE SM 1/2-13	1
176046	EXP ANCHOR 1/2x3-3/4i ZP	4
100322	NUT HEX STD 1/2-13 SST	4
100363	WASHER FLAT 1/2i SST	4
319895	HDW PKG LABELS 2-5 & 5-12 YRS	1
115176	LABEL HD SRF WARNING ASTM	1
156847	LABEL PLAY SAFE 5-12 YRS	1
182212	LABEL ENTANGLEMENTWARNING	1
182213	LABEL HOT SURFACE WARNING	1
156845	LABEL PLAY SAFE 2-5 YRS	1

DB = Direct Bury
SM = Surface Mount

Specifications

Fasteners:	Primary fasteners shall be socketed and pinned tamper-proof in design, stainless steel (SST) per ASTM F 879 unless otherwise indicated (see specific product installation/specifications).
Support:	Weldment comprised of 1.900” (48,26 mm) O.D. RS-20 (.090” - .100”) (2,28 mm-2,54 mm) 1.315” (33,40 mm) O.D. RS-20 (.080” - 090”) (2,03 mm-2,28 mm) and 3/16” x 5” (4,75 mm x 127 mm) diameter plate. Finish: ProShield, color specified.
Boards:	Recycled high-density polyethylene, cedar and mink in color.
Installation Time:	DB - Approx. 1 person hour
	SM - Approx. 1 person hour
Concrete Req.:	DB - Approx. 1.8 cu. ft.
Weight:	DB - 28 lbs.
	SM - 25 lbs
Fall Height:	8” (0,20)

Installation Instructions

1) (Direct Bury) Dig footing as shown, see your plan view.

2) Attach recycled plastic lumber using lag screws with SAE flat washers as shown. Refer to Board Connection Detail.

3) (Direct Bury) Position footer in footing hole and pour concrete footing. With footer plumb, prop footer to hold in position. Allow concrete footer to cure a minimum of 72 hours before users are allowed to play on the structure.

   (Surface Mount) Mark anchor bolt locations on concrete slab through holes in support plate. Remove the footer. Drill 4” deep holes on marks into concrete slab using hammer drill and 1/2” masonry bit. Tap expansion anchors into holes and secure disc climber using 1/2” standard hex nuts with 1/2” flat washers.

4) Apply labels as shown.

5) Install protective surfacing before users are allowed to play on the structure.

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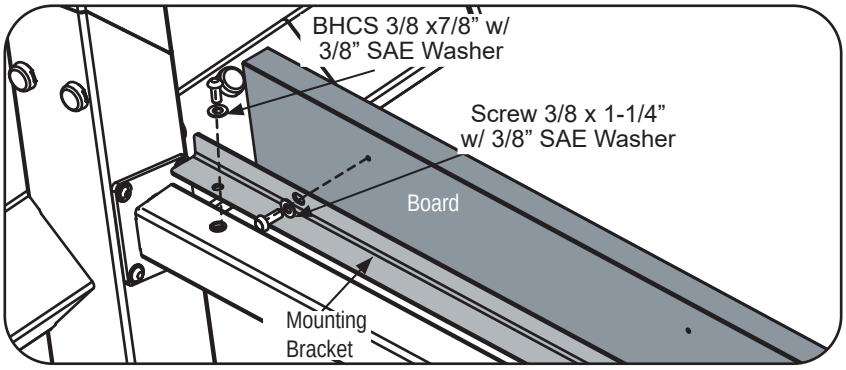
ISO 14001 CERTIFIED

ISO 9001 Certified

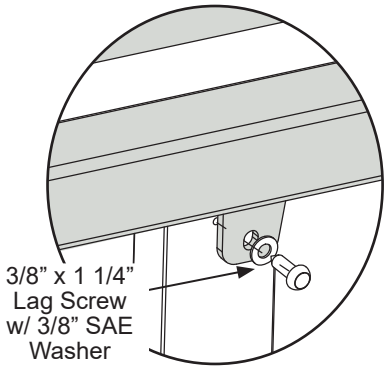
SAFETY NOTE
Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. ASTM F1487.)

DETAIL LUMBER BRACKET CONN.

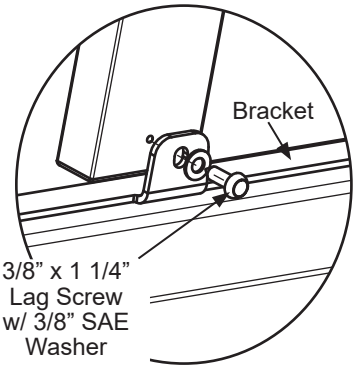


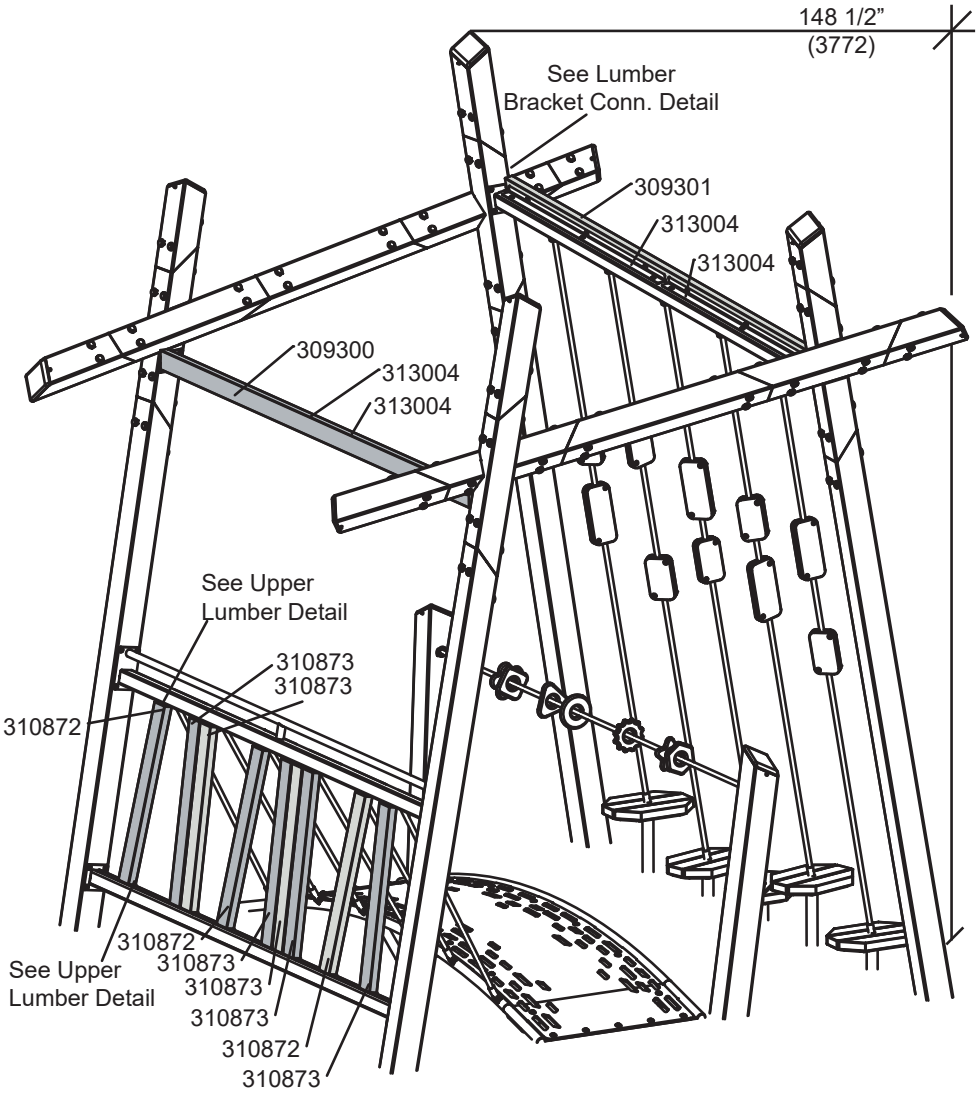
FOR EASE OF INSTALLATION, RECOMMEND LIFTING EQUIPMENT CAPABLE OF LIFTING 600 LBS.

DETAIL UPPER BOARD



DETAIL LOWER LUMBER





Forma™

307437 Foxtrot® Multi-Climber

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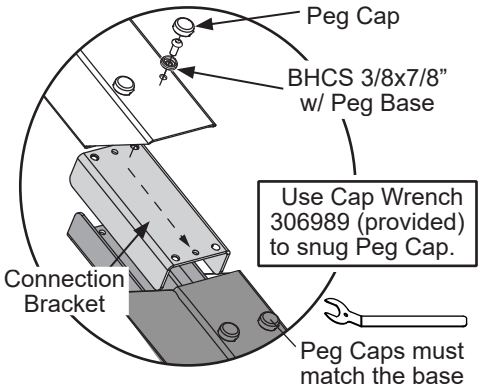
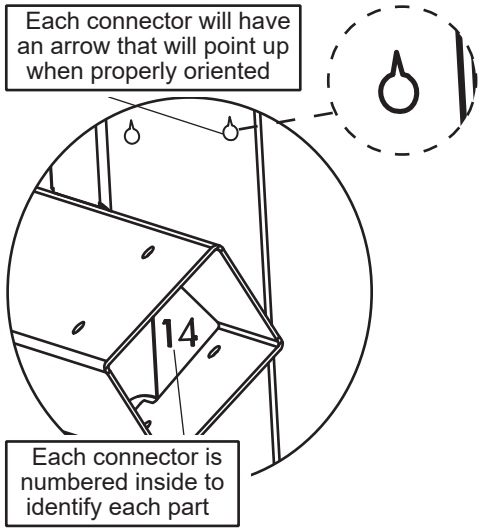
DETAIL BRACKET CONN.





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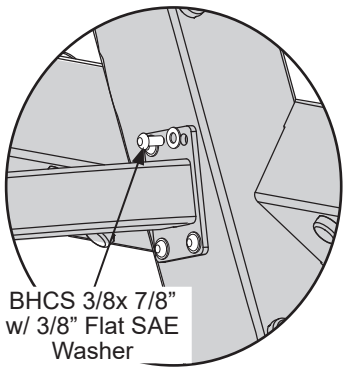
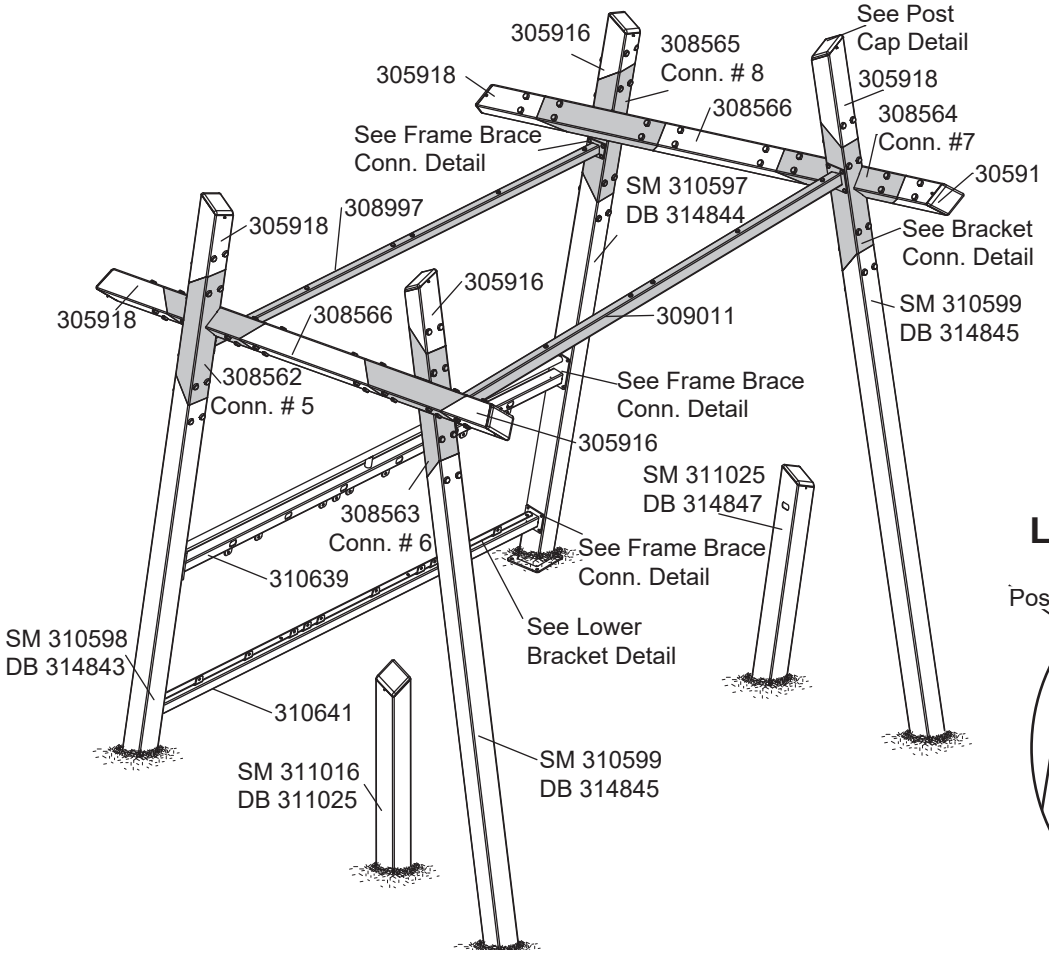
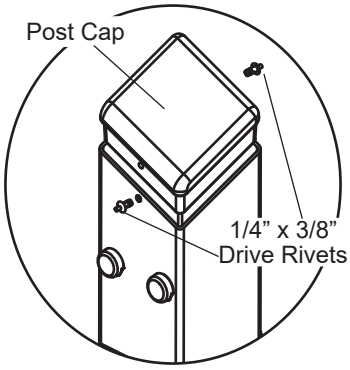
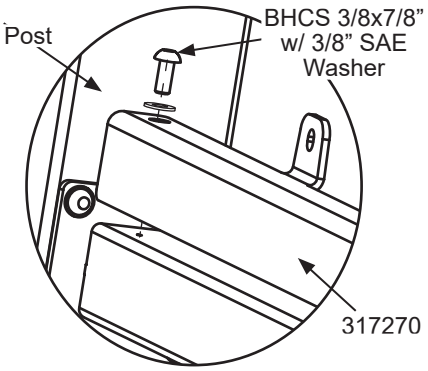




DETAIL POST CAP



DETAIL LOWER BRACKET



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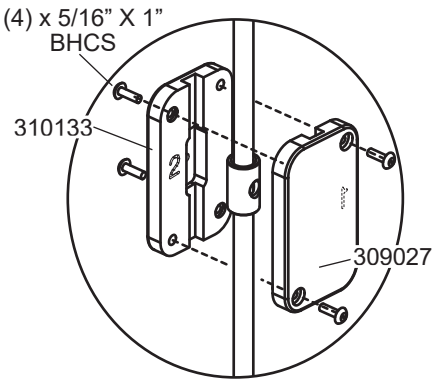
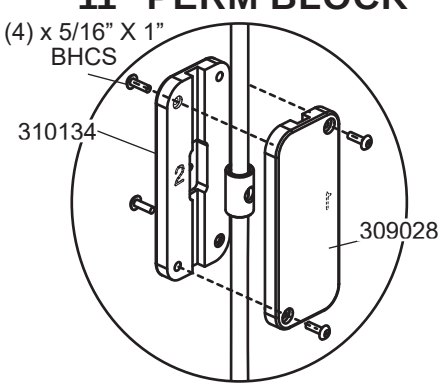
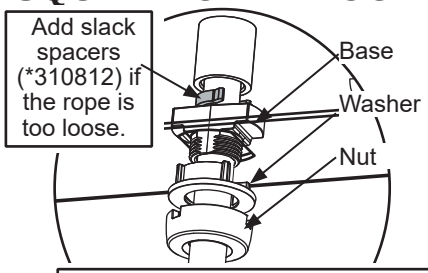
DETAIL
8” ROPE BLOCK



DETAIL
11” PERM BLOCK

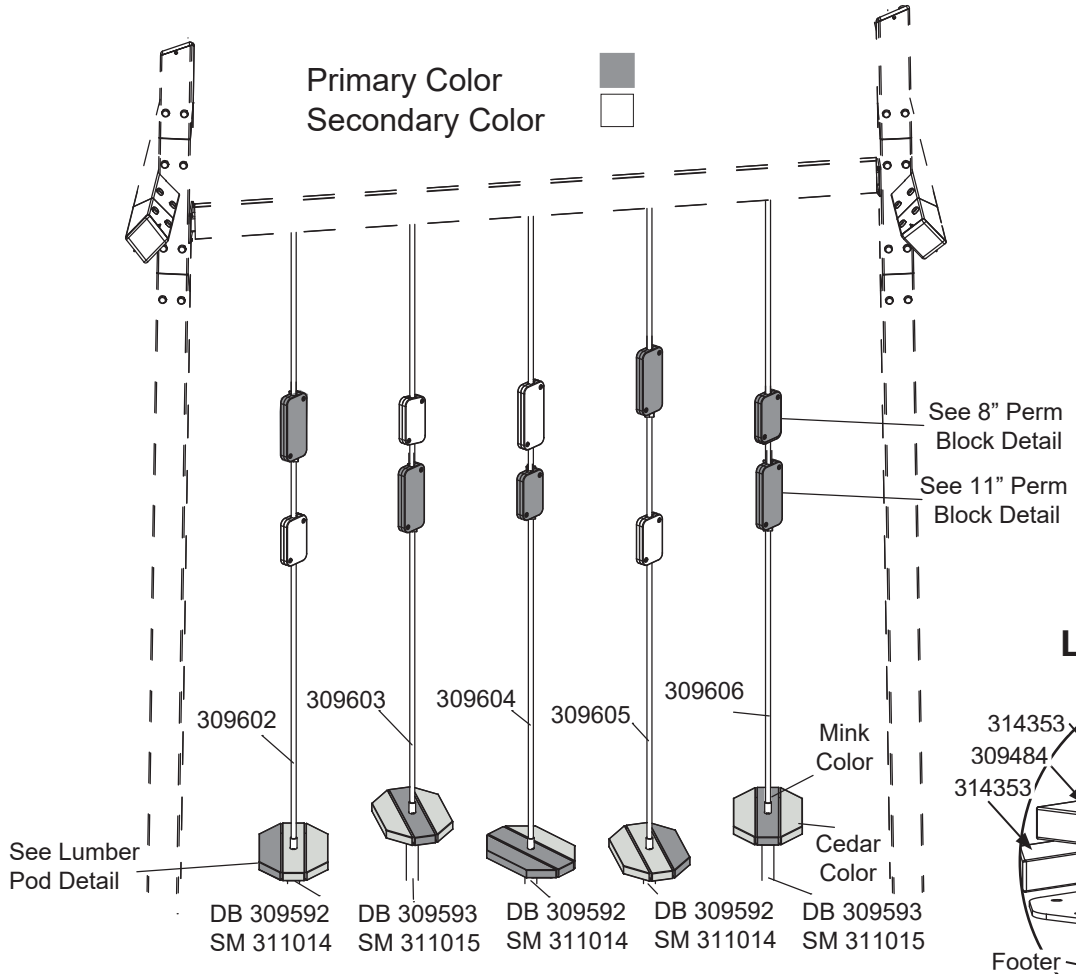


DETAIL
SQUARE CABLE CONN.

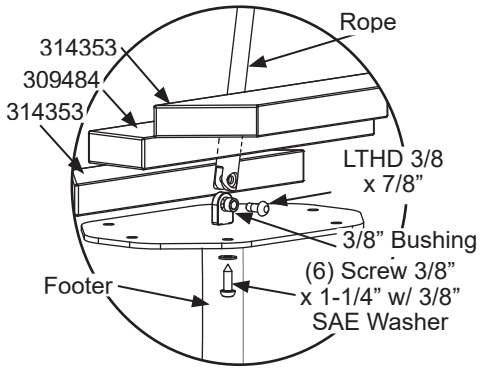


*may be located in spare parts kit

Place base inside the pipe and rotate into place. Use washer to align rope into place. Pull the cable straight and tighten the nut hand tight. Use the Spanner (317384) and turn the nut a quarter rotation to reach 15 ft-lbs.



DETAIL
LUMBER POD



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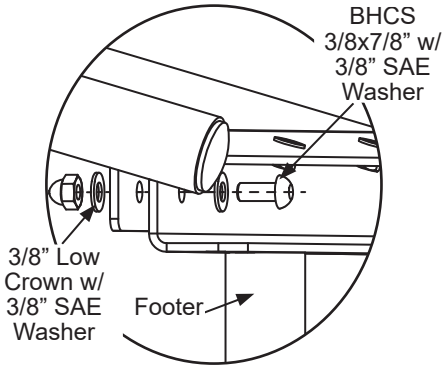
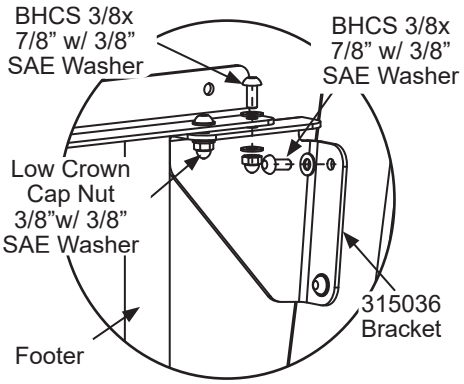
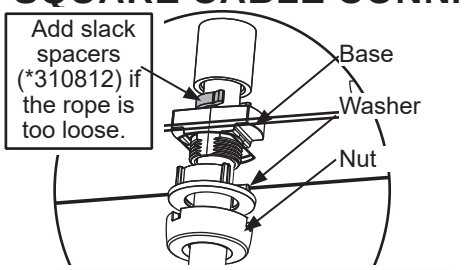
DETAIL FOOTER ATTCH.



DETAIL DB FOOTER

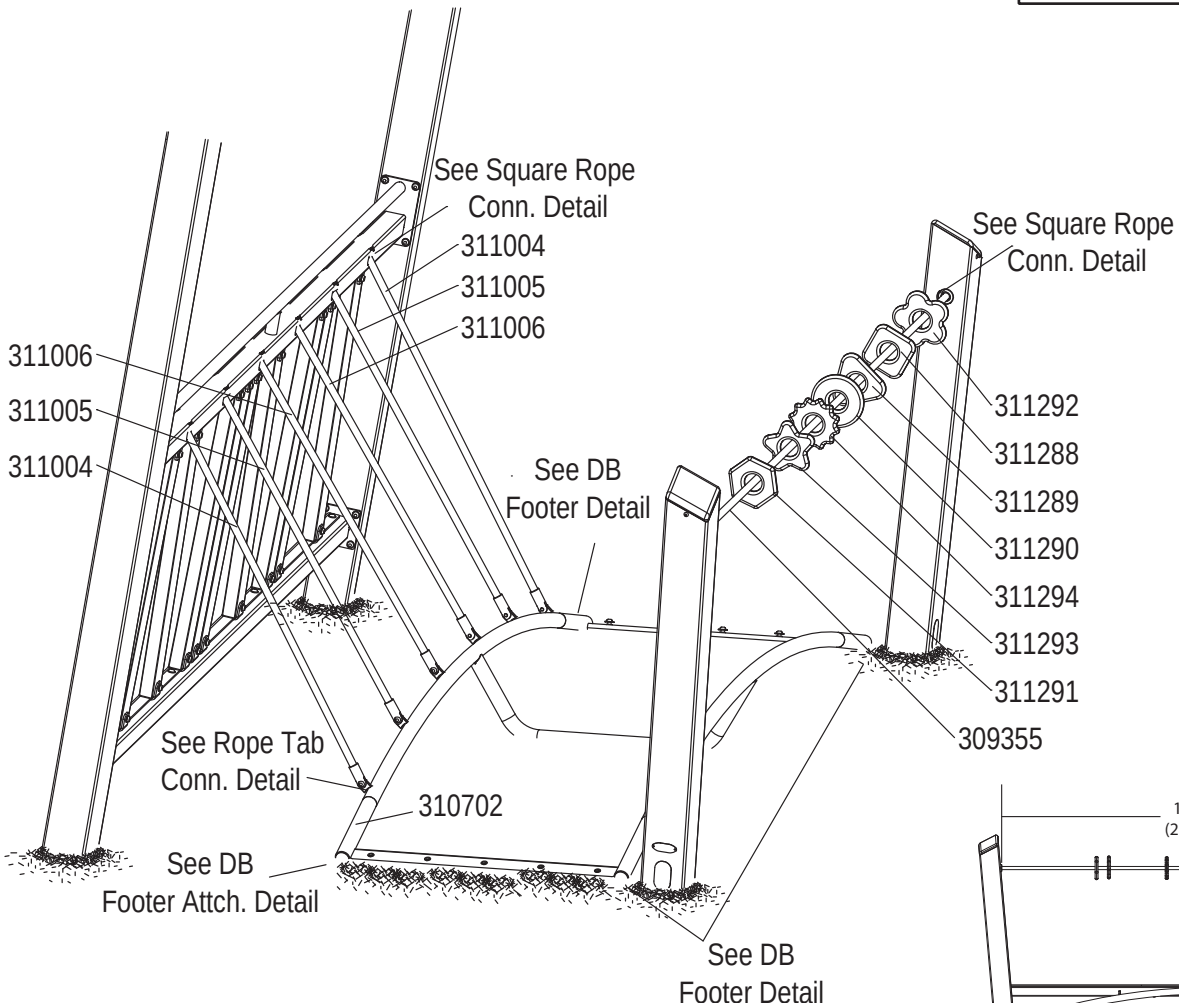


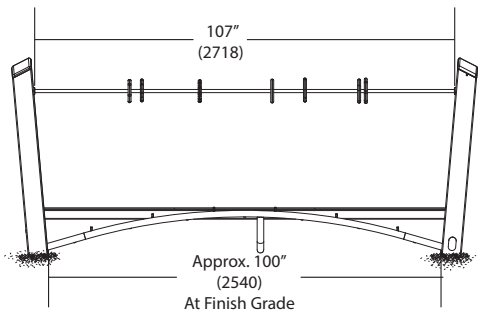
DETAIL SQUARE CABLE CONN.



*may be located in spare parts kit

Place base inside the pipe and rotate into place. Use washer to align rope into place. Pull the cable straight and tighten the nut hand tight. Use the Spanner (317384) and turn the nut a quarter rotation to reach 15 ft-lbs.





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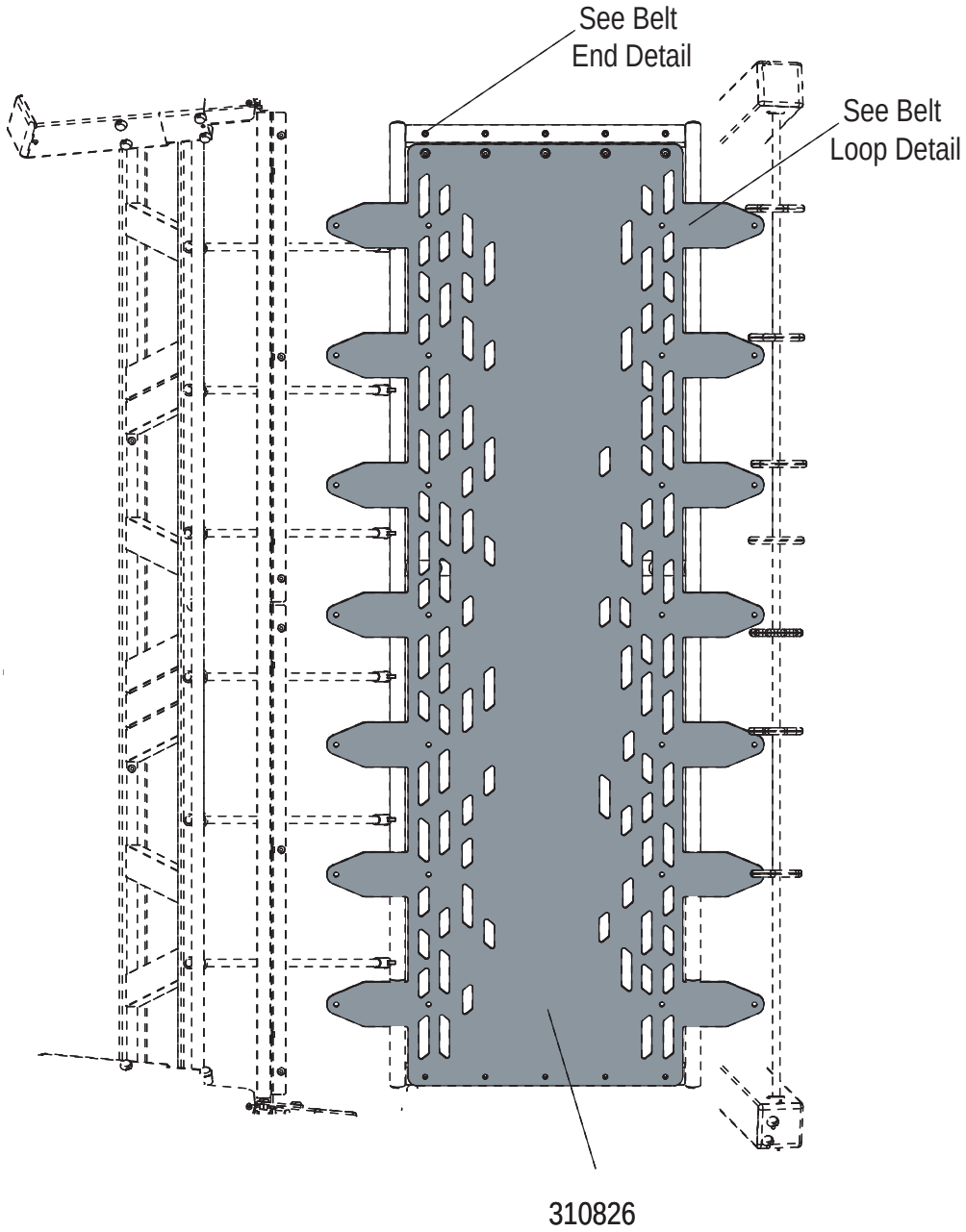
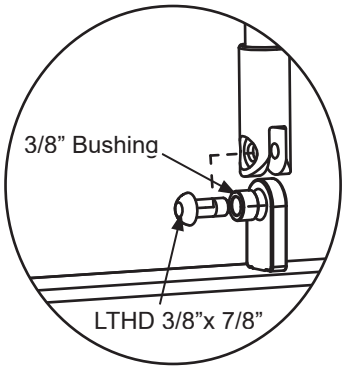
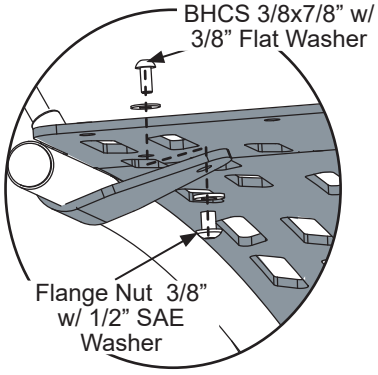


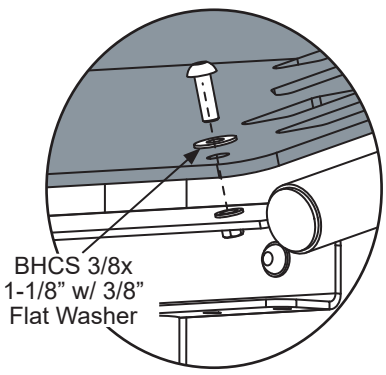
DETAIL
CABLE TAB CONN



DETAIL
BELT LOOP



DETAIL
BELT END



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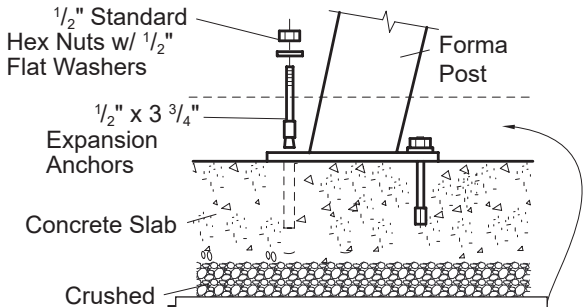
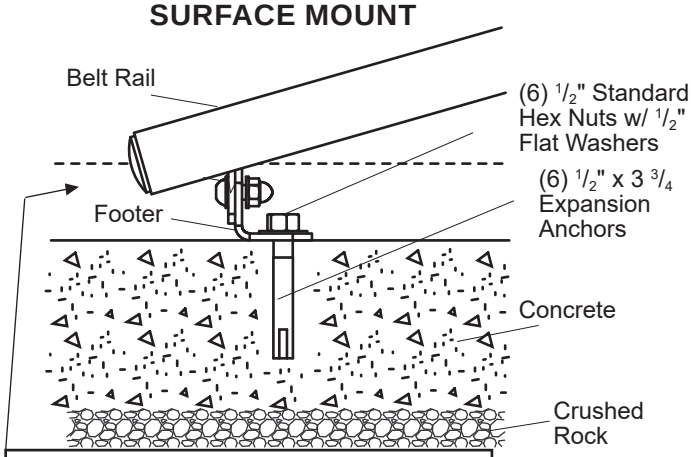
DETAIL
SURFACE MOUNT



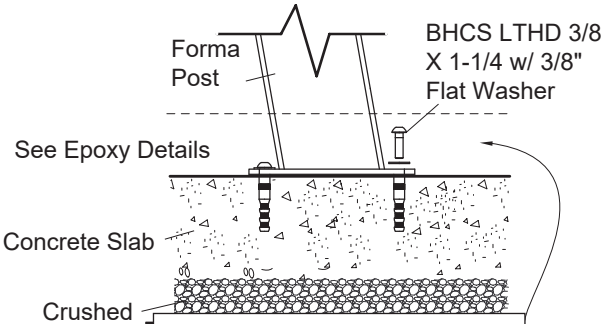
NOTE: Sufficient protective surfacing must cover hardware to satisfy fall height requirements.

DETAIL
SURFACE MOUNT



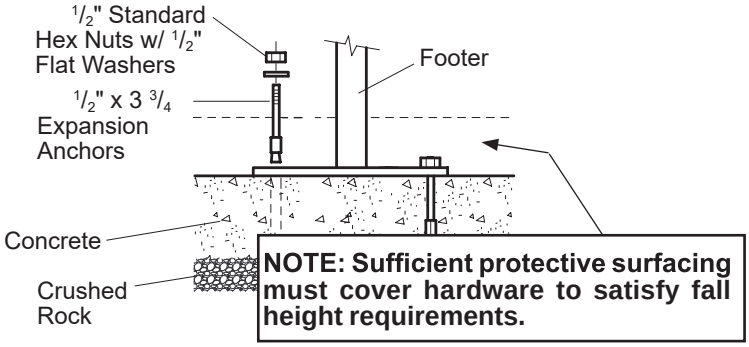
NOTE: Sufficient protective surfacing must cover hardware to satisfy fall height requirements.

DETAIL
SURFACE MOUNT



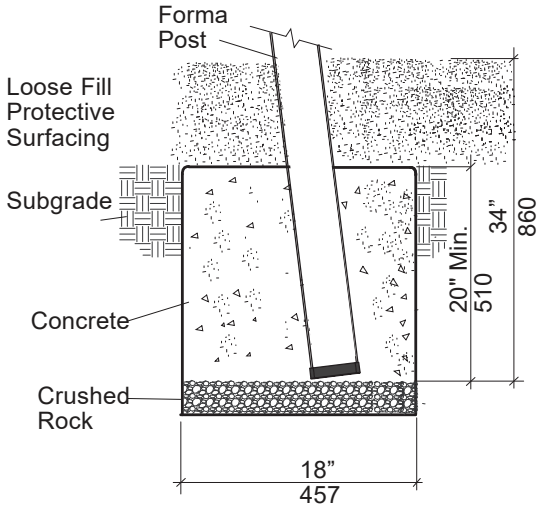
NOTE: Sufficient protective surfacing must cover hardware to satisfy fall height requirements.

DETAIL
SURFACE MOUNT

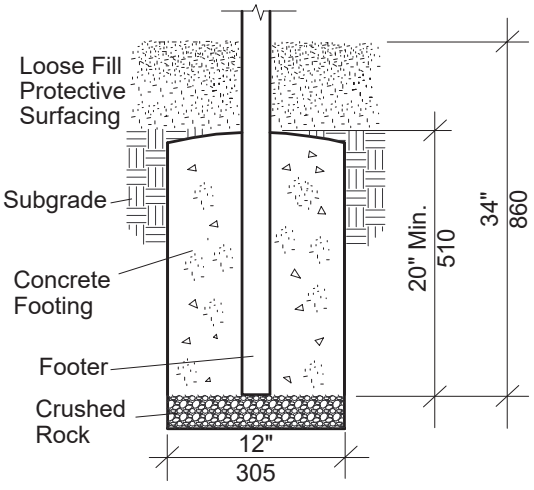


NOTE: Sufficient protective surfacing must cover hardware to satisfy fall height requirements.

DETAIL
DIRECT BURY



DETAIL
DIRECT BURY



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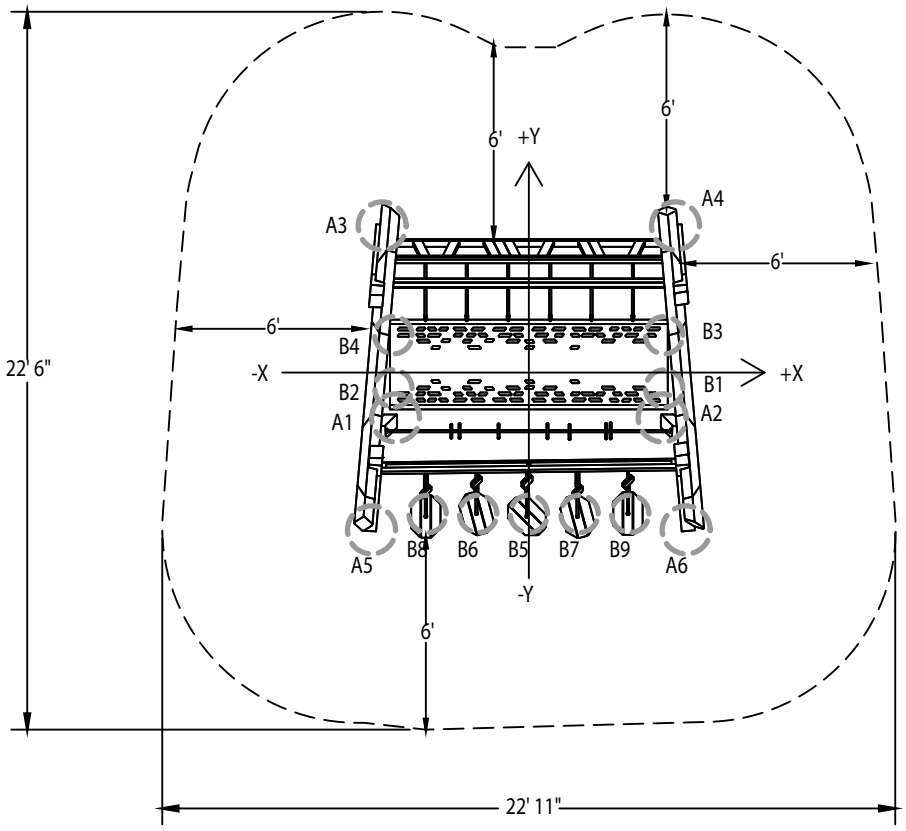

NOTE: Refer to the site Plan for footing location

N.	I.D.	X (ft-in)	Y (ft-in)	Dist. to O	DIA (in)
1	A1	-4'-2"	-1'-5"	4'-5"	18
2	A2	4'-2"	-1'-5"	4'-5"	18
3	A3	-4'-7"	4'-7"	6'-6"	18
4	A4	4'-7"	4'-7"	6'-6"	18
5	A5	-4'-11"	-4'-11"	6'-11 1/2"	18
6	A6	4'-11"	-4'-11"	6'-11 1/2"	18
7	B1	4'-3"	-6"	4'-3"	14
8	B2	-4'-3"	-6"	4'-3"	14
9	B3	4'-3"	1'-2"	4'-4 1/2"	14
10	B4	-4'-3"	1'-2"	4'-4 1/2"	14
11	B5	0"	-4'-5"	4'-5"	14
12	B6	-1'-7"	-4'-5"	4'-8 1/2"	14
13	B7	1'-7"	-4'-5"	4'-8 1/2"	14
14	B8	-3'-2"	-4'-5"	5'-5"	14
15	B9	3'-2"	-4'-5"	5'-5"	14

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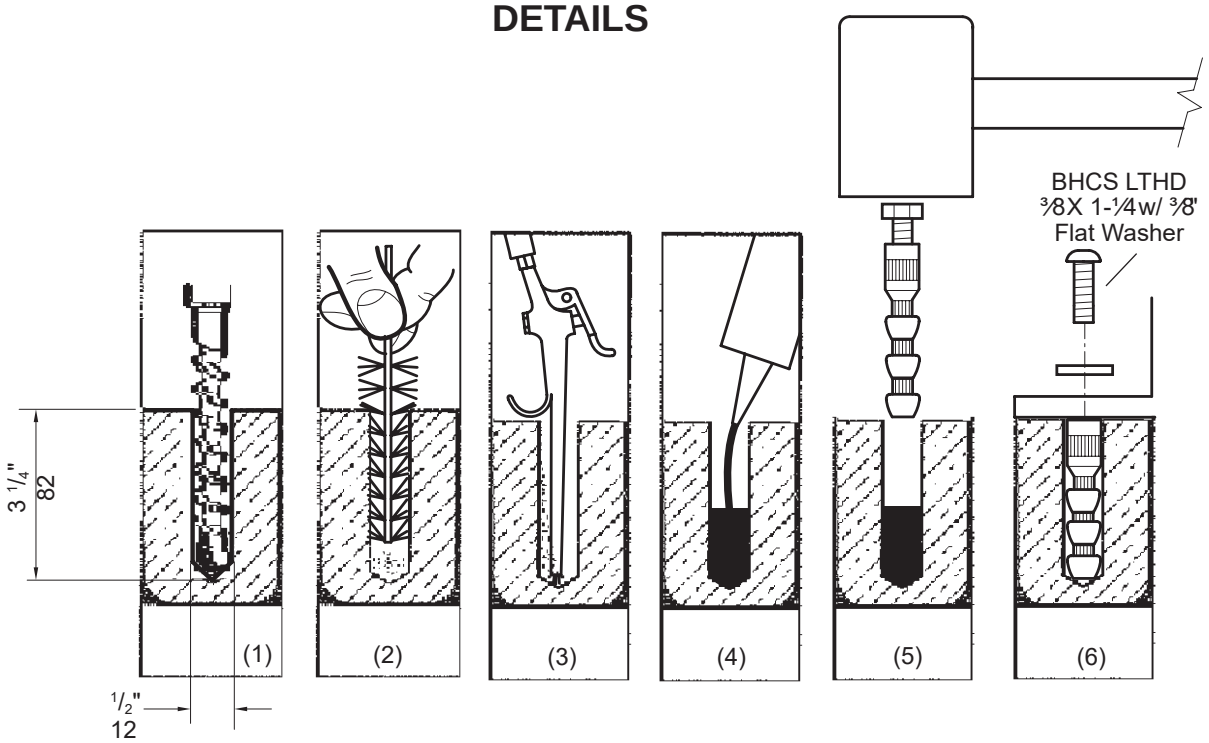
DETAIL
SURFACE MOUNT
POST A1 AND A2

SURFACE MOUNT DETAILS



1) Surfaces should be clean and free of moisture, grease and oil.

2) With Forma Post in final position, use a center punch to mark chemical anchor locations on concrete slab through holes in surface mount base.

3) Move Forma Post aside. Using a $^1/_2$" diameter drill bit, drill holes to a depth of 3 $^1/_4$". Drill the holes perpendicular to the work surface. To assure full holding power, do not ream the holes or allow the drill to wobble (1). Verify hole depth after drilling.

4) Clean the holes using oil free, dry compressed air and a wire or stiff nylon brush. Dust and debris left in holes will significantly reduce the holding capacity of the anchor; several repetitions of brushing and blowing are required to obtain a properly cleaned holes. Compressed air nozzle should reach the bottom of hole. (2 & 3).

5) Insert resin into hole. Hole should be approximately half full of resin. (4)

6) Thread $^3/_8$" x 1 $^3/_4$" hex head bolt into anchor. Hammer anchor into hole until flush with concrete surface. Remove $^3/_8$" x 1 $^3/_4$" hex head bolt from anchor. (5) **NOTE:** A 2$^1/_2$ pound mallet may be needed.

7) Allow resin to cure for the specified time. See chart for cure time.

(8) Re-attach Forma Post. Attach surface mount base to anchors, using $^3/_8$" x 1 $^1/_4$" BHCS w/Pin limited thread with $^3/_8$ flat washer. (6)

9) Always wear safety glasses. Use only solid carbide tipped drill bits.

Minimum Cure Times Based On Ground Temperature.	
Temperature (ºF)	**Minimum Cure Time**
68 and over **50-68** **32-50** **23-32**	**20 minutes** **40 minutes** **2 hours** **24 hours**

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Parts List

Part#	Description	Qty.
310599	107i POST B , Specify Color	2
314844	127i POST LH B , Specify Color	1
314843	127i POST RH B , Specify Color	1
314845	140i POST B , Specify Color	2
305916	16i EXTENSION , Specify Color	4
305918	22i EXTENSION , Specify Color	4
308566	40i 4P BEAM , Specify Color	2
309355	4P BALANCE ROPE 5 , Specify Color	1
313004	4P BOARD MOUNTING BRACKET , Specify Color	4
309300	4P BRACE LUMBER / 172 Cedar	1
308997	4P FRAME REAR BRACE , Specify Color	1
309011	4P FRAME ROPE BEAM , Specify Color	1
309301	4P ROPE BEAM LUMBER / 172 Cedar	1
311016	50i POST A , Specify Color	1
311025	50i POST B , Specify Color	1
306022	5i SQ CAST END CAP PNT , Specify Color	10
311652	7GA x 2i x 2i x 29iL BRK , Specify Color	2
314846	82i POST A , Specify Color	1
314847	82i POST B , Specify Color	1
310597	95i POST LH B , Specify Color	1
310598	95i POST RH B , Specify Color	1
310826	BALANCE CTR BELT	1
310701	BALANCE CTR BELT FRM , Specify Color	1
310600	BALANCE CTR HRAIL LWR , Specify Color	1
310637	BALANCE CTR HRAIL UPR , Specify Color	1
311004	BALANCE CTR ROPE 1 , Specify Color	2
311005	BALANCE CTR ROPE 2 , Specify Color	2
311006	BALANCE CTR ROPE 3 , Specify Color	2
310872	BALANCE CTR RPL A / 172 Cedar	1
310872	BALANCE CTR RPL A / 288 Mink	2
310873	BALANCE CTR RPL B / 172 Cedar	2
310873	BALANCE CTR RPL B / 288 Mink	4
315035	BRIDGE FTR WELDT , Specify Color	2
311290	CIRCLE PERM SLIDER , Specify Color	1
305951	CONNECTION BRACKET , Specify Color	32
206894	Epoxy Cartridge (Wej-It Anchor)	1
311292	FLOWER PERM SLIDER , Specify Color	1
315036	FTR BRKT , Specify Color	2
311294	GEAR PERM SLIDER , Specify Color	1
311291	HEXAGON PERM SLIDER , Specify Color	1
317270	LOWER COVER PLT , Specify Color	1
314455	PEG CAP CAST PNT, Specify Secondary Color	64
314455	PEG CAP CAST PNT, Specify Primary Color	64
309027	8i Rope Block #1, Specify Primary Color	2
309027	8i Rope Block #1, Specify Secondary Color	3
310133	8i Rope Block #2, Specify Primary Color	2
310133	8i Rope Block #2, Specify Secondary Color	3
309028	11i Rope Block #1, Specify Primary Color	4
309028	11i Rope Block #1, Specify Secondary Color	1
310134	11i Rope Block #2, Specify Primary Color	4
310134	11i Rope Block #2, Specify Secondary Color	1
317384	ROPE SPANNER WRENCH PVC / 009 Red	1
314353	RPL DBL ANG STEPPER BRD 3.5X16 / 172 Cedar	7
314353	RPL DBL ANG STEPPER BRD 3.5X16 / 288 Mink	3
309593	RPL STEPPER PLT W/SGL TAB 12i FIXED DB , Specify Color	2
311015	RPL STEPPER PLT W/SGL TAB 12i FIXED SM , Specify Color	2
309592	RPL STEPPER PLT W/SGL TAB 6i FIXED DB , Specify Color	3
311014	RPL STEPPER PLT W/SGL TAB 6i FIXED SM , Specify Color	3
309484	RPL STR STEPPER BRD 3.5 X 16 W/CTR HOLE / 172 Cedar	2
309484	RPL STR STEPPER BRD 3.5 X 16 W/CTR HOLE / 288 Mink	3
311288	SQUARE PERM SLIDER , Specify Color	1
308562	SQUARE TUBE BEAM CONN 5 , Specify Color	1
308563	SQUARE TUBE BEAM CONN 6 , Specify Color	1
308564	SQUARE TUBE BEAM CONN 7 , Specify Color	1
308565	SQUARE TUBE BEAM CONN 8 , Specify Color	1
311293	STAR PERM SLIDER , Specify Color	1
309602	SWIGGLE 2-5 ROPE #1 , Specify Color	1
309603	SWIGGLE 2-5 ROPE #2 , Specify Color	1
309604	SWIGGLE 2-5 ROPE #3 , Specify Color	1
309605	SWIGGLE 2-5 ROPE #4 , Specify Color	1
309606	SWIGGLE 2-5 ROPE #5 , Specify Color	1
311289	TRIANGLE PERM SLIDER , Specify Color	1
320344	HDW PKG 3-HOLE SM 1/2 x 3-3/4	2
100322	NUT HEX STD 1/2-13 SST	3
100363	WASHER FLAT 1/2i SST	3
176046	EXP ANCHOR 1/2x3-3/4i ZP	3
183388	HDW PKG 4-HOLE SM 1/2 x 3-3/4	9
100322	NUT HEX STD 1/2-13 SST	4
100363	WASHER FLAT 1/2i SST	4
176046	EXP ANCHOR 1/2x3-3/4i ZP	4
315202	HDW PKG FORMA 4-POST FRAME	1
100196	BHCS 6LP 3/8x7/8i SST	156
100365	WASHER FLAT SAE 3/8i SST	40
100611	RIVET 1/4X3/8i DRV AS	16
205152	LAG SCR BH 6LP 3/8x1-1/4i SST	12
307377	PEG BASE MACHINED	128
315203	HDW PKG FOXTROT™ MULTI-CLIMBER DB	1
100196	BHCS 6LP 3/8x7/8i SST	50
100198	BHCS 6LP 3/8x1-1/8i SST	10
100290	BHCS 6LP LTHD 3/8x7/8iSST	11
100349	NUT L/C CAP 3/8-16 SST	12
100362	WASHER FLAT 3/8i SST	24
100365	WASHER FLAT SAE 3/8i SST	96
100611	RIVET 1/4X3/8i DRV AS	4
127179	BUSHING 5/8OD X 3/8 LG SST	11
205152	LAG SCR BH 6LP 3/8x1-1/4i SST	48
264971	BHCS 6LP 5/16i -18 X 1i SST	40
100353	FLG NUT 6LP 3/8-16 SST	14
113550	WASHER FLAT SAE 1/2i SST	14
310812	SLACK SPACER	4
315204	HDW PKG FOXTROT™ MULTI-CLIMBER SM	1
100196	BHCS 6LP 3/8x7/8i SST	42
100198	BHCS 6LP 3/8x1-1/8i SST	10
100290	BHCS 6LP LTHD 3/8x7/8iSST	11
100349	NUT L/C CAP 3/8-16 SST	8
100362	WASHER FLAT 3/8i SST	24
100365	WASHER FLAT SAE 3/8i SST	84
100611	RIVET 1/4X3/8i DRV AS	4
127179	BUSHING 5/8OD X 3/8 LG SST	11
205152	LAG SCR BH 6LP 3/8x1-1/4i SST	48
264971	BHCS 6LP 5/16i -18 X 1i SST	40
100353	FLG NUT 6LP 3/8-16 SST	14
113550	WASHER FLAT SAE 1/2i SST	14
310812	SLACK SPACER	4
182734	HDW PKG LABELS 2-5 YRS	1
115176	LABEL HD SRF WARNING ASTM	1
156845	LABEL PLAY SAFE 2-5 YRS	1
182212	LABEL ENTANGLEMENTWARNING	1
182213	LABEL HOT SURFACE WARNING	1
207241	Hdw Pkg Power-Ser Anchor 4-Hole	2
206892	Anchor Wej-It 3/8-16 SST	4
100209	HEX CAP 3/8x1-3/4i SST	1
100362	WASHER FLAT 3/8i SST	4
208324	BHCS 6LP LTHD 3/8 X 1-1/4 SST W/PATCH	4

Specifications

Belt:	Made from .315" (8,00 mm) thick mini rough top 3-ply rubber belting with polyester fabric plys, black in color.
Boards:	Recycled high-density polyethylene. Cedar and mink in color.
Cable Assembly:	Made of tightly woven, polyester-wrapped, six stranded galvanized-steel cable with a polypropylene core. Color Specific. (Cable connectors) Die Cast 369.1 Alum.
Fasteners:	Primary fasteners shall be socketed and pinned tamper-proof in design, stainless steel (SST) per ASTM F 879 unless otherwise indicated (see specific product installation/specifications).
Forma Frame:	ASTM A53, 5"SQ x .120 wall tubing. Shall be galvanized after rolling and shall have both I.D. and the cut ends sprayed with a corrosion resistant coating Finish: Proshield, Color Specific.
Permalene Panels:	Recycled Permalene, color specified.
Top Caps:	Cast aluminum. Finish: ProShield, color specified.
Installation Time:	DB - Approx. 24 person hours
Concrete Req.:	DB - Approx. 29.4 cu. ft.
Weight:	DB - 1500 lbs. SM - 1381 lbs.
Fall Height:	DB - 46"" (1, 17 m)

Installation Instructions

1) (Direct Bury) Dig footings spaced as shown. Refer to Concrete Footing Detail.
2) Assemble the Frame and place it into holes.
3) Attach Lumber brackets as shown.
4) Attach rails between the post. Attach the bracket to lower rail.
5) Attach lumber to the upper rail and the lower bracket.
6) Assemble the pods. Attach Cables to the frame.
7) Attach Permalene blocks to the suspended cables.
8) Connect chains to the ends of the cables. Attach footers to the chains.
9) Attach footers to the bridge frame.
10) Connect cables to bridge frame. Connect cables to the upper rail.
11) "(Direct Bury) Attach posts to footers using brackets. Level the bridge and move the bridge to tension the cables. (Surface Mount) Pull bridge to tension ropes. Anchor bridge since it will be less accessible once the belt is attached. Drill 1/2" x 4" deep holes through footer plates using hammer drill and 1/2" masonry bit. Tap expansion anchors into drilled holes. Fasten anchor plates to expansion anchors using 1/2" standard hex nuts with 1/2" flat washers."
12) Place the Permalene shapes on the rope then connect the rope between posts
13) Attach belt to bridge frame as shown.
14) (Direct Bury) Stake footers on the pod assemblies to match the angle of the posts.

    (Direct Bury) Pour concrete footing . Allow concrete footing to cure for a minimum of 72 hours before users are allowed to play on the structure.

    (Surface Mount) Mark holes when cables are pulled into the proper position. Drill 1/2" x 4" deep holes through footer plates using hammer drill and 1/2" masonry bit. Tap expansion anchors into drilled holes. Fasten anchor plates to expansion anchors using 1/2" standard hex nuts with 1/2" flat washers.

    (Surface Mount) Refer to the Instructions For Chemical Anchor Installation for posts A1 and A2
15) Apply Play Safe and Warning Labels, as shown.
16) Install protective surfacing before users are allowed to play on the structure.

10/2/2023 - Added a cap wrench detail.

6/24/2025 - Added side view for rope distance and updated LSI logo.

1/28/2026 - Added PN for spacers and tools to notes.

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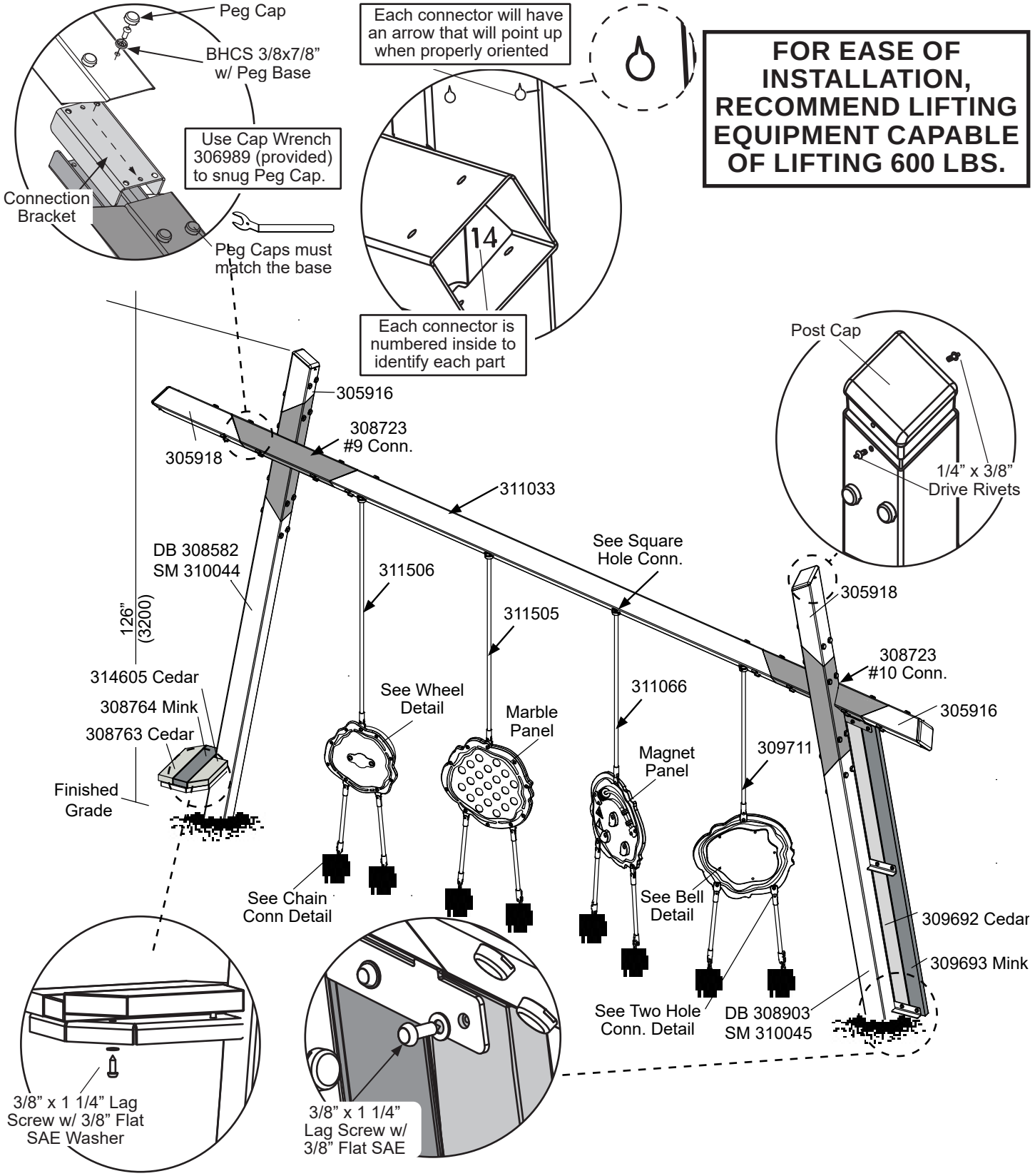
SAFETY NOTE
Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. ASTM F1487.)



Forma™

307430 Focal® Sensory Wall

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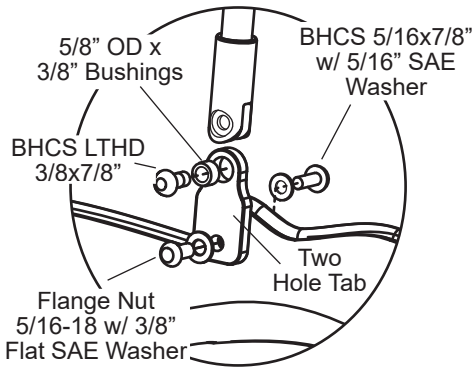
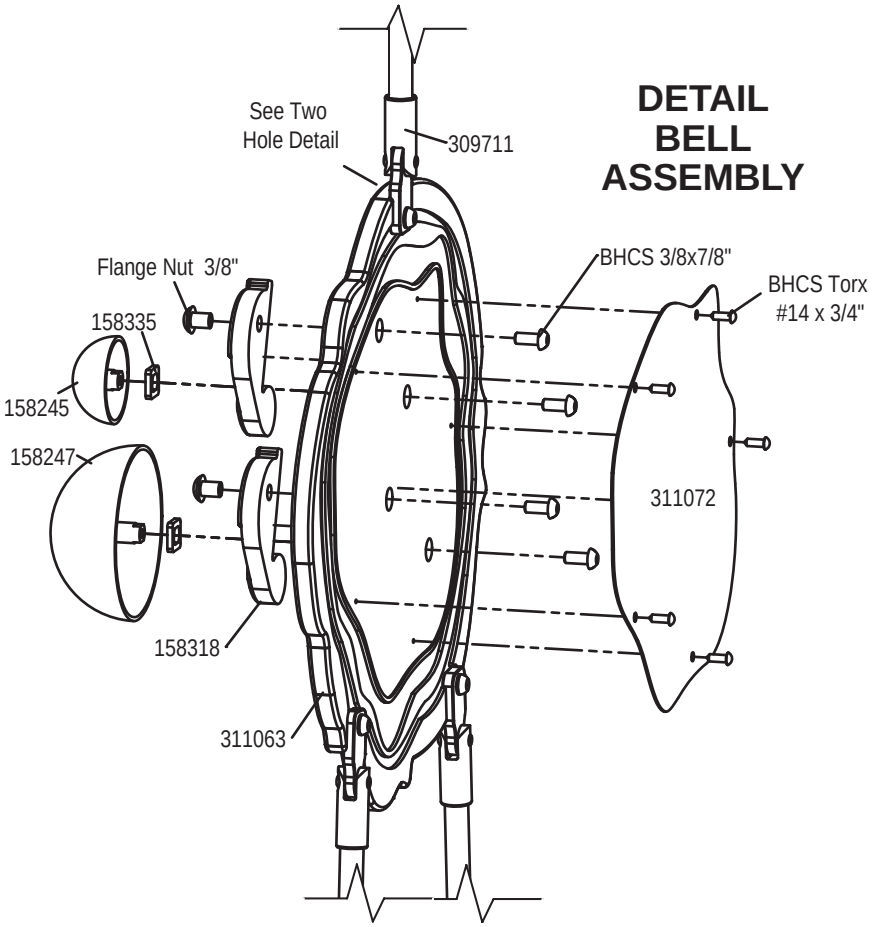
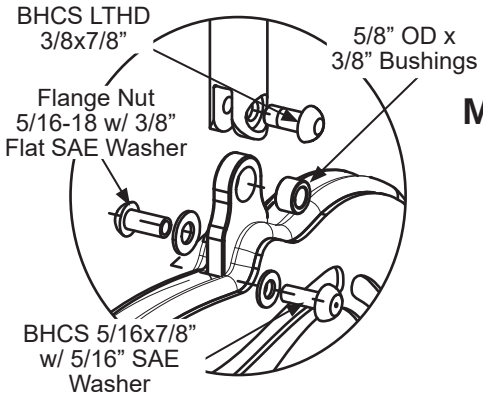
DETAIL TWO HOLE CONN.



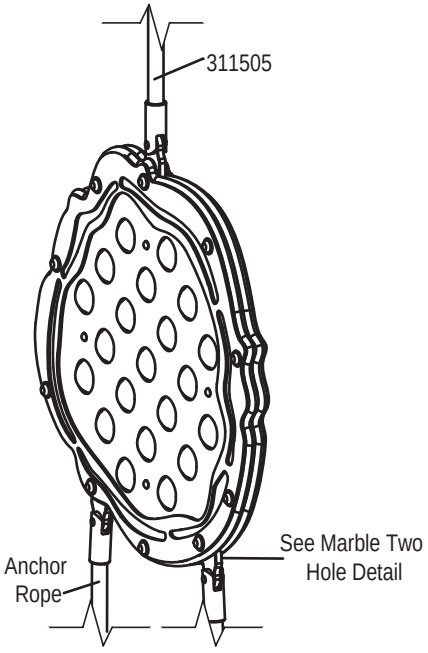
DETAIL BELL ASSEMBLY



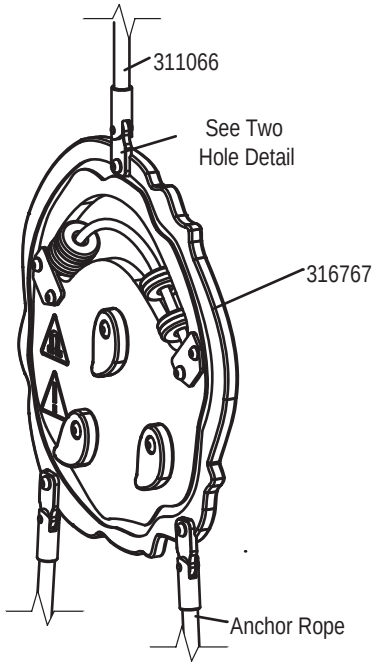
DETAIL MARBLE TWO HOLE



DETAIL MARBLE PANEL



DETAIL MAGNET PANEL



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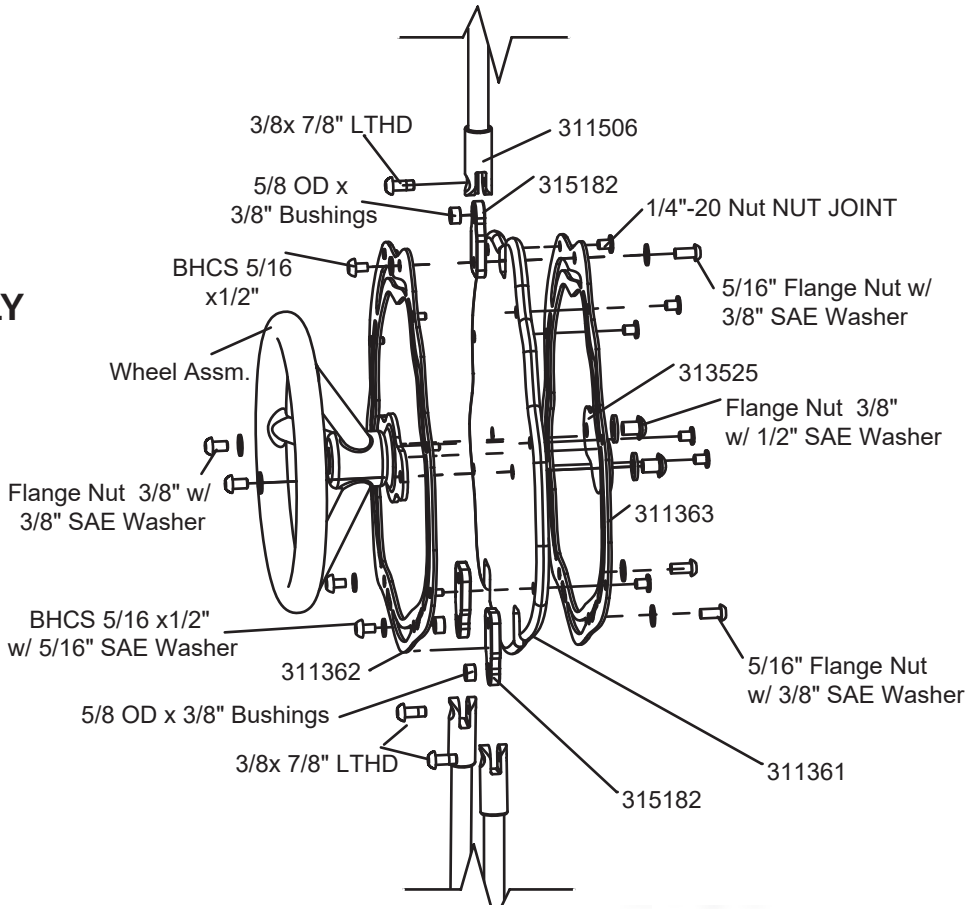
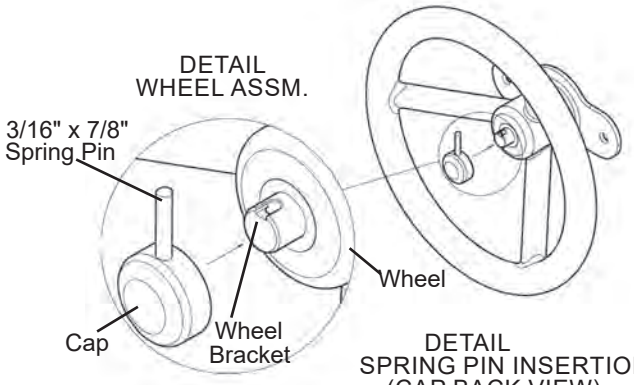
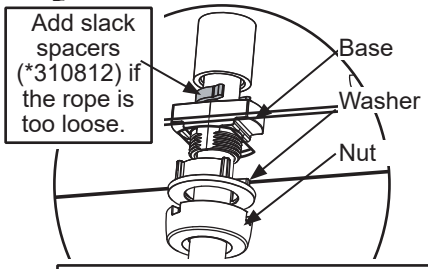
DETAIL WHEEL ASSEMBLY





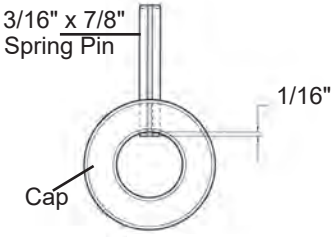
DETAIL SQUARE CABLE CONN.



*may be located in spare parts kit

Place base inside the pipe and rotate into place. Use washer to align rope into place. Pull the cable straight and tighten the nut hand tight. Use the Spanner (317384) and turn the nut a quarter rotation to reach 15 ft-lbs.

DETAIL
SPRING PIN INSERTION
(CAP BACK VIEW)



NOTE: To assist in the alignment of the cap to the wheel bracket shaft, tap spring pin through cap approximately 1/16". Orient spring pin to groove on wheel bracket shaft. Slide cap in place and tap spring pin though cap and shaft until flush

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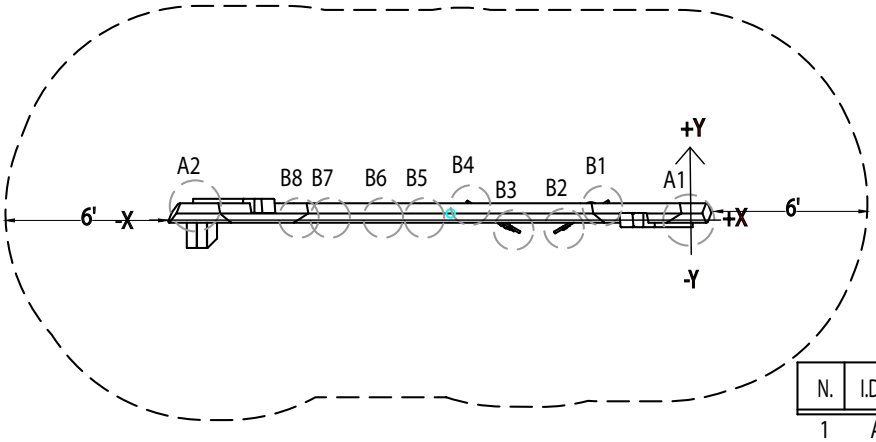
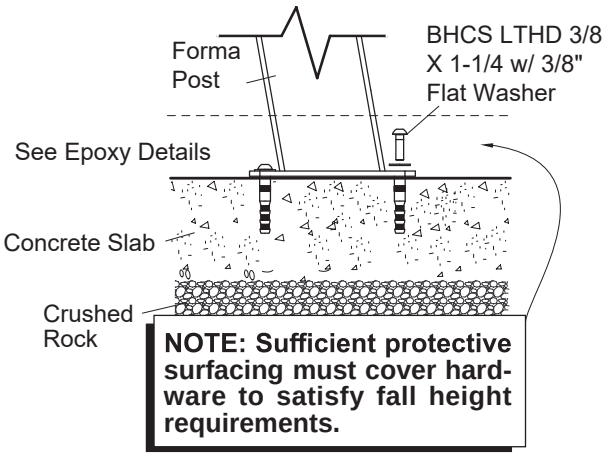


N.	I.D.	X (ft-in)	Y (ft-in)	Dist. to O	DIA (in)
1	A1	0"	0"	0"	18
2	A2	-14'-6"	5"	14'-6"	18
3	B1	-2'-6 1/2"	5"	2'-7"	14
4	B2	-3'-8"	-3"	3'-8"	14
5	B3	-5'-1 1/2"	-3 1/2"	5'-2"	14
6	B4	-6'-5"	5 1/2"	6'-5"	14
7	B5	-7'-9"	1"	7'-9 1/2"	14
8	B6	-9'	1"	9'	14
9	B7	-10'-6 1/2"	1"	10'-6 1/2"	14
10	B8	-11'-5 1/2"	1"	11'-5 1/2"	14

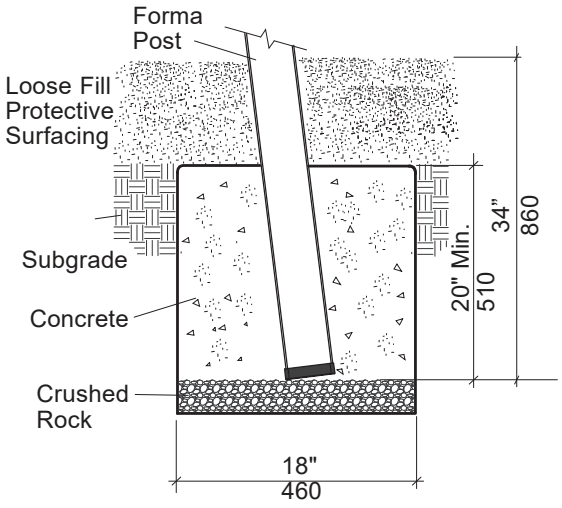
NOTE: Refer to the site Plan for footing location

DETAIL
SURFACE MOUNT



NOTE: Sufficient protective surfacing must cover hardware to satisfy fall height requirements.

DETAIL
DIRECT BURY



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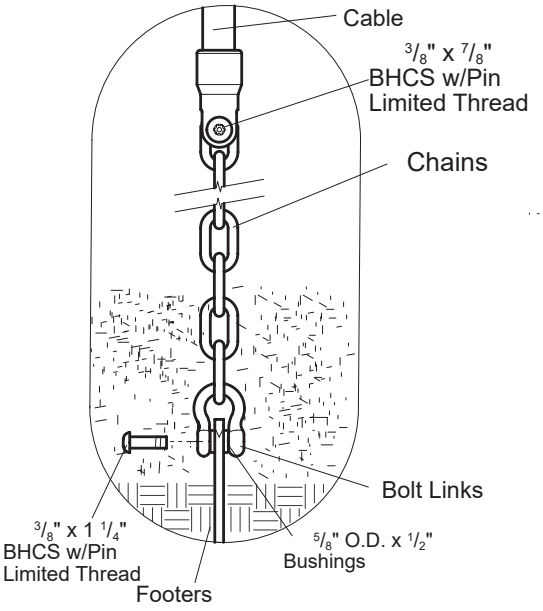
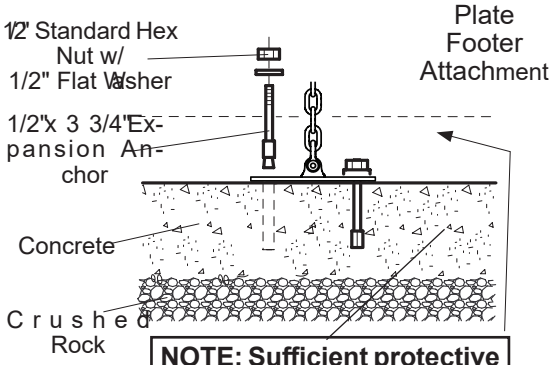
DETAIL
CHAIN/ CABLE CONN.

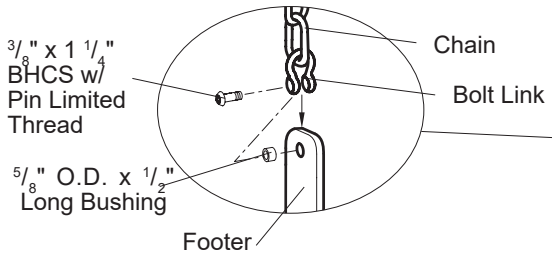


SECTION
SURFACE MOUNT

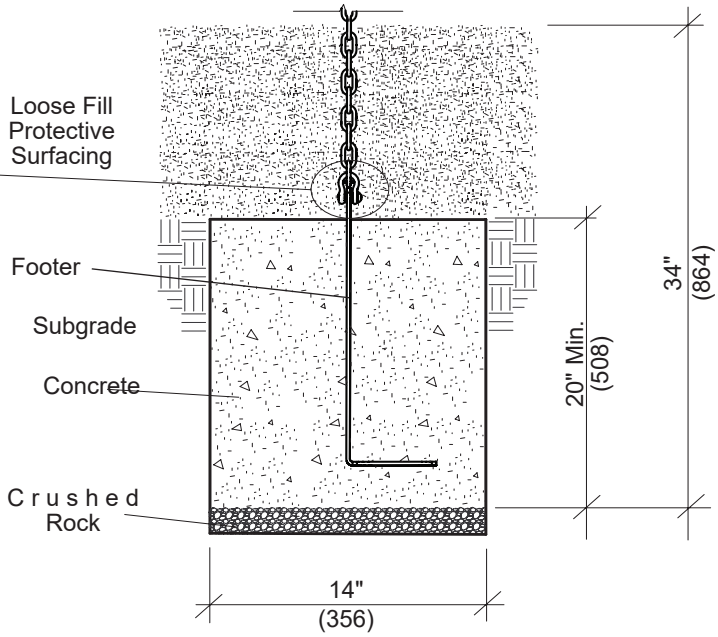


NOTE: Sufficient protective surfacing must cover hardware to satisfy fall height requirements.

DETAIL
PLATE FOOTER ATTACHMENT



DETAIL
DIRECT BURY



IMPORTANT! Tension ropes/nets before pouring concrete footings.

NOTE: The hole depth for the footer needs to be deep enough, so the footer plate does not contact the bottom of the hole. The weight of the concrete will force the footer plate down, further tightening the cable.

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Parts List

Part#	Description	Qty.
308582	122i POST , Specify Color	1
308903	98i POST , Specify Color	1
194074	CHN 1/4i P70 14i LG	8
247871	SINGLE ROPE FOOTER HDG	8
311033	111i BEAM A , Specify Color	1
305916	16i EXTENSION , Specify Color	2
305918	22i EXTENSION , Specify Color	2
311530	3/8i X 1 1/2i X 3i TAB 2 HOLE SST PNT , Specify Color	3
311530	3/8i X 1 1/2i X 3i TAB 2 HOLE SST PNT , Specify Color	6
311530	3/8i X 1 1/2i X 3i TAB 2 HOLE SST PNT , Specify Color	3
306022	5i SQ CAST END CAP PNT , Specify Color	4
310045	66i POST , Specify Color	1
310044	90i POST , Specify Color	1
158433	BELL 3i PNT , Specify Color	1
158435	BELL 6i PNT , Specify Color	1
311063	BELL AND MIRROR PANEL , Specify Color	1
158318	BELL STRIKER ACCENT , Specify Color	2
127242	BRKT STRG WHL 3-3/16i SFT PNT , Specify Color	1
200432	CHAIN 5i	8
305951	CONNECTION BRACKET , Specify Color	16
184271	CUST FTR SM PNT , Specify Color	8
206894	Epoxy Cartridge (Wej-It Anchor)	1
311066	MAGNET PNL ROPE , Specify Color	1
315201	MARBLE PNL POLYCARBONATE ASM , Specify Color	1
314455	PEG CAP CAST PNT, Specify Secondary Color	32
314455	PEG CAP CAST PNT, Specify Primary Color	32
309693	RPL 2X4 72.813i 10 DEG MITER / 288 Mink	1
309692	RPL 2X4 73.500i 10 DEG MITER / 172 Cedar	1
314605	RPL ANG STEPPER BRD 3.5 X 12.5 / 172 Cedar	1
308763	RPL ANGLED STEPPER BRD 3.5X16 / 172 Cedar	1
308764	RPL STR STEPPER BRD 3.5X16 / 288 Mink	1
311505	SENSORY MARBLE ROPE , Specify Color	1
309711	SENSORY ROPE 1 , Specify Color	1
311361	SENSORY STEERING WHEEL PC	1
311506	SENSORY STEERING WHEEL ROPE , Specify Color	1
311362	SENSORY STEERING WHEEL TRIM A , Specify Color	1
311363	SENSORY STEERING WHEEL TRIM B , Specify Color	1
308723	SQUARE TUBE BEAM CONN 10 , Specify Color	1
308722	SQUARE TUBE BEAM CONN 9 , Specify Color	1
313525	STEERING WHEEL BACKER PLT , Specify Color	1
108432	STEERING WHL ASY / 044 Tan	1
311295	SW ANCHOR ROPE , Specify Color	8
311072	SW SPIN PANEL MIRROR	1
20274	HDW PKG 2-HOLE SM 1/2 x 3-3/4	8
100322	NUT HEX STD 1/2-13 SST	2
100363	WASHER FLAT 1/2i SST	2
176046	EXP ANCHOR 1/2x3-3/4i ZP	2
315158	HDW PKG FOCAL™ MAGNET & MARBLE PNL	2
100290	BHCS 6LP LTHD 3/8x7/8iSST	5
100292	BHCS 6L LTHD 3/8x1-1/4SST	2
127179	BUSHING 5/8OD X 3/8 LG SST	3
138915	BOLT LINK SST	2
156962	BUSHING 5/8 OD X 1/2 LG SST	2
100365	WASHER FLAT SAE 3/8i SST	3
132626	BHCS 6LP 5/16x7/8i SST	3
175006	FLG NUT 6LP 5/16-18 SST	3
223956	WASHER FLAT SAE 5/16i SST	3
315157	HDW PKG FOCAL™ MIRROR & BELL PNL	1
100196	BHCS 6LP 3/8x7/8i SST	4
100290	BHCS 6LP LTHD 3/8x7/8iSST	5
100292	BHCS 6L LTHD 3/8x1-1/4SST	2
100353	FLG NUT 6LP 3/8-16 SST	2
127179	BUSHING 5/8OD X 3/8 LG SST	3
127872	BHCS TORX #14 x 3/4 SST THREAD TYPE AB	5
131849	BHCS 6LP 5/16x1/2i SST	3
138915	BOLT LINK SST	2
156962	BUSHING 5/8 OD X 1/2 LG SST	2
158335	PLATE BELL POST SST	2
175006	FLG NUT 6LP 5/16-18 SST	3
223956	WASHER FLAT SAE 5/16i SST	3
315160	HDW PKG FOCAL™ STEERING WHL PNL	1
100195	BHCS 6LP 3/8x5/8i SST	2
100290	BHCS 6LP LTHD 3/8x7/8iSST	5
100292	BHCS 6L LTHD 3/8x1-1/4SST	2
100353	FLG NUT 6LP 3/8-16 SST	2
100365	WASHER FLAT SAE 3/8i SST	5
113550	WASHER FLAT SAE 1/2i SST	2
126301	NUT JOINT CONN JCN 1/4-20	6
127179	BUSHING 5/8OD X 3/8 LG SST	3
131849	BHCS 6LP 5/16x1/2i SST	3
138915	BOLT LINK SST	2
156962	BUSHING 5/8 OD X 1/2 LG SST	2
175006	FLG NUT 6LP 5/16-18 SST	3
234353	CAP STEERING WHEEL PNT / 006 White	1
237528	SPRING PIN 3/16X7/8i SST	1
223956	WASHER FLAT SAE 5/16i SST	3
315156	HDW PKG FORMA™ SENSORY 2-POST FRAME	1
100196	BHCS 6LP 3/8x7/8i SST	64
100365	WASHER FLAT SAE 3/8i SST	12
100611	RIVET 1/4X3/8i DRV AS	8
205152	LAG SCR BH 6LP 3/8x1-1/4i SST	12
307377	PEG BASE MACHINED	64
319895	HDW PKG LABELS 2-5 & 5-12 YRS	1
115176	LABEL HD SRF WARNING ASTM	1
156847	LABEL PLAY SAFE 5-12 YRS	1
182212	LABEL ENTANGLEMENTWARNING	1
182213	LABEL HOT SURFACE WARNING	1
156845	LABEL PLAY SAFE 2-5 YRS	1
207241	Hdw Pkg Power-Ser Anchor 4-Hole	2
206892	Anchor Wej-It 3/8-16 SST	4
100209	HEX CAP 3/8x1-3/4i SST	1
100362	WASHER FLAT 3/8i SST	4
208324	BHCS 6LP LTHD 3/8 X 1-1/4 SST W/PATCH	4

Specifications

Boards:	Recycled high-density polyethylene. Cedar and mink in color.
Cable Assembly:	Made of tightly woven, polyester-wrapped, six stranded galvanized-steel cable with a polypropylene core. Color Specific. (Cable connectors) Die Cast 369.1 Alum.
Chain Support:	Made from 1/4" (6,35 mm) HRPO steel plate. Finish: Hot dip galvanized per ASTM A123.
Chain:	Steel 1/4" (6,35 mm) straight link chain, 3,150 lb (1428,82 kilograms). working load limit. Finish: ProGuard.
Fasteners:	Primary fasteners shall be socketed and pinned tamper-proof in design, stainless steel (SST) per ASTM F 879 unless otherwise indicated (see specific product installation/ specifications).
Forma Frame:	ASTM A53, 5"SQ x .120 wall tubing. Shall be galvanized after rolling and shall have both I.D. and the cut ends sprayed with a corrosion resistant coating Finish: Proshield, Color Specific.

Permalene Panels:	Recycled Permalene, color specified.
Polycarbonate:	Made from 1/2” (12,7MM) clear polycarbonate.
Top Caps:	Cast aluminum. Finish: ProShield, color specified.
Installation Time:	DB Approx. 8 person hours
	SM Approx. 8 person hours
Concrete Req.:	DB - Approx. 20 cu. ft.
Weight:	DB - 589 lbs.
	SM - 525 LBS
Fall Height:	- 18” (0,46m)

Installation Instructions

1) (Direct Bury) Dig footings spaced as shown. Refer to Concrete Footing Detail.
2) Assemble the Frame and place it into holes. Brace frame to keep the posts plum.
3) Attach ropes to upper beam.
4) Assemble bell and wheel panels. See assemblies
5) Attach play panels to the appropriate ropes along with chain/ rope connectors. The footers need to be pulled towards the center of the holes.
6) Attach lumber to the posts as shown
7) Attach lumber to seat as shown. Note The seat needs to be level.
8) (Direct Bury) With braces level and posts plumb, pour concrete footing. Allow concrete footing to cure for a minimum of 72 hours before users are allowed to play on the structure.

   (Surface Mount) Drill 1/2” x 4” deep holes through footer plates using hammer drill and 1/2” masonry bit. Tap expansion anchors into drilled holes. Fasten anchor plates to expansion anchors using 1/2” standard hex nuts with 1/2” flat washers.
9) Apply Play Safe and Warning Labels, as shown.
10) Install protective surfacing before users are allowed to play on the structure.

10/2/2023 - Added a cap wrench detail.

2/3/2024 - Reference Forma Audit changes

5/22/2025 - Updated Part Numbers on Stepper.

1/28/2026 - Added PN for spacers and tools to notes.

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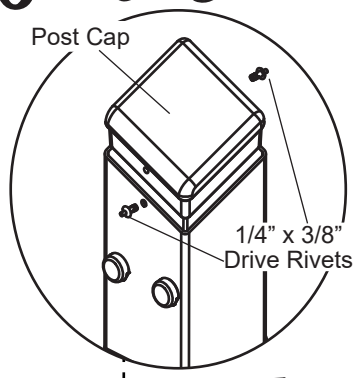
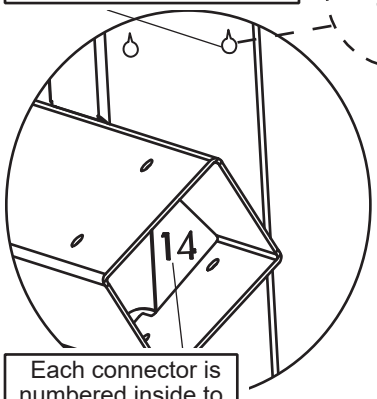
SAFETY NOTE
Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. ASTM F1487.)

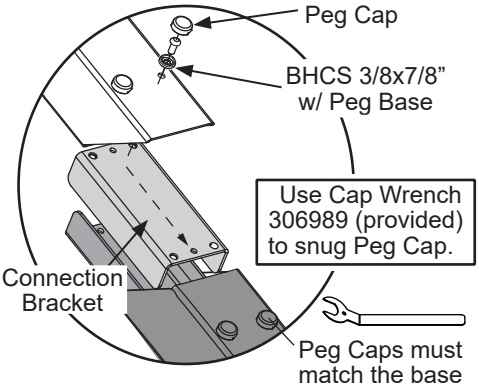


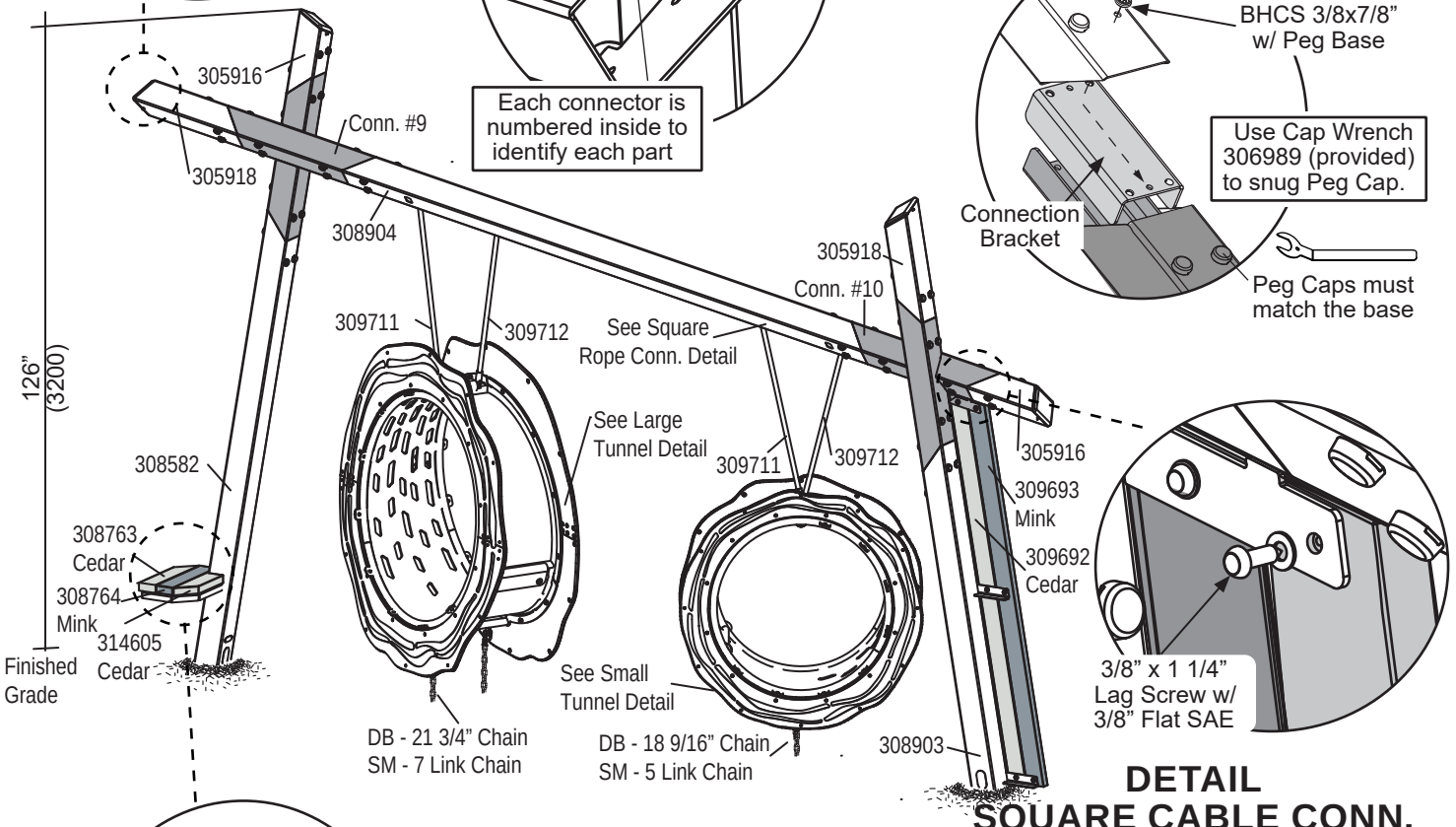
Each connector will have an arrow that will point up when properly oriented

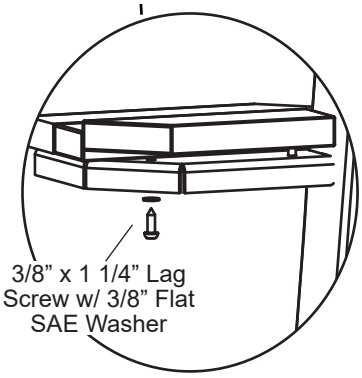


Each connector is numbered inside to identify each part

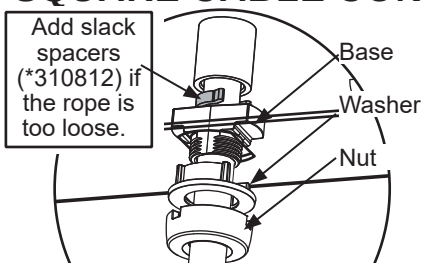
FOR EASE OF INSTALLATION, RECOMMEND LIFTING EQUIPMENT CAPABLE OF LIFTING 600 LBS.







DETAIL SQUARE CABLE CONN.



*may be located in spare parts kit

Place base inside the pipe and rotate into place. Use washer to align rope into place. Pull the cable straight and tighten the nut hand tight. Use the Spanner (317384) and turn the nut a quarter rotation to reach 15 ft-lbs.

Forma™

307431 Fox Den® Hangouts

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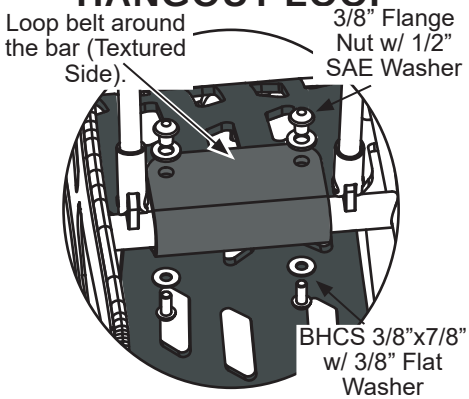
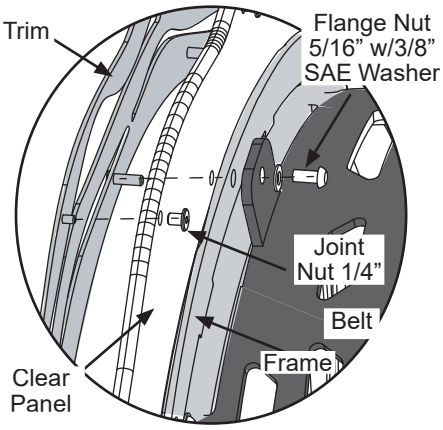
DETAIL HANGOUT LOOP



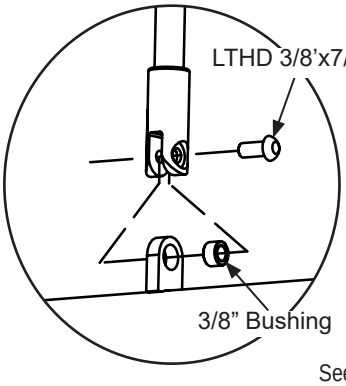
IMPORTANT ! Max torque value for 5/16" hardware is 10 ft-lb Do not use an impact wrench

IMPORTANT ! Max torque value for 1/4" hardware is 5 ft-lb Do not use an impact wrench

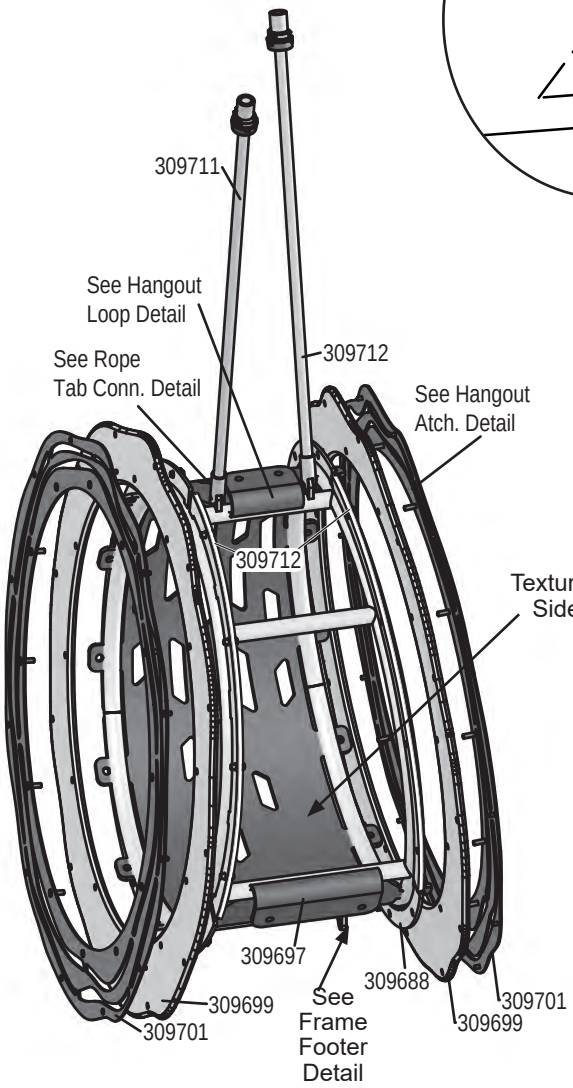
DETAIL HANGOUT ATCH.



DETAIL ROPE TAB CONN.

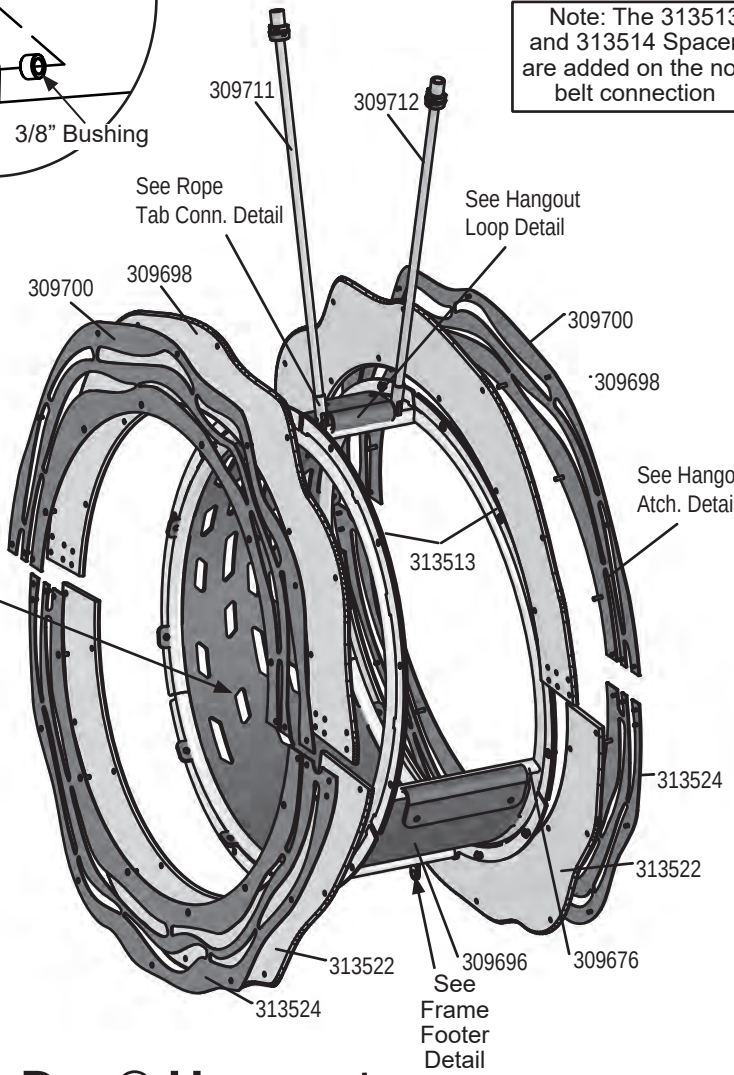


DETAL SMALL TUNNEL



DETAL LARGE TUNNEL

Note: The 313513 and 313514 Spacers are added on the non-belt connection



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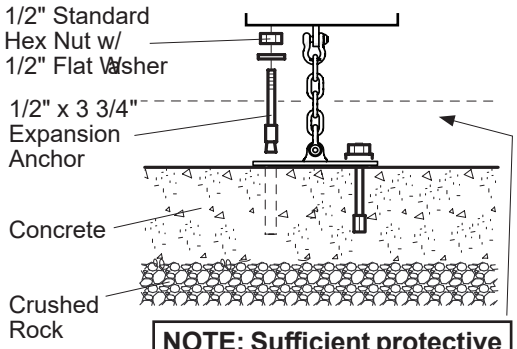
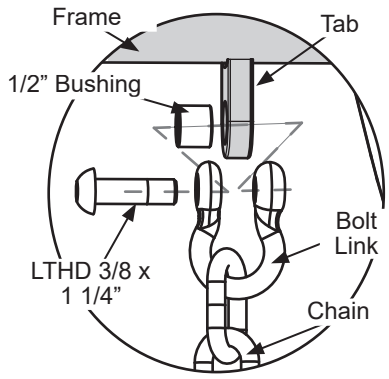
SECTION
SURFACE MOUNT

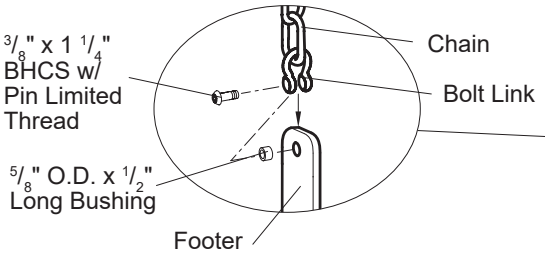


NOTE: Sufficient protective surfacing must cover hardware to satisfy fall height requirements.

DETAIL
FRAME FOOTER CONN.



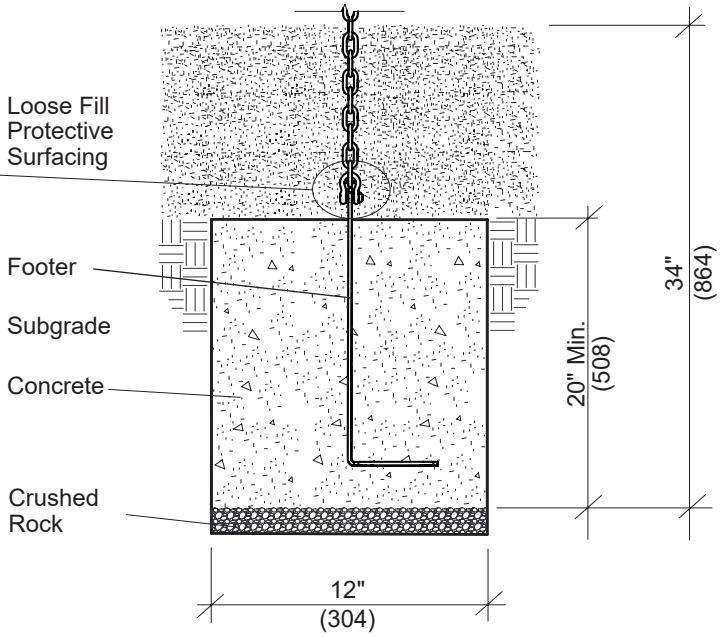
DETAIL
PLATE FOOTER ATTACHMENT



IMPORTANT! Tension ropes/nets before pouring concrete footings.

NOTE: The hole depth for the footer needs to be deep enough, so the footer plate does not contact the bottom of the hole. The weight of the concrete will force the footer plate down, further tightening the cable.

DETAIL
DIRECT BURY



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Parts List

Part#	Description	Qty.
308904	111i BEAM , Specify Color	1
308582	122i POST , Specify Color	1
305916	16i EXTENSION , Specify Color	2
305918	22i EXTENSION , Specify Color	2
306022	5i SQ CAST END CAP PNT , Specify Color	4
308903	98i POST , Specify Color	1
190780	CHN 1/4i P70 18-9/16i	2
196888	CHN 1/4i P70 21-3/4i	2
305951	CONNECTION BRACKET , Specify Color	16
314455	PEG CAP CAST PNT, Specify Secondary Color	32
314455	PEG CAP CAST PNT, Specify Primary Color	32
309693	RPL 2X4 72.813i 10 DEG MITER / 288 Mink	1
309692	RPL 2X4 73.500i 10 DEG MITER / 172 Cedar	1
314605	RPL ANG STEPPER BRD 3.5 X 12.5 / 172 Cedar	1
308763	RPL ANGLED STEPPER BRD 3.5X16 / 172 Cedar	1
308764	RPL STR STEPPER BRD 3.5X16 / 288 Mink	1
309697	SENSORY HANGOUT 32i DIA BELT	1
309682	SENSORY HANGOUT 32i FRM , Specify Color	1
309699	SENSORY HANGOUT 32i PC	2
313514	SENSORY HANGOUT 32i SPCR , Specify Color	2
309701	SENSORY HANGOUT 32i TRIM , Specify Color	2
309696	SENSORY HANGOUT 42i DIA BELT	1
309674	SENSORY HANGOUT 42i FRM , Specify Color	1
309698	SENSORY HANGOUT 42i PC A	2
313522	SENSORY HANGOUT 42i PC B	2
313513	SENSORY HANGOUT 42i SPCR , Specify Color	2
309700	SENSORY HANGOUT 42i TRIM A , Specify Color	2
313524	SENSORY HANGOUT 42i TRIM B , Specify Color	2
309711	SENSORY ROPE 1 , Specify Color	2
309712	SENSORY ROPE 2 , Specify Color	2
247871	SINGLE ROPE FOOTER HDG	4
308723	SQUARE TUBE BEAM CONN 10 , Specify Color	1
308722	SQUARE TUBE BEAM CONN 9 , Specify Color	1
315156	HDW PKG FORMA™ SENSORY 2-POST FRAME	1
100196	BHCS 6LP 3/8x7/8i SST	64
100365	WASHER FLAT SAE 3/8i SST	12
100611	RIVET 1/4X3/8i DRV AS	8
205152	LAG SCR BH 6LP 3/8x1-1/4i SST	12
307377	PEG BASE MACHINED	64
315176	HDW PKG FOX DEN™ 32i HANGOUT	1
100196	BHCS 6LP 3/8x7/8i SST	4
100290	BHCS 6LP LTHD 3/8x7/8iSST	2
100292	BHCS 6L LTHD 3/8x1-1/4SST	4
100353	FLG NUT 6LP 3/8-16 SST	4
100362	WASHER FLAT 3/8i SST	4
100365	WASHER FLAT SAE 3/8i SST	24
113550	WASHER FLAT SAE 1/2i SST	4
126301	NUT JOINT CONN JCN 1/4-20	24
127179	BUSHING 5/8OD X 3/8 LG SST	2
138915	BOLT LINK SST	4
156962	BUSHING 5/8 OD X 1/2 LG SST	4
175006	FLG NUT 6LP 5/16-18 SST	24
315175	HDW PKG FOX DEN™ 42i HANGOUT	1
100196	BHCS 6LP 3/8x7/8i SST	4
100290	BHCS 6LP LTHD 3/8x7/8iSST	2
100292	BHCS 6L LTHD 3/8x1-1/4SST	4
100353	FLG NUT 6LP 3/8-16 SST	4
100362	WASHER FLAT 3/8i SST	4
100365	WASHER FLAT SAE 3/8i SST	24
113550	WASHER FLAT SAE 1/2i SST	4
126301	NUT JOINT CONN JCN 1/4-20	48
127179	BUSHING 5/8OD X 3/8 LG SST	2
138915	BOLT LINK SST	4
156962	BUSHING 5/8 OD X 1/2 LG SST	4
175006	FLG NUT 6LP 5/16-18 SST	24
319895	HDW PKG LABELS 2-5 & 5-12 YRS	1
115176	LABEL HD SRF WARNING ASTM	1
156847	LABEL PLAY SAFE 5-12 YRS	1
182212	LABEL ENTANGLEMENTWARNING	1
182213	LABEL HOT SURFACE WARNING	1
156845	LABEL PLAY SAFE 2-5 YRS	1

Specifications

Belt: Made from .315" (8,00 mm) thick mini rough top 3-ply rubber belting with polyester fabric plys, black in color.

Boards: Recycled high-density polyethylene. Cedar and mink in color.

Cable Assembly: Made of tightly woven, polyester-wrapped, six stranded galvanized-steel cable with a polypropylene core. Color Specific. (Cable connectors) Die Cast 369.1 Alum.

Chain Support: Made from 1/4" (6,35 mm) HRPO steel plate. Finish: Hot dip galvanized per ASTM A123.

Chain: Steel 1/4" (6,35 mm) straight link chain, 3,150 lb (1428,82 kilograms). working load limit. Finish: ProGuard.

Fasteners: Primary fasteners shall be socketed and pinned tamper-proof in design, stainless steel (SST) per ASTM F 879 unless otherwise indicated (see specific product installation/ specifications).

Forma Frame: ASTM A53, 5"SQ x .120 wall tubing. Shall be galvanized after rolling and shall have both I.D. and the cut ends sprayed with a corrosion resistant coating Finish: Proshield, Color Specific.

Panels: 5052 H32 Aluminum panels. Finish: Proshield, specify color.

Polycarbonate: Made from 1/2" (12,7MM) clear polycarbonate.

Top Caps: Cast aluminum. Finish: ProShield, color specified.

Installation Time: DB - Approx. 10 person hours

Concrete Req.: DB - Approx. 18.0 cu. ft.

Weight: DB - 769 lbs.

Fall Height: DB - 67" (1,70 m)

Installation Instructions

1) (Direct Bury) Dig footings spaced as shown. Refer to Concrete Footing Detail.
2) Assemble the Frame and place it into holes. Brace frame to keep the posts plum.
3) Attach ropes to upper beam.
4) Attach hangout frames to the Cables.
5) Loop belt around the hangout frame.
6) Attach panels as shown and fasten hardware through the belt.
7) Connect the chains to the frame and footers.
8) Attach lumber to the posts as shown
9) Attach lumber to seat as shown. Note The seat needs to be level.
10) (Direct Bury) With braces level and posts plumb, pour concrete footing. Allow concrete footing to cure for a minimum of 72 hours before users are allowed to play on the structure.

    (Surface Mount) Refer to the Instructions For Chemical Anchor Installation
11) Apply Play Safe and Warning Labels, as shown.
12) Install protective surfacing before users are allowed to play on the

structure.

8/28/23 - Added notes for the 1/4” and 5/16” hardware.

10/2/2023 - Added a cap wrench detail.

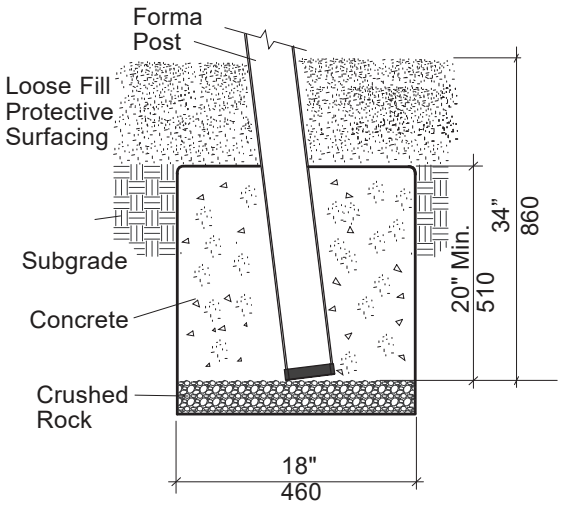
2/3/2024 - Reference Forma Audit changes

6/6/2025 - Updated text from ‘rough side’ to ‘textured side’ and updated the LSI logo.

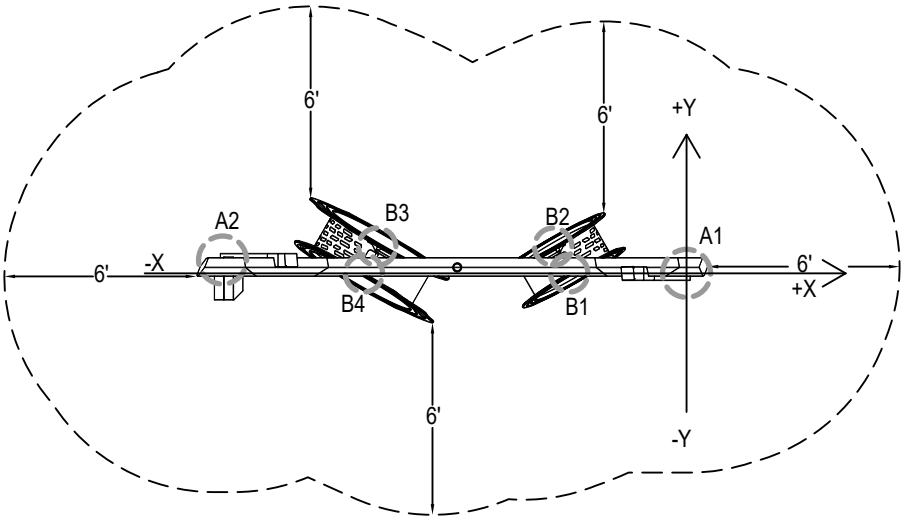
1/28/2026 - Added PN for spacers and tools to notes.

DETAIL

DIRECT BURY



NOTE: Refer to the site Plan for footing location



N.	I.D.	X (ft-in)	Y (ft-in)	Dist. to O	DIA (in)
1	A1	0"	0"	0"	18
2	A2	-14'-6"	5"	14'-6"	18
3	B1	-3'-8"	0"	3'-8"	14
4	B2	-4'-2"	10"	4'-3"	14
5	B3	-9'-8"	10"	9'-8 1/2"	14
6	B4	-10'-1"	0"	10'-1"	14

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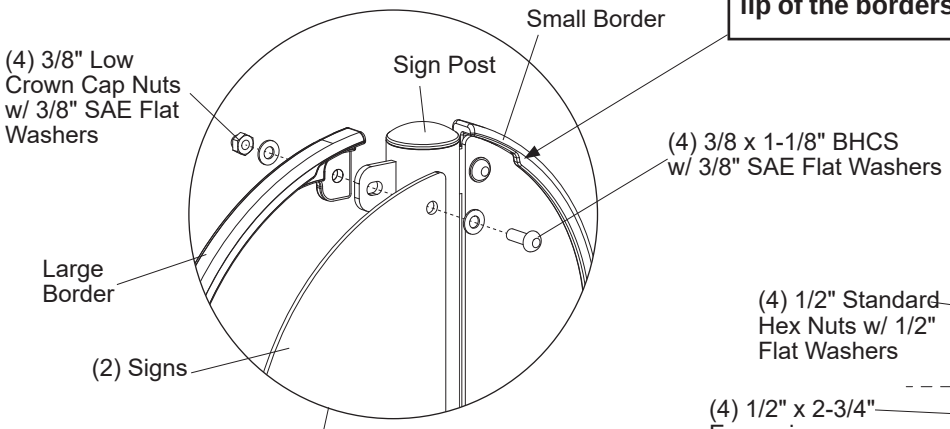
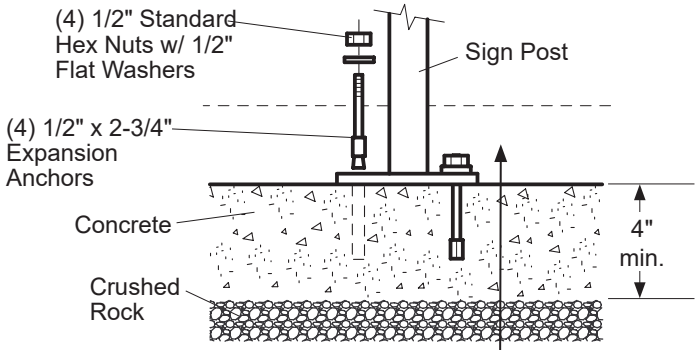
SAFETY NOTE
Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. ASTM F1487.)

DETAIL
SIGN ATTACHMENT

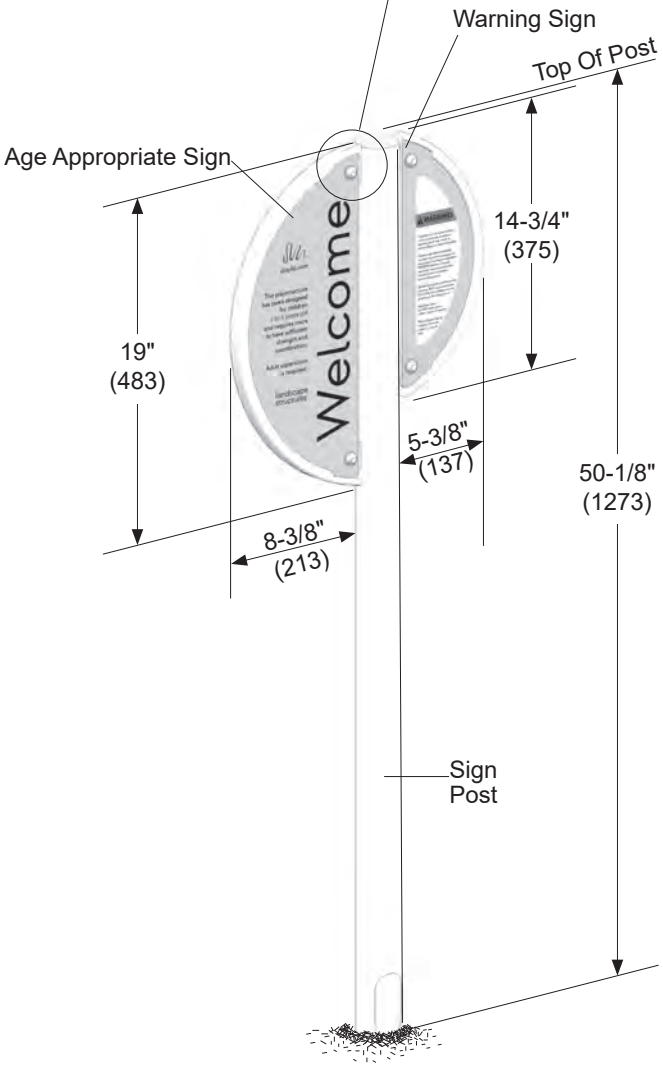


NOTE: Signs fit inside the lip of the borders.

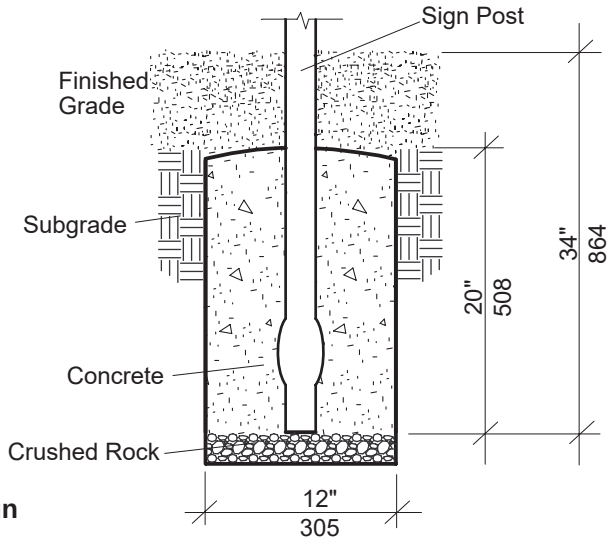
DETAIL
SURFACE MOUNT



NOTE: Sufficient protective surfacing must cover hardware to satisfy fall height requirements.



DETAIL
DIRECT BURY FOOTING



Model 182503 - Landscape Structures Provided Welcome Sign
Model 182504 - Welcome Sign

Signs

Welcome Sign

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Document #37111400

Parts List

Part#	Description	Qty.
367171	Warning Sign,Gray	1
367172	Age Appropriate Sign, 2-12 Years, Gray	*
367173	Age Appropriate Sign, 2-5 Years, Gray	*
367174	Age Appropriate Sign, 5-12 Years, Gray	*
367175	Age Appropriate Sign, 1 1/2-5 Years, Gray	*
367176	Age Appropriate Sign, 1 1/2-12 Years, Gray	*
367177	Age Appropriate Sign, 6-23 Months, Gray	*
180598	Sign Post (DB), Specify Color	*
181119	Sign Post (SM), Specify Color	*
343142	Large Border, Black	1
343188	Small Border, Black	1
371113	**Age/Warning Sign Hardware Package**	1
100198	3/8" x 1 1/8" BHCS w/Pin, SST	4
100349	3/8" Low Crown Cap Nut, SST	4
100365	3/8" SAE Flat Washer, SST	8
121348	**4 Hole (SM) Hardware Package**	1
100266	1/2" x 2 3/4" Expansion Anchor	4
100322	1/2" Standard Hex Nut, SST	4
100363	1/2" Flat Washer, SST	4

DB = Direct Bury
SM = Surface Mount
*** = Quantity Determined By Your Order**

Specifications

Sign Panel: Panel is fabricated from 3/16" (.188")(4,76 mm) aluminum plate. Finish: ProShield®, gray in color. **(Sign)** Digital image is transfered to a 1/8" (.125")(3,17 mm) ProShield coated aluminum plate, then infused into the ProShield.

Border: Injection molded nylon, black in color.

Post: Weldment comprised 2.375" (60,33 mm) O.D. RS20 (.095-.105) (2,41 mm-2,67 mm) wall galvanized tube, $^{1}/_{4}$" (6,35 mm) HRPO steel sheet and aluminum post cap. Finish: ProShield, color specified.

Fasteners: Primary fasteners shall be socketed and pinned tamperproof in design, stainless steel (SST) per ASTM F 879 unless otherwise indicated (see specific product installation/specifications).

Installation Time: **(DB)** Approx. 1 man hour
(SM) Approx. $^{1}/_{2}$ man hour
Concrete Req: Approx. 1.31 cu. ft.
Weight: **(DB)** - 24 lbs.
(SM) - 27 lbs.

Installation Instructions

Direct Bury

1) Dig footing hole to depth and diameter shown.
2) Attach sign panels and borders to post as shown, using $^{3}/_{8}$" x 1 $^{1}/_{8}$" BHCS with $^{3}/_{8}$" SAE flat washers and $^{3}/_{8}$" low crown cap nuts with $^{3}/_{8}$" SAE flat washers.
3) Set sign assembly in footing hole and temporarily brace in plumb position.
4) Pour concrete footing. After concrete has cured, remove bracing.

Surface Mount

1) Attach sign panels and borders to post as shown, using $^{3}/_{8}$" x 1 $^{1}/_{8}$" BHCS with $^{3}/_{8}$" SAE flat washers and $^{3}/_{8}$" low crown cap nuts with $^{3}/_{8}$" SAE flat washers.
2) With sign in proper position, using a $^{1}/_{2}$" masonry bit and hammer drill, drill 3" deep holes into concrete slab through holes in post plate. Tap $^{1}/_{2}$" x 2 $^{3}/_{4}$" expansion anchors into holes and secure using $^{1}/_{2}$" standard hex nuts with $^{1}/_{2}$" flat washers.

ECO 0112505 Document 37111400 replaces 22074200. Border and artwork updated.

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SAFETY NOTE

Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. *ASTM F1487*.)

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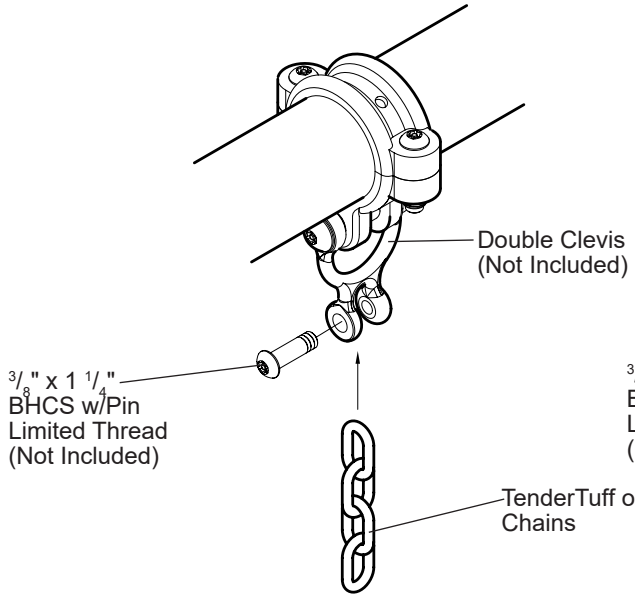
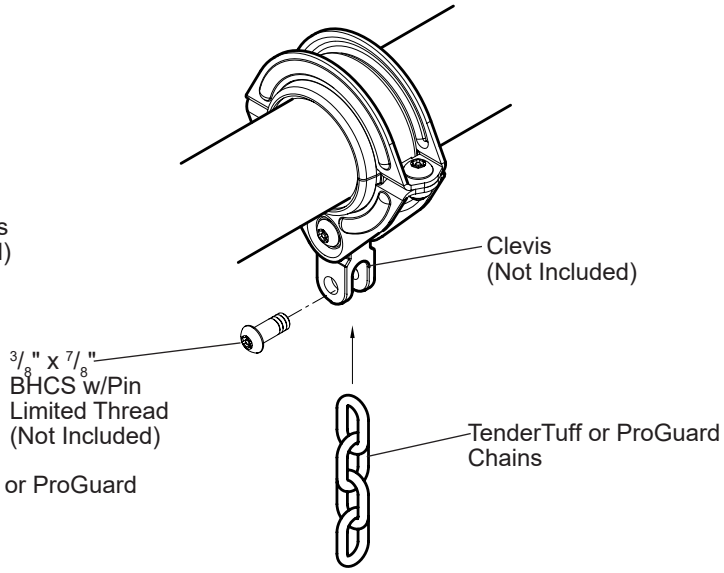
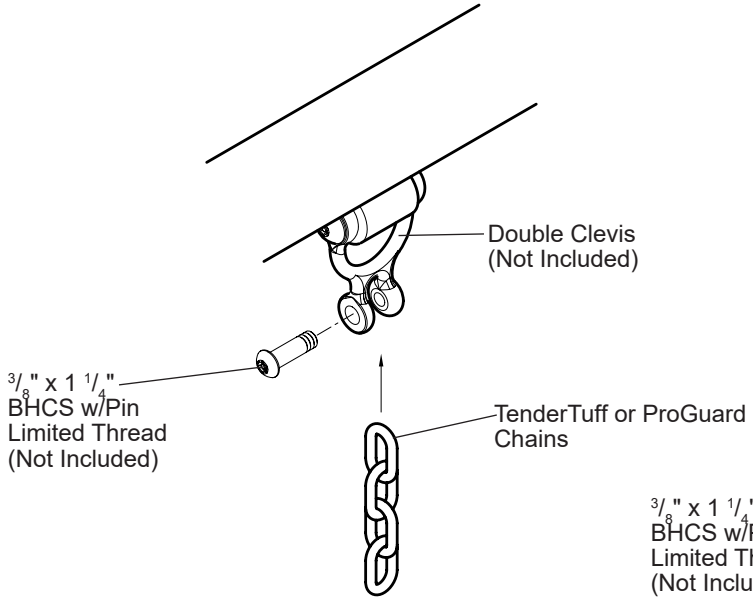
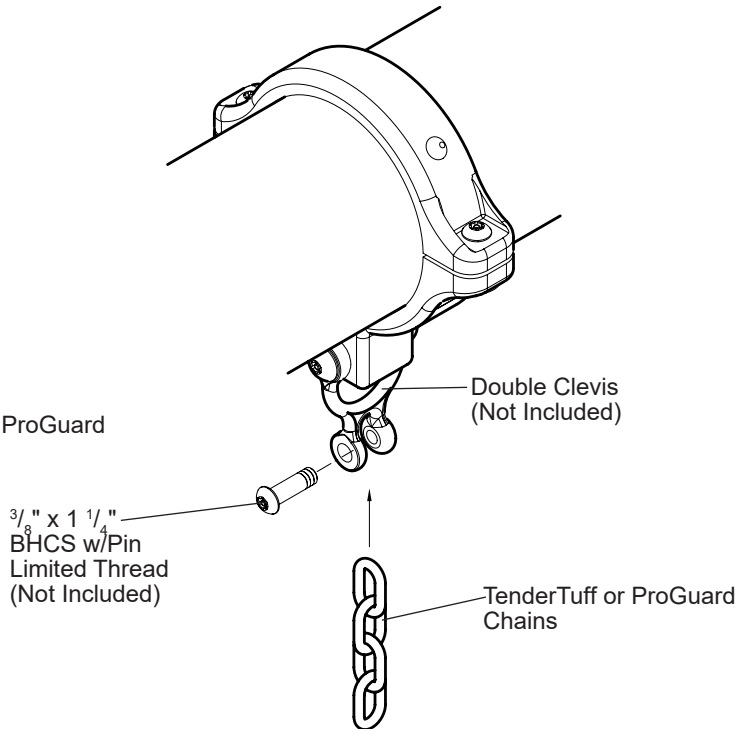
SWING HANGER OPTIONS

Swing Hanger Components included with Swing Frame.









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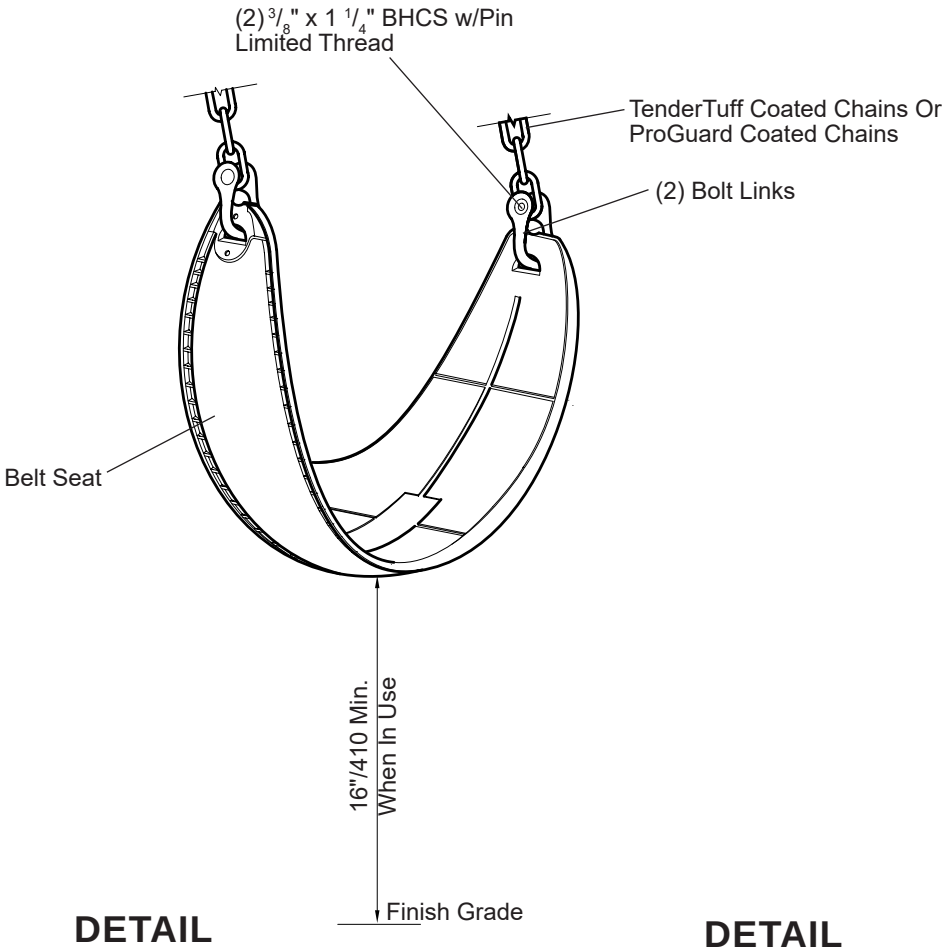
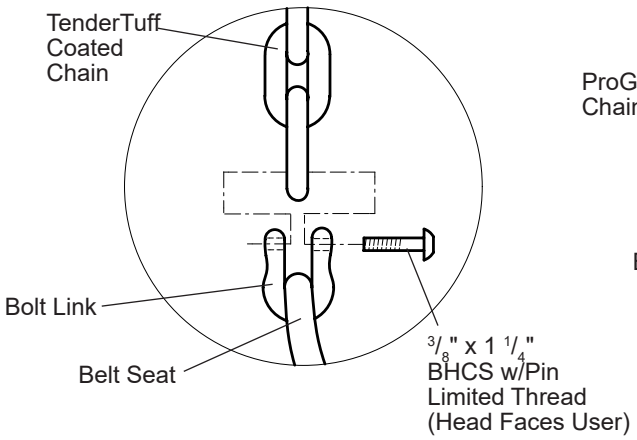
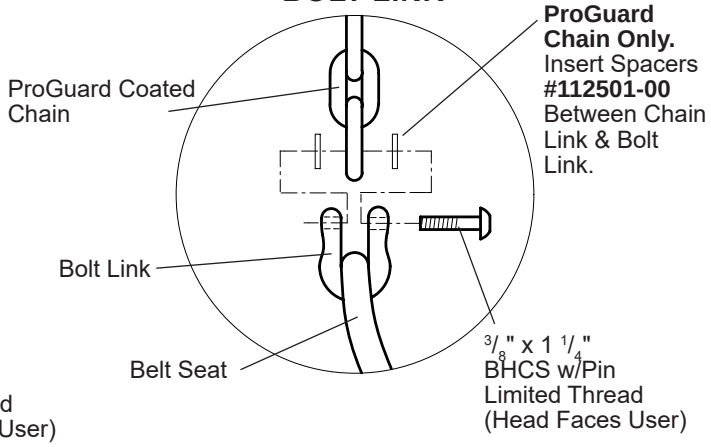


DETAIL
BOLT LINK



DETAIL
BOLT LINK



Swings

174018 Belt Seat

601 7TH STREET SOUTH, DELANO, MINNESOTA 55328-8605 888-574-4678 LSI Install Help 888-438-6574 LSI Direct 763-972-5200 Int. FAX (763) 972-3185

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Swings 174018 Belt Seat

Parts List

Part #	Description	Qty.
	7 Ft. High Beam	
128842	Belt Swing Seat, Black	1
178679	57 7/16" Chain, TenderTuff, Specify Color	2
175251	57 7/16" Chain, ProGuard	2
132672	**Bolt Link w/Bolt & Spacers**	1
100292	3/8" x 1 1/4" BHCS w/Pin Ltd. Thread, SST	2
138915	Bolt Link, SST	2
112501	Chain Spacer	4
132635	**Bolt Link w/Bolt Hardware Package**	1
100292-00	3/8" x 1 1/4" BHCS w/Pin Ltd. Thread, SST	2
138915	Bolt Link, SST	2
	8 Ft. High Beam	
128842	Belt Swing Seat, Black	1
152050	67 7/8" Chain, TenderTuff, Specify Color	2
174404	67 7/8" Chain, ProGuard	2
132672	**Bolt Link w/Bolt & Spacers**	1
100292	3/8" x 1 1/4" BHCS w/Pin Ltd. Thread, SST	2
138915	Bolt Link, SST	2
112501	Chain Spacer	4
132635	**Bolt Link w/Bolt Hardware Package**	1
100292	3/8" x 1 1/4" BHCS w/Pin Ltd. Thread, SST	2
138915	Bolt Link, SST	2
	10 Ft. High Beam	
128842	Belt Swing Seat, Black	1
152052	90 11/16" Chain, TenderTuff, Specify Color	2
174884	90 11/16" Chain, ProGuard	2
132672	**Bolt Link w/Bolt & Spacers**	1
100292	3/8" x 1 1/4" BHCS w/Pin Ltd. Thread, SST	2
138915	Bolt Link, SST	2
112501	Chain Spacer	4
132635	**Bolt Link w/Bolt Hardware Package**	1
100292	3/8" x 1 1/4" BHCS w/Pin Ltd. Thread, SST	2
138915	Bolt Link, SST	2

Specifications

Chain Spacer: Made from white nylon measuring .080" x .785" O.D.

Chain/ProGuard: Steel 3/16" straight link chain, 800 lb. working load limit. Finish: ProGuard.

Chain/Coated: Steel 3/16" straight link chain, 800 lb. working load limit. Finish: TenderTuff®, color specified.

Belt Seats: Molded from U.V. stabilized black EPDM rubber encapsulating a weldment comprised of a 22 GA (.029") spring stainless steel sheet, and (4) .105" thick stainless steel washers. The belt seat elliptical shape measures 7" wide x 26" long x .700" thick.

Bolt Link: Stainless Steel.

Fasteners: Primary fasteners shall be socketed and pinned tamperproof in design, stainless steel (SST) per ASTM F 879 unless otherwise indicated (see specific product installation/specifications).

Installation Time: 1/4 man hour per seat

Weight: 8 lbs. (7 Ft. Beam w/ProGuard Chains)
9 lbs. (7 Ft. Beam w/TenderTuff Chains
8 lbs. (8 Ft. Beam w/ProGuard Chains)
9 lbs. (8 Ft. Beam w/TenderTuff Chains)
10 lbs. (10 Ft. Beam w/ProGuard Chains)
11 lbs. (10 Ft. Beam w/TenderTuff Chains)

Installation

NOTE: *Refer to Swing Frame assembly for swing hanger type.*

Swing Hangers With Double Clevis

1) Attach chains to double clevis using 3/8" x 1 1/4" BHCS w/pin limited thread, as shown.
2) Attach chains to belt seat using bolt links with 3/8" x 1 1/4" BHCS w/ pin limited thread. Be sure bolt heads face user. **NOTE:** *Use chain spacers as shown when installing ProGuard chains.*
3) Install protective surfacing before users are allowed to play on the structure.

Anti-wrap Swing Hangers

1) Attach chains to aluminum clevis using 3/8" x 7/8" BHCS w/pin limited thread, as shown.
2) Attach chains to belt seat using bolt links with 3/8" x 1 1/4" BHCS w/ pin limited thread. Be sure bolt heads face user. **NOTE:** *Use chain spacers as shown when installing ProGuard chains.*
3) Install protective surfacing before users are allowed to play on the structure.

Specifications are subject to change without notice.

5/14/25 - Clarification and note added for swing hanger components being part of swing frame assembly.

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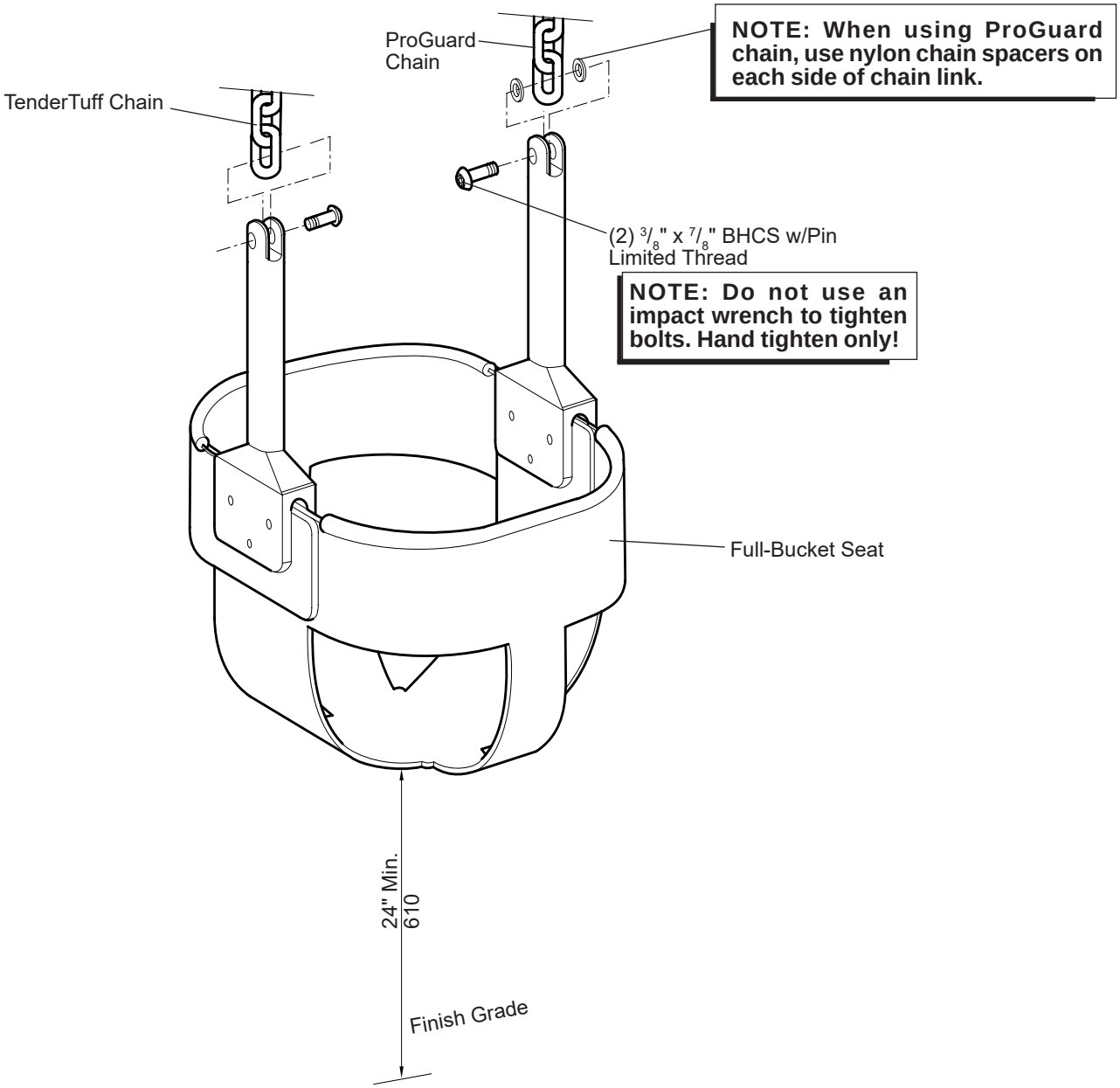
SAFETY NOTE

Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. *ASTM F1487*.)

18985400



Swings

176038 Full-Bucket Seat, w/Chains

601 7TH STREET SOUTH, DELANO, MINNESOTA 55328-8605 888-574-4678 LSI Install Help 888-438-6574 LSI Direct 763-972-5200 Int. FAX (763) 972-3185

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Swings 176038 Full-Bucket Seat, w/Chains

Parts List

Part#	Description	Qty.
	7 Ft. High Beam (5” Dia. Beam)	
186276	Full-Bucket Swing Seat, Black	1
141739	43 3/16” Chain, TenderTuff, Specify Color	2
175248	43 3/16” Chain, ProGuard	2
138414	**Bucket Seat Hardware Package**	1
100290	3/8” x 7/8” BHCS w/Pin Limited Thread, SST	2
112501	Chain Spacer (For ProGuard Chains Only)	4
	8 Ft. High Beam	
186276	Full-Bucket Swing Seat, Black	1
160110	52 9/16" Chain, TenderTuff, Specify Color	2
174882	52 9/16" Chain, ProGuard	2
138414	**Bucket Seat Hardware Package**	1
100290	3/8" x 7/8" BHCS w/Pin Limited Thread, SST	2
112501	Chain Spacer (For ProGuard Chains Only)	4
	10 Ft. High Beam	
186276	Full-Bucket Swing Seat, Black	1
152051	76 7/16" Chain, TenderTuff, Specify Color	2
174883	76 7/16" Chain, ProGuard	2
138414	**Bucket Seat Hardware Package**	1
100290	3/8" x 7/8" BHCS w/Pin Limited Thread, SST	2
112501	Chain Spacer (For ProGuard Chains Only)	4
	7 Ft. High Beam (Tot)	
186276	Full-Bucket Swing Seat, Black	1
152053	37 1/2" Chain, TenderTuff, Specify Color	2
175247	37 1/2" Chain, ProGuard	2
138414	**Bucket Seat Hardware Package**	1
100290	3/8" x 7/8" BHCS w/Pin Limited Thread, SST	2
112501	Chain Spacer (For ProGuard Chains Only)	4
	75" High Beam (Toddler)	
186276	Full-Bucket Swing Seat, Black	1
152016	29 7/8" Chain, TenderTuff, Specify Color	2
174881	29 7/8" Chain, ProGuard	2
138414	**Bucket Seat Hardware Package**	1
100290	3/8" x 7/8" BHCS w/Pin Limited Thread, SST	2
112501	Chain Spacer (For ProGuard Chains Only)	4

Specifications

Full-Bucket Seat: Seat shall be molded of U.V. stabilized, high quality, black rubber, encapsulating a 24 gauge stainless steel reinforcement plate. Handle cast from 356-T6 aluminum alloy with black polyarmor paint finish. Handle attaches to seat with (3) 1/4" x 1 5/16" long stainless steel rivets. The finished size of the full bucket shall be 9" deep x 10 1/2" wide.

Chain/Coated: Steel 3/16" straight link chain, 800 lb. working load limit. Finish: TenderTuff, color specified.

Chain/ProGuard: Steel 3/16" straight link chain, 800 lb. working load limit. Finish: ProGuard.

Fasteners: Primary fasteners shall be socketed and pinned tamperproof in design, stainless steel (SST) per ASTM F 879 unless otherwise indicated (see specific product installation/specifications).

Installation Time: 1/4 man hour per seat

Weight:
14 lbs. (7 FT. Beam 5” Dia. w/TenderTuff Chain)
13 lbs. (7 FT. Beam 5” Dia. w/ProGuard Chain)
14 lbs. (8 FT. Beam w/TenderTuff Chain)
14 lbs. (8 FT. Beam w/ProGuard Chain)
17 lbs. (10 FT. Beam w/TenderTuff Chain)
16 lbs. (10 FT. Beam w/ProGuard Chain)
12 lbs. (7 FT. Beam w/TenderTuff Chain)
12 lbs. (7 FT. Beam w/ProGuard Chain)
11 lbs. (75" Beam w/TenderTuff Chain)
11 lbs. (75" Beam w/ProGuard Chain)

Installation Instructions

NOTE: *Refer to Swing Frame assembly for swing hanger type.*

Swing Hangers with Double Clevis

1) Attach chains to double clevis using 3/8" x 1 1/4" BHCS w/pin limited thread bolts, as shown.
2) Attach chains to full-bucket seat using 3/8" x 7/8" BHCS w/pin limited thread bolts. Be sure bolt heads face user. **NOTE:** *Use chain spacers as shown when installing ProGuard chains.*
3) Install protective surfacing before users are allowed to play on the structure.

Anti-wrap Swing Hangers

1) Attach chains to aluminum clevis using 3/8" x 7/8" BHCS w/pin limited thread bolts, as shown.
2) Attach chains to full-bucket seat using 3/8" x 7/8" BHCS w/pin limited thread bolts. Be sure bolt heads face user. **NOTE:** *Use chain spacers as shown when installing ProGuard chains.*
3) Install protective surfacing before users are allowed to play on the structure.

5/14/2025 Clarification and note added to swing hanger components being part of swing frame assembly.
2/10/2016 Added Hand Tighten Only Note.

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SAFETY NOTE

Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. *ASTM F1487*.)

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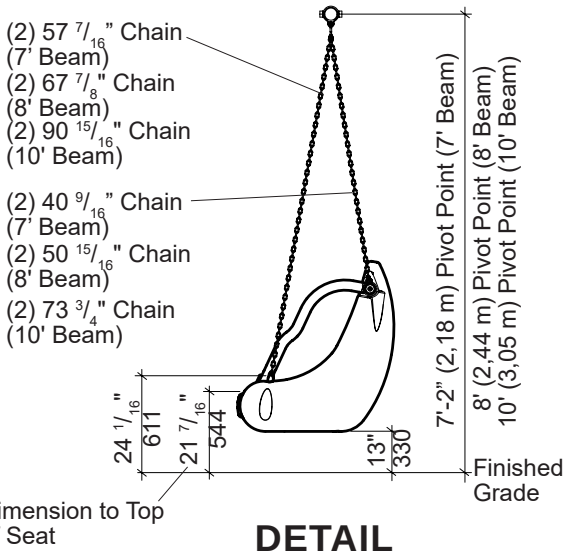
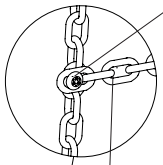
ELEVATION

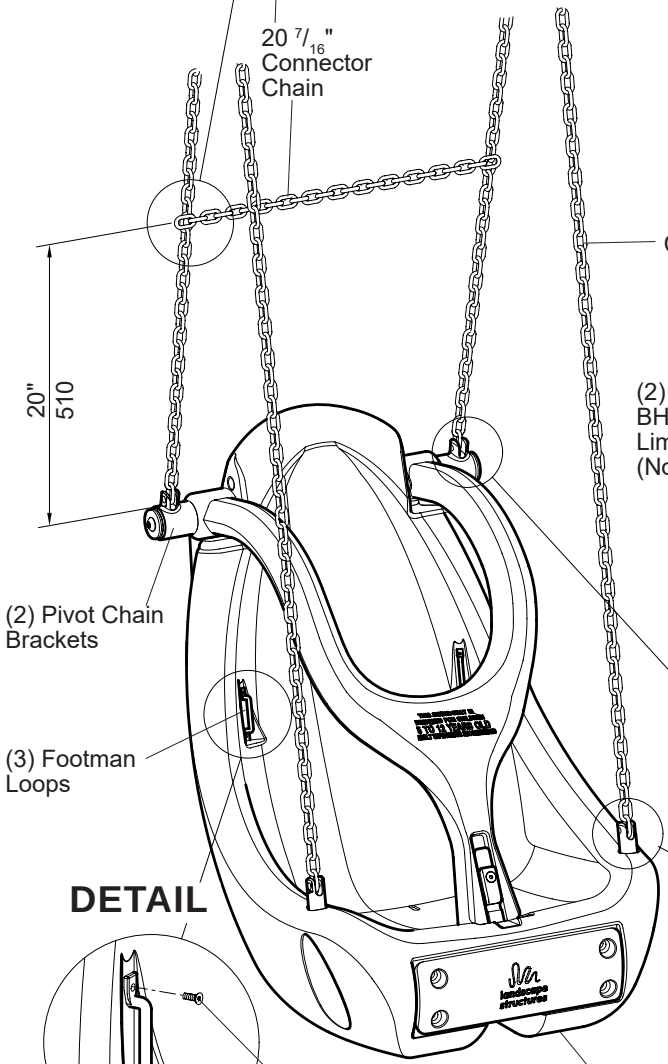


DETAIL

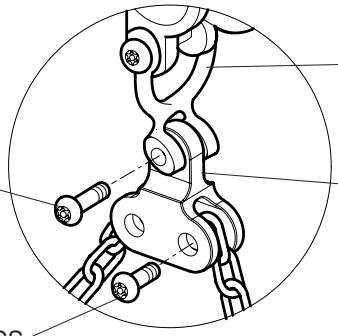


(ProGuard Chain)
(2) 3/8" x 7/8" BHCS w/Pin & 3/8" Hex Jam Nuts

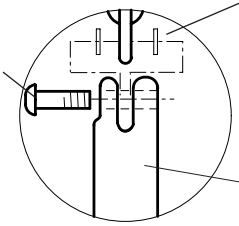
(TenderTuff Chain)
(2) 3/8" x 1 1/8" BHCS w/Pin & 3/8" Standard Hex Nuts w/ 3/8" SAE Flat Washers



DETAIL
HANGER ASSEMBLY

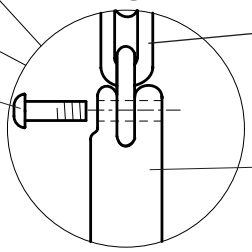


DETAIL
BRACKET



NOTE: For ProGuard chain, insert (8) nylon spacers between chain links & brackets

DETAIL
BRACKET



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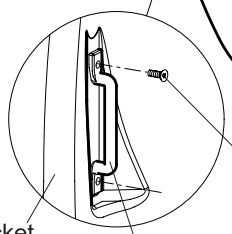

Swings

177351 Molded Bucket Seat, w/Harness

601 7TH STREET SOUTH, DELANO, MINNESOTA 55328-8605 888-574-4678 LSI Install Help 888-438-6574 LSI Direct 763-972-5200 Int. FAX (763) 972-3185

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Document #25974300

Swings 177351 Molded Bucket Seat, w/Harness

Parts List

Part#	Description	Qty.
259433	Molded Bucket Seat Assembly, Specify Color	1
	7 Ft. High Beam - ProGuard Finished Chains	
175251	57 7/16" Long, (Front)	2
193869	40 9/16" Long, (Back)	2
175653	20 7/16" Long, (Connector)	1
	8 Ft. High Beam - ProGuard Finished Chains	
174404	67 7/8" Long, (Front)	2
175619	50 15/16" Long, (Back)	2
175653	20 7/16" Long, (Connector)	1
	10 Ft. High Beam - ProGuard Finished Chains	
174884	90 11/16" Long, (Front)	2
175623	73 3/4" Long, (Back)	2
175653	20 7/16" Long, (Connector)	1
	7 Ft. High Beam - TenderTuff Chains	
178679	57 7/16" Long, (Front), Specify Color	2
179286	40 9/16" Long, (Back), Specify Color	2
174571	20 7/16" Long, (Connector), Specify Color	1
	8 Ft. High Beam - TenderTuff Chains	
152050	67 7/8" Long, (Front), Specify Color	2
174572	50 15/16" Long, (Back), Specify Color	2
174571	20 7/16" Long, (Connector), Specify Color	1
	10 Ft. High Beam -TenderTuff Chains	
152052	90 11/16" Long, (Front), Specify Color	2
175621	73 3/4" Long, (Back), Specify Color	2
174571	20 7/16" Long, (Connector), Specify Color	1
225662	**Molded Seat w/Yoke Hardware Package**	1
100196	3/8" x 7/8" BHCS w/Pin, SST	2
100198	3/8" x 1 1/8" BHCS w/Pin, SST	2
100290	3/8" x 7/8" BHCS w/Pin Limited Thread, SST	8
100327	3/8" Standard Hex Nut, SST	2
100365	3/8" SAE Flat Washer, SST	6
106035	Seat Mounting Bracket	2
112501	Nylon Spacer	8
128296	3/8" Hex Jam Nut, SST	2
207709	Footman Loop, SST	3
160307	Double Pivot Block Assy.	2
162462	#10-24 x 1/2" Flat Head Screw, SST	6

Specifications

Bucket Seat Assy.: **(Bucket Seat & Yoke)** Rotationally molded from U.V. stabilized linear low density polyethylene, color specified. **(Pipebolt)** Made from 1.125" O.D. 6005-T5 threaded annodized aluminum tube. **(Bearings)** UHMW PE lubricated. **(Brackets)** Made from 356-T6 aluminum.

Chain/ProGuard: Steel 3/16" straight link chain, 800 lb. working load limit. Finish: ProGuard.

Chain/Coated: Steel 3/16" straight link chain, 800 lb. working load limit. Finish: TenderTuff, color specified.

Seat Mounting Bracket: Cast from 535 aluminum magnesium.

Bumper: Molded from U.V. stabilized black EPDM rubber encapsulating 11 GA (.120") HRPO steel sheet.

Dbl. Pivot Block: Fabricated from 6061-T6 Aluminum with bronze oil impregnated bearing.

Fasteners: Primary fasteners shall be socketed and pinned tamperproof in design, stainless steel (SST) per ASTM F 879 unless otherwise indicated (see specific product installation/specifications).

Installation Time: Approx. 1 man hour

Weight: 50 lbs. (7 Ft. Beam w/ProGuard Chains)
53 lbs. (7 Ft. Beam w/TenderTuff Chains)
48 lbs. (8 Ft. Beam w/ProGuard Chains)
51 lbs. (8 Ft. Beam w/TenderTuff Chains)
51 lbs. (10 Ft. Beam w/ProGuard Chains)
55 lbs. (10 Ft. Beam w/TenderTuff Chains)

Installation Instructions

1) Insert seat mounting brackets into molded-in holes in front of bucket seat and attach ends of chain, using 3/8" x 7/8" BHCS w/pin limited thread. See Bracket Detail. **NOTE:** *For ProGuard coated chain, insert (4) nylon spacers between chain links and brackets.*

2) Attach ends of chain to pivot chain brackets, using 3/8" x 7/8" BHCS w/pin limited thread. See Bracket Detail. **NOTE:** *For ProGuard coated chain, insert (4) nylon spacers between chain links and brackets.*

3) Attach chains to double pivot blocks, using 3/8" x 7/8" BHCS w/pin limited thread.

4) **NOTE**: *Refer to Swing Frame assembly for swing hanger type.*

   (Swing Hangers with Double Clevis) Attach chains to swing hanger double clevis, using 3/8" x 1 1/4" BHCS w/pin limited thread.

   (Anti-wrap Swing Hangers) Attach chains to anti-wrap swing hanger clevis, using 3/8" x 7/8" BHCS w/pin limited thread.

5) **(ProGuard Chain)** Attach connector chain to back swing chains at dimension shown, using 3/8" x 7/8" BHCS w/pin & 3/8" jam nuts. Refer to Detail.

   (TenderTuff Chain) Attach connector chain to back swing chains at dimension shown, using 3/8" x 1 1/8" BHCS w/pin & 3/8" standard hex nuts with 3/8" SAE Flat Washers. Refer to Detail.

6) Attach footman loops, using #10-24 x 1/2" flat head screws, as shown. Footman loops are used for seat belts (not included).

7) Attach bumper to front of swing seat, using 3/8" x 7/8" BHCS w/pin with 3/8" SAE Flat Washers.

8) Install protective surfacing before users are allowed to play on the structure.

5/14/25 - Clarification and note added for swing hanger components being part of swing frame assembly.
ECO 0101646. Document 25974300 replaces 22554400. Added age appropriate message to swing yoke.

Specifications are subject to change without notice.

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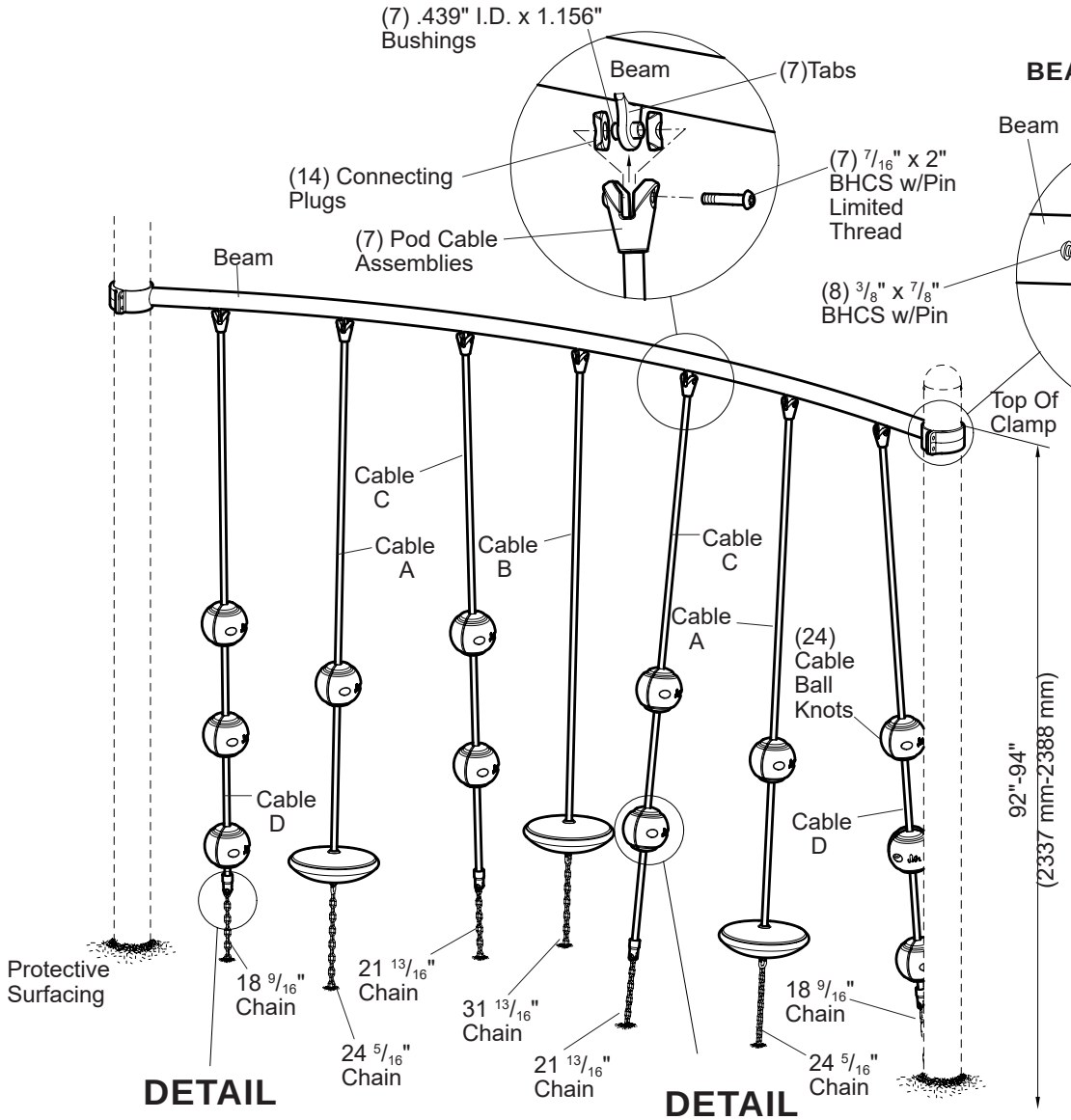
SAFETY NOTE

Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. ASTM F1487.)

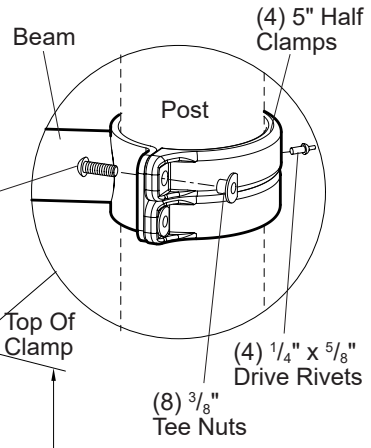
24321200

DETAIL
SWIGGLEKNOTS BRIDGE - GROUND LEVEL

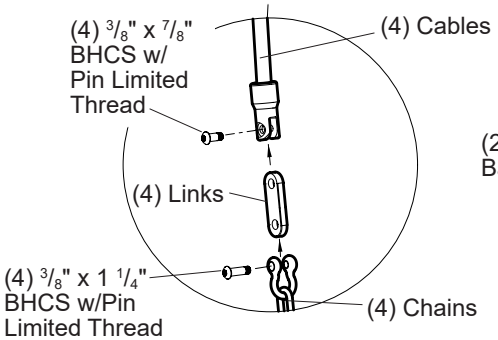
DETAIL
POD CABLE ATTACHMENT



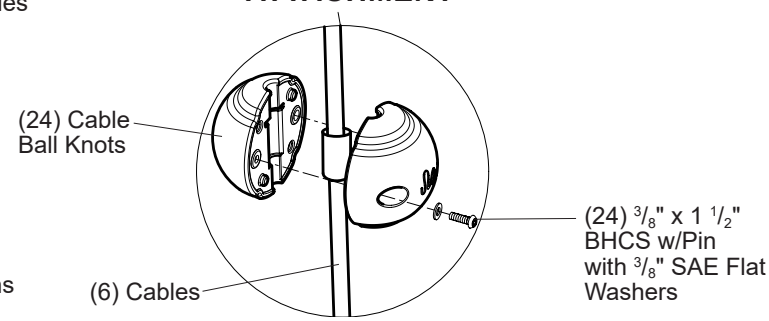
DETAIL
BEAM ATTACHMENT



DETAIL
CHAIN ATTACHMENT



DETAIL
CABLE BALL KNOT ATTACHMENT



PlayBooster® 193171 SwiggleKnots™ Bridge, 123"

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SAFETY NOTE

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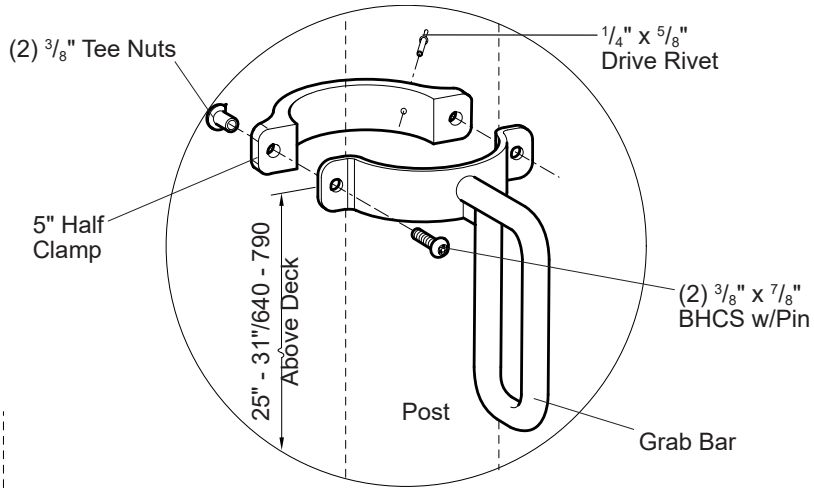
194970c

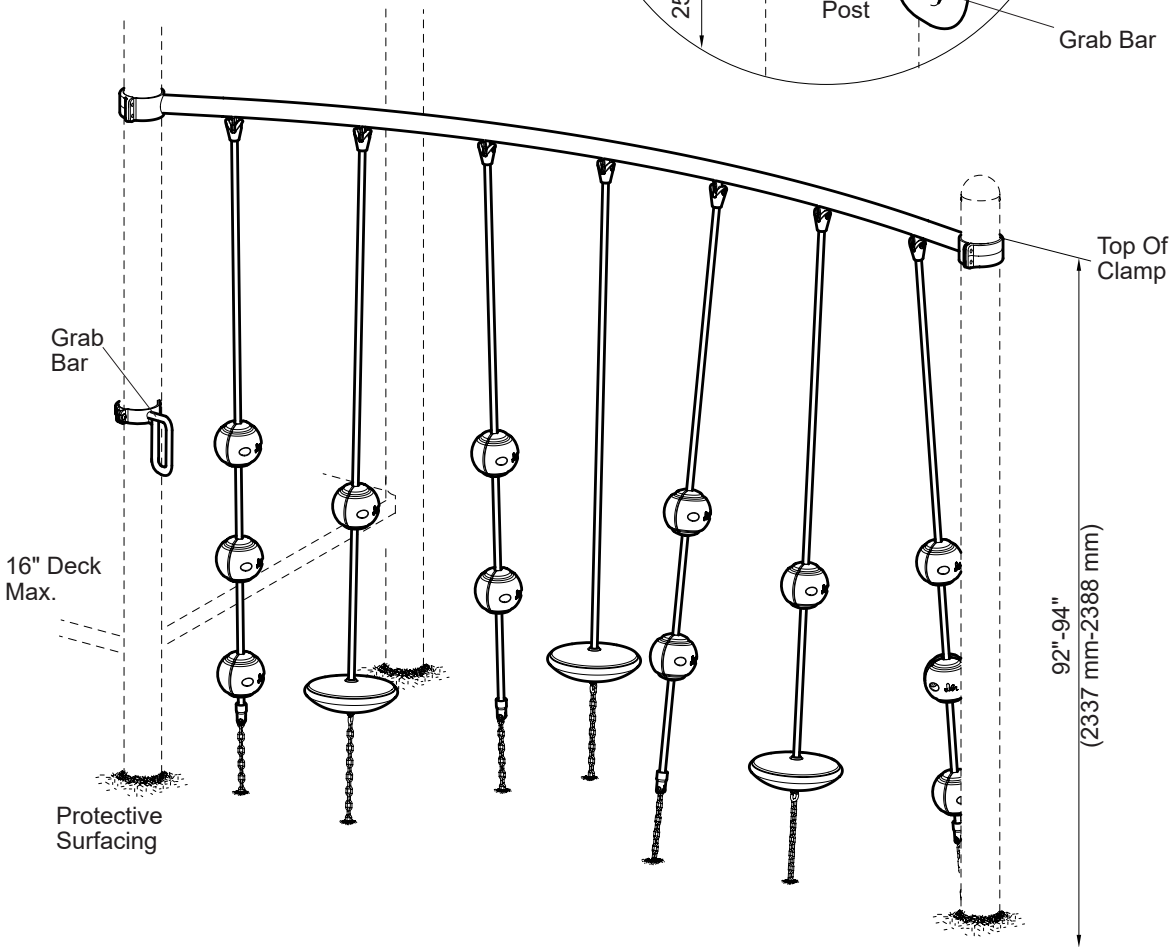
DETAIL

SWIGGLEKNOTS BRIDGE - GROUND TO DECK

DETAIL

GRAB BAR ATTACHMENT





PlayBooster® **193171 SwiggleKnots™ Bridge, 123"**

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SAFETY NOTE

Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. ASTM F1487.)

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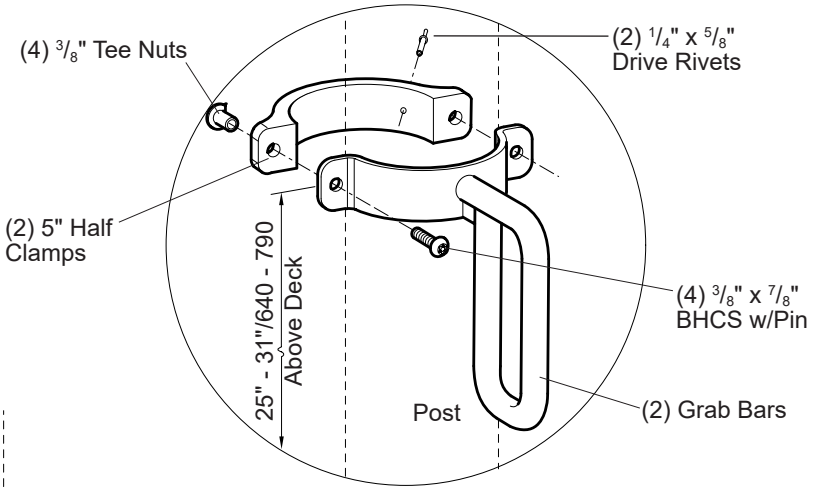
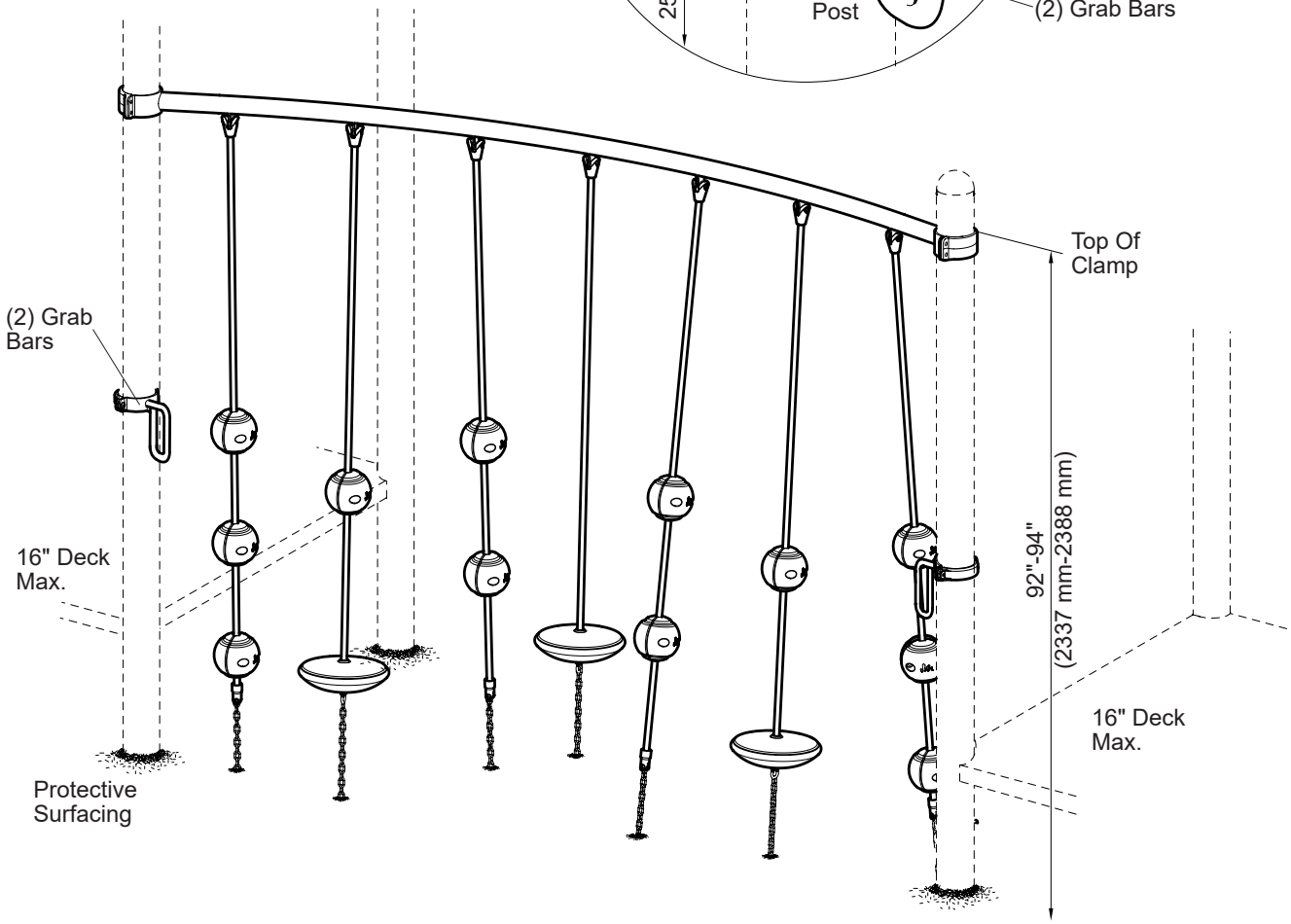
DETAIL

SWIGGLEKNOTS BRIDGE - DECK TO DECK

DETAIL

GRAB BAR ATTACHMENT





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SAFETY NOTE

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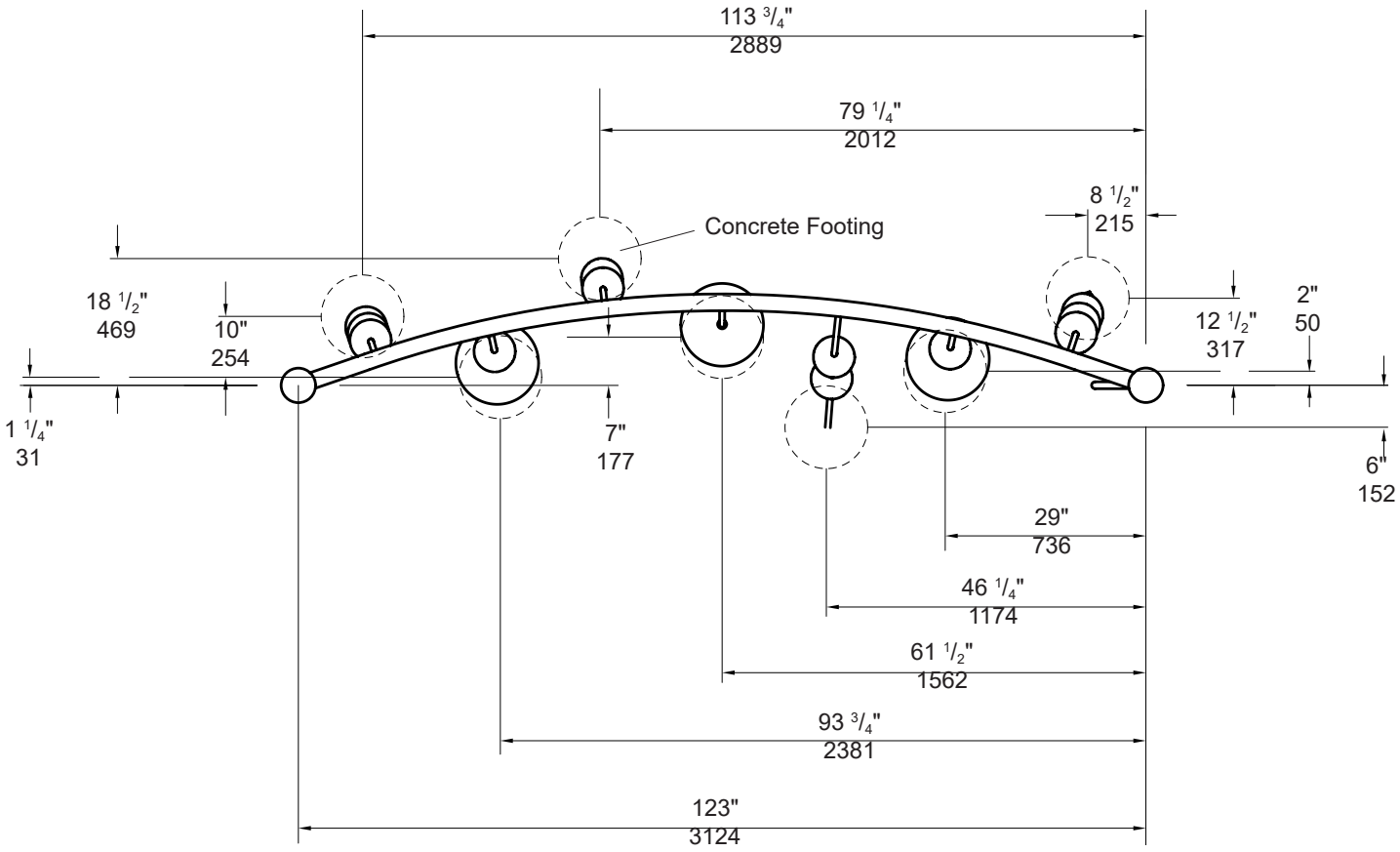
194970e

PLAN VIEW/FOOTING LAYOUT



PlayBooster® **193171 SwiggleKnots™ Bridge, 123"**

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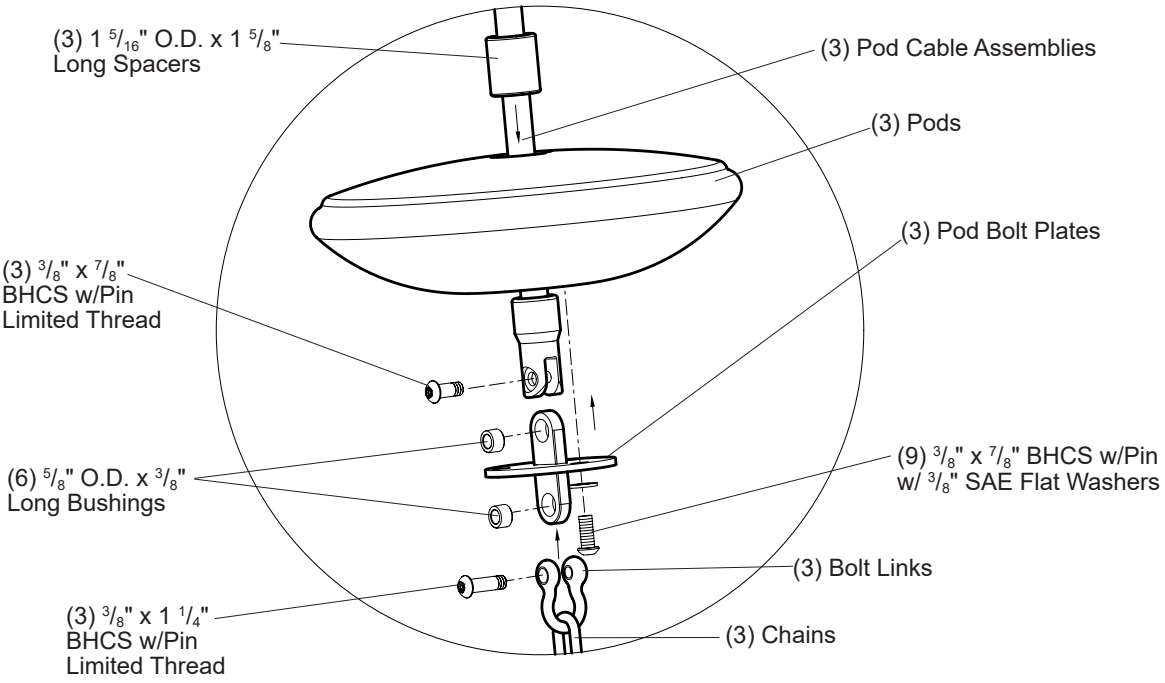
ISO 9001 Certified

SAFETY NOTE

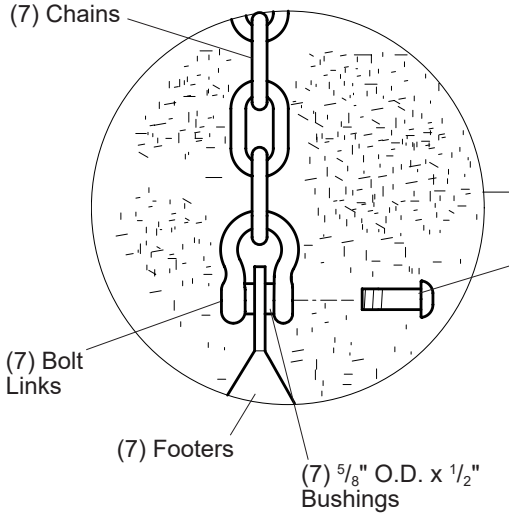
Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. ASTM F1487.)

194970b

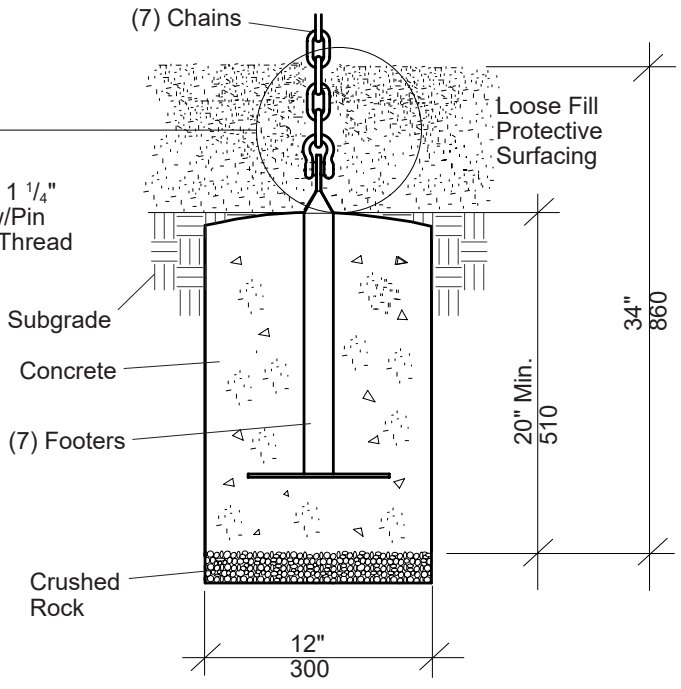
DETAIL
POD ATTACHMENT



DETAIL



DETAIL
FOOTER ATTACHMENT



NOTE: The hole depth for the footer needs to be deep enough, so the footer plate doesn't contact the bottom of the hole. The weight of the concrete will force the footer plate down, tightening the cable.

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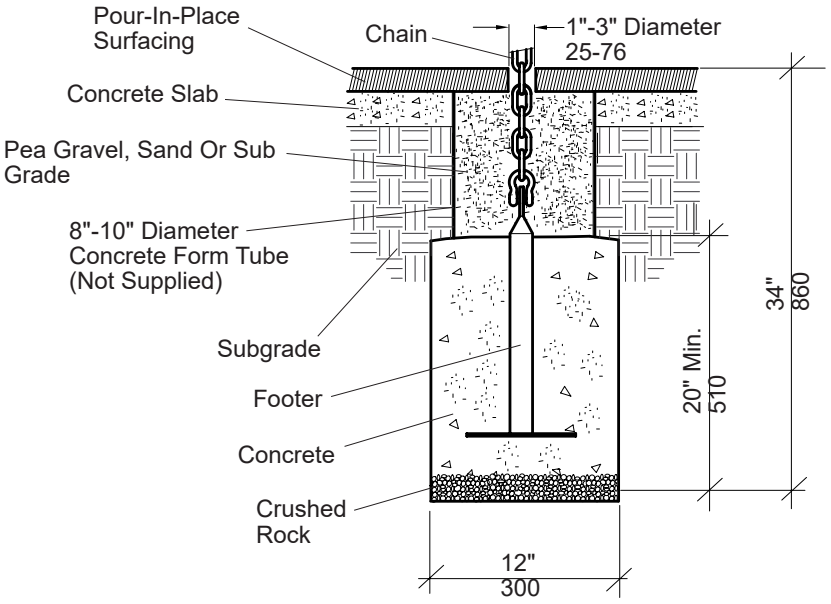
179891b

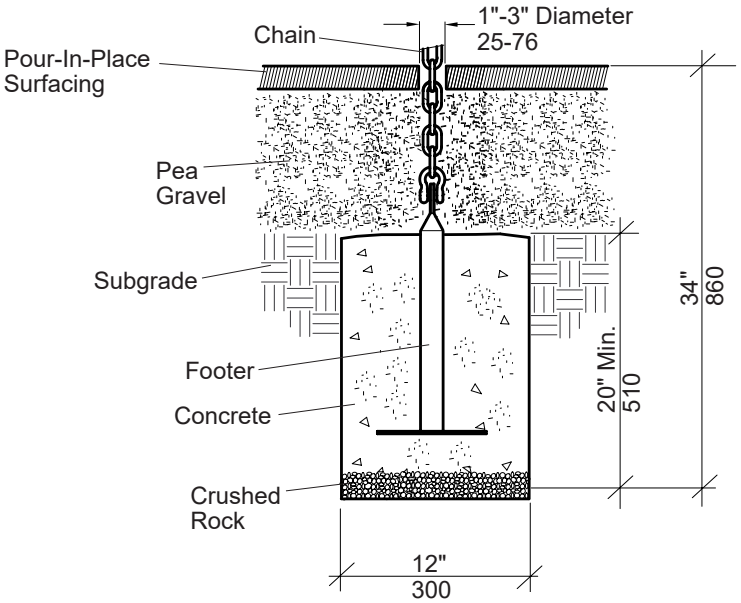
DETAIL

DIRECT BURY WITH POUR-IN-PLACE SURFACING



DETAIL

DIRECT BURY WITH POUR-IN-PLACE SURFACING (PEA GRAVEL)



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PlayBooster® 193171 SwiggleKnots™ Bridge, 123"

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Parts List

Part#	Description	Qty.
	Ground Level	
100610	1/4" x 5/8" Drive Rivet, AL/SST	4
105327	5" Half Clamp, Specify Color	4
154460	Pod, Specify Color	3
164367	Footer, Specify Color	7
176895	3/8" x 1" x 2 1/2" Link, SST	4
177932	Pod Bolt Plate, Specify Color	3
178586	1 5/16" O.D. x 1 5/8" Long AL. Spacer	3
192629	Beam, Specify Color	1
192734	SwiggleKnots Cable A, Specify Color	2
192735	SwiggleKnots Cable B, Specify Color	1
192736	SwiggleKnots Cable C, Specify Color	2
192737	SwiggleKnots Cable D, Specify Color	2
192748	Cable Ball Knot (Half), Specify Color	24
193111	1/4" P70 x 24 5/16" Long Chain	2
190780	1/4" P70 x 18 9/16" Long Chain	2
193113	1/4" P70 x 21 13/16" Long Chain	2
193114	1/4" P70 x 31 13/16" Long Chain	1
195411	**SwiggleKnots Bridge Hardware Package**	1
100171	3/8" x 1 1/2" BHCS w/Pin, SST	24
100196	3/8" x 7/8" BHCS w/Pin, SST	17
100290	3/8" x 7/8" BHCS w/Pin Limited Thread, SST	7
100292	3/8" x 1 1/4" BHCS w/Pin Limited Thread, SST	14
100351	3/8" Tee Nut, SST	8
100365	3/8" SAE Flat Washer, SST	33
127179	5/8" O.D. x 3/8" Bushing, SST	6
138915	Bolt Link, SST	14
156962	5/8" O.D. x 1/2" Bushing, SST	7
157224	.439" I.D. x 1.156" Bushing, SST	7
157704	7/16" x 2" BHCS w/Pin Limited Thread, SST	7
162729	Connecting Plug	14
	Ground To Deck	
100610	1/4" x 5/8" Drive Rivet, AL/SST	4
105327	5" Half Clamp, Specify Color	5
154460	Pod, Specify Color	3
164367	Footer, Specify Color	7
176895	3/8" x 1" x 2 1/2" Link, SST	4
177932	Pod Bolt Plate, Specify Color	3
178586	1 5/16" O.D. x 1 5/8" Long AL. Spacer	3
192629	Beam, Specify Color	1
192734	SwiggleKnots Cable A, Black	2
192735	SwiggleKnots Cable B, Black	1
192736	SwiggleKnots Cable C, Black	2
192737	SwiggleKnots Cable D, Black	2
192748	Cable Ball Knot, Specify Color	24
193111	1/4" P70 x 24 5/16" Long Chain	2
190780	1/4" P70 x 18 9/16" Long Chain	2
193113	1/4" P70 x 21 13/16" Long Chain	2
193114	1/4" P70 x 31 13/16" Long Chain	1
141541	Grab Bar, Specify Color	1
195411	**SwiggleKnots Bridge Hardware Package**	1
100171	3/8" x 1 1/2" BHCS w/Pin, SST	24
100196	3/8" x 7/8" BHCS w/Pin, SST	17
100290	3/8" x 7/8" BHCS w/Pin Limited Thread, SST	7
100292	3/8" x 1 1/4" BHCS w/Pin Limited Thread, SST	14
100351	3/8" Tee Nut, SST	8
100365	3/8" SAE Flat Washer, SST	33
127179	5/8" O.D. x 3/8" Bushing, SST	6
138915	Bolt Link, SST	14
156962	5/8" O.D. x 1/2" Bushing, SST	7
157224	.439" I.D. x 1.156" Bushing, SST	7
157704	7/16" x 2" BHCS w/Pin Limited Thread, SST	7
162729	Connecting Plug	14
106518	**Grab Bar Hardware Package**	1
100196	3/8" x 7/8" BHCS w/Pin, SST	2
100351	3/8" Tee Nut, SST	2
100610	1/4" x 5/8" Drive Rivet, AL/SST	1
	Deck To Deck	
100610	1/4" x 5/8" Drive Rivet, AL/SST	4
105327	5" Half Clamp, Specify Color	6
154460	Pod, Specify Color	3
1643670	Footer, Specify Color	7
176895	3/8" x 1" x 2 1/2" Link, SST	4
177932	Pod Bolt Plate, Specify Color	3
178586	1 5/16" O.D. x 1 5/8" Long AL. Spacer	3
192629	Beam, Specify Color	1
192734	SwiggleKnots Cable A, Black	2
192735	SwiggleKnots Cable B, Black	1
192736	SwiggleKnots Cable C, Black	2
192737	SwiggleKnots Cable D, Black	2
192748	Cable Ball Knot, Specify Color	24
193111	1/4" P70 x 24 5/16" Long Chain	2
190780	1/4" P70 x 18 9/16" Long Chain	2
193113	1/4" P70 x 21 13/16" Long Chain	2
193114	1/4" P70 x 31 13/16" Long Chain	1
141541	Grab Bar, Specify Color	2
195411	**SwiggleKnots Bridge Hardware Package**	1
100171	3/8" x 1 1/2" BHCS w/Pin, SST	24
100196	3/8" x 7/8" BHCS w/Pin, SST	17
100290	3/8" x 7/8" BHCS w/Pin Limited Thread, SST	7
100292	3/8" x 1 1/4" BHCS w/Pin Limited Thread, SST	14
100351	3/8" Tee Nut, SST	8
100365	3/8" SAE Flat Washer, SST	33
127179	5/8" O.D. x 3/8" Bushing, SST	6
138915	Bolt Link, SST	14
156962	5/8" O.D. x 1/2" Bushing, SST	7
157224	.439" I.D. x 1.156" Bushing, SST	7
157704	7/16" x 2" BHCS w/Pin Limited Thread, SST	7
162729	Connecting Plug	14
106518	**Grab Bar Hardware Package**	2
100196	3/8" x 7/8" BHCS w/Pin, SST	4
100351	3/8" Tee Nut, SST	4
100610	1/4" x 5/8" Drive Rivet, AL/SST	2

Specifications are subject to change without notice.

Document #24321200

Eco #0101303 Document 24321200 replaces 20997800. Consolidate chain part numbers.
12/15/2020 Added specify color to cable parts.

PlayBooster® 193171 SwiggleKnots™ Bridge, 123"

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Specifications

Cable Assembly: **(Cable)** Made of tightly woven polyester-wrapped, six-stranded galvanized-steel cable with a polypropylene core. **(Cable Connectors)** 6063-T6 aluminum

Pod: Rotationally molded from U.V. stabilized linear low density polyethylene, color specified.

Chain: Steel 1/4" (6,35 mm) straight link chain, 3,150 lbs. (1428,82 kilograms) working load limit. Finish: ProGuard.

Ball Knot: Rotationally molded from U.V. stabilized linear low density polyethylene, color specified.

Pod Bolt Plate: Weldment consists of 3/16" (4,75 mm) HRPO steel plate and 3/8" (9,53 mm) thick SST plate. Finish: ProShield®, color specified.

Grab Bar: Weldment comprised of formed 7/8" O.D. 11 GA (.120") and 1/4" x 1 3/4" stainless steel half clamp. Finish: TenderTuff™, color specified.

Beam: Weldment comprised of 2.375" (60,33 mm) O.D. RS20 (.095"-.105") (2,41 mm-2,67 mm) wall galvanized steel tubing, 3/8" (9,53 mm) thick HRPO steel plate, and 1/4" (6,35 mm) HRPO flat steel. Finish: ProShield, color specified.

Footer: Weldment comprised of 1.660" (42,16 mm) O.D. RS20 (.120" - .130") (3,05 mm-3,30 mm) wall galvanized steel tubing and 3/16" (4,75 mm) HRPO sheet steel. ProShield, color specified.

Half Clamps: Cast aluminum. Finish: ProShield, color specified.

Fasteners: Primary fasteners shall be socketed and pinned tamperproof in design, stainless steel (SST) per ASTM F 879 unless otherwise indicated (see specific product installation/specifications).

Installation Time: Approx. 5 man hours
Concrete Req.: Approx. 9.17 cu. ft.
Weight: 141 lbs. Ground Level
146 lbs. Ground To Deck
151 lbs. Deck To Deck
Fall Height: 49"-51" (1,24 m-1,29 m)

Installation Instructions

1) **(Direct Bury) Refer to the Site Plan for footing locations.**

2) Attach beam to posts at height shown. Refer to the Beam Attachment Detail.

3) **(Ground To Deck & Deck To Deck)** Attach grab bars to posts at dimension shown, using 5" half clamps and 3/8" x 7/8" BHCS w/pin with 3/8" tee nuts. Refer to the Typical Offset Hanger Clamp Assembly Sheet.

4) Attach cable ball knots to cables A, C and D. Refer to the Cable Ball Knot Attachment Detail.

5) Attach pod cable assemblies to pod climb across tabs. Refer to the Pod Cable Attachment Detail. **NOTE:** *Pod cable assemblies are numbered A, B, C and D, and must be attached to pod climb across as shown.*

6) Attach chains to cables C and D. Refer to the Chain Attachment Detail.

7) Feed cables A and B through 1 5/16" O.D. x 1 5/8" long spacers and holes in pods. Attach pod bolt plates to cables Refer to the Pod Attachment Detail.

8) Attach pod bolt plates to pods. Refer to the Pod Attachment Detail.

9) Attach chains to pod bolt plates. Refer to the Pod Attachment Detail. **NOTE:** *Chains are different lengths, and must be attached to pod bolt plates as shown.*

10) Attach footers to chains. Refer to the Footer Attachment Detail.

11) With pod cable assemblies positioned properly, pour concrete footings. Allow concrete footings to cure for a minimum of 72 hours before users are allowed to play on the structure.

    (Direct Bury With Pour-In Place Surfacing) Cut 7 lengths of concrete form tubes (not supplied) long enough to set on top of concrete footings and be level with top of concrete slab. Concrete form tubes should be 8"-10" in diameter. Disconnect bolt links from pod bolt plates. Place concrete form tubes over chains and footers. Connect bolt links to pod bolt plates. Fill concrete form tubes with pea gravel, sand or sub grade. Pour concrete slab. After concrete slab has cured, pour surfacing. **NOTE:** *When pouring surfacing leave a 1"-3" diameter opening around chains. Refer to the Direct Bury Pour-In-Place Surfacing Detail.*

12) Install 1/4" x 5/8" drive rivets in 5" half clamps. Drill through hole in 5" half clamps and into 5" post with a 1/4" or "F" (only) drill bit, insert drive rivet in hole through clamp and into post. Hammer drive rivet pin in until flush with head. Refer to the Typical Offset Hanger Clamp Spec Sheet.

13) Install protective surfacing before users are allowed to play on the structure.

Specifications are subject to change without notice.

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SAFETY NOTE

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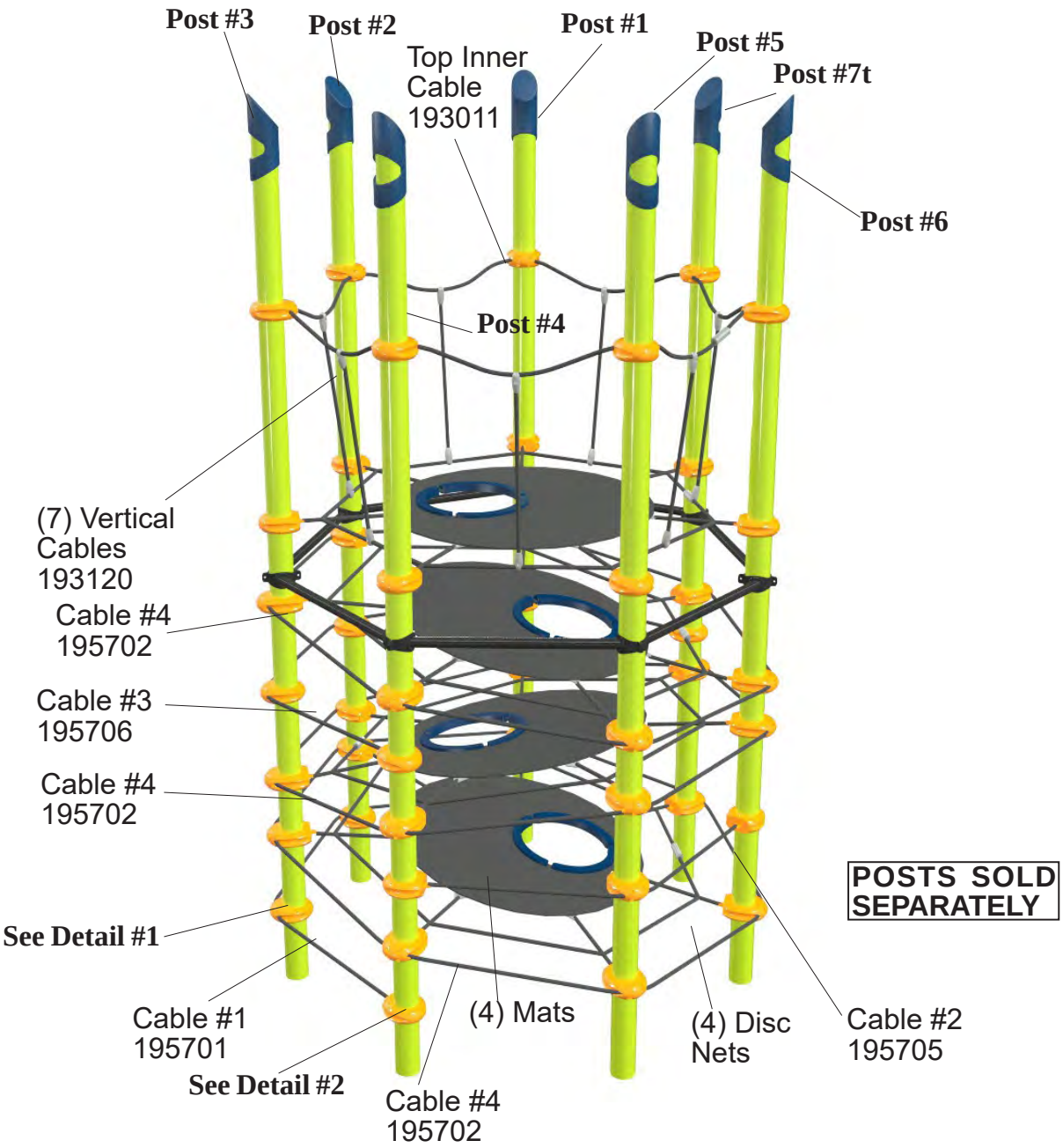
IMPORTANT! Clamp and brace locations and dimensions are critical.



POSTS SOLD SEPARATELY

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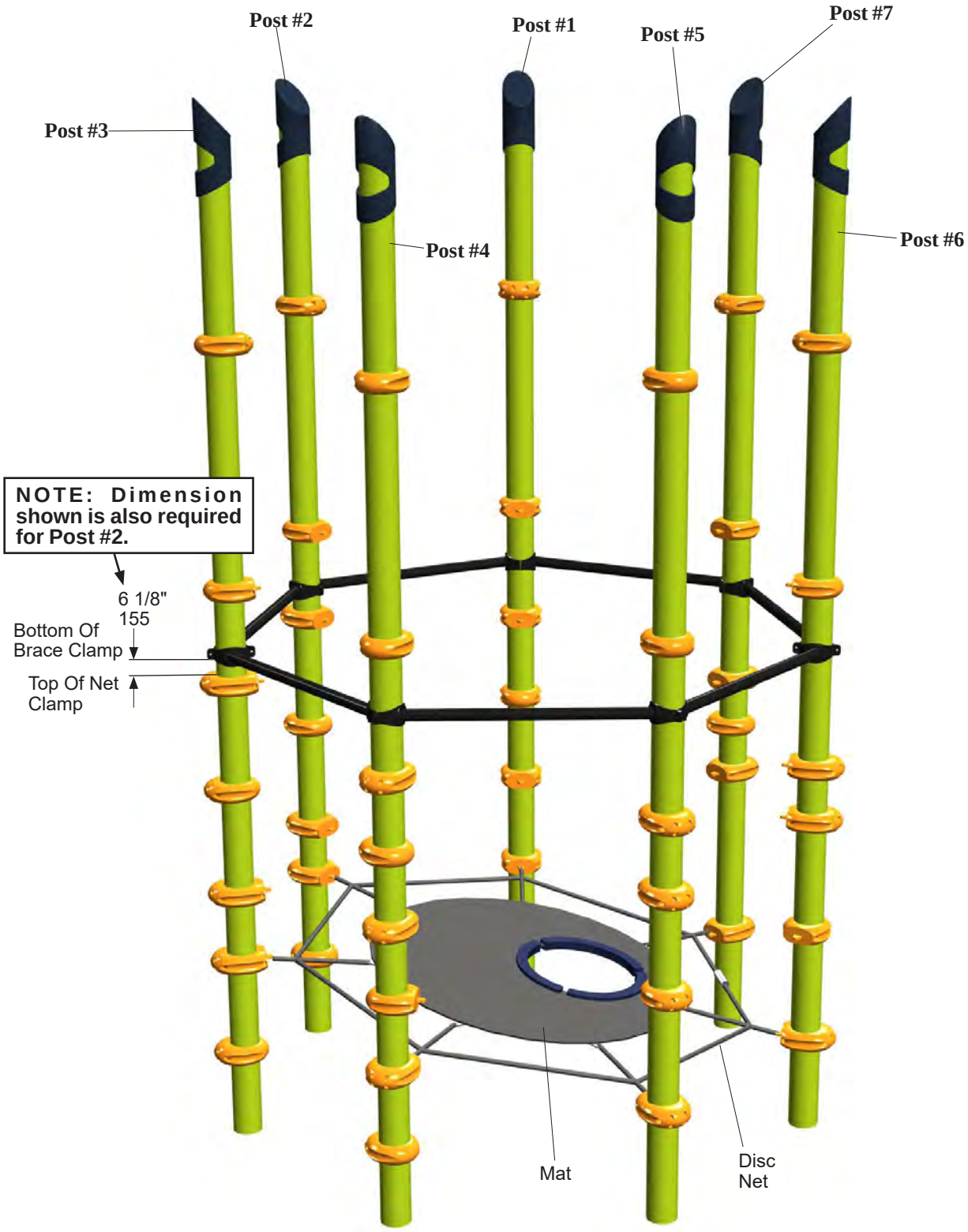
STEP #1



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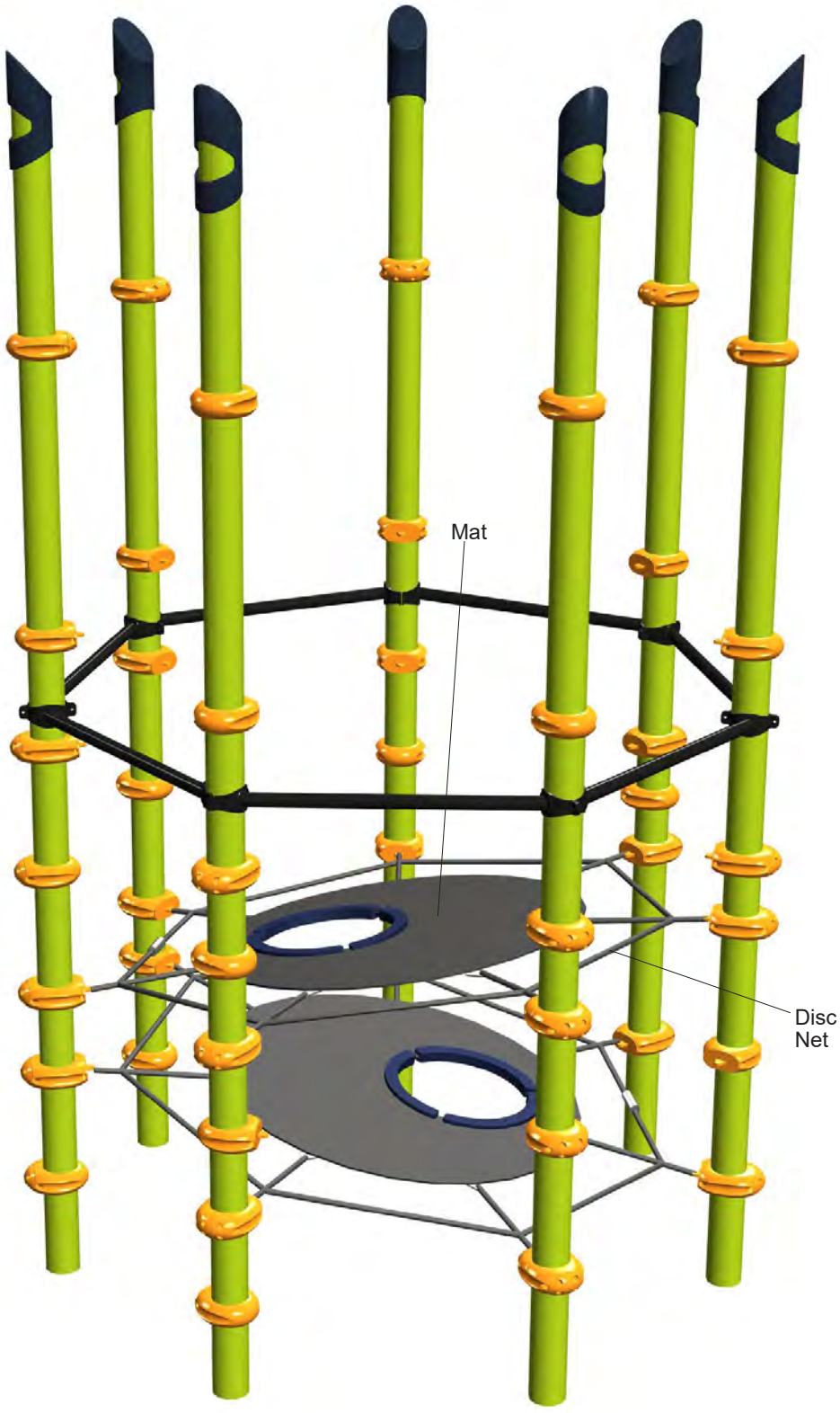
STEP #2



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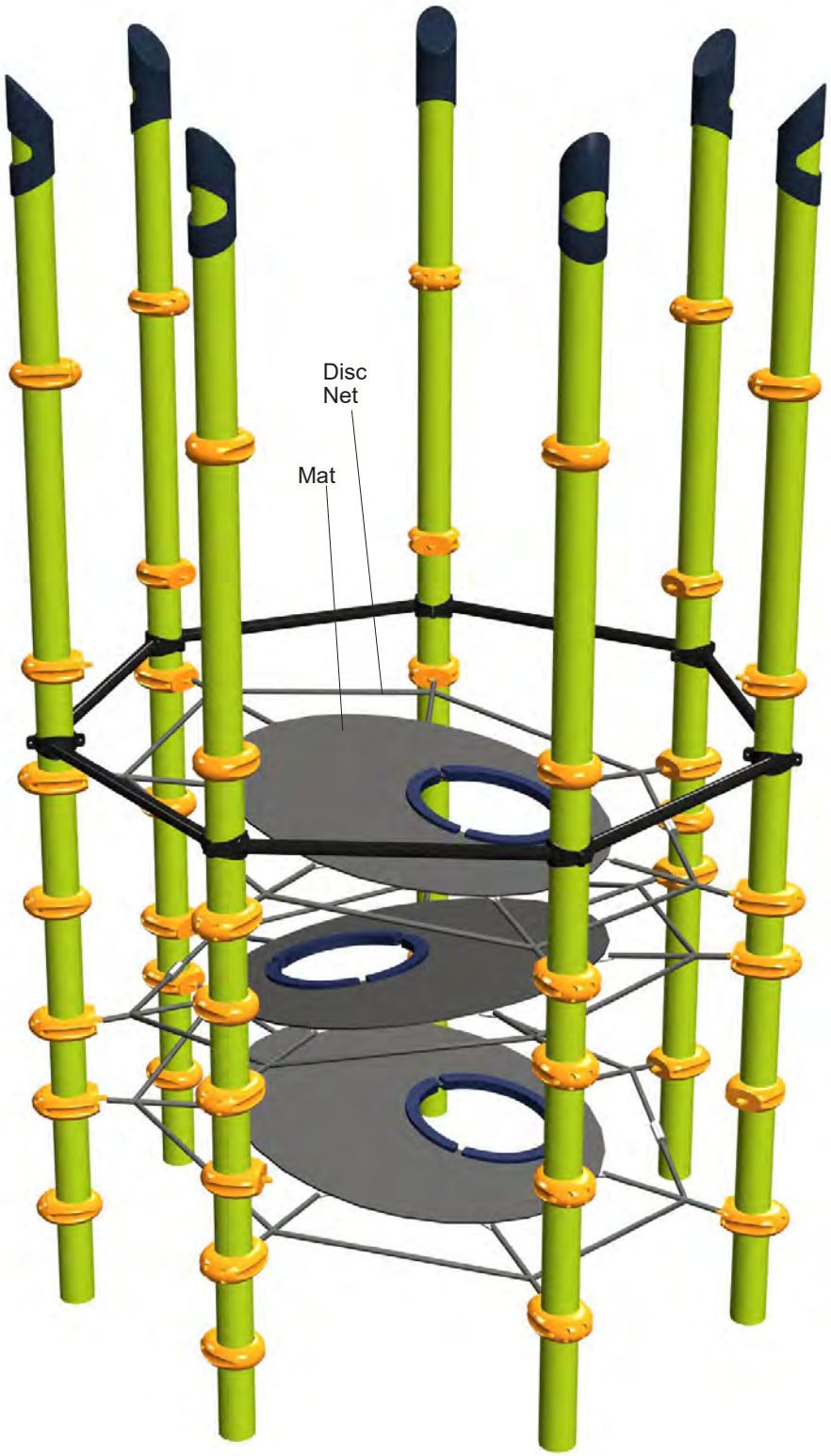
STEP #3



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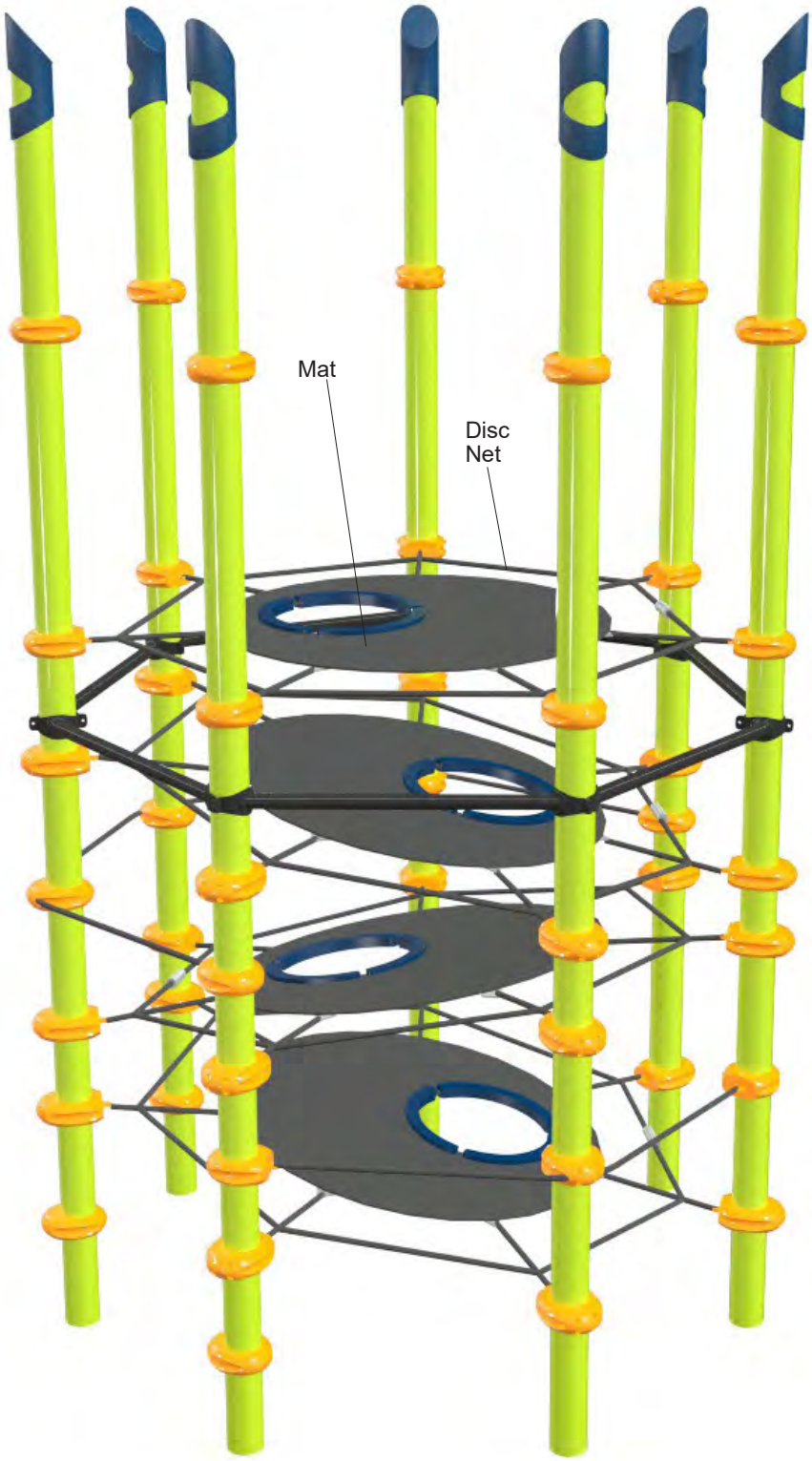
STEP #4



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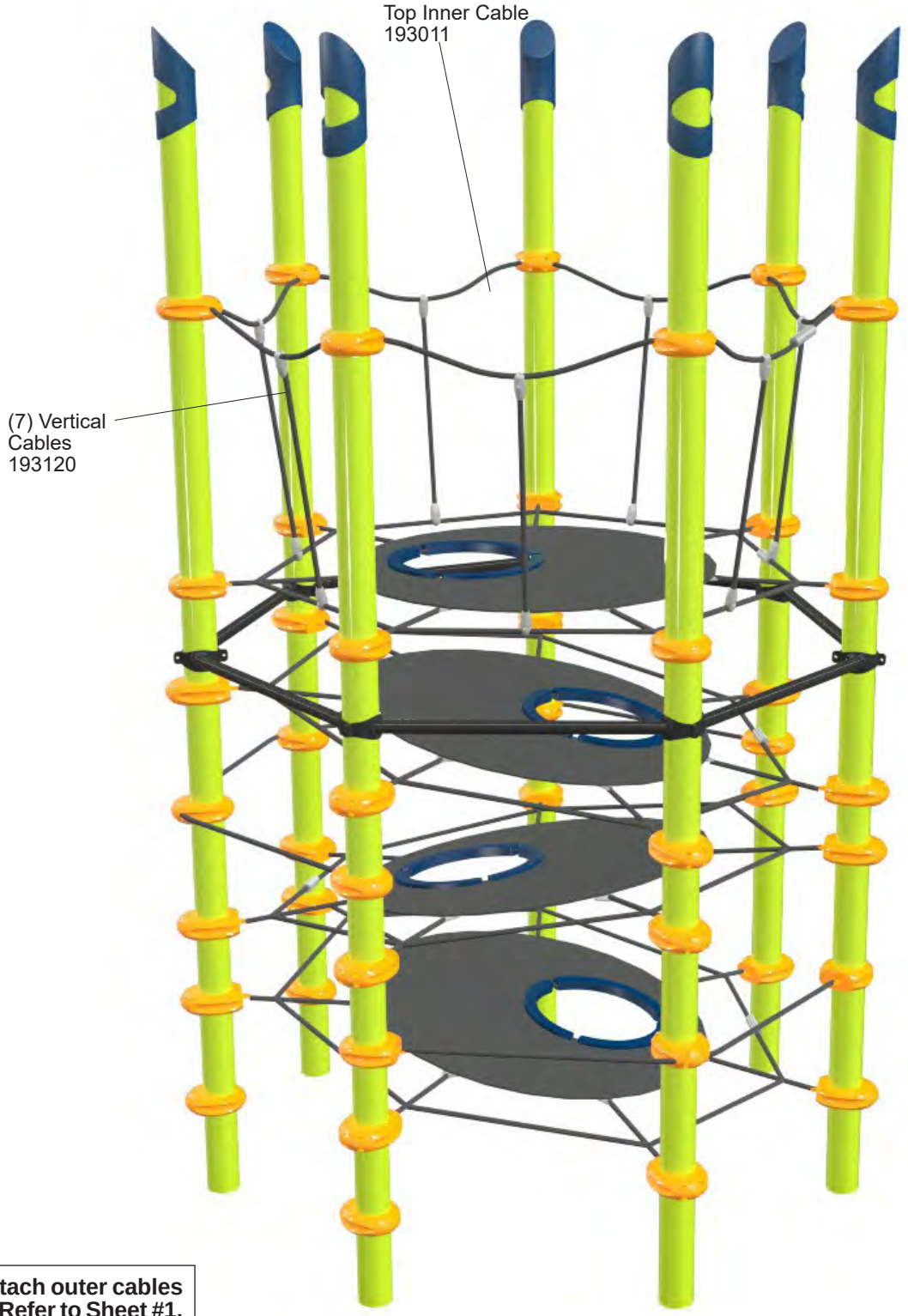
STEP #5



Step #6: Attach outer cables to clamps, Refer to Sheet #1.

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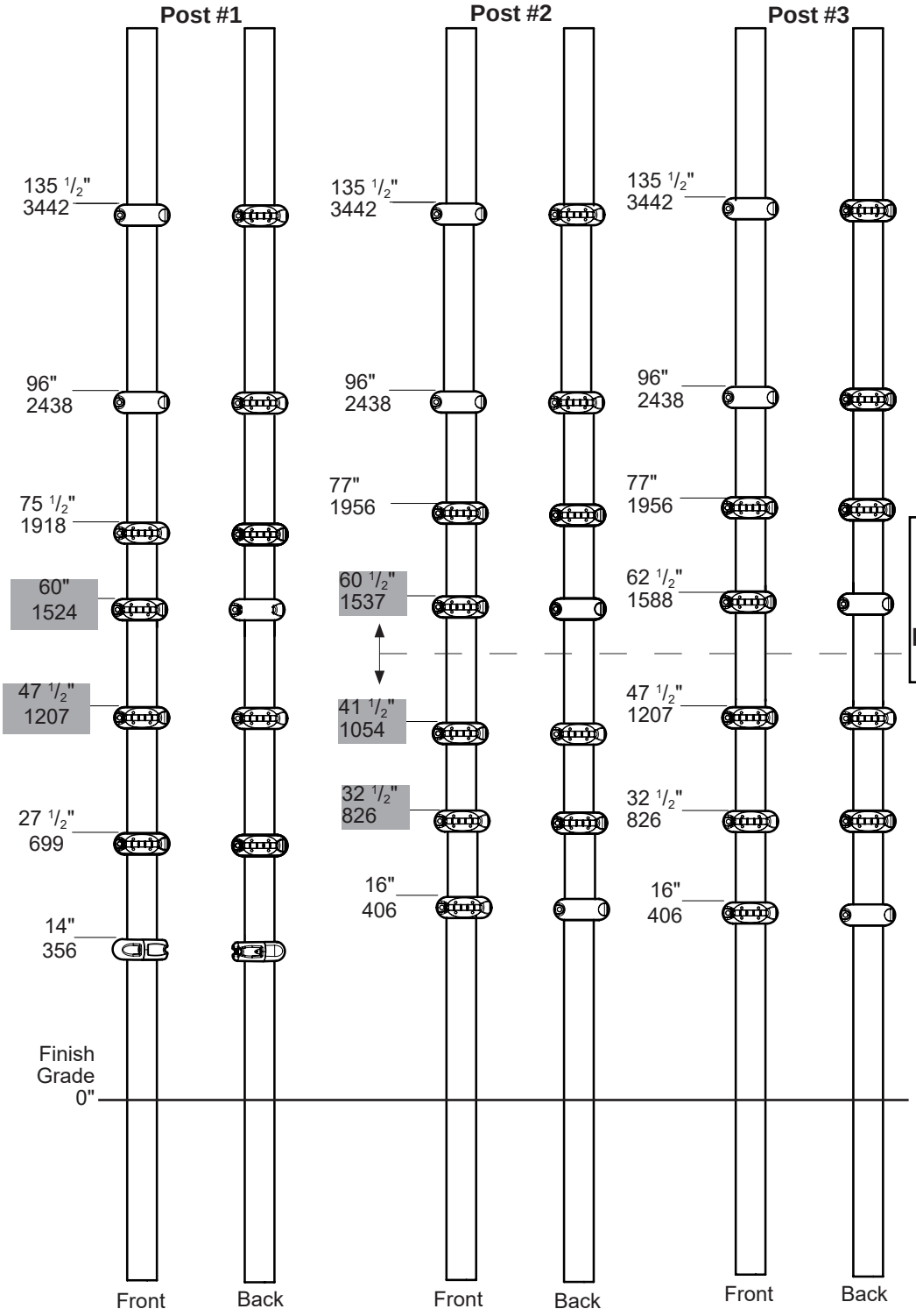
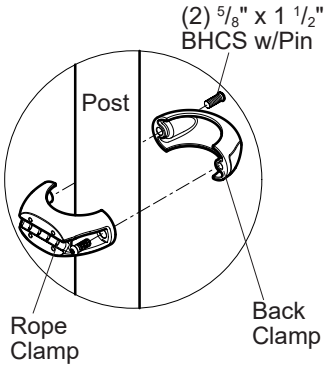
DETAIL
CLAMP PLACEMENT



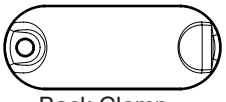
ALL CLAMP HEIGHT MEASUREMENTS TAKEN FROM FINISH GRADE

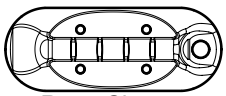
NOTE: THE HIGHLIGHTED CLAMPS WILL BE ADJUSTED IF A ZENITH NET IS INSTALLED TO NETPLEX. REFER TO SITE PLAN

DETAIL
ROPE CLAMP ATTACHMENT



NOTE: Clamps shown on back view face center of Disc Net Climber.


Back Clamp


Rope Clamp

IMPORTANT! Clamp and brace locations and dimensions are critical.

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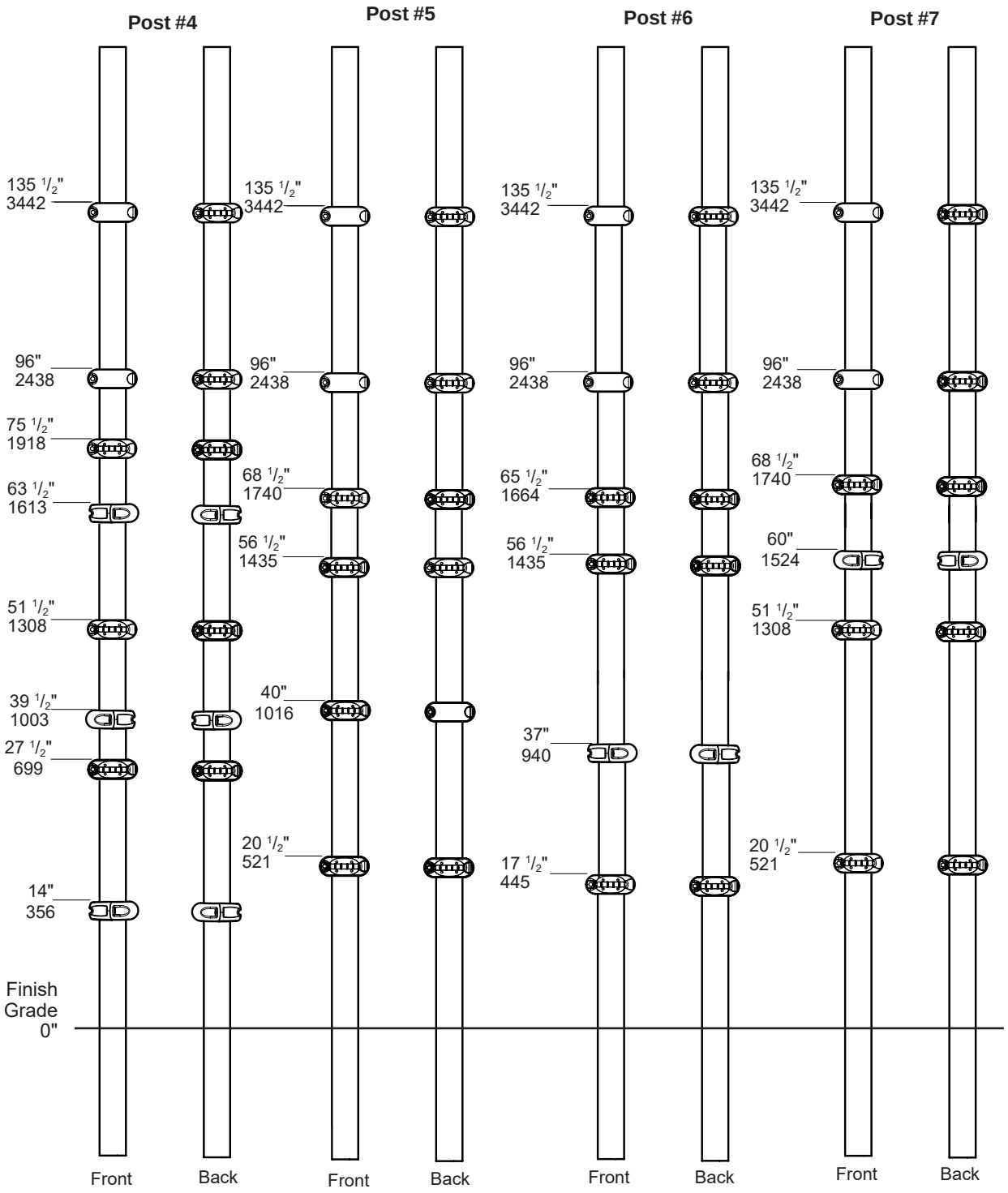
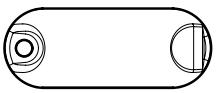
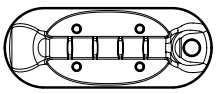
DETAIL
CLAMP PLACEMENT



NOTE: Clamps shown on back view face center of Disc Net Climber.



Back Clamp



Rope Clamp

IMPORTANT! Clamp and brace locations and dimensions are critical.

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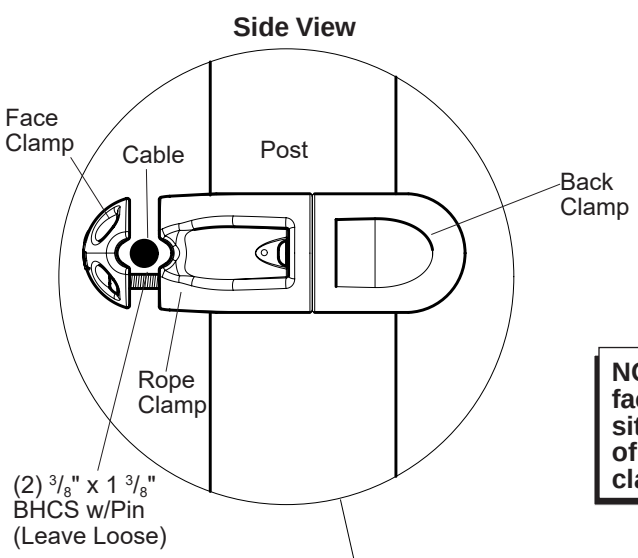
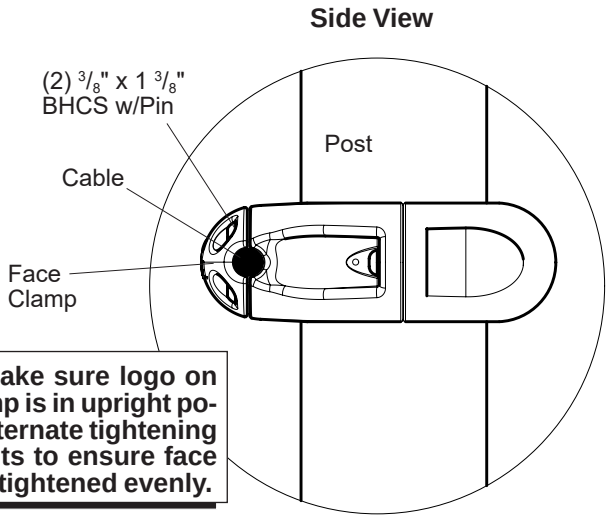
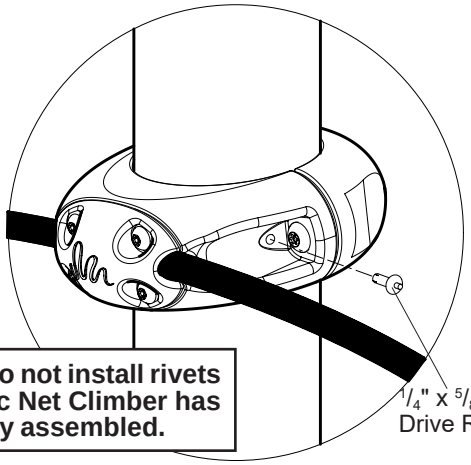
DETAIL #1
FACE CLAMP ATTACHMENT



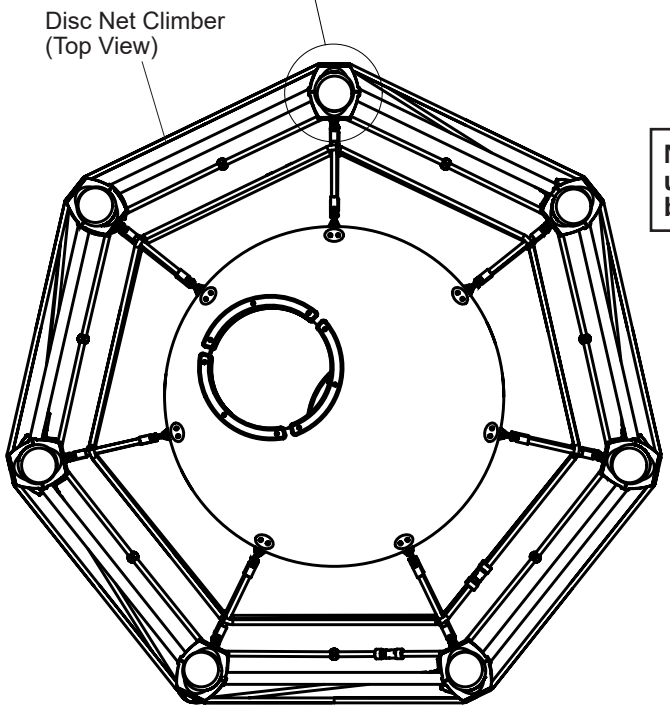


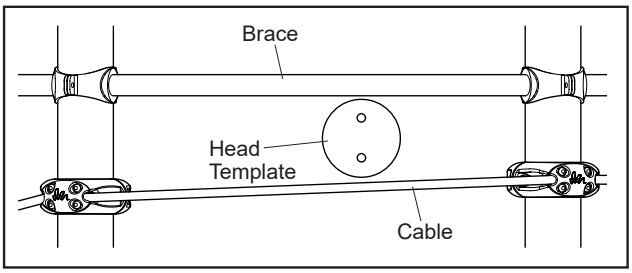
NOTE: Make sure logo on face clamp is in upright position. Alternate tightening of (4) bolts to ensure face clamp is tightened evenly.

DETAIL
DRIVE RIVET



NOTE: Do not install rivets until Disc Net Climber has been fully assembled.





INSPECTION

Place head template between brace and cable. Template should be perpendicular to the opening. Head template shall pass between brace and cable.

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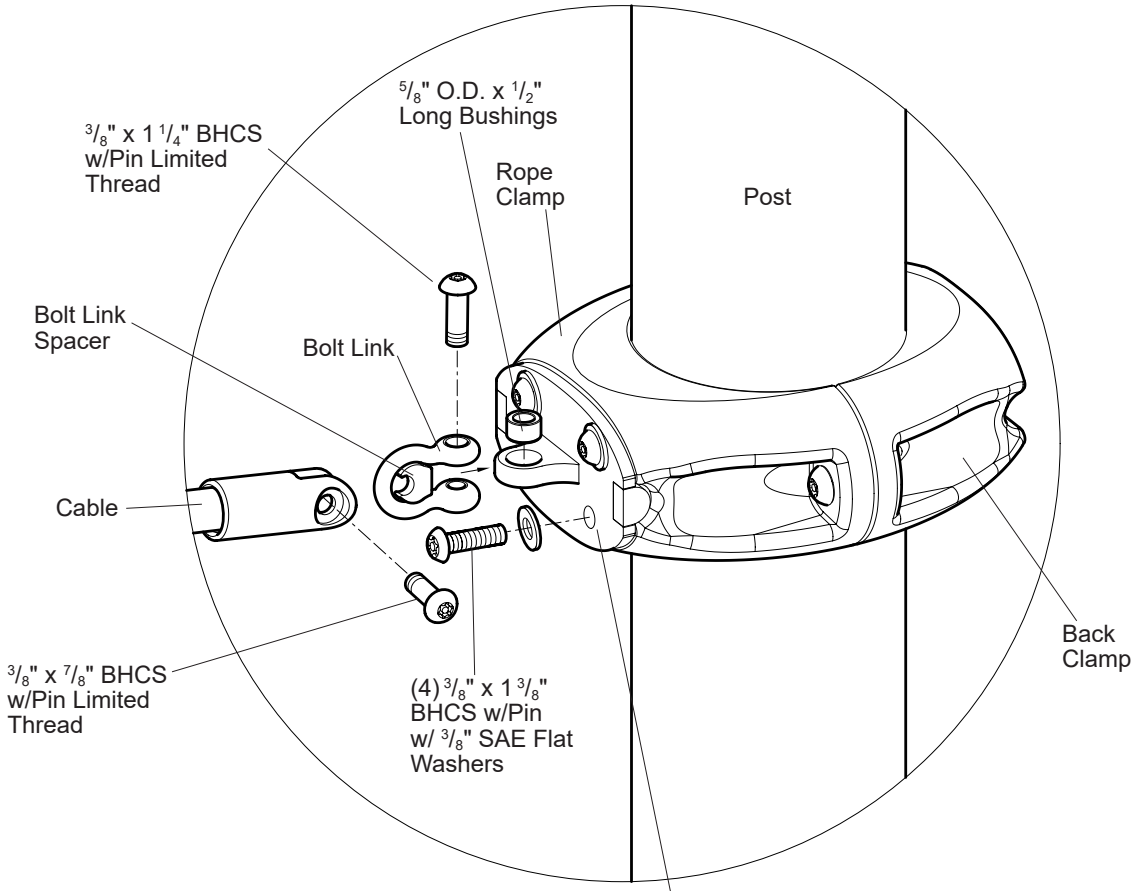
SAFETY NOTE

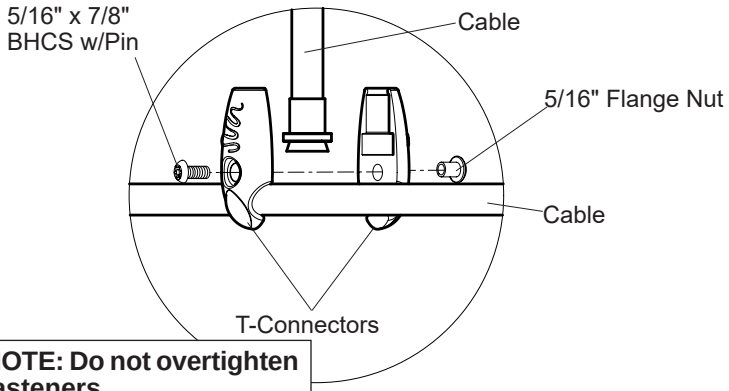
Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. ASTM F1487.)

194964f

DETAIL #2
CABLE TO CASTING PLATE ATTACHMENT

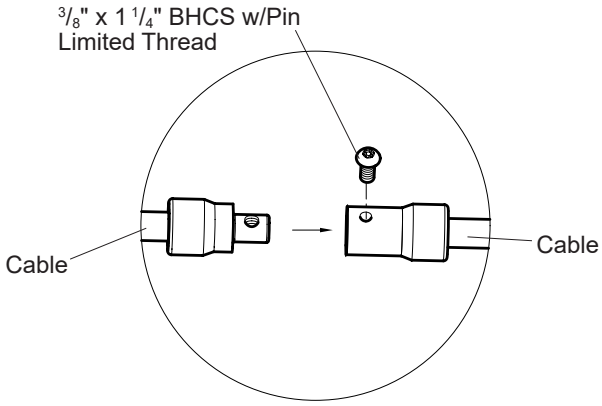


DETAIL
T-CONNECTOR ATTACHMENT



NOTE: Do not overtighten fasteners.

DETAIL
CABLE TO CABLE ATTACHMENT



PlayBooster® **194659 Disc Net™ Climber, 7-Post**

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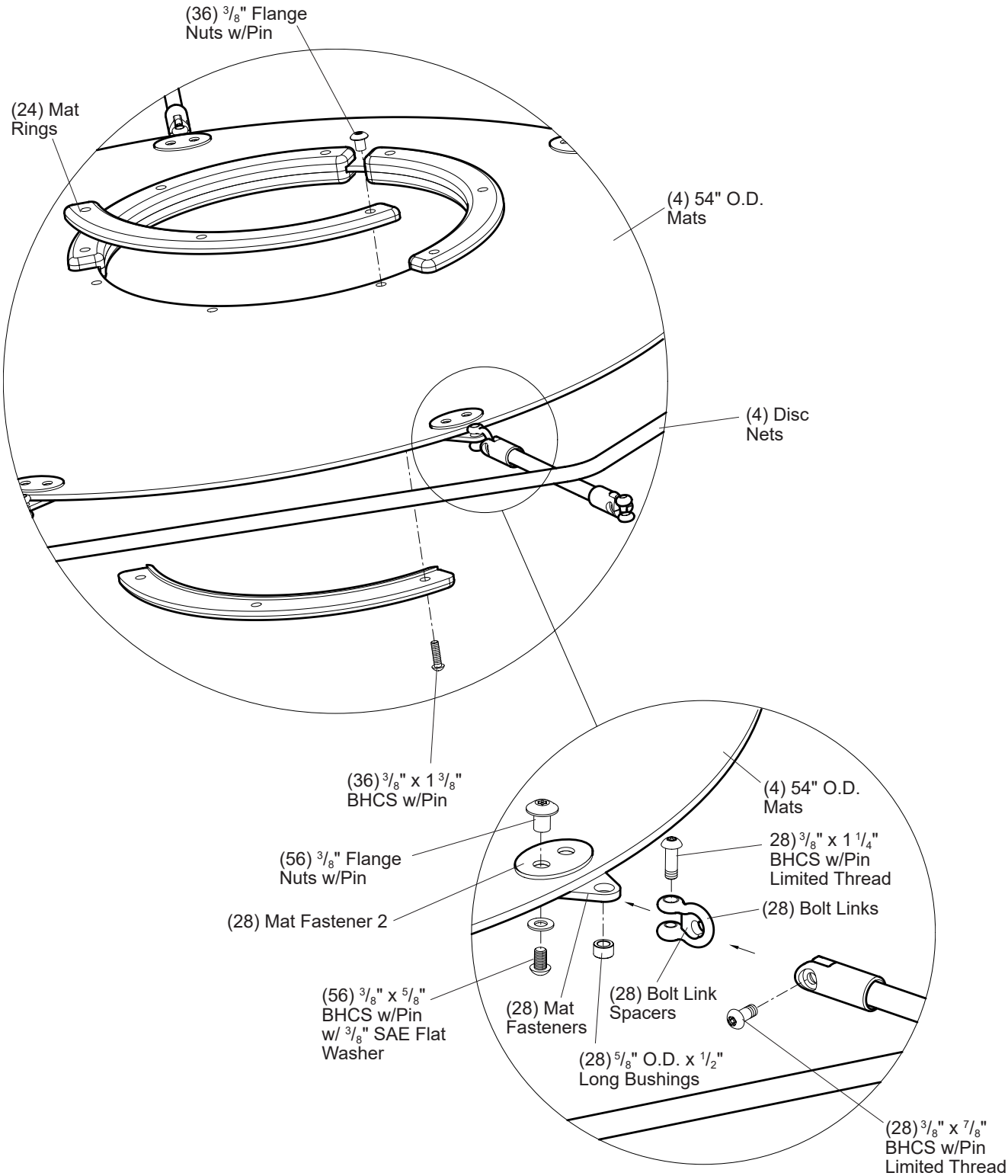
SAFETY NOTE

Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. ASTM F1487.)

196045z

DETAIL
MAT ATTACHMENT



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PlayBooster® 194659 Disc Net™ Climber, 7-Post

Installation Time: Approx. 24 man hours
Weight: 527 lbs.
Fall Height: 96" (2438 mm)

Parts List

Part#	Description	Qty.
100610	1/4" x 5/8" Drive Rivet, AL/SST	54
127551	5/8" x 1 1/2" BHCS w/Pin, SST	94
138915	Bolt Link, SST	62
228416	54" O.D. Mat, Black	4
191086	T-Connector, Aluminum	28
193011	Top Inner Cable, Specify Color	1
193120	Vertical Cable, Specify Color	7
193438	Mat Ring, Specify Color	24
193984	Rubber Mat Fastener, Black	28
193985	Rubber Mat Fastener 2, Black	28
194082	Casting Plate Single Tab, Specify Color	34
203694	Disc Net w/Clevis Ends, Specify Color	4
195701	Disc Cable 1 (122"), Specify Color	1
195702	Inner Cable 4 (323 15/16"), Specify Color	3
195705	Inner Cable 2 (76"), Specify Color	1
195706	Inner Cable 3 (167 1/4"), Specify Color	1
195922	5" Rope Clamp, Specify Color	68
195942	5" Face Clamp, Specify Color	34
195943	5" Back Clamp, Specify Color	26
111812	Permalene® Head Form Set, Yellow/Black	1
255122	**7-Post Disc Net Climber Hardware Package**	1
100195	3/8" x 5/8" BHCS w/Pin, SST	56
100292	3/8" x 1 1/4" BHCS w/Pin Limited Thread, SST	66
100353	3/8" Flange Nut w/Pin, SST	92
100365	3/8" SAE Flat Washer, SST	192
113027	3/8" x 1 3/8" BHCS w/Pin, SST	308
156962	5/8" O.D. x 1/2" Long Bushing, SST	62
175006	Flg Nut 6LP 5/16", SST	14
132626	BHCS 6LP 5/16" x 7/8", SST	14
196319	Bolt Link Spacer, Aluminum	62
100290	3/8" x 7/8" BHCS w/Pin Limited Thread, SST	62

Specifications

Rubber Mat Fastener: Fabricated from 3/8" (9,53 mm) HRPO steel plate. Finish: ProShield, black in color.

Rubber Mat Fastener 2: Fabricated from 1/8" (3,17 mm) HRPO steel plate. Finish: ProShield, black in color.

Mat Ring: Permalene®, color specified.

Casting Plate: Weldment comprised of 3/8" (9,53 mm) HRPO steel plate and 1/4" (6,35 mm) HRPO steel plate. Finish: ProShield®, color specified.

Clamp: 369.1 Aluminum. Finish: ProShield®, color specified.

Mat: .315" (8,00 mm) Thick mini rough top rubber belting with polyester fabric plys, black in color.

Cable Assembly: **(Cable)** Made of tightly woven polyester-wrapped, six-stranded galvanized-steel cable with a polypropylene core. **(Cable Connectors)** 6063-T6 aluminum.

Fasteners: Primary fasteners shall be socketed and pinned tamperproof in design, stainless steel (SST) per ASTM F 879 unless otherwise indicated (see specific product installation/specifications).

Installation Instructions

1) Attach clamps to posts. Refer to Rope Clamp Attachment Detail.
2) Assemble mats. Refer to the Mat Attachment Detail.
3) Starting with the bottom mat, attach mats to single tab casting plates. Refer to Detail #2 Cable to Casting Plate Attachment Detail.
4) Attach top cable. Refer to Detail #1 Face Clamp Attachment and Cable to Cable Attachment Details.
5) Attach vertical cables. Refer to the T-Connector Attachment Detail.
6) Attach outer cables. Refer to the Detail #1 Face Clamp Attachment and Cable to Cable Attachment Details.
7) Perform compliance check using supplied templates to ensure all spaces are compliant.
8) Install 1/4" x 5/8" drive rivets in 5" rope clamps. Drill through hole in 5" rope clamps and into 5" post with a 1/4" or "F" (only) drill bit, insert drive rivet in hole through clamp and into post. Hammer drive rivet pin in until flush with head. Refer to the Rivet Detail.
9) Install protective surfacing before users are allowed to play on the structure.

Document #30852000

Specifications are subject to change without notice.

ECO-0102244 Document 30852000 replaces 26928700. Modified clamp positions and note for zenith applications

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SAFETY NOTE

Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. ASTM F1487.)

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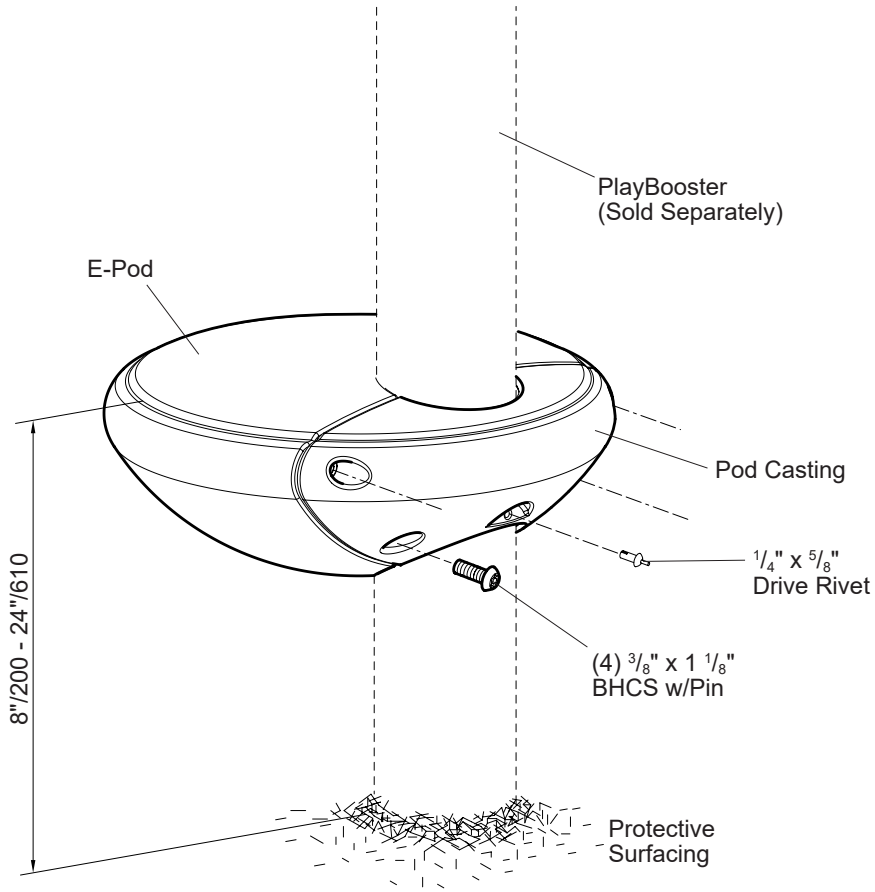

PlayBooster® 166809 E-Pod® Step

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PlayBooster® 166809 E-pod® Step

Parts List

Part#	Description	Qty.
154461	E-Pod, Specify Color	1
156806	Pod Casting, Specify Color	1
156968	**Pod Hardware Package**	1
100198	$^3/_8$" x 1 $^1/_8$" BHCS w/Pin, SST	4
100610	$^1/_4$" x $^5/_8$" Drive Rivet, AL/SST	1

Specifications

E-Pod: Rotationally molded from U.V. stabilized linear low density polyethylene, color specified.

Pod Casting: Fabricated from sand cast alloy 356 in accordance with ASTM B26. Finish: ProShield®, color specified.

Fasteners: Primary fasteners shall be socketed and pinned tamperproof in design, stainless steel (SST) per ASTM F 879 unless otherwise indicated (see specific product installation/specifications).

Installation Time: Approx. $^1/_4$ man hour
Weight: 11 lbs.
Fall Height: Pod Height

Installation Instructions

1) Attach e-pod and pod casting to post as shown, using $^3/_8$" x 1 $^1/_8$" BHCS w/pin.

2) Drill through hole in pod casting and into post with a $^1/_4$" or "F" (only) drill bit. Insert $^1/_4$" x $^5/_8$" rivet in hole and hammer rivet pin in until it is flush with head.

3) Install protective surfacing before users are allowed to play on the structure.

Specifications are subject to change without notice.

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SAFETY NOTE

Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. ASTM F1487.)

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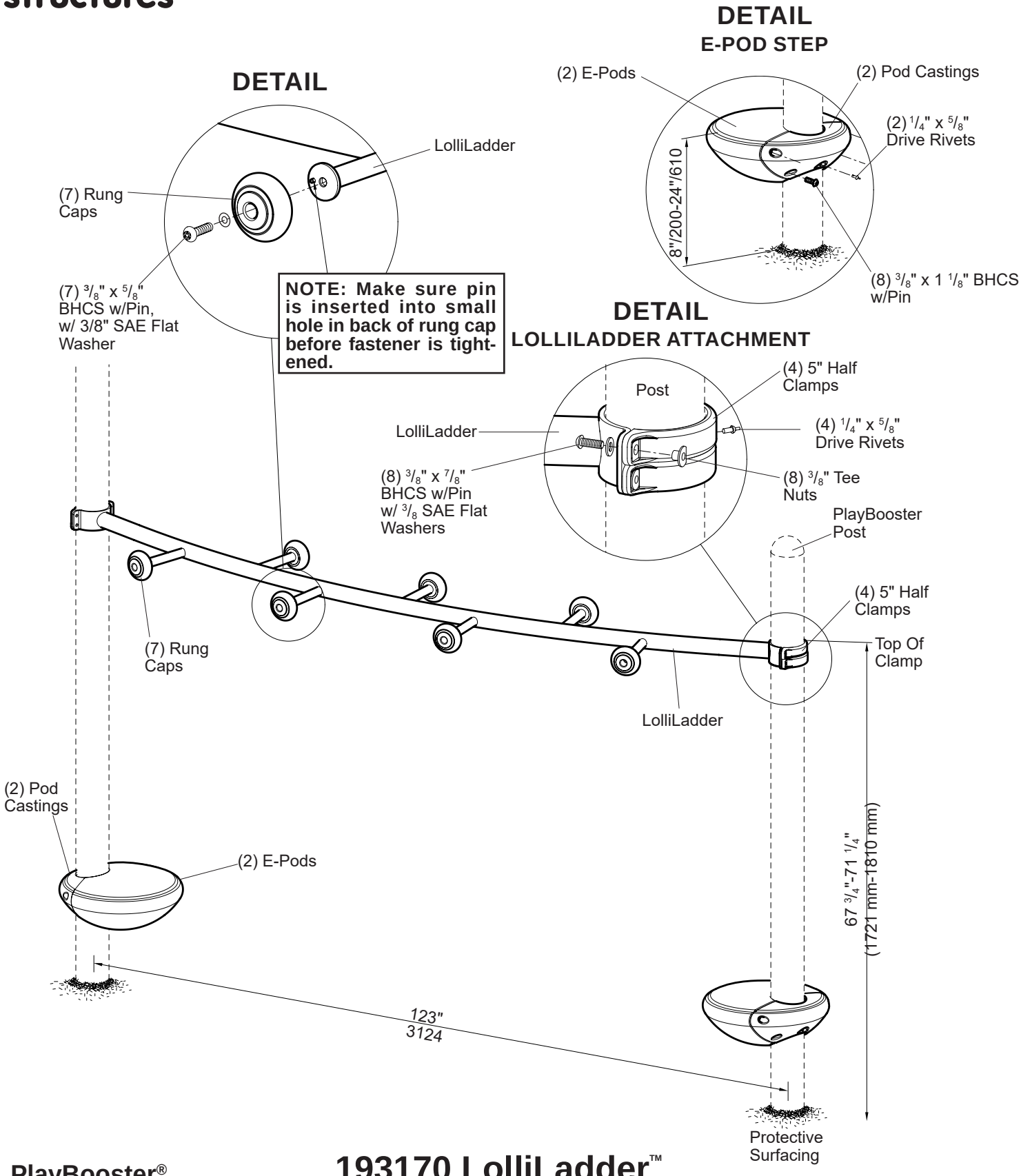

PlayBooster® 193170 LolliLadder™

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PlayBooster® 193170 LolliLadder™

Parts List

Part#	Description	Qty.
100610	1/4" x 5/8" Drive Rivet, AL/SST	4
105327	5" Half Clamp, Specify Color	4
182262	Rung Cap, Black	7
190760	LolliLadder, Specify Color	1
154461	E-Pod, Specify Color	2
156806	Pod Casting, Specify Color	2
249515	**LolliLadder Hardware Package**	1
100196	3/8" x 7/8" BHCS w/Pin, SST	8
100195	3/8" x 5/8" BHCS w/Pin, SST	7
100351	3/8" Tee Nut w/Pin, SST	8
100365	3/8" SAE Flat Washer, SST	15
156968	**Pod Hardware Package**	2
100198	3/8" x 1 1/8" BHCS w/Pin, SST	8
100610	1/4" x 5/8" Drive Rivet, AL/SST	2

Specifications

LolliLadder: Weldment comprised of 1/4" (6,35 mm) stainless flat steel, 2.375" (60,33 mm) O.D. RS40 (.130"-.140") (3,30 mm-3,55 mm) wall galvanized steel tubing, and 1.315" (33,40 mm) O.D. RS20 (.080"-.090") (2,03 mm-2,29 mm) wall galvanized tubing. Finish: ProShield®, color specified.. Finish: ProShield, color specified.

Rung Cap: EPDM, black in color.

E-Pod: Rotationally molded from U.V. stabilized linear low density polyethylene, color specified.

Pod Casting: Fabricated from sand cast alloy 356 in accordance with ASTM B26. Finish: ProShield®, color specified.

Half Clamp: Cast aluminum. Finish: ProShield, color specified.

Fasteners: Primary fasteners shall be socketed and pinned tamperproof in design, stainless steel (SST) per ASTM F 879 unless otherwise indicated (see specific product installation/specifications).

Installation Time: Approx. 2 1/4 man hours
Weight: 81 lbs.
Max. Fall Height: 69" -72" (1,75 m-1,82 m)

Installation Instructions

1) **(Direct Bury) Refer to the Site Plan for footing locations.**

2) Attach rung caps to LolliLadder. Refer to Detail. **NOTE:** *Make sure pin is inserted into small hole in back of rung cap before fastener is tightened.*

3) Attach LolliLadder to posts at height shown. Refer to LolliLadder Attachment Detail.

4) Attach e-pods and pod castings to post as shown, using 3/8" x 1 1/8" BHCS w/pin. Refer to E-Pod Step Detail.

5) Drill through hole in pod casting and into post with a 1/4" or "F" (only) drill bit. Insert 1/4" x 5/8" rivet in hole and hammer rivet pin in until it is flush with head.

6) Install 1/4" x 5/8" drive rivets in all 5" half clamps. Drill through hole in 5" half clamps and into 5" post with a 1/4" or “F” (only) drill bit, insert drive rivet in hole through clamp and into post. Hammer drive rivet pin in until flush with head. Refer to the Typical Offset Hanger Clamp Spec Sheet.

7) Install protective surfacing before users are allowed to play on the structure.

Specifications are subject to change without notice.

Eco #0101422 Document 24949000 replaces 22573200. Rung cap and hdw pkg change.

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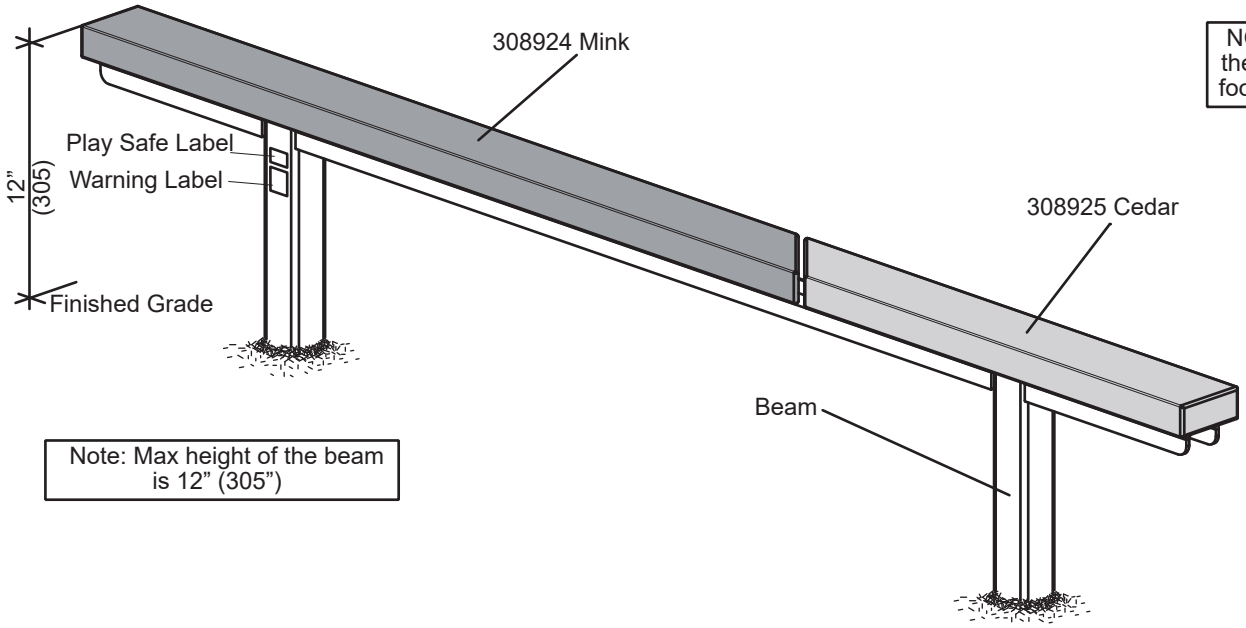
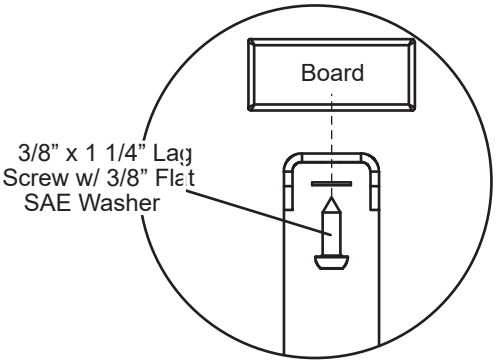
SAFETY NOTE
Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. ASTM F1487.)



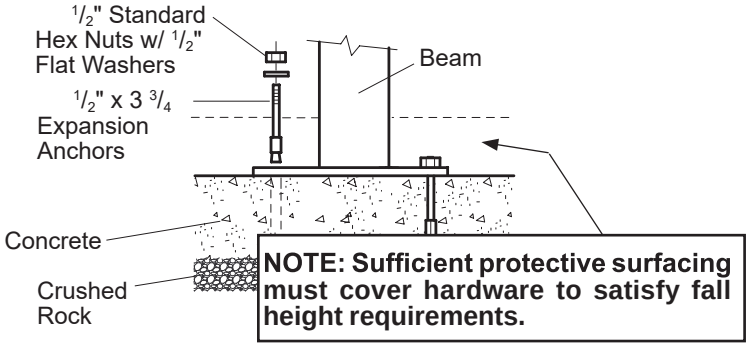
NOTE: Refer to the site Plan for footing location

Note: Max height of the beam is 12" (305")

DETAIL
BOARD CONNECTION

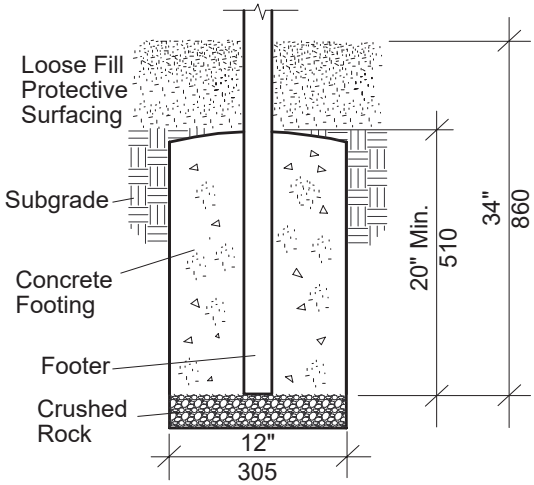


DETAIL
SURFACE MOUNT



NOTE: Sufficient protective surfacing must cover hardware to satisfy fall height requirements.

DETAIL
DIRECT BURY



Forma™

307436 Footprint™ Balance Beam

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Document #31570200

Forma™ 307436 Footprint™ Balance Beam

Parts List

Part#	Description	Qty.
308924	RPL BAL BEAM BRD #1, Mink	1
308925	RPL BAL BEAM BRD #2, Cedar	1
308926	RPL BAL BEAM FRM (DB), Specify Color	1
311065	RPL BAL BEAM FRAME (SM), Specify Color	1
314703	HDW PKG FOOTPRINT™ BALANCE BEAM	1
100365	WASHER FLAT SAE 3/8i SST	5
205152	LAG SCR BH 6LP 3/8x1-1/4i SST	5
183388	HDW PKG 4-HOLE SM 1/2-13	2
176046	EXP ANCHOR 1/2x3-3/4i ZP	4
100322	NUT HEX STD 1/2-13 SST	4
100363	WASHER FLAT 1/2i SST	4
204978	Hdw Pkg Labels 2-12 Yrs	1
115176	LABEL HD SRF WARNING ASTM	1
156846	LABEL PLAY SAFE 2-12 YRS	1
182212	LABEL ENTANGLEMENTWARNING	1
182213	LABEL HOT SURFACE WARNING	1

DB = Direct Bury
SM = Surface Mount

Specifications

Boards:	Recycled high-density polyethylene. Cedar and mink in color.
Fasteners:	Primary fasteners shall be socketed and pinned tamper-proof in design, stainless steel (SST) per ASTM F 879 unless otherwise indicated (see specific product installation/specifications).
Support:	Weldment comprised of 1.900" (48,26 mm) O.D. RS-20 (.090" - .100") (2,28 mm-2,54 mm) 1.315" (33,40 mm) O.D. RS-20 (.080" - 090") (2,03 mm-2,28 mm) and 3/16" x 5" (4,75 mm x 127 mm) diameter plate. Finish: ProShield, color specified.
Installation Time:	DB - Approx. 1 person hour
	SM - Approx. 1 person hour
Concrete Req.:	DB - Approx. 2.6 cu. ft.
Weight:	DB - 47 lbs.
	SM - 41 lbs.
Fall Height:	12" (0,30)

Installation Instructions

1) (Direct Bury) Dig footing as shown, see your plan view.

2) Attach recycled plastic lumber using lag screws with SAE flat washers as shown. Refer to Board Connection Detail.

3) (Direct Bury) Position beam in footing hole and pour concrete footing. With beam plumb and level, prop beam to hold in position. Allow concrete footer to cure a minimum of 72 hours before users are allowed to play on the structure.

   (Surface Mount) Mark anchor bolt locations on concrete slab through holes in support plate. Remove the footer. Drill 4" deep holes on marks into concrete slab using hammer drill and 1/2" masonry bit. Tap expansion anchors into holes and secure disc climber using 1/2" standard hex nuts with 1/2" flat washers."

4) Apply labels as shown.

5) Install protective surfacing before users are allowed to play on the component.

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SAFETY NOTE
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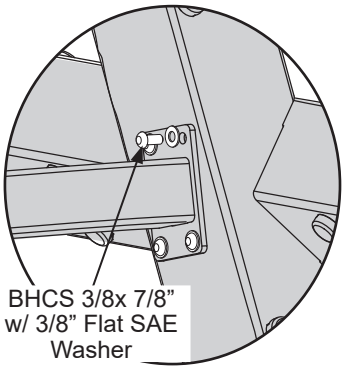
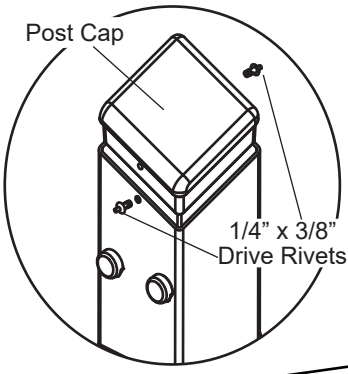
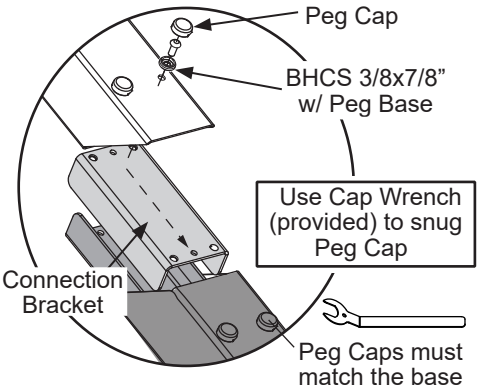
DETAIL FRAME BRACE CONN.

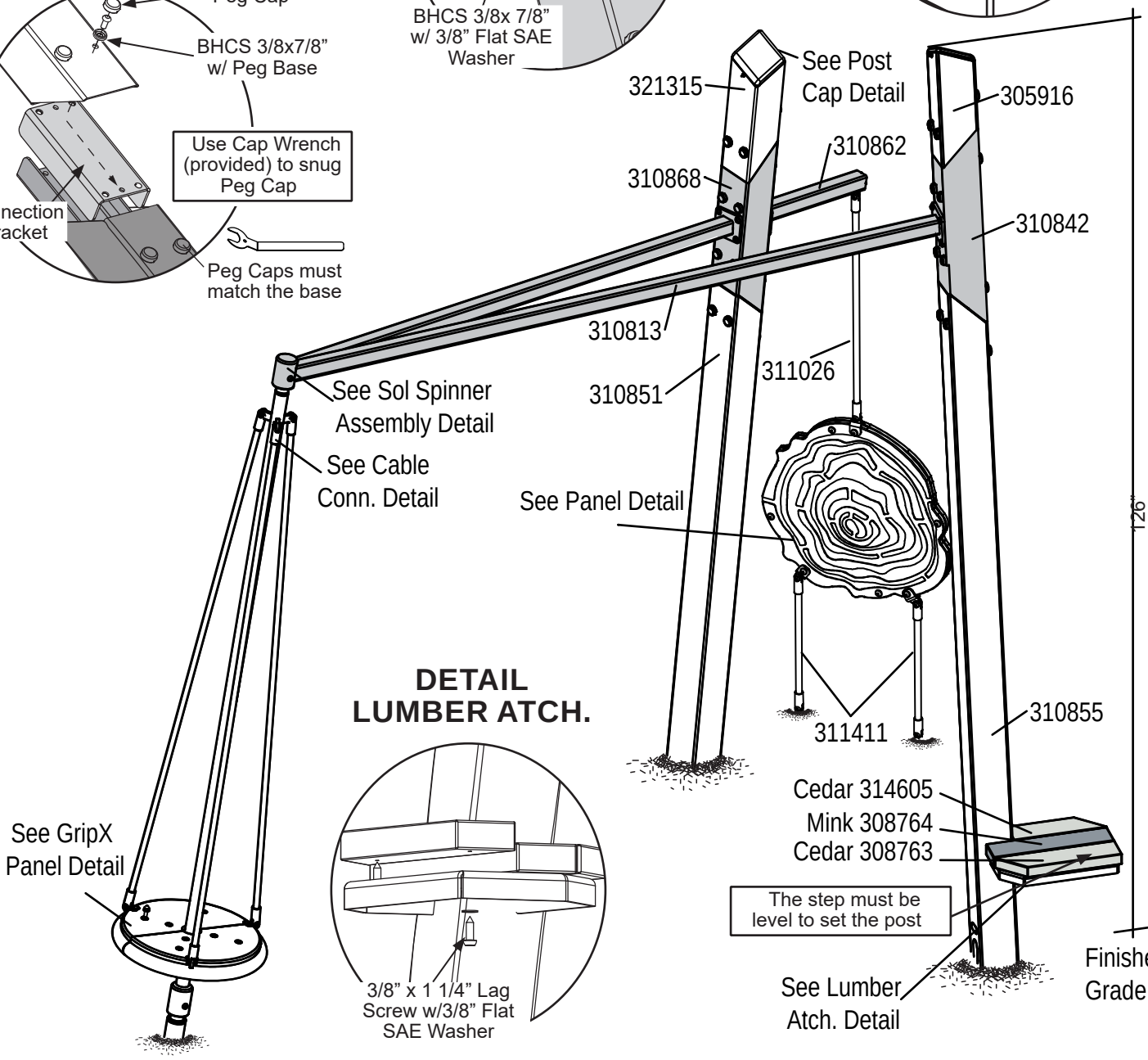


DETAIL POST CAP



DETAIL BRACKET CONN.





DETAIL LUMBER ATCH.

Forma™

307426 Sol™ Spinner

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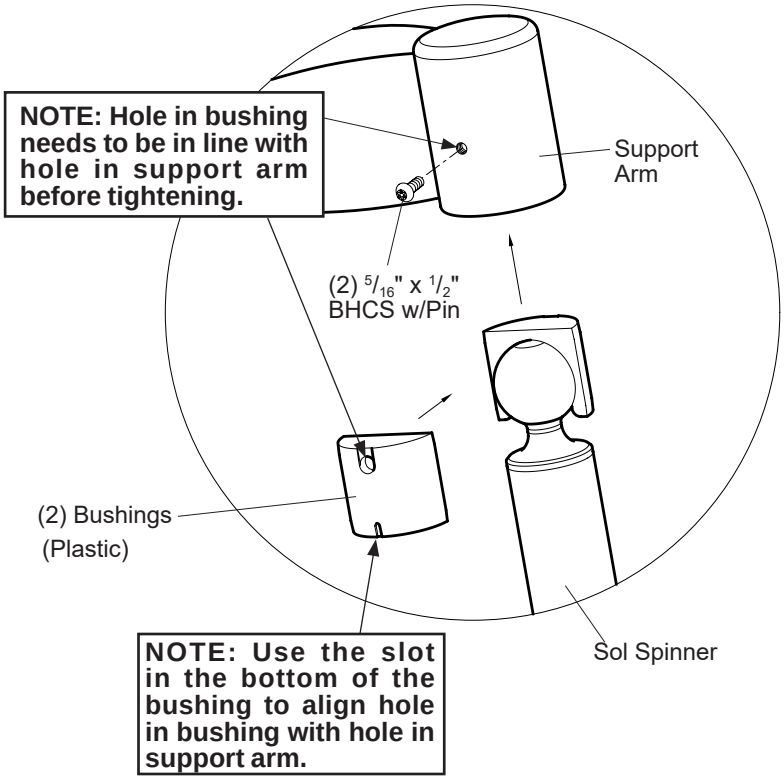
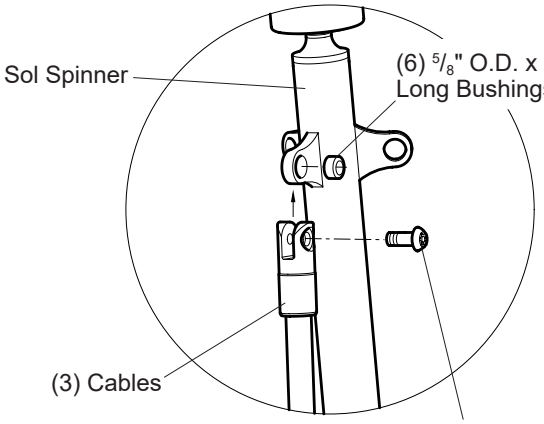
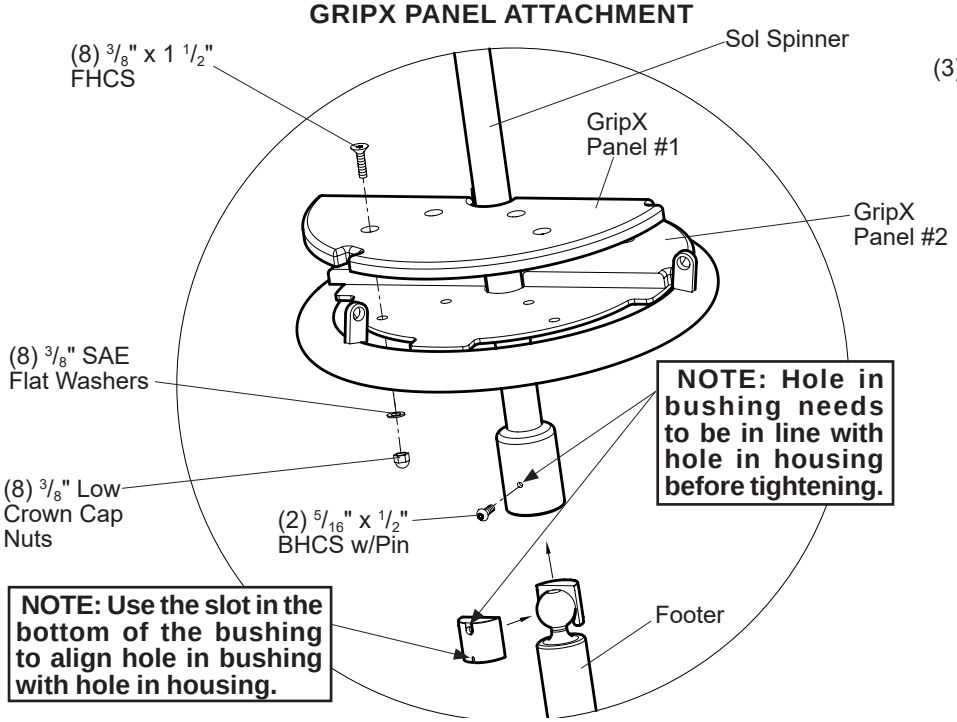
DETAIL
SOL SPINNER ASSEMBLY



DETAIL
CABLE ATTACHMENT



DETAIL
GRIPX PANEL ATTACHMENT



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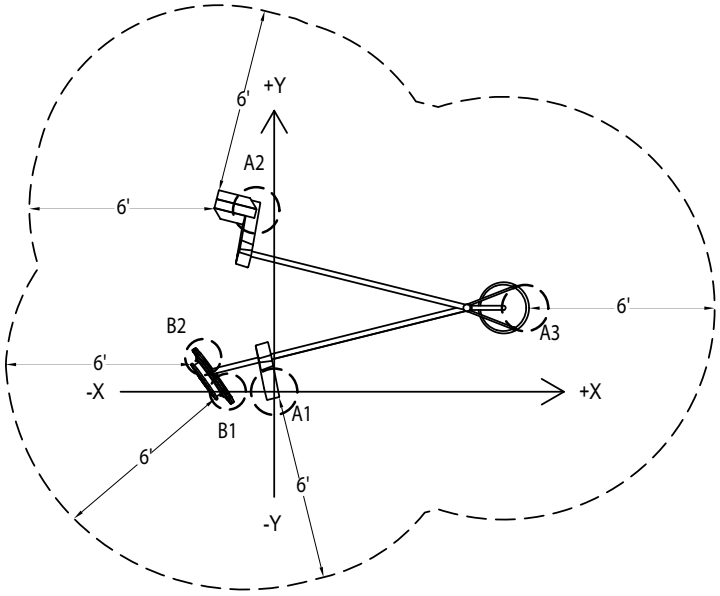
SAFETY NOTE

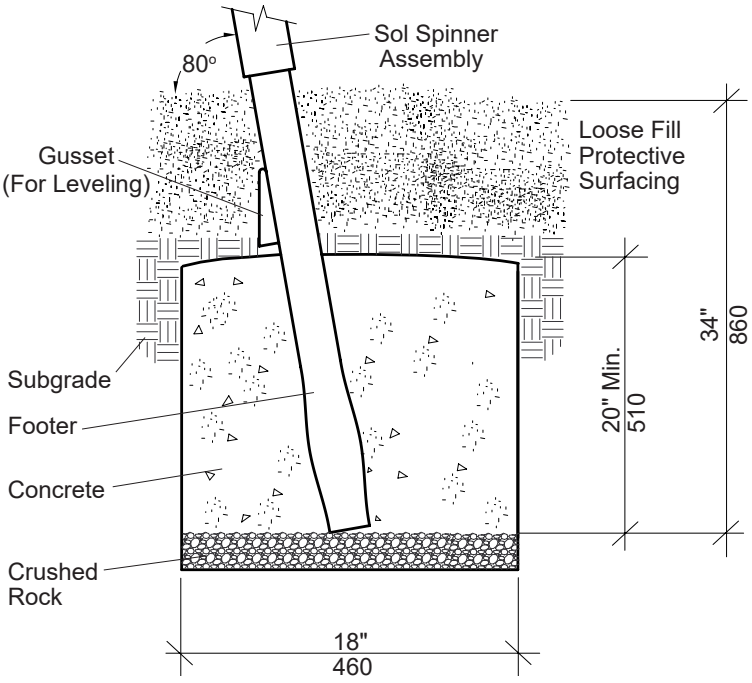
Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. ASTM F1487.)



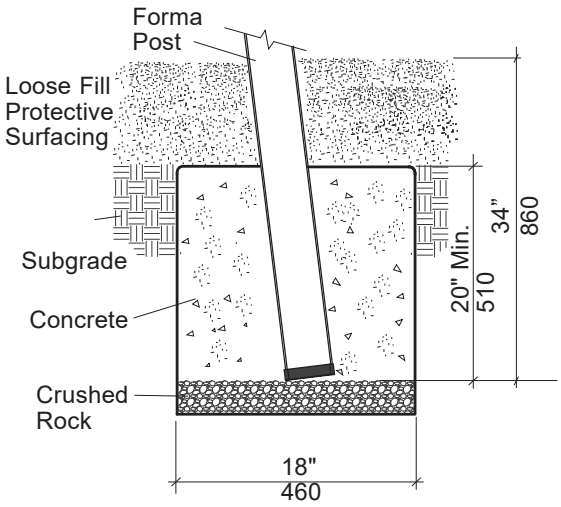
N.	I.D.	X (ft-in)	Y (ft-in)	Dist. to O	DIA (in)
1	A1	0"	0"	0"	18
2	A2	-7"	5'-10 1/2"	5'-11"	18
3	A3	8'-1 1/2"	2'-8 1/2"	8'-7"	18
4	B1	-1'-6"	0"	1'-6"	14
5	B2	-2'-3 1/2"	1'-1 1/2"	2'-6 1/2"	14

Note: For direct bury; the Rope might need to be propped up to achieve proper height.

DETAIL
FOOTER ATTACHMENT



DETAIL
DIRECT BURY



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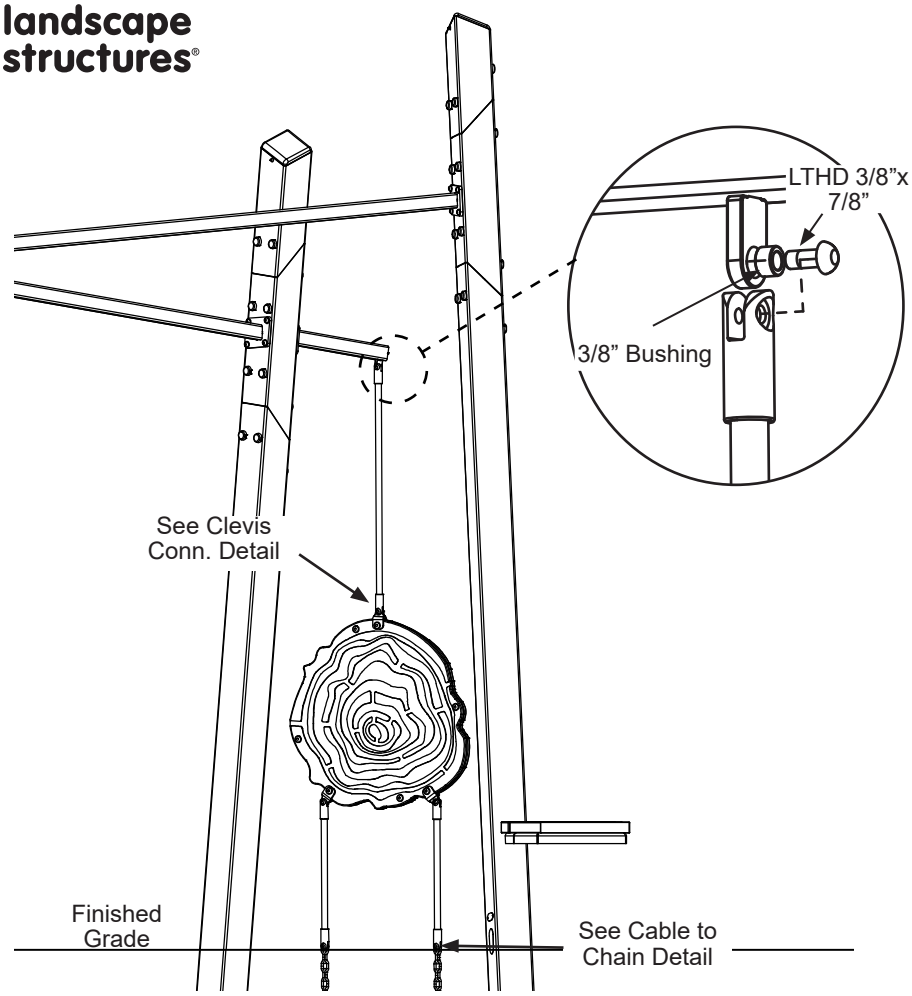
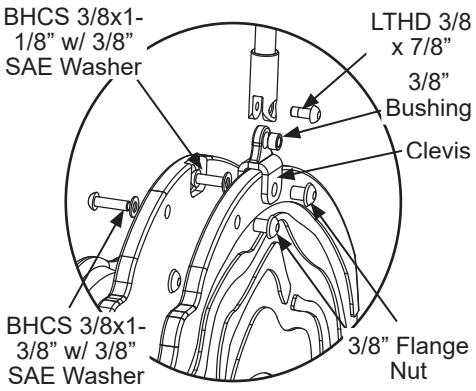
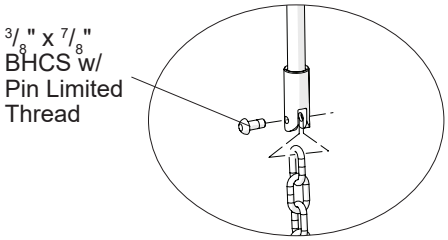


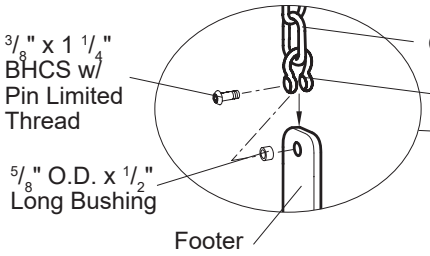
DETAIL CLEVIS CONN.



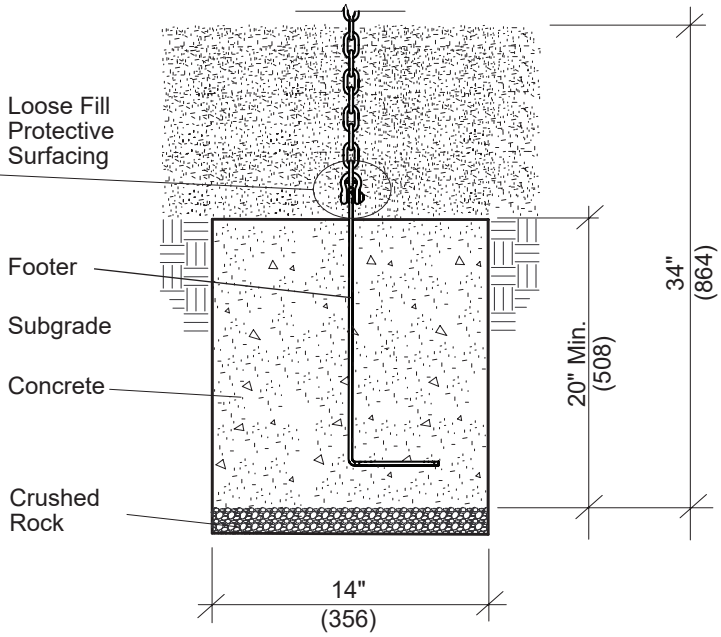
DETAIL CABLE TO CHAIN ATTACHMENT



DETAIL PLATE FOOTER ATTACHMENT



DETAIL DIRECT BURY



IMPORTANT! Tension ropes/nets before pouring concrete footings.

NOTE: The hole depth for the footer needs to be deep enough, so the footer plate does not contact the bottom of the hole. The weight of the concrete will force the footer plate down, further tightening the cable.

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Document #33374800

Parts List

Part#	Description	Qty.
157092	EVOS SPNR FTR, Specify Color	1
173635	WEE PLANET CLEVIS, Specify Color	3
194601	SOL™ SPINNER WELDMENT/PNT , Specify Color	1
195050	CABLE SOL™ SPINNER , Specify Color	3
200434	CHAIN 12.5i	2
211278	SOL™ SPINNER R PANEL GRIPX / 005 Black	1
211279	SOL™ SPINNER L PANEL GRIPX / 005 Black	1
247871	SINGLE ROPE FOOTER HDG	2
305916	16i EXTENSION , Specify Color	1
305951	CONNECTION BRACKET , Specify Color	8
306022	5i SQ CAST END CAP, Specify Color	2
308763	RPL ANGLED STEPPER BRD 3.5X16 / 172 Cedar	1
308764	RPL STR STEPPER BRD 3.5X16 / 288 Mink	1
310813	SOL™ SPINNER SQ FRAME , Specify Color	1
310842	SPINNER CONNECTION TUBE 1 , Specify Color	1
310851	SPINNER POST 1 , Specify Color	1
310855	SPINNER POST 2 , Specify Color	1
310862	SPINNER RAIN SOUND PNL BEAM , Specify Color	1
310868	SPINNER CONNECTION TUBE 2 , Specify Color	1
310919	SPINNER RAIN SOUND WHEEL ASSY , Specify Color	1
311026	FORGE SMALL PANEL ROPE 2 , Specify Color	1
311411	FORGE LARGE PANEL ROPE 2 , Specify Color	2
314455	PEG CAP CAST, Specify Color	16
314455	PEG CAP CAST, Specify Color	16
314605	RPL ANG STEPPER BRD 3.5 X 12.5 / 172 Cedar	1
321315	19i EXTENSION , Specify Color	1
182693	HDW PKG LABELS 5-12 YRS	1
115176	LABEL HD SRF WARNING ASTM	1
156847	LABEL PLAY SAFE 5-12 YRS	1
182212	LABEL ENTANGLEMENTWARNING	1
182213	LABEL HOT SURFACE WARNING	1
314618	HDW PKG FORMA™ SOL™ SPINNER	1
100196	BHCS 6LP 3/8x7/8i SST	44
100198	BHCS 6LP 3/8x1-1/8i SST	3
100290	BHCS 6LP LTHD 3/8x7/8iSST	12
100292	BHCS 6L LTHD 3/8x1-1/4SST	2
100349	NUT L/C CAP 3/8-16 SST	8
100353	FLG NUT 6LP 3/8-16 SST	7
100365	WASHER FLAT SAE 3/8i SST	33
100611	RIVET 1/4X3/8i DRV AS	4
113027	BHCS 6LP 3/8x1-3/8i SST	4
127179	BUSHING 5/8OD X 3/8 LG SST	10
131849	BHCS 6LP 5/16x1/2i SST	4
138915	BOLT LINK SST	2
151421	FHCS 6LP 3/8x1-1/2iSST W/PATCH	8
156962	BUSHING 5/8 OD X 1/2 LG SST	2
186027	SPINNER UHMW BUSHING	4
205152	LAG SCR BH 6LP 3/8x1-1/4i SST	6
307377	PEG BASE MACHINED	32

Specifications

Boards: Recycled high-density polyethylene. Cedar and mink in color.

Cable Assembly: Made of tightly woven, polyester-wrapped, six stranded galvanized-steel cable with a polypropylene core. Color Specific. (Cable connectors) Die Cast 369.1 Alum.

Chain Support: Made from 1/4" (6,35 mm) HRPO steel plate. Finish: Hot dip galvanized per ASTM A123.

Fasteners: Primary fasteners shall be socketed and pinned tamper-proof in design, stainless steel (SST) per ASTM F 879 unless otherwise indicated (see specific product installation/ specifications).

Forma Frame: ASTM A53, 5"SQ x .120 wall tubing. Shall be galvanized after rolling and shall have both I.D. and the cut ends sprayed with a corrosion resistant coating Finish: Proshield, Color Specific.

GripX Permalene: 3/4" (19,05 mm) Thick Permalene®, gray in color.

Permalene Panels: Recycled Permalene, color specified.

Top Caps: Cast aluminum. Finish: ProShield, color specified.

Installation Time: DB - Approx. 6 person hours

Concrete Req.: DB - Approx. 12.4 cu. ft.

Weight: DB - 474 lbs.

Fall Height: DB -18" (0,46 m)

Installation Instructions

1) Dig footings spaced as shown. Refer to Concrete Footing Detail.
2) Attach GripX panels to Sol Spinner. Refer to the GripX Panel Attachment Detail.
3) Attach support arm to posts at height shown. Refer to Detail.
4) Place a bushing on each side of the footers 1 7/8" ball, as shown. Insert footer with bushings into Sol Spinner. Align holes in bushings with holes in housing. When holes are aligned, insert 5/16" x 1/2" BHCS w/pin. Refer to the GripX Panel Attachment Detail. NOTE: Use the slot in the bottom of the bushing to align holes.
5) Place a bushing on each side of the Sol Spinners 1 7/8" ball, as shown. Insert Sol Spinner with bushings into support arm. Align holes in bushings with holes in housing. When holes are aligned, insert 5/16" x 1/2" BHCS w/pin. Refer to the Sol Spinner Assembly Detail. NOTE: Use the slot in the bottom of the bushing to align holes.
6) Attach cables to Sol Spinner using 5/8" O.D. bushings and 3/8" x 7/8" BHCS limited thread bolts w/pin. Refer to the Cable Attachment Detail.
7) Place a level on the seat as shown to ensure proper post orientation. Place a level on the footer gusset, when gusset is plumb, pour concrete footings. Allow concrete footings to cure a minimum of 72 hours before users are allowed to play on structure. NOTE: Sol Spinner assembly will have to be propped in position, until concrete has cured.
8) Apply Play Safe and Warning Labels, as shown.
9) Install protective surfacing before users are allowed to play on the structure.

10/2/2023 - Added a cap wrench detail.

ECO# 0102482 Document 33374800 replaces 31570600. Update rotation of rain panel.

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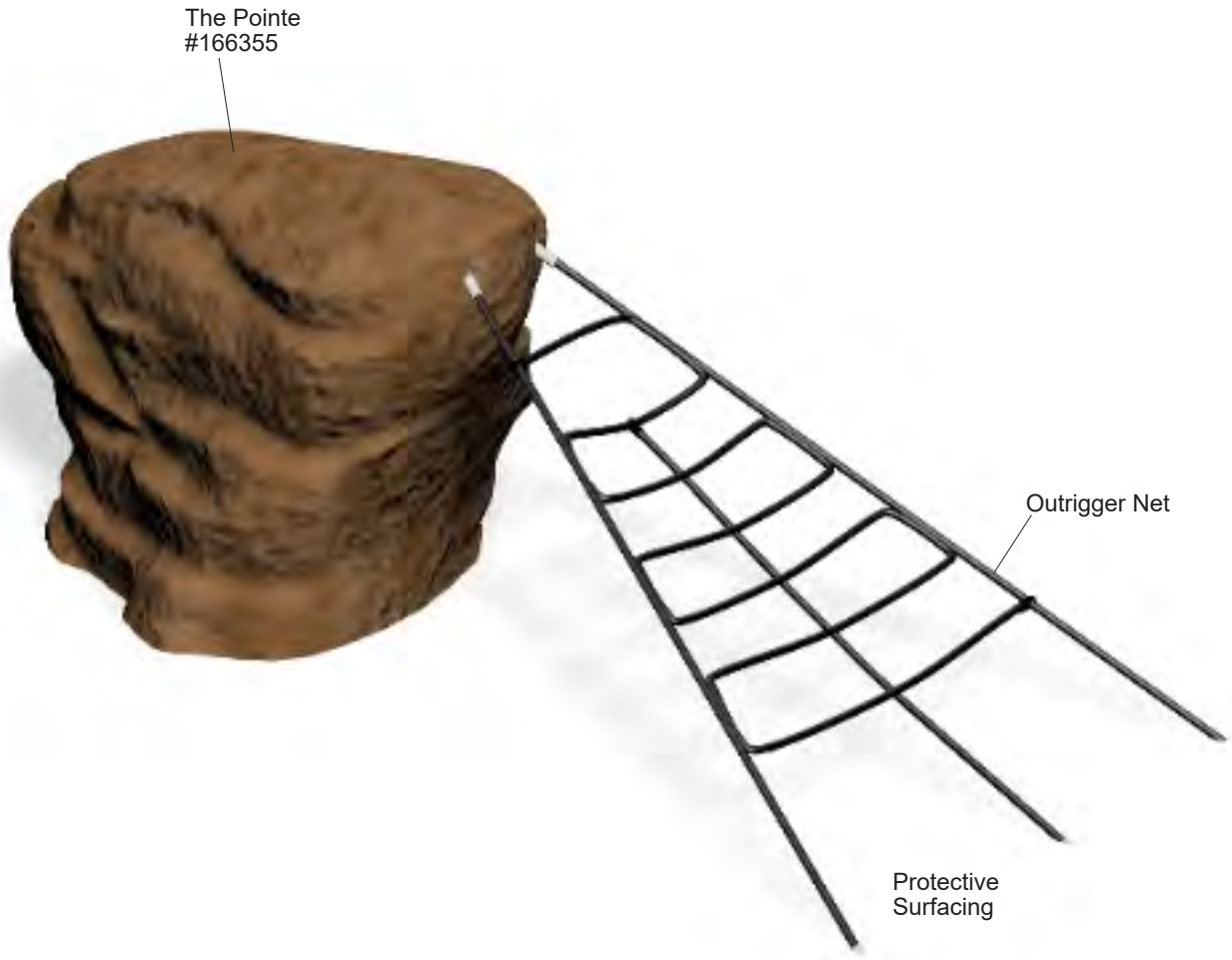
ISO 9001 Certified

SAFETY NOTE

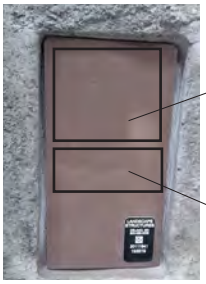
Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. ASTM F1487.)

16837200



DETAIL

LABELS



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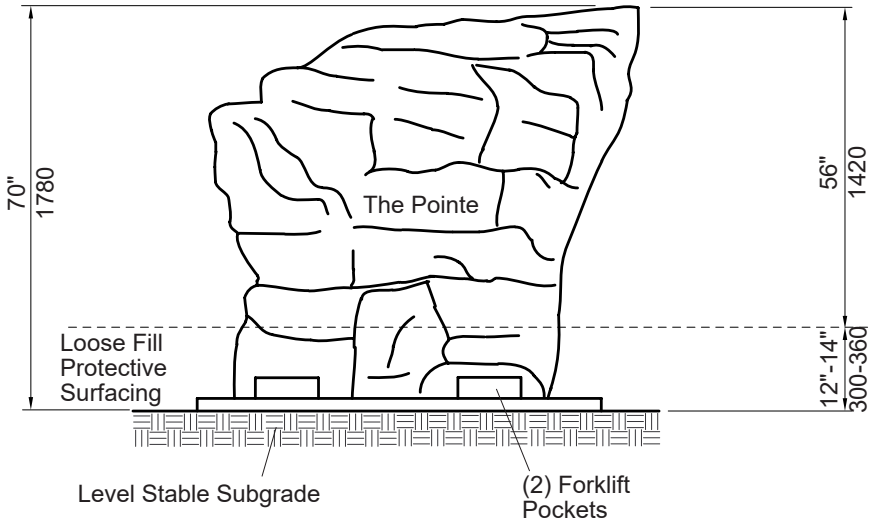
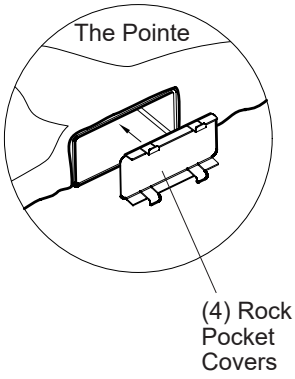
SAFETY NOTE
Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. ASTM F1487.)

168372d

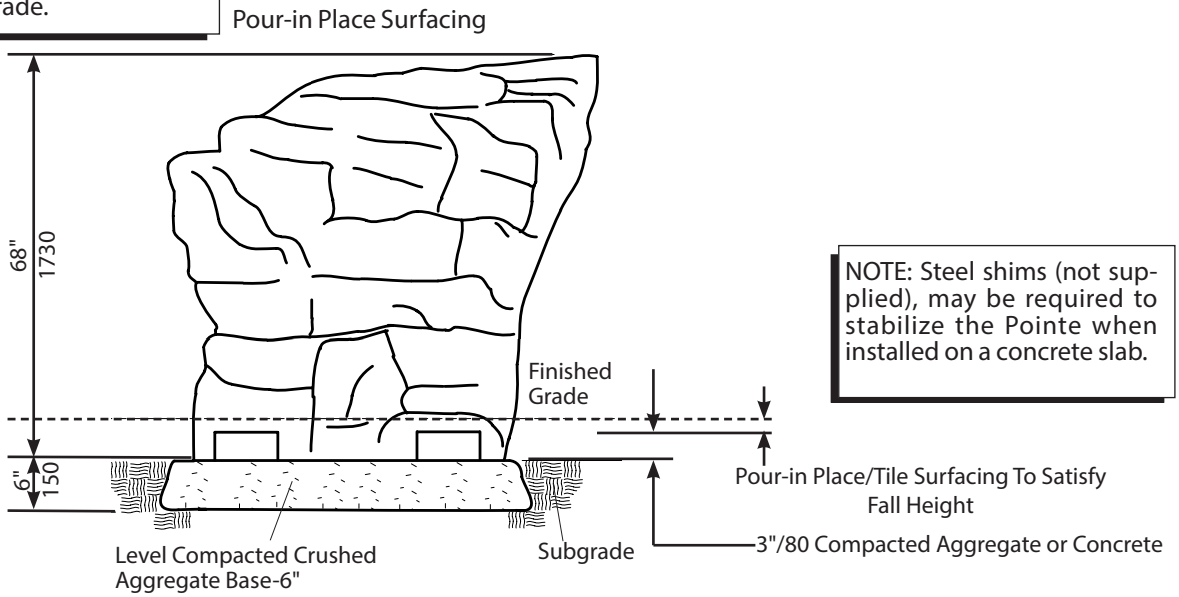
PLAN VIEW/POINTE



DETAIL
POINTE POCKET



NOTE: Aggregate must be at same level as subgrade, or below subgrade.



NOTE: Steel shims (not supplied), may be required to stabilize the Pointe when installed on a concrete slab.

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SAFETY NOTE

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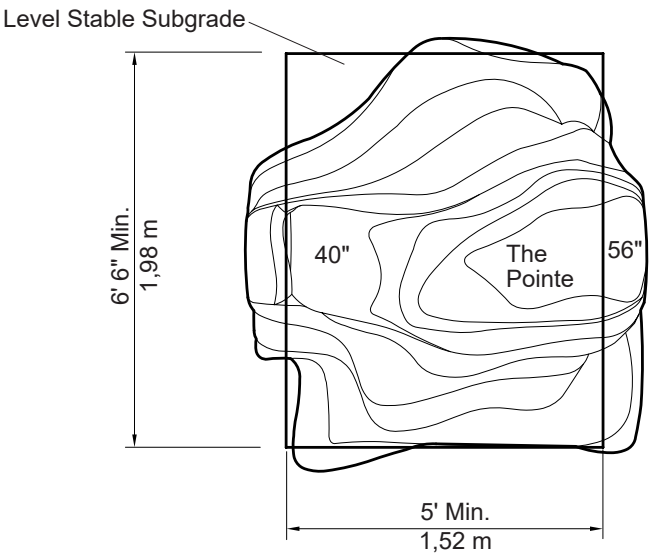
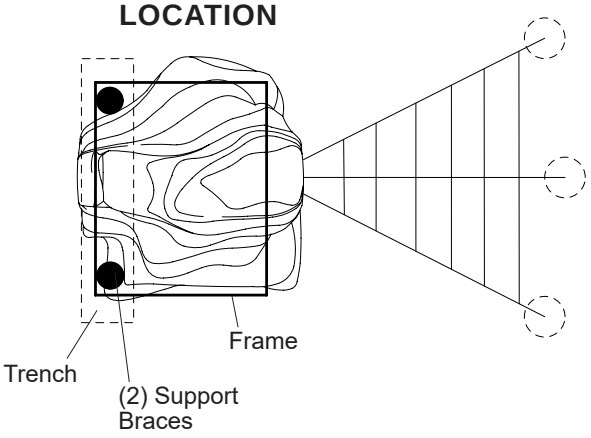
168372d



DETAIL
SUPPORT BRACE LOCATION



NOTE: Position support braces under frame approx., as shown.

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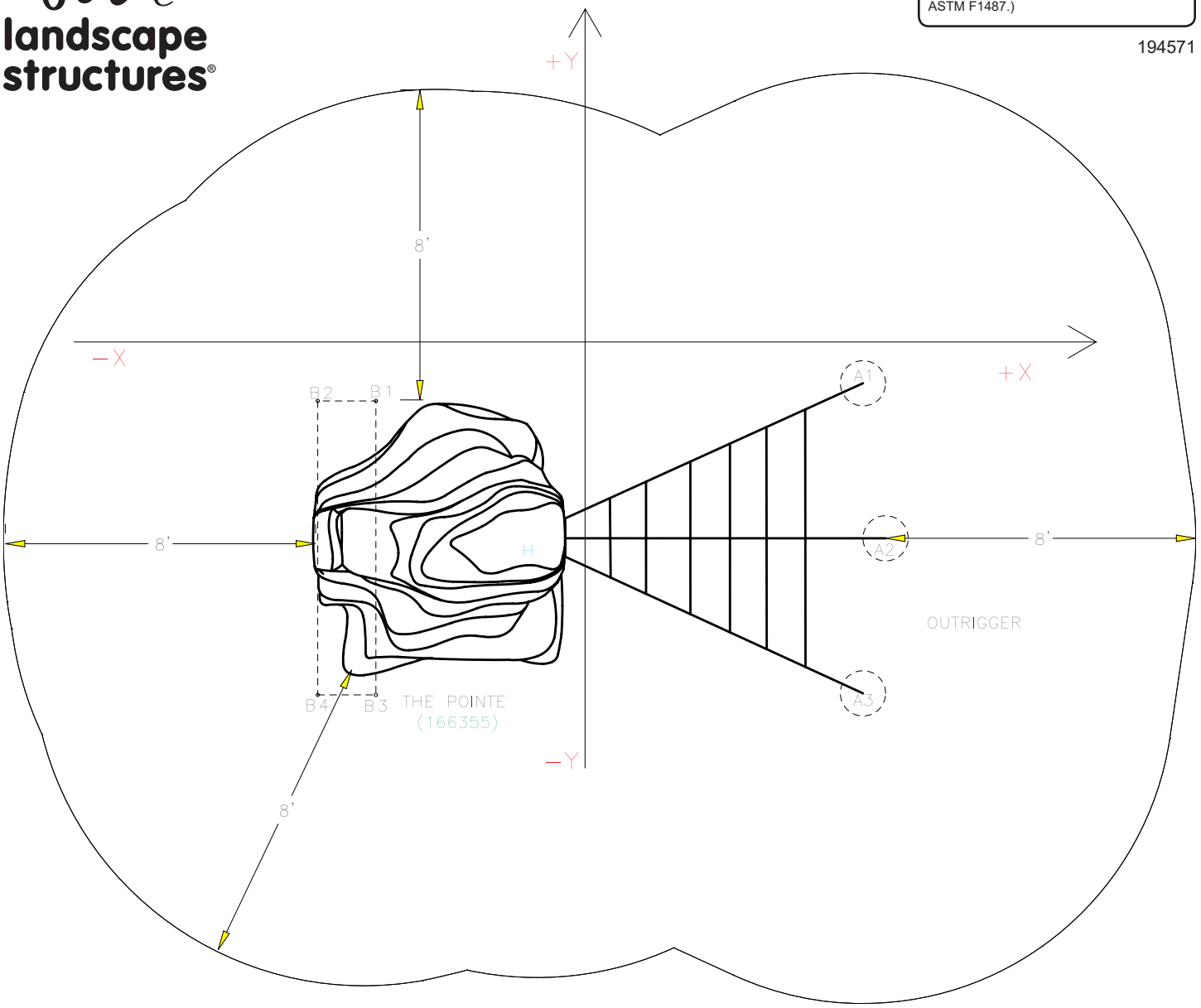
PLANVIEW FOOTING LAYOUT

SAFETY NOTE
Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. ASTM F1487.)

194571



N.	I.D.	X (ft−in)	Y (ft−in)	Dist. to O	DIA (in)
1	A1	6' - 6"	1' - 3"	6' - 9"	14
2	A2	7'−9"	−5'−1"	9'−3"	14
3	A3	6' - 6"	8' - 11"	13' - 2"	14
4	B1	−5'−5"	−1'−6"	5'−7"	TRENCH
5	B2	−6'−11"	−1'−6"	7'−1"	TRENCH
6	B3	−5'−5"	−9'−1"	10'−7"	TRENCH
7	B4	−6'−11"	−9'−1"	11'−5"	TRENCH

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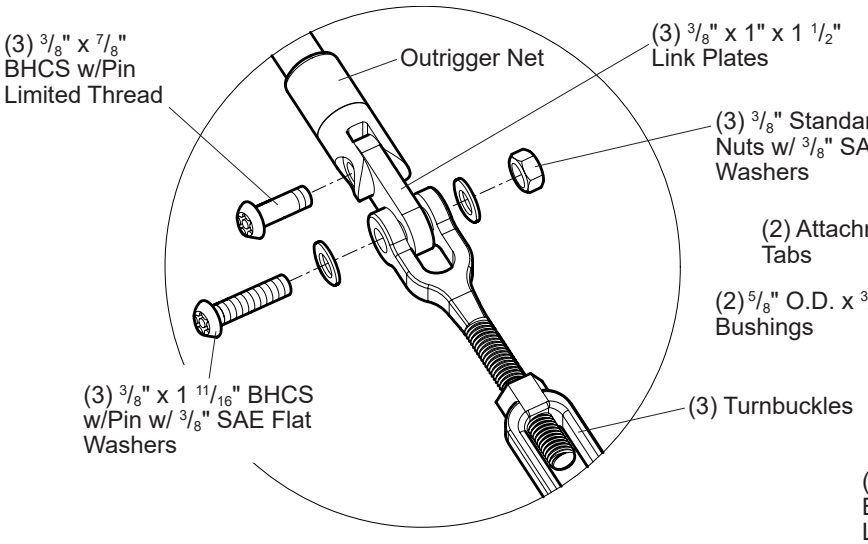
SAFETY NOTE

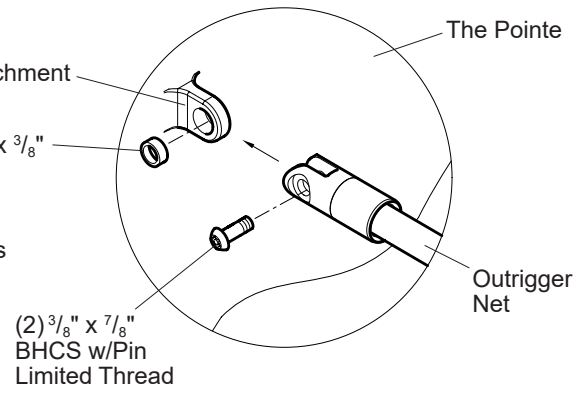
Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. ASTM F1487.)

167489e

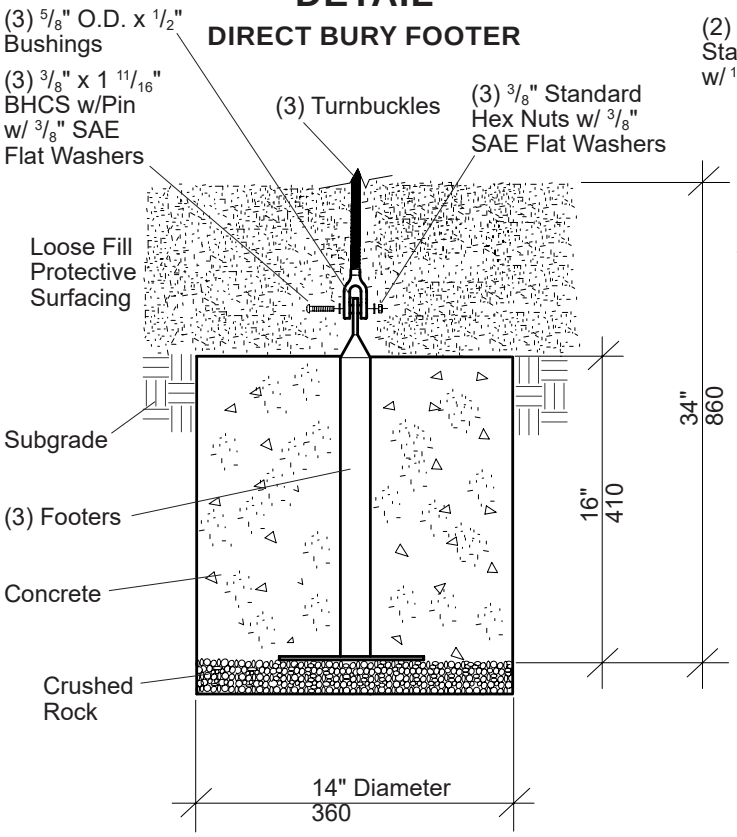
DETAIL
TURNBUCKLE ATTACHMENT



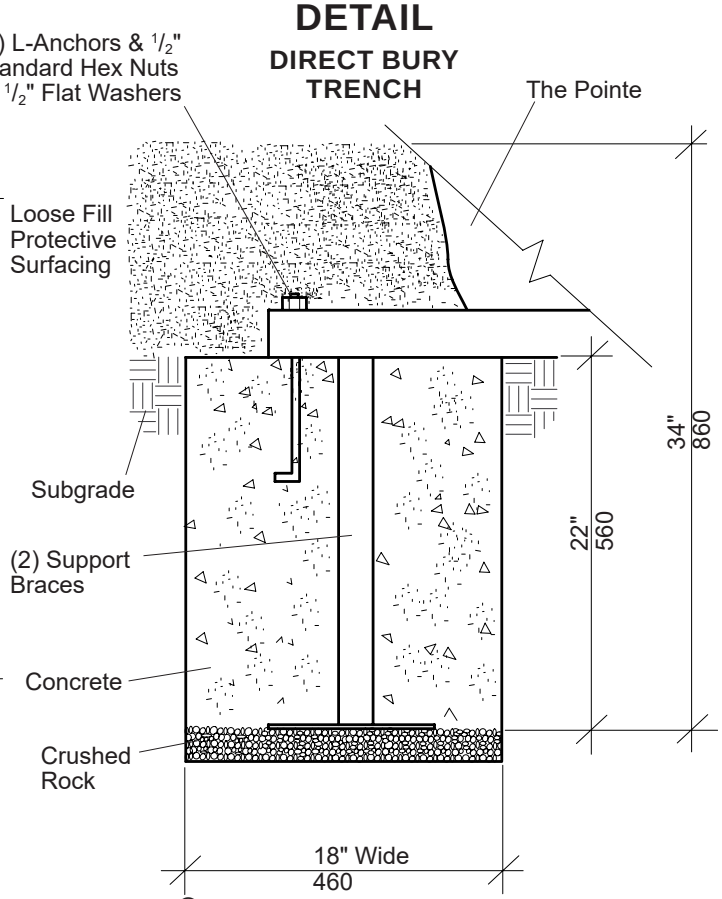
DETAIL
NET ATTACHMENT



DETAIL
DIRECT BURY FOOTER



DETAIL
DIRECT BURY TRENCH



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TRENCH DETAILS

NOTE: Use a level to ensure the Pointe frame is level.

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Parts List

Part#	Description	Qty.
156383	Single Post Footer, Black	3
166355	Pointe H HI	1
203678	Outrigger Net, Black	1
166782	Support Brace, Black	2
168380	L-Anchor	2
100322	1/2" Standard Hex Nut, SST	2
100363	1/2" Flat Washer, SST	2
146301	Rock Pocket Cover	4
167072	**Outrigger Net Hardware Package**	1
100290	3/8" x 7/8" BHCS w/Pin Limited Thread, SST	5
100327	3/8" Standard Hex Nut, SST	6
100365	3/8" SAE Flat Washer, SST	12
123224	3/8" x 1 11/16" BHCS w/Pin, SST	6
127179	5/8" O.D. x 3/8" Long Bushing, SST	2
156962	5/8" O.D. x 1/2" Long Bushing, SST	3
157002	Turnbuckle	3
162921	3/8" x 1" x 1 1/2" Link Plate, SST	3
241541	**Warning Label Hardware Package, 5-12**	1
183064	Warning Label	1
200333	Label 5-12 Yrs	1

Specifications

The Pointe Assy.: Weldment comprised of 1/4" HRPO steel sheet, C8 x 13.75 steel channel, 3" x 1 1/2" x .120" wall galvanized steel tube and 1 1/8" square bar. Finish: ProShield®. **(Pointe-fully assembled)** Castings are made from Glass Fiber Reinforced Concrete (GFRC). Glass fiber is Alkali Resistant (AR) type glass formulated for concrete. Nominal wall thickness of 1" and weighs approximately 11 1/2 lbs. per square foot. Castings have a strength of 1,500 lbs. per square inch in tension and 5,000 lbs. per square inch in compression. Finish: Latex paint made for concrete, Stone in color.

Support Brace: Weldment comprised of 1.660" O.D. RS20 (.085" - .095" wall) galvanized steel tube and 3/16" HRPO steel sheet. Finish: ProShield, black in color.

Outrigger Net Assy.: **(Net)** Made of tightly woven polyester-wrapped, six-stranded galvanized-steel cable with a polypropylene core. **(Cord Connectors)** fabricated from 1.25" O.D. 6061-T6 aluminum and **(T-Connectors)** fabricated from 6061-T6 aluminum.

Turnbuckle: Fabricated from forged galvanized steel.

Rock Pocket Cover: Fabricated from 13 Ga. (.090") HRPO flat steel conforming to ASTM A569. Finish: Zinc plate with yellow chromate finish.

Footer: Weldment comprised of 1.660" O.D. RS20 (.085" - .095" Wall) galvanized steel tubing and 3/16" HRPO sheet steel. Finish: ProShield, black in color.

Fasteners: Primary fasteners shall be socketed and pinned tamperproof in design, stainless steel (SST) per ASTM F 879 unless otherwise indicated (see specific product installation/specifications).

Specifications are subject to change without notice.

Installation Time: 12 man hours
Concrete Req.: Approx. 25 cu. ft.
Area Req: 30' (9,14 m) x 24' (7,31 m)
Actual Size: The Pointe measures 84" (2,13 m) long x 78" (1,98 m) wide x 70" (1,77 m) high.
Fall Height: 56" (1,42 m)
Weight: 2,970 lbs.

Installation Instructions

1) Refer to the Plan View/Footing Layout for trench and footing locations.

   Warning: Never crawl under any part of the Pointe - especially when it is only supported by a forklift.

2) To unload the Pointe a "Lull" type material handler with at least an 4,000 lb. capacity is recommended. Maximum fork extension size is 3 1/2" high x 7 1/2" wide with no maximum length. **NOTE:** *At least 2 people are recommended for the Pointe installation. One person to operate the material handling equipment and one person to spot for the operator.*

3) The Pointe should be placed on level stable ground. Pick up the Pointe by inserting the material handling forks into the forklift pockets. Be very careful to keep the Pointe level to the ground when raising or lowering. Do not tip the Pointe on a corner or edge. Do not contact the concrete face of the Pointe with material handler forks, chipping can occur. Refer to the Plan View for proper orientation. **NOTE:** *Use a level to ensure the Pointe frame is level.*

4) Place support braces in trenches underneath the Pinnacle and Pointe frames, as shown to ensure frame stays level. Refer to the PlanView/ Footing Layout and Trench Details.

5) **(Outrigger Net)** Insert 5/8" O.D. x 3/8" bushings into Pointe attachment tabs. Attach outrigger net to attachment tabs using 3/8" x 7/8" BHCS w/ pin limited thread. Refer to the Net Attachment Detail.

6) **(Outrigger Net)** Attach 3/8" x 1" x 1 1/2" link plates to outrigger net assembly using 3/8" x 7/8" BHCS w/pin limited thread. Turn turnbuckles open as far as possible. Attach turnbuckles to 3/8" x 1" x 1 1/2" link plates, using 3/8" x 1 11/16" BHCS w/pin with 3/8" SAE flat washers, and 3/8" standard hex nuts with 3/8" SAE flat washers. Attach turnbuckles to footers, using 3/8" x 1 11/16" BHCS w/pin with 3/8" SAE flat washers, 5/8" O.D. x 1/2" bushings and 3/8" standard hex nuts with 3/8" SAE flat washers. Refer to the Turnbuckle Attachment Detail.

7) **(Outrigger Net)** Place footers in footing holes at dimension shown. Disconnect turnbuckles from footers.

8) Attach L-anchors to the Pointe frame, using 1/2" standard hex nuts with 1/2" flat washers. Refer to the Direct Bury Trench Detail.

9) Use a hammer to tap rock pocket covers into rock pockets until tight. Refer to the Pointe Pocket Detail.

10) With the Pointe frame level and in position, pour concrete footings and trench. Trench should be filled with concrete up to the bottom of the Pointe frame. After concrete footings have cured for a minimum of 72 hours, reattach turnbuckles to outrigger net, then tighten evenly until net is tight. Refer to the Turnbuckle attachment Detail & Direct Bury Footer Detail.

11) Apply the warning label and age label.

12) Install protective surfacing before users are allowed to play on the structure.

Document #26899400
Eco 0101781 Document 26899400 replaces 20783000. Hdw Pkg for new safety plate added.

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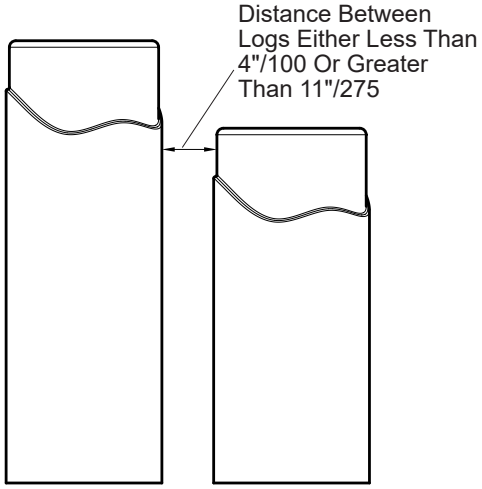
SAFETY NOTE

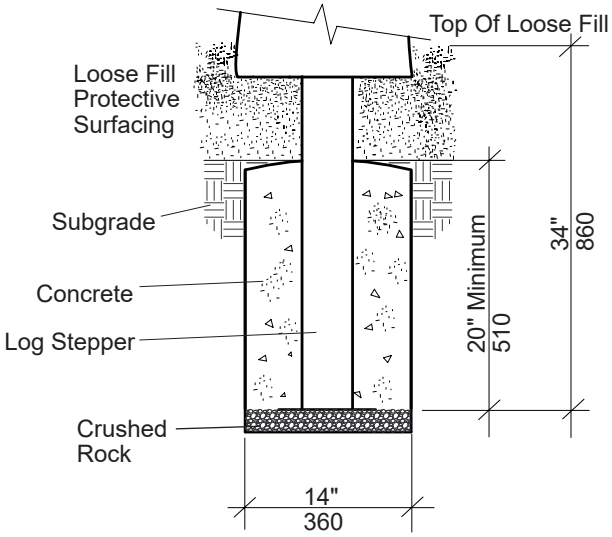
Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. ASTM F1487.)

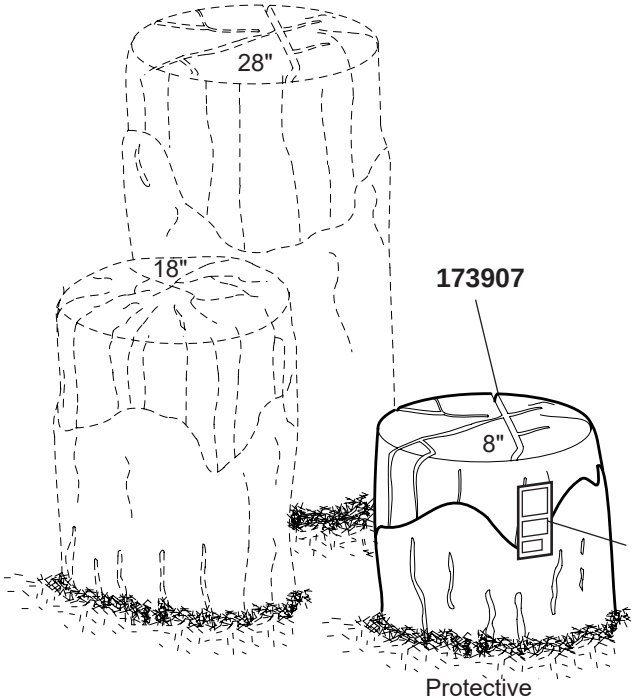
20070000

DETAIL
LOG STEPPER SPACING

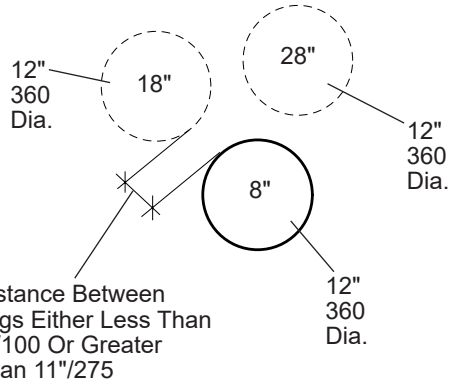


DETAIL
DIRECT BURY





PLAN VIEW/FOOTING LAYOUT
(LAYOUT VARIES - SEE YOUR PLAN)



Play Naturally™

173907 8" Height (Shown)
173908 18" Height
173909 28" Height

Climbers

Log Steppers

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Climbers Log Steppers

Parts List

Part#	Description	Qty.
200691	8" Log Stepper (DB), Natural	*
200692	18" Log Stepper (DB), Natural	*
200693	28" Log Stepper (DB), Natural	*
224345	**Warning Label Package 2-12 (8" Stepper Only)**	1
183064	Label Warning	1
200331	Label 2-5 Yrs.	1
200332	Label 2-12 Yrs.	1
200333	Label 5-12 Yrs.	1

DB = Direct Bury

*** = Quantity Determined By Your Order**

Specifications

Log Stepper Assy.: **(Footer Post)** Weldment comprised of 5" O.D. x 11 GA. (.120") wall galvanized steel tubing and $^{3}/_{16}$" HRPO steel plate. Finish: ProShield, color specified. **(Log Stepper-fully assembled)** Precast solid pour concrete product. Finish: Latex paint made for concrete, natural colors.

Installation Time: Approx. $^{1}/_{2}$ man hour each

Concrete Req.: Approx. 1.78 cu. ft. each

Weight: 8" - 162 lbs.
18" - 230 lbs.
28" - 424 lbs.

Installation Instructions

1) **(Direct Bury)** Dig footing as shown. See your Plan View/Footing Layout.

2) To unload the log steppers and place in footing holes, a "Lull" type material handler and strap are recommended. Position log steppers in footing holes at dimensions shown, and prop in plumb position. With log steppers and handrail plumb, pour concrete footings. Allow concrete footings to cure for a minimum of 72 hours before users are allowed to play on the structure.

3) **(8" Stepper Only)** Apply the warning label and age label for the intended age range.

4) Install protective surfacing before users are allowed to play on the structure

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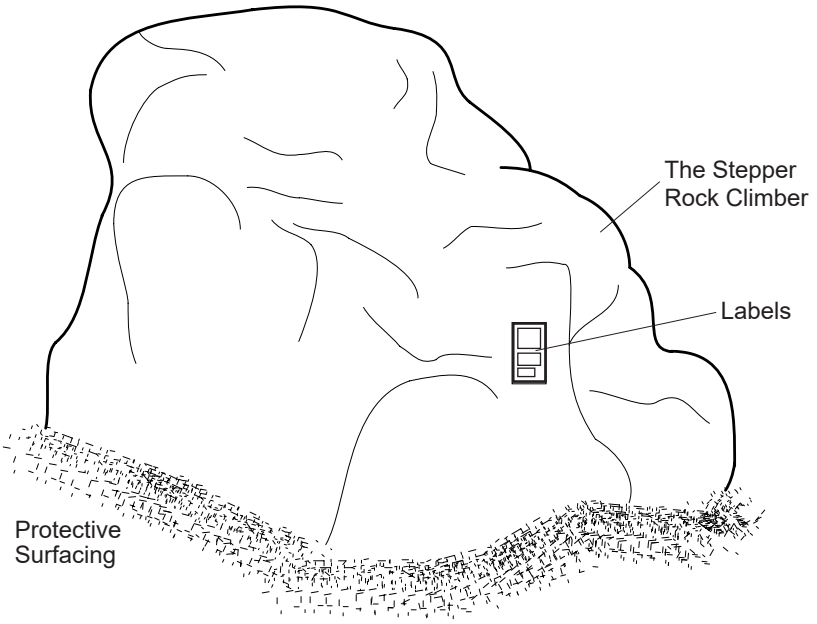
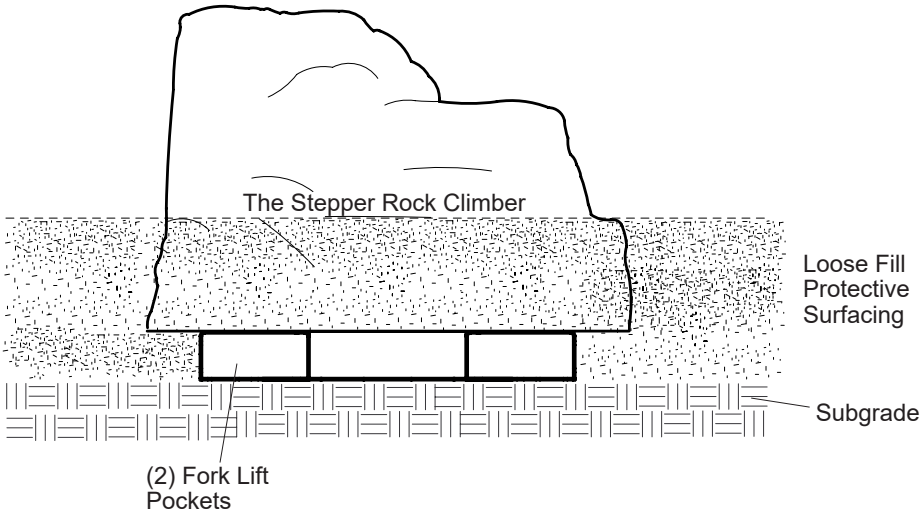
SAFETY NOTE

Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. ASTM F1487.)

17742500



DETAIL
FORK LIFT POCKETS



Play Naturally™

Nature-Inspired Climbers

160419 The Stepper™ Rock Climber

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160419 The Stepper™ Rock Climber

Parts List

Part#	Description	Qty.
173221	The Stepper Rock Climber Assembly	1
224345	**Warning Label Package, 2-12 Yrs.**	**1**
183064	Warning Label.	1
200331	Label 2-5 Yrs	1
200332	Label 2-12 Yrs	1
200333	Label 5-12 Yrs	1

Specifications

Stepper Assembly: **(Base)** Weldment comprised of 1/4" (.250") HRPO sheet steel and 1/8" (.125") HRPO steel plate. Finish: ProShield®. **(Stepper-fully assembled)** Glass reinforced wet cast solid pour concrete product. Finish: Latex paint made for concrete, Stone in color.

Fasteners: Primary fasteners shall be socketed and pinned tamperproof in design, stainless steel (SST) per ASTM F 879 unless otherwise indicated (see specific product installation/specifications).

Installation Time: Approx. 1/2 man hour
Weight: 1150 lbs.
Min. Use Zone: 6' (1,83 m)
Area Required: 15' 4" x 14' 9" (4,67 m x 4,50 m)
Actual Size: Stepper measures 40" x 33" x 26" high (1020 mm x 840 mm x 660 mm high)
Fall Height: Varies based on surfacing.

Installation Instructions

1) To unload The Stepper Rock Climber a fork lift is recommended. Pick up The Stepper Rock Climber by inserting the fork lift forks into the fork lift pockets. Be very careful to keep The Stepper Rock Climber to the ground when raising or lowering. Do not tip The Stepper Rock Climber on a corner or edge. Do not contact the concrete face of The Stepper Rock Climber with material handler forks, chipping can occur.
2) Apply the warning label and age label for the intended age range.
3) Install protective surfacing before users are allowed to play on the structure.
4) **NOTE: After installation if Touch-up/Repairs are needed, contact Landscape Structures at 1-888-574-4678.**

Specifications are subject to change without notice.

Eco #0101222 Document 23918700 replaces 20881600. Updated labels and view.

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SAFETY NOTE

Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. ASTM F1487.)

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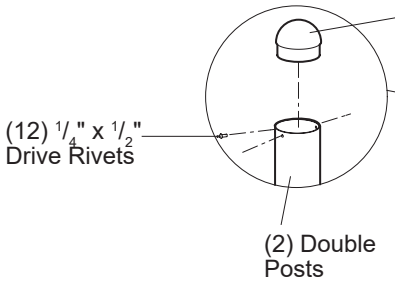
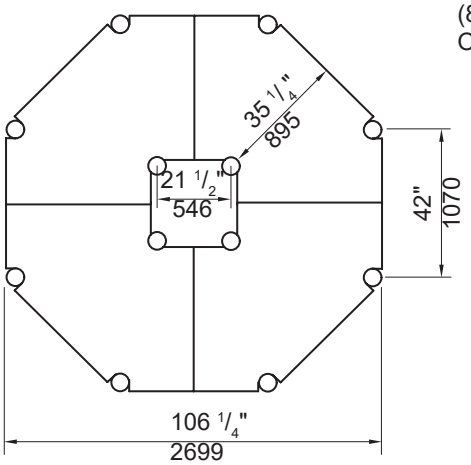
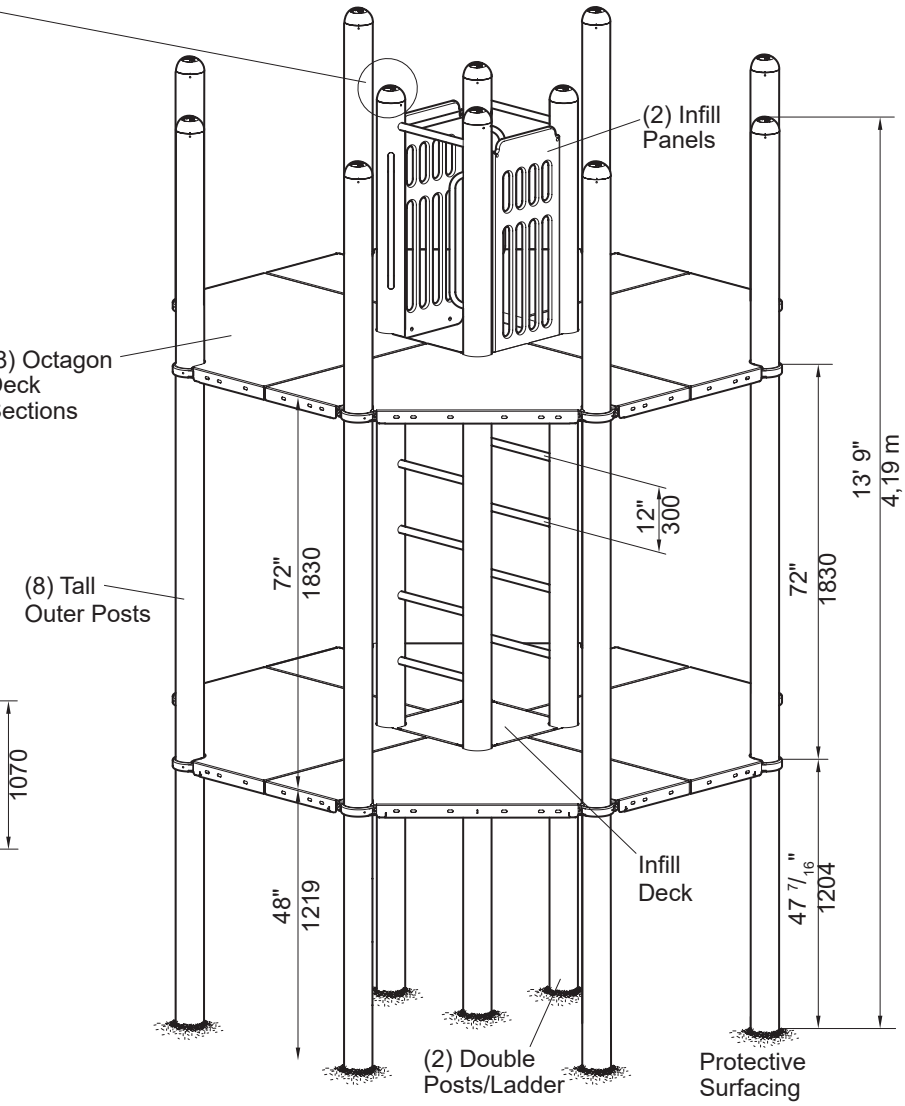
DETAIL
POST CAP ATTACHMENT



PLAN VIEW





PlayOdyssey 188689 PlayOdyssey® 10' Tower, w/o Roof

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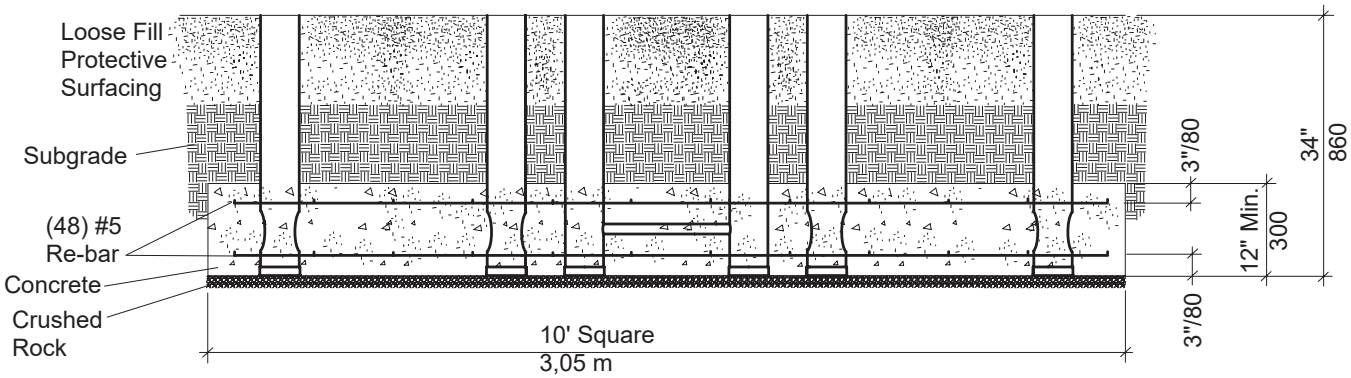
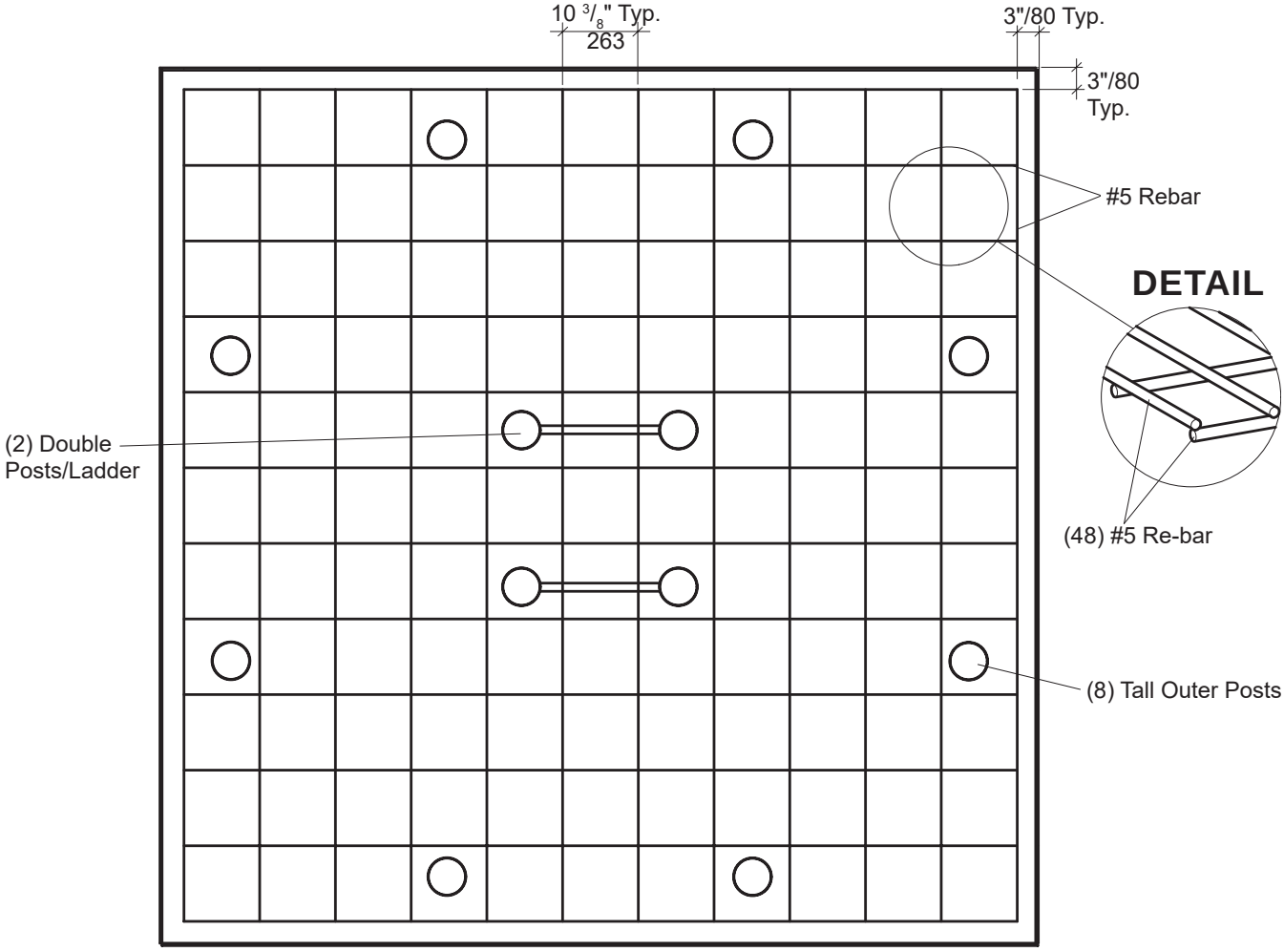
SAFETY NOTE

Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. ASTM F1487.)

165848b

PLAN VIEW/FOOTING LAYOUT





NOTE: Place #5 re-bar 3" up from the bottom and 3" down from the top of the concrete, as shown. Rebar should be placed 3" in from the edge of the concrete on all sides and approximately 10 3/8" on center.

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Concrete Footing With Re-Rod

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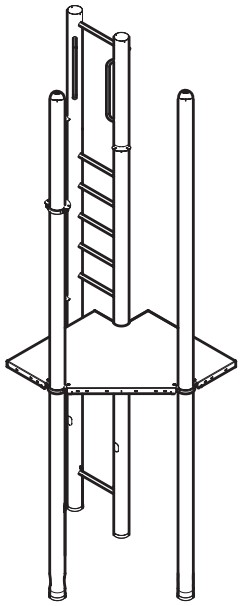
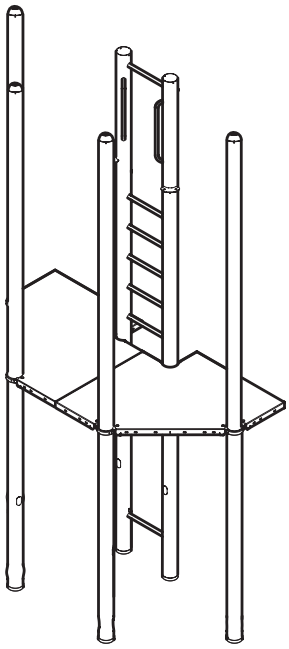
DETAIL
MAINSTRUCTURE ASSEMBLY SEQUENCE

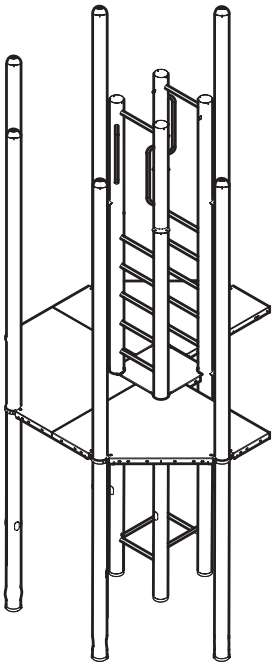
Step #1



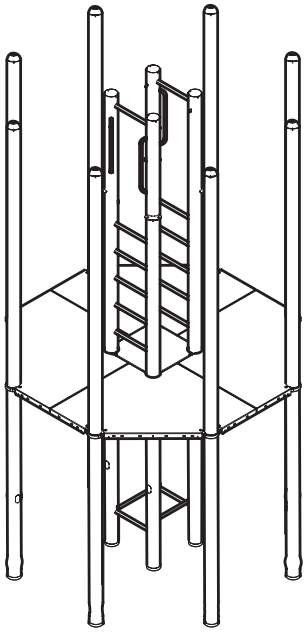
Step #2



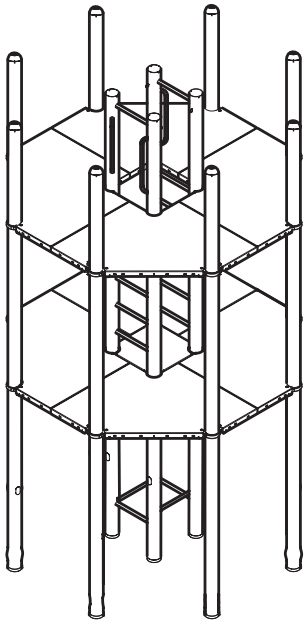
Step #3



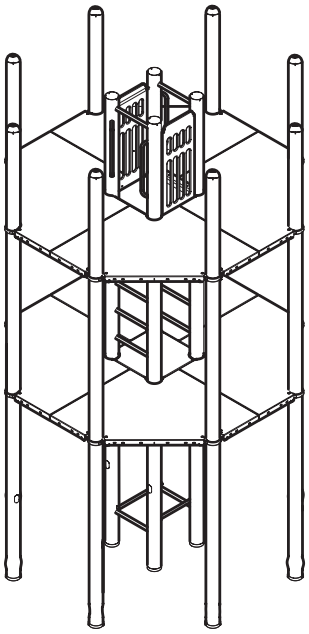
Step #4



Step #5



Step #6



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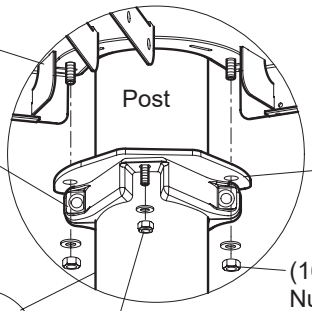
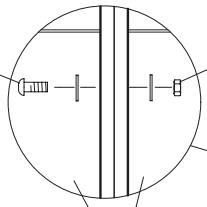
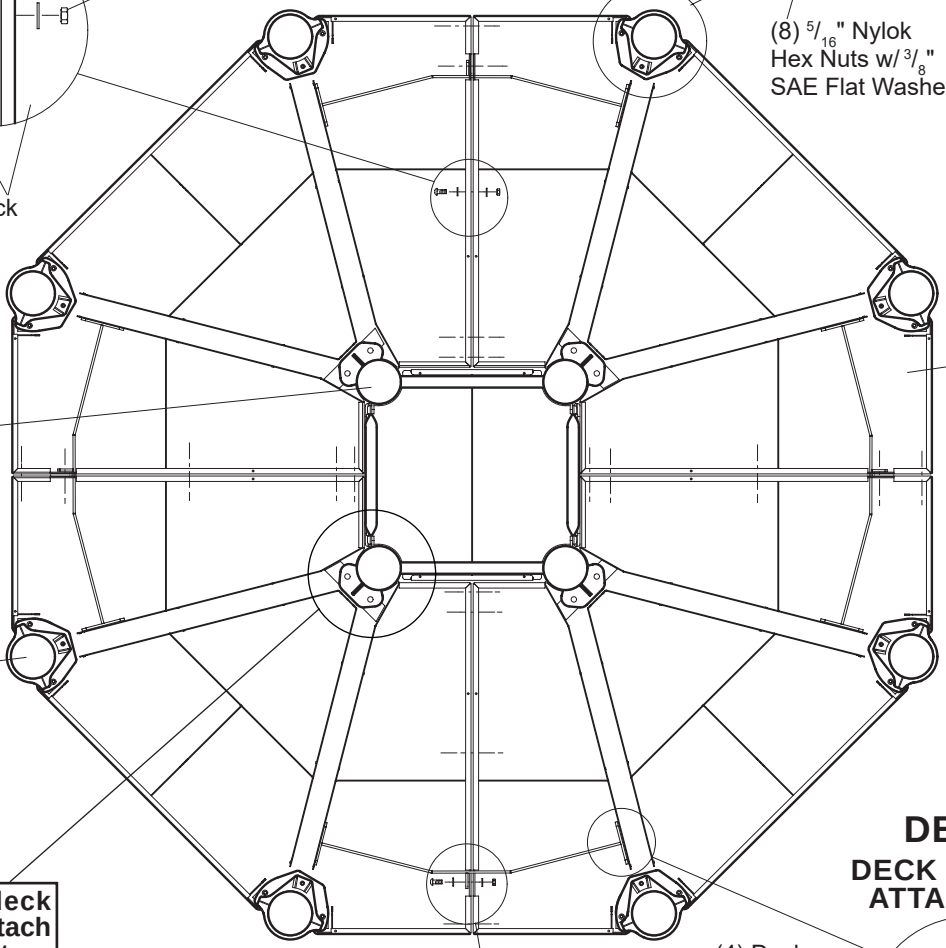
DETAIL
DECK TO TALL OUTER POST ATTACHMENT



DETAIL
DECK TO DECK ATTACHMENT

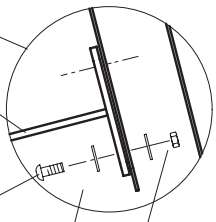


DETAIL
DECK ASSEMBLY (BOTTOM VIEW)

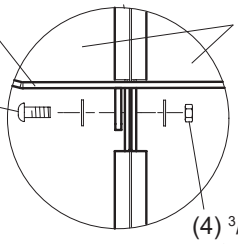


NOTE: Octagon deck sections do not attach to inner post plates. They only rest on plates.

DETAIL
DECK SUPPORT ATTACHMENT



DETAIL
DECK SUPPORT ATTACHMENT



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Deck Assembly

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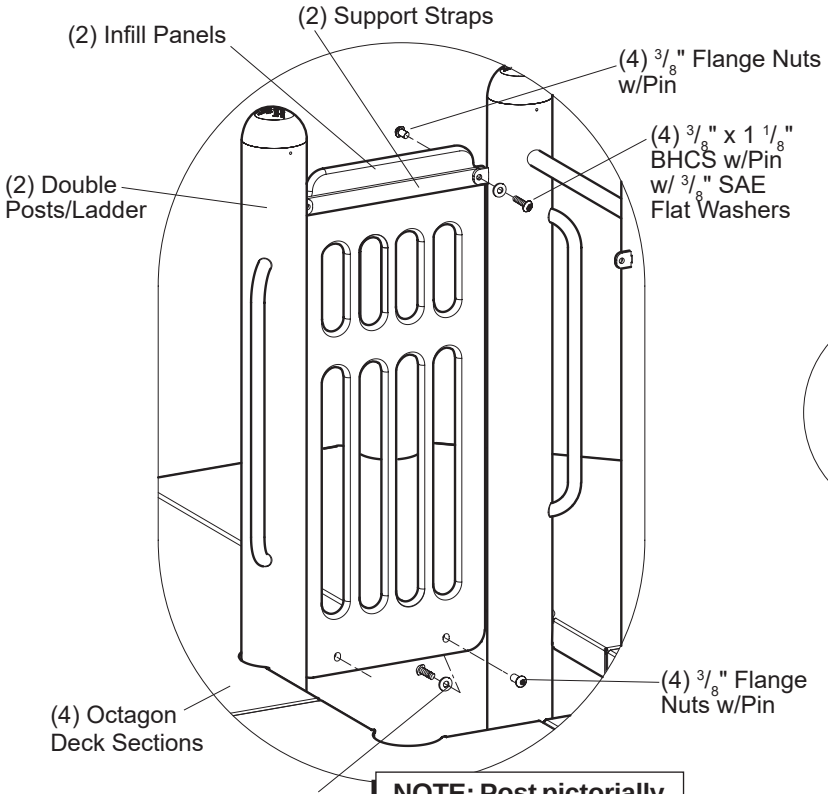
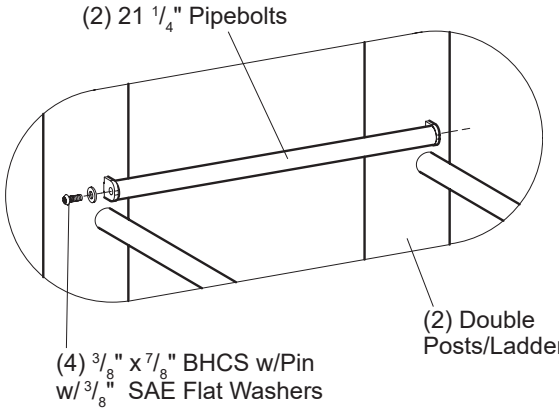
DETAIL
INFILL PANEL ATTACHMENT

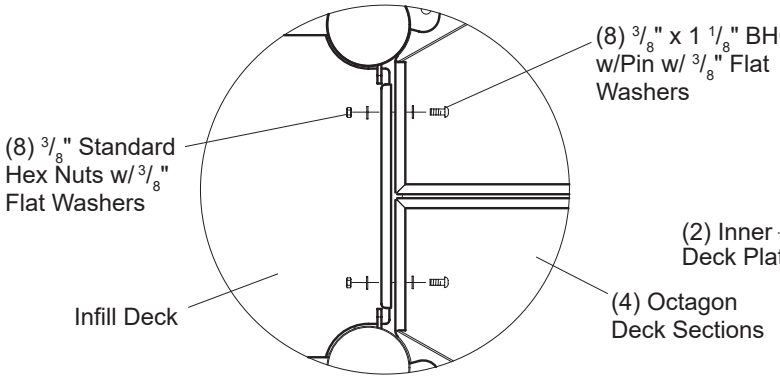


NOTE: Post pictorially removed for clarity.

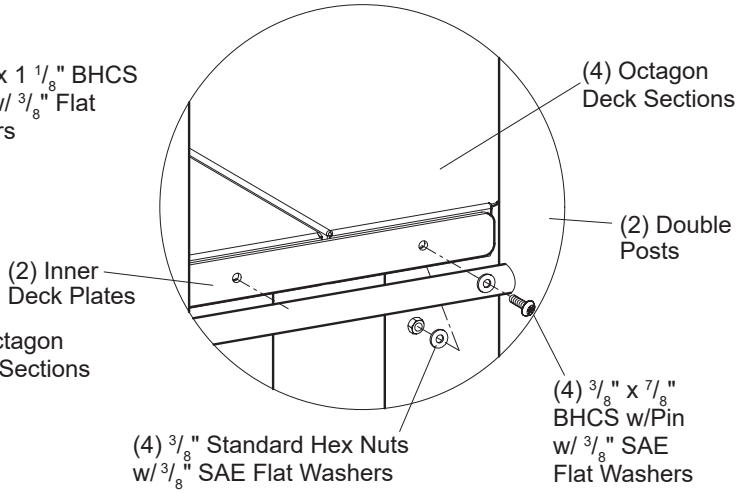
DETAIL
PIPEBOLT ATTACHMENT



DETAIL
INFILL DECK ATTACHMENT (BOTTOM VIEW)



DETAIL
INNER UPPER DECK PLATE ATTACHMENT



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PlayOdyssey 188689 PlayOdyssey® 10' Tower, w/o Roof

Parts List

Part#	Description	Qty.
100610	1/4" x 5/8" Drive Rivet, Al/SST	16
105327	5" Half Clamp, Specify Color	16
106022	Deck Hanger Clamp, Specify Color	16
128503	Infill Panel, Specify Color	2
136366	Infill Deck, Specify Color	1
149182	Support Strap, Specify Color	2
152982	Octagon Deck Section, Specify Color	8
165206	Outer Attachment Plate, Specify Color	16
185297	Double Post/Ladder, (DB), Specify Color	2
185298	Tall Outer Post, (DB), Specify Color	8
165501	Deck Support, Specify Color	8
165725	21 1/4" Pipebolt, Specify Color	2
165726	Inner Deck Plate, Specify Color	2
165895	Re-bar #5 x 114" long	48
161236	Post Cap, Specify Color	4
113300	1/4" x 1/2" Drive Rivet, Aluminum	12
165599	**PlayOdyssey Tower Hardware Package**	1
100196	3/8" x 7/8" BHCS w/Pin, SST	12
100198	3/8" x 1 1/8" BHCS w/Pin, SST	108
100321	3/8" Hex Patch Nut, SST	32
100327	3/8" Standard Hex Nut, SST	84
100329	5/16" Nylok Hex Nut, SST	16
100351	3/8" T-Nut, SST	32
100353	3/8" Flange Nut w/Pin, SST	8
100362	3/8" Flat Washer, SST	164
100365	3/8" SAE Flat Washer, SST	64
113027	3/8" x 1 3/8" BHCS w/Pin, SST	8

Specifications

Double Post: Weldment comprised of 5" O.D. x 11 GA (.120") galvanized steel tubing, 1.029" O.D. RS-20 (.070" - .080") galvanized steel tubing, 1.315" O.D. RS-20 (.080" - .090") galvanized steel tubing and 1/4" x 1 1/4" HRPO flat steel. Finish: ProShield®, color specified.

Outer Post: Fabricated from 5" O.D. x 11 GA (.120") galvanized steel tubing and die cast 369.1 aluminum post cap. Finish: ProShield, color specified.

Octagon Deck: Flange formed from 12 GA (.105") sheet steel conforming to ASTM A1011. Standing surface is perforated with 5/16" diameter holes. Deck face has (4) slotted holes for face mounting components. The combined finished size measures 2 5/8" x 106 1/4" x 106 1/4". Finish: TenderTuff®, color specified.

Post Cap: Cast aluminum. Finish: ProShield, color specified.

Re-bar #5: 5/8" Diameter.

Pipebolt: Fabricated from 1.125" O.D. 6061-T6 aluminum tube, with 3/8" internal threads.

Infill Deck: Flange formed from 12 GA (.105") sheet steel conforming to ASTM A1011. Standing surface is perforated with 5/16" diameter holes. The finished size measures 2 5/8" x 24 3/8" x 24 3/8". Finish: TenderTuff, color specified.

Infill Panel: Solid color Permalene®, color specified.

Inner Deck Plate: Fabricated from 1/4" HRPO steel sheet. Finish: ProShield, color specified.

Support Strap: Fabricated from 1/4" x 1 1/4" HRPO flat steel. Finish: ProShield, color specified.

Clamps: Cast aluminum. Finish: ProShield, color specified.

Fasteners: Primary fasteners shall be socketed and pinned tamperproof in design, stainless steel (SST) per ASTM F 879 unless otherwise indicated (see specific product installation/specifications).

Installation Time: Approx. 34 hours with 4 people minimum
Concrete Req.: Approx. 3.70 cu. yds.
Actual Size: 106 1/4" x 106 1/4" (2,70 m x 2,70 m)
Weight: 3048 lbs.
Fall Height: 120" (3,04 m) Deck Height

Specifications are subject to change without notice.

Eco # 0101724 Document #26269900 replaces #18869000. Added note for inner post plates.

PlayOdyssey 188689 PlayOdyssey® 10' Tower, w/o Roof

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Installation Instructions

NOTE: *To lift deck sections, a "Lull" type material handler is recommended.*

1) Dig footing, and level ground as shown. Refer to the Plan View/Footing Layout.

Deck/Double Post Assembly

2) **Step #1 -** Attach deck hanger clamps to outer posts at height shown, using 5" half clamps, 3/8" x 1 1/8" BHCS w/pin and 3/8" tee nuts. Refer to the Offset Hanger Clamp Assembly Spec Sheet.

3) Attach outer attachment plates to deck hanger clamps, using 5/16" nylok hex nuts with 3/8" SAE flat washers. Refer to Detail.

4) Stand double post/ladder and (2) tall outer posts upright in footing hole. **NOTE:** *Rope may be used to tie off the double post. The use of rope will help keep the double post in plumb position, while attaching decks. Tie a rope (not supplied) on each side of the top ladder rung. The rope should be long enough to attach to a ground stake (not supplied). When the double post is in plumb position, pull the ropes tight, and attach to ground stakes.*

5) Lift deck section and place onto outer attachment plates, and double post plate. Attach deck section to tall outer post attachment plates, using 3/8" patch hex nuts with 3/8" SAE flat washers. Refer to Detail.

6) **Step #2 -** Stand (2) tall outer posts upright in footing hole. Lift deck section and place onto tall outer post attachment plates, and double post plate. Attach deck section to tall outer post attachment plates, using 3/8" patch hex nuts with 3/8" SAE flat washers. Refer to Detail.

7) **Step #3 -** Attach infill deck to deck sections, using 3/8" x 1 1/8" BHCS w/pin with 3/8" flat washers and 3/8" standard hex nuts with 3/8" flat washers. Refer to the Infill Deck Attachment Detail.

8) Stand remaining double post and (2) tall outer posts upright in footing hole. Lift deck section and place onto tall outer post attachment plates, and double post plate. Attach deck section to tall outer post attachment plates, using 3/8" patch hex nuts with 3/8" SAE flat washers. Refer to Detail.

9) Attach 21 1/4" pipebolts to double posts, using 3/8" x 7/8" BHCS w/pin and 3/8" SAE flat washers. Refer to the Pipebolt Attachment Detail.

10) **Step #4 -** Stand remaining tall outer posts upright in footing hole. Lift deck section and place onto tall outer post attachment plates, and double post plate. Attach deck section to tall outer post attachment plates, using 3/8" patch hex nuts with 3/8" SAE flat washers. Refer to Detail.

11) Attach infill deck to deck sections, using 3/8" x 1 1/8" BHCS w/pin with 3/8" flat washers and 3/8" standard hex nuts with 3/8" flat washers. Refer to the Infill Deck Attachment Detail.

12) Attach (4) deck sections together, using 3/8" x 1 1/8" BHCS w/pin with 3/8" flat washers and 3/8" standard hex nuts with 3/8" flat washers. Refer to the Deck Assembly Detail.

13) Attach (4) deck supports to decks, using 3/8" x 1 3/8" BHCS w/pin, 3/8" x 1 1/8" BHCS w/pin,3/8" flat washers and 3/8" standard hex nuts. Refer to the Deck Assembly Detail.

14) **Step #5 -** Attach remaining (4) deck sections to tall outer post attachment plates, using 3/8" patch hex nuts with 3/8" SAE flat washers. Refer to Detail.

15) **Step #6 -** Attach infill panels to double posts, using support straps, 3/8" flange nuts and 3/8" x 1 1/8" BHCS w/pin with 3/8" SAE flat washers. Refer to the Infill Panel Attachment Detail.

16) Attach (2) inner upper deck plates to deck sections, using 3/8" x 7/8" BHCS w/pin with 3/8" SAE flat washers and 3/8" standard hex nuts with 3/8" SAE flat washers. Refer to the Inner Deck Plate Attachment Detail.

Post Cap Assembly

17) Insert the post caps into the double posts. Using the holes in the double posts as guides drill through holes with a 1/4" or "F" only drill bit. Insert 1/4" x 1/2" drive rivets in holes and hammer drive rivet pin in until flush with head. Refer to thePost Cap Attachment Detail.

Finishing Steps

18) Install 1/4" x 5/8" drive rivets in all 5" half clamps. Refer to the Typical Offset Hanger Clamp Spec Sheet.

19) With posts plumb and decks level, pour concrete footing. Let concrete cure for 72 hours before use. Refer to the Plan View/Footing Layout. **NOTE:** *Make sure Re-rod is placed in concrete as shown.*

20) Install enclosures/play components as shown on your site drawings.

21) Install protective surfacing before users are allowed to play on the structure.

Specifications are subject to change without notice.

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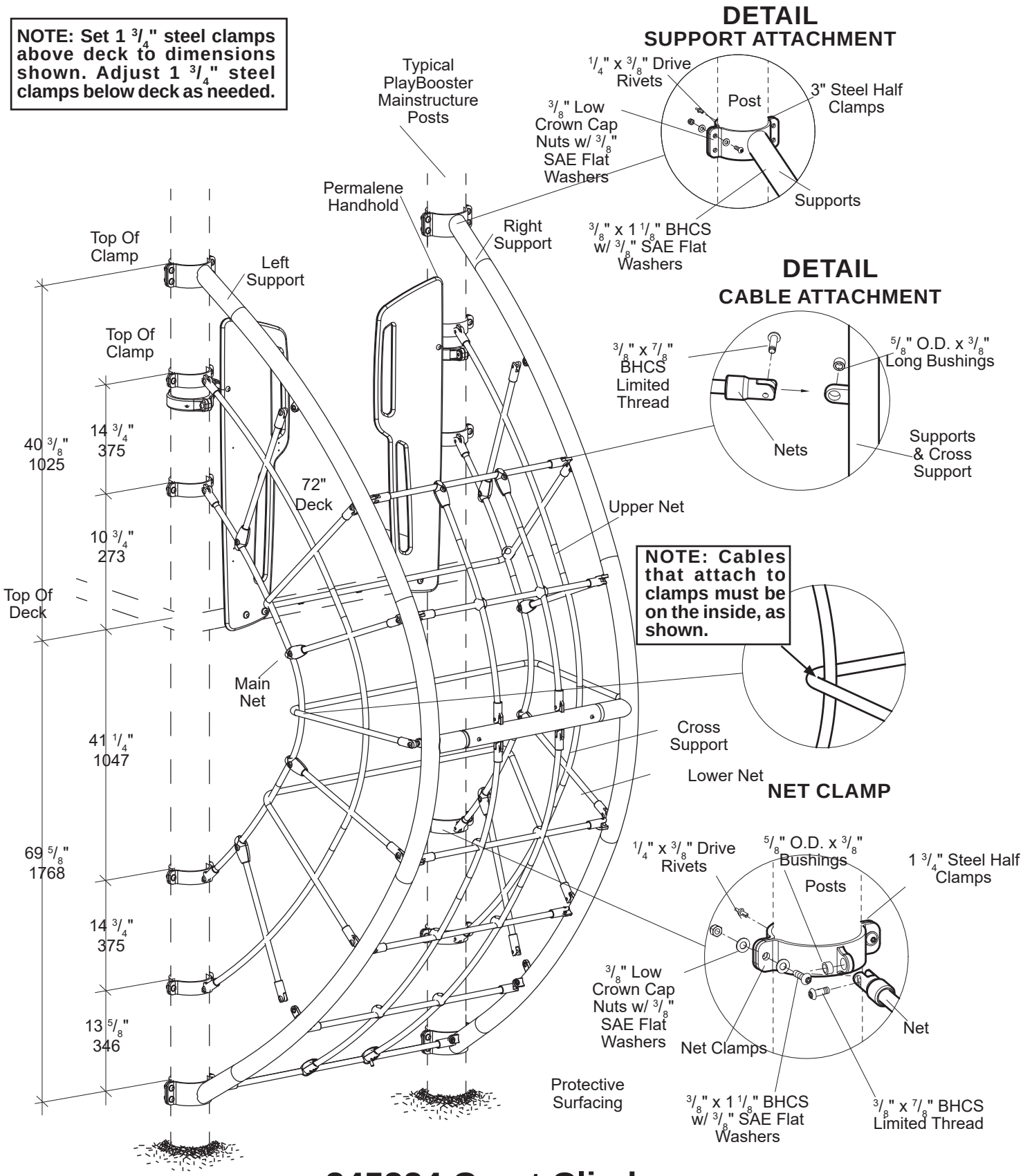
SAFETY NOTE
Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. ASTM F1487.)

NOTE: Set 1 3/4" steel clamps above deck to dimensions shown. Adjust 1 3/4" steel clamps below deck as needed.



PlayBooster®

345324 Crest Climber

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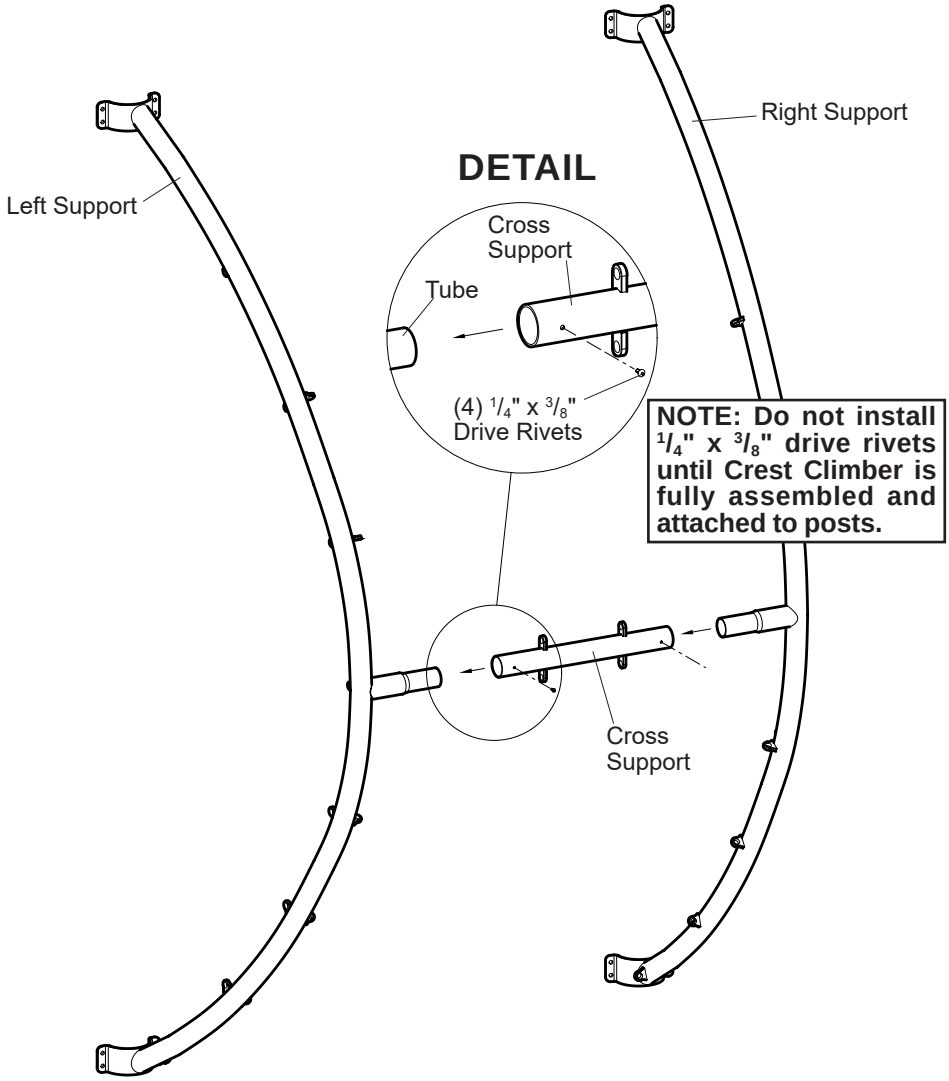
SAFETY NOTE

Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. ASTM F1487.)

DETAIL
EXPLODED VIEW



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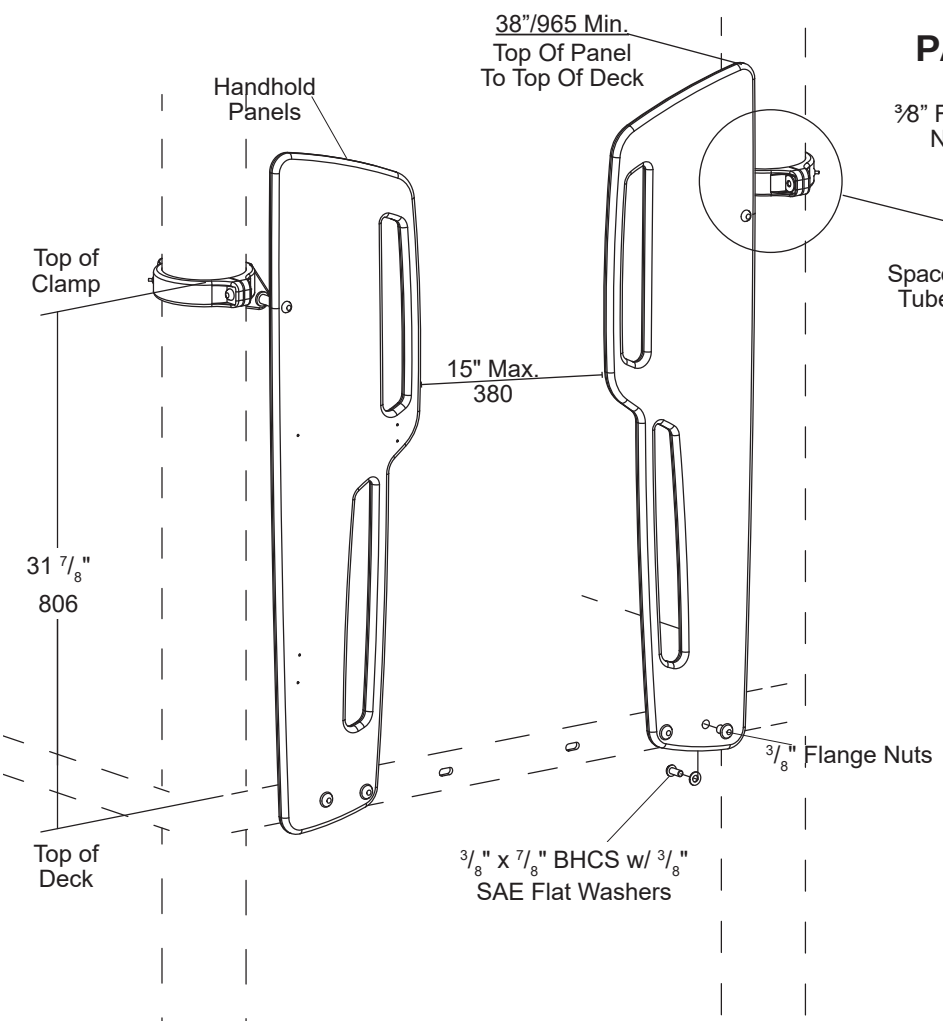
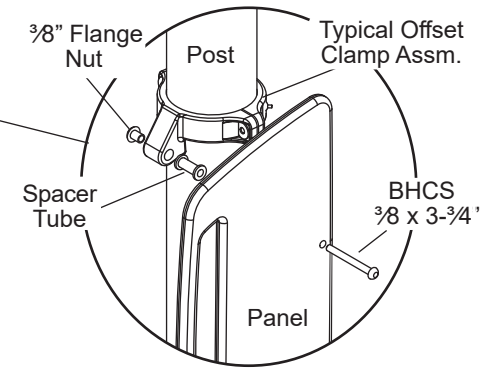
SAFETY NOTE
Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. ASTM F1487.)

DETAIL HANDHOLD PANEL



DETAIL PANEL ATTACHMENT



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PlayBooster® 345324 Crest Climber

Parts List

Part#	Description	Qty.
100610	1/4" x 5/8" Drive Rivet, AL/SST	2
105327	5" Half Clamp, Specify Color	2
113468	7/8" O.D. x 1 11/16" Spacer Tube, AL., Specify Color	2
113729	5" Offset Hanger Clamp, Specify Color	2
346076	Handhold Panel, Specify Color	2
190918	Support, (LH), Specify Color	1
191036	Support, (RH), Specify Color	1
191012	Cross Support, Specify Color	1
202720	Lower Net (Cable Assy.), Specify Color	1
202750	Upper Net (Cable Assy.), Specify Color	1
206661	Main Net (Cable Assy.), Specify Color	1
125711	3" Wide Half Clamp, Specify Color	4
104731	1 3/4" Steel Half Clamp, Specify Color	8
161898	Net Clamp, Specify Color	8
139861	**Handhold Hardware Package**	2
100196	3/8" x 7/8" BHCS , SST	4
100198	3/8" x 1 1/8" BHCS , SST	4
100351	3/8" Tee Nut, SST	4
100353	3/8" Flange Nut , SST	6
100365	3/8" SAE Flat Washer, SST	4
124460	3/8" x 3 3/4" BHCS , SST	2
267319	**Crest Climber Hardware Package**	1
100198	3/8" x 1 1/8" BHCS , SST	32
100290	3/8" x 7/8" BHCS Limited Thread, SST	38
100349	3/8" Low Crown Cap Nut, SST	32
100365	3/8" SAE Flat Washer, SST	64
100611	1/4" x 3/8" Drive Rivet, AL/SST	16
127179	5/8" O.D. x 3/8" Bushing, SST	38

Specifications

Support: Weldment comprised of 2.375" (60,33 mm) O.D. RS40 (.130" - .140") (3,30 mm-3,56 mm) wall galvanized steel tubing,3/8" (9,53 mm) thick SST plate, and 1/4" (6,35 mm) HRPO flat steel. Finish: ProShield®, color specified.

Handhold Panel: Permalene®, color specified.

Cross Support: Weldment comprised of 2.375" (60,33 mm) O.D. RS40 (.130" - .140") (3,30 mm-3,56 mm) wall galvanized steel tubing and 3/8" (9,53 mm) thick SST plate. Finish: ProShield, color specified.

Cable Assembly: **(Cable)** Made of tightly woven polyester-wrapped, six-stranded galvanized-steel cable with a polypropylene core. **(Cable Connectors)** 6063-T6 aluminum.

Net Clamp: Weldment comprised of 1/4" (6,35 mm) x 1 3/4" (44,45 mm) HRPO flat steel and .375" (9,53 mm) stainless steel sheet. Finish: ProShield, color specified.

Steel Half Clamps: Fabricated from of 1/4" (6,35 mm) HRPO flat steel. Finish: ProShield, color specified.

5" Clamps: Cast aluminum. Finish: ProShield, color specified.

Fasteners: Primary fasteners shall be socketed and pinned tamperproof in design, stainless steel (SST) per ASTM F879 unless otherwise indicated (see specific product installation/specifications).

Installation Time: 4 man hours
Weight: 205 lbs.
Fall Height: 93" (2,36 m)

Installation Instructions

1) Attach handhold panels to the face of the deck. Refer to the Handhold Panel Attachment Detail..

2) Attach offset hanger clamps to post at height shown, using 5" half clamps and 3/8" x 1 1/8" BHCS with 3/8" tee nuts. Refer To The Typical Offset Hanger Clamp Spec Sheet.

3) Attach panels to offset hanger clamp assemblies. Refer to the Handhold Panel Attachment Detail.

4) Attach left support to post at height shown. Refer to the Support Attachment Detail. Place cross support onto left support. Refer to Exploded View Detail.

5) Place right support onto cross support. Attach right support to post at height shown. Refer to the Support Attachment Detail & Exploded View Detail. **NOTE:** *Make sure cross support is level.*

6) Install 1/4" x 3/8" drive rivets in inner cross support and rail support. Drill through holes in inner cross support and supports with a 1/4" or "F" (only) drill bit. Insert drive rivets in inner cross support and supports. Hammer drive rivet pin in until flush with head.

7) Attach net clamps to posts at height shown. Refer to the Net Clamp Detail. **NOTE:** *Set 1 3/4" steel clamps above deck to dimensions shown. Adjust 1 3/4" steel clamps below deck as needed.*

8) Attach nets to supports, cross support and net clamps. Refer to the Cable and Net Clamp Attachment Details.

9) Install 1/4" x 3/8" drive rivets in 1 3/4" & 3" wide steel clamps. Drill through hole in steel clamps and into 5" post with a 1/4" or "F" (only) drill bit, insert drive rivet in hole through clamp and into post. Hammer drive rivet pin in until flush with head. Refer to the Typical Offset Hanger Clamp Spec Sheet.

10) Install 1/4" x 5/8" drive rivets in all 5" half clamps. Drill through hole in 5" half clamps and into 5" post with a 1/4" or "F" (only) drill bit, insert drive rivet in hole through clamp and into post. Hammer drive rivet pin in until flush with head. Refer to the Typical Offset Hanger Clamp Spec Sheet.

11) Install protective surfacing before users are allowed to play on the structure.

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DETAIL
GUARDRAIL ATTACHMENT

ISO 14001 CERTIFIED

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SAFETY NOTE
Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. ASTM F1487.)

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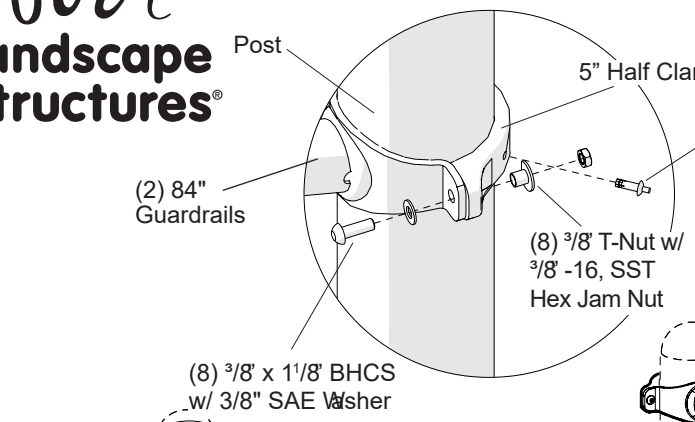
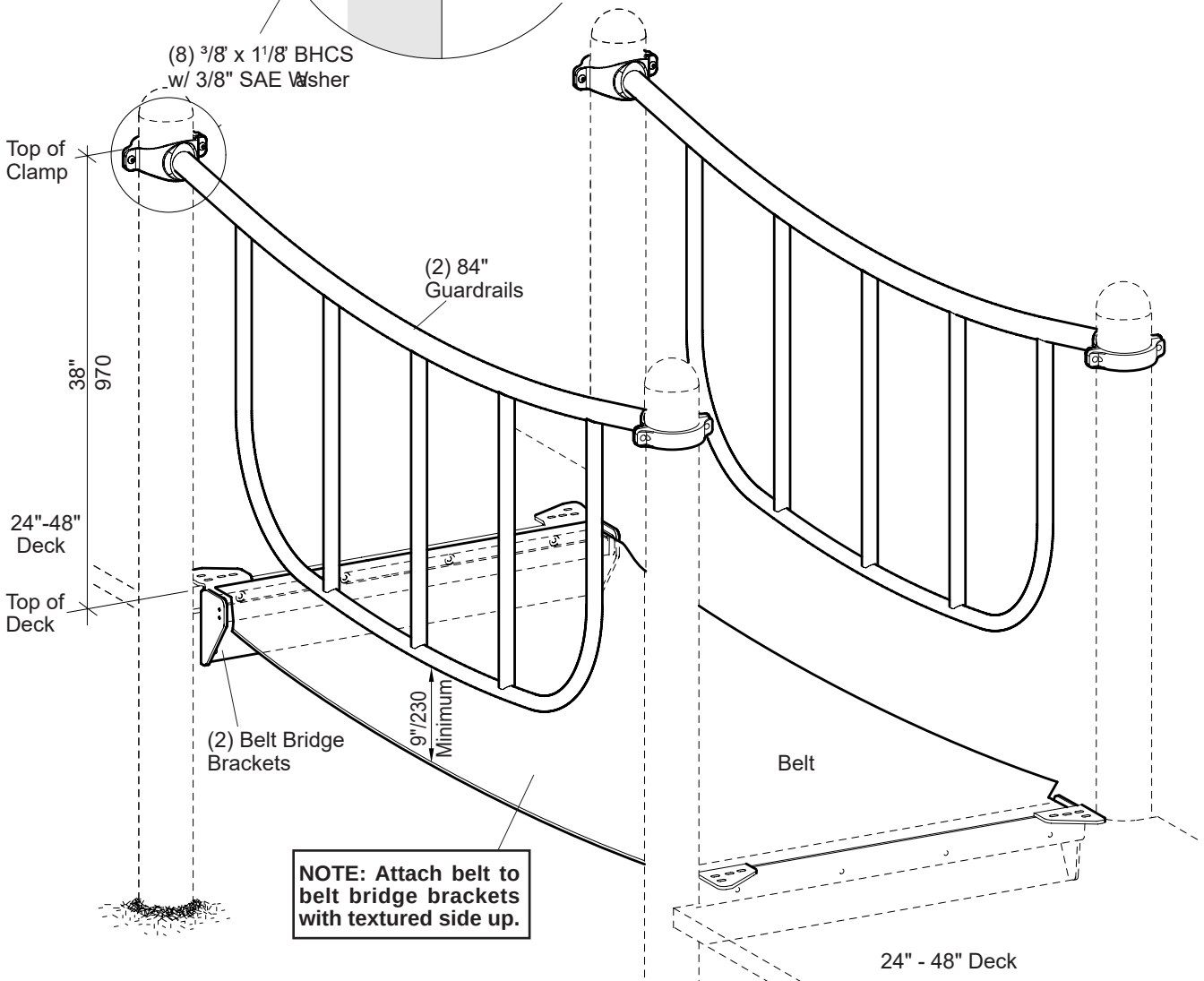
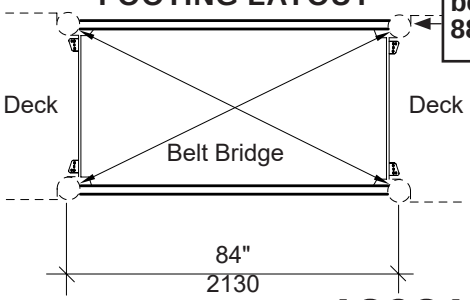




NOTE: Attach belt to belt bridge brackets with textured side up.

PLAN VIEW
FOOTING LAYOUT



IMPORTANT: The diagonal dimensions between posts are critical and must be 88 $^{15}/_{16}$" ± $^{1}/_{4}$".

NOTE: Belt Bridge attaches to Tenderdecks only.

Protective Surfacing

PlayBooster®

120310 Belt Bridge, 84"

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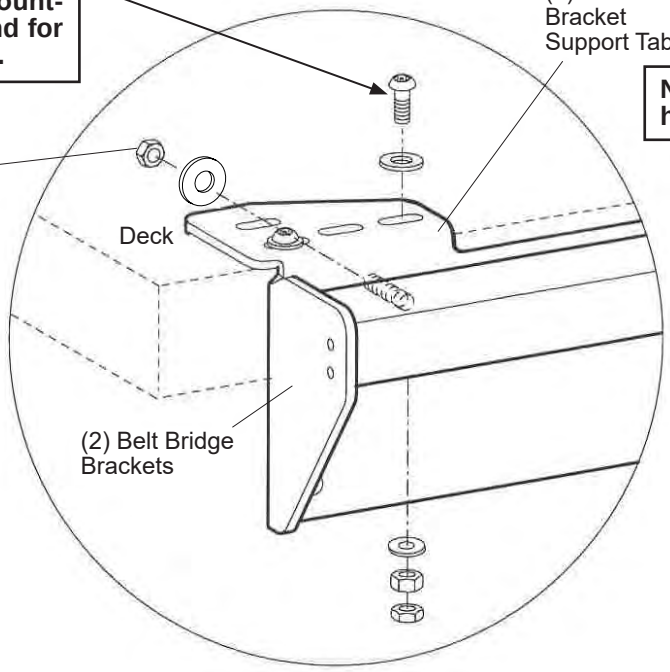
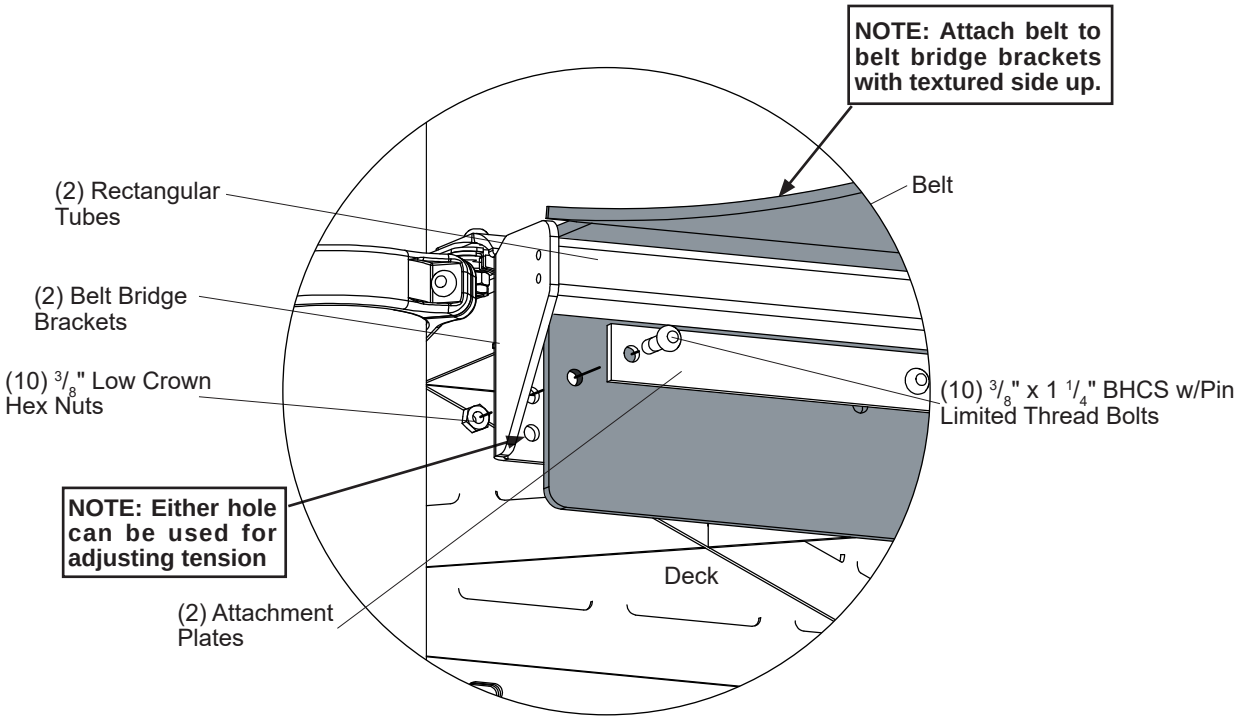
DETAIL
BELT BRIDGE BRACKET



DETAIL
BELT ATTACHMENT



PlayBooster® 120310 Belt Bridge, 84"

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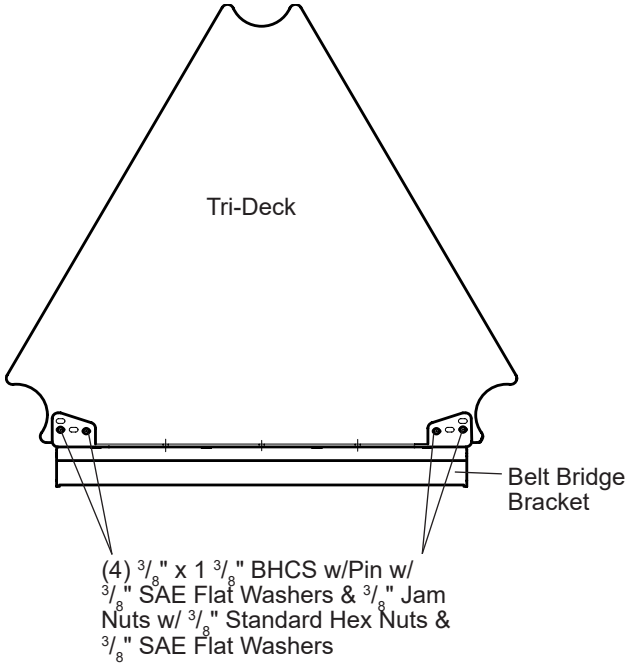

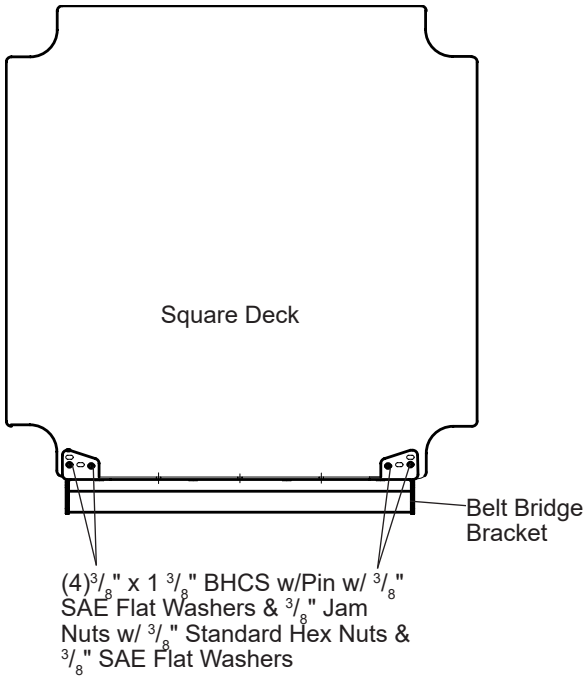

PlayBooster®

Tri-Deck/Square Deck

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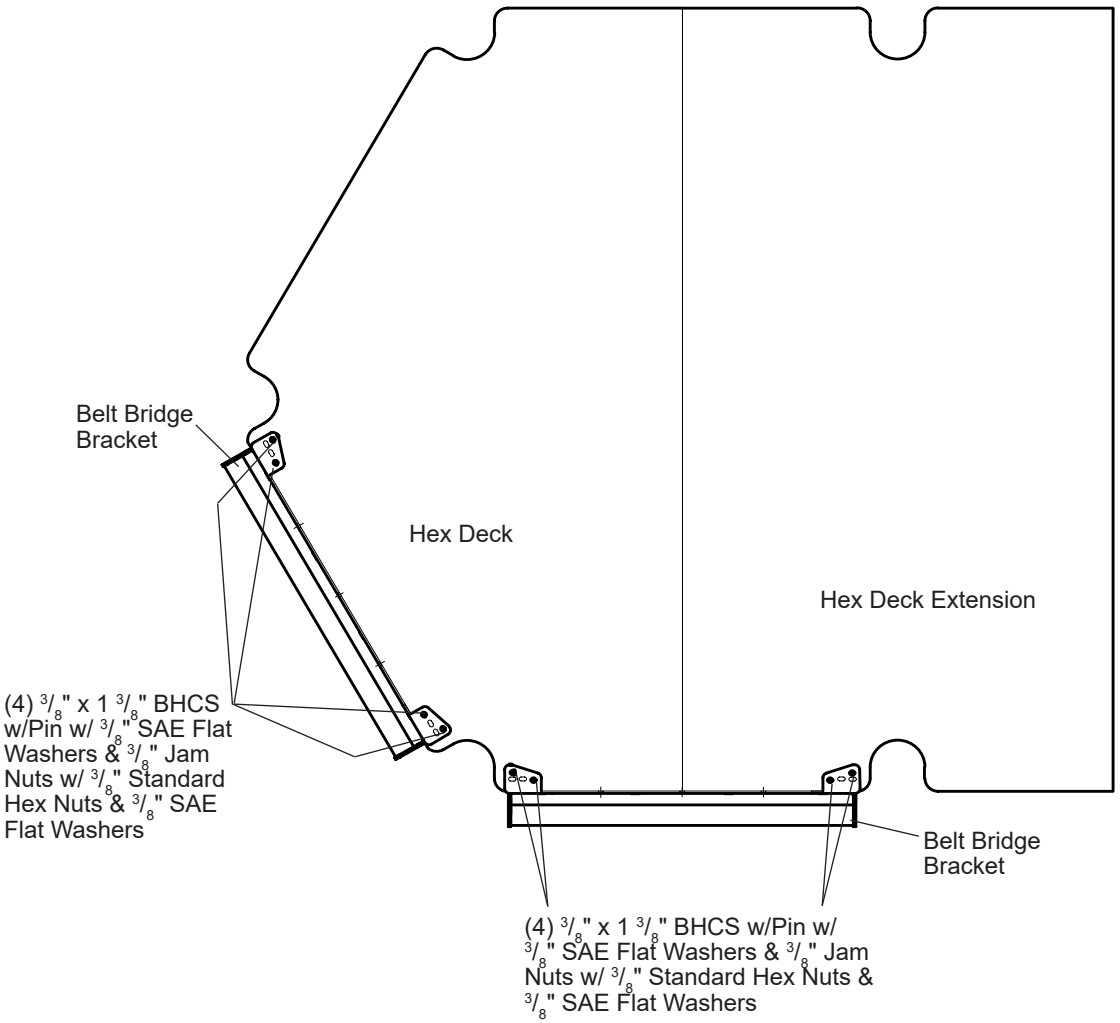

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Hex Deck

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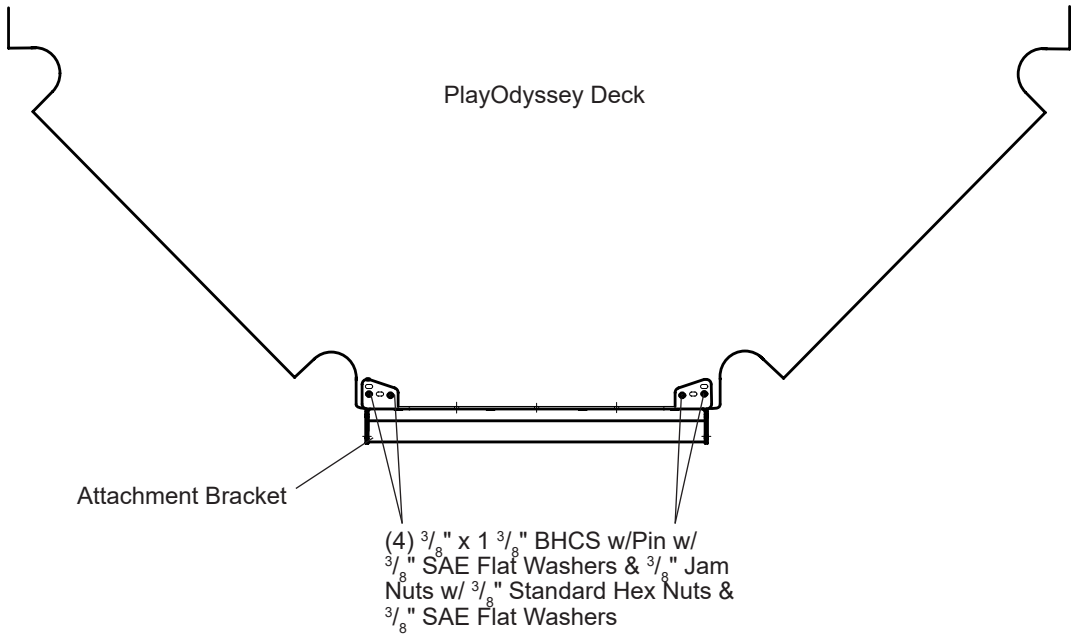

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PlayBooster® 120310 Belt Bridge, 84"

Parts List

Part#	Description	Qty.
228428	Belt 42" x 93", Black	1
141269	84" Guardrail, Specify Color	2
134698	Belt Bridge Bracket, Specify Color	2
119801	Attachment Plate, Specify Color	2
105327	5" Half Clamp, Specify Color	4
247612	**Belt Bridge Hardware Package**	1
100292	3/8" x 1 1/4" BHCS w/Pin Ltd. Thread Bolt, SST	10
100321	3/8" Hex Patch Nut, SST	8
100327	3/8" Standard Hex Nut, SST	8
100365	3/8" SAE Flat Washer, SST	16
113027	3/8" x 1 3/8" BHCS w/Pin, SST	8
100362	3/8" Flat Washer, SST	8
128296	3/8" Hex Jam Nut, SST	8
100349	3/8" Low Crown Hex Nut, SST	10
247798	**Hardware AL/ST Clamp PB**	1
100198	3/8" x 1 1/8" BHCS w/Pin, SST	8
100351	3/8" Tee Nut, SST	8
100610	1/4" x 5/8" Drive Rivet, AL/SST	4
128296	3/8" Hex Jam Nut, SST	8
100365	3/8" SAE Washer, SST	8

Specifications

Belt: Made from .315" thick mini rough top 3-ply rubber belting with polyester fabric plys, 42" wide x 93" long, black in color.

Belt Bridge Brkt: Weldment comprised of 1/4" HRS rectangular steel tubing and formed 1/4" HRS flat steel. Finish: ProShield®, color specified.

Attachment Plate: Fabricated from 1/4" HRS flat steel. Finish: ProShield®, color specified.

Guardrail: Weldment comprised of 1.900" O.D. RS-20 (.090" - .100") galvanized steel tubing beam, 1.315" O.D. RS-20 (.080" - .090") and 1/4" x 3 1/4" steel half clamps. Finish: ProShield, color specified.

Half Clamp: Cast aluminum. Finish: ProShield, color specified.

Fasteners: Primary fasteners shall be socketed and pinned tamperproof in design, stainless steel (SST) per ASTM F 879 unless otherwise indicated (see specific product installation/specifications).

Installation Time: Approx. 4 man hours
Weight: 219 lbs.
Fall Height: Deck Height

Installation Instructions

1) With mainstructure posts and decks in position, attach guardrails to mainstructure posts at height shown, using 5" half clamps, 3/8" x 1 1/8" BHCS w/pin , 3/8" flat washers and 3/8" hex jam nuts with 3/8" flat washers and 3⁄8" T-Nuts. Refer to the Guardrail Attachment Detail.

2) Loosely attach (1) belt bridge bracket to the face of the deck using 3/8" hex patch nuts with 3/8" flat washers. Refer to the Belt Bridge Bracket Detail.

3) Feed the belt over the top of the rectangular tubing on the belt bridge bracket. Attach the belt to the top holes in the belt bridge bracket using the attachment plate, 3/8" x 1 1/4" BHCS w/pin limited thread bolts and 3/8" low crown hex nuts. Refer to the Belt Attachment Detail. **NOTE:** ***Attach belt to belt bridge brackets with textured side up.***

4) Attach the other end of the belt to the top holes in the belt bridge bracket using the attachment plate, 3/8" x 1 1/4" BHCS w/pin limited thread bolts and 3/8" low crown hex nuts. Refer to the Belt Attachment Detail.

5) Attach the belt bridge bracket with belt to the face of the deck using 3/8" hex patch nuts with 3/8" SAE flat washers. Tighten belt bridge brackets to the face of the deck both ends. Refer to the Belt Bridge Bracket Detail.

6) Drill 3/8" holes through the top of the deck, using the belt bridge bracket support tabs as a drilling guide. **NOTE:** *See installation sheet 2 and 3 for specific mounting holes to be used and for proper length hardware.*

7) If the belt requires more tension, move the belt to the bottom holes in the belt bridge bracket. Refer to the Belt Bridge Bracket Detail.

8) Install 1/4" x 5/8" drive rivets in all 5" half clamps. Refer to the Offset Hanger Clamp Spec Sheet.

9) Install protective surfacing before users are allowed to play on the structure.

Specifications are subject to change without notice.

ECO #0102468 Document #33254500 replaces #24794300. Updated belt attachment detail.

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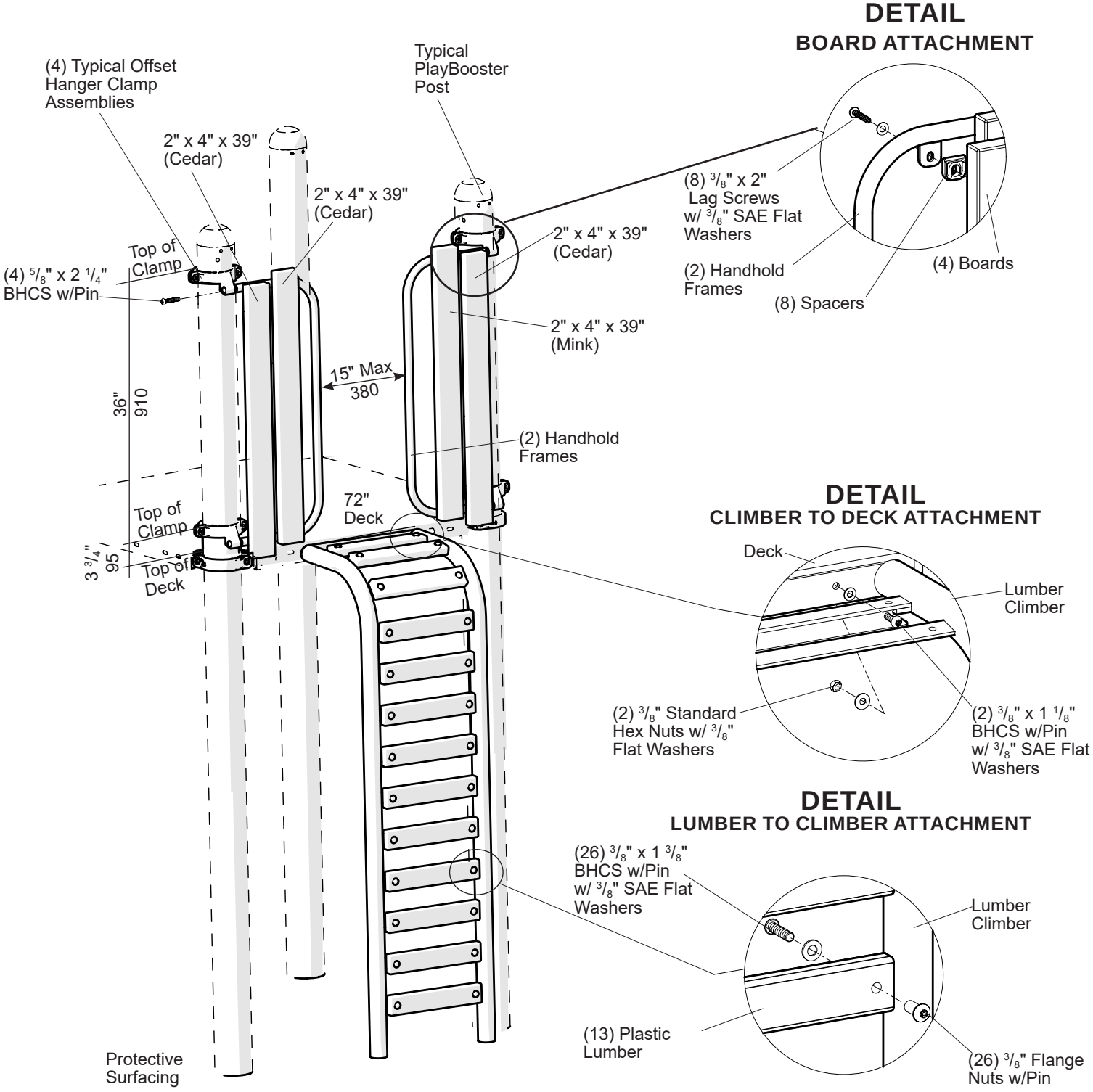
SAFETY NOTE

Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. ASTM F1487.)



Play Naturally™

PlayBooster® 271906 Wood Plank Ladder, w/Recycled Wood GR. HHolds

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PlayBooster® 271906 Wood Plank Ladder, w/Recycled Wood GR. HHolds

Parts List

Part#	Description	Qty.
100610	1/4" x 5/8" Drive Rivet, AL/SST	4
105327	5" Half Clamp, Specify Color	4
113729	Offset Hanger Clamp, Specify Color	4
168211	Handhold Frame, Tan	2
168467	2" x 4" x 38 5/8" Board, Cedar or Mink	4
212380	Lumber Climber Plastic Wood, Mink	13
269504	Wood Plank Ladder 72", DB	1
269723	Wood Plank Ladder 72", SM	1
272029	**Wood Plank Ladder Hardware Package**	1
100198	3/8" x 1 1/8" BHCS w/Pin, SST	2
100327	3/8" Hex Nut, SST	2
100353	3/8" Flange Nut, SST	26
100362	3/8" Flat Washer, SST	2
100365	3/8" SAE Flat Washer, SST	28
113027	3/8" x 1 3/8" BHCS w/Pin, SST	26
299782	**Wood-Grain Handhold Hardware Package**	1
100198	3/8" x 1 1/8" BHCS w/Pin, SST	8
100203	5/8" x 2 1/4" BHCS w/Pin, SST	4
100351	NUT MOD-T 3/8-16 SST	8
100365	3/8" SAE Flat Washer, SST	8
139039	LAG SCR BH 6LP 3/8x2i SST	8
207485	Railing Board Spacer	8
112578	**3-Hole (SM) Hardware Package**	2
100263	3/8" x 2 3/4" Expansion Anchors	6
100327	3/8" Standard Hex Nut, SST	6
100365	3/8" SAE Flat Washer, SST	6

DB = Direct Bury
SM = Surface Mount

Specifications

Wood Plank Ladder: Weldment comprised of 2.375" O.D. RS-20 (.095" - .105") galvanized steel tubing, and ¼" HRPO Steel Plate. Finish: ProShield®, color specified.

Poly Board: Recycled high-density polyethylene, cedar or mink in color.

Handhold Frame: Weldment comprised of 1.125" O.D. 11 GA. (.120") steel tubing with 203 or 303 stainless steel inserts, with 5/8" internal thread and 1/4" HRPO steel plate. Finish: ProShield, tan in color.

Clamps: Cast aluminum. Finish: ProShield, color specified.

Fasteners: Primary fasteners shall be socketed and pinned tamperproof in design, stainless steel (SST) per ASTM F 879 unless otherwise indicated (see specific product installation/specifications).

Installation Time: **SM** - Approx. 2 1/2 man hours
DB - Approx. 3 man hours
Concrete Req.: Approx. 1.3 cu. ft.
Weight: **DB** - 155 lbs.
SM - 145 lbs.
Fall Height: Deck Height

Installation Instructions

1) **(Direct Bury)** Dig footing hole.

2) Attach Wood Plank Ladder Frame to deck using ⅜" x 1 ⅛" BHCS w/ pin with ⅜" SAE Flat washer (small) and ⅜" standard hex nuts with ⅜" flat washers (large). See Climber to Deck Attachment Detail.

3) Attach Lumber Boards to Wood Plank Ladder Frame using 3/8" x 1 3/8" BHCS w/pin with 3/8" SAE flat washers (small) and 3/8" flange nuts w/pin. See lumber to climber attachment Detail.

4) Line up pilot holes in boards with spacers and handhold frame tabs and attach, using 3/8" x 2" lag screws with 3/8" SAE flat washers. Refer to the Board Attachment Detail

5) Attach offset hanger clamps assemblies to posts at height shown using half Clamps and 3/8" x 1 1/8" BHCS w/pin with 3/8" tee nuts. Ref To The Typical Offset Hanger Clamp Spec Sheet.

6) Attach handhold frames to offset hanger clamp assemblies using 5/8" x 2 1/4" BHCS w/pin. See Panel Attachment Detail.

7) **(Direct Bury)** With Wood Plank Ladder in final position, pour concrete footings. Allow concrete footing to cure a minimum of 72 hours before users are allowed to play on the structure.

   (Surface Mount) Mark anchor bolt locations on concrete slab through Holes in anchor plate and remove climber. Drill 3/8" x 3" deeps holes on marks into concrete using hammer drill and 3/8" masonry bit. Tap Expansion anchor into drilled holes. Reposition the climber and reattach to face of the deck following Step 2. Fasten anchor plates to expansion anchors using 3/8" standard hex nuts with 3/8" SAE flat washers.

8) Install 1/" x 5/" drive rivet in all 5" half clamps. Refer to the Typical Offset Hanger Clap Spec Sheet.

9) Install protective surfacing before users are allowed to play on the structure.

ECO #0102160 Document #29980100 replaces #27202700. Updated hdw pkg.

Specifications are subject to change without notice.

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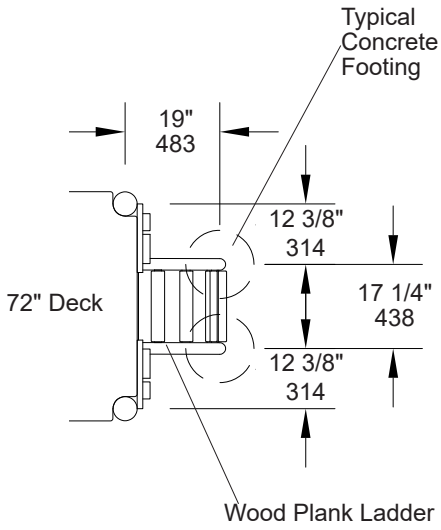
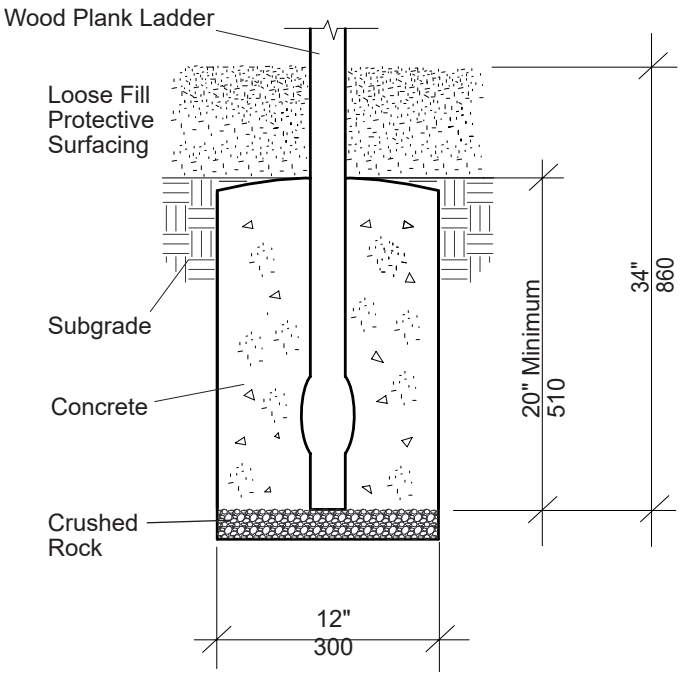
SAFETY NOTE
Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. ASTM F1487.)

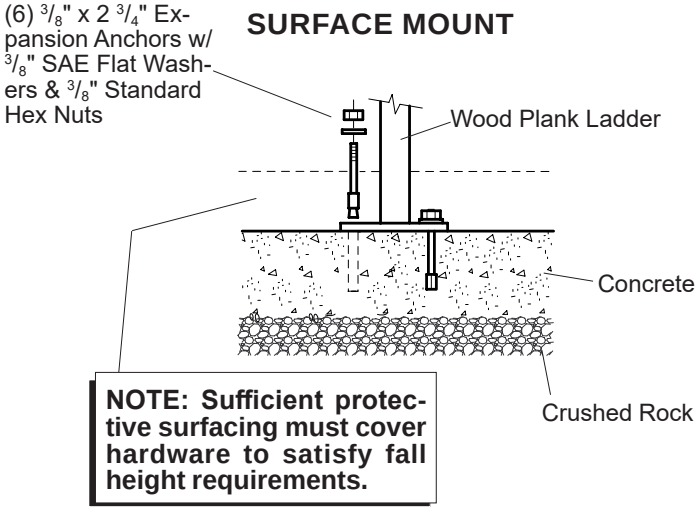
PLAN VIEW/FOOTING LAYOUT



DETAIL
DIRECT BURY



DETAIL
SURFACE MOUNT



NOTE: Sufficient protective surfacing must cover hardware to satisfy fall height requirements.

PlayBooster® 271906 Wood Plank Ladder, w/Recycled Wood GR. HHolds

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Document #29980100

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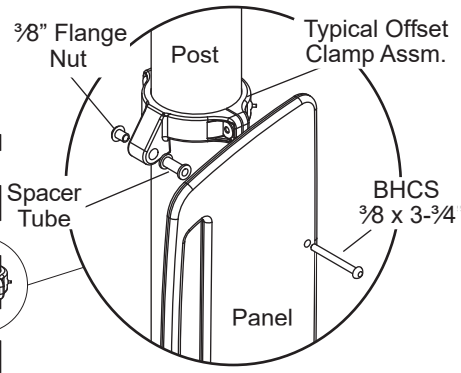
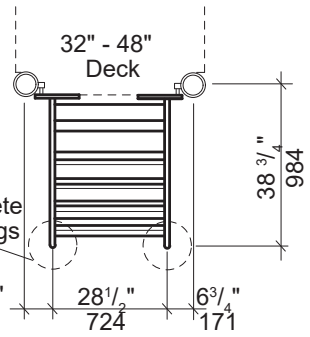
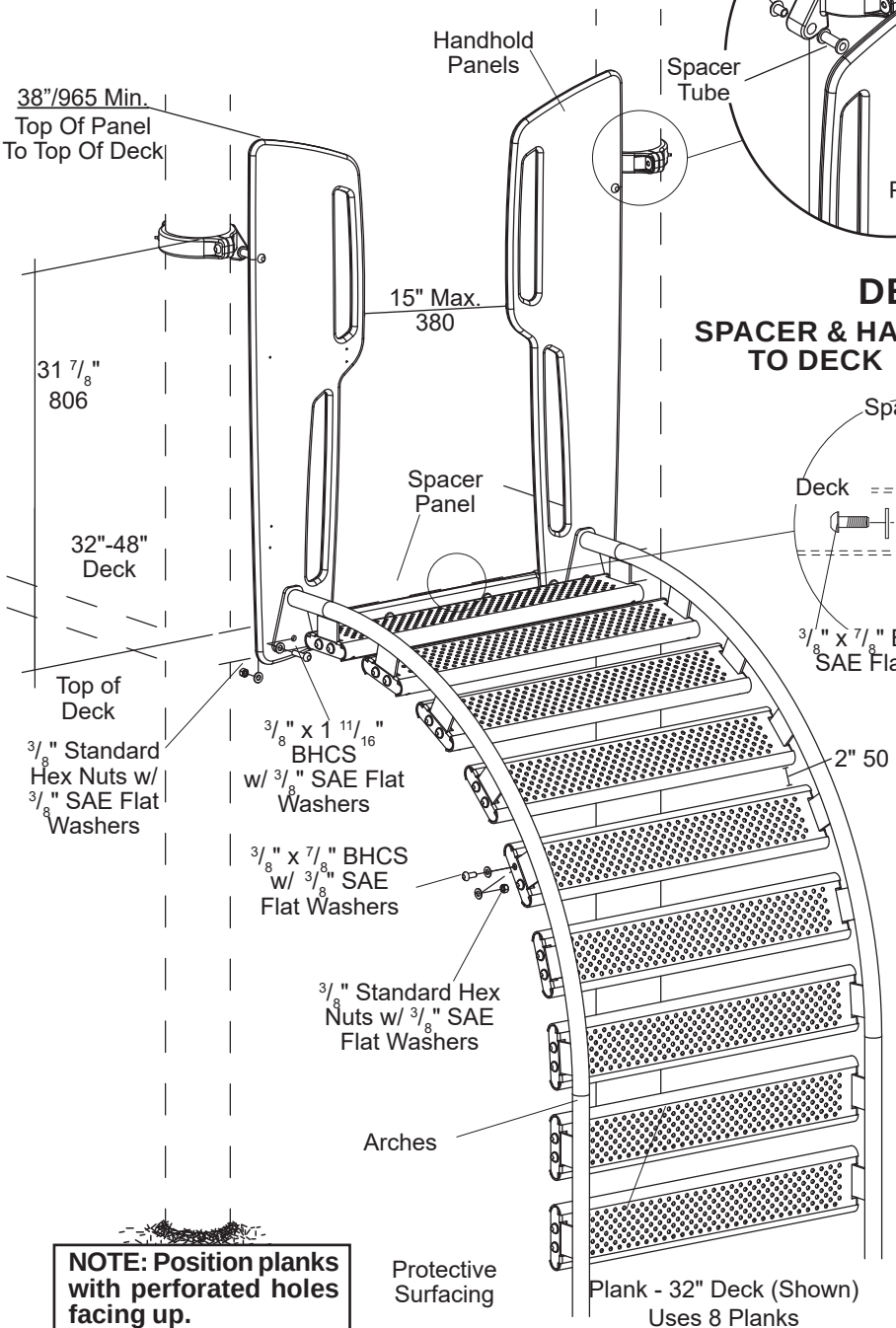
SAFETY NOTE
Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. ASTM F1487.)

DETAIL PANEL ATTACHMENT



PLAN VIEW FOOTING LAYOUT

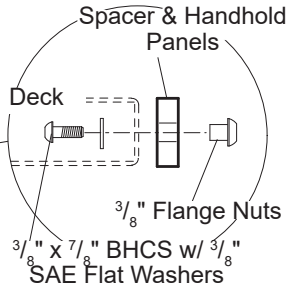




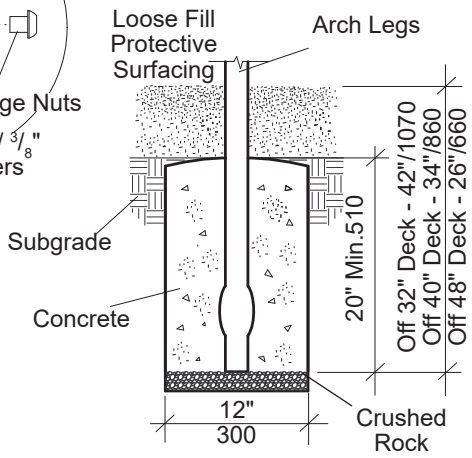
NOTE: Position planks with perforated holes facing up.

Plank - 32" Deck (Shown)
Uses 8 Planks
40" Deck, Uses 8 Planks
48" Deck, Uses 9 Planks

DETAIL SPACER & HANDHOLD PANELS TO DECK ATTACHMENT

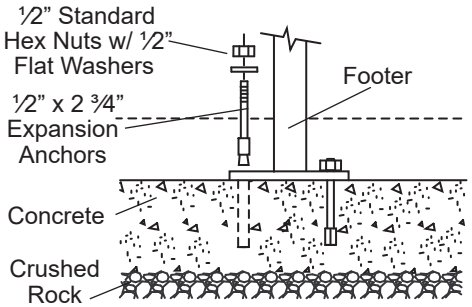


DETAIL DIRECT BURY



DETAIL SURFACE MOUNT

NOTE: Sufficient protective surfacing must cover hardware to satisfy fall height requirements.



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345320 Cozy Climber™

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Document #34519000

PlayBooster® 345320 Cozy Climber™

Parts List

Part#	Description	Qty.
113226	Plank 32” & 40”, Specify Color	8
113226	Plank 48”, Specify Color	9
346076	Handhold Panel, Specify Color	2
351083	Spacer Panel, Specify Color	1
113255	32” & 40” Arch (DB), Specify Color	2
113613	48” Arch (DB), Specify Color	2
114190	40” Arch (SM), Specify Color	2
114188	48” Arch (SM), Specify Color	2
105327	5” Half Clamp, Specify Clamp	2
113729	Offset Hanger Clamp, Specify Color	2
113468	Spacer Tube, Specify Color	2
148138	**32” & 40” Tenderdeck Hardware Package**	1
124460	3/8” x 3 3/4” BHCS w/Pin, SST	2
100196	3/8” x 7/8” BHCS w/Pin, SST	36
100198	3/8” x 1 1/8” BHCS w/Pin, SST	4
100327	3/8” Standard Hex Nut, SST	34
100351	3/8” Tee nut, SST	4
100353	3/8” Flange Nut w/Pin, SST	6
100365	3/8” SAE Flat Washer, SST	72
123224	3/8” x 1 11/16” BHCS w/Pin, SST	2
148139	**48” Tenderdeck Hardware Package**	1
124460	3/8” x 3 3/4” BHCS w/Pin, SST	2
100196	3/8” x 7/8” BHCS w/Pin, SST	40
100198	3/8” x 1 1/8” BHCS w/Pin, SST	4
100327	3/8” Standard Hex Nut, SST	38
100351	3/8” Tee nut, SST	4
100353	3/8” Flange Nut w/Pin, SST	6
100365	3/8” SAE Flat Washer, SST	80
123224	3/8” x 1 11/16” BHCS w/Pin, SST	2
111392	**2-Hole (SM) Hardware Package**	1
100266	1/2” x 2 3/4” Expansion Anchor	2
100322	1/2” Standard Hex Nut, SST	2
100363	1/2” Flat Washer, SST	2

DB = Direct Bury
SM = Surface Mount

Specifications

Arch: Weldment comprised of 1.315” O.D. RS-20 (.080” - .090”) galvanized steel tubing and 3/16” x 2 1/2” x 2 3/4” flat steel plates. Finish: ProShield®, color specified.

Plank: Flange formed from 12 GA (.105) sheet steel conforming to ASTM A1011. Standing surface is perforated with 5/16” diameter holes. Finish: TenderTuff™, color specified.

Handhold Panel: Permalene®, color specified.

Offset Hanger Clamp Assembly: Cast aluminum. Finish: ProShield, color specified.

Spacer Tube: Made from 6061-T6 aluminum 7/8” O.D. x 1 11/16”. Finish: ProShield, color specified.

Fasteners: Primary fasteners shall be socketed and pinned tamperproof in design, stainless steel (SST) per ASTM F 879 unless otherwise indicated (see specific product installation/specifications).

Installation Time: **SM** - Approx. 2 1/2 man hours
DB - Approx. 3 man hours

Concrete Req.: Approx. 2.6 cu. ft.

Weight: 32” & 40” - 116 lbs.
48” - 126 lbs.

Fall Height: Deck Height

Installation Instructions

1) **(Direct Bury)** Dig footings as shown.
2) Attach arches to handhold panels and the face of deck using 3/8” x 1 11/16” BHCS w/pin with 3/8” SAE flat washers and 3/8” standard hex nuts with 3/8” SAE flat washers. **NOTE:** *Arches attach to outside holes in handhold panels.*
3) Attach spacer and handhold panels to the face of the deck using 3/8” x 7/8” BHCS w/pin with 3/8” SAE flat washers and 3/8” flange nuts w/pin. Refer to the Spacer & Handhold Panels To Deck Attachment Detail.
4) Attach offset hanger clamps to handhold panels using 3/8” x 3 3/4” BHCS w/pin, spacer tubes and 3/8” flange nuts w/pin. Refer to the Panel Attachment Detail.
5) Attach offset hanger clamps to posts using 5” half clamps, 3/8” x 1 1/8” BHCS w/pin and 3/8” tee nuts. Refer to the Typical Offset Hanger Clamp Spec Sheet.
6) Insert planks over flanges on arches and attach using 3/8” x 7/8” BHCS w/pin with 3/8” SAE flat washers and 3/8” standard hex nuts with 3/8” SAE flat washers. **NOTE:** *Position planks with perforated holes facing up.*
7) **(Direct Bury)** With climber in final position, pour concrete footings. Allow concrete footings to cure for a minimum of 72 hours before users are allowed to play on the structure.

   (Surface Mount) Drill 1/2” x 3” deep holes through support plate using hammer drill and 1/2” masonry bit. Tap expansion anchors into drilled holes. Fasten support plate to expansion anchors using 1/2” standard hex nuts with 1/2” flat washers.
8) Install protective surfacing before users are allowed to play on the structure.

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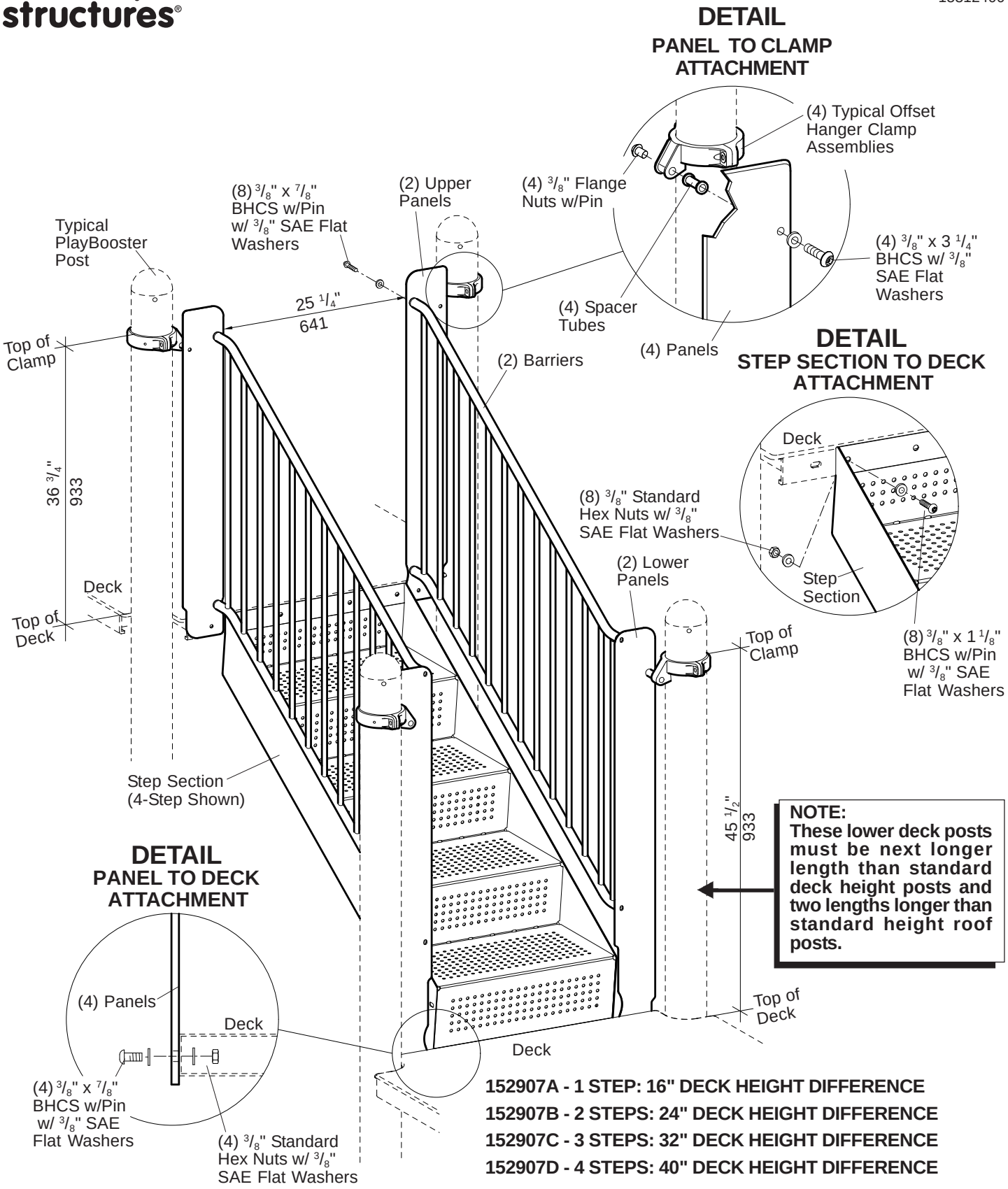
SAFETY NOTE

Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. *ASTM F1487*.)

15312400



152907A - 1 STEP: 16" DECK HEIGHT DIFFERENCE

152907B - 2 STEPS: 24" DECK HEIGHT DIFFERENCE

152907C - 3 STEPS: 32" DECK HEIGHT DIFFERENCE

152907D - 4 STEPS: 40" DECK HEIGHT DIFFERENCE

PlayBooster® 152907 Deck Link, w/ Barriers

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Document #15628400

PlayBooster® 152907 Deck Link, w/ Barriers

Parts List

Part#	Description	Qty.
144696	1-Step Section, Specify Color	1
144698	2-Step Section, Specify Color	1
144700	3-Step Section, Specify Color	1
144702	4-Step Section, Specify Color	1
144703	1-Step Barrier, Specify Color	2
144705	2-Step Barrier, Specify Color	2
144707	3-Step Barrier, Specify Color	2
144709	4-Step Barrier, Specify Color	2
153896	Lower Panel, Specify Color	2
153895	Upper Panel, Specify Color	2
113468	Spacer Tube, Specify Color	4
100610	1/4" x 5/8" Drive Rivet, AL/SST	4
105327	5" Half Clamp, Specify Color	4
113729	Offset Hanger Clamp, Specify Color	4
156283	**Deck Link Barr/Hrail Hardware Package**	1
100168	3/8" x 3 1/4" BHCS, SST	4
100196	3/8" x 7/8" BHCS w/Pin, SST	12
100198	3/8" x 1 1/8" BHCS w/Pin, SST	16
100327	3/8" Standard Hex Nut, SST	12
100351	3/8" Tee Nut, SST	8
100353	3/8" Flange Nut w/Pin, SST	4
100365	3/8" SAE Flat Washer, SST	36

Specifications

Panels: Zinc plated 7 GA. (.179") HR flat steel. Finish: ProShield®, color specified.

Step Section: Formed from 12 GA (.105) sheet steel conforming to ASTM A1011. Standing surface is 24 3/8" wide x 14" deep and is perforated with 5/16" diameter holes. Finish: TenderTuff, color specified.

Barrier: Weldment comprised of 1.125" O.D. x 11 Ga. (.120" wall) steel tubing, 5/8" O.D. steel bar with 203 or 303 stainless steel inserts with 3/8" internal threads. Finish: TenderTuff, color specified.

Spacer Tube: Made from 6061-T6 aluminum 7/8" O.D. x 1 11/16". Finish: ProShield, color specified.

Clamps: Cast aluminum. Finish: ProShield, color specified.

Fasteners: Primary fasteners shall be socketed and pinned tamperproof in design, stainless steel (SST) per ASTM F 879 unless otherwise indicated (see specific product installation/specifications).

Installation Time: Approx. 1 1/2 man hours

Weight:
1-Step - 130 lbs.
2-Step - 182 lbs.
3-Step - 236 lbs.
4-Step - 296 lbs.

Fall Height: Deck Height

Installation Instructions

1) Attach step section to decks using 3/8" x 1 1/8" BHCS w/pin with 3/8" SAE flat washers and 3/8" standard hex nuts with 3/8" SAE flat washers, as shown. Refer to the Step Section To Deck Attachment Detail.

2) Attach upper and lower panels to the face of the deck using 3/8" x 7/8" BHCS w/pin with 3/8" SAE flat washers and 3/8" standard hex nuts with 3/8" SAE flat washers. Refer to the Panel to Deck Attachment Detail.

3) Attach offset hanger clamps to posts at heights shown using 5" half clamps, 3/8" x 1 1/8" BHCS w/pin with 3/8" tee nuts. Refer to the Typical Offset Hanger Clamp Spec Sheet.

4) Attach upper and lower panels to offset hanger clamps using 3/8" x 3 1/4" BHCS with 3/8" SAE flat washers, spacer tubes and 3/8" flange nuts w/pin. Refer to the Panel To Clamp Attachment Detail.

5) Attach barriers to upper and lower panels using 3/8" x 7/8" BHCS w/pin and 3/8" SAE flat washers, as shown.

6) Install 1/4" x 5/8" drive rivets in all 5" half clamps. Refer to the Typical Offset Hanger Clamp Spec Sheet.

7) Install protective surfacing before users are allowed to play on the structure.

Specifications are subject to change without notice.

Eco #53000 Document #15628400 replaces #15312400. Added 3/8" x 1 1/8" BHCS w/Pin to hardware package.

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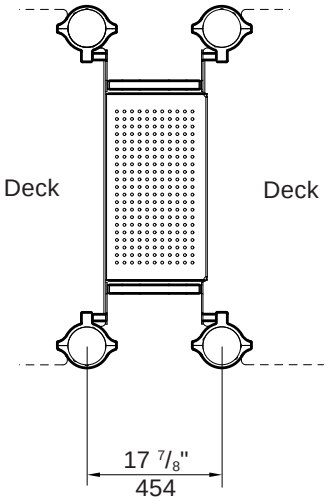
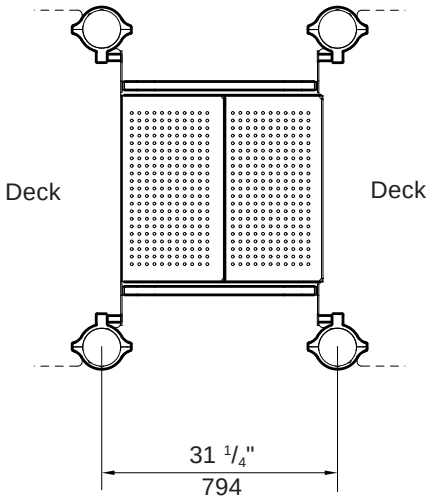
PLAN VIEW/FOOTING LAYOUTS

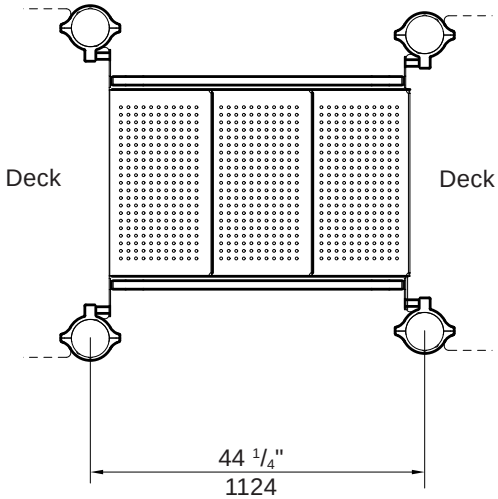
FOOTINGS/ 1-STEP



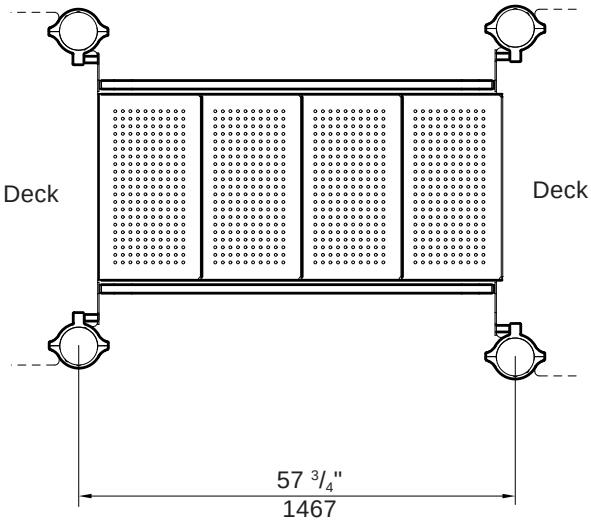
FOOTINGS/ 2-STEP



FOOTINGS/ 3-STEP



FOOTINGS/ 4-STEP



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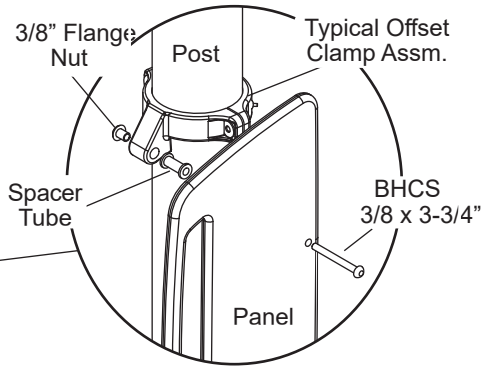
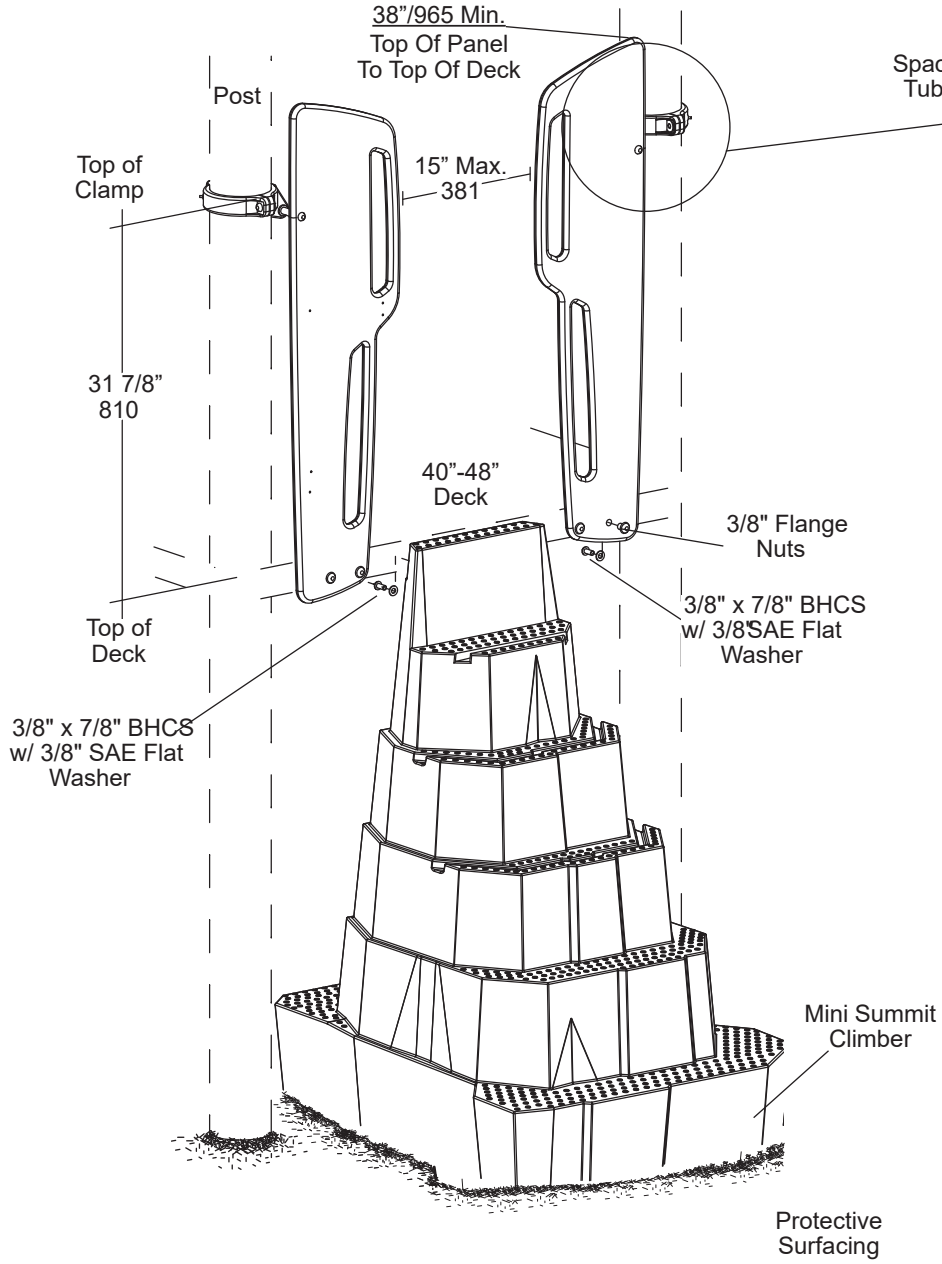
SAFETY NOTE
Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. ASTM F1487.)

NOTE: Summit Climber cannot be installed over a concrete slab off a 40" deck.

DETAIL PANEL ATTACHMENT





PlayBooster® 345313 Mini Summit Climber, 40”-48” Decks

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Document #34518200

PlayBooster® 345313 Mini Summit Climber, 40”-48” Decks

Parts List

Part#	Description	Qty.
152553	Mini Summit Climber, Specify Color	1
346076	Handhold Panel, Specify Color	2
105327	5” Half Clamp, Specify Color	2
113729	Offset Hanger Clamp, Specify Color	2
100610	1/4” x 5/8” Drive Rivet, AL/SST	2
113468	Spacer Tube, Specify Color	2
153191	Support, DB, Specify Color	1
153239	Support, SM, Specify Color	1
139899	**Summit Climber PO Hardware Package**	1
100196	3/8” x 7/8” BHCS w/Pin, SST	6
100198	3/8” x 1 1/8” BHCS w/Pin, SST	4
100351	3/8” Tee Nut, SST	4
100353	3/8” Flange Nut w/Pin, SST	6
100365	3/8” SAE Flat Washer, SST	6
124460	3/8” x 3 3/4” BHCS w/Pin, SST	2
129111	**Support Hardware Package**	1
100198	3/8” x 1 1/8” BHCS w/Pin, SST	2
100362	3/8” Flat Washer, SST	2
111391	**2 Hole (SM) Hardware Package**	1
100263	3/8” x 2 3/4” Expansion Anchor	2
100327	3/8” Standard Hex Nut, SST	2
100362	3/8” Flat Washer, SST	2

SM = Surface Mount
DB = Direct Bury

Specifications

Mini Summit Climber: Rotationally molded from U.V. stabilized linear low density polyethylene, color specified.

Handhold Panel: Permalene®, color specified.

Support (DB): Weldment comprised of 2.375” O.D. RS-20 (.095” - .105”) galvanized steel tubing and 1/4” x 3” mounting plate. Finish: ProShield®, color specified.

Clamps: Cast aluminum. Finish: ProShield, color specified.

Fasteners: Primary fasteners shall be socketed and pinned tamperproof in design, stainless steel (SST) per ASTM F 879 unless otherwise indicated (see specific product installation/specifications).

Installation Time: **SM** - Approx. 1/2 man hour
DB - Approx. 3/4 man hour

Concrete: 1.31 cu. ft.

Weight: 86 lbs. **SM**
88 lbs. **DB**

Fall Height: Deck Height

Installation Instructions

1) **(Direct Bury)** Dig footing as shown. Refer to the Plan View & Direct Bury Details.

2) Attach offset hanger clamps to posts at height shown using 5” half clamps, 3/8” x 1 1/8” BHCS w/pin and 3/8” tee nuts. Refer to the Typical Offset Hanger Clamp Spec Sheet.

3) Attach handhold panels to the face of the deck using 3/8” x 7/8” BHCS w/pin with 3/8” SAE flat washers and 3/8” flange nuts w/pin. Refer to the Tenderdeck Detail.

4) Attach handhold panels to the offset hanger clamp assemblies using 3/8” x 3 3/4” BHCS w/pin, spacer tubes and 3/8” flange nuts w/pin. Refer to the Panel Attachment Detail.

5) Attach support to Mini Summit Climber using 3/8” x 1 1/8” BHCS w/ pin with 3/8” flat washers, as shown. Refer to the Direct Bury Detail.

6) Attach Mini Summit Climber or to the face of the deck using 3/8” x 7/8” BHCS w/pin with 3/8” SAE flat washers, as shown.

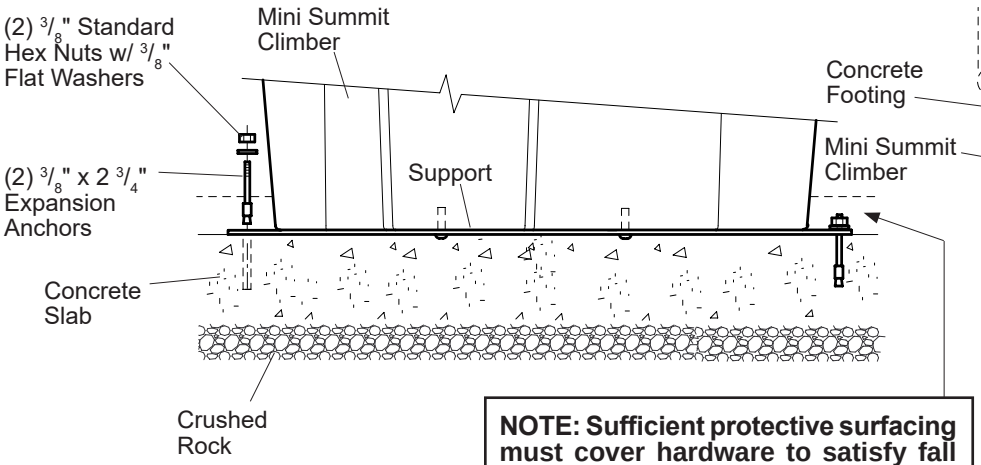
7) **(Direct Bury)** With summit climber plumb and level, pour concrete footing. Allow concrete footing to cure a minimum of 72 hours before users are allowed to play on the structure.

   (Surface Mount) Drill 3/8” x 3” deep holes through support plate using hammer drill and 3/8” masonry bit. Tap expansion anchors into drilled holes. Fasten support plate to expansion anchors using 3/8” standard hex nuts with 3/8” flat washers. Refer to the Surface Mount Detail.

8) Install protective surfacing before users are allowed to play on the structure.

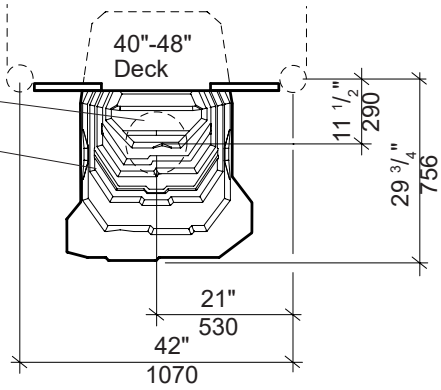
SAFETY NOTE
Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. ASTM F1487.)

DETAIL
SURFACE MOUNT

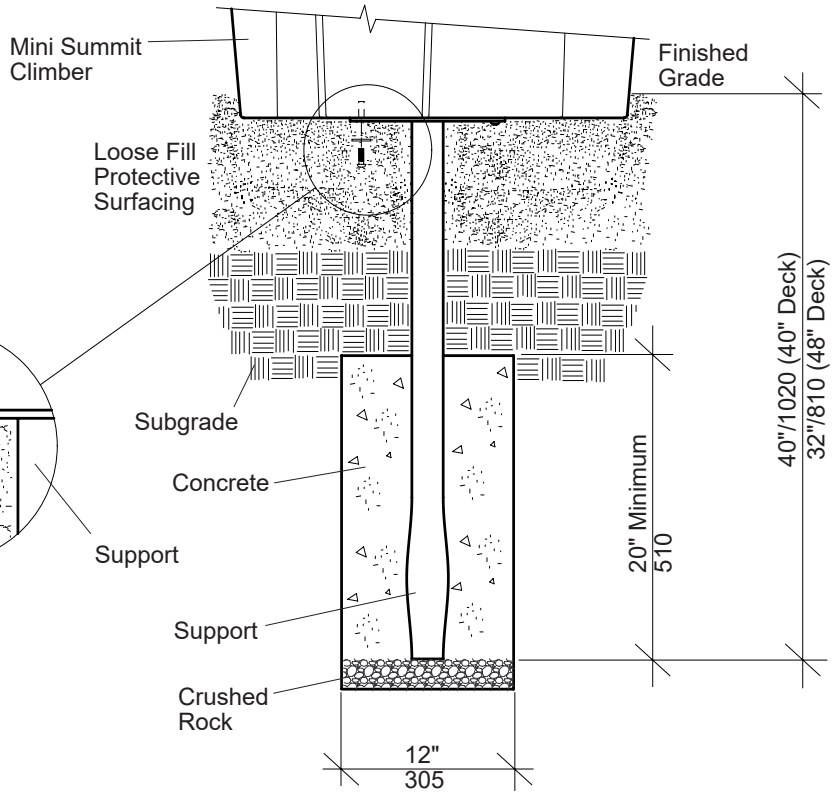


NOTE: Sufficient protective surfacing must cover hardware to satisfy fall height requirements.

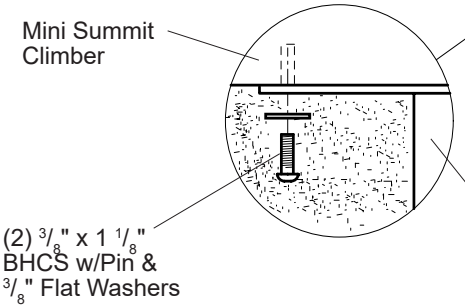
PLAN VIEW



DETAIL
DIRECT BURY



DETAIL



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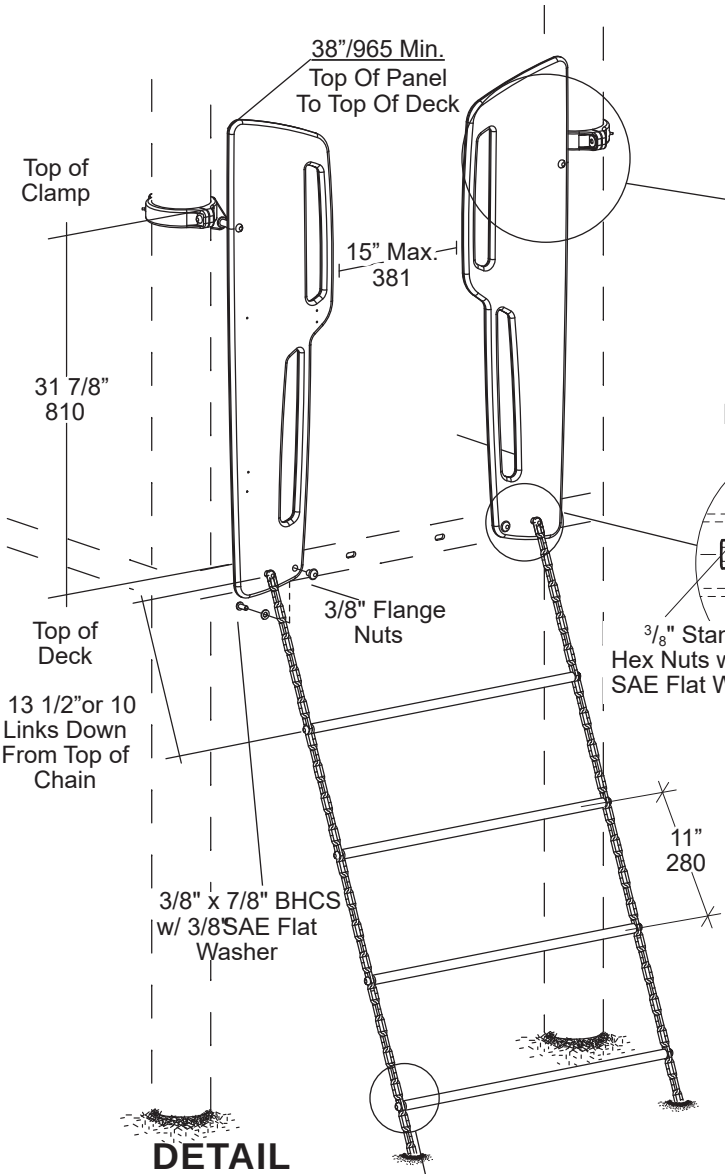
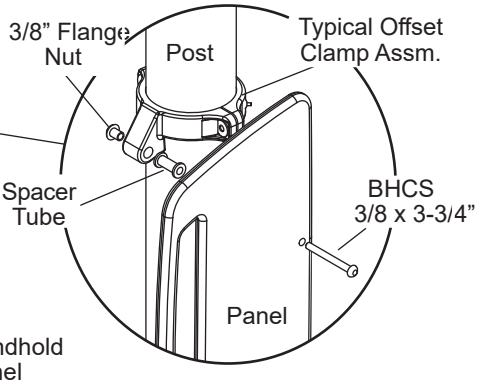
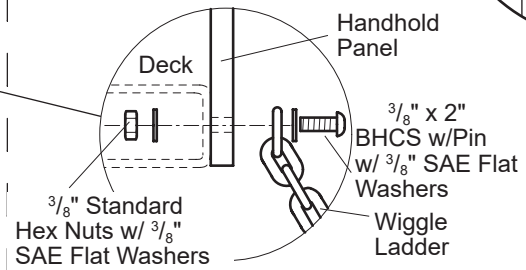
SAFETY NOTE
Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. ASTM F1487.)



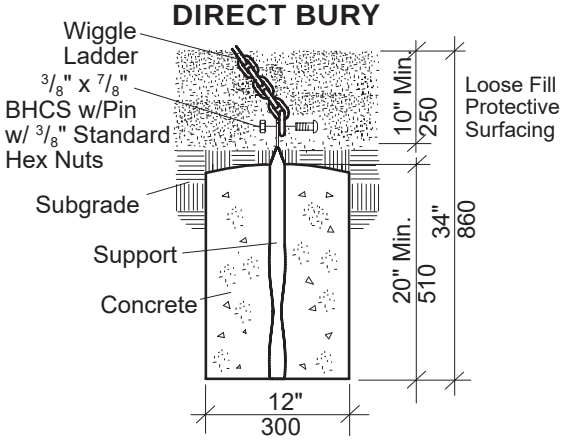
DETAIL
PANEL ATTACHMENT



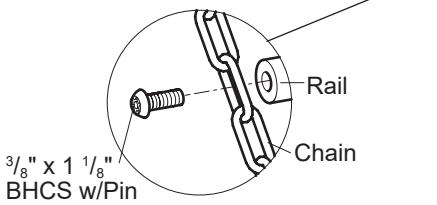
DETAIL
DECK MOUNT



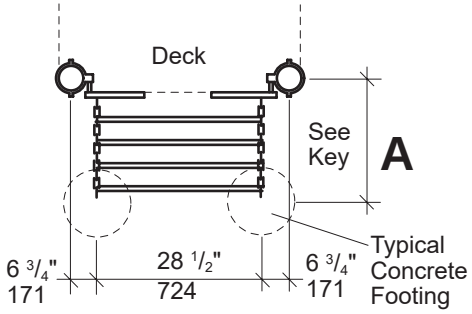
DETAIL
DIRECT BURY



DETAIL
RAIL ATTACHMENT



PLAN VIEW/FOOTING LAYOUT



KEY Height	Dimension "A"
Off 32" / 810 Deck	28" / 710
Off 40" / 1020 Deck	30" / 760
Off 48" / 1220 Deck	31" / 790
Off 56" / 1490 Deck	31" / 790
Off 64" / 1630 Deck	34" / 860
Off 72" / 1830 Deck	39" / 990

NOTE: Dimensions shown in KEY are based on 12" of protective surfacing and top of supports 2" below sub-grade. Dimensions will vary if your depth of protective surfacing varies. Read installation instructions.

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345315 Wiggle Ladder, DB

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Document #34518300

PlayBooster® 345315 Wiggle Ladder, DB

Parts List

Part#	Description	Qty.
346076	Handhold Panel, Specify Color	2
105327	5” Half Clamp, Specify Color	2
113729	Offset Hanger Clamp, Specify Color	2
113468	Spacer Tube, Specify Color	2
118029	Support (DB)	2
152159	(32” Deck) 54 7/16” Chain, Specify Color	2
119813	(32” Deck) Rail, Specify Color	2
190455	**(32” Deck) Wiggle Ladder Hardware Package**	1
124460	3/8” x 3 3/4” BHCS w/Pin, SST	2
100196	3/8” x 7/8” BHCS w/Pin, SST	4
100198	3/8” x 1 1/8” BHCS w/Pin, SST	8
100327	3/8” Standard Hex Nut, SST	4
100351	3/8” Tee Nut, SST	4
100353	3/8” Flange Nut w/Pin, SST	4
100365	3/8” SAE Flat Washer, SST	6
100173	3/8” x 2” BHCS w/Pin, SST	2
152055	(40” Deck) 59 15/16” Chain, Specify Color	2
119813	(40” Deck) Rail, Specify Color	3
190456	**(40” Deck) Wiggle Ladder Hardware Package**	1
124460	3/8” x 3 3/4” BHCS w/Pin, SST	2
100196	3/8” x 7/8” BHCS w/Pin, SST	4
100198	3/8” x 1 1/8” BHCS w/Pin, SST	10
100327	3/8” Standard Hex Nut, SST	4
100351	3/8” Tee Nut, SST	4
100353	3/8” Flange Nut w/Pin, SST	4
100365	3/8” SAE Flat Washer, SST	6
100173	3/8” x 2” BHCS w/Pin, SST	2
152056	(48” Deck) 68 1/4” Chain, Specify Color	2
152057	(56” Deck) 76 3/4” Chain, Specify Color	2
119813	(48” & 56” Deck) Rail, Specify Color	4
190457	**(48”&56”Deck)Wiggle Ladder Hardware Pkg**	1
124460	3/8” x 3 3/4” BHCS w/Pin, SST	2
100196	3/8” x 7/8” BHCS w/Pin, SST	4
100198	3/8” x 1 1/8” BHCS w/Pin, SST	12
100327	3/8” Standard Hex Nut, SST	4
100351	3/8” Tee Nut, SST	4
100353	3/8” Flange Nut w/Pin, SST	4
100365	3/8” SAE Flat Washer, SST	6
100173	3/8” x 2” BHCS w/Pin, SST	2
152157	(64” Deck) 84 5/16” Chain, Specify Color	2
119813	(64” Deck) Rail, Specify Color	5
190458	**(64” Deck) Wiggle Ladder Hardware Package**	1
124460	3/8” x 3 3/4” BHCS w/Pin, SST	2
100196	3/8” x 7/8” BHCS w/Pin, SST	4
100198	3/8” x 1 1/8” BHCS w/Pin, SST	14
100327	3/8” Standard Hex Nut, SST	4
100351	3/8” Tee Nut, SST	4
100353	3/8” Flange Nut w/Pin, SST	4
100365	3/8” SAE Flat Washer, SST	6
100173	3/8” x 2” BHCS w/Pin, SST	2
152158	(72” Deck) 92 7/8” Chain, Specify Color	2
119813	(72” Deck) Rail, Specify Color	6
190454	**(72” Deck) Wiggle Ladder Hardware Package**	1
124460	3/8” x 3 3/4” BHCS w/Pin, SST	2
100196	3/8” x 7/8” BHCS w/Pin, SST	4
100198	3/8” x 1 1/8” BHCS w/Pin, SST	16
100327	3/8” Standard Hex Nut, SST	4
100351	3/8” Tee Nut, SST	4
100353	3/8” Flange Nut w/Pin, SST	4
100365	3/8” SAE Flat Washer, SST	6
100173	3/8” x 2” BHCS w/Pin, SST	2

DB = Direct Bury

PlayBooster® 345315 Wiggle Ladder, DB

Specifications

Chain: 4/0 Chain zinc plated. Finish: TenderTuff®, color specified.

Rail: Fabricated from 13/16" diameter x 27 15/16" long CRS solid bar stock with both ends tapped 3/8". Finish: TenderTuff, color specified.

Support: Fabricated from 1.315" O.D. RS-20 (.080" - .090") galvanized steel tubing.

Handhold Panel: Permalene®, color specified.

Spacer Tube: Made from 6061-T6 aluminum 7/8" O.D. x 1 11/16". Finish: ProShield®, color specified.

Offset Hanger Clamp Assembly: Cast aluminum. Finish: ProShield, color specified.

Fasteners: Primary fasteners shall be socketed and pinned tamperproof in design, stainless steel (SST) per ASTM F 879 unless otherwise indicated (see specific product installation/specifications).

Installation Time: Approx. 2 1/2 man hours
Concrete Req.: Approx. 2.6 cu. ft.
Weight: Off 32" Deck - 41 lbs.
Off 40" Deck - 47 lbs.
Off 48" Deck - 52 lbs.
Off 56" Deck - 53 lbs.
Off 64" Deck - 58 lbs.
Off 72" Deck - 64 lbs.
Fall Height: Deck Height

Installation Instructions

1) Attach chains and outside holes of handhold panels to the face of deck using 3/8" x 2" BHCS w/pin with 3/8" SAE flat washers and 3/8" standard hex nuts with 3/8" SAE flat washers. Attach inside holes of handhold panels to the face of deck using 3/8" x 7/8" BHCS w/pin with 3/8" SAE flat washers and 3/8" flange nuts w/pin. Refer to the Deck Mount Detail.

2) Attach offset hanger clamps to posts at heights shown using 5" half clamps, 3/8" x 1 1/8" BHCS w/pin and 3/8" tee nuts. Refer to the Typical Offset Hanger Clamp Spec Sheet.

3) Attach handhold panels to the offset hanger clamp assemblies using 3/8" x 3 3/4" BHCS w/pin, spacer tubes and 3/8" flange nuts w/pin. Refer to Panel Attachment Detail.

4) Attach wiggle ladder rails between chains using 3/8" x 1 1/8" BHCS w/pin. Refer to the Rail Attachment Detail. **NOTE:** *First rail attaches 13 1/2" or (10) links down from the top of the chain, attach the remaining rails 11" between rails, as shown.*

5) Determine footing locations by pulling chains tight and laying end on subgrade. Dig footing holes where chains meet subgrade to the width and depth shown.

6) Fasten chains to the supports using 3/8" x 7/8" BHCS w/pin and 3/8" standard hex nuts.

7) Pour concrete into footing holes. Push supports into concrete until chain is tight and top of support is positioned 1 3/4" above subgrade. Temporarily brace supports into position until concrete has cured. Refer to the Direct Bury Detail.

8) After concrete has cured a minimum of 72 hours, remove support brace and install protective surfacing before users are allowed to play on the structure.

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SAFETY NOTE

Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. ASTM F1487.)

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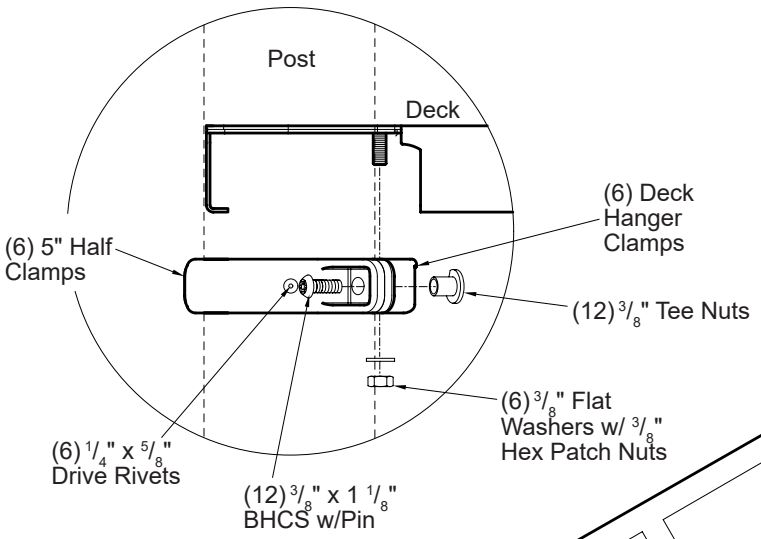
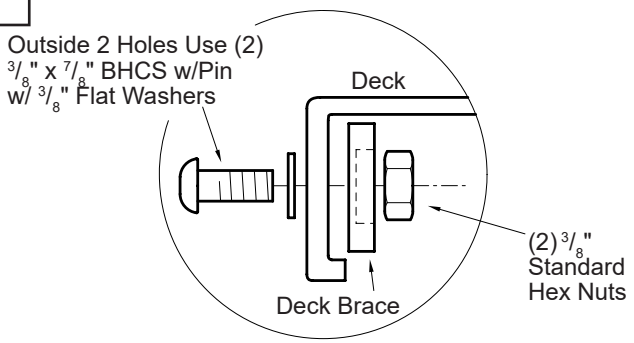
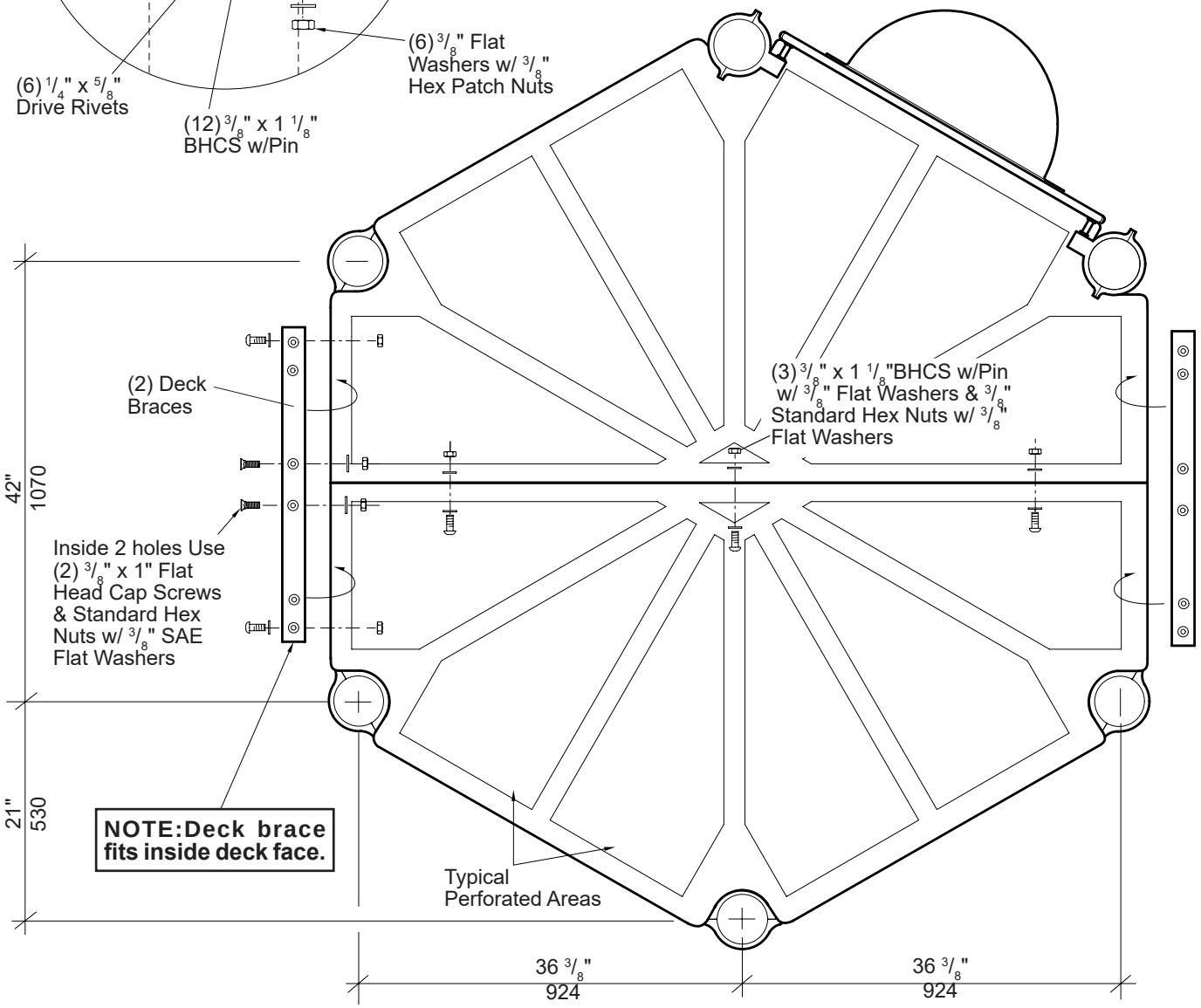
NOTE: When using this deck, ALL enclosures and components are mounted on the OUTSIDE of the posts like the bubble panel shown below.

DETAIL
DECK HANGER CLAMP



DETAIL
DECK BRACE





178710 Hexagon Tenderdeck

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PlayBooster® 178710 Hexagon Tenderdeck

Parts List

Part#	Description	Qty.
207385	Deck Brace, Silver	2
105327	5" Half Clamp, Specify Color	6
106022	Deck Hanger Clamp, Specify Color	6
145659	Hex Deck, Specify Color	2
137121	**Hex Deck Hardware Package**	1
100196	3/8" x 7/8" BHCS w/Pin, SST	4
100198	3/8" x 1 1/8" BHCS w/Pin, SST	15
100327	3/8" Standard Hex Nut, SST	11
100351	3/8" Tee Nut, SST	12
100362	3/8" Flat Washer, SST	16
100365	3/8" SAE Flat Washer, SST	4
100610	1/4" x 5/8" Drive Rivet, AL/SST	6
100321	3/8" Hex Patch Nut, SST	6
137091	3/8" x 1" Flat Head Cap Screw, SST	4

Specifications

Hex Deck: Flange formed from 12 GA (.105") (2,67 mm) sheet steel conforming to ASTM A1011. Standing surface is perforated with 5/16" (7,94 mm) diameter holes. Deck face has (4) slotted holes for face mounting components. The finished size measures 2 5/8" x 36" (66,68 mm x 914 mm) per each of the six sides for an overall dimension of 78" (1981 mm) face to face or 87" (2210 mm) point to point. Finish: TenderTuff™, color specified.

Deck Brace: Fabricated from 3/8" x 1 3/4" x 28 1/2" long zinc plated steel strap. Finish: ProShield®, silver in color.

Deck Hanger Clamp Assembly: Cast aluminum. Finish: ProShield®, color specified.

Fasteners: Primary fasteners shall be socketed and pinned tamperproof in design, stainless steel (SST) per ASTM F 879 unless otherwise indicated (see specific product installation/specifications).

Installation Time: Approx. 2 1/2 man hours

Weight: 284 lbs.

Installation Instructions

1) Mark posts for the appropriate height of the deck you are installing.
2) With deck on ground, position deck braces inside & under deck as shown and fasten outside two holes of deck braces to hex deck half using 3/8" x 7/8" BHCS w/pin with 3/8" flat washers and 3/8" standard hex nuts. Fasten inside two holes of deck braces to hex deck half using 3/8" x 1" flat head cap screws and 3/8" standard hex nuts with 3/8" SAE flat washers. Fasten tenderdeck members together using 3/8" x 1 1/8" BHCS w/pin with 3/8" flat washers and 3/8" standard hex nuts with 3/8" flat washers.
3) Fasten hanger clamps to marked position on posts. See Detail on the front of this sheet.
4) Lower deck assembly into position, lining up stud underneath deck with deck hanger clamp as shown. Attach using 3/8" hex patch nuts with 3/8" flat washers.
5) Level deck and plumb posts. Install the 1/4" x 5/8" drive rivets in all 5" half clamps. Refer to the Typical Offset Hanger Clamp Spec sheet.
6) After all enclosures/ components are installed, pour concrete footings per the Typical Concrete Footing Detail sheet. Allow concrete footings to cure a minimum of 72 hours before users are allowed to play on the structure.
7) Install protective surfacing before users are allowed to play on the structure.

Specifications are subject to change without notice.

Eco #0100264 Document #20738800 replaces #7936000. Changed brace part number.

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SAFETY NOTE

Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. ASTM F1487.)

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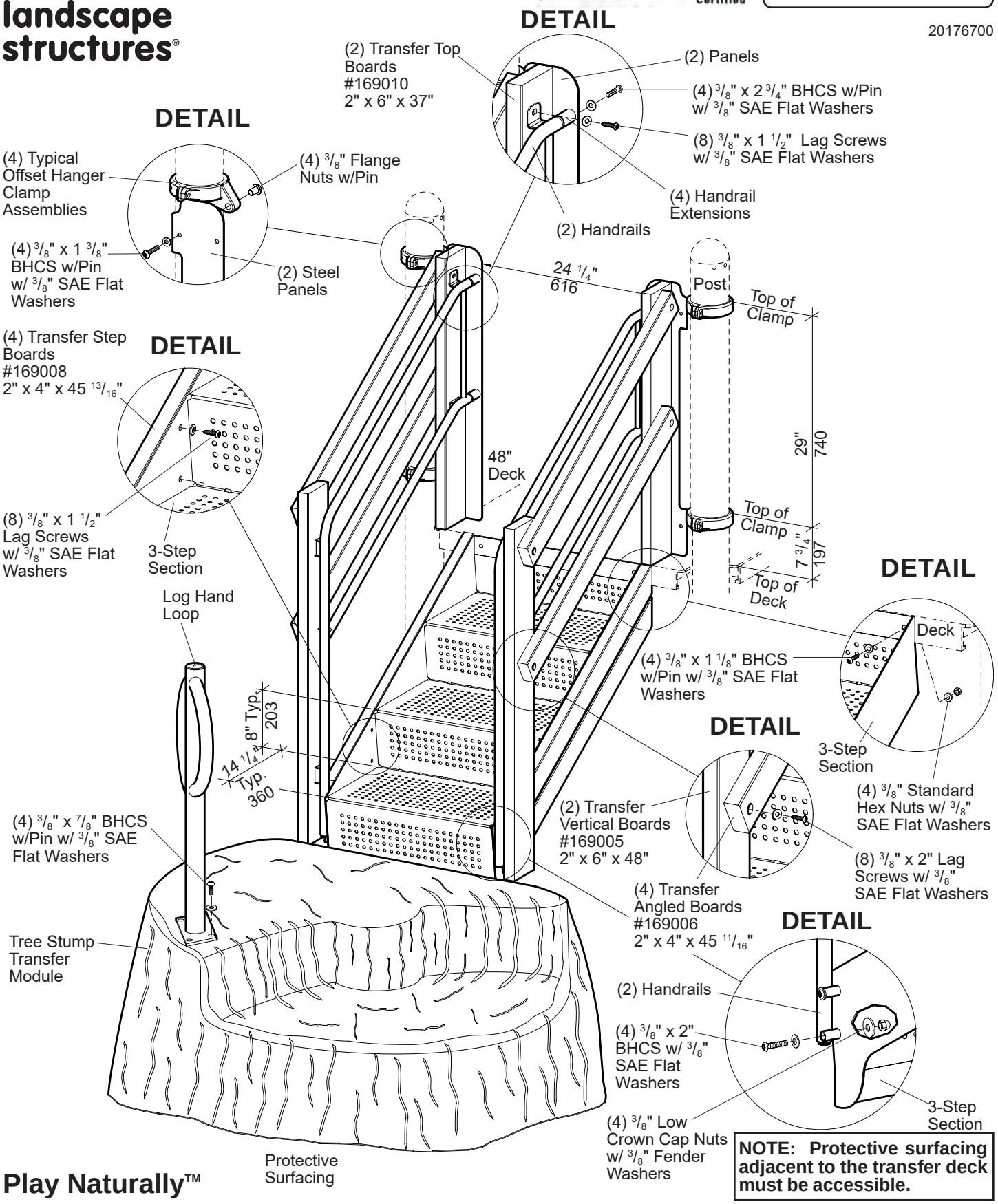

NOTE: Protective surfacing adjacent to the transfer deck must be accessible.

Play Naturally™

PlayBooster® 169321 Tree Stump Transfer Module

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Document #20176700

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SAFETY NOTE

Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. ASTM F1487.)

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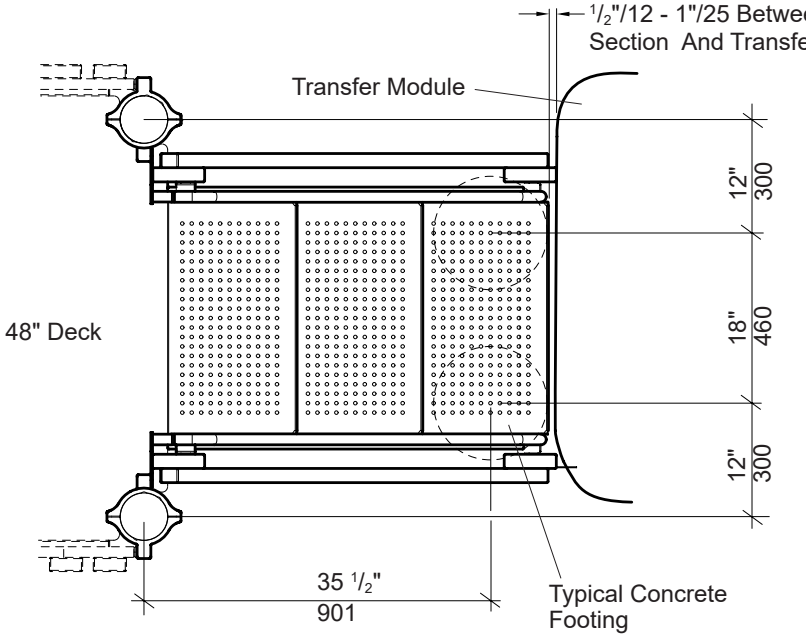
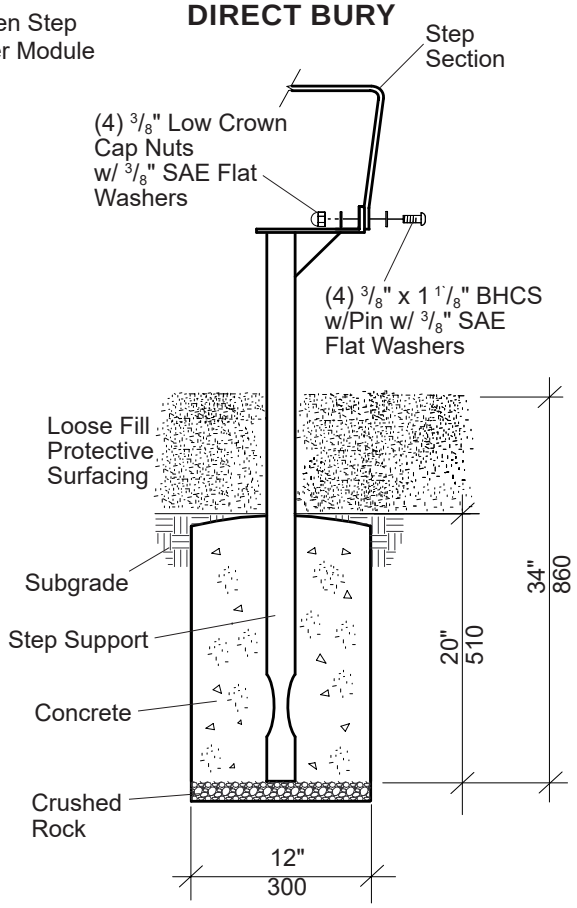
PLAN VIEW/FOOTING LAYOUT

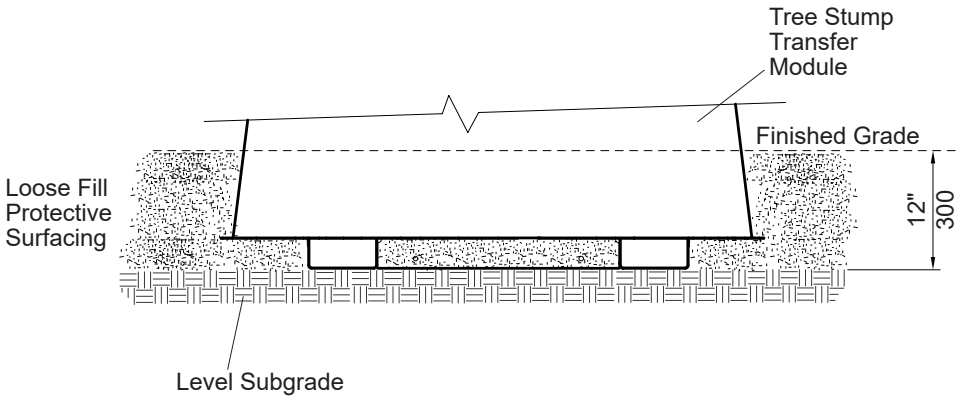


DETAIL

STEP SUPPORT DIRECT BURY



PLAN VIEW/TRANSFER MODULE



NOTE: When placing the tree stump transfer module next to the step section, there must be a 1/2" to 1" gap between the tree stump transfer module and the step section.

PlayBooster® 169321 Tree Stump Transfer Module

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PlayBooster® 169321 Tree Stump Transfer Module

Parts List

Part#	Description	Qty.
100610	1/4" x 5/8" Drive Rivet, AL/SST	4
105327	5" Half Clamp, Specify Color	4
113729	Offset Hanger Clamp, Specify Color	4
144700	3-Step Section, Specify Color	1
153401	Steel Panel, Tan	2
163460	1 1/8" O.D. x 2" Handrail Extension, Tan	4
169005	2" x 6" x 48" Transfer Vertical Board, Cedar	2
169006	2" x 4" x 45 11/16" Transfer Angled Board, Cedar	4
169008	2" x 4" x 45 13/16" Transfer Step Board, Cedar	4
169010	2" x 6" x 37" Transfer Top Board, Cedar	2
169060	Transfer Handrail (RH), Tan	1
169061	Transfer Handrail (LH), Tan	1
169410	Log Hand Loop, Tan	1
181406	Step Support, Specify Color	1
183423	Tree Stump Module, Natural	1
201764	**Tree Stump Transfer Module Hdw. Package**	1
100173	3/8" x 2" BHCS, SST	4
100175	3/8" x 2 3/4" BHCS, SST	4
100196	3/8" x 7/8" BHCS w/Pin, SST	4
100198	3/8" x 1 1/8" BHCS w/Pin, SST	16
100327	3/8" Standard Hex Nut, SST	4
100351	3/8" Tee Nut, SST	8
100353	3/8" Flange Nut w/Pin, SST	4
100365	3/8" SAE Flat Washer, SST	56
100378	3/8" Fender Washer, SST	4
113027	3/8" x 1 3/8" BHCS w/Pin, SST	4
139039	3/8" x 2" Lag Screw, SST	8
168198	3/8" x 1 1/2" Lag Screw, SST	16
100349	3/8" Low Crown Cap Nuts, SST	8

RH = Right Hand
LH = Left Hand

Specifications

Railing: Weldment comprised of formed 1 1/8" (28,57 mm) O.D. x 11 GA (.120") (3,04 mm) steel tubing with 203 or 303 stainless steel inserts with 3/8" (9,52 mm) internal threads, 5/8" (15,87 mm) O.D. steel bar, 3/16" (4,74 mm) HR flat steel, 3/4" (19,05 mm) O.D. x 11 GA. (.120") (3,04 mm) stainless steel tube and 1/8" (3,17 mm) HRPO sheet steel. Finish: ProShield®, tan in color.

Tree Stump Module Assy.: **(Frame)** Weldment comprised of 11 GA. (.120") (3,04 mm) wall steel sheet. Finish: ProShield. **(Transfer module-fully assembled)** Glass reinforced wet cast solid pour concrete product. Finish: Latex paint made for concrete, natural colors.

Log Hand Loop: Weldment comprised of 1.315" (33,4 mm) O.D. RS20 (.080"-.090") (2,03 mm-2,28 mm) wall galvanized steel tubing, 1.900" (48,26 mm) O.D. RS20 (.090"-.100") (2,28 mm-2,54 mm) wall galvanized steel tubing, 1/4" (6,35 mm) HRPO steel plate and 12 GA (.105") (2,66 mm) HRPO steel sheet. Finish: ProShield, tan in color.

Step Section: Formed from 12 GA (.105") (2,66 mm) sheet steel conforming to ASTM A1011. Standing surface is 24 3/8" (619,12 mm) wide x 14" (355,6 mm) deep and is perforated with 5/16" (7,93 mm) diameter holes. Finish: TenderTuff™, color specified.

Handrail Extension: Made from 1 1/8" (28,57 mm) O.D. x 2" (50,8 mm) 6061-T6 aluminum tube. Finish: ProShield, tan in color.

Poly Board: Recycled 1 1/2" x 3 1/2" (38,1 mm x 88,9 mm) and 1 1/2" x 5 1/2" (38,1 mm x 139,7 mm) cedar colored high-density polyethylene.

Step Support: Weldment comprised of 1.660 (42,16 mm) O.D. RS20 (.080"-.095) (2,03 mm-2,41 mm) and 7GA. (.179") (4,54 mm) HRPO steel. Finish: ProShield, color specified.

Clamps: Cast aluminum. Finish: ProShield, color specified.

Fasteners: Primary fasteners shall be socketed and pinned tamperproof in design, stainless steel (SST) per ASTM F 879 unless otherwise indicated (see specific product installation/specifications).

Installation Time: Approx. 5 man hours
Concrete Req.: Approx. 2.62 cu. ft.
Weight: 3700 lbs.
Fall Height: Deck Height

Specifications are subject to change without notice.

Eco #0100098 Document 20176700 replaces 18368300. Replaced hardware package.

PlayBooster® 169321 Tree Trunk Transfer Module

Installation Instructions

1) Dig footings as shown. Refer to your Plan View/Footing Layout.

2) Attach the step support to the 3-step section using 3/8" x 1 1/8" BHCS w/ pin with 3/8" SAE flat washers and 3/8" low crown cap nuts with 3/8" SAE flat washers. Refer to the Step Support Attachment Detail.

3) Attach the 3-step section to the face of the mainstructure deck using 3/8" x 1 1/8" BHCS w/pin with 3/8" SAE flat washers and 3/8" standard hex nuts with 3/8" SAE flat washers. Refer to the Step Attachment Detail.

4) Attach offset hanger clamps to posts at heights shown, using 5" half clamps, 3/8" x 1 1/8" BHCS w/pin and 3/8" tee nuts. Refer to the Typical Offset Hanger Clamp Spec Sheet.

5) Attach panels to offset hanger clamp assemblies, using 3/8" x 1 3/8" BHCS, with 3/8" SAE flat washers and 3/8" flange nuts w/pin. See Panel Attachment Detail.

6) Attach handrails to the panels, using handrail extensions, and 3/8" x 2 3/4" BHCS w/pin with 3/8" SAE flat washers. Refer to the Handrail Attachment Detail.

7) Attach handrails to the 3-step section, using 3/8" x 2" BHCS with 3/8" SAE flat washers and 3/8" low crown cap nuts with 3/8" fender washers. Refer to the Handrail Attachment Detail.

8) Line up pilot holes in top boards with handrail angle slots, and attach using 3/8" x 1 1/2" lag screws with 3/8" SAE flat washers. Refer to the Handrail Attachment Detail.

9) Line up pilot holes in step section with pilot holes in step boards and attach, using 3/8" x 1 1/2" lag screws with 3/8" SAE flat washers. Refer to the Transfer Step Board Attachment Detail.

10) Line up pilot holes in angled boards with pilot holes in top boards and vertical boards and attach, using 3/8" x 2" lag screws with 3/8" SAE flat washers. Refer to the Angled Board Attachment Detail.

11) To unload the tree stump transfer module, a "Lull" type material handler with at least an 4,000 lb. capacity is recommended. Maximum fork extension size is 3 1/2" high x 7 1/2" wide with no maximum length. **NOTE:** *At least 2 people are recommended for the tree stump transfer module installation. One person to operate the material handling equipment and one person to spot for the operator.*

12) The tree stump transfer module should be placed on level ground. Pick up the tree stump transfer module by inserting the material handling forks into the forklift pockets. Be very careful to keep the tree stump transfer module level to the ground when raising or lowering. Do not tip the tree stump transfer module on a corner or edge. Do not contact the concrete face of the tree stump transfer module with material handler forks, chipping can occur. Place the tree stump transfer module next to the step section. **NOTE:** *When placing the tree stump transfer module next to the step section there must be a 1/2" to 1" gap between the tree stump transfer module and the step section.*

13) Attach log hand loop to tree stump transfer module, using 3/8" x 7/8" BHCS w/pin and 3/8" SAE flat washers.

14) With steps level and supports plumb, pour concrete footings. Allow concrete footings to cure a minimum of 72 hours before users are allowed to play on the structure.

15) Install 1/4" x 5/8" drive rivets in all 5" half clamps. Refer to the Typical Offset Hanger Clamp Spec Sheet.

16) Install protective surfacing before users are allowed to play on the structure.

17) **NOTE: After installation if Touch-up/Repairs are needed to the concrete, contact Landscape Structures at 1-888-574-4678.**

Specifications are subject to change without notice.

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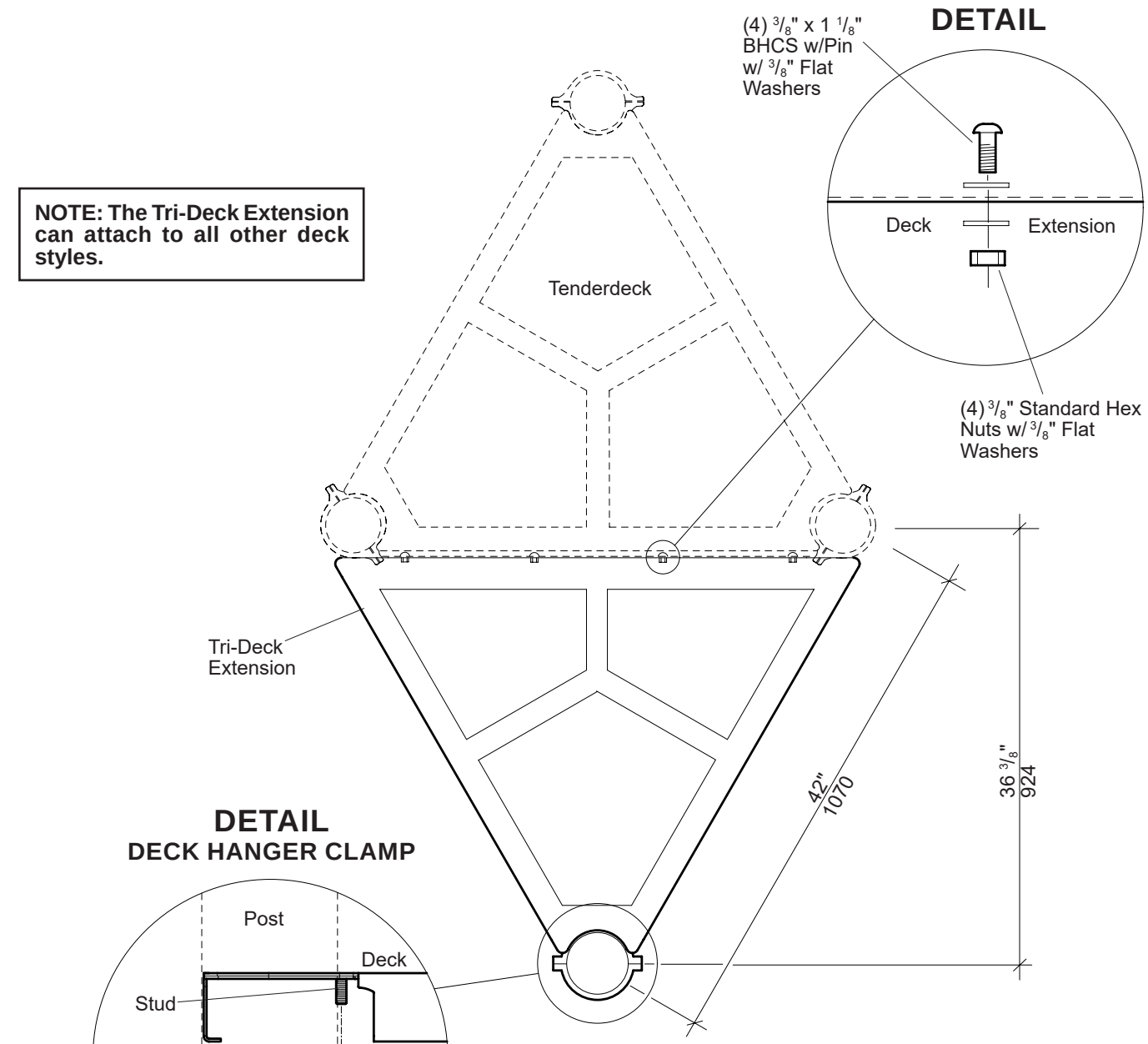
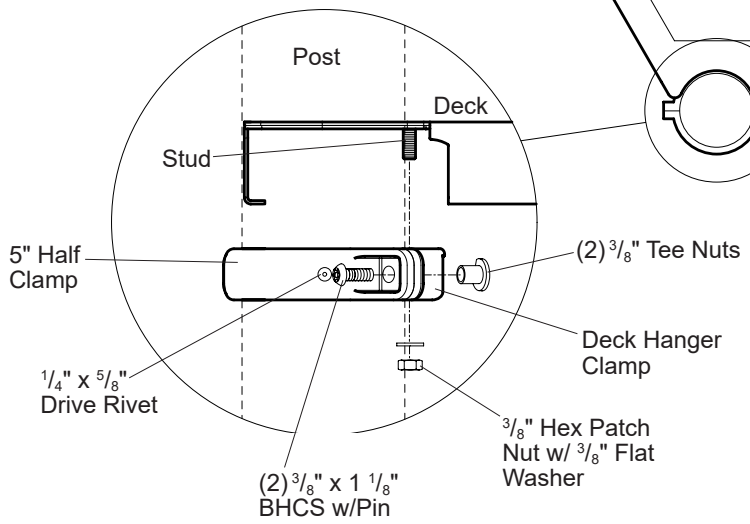
SAFETY NOTE

Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. ASTM F1487.)

14582600

NOTE: The Tri-Deck Extension can attach to all other deck styles.





NOTE: When using this deck, ALL enclosures and components are mounted on the OUTSIDE of the posts.

PlayBooster® 119646 Triangular Tenderdeck Extension

601 7TH STREET SOUTH, DELANO, MINNESOTA 55328-8605 888-574-4678 LSI Install Help 888-438-6574 LSI Direct 763-972-5200 Int. FAX (763) 972-3185

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PlayBooster® 119646 Triangular Tenderdeck Extension

Parts List

Part#	Description	Qty.
145663	Tri-Deck Extension, Specify Color	1
105327	5" Half Clamp, Specify Color	1
106022	5" Deck Hanger Clamp, Specify Color	1
119593	**Tri-Deck Extension Hardware Package**	1
100198	$^3/_8$" x 1 $^1/_8$" BHCS w/Pin, SST	6
100321	$^3/_8$" Hex Patch Nut, SST	1
100327	$^3/_8$" Standard Hex Nut, SST	4
100351	$^3/_8$" Tee Nut, SST	2
100362	$^3/_8$" Flat Washer, SST	9
100610	$^1/_4$" x $^5/_8$" Drive Rivet, AL/SST	1

Specifications

Tri-Deck Extension: Flange formed from 12 GA (.105") sheet steel conforming to ASTM A1011. Standing surface is perforated with $^5/_{16}$" diameter holes. Deck face has (4) slotted holes for face mounting components. The finished size of two of the three sides measures 2 $^5/_8$" x 37 $^7/_8$" on the face of the deck and the other side measures 2 $^5/_8$" x 43 $^3/_4$". Finish: TenderTuff™, color specified.

Deck Hanger Clamp Assembly: Cast aluminum. Finish: ProShield®, color specified.

Fasteners: Primary fasteners shall be socketed and pinned tamperproof in design, stainless steel (SST) per ASTM F 879 unless otherwise indicated (see specific product installation/specifications).

Installation Time: Approx. $^3/_4$ man hour

Weight: 52 lbs.

Installation Instructions

1) Mark the post for the appropriate height of the deck you are installing.
2) Fasten the deck hanger clamp to the marked position on the post. Refer to the Deck Hanger Clamp Detail.
3) Lift the deck into position, line up the studs underneath the deck with the deck hanger clamp. Attach using a $^3/_8$" hex patch nut and $^3/_8$" flat washer, as shown.
4) Attach the tri-deck extension to the tenderdeck using $^3/_8$" x 1 $^1/_8$" BHCS w/pin with $^3/_8$" flat washers and $^3/_8$" standard hex nuts with $^3/_8$" flat washers.
5) With the tri-deck extension level and the post plumb, install the $^1/_4$" x $^5/_8$" drive rivet in the 5" half clamp. Refer to the Typical Offset Hanger Clamp Spec Sheet.
6) Install protective surfacing before users are allowed to play on the structure.

Specifications are subject to change without notice.

Eco #52268 Document #14582600 replaces #13954100. Replaced Tri-Deck Extension.

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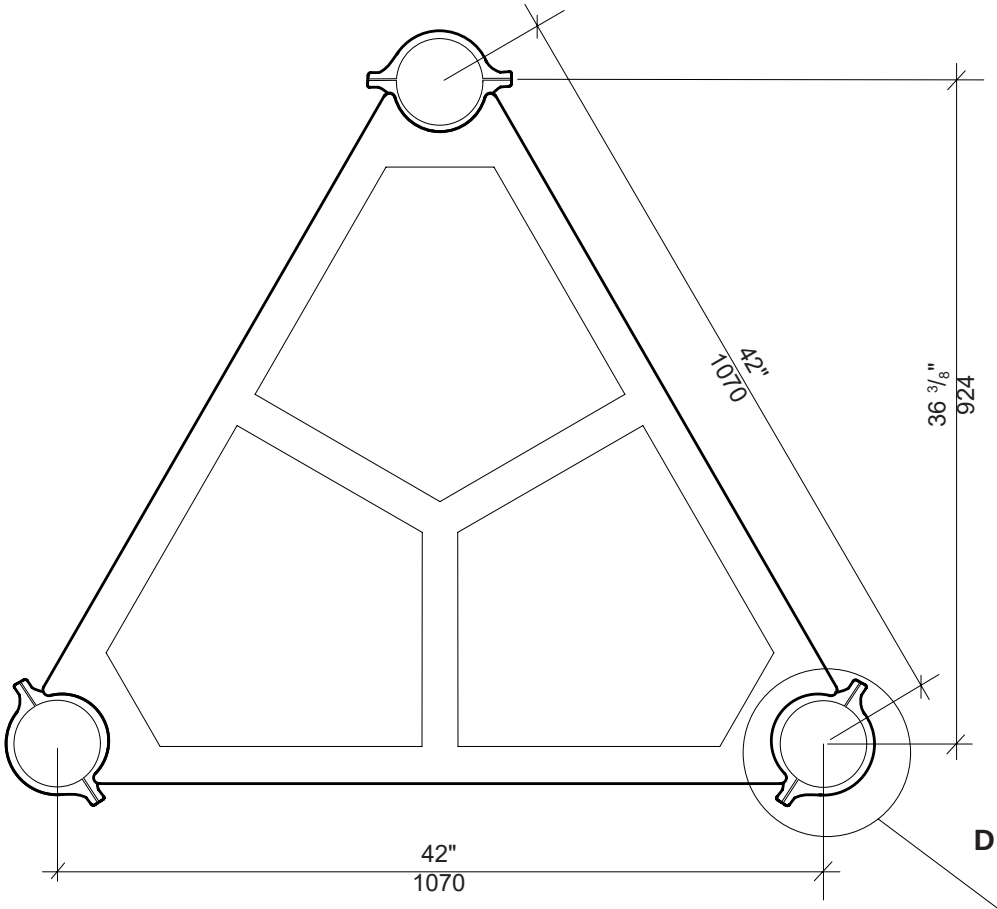
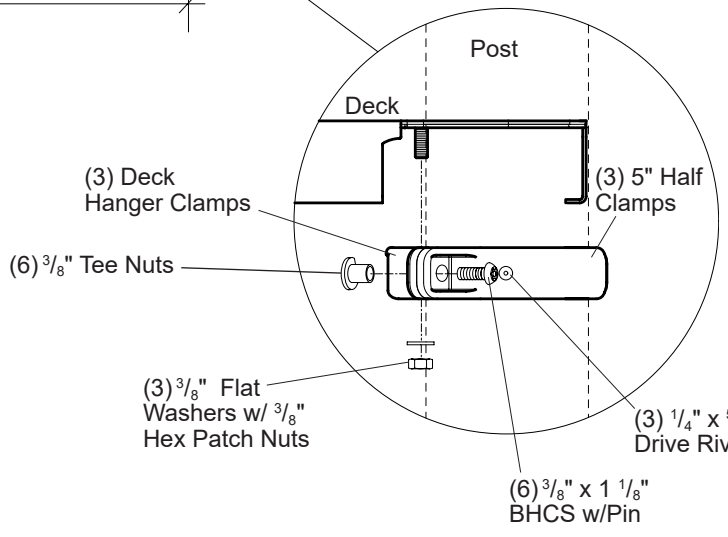
SAFETY NOTE

Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. ASTM F1487.)

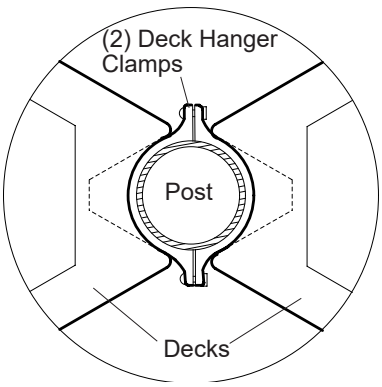
14582400



DETAIL
DECK HANGER CLAMP



DETAIL



Configuration for Back to Back Decks at Same Height.

PlayBooster® 111231 Triangular Tenderdeck

601 7TH STREET SOUTH, DELANO, MINNESOTA 55328-8605 888-574-4678 LSI Install Help 888-438-6574 LSI Direct 763-972-5200 Int. FAX (763) 972-3185

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PlayBooster® 111231 Triangular Tenderdeck

Parts List

Part#	Description	Qty.
145657	Tri-Deck, Specify Color	1
105327	5" Half Clamp, Specify Color	3
106022	Deck Hanger Clamp, Specify Color	3
120203	**Triangular Deck Hardware Package**	1
100198	3/8" x 1 1/8" BHCS w/Pin, SST	6
100321	3/8" Hex Patch Nut, SST	3
100351	3/8" Tee Nut, SST	6
100362	3/8" Flat Washer, SST	3
100610	1/4" x 5/8" Drive Rivet, AL/SST	3

Specifications

Triangular Deck: Flange formed from 12 GA (.105") sheet steel conforming to ASTM A1011. Standing surface is perforated with 5/16" diameter holes. Deck face has (4) slotted holes for face mounting components. The finished size measures 2 5/8" x 37 3/4". Finish: TenderTuff™, color specified.

Deck Hanger Clamp Assembly: Cast aluminum. Finish: ProShield®, color specified.

Fasteners: Primary fasteners shall be socketed and pinned tamperproof in design, stainless steel (SST) per ASTM F 879 unless otherwise indicated (see specific product installation/specifications).

Installation Time: Approx. 1/2 man hour

Weight: 61 lbs.

Installation Instructions

1) Mark posts for the appropriate height of the deck you are installing.
2) Fasten deck hanger clamps to marked position on posts. See Detail on the front of this sheet.
3) Lift deck assembly into position, lining up stud underneath deck with deck hanger clamp as shown. Attach using 3/8" hex patch nuts with 3/8" flat washers. With deck level and posts plumb, final tighten all hardware.
4) Install 1/4" x 5/8" drive rivets in all 5" half clamps. Refer to the Typical Offset Hanger Clamp Spec Sheet.
5) After attachment of enclosures and components is complete, pour concrete footings. Allow concrete footings to cure a minimum of 72 hours before users are allowed to play on the structure.
6) Install protective surfacing before users are allowed to play on the structure.

Specifications are subject to change without notice.

Eco #52268 Document #14582400 replaces #13954200. Replaced Tri-Deck.

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SAFETY NOTE

Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. ASTM F1487.)

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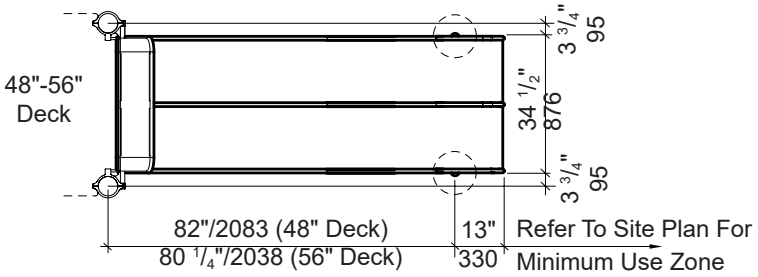
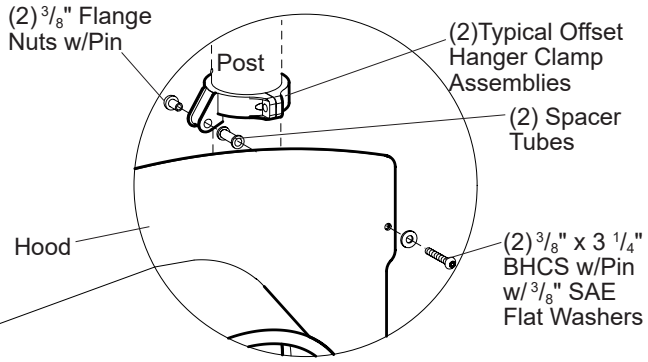
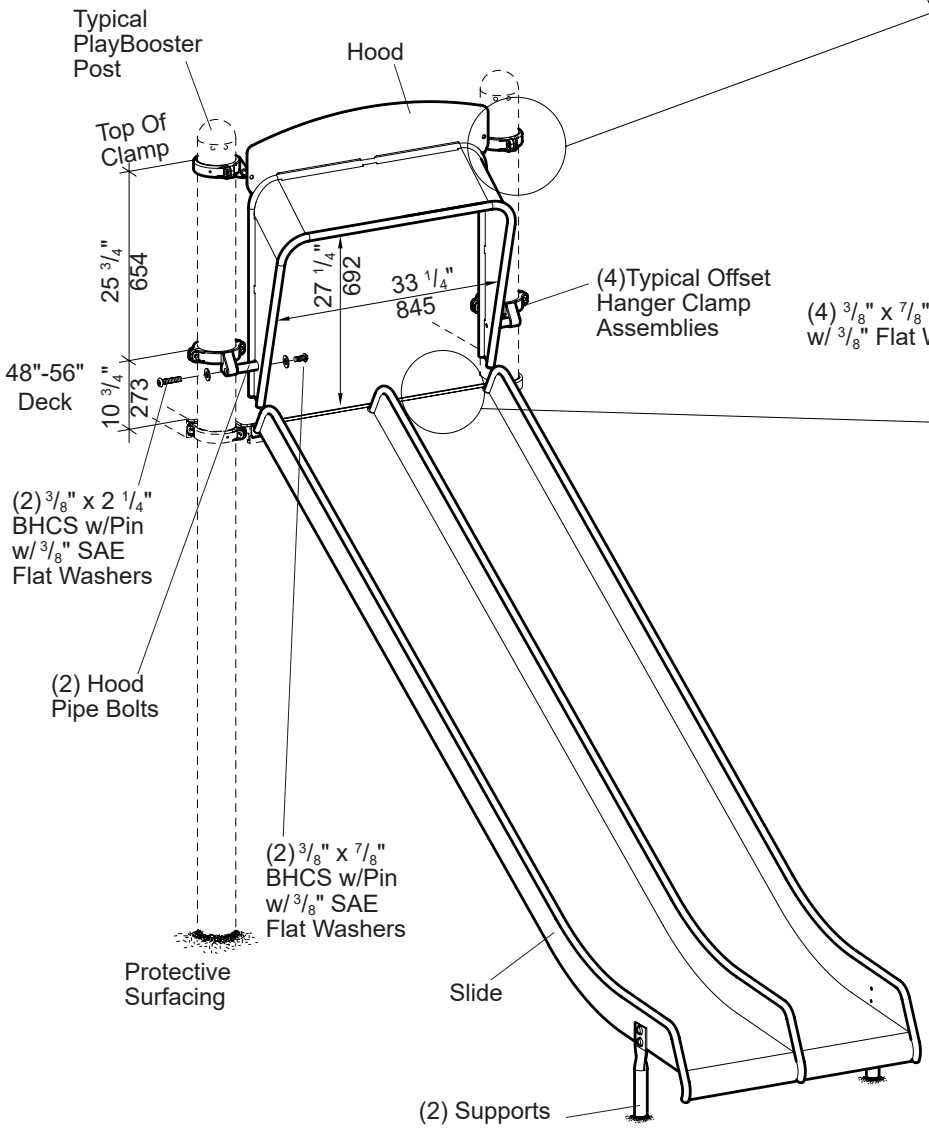
PLAN VIEW/FOOTING LAYOUT

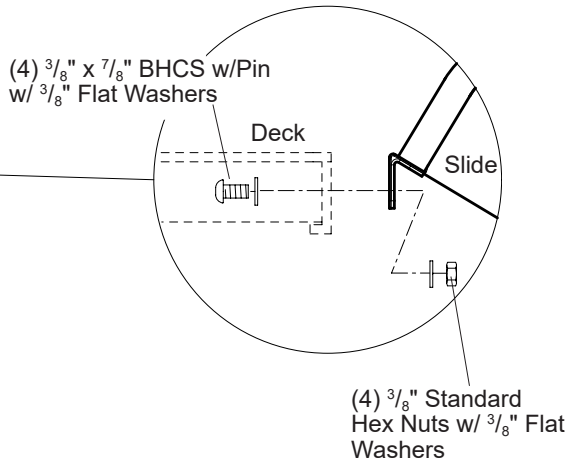


DETAIL
HOOD ATTACHMENT





DETAIL
DECK CONNECTION



PlayBooster® 190857 Double Stainless Steel Slide, w/Steel Hood, 48"-56"

601 7TH STREET SOUTH, DELANO, MINNESOTA 55328-8605 888-574-4678 LSI Install Help 888-438-6574 LSI Direct 763-972-5200 Int. FAX (763) 972-3185

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PlayBooster® 190857 Double Stainless Steel Slide, w/Steel Hood, 48"-56"

Parts List

Part#	Description	Qty.
100610	1/4" x 5/8" Drive Rivet, AL/SST	4
191103	Support, (DB), Specify Color	2
105327	5" Half Clamp, Specify Color	4
113468	Spacer Tube, Specify Color	2
113729	Offset Hanger Clamp, Specify Color	4
190228	Double Slide Bedway 48"-56", SST	1
190322	Double Slide Hood, Specify Color	1
190324	Hood Pipe Bolt, Specify Color	2
190294	48" Deck Support (SM), Specify Color	2
190296	56" Deck Support (SM), Specify Color	2
190863	**Double Slide Hood Hardware Pkg.**	1
100168	3/8" x 3 1/4" BHCS w/Pin, SST	2
100196	3/8" x 7/8" BHCS w/Pin, SST	2
100198	3/8" x 1 1/8" BHCS w/Pin, SST	8
100199	3/8" x 2 1/4" BHCS w/Pin, SST	2
100351	3/8" Tee Nut, SST	8
100353	3/8" Flange Nut w/Pin, SST	2
100365	3/8" SAE Flat Washer, SST	6
126617	**Double Slide Hardware Package**	1
100196	3/8" x 7/8" BHCS w/Pin, SST	8
100327	3/8" Standard Hex Nut, SST	8
100362	3/8" Flat Washer, SST	8
100365	3/8" SAE Flat Washer, SST	4
108184	Bolt Cap Part "A"	4
108185	Bolt Cap Part "B"	4
121348	**4-Hole SM Hardware Package**	1
100266	1/2" x 2 3/4" Expansion Anchor	4
100322	1/2" Standard Hex Nut, SST	4
100363	1/2" Flat Washer, SST	4

DB = Direct Bury
SM = Surface Mount

Specifications

Slide: Weldment comprised of 16 GA (.060") (1,52 mm) 304 stainless steel sheet with 2B finish, 12 GA (.105") (2,66 mm) 304 stainless steel sheet and 1" (25,4 mm) O.D. stainless steel top rail. Finish: #7 Broken glass bead blast.

Hood: Weldment comprised of 16 GA. (.060") (1,52 mm) HRPO steel sheet, 1.029" (26,14 mm) O.D. RS20 (.070"-.080") (1,78 mm-2,03 mm) wall galvanized steel tubing, 7 GA. (.179") (4,55 mm) HRPO steel sheet, and 12 Ga. (.105") (2,67 mm) steel sheet. Finish: ProShield, color specified.

Spacer Tube: Made from 6061-T6 aluminum 7/8" (22,22 mm) O.D. x 1 11/16" (42,85 mm). Finish: ProShield, color specified.

Support: Fabricated from 1.660 (42,16 mm) O.D. RS20 (.085" - .095") (2,16 mm-2,41 mm) galvanized steel tubing. Finish: ProShield, color specified.

Hood Pipe Bolt: Fabricated from 1.125" (28,58 mm) O.D. aluminum. Finish: ProShield, color specified.

Bolt Caps: Made from injection molded polypropelene U.V. stabilized, white in color.

Clamps: Cast aluminum. Finish: ProShield, color specified.

Fasteners: Primary fasteners shall be socketed and pinned tamperproof in design, stainless steel (SST) per ASTM F 879 unless otherwise indicated (see specific product installation/specifications).

Installation Time: Approx. 2 1/2 man hours
Concrete Req: Approx. 2.62 cu. ft.
Weight: **SM** - 175 lbs. 48" Deck
SM - 175 lbs. 56" Deck
DB - 176 lbs.
Fall Height: 48" Deck (1,21 m)
56" Deck (1,42 m)

Installation Instructions

1) **(Direct Bury)** Dig footings spaced as shown.

2) Attach offset hanger clamps to posts at height shown, using 5" half clamps and 3/8" x 1 1/8" BHCS w/pin with 3/8" tee nuts. Refer To The Typical Offset Hanger Clamp Spec Sheet.

3) Attach top of hood to offset hanger clamp assemblies using 3/8" x 3 1/4" BHCS w/pin with 3/8" SAE flat washers , spacer tubes and 3/8" flange nuts w/pin. Refer to the Hood Attachment Detail.

4) Attach bottom of hood to offset hanger clamp assemblies using 3/8" x 2 1/4" BHCS w/pin, 3/8" x 7/8" BHCS w/pin, 3/8" SAE flat washers, and hood pipe bolts. Refer to the Hood Attachment Detail.

5) Insert 3/8" x 7/8" BHCS w/pin through slide bedway, supports, bolt caps part "A", 3/8" SAE flat washers and fasten with 3/8" standard hex nuts. Snap bolt caps part "B" onto bolt caps part "A". Refer to the Support Attachment Detail.

6) Attach slide to the face of the deck using 3/8" x 7/8" BHCS w/pin with 3/8" flat washers and 3/8" standard hex nuts with 3/8" flat washers. Refer to the Deck Connection Detail.

7) **(Direct Bury)** With supports plumb pour concrete footings. Allow concrete footings to cure for a minimum of 72 hours before users are allowed to play on the structure.

   (Surface Mount) Mark anchor bolt locations on concrete slab through holes in anchor plates and remove slide. Drill 1/2" x 3" deep holes on marks into concrete using a hammer drill and 1/2" masonry bit. Tap expansion anchors into drilled holes. Reposition slide and reattach to hood and face of the deck following step 6. Fasten supports to expansion anchors using 1/2" standard hex nuts with 1/2" flat washers.

8) Install protective surfacing before users are allowed to play on the structure.

Specifications are subject to change without notice.

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SAFETY NOTE
Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. ASTM F1487.)

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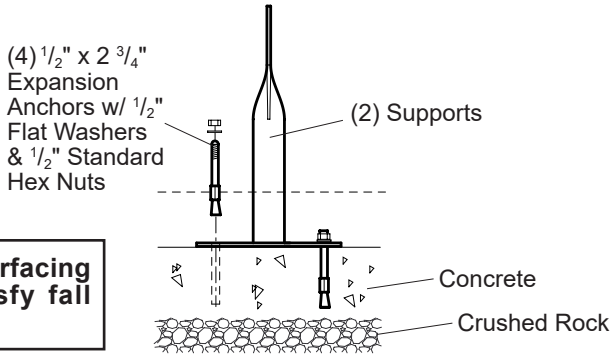
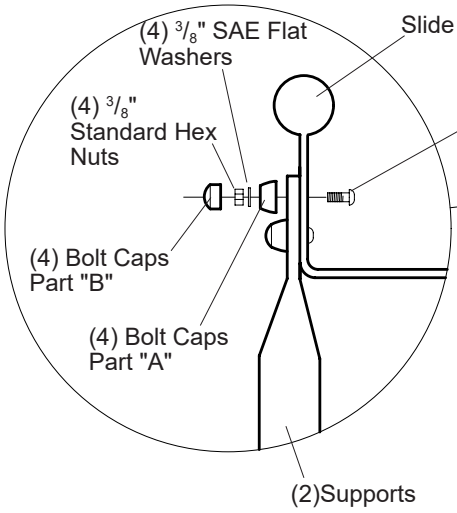
DETAIL
SURFACE MOUNT

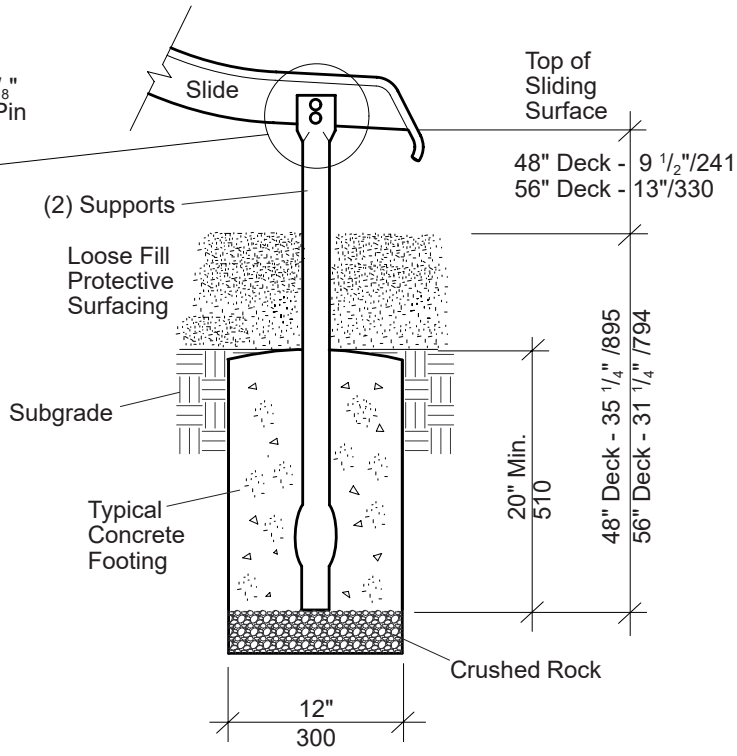


NOTE: Sufficient protective surfacing must cover hardware to satisfy fall height requirements.

DETAIL
SUPPORT ATTACHMENT



DETAIL
DIRECT BURY



PlayBooster® 190857 Double Stainless Steel Slide, w/Steel Hood, 48"-56"

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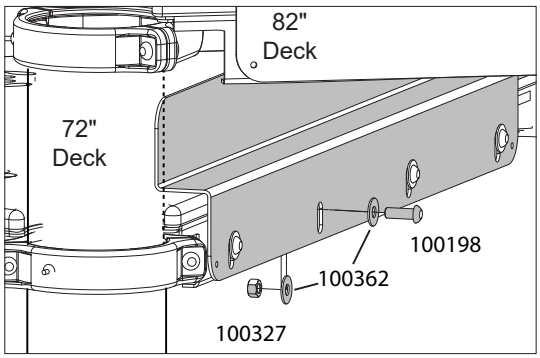
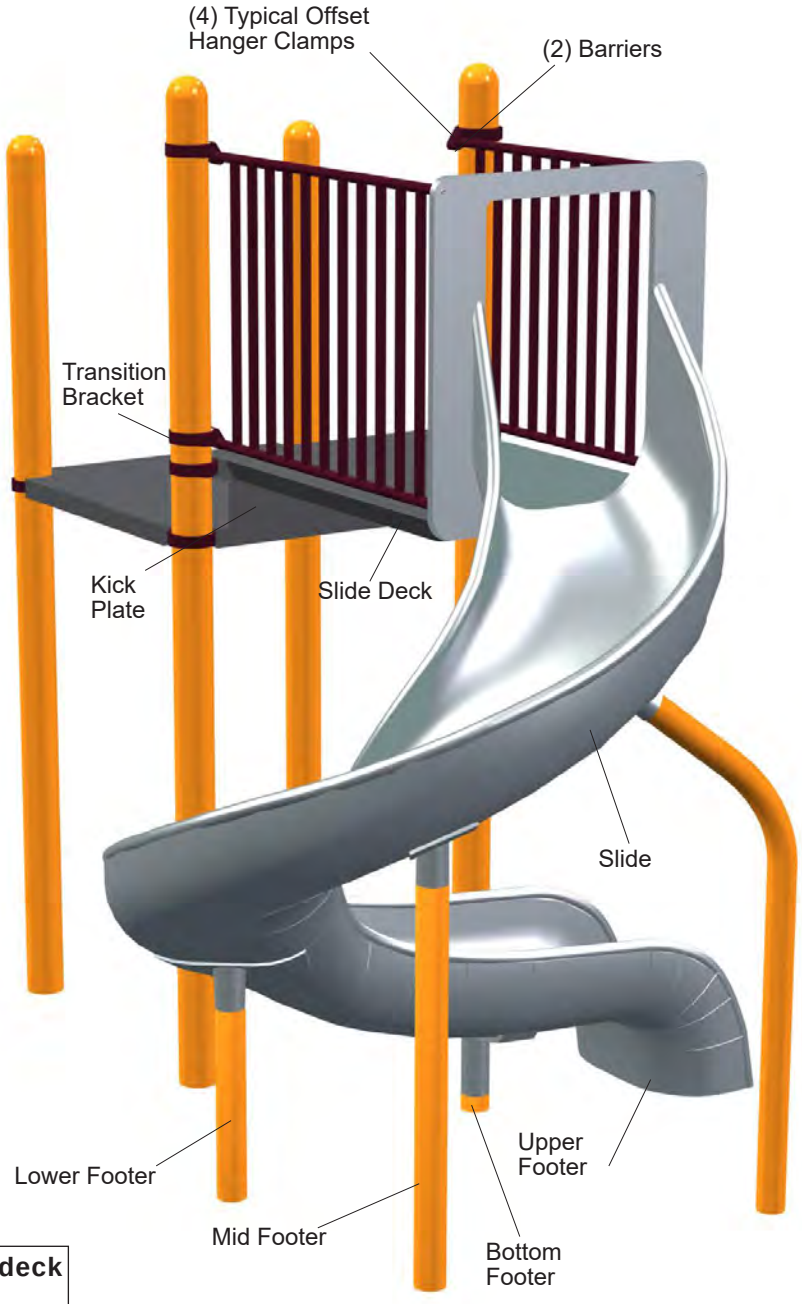
SAFETY NOTE

Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. ASTM F1487.)



DETAIL
KICK PLATE TO DECK



NOTE: Posts and deck sold separately.

PlayBooster® 194699 Spiral Stainless Steel Slide, 82" Deck

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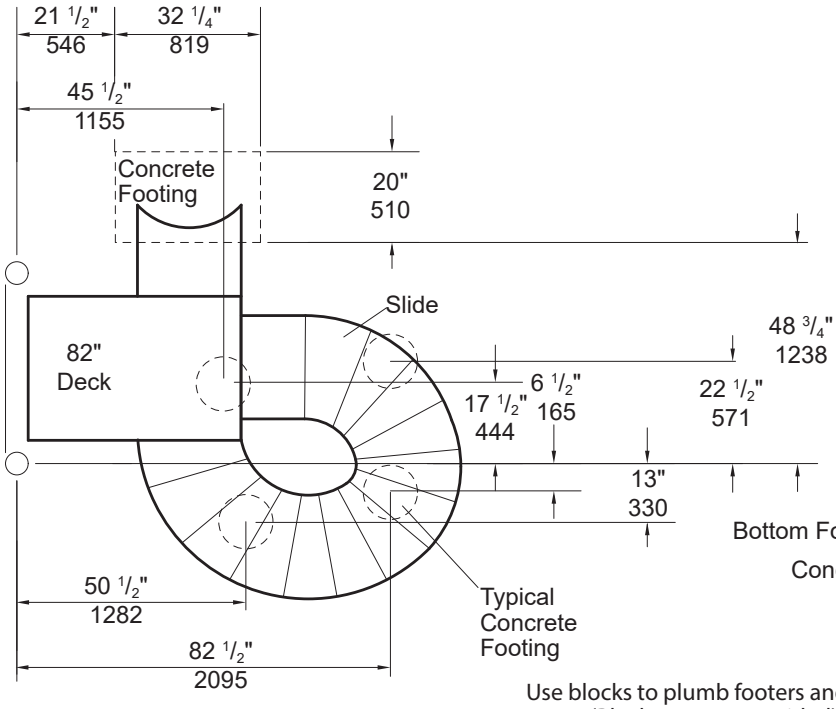
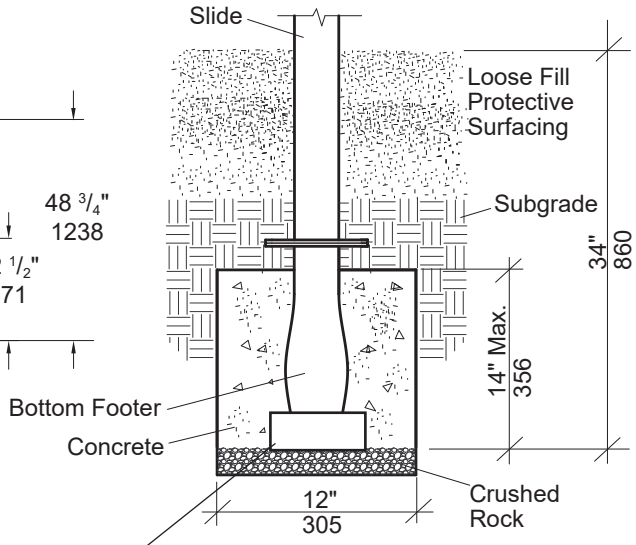
PLANVIEW/FOOTING LAYOUT

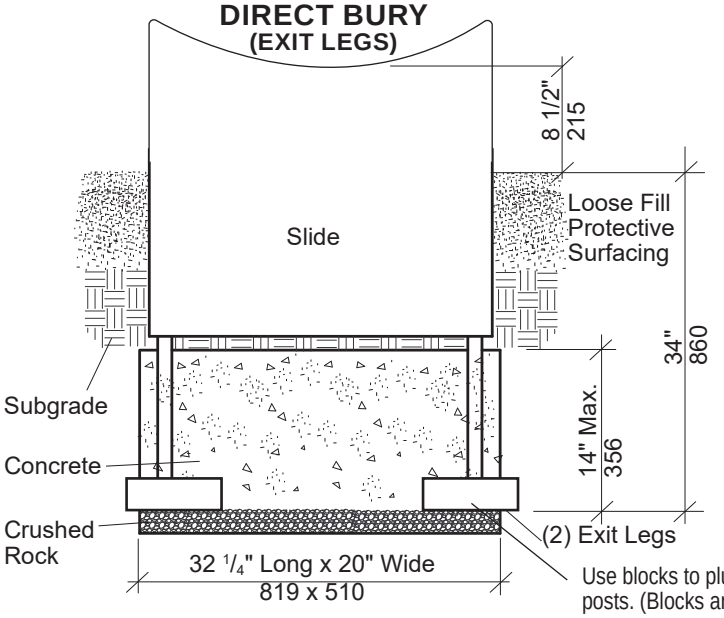


DETAIL
DIRECT BURY
(BOTTOM FOOTER)



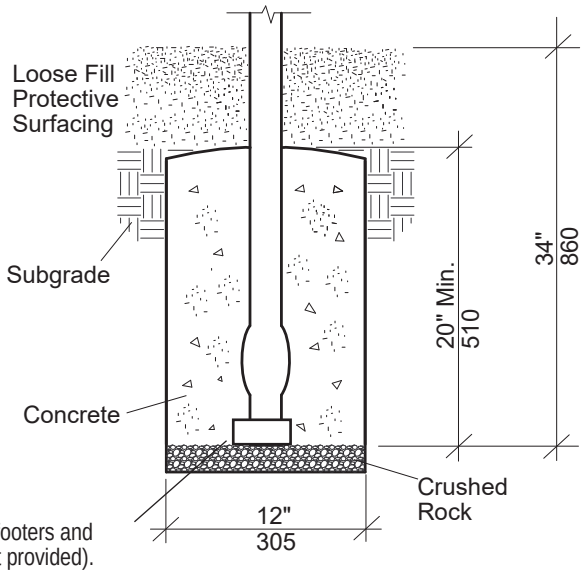
Use blocks to plumb footers and posts. (Blocks are not provided).

DETAIL
DIRECT BURY
(EXIT LEGS)

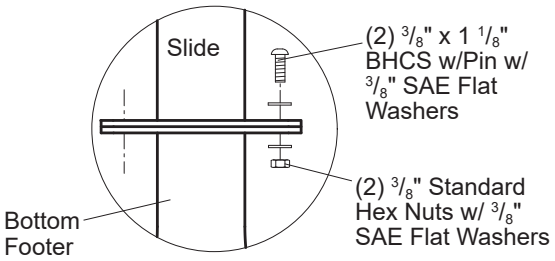


Use blocks to plumb footers and posts. (Blocks are not provided).

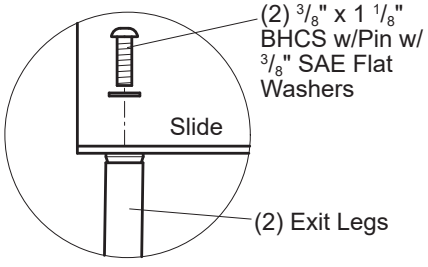
DETAIL
DIRECT BURY
UPPER, MID & LOWER FOOTERS



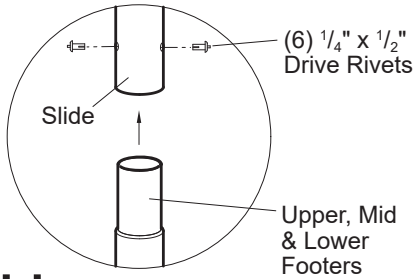
DETAIL
BOTTOM FOOTER



DETAIL
EXIT LEGS



DETAIL
UPPER/MID/LOWER FOOTERS



PlayBooster® 194699 Spiral Stainless Steel Slide, 82" Deck

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SAFETY NOTE

Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. ASTM F1487.)

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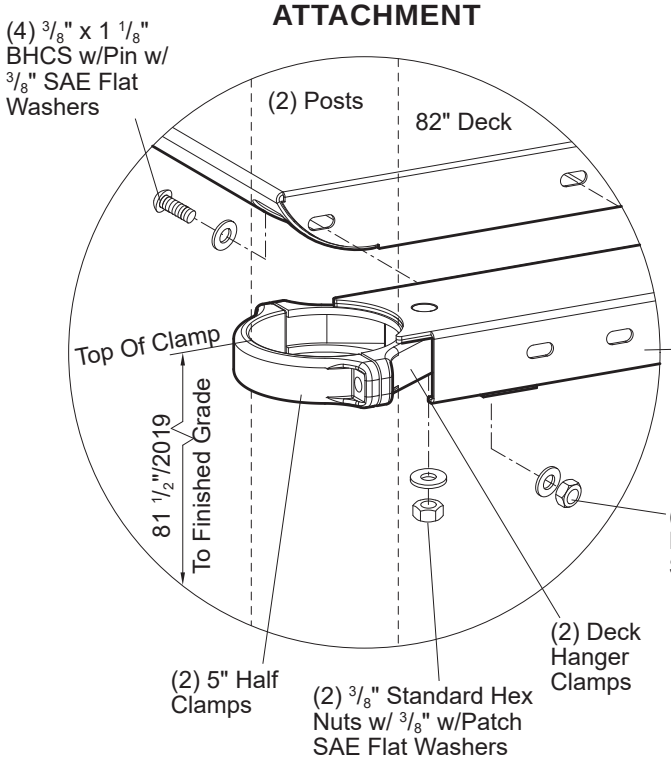
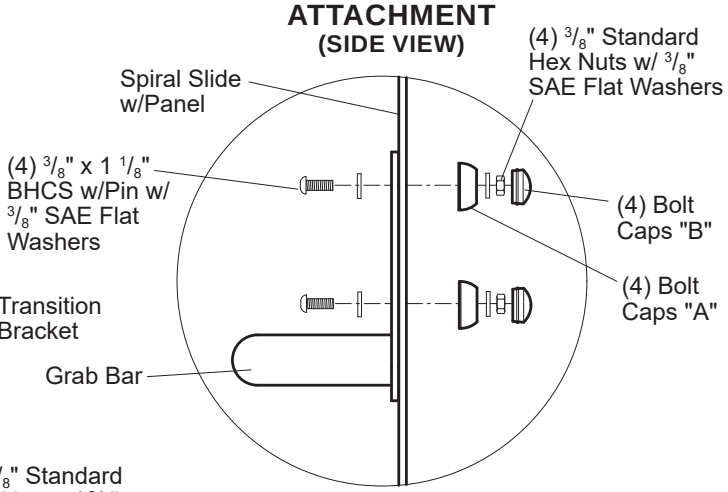
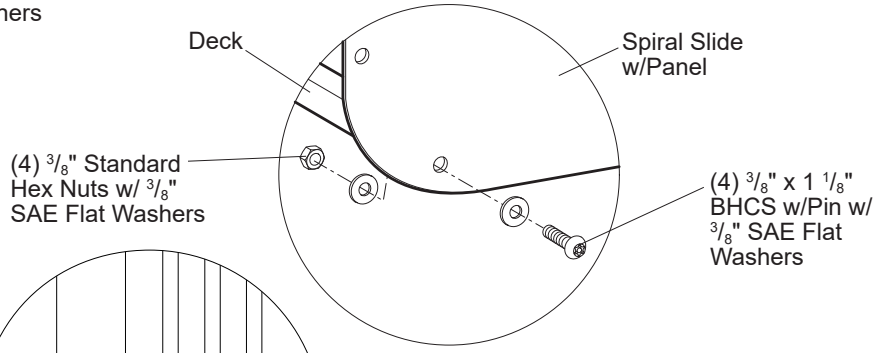
DETAIL
DECK & TRANSITION BRACKET ATTACHMENT



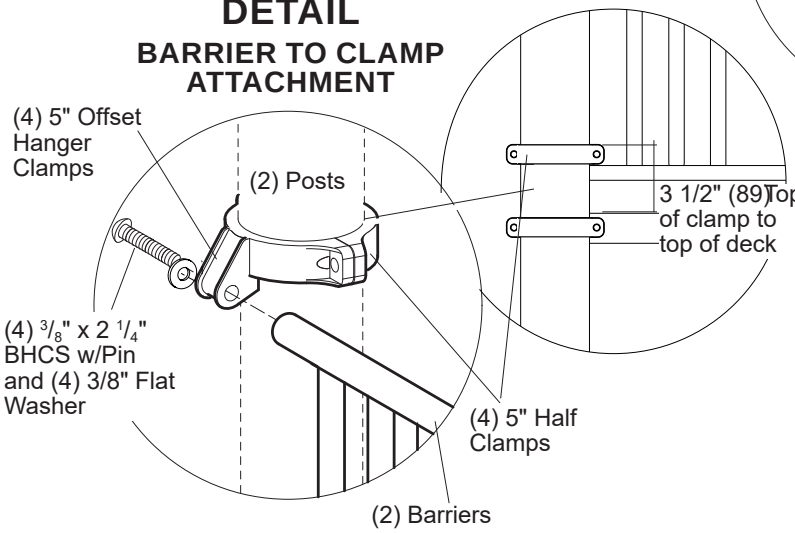
DETAIL
GRAB BAR ATTACHMENT (SIDE VIEW)



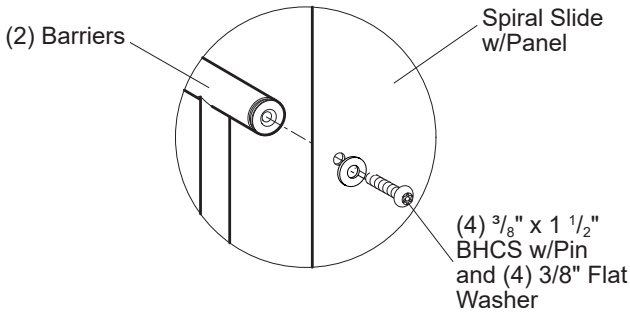
DETAIL
SLIDE PANEL TO DECK ATTACHMENT



DETAIL
BARRIER TO CLAMP ATTACHMENT



DETAIL
BARRIER TO SLIDE ATTACHMENT



PlayBooster® 194699 Spiral Stainless Steel Slide, 82" Deck

601 7TH STREET SOUTH, DELANO, MINNESOTA 55328-8605 888-574-4678 LSI Install Help 888-438-6574 LSI Direct 763-972-5200 Int. FAX (763) 972-3185

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Document #30852000

Parts List

Part#	Description	Qty.
100610	1/4" x 5/8" Drive Rivet, AL/SST	4
105327	5" Half Clamp, Specify Color	6
106022	Deck Hanger Clamp, Specify Color	2
113729	Offset Hanger Clamp, Specify Color	4
292070	Kick Plate, Specify Color	1
176646	Barrier, Specify Color	2
177507	Grab Bar, Specify Color	1
177558	Slide Deck, Specify Color	1
178576	Spiral Slide w/Panel	1
184129	Upper Footer, Specify Color	1
178580	Mid Footer, Specify Color	1
178581	Lower Footer, Specify Color	1
179476	Bottom Footer, Specify Color	1
179477	Exit Leg, Specify Color	2
184259	Transition Bracket, Specify Color	1
106676	**Transition Bracket Hardware Package**	1
100198	3/8" x 1 1/8" BHCS w/Pin, SST	4
100321	3/8" Hex Patch Nut, SST	2
100351	3/8" Tee Nut, SST	4
100362	3/8" Flat Washer, SST	2
100610	1/4" x 5/8" Drive Rivet, AL/SST	2
258008	**Stainless Steel Spyro Slide Hardware Package**	1
100198	3/8" x 1 1/8" BHCS w/Pin, SST	22
100171	3/8" x 1 1/2" BHCS w/Pin, SST	4
100199	3/8" x 2 1/4" BHCS w/Pin, SST	4
100327	3/8" Standard Hex Nut, SST	12
100351	3/8" Tee Nut, SST	8
100365	3/8" SAE Flat Washer, SST	26
108184	Bolt Cap Part A, White	4
108185	Bolt Cap Part B, White	4
113300	1/4" x 1/2" Drive Rivet, AL/AL	6
100362	3/8" Flat Washer, SST	8

Specifications

Transition Bracket: Formed from 11 GA (.120") (3,05 mm) HRPO low carbon sheet steel. Finish: TenderTuff, color specified.

Barrier: Weldment comprised of 1.315" (33,40 mm) O.D. RS20 (.080"-.090") (2,03 mm-2,28 mm) wall galvanized steel tubing with 203 or 303 stainless steel welded inserts with 3/8" internal threads, and 1.029" (26,13 mm) O.D. RS20 (.070"-.080") (1,77 mm-2,03 mm) wall galvanized steel tubing. Finish: ProShield®, color specified.

Grab Bar: Weldment comprised of 1.029" (26,14 mm) O.D. RS20 (.080"-.090") (2,03 mm-2,28 mm) wall galvanized steel tubing and 7 GA. (.179") (4,54 mm) thick HRPO steel sheet. Finish: ProShield®, color specified.

Deck: Flange formed from 12 GA (.105") (2,67 mm) sheet steel conforming to ASTM A1011. Standing surface is perforated with 5/16" (7,94 mm) diameter holes. Finish: TenderTuff™, color specified.

Slide: Weldment comprised of .098" (2,50 mm) thick 304 stainless steel.

Upper/Mid & Lower Footers: Fabricated from 3.500" (88,9 mm) O.D. RS20 x .125" (3,18 mm) wall galvanized steel tubing. Finish: ProShield®, color specified.

Bottom Footer: Weldment comprised of 3.500" (88,9 mm) O.D. RS20 (.125") (3,18 mm) wall galvanized steel tubing and 1/4" (6,35 mm) HRPO steel sheet. Finish: ProShield®, color specified.

Exit Leg: Weldment comprised of 1.315" (33,40 mm) O.D. RS20 (.080"-.090") (2,03 mm-2,28 mm) wall galvanized steel tubing with 203 or 303 stainless steel welded inserts with 3/8" internal threads. Finish: ProShield®, color specified.

Clamps: Cast Aluminum. Finish: ProShield®, color specified.

Fasteners: Primary fasteners shall be socketed and pinned tamperproof in design, stainless steel (SST) per ASTM F 879 unless otherwise indicated (see specific product installation/specifications)

Installation Time: Approx. 9 man hours
Concrete Req.: Approx. 10 cu. ft.
Area Req.: 82" (2,08 m) minimum use zone at Exit
Weight: 738 lbs.
Fall Height: 82" (2,08 m)

Installation Instructions

NOTE: *To lift Spiral Slide into postion, a "Lull" type material handler with strap is recommended.*

1) **(Direct Bury)** Dig footing holes. Refer to the PlanView & Direct Bury Details.
2) Preassemble the spiral slide over a clean non-scratching surface.
3) Insert upper, mid and lower footers into slide tubes. Drill through holes in slide tubes into footers with a 1/4" or "F" (only) drill bit. Insert 1/4" x 1/2" drive rivets into holes and hammer drive rivet pin in until flush with head. Refer to the Upper/Mid/Lower Footer Detail.
4) Attach bottom footer and exit legs to slide. Refer to the Bottom Footer & Exit Legs Details.
5) Attach grab bar to slide panel. Refer to the Grab Bar Attachment Detail.
6) Mark posts at 81 1/2" above finished grade. Attach deck hanger clamps to hanger bracket. Position hanger bracket with deck hanger clamps between posts level with marks. Attach to posts. Refer to the Deck and Transition Attachment and Typical Offset Hanger Clamp Spec Sheet.
7) With three people minimum attach the entrance deck to the face of the transition bracket. Refer to the Deck and Transition Attachment.
8) Stand the preassembled spiral slide upright into footing holes with panel facing the entrance deck. Base footing is to be blocked up (blocks not supplied) to plum footers.
9) Attach slide panel to deck. Refer to the Slide Panel To Deck Attachment Detail.
10) Attach barriers to slide panel and posts. Refer to the Barrier to Slide Attachment Detail and Barrier to Clamp Attachment Detail.
11) Level barriers and entrance deck. You may need to adjust hanger clamp assemblies and prop up slide to do so.
12) Install 1/4" x 5/8" drive rivets in all 5" half clamps. Refer to the Typical Offset Hanger Clamp Spec Sheet.
13) With slide footers plumb, pour concrete footings. Allow concrete to cure a minimum of 72 hours before users are allowed to play on the structure.
14) Install protective surfacing before users are allowed to play on the structure.

Specifications are subject to change without notice.

ECO# 0102245 Document 30859700 replaces 28323900. Chg to kick plate

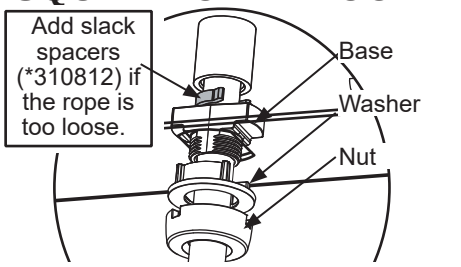
landscape structures®

ISO 14001 CERTIFIED

ISO 9001 Certified

SAFETY NOTE
Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. ASTM F1487.)

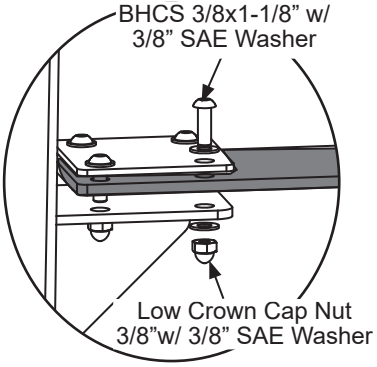
DETAIL SQUARE CABLE CONN.



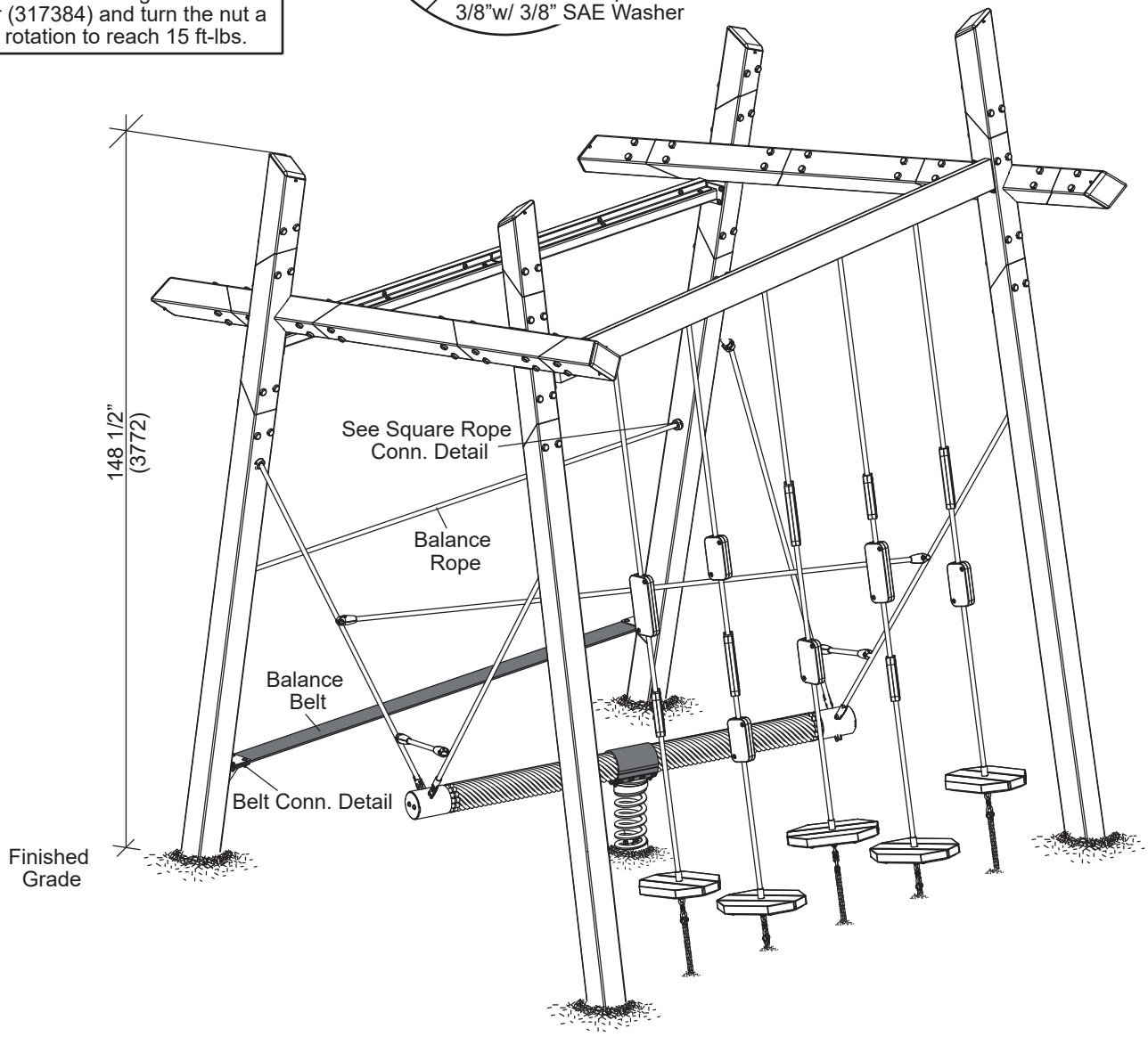
*may be located in spare parts kit

Place base inside the pipe and rotate into place. Use washer to align rope into place. Pull the cable straight and tighten the nut hand tight. Use the Spanner (317384) and turn the nut a quarter rotation to reach 15 ft-lbs.

DETAIL BELT CONN.



FOR EASE OF INSTALLATION, RECOMMEND LIFTING EQUIPMENT CAPABLE OF LIFTING 600 LBS.



307423 Folio® Balance Climber

Forma™

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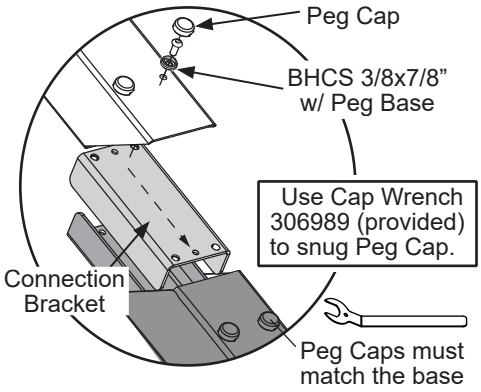
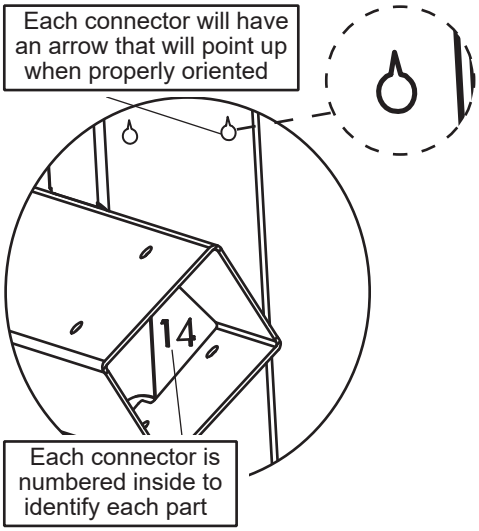
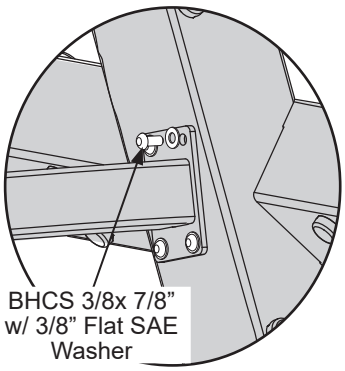
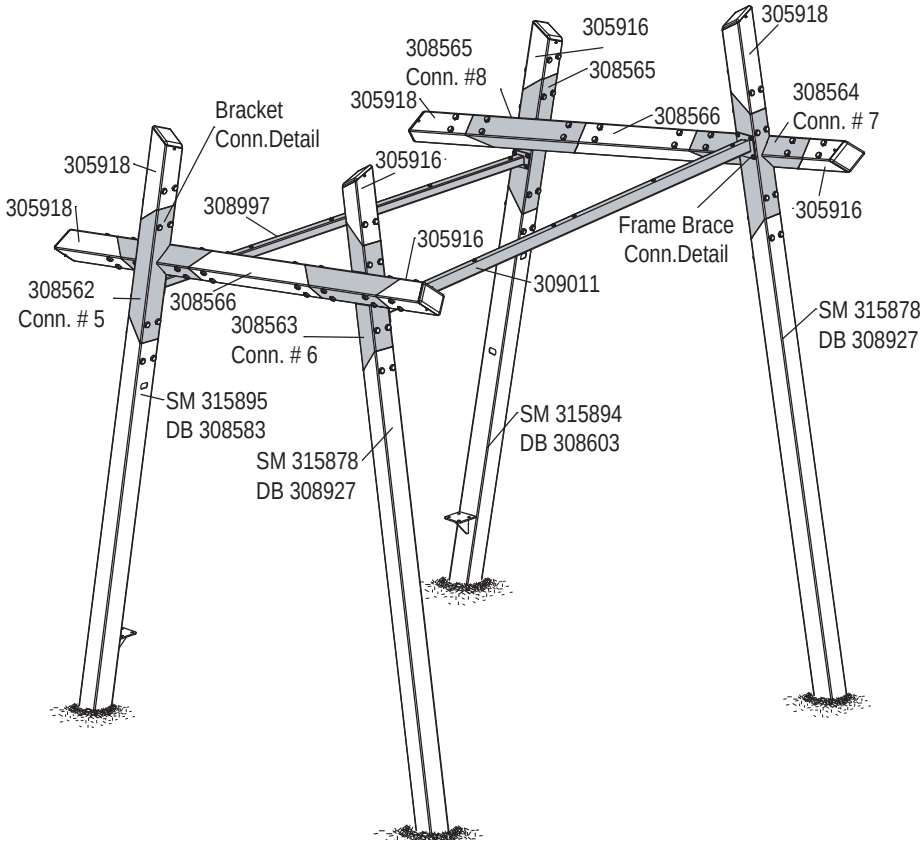
DETAIL BRACKET CONN.



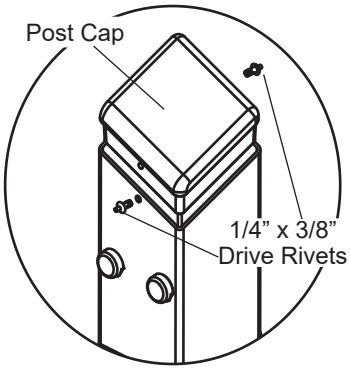


DETAIL FRAME BRACE CONN.





DETAIL POST CAP



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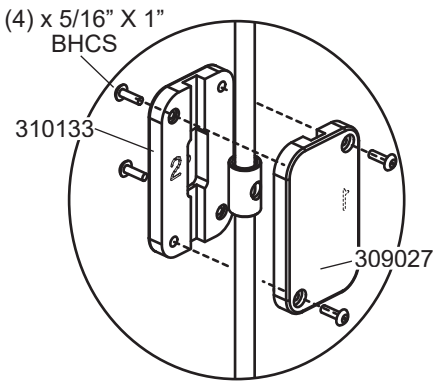
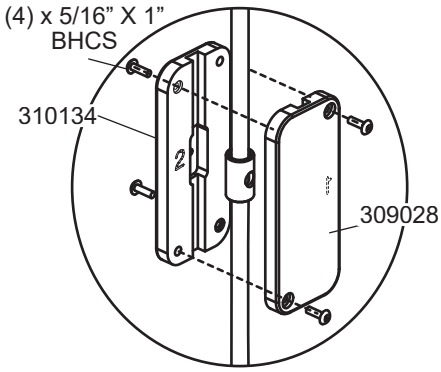
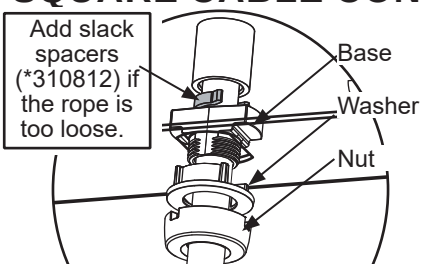
DETAIL
8” ROPE BLOCK



DETAIL
11” PERM BLOCK



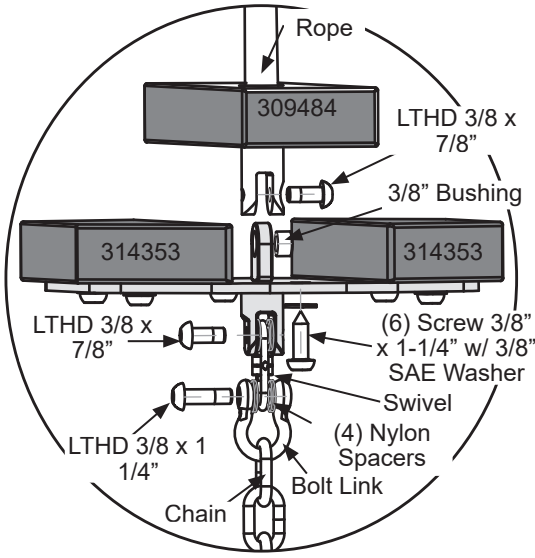
DETAIL
SQUARE CABLE CONN.

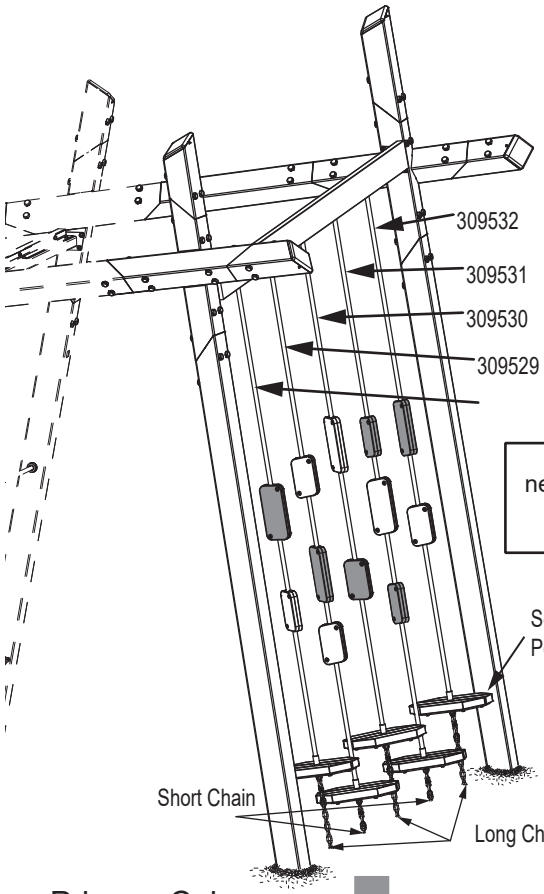


*may be located in spare parts kit

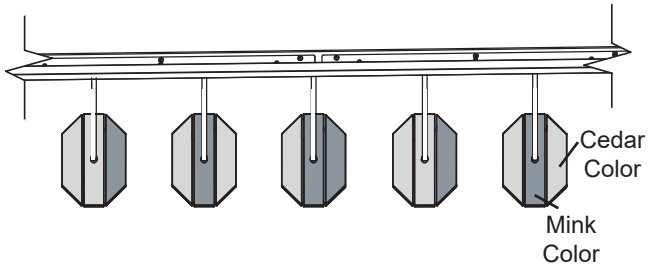
Place base inside the pipe and rotate into place. Use washer to align rope into place. Pull the cable straight and tighten the nut hand tight. Use the Spanner (317384) and turn the nut a quarter rotation to reach 15 ft-lbs.

DETAIL
LUMBER POD





The rope angle needs to be pulled parallel to the posts.



Primary Color
Secondary Color

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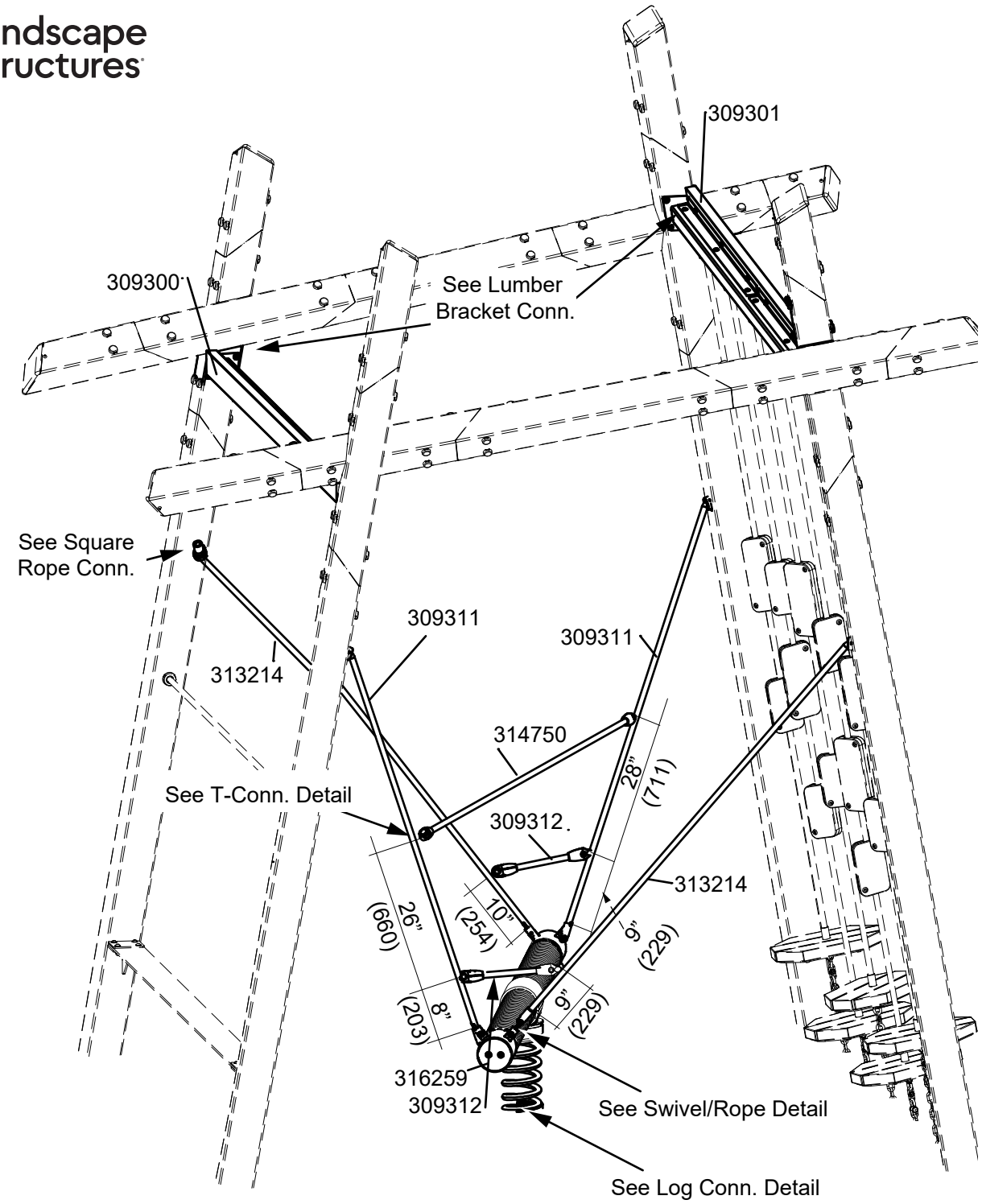

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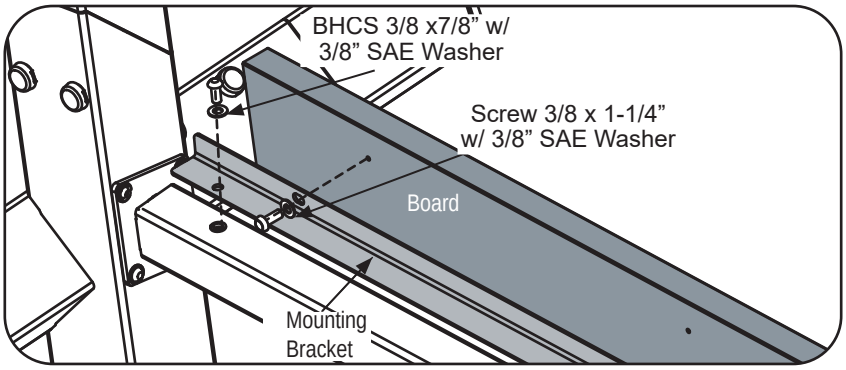
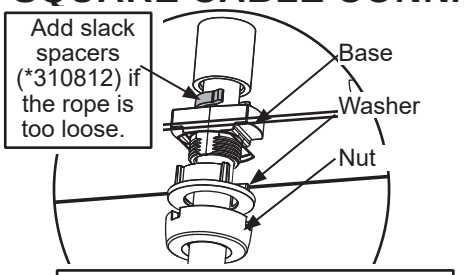
DETAIL
LUMBER BRACKET CONN.



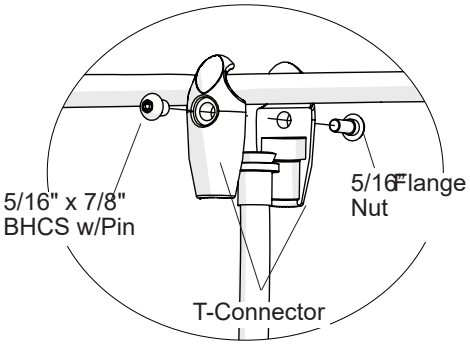
DETAIL
SQUARE CABLE CONN.



*may be located in spare parts kit

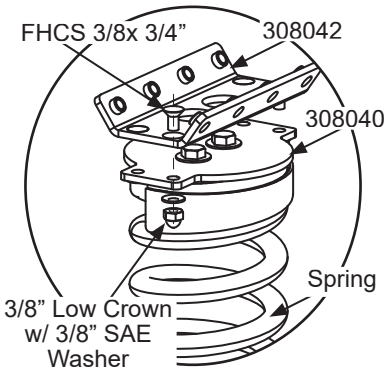
Place base inside the pipe and rotate into place. Use washer to align rope into place. Pull the cable straight and tighten the nut hand tight. Use the Spanner (317384) and turn the nut a quarter rotation to reach 15 ft-lbs.

DETAIL
T-CONN.

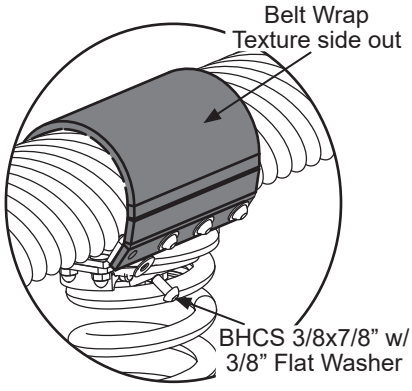


NOTE: Do not overtighten fasteners.

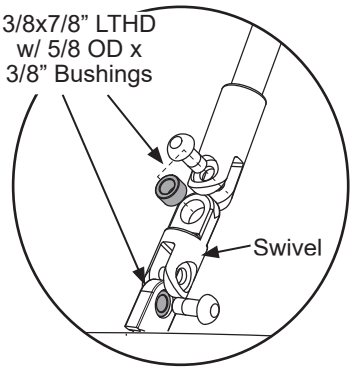
DETAIL
LOG CONN. STEP 1



DETAIL
LOG CONN. STEP 2



DETAIL
SWIVEL/ROPE



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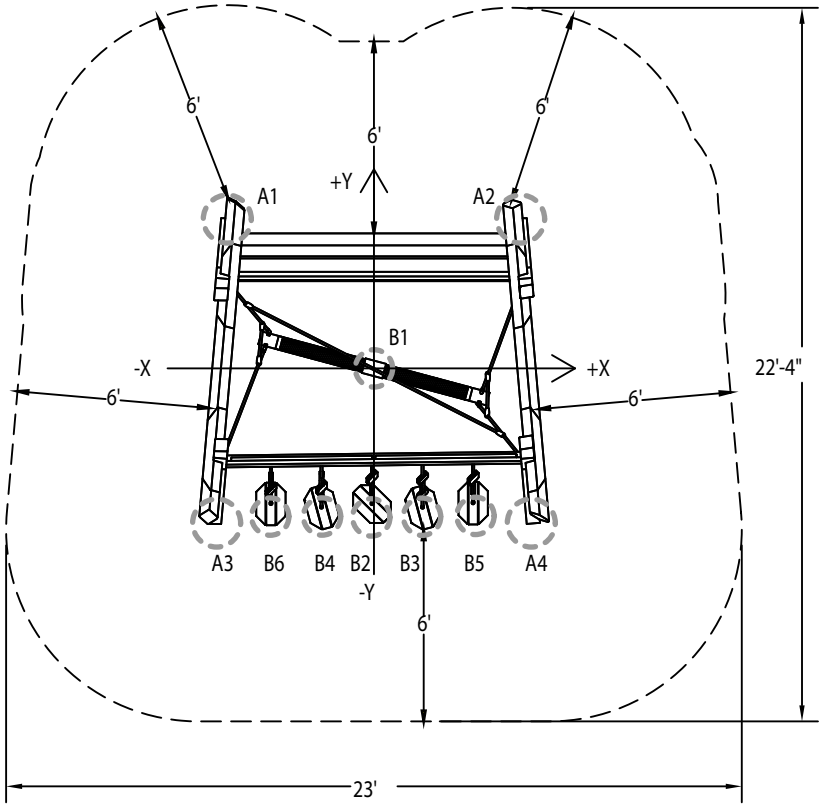
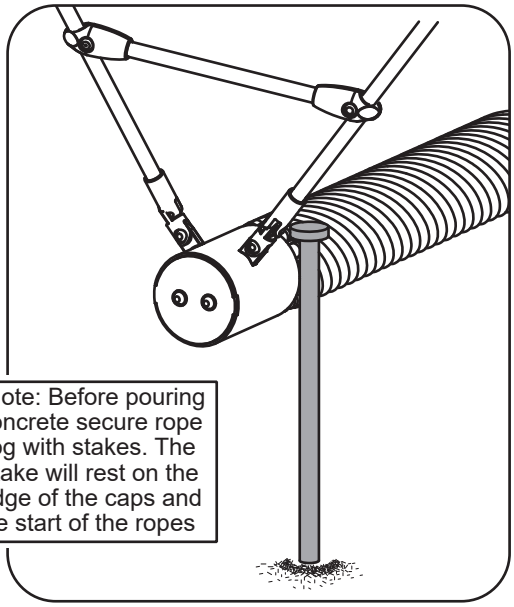
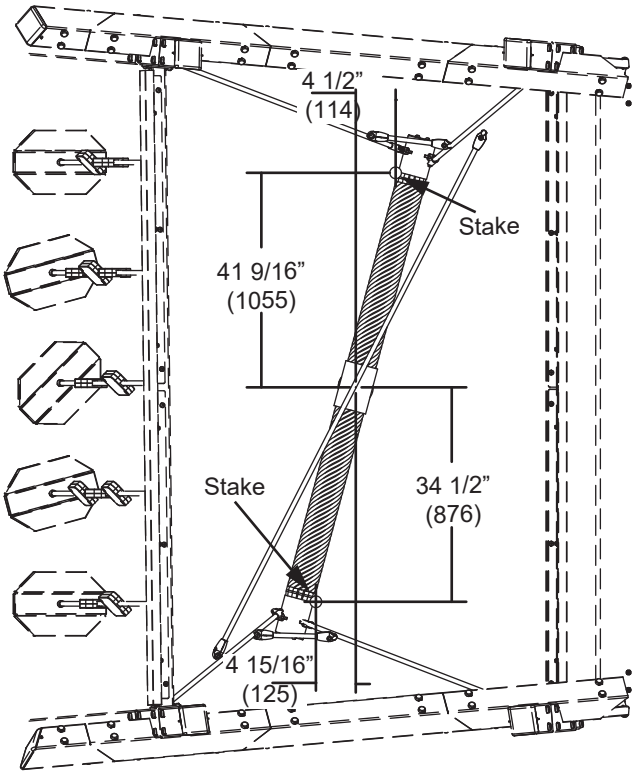


N.	I.D.	X (ft-in)	Y (ft-in)	Dist. to O	DIA (in)
1	A1	-4'-7"	4'-8"	6'-6 1/2"	18
2	A2	4'-7"	4'-8"	6'-6 1/2"	18
3	A3	-4'-11"	-4'-10"	6'-10 1/2"	18
4	A4	4'-11"	-4'-10"	6'-10 1/2"	18
5	B1	0"	0"	0"	14
6	B2	-1"	-4'-8"	4'-8"	14
7	B3	1'-6"	-4'-7 1/2"	4'-10 1/2"	14
8	B4	-1'-7 1/2"	-4'-7 1/2"	4'-11"	14
9	B5	3'-2"	-4'-7 1/2"	5'-7"	14
10	B6	-3'-3"	-4'-7 1/2"	5'-8"	14

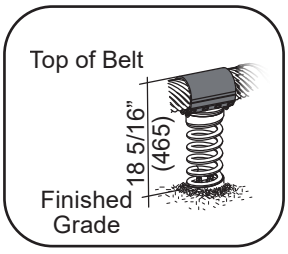
DETAIL STAKE



Note: Before pouring concrete secure rope log with stakes. The stake will rest on the edge of the caps and the start of the ropes



Note: For direct bury; the Rope might need to be propped up to achieve proper height.



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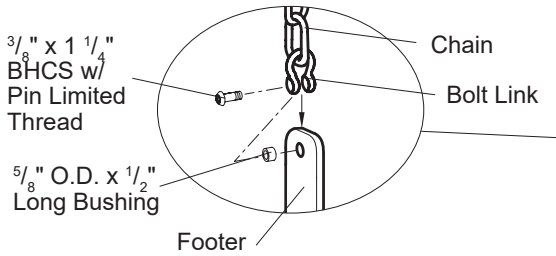
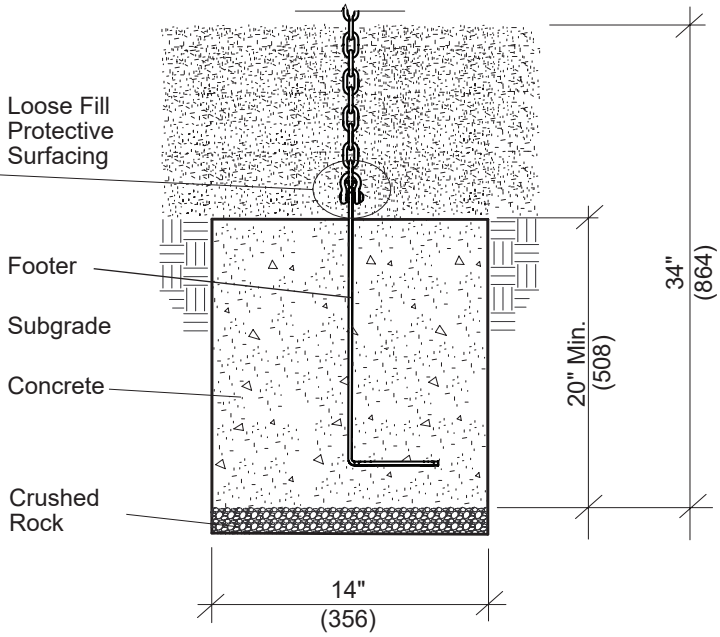
DETAIL
PLATE FOOTER ATTACHMENT



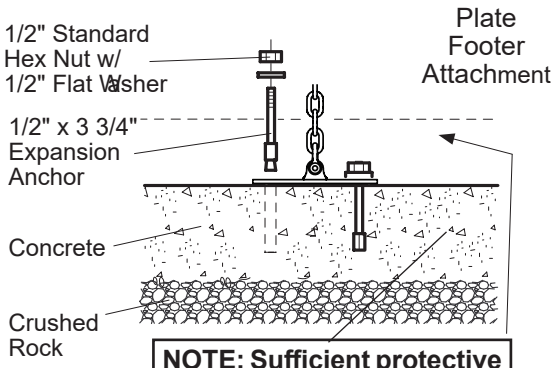
DETAIL
DIRECT BURY



IMPORTANT! Tension ropes/nets before pouring concrete footings.

NOTE: The hole depth for the footer needs to be deep enough, so the footer plate does not contact the bottom of the hole. The weight of the concrete will force the footer plate down, further tightening the cable.

SECTION
SURFACE MOUNT



NOTE: Sufficient protective surfacing must cover hardware to satisfy fall height requirements.

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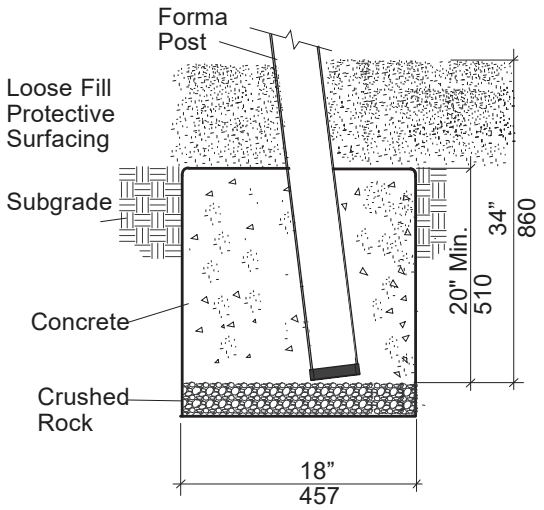
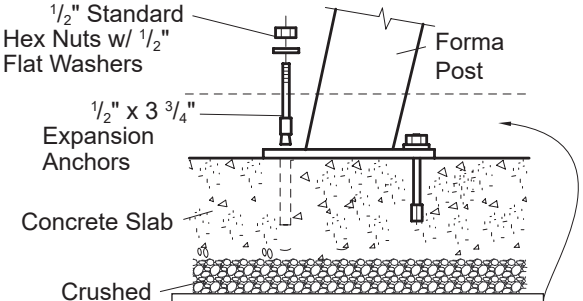
DETAIL
DIRECT BURY

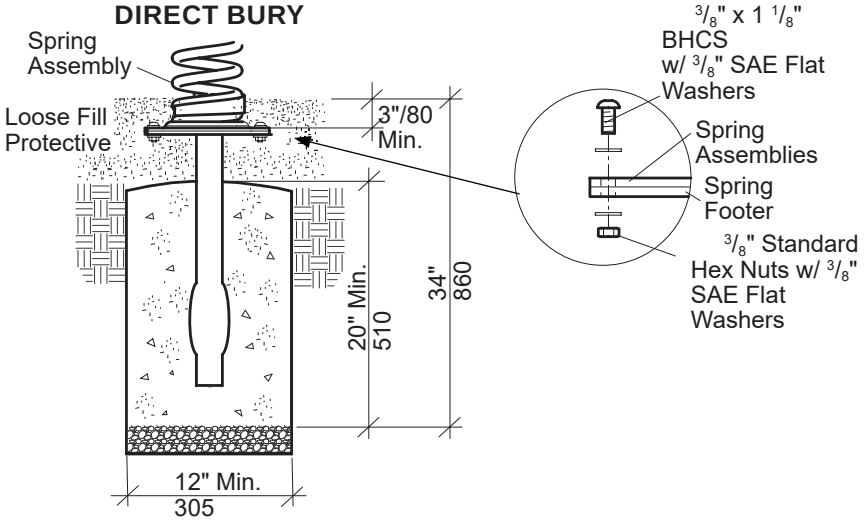


DETAIL
SURFACE MOUNT

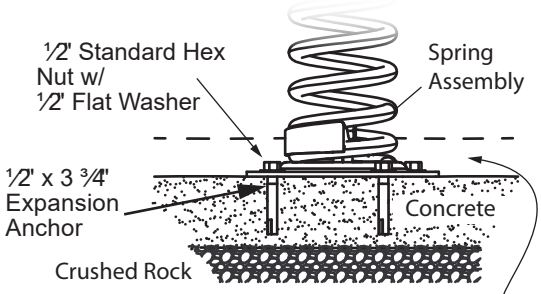


NOTE: Sufficient protective surfacing must cover hardware to satisfy fall height requirements.

DETAIL
DIRECT BURY



DETAIL
SURFACE MOUNT



NOTE: Sufficient protective surfacing must cover hardware to satisfy fall height requirements.

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Document #31570400

Parts List

Part# / Item number	Description / Product name	Qty. / Quantity
115154	LEG SPRING DB PNT, Specify Color	1
127032	CHN 1/4i P70 X 11-1/2i LONG	3
132276	SPRING ASY, Specify Color	1
179682	CHN 1/4i P70 13i	2
184271	CUST FTR SM PNT, Specify Color	5
191086	T-CONNECTOR	12
196888	CHN 1/4i P70 21-3/4i	3
218781	ROPE SWIVEL TAB	4
247871	SINGLE ROPE FOOTER HDG	5
305916	16i EXTENSION, Specify Color	4
305918	22i EXTENSION, Specify Color	4
305951	CONNECTION BRACKET, Specify Color	32
306022	5i SQ CAST END CAP PNT, Specify Color	8
308040	SPRING TOP PLATE, Specify Color	1
308042	BALANCE BEAM BELT BRACKET, Specify Color	1
308043	BALANCE BEAM BELT	1
308562	SQUARE TUBE BEAM CONN 5, Specify Color	1
308563	SQUARE TUBE BEAM CONN 6, Specify Color	1
308564	SQUARE TUBE BEAM CONN 7, Specify Color	1
308565	SQUARE TUBE BEAM CONN 8, Specify Color	1
308566	40i 4P BEAM, Specify Color	2
308583	127i POST RH WLD, Specify Color	1
308603	127i POST LH WLD, Specify Color	1
308927	140i POST, Specify Color	2
308997	4P FRAME REAR BRACE, Specify Color	1
309011	4P FRAME ROPE BEAM, Specify Color	1
309027	8i Rope Block #1, Specify Primary Color	3
309027	8i Rope Block #1, Specify Secondary Color	4
309028	11i Rope Block #1, Specify Primary Color	3
309028	11i Rope Block #1, Specify Secondary Color	2
309300	4P BRACE LUMBER / 172 Cedar	1
309301	4P ROPE BEAM LUMBER / 172 Cedar	1
309311	4P BALANCE ROPE 1, Specify Color	2
309312	4P BALANCE ROPE 2, Specify Color	2
309355	4P BALANCE ROPE 5, Specify Color	1
309424	4P BALANCE BELT	1
309425	4P BELT CLAMP / 005 Black	2
309484	RPL STR STEPPER BRD 3.5 X 16 W/CTR HOLE / 172 Cedar	2
309484	RPL STR STEPPER BRD 3.5 X 16 W/CTR HOLE / 288 Mink	3
309488	RPL STEPPER PLT W/DBL ROPE TAB, Specify Color	5
309528	SWIGGLE 5-12 ROPE #1, Specify Color	1
309529	SWIGGLE 5-12 ROPE #2, Specify Color	1
309530	SWIGGLE 5-12 ROPE #3, Specify Color	1
309531	SWIGGLE 5-12 ROPE #4, Specify Color	1
309532	SWIGGLE 5-12 ROPE #5, Specify Color	1
310133	8i Rope Block #2, Specify Primary Color	3
310133	8i Rope Block #2, Specify Secondary Color	4
310134	11i Rope Block #2, Specify Primary Color	3
310134	11i Rope Block #2, Specify Secondary Color	2
313004	4P BOARD MOUNTING BRACKET, Specify Color	4
313214	4P BALANCE ROPE 3, Specify Color	2
314353	RPL DBL ANG STEPPER BRD 3.5X16 / 172 Cedar	7
314353	RPL DBL ANG STEPPER BRD 3.5X16 / 288 Mink	3
314455	PEG CAP CAST PNT, Specify Primary Color	64
314455	PEG CAP CAST PNT, Specify Secondary Color	64
314750	4P BALANCE ROPE 4, Specify Color	1
315792	CHN 1/4i P70 3i	2
315878	107 1/8i POST SM, Specify Color	2
315894	95 3/8i POST LH WLD SM, Specify Color	1
315895	95 3/8i POST RH WLD SM, Specify Color	1
317384	ROPE SPANNER WRENCH PVC / 009 Red	1
320274	HDW PKG 2-HOLE SM 1/2 x 3-3/4	5
100322	NUT HEX STD 1/2-13 SST	2
100363	WASHER FLAT 1/2i SST	2
176046	EXP ANCHOR 1/2x3-3/4i ZP	2
183388	HDW PKG 4-HOLE SM 1/2 x 3-3/4	5
100322	NUT HEX STD 1/2-13 SST	4
100363	WASHER FLAT 1/2i SST	4
176046	EXP ANCHOR 1/2x3-3/4i ZP	4
115326	HDW PKG DB SPRING RIDER	1
100198	BHCS 6LP 3/8x1-1/8i SST	4
100327	NUT HEX STD 3/8-16 SST	4
100365	WASHER FLAT SAE 3/8i SST	8
315529	HDW PKG FOLIO™ BALANCE BELT & ROPES	1
100198	BHCS 6LP 3/8x1-1/8i SST	8
100349	NUT L/C CAP 3/8-16 SST	8
100365	WASHER FLAT SAE 3/8i SST	16
132626	BHCS 6LP 5/16x7/8i SST	6
175006	FLG NUT 6LP 5/16-18 SST	6
310812	SLACK SPACER	4
315527	HDW PKG FOLIO™ ROPE BALANCE BEAM	1
100196	BHCS 6LP 3/8x7/8i SST	8
100290	BHCS 6LP LTHD 3/8x7/8iSST	8
100349	NUT L/C CAP 3/8-16 SST	4
100362	WASHER FLAT 3/8i SST	8
100363	WASHER FLAT 1/2i SST	4
129692	NUT HEX STD 1/2-13 SSTPAT	2
129693	NUT HEX JAM 1/2-13 SST	2
131862	HEX CAP 1/2x2-1/4 SST	2
148686	FHCS 6LP 3/8x3/4i SST PAT	4
100365	WASHER FLAT SAE 3/8i SST	4
127179	BUSHING 5/8OD X 3/8 LG SST	8
315528	HDW PKG FOLIO™ RPL SWIGGLE STIX	1
100365	WASHER FLAT SAE 3/8i SST	30
127179	BUSHING 5/8OD X 3/8 LG SST	5
205152	LAG SCR BH 6LP 3/8x1-1/4i SST	30
264971	BHCS 6LP 5/16i -18 X 1i SST	48
317230	SWIVEL LINK	5
100290	BHCS 6LP LTHD 3/8x7/8iSST	10
100292	BHCS 6L LTHD 3/8x1-1/4SST	10
138915	BOLT LINK SST	10
156962	BUSHING 5/8 OD X 1/2 LG SST	5
112501	SPACER NYLON 3/8i ID	20
315202	HDW PKG FORMA 4-POST FRAME	1
100196	BHCS 6LP 3/8x7/8i SST	156
100365	WASHER FLAT SAE 3/8i SST	40
100611	RIVET 1/4X3/8i DRV AS	16
205152	LAG SCR BH 6LP 3/8x1-1/4i SST	12
307377	PEG BASE MACHINED	128
182693	HDW PKG LABELS 5-12 YRS	1
115176	LABEL HD SRF WARNING ASTM	1
156847	LABEL PLAY SAFE 5-12 YRS	1
182212	LABEL ENTANGLEMENTWARNING	1
182213	LABEL HOT SURFACE WARNING	1

Forma™ 307423 Folio® Balance Climber

Document #31570400

Specifications

Belt:	Made from .315” (8,00 mm) thick mini rough top 3-ply rubber belting with polyester fabric plys, black in color.
Boards:	Recycled high-density polyethylene. Cedar and mink in color.
Cable Nets:	(Cable) Made of tightly woven polyester-wrapped, six-stranded galvanized-steel cable with a polypropylene core. Color Specific. (Cable Connectors) 6063-T6 Alum.
Chain Support:	Made from 1/4” (6,35 mm) HRPO steel plate. Finish: Hot dip galvanized per ASTM A123.
Chain:	Steel 1/4” (6,35 mm) straight link chain, 3,150 lb (1428,82 kilograms). working load limit. Finish: ProGuard.
Fasteners:	Primary fasteners shall be socketed and pinned tamperproof in design, stainless steel (SST) per ASTM F 879 unless otherwise indicated (see specific product installation/specifications).
Forma Frame:	ASTM A53, 5”SQ x .120 wall tubing. Shall be galvanized after rolling and shall have both I.D. and the cut ends sprayed with a corrosion resistant coating Finish: Proshield, Color Specific.
Permalene Panels:	Recycled Permalene, color specified.
Top Caps:	Cast aluminum. Finish: ProShield, color specified.

Installation Time:	DB - Approx. 20 person hours
	SM- Approx. 20 person hours
Concrete Req.:	DB - Approx. 24.73 cu. ft.
Weight:	DB - 1186 lbs.
	SM- 1077 lbs.
Fall Height:	20” (0,51 m)

Installation Instructions

1) (Direct Bury) Dig footings spaced as shown. Refer to Concrete Footing Detail.
2) Assemble the Frame and place it into holes.
3) Attach cables to upper beam.
4) Attach Lumber brackets as shown.
5) Connect balance rope. Add slack spacers if rope is loose.
6) Attach balance belt as shown
7) Attach ropes to the frame as shown.
8) Assemble the rope log to the spring assembly. Connect the ropes to the tabs on the log. Stake the log into position and ensure it is level.
9) Assemble the pods. Attach Cables to the frame.
10) Attach Permalene blocks to the suspended cables.
11) Connect chains to the ends of the cables. Attach footers to the chains.
12) (Direct Bury) Stake footers on the pod assemblies to match the angle of the posts.

    (Surface Mount) Mark holes when cables are pulled into the proper position. Drill 1/2” x 4” deep holes through footer plates using hammer drill and 1/2” masonry bit. Tap expansion anchors into drilled holes. Fasten anchor plates to expansion anchors using 1/2” standard hex nuts with 1/2” flat washers.
13) (Direct Bury) Pour concrete footing . Allow concrete footing to cure for a minimum of 72 hours before users are allowed to play on the structure.
14) Apply Play Safe and Warning Labels, as shown.
15) Install protective surfacing before users are allowed to play on the structure.

10/2/2023 - Added a cap wrench detail.

1/28/2026 - Updated LSI logo and added PN for spacers and tools to notes.

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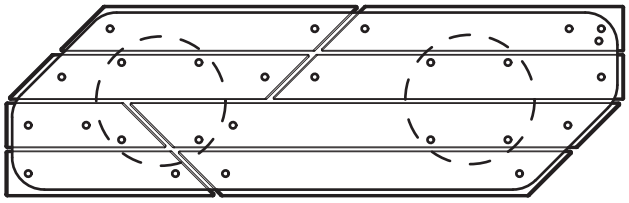
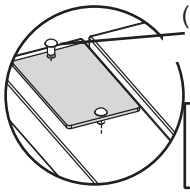
ISO 9001 Certified

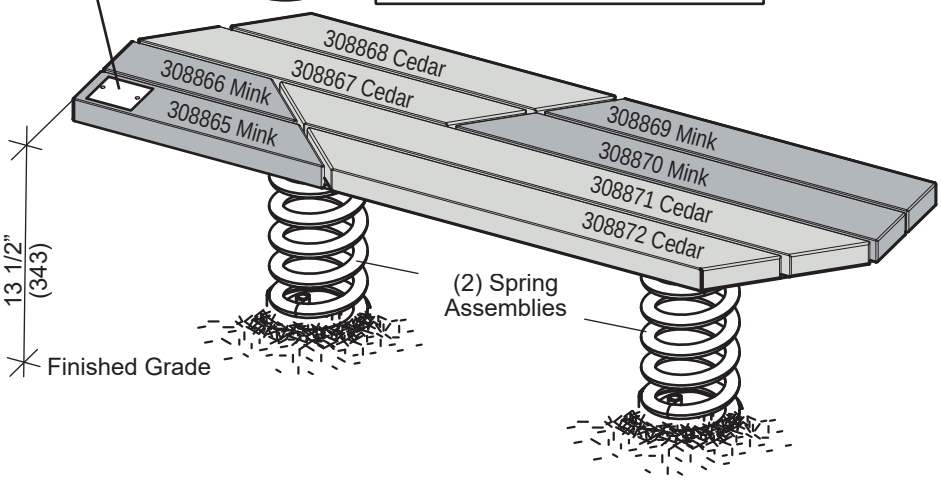
SAFETY NOTE
Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. ASTM F1487.)

DETAIL TOP DOWN BOARD PLACEMENT

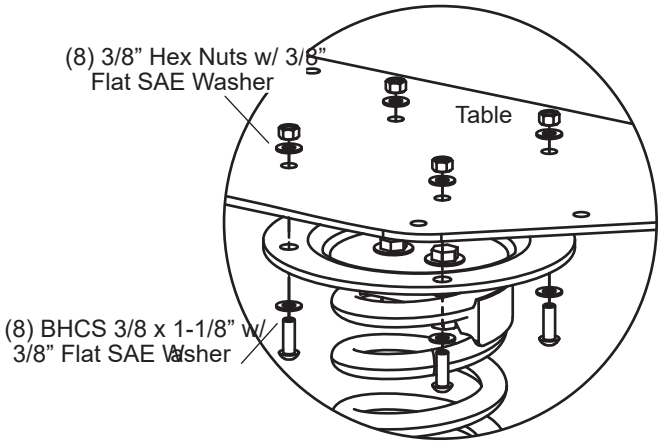




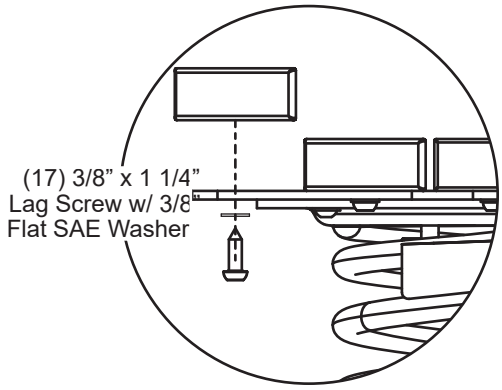
IMPORTANT! Do not use an impact wrench to tighten BHCS Torx bolts. Hand tighten only.



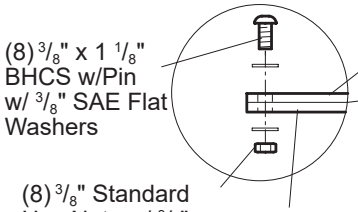
DETAIL PLATFORM CONNECTION



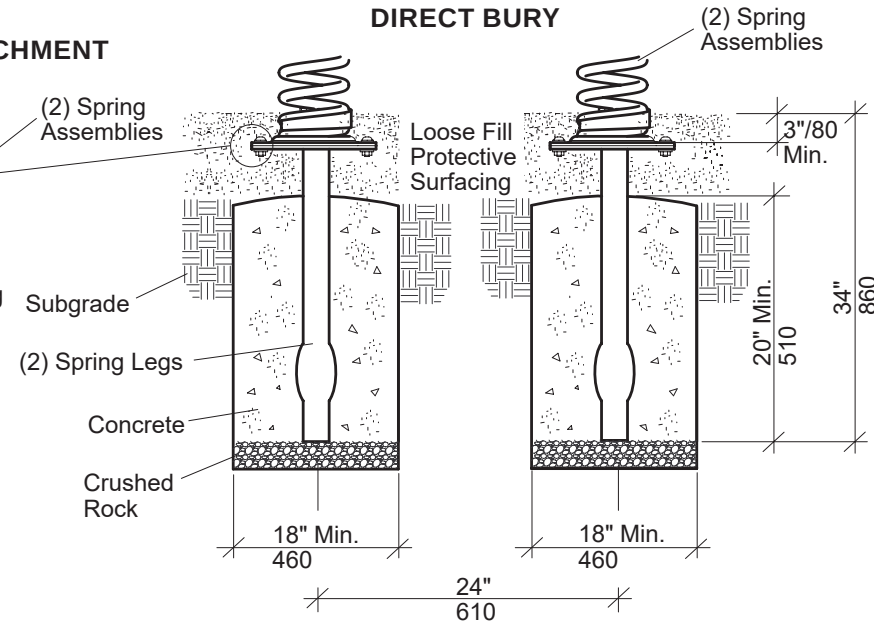
DETAIL BOARD CONNECTION



DETAIL SPRING LEG ATTACHMENT



DETAIL DIRECT BURY



NOTE: Refer to the site Plan for footing location

Forma™ 307435 Footprint® Wobble Bouncer

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Forma™ 307435 Footprint® Wobble Bouncer

Parts List

Part#	Description	Qty.
115154	LEG SPRING (DB), Specify Color	2
178876	CUST SPRG ASY W/PL , Specify Color	2
308863	RPL DBL POD/TABLE, Specify Color	1
308865	RPL DBL SPRING POD BRD #1, Mink	1
308866	RPL DBL SPRING POD BRD #2, Mink	1
308867	RPL DBL SPRING POD BRD #3, Cedar	1
308868	RPL DBL SPRING POD BRD #4, Cedar	1
308869	RPL DBL SPRING POD BRD #5, Mink	1
308870	RPL DBL SPRING POD BRD #6, Mink	1
308871	RPL DBL SPRING POD BRD #7, Cedar	1
308872	RPL DBL SPRING POD BRD #8, Cedar	1
314769	HDW PKG FOOTPRINT™ WOBBLE BOUNCER	
100198	BHCS 6LP 3/8x1-1/8i SST	8
100327	NUT HEX STD 3/8-16 SST	8
100365	WASHER FLAT SAE 3/8i SST	33
205152	LAG SCR BH 6LP 3/8x1-1/4i SST	17
207241	Hdw Pkg Power-Ser Anchor 4-Hole	2
206892	Anchor Wej-It 3/8-16 SST	4
100209	HEX CAP 3/8x1-3/4i SST	1
100362	WASHER FLAT 3/8i SST	4
208324	BHCS 6LP LTHD 3/8 X 1-1/4 SST W/PATCH	4
251735	HDW PKG LABELS 5-12 YRS	1
249825	5-12 YRS PLAY SAFE WARNING PLATE FLAT SMALL	1
129671	BHCS TORX #14 x 1/2 SST	2
127463	BIT HEX TPP T27 (TORX)	1
115326	HDW PKG DB SPRING RIDER	2
100198	BHCS 6LP 3/8x1-1/8i SST	4
100327	NUT HEX STD 3/8-16 SST	4
100365	WASHER FLAT SAE 3/8i SST	8

Specifications

Fasteners:	Primary fasteners shall be socketed and pinned tamper-proof in design, stainless steel (SST) per ASTM F 879 unless otherwise indicated (see specific product installation/specifications).
Boards:	Recycled high-density polyethylene, cedar and mink in color.
Spring:	Fabricated from 5 5/8" (142,88 mm) diameter 13/16" (20,62 mm) tempered alloy steel coil, with cast aluminum wedges A356 alloy placed in each end of spring. Finish: ProShield, color specified.
Installation Time:	DB - Approx. 3 person hours
	SM - Approx. 3 person hours
Concrete Req.:	DB - Approx. 1.4 cu. ft.
Weight:	DB - 180 lbs
	SM -.146 lbs.
Fall Height:	17" (0,43)

Installation Instructions

1) (Direct Bury) Dig footing holes as shown. Refer to the Site Plan for proper location of Wobble Pods.

2) Attach spring assemblies to Platform Plate, using 3/8" x 1-1/8" BHCS w/pin with 3/8" SAE flat washers and 3/8" Standard Hex Nuts with 3/8" SAE Flat Washers as shown. Refer to platform connection detail.

3) (Direct Bury) Attach spring legs to spring assemblies, using 3/8" x 1 1/8" BHCS w/ pin with 3/8" SAE flat washers and 3/8" standard hex nuts with 3/8" SAE flat washers, as shown. Refer to the Spring Leg Attachment Detail.

4) Attach recycled plastic lumber using lag screws with SAE flat washers as shown. Refer to Board Connection Detail.

5) (Direct Bury) With Wobble bouncer propped in plumb position, pour concrete footings. Allow concrete footings to cure for a minimum of 72 hours before users are allowed to play on the structure.

   (Surface Mount) Refer to the Instructions for Chemical Anchor Installation

6) Attach label using #14 x 1/2" BHCS Torx.

7) Install protective surfacing before users are allowed to play on the component.

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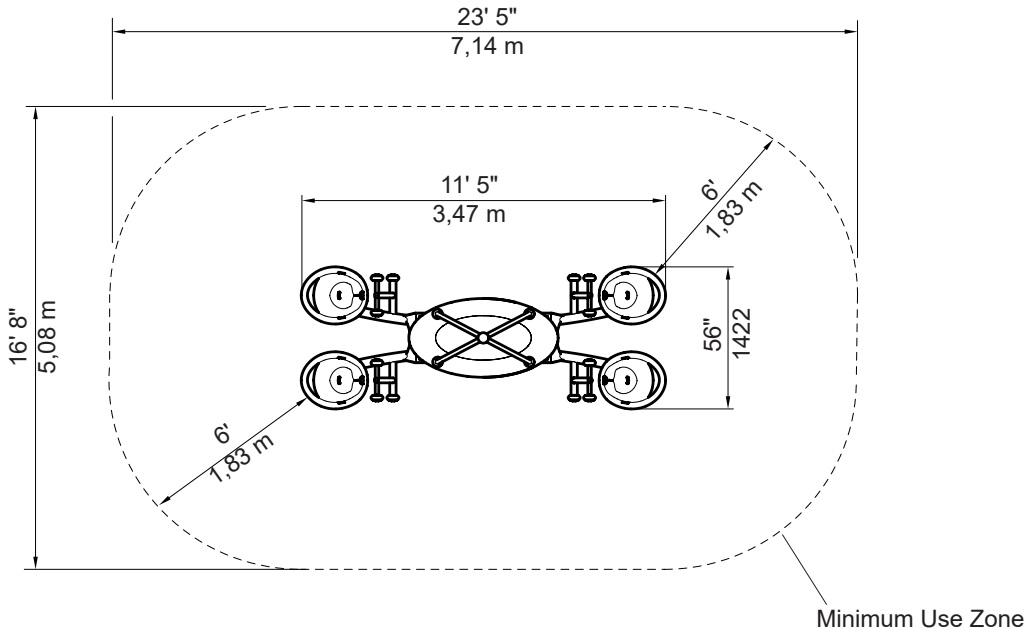
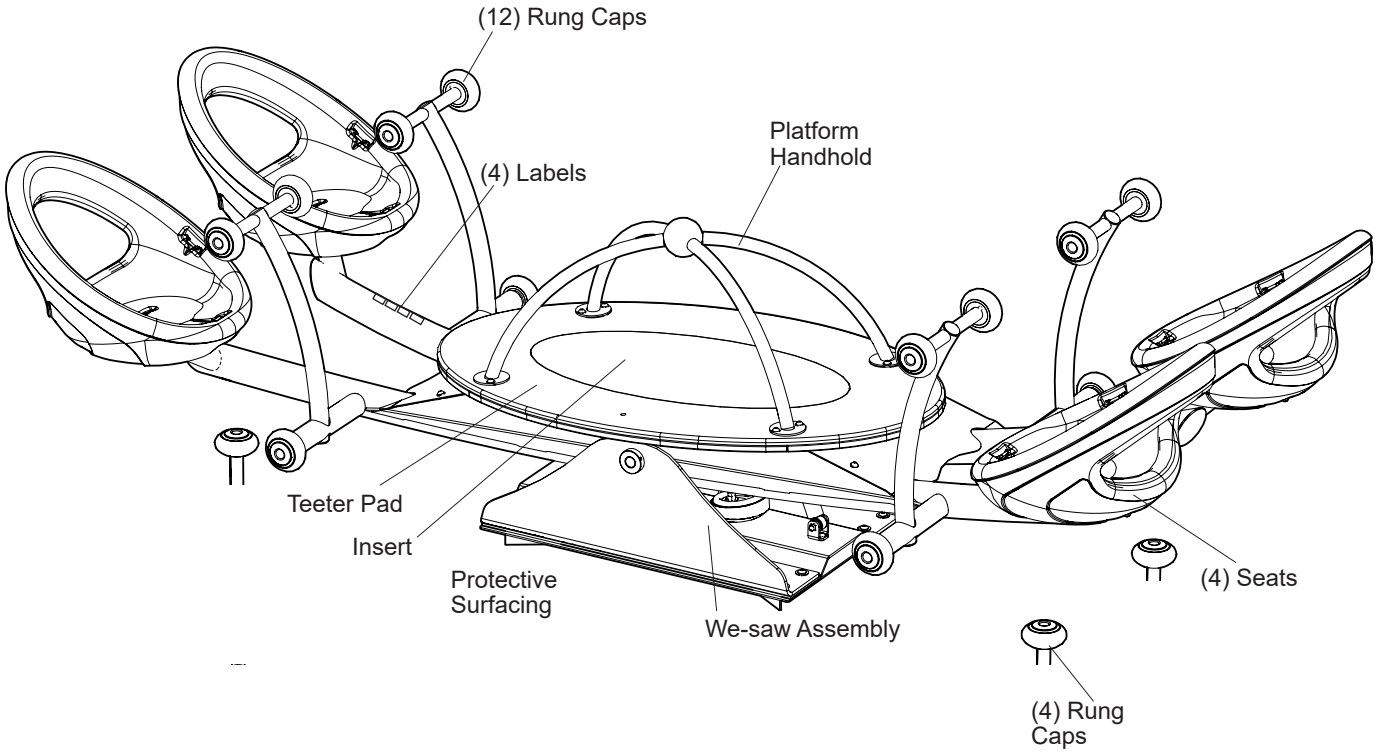
SAFETY NOTE
Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. ASTM F1487.)

PLAN VIEW





Kids in Motion

186490 We-saw™

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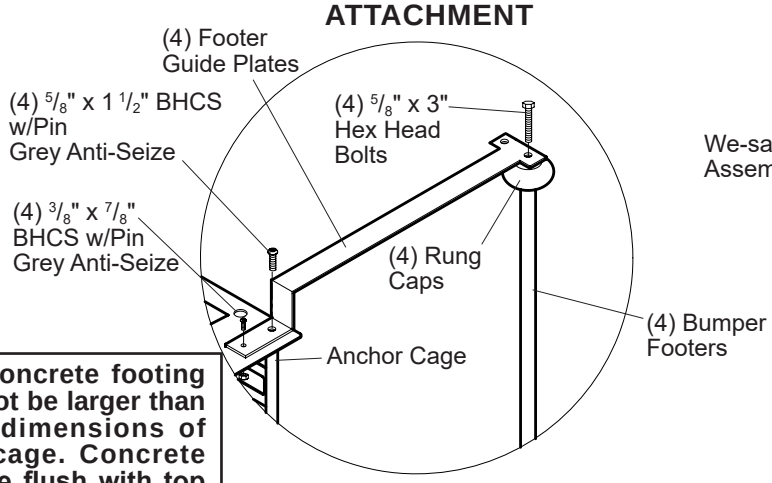
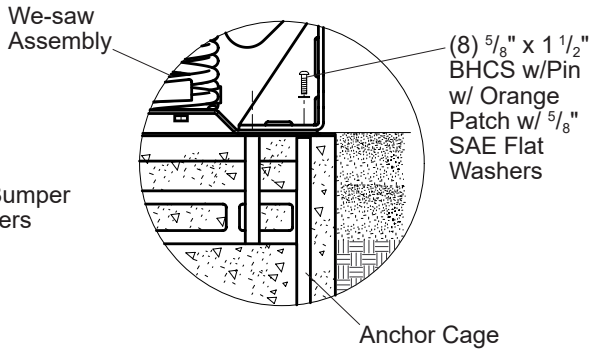
DETAIL
BUMPER FOOTER ATTACHMENT

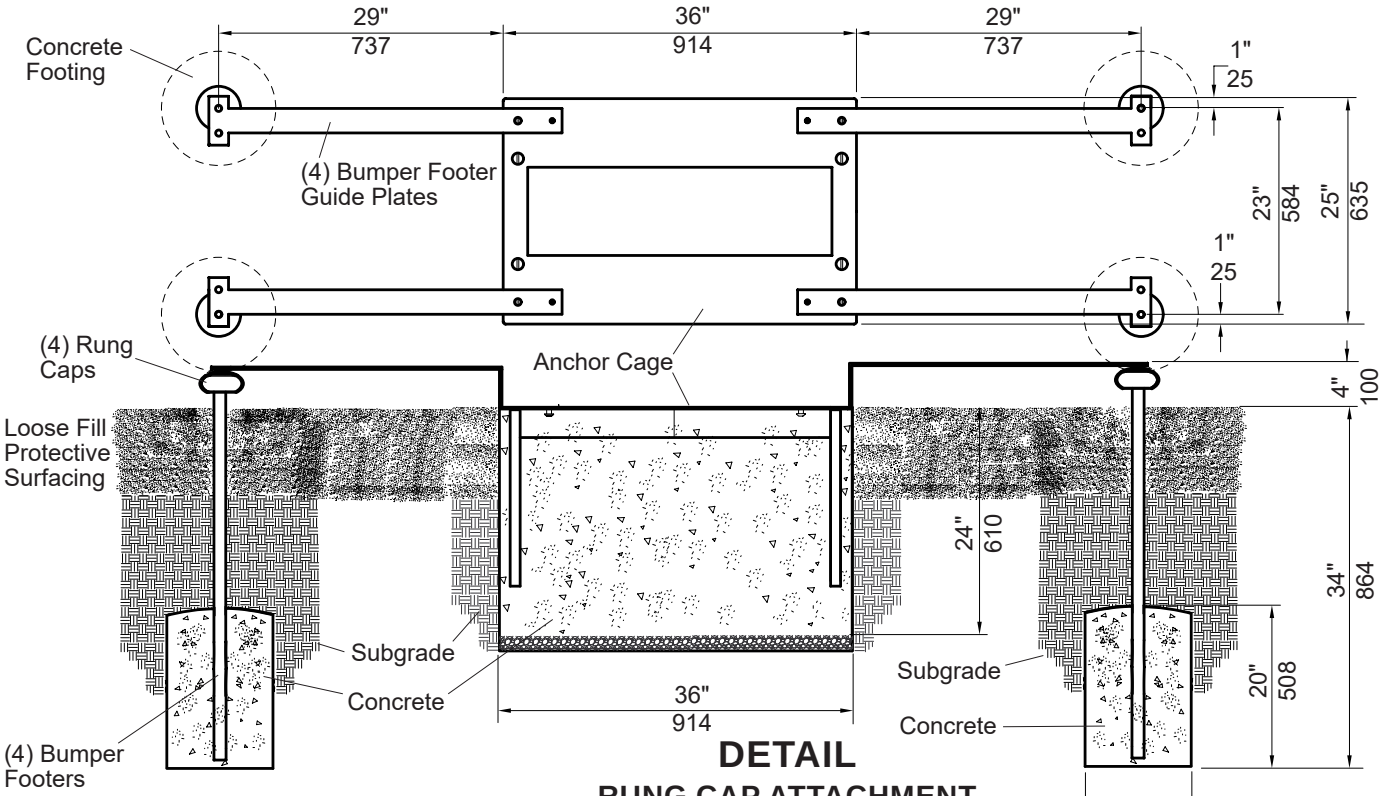


NOTE: Concrete footing should not be larger than outside dimensions of anchor cage. Concrete should be flush with top of anchor cage.

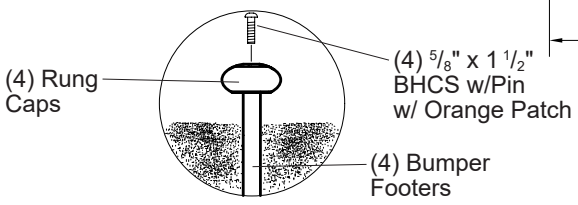
DETAIL
WE-SAW ASSEMBLY ATTACHMENT



DETAIL
CONCRETE FOOTINGS
(WITH FOOTER GUIDE PLATES)



DETAIL
RUNG CAP ATTACHMENT



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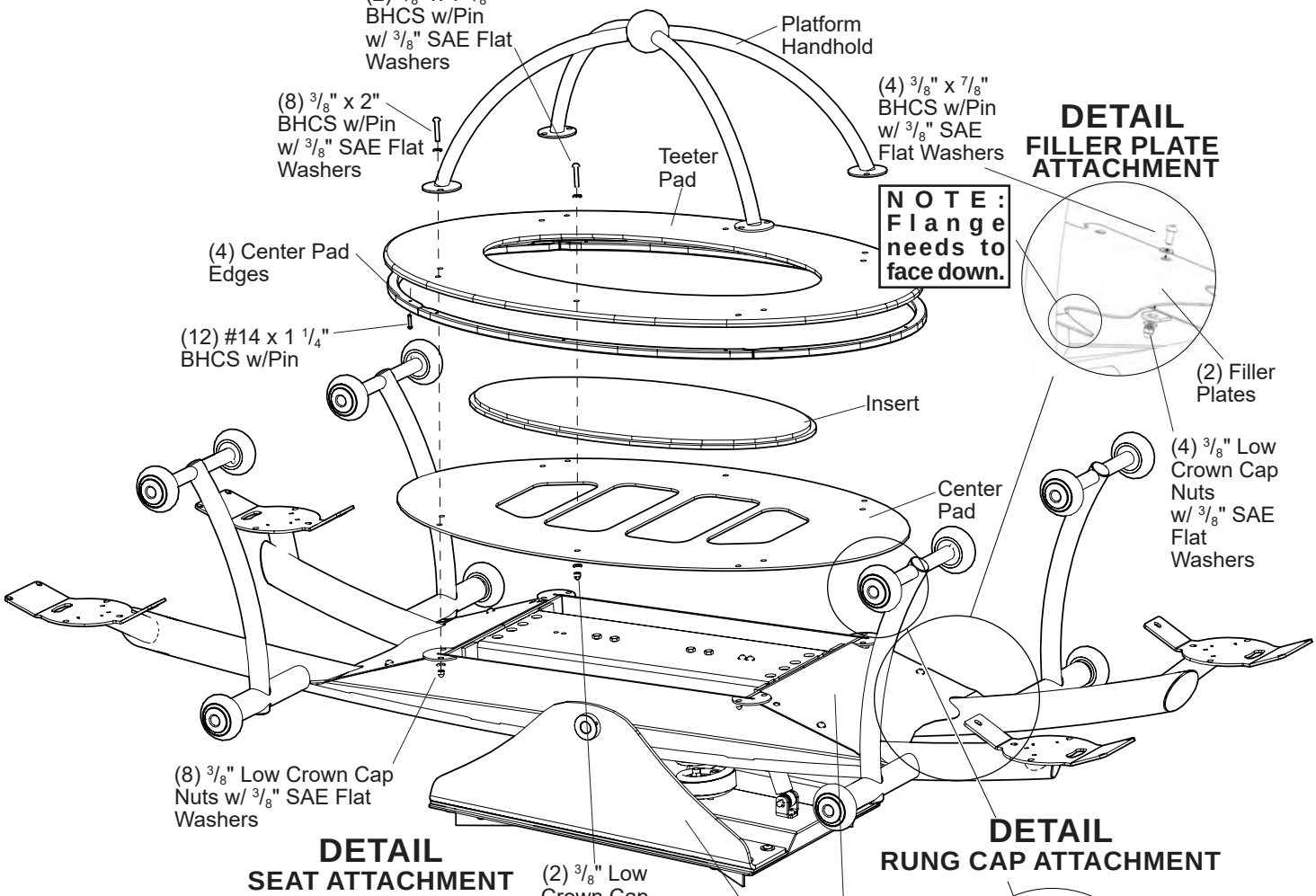
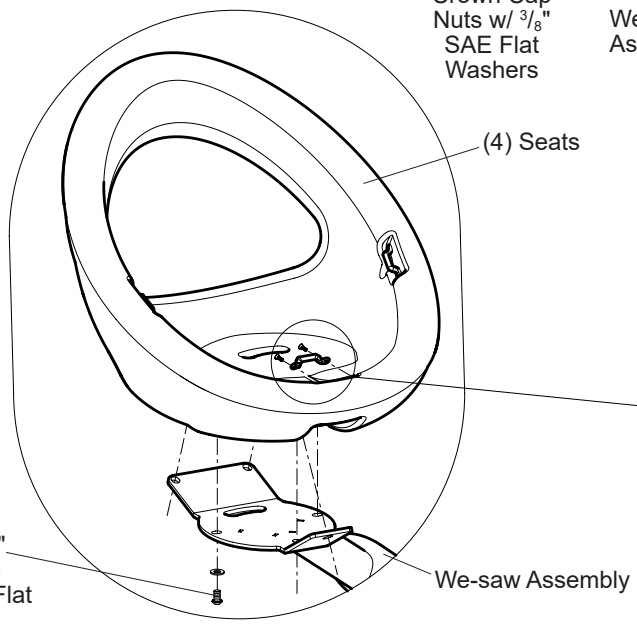
DETAIL
WE-SAW ASSEMBLY



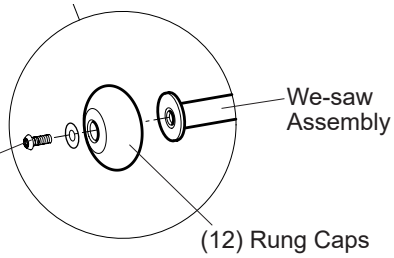
DETAIL
FILLER PLATE ATTACHMENT

NOTE: Flange needs to face down.

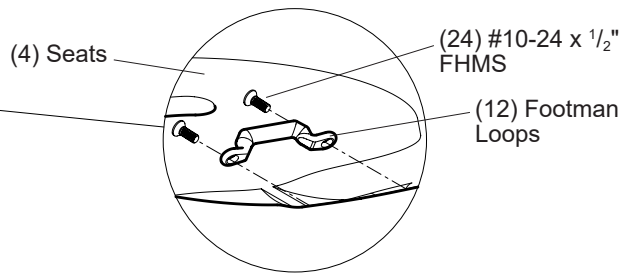
DETAIL
SEAT ATTACHMENT



DETAIL
RUNG CAP ATTACHMENT



DETAIL



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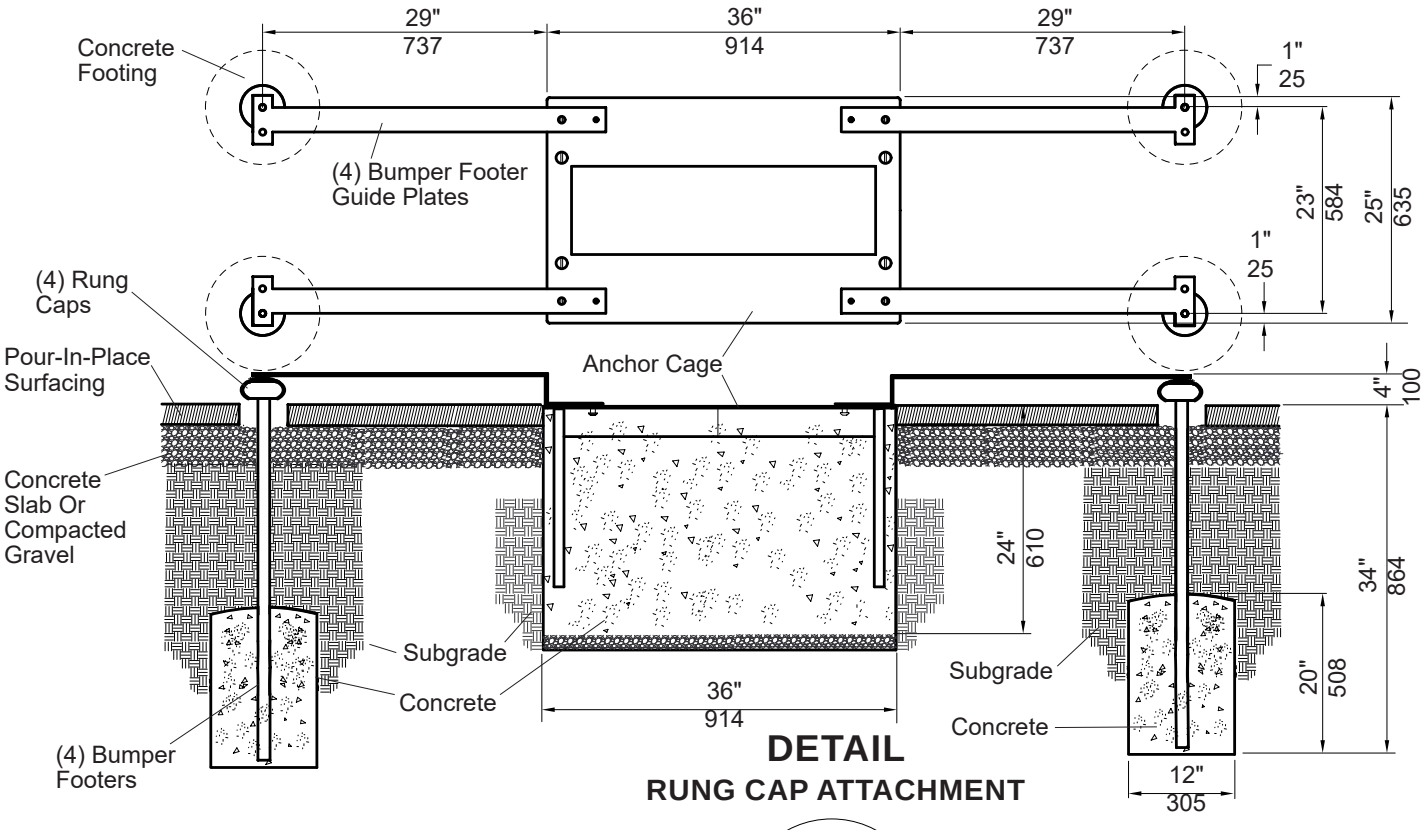
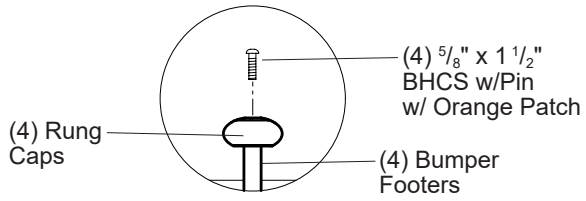
DETAIL

DIRECT BURY WITH POUR-IN-PLACE SURFACING

CONCRETE FOOTINGS
(WITH FOOTER GUIDE PLATES)



DETAIL
RUNG CAP ATTACHMENT



601 7TH STREET SOUTH, DELANO, MINNESOTA 55328-8605 888-574-4678 LSI Install Help 888-438-6574 LSI Direct 763-972-5200 Int. FAX (763) 972-3185

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Kids in Motion 186490 We-saw™

Document #38192700

Parts List

Part#	Description	Qty.
181123	Seat, Specify Color	4
182262	Rung Cap, Black	16
182458	Platform Handhold, Specify Color	1
182947	Center Pad, Black	1
211277	GripX Insert, Black	1
183327	Teeter Pad, Specify Color	1
183328	Pad Edge Long, Specify Color	2
183329	Pad Edge Short, Specify Color	2
183748	Filler Plate, Specify Color	2
186453	Anchor Cage, Black	1
187231	Bumper Footer, Specify Color	4
273373	We-saw Assembly, Specify Color	1
186951	Footer Guide Plate, Black	4
381580	**We-saw Hardware Package**	1
100173	3/8" x 2" BHCS w/Pin, SST	8
100196	3/8" x 7/8" BHCS w/Pin, SST	28
100201	5/8" x 1 1/2" BHCS w/Pin, SST-Patch	12
100365	3/8" SAE Flat Washer, SST	64
129500	5/8" SAE Flat Washer, SST	8
129672	#14 x 1 1/4" TORX BHCS, SST	12
207709	Footman Loop, SST	12
162462	#10-24 x 1/2" FHMS	24
115176	ASTM Hard Surface Warning Label	1
156846	Play Safe Label, 2-12 Years	1
182212	Entanglement Warning Label	1
182213	Hot Surface Warning Label	1
100349	3/8" Low Crown Cap Nut, SST	14
127463	Bit Hex TPP T-27 Torx	1
113027	3/8" x 1 3/8" BHCS w/Pin, SST	2
100195	3/8" x 5/8" BHCS w/Pin, SST	12
188123	**Bumper Guide Plate Hardware Package**	1
127546	3/8" x 7/8" BHCS w/Pin, SST	4
127551	5/8" x 1 1/2" BHCS w/Pin, SST	4
188124	5/8" x 3" Hex Cap Screw, ZP	4

Specifications

We-saw Assembly: **(Arm Assembly)** Weldment comprised of 3.500" (88,9 mm) O.D. x 8 GA. (.162") (4,11 mm) wall galvanized steel tubing, 2.375" (60,33) O.D. RS40 (.130"-.140") (3,30 mm-3,56 mm) wall galvanized steel tubing, 1.900" (48,26 mm) O.D. RS40 (.120"-.130") (3,05 mm-3,30 mm) wall galvanized steel tubing, .375" (9,52 mm) thick HRPO steel plate and .250" (6,35 mm) stainless steel plate. Finish: Proshield®, specify color. **(Rocker Assembly)** Weldment comprised .250" (6,35 mm) HRPO steel plate and 2" (50 mm) x 5/16" (7,93 mm) wall steel tubing. Finish: ProShield, Black in color. **(Base)** Weldment comprised .375" (9,53 mm) HRPO steel plate and 2.500" (63,50 mm) O.D. x 1.150" (29,21 mm) I.D. stainless steel tubing. Finish: Pro-Shield, Black in color. **(Base Plate)** Fabricated from .250" (6,35 mm) HRPO steel plate. Finish: ProShield, Black in color. **(Spring)** 5 5/8" (142,87 mm) diameter 13/16" (20,62 mm) tempered alloy steel coil. Finish: ProShield, Black in color. **(Spring Wedge)** Cast from ductile iron alloy. Finish: ProShield, Black in color. **(Bearings)** 1.145" (29,08 mm) I.D. igus **(Shaft)** 1.14" (28,96 mm) O.D. stainless steel. **(Cylinder)** Chrome plated steel.

Filler Plate: Fabricated from 5052 Sheet Aluminum. Finish: ProShield, color specified.

GripX Insert: 3/4" (19,05 mm) Thick Permalene®, black in color.

Teeter Pad & Edges: Permalene®, color specified.

Platform Handhold: Weldment comprised of 1.315" (33,4 mm) O.D. RS20 (.080"-.090") (2,03 mm - 2,28 mm) wall galvanized steel tubing, 10 GA (.135") (3, 42 mm) HRPO steel sheet and 7 GA. (.179") (4,54 mm) HRPO steel sheet. Finish: Proshield®, color specified.

Anchor Cage: Weldment comprised of 1.029" (26,13 mm) O.D. RS20 (.070"-.080") (1,77 mm - 2,03 mm) wall galvanized steel tubing with 203 or 303 stainless steel welded inserts with 5/8" internal threads and 7 GA. (.179") (4,54 mm) HRPO steel sheet. Finish: Proshield®, black in color.

Rung Cap: Molded from U.V. stabilized black EPDM rubber encapsulating .250" (6,35 mm) thick aluminum sheet and .125" (3,18 mm) thick aluminum plate.

Center Pad: Fabricated from .250" (6,35 mm) thick HRPO steel sheet plate. Finish: Proshield®, black in color.

Bumper Footer: Weldment comprised of 1.315" (33,40 mm) O.D. RS20 (.080"-.090") (2,03 mm - 2,29 mm) wall galvanized steel tubing with 203 or 303 stainless steel welded inserts with 5/8" internal threads and .250" (6,35 mm) thick stainless steel plate. Finish: Proshield®, color specified.

Seat: Rotationally molded from U.V. stabilized linear low density polyethylene, color specified.

Fasteners: Primary fasteners shall be socketed and pinned tamperproof in design, stainless steel (SST) per ASTM F 879 unless otherwise indicated (see specific product installation/specifications).

Installation Time: Approx. 16 man hours
Fall Height: 54" (1,37 m)
Min. Use Zone: 6' (1,83 m)
Area Required: 16' 8" x 23' 5" (5,08 m x 7,14 m)
Concrete Req.: Approx. 17.82 cu. ft.
Weight: 783 lbs.

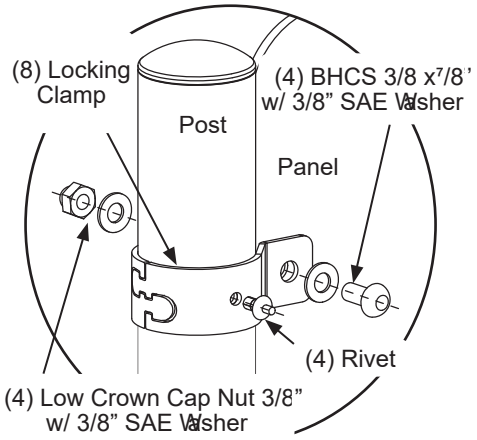
Installation Instructions

1) **(Direct Bury)** Dig footing holes for anchor cage and bumper footers. Build a form for anchor cage concrete footing. Concrete footing for anchor cage should not be larger than outside dimensions of anchor cage. Refer to Concrete Footing Details.
2) Attach rung caps and bumper footers to bumper footer guide plates using $^{5}/_{8}$" x 3" hex head bolts. Refer to the Bumper Footer Attachment Detail.
3) Attach bumper footer guide plates to anchor cage using $^{5}/_{8}$" x 1 $^{1}/_{2}$" BHCS w/pin and $^{3}/_{8}$" x $^{7}/_{8}$" BHCS w/pin. Refer to the Bumper Footer Attachment Detail.
4) Place anchor cage and bumper footers in footing holes, as shown. Top of anchor cage should be flush with finished grade. With anchor cage level and bumper footers plumb, pour concrete. Concrete should be flush with top of anchor cage. Allow concrete footing to cure for a minimum of 72 hours before continuing. Refer to the Concrete Footing Details.
5) Remove footer guide plates from anchor cage and bumper footers. Discard bumper guard plates and hardware. Attach rung caps to bumper footers using $^{5}/_{8}$" x 1 $^{1}/_{2}$" BHCS w/pin. Refer to the Rung Cap Attachment Detail.
6) Set We-saw assembly onto anchor cage. Line up holes in We-saw assembly bottom plate with threaded inserts in anchor cage. Attach We-saw assembly to anchor cage using $^{5}/_{8}$" x 1 $^{1}/_{2}$" BHCS w/pin with $^{5}/_{8}$" SAE flat washers. Refer to the We-saw Assembly Attachment Detail.
7) Attach filler plates to We-saw assembly using #3/8 x 7/8" BHCS w/pin with $^{3}/_{8}$" SAE flat washers and $^{3}/_{8}$" low crown cap nuts with $^{3}/_{8}$" SAE flat washers. Refer to the Filler Plate Attachment Detail. Make sure flanges on filler plates are pointing downwards.
8) Attach center pad edges to teeter pad, using #14 x 1 $^{1}/_{4}$" BHCS w/pin. Refer to the We-saw Assembly Detail.
9) Attach platform handhold, teeter pad, insert and center pad to We-saw assembly attachment plates, using $^{3}/_{8}$" x 2" BHCS w/pin with $^{3}/_{8}$" SAE flat washers and $^{3}/_{8}$" low crown cap nuts with $^{3}/_{8}$" SAE flat washers. Refer to the We-saw Assembly Detail.
10) Attach teeter pad to center pad using $^{3}/_{8}$" x 1 $^{3}/_{8}$" BHCS w/pin with $^{3}/_{8}$" SAE flat washers and $^{3}/_{8}$" low crown cap nuts with $^{3}/_{8}$" SAE flat washers. Refer to the We-saw Assembly Detail.
11) Attach rung caps to We-saw assembly using $^{5}/_{8}$" x 1 $^{1}/_{2}$" BHCS w/pin. Refer to the Rung Cap Attachment Detail.
12) Attach seats to We-saw assembly using $^{3}/_{8}$" x $^{7}/_{8}$" BHCS w/pin with $^{3}/_{8}$" SAE flat washers. Refer to the Seat Attachment Detail.
13) Attach footman loops,using #10-24 x $^{1}/_{2}$" flat head screws, as shown. Footman loops are used for seat belts (not included).
14) Apply Play Safe and warning labels, as shown.
15) Install protective surfacing before users are allowed to play on the structure.

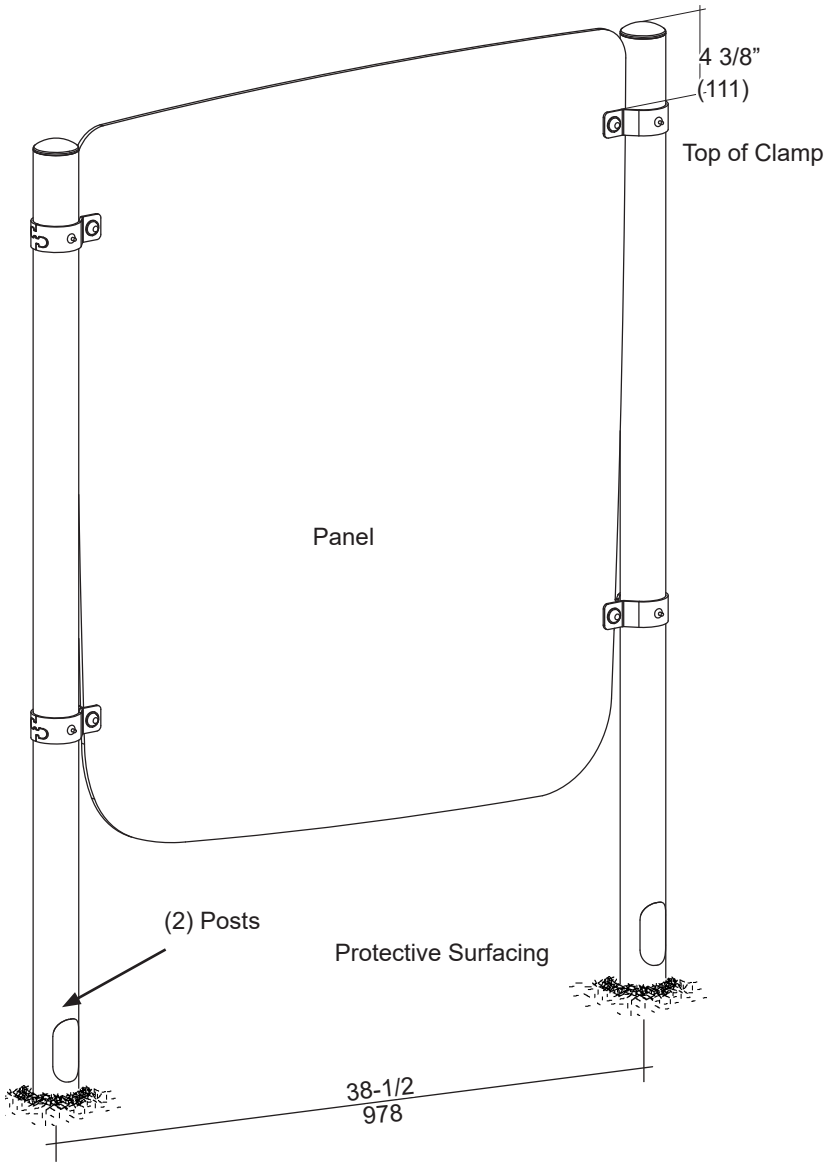
ECO# 0113010 Document 38192700 replaces 32121700. Updated hardware package number and updated LSI logo.

SAFETY NOTE
Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. ASTM F1487.)

DETAIL PUZZLE CLAMP



NOTE: DB POST WILL HAVE THE RIVET HOLES TO INDICATE CLAMP LOCATION. SM VERSION WILL REQUIRE FIELD DRILLING RIVET HOLES



NOTE: Due to the possibility of scratching, it is important to leave packaging on panel until immediately prior to installation.

Signs

355992 Symbol Communication Sign

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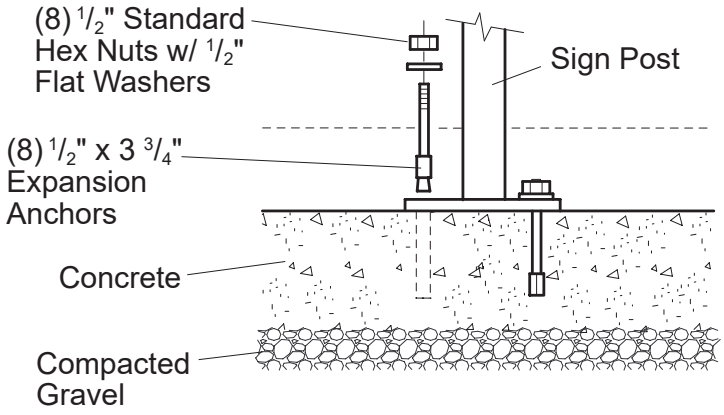
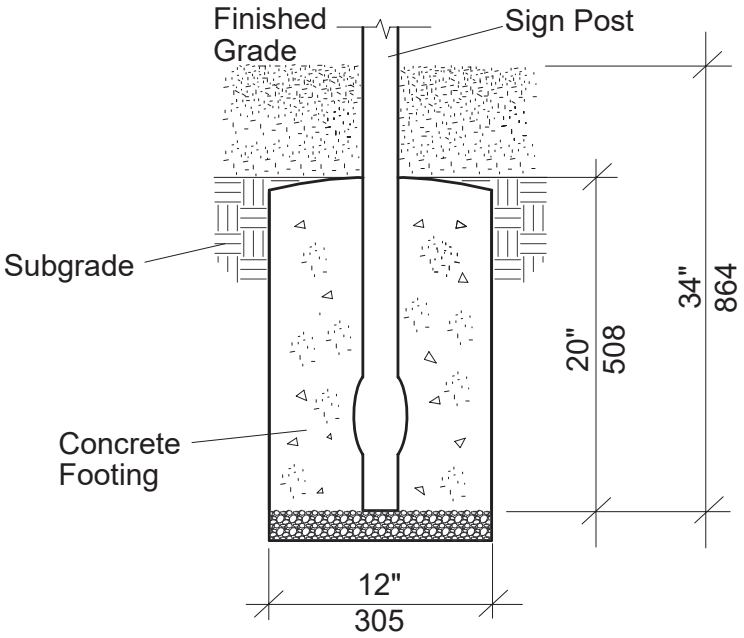
Document #35599600

SAFETY NOTE
Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. ASTM F1487.)

DETAIL
SURFACE MOUNT



DETAIL
DIRECT BURY FOOTING



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Parts List

Number	Product Name	QTY.
354477	LOCKING CLAMP 2-3/8i TUBE PNT	8
353934	COMMUNICATION BOARD POST	2
354038	COMMUNICATION BOARD ENGLISH/SPANISH	1
355982	COMMUNICATION BOARD POST SM WLD	2
358230	COMMUNICATION BOARD ENGLISH/ENGLISH	1
356039	Hdw Pkg Communication Sign	1
100196	BHCS 6LP 3/8x7/8i SST	4
100349	NUT L/C CAP 3/8-16 SST	4
100365	WASHER FLAT SAE 3/8i SST	8
127155	RIVET 1/4X5/16i DRV AS	4
183388	HDW PKG 4-HOLE SM 1/2 x 3-3/4	1
100322	NUT HEX STD 1/2-13 SST	4
100363	WASHER FLAT 1/2i SST	4
176046	EXP ANCHOR 1/2x3-3/4i ZP	4

Specifications

Installation Time:	(DB) Approx. 1 man hour
	(SM) Approx. 1/2 man hour
Concrete Req.:	Approx. 3 cu. ft.
Weight:	(DB) - 77 lbs.
	(SM) - 67 lbs.

Installation Instructions

Direct Bury

1) Dig footings holes to depth and spacing as shown.
2) Attach sign panel to posts as shown, using 3/8” x 7/8” BHCS w/ pin with 3/8” SAE flat washers and 3/8” low crown cap nuts with 3/8” SAE flat washers. Install 1/4” x 3/8” drive rivets in locking clamps. Insert drive rivet in hole through clamp and into pre drilled post. Hammer drive rivet pin in until flush with head.
3) Set sign assembly in footing holes and temporarily brace in plumb position.
4) Pour concrete footings. After concrete has set, remove bracing and install protective surfacing before users are allowed to play on the structure.

Surface Mount

1) Attach sign panel to posts as shown, using 3/8” x 7/8” BHCS w/ pin with 3/8” SAE flat washers and 3/8” low crown cap nuts with 3/8” SAE flat washers. Install 1/4” x 3/8” drive rivets in locking clamps. Drill through locking clamp and into the post with a 1/4” or “F” (only) drill bit, insert drive rivet in hole through clamp and into post. Hammer drive rivet pin in until flush with head.
2) With sign in proper position, use a 1/2” masonry bit and hammer drill, drill 3” deep holes into concrete slab through holes in anchor plates. Tap 1/2” x 3 3/4” expansion anchors into holes and secure using 1/2” standard hex nuts with 1/2” flat washers.

6/03/2025 - Removed install instructions from parts list and updated LSI logo

9/17/2025 - Added post to post dimension.

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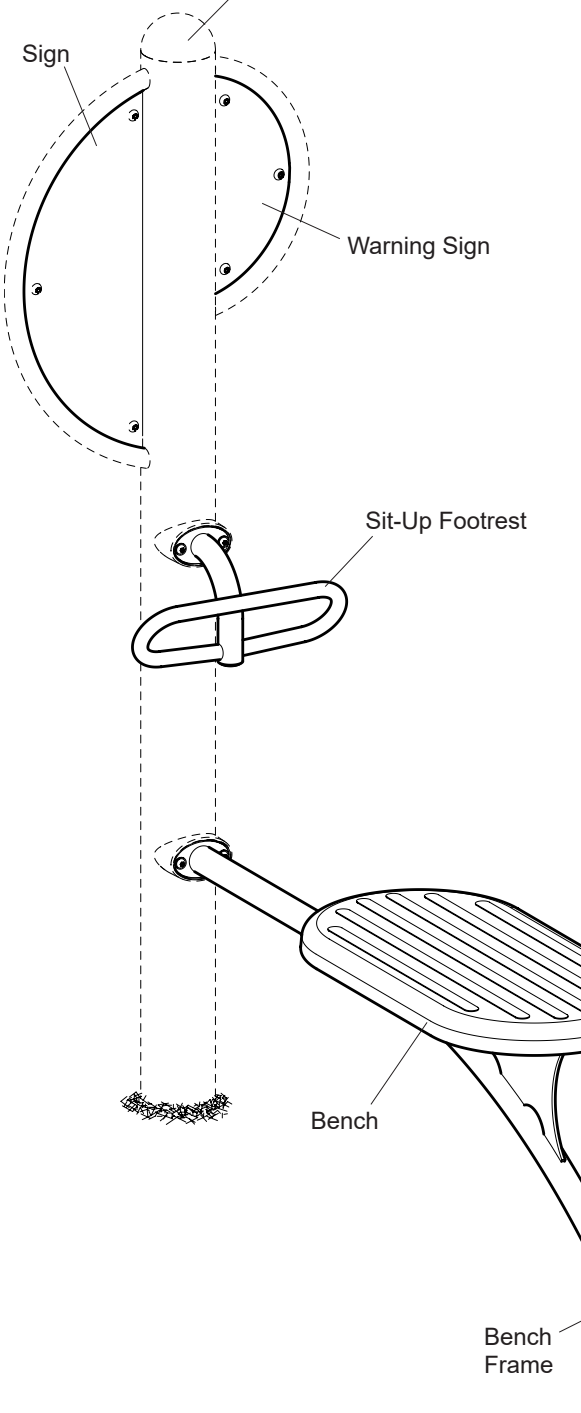
SAFETY NOTE

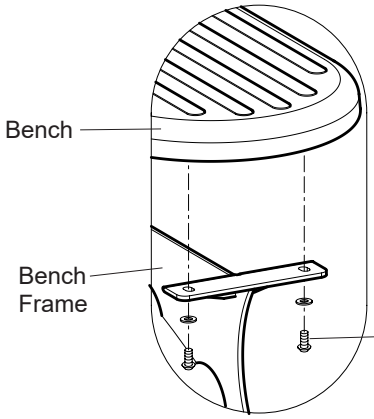
Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. ASTM F3101.)

19349200

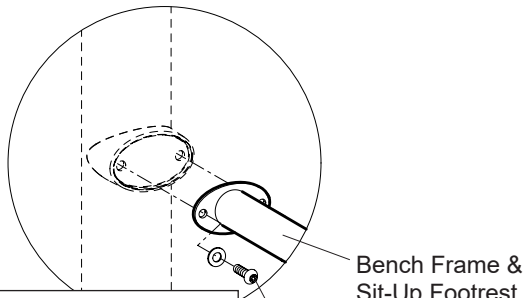
Refer To The HealthBeat Post Installation Document



DETAIL
BENCH ATTACHMENT



DETAIL
BENCH FRAME/FOOT REST ATTACHMENT



NOTE: Make sure Sit-Up Footrest is level before tightening fasteners.

HealthBeat® 192451 Ab Crunch/Leg Lift

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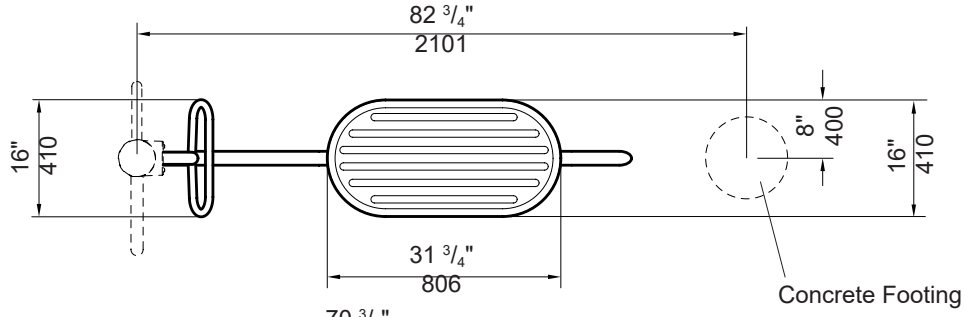
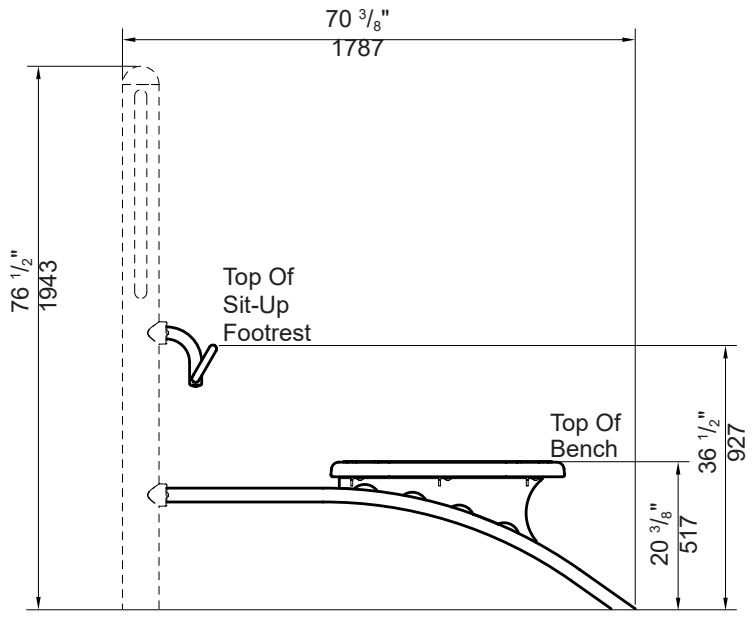
SAFETY NOTE

Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. ASTM F3101.)

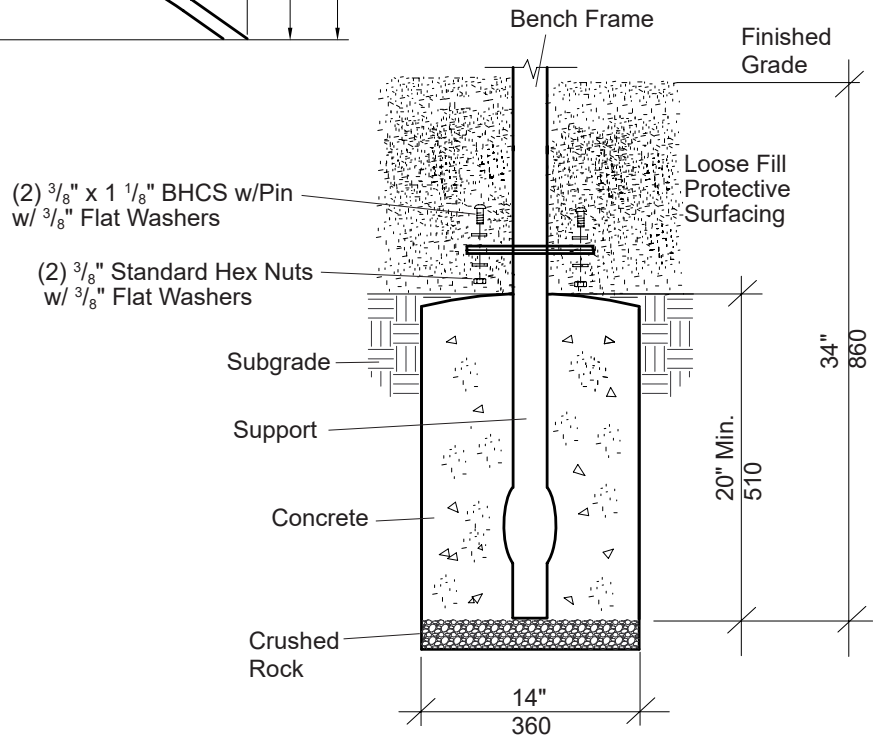
193492a

PLAN VIEW/FOOTING LAYOUT





DETAIL
DIRECT BURY



192451 Ab Crunch/Leg Lift

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Document #30763200

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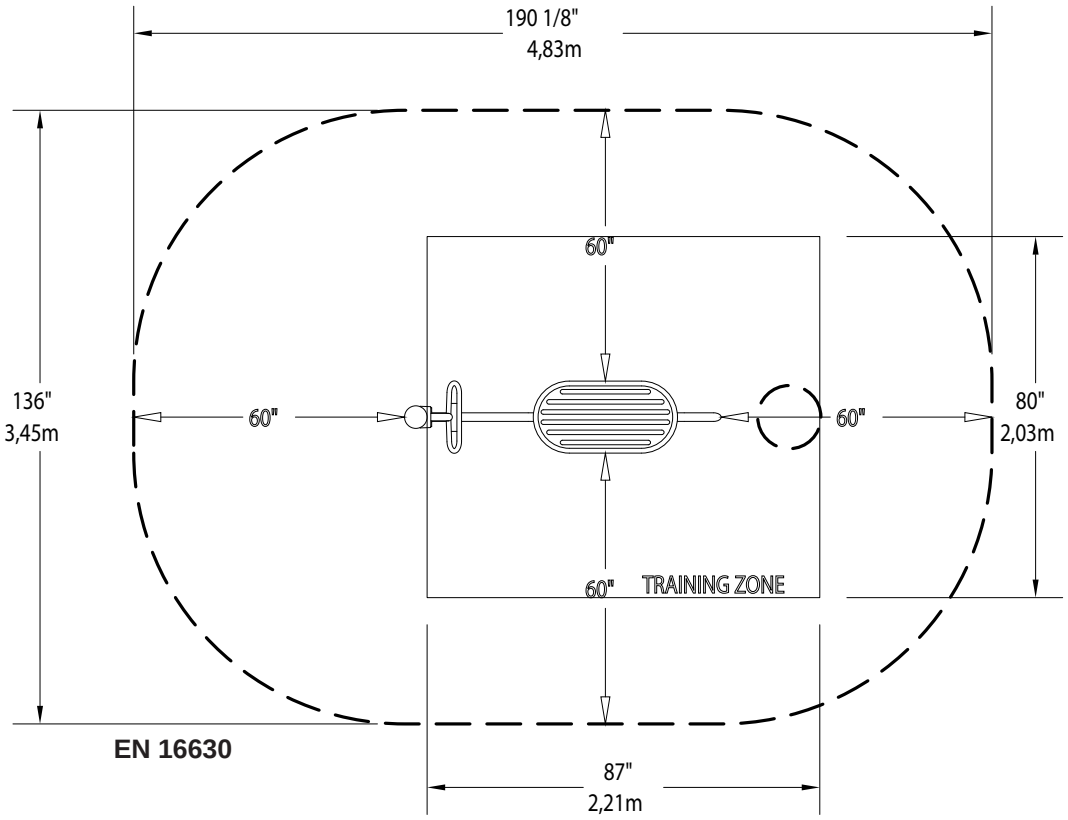
SAFETY NOTE

Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. ASTM F3101.)

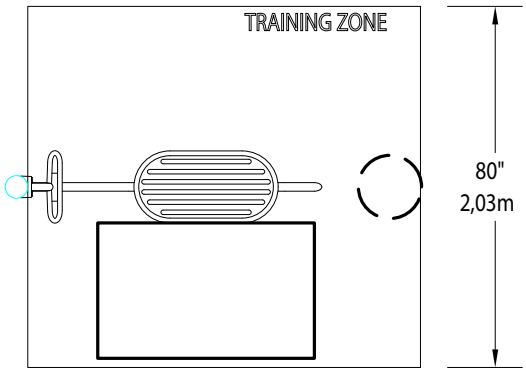
TRAINING/CLEARANCE SPACE



EN 16630

EN 16630

The clearance space shall reflect the recognized standard for the area. Typically, ASTM for U.S.A. and EN for European installation. The clearance space shall have a protective surface that has a critical height value for the fall height of the equipment.



ASTM F3101

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192451 Ab Crunch/Leg Lift

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HealthBeat® 192451 Ab Crunch/Leg Lift

Parts List

Part #	Description	Qty.
206494	Ab Bench Frame (DB), Specify Color	1
206616	Ab Bench Support, (DB), Specify Color	1
191045	Ab Bench Frame (SM), Specify Color	1
191044	Footrest, Specify Color	1
160716	Bench, Black	1
220079	HealthBeat® Sign Ab Crunch/Leg Lift	1
220208	HealthBeat Sign Warning	*
220105	HealthBeat Sign Warning (EN)	*
161668	**Ab-Crunch/Leg Lift Hardware Package**	1
100196	3/8" x 7/8" BHCS w/Pin, SST	6
100198	3/8" x 1 1/8" BHCS w/Pin, SST	4
100362	3/8" Flat Washers, SST	6
100365	3/8" SAE Flat Washer, SST	4
207263	**Support (DB) Hardware Package**	1
100198	3/8" x 1 1/8" BHCS w/Pin, SST	2
100362	3/8" Flat Washers, SST	4
100327	3/8" Standard Hex Nuts, SST	2
207261	**Power-Ser Anchor 2-Hole (SM) Hardware Pkg .**	1
206892	Anchor Wej-It 3/8-16 , SST	2
100362	3/8" Flat Washer, SST	2
208324	3/8" x 1 1/4" BHCS w/Pin Limited Thread, SST	2
100209	3/8" x 1 3/4" Hex Head Bolt, SST	1

SM = Surface Mount
DB = Direct Bury
*** = Quantity Determined By Your Order**

Specifications

Bench Frame: Weldment comprised of 1.900" (48,26 mm) O.D. RS40 (.120"-.130")(3,04 mm-3,30 mm) wall galvanized steel tube, 1/4" (6,35 mm) HRPO sheet steel and 3/16" (4,75 mm) HRPO sheet steel. Finish: ProShield®, color specified.

Sign Panel: Panel is fabricated from 11 GA. (.120") (3,05 mm) aluminum. Finish: ProShield®, gray in color. **(Sign)** Digital image is transferred to a .120" (3,05 mm) thick ProShield coated aluminum plate, then infused into the ProShield.

Bench Support: Weldment comprised of 1.900" (48,26 mm) O.D. RS40 (.120"-.130")(3,04 mm-3,30 mm) wall galvanized steel tube, and 1/4" (6,35 mm) HRPO sheet steel. Finish: ProShield®, color specified.

Sit-Up/Footrest: Weldment comprised of 1.660" (42,16 mm) O.D. RS40 (.108"-.132")(92,15 mm-2,41 mm) wall galvanized steel tube, 1.029" (26,13 mm) O.D. RS20 (.070"-.080")(1,77 mm-2,03 mm) wall, and 3/16" (4,75 mm) HRPO sheet steel. Finish: ProShield, color specified.

Bench: Rotationally molded from U.V. stabilized linear low density polyethylene, black in color.

Fasteners: Primary fasteners shall be socketed and pinned tamperproof in design, stainless steel (SST) per ASTM F 879 unless otherwise indicated (see specific product installation/specifications).

Installation Time: **(DB)** 1 man hour
(SM) 3/4 man hour
Area Required: See Training/Clearance Space
Weight: **(DB)** 53 lbs.
(SM) 45 lbs.
Concrete: **(DB)** Approx. 1.78 cu.ft.
Fall Height: 21" (530 mm) Bench

Installation Instructions

1) **(Direct Bury)** Dig footing spaced as shown. Refer to the Plan View/ Footing Layout & Direct Bury Detail.

2) **(Direct Bury)** Attach bench support to bench frame. Refer to the Direct Bury Detail.

3) Attach bench frame and sit-up footrest to Ab Crunch post. Refer to the Bench Frame/Foot Rest Attachment Detail. **NOTE:** *Make sure Sit-Up Footrest is level before tightening fasteners.*

4) Attach bench to bench frame. Refer to the Bench Attachment Detail.

5) **(Direct Bury)** With bench frame in plumb position. Pour concrete footing. Allow concrete footing to cure a minimum of 72 hours before users are allowed to play on the fitness equipment.

   (Surface Mount) Refer to the Instructions For Chemical Anchor Installation on the back of sheet 1.

6) Install protective surfacing before users are allowed to play on the component.

Specifications are subject to change without notice.

ECO #0102194 Document 30763200 replaces 26967600 Update to layout

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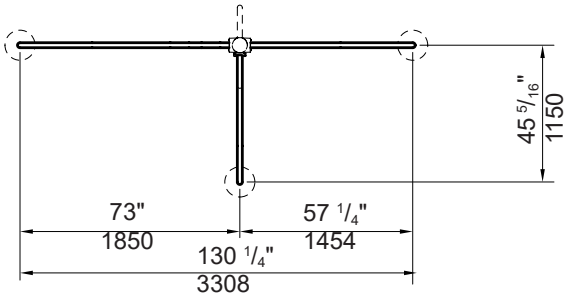
SAFETY NOTE

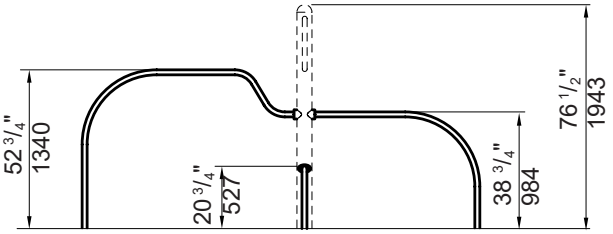
Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. ASTM F3101.)

19349300

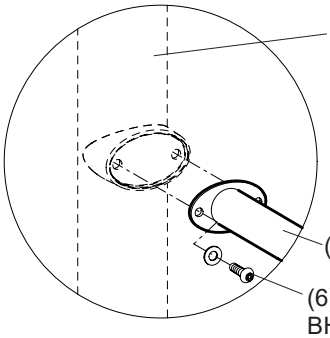
PLAN VIEW/FOOTING LAYOUT



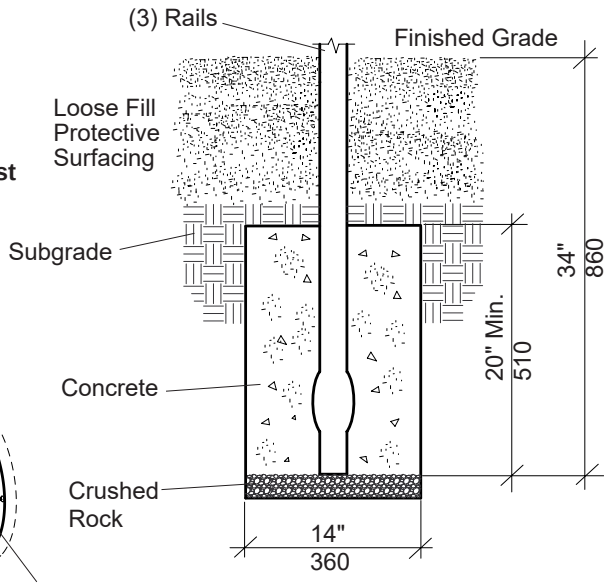
ELEVATION

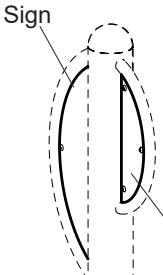


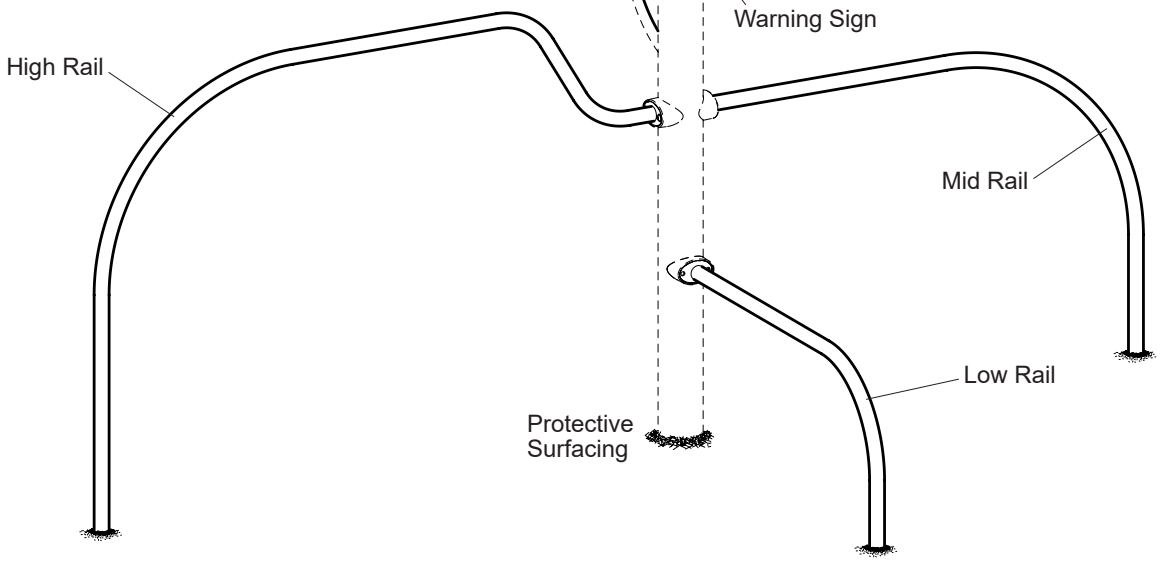
DETAIL
RAIL ATTACHMENT



DETAIL
DIRECT BURY







HealthBeat® 192452 Assisted Row/Push-Up

601 7TH STREET SOUTH, DELANO, MINNESOTA 55328-8605 888-574-4678 LSI Install Help 888-438-6574 LSI Direct 763-972-5200 Int. FAX (763) 972-3185

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HealthBeat® 192452 Assisted Row/Push-Up

Parts List

Part #	Description	Qty.
210048	Low Rail, (DB), Specify Color	1
190851	Low Rail, (SM), Specify Color	1
210050	Mid Rail, (DB), Specify Color	1
190850	Mid Rail, (SM), Specify Color	1
210051	High Rail, (DB), Specify Color	1
190849	High Rail, (SM), Specify Color	1
220080	HealthBeat® Sign Assisted Row/Push-Up	2
220208	HealthBeat Sign Warning	*
220105	HealthBeat Sign Warning (EN)	*
161672	**Assisted Row Hardware Package**	1
100198	3/8" x 1 1/8" BHCS w/Pin, SST	6
100365	3/8" SAE Flat Washers, SST	6
207273	**Power-Ser Anchor 12-Hole (SM) Hdw. Pkg.**	1
206892	Anchor Wej-It 3/8-16 , SST	12
100362	3/8" Flat Washer, SST	12
208324	3/8" x 1 1/4" BHCS w/Pin Limited Thread, SST	12
100209	3/8" x 1 3/4" Hex Head Bolt, SST	1

SM = Surface Mount
DB = Direct Bury
*** = Quantity Determined By Your Order**

Specifications

Rail: Weldment comprised of 1.660" (42,16 mm) O.D. RS20 (.085"-.095")(2,15 mm-2,41 mm) wall galvanized steel tube, and 3/16" (4,75 mm) HRPO sheet steel Finish: ProShield®, color specified.

Sign Panel: Panel is fabricated from 11 GA. (.120") (3,05 mm) aluminum. Finish: ProShield®, gray in color. **(Sign)** Digital image is transferred to a .120" (3,05 mm) thick ProShield coated aluminum plate, then infused into the ProShield.

Fasteners: Primary fasteners shall be socketed and pinned tamperproof in design, stainless steel (SST) per ASTM F 879 unless otherwise indicated (see specific product installation/specifications).

Installation Time: **(DB)** 2 man hours
(SM) 1 1/2 man hours
Area Required: See Training/Clearance Space
Concrete: **(DB)** Approx. 5.34 cu.ft.
Weight: **(DB)** 55 lbs.
(SM) 62 lbs.
Fall Height: 53" (1350 mm)

Installation Instructions

1) **(Direct Bury)** Dig footings spaced as shown. Refer to the Plan View/ Footing Layout.

2) Attach rails to HealthBeat post. Refer to the Rail Attachment Detail.

3) **(Direct Bury)** With rails in plumb position. Pour concrete footings. Allow concrete footings to cure a minimum of 72 hours before users are allowed to play on the fitness equipment.

   (Surface Mount) Refer to the Instructions For Chemical Anchor Installation on sheet 2.

4) Install protective surfacing before users are allowed to use the component.

Specifications are subject to change without notice.

ECO #0102194 Document 30763300 replaces 22026100 Update to layout

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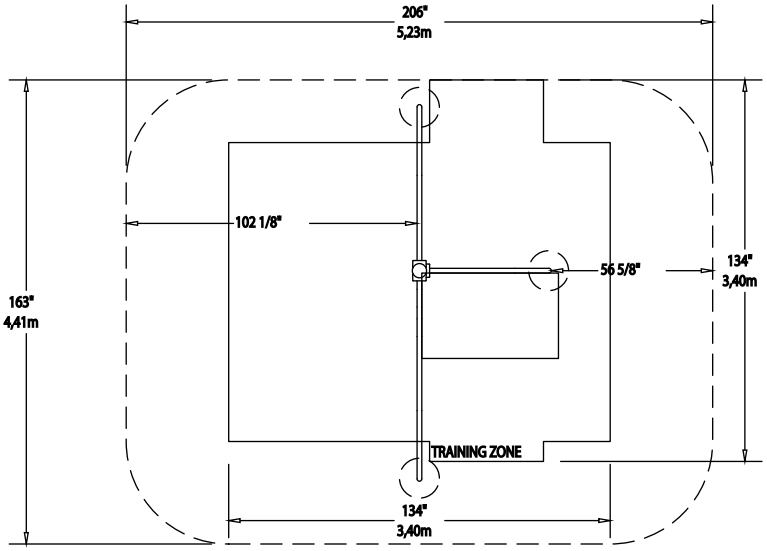
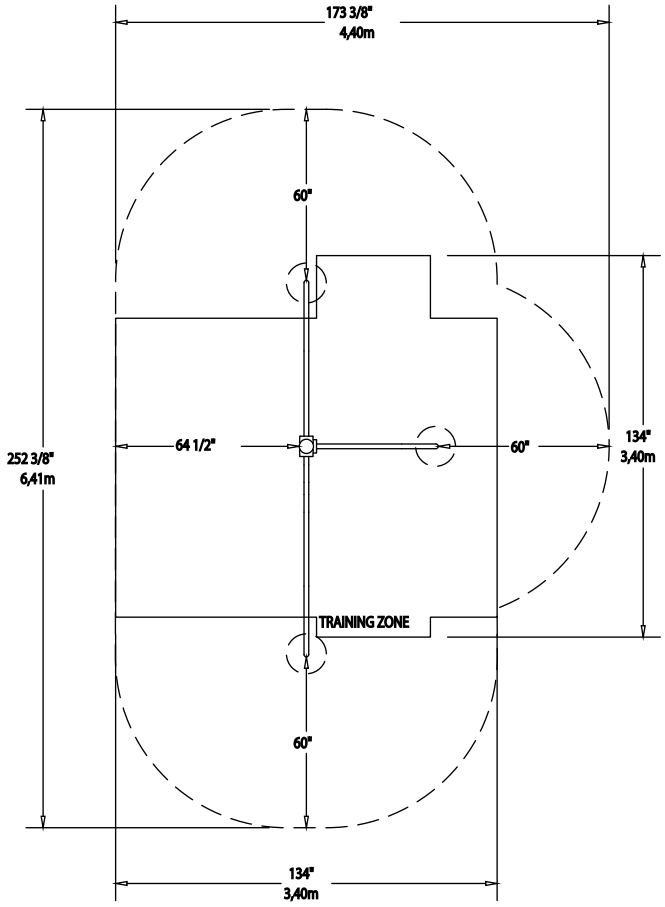
SAFETY NOTE

Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. ASTM F3101.)

TRAINING/CLEARANCE SPACE



ASTM F3101



EN 16630

The clearance space shall reflect the recognized standard for the area. Typically, ASTM for U.S.A. and EN for European installation. The clearance space shall have a protective surface that has a critical height value for the fall height of the equipment.

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192452 Assisted Row/Push-Up

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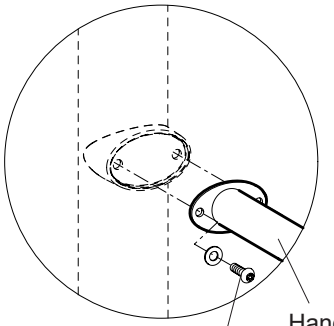
SAFETY NOTE

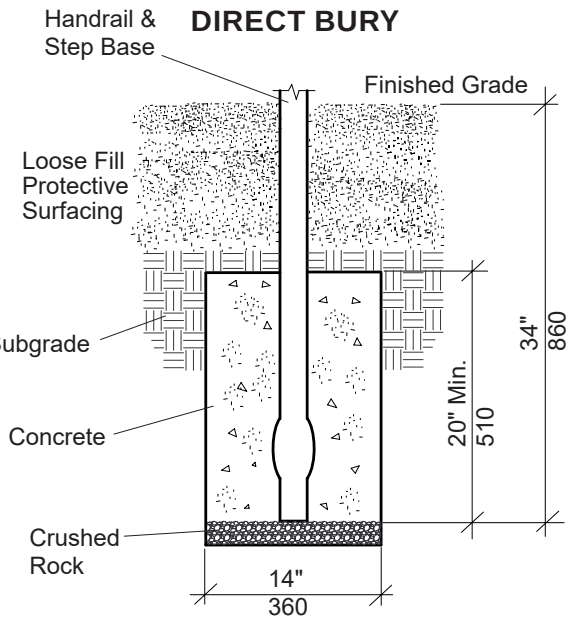
Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. ASTM F3101.)

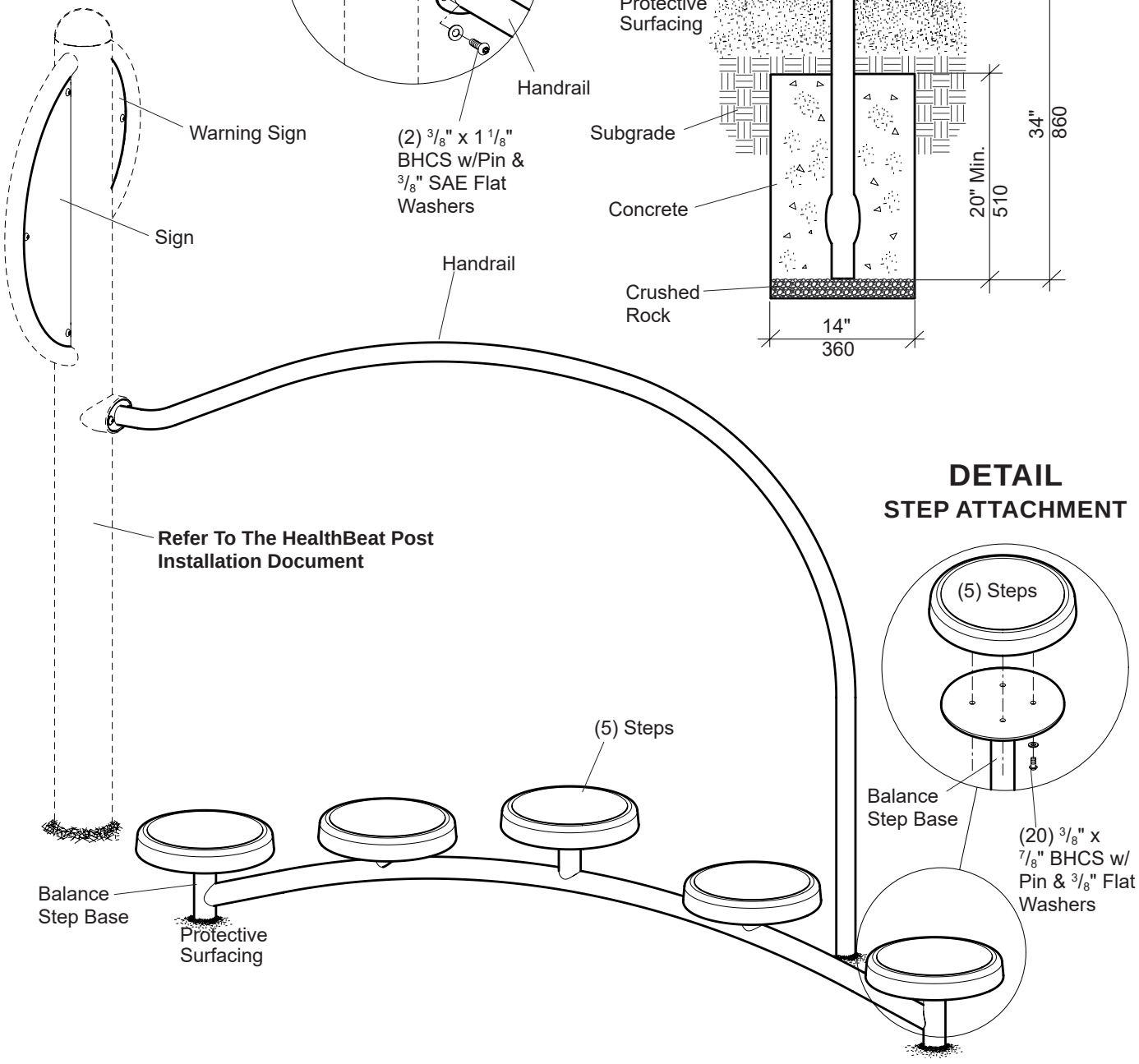
19349500

DETAIL
HANDRAIL ATTACHMENT



DETAIL
DIRECT BURY





DETAIL
STEP ATTACHMENT

192454 Balance Steps

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Document #30763600

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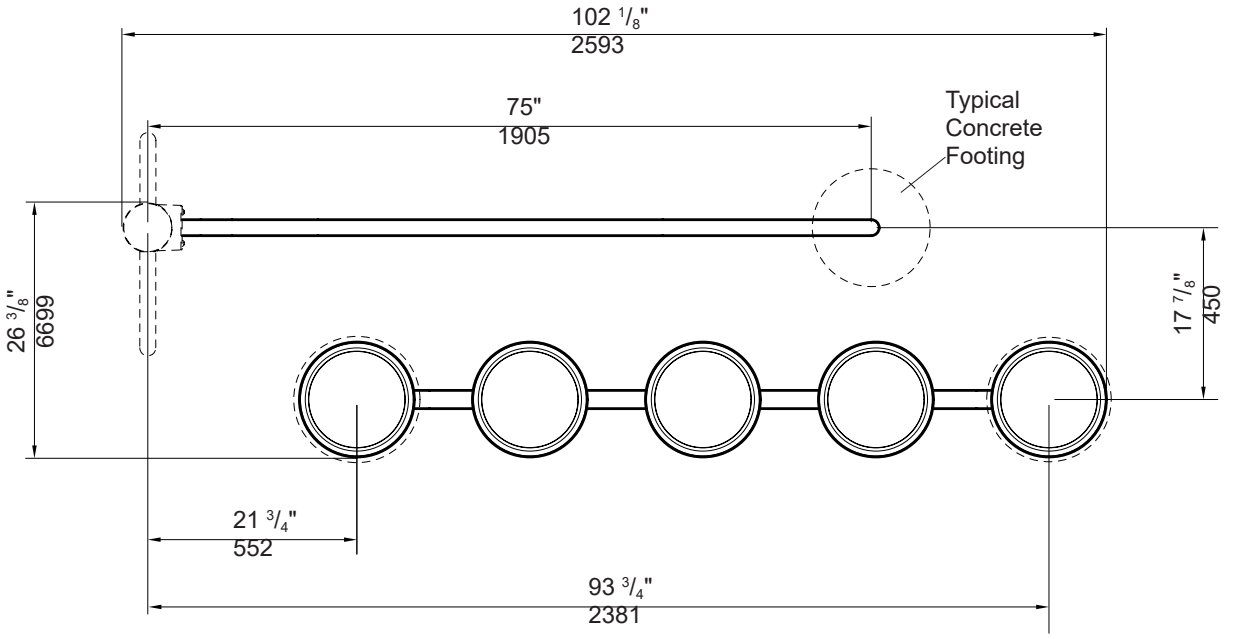
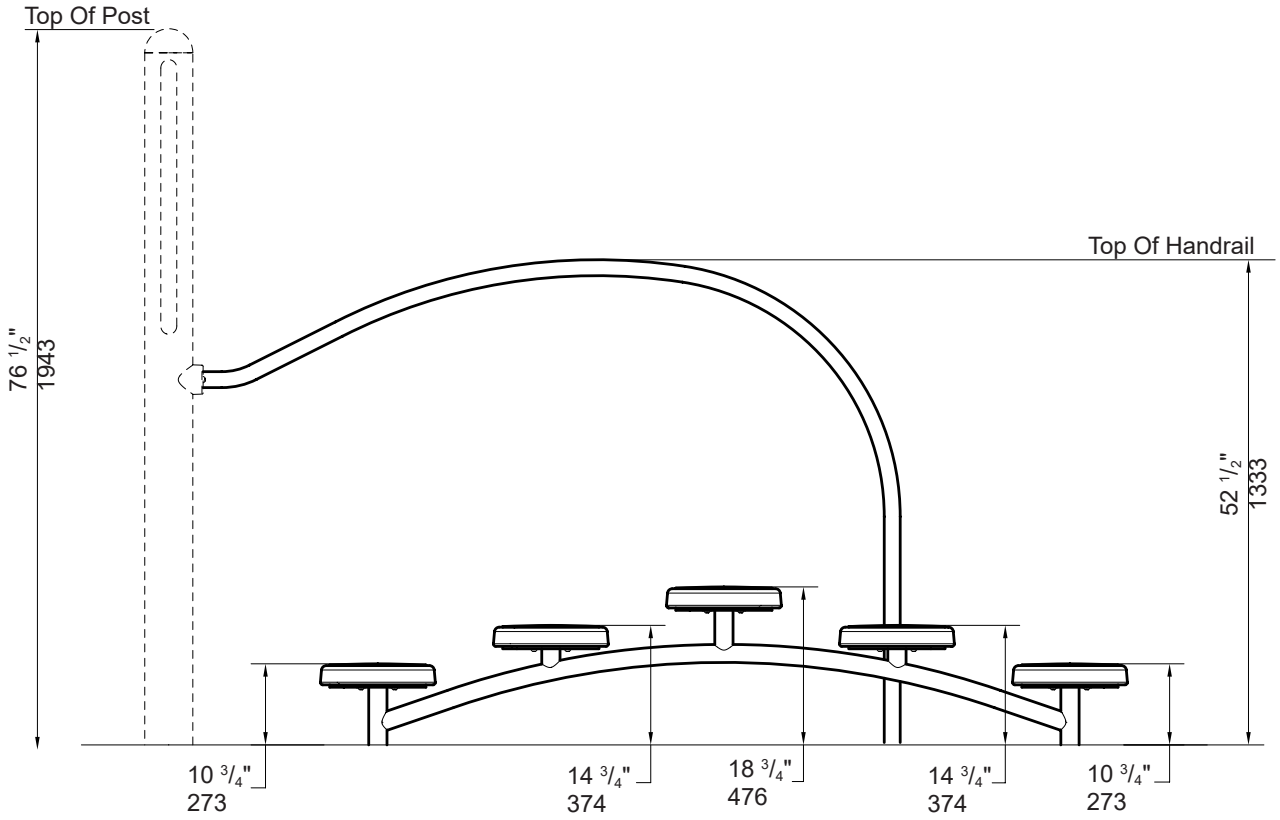
SAFETY NOTE

Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. ASTM F3101.)

193495a

PLAN VIEW/FOOTING LAYOUT





192454 Balance Steps

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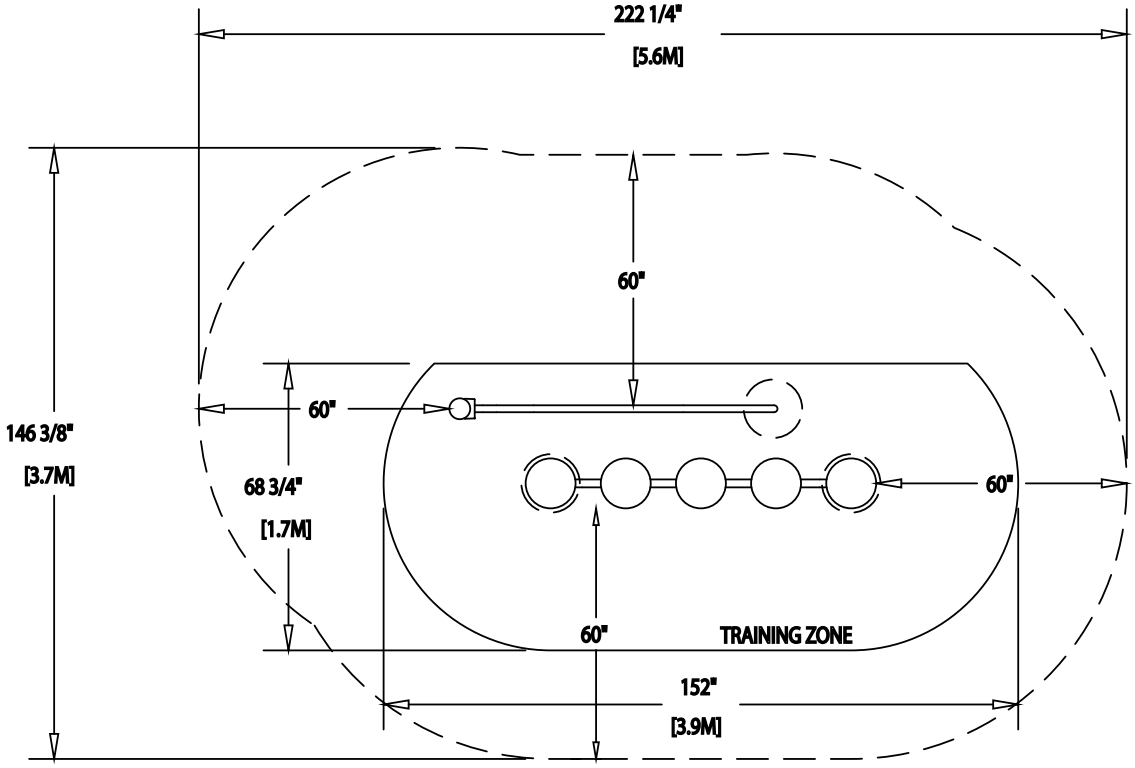
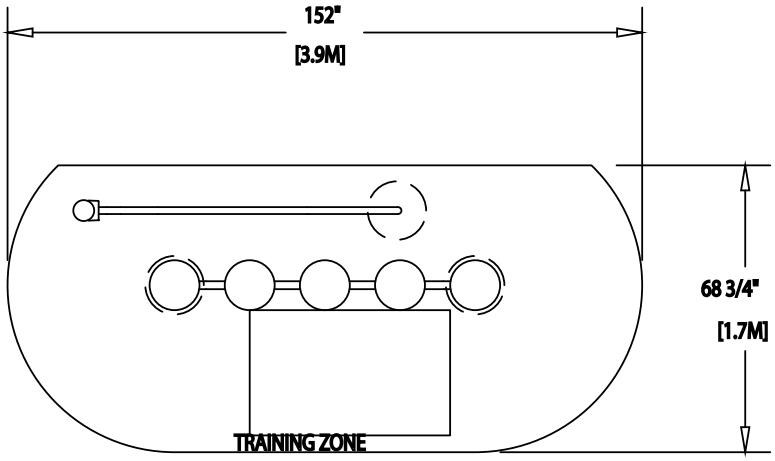
SAFETY NOTE

Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. ASTM F3101.)

TRAINING/CLEARANCE SPACE



EN 16630



ASTM F3101

The clearance space shall reflect the recognized standard for the area. Typically, ASTM for U.S.A. and EN for European installation. The clearance space shall have a protective surface that has a critical height value for the fall height of the equipment.

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192454 Balance Steps

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HealthBeat® 192454 Balance Steps

Parts List

Part #	Description	Qty.
206483	Balance Step Base, (DB), Specify Color	1
191071	Balance Step Base, (SM), Specify Color	1
206482	Balance Step Handrail, (DB), Specify Color	1
191070	Balance Step Handrail, (SM), Specify Color	1
160586	Step/Seat, Black	5
220081	HealthBeat® Sign Balance Steps	1
220208	HealthBeat Sign Warning	*
220105	HealthBeat Sign Warning (EN)	*
161669	**Balance/Steps Hardware Package**	1
100196	3/8" x 7/8" BHCS w/Pin, SST	20
100198	3/8" x 1 1/8" BHCS w/Pin, SST	2
100362	3/8" Flat Washers, SST	20
100365	3/8" SAE Flat Washers, SST	2
207273	**Power-Ser Anchor 12-Hole (SM) Hdw. Pkg .**	1
206892	Anchor Wej-It 3/8-16 , SST	12
100362	3/8" Flat Washer, SST	12
208324	3/8" x 1 1/4" BHCS w/Pin Limited Thread, SST	12
100209	3/8" x 1 3/4" Hex Head Bolt, SST	1

SM = Surface Mount
DB = Direct Bury
*** = Quantity Determined By Your Order**

Specifications

Handrail: Weldment comprised of 1.660" (42,16 mm) O.D. RS40 (.111"-.121")(2,81 mm-3,07 mm) wall galvanized steel tube, and 3/16" (4,75 mm) HRPO sheet steel. Finish: ProShield®, color specified.

Sign Panel: Panel is fabricated from 11 GA. (.120") (3,05 mm) aluminum. Finish: ProShield®, gray in color. **(Sign)** Digital image is transferred to a .120" (3,05 mm) thick ProShield coated aluminum plate, then infused into the ProShield.

Step: Rotationally molded from U.V. stabilized linear low density polyethylene, black in color.

Balance Step Base: Weldment comprised of 1.900" (48,26 mm) O.D. RS40 (.120"-.130") (3,04 mm-3,30 mm) wall galvanized steel tube, and 1/4" (6,35 mm) HRPO sheet steel. Finish: ProShield®, color specified.

Fasteners: Primary fasteners shall be socketed and pinned tamperproof in design, stainless steel (SST) per ASTM F 879 unless otherwise indicated (see specific product installation/specifications).

Installation Time: **(DB)** 2 man hours
(SM)1 3/4 man hours
Area Required: See Training/Clearance Space
Weight: **(DB)** 98 lbs.
(SM) 116 lbs.
Concrete: **(DB)** Approx. 5.34 cu.ft.
Fall Height: 16" (410 mm)

Installation Instructions

1) **(Direct Bury)** Dig footings spaced as shown. Refer to the Plan View/ Footing Layout.

2) Attach handrail to HealthBeat post. Refer to the Handrail Attachment Detail.

3) Attach steps to balance step base. Refer to the Step Attachment Detail.

4) **(Direct Bury)** Place balance step base, and handrail into footing holes, and prop in plumb position. Pour concrete footings. Allow concrete footings to cure a minimum of 72 hours before users are allowed to play on the fitness equipment.

   (Surface Mount) Refer to the Instructions For Chemical Anchor Installation on sheet 2.

5) Install protective surfacing before users are allowed to play on the component.

Specifications are subject to change without notice.

ECO #0102194 Document 30763600 replaces 22026200 Update to layout

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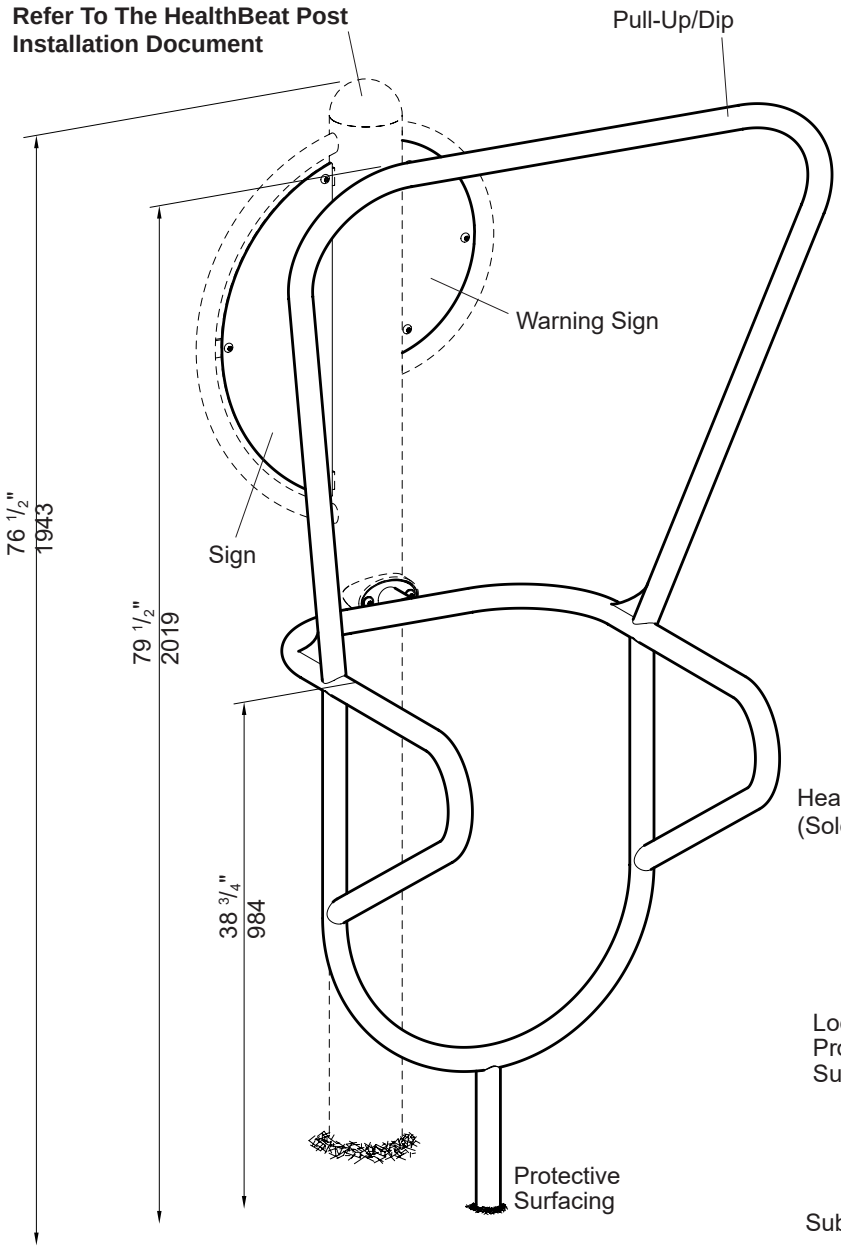
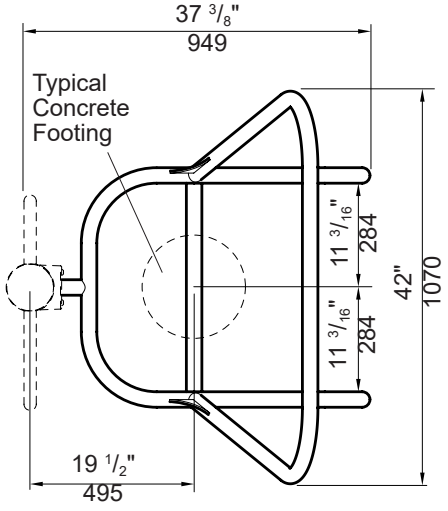
SAFETY NOTE

Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. ASTM F3101.)

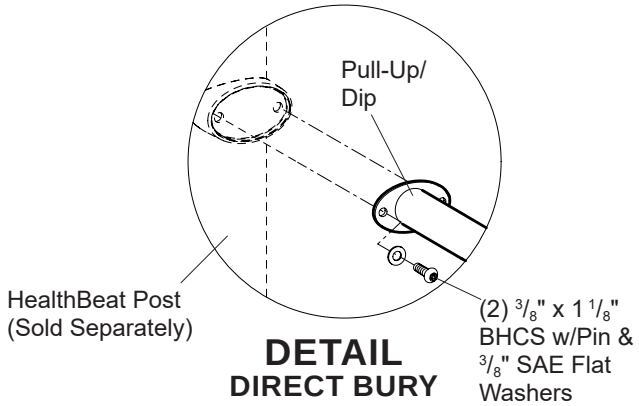
19350100



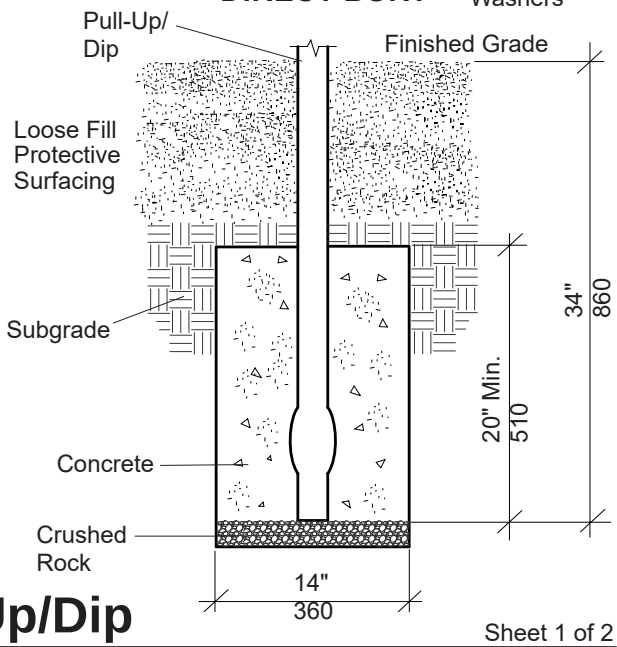
DETAIL
PLAN VIEW



DETAIL
PULL-UP/DIP ATTACHMENT



DETAIL
DIRECT BURY



192460 Pull-Up/Dip

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Document #30764400

HealthBeat® 192460 Pull-Up/Dip

Parts List

Part #	Description	Qty.
206591	Pull-Up/ Dip, (DB), Specify Color	1
191088	Pull-Up/ Dip, (SM), Specify Color	1
220096	HealthBeat® Sign Pull-Up/Dip	1
220208	HealthBeat Sign Warning	*
220105	HealthBeat Sign Warning (EN)	*
206313	**Pull-Up Bar Hardware Package**	1
100198	3/8" x 1 1/8" BHCS w/Pin, SST	2
100365	3/8" SAE Flat Washers, SST	2
207241	**Power-Ser Anchor 4-Hole (SM) Hardware Pkg .**	1
206892	Anchor Wej-It 3/8-16 , SST	4
100362	3/8" Flat Washer, SST	4
208324	3/8" x 1 1/4" BHCS w/Pin Limited Thread, SST	4
100209	3/8" x 1 3/4" Hex Head Bolt, SST	1

SM = Surface Mount
DB = Direct Bury
*** = Quantity Determined By Your Order**

Specifications

Pull-Up/Dip: Weldment comprised of 1.660" (42,16 mm) O.D. RS40 (.111"-.121") (2,81 mm-3,07 mm) wall galvanized steel tube, 1/4" (6,35 mm) HRPO sheet steel and 3/16" (4,75 mm) HRPO sheet steel. Finish: ProShield®, color specified.

Sign Panel: Panel is fabricated from 11 GA. (.120") (3,05 mm) aluminum. Finish: ProShield®, gray in color. **(Sign)** Digital image is transferred to a .120" (3,05 mm) thick ProShield coated aluminum plate, then infused into the ProShield.

Fasteners: Primary fasteners shall be socketed and pinned tamperproof in design, stainless steel (SST) per ASTM F 879 unless otherwise indicated (see specific product installation/specifications).

Installation Time: **(DB)** 1 man hour
(SM) 3/4 man hour
Area Required: See Site Plan
Weight: **(DB)** 64 lbs.
(SM) 66 lbs.
Concrete: **(DB)** Approx. 1.78 cu.ft.
Fall Height: 81" (2,05 m)

Installation Instructions

1) **(Direct Bury)** Dig footing as shown. Refer to the Plan View.

2) Attach Pull-Up/Dip to HeathBeat post. Refer to the Pull-Up Dip Attachment Detail.

3) **(Direct Bury)** With Pull-Up/Dip in plumb position. Pour concrete footing. Allow concrete footing to cure a minimum of 72 hours before users are allowed to use fitness equipment.

   (Surface Mount) Refer to the Instructions For Chemical Anchor Installation on sheet 2.

4) Install protective surfacing before users are allowed to play on the component.

Specifications are subject to change without notice.

ECO #0102194 Document 30764400 replaces 22027200 Update to layout

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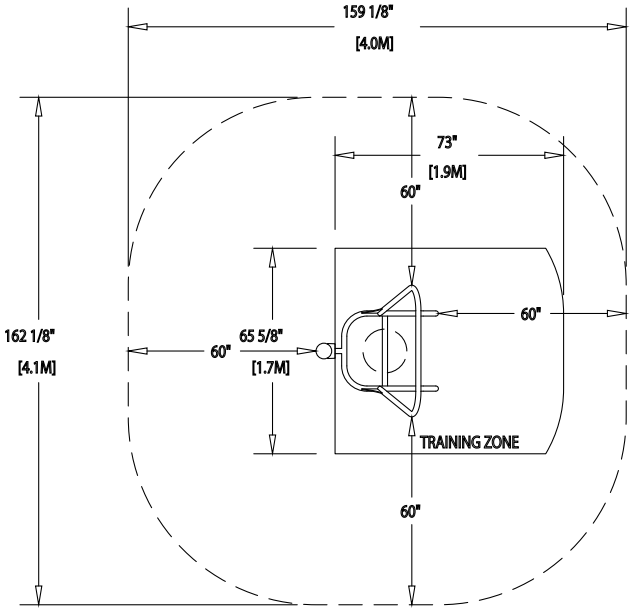
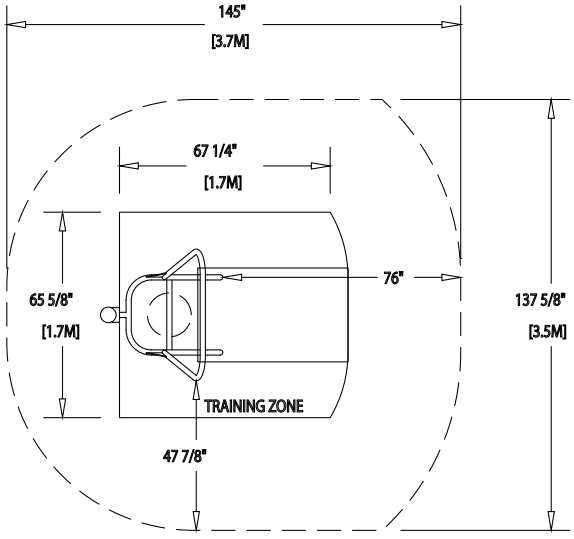
SAFETY NOTE

Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. ASTM F3101.)



EN 16630



ASTM F3101

The clearance space shall reflect the recognized standard for the area. Typically, ASTM for U.S.A. and EN for European installation. The clearance space shall have a protective surface that has a critical height value for the fall height of the equipment.

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192460 Pull-Up/Dip

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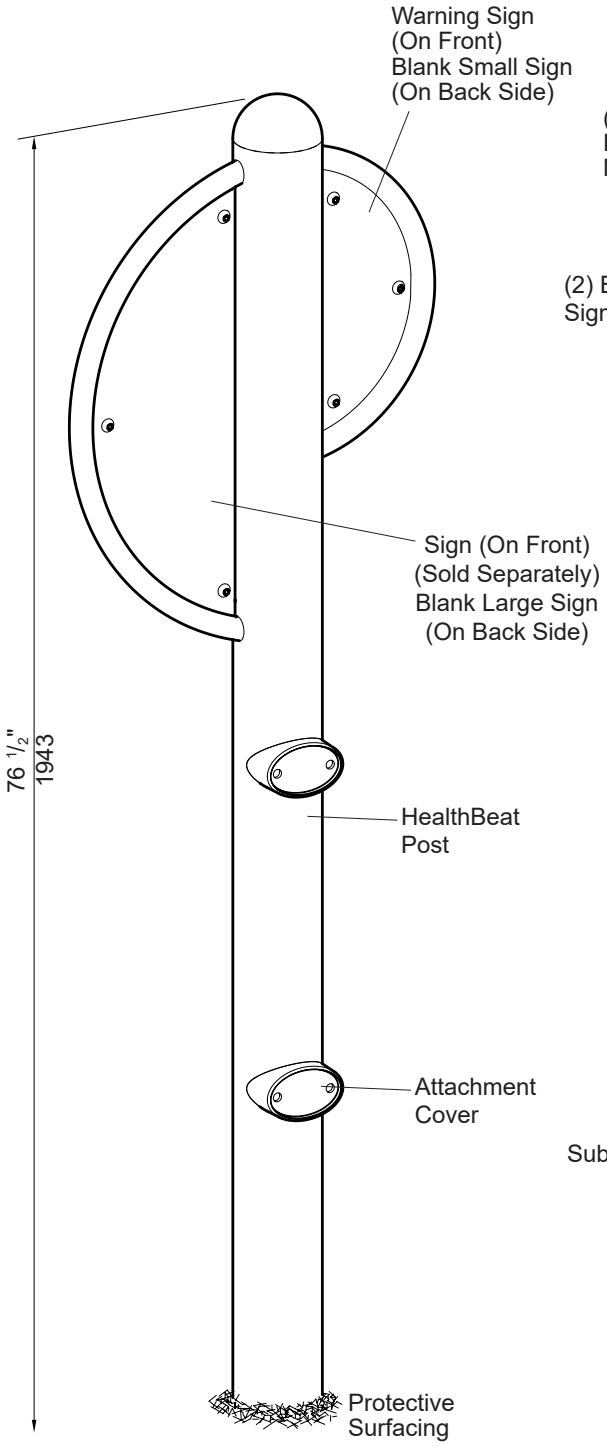
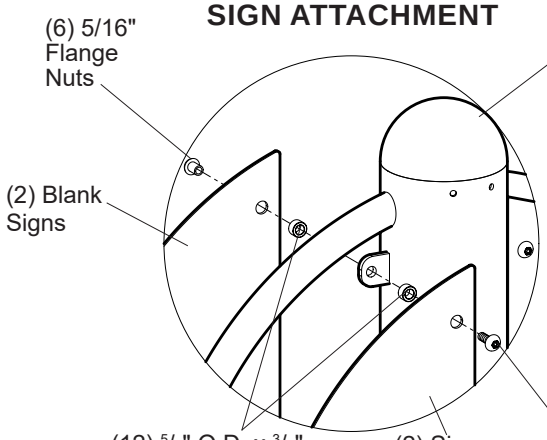
SAFETY NOTE

Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. ASTM F3101.)

20730200

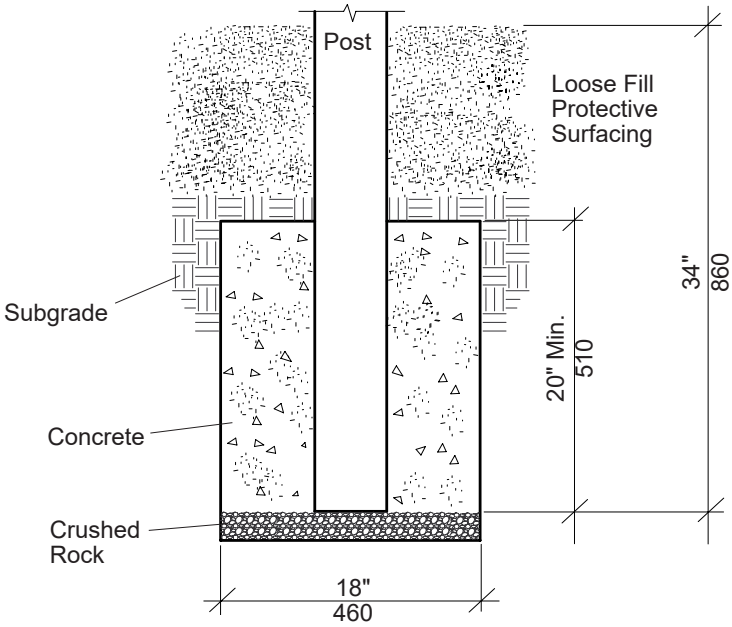


DETAIL
SIGN ATTACHMENT



NOTE: Posts with attachment covers on both sides of the post, will have signs on both sides of the post.

DETAIL
DIRECT BURY



Model #205944 Shown.

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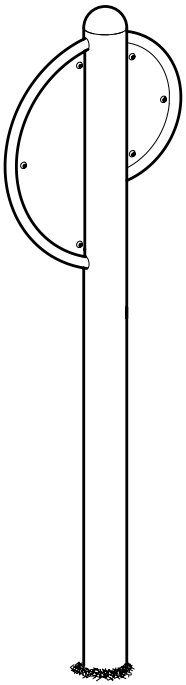
SAFETY NOTE

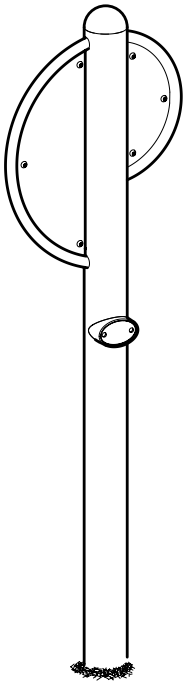
Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. ASTM F3101.)

207302a

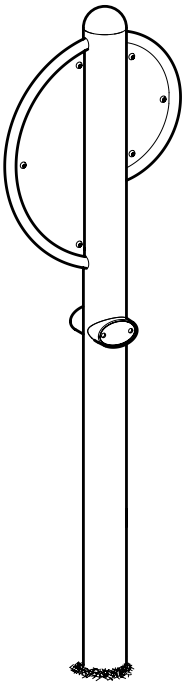
Model #205941
(Post w/ No Connectors)



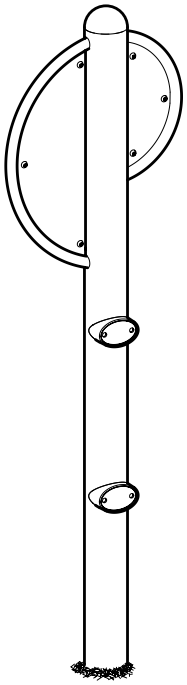
Model #205942
(Post w/ 1 Connector On Top)



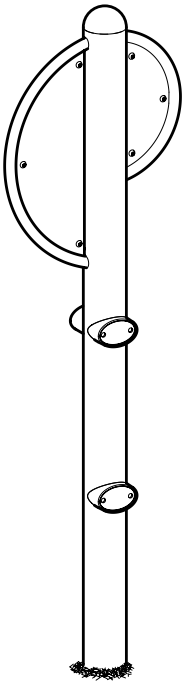
Model #205943
(Post w/ 2 Connectors On Top)



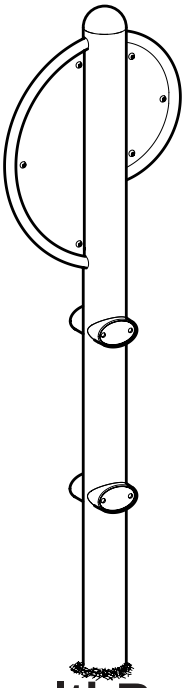
Model #205944
(Post w/ 1 Connector Top & Bottom)



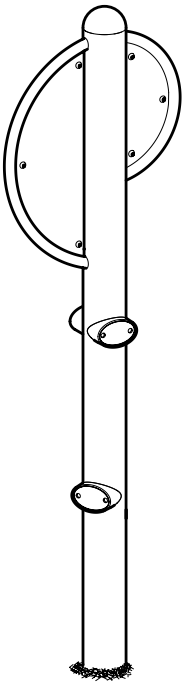
Model #205945
(Post w/ 2 Connectors Top & 1 Bottom)



Model #205946
(Post w/ 2 Connectors Top & Bottom)



Model #205947
(Post w/ 2 Connectors Top & 1 Bottom 90*)



HealthBeat®

HealthBeat® Posts

601 7TH STREET SOUTH, DELANO, MINNESOTA 55328-8605 888-574-4678 LSI Install Help 888-438-6574 LSI Direct 763-972-5200 Int. FAX (763) 972-3185

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Parts List

Part #	Description	Qty.
	Model #205941	
206405	HealthBeat® Blank Sign, Large	1
206406	HealthBeat® Blank Sign, Small	1
206418	HealthBeat Post w/Cap, (DB), Carbon	1
194587	HealthBeat Post w/Cap, (SM), Carbon	1
255128	**HealthBeat Sign Hardware Package**	1
175006	Flg Nut 6LP 5/16", SST.	6
132626	BHCS 6LP 5/16" x 7/8", SST	6
214297	5/8" O.D. x 3/8" Long Bushing, Nylon	12
207241	**Power-Ser Anchor 4-Hole (SM) Hdw. Pkg .**	1
206892	Anchor Wej-It 3/8-16 , SST	4
100362	3/8" Flat Washer, SST	4
208324	3/8" x 1 1/4" BHCS w/Pin Limited Thread, SST	4
100209	3/8" x 1 3/4" Hex Head Bolt, SST	1
	Model #205942	
206405	HealthBeat® Blank Sign, Large	1
206406	HealthBeat® Blank Sign, Small	1
206419	HealthBeat Post w/Cap, (DB), Carbon	1
194588	HealthBeat Post w/Cap, (SM), Carbon	1
206303	Attachment Cover, Carbon	1
255128	**HealthBeat Sign Hardware Package**	1
175006	Flg Nut 6LP 5/16", SST.	6
132626	BHCS 6LP 5/16" x 7/8", SST	6
214297	5/8" O.D. x 3/8" Long Bushing, Nylon	12
207241	**Power-Ser Anchor 4-Hole (SM) Hdw. Pkg .**	1
206892	Anchor Wej-It 3/8-16 , SST	4
100362	3/8" Flat Washer, SST	4
208324	3/8" x 1 1/4" BHCS w/Pin Limited Thread, SST	4
100209	3/8" x 1 3/4" Hex Head Bolt, SST	1
	Model #205943	
206420	HealthBeat Post w/Cap, (DB), Carbon	1
194589	HealthBeat Post w/Cap, (SM), Carbon	1
206303	Attachment Cover, Carbon	2
255128	**HealthBeat Sign Hardware Package**	1
175006	Flg Nut 6LP 5/16", SST.	6
132626	BHCS 6LP 5/16" x 7/8", SST	6
214297	5/8" O.D. x 3/8" Long Bushing, Nylon	12
207241	**Power-Ser Anchor 4-Hole (SM) Hdw. Pkg .**	1
206892	Anchor Wej-It 3/8-16 , SST	4
100362	3/8" Flat Washer, SST	4
208324	3/8" x 1 1/4" BHCS w/Pin Limited Thread, SST	4
100209	3/8" x 1 3/4" Hex Head Bolt, SST	1
	Model #205944	
206405	HealthBeat® Blank Sign, Large	1
206406	HealthBeat® Blank Sign, Small	1
206421	HealthBeat Post w/Cap, (DB), Carbon	1
194590	HealthBeat Post w/Cap, (SM), Carbon	1
206303	Attachment Cover, Carbon	2
255128	**HealthBeat Sign Hardware Package**	1
175006	Flg Nut 6LP 5/16", SST.	6
132626	BHCS 6LP 5/16" x 7/8", SST	6
214297	5/8" O.D. x 3/8" Long Bushing, Nylon	12
207241	**Power-Ser Anchor 4-Hole (SM) Hdw. Pkg .**	1
206892	Anchor Wej-It 3/8-16 , SST	4
100362	3/8" Flat Washer, SST	4
208324	3/8" x 1 1/4" BHCS w/Pin Limited Thread, SST	4
100209	3/8" x 1 3/4" Hex Head Bolt, SST	1

Parts List

Part #	Description	Qty.
	Model #205945	
206422	HealthBeat Post w/Cap, (DB), Carbon	1
194591	HealthBeat Post w/Cap, (SM), Carbon	1
206303	Attachment Cover, Carbon	3
255128	**HealthBeat Sign Hardware Package**	1
175006	Flg Nut 6LP 5/16", SST.	6
132626	BHCS 6LP 5/16" x 7/8", SST	6
214297	5/8" O.D. x 3/8" Long Bushing, SST	12
207241	**Power-Ser Anchor 4-Hole (SM) Hdw. Pkg .**	1
206892	Anchor Wej-It 3/8-16 , SST	4
100362	3/8" Flat Washer, SST	4
208324	3/8" x 1 1/4" BHCS w/Pin Limited Thread, SST	4
100209	3/8" x 1 3/4" Hex Head Bolt, SST	1
	Model #205946	
206423	HealthBeat Post w/Cap, (DB), Carbon	1
194592	HealthBeat Post w/Cap, (SM), Carbon	1
206303	Attachment Cover, Carbon	4
255128	**HealthBeat Sign Hardware Package**	1
175006	Flg Nut 6LP 5/16", SST.	6
132626	BHCS 6LP 5/16" x 7/8", SST	6
214297	5/8" O.D. x 3/8" Long Bushing, Nylon	12
207241	**Power-Ser Anchor 4-Hole (SM) Hdw. Pkg .**	1
206892	Anchor Wej-It 3/8-16 , SST	4
100362	3/8" Flat Washer, SST	4
208324	3/8" x 1 1/4" BHCS w/Pin Limited Thread, SST	4
100209	3/8" x 1 3/4" Hex Head Bolt, SST	1
	Model #205947	
206424	HealthBeat Post w/Cap, (DB), Carbon	1
194593	HealthBeat Post w/Cap, (SM), Carbon	1
206303	Attachment Cover, Carbon	3
255128	**HealthBeat Sign Hardware Package**	1
175006	Flg Nut 6LP 5/16", SST.	6
132626	BHCS 6LP 5/16" x 7/8", SST	6
214297	5/8" O.D. x 3/8" Long Bushing, Nylon	12
207241	**Power-Ser Anchor 4-Hole (SM) Hdw. Pkg .**	1
206892	Anchor Wej-It 3/8-16 , SST	4
100362	3/8" Flat Washer, SST	4
208324	3/8" x 1 1/4" BHCS w/Pin Limited Thread, SST	4
100209	3/8" x 1 3/4" Hex Head Bolt, SST	1

Specifications

Post: Weldment comprised of 5.000" (127 mm) O.D. 11 GA. (.120") (3,05 mm) wall galvanized steel tubing, 1.315" (33,4 mm) O.D. RS20 (.080" - .090") (2,03 mm-2,28 mm) wall galvanized steel tubing, $^{1}/_{4}$" (6,35 mm) HRPO steel sheet and 5" (127 mm) O.D. aluminum post cap. Finish: ProShield®, carbon in color.

Attachment Cover: Fabricated from A356 sand casted aluminum. Finish: ProShield, carbon in color

Sign Panel: Panel is fabricated from 11 GA. (.120") (3,05 mm) aluminum. Finish: ProShield®, gray in color. **(Sign)** Digital image is transferred to a .120" (3,05 mm) thick ProShield coated aluminum plate, then infused into the ProShield.

Fasteners: Primary fasteners shall be socketed and pinned tamperproof in design, stainless steel (SST) per ASTM F 879 unless otherwise indicated (see specific product installation/specifications).

Installation Time: **(DB)** 1 man hour
(SM) $^{3}/_{4}$ man hour

Weight: **(DB)** 70 lbs.
(SM) 63 lbs.

Concrete: **(DB)** Approx. 2.94 cu.ft. per post

Installation Instructions

1) **(Direct Bury)** Dig footing. Refer to the Site Plan for footing location.

2) Attach signs. Refer to the Sign Attachment Detail

3) **(Direct Bury)** With post propped in plumb position, pour concrete footing. Allow concrete footing to cure a minimum of 72 hours. **NOTE:** *Do not pour concrete footings for posts with connectors until fitness structure has been fully assembled.*

   (Surface Mount) Refer to the Instructions For Chemical Anchor Installation on sheet 2.

4) Install protective surfacing before users are allowed to play on the component.

Specifications are subject to change without notice.

Eco #0101535 Document #25526800 replaces #21449200. M8 hardware replaced with 5/16"

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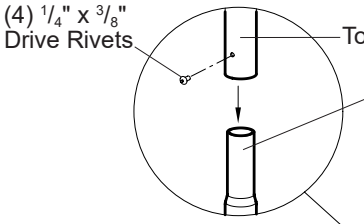
SAFETY NOTE

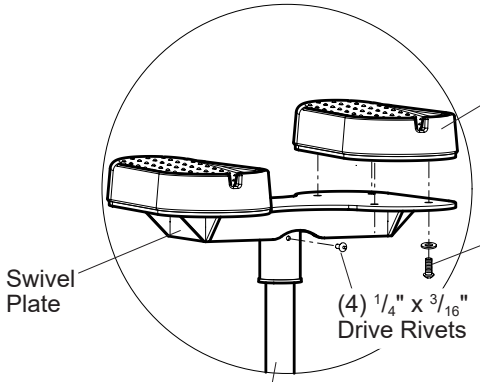
Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. ASTM F3101.)

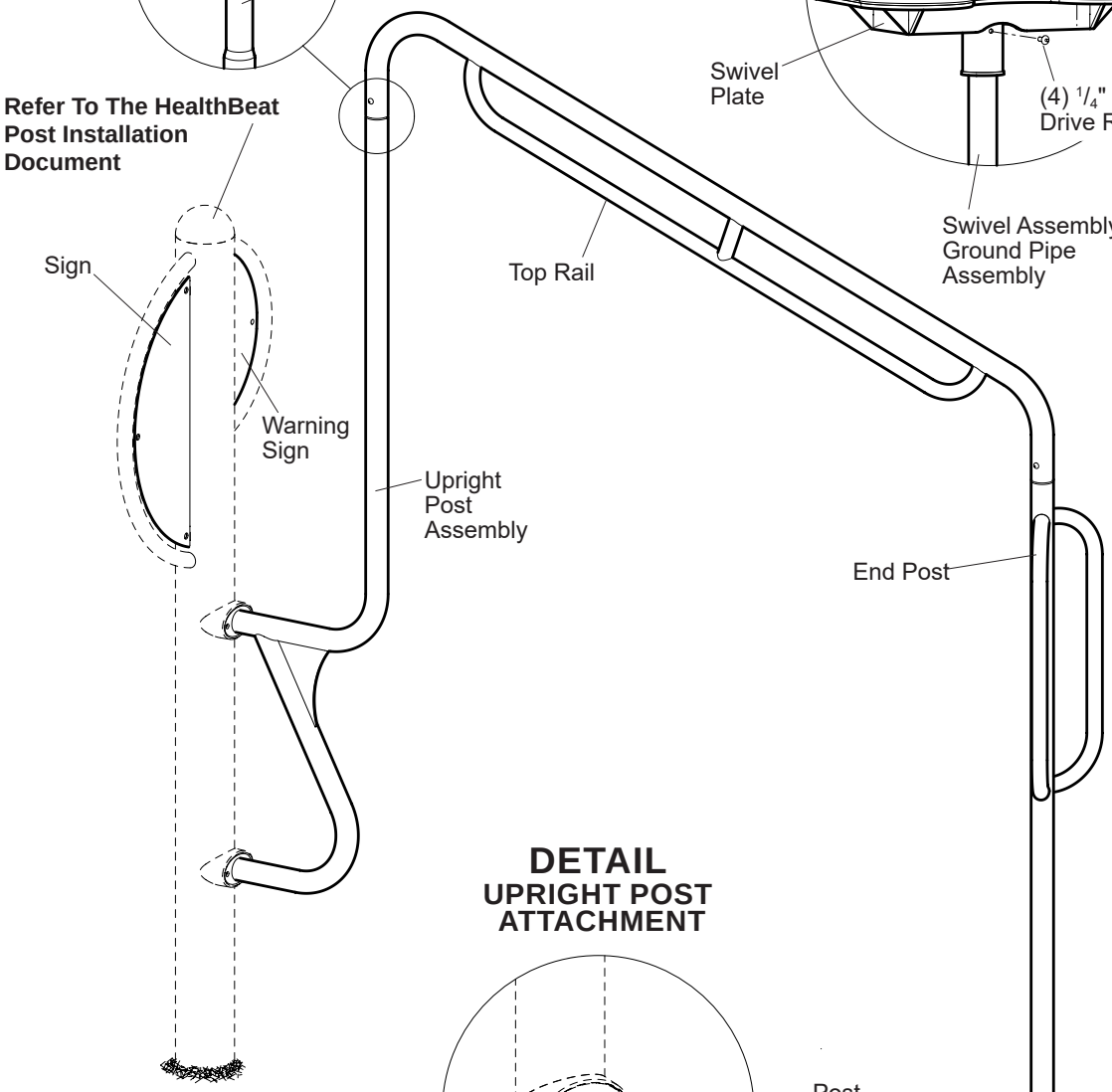
19350300

DETAIL
TOP RAIL ATTACHMENT

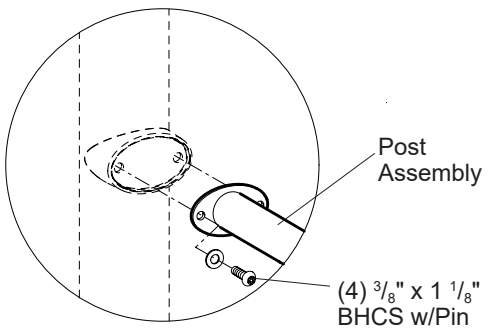


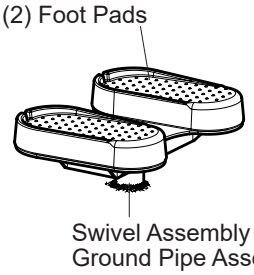
DETAIL
FOOT PAD ATTACHMENT





DETAIL
UPRIGHT POST ATTACHMENT





192462 Stretch Station

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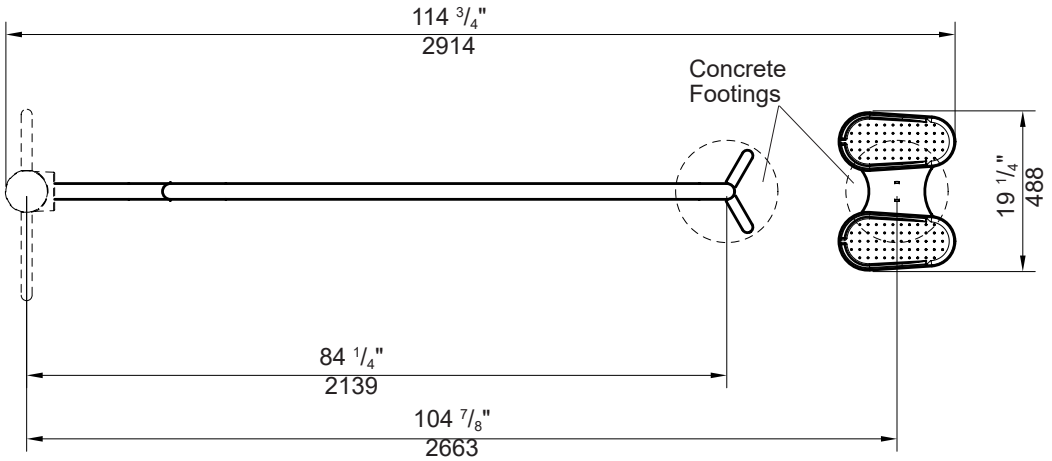
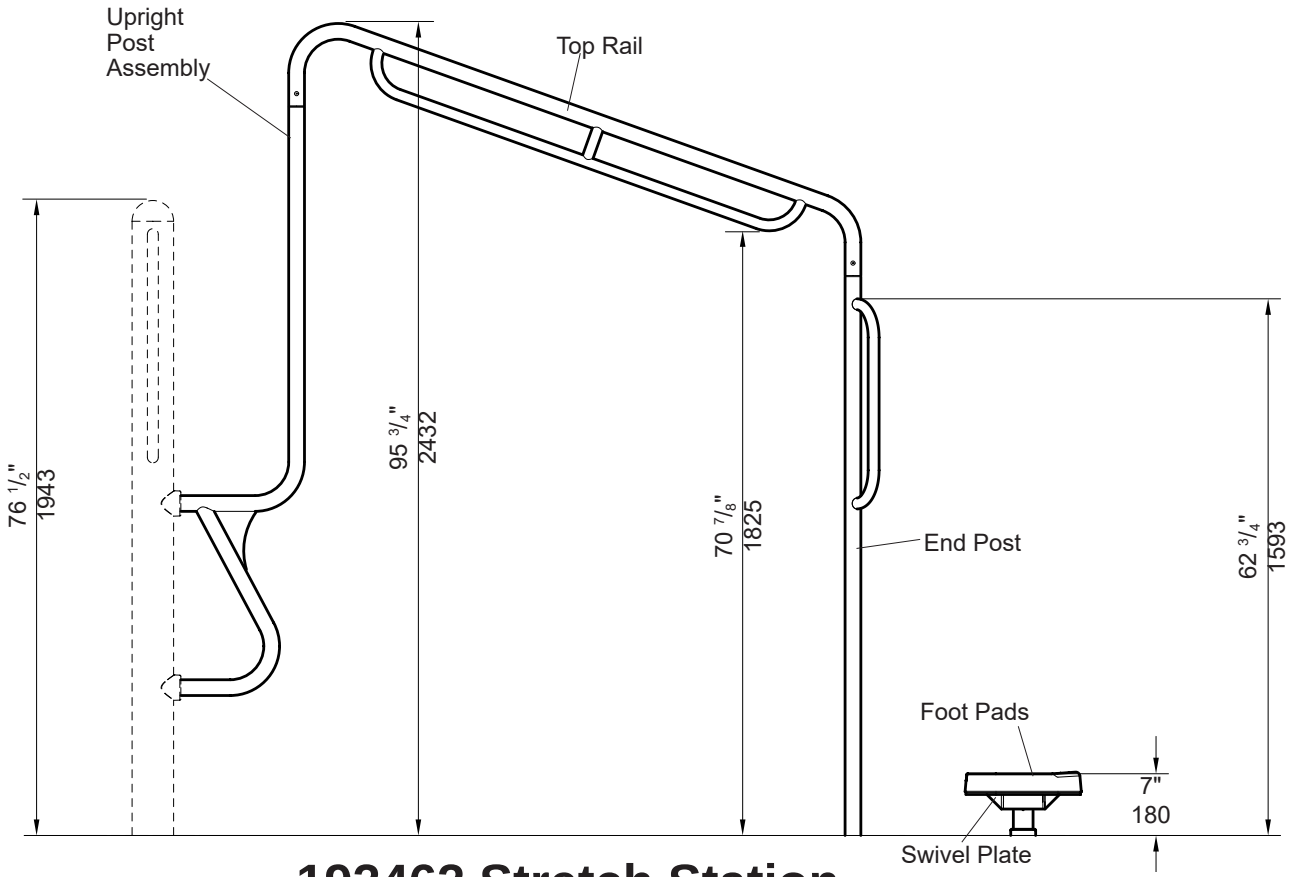
SAFETY NOTE

Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. ASTM F3101.)

PLAN VIEW /FOOTING LAYOUT

193503a





192462 Stretch Station

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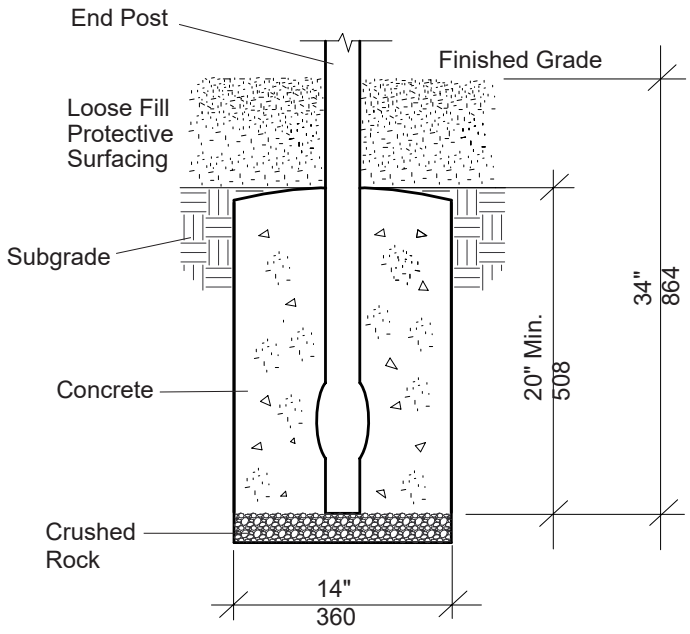
SAFETY NOTE

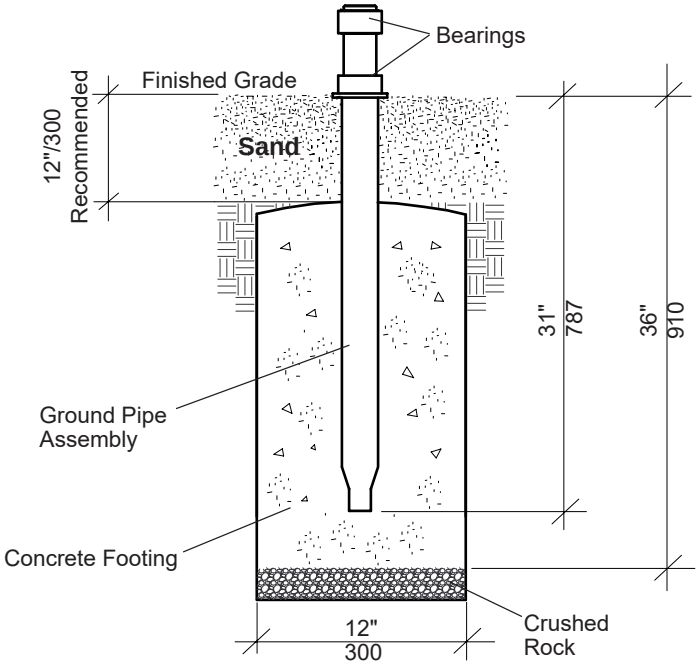
Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. ASTM F3101.)

193503B

DETAIL
DIRECT BURY



DETAIL
DIRECT BURY



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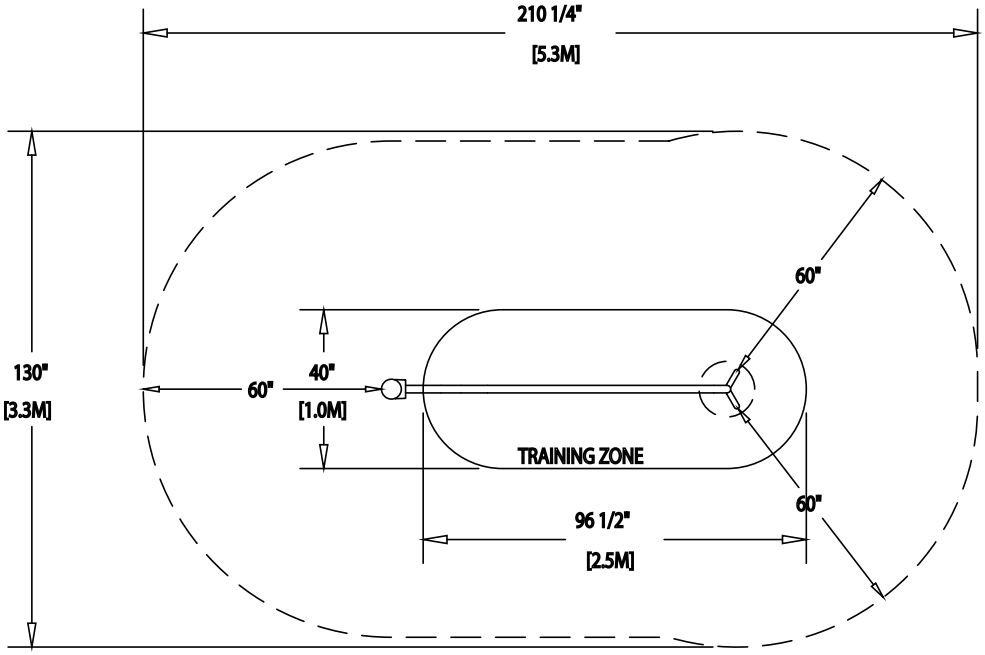
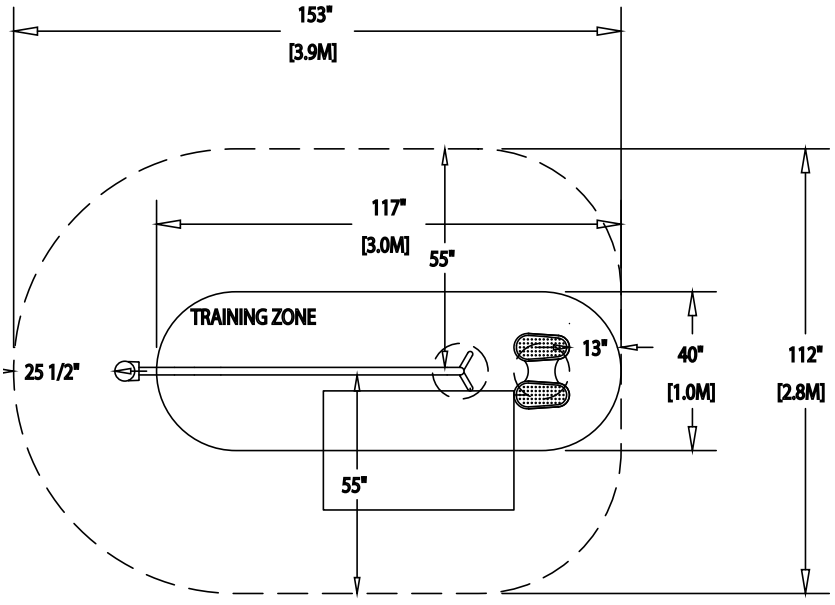
SAFETY NOTE

Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. ASTM F3101.)

TRAINING/CLEARANCE SPACE



EN 16630



ASTM F3101

The clearance space shall reflect the recognized standard for the area. Typically, ASTM for U.S.A. and EN for European installation. The clearance space shall have a protective surface that has a critical height value for the fall height of the equipment.

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HealthBeat® 192462 Stretch Station

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Parts List

Part #	Description	Qty.
206670	Foot Pad, Black	2
176828	Top Rail, Specify Color	1
206817	Swivel Plate, Specify Color	1
206617	End Post, (DB), Specify Color	1
194039	End Post, (SM), Specify Color	1
194040	Upright Post Assy., Specify Color	1
107440	Ground Pipe Assembly (DB)	1
206242	Swivel Assembly, (SM), Specify Color	1
220102	HealthBeat® Sign Stretch	1
220208	HealthBeat Sign Warning	1
207289	**Stretch Station Hardware Package**	1
100196	3/8" x 7/8" BHCS w/Pin, SST	8
100198	3/8" x 1 1/8" BHCS w/Pin, SST	4
100365	3/8" SAE Flat Washer, SST	12
100609	1/4" x 3/16" Drive Rivet, AL/SST	4
100611	1/4" x 3/8" Drive Rivet, AL/SST	4
207254	**Power-Ser Anchor 8-Hole (SM) Hardware Pkg.**	1
206892	Anchor Wej-It 3/8-16 , SST	8
100362	3/8" Flat Washer, SST	8
208324	3/8" x 1 1/4" BHCS w/Pin Limited Thread, SST	8
100209	3/8" x 1 3/4" Hex Head Bolt, SST	1

SM = Surface Mount
DB = Direct Bury

Specifications

Top Rail: Weldment comprised of 1.315" (33,4 mm) O.D. RS20 (.080" - .090") (2,03 mm-2,29 mm) galvanized steel tubing and 1.900" (48,26 mm) O.D. RS40 (.120" - .130") (3,05 mm-3,30 mm) galvanized steel tubing. Finish: ProShield®, color specified.

Sign Panel: Panel is fabricated from 11 GA. (.120") (3,05 mm) aluminum. Finish: ProShield®, gray in color. **(Sign)** Digital image is transferred to a .120" (3,05 mm) thick ProShield coated aluminum plate, then infused into the ProShield.

Upright Post Assy.: Weldment comprised 1.900" (48,26 mm) O.D. RS40 (.120" - .130") (3,05 mm-3,30 mm) galvanized steel tubing, 1/4" (6,35 mm) HRPO steel plate and 7 GA. (.179") (4,55 mm) HRPO sheet steel. Finish: ProShield, color specified.

End Post: Weldment comprised 1.900" (48,26 mm) O.D. RS40 (.120" - .130") (3,05 mm-3,30 mm) galvanized steel tubing and 1.315" (33,4 mm) O.D. RS20 (.080" - .090") (2,03 mm-2,29 mm) galvanized steel tubing. Finish: ProShield, color specified.

Foot Pad: Rotationally molded from U.V. stabilized linear low density polyethylene, black in color.

Swivel Plate: Weldment comprised of 2.375" (60,33 mm) O.D. x .188" (4,78 mm) wall steel tubing, and 1/4" (6,35 mm) HRPO steel sheet. Finish: ProShield, color specified.

Ground Pipe Assy.: Comprised of 1.660 OD X .191WA HR EW STL uncoated a500 or LSI approved equivalent zinc plated, and oil impregnated bronze bearings.

Fasteners: Primary fasteners shall be socketed and pinned tamperproof in design, stainless steel (SST) per ASTM F 879 unless otherwise indicated (see specific product installation/specifications).

Specifications are subject to change without notice.

Installation Time: **(DB)** 3 1/2 man hours
(SM) 3 man hours
Area Required: See Training/Clearance Space
Weight: **(DB)** 115 lbs.
(SM) 107 lbs.
Concrete: **(DB)** Approx. 3.56 cu.ft.
Fall Height: 96" (2,43 m)

Installation Instructions

1) **(Direct Bury)** Dig footings as shown. Refer to the Direct Bury Detail.

2) Attach upright post assembly to HealthBeat post. Refer to Upright Post Attachment Detail.

3) Place top rail onto upright post assembly and end post. With end post in-line with HealthBeat post and swivel assembly footing, drill 1/4" holes through post assembly and end post, using the predrilled 1/4" holes in top rail as a guide. Insert 1/4" x 3/8" drive rivets into drilled holes and tap pin in until it is flush with rivet head. Refer to the Top Rail Attachment Detail.

4) **(Direct Bury)** Place swivel plate over bearings on ground pipe assembly. Tap 1/4" x 3/16" drive rivets into holes.

   (Surface Mount) Refer to the Instructions For Chemical Anchor Installation on the back of sheet 2.

   (Surface Mount) Place swivel plate over bearings on swivel assembly. Tap 1/4" x 3/16" drive rivets into holes.

5) Attach foot pads to swivel plate. Refer to Foot Pad Attachment Detail.

6) **(Direct Bury)** Prop end post and ground pipe assembly in plumb position. Pour concrete footings. Allow concrete footings to cure a minimum of 72 hours before users are allowed to play on the fitness equipment. **NOTE:** *Refer to the PLAN VIEW/FOOTING LAYOUT for correct locations for posts and swivel base.*

7) Install protective surfacing before users are allowed to use the component.

ECO #0111324 Document 36021100 replaces 31566100 Updated ground pipe specifications

SECTION 11 66 13
EXERCISE EQUIPMENT

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Exercise equipment including the following:
   1. HealthBeat Assisted Row/Push-Up.
   2. HealthBeat Balance Steps.
   3. HealthBeat Pull-Up/Dip.
   4. HealthBeat Stretch.
   5. HealthBeat Welcome Sign

1.2 RELATED SECTIONS

A. Section 02 20 00 - Assessment.

1.3 REFERENCES

A. ASTM International (ASTM):
   1. ASTM F3101 – Standard Specification for Unsupervised Public Use Outdoor Fitness Equipment.
   2. ASTM A1011 - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength.
   3. ASTM B117 - Standard Practice for Operating Salt Spray (Fog) Apparatus.
   4. ASTM D522 - Standard Test Methods for Mandrel Bend Test of Attached Organic Coatings.
   5. ASTM D638 - Standard Test Method for Tensile Properties of Plastics.
   6. ASTM D1505 - Standard Test Method for Density of Plastics by the Density-Gradient Technique.
   7. ASTM D1654 - Standard Test Method for Evaluation of Painted or Coated Specimens Subjected to Corrosive Environments.
   8. ASTM D2794 - Standard Test Method for Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact).
   9. ASTM D3359 - Standard Test Methods for Rating Adhesion by Tape Test.
   10. ASTM D3363 - Standard Test Method for Film Hardness by Pencil Test.
   11. ASTM F879 - Standard Specification for Stainless Steel Socket Button and Flat Countersunk Head Cap Screws.
   12. ASTM G154 - Standard Practice for Operating Fluorescent Ultraviolet (UV) Lamp Apparatus for Exposure of Nonmetallic Materials.

B. Industrial Fasteners Institute (IFI): IFI 125 - Test Procedure for the Performance of Chemical Coated Prevailing -Torque Screws.

C. ADA Standard for Accessible Design.

1.4 SUBMITTALS

A. Submit under provisions of Section 01 30 00 - Administrative Requirements.

B. Product Data: Manufacturer's data sheets on each product to be used, including:
   1. Preparation instructions and recommendations.
   2. Storage and handling requirements and recommendations.
   3. Installation methods.
   4. Maintenance recommendations.

C. Shop Drawings:

D. Selection Samples: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns.

E. Installation Documentation: All shipments shall include a packet of order-specific, step-by-step instructions for assembly of each component, including equipment assembly diagrams, estimated hours for assembly, footing dimensions, concrete quantity for direct bury components, fall height information, and area required information.

1.5 QUALITY ASSURANCE

A. Manufacturer Qualifications: Minimum 5 years of experience manufacturing similar products.

B. Installer Qualifications: Minimum 3 years of experience installing similar products.

C. All exercise equipment shall be certified and validated to be in conformance with the ASTM F3101 Standard.

D. To the best of manufacturer's belief and knowledge exercise equipment conforms to the U.S. Consumer Products Safety Commission (CPSC) Guidelines.

E. Unless otherwise noted, all exercise equipment is considered accessible according to the 2010 ADA Standard for Accessible Design.
   1. Comply with applicable provisions in the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines for Buildings and Facilities and ICC A117.1 for Exercise Machines and Equipment designated as accessible.

F. Mock-Up: Provide a mock-up for evaluation of surface preparation techniques and application workmanship.
   1. Finish areas designated by Architect.
   2. Do not proceed with remaining work until workmanship is approved by Architect.
   3. Refinish mock-up area as required to produce acceptable work.

1.6 PRE-INSTALLATION MEETINGS

A. Convene minimum two weeks prior to starting work of this section.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver and store products in manufacturer's unopened packaging bearing the brand name and manufacturer's identification until ready for installation.

B. Packaging: Components shall be individually wrapped or bulk wrapped to provide protection during shipment. Small parts and hardware packages will be placed in crates for shipment.

The components and crates are then shrink-wrapped to skids (pallets) to ensure secure shipping.

C. Handling: Handle materials to avoid damage.

D. The manufacturer will deliver the equipment to a location designated by the contractor. The contractor will be responsible for unloading, handling, and any related logistics following delivery.

1.8 PROJECT CONDITIONS

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's recommended limits.

1.9 SEQUENCING

A. Ensure that products of this section are supplied to affected trades in time to prevent interruption of construction progress.

B. Hardware Packages: All shipments shall include individual component-specific hardware packages. Each hardware package shall be labeled with the part number, description, a component diagram showing the appropriate component, package weight, a bar code linking the hardware package to the job number, assembler’s name, date and time the package was assembled, work center number and work order number.

1.10 WARRANTY

A. Landscape Structures Inc. ("Manufacturer") warrants that all exercise equipment sold will conform in kind and in quality to the specifications manual for the products identified in the Acknowledgment of Order and will be free of defects in manufacturing and material. Manufacturer further warrants:
   1. 100-Year Limited Warranty: On all stainless-steel fasteners and aluminum castings against structural failure due to corrosion/natural deterioration or manufacturing defects.
   2. 15-Year Limited Warranty: On all plastic, aluminum and steel components against structural failure due to material or manufacturing defects.
   3. 3-Year Limited Warranty: On all other parts, i.e.: HealthBeat resistance mechanism against failure due to corrosion/natural deterioration or manufacturing defects.
   4. The environment near a saltwater coast can be extremely corrosive. Some corrosion and/or deterioration is considered "normal wear" in this environment. Product installed within 500 yards (457 meters) of a saltwater shoreline will only be covered for half the period of the standard product warranty, up to a maximum of five years, for defects caused by corrosion. Products installed in direct contact with saltwater or that are subjected to salt spray are not covered by the standard warranty for any defects caused by corrosion.
   5. This warranty does not include any cosmetic issues or wear and tear from normal use. It is valid only if the exercise equipment is erected to conform with Landscape Structures' installation instructions and maintained according to the maintenance procedures furnished by Landscape Structures Inc.

1.11 EXTRA MATERIALS

A. Maintenance Kit: A maintenance kit shall be provided for each exercise equipment design ordered. The kit will include a maintenance document with recommendations on how often to inspect, what to look for and what to do to keep the equipment in like-new condition. The kit also includes appropriate color touch-up paint and additional installation tools for the

tamperproof fasteners.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturer: Landscape Structures Inc., which is located at: 601 S. 7th St.; Delano, MN 55328-0198; Toll Free Tel: 888-438-6574; Tel: 763-972-5200; Fax: 763-972-3185; Email: info@playlsi.com; Web: https://www.playlsi.com

B. Substitutions: Not permitted.

C. Requests for substitutions will be considered in accordance with provisions of Section 01 60 00 - Product Requirements.

2.2 MATERIAL

A. Material: All materials shall be structurally sound and suitable for safe exercise. Durability shall be ensured on all steel parts by the use of time-tested coatings such as zinc plating, galvanizing, ProShield finish, TenderTuff coating, etc. Colors shall be specified.

B. Fasteners: Primary fasteners shall be socketed and pinned, tamperproof in design, stainless steel (SST) per ASTM F879 unless otherwise indicated (see specific product installation/specifications). All primary fasteners shall include a locking patch-type material that will meet the minimum torque requirements of IFI-125. Manufacturer shall provide special tools for pinned tamperproof fasteners.

C. TenderTuff Coating: Metal components to be TenderTuff coated shall be thoroughly cleaned in a hot phosphatising wash system, then primed with a water-based thermosetting solution. Primed parts shall be preheated prior to dipping in UV stabilized, liquid polyvinyl chloride (PVC), and then salt cured at approximately 400 degrees F (204 degrees C). The finished coating shall be approximately 0.080 inch (2.03 mm) thick at an 85 durometer with a minimum tensile strength of 1700 psi and a minimum tear strength of 250 lbs per inch.

D. ProShield Finish: All metal components with ProShield finish shall be thoroughly cleaned and pretreated through a multi-stage wash system. Parts are then thoroughly dried, preheated and processed through a set of powder spray guns where a minimum 0.002 inch (0.05 mm) of epoxy primer is applied. A minimum 0.004 inch (0.10 mm) of architectural-grade Super Durable polyester TGIC powder is applied. The average ProShield film thickness is 0.006 inch (0.15 mm).
    1. ProShield is formulated and tested per the following ASTM standards. Each color must meet or exceed the ratings listed below:
        a. Hardness (D3363) rating 2H.
        b. Flexibility (D522) pass 1/8 inch (3.18 mm) mandrel.
        c. Impact (D2794) rating minimum 80 inch-pounds.
        d. Salt Fog Resistance (B117 and D1654) 4,000 hours and rating 6 or greater.
        e. UV Exposure (G154, 340 bulb) 3,000 hours, rating delta E of 2, and 90 percent gloss retention. Certain colors may exceed delta E of 2. Contact manufacturer for exceptions.
        f. Adhesion (D3359, Method B) rating 5B.
    2. The Paint Line shall employ a "checkered" adhesion test daily.
    3. Standard colors are available.

E. Rotationally Molded Polyethylene Parts: These parts shall be molded using prime natural linear low-density polyethylene with a tensile strength of 2400 psi per ASTM D638. Rotational molding resin is compounded with color and UV-stabilizing additives with a nominal wall thickness typically 1/4 inch (6.35 mm) with some variation depending upon

product type.

F. Recycled Permalene Parts: These parts shall be manufactured from 3/4 inch (19.05 mm) high-density polyethylene that has been specially formulated for optimum UV stability and color retention. Products shall meet or exceed density of 0.960 grams per cubic centimeter per ASTM D1505, tensile strength of 2400 PSI per ASTM D638.

G. Footings: Unless otherwise specified, the depth on all footings shall be 34 inches (864 mm) below Finished Grade (FG) on all in-ground exercise events/posts.

2.3 HealthBeat Assisted Row/Push-Up

A. Model 192452

B. Description:
1. Ages: 13 years and older
2. Overall Height: 76.5 inches (1943 mm)
3. Fall Height: 53 inches (1350 mm)
4. A great upper-body workout that exercises multiple muscles with several activities in one station. Bars of multiple heights accommodate users of all fitness levels.
5. Signage includes links to instructional videos that can be viewed on a smart device while at each fitness station.

C. Materials:
1. Rail: Weldment comprised of 1.660 inch (42.16 mm) O.D. RS20 (0.085 inch – 0.095 inch) (2.16 mm – 2.41 mm) wall galvanized steel tube, and 3/16 inch (4.76 mm) HRPO sheet steel. Finish: ProShield, color specified.
2. Sign Panel: Panel is fabricated from 11 gauge (0.120 inch) (3.05 mm) aluminum. Finish: ProShield, gray in color. (Sign) Digital image is transferred to a 0.120 inch (3.05 mm) thick ProShield coated aluminum plate, then infused into the ProShield.
3. Fasteners: Primary fasteners shall be socketed and pinned tamperproof in design, stainless steel (SST) per ASTM F879 unless otherwise indicated.

2.4 HealthBeat Balance Steps

A. Model 192454

B. Description:
1. Ages: 13 years and older
2. Overall Height: 76.5 inches (1943 mm)
3. Fall Height: 16 inches (407 mm)
4. May be used as a balance beam or as a step aerobics station. Builds coordination and balance. Stepping forms are durable, rotationally molded polyethylene.
5. Signage includes links to instructional videos that can be viewed on a smart device while at each fitness station.

C. Materials:
1. Handrail: Weldment comprised of 1.660 inch (42.16 mm) O.D. RS20 (0.085 inch – 0.095 inch) (2.16 mm – 2.41 mm) wall galvanized steel tube, and 3/16 inch (4.76 mm) HRPO sheet steel. Finish: ProShield, color specified.
2. Step: Rotationally molded from U.V. stabilized linear low density polyethylene, Black in color.
3. Balance Step Base: Weldment comprised of 1.900 inch (48.26 mm) O.D. RS40 (0.120 inch – 0.130 inch) (3.05 mm – 3.30 mm) wall galvanized steel tube, and

1/4 inch (6.35 mm) HRPO sheet steel. Finish: ProShield, color specified.

4. Sign Panel: Panel is fabricated from 11 gauge (0.120 inch) (3.05 mm) aluminum. Finish: ProShield, gray in color. (Sign) Digital image is transferred to a 0.120 inch (3.05 mm) thick ProShield coated aluminum plate, then infused into the ProShield.
5. Fasteners: Primary fasteners shall be socketed and pinned tamperproof in design, stainless steel (SST) per ASTM F879 unless otherwise indicated.

2.5 HealthBeat Pull-Up/Dip

A. Model 192460

B. Description:
1. Ages: 13 years and older
2. Overall Height: 79.5 inches (2020 mm)
3. Fall Height: 81 inches (2058 mm)
4. Multiple highly effective strength-building exercises for the upper body.
5. Signage includes links to instructional videos that can be viewed on a smart device while at each fitness station.

C. Materials:
1. Pull-Up/Dip: Weldment comprised of 1.660 inch (42.16 mm) O.D. RS40 (0.111 inch – 0.121) (2.82 mm – 3.07 mm) wall galvanized steel tube, 1/4 inch (6.35 mm) HRPO sheet steel and 3/16 inch (4.76 mm) HRPO sheet steel. Finish: ProShield, color specified.
2. Sign Panel: Panel is fabricated from 11 gauge (0.120 inch) (3.05 mm) aluminum. Finish: ProShield, gray in color. (Sign) Digital image is transferred to a 0.120 inch (3.05 mm) thick ProShield coated aluminum plate, then infused into the ProShield.
3. Fasteners: Primary fasteners shall be socketed and pinned tamperproof in design, stainless steel (SST) per ASTM F879 unless otherwise indicated.

2.6 HealthBeat Stretch

A. Model 192462

B. Description:
1. Ages: 13 years and older
2. Overall Height: 95.75 inches (2432 mm)
3. Fall Height: 96 inches (2439 mm)
4. Allows for stretching of upper body muscles as well as the often difficult-to-target core muscles. Maintains flexibility and range of motion.
5. Signage includes links to instructional videos that can be viewed on a smart device while at each fitness station.

C. Materials:
1. Top Rail: Weldment comprised of 1.315 inch (33.4 mm) O.D. RS20 (0.080 inch – 0.090 inch) (2.03 mm – 2.29 mm) galvanized steel tubing and 1.900 inch (48.26 mm) O.D. RS40 (0.120 inch – 0.130 inch) (3.05 mm – 3.30 mm) galvanized steel tubing. Finish: ProShield, color specified.
2. Upright Post Assembly: Weldment comprised 1.900 inch (48.26 mm) O.D. RS40 (0.120 inch – 0.130 inch) (3.05 mm – 3.30 mm) galvanized steel tubing, 1/4 inch (6.35 mm) HRPO steel plate and 7 gauge (0.179 inch) (4.55 mm) HRPO sheet steel. Finish: ProShield, color specified.
3. End Post: Weldment comprised 1.900 inch (48.26 mm) O.D. RS40 (0.120 inch – 0.130 inch) (3.05 mm – 3.30 mm) galvanized steel tubing and 1.315 inch (33.4 mm) O.D. RS20 (0.080 inch – 0.090 inch) (2.03 mm – 2.29 mm) galvanized steel

tubing. Finish: ProShield, color specified.

4. Foot Pad: Rotationally molded from U.V. stabilized linear low density polyethylene, Black in color.
5. Swivel Plate: Weldment comprised of 2.375 inch (60.33 mm) O.D. by 0.188 inch (4.78 mm) wall steel tubing, and 1/4 inch (6.35 mm) HRPO steel sheet. Finish: ProShield, color specified.
6. Ground Pipe Assembly: Comprised of 1.660 inch (42.16 mm) O.D. schedule 80 black pipe, and oil impregnated bronze bearings.
7. Sign Panel: Panel is fabricated from 11 gauge (0.120 inch) (3.05 mm) aluminum. Finish: ProShield, gray in color. (Sign) Digital image is transferred to a 0.120 inch (3.05 mm) thick ProShield coated aluminum plate, then infused into the ProShield.
8. Fasteners: Primary fasteners shall be socketed and pinned tamperproof in design, stainless steel (SST) per ASTM F879 unless otherwise indicated.

2.7 HealthBeat Welcome Sign

A. Model 192464

B. Description:

1. Ages: 13 years and older
2. Overall Height: 76.5 inches (1943 mm)
3. The HealthBeat Welcome Sign introduces the fitness system and provides a link to instructional videos.

C. Materials:

1. Post: Weldment comprised of 5.000 inch (127 mm) O.D. 11 gauge (0.120 inch) (3.05 mm) wall galvanized steel tubing, 1.315 inch (33.4 mm) O.D. RS20 (0.080 inch – 0.090 inch) (2.03 mm – 2.29 mm) wall galvanized steel tubing, 1/4 inch (6.35 mm) HRPO steel sheet and 5 inch (127 mm) O.D. aluminum post cap. Finish: ProShield, Carbon in color.
2. Sign Panel: Panel is fabricated from 11 gauge (0.120 inch) (3.05 mm) aluminum. Finish: ProShield, gray in color. (Sign) Digital image is transferred to a 0.120 inch (3.05 mm) thick ProShield coated aluminum plate, then infused into the ProShield.
3. Fasteners: Primary fasteners shall be socketed and pinned tamperproof in design, stainless steel (SST) per ASTM F879 unless otherwise indicated.

2.8 HealthBeat Post

A. Model 205941, 205942, 205943, 205944, 205945, 205946, or 205947 depending on attachment points

B. Description:

1. Ages: 13 years and older
2. Overall Height: 76.5 inches (1943 mm)
3. The fresh, contemporary design of HealthBeat offers the ability to pair any two stations together on the same post (except Assisted Row/Push-Up), saving space and cost. To maximize configuration options, HealthBeat Posts are sold separately.

C. Materials:

1. Post: Weldment comprised of 5.000 inch (127 mm) O.D. 11 gauge (0.120 inch) (3.05 mm) wall galvanized steel tubing, 1.315 inch (33.4 mm) O.D. RS20 (0.080 inch – 0.090 inch) (2.03 mm – 2.29 mm) wall galvanized steel tubing, 1/4 inch (6.35 mm) HRPO steel sheet and 5 inch (127 mm) O.D. aluminum post cap. Finish: ProShield, Carbon in color.

2. Attachment Cover: Fabricated from A356 sand casted aluminum. Finish: ProShield, Carbon in color.
3. Sign Panel: Panel is fabricated from 11 gauge (0.120 inch) (3.05 mm) aluminum. Finish: ProShield, gray in color. (Sign) Digital image is transferred to a 0.120 inch (3.05 mm) thick ProShield coated aluminum plate, then infused into the ProShield.
4. Fasteners: Primary fasteners shall be socketed and pinned tamperproof in design, stainless steel (SST) per ASTM F879 unless otherwise indicated.

PART 3 EXECUTION

3.1 EXAMINATION

A. Do not begin installation until substrates have been properly prepared. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

A. Clean surfaces thoroughly prior to installation. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.3 INSTALLATION

A. Install in accordance with manufacturer's instructions, approved submittals and in proper relationship with adjacent construction.

3.4 PROTECTION

A. Protect installed products until completion of project.

B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION

E3

SECTION 11 68 13
PLAYGROUND EQUIPMENT

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Playground equipment including the following:
1. PlayBooster Playsystem.
2. Freestanding Climbers.
3. Freestanding Spinners.
4. Freestanding Tunnels.
5. Freestanding Multiple User Motion Events.
6. Freestanding Play Structures.
7. Swings.
8. Playground Signs.

1.2 RELATED SECTIONS

A. Section 02 20 00 – Assessment.

B. Section 31 20 00 – Earth Moving

C. Section 03 30 00 – Landscape Cast-In-Place Concrete

1.3 REFERENCES

A. ASTM International (ASTM):
1. ASTM A123 - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
2. ASTM A500 - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.
3. ASTM A635 - Standard Specification for Steel, Sheet and Strip, Heavy-Thickness Coils, Hot-Rolled, Alloy, Carbon, Structural, High-Strength Low-Alloy, and High-Strength Low-Alloy with Improved Formability, General Requirements for.
4. ASTM A1011 - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength.
5. ASTM B117 - Standard Practice for Operating Salt Spray (Fog) Apparatus.
6. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
7. ASTM C39 - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens.
8. ASTM C947 - Standard Test Method for Flexural Properties of Thin-Section Glass-Fiber-Reinforced Concrete (Using Simple Beam with Third-Point Loading).
9. ASTM D522 - Standard Test Methods for Mandrel Bend Test of Attached Organic Coatings.
10. ASTM D638 - Standard Test Method for Tensile Properties of Plastics,
11. ASTM D1505 - Standard Test Method for Density of Plastics by the Density-Gradient Technique.

12. ASTM D1654 - Standard Test Method for Evaluation of Painted or Coated Specimens Subjected to Corrosive Environments.
13. ASTM D2794 - Standard Test Method for Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact).
14. ASTM D3359 - Standard Test Methods for Rating Adhesion by Tape Test.
15. ASTM D3363 - Standard Test Method for Film Hardness by Pencil Test.
16. ASTM F879 - Standard Specification for Stainless Steel Socket Button and Flat Countersunk Head Cap Screws.
17. ASTM F1487 - Standard Consumer Safety Performance Specification for Playground Equipment for Public Use.
18. ASTM G154 - Standard Practice for Operating Fluorescent Ultraviolet (UV) Lamp Apparatus for Exposure of Nonmetallic Materials.

B. Industrial Fasteners Institute (IFI): IFI 125 - Test Procedure for the Performance of Chemical Coated Prevailing-Torque Screws.

C. ADA Standard for Accessible Design.

1.4 SUBMITTALS

A. Submit under provisions of Section 01 30 00 - Administrative Requirements.

B. Product Data: Manufacturer's data sheets on each product to be used, including:
1. Preparation instructions and recommendations.
2. Storage and handling requirements and recommendations.
3. Installation methods.

C. Installation Documentation: All shipments shall include a packet of order-specific, step-by-step instructions for assembly of each component, including equipment assembly diagrams, estimated hours for assembly, footing dimensions, concrete quantity for direct bury components, fall height information, and area required information.

1.5 QUALITY ASSURANCE

A. Manufacturer Qualifications: Minimum 5 year experience manufacturing similar products.

B. Installer Qualifications: Minimum 3 year experience installing similar products.

C. All play equipment shall be certified to be in conformance with the ASTM F1487 Standard.

D. To the best of manufacturer's belief and knowledge play structures conform to the U.S. Consumer Products Safety Commission (CPSC) Guidelines.

E. Unless otherwise noted, all play structures are considered accessible according to the 2010 ADA Standard for Accessible Design. (See the play components listing for each structure to determine the number of additional play components required to meet the guidelines.)
1. Comply with applicable provisions in the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines for Buildings and Facilities and ICC A117.1 for playground equipment designated as accessible.

F. F. Mock-Up: Provide a mock-up for evaluation of surface preparation techniques and application workmanship.

1. Finish areas designated by Architect.

2.Do not proceed with remaining work until workmanship is approved by Architect.

3.Refinish mock-up area as required to produce acceptable work

1.6 PRE-INSTALLATION MEETINGS

A. Convene minimum two weeks prior to starting work of this section.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver and store products in manufacturer's unopened packaging bearing the brand name and manufacturer's identification until ready for installation.

B. Packaging: Components shall be individually wrapped or bulk wrapped to provide protection during shipment. Small parts and hardware packages will be placed in crates for shipment. The components and crates are then shrink-wrapped to skids (pallets) to ensure secure shipping.

C. Handling: Handle materials to avoid damage.

D. The manufacturer will deliver the equipment to a location designated by the contractor. The contractor will be responsible for unloading, handling, and any related logistics following delivery.

1.8 PROJECT CONDITIONS

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's recommended limits.

1.9 SEQUENCING

A. Ensure that products of this section are supplied to affected trades in time to prevent interruption of construction progress.

B. Hardware Packages: Each hardware package shall be labeled with the part number, description, package weight, a bar code linking the hardware package to the job number, assembler's name, date and time the package was assembled, work center number, and work order number.

1.10 WARRANTY

A. Landscape Structures Inc. ("Manufacturer") warrants that all play structures and/or equipment sold will conform in kind and in quality to the specifications manual for the products identified in the Acknowledgment of Order and will be free of defects in manufacturing and material. Manufacturer further warrants
   1. 100-Year Limited Warranty: On all PlayBooster and PlayShaper and PlaySense aluminum posts, stainless steel fasteners, clamps, beams and caps against structural failure due to corrosion/natural deterioration or manufacturing defects, and on PlayBooster steel posts against structural failure due to material or manufacturing defects.
   2. 15-Year Limited Warranty: On all Evos and Weevos steel arches, all plastic components (including TuffTimbers edging), all aluminum and steel components not covered above, Mobius climbers, Rhapsody Outdoor Musical Instruments, decks and TenderTuff coatings (except Wiggle Ladders, Chain Ladders and Swing Chain) against structural failure due to material or manufacturing defects.
   3. 10-Year Limited Warranty: On concrete products against structural failure due to natural deterioration or manufacturing defects. Does not cover minor chips, hairline cracks or efflorescence.
   4. 5-Year Limited Warranty: On Rhapsody cables and mallets against defects in

materials or manufacturing defects and on polycarbonate panels against defects in materials or manufacturing defects.

5. 3-Year Limited Warranty: On all other parts, i.e. all swing seats and hangers, all swing chain and cables, ZipKrooz cables, Track Ride trolleys and bumpers, Mobius Climber handholds, Wiggle Ladders, Chain Ladders, all rocking equipment including Sway Fun gliders, belting material, LSI Flexx flexible cable netting, Seesaws, etc., against failure due to corrosion/natural deterioration or manufacturing defects..
6. The environment near a saltwater coast can be extremely corrosive. Some corrosion and/or deterioration is considered "normal wear" in this environment. Product installed within 500 yards (457 meters) of a saltwater shoreline will only be covered for half the period of the standard product warranty, up to a maximum of five years, for defects caused by corrosion. Products installed in direct contact with saltwater or that are subjected to salt spray are not covered by the standard warranty for any defects caused by corrosion.
7. This warranty does not include any cosmetic issues or wear and tear from normal use. It is valid only if the playstructures and/or equipment are erected to conform with Landscape Structures' installation instructions and maintained according to the maintenance procedures furnished by Landscape Structures Inc.

1.11 EXTRA MATERIALS

A. Maintenance Kit: A maintenance kit shall be provided for each Play Structure design ordered. The kit will include a maintenance document with recommendations on how often to inspect, what to look for and what to do to keep the equipment in like-new condition. The kit also includes appropriate color touch-up paint and additional installation tools for the tamperproof fasteners.

PRODUCTS

1.12 MANUFACTURERS

A. Acceptable Manufacturer: Landscape Structures Inc., which is located at: 601 S. 7th St.; Delano, MN 55328-0198; Tel: 763-972-5200; Email: request info (webmaster@playlsi.com); Web: https://www.playlsi.com

B. Substitutions: Not permitted.

C. Requests for substitutions will be considered in accordance with provisions of Section 01 60 00 - Product Requirements.

1.13 MATERIAL

A. Material: All materials shall be structurally sound and suitable for safe play.

B. ProShield Finish: All metal components with ProShield finish shall be thoroughly cleaned and pretreated through a multi-stage wash system. Parts are then thoroughly dried, preheated and processed through a set of powder spray guns where a minimum .002 inch (.05 mm) of epoxy primer is applied. A minimum .004 inch (0.10 mm) of architectural-grade Super Durable polyester TGIC powder is applied. The average ProShield film thickness is .006 inch (0.15 mm).

1. ProShield is formulated and tested per the following ASTM standards. Each color must meet or exceed the ratings listed below:

a. Hardness (D3363) rating 2H.
b. Flexibility (D522) pass 1/8 inch (3 mm) mandrel.
c. Impact (D2794) rating minimum 80 inch-pounds.
d. Salt Fog Resistance (B117 and D1654) 4,000 hours and rating 6 or greater.
e. UV Exposure (G154, 340 bulb) 3,000 hours, rating delta E of 2, and 90 percent gloss retention. Certain colors may exceed delta E of 2. Contact manufacturer for exceptions.
f. Adhesion (D3359, Method B) rating 5B.

2. The Paint Line shall employ a "checkered" adhesion test daily.
3. Standard colors are available.

C. ProGuard Finish: Metal parts with ProGuard finish shall be cleaned and have a zinc alloy thermo-diffusion coating applied in accordance with ASTM A1059. It is highly corrosion and abrasion resistant, without flaking, peeling, blistering or chipping. ProGuard is applied standard to all Landscape Structures swing chain.

D. TenderTuff Coating: Metal components to be TenderTuff coated shall be thoroughly cleaned in a hot phosphatising wash system, then primed with a water-based thermosetting solution. Primed parts shall be preheated prior to dipping in UV stabilized, liquid polyvinyl chloride (PVC), and then salt cured at approximately 400 degrees F (204 degrees C). The finished coating shall be approximately .080 inch (2 mm) thick at an 85 durometer with a minimum tensile strength of 1700 psi and a minimum tear strength of 250lbs/inch. Standard colors are available.

E. Belting, Textured: These parts shall be 0.315" thick mini rough top 3-ply rubber belting with polyester fabric layers. Black only.

F. Cables: These parts shall be made of tightly woven polyester-wrapped, six-stranded galvanized steel cable with either a polypropylene or steel core. Cables will be 20 mm in diameter. Standard colors are available. Some products available only in Black.

G. DigiFuse Panels: These panels shall be manufactured from 1/4" thick aluminum sheet. Dye sublimation printed digital artwork is fused onto the powdercoated substrate.

H. GripX Platforms and Panels: These parts shall be manufactured from 3/4" UV-stabilized high-density polyethylene with a stippled pattern that enhances traction and appearance. No color choices; GripX will only be Black or Gray and predetermined for each product.

I. Permalene: These parts shall be manufactured from 3/4" high-density polyethylene that has been specially formulated for optimum UV stability and color retention. Products shall meet or exceed density of .960 G/cc per ASTM D1505, tensile strength of 2400 PSI per ASTM D638. Available in a three-layer product with (2) .100" thick colored exterior layers over a .550" thick recycled Black interior core, or as a solid white- or natural-colored panel. Standard colors are available.

J. Recycled Plastic Lumber: These boards shall be manufactured from UV-stabilized recycled high-density polyethylene. Thickness varies. Standard colors are available.

K. Rotationally Molded Polyethylene: These parts shall be molded using prime natural linear low-density polyethylene having a tensile strength of 2400 PSI per ASTM D638. Rotational molding resin is compounded with color and UV-stabilizing additives with a nominal wall thickness typically 1/4" with some variation depending upon product type. Standard colors are available.

L. Steel Decks: All steel decks shall be of modular design and have 5/16" diameter holes on the standing surface. There shall be a minimum of (4) slots in each face to accommodate face mounting of components. Decks shall be manufactured from a single piece of low

carbon 12 GA (.105") sheet steel conforming to ASTM specification A-1011. The sheet shall be perforated with a return flange on the perimeter to provide the reinforcement necessary to ensure structural integrity. There shall be no unsupported area larger than 3.5 square feet. The unit shall then be TenderTuff-coated Brown or Gray only. Decks shall be designed so that all sides are flush with the outside edge of the supporting posts.

M. SteelX: These parts shall be fabricated from 0.179" thick zinc plated flat steel and ProShield-finished. Footings: Unless otherwise specified, the bury on all footings shall be 34" below Finished Grade (FG) on all in-ground play events/posts. Other types of anchoring are available upon request.

N. Fasteners: Primary fasteners shall be socketed and pinned tamperproof in design, stainless-steel (SST) per ASTM F 879 unless otherwise indicated (see specific product installation/specification documents). All primary fasteners shall include a locking patch type material that will meet the minimum torque requirements of IFI-125. Manufacturer to provide special tools for pinned tamperproof fasteners.

1.6 PLAYBOOSTER

A. Description:
1. Ages 5 to 12 Years.
2. The PlayBooster playground structure, The original post-and-clamp system combines exciting ground-level components with climbing events and overhead activities. The PlayBooster family includes GeoPlex geometric climbing panels, the interconnected cables of Netplex, the contemporary Vibe, the nature-inspired Tree House and the double-decker PlayOdyssey Tower.
3. Netplex: U.S. Patent number 9,375,609 and 10,260,538
4. GeoPlex: U.S. Patent number 10,987,533

B. Material:
1. Posts: Post length shall vary depending upon the intended use and shall be a minimum of 42" (1067 mm) above the deck height. All posts shall be ProShield finished to specified color. All posts shall have a “finished grade marker” positioned on the post identifying the 34" (864 mm) bury line required for correct installation and the top of the loose fill protective surfacing. Top caps for posts shall be aluminum die cast from 369.1 alloy and ProShield finished to match the post color. All caps shall be factory installed and secured in place with interference fit. A molded low-density polyethylene cap, with drain holes, shall be pressed onto the bottom end of the post to increase the footing area.
2. Steel Posts: All steel PlayBooster posts are manufactured from 5 inches (127 mm) O.D. tubing with a wall thickness of .120 inches (3.0 mm) and shall be galvanized after rolling and shall have both the I.D. and the cut ends sprayed with a corrosion resistant coating.
3. Steel Post Mechanical Properties:
   a. Yield Strength (min): 50,000 PSI.
   b. Tensile Strength (min): 55,000 PSI.
   c. Elongation: 25% in 2 inches (51 mm).
   d. Modulus of Elasticity: 29.5 x 1,000,000 PSI.
4. Aluminum Posts: All aluminum PlayBooster posts are manufactured from 6005A-T61 extruded tubing conforming to ASTM B-221. Posts shall have a 5 inch (127 mm) outside diameter with a .125 inches (3.2 mm) wall thickness.
5. Aluminum Post Mechanical Properties:
   a. Yield Strength (min): 35,000 PSI.
   b. Tensile Strength (min): 38,000 PSI.
   c. Elongation: 10% in 2 inches.
   d. Modulus of Elasticity: 10 x 1,000,000 PSI.
6. Arch Posts: Aluminum arch posts shall be manufactured from 6063-T6 alloy. The arch

shall be formed to a 21 inches (533 mm) center line radius to complement the 42 inches (1067 mm) center-to-center module. The arch shall be of one continuous piece construction. There shall be no welds or additional pieces mechanically fastened to manufacture the arch. Each arch shall be designed to provide a minimum of 90-1/2 inches (2300 mm) clear span from the deck to the inside of the arch at the radius peak. Arches shall be ProShield finished to a specified color.

7. Clamps: All clamps are ProShield finished and, unless otherwise noted, shall be die cast using a 369.1 aluminum alloy and have the following mechanical properties:
   a. Ultimate Tensile: 47,000 PSI.
   b. Yield Strength: 28,000 PSI.
   c. Elongation: 7% in 2 inches (51 mm).
   d. Shear Strength: 29,000 PSI.
   e. Endurance Limit: 20,000 PSI.
8. Clamps: Each functional clamp assembly shall have an appropriate number of half clamps and shall be fastened to mating parts with (2) 3/8 inch x 1-1/8 inches (9.5mm x 28.6 mm) pinned button head cap screws (SST) and (2) stainless-steel (SST) recessed "T" nuts. A 1/4 inch (6 mm) aluminum drive rivet with stainless steel pin is used to ensure a secure fit to the post.
9. PlayBooster clamps have three functional applications and shall be named as follows:
   a. Offset hanger clamp assembly.
   b. Deck hanger clamp assembly.
   c. Hanger clamp assembly.
10. Netplex Clamps: All clamps are ProShield finished and, unless otherwise noted, shall be die cast using a 369.1 aluminum alloy and have the following mechanical properties:
   a. Ultimate Tensile: 47,000 PSI.
   b. Yield Strength: 28,000 PSI.
   c. Elongation: 7% in 2 inches (51 mm).
   d. Shear Strength: 29,000 PSI.
   e. Endurance Limit: 20,000 PSI.
11. Netplex Clamps: Each functional clamp assembly shall have an appropriate number of rope clamps and back clamps and shall be fastened to each other with (2) 5/8 inch x 1-1/2 inches (16 mm x 38 mm) pinned button head cap screws (SST) and (2) stainless-steel (SST) recessed "T" nuts. Either a face clamp shall be fastened to rope clamp with (2) 3/8 inch by 1-3/8 inches (9.5 mm x 35 mm) pinned button head cap screws or a single tab casting plate shall be fastened to rope clamp with (4) 3/8 inch by 1-3/8 inches (9.5 mm x 35 mm) pinned button head cap screws with 3/8 inch (9.5 mm) SAE flat washers. A 1/4 inch x 5/8 inch (6 mm x 16 mm) aluminum drive rivet with stainless steel pin is used to ensure a secure fit to the post.
12. GeoPlex Clamps: All clamps are ProShield finished and, unless otherwise noted, shall be fabricated from 7GA using (4.54 mm) T316 stainless steel.
   a. Ultimate Tensile: 84,000 PSI.
   b. Yield Strength: 25,000 PSI.
13. PlayOdyssey Structural Frame: Post length of the double ladder/central column shall vary depending upon the deck height and shall be flush with the bottom of a deck infill or a minimum of 46 inches (1168 mm) above the deck height. All posts shall be ProShield finished to specified color. All posts shall have a "finished grade marker" positioned on the post identifying the 60 inches (1524 mm) bury line required for correct installation and the top of the loose fill protective surfacing. Post caps shall be aluminum die cast from 369.1 alloy and ProShield finished to match the post color. All caps shall be factory installed and secured in place with (3) self-sealing rivets. A molded low-density polyethylene cap, with drain holes, shall be pressed onto the bottom end of the ladder posts to increase the footing area. Ladders are bolted together below grade to act as a single column for installation purposes. The deck support weldments/arms are comprised of 5/16 inch (7.9 mm) steel conforming to 1010 steel per ASTM A635 and welded to a 52 inches (1321 mm) steel post. Arms

are secured to each ladder post with (4) 5/8 inch x 1-1/2 inches (16 mm x 38 mm) pinned button head cap screws through (2) 1/4 inch (6 mm) flanges.

14. PlayOdyssey Aluminum Roof Posts: All formed aluminum PlayOdyssey roof posts are manufactured from 6063-T6 extruded tubing conforming to ASTM B-221. Posts shall have a 5 inches (127 mm) outside diameter with a .125 inches (3.2 mm) wall thickness. Post sleeve shall have 4.675 inches (118.7 mm) outside diameter with a .150 inch (3.8 mm) wall thickness. Post cap shall be aluminum die cast from 369.1 alloy and ProShield finished to match the post color. All caps shall be factory installed and secured in place with three self-sealing rivets.
15. Forma Frames: All Forma frames are manufactured from 5" square steel tubing with a wall thickness of .120" and shall be galvanized after rolling and shall have both I.D. and the cut ends sprayed with a corrosion resistant coating. Frames are ProShield-finished to a specified color.
Frame Caps: Top caps for frames shall be aluminum die cast and ProShield finished to match the frame color. All caps shall be secured in place with 3/8" x 3/8" drive rivets.
Peg Caps: Peg caps shall be aluminum die cast and ProShieldfinished to match the corresponding frame or bracket color. A provided Cap Wrench is used to snug Peg Cap over hardware.
Supports: Forma supports are manufactured from 2" square steel tubing with a wall thickness of .120". Supports are ProShield-finished to a specified color.

1.7 FREESTANDING CLIMBERS

A. Concrete Products: Two processes are used to produce concrete products. (See specific product installation/specification documents). Finish is exterior latex paint suited for concrete applications. No color choices.

B. Glass Fiber Reinforced Concrete (GFRC) Products: Glass fiber is alkali-resistant (AR) with high tensile properties formulated for concrete. GFRC nominal product thickness is 1 inch (25 mm) with a unit weight of about 12 lbs per square foot and an average ultimate flexural strength of 2,100 psi per ASTM C947.

C. Precast Concrete Products: Wet-cast solid, molded concrete with an average compressive strength of 5,000 psi per ASTM C39. Unit weight range of about 115 to 145 lbs per cubic foot.

1.8 FREESTANDING MULTIPLE USER MOTION EVENTS

A. We-Saw Seesaw
1. Model 186490
2. Description: The We-saw is a new take on our traditional seesaw. Its unique design and gentle rocking motion invites kids and families of all ages and abilities to participate in the fun. The We-saw is wheelchair accessible. Like all our seesaws, the We-saw provides opportunities for collaborative play and teamwork.
   a. Age Ranges: 2 to 5 Years, 5 to 12 years
   b. 4 seats with center platform for additional participants
   c. Center platform made of GripX, a UV stabilized HDPE (high density polyethylene) marine-grade material. Specially designed slip resistant texture enhances traction and appearance. Platform is trimmed with your choice of colorful Permalene.
   d. Spring mechanism and in-ground bumpers for controlled motion
   e. Base assembly is ProShield-finished in black
   f. In-ground bumpers protect surfacing from impact and extend the life of the product

g. Rubber stops on hand and foot-holds ensure a firm grip
h. Walk-in seating ensures easy access or transfer into seat
i. Seats made of durable, color fast, vibrant polyethylene

3. Materials:
   a. We-saw Assembly: (Arm Assembly) Weldment comprised of 3.500 inches (88,9 mm) O.D. x 8 GA. (.162 inch) (4,11 mm) wall galvanized steel tubing, 2.375 inches (60,33 mm) O.D. RS40 (.130 inch to .140 inch) (3,30 mm to 3,56 mm) wall galvanized steel tubing, 1.900 inches (48,26 mm) O.D. RS40 (.120 inch to .130 inch) (3,05 mm to 3,30 mm) wall galvanized steel tubing, .375 inch (9,52 mm) thick HRPO steel plate and .250 inch (6,35 mm) HRPO steel plate. Finish: Proshield, specify color. (Rocker Assembly) Weldment comprised .250 inch (6,35 mm) HRPO steel plate and 2 inches (50 mm) x 5/16 inch (7,93 mm) wall steel tubing. Finish: ProShield, black in color. (Base) Weldment comprised .375 inch (9,53 mm) HRPO steel plate and 2.500 inches (63,50 mm) O.D. x 1.150 inches (29,21 mm) I.D. stainless steel tubing. Finish: ProShield, black in color. (Base Plate) Fabricated from .250 inch (6,35 mm) HRPO steel plate. Finish: ProShield, black in color. (Spring) 5-5/8 inches (142,87 mm) diameter 13/16 inch (20,62 mm) tempered alloy steel coil. Finish: ProShield, black in color. (Spring Wedge) Cast from ductile iron alloy. Finish: ProShield, black in color. (Bearings) 1.145 inches (29,08 mm) I.D. oilite bronze. (Shaft) 1.14 inches (28,96 mm) O.D. stainless steel. (Cylinder) Chrome plated steel.
   b. Filler Plate: Fabricated from 12 Ga. (105 inch) (2,66 mm) HRPO steel sheet. Finish: ProShield, color specified.
   c. GripX Insert: 3/4 inch (19,05 mm) Thick Permalene, black in color.
   d. Teeter Pad & Edges: Permalene, color specified.
   e. Platform Handhold: Weldment comprised of 1.315 inches (33,4 mm) O.D. RS20 (.080 inch to .090 inch) (2,03 mm to 2,28 mm) wall galvanized steel tubing, 10 GA (.135 inch) (3, 42 mm) HRPO steel sheet and 7 GA. (.179 inch) (4,54 mm) HRPO steel sheet. Finish: Proshield, color specified.
   f. Anchor Cage: Weldment comprised of 1.029 inches (26,13 mm) O.D. RS20 (.070 inch to.080 inch) (1,77 mm to 2,03 mm) wall galvanized steel tubing with 203 or 303 stainless steel welded inserts with 5/8 inch (16 mm) internal threads and 7 GA. (.179 inch) (4,54 mm) HRPO steel sheet. Finish: Proshield, black in color.
   g. Rung Cap: Molded from U.V. stabilized black EPDM rubber encapsulating .250 inch (6,35 mm) thick aluminum sheet and .125 inch (3,18 mm) thick aluminum plate.
   h. Center Pad: Fabricated from .250 inch (6,35 mm) thick HRPO steel sheet plate. Finish: Proshield, black in color.
   i. Bumper Footer: Weldment comprised of 1.315 inches (33,40 mm) O.D. RS20 (.080 inch to .090 inch) (2,03 mm to 2,29 mm) wall galvanized steel tubing with 203 or 303 stainless steel welded inserts with 5/8 inch (16 mm) internal threads and .250 inch (6,35 mm) thick HRPO steel plate. Finish: Proshield, color specified.
   j. Seat: Rotationally molded from U.V. stabilized linear low density polyethylene, color specified.
   k. Fasteners: Primary fasteners shall be socketed and pinned tamperproof in design, stainless steel (SST) per ASTM F 879 unless otherwise indicated.
   l. Sol Spinner
      1) Support Arm: Weldment comprised of 2.375” (60,33 mm) O.D. RS40 (.130”-.140”)(3,30 mm - 3,56 mm) wall galvanized steel tube, 2.750” (69,85 mm) O.D. 1018 steel, and 1/4” (6,35 mm) HRPO flat steel. Finish: ProShield, color specified.
      2) Cable: Made of tightly woven polyester-wrapped, six-stranded galvanized-steel cable with a polypropylene core.
      3) Cable Connectors: 6063-T6 aluminum.

4) Sol Spinner: Weldment comprised of 1.900” (48,26 mm) O.D. RS20 (.090”-.100”)(2,29 mm-2,54 mm) wall galvanized steel tube, 1.660” (42,16 mm) O.D. RS40 (.111”-.121”)(2,82 mm-3,07 mm) wall galvanized
5) steel tube, 1/4” (6,35 mm) HRPO steel plate,3/8” (9,53mm) stainless steel plate, 2.750” (69,85 mm) O.D. 1018 steel, and 1 7/8” (47,63 mm) steel ball. Finish: ProShield, color specified.
6) GripX Panels: Permalene, black in color.
7) Bushing: Oil-filled UHMW PE.
8) Footer: Weldment comprised of 2.375” (60,33 mm) O.D. RS40 (.130”-.140”)(3,30 mm - 3,56 mm) wall galvanized steel tube, 12 Ga. (.105”) (2,67 mm) HR flat steel and 1 7/8” (47,63 mm) steel ball. Finish: ProShield, color specified.
9) Clamps: Cast Aluminum. Finish: ProShield, color specified.
10) Fasteners: Primary fasteners shall be socketed and pinned tamperproof in design, stainless steel (SST) per ASTM F 879 unless otherwise indicated.

m. Lolliladder with E-Pods
1) LolliLadder: Weldment comprised of 1/4” (6,35 mm)stainless flat steel, 2.375” (60,33 mm) O.D. RS40 (.130”-.140”) (3,30 mm-3,55 mm) wall galvanized steel tubing, and 1.315” (33,40 mm) O.D. RS20 (.080”-.090”) (2,03 mm-2,29 mm) wall galvanized tubing. Finish: ProShield, color specified.. Finish: ProShield, color specified.
2) Rung Cap: EPDM, black in color.
3) E-Pod: Rotationally molded from U.V.stabilized linear low density polyethylene, color specified.
4) Pod Casting: Fabricated from sand cast alloy 356 in accordance with ASTM B26. Finish: ProShield, color specified.
5) Half Clamp: Cast aluminum. Finish: ProShield, color specified.
6) Fasteners: Primary fasteners shall be socketed and pinned tamperproof in design, stainless steel (SST) per ASTM F 879 unless otherwise indicated.

1.9 SWINGS

A. Arch Swing Frame
1. Models:
a. Model 221292 Arch Swing Frame
b. Model 221293 Arch Swing Frame Additional Bay
2. Description: The 5" Arch Swing Frame brings beauty and fun to the playground for kids ages 2 to 12. The design of the Arch Swing Frame matches perfectly with any playstructure. Seats with chains and fasteners sold separately.
a. Age Ranges: 2 to 5 years, 5 to 12 years
b. 5"-diameter aluminum arches with a 5"-diameter steel support beam
c. Accommodates Full Bucket Seat, Half Bucket Seat, Flat-Molded Seat, Belt Seat, Molded Bucket Seat with Harness (2-5yo), Molded Bucket Seat with Harness (5-12yo) and Molded Bucket Seat without Harness
d. Accommodates two swings per bay
3. Material:
a. Posts: Aluminum posts are manufactured from 6005A-T61 extruded tubing conforming to ASTM B-221. Posts shall have a 5 inch (127 mm) outside diameter with a .125 inches (3 mm) wall thickness. Finish: ProShield, color specified.
b. Swing Beam: Weldment comprised of tee clamps and 5 inch (127 mm) O.D. extruded 6005-T5 aluminum alloy tube with a 0.125 inch (3 mm) wall. Finish: ProShield, color specified.
c. Clamp: Cast aluminum. Finish: ProShield, color specified

d. Fasteners: Primary fasteners shall be socketed and pinned tamperproof in design, stainless steel (SST) per ASTM F879 unless otherwise indicated.

B. Belt Seat with Chains
1. Model 174018.
2. Description: This durable seat is made of weather-resistant EPDM rubber. Includes chain and fasteners.
   a. Choose from TenderTuff-coated or ProGuard-finished swing chain
   b. Impact-absorbing edge
   c. Includes fasteners
   d. Stainless steel insert for maximum durability and safety
3. Materials:
   a. Chain Spacer: Made from white nylon measuring .080 inch x .785 inch (2 mm x 19 mm) O.D.
   b. Chain/ProGuard: Steel 3/16 inch (4.8 mm) straight link chain, 800 lb. working load limit. Finish: ProGuard.
   c. Chain/Coated: Steel 3/16 inch (4.8 mm) straight link chain, 800 lb. working load limit. Finish: TenderTuff, color specified.
   d. Belt Seats: Molded from U.V. stabilized black EPDM rubber encapsulating a weldment comprised of a 22 GA (.029 inch) (0.74 mm) spring stainless steel sheet, and (4) .105 inch (2.7 mm) thick stainless steel washers. The belt seat elliptical shape measures 7 inches wide x 26 inches long x .700 inch thick (178 mm x 660 mm x 18 mm).
   e. Bolt Link: Stainless Steel.

C. Molded Bucket Seat with Harness and Chains
1. Models:
   a. Model 177351 for ages 5 to 12 years.
2. Description: The Molded Bucket Seat with Harness and Chains provides greater stability for kids with limited upper-body strength. Includes chain and fasteners.
   a. Choose from TenderTuff-coated or ProGuard-finished swing chain
   b. Front impact bumper
   c. Harness securely locks in place
   d. High back and deep seat
   e. Includes fasteners and ProGuard and TenderTuff-coated chain
   f. Swing and harness molded from durable, colorfast polyethylene
3. Materials:
   a. Bucket Seat Assy.: (Bucket Seat & Yoke) Rotationally molded from U.V. stabilized linear low density polyethylene, color specified. (Pipebolt) Made from 1.125 inch (29 mm) O.D. 6005-T5 threaded anodized aluminum tube. (Bearings) UHMW PE lubricated. (Brackets) Made from 356-T6 aluminum.
   b. Chain/ProGuard: Steel 3/16 inch (4.8 mm) straight link chain, 800 lb. working load limit. Finish: ProGuard.
   c. Chain/Coated: Steel 3/16 inch (4.8 mm) straight link chain, 800 lb. working load limit. Finish: TenderTuff, color specified.
   d. Seat Mounting Bracket: Cast from 535 aluminum magnesium.
   e. Bumper: Molded from U.V. stabilized black EPDM rubber encapsulating 11 GA (.120 inch) (3 mm) HRPO steel sheet.
   f. Double Pivot Block: Fabricated from 6061-T6 Aluminum with bronze oil impregnated bearing.
   g. Fasteners: Primary fasteners shall be socketed and pinned tamperproof in design, stainless steel (SST) per ASTM F 879 unless otherwise indicated.

D. Full Bucket Seat with Chains
1. Model 176038.
2. Description: Children ages 2 to 3 love to swing in this snug seat. Includes chain and

fasteners.
a. Choose from TenderTuff-coated or ProGuard-finished chain
b. Includes fasteners
c. Made of high-performing EPDM to resist cracking
d. No S-hooks to pinch small fingers
e. Rounded top edge and stainless steel spring insert adds extra durability and softness
f. Seat and cast-aluminum handles available in black only

3. Materials:
a. Full Bucket Seat: Seat shall be molded of U.V. stabilized, high quality, black rubber, encapsulating a 24 gauge stainless steel reinforcement plate. Handle cast from 356-T6 aluminum alloy with black polyarmor paint finish. Handle attaches to seat with (3) 1/4" x 1 5/16" long stainless steel rivets. The finished size of the full bucket shall be 9" deep x 10 1/2" wide.
b. Chain/Coated: Steel 3/16 inch (4.8 mm) straight link chain, 800 lb. working load limit. Finish: TenderTuff, color specified.
c. Chain/ProGuard: Steel 3/16 inch (4.8 mm) straight link chain, 800 lb. working load limit. Finish: ProGuard.
d. Fasteners: Primary fasteners shall be socketed and pinned tamperproof in design, stainless steel (SST) per ASTM F 879 unless otherwise indicated.
e. .

1.10 PLAYGROUND SIGNS

A. Welcome Sign
1. Models 182503 and 182504
2. Description: Greet playground visitors with a helpful Welcome Sign, prominently displaying the playsystem age range and safety information for kids and their supervisors, enhancing the value of your purchase.
a. Printed on 1/8" aluminum plate for extreme durability
b. ASTM-required safety wording
c. Six age ranges available
d. Welcome message and safety information appears on both sides
e. Post is ProShield-finished to match your playsystem
f. Sign panel available in gray ProShield only
g. Permalene edge protector available in black only (not shown on all images)
h. Available in direct bury and surface mount
3. Material:
a. Sign Panel: Panel is fabricated from 1/8 inch (.125 inch) (3,17 mm) aluminum plate. Finish: ProShield, gray in color. (Sign) Digital image is transferred to the panel, then infused into the ProShield.
b. Border: Permalene, black in color.
c. Post: Weldment comprised 2.375 inch (60,33 mm) O.D. RS20 (.095-.105) (2,41 mm-2,67 mm) wall galvanized tube, ¼” (6,35 mm) HRPO steel sheet and aluminum post cap. Finish: ProShield, color specified.
d. Fasteners: Primary fasteners shall be socketed and pinned tamperproof in design, stainless steel (SST) per ASTM F 879 unless otherwise indicated.

B. Symbol Communication Sign
1. Model 355992.
2. Description: Pictures and symbols are an effective way for non-verbal, speech-challenged, and early-learning individuals to communicate with friends and caregivers. Placing a Symbol Communication Sign at the entrance to a play area ensures that everyone can express themselves!
a. Assist and augment communication at the entrance to a play space
b. Helpful for non-verbal children, early learners, and those who speak different

languages
   c. DigiFuse provides vivid, full-color, photo-realistic graphics with long-lasting durability on aluminum barriers for the optimal combination of beauty and strength
   d. English words on one side and choice of English or Spanish words on the other side.
   e. Panel is constructed from 1/4" aluminum
   f. Choose any ProShield color for posts
   g. Available in direct bury and surface mount
3. Material:
   a. Post: Weldment comprised 2.375 inch (60,33 mm) O.D. RS20 (.095-.105) (2,41 mm-2,67 mm) wall galvanized tube, ¼” (6,35 mm) HRPO steel sheet and aluminum post cap. Finish: ProShield, color specified.
   b. Locking Clamp: Fabricated from 7GA. (.179”)(4,54 mm) stainless steel. Finish: ProShield, color specified.
   c. Sign Panel: Panel is fabricated from 1/8 inch (.125 inch) (3,17 mm) aluminum plate. Finish: ProShield, gray in color. (Sign) Digital image is transferred to the panel, then infused into the ProShield.
   d. Fasteners: Primary fasteners shall be socketed and pinned tamperproof in design, stainless steel (SST) per ASTM F 879 unless otherwise indicated.

PART 2 EXECUTION

2.1 EXAMINATION

A. Do not begin installation until substrates have been properly prepared. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

2.2 PREPARATION

A. Clean surfaces thoroughly prior to installation. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

2.3 INSTALLATION

A. Install in accordance with manufacturer's instructions, approved submittals and in proper relationship with adjacent construction.

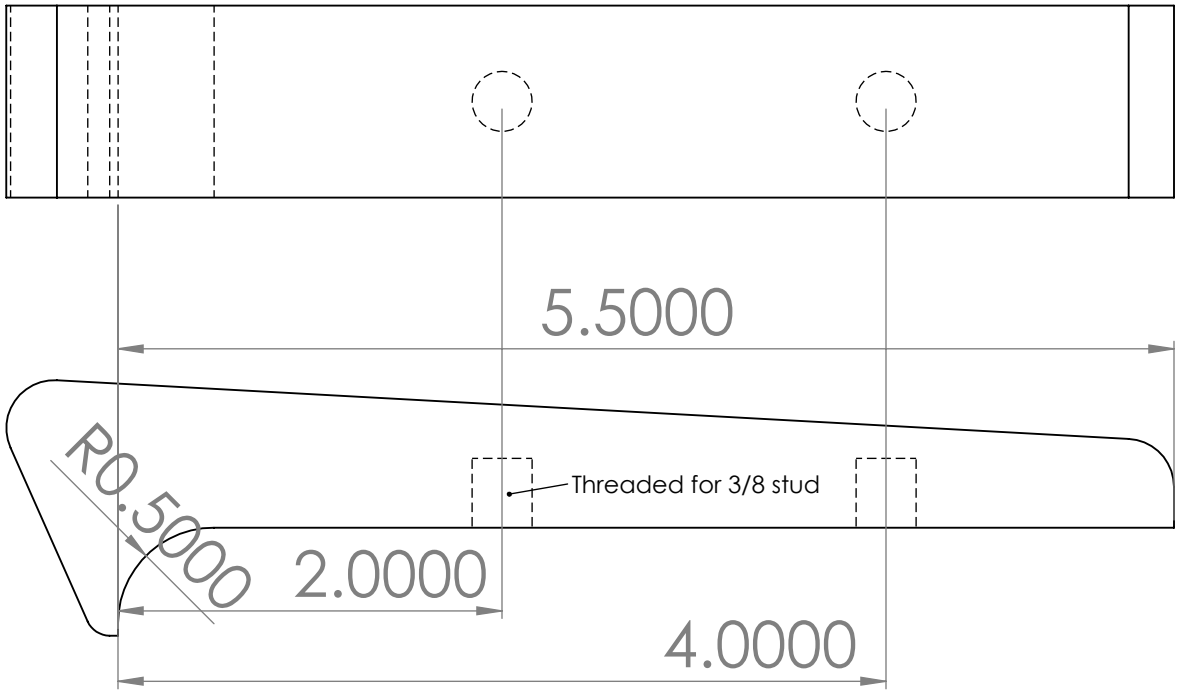
2.4 PROTECTION

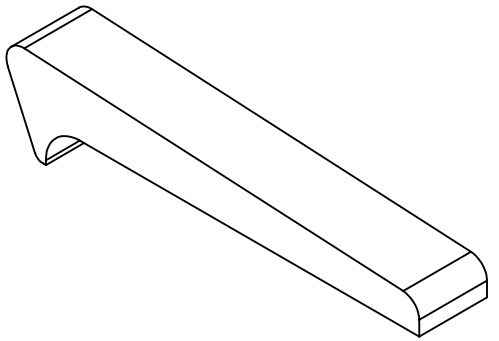
A. Protect installed products until completion of project.

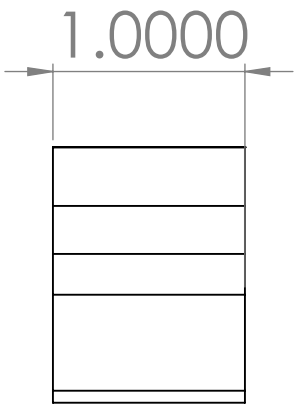
B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION

Landscape Structures Inc.
601 S. 7th Street
Delano, MN 55328-0198
Tel: 763-972-5200
Email: info@playlsi.com
Web: https://www.playlsi.com







6061 T6 Aluminum. Debur. Type II Clear anodize or Hard Anodize.
Set with two 3/8" x 1-1/2" studs and epoxy.

Spacing: product to be spaced 18-24" from end of the wall and approx 36" +/- 6" on center (do not exceed 4' max). Do not apply product at grout joint. For applications with grout joints, layout should be symmetric but part locations must be safe drilling distance from joint (min 4")

Not intended for use on steps, stairs, sidewalk curb or any other pedestrian trafficked surface.

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Intellicept- Makers of SKATESTOPPERS

TITLE:

Gorilla R0.5

SIZE	DWG. NO.	REV
A	GOR05CUTSHEET122025	

SHEET 1 OF 1