



DEPARTMENT OF REGULATORY AND ECONOMIC RESOURCES (RER)
BOARD AND CODE ADMINISTRATION DIVISION

MIAMI-DADE COUNTY
PRODUCT CONTROL SECTION
11805 SW 26 Street, Room 208
Miami, Florida 33175-2474
T (786) 315-2590 F (786) 315-2599

www.miamidade.gov/economy

NOTICE OF ACCEPTANCE (NOA)

Canam Steel Corporation, Hambro Division
450 East Hillsboro Boulevard
Deerfield Beach, FL 33441

SCOPE:

This NOA is being issued under the applicable rules and regulations governing the use of construction materials. The documentation submitted has been reviewed and accepted by Miami-Dade County RER-Product Control Section to be used in Miami Dade County and other areas where allowed by the Authority Having Jurisdiction (AHJ).

This NOA shall not be valid after the expiration date stated below. The Miami-Dade County Product Control Section (In Miami Dade County) and/or the AHJ (in areas other than Miami Dade County) reserve the right to have this product or material tested for quality assurance purposes. If this product or material fails to perform in the accepted manner, the manufacturer will incur the expense of such testing and the AHJ may immediately revoke, modify, or suspend the use of such product or material within their jurisdiction. RER reserves the right to revoke this acceptance, if it is determined by Miami-Dade County Product Control Section that this product or material fails to meet the requirements of the applicable building code.

This product is approved as described herein, and has been designed to comply with the High Velocity Hurricane Zone of the Florida Building Code.

DESCRIPTION: "Hambro D500 Floor & Roof System"

APPROVAL DOCUMENT: Dwg. No. H-ILL-1I, titled "D-500 Fabrication Detail", one sheet, Dwg. No. ED-1 titled "Typical Erection Procedures", one sheet, Dwg. No. ED-2 titled "Typical Details", one sheet, Dwg. No. IN-1 through IN-5 titled "Installation details" all prepared by Canam Steel Corporation, Hambro Division, all signed & sealed by Ian H. Yap, P.E. on Feb. 15, 2016, all bearing the Miami-Dade County Product Control Revision stamp with the Notice of Acceptance number and the expiration date by the Miami-Dade County Product Control Section.

MISSILE IMPACT RATING: None

LABELING: Each steel joist shall bear a permanent label with the manufacturer's name or logo, city, state and the following statement: "Miami-Dade County Product Control Approved", unless otherwise noted herein.

RENEWAL of this NOA shall be considered after a renewal application has been filed and there has been no change in the applicable building code negatively affecting the performance of this product.

TERMINATION of this NOA will occur after the expiration date or if there has been a revision or change in the materials, use, and/or manufacture of the product or process. Misuse of this NOA as an endorsement of any product, for sales, advertising or any other purposes shall automatically terminate this NOA. Failure to comply with any section of this NOA shall be cause for termination and removal of NOA.

ADVERTISEMENT: The NOA number preceded by the words Miami-Dade County, Florida, and followed by the expiration date may be displayed in advertising literature. If any portion of the NOA is displayed, then it shall be done in its entirety.

INSPECTION: A copy of this entire NOA shall be provided to the user by the manufacturer or its distributors and shall be available for inspection at the job site at the request of the Building Official.

This NOA **revises & renews** NOA # 11-0412.03 and consists of this page 1, evidence submitted pages E-1, E-2, & E-3 as well as approval document mentioned above.

The submitted documentation was reviewed by **Helmy A. Makar, P.E., M.S.**



Helmy A. Makar
10/06/2016

NOA No. 16-0224.14
Expiration Date: 04/30/2021
Approval Date: 10/06/2016

Canam Steel Corporation, Hambro Division

NOTICE OF ACCEPTANCE: EVIDENCE SUBMITTED

1. EVIDENCE SUBMITTED UNDER PREVIOUS APPROVAL # 98-0310.06

A. DRAWINGS

1. Drawings No. H-1LL-1 titled "Serie-H Fabrication Detail", Drawing No. ED-1 titled "Typical Erection Procedures", Drawing No. ED-2 titled "Typical Details", dated July 1, 1991, last revised May 11, 1995, signed and sealed by Charles F. Couch, P.E.

B. TESTS

1. None.

C. CALCULATIONS

1. Calculations titled "Hambro D-500 Composite Floor and Roof System, Design Brief", prepared, signed and sealed by Charles F. Couch, P.E., on October 1, 1994.

D. MATERIAL CERTIFICATIONS

1. None.

E. STATEMENTS

1. Letter stating that there has been no change to their product and that Mr. Charles F. Couch, P.E., is still their engineer and in the engineering business, prepared by Hambro Structural Systems, a division of Canam Steel Corporation, dated March 6, 1998, and signed by michael a. Romano.

F. OTHER

1. This approval renews NOA No. 94-1007.04, issued on July 6, 1995.

2. EVIDENCE SUBMITTED UNDER PREVIOUS APPROVAL # 00-1227.02

A. DRAWINGS

1. Drawings No. H-1LL-1 titled "Serie-H Fabrication Detail", Drawing No. ED-1 titled "Typical Erection Procedures", Drawing No. ED-2 titled "Typical Details", dated July 1, 1991, last revised May 11, 1995, signed and sealed by Charles F. Couch, P.E. These drawings are submitted because the file drawings are hard to read.

B. TESTS

1. None.

C. CALCULATIONS

1. None.

D. MATERIAL CERTIFICATIONS

1. None.



Helmy A. Makar, P.E., M.S.
Product Control Section Supervisor

NOA No. 16-0224.14

Expiration Date: 04/30/2021

Approval Date: 10/06/2016

NOTICE OF ACCEPTANCE: EVIDENCE SUBMITTED

3. EVIDENCE SUBMITTED UNDER PREVIOUS APPROVAL # 02-0318.09

A. DRAWINGS

1. *Dwg. No. H-1LL-1, titled "Serie-H Fabrication Detail", one sheet, Dwg. No. ED-1 titled "Typical Erection Procedures", one sheet, Dwg. No. ED-2 titled "Typical Details", one sheet, all prepared by Canam Steel Corporation, Hambro Division, all signed & sealed by Craig W. Storch, P.E. on January 14, 2005*

B. TESTS

1. *None.*

C. CALCULATIONS

1. *None.*

D. QUALITY ASSURANCE

1. *By Miami-Dade County Building Code Compliance Office.*

E. MATERIAL CERTIFICATIONS

1. *None.*

4. EVIDENCE SUBMITTED UNDER PREVIOUS APPROVAL # 06-0420.02

A. DRAWINGS

1. *None.*

B. TESTS

1. *None.*

C. CALCULATIONS

1. *None.*

D. QUALITY ASSURANCE

1. *By Miami-Dade County Building Code Compliance Office.*

E. MATERIAL CERTIFICATIONS

1. *None.*



Helmy A. Makar, P.E., M.S.
Product Control Section Supervisor
NOA No. 16-0224.14
Expiration Date: 04/30/2021
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Canam Steel Corporation, Hambro Division

NOTICE OF ACCEPTANCE: EVIDENCE SUBMITTED

5. EVIDENCE SUBMITTED UNDER PREVIOUS APPROVAL # 11-0412.03

A. DRAWINGS

1. *Dwg. No. H-ILL-1I, titled "Serie D500 Fabrication Detail", one sheet, Dwg. No. ED-1 titled "Typical Erection Procedures", one sheet, Dwg. No. ED-2 titled "Typical Details", one sheet, all prepared by Canam Steel Corporation, Hambro Division, all signed & sealed by Ian H. Yap, P.E. on July 26, 2011.*

B. TESTS

1. *None.*

C. CALCULATIONS

1. *None.*

D. QUALITY ASSURANCE

1. *By Miami-Dade County Building and Neighborhood Compliance Department.*

E. MATERIAL CERTIFICATIONS

1. *None.*

6. NEW EVIDENCE SUBMITTED

A. DRAWINGS

1. *Dwg. No. H-ILL-1I, titled "D-500 Fabrication Detail", one sheet, Dwg. No. ED-1 titled "Typical Erection Procedures", one sheet, Dwg. No. ED-2 titled "Typical Details", one sheet, Dwg. No. 1N-1 through 1N-5 titled "Installation details" all prepared by Canam Steel Corporation, Hambro Division, all signed & sealed by Ian H. Yap, P.E. on Feb. 15, 2016.*

B. TESTS

1. *None.*

C. CALCULATIONS

1. *None.*

D. QUALITY ASSURANCE

1. *By Miami-Dade County Department Regulatory and Economic Resources.*

E. MATERIAL CERTIFICATIONS

1. *None.*

F. OTHERS

1. *Florida Building Code, 2014 Edition Compliance letter, prepared by Canam Group, dated 02/15/2016, signed & sealed by Ian H. Yap, P.E.*

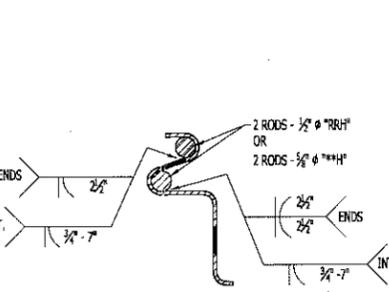
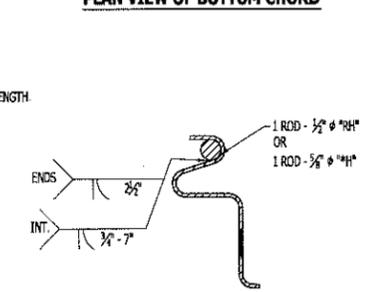
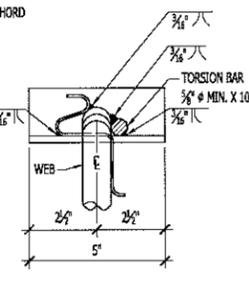
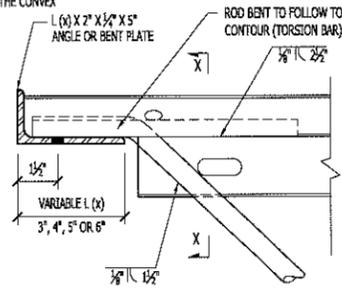
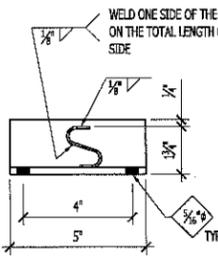
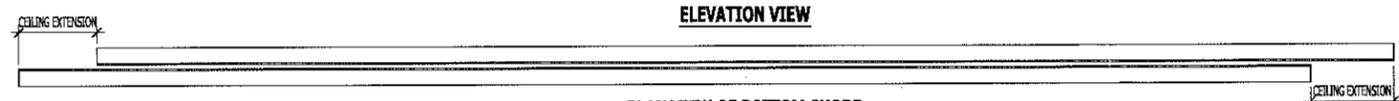
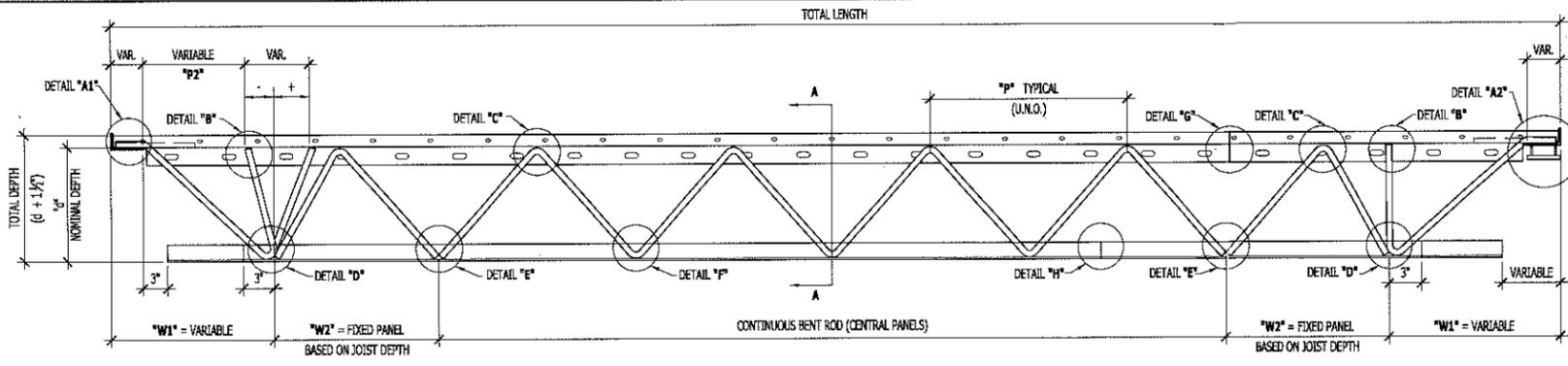


Helmy A. Makar, P.E., M.S.
Product Control Section Supervisor

NOA No. 16-0224.14

Expiration Date: 04/30/2021

Approval Date: 10/06/2016



END VIEW

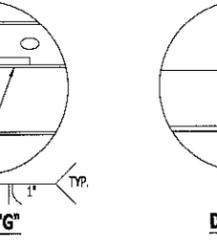
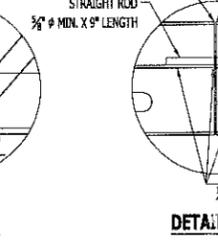
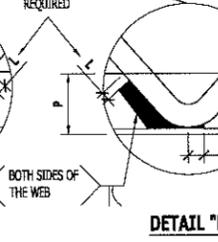
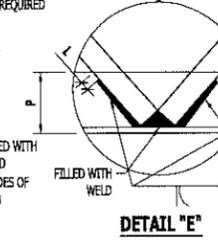
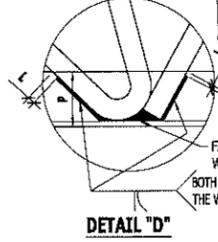
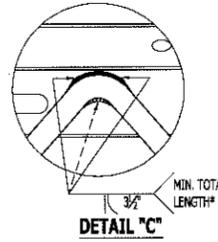
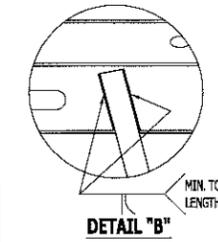
DETAIL "A1"

SECTION "X-X"

TOP CHORD SINGLE REINFORCING "RH" OR "HH" (AS REQUIRED)

TOP CHORD DOUBLE REINFORCING "RRR" OR "HHH" (AS REQUIRED)

JOIST GEOMETRY (SEE ELEVATION AS REFERENCE)				
NOM. DEPTH "D" (in.)	"W1" (in.)	"W2" (in.)	"P" (in.)	"P2" (in.)
6	12 TO 20	9	16	8 TO 16
8 TO 10	10 TO 20	12	20	6 TO 12
12	14 TO 25	16	24	10 TO 16
14 TO 16	19 TO 36	20	24	15 TO 24
18 TO 24	23 TO 36	24	24	19 TO 24



DETAIL "B"

DETAIL "C"

DETAIL "D"

DETAIL "E"

DETAIL "F"

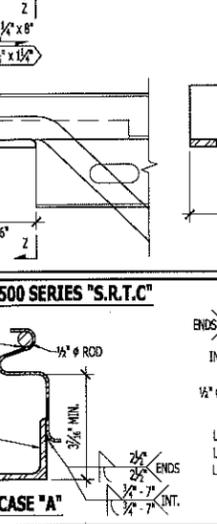
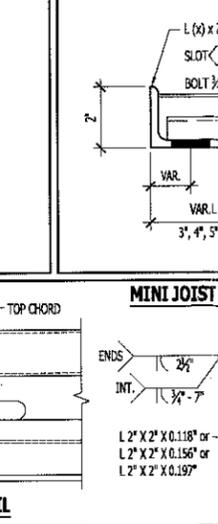
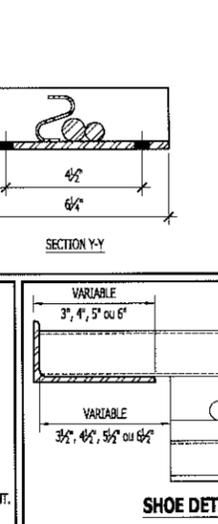
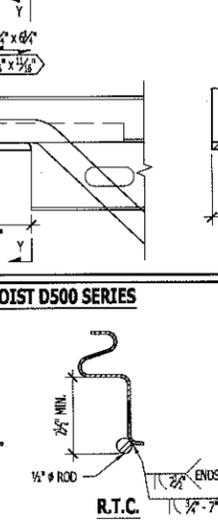
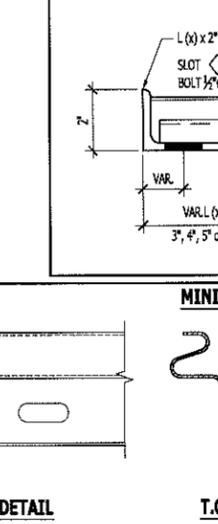
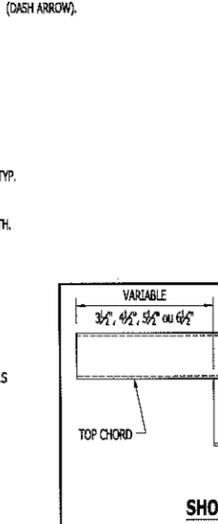
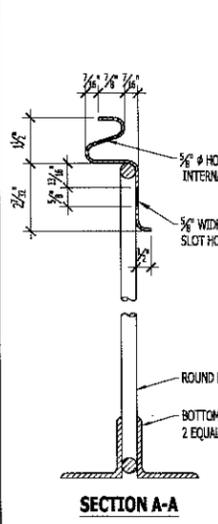
DETAIL "G"

DETAIL "H"

* IF WEB ROD CONNECTION OCCURS AT A SLOT, THE MIN. 1" WELD LENGTH SHALL BE MAINTAINED

* IF WEB ROD CONNECTION OCCURS AT A SLOT, THE MIN. 3/8" MIN WELD LENGTH SHALL BE MAINTAINED.

* IF ROD ARE EQUAL OR GREATER THAN 3/8", BE SURE TO ADD EXTRA WELDING IN THE LOWER CAVITY (DASH ARROW).



SECTION A-A

SHOE DETAIL

T.C.

R.T.C.

SHOE DETAIL

CASE "A"

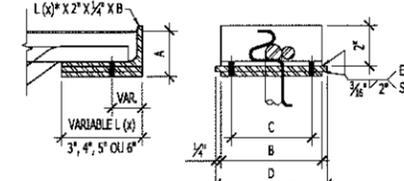
CASE "B"

DETAIL "A2" DEEP SHOE 2" @ 3/4"

DIM. A (no.)	ANGLE (no.)	PLATE (S) (no.)			
		NO HOLE	3/8" HOLE	3/8" HOLE	3/8" HOLE
2	L(x) 2 x 1/4"	1/4	1/4	1/4	1/4
2 1/4	L(x) 2 x 1/4"	1/4	1/4 + 1/4	1/4	1/4
2 1/2	L(x) 2 x 1/4"	1/4	1/4	1/4 + 1/4	1/4
2 3/4	L(x) 2 x 1/4"	1/4 + 1/4	1"	1/4 + 1/4	1/4 + 1/4
3	L(x) 2 x 1/4"	1/4 + 1/4	1 1/2"	1 1/2"	1/4 + 1/4
3 1/4	L(x) 2 x 1/4"	1/4 + 1/4	1 1/2"	1 1/2"	1/4 + 1/4

ATTACHED TO SUPPORT: WELDING 5, SCREW (3/8" HOLE) 5, BOLT 1/2" (3/8" HOLE) 6 1/2, BOLT 3/4" (3/8" HOLE) 8

DIM B (no.): DIM C (no.), DIM D (no.)

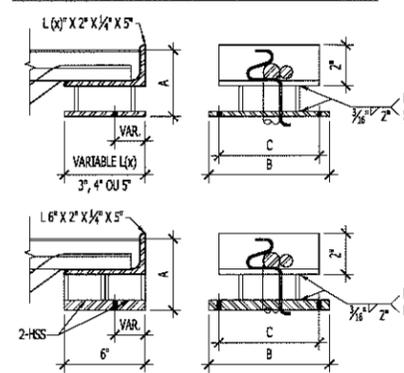


DETAIL "A2" DEEP SHOE 3 1/2" @ 12"

DIM. A (no.)	APPUIT (no.)	ANGLE (no.)	TUBE (no.)	PL (no.)
3 1/2 @ 12	3	3 x 2 x 1/4"	HSS 3 x 3 x 3/16"	5/8"
	4	4 x 2 x 1/4"	HSS 3 x 3 x 3/16"	1/2"
	5	5 x 2 x 1/4"	HSS 4 x 4 x 1/4"	1/2"
	6	6 x 2 x 1/4"	2-HSS 3 x 3 x 3/16"	1/2"

FIXATION SUR L'APPUIT: WELDING 8, SCREW (3/8" HOLE) 8, BOLT 1/2" (3/8" HOLE) 8, BOLT 3/4" (3/8" HOLE) 8

DIM B (no.): DIM C (no.)



NOTES

- MATERIALS:** T.C. (TOP CHORD) - HAMBRO ROLL FORMED SECTION, Fy = 50 KSI MIN. THICKNESS T = 0.09" B.C. (BOTTOM CHORD) - HOT OR COLD ROLLED ANGLES, Fy = 50 KSI MIN. WEB - BENT HOT ROLLED ROD (MAX. 1" @ 50 KSI YIELD STRENGTH MIN.), HSS, Fy = 44 KSI MIN. PLATE, Fy = 44 KSI MIN. ANGLE SHOE, Fy = 50 KSI MIN.
- JOINTS:** TOP AND BOTTOM CHORD SPLICE BY BUTT WELDING AT ANY POINT. NON-CONTINUOUS WEB MEMBER SPLICES TO OCCUR AT BOTTOM CHORD ONLY.
- WELDING:** TO BE IN ACCORDANCE WITH HAMBRO SHOP STANDARDS WHICH HAVE BEEN VERIFIED BY FULL SCALE TESTING. MATERIAL SURFACES SHOULD BE DRY AND CLEAN FREE FROM LOOSE SCALE, PAINT OR GREASE THAT IS DETRIMENTAL TO WELDING. BUTT WELDS FOR T.C. ARE MADE WITH THE SMAW PROCESS FOR THICKNESS NOT EXCEEDING 5MM, THE GMAW PROCESS CAN BE USED. GROOVE WELDS FOR B.C. ARE MADE WITH THE GMAW PROCESS. FILLETS AND FLARE BEVEL GROOVE WELDS ARE USUALLY MADE WITH THE GMAW PROCESS OR BY THE SMAW PROCESS. ALL WELDING SHALL BE MADE IN FLAT OR HORIZONTAL POSITIONS.
- WELDING CONSUMABLES:** SMAW: E70XX GMAW: E805-X
- CAMBER:** APPROXIMATE CAMBER WILL BE AS FOLLOWS:
 BASED:
 THE TOP CHORD: t = 0.090"
 SPAN RANGE:
 15'-0" TO 20'-0" : 0" TO 1"
 20'-0" TO 25'-0" : 3/8" TO 1 1/2"
 25'-0" TO 30'-0" : 1/2" TO 1 3/4"
 30'-0" TO 40'-0" : 1" TO 2"
 IN NO CASE JOISTS WILL BE MANUFACTURED WITH NEGATIVE CAMBER.
- SWEEP:** THE MAXIMUM SWEEP OF A JOIST OF THE LENGTH UPON COMPLETION OF MANUFACTURE SHALL BE NOT GREATER THAN 1/240 OF THE LENGTH ON WHICH THE SWEEP IS MEASURED
- PAINTING:** JOIST SHALL BE SHOP PAINTED BY ONE COAT OF STANDARD SHOP PRIMER.
- EACH PROJECT SHALL HAVE INDIVIDUAL JOIST CALCULATIONS SHOWING DESIGN LOADS AND INDIVIDUAL JOIST MEMBER SIZES

PRODUCT REVISED as complying with the Florida Building Code Acceptance No 16-0224-10 Expiration Date 04/30/2021

Handwritten signature and date: 2/15/16

HAMBRO STANDARD BOTTOM CHORDS

MEMBER (in.)	AREA in. ²	WEIGHT lb./ft.
2 7/8" X 2 7/8" X 0.236"	2.539	8.75
3" X 3" X 0.224"	2.59	8.80
3" X 3" X 0.236"	2.657	9.16
3 1/8" X 3 1/8" X 0.236"	2.775	9.57
3" X 3" X 0.25"	2.88	9.90
2 1/2" X 2 1/2" X 0.15"	2.93	10.01
3" X 3" X 0.281"	3.21	10.94
3" X 3" X 0.16"	3.555	12.20
3 1/2" X 3 1/2" X 0.287"	3.85	13.12
3 1/2" X 3 1/2" X 0.313"	4.19	14.40
3" X 3" X 3/8"	4.219	14.41
3 1/2" X 3 1/2" X 0.344"	4.58	15.58
3 1/2" X 3 1/2" X 3/8"	4.969	17.00

HAMBRO STANDARD BOTTOM CHORDS

MEMBER (in.)	AREA in. ²	WEIGHT lb./ft.
1" X 1" X 0.109"	0.41	1.40
1 1/4" X 1 1/4" X 0.109"	0.52	1.78
1 1/4" X 1 1/4" X 0.118"	0.546	1.91
1 3/8" X 1 3/8" X 0.118"	0.605	2.11
1 1/2" X 1 1/2" X 0.109"	0.63	2.14
1 1/2" X 1 1/2" X 0.118"	0.664	2.32
1 5/8" X 1 5/8" X 0.118"	0.723	2.52
1 1/2" X 1 1/2" X 0.130"	0.75	2.54
1 1/2" X 1 1/2" X 0.137"	0.78	2.66
1 3/4" X 1 3/4" X 0.118"	0.782	2.73
1 1/2" X 1 1/2" X 0.157"	0.866	3.00
1 1/2" X 1 1/2" X 0.155"	0.88	3.00
2" X 2" X 0.118"	0.900	3.13
1 3/4" X 1 3/4" X 0.143"	0.96	3.26
1 5/8" X 1 5/8" X 0.157"	0.945	3.28
1 3/4" X 1 3/4" X 0.155"	1.04	3.52
1 3/4" X 1 3/4" X 0.157"	1.024	3.55
1 3/4" X 1 3/4" X 5/32"	1.045	3.57
2" X 2" X 0.145"	1.118	3.804
1 7/8" X 1 7/8" X 0.157"	1.103	3.82
1 3/4" X 1 3/4" X 11/64"	1.144	3.89
2" X 2" X 0.156"	1.2	4.08
2" X 2" X 0.157"	1.181	4.10
2" X 2" X 0.166"	1.27	4.34
2 1/8" X 2 1/8" X 0.157"	1.260	4.37
1 7/8" X 1 7/8" X 0.197"	1.354	4.68
2" X 2" X 0.186"	1.42	4.82
2" X 2" X 3/16"	1.43	4.88
2" X 2" X 0.197"	1.452	5.02
2 1/8" X 2 1/8" X 0.197"	1.550	5.36
2" X 2" X 0.216"	1.64	5.56
2" X 2" X 7/32"	1.655	5.62
2 1/4" X 2 1/4" X 0.197"	1.649	5.70
2 3/8" X 2 3/8" X 0.197"	1.747	6.04
2 1/2" X 2 1/2" X 0.186"	1.81	6.14
2" X 2" X 0.247"	1.85	6.30
2 1/2" X 2 1/2" X 0.197"	1.846	6.38
2" X 2" X 1/4"	1.875	6.38
2 1/8" X 2 1/8" X 0.236"	1.831	6.31
2 1/4" X 2 1/4" X 0.236"	1.945	6.72
2 1/2" X 2 1/2" X 0.21"	2.01	6.84
2 3/8" X 2 3/8" X 0.236"	2.067	7.12
2 1/2" X 2 1/2" X 0.23"	2.194	7.46
2 1/2" X 2 1/2" X 0.236"	2.185	7.53
2 5/8" X 2 5/8" X 0.236"	2.303	7.94
2 1/2" X 2 1/2" X 1/4"	2.375	8.21
2 3/4" X 2 3/4" X 0.236"	2.421	8.34

NOVEMBER 2016

NO.	DATE	DESCRIPTION
1	03-17-04	
2	03-12-17	
3	05-06-17	
4	06-05-09	
5	15-05-20	GENERAL REVISION
6	15-05-09	DEEP SHOE

DRAWN BY: EV
 CHECKED BY: MED and MN
 DATE: 97-03-12

LICENSE No 59557

STATE OF FLORIDA

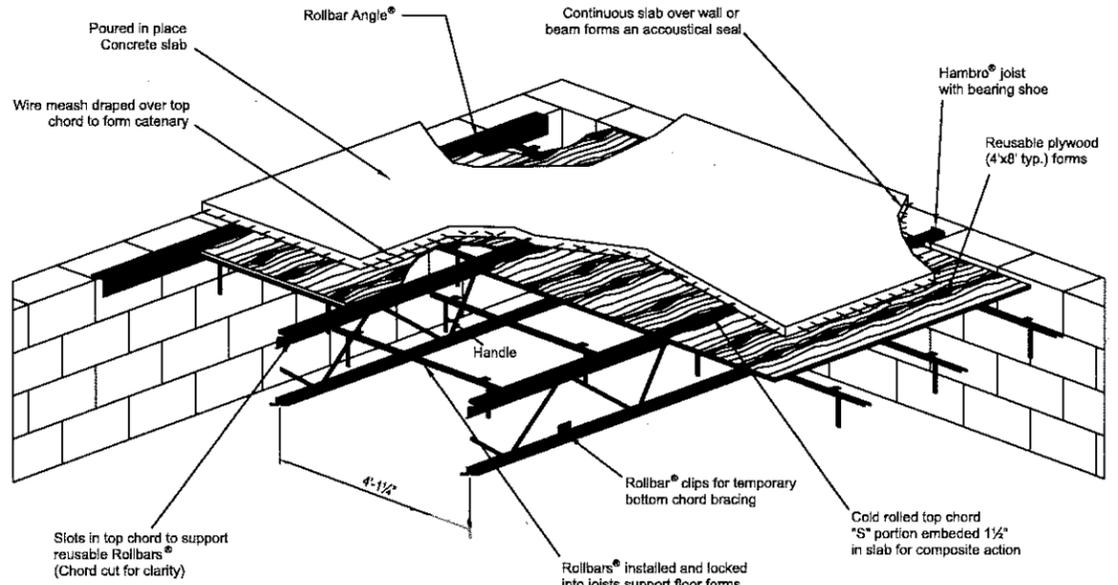
CANAM BUILDINGS

270, CHAMON DU TREMBLAY, BOUCHERVILLE (QUEBEC) CANADA, 348 593
 T. 450.641.4000 1800.866.536.4000 F.450.641.4001

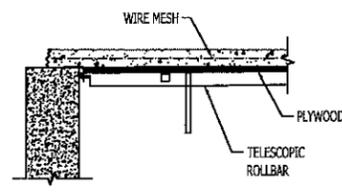
D-500 FABRICATION DETAIL H-ILL-11

GENERAL NOTES - D500

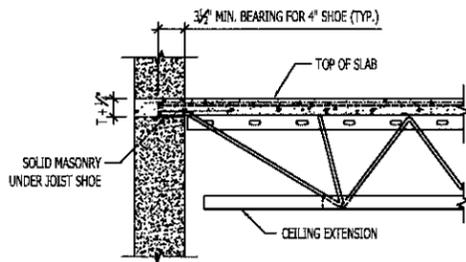
- REFER TO "DESIGN CRITERIA" TABLE ON PLAN FOR CONCRETE SLAB THICKNESS ON REMOVABLE PLYWOOD FORMS. MINIMUM CONCRETE COMPRESSIVE STRENGTH REQUIRED : $f_c = 3000\text{psi}$ AT 28 DAYS , UNLESS NOTED OTHERWISE.
- ALL CONCRETE WORK, FORM WORK, LAPPING & REINFORCEMENT WORK, SHALL CONFORM TO ACI 318 LATEST EDITION .
- REFER TO "DESIGN CRITERIA" TABLE ON PLAN FOR WELDED WIRE MESH. $F_y = 60\text{ksi}$ (MIN.), UNLESS NOTED OTHERWISE, CONFORM TO ASTM A-185 LATEST EDITION .
- STANDARD JOIST SHOE TO BE $4\frac{1}{2} \times 2\frac{1}{2} \times \frac{1}{4}$ " WITH A WIDTH OF 5" WHERE WELDED, UNLESS NOTED OTHERWISE.
- STANDARD TIE JOIST SHOE TO BE $4\frac{1}{2} \times 2\frac{1}{2} \times \frac{1}{4}$ " WITH A WIDTH OF 6 $\frac{1}{4}$ " WHERE BOLTED WITH $\frac{1}{2}$ " BOLTS UNLESS NOTED OTHERWISE.
- JOIST TO HAVE ONE DIP COAT STANDARD GREY PRIMER (SSPC - PAINT 15) , UNLESS NOTED OTHERWISE.
- INSTALLATION SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATION AND WITH THE LATEST HAMBRO INSTALLATION MANUAL BROCHURE (SEE SHEET 1N-1 THRU 1N-5)
- HAMBRO JOIST SPACING IS 4'-1 $\frac{1}{4}$ " UNLESS NOTED OTHERWISE.
- LOCATION OF JOIST MARKS ALONG JOIST LINES ON PLAN CORRESPONDS TO THE LOCATION OF METAL IDENTIFICATION TAG ON JOIST.
- PLUMBING HOLE IN SLAB MUST BE COORDINATED WITH JOIST SPACING AND EDGE OF HOLE MUST BE KEPT AT A MINIMUM OF 6" FROM JOIST CENTERLINE.
- WARNING... DO NOT MODIFY OR ALTER ANY HAMBRO PRODUCT WITHOUT WRITTEN CONSENT FROM ONE OF THE RESPONSIBLE ENGINEERS ON THIS PROJECT AND SUPPORT FROM CANAM QUALITY SALES AGENT.
- WARNING... JOIST STORAGE AT SITE GROUND MUST BE FREE OF ALL DEBRIS AND LEVEL. WOOD SPACERS BETWEEN BUNDLES OF JOISTS MUST BE SUFFICIENT TO PREVENT ONLY EXCESSIVE OVERHANG AT ENDS OR BENDING AT ANY LOCATION.
- WARNING... SLINGING OF JOISTS CHAINS MUST BE HOOKED AROUND CHORDS AT 2 LOCATIONS. JOISTS MUST NEVER BE HOISTED BY CHAINS AROUND WEB MEMBERS.
- WARNING... IMPORTANT NOTE ALL JOISTS LEAVING FABRICATOR'S PREMISES ARE INSPECTED AS TO THEIR QUALITY AND ALIGNMENT ANY DAMAGE, ERRORS OR OMISSIONS DISCOVERED AT SITE MUST BE REPORTED IMMEDIATELY BEFORE ERECTION. JOISTS ARE TO BE ALIGNED IN A TRUE VERTICAL AND LATERAL PLANE IF JOISTS ARE DAMAGED, NO WORK IS TO BE DONE TO CORRECT DAMAGE OR ERRORS UNLESS AUTHORIZED BY CANAM



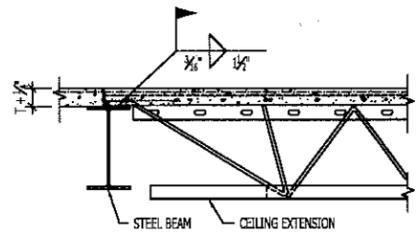
NOTE: Rollbars are rotated and removed for removal of forms



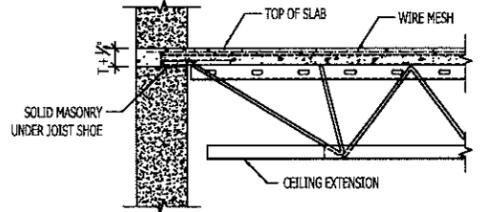
HAMBRO SIDE FORMING DETAIL ALTERNATE "A" - TELESCOPIC ROLLBAR
(FOR ALL DETAILS NOT SHOWN SEE BELOW)



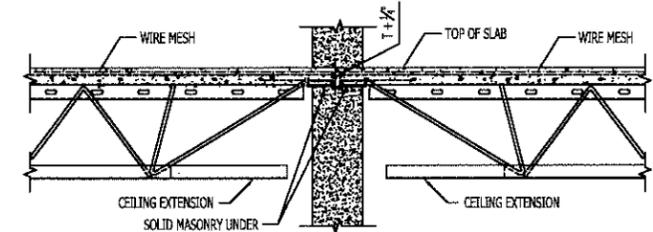
TYPICAL WALL BEARING DETAIL



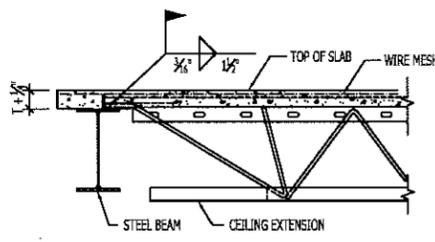
TYPICAL JOIST BEARING DETAIL AT STEEL BEAM



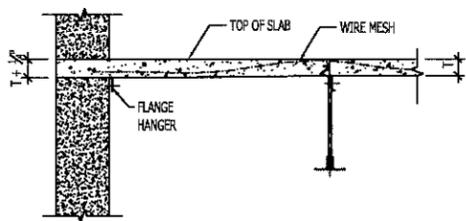
1 JOIST BEARING DETAIL ON WALL



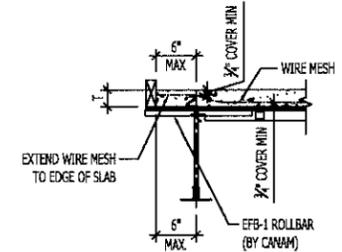
2 JOIST BEARING DETAIL ON WALL



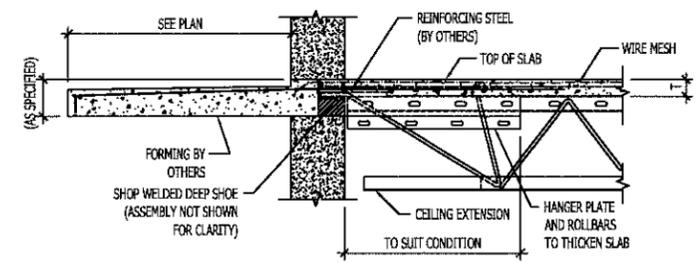
3 JOIST BEARING DETAIL ON STEEL BEAM



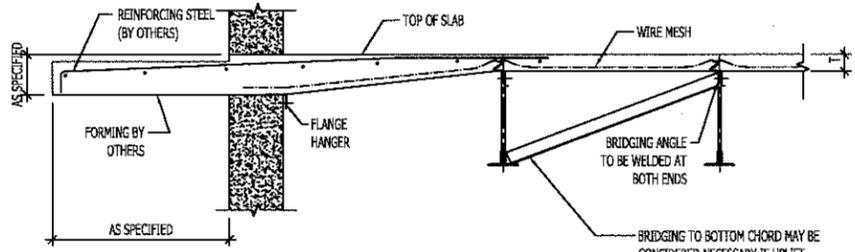
4 DETAIL SHOWING SLAB BEARING ON EXTERIOR BEARING WALL



5 SECTION AT EDGE OF SLAB

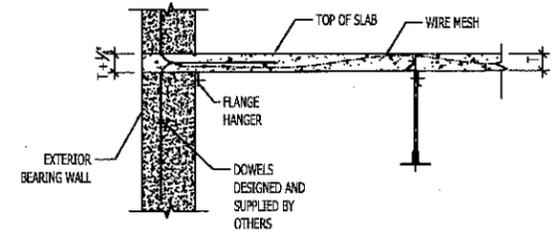


7 CANTILEVERED BALCONY DETAIL

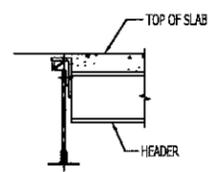


8 CANTILEVERED BALCONY DETAIL

IMPORTANT:
ANGLES TO BE INSTALLED AFTER HAMBRO FORMS STRIPPED BUT BEFORE THE REMOVAL OF BALCONY SUPPORT.

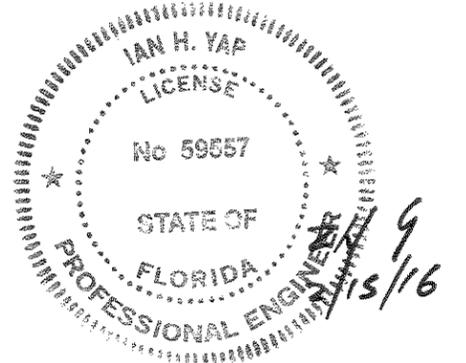


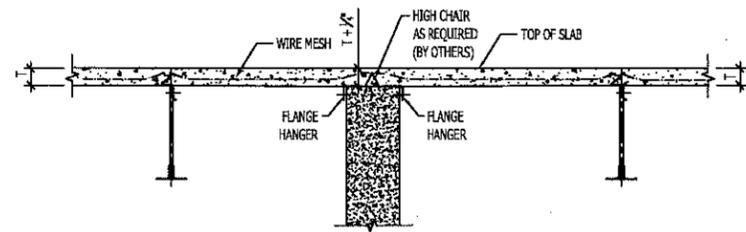
9 DETAIL SHOWING SLAB RESTING ON WALL AT ROOF



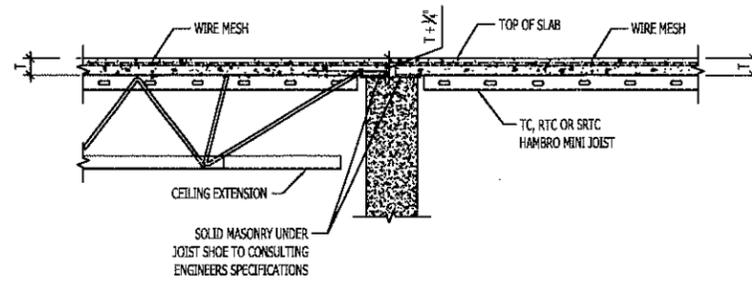
10 HEADER SUPPORT DETAIL

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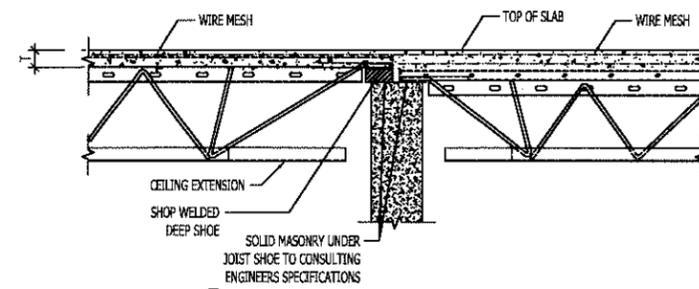




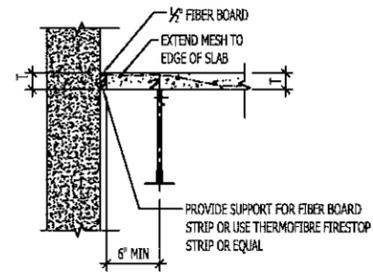
11 JOIST PARALLEL TO WALLS



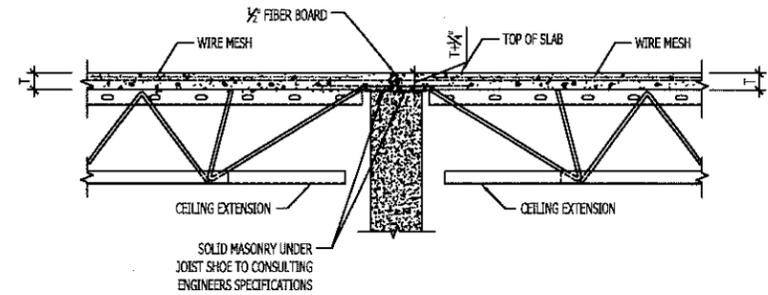
12 BEARING WALL AT CORRIDOR



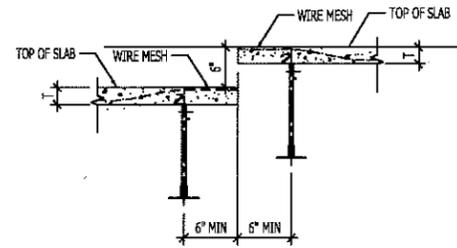
13 RAISED SHOE TO SUIT SLAB THICKNESS



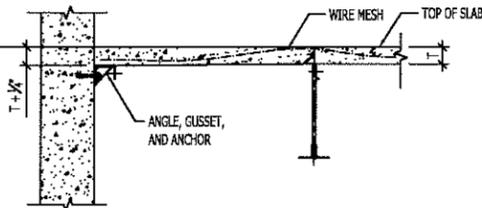
14 EXPANSION JOINT DETAIL AT WALL



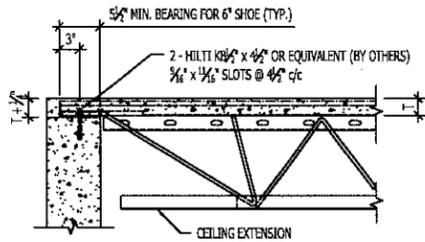
15 EXPANSION JOINT DETAIL OVER WALL



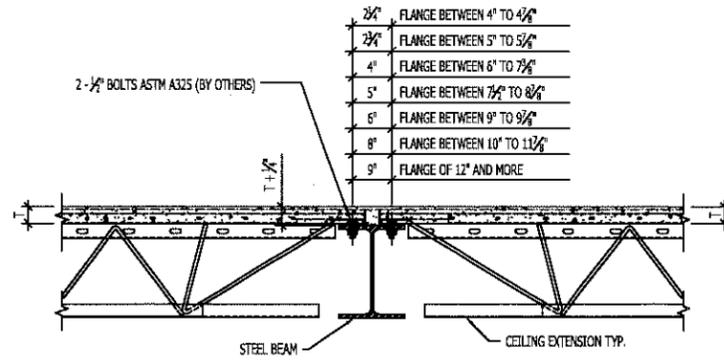
16 SLABS AT DIFFERENT LEVELS TO CREATE STEP



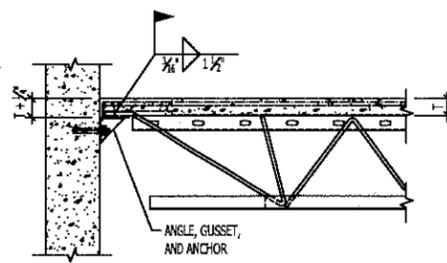
17 SLABS BEARING ON ANGLE



18 TIE JOIST AT WALL



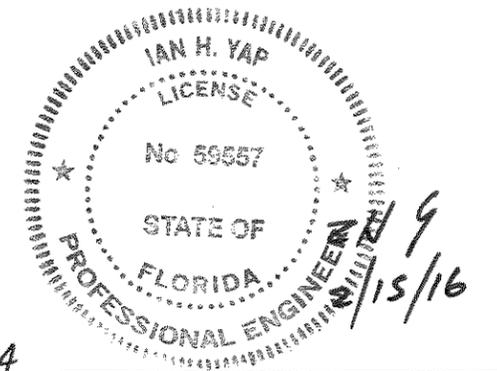
19 TIE JOIST AT BEAM



20 TIE JOIST AT BEAM

3/4"	FLANGE BETWEEN 4" TO 4 1/4"
3/4"	FLANGE BETWEEN 5" TO 5 1/4"
4"	FLANGE BETWEEN 6" TO 7 1/4"
5"	FLANGE BETWEEN 7 1/2" TO 8 1/4"
6"	FLANGE BETWEEN 9" TO 9 1/4"
8"	FLANGE BETWEEN 10" TO 11 1/4"
9"	FLANGE OF 12" AND MORE

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DELIVERY, HANDLING AND STORAGE

DELIVERY

Hambro® joists are delivered on a flat bed trailer, banded in nested bundles and tagged by job. Proper equipment should be provided for off-loading the material.

All material must be checked by the buyer and/or installer upon arrival at the job site, with discrepancies and damages promptly reported to your Hambro® supplier at time of delivery.

NOTE: Hambro® joists shall be fabricated with approximately following cambers*:

SPAN	CAMBER
10' to 20'	0" to 3/4"
20' to 30'	3/4" to 1-1/2"
30' to 40'	1-1/2" to 2"

* Based upon dead load design

HOISTING

When hoisted by crane, the cables must be placed at third points and under the top chord of the joists, never attached to the web members.

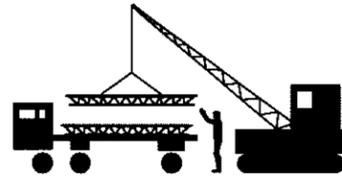


Diagram #1

STORING

The Hambro® joists must be stored upright on a level surface; to prevent damage, joists should not be stacked.

DAMAGED JOISTS

Care should be exercised at all times to avoid damage through careless handling during unloading, storing and installing. Note, that damaged joists may impair the performance and safety of the system, and must be repaired or replaced prior to installation.

DO NOT MAKE FIELD REPAIRS TO DAMAGED HAMBRO® JOISTS WITHOUT WRITTEN APPROVAL FROM YOUR HAMBRO® SUPPLIER AND STRUCTURAL ENGINEER OF RECORD. HAMBRO® WILL PROVIDE A REPAIR DETAIL AT NO CHARGE TO OUR CUSTOMERS.

ROLLBAR® DELIVERY

The Rollbars® will be delivered to the job site in racks or bundles per type. Upon job completion, all Rollbars® are to be sorted per type and placed back in racks or bundles for pick up.

JOIST IDENTIFICATION

The Hambro® joist is tagged with an identification plate attached at one end, at joist shoe.

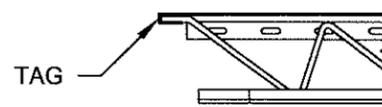


Diagram #2

1

INSTALLING THE JOISTS

TYPICAL SPACING

Hambro® joists are typically spaced at 4'-1 1/4" o.c., to start the installation procedure, space them approximately 4' o.c. on the bearing provided. Typical Hambro spacing may also be 5' nominal. For the sake of simplicity, in this manual the standard spacing will be 4'-1 1/4".

FOUR POINTS WHERE EXTRA CARE SHOULD BE TAKEN

A. **Direction of Top Chord:** It is necessary that all top chords face the same direction within a section of Hambro® slab. As you will note from diagram #3, the plywood forms butt on one side of the top chord, but tuck under on the opposite side in order to facilitate the stripping of the plywood. See the installation drawings for orientation and placement of the tagged I.D. end with respect to the bearing location. If the joists are not installed as indicated, plywood forms will not fit properly (the plywood forms will be too wide or too narrow to suit the joists spacing).

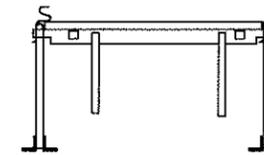


Diagram #3

B. **Special joists** will determine the direction of the top chord. Before you start installation, determine proper direction of top chords from joists that have special conditions (i.e. deep shoe (DS), hanger plate (HR), point load reinforcing (PL)). Study the Hambro® installation drawings for special conditions and follow the position of the tagged ends for proper orientation of joists. A little care at the start will eliminate the additional cost of removing bars and reinstalling joists.

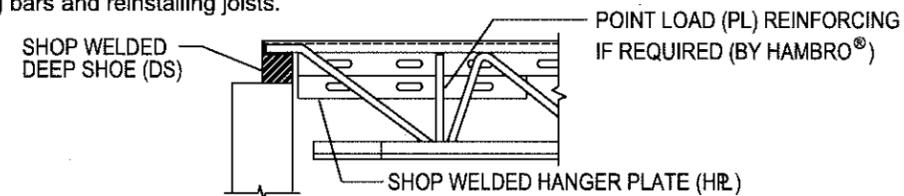


Diagram #4

C. **End joists:** A close measurement shall be taken on the first joist that is set, usually the one next to the wall, beam, or tie joist. Careful measurement of this spacing, which is usually a little larger or smaller than the standard 4'-1 1/4" spacing, will save unnecessary shifting of the system. All measurements should be taken nominally to the centerline of the joists.

D. **Bearing:** It is important to make sure that the joist shoes are placed properly on the supporting walls or beams. Joists should be centered so you get equal bearing for the shoes. The minimum bearing on masonry, concrete, metal stud or wood support is 3 1/2 inches. The minimum bearing on structural steel is 2 1/2 inches, unless noted otherwise. REDUCED BEARING COULD PRESENT A SAFETY HAZARD. As soon as the Hambro® joist is installed, the Rollbar® shall be installed. Particular attention should be paid to the installation of long Hambro® joists, each joist shall be adequately braced with the Rollbar® before the next joist is installed.

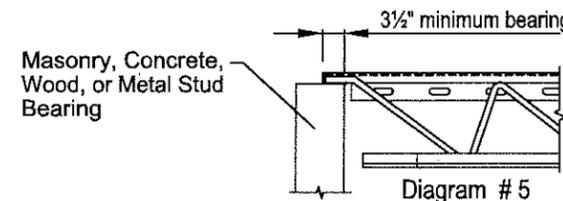


Diagram #5

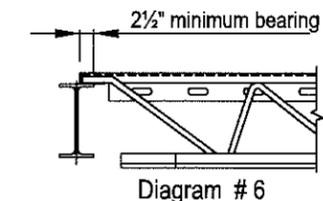
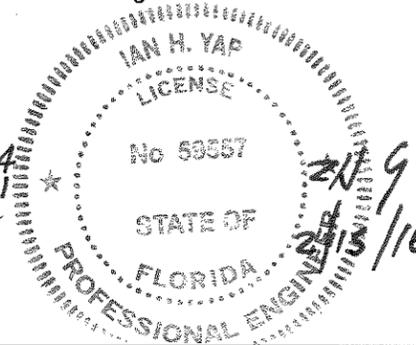


Diagram #6

2

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INSTALLING THE ROLLBAR®

Slots in the top chord are 5/8" x 1 1/4" and spaced 7 inches o.c. The first Rollbar® at the end of the joist, nearest the beam or wall, must be installed with the handles and the angle clips facing the wall and the flat surface of the bar must come in contact with the plywood forms.

SPACING

In order to support plywood forms properly, care should be taken to install the Rollbar® at 21" o.c.*, for the usual 2 1/2" - 3 1/2" slab, but never greater than 28" o.c. Exceeding this dimension would be dangerous, since it overloads the bars and plywood. **IMPROPER SPACING OF ROLLBAR® MAY AFFECT THE STRUCTURAL SAFETY OF THE SYSTEM DURING THE CONCRETING STAGE.** There should be a Rollbar® as close to 7" from the end of each plywood form as field conditions permit. In the event that this is not possible, one alternate which has proven to be successful in preventing the ends of the forms from deflecting under the imposed construction load is shown in diagram # 7.

* (Unless superseded by local conditions.)

Spanner bars or a standard Rollbar® laid flat may be used.

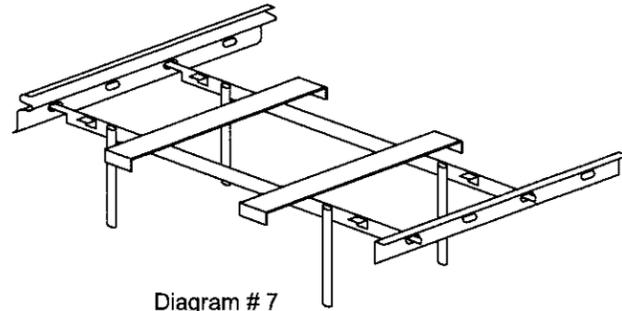


Diagram # 7

For "L" up to 1'-10 1/4", forms are to be supported by 1/2" or 7/16" diameter steel rods or EFB Rollbars® which fit into the slotted top chord, see Diagram # 8.

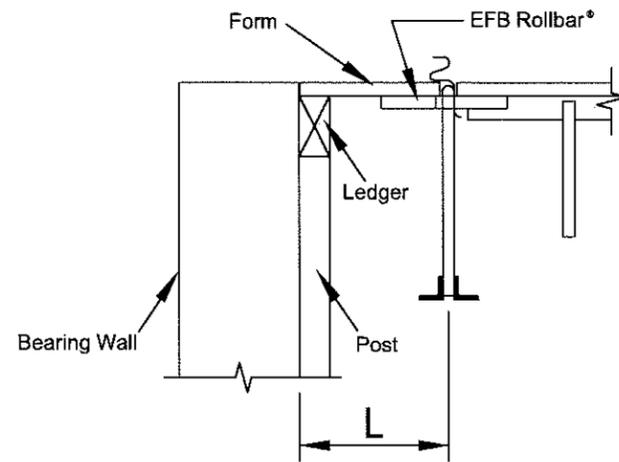


Diagram # 8

3

THICKENED SLABS

In the areas where thicker concrete slabs are specified, the Rollbar® should be installed at closer intervals. Where certain areas have been thickened and a hanger plate (HL) is used, they should not be spaced more than 14" o.c. for 4 inch to 6 inch slabs and 7" o.c. for slabs greater than 6 inches.

STAGGER ROLLBAR® SPACING

Stagger the bars from bay to bay, whenever possible, so that only one Rollbar® end is in each slot. This will simplify the stripping procedure. This does not apply to the temporary bottom chord bracing or first the Rollbar® nearest the supporting wall or beam.

TEMPORARY TOP CHORD BRACING

Rollbars® inserted into the horizontal slots of the joist top chord not only provide a platform for the plywood forming, but also act to stabilize the joists. At end bays, or along load bearing surfaces, the Rollbars® are inserted into slots in Rollbar® Angle (RA). If no wall or structural frame is present, brace the top chord to the floor or grade as shown in Diagram #10 (below).

TEMPORARY BOTTOM CHORD BRACING

To provide additional stability during concreting, a Rollbar® shall be inserted in the clips that are welded to the bottom chords of the joists. This temporary bracing is removed when stripping the forms. Bottom chord bracing shall be firmly braced to stable walls or main structural frame (i.e. a 2"x4" braced from the bottom chord angles to the end wall or beam as shown in Diagram #9 (below).

NOTE: Bracing must be continuous at bottom chords to insure that all joists remain vertical. At end joist, where no wall or structural frame is present, brace the bottom chord to the floor or grade.

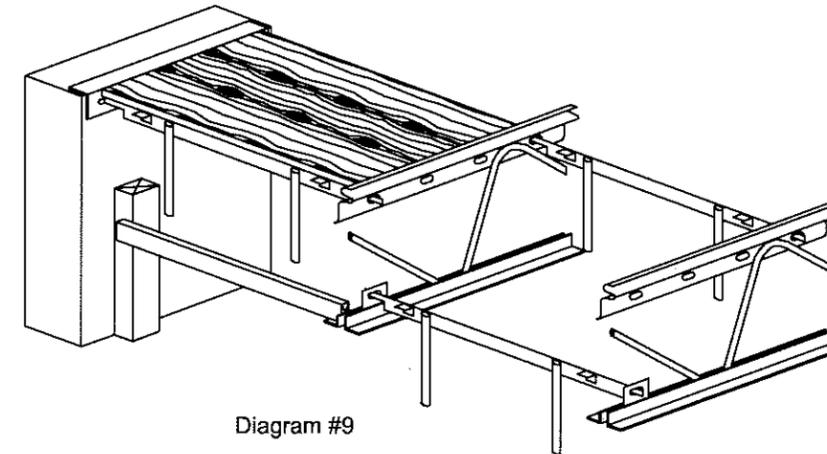


Diagram #9

To prevent lateral movement of the top chords during construction, the lateral support provided by the regular 4'-1 1/4" slotted Rollbar® must be carried through to the end walls or beams. When TRB's are used, due to odd spacing of the joists, positive spreaders must be spaced at 1/4 points (i.e. a 2" x 4" cut to exact length). See Diagram #10 (below).

NOTE: Plywood forms ripped to exact width will also provide the required lateral support.

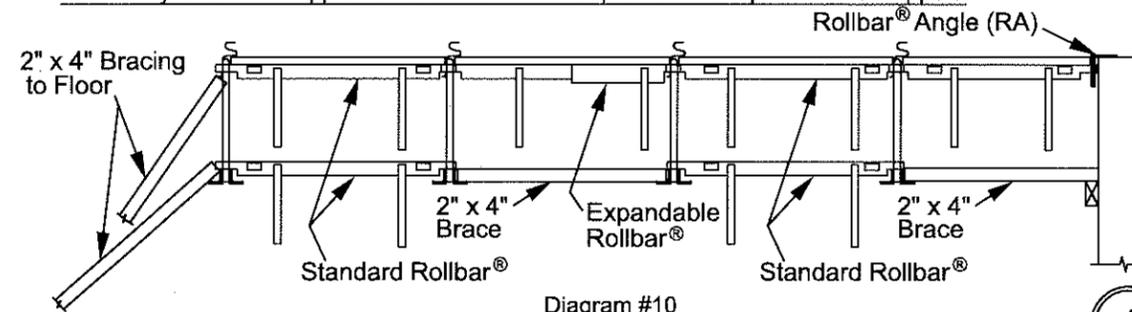
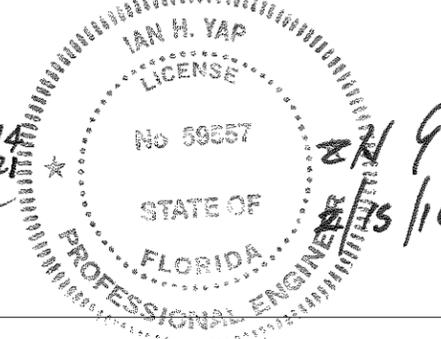


Diagram #10

4

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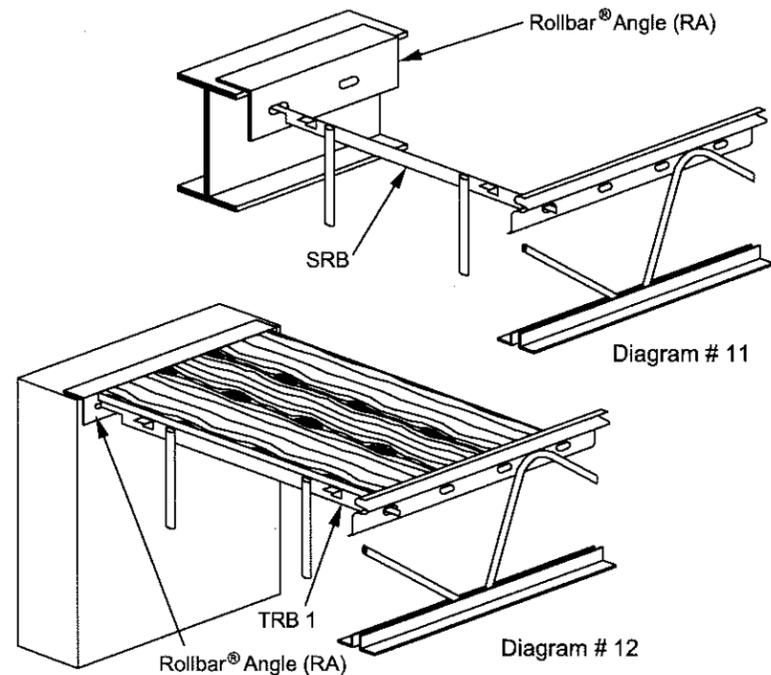
PLACING THE REUSABLE PLYWOOD FORMS

PLYWOOD TYPES

The standard spacing (4'-1 1/4") is designed to accept a standard 4' x 8' sheet of 3/8", 1/2" or 5/8" plywood. When using 3/8" plywood, it is not necessary to butt the forms. They may be overlapped. When using 1/2" or 5/8" plywood, all joints must be butted since the double thickness would encroach into the area of the top chord that is designed to be imbedded into the concrete. Grade CDX is acceptable. (If 3/4" plywood forms are desired, verify acceptable performance prior to initial use.)

END BAY CONDITION

When placing the plywood forms next to the end joist, be sure to avoid having the plywood sit on the bearing wall or beam. You will find that a form, bonded between the concrete pour and the bearing, is no longer removable and has to be chopped out. (see Diagrams #11 & #12)



Oiling the plywood form as required, prior to installation, will save labor in stripping and will also prolong the useful life of the forms.

CAUTION

1. Before any plywood forms are placed, there should be at least 3 standard spaced joists set (see Top & Bottom Chord Bracing on Page 10) with all the bars installed to safely develop the non-composite structural capacity of the Hambro® joists.
2. Full sheets of plywood are recommended. When shorter pieces are used, make sure they are adequately supported and safe for workers and construction loads.
3. Bundles of plywood or Rollbar® racks should be placed on supporting walls or beams, never on the joist system. The system is not designed for this condition, and this will present a serious SAFETY HAZARD.

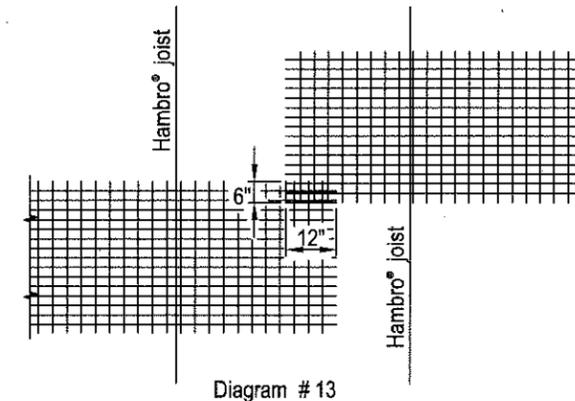
5

PLACING THE MESH

FLAT 8' x 20' SHEETS of plain welded wire mesh are recommended instead of rolled mesh for its ease of handling, and because it lays more naturally without ends sticking up.

LAPPING

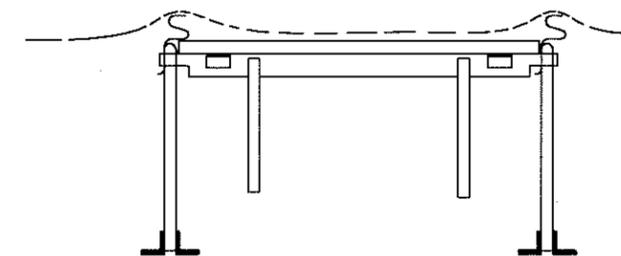
Be sure to get the minimum lap in both directions also be sure the mesh sits on the perimeter beams or walls at least 4" in order to develop the capacity of the slab, see Diagram #13 - Mesh Lapping.



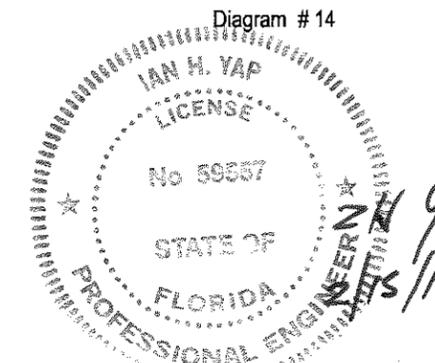
Unless otherwise noted on the approved installation drawings or final contract drawings a single layer of mesh is all that is required

Always check approved installation drawings and follow the contract drawings for slab reinforcement.

The flat sheets of mesh should drape naturally to the desired location and as noted in Diagram #14 do not step down the mesh on either side the top chord.



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6



2-12-16

1N-3

PLACING THE CONCRETE

CONCRETE MIX

The minimum compressive concrete strength is 3000 psi for normal weight concrete. The aggregate in the concrete mix should not be greater than 3/4".

PLACING

When placing the concrete, maintain a depth of one inch minimum above the top chord for a nominal 2 1/2" slab. You will notice the joists are fabricated with a positive camber to offset the deflection caused by the weight of the concrete. It will come out as the slab is poured, leaving a small residual camber for additional dead load.

NOTE: Hambro® joists shall be fabricated with approximately following cambers*:

SPAN	CAMBER
10' to 20'	0" to 3/4"
20' to 30'	3/4" to 1-1/2"
30' to 40'	1-1/2" to 2"

* Based upon dead load design

SLUMP

Field experience indicates a 4" to 5" slump at the time of the pour is easy to work with and finish. Greater slumps will create excessive leakage and cleanup. **CAUTION: TOO HIGH A SLUMP REDUCES THE STRENGTH OF THE CONCRETE AND CAUSES EXCESSIVE SHRINKAGE CRACKS.**

CURING

Curing procedures shall be in accordance with the latest ACI requirements.

VIBRATING

The concrete shall be lightly but thoroughly vibrated to ensure:

1. The full encasement of the top chord in the concrete (letting the vibrator lightly hit the top chord will assure encasement). This is important in order to obtain the full design capacity of the system.
2. The elimination of "honeycombs".
3. That proper concrete cover is provided under the mesh.

CONSTRUCTION JOINTS

When pouring and finishing a deck, it is not necessary to complete the entire deck monolithically. If it becomes necessary to stop the pour parallel to the joists, the joint should be midway between the joists, but never closer than 6" to the top chord.

7

STRIPPING OF FORMS

SAFETY PRECAUTIONS WHEN POURING CONCRETE

The following 5 steps should be followed before and during the concrete pour to ensure a safe operation:

1. Check that all the Rollbars® and joists remain in the proper position prior to and during the pour.
2. As previously mentioned, reduce the spacing of the Rollbar® if the slab thickness is greater than 3 1/2".
3. Check the plywood forms prior to and during the pour to be sure they are properly lapped or butted and that the plywood or any other material has not moved or covered the top chord.
4. During the pour, care should be taken not to subject the joists to excessive construction loads. Otherwise, the performance and safety of the system may be impaired. Do not pour concrete in excess of slab thickness specified on drawings, and do not drop large bucket loads in a concentrated area.
5. The Rollbar® is not designed to support buggies; therefore, runways must be placed on the top chord. This is usually accomplished with wood planks 2" x 12", placed perpendicular to the top chord.

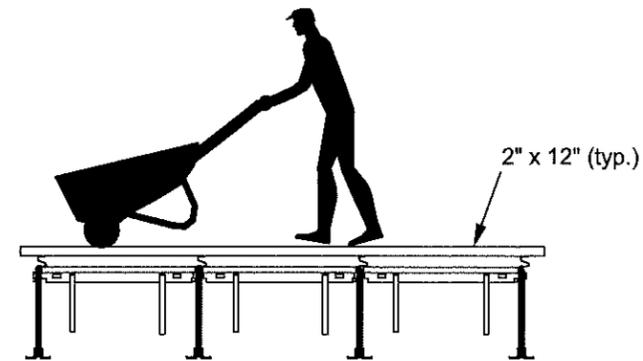


Diagram # 15

When the concrete attains a cylinder strength of 500 psi, you may remove the bars and plywood forms. When the concrete attains a cylinder strength of 1,000 psi, the deck is ready for work. Care should be exercised not to overload the system.

Avoid dropping the plywood forms when stripping. This causes damaged corners and edges, and greatly reduces the amount of re-use.

Also avoid dropping a Rollbar® on the slab, as this may cause chipping of the concrete surface.

Re-rack the bars by type. Place the racks where they are accessible for pick-up.

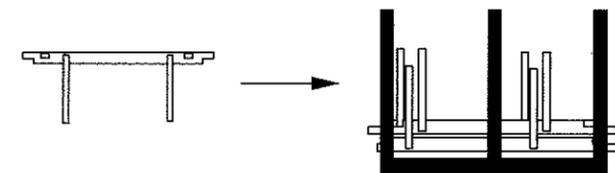
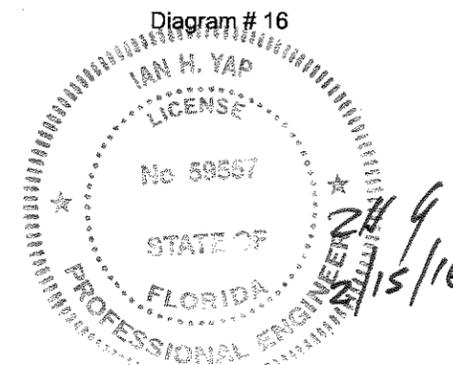


Diagram # 16

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IMPORTANT NOTICES

- A. Do not modify or alter any Hambro® product without first obtaining written approval for the desired change from the structural engineer of record and guidance from a qualified Hambro® Representative.
- B. Similarly, if it becomes necessary to vary from the "APPROVED" installation drawings supplied with each job, obtain approval from the structural engineer of record prior to making the change.
- C. CAUTION...DO NOT OVERLOAD (i.e. skids of blocks, drywall, sand, etc.) slab or joist at any phase of construction.

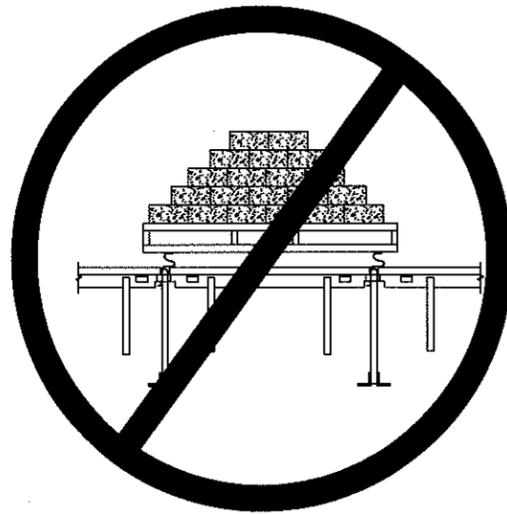
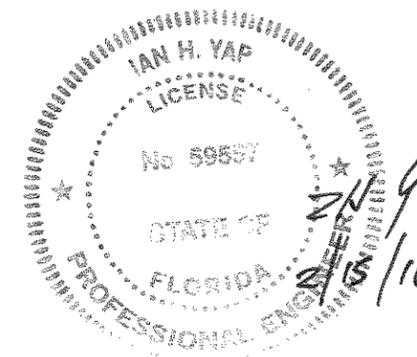


Diagram # 17

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