Becker Structural Engineers, Inc.
19 Commercial Street
Portland, ME 04101
207-879-1838

Transmittal

TO: City of Portland Housing & Neighborhood Services
City Hall Room 315
389 Congress Street
Portland, ME 04101
ATTN: Mr. Mike Nugent
DATE: 05-02-02
PROJECT: Avis
PROJECT No: 768

■Attached ❒Under separate cover via:

OFor Approval
OFor Your Use
OFor Review & Comment

❒Reviewed
❒For Signature
❒Returned for Corrections
■Other:

❒Prints ❒Specifications ❒Bond Reproducibles
❒Mylars ❒Calculations ❒Shop Drawings
❒Sepias ❒Letter ■Other:

Copies	Date	Drwg No.	Description
1	05/02/2002		Special Inspections Report

Comments:
CC: Mark Geuther – Horne Construction
Frank St. Pierre – Gawron Architects
Ronald Robson – Avis

Signed: _____
Ethan A. Rhile

DEPT. MAY ? RECEIVED

B E C K E R
structural engineers, inc.

Special Inspections Report

Avis Car Rental Facility

Jetport Boulevard
Portland, ME

May 2,2002

Prepared for:

Avis Rent-A-Car
0-20 Grand Central Parkway
East Elmhurst, *N Y* 11390

In conjunction with:

The **City** of Portland
389 Congress Street
City Hall Room 315
Portland, ME 04101

13 Commercial Street, Portland, ME 04101-4701 ■ Tel. 207-879-1**839** ■ Fax 207-879-1622

BECKER

structural engineers, inc.

Special Inspections Report
Avis Car Rental Facility
Jetport Boulevard, Portland, ME

May 2,2002

Table of Contents:

13 Commercial Street, Portland, ME 04101-4721 ■ Tel. 207-878-1388 ■ Fax 207-878-1822

1000 Statement of Special Inspections

Becker Structural Engineers, Inc.

STATEMENT OF SPECIAL INSPECTIONS

PROJECT: Avis Vehicle Service Center, Jetport Blvd, Portland, ME

LOCATION: Portland, Maine

PERMIT APPLICANT: Gawron Architects

APPLICANT'S ADDRESS: ***29*** Blackpoint Road, Scarborough, ME **04074**

STRUCTURAL ENGINEER OF RECORD: Paul B. Becker, P.E. – Becker Structural Engineers, Inc.

ARCHITECT OF RECORD: Stan Gawron – Gawron Architects

This Statement of Special Inspections is submitted in accordance with Section 1705.0 of the ***1999*** BOCA National Building Code. It includes a listing of special inspections applicable to this project as well as the name of the Special Inspector, and the names of other agencies intended to be retained for conducting these inspections.

The Special Inspector shall keep records of all inspections listed herein, and shall furnish inspection reports to the Code Official and to the Registered Design Professional of Record. All discrepancies shall be brought to the immediate attention of the Contractor for correction. If the discrepancies are not corrected the discrepancies shall be brought to the attention of the Code Official and L_0 the Registered Design Professional of Record. Interim reports shall be submitted to the Code Official and to the Registered De sign Professional of Record monthly, unless more frequent submissions are requested by the Code Official.

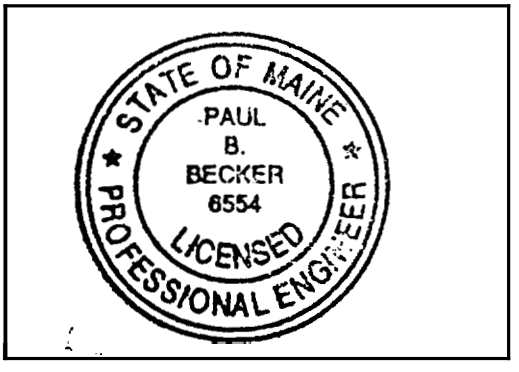
Job site safety is solely the responsibility of the Contractor. Materials and activities to be inspected are not to include the Contractor's equipment and methods used to erect or install the materials listed.

Prepared By:

Paul B. Becker, P.E.

NAME

SIGNATURE DATE



Preparer's P.E. Seal

Applicant's Authorization:

SIGNATURE DATE

Building Code Official:

SIGNATURE DATE

Becker Structural Engineers, Inc.

LIST OF AGENTS

PROJECT: Avis Vehicle Service Center, Jetport Blvd, Portland, ME

STRUCTURAL **ENGINEER** OF RECORD: Paul B. Becker, P.E. - Becker Structural Engineers, Inc.

Name Firm

19 Commercial Street – Portland, ME 04101

Address

ARCHITECT OF **RECORD:** Stan Gawron – Gawron Architects

Name Firm

29 Black Point Road, Scarborough, ME 04074

Address

Following is the List of Agents selected for performance of Special Inspections for this project:

		Name	Firm	Abbreviation
1.	Special Inspector	Paul B. Becker, P.E.	Becker Structural Engineers, Inc.	BSE
2.	Testing Laboratory	Steve Randall	John Turner Consulting	JTC
3.	Testing Laboratory			
4.				
5.				
6.				
7.				
8.				
9.				
10.				

Becker Structural Engineers, Inc.

FINAL **REPORT** OF SPECIAL INSPECTIONS

PROJECT: Avis Vehicle Service Center, Jetport Blvd, Portland, ME

LOCATION: Portland, Maine

PERMIT APPLICANT: Gawron Architects

APPLICANT'S **ADDRESS:** 29 Blackpoint Road, Scarborough ME

STRUCTURAL ENGINEER OF **RECORD:** Paul B. Becker, P.E. - Becker Structural Engineers, Inc.
Name Firm

ARCHITECT OF **RECORD:** Stan Gawron – Gawron Architects
Name Firm

GENERAL CONTRACTOR: Mark E. Geuther – Home Construction

To the best of **my** information, knowledge, and belief, the Special Inspections required for **this project**, and described **in** the Statement of Special Inspections submitted for the project, have been **completed.**

The following discrepancies that were outstanding since the last interim report, No. __ dated _____, have been corrected:

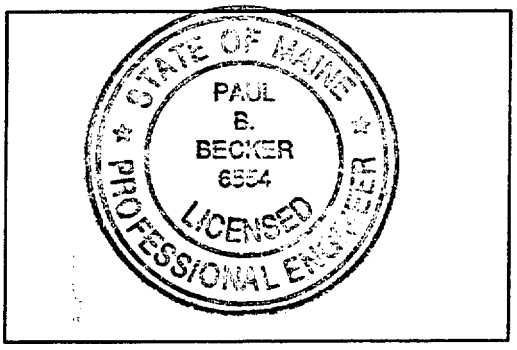
N/A

(Use additional sheets, if necessary)

Interim reports submitted to this final report and numbered __ **to** __ form a basis for, and are to be **considered an** integral part of this final report.

Submitted By:
SPECIAL INSPECTOR
Paul B. Becker, P.E.
NAME

5/2/02
SIGNATURE DATE



Special Inspector's P.E. Seal

Summary of Services (Exhibit A)

PROJECT: Avis Vehicle Service Center, Jetport Blvd, Portland, ME

SCHEDULE OF SPECIAL INSPECTION SERVICES

MATERIAL/ACTIVITY	ITEM	SERVICE	APPLICABLE TO THIS PROJECT Y/N	EXTENT (All,Sample, Other, None)	COMMENTS	AGENT	DATE	REV.
1705.2 Inspection of Fabricators	1.00							
		Fabrication Procedures	Y	As Required by following sections	See Wood, Steel	BSE	4/19/02	
		Procedure Implementation	Y	As Required by following sections	& concrete Sections	BSE	4/19/02	

All Steel Construction Special Inspections have been completed in accordance with BOCA Section 1705.12 Special Inspector _____ Date 5/2/02

1-Nov-01

4

SCHEDULE OF SPECIAL INSPECTION SERVICES

PROJECT: Avis Vehicle Service Center, Jetport Blvd, Portland, ME

MATERIAL/ACTIVITY	ITEM	SERVICE	APPLICABLE TO THIS PROJECT Y/N	EXTENT (All,Sample, Other, None)	COMMENTS	AGENT	DATE	REV.
1705.3 STEEL CONSTRUCTION	2.00							
Steel Fabrication		In-plant review Part A - Fabrication procedures/QA						
		1. AISC Category 1	Y	Provide AISC Certification	SSFNE Accepted	BSE	4/22/02	
		2. AWS Quality Assurance	Y	Provide Welder Certification		BSE	4/22/02	
		Part B - Procedures implementation Review conformance to Part A						
		Review material certificates						
		1. Bolts, Nuts, Washers	Y	Sample	AISC ASD A3.4	BSE	5/2/02	
		2. Structural Steel	Y	Sample	AISC A6 or A568	BSE	4/26/02	
		3. Weld Filler Material	Y	Sample	AISC ASD A3.6	BSE	4/22/02	
		Review connections						
		1. Shop Bolted	N					
		2. Shop Welded	Y	ALL	IN FIELD (VISUAL)	JTC	3/8/02	
		3. Connection Design Calcs	N		Design By BSE			
		4. Shop Welder Certs	Y	ALL		BSE	4/22/02	
		Review welding of seismic-resisting system in Cat. "C" buildings	N		AWS D1.1 SECTION 6			
Steel Erection		Review materials certs of compliance						
		1. Bolts, Nuts, Washers	Y	ALL		BSE	5/2/02	
		2. Structural Steel	Y	ALL		BSE	4/26/02	
		3. Weld Filler Material	Y	ALL		BSE	4/22/02	
		Review primary steel connections						
		Moment connections	Y			JTC	3/8/02	
		Shear connections						
		1. Field Bolted	Y	ALL		JTC	3/8/02	
		2. Field Welded	Y	ALL		JTC	3/8/02	
		Bracing connections						
		Review welded Cat. "C" seismic connections	N	Not Applicable				
		Review welded column splices	N					
		Review base metal testing for "t" > 1 1/2"	N					
		Review secondary steel connections	N					
		1. Girts	N					
		2. Lintels	N					
		3. Steel Deck	Y	ALL		BSE	4/19/02	
		Lintels/Relieving Angles	N					
		Review installation of shear studs	N					
		Review Details/Steel Frame	Y	Sample		BSE	3/8/02	

All Steel Construction Special Inspections have been completed in accordance with BOCA Section 1705.3 Special Inspector _____ Date 5/2/02

SCHEDULE OF SPECIAL INSPECTION SERVICES

PROJECT: Avis Vehicle Service Center, Jetport Blvd, Portland, ME

MATERIAL/ACTIVITY	ITEM	SERVICE	APPLICABLE TO THIS PROJECT Y/N	EXTENT (All,Sample, Other, None)	COMMENTS	AGENT	DATE	REV.
1705.3 STEEL CONSTRUCTION (Continued)	2.00							
Steel Joist & Joist Girder		In-plant review						
		Part A - Fabrication procedures	N					
		Part B - Procedures implementation						
		Review conformance to Part A	N					
		Review material certificates of compliance						
		1. Structural Steel	Y	ALL		BSE	5/2/02	
		2. Weld Material	Y	ALL		BSE	4/22/02	
		Review connections	Y	ALL		BSE	1/17/02	
		Review welder certification	Y	ALL		BSE	4/22/02	
Steel Joist/Joist Girder Erection		Review joist bearing connections	Y	ALL		BSE	4/19/02	
		Review joist bearing length	Y	ALL		BSE	4/19/02	
		Review joist bridging	Y	ALL		BSE	4/19/02	

All Steel Construction Special Inspections have been completed in accordance with BOCA Section 1705.3 Special Inspector _____ Date 5/2/02

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SCHEDULE OF SPECIAL INSPECTION SERVICES

PROJECT: Avis Vehicle Service Center, Jetport Blvd, Portland, ME

MATERIAL/ACTIVITY	ITEM	SERVICE	APPLICABLE TO THIS PROJECT Y/N	EXTENT (All,Sample, Other, None)	COMMENTS	AGENT	DATE	REV.
1705.4 CONCRETE CONSTR.	3.00							
Concrete Materials		Review materials (ACI Chapter 3)						
		1. Cement	Y	ALL	ASTM C150	BSE	12/5/01	
		2. Normal WT aggregates	Y	ALL	ASTM C33	BSE	12/5/01	
		3. Air Entraining admix	Y	ALL	ASTM C260	BSE	12/5/01	
		4. Normal range water reducing admix	Y	ALL	ASTM C494	BSE	12/5/01	
		5. Hi-Range water reducing admix	Y	ALL	ASTM C494	BSE	12/5/01	
		6. Accel Admix	Y	ALL	ASTM C494 Type A/C	BSE	12/5/01	
		7. Moisture Barrier	Y	ALL	8 mil	BSE	4/30/02	
		8. Curing Products	Y	ALL		BSE	12/5/01	
		9. Preformed expansion Joint	Y	ALL		BSE	12/5/01	
		Review mix design	Y	ALL	ACI Chapter 4	BSE	12/5/01	
		Review reinforcing certification & weld-ability if required	Y	ALL	NO WELDING Certificate Only	BSE	4/22/02	
Placing Reinforcement		Review condition & placement of rein-forcing and prestressing steel	Y	Sample	ACI 318 7.4-7.7	BSE	1/28/02	
		Review welding of reinforcing in Cat "C" seismic-resisting systems	N	Not Applicable				
		Review Embedded items, bolts, plates, etc.	Y	Sample		BSE	1/28/02	
Formwork								
Formwork		Review form removal & reshoring	N		ACI 318.6.2	BSE	N/REQ'D	
Concrete Operations		Field Sampling & Testing of Concrete	Y	Every 50 yards or each separate placement Sample Air, Temp, Slump ASTM C172, C231				
		Review concrete strength tests	Y		ACI 318 5.6	BSE	4/19/02	
		Review mix proportions and technique	Y		ACI 318 5.2, 5.3, 5.4, & 5.8	JTC	4/19/02	
		Review concrete placement	Y		ACI 318 5.9 & 5.10	JTC	4/19/02	
		Review curing technique & temperature	Y		ACI 318 5.11, 5.12, & 5.13	JTC	4/19/02	
Prestressing Operations		Review application of prestressing force	N		ACI 318 18.18			
		Review grouting of bonded prestressing tendons in Cat.Cseismic-resisting systems	N					
Precast Manufacturing		In-plant review Part A - Fabrication procedures	N					
		Part B - Procedures Implementation Review conformance to Part A	N N					
Erection of Precast Concrete		Review erection of precast units	N					
		Review key reinforcement	N					
		Review key grouting	N					
		Review concrete topping	N					
		Review connections	N					

All Concrete Construction Special Inspections have been completed in accordance with BOCA Section 1705.4 Special Inspector _____ Date 5/2/02

SCHEDULE OF SPECIAL INSPECTION SERVICES

PROJECT: Avis Vehicle Service Center, Jetport Blvd, Portland, ME

MATERIAL/ACTIVITY	ITEM	SERVICE	APPLICABLE TO THIS PROJECT Y/N	EXTENT (All,Sample, Other, None)	COMMENTS	AGENT	DATE	REV.
1705.5 MASONRY CONSTR	4.00							
Materials		Review materials certification						
		Masonry units	Y	Sample		BSE	4/30/02	
		Reinforcing steel	Y	Sample		BSE	4/22/02	
		Review grout materials & mix design	Y	Sample		BSE	4/30/02	
		Review mortar materials & mix design	Y	Sample		BSE	4/30/02	
		Review strength determination						
		Unit strength method	Y	Sample		BSE	4/30/02	
		Review unit strengths & grout,	Y	Sample		BSE	4/30/02	
		mortar mixes	Y	Sample		BSE	4/30/02	
		Prism strength method						
		Review pre-construction test results	N					
		Field tests during construction	N					
		Grout testing						
		Determine compressive strength	Y	Field Samples	NOT REQ'D - PROPORTION	JTC BSE	4/22/02	
		Mortar testing						
		Field test compressive strength ASTM C780 (Req'd only if property reqs of ASTM C270 are used)	Y	ALL	NOT REQ'D PROPORTION SPEC USED	BSE JTC	4/22/02	
General Masonry Work		Review mortar mix proportions & mixing	Y	Sample	ACI 530.1;2.3.2.5	JTC BSE	4/22/02	
		Review general installation of mortar	Y	Sample	ACI 530.1;4.2.2	BSE	2/28/02	
		Review general installation of mortar grout, masonry units.	Y	Sample	ACI 530.1;2.3.3.3,4.3.3	BSE	2/28/02	
		Review installation of horiz., vert., & joint reinforcing (Incl. Location, sizes, splices, & positioning devices)	Y	Sample	ACI 530, CH. 8	BSE	2/21/02	
		Review hot/cold weather procedures	Y	Sample	ACI 530; 1;2.3.2.2,2.3.2.3	BSE	2/15/02	
		Review installation of anchorage devices	Y	Sample	ACI 530; 4.2, 5.14	BSE	2/21/02	
		Review installation of lintels	Y	Sample		BSE	2/21/02	
		Review welding of reinf., grouting, consolidation and reconsolidation for seismic Cat. "C" buildings	N					

All Masonry Construction Special Inspections have been completed in accordance with BOCA Section 1705.5 Special Inspector _____ Date 5/2/02

1-Nov-01

SCHEDULE OF SPECIAL INSPECTION SERVICES

PROJECT: Avis Vehicle Service Center, Jetport Blvd, Portland, ME

MATERIAL/ACTIVITY	ITEM	SERVICE	APPLICABLE TO THIS PROJECT Y/N	EXTENT (All,Sample, Other, None)	COMMENTS	AGENT	DATE	REV.
1705.6 WOOD CONSTRUCTION	5.00							
Wood Truss Fabrication		In-plant review						
		Part A - Fabrication procedures	N					
		Part B - Procedures implementation	N					
		Review conformance to Part A	N					
		Review member arrangment	N					
		Check for TPI Stamp	N					
Wood Truss Materials		Review lumber						
		Wood species	N					
		Grade stamps	N					
		Moisture content	N					
		Review connector plates						
		Size	N					
		Gage	N					
		Orientation	N					
		Location	N					
		Fit	N					
Wood Truss Erection		Review storage at site	N					
		Review permanent bracing	N					
		Review field connections	N					
Glulam Fabrication		In-plant review						
		Part A - Fabrication procedures	N					
		Part B - Procedures implementation	N					
		Review conformance to Part A	N					
Glulam Materials		Review wood species and grade	N					
Glulam and Erection		Review connections						
		Bolted connections	N					
		Connection fittings	N					
Lateral-Resisting System (Seis. Perf. Cat. "C")		Review seismic connections						
		Nailed connections	N	Not Applicable				
		Bolted connections	N	Not Applicable				
		Structural glued connections	N	Not Applicable				
		Other seismic fasteners	N	Not Applicable				
Wood Framing (Gravity System)		Review Field Fabrication	N					
		Wall stud Framing	N					
		Header Framing	N					

All Wood Construction Special Inspections have been completed in accordance with BOCA Section 1705.6 Special Inspector _____ Date 5/2/01

9

SCHEDULE OF SPECIAL INSPECTION SERVICES

PROJECT: Avis Vehicle Service Center, Jetport Blvd, Portland, ME

MATERIAL/ACTIVITY	ITEM	SERVICE	APPLICABLE TO THIS PROJECT Y/N	EXTENT (All,Sample, Other, None)	COMMENTS	AGENT	DATE	REV.
[illegible]	6.00							
Site Preparation		Review site preparation prior to prepared fill placement.	Y		Building only	JTC	12/20/01	
During Fill Placement		Review compliance to soils report						
		Material	Y	Sample	Building only	JTC	12/20/01	
		Lift thickness	Y	Sample	Building only	JTC	12/20/01	
Evaluation of in-Place Density		Review in-place dry density for compli-ance with soils report	Y	Sample	Building only	JTC	12/20/01	

All Prepared Fill Special Inspections have been completed in accordance with BOCA Section 1705.7 Special Inspector _____ Date 5/2/02

01

SCHEDULE OF SPECIAL INSPECTION SERVICES

PROJECT: Avis Vehicle Service Center, Jetport Blvd, Portland, ME

MATERIAL/ACTIVITY	ITEM	SERVICE	APPLICABLE TO THIS PROJECT Y/N	EXTENT (All,Sample, Other, None)	COMMENTS	AGENT	DATE	REV.
1705.8 PILE FOUNDATIONS	7.00							
Pile Fabrication		In-plant review						
		Part A - Fabrication procedures	N	Not Applicable				
		Part B - Procedures implementation	N	Not Applicable				
		Review conformance to Part A	N	Not Applicable				
Pile Driving		Review pile driving records	N	Not Applicable				
		Review load test results	N	Not Applicable				
		Review pile driving equipment & procedure	N	Not Applicable				
Pile Materials		Review accessories						
		Pile tip assembly	N	Not Applicable				
		Pile splice assembly	N	Not Applicable				
		Rock anchors	N	Not Applicable				
		Tendons	N	Not Applicable				
		Review steel piles						
		Material identification markings	N	Not Applicable				
		Inspection of corrosion protection	N	Not Applicable				
		Review timber piles						
		Wood species	N	Not Applicable				
		Butt or tip diameter	N	Not Applicable				
		Grade stamps/markings/treatment	N	Not Applicable				
		Review other pile systems	N	Not Applicable				
Prestressed Concrete Piles		See "Precast Concrete"						

SCHEDULE OF SPECIAL INSPECTION SERVICES

PROJECT: Avis Vehicle Service Center, Jetport Blvd, Portland, ME

MATERIAL/ACTIVITY	ITEM	SERVICE	APPLICABLE TO THIS PROJECT Y/N	EXTENT (All,Sample, Other, None)	COMMENTS	AGENT	DATE	REV.
1705.12 SPECIAL CASES	8.00							
Fireproofing		Fireproofing	N	Not Applicable				
		Review Product Data Sheets	N					
		Review In-Place Density	N					
		Review In-Place Thickness	N					
		Review In-Place Bond	N					
		Review scope of installation for	N					
		conformance with design documents	N					
Cold Formed Framing								
Cold Formed Truss Fabrication		In-plant review						
		Part A - Fabrication procedures	Y	Provide certification that fabricator maintains		BSE	4/30/02	
		Part B - Procedures implementation	Y	an agreement with approved independent		BSE	4/30/02	
		Review conformance to Part A	Y	inspection or Q.C. agency as per 1705.2.		BSE	4/30/02	
		Review member arrangment	N					
Cold FormedTruss Materials		Review Cold Formed Material						
		Material Certification	Y			BSE		
		Galvanizing	Y			BSE		
		Review connector plates						
		Size	N					
		Gage	N					
		Orientation	Y	Sample		BSE	3/8/02	
		Location	Y	Sample		BSE	3/8/02	
		Fit	Y	Sample		BSE	3/8/02	
Cold Formed Erection		Review storage at site	N					
		Review permanent bracing	Y			BSE	3/8/02	
		Review field connections	N					

All Steel Construction Special Inspections have been completed in accordance with BOCA Section 1705.12 Special Inspector _____ Date 5/2/02

1-Nov-01

1001 Disclaimers and Qualifications

The program of Structural/Special Tests and Inspections does not relieve the Contractor or its subcontractors of their responsibilities and obligations for quality control of the work, for any design work which is included in the scope of services, and for full compliance with the requirements of the Construction Documents. Furthermore, the detection of, or the failure to detect, deficiencies or defects in work during testing and inspection conducted pursuant to the Program does not relieve the Contractor or its subcontractors of their responsibility to correct all deficiencies or defects, whether detected or undetected, in all parts of work, and to otherwise comply with all requirements of the Construction Documents. Additional disclaimers and/or qualifications may be included in the Owner-Special Inspection agreement.

02200 Earthwork
02200.1 Testing Reports

74-507

GEOTECHNICAL CONSULTING
SITE INSPECTIONS
MATERIAL TESTING

JOHN **TURNER** CONSULTING, INC.

REPORT OF SIEVE TEST **RESULTS**

CLIENT: Avis Rent A Car System, Inc.
Attn: Mr. Ronald A. Robson
90-20 Grand Central Parkway
East Elmhurst, NY **11369**

PROJECT: Avis Rent A Car System, Inc.
Portland Jetport
Portland, NH

DATE: November **27,2001**

REPORT **#: 01-196-001**

SIEVE SIZE	PERCENT PASSING	ME DOT TYPE D SPEC	SPECS	SPECS
4"				
3"	**100**	**100**		
2"	**89**			
1.5"	**82**			
1"	**73**			
¾"	**70**			
½"	**64**			
3/8"	**61**			
¼"	**58**	**25-70**		
#4	**56**			
#8				
#10	**46**			
#20	**39**			
#30				
#40	**27**	**0-30**		
#50				
#80	**19**			
#100	**10**			
#200	**6.8**	**0-7.0**		

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DEC 18 2001
BECKER
STRUCTURAL ENGINEERS

TEAMWORK

*818 Central **Avenue, Dover, NH***
***603-749-1841** Fax: 603- 743-3370*

GEOTECHNICAL CONSULTING
SITE INSPECTIONS
MATERIAL **TESTING**

JOHN **TURNER** CONSULTING, INC.

REPORT OF PROCTOR TEST RESULTS

CLIENT:	Avis Rent A Car System, Inc. Attn: Mr. Ronald A. Robson **90-20** Grand Central Parkway East Elmhurst, **NY 11369**	PROJECT:	Avis Rent A Car System, Inc. Portland Jetport Portland, **NH**

DATE:	November **27,2001**	REPORT **#:**	**01-196-002**
Sampled Source:	On-site	Soil Type:	Bank Run Gravel
Soil ID#:	**1188**	Intended Use:	Subbase
Date Received:	**11-27-01**	Sampled By:	Steve Randall
Method Used:	ASTM D1557	Tested By:	Steve Randall

PROCTOR TEST RESULTS

Method of Proctor Testing:	ASTM **D1557** (modified)	
Maximum Dry Density:	**138.4**	lbs/ft^3
Optimum Moisture:	**6.1**	**%**

818 Central Avenue, Dover, NH
***603-749-1841** Fax: 603- 743-3370*

GEOTECHNICAL CONSULTING
SITE INSPECTIONS
MATERIAL TESTING

JOHN **TURNER** CONSULTING, INC.

REPORT OF SIEVE TEST RESULTS

CLIENT:	Avis Rent A Car System, Inc. Attn: Mr. Ronald A. Robson 90-20 Grand Central Parkway East Elmhurst, NY 11369	PROJECT:	Avis Rent A Car System, Inc. Portland Jetport Portland, NH
DATE:	November 27,2001	REPORT #:	01-196-003

Sampled Source:	Shaws Brothers	Soil Type:	Crushed Gravel
Soil ID #:	1189	Intended Use:	Base
Date Received:	11-27-01	Sampled By:	Steve Randall
Method of Test:	ASTM C136/117	Tested By:	Steve Randall

SIEVE SIZE	PERCENT PASSING	ME DOT TYPE A SPEC	SPECS	SPECS
4"				
3"	100	100		
2"				
1.5"	100			
1"	77			
¾"	62			
½"	53	45-70		
3/8"	50			
¼"	45	30-55		
#4	44			
#8				
#10	38			
#20	34			
#30				
#40	29	0-20 F		
#50				
#80	18			
#100	7.4			
#200	3.8	0-5.0		
REMARKS:				

GEOTECHNICAL CONSULTING
SITE INSPECTIONS
MATERIAL TESTING

JOHN TURNER CONSULTING, INC.

REPORT OF SOILS FIELD COMPACTION TESTING

CLIENT: Avis Rent A Car System, Inc.
Attn: Mr. Ronald A. Robson
90-20 Grand Central Parkway
East Elmhurst, NY **11369**

PROJECT: Avis Rent A Car System, Inc.
Portland Jetport
Portland, NH

DATE: November **28,2001** REPORT **#: 01-196-004**

General Location: Parking lot
Field Rep: Scott TeBordo
Contractor: Shaws Brothers
Earthwork:
Air Temp: **45°F**
Weather: Overcast
Soil Type: Bank Run Gravel
Proctor Value: **138.4** lbs/ft3 Optimum Moisture: **6.1 %**

TEST NUMBER	DEPTH/ELEV.	MOISTURE	DRY DENSITY	PERCENT COMPACTION
1	6" BFG	3.3	131.6	95.1
2	6" BFG	1.8	134.3	97.0
3	6" BFG	2.7	134.9	97.4
LOCATION: Station 3 + 00 – 50' West of center				
4	6" BFG	2.5	133.6	96.5
5	6" BFG	2.4	131.5	95.0
6	6" BFG	2.8	131.8	95.4
LOCATION:				
LOCATION:				
REMARKS:				

GEOTECHNICAL CONSULTING
SITE INSPECTIONS
MATERIAL TESTING

JOHN TURNER CONSULTING, INC.

REPORT OF PROCTOR TEST RESULTS

CLIENT:	Avis Rent A Car System, Inc. Attn: Mr. Ronald A. Robson 90-20 Grand Central Parkway East Elmhurst, NY 11369	PROJECT:	Avis Rent A Car System, Inc. Portland Jetport Portland, NH

DATE:	November 28,2001	REPORT #:	01-196-005
Sampled Source:	Shaw's Brothers Pit	Soil Type:	Crushed Gravel
Soil ID#:	1189	Intended Use:	Base
Date Received:	11-27-01	Sampled By:	Steve Randall
Method **Used:**	ASTM D1557	Tested By:	Steve Randall

PROCTOR TEST RESULTS

Method of Proctor Testing:	ASTM D1557 (modified)	
Maximum Dry Density:	137.5	lbs/ft^3
Optimum Moisture:	6.3	%

TEAMWORK

818 Central Avenue, Dover, NH
603-749-1841 Fax: 603- 743-3370

GEOTECHNICAL CONSULTING
SITE INSPECTIONS
MATERIAL TESTING

JOHN TURNER CONSULTING, INC.

REPORT OF SOILS FIELD COMPACTION TESTING

CLIENT: Becker Structural Engineers, Inc.
Attn: Mr. Paul Becker
19 Commercial Street
Portland, ME 04101

PROJECT: Avis Rent A Car System
Portland Jetport
Portland, NH

DATE: December 20,2001

REPORT #: 01-196-007

General Location: Footing Base
Field Rep: Ty Cobb
Contractor: Shaws Brothers
Earthwork:
Air Temp: 40°F
Weather: Cloudy
Soil Type: Sand & Gravel
Proctor Value: 132.8 lbs/ft3

Optimum Moisture: 7.5 %

Gauge Type: Troxler 3430

Required Compaction: 95 %

TESTNUMBER	DEPTH/ELEV.	MOISTURE	DRY DENSITY	PERCENT
1	Footing Grade	5.6	131.8	99.2
2	Footing Grade	7.8	131.6	99.0
3	Footing Grade	7.0	131.4	98.8
LOCATION:				
LOCATION:				
LOCATION:				
LOCATION:				
REMARKS:				

03300 Cast-in-Place Concrete

03300.1 Inspection Reports

BECKER
structural engineers

Date: December 20.2001
Time: 4:00pm
Temp: 40's
Weather: Cloudy Morning, Rain in the afternoon

Project: Avis **Rental Car Facility**
South Portland, Maine

Inspection Report - Cast-in-place Concrete

Location: Excavation & Reinforcement for foundations, Column Lines G/4 to G/5, G/5 to J/5, J15 to J/1, J/1 to GI1

Satisfactory	Unsatisfactory	Not Completed	N/A		Satisfactory	Unsatisfactory	Not Completed	N/A	Additional Items:
		x		Reinforcement Size					
		x		Quanity					
		x		Condition					
		x		Placement					
		x		Embed/Anchors					
		x		Lap Splices					
			x	Reinf. Weld					
			x	Hot Weather					
			x	Cold Weather					

Notes: I stopped by the site at two times today. The placement was proceeding, but was not prepared in time for a concrete pour in the morning. When I arrived in the afternoon the excavations were being covered protect them from rain.

Signed: Ethan A. Rhile, P. E. Date: 12/21/01

WO 768.01

BECKER
structural engineers

Date: December 21,2001
Time: 11:00pm
Temp: Mid 30's
Weather: Rain/ Snow overnight, sunny morning

Project: Avis Rental Car Facility
South Portland, Maine

Inspection Report - Cast-in-place Concrete

Location: Excavation & Reinforcement for foundations, Column Lines G/4 to G/5, G/5 to J/5, J/5 to J/1, J/1 to G/1

Satisfactory	Unsatisfactory	Not Completed	N/A		Satisfactory	Unsatisfactory	Not Completed	N/A	Additional Items:
		x		Reinforcement Size					
		x		Quanity					
		x		Condition					
		x		Placement					
		x		Embed/Anchors					
		x		Lap Splices					
			x	Reinf. Weld					
			x	Hot Weather					
			x	Cold Weather					

Notes: I stopped by the site at 11:00am. Reinforcement placement was ongoing. I pointed out the following to Kevin Donahue, the project superintendent: The excavation contained standing water. Horne will will evaulate the need to tent and heat the excavation for the pour scheduled at noon on Wednesday. Kevin indicated that the reinforcement placement would take the rest of the afternoon, and possibly some time on Wednesday. In general, I pointed out that the precast bars supports should be installed, and I pointed out that some of the pier ties were being used as bar positioners. Kevin said that the all issues would be addressed before the concrete is placed on Wednesday, December 26, 2001

Signed: Ethan A. Rhile, P. E. Date: 12/21/01

WO 768.01

BECKER
structural engineers

Date: December 27, 2001
Time: 9:30am
Temp: 33
Weather: Partly Cloudy

Project: Avis **Rental** Car **Facility**
South Portland, Maine

Inspection Report - Cast-in-place Concrete

Location: Footings- Columns G/1 to B/1, B/1 to B/6, B/6 to C/6

Satisfactory	Unsatisfactory	Not Completed	N/A		Satisfactory	Unsatisfactory	Not Completed	N/A	Additional Items:
x				Reinforcement Size					
x				Quanity					
x				Condition					
x				Placement					
			x	Embed/Anchors					
x				Lap Splices					
			x	Reinf. Weld					
			x	Hot Weather					
x				Cold Weather					

Notes: I reviewed the footing steel in these locations. I asked Kevin to review the spacing requirement for the precast bar support for future concrete pours, as the supports were at the very limits for these footings.

Signed: Ethan A. Rhile, P. E. Date: 1/7/02

WO 768.01

BECKER
structural engineers

Date: January 2, 2002
Time: 10:10am
Temp: 30
Weather: Sunny

Project: **Avis** Rental Car **Facility**
South **Portland, Maine**

Inspection Report - Cast-in-place Concrete

Location: Walls & Piers- G/5 to J/5, J-5 to J-1, J-1 to G-1

Satisfactory	Unsatisfactory	Not Completed	N/A		Satisfactory	Unsatisfactory	Not Completed	N/A	Additional Items:
x				Reinforcement Size					
x				Quanity					
x				Condition					
x				Placement					
			x	Embed/Anchors					
x				Lap Splices					
			x	Reinf. Weld					
			x	Hot Weather					
			x	Cold Weather					

Notes: Viewed horiz steel & pier steel with 1 side of formwork in place. Per my conversation with Kevin at Horne, corner bars will be installed prior to erecting the other side of the form. Anchor bolts were to be placed in templates & anchored to forms.

Signed: Ethan A. Rhile, P. E. Date: 1/7/02

WO 768.01

BECKER
structural engineers

Date: January 3, 2002
Time: 10:30am
Temp: mid 30's
Weather: Sunny

Project: **Avis Rental Car Facility**
South Portland, Maine

Inspection Report - Cast-in-place Concrete

Location: Walls & Piers - G/4 to G/5, G/6 to J/5, J/5 to J/2

Satisfactory	Unsatisfactory	Not Completed	N/A		Satisfactory	Unsatisfactory	Not Completed	N/A	Additional Items:
x				Reinforcement Size					
x				Quanity					
x				Condition					
x				Placement					
		x		Embed/Anchors					
x				Lap Splices					
			x	Reinf. Weld					
			x	Hot Weather					
x				Cold Weather					

Notes: I reviewed the reinforcement and watched the pour today. I noted that the masonry dowels were placed in the top of the concrete wall after the concrete had been placed and started to cure. This procedure does not conform to the requirements of the project documents nor the the standards of ACI. After a discussion with Mark Geuther of Horne. it was agreed that new dowels will be epoxied into the wall as directed by Becker Structural Engineers prior to masonry placement.

Signed: _____ Date: 1/7/02
Ethan A. Rhile, P. E.

WO 768.01

Uccker Structural Engineers
19 Commcrical Street
Portland, Mainc 04101
Phone: (207)879-1838
Fax(207) 879-1822

S

BECKER
structural engineers

Date: January 4,2002
Time: 10:15am
Temp: Mid Teens
Weather: Sunny

Project: Avis **Rental Car Facility**
South **Portland, Maine**

Inspection Report - Cast-in-place Concrete
Location: Walls & Piers- J/2 to J/1, J/1 to G/1

Satisfactory	Unsatisfactory	Not Completed	N/A		Satisfactory	Unsatisfactory	Not Completed	N/A	Additional Items:
x				Reinforcement Size					
x				Quanity					
x				Condition					
x				Placement					
x				Embed/Anchors					
x				Lap Splices					
			x	Reinf. Weld					
			x	Hot Weather					
x				Cold Weather					

Notes: I reviewed the wall steel with both sides of formwork in place and had no comments

Signed: Ethan A. Rhile, P. E. Date: 1/7/02

WO 768.01

BECKER
structural engineers

Date: January9.2002
Time: 9:15 AM
Temp: 30
Weather: Light Snow

Project: Avis Rental Car Facility
South Portland, Maine

Inspection Report - Cast-in-place Concrete
Location: Walls & Piers- G/1 to B11, B/1 *to* B/3

Satisfactory	Unsatisfactory	Not Completed	N/A		Satisfactory	Unsatisfactory	Not Completed	N/A	Additional Items:
		x		Reinforcement Size					
		x		Quanity					
		x		Condition					
		x		Placement					
		x		Embed/Anchors					
		x		Lap Splices					
			x	Reinf. Weld					
			x	Hot Weather					
		x		Cold Weather					

Notes: Reinforcement placement was not completed. I will return tomorrow.

Signed: _____ Date: 1/11/02
Ethan A. Rhile, P. E.

Becker Structural Engineers
19 Commcrical Street
Portland. Mainc 04101
Phone: (207) 879-1838
Fax(207) 879-1822

BECKER
structural engineers

Date: January 10, 2002
Time: 7:30 AM
Temp: Low 30's
Weather: Partly Cloudy

Project: Avis **Rental Car Facility**
South Portland, Maine

Inspection Report - Cast-in-place Concrete
Location: Walls & Piers- G/1 to B/1, B II to B/3

Satisfactory	Unsatisfactory	Not Completed	N/A		Satisfactory	Unsatisfactory	Not Completed	N/A	Additional Items:
x				Reinforcement Size					
x				Quanity					
x				Condition					
x				Placement					
x				Embed/Anchors					
x				Lap Splices					
			x	Reinf. Weld					
			x	Hot Weather					
x				Cold Weather					

Notes: No comments.

Signed: Ethan A. Rhile, P. E. Date: 1/16/02

WO 768.01

Becker Structural Engineers
19 Commercial Street
Portland. Maine 04101
Phone: (207) 879-1838
Fax(207) 879-1822

BECKER
structural engineers

Date: January 14, 2002
Time: 9:30 AM
Temp: Mid 20's
Weather: Sunny, Snow yesterday with ice

Project: **Avis Rental Car Facility**
South Portland, Maine

Inspection Report - Cast-in-place Concrete

Location: Walls & Piers- Columns B/3 to B/6, B/6 to C/6, C/6 to C/11

Satisfactory	Unsatisfactory	Not Completed	N/A		Satisfactory	Unsatisfactory	Not Completed	N/A	Additional Items:
x				Reinforcement Size					
x				Quanity					
x				Condition					
x				Placement					
x				Embed/Anchors					
x				Lap Splices					
			x	Reinf. Weld					
			x	Hot Weather					
x				Cold Weather					

Notes: Slump of Truck 1 - 5 1/4
Slump of Truck 2 - 5 1/2
These slumps do not meet the requirements of the project specifications. Corrective action to be taken by the concrete supplier. This issue was addressed in a letter.

Signed: Ethan A. Rhile, P. E. Date: 1/16/02

WO 768.01

9

Becker Structural Engineers
19 Commerical Street
Ponland, Maine 04101
Phone: (207) 879-1838
Fax(207) 879-1822

BECKER
Structural engineers

Date: January 16,2002
Time: 1:30 PM
Temp: Mid 30's
Weather: Sunny

Project: **Avis Rental Car Facility**
South Portland, Maine

Inspection Report - Cast-in-place Concrete

Location: Footings, Columns C/4 to G/4

Satisfactory	Unsatisfactory	Not Completed	N/A		Satisfactory	Unsatisfactory	Not Completed	N/A	Additional Items:
x				Reinforcement Size					
x				Quanity					
x				Condition					
x				Placement					
x				Embed/Anchors					
x				Lap Splices					
			x	Reinf. Weld					
			x	Hot Weather					
x				Cold Weather					

Notes: No comments.

Signed: _____ Date: 1/16/02
Ethan A. Rhile, P. E.

WO 768.01

BECKER
structural engineers

Date: January 18,2002
Time: 9:50 AM
Temp: Upper 20's
Weather: Partly Cloudy

Project: Avis Rental Car Facility
South Portland, Maine

Inspection Report - Cast-in-place Concrete

Location: Walls 8 Piers - G/4 to C/4, Sump Pit Foundation Pad

Satisfactory	Unsatisfactory	Not Completed	N/A		Satisfactory	Unsatisfactory	Not Completed	N/A	Additional Items:
x				Reinforcement Size					
x				Quanity					
x				Condition					
x				Placement					
x				Embed/Anchors					
x				Lap Splices					
			x	Reinf. Weld					
			x	Hot Weather					
x				Cold Weather					

Notes: All reinforcement appeared to be in conformance with the project documents.

Signed: Ethan A. Rhile, P. E. Date: 1/21/02

WO 768.01

BECKER
structural engineers

Date: January 22,2002
Time: 8:00 AM
Temp: Mid to Upper 30's
Weather: Sunny, Snow last evening

Project: **Avis Rental Car Facility**
South Portland, Maine

Inspection Report - Cast-in-place Concrete

Location: Car wash sump pit walls, Entry pad footing between B & C outboard of 6 line

Satisfactory	Unsatisfactory	Not Completed	N/A		Satisfactory	Unsatisfactory	Not Completed	N/A	Additional Items:
x				Reinforcement Size					
x				Quanity					
x				Condition					
x				Placement					
x				Embed/Anchors					
x				Lap Splices					
			x	Reinf. Weld					
			x	Hot Weather					
x				Cold Weather					

Notes: All reinforcement appeared to be in conformance with the project documents.

Signed: Ethan A. Rhile, P. E. Date: 1/24/02

WO 768.01

BECKER
structural engineers

Date: January 24,2002
Time: 7:30 AM
Temp: Upper 30's
Weather: Cloudy - Rain forcasted for afternoon

Project: Avis Rental Car Facility
South Portland, Maine

Inspection Report - Cast-in-place Concrete

Location: Car Wash Piers B/7 & 8, D/7 & 8, Entry pad foundation wall between B & C outboard of 6 line

Satisfactory	Unsatisfactory	Not Completed	N/A		Satisfactory	Unsatisfactory	Not Completed	N/A	Additional Items:
x				Reinforcement Size					
x				Quanity					
x				Condition					
x				Placement					
x				Embed/Anchors					
x				Lap Splices					
			x	Reinf. Weld					
			x	Hot Weather					
x				Cold Weather					

Notes: Kevin and I discusses the #9 bar hooks at the tops of the fuel island piers. Per the direction of Becker Structural Engineers, 1 pair of the middle hooks will be removed to relieve the conflict at the centerline of the pier. All reinforcement appeared to be in accordance with the contract documents and field direction given by Becker Structural Engineers.

Signed: Ethan A. Rhile, P. E. Date: 1/24/02

WO 768.01

Becker Structural Engineers
19 Commercial Street
Portland, Maine 04101
Phone: (207) 879-1838
Fax(207) 879-1822

BECKER
structural engineers

Date: January 28.2002
Time: 2:00pm
Temp: Upper 30s
Weather: Cloudy

Project: Avis Rental Car Facility
South Portland, Maine

Inspection Report - Cast-in-place Concrete

Location: Fuel Island Piers

Satisfactory	Unsatisfactory	Not Completed	N/A		Satisfactory	Unsatisfactory	Not Completed	N/A	Additional Items:
x				Reinforcement Size					
x				Quanity					
x				Condition					
x				Placement					
x				Embed/Anchors					
x				Lap Splices					
			x	Reinf. Weld					
			x	Hot Weather					
x				Cold Weather					

Notes: I reviewed the piers with one side of the forms not in place and without the anchorbolts in place. The reinforcement appeared to be in conformance with the project documents and field decisions made previously.

Signed: Ethan A. Rhile, P. E. Date: 2/4/02

WO 768.01

03300 Cast-in-Place Concrete
03300.2 7/28-Day Compression Tests

Offices:
Dover. NH
Manchester, NH
N. Chelmsford, MA

GEOTECHNICAL CONSULTNG
SITE INSPECTIONS
MATERIAL TESTING

JOHN TURNER CONSULTING, INC.

REPORT OF CONCRETE FIELD/COMPRESSION TESTING

CLIENT:	**Becker** Structural Engineers, Inc. Attn: Mr. Paul Becker 19 Commercial Street Portland, ME 04101	**PROJECT:**	Avis Rent A Car System Portland Jetport Portland, NH
DATE:	January 24, 2002	**REPORT #:**	01-196-008

01-24-02	28	28.27in²	3710
01-24-02	28	28.27111'	3630
	H	28.27in²	

SPECIFIC LOCATION: 50' West from Southeast corner

DESIGN STRENGTH: 3000 PSI
YARDS PLACED: 10 YARDS

REMARKS:

TEAMWORK

818 Central Avenue, Dover, NH
603-749-1841 Fax: 603- 743-3370

Offices:
Dover, NH
Manchester, NH
N. Chelmsford, MA

GEOTECHNICAL CONSULTING
SITE INSPECTIONS
MATERIAL TESTING

JOHN TURNER CONSULTING, INC.

REPORT OF CONCRETE FIELD/COMPRESSION TESTING

CLIENT:	Becker Structural Engineers, Inc. Attn: Mr. Paul Becker 19 Commercial Street Portland, ME 04101	PROJECT:	Avis Rent A Car System Portland Jetport Portland, NH

DATE: January 25,2002 REPORT #: 01-196-009

General Location: Northeast corner Footings
Date Cast: 12-28-01
Field Rep.: John Howard
Contractor: -
Supplier: Dragon
Admixtures: 2% Polarset
Air Temp: 34°F
Weather: Clear
Nominal size of Aggr.: ¾"
Average Cylinder Weight:

3916865/ **4 cyl**	4.0	6.0	**68**	40 min.
DATE OF TEST	AGE	SPECIMEN AREA	COMPRESSIVE STRENTH(psi)	
01-04-02	7	28.27in^2	2260	
01-25-02	28	28.27in^2	4340	
01-25-02	28	28.27in^2	4420	
	H	28.27in^2		

SPECIFIC LOCATION: **15'** South of Northwest corner

DESIGN STRENGTH: 3000 PSI
YARDS PLACED: 10 YARDS

REMARKS:

*818 Central **Avenue,** Dover, NH*
603-749-1841 Fax: 603- 743-3370

Offices:
Dover, NH
Manchester, NH
N. Chelmsford, MA

GEOTECHNICAL CONSULTING
SITE INSPECTIONS
MATERIAL TESTING

JOHN **TURNER** CONSULTING, INC.

REPORT OF CONCRETE FIELD/COMPRESSION TESTING

CLIENT: Becker Structural Engineers, Inc.
Attn: Mr. Paul Becker
19 Commercial Street
Portland, ME 04101

PROJECT: Avis Rent A Car System
Portland Jetport
Portland, NH

TICKET #/CYL?	SLUMP	AIR CONTENT	CONCR TEMP.	ELAPSED TIME
3916914/ 4 **cyl**	3.5	5.2	70	60 min.
3916915	4.0			70 min.

REMARKS:

818 Central Avenue, Dover, NH
603-749-1841 Fax: 603- 743-3370

Offices:
***Dover,** NH*
***Manchester,** NH*
*N. **Chelmsford,** MA*

GEOTECHNICAL CONSULTING
SITE INSPECTIONS
MATERIAL TESTING

JOHN TURNER CONSULTING, INC.

REPORT OF CONCRETE FIELDKOMPRESSION TESTING

CLIENT:	Becker Structural Engineers, Inc. Attn: Mr. Paul Becker 19 Commercial Street Portland, ME 04101	PROJECT:	Avis Rent A Car System Portland Jetport Portland, NH

3916946/ 4 **cyl**	4.0	**5.8**	68	***65*** min.
02-01-02	28	28.27in^2	3820	
02-01-02	28	28.27in^2	3850	
	H	28.27in^2		

SPECIFIC LOCATION: J1

DESIGN STRENGTH: 3000 PSI
YARDS PLACED: 11 YARDS

REMARKS:

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FEB 6 2002
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STRUCTURAL ENGINEERS

TEAMWORK

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Offices:
Dover, NH
Manchester, NH
N. Chelmsford, MA

GEOTECHNICAL CONSULTING
SITE INSPECTIONS
MATERIAL **TESTING**

JOHN TURNER CONSULTING, INC.

REPORT OF CONCRETE FIELDKOMPRESSION TESTING

CLIENT: Becker Structural Engineers, Inc.
Attn: Mr. Paul Becker
19 Commercial Street
Portland, ME 04101

PROJECT: Avis Rent A Car System
Portland Jetport
Portland, NH

DATE: February 1,2002 REPORT #: 01-196-014

General Location: North & East Walls
Date Cast: 1-14-02
Field Rep.: Mike Newman
Contractor: Horne
Supplier: Dragon
Admixtures: 2% Polarset
Air Temp: 32°F
Weather: Cloudy
Nominal size of Aggr.: ¾"
Average Cylinder Weight:

TICKET #/CYL?	SLUMP	AIR CONTENT	CONCR. TEMP.	ELAPSED TIME
3917090/ 4 cyl	5.25	7.0	64	85 min.
3917091	5.50	7.4	56	80 min.

02-11-02	28	28.27in^2	4160
02-11-02	28	28.27in^2	4080
	H	28.27in^2	

SPECIFIC LOCATION: East Wall

DESIGN STRENGTH: 3000 PSI
YARDS PLACED: **21.5** YARDS

REMARKS: High slump results reported to Ethan Rhile on-site.

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STRUCTURAL ENGINEERS

TEAMWORK

818 CentralAvenue, Dover, NH
603-749-1841 Fax: 603- 743-3370

5

Offices:
Dover, NH
Manchester, NH
N. Chelmsford, MA

GEOTECHNICAL CONSULTING
SITE INSPECTIONS
MATERIAL TESTING

JOHN TURNER CONSULTING, INC.

REPORT OF CONCRETE FIELD/COMPRESSION TESTING

CLIENT: Becker Structural Engineers, Inc.
Attn: Mr. Paul Becker
19 Commercial Street
Portland, ME 04101

PROJECT: Avis Rent A Car System
Portland Jetport
Portland, NH

DATE: February 5,2002

REPORT #: 01-196-012

General Location: Walls
Date Cast: 1-8-02
Field Rep.: Martin Menke
Contractor: Horne
Supplier: Dragon
Admixtures:
Air Temp: 41°F
Weather: Clear
Nominal size of Aggr.: ¾"
Average Cylinder Weight:

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STRUCTURAL ENGINEERS

TICKET #/CYL?	SLUMP	AIR CONTENT	CONCR. TEMP.	ELAPSED TIME
3916982/ 4 **cyl**	4.0	5.4	53	65 min.

DATE OF TEST	AGE	SPECIMEN AREA	COMPRESSIVE STRENTH(psi)
01-15-02	7	28.27in^2	2060
02-05-02	28	28.27in^2	3480
02-05-02	28	28.27in^2	3650
	H	28.27in^2	

SPECIFIC LOCATION: Line G-J, 1-**2**

TEAMWORK

818 Central Avenue, Dover, NH
603-749-1841 Fax: 603- 743-3370

Offices:
Dover, NH
Manchester, NH
N. Chelmsford, MA

GEOTECHNICAL CONSULTING
SITE INSPECTIONS
MATERIAL TESTING

JOHN TURNER CONSULTING, INC.

REPORT OF CONCRETE FIELD/COMPRESSION TESTING

CLIENT: Becker Structural Engineers, Inc.
Attn: Mr. Paul Becker
19 Commercial Street
Portland, ME 04101

PROJECT: Avis Rent A Car System
Portland Jetport
Portland, NH

TICKET #/CYL?	SLUMP	AIR CONTENT	CONCR TEMP.	ELAPSED TIME
3917016/ **4 cyl**	**4.0**	**5.8**	58	80 min.
3917017	4.0		-	75 min.

REMARKS:

RECEIVED
FEB 1 1 2002
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STRUCTURAL ENGINEERS

TEAMWORK

818 Central Avenue, Dover, NH
603-749-1841 Fax: 603- 743-3370

Offices:
***Dover,** NH*
Manchester, NH
*N. **Chelmsford,** MA*

GEOTECHNICAL CONSULTING
SITE INSPECTIONS
MATERIAL. TESTING

JOHN TURNER CONSULTING, INC.

REPORT OF CONCRETE FIELD/COMPRESSION TESTING

CLIENT:	Becker Structural Engineers, Inc. Attn: Mr. Paul Becker 19 Commercial Street Portland, ME 04101	PROJECT:	Avis Rent A Car System Portland Jetport Portland, NH

DATE: February 13,2002 REPORT #: 01-196-014A

General Location: North wall – Footing
Date Cast: 1-16-02
Field Rep.: Mike Newman
Contractor: Horne
Supplier: Dragon
Admixtures: 2% Polarset
Air Temp: 37°F
Weather: Sunny
Nominal size of Aggr.: ¾"
Average Cylinder Weight:

391715514 **cyl**	3.25	6.4	57	45 min.

DATE OF TEST	AGE	SPECIMEN AREA	COMPRESSIVE STRENTH(psi)
01-23-02	7	28.27in^2	1910
02-13-02	28	28.27in^2	4730
02-13-02	28	28.27in^2	4760
	H	28.27in^2	

SPECIFIC LOCATIOP.. 30' East of West wall

DESIGN STRENGTH: 3000 PSI
YARDS PLACED: 5.5 YARDS

REMARKS:

RECEIVED
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STRUCTURAL BECKER ENGINEERS

TEAMWORK

818 Central Avenue, Dover, NH
***603-749-1841** Fax: 603- 743-3370*

Offices:
Dover, NH
Manchester, NH
N. Chelmsford, MA

GEOTECHNICAL CONSULTING
SITE INSPECTIONS
MATERIAL TESTING

JOHN TURNER CONSULTING, INC.

REPORT OF CONCRETE **FIELD/COMPRESSION** TESTING

CLIENT: Becker Structural Engineers, Inc.
Attn: Mr. Paul Becker
19 Commercial Street
Portland, ME 04101

PROJECT: Avis Rent A Car System
Portland Jetport
Portland, NH

3917187/ **4** cyl	3.75	***5.8***	56	90 min.

02-15-02	28	28.27in^2	4220
02-15-02	28	28.27in^2	4370
	H	28.27in^2	

SPECIFIC LOCATION: 40' East of West wall

DESIGN STRENGTH: 3000 PSI
YARDS PLACED: 10 YARDS

REMARKS:

TEAMWORK

818 Central Avenue, Dover, NH
603-749-1841 Fax: 603- 743-3370

Offices:
Dover, NH
Manchester, NH
*N. **Chelmsford, MA***

GEOTECHNICAL CONSULTING
SITE INSPECTIONS
MATERIAL TESTING

JOHN **TURNER** CONSULTING, INC.

REPORT OF CONCRETE FIELD/COMPRESSION TESTING

CLIENT:	Becker Structural Engineers, Inc. Attn: Mr. Paul Becker 19 Commercial Street Portland, ME 04101	PROJECT:	Avis Rent A Car System Portland Jetport Portland, NH
DATE:	February 19,2002	REPORT #:	01-196-015

General Location: Sump hoie in carwash
Date Cast: 1-22-02
Field Rep.: Ty Cobb
Contractor: EMRG, Inc.
Supplier: Dragon
Admixtures: Winter Service
Air Temp: 44°F
Weather: Sunny
Nominal size of Aggr.: ¾"
Average Cylinder Weight:

391724214 cyl	2.5	5.4	52	60 min.
DATE OF TEST	AGE	SPECIMEN AREA	COMPRESSIVE STRENTH(psi)	
01-29-02	7	28.27in2	2220	
02-19-02	28	28.27in2	4450	
02-19-02	28 H	28.27in2	4200	

SPECIFIC LOCATION: Middle of Sump Hole

DESIGN STRENGTH: 3000 PSI
YARDS PLACED: 5 YARDS

REMARKS:

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GEOTECHNICAL CONSULTING
SITE INSPECTIONS
MATERIAL TESTING

JOHN TURNER CONSULTING, INC.

REPORT OF CONCRETE FIELD/COMPRESSION TESTING

CLIENT: Becker Structural Engineers, Inc.
Attn: Mr. Paul Becker
19 Commercial Street
Portland, ME 04101

PROJECT: Avis Rent A Car System
Portland Jetport
Portland, **NH**

DATE: February 21.2002 REPORT #: 01-196-016

General Location: Northeast garage entrance14
Date Cast: 1-24-02
Field Rep.: Mike Newman
Contractor: EMRG, Inc.
Supplier: Dragon
Admixtures: 2% Polarset
Air Temp: 39°F
Weather: Rain
Nominal size of Aggr.: ¾"
Average Cylinder Weight:

TICKET #/CYL?	SLUMP	AIR CONTENT	CONCR. TEMP.	ELAPSED TIME
3917288/ 4 **cyl**	3.5	**5.0**	64	85 min.
3917291	3.5	-	-	65 min.

DATE OF TEST	AGE	SPECIMEN AREA	COMPRESSIVE STRENTH(psi)
01-31-02	7	28.27in2	2760
02-21-02	28	28.27in2	3900
02-21-02	28 **H**	28.27in2	3820

SPECIFIC LOCATION: Garage Entrance: East wall, **2'** South of North wall

DESIGN STRENGTH: 3000 PSI
Y A W S PLACED: 16 YARDS

REMARKS:

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N. Chelmsford, MA

GEOTECHNICAL CONSULTING
SITE INSPECTIONS
MATERIAL TESTING

JOHN **TURNER** CONSULTING, INC.

REPORT OF CONCRETE FIELDKOMPRESSION TESTING

CLIENT: Becker Structural Engineers, Inc.
Attn: Mr. Paul Becker
19 Commercial Street
Portland, ME 04101

PROJECT: Avis Rent A Car System
Portland Jetport
Portland, NH

TICKET #/CYL?	SLUMP	AIR CONTENT	CONCR. TEMP.	ELAPSED TIME
3917288/ **4** cyl	3.5	5.0	64	**85** min.
3917291	3.5			65 min.

02-28-02	**28**	28.27in2	4650
02-28-02	28 H	28.27in2	4370

SPECIFIC LOCATION: Northeast pillar

DESIGN STRENGTH: 3000 PSI
YARDS PLACED: 10 YARDS

REMARKS:

TEAMWORK

818 Central Avenue, Dover, NH
603-749-1841 Fax: 603- 743-3370

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Manchester, NH
N. Chelmsford, MA

GEOTECHNICAL CONSULTING
SITE INSPECTIONS
MATERIAL TESTING

JOHN TURNER CONSULTING, INC.

REPORT OF CONCRETE FIELD/COMPRESSION TESTING

CLIENT:	Becker Structural Engineers, Inc. Attn: Mr. Paul Becker 19 Commercial Street Portland, ME 04101	PROJECT:	Avis Rent A Car System Portland Jetport Portland, NH

DATE: March 8,2002 REPORT #: 01-196-018

General Location:	Footings for gas island
Date Cast:	2-8-02
Field Rep.:	Mike Newman
Contractor:	EMRG, Inc.
Supplier:	Dragon
Admixtures:	Polarset 2%
Air Temp:	44°F
Weather:	Sunny
Nomina1 sue of Aggr.:	¾"
Average Cylinder Weight:	

3917534/ 4 cyl	4.0	5.3	58	85 min.

SPECIFIC LOCATION: 6' North of Southern pier, West Footing

DESIGN STRENGTH: 3000 PSI
YARDS PLACED: 11 YARDS

REMARKS: Ran out of concrete 3' South of Northern pier, East footing. Formed up.

Offices:
Dover, NH
Manchester, NH
N. Chelmsford, MA

GEOTECHNICAL CONSULTING
SITE INSPECTIONS
MATERIAL TESTING

JOHN **TURNER** CONSULTING, INC.

REPORT OF CONCRETE FIELD/COMPRESSION TESTING

CLIENT: Becker Structural Engineers, Inc.
Attn: Mr. Paul Becker
19 Commercial Street
Portland, ME 04101

PROJECT: Avis Rent A Car System
Portland Jetport
Portland, NH

DATE: March 14,2002 REPORT #: 01-196-019

General Location: Fuel Island Foundation Walls
Date Cast: 2-14-02
Field Rep.: Mike Newman
Contractor: EMRG, Inc.
Supplier: Dragon
Admixtures: Polarset 2%
Air Temp: 31°F
Weather: Cloudy
Nominal size of Aggr.: ¾"
Average Cylinder Weight:

TICKET #/CYL?	SLUMP	AIR CONTENT	CONCR. TEMP.	ELAPSED TIME
*3917637/ 4 cyl	4.75	5.6	55	70 min.
3917642	4.0		54	50 min.

03-14-02	28	28.27in2	4340
03-14-02	28 H	28.27in2	4300

SPECIFIC LOCATION: Midway between North & South piers, West wall

DESIGN STRENGTH: 3000 PSI
YARDS PLACED: 14.5 YARDS

REMARKS: * 2.5" slump on-site, 15 gallons of water added, on-site.

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MAR 1 2002
BECKER STRUCTURAL ENGINEERS

TEAMWORK

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603-749-1841 Fax: 603-743-3370

Offices:
Dover, NH
Manchester. NH
N. Chelmsford MA

GEOTECHNICAL CONSULTING
SITE INSPECTIONS
MATERIAL TESTING

JOHN TURNER CONSULTING, INC.

REPORT OF CONCRETE FIELD/COMPRESSION TESTING

CLIENT: Becker Structural Engineers, Inc.
Attn: Mr. Paul Becker
19 Commercial Street
Portland, ME 04101

PROJECT: Avis Rent A Car System
Portland Jetport
Portland, NH

DATE: April 19, 2002 **REPORT #:** 01-196-021

General Location:	Car wash topping slab, East bay
Date Cast:	3-22-02
Field Rep.:	Mike Newman
Contractor:	EMRC, Inc.
Supplier:	Dragon
Admixtures:	Polarset 2%
Air Temp:	20°F
Weather:	Sunny
Nominal size of Aggr.:	¾"
Average Cylinder Weight:	

TICKET #/CYL?	SLUMP	AIR CONTENT	CONCR. TEMP.	ELAPSED TIME
3918231	5.0		50	70 min.
3918233/4 cyl	4.75	5.4	49	85 min.
3918142	5.0			35 min.

DATE OF TEST	AGE	SPECIMEN AREA	COMPRESSIVE STRENTH (psi)
03-29-02	7	28.27in2	2910
04-19-02	28	28.27in2	4620
04-19-02	28 H	28.27in2	4870

SPECIFIC LOCATION: 1' North of South wall, 5' West of East wall

DESIGN STRENGTH: 4000 PSI
YARDS PLACED: 30 YARDS

REMARKS: 5" dump requested by job foreman.

03300 Cast-in-Place Concrete
03300.3 Reinforcement Mill Certifications

Fabricators of Reinforcing Steel

MacFarlane *Steel* Corporation

TEL 207-935-3531
FAX 207-935-3058

P.O. Box 142
Fryeburg, ME 04037

FAX COVER SHEET

TO: Mark - Horne Const

FROM: Laurie

DATE: 4/19/02

FAX NO. TO: 603 692-7186

FAX NO. FROM

NUMBER OF PAGES INCLUDING THIS PAGE: 6

ANY QUESTIONS OR PROBLEMS PLEASE CALL (207)935 3531

HARD COPY TO BE MAILED: YES _____ NO: X

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APR 2 2 2002
BECKER
STRUCTURAL ENGINEERS

COMMENTS: Here are the copies of mill certs for the bar in your project Ans in So Ptld. Me

THANK YOU FOR YOUR ASSISTANCE.

1

CO·STEEL SAYREVILLE

T...NG LABORATORY REPORT

COMPTE RENDU DU LABORATOIRE D'ESSAI

NORTH CROSSMAN RD
P.O. Box 249
SAYREVILLE, NJ, USA
08871-0249

FAX : (732)721-6674 TEL : (732)721-6600

- PHYSICAL PROPERTIES - PROPRIETES PHYSIQUES
- METALLURGICAL PROPERTIES - PROPRIETES METALLURGICAL
- CHEMICAL ANALYSIS - ANALYSE CHIMIQUE

BILL OF LADING
NO DE CONN.
272 851

SHIP TO / EXPEDIER A

MACFARLANE STEEL CORP
WOODLAWN ROAD
FRYEBURG, ME, USA
04037
Attn:GARY MACFARLANE

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Plant Metallurgical Engineer

TO THE ITEMS TESTED.

ARE A TRUE AND CORRECT CO... BY THE AFOREMENTIONED COMPANY, IN ... OF THE SPECIFICATIONS CITED BELOW.

THIS PRODUCT HAS BEEN MELTED AND MAN... ...D MANUFACTURED IN U.S.A.

MATERIAL TESTED / MATERIAU EPROUVE	GRADE / NUANCE	CONTROL NO. / NO. DE CONTROLE
REBAR 10 M #3 REBAR(40 FT)	ASTM A615M GR420 [GR60]	65043601

CUSTOMER P.O. NO. / NO DE COMM DU C... NO. / LIENT

AMOS

TEST RESULTS FOR HEAT N20483 HEAT SEQ 1

SAMPLE	C	MN	P	S	SI
1	.42	.83	.021	.045	.19

MECHANICAL TESTS AVERAGE OF 2 TESTS YIELD: 63379.0 PSI, TENSILE: 103217 PSI %ELONGATION: 12 GUAGE LENGTH: 8 IN - BEND TEST PASSED

Printed: 1/29/01

CO·STEEL SAYREVILLE
NORTH CROSSMAN RD
P.O. Box 249
SAYREVILLE, NJ, USA
08871-0249
FAX : (732)721-6674 TEL : (732)721-6600

TESTING LABORATORY REPORT

- PHYSICAL PROPERTIES - METALLURGICAL PROPERTIES - CHEMICAL ANALYSIS

THIS REPORT SHALL NOT BE REPRODUCED EXCEPT IN FULL, THIS REPORT RELATES ONLY TO THE ITEMS TESTED.
THE CHEMISTRY ANALYSIS WAS DETERMINED IN ACCORDANCE WITH TEST METHODS ASTM E 415 AND/OR ASTM E 1019.

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319918

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WOODLAWN ROAD
FRYEBURG, ME, USA
04037
Attn:GARY MACFARLANE

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MATERIAL TESTED	GRADE	CONTROL NO.	CUSTOMER P.O.
REBAR 13 M /#4 REBAR(40 FT)	ASTM A615M GR420 [GR60]	67087201	AMOS AUG/SEPT

TEST RESULTS FOR HEAT N25412 HEAT SEQ 1

SAMPLE	C	MN	P	S	SI	CU	NI	CR	MO	SN
1	.39	.88	.016	.063	.18	.51	.24	.12	.06	.024

MECHANICAL TESTS AVERAGE OF 2 YIELD: 65444.5 PSI, TENSILE: 104915 PSI %ELONGATION: 13 GUAGE LENGTH: 8 IN - BEND TEST PASSED

MATERIAL TESTED	GRADE	CONTROL NO.	CUSTOMER P.O.
REBAR 13 M /#4 REBAR(40 FT)	ASTM A615M GR420 [GR60]	67087201	AMOS AUG/SEPT

TEST RESULTS FOR HEAT N25428 HEAT SEQ 1

SAMPLE	C	MN	P	S	SI	CU	NI	CR	MO	SN
1	.44	.90	.022	.070	.17	.50	.19	.10	.05	.025

MECHANICAL TESTS AVERAGE OF 2 YIELD: 64171.5 PSI, TENSILE: 104406 PSI %ELONGATION: 12 GUAGE LENGTH: 8 IN - BEND TEST PASSED

MATERIAL TESTED	GRADE	CONTROL NO.	CUSTOMER P.O.
REBAR 13 M /#4 REBAR(40 FT)	ASTM A615M GR420 [GR60]	67087201	AMOS AUG/SEPT

TEST RESULTS FOR HEAT N25429 HEAT SEQ 1

SAMPLE	C	MN	P	S	SI	CU	NI	CR	MO	SN
1	.45	.96	.021	.065	.20	.45	.20	.11	.05	.026

MECHANICAL TESTS AVERAGE OF 2 YIELD: 66206.0 PSI, TENSILE: 106698 PSI %ELONGATION: 11 GUAGE LENGTH: 8 IN - BEND TEST PASSED

MATERIAL TESTED	GRADE	CONTROL NO.	CUSTOMER P.O.
REBAR 13 M /#4 REBAR(40 FT)	ASTM A615M GR420 [GR60]	67087201	AMOS AUG/SEPT

TEST RESULTS FOR HEAT N25430 HEAT SEQ 1

SAMPLE	C	MN	P	S	SI	CU	NI	CR	MO	SN
1	.40	.98	.016	.058	.21	.43	.21	.14	.07	.025

MECHANICAL TESTS AVERAGE OF 2 YIELD: 65954.0 PSI, TENSILE: 106188 PSI %ELONGATION: 13 GUAGE LENGTH: 8 IN - BEND TEST PASSED

MATERIAL TESTED	GRADE	CONTROL NO.	CUSTOMER P.O.
REBAR 13 M /#4 REBAR(40 FT)	ASTM A615M GR420 [GR60]	67087201	AMOS AUG/SEPT

TEST RESULTS FOR HEAT N25431 HEAT SEQ 1

SAMPLE	C	MN	P	S	SI	CU	NI	CR	MO	SN
1	.42	1.02	.017	.057	.19	.39	.24	.19	.08	.024

MECHANICAL TESTS AVERAGE OF 2 YIELD: 62134.0 PSI, TENSILE: 100841 PSI %ELONGATION: 14 GUAGE LENGTH: 8 IN - BEND TEST PASSED

Date Printed: 09/21/01 21:05:10

w_shp0517_lab_cert

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P.O. Box 249
SAYREVILLE, NJ, USA
08871-0249

FAX : (732)721-6674 TEL : (732)721-6600

TESTING LABORATORY REPORT

- PHYSICAL PROPERTIES - METALLURGICAL PROPERTIES - CHEMICAL ANALYSIS

THIS REPORT SHALL NOT BE REPRODUCED EXCEPT IN FULL, THIS REPORT RELATES ONLY TO THE ITEMS TESTED.
THE CHEMISTRY ANALYSIS WAS DETERMINED IN ACCORDANCE WITH TEST METHODS ASTM E 415 AND/OR ASTM E 1019.

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S H I P MACFARLANE STEEL CORP
WOODLAWN ROAD
FRYEBURG, ME, USA
04037

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CO·STEEL SAYREVILLE

CERTIFIES THAT THE RESULTS BELOW ARE A TRUE AND CORRECT COPY OF THE RECORDS PREPARED AND MAINTAINED BY THE AFOREMENTIONED COMPANY, IN COMPLIANCE WITH THE REQUIREMENTS OF THE SPECIFICATIONS CITED BELOW.

Plant Metallurgical Engineer

THIS PRODUCT HAS BEEN MELTED AND MANUFACTURED IN U.S.A.

MATERIAL TESTED	GRADE	CONTROL NO.	CUSTOMER P.O.
REBAR 16 M #5 REBAR(40 FT)	ASTM A615M GR420 [GR60]	69267306	GARY

TEST RESULTS FOR HEAT N29488 HEAT SEQ 1

SAMPLE	C	MN	P	S	SI	CU	NI	CR	MO	SN
1	.37	.87	.010	.034	.20	.63	.54	.12	.12	.051

MECHANICAL TESTS AVERAGE OF 2 YIELD: 66168.0 PSI, TENSILE: 101207 PSI %ELONGATION: 12 GUAGE LENGTH: 8 IN - BEND TEST PASSED

MATERIAL TESTED	GRADE	CONTROL NO.	CUSTOMER P.O.
REBAR 16 M #5 REBAR(40 FT)	ASTM A615M GR420 [GR60]	69267306	GARY

TEST RESULTS FOR HEAT N29490 HEAT SEQ 1

SAMPLE	C	MN	P	S	SI	CU	NI	CR	MO	SN
1	.38	.85	.006	.038	.17	.59	.60	.07	.13	.049

MECHANICAL TESTS AVERAGE OF 2 YIELD: 75620.0 PSI, TENSILE: 102837 PSI %ELONGATION: 10 GUAGE LENGTH: 8 IN - BEND TEST PASSED

Date Printed: 04/01/02 18:47:50

CO·STEEL SAYREVILLE
NORTH CROSSMAN RD
P.O. Box 249
SAYREVILLE, NJ, USA
08871-0249
FAX : (732)721-6674 TEL : (732)721-6600

TEST LABORATORY REPORT
COMPTE RENDU DU LABORATOIRE D'ESSAI

- PHYSICAL PROPERTIES - PROPRIETES PHYSIQUES
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- CHEMICAL ANALYSIS - ANALYSE CHIMIQUE

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FRYEBURG, ME, USA
04037
Attn:GARY MACFARLANE

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Plant Metallurgical Engineer

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MATERIAL TESTED / MATERIAU EPROUVE	CONTROL NO. / NO. DE CONTROLE	CUSTOMER P.O. NO. / NO DE COMM DU CLIENT
REBAR 19 M #6 REBAR(30 FT)		66118309

TEST RESULTS FOR HEAT N23474 HEAT SEQ 1 GR420 [GR60] AMOS

SAMPLE	C	MN	P	S	SI	CU	NI	CR	MO	SN
1	.41	1.02	.015	.047	.22	.35	.13	.12	.04	.024

MECHANICAL TESTS AVERAGE OF 2 TESTS YIELD: 65416.0 PSI, TENSILE: 107744 PSI

H: 8 IN

Date Printed: 6/12/01 21:39:27

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SAYREVILLE, NJ, USA
08871-0249
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TESTING LABORATORY REPORT

BILL OF LADING 313587

- PHYSICAL PROPERTIES - METALLURGICAL PROPERTIES - CHEMICAL ANALYSIS

THIS REPORT SHALL NOT BE REPRODUCED EXCEPT IN FULL. THIS REPORT RELATES ONLY TO THE ITEMS TESTED. THE CHEMISTRY ANALYSIS WAS DETERMINED IN ACCORDANCE WITH TEST METHODS ASTM E 415 AND/OR ASTM E 1019.

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WOODLAWN ROAD
FRYEBURG, ME, USA
04037
Attn:GARY MACFARLANE

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Plant Metallurgical Engineer

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MATERIAL TESTED	GRADE	CONTROL NO.	CUSTOMER P.O.
REBAR 29 M /#9 REBAR(40 FT)	ASTM A615M GR420 [GR60]	67087207	AMOS AUG/SEPT

TEST RESULTS FOR HEAT N21985 HEAT SEQ 1

SAMPLE	C	MN	P	S	SI	CU	NI	CR	MO	SN
1	.39	.83	.017	.056	.22	.56	.17	.13	.04	.020

MECHANICAL TESTS AVERAGE OF 2 YIELD: 70547.0 PSI, TENSILE: 101068 PSI %ELONGATION: 14 GUAGE LENGTH: 8 IN - BEND TEST PASSED

MATERIAL TESTED	GRADE	CONTROL NO.	CUSTOMER P.O.
REBAR 29 M /#9 REBAR(40 FT)	ASTM A615M GR420 [GR60]	67087207	AMOS AUG/SEPT

TEST RESULTS FOR HEAT N22132 HEAT SEQ 1

SAMPLE	C	MN	P	S	SI	CU	NI	CR	MO	SN
1	.36	.92	.035	.070	.19	.44	.15	.19	.05	.021

MECHANICAL TESTS AVERAGE OF 2 YIELD: 67545.5 PSI, TENSILE: 99767 PSI %ELONGATION: 15 GUAGE LENGTH: 8 IN - BEND TEST PASSED

MATERIAL TESTED	GRADE	CONTROL NO.	CUSTOMER P.O.
REBAR 29 M /#9 REBAR(40 FT)	ASTM A615M GR420 [GR60]	67087207	AMOS AUG/SEPT

TEST RESULTS FOR HEAT N22133 HEAT SEQ 1

SAMPLE	C	MN	P	S	SI	CU	NI	CR	MO	SN
1	.40	.91	.021	.049	.24	.35	.14	.15	.05	.024

MECHANICAL TESTS AVERAGE OF 2 YIELD: 68145.5 PSI, TENSILE: 102419 PSI %ELONGATION: 12 GUAGE LENGTH: 8 IN - BEND TEST PASSED

9

Date Printed: 08/22/01 13:57:31

w_shp0517_lab_cert

03300 Cast-in-Place Concrete

03300.4 Concrete Mix Designs

Material Certifications

Becker Structural Engineers, Inc.
19 Commercial Street
Portland, ME 04101
207-879-1838

Transmittal

TO: Horne Construction
154 High Street
Somersworth, NH 03878-2612
(603) 692-7180

ATTN: Mr. Mark E. Geuther – Project Manager
DATE: 12/5/2001
PROJECT: Avis Vehicle Service Center
PROJECT No: 768

☒ Attached ☐ Under separate cover via:

☐ For Approval ☒ Reviewed
☐ For Your Use ☐ For Signature
☐ For Review & Comment ☐ Returned for Corrections
☐ Other:

☐ Prints ☐ Specifications ☐ Bond Reproducibles
☐ Mylars ☐ Calculations ☒ Shop Drawings
☐ Sepias ☐ Letter ☐ Other:

Copies	Date	Drwg No.	Description
5	12/3/2001	Packet	Concrete Mix Designs

Comments: For this submittal, we have marked all of the copies. Per the specifications and the project general notes, we are to receive 3 copies of shop drawing submittals. In the future, only 2 copies will be returned to the Architect (1 copy to the contractor), and the remaining copies will be returned unmarked as extra copies if extra copies are received.

Signed: _____
Ethan A. Rhile

CC: Frank St Pierre - Gawron

1

HORNE CONSTRUCTION

154 High Street Somersworth, NH 03878-2612
Telephone (603) 692-7180 Fax (603) 692-7186 E-Mail Horne@ttlc.net

Letter of Transmittal

No. 00013
Project 02-004
Avis Service Center

Date December 4,2001

To: **Becker Structural Engi**
19 Commerical Street
Portland, ME 04101

Att **Mr. Ethan Rhile**

RE Concrete Design **Mixes**

We Are Sending ☐ Attached ☐ Separate Cover Via Overnight Fedex

☐ Addenda	☐ Application for Payment	☐ ASI	☐ Building Permit
☐ Change Order	☐ Contract	☐ Insurance Certificates	☐ Letter
☐ Meeting Minutes	☐ Photographs	☐ Plans	3 Prints
☐ Purchase Order	☐ Samples	☐ Schedule	☐ Shop Drawing(s)
☐ Sketches	☐ Specifications	☐ Subcontract	☐ Submittal
☐ Other			

Copies	Date	Item	Number	Description
7	12/4/2001	Submittal	03000-001	Concrete Design Mixes

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Transmitted by: Home Construction

Signed: Mark E. Geuther

By: Mark E. **Geuther** - Project Manager

Date: 12.4.01

2

CC: File, Field T/O, Frank St. Pierre T/O

HORNE CONSTRUCTION
154 High Street, Somenworth, NH 03878
Tel: (603) 692-7180 • Fax: (603) 692-7186
E-Mail: mgeuther@ttk.net

OFFICE COPY SUBMISSION

Project:	**Avis** Vehicle Service Center Jetport Boulevard Portland ME 04102
Architect:	Gawron Architects 29 Blackwater **Road** Scarborough ME 04074 (207)-883-6307
Civil Engineer:	**Sebago** Technics 1 Chabot Street Westbrook ME 04098-1339 (207)-856-0277
Structural Engineer:	Becker **Structural** Engineers 19 Commerical Street Portland ME 04101 (207)479-1838
Mechanical/ Electrical Engineer :	Bennett Consulting Bennett Road Freeport ME 04032 (207)-865-9475
General Contractor:	Home Construction Co., Inc. 154 High Street Somersworth, NH 03878-2612
Subcontractor/ Supplier	**Dragon** Products Company 38 Preble St Portland ME 04104
Manufacturer:	
Specification Section:	03300
Drawing No.:	SO, S1, s2, s3, s4
Submittal No.:	03000-002
Submittal Title:	Redi-Mix Concrete Design Mixes
Notes:	

RECEIVED

DEC 0 5 2001

BECKER STRUCTURAL ENGINEERS

corporate Offices
38 Preble St • P.O Box 1521
Portland, Maine 04104
207-774-6355 • Fax 207-761-5694

OFFICE COPY SUBMISSION 1

CONCRETE MIX DESIGN

MIX ID : PDAVISSERCTR34 [1   3000 PSI   11/05/01

CONTRACTOR : HORNE CONSTRUCTION
PROJECT : AVIS VEHICLE SERVICE CENTER
SOURCE OF CONCRETE : DRAGON PRODUCTS COMPANY, PD BD
CONSTRUCTION TYPE : FOOTINGS, FOUNDATION
PLACEMENT : CHUTE, CRANE, PUMP

WEIGHTS PER CUBIC YARD (SATURATED, SURFACE-DRY)

		YIELD, CU FT
DRAGON, TYPE 11, LB	336	1.71
BLUE CIRCLE, NEWCEM, LB	144	0.79
FINE AGGREGATE, ASTM C-33, LB	1372	8.30
3/4" QUARRY STONE, ASTM C-33, LB	1800	10.41
WATER, LB (GAL-US)	265 (31.8)	4.25
TOTAL AIR, %	6.0 +/- 2.0	1.62
	TOTAL	27.08

W.R.GRACE: WRDA-HYCOL, 02-US	19.20
(OPTIONAL) W.R.GRACE: DARACEM-19, OZ	38.40
W.R.GRACE: DAREX 11, OZ-US	2.9
WATER/CEMENT RATIO, LBS/LB	0.55
SLUMP, IN	4.00
CONCRETE UNIT WEIGHT, PCF	144.6

1.71+0.79=2.5
2.5

CC: PORTLAND DISPATCH
SLUMP SHOWN IS MAX PRIOR TO THE ADDITION OF DARACEM-19
FINAL SLUMP NOT TO EXCEED 8"

PREPARED BY :

TECHNICAL SERVICES

265 / (336+144) = 0.553

DRAGON® PRODUCTS COMPANY

4

Corporate Offices
38 Preble St. • P.O. Box 1521
Portland. Maine 04104
201-774-6355 • Fax 201-76 1-5694

CONCRETE MIX DESIGN

MIX ID : PDAVISSERCTR44n [ ] 4000 PSI 11/05/01

CONTRACTOR : HORNE CONSTRUCTION
PROJECT : AVIS VEHICLE SERVICE CENTER
SOURCE OF CONCRETE : DRAGON PRODUCTS COMPANY, PD BD
CONSTRUCTION TYPE : INTERIOR SLABS
PLACEMENT : CHUTE, CRANE, PUMP

WEIGHTS PER CUBIC YARD (SATURATED, SURFACE-DRY)

			YIELD, CU FT
DRAGON, TYPE II, LB	406		2.07
BLUE CIRCLE, NEWCEM, LB	174		0.95
FINE AGGREGATE, ASTM C-33, LB	1330		8.04
3/4" QUARRY STONE, ASTM C-33, LE	1820		10.53
WATER, LB (GAL-US)	275	(33.0)	4.41
TOTAL AIR, %	4.0	+/- 1.0	**1.08**
		TOTAL	27.08

W.R.GRACE: WRDA-HYCOL, OZ-US	23.20
(OPTIONAL) W.R.GRACE: DARACEM-19, OZ	46.40
W.R.GRACE: DAREX II, OZ-US	1.2
WATER/CEMENT RATIO, LBS/LB	0.47
SLUMP, IN	4.00
CONCRETE UNIT WEIGHT, PCF	147.9

$\frac{275}{406+174} = 0.474$

cc: PORTLAND DISPATCH
SLUMP SHOWN IS MAX PRIOR TO THE ADDITION OF DARACEM-19
FINAL SLUMP NOT TO EXCEED 8"
W.R.GRACE: POLYPROPYLENE FIBER REINFORCEMENT

PREPARED BY : Mark R. West

TECHNICAL SERVICES

DRAGON® PRODUCTS COMPANY

Corporate Offices
38 Preble St. • P.O. **Box** 1521
Portland, Maine 04104
207-774-6355 • Fax 207-761-5694

CONCRETE MIX DESIGN

MIX ID : PDAVISSERCTR45e [1 **4500 PSI** (4000 SPECIFIED) 11/30/01

CONTRACTOR : HORNE CONSTRUCTION
PROJECT : AVIS VEHICLE SERVICE CENTER
SOURCE OF CONCRETE : DRAGON PRODUCTS COMPANY, PD BD
CONSTRUCTION TYPE : EXTERIOR SLABS
PLACEMENT : CHUTE, CRANE, PUMP

WEIGHTS PER CUBIC YARD (SATURATED, SURFACE-DRY)

			YIELD, CU FT
DRAGON, TYPE 11, LB	464		2.36
BLUE CIRCLE, NEWCEM, LB	198		1.09
FINE AGGREGATE, ASTM C-33, LB	1196		7.23
3/4" QUARRY STONE, ASTM C-33, LB	1820		10.53
WATER, LB (GAL-US)	265	(31.8)	4.25
TOTAL AIR, %	6.0	+/- 1.0	1.62
		TOTAL	27.08

W.R.GRACE: WRDA-HYCOL, OZ-US	26.48
W.R.GRACE: DARACEM-19, OZ-US	52.96
W.R.GRACE: DAREX II, OZ-US	4.0
WATER/CEMENT RATIO, LBS/LB	0.40
SLUMP, IN	4.00
CONCRETE UNIT WEIGHT, PCF	145.6

$\frac{265}{464+198} = 0.400$

CC: PORTLAND DISPATCH
SLUMP SHOWN IS MAX PRIOR TO THE ADDITION OF DARACEM-19
FINAL SLUMP NOT TO EXCEED 8"
(OPTIONAL) W.R.GRACE: POLYPROPYLENE FIBER REINFORCEMENT

PREPARED BY :

_____

TECHNICAL SERVICES

MAINE YOUTH CENTER
Mix: PDMEJUVENILE34 F'c: 3000 psi
11/05/01

MIX DESCRIPTION

PDMEJUVENILE34 ---------- 3000 psi ---------- 0/ 0/ 0

Sample Date	Sample ID	Air Tmp deg F	Con Tmp deg F	Air Cont %	Slump in	7 day Comp psi	28 day Comp psi	Moving Avg: 3 28 day Comp psi
6/ 9/ 0	1	70	75	6.0	2.25	2440	3945	-
6/13/ 0	2	75	65	6.0	2.00	2900	4355	-
6/14/ 0	3	82	68	6.0	4.00	2860	4050	4117
6/15/ 0	4	70	63	5.8	3.75	3040	4495	4300
6/20/ 0	5	83	75	5.0	2.25	2480	3745	4097
6/20/ 0	6	83	74	4.8	3.50	2620	3905	4048
6/23/ 0	8	72	80	6.4	3.50	2510	3470	3707
6/26/ 0	9	80	75	5.9	3.25	2410	3625	3667
6/28/ 0	10	80	76	6.2	3.00	2410	3485	3527
6/29/ 0	11	80	75	7.2	6.00	2550	3675	3595
7/ 5/ 0	12	78	75	5.4	5.50	2790	4425	3862
7/12/ 0	14	83	75	6.0	3.50	2620	3855	3985
7/21/ 0	18	87	85	6.0	3.25	2970	4510	4263
8/ 8/ 0	23	87	84	5.6	3.00	3010	3875	4080
8/15/ 0	25	75	80	6.4	2.50	2860	4700	4362
8/16/ 0	26	78	80	7.4	4.00	2650	4280	4285
8/21/ 0	27	75	76	6.8	4.00	2440	3785	4255
8/22/ 0	28	85	83	6.0	6.00	3010	3715	3927
8/25/ 0	30	87	81	6.0	6.00	2860	4190	3897
8/28/ 0	31	82	74	5.6	3.50	2860	4190	4032
8/29/ 0	32	78	76	6.8	2.50	3110	4795	4392
8/30/ 0	33	80	74	6.9	3.00	2620	4070	4352
8/31/ 0	34	86	77	6.2	4.00	2330	4135	4333
9/ 1/ 0	35	88	80	5.3	2.50	2550	4190	4132
9/ 8/ 0	38	80	74	5.4	2.00	3010	4225	4183
9/ 8/ 0	39	78	72	7.2	3.00	2690	4135	4183
9/11/ 0	40	78	74	5.4	2.50	2330	4210	4190
9/13/ 0	41	80	79	5.0	5.00	2440	4475	4273
9/13/ 0	42	80	78	5.5	7.00	2120	4035	4240
9/14/ 0	43	73	70	5.3	2.50	2440	4490	4333
9/18/ 0	44	79	72	6.2	3.00	2160	3910	4145
9/19/ 0	45	74	74	6.0	3.00	2260	3875	4092
9/20/ 0	46	77	74	6.3	3.00	2090	3710	3832

Concrete Test Report Summary

Sample Date	Sample ID	Air Tmp deg F	Con Tmp deg F	Air Cont %	Slump in	7 day Comp psi	28 day Comp psi	Moving Avg: 3 28 day Comp psi
9/21,' 0	47	72	72	6.2	2.50	2330	3910	3832
9/22/ 0	48	72	76	7.2	6.25	1910	3875	3832
9/25/ 0	49	76	75	6.0	7.50	2120	4265	4017
9/26/ 0	50	50	74	8.5	7.50	2190	4085	4075
9/27/ 0	51	70	74	7.5	8.00	2440	4370	4240
9/28/ 0	52	60	74	6.0	6.50	2160	4175	4210
10/ 2/ 0	54	60	72	9.0	7.50	2090	3860	4135
10/ 3/ 0	55	78	75	6.0	5.50	2510	4455	4163
10/ 5/ 0	57	55	69	9.0	7.50	2330	4385	4233
10/12/ 0	58	65	64	7.0	5.50	2620	3695	4178
10/12/ 0	59	67	64	6.0	4.50	2860	3800	3960
10/20/ 0	64	65	63	5.6	6.00	3110	4530	4008
10/25/ 0	65	66	62	7.3	6.75	2620	3470	3933
10/26/ 0	66	65	58	7.5	6.75	2580	3765	3922
10/31/ 0	67	40	55	7.0	6.00	2330	3555	3597
11/ 2/ 0	68	50	62	7.1	3.00	2370	3305	3542
11/ 7/ 0	69	50	62	6.2	5.00	3010	4070	3643
11/ 9/ 0	70	52	69	6.0	5.25	2690	3540	3638
11/15/ 0	76	38	58	7.1	7.75	2550	3750	3787
11/17/ 0	77	40	69	7.2	6.50	2790	3805	3698
11/29/ 0	79	45	65	5.5	5.50	2790	3895	3817
12/ 5/ 0	80	35	56	6.2	7.00	3220	4775	4158
Count		55	55	55	55	55	55	53
Average		71	72	6.3	4.58	2583	4034	4025
Standard Deviation		14	7	0.9	1.83	311	355	240
Range		35	55	4.8	2.00	1910	3305	3527
		88	85	9.0	8.00	3220	4795	4392
Coefficient of Variation		19.71	9.87	14.42	40.04	12.05	8.80	5.97

$3000 + 1.34(355) = 3476$

$3000 + 2.33(355) - 580 = 3327$

9

MAINE YOUTH CENTER
Mix: PDMEJUVENILE44 F'c: 4000 psi
11/05/01

MIX DESCRIPTION
==========

PDMEJUVENILE44 ---------- 4000 psi ---------- 0/ 0/ 0

Sample Date	Sample ID	Air Tmp deg F	Con Tmp deg F	Air Cont %	Slump in	7 day Comp psi	28 day Comp psi	Moving Avg: 3 28 day Comp psi
7/31/ 0	19	80	83	6.2	3.50	3400	4545	-
7/31/ 0	20	80	84	5.5	3.50	3320	4740	-
8/ 2/ 0	21	75	73	6.0	3.50	3150	4460	4582
10/15/ 0	60	40	60	1.4	6.00	4700	5535	4912
10/15/ 0	61	40	59	1.8	6.25	4070	4670	4888
10/15/ 0	62	40	59	1.5	5.75	4950	5415	5207
10/15/ 0	63	40	60	2.3	6.00	4100	4900	4995
11/13/ 0	71	50	65	1.9	3.00	3290	4230	4848
11/13/ 0	72	50	61	1.9	3.00	3430	4650	4593
11/13/ 0	73	50	60	2.0	3.00	3710	4685	4522
11/13/ 0	74	50	63	2.1	3.00	3500	4795	4710
11/13/ 0	75	50	64	1.8	3.00	3470	4490	4657
11/21/ 0	78	34	64	3.0	4.75	3500	4735	4673
12/ 6/ 0	81	24	55	2.1	3.00	3610	5165	4797
12/13/ 0	82	28	67	1.8	4.00	3540	4740	4880
12/19/ 0	83	30	60	2.4	4.25	3500	4350	4752
12/27/ 0	85	-	-	-	-	3710	4950	4680
1/ 3/ 1	86	8	63	2.4	4.00	4170	5110	4803
1/12/ 1	90	20	58	1.5	7.00	3540	4335	4798
2/ 2/ 1	93	25	65	1.5	6.00	4240	5520	4988
2/ 2/ 1	94	25	64	1.4	6.50	4000	5090	4982
4/ 5/ 1	99	35	80	1.9	5.75	3860	4545	5052
4/ 5/ 1	100	35	74	1.8	6.50	4390	5145	4927
5/ 8/ 1	103	55	65	1.2	7.50	3750	4615	4768
5/ 8/ 1	104	60	64	1.4	7.25	3540	4420	4727
5/25/ 1	106	65	70	2.9	7.50	3710	4830	4622
5/25/ 1	107	70	70	1.9	7.50	3960	4810	4687
6/ 1/ 1	108	50	64	2.2	5.00	3610	4810	4817
6/ 1/ 1	109	60	66	2.5	5.25	3430	4630	4750
6/ 8/ 1	110	70	74	2.2	6.00	3750	4700	4713
6/26/ 1	111	80	78	2.3	8.25	3750	4370	4567
6/26/ 1	112	85	80	2.4	7.75	3360	4475	4515
6/2[illegible]/ 1	113	75	79	2.0	8.00	3680	4735	4527

Concrete Test Report Summary

Sample Date	Sample ID	Air Tmp deg F	Con Tmp deg F	Air Cont %	Slump in	7 day Comp psi	28 day Comp psi	Moving Avg: 3 28 day Comp psi
7/10/ 1	114	70	78	2.0	7.00	3930	4635	4615
7/10/ 1	115	70	78	2.2	7.50	3640	4455	4608
7/10/ 1	116	70	80	2.2	7.50	3540	4635	4575
Count		35	35	35	35	36	36	34
Average		51	68	2.3	5.52	3744	4748	4757
Standard Deviation		20	8	1.2	1.77	389	322	169
Range		8	55	1.2	3.00	3150	4230	4515
		85	84	6.2	8.25	4950	5535	5207
Coefficient of Variation		39.93	12.15	50.76	32.06	10.38	6.79	3.55

$4000 + 1.34(322) = 4431$

$4000 + 2.33(322) - 500 = 4250$

11

PORTLAND WWTF
Mix: PDPWDGRITSPLT44 F'c: 4000 psi
11/05/01

MIX DESCRIPTION

PDPWDGRITSPLT44 ---------- 4000 psi ---------- 0/ 0/ 0

Sample Date	Sample ID	Air Tmp deg F	Con Tmp deg F	Air Cont %	Slump in	7 day Comp psi	28 day Comp psi	Moving Avg: 3 28 day Comp psi
6/ 8/ 0	1	68	70	5.8	2.50	3395	4860	-
6/ 9/ 0	2	75	72	6.3	3.00	2410	4105	-
6/14/ 0	3	70	78	5.0	1.25	4015	4990	4652
7/12/ 0	6	80	88	7.0	5.25	2900	4280	4458
7/25/ 0	7	67	76	4.7	3.50	3695	5465	4912
7/27/ 0	8	60	73	4.7	1.75	3485	5305	5017
8/ 8/ 0	10	90	88	7.4	1.50	3415	4705	5158
8/11/ 0	11	78	84	6.2	2.75	3965	5555	5188
8/11/ 0	12	78	84	9.0	1.50	3610	4990	5083
8/17/ 0	13	75	74	4.6	5.00	3875	5695	5413
8/18/ 0	14	75	80	4.8	1.50	3925	5655	5447
8/25/ 0	15	78	77	5.6	2.00	3185	4580	5310
9/ 1/ 0	16	85	80	6.0	3.00	3435	4985	5073
9/14/ 0	17	75	75	4.9	3.00	3130	4685	4750
9/15/ 0	18	70	74	4.0	1.00	3980	5745	5138
10/11/ 0	19	40	60	7.2	3.00	3590	4580	5003
10/13/ 0	20	43	59	7.0	3.00	3710	4775	5033
10/13/ 0	21	50	56	6.4	2.00	4050	4985	4780
10/20/ 0	22	65	68	6.0	2.00	3115	4350	4703
10/27/ 0	23	45	64	5.6	2.00	3305	4720	4685
11/ 3/ 0	24	61	68	5.7	2.50	3320	4635	4568
11/ 6/ 0	5	50	69	4.0	3.00	3415	4265	4540
11/ 6/ 0	6	46	67	5.9	3.00	3590	4315	4405
11/14/ 0	25	50	57	4.5	2.00	3695	4845	4475
11/27/ 0	26	45	58	5.6	3.00	3575	4790	4650
12/ 5/ 0	27	30	58	4.8	3.50	3470	4615	4750
12/19/ 0	28	30	58	4.8	3.50	3470	4615	4673
12/28/ 0	29	18	57	5.1	3.50	3980	5025	4752
1/11/ 1	30	15	55	5.0	3.00	3730	5040	4893
1/24/ 1	31	35	63	4.5	2.00	3375	4615	4893
2/ 2/ 1	32	25	57	4.8	2.25	3570	4420	4692
2/13/ 1	33	35	65	5.4	2.50	3745	4900	4645
2/16/ 1	34	33	61	6.2	1.50	3660	4790	4703

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Concrete Test Report Summary

Sample Date	Sample ID	Air Tmp deg F	Con Tmp deg F	Air Cont %	Slump in	7 day Comp psi	28 day Comp psi	Moving Avg: 3 28 day Comp psi
3/15/ 1	35	47	72	5.2	2.75	3485	4525	4738
3/16/ 1	35	47	72	5.2	2.75	3485	4525	4613
Count		35	35	35	35	35	35	33
Average		55	69	5.6	2.61	3536	4827	4842
Standard Deviation		20	10	1.1	0.94	337	419	273
Range		15	55	4.0	1.00	2410	4105	4405
		90	88	9.0	5.25	4050	5745	5447
Coefficient of Variation		36.87	14.11	19.01	35.90	9.54	8.68	5.64

$4000 + 1.34(419) = 4561$

$4000 + 2.33(419) - 500 = 4476$

13

MILL TEST RESULTS
Laboratory at Thomaston, Maine

Date: *August* 31, 2001
Cement **Type:** II

CHEMICAL DATA	Percent
Silicon Dioxide	20.8
Aluminum Dioxide	**4.6**
Ferric Oxide	**2.9**
Calcium Oxide	**62.1**
Magnesium Oxide	**3.7**
Sulphur Trioxide	**3.0**
Loss on Ignition	0.88
Insoluble Residue	0.21
Tricalcium Silicate	52
Dicalcium Silicate	21
Tricalcium Aluminate	7
Sodium Oxide	0.36
Potassium Oxide	**1.43**
Equivalent Alkalies	**1.30**

PHYSICAL DATA	
Specific Surface. Blaine (sq m/kg)	**374**
Percent Passing 325 Mesh	98.5
Compressive Strength (psi)	
Mortar Cubes	
1 day	2610
3 day	3740
7 day	**4560**
28 day	**5560**
Vicat Setting Time	
Initial (min.)	110
Final (min.)	**240**
Air Content (%)	7.1
Autoclave Expansion (%)	0.14

Certified by:

Jennifer L. Kimball

We hereby certify that this cement complies with current ASTM C 150, AASHTO M-85 and **CSA-A5** Type 10 specifications.

Blue Circle Cement
Sparrows Point Plant
2001 Wharf Road
Baltimore, MD 21219
Telephone 410-388-1177
Fax 410-388-1206

LABORATORY TEST REPORT - NewCem

To: _____ Carrier: _____

_____ Date Shipped: _____

_____ Loaded From: _____

CHEMICAL

Sulfide Sulfur (S), % 0.94

Sulfate Ion (as SO_3), % 0.13

Sample Identification

Voyage: Adelaide 26-01-1094

Date: 27-Jun-01

Terminal: Boston

PHYSICAL

Slag Activity Index, %:
7 Day 106.2
28 Day 124.0

Fineness:
Blaine
cm^2/g 5,510

325 Sieve
% retain 1.6

Air Content, %: 6.2

Compressive Strength: Mpa ; psi
7 Day 34.27 4,968
28 Day 49.93 7,242

This ground granulated blast furnace slag complies with the current specification of the chemical and physical requirements of ASTM C-989, AASHTO M-302; Grade 120 and ASTM C-595M, AASHTO M-240 Type IS, when blended with Portland cement, conforming to ASTM C-150, at the prescribed proportions. NewCem is guaranteed to meet all applicable VADH, GADOT, NYDOT and SCDOT specifications.

Thomas R Griffiths
Quality Control Manager

8/3/01
Date

GRACE

Grace Construction Products

W.R. Grace & Co. - Conn
62 Whittemore Avenue
Cambridge, MA 02140-1692

(617) 876-1400
http://www.gcp.grace.com

January 9, 2001

Dragon Products Co.
P.O. Box 1521
Portland, ME 04104

ATTN: Mark West

This is to certify **WRDA® with HYCOL®**, a water-reducing admixture, as manufactured and supplied by Grace Construction Products, W. R. Grace & Co.-Conn., is formulated to comply with Specification for Chemical Admixtures for Concrete, **ASTM** Designation: C 494, Types **A** & D (AASHTO M 194, Types **A** & D).

WRDA® with HYCOL® does not contain calcium chloride or chloride containing compounds as a functional ingredient. Chloride ions may be present in trace **amounts** contributed from the process water used in manufacturing.

The foregoing is in addition to and not in substitution for our standard Conditions of Sale printed on the reverse side hereof.

Lawrence R. Roberts
Director of Technology, Planning and Transfer
Cement & Concrete Products

Meeting Commitments Exceeding Expectations Creating Value

GRACE

Grace Construction Products

W.R. Grcce & Co. - Ccnn
62 Whittemore Avenue
Cambridge, MA 02140-1692

(617)876-1400
htlp//www.gcc._=rcce.com

January 9, 2001

Dragon Products Co.
P.O. Box 1521
Portland, ME 04104

ATTN: MarkWest

This is to certify that **DAREX® II AEA,** an air-entrainins admixture; as manufactured and supplied by Grace Construction Products, W. R. Grace & Co.-Conn., is formulated to comply with Specification for Air-Entraining Admixtures for Concrete. ASTM Designation: C 260 **(AASHTO** M 154).

DAREX® II AEA does not contain calcium chloride or chloride containing compounds as a functional ingredient. Chloride ions may be present in trace amounts contributed from the process water used in the manufacturing.

The foregoing is in addition to and not in substitution for our standard Conditions of Sale printed on the reyerse side hereof.

Lawrence R. Roberts
Director of Technology, Planning and Transfer
Cement & Concrete Products

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Meeting Commitments
Exceeding Expectations
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GRACE

Grace Construction Products

W.R. Grace & Co. . Conn
62 Whittemore Avenue
Cambridge, MA 02140-1692

(617) 876-1400
http://www.gcp.grace.com

January 9,2001

Dragon Products Co.
P.O. Box 1521
Portland. ME 04104

ATTN: MarkWest

This is to certify that **DARACEM® 19,** a high-range water reducing admixture, as manufactured and supplied by Grace Construction Products, W. R. Grace & Co.-Conn., is formulated to comply with Specification for Chemical Admixtures for Concrete, ASTM Designation: C 494, Type F (AASHTO M 194, Type F).

DARACEM® 19 does not contain calcium chloride or chloride containing compounds as a functional ingredient. Chloride ions may be present in trace amounts contributed from the process water used in manufacturing.

The foregoing is in addition to and not in substitution for our standard Conditions of Sale printed on the reverse side hereof.

Lawrence R. Roberts
Director of Technology, Planning and Transfer
Cement & Concrete Products

18

Meeting Commitments
Exceeding Expectations
Creating Value

GRACE

Grace Construction Products

W.R. Grace & Co.- Conn
62 Whittemore Avenue
Cambridge. MA 02 1401692

(617)876-1400
http//www.gcp.grace.com

Januaii 9,2001

Dragon Products Co.
P.O. Box 1521
Portland, ME 04104

ATTN: MarkWest

This is to certify that **GRACE FIBERS ™** are synthetic fibers for concrete made from 100% virgin _polypropylene in collated, fibrillated ***form.*** Designed specifically for use in concrete, they are alkali resistant, non absorptive and completely non-corrosive. **GRACE FIBERS™** comply **with ASTM** Designation C1116 **Standard** Specification for Fiber-Reinforced Concrete or Shotcrete, Type III Synthetic Fiber-Reinforced Concrete or Shotcrete.

Further, we certify the physical properties of **GRACE FIBERS™** are within the limits listed below:

Specific Gravity	0.91
Modulus of Elasticity	500 ksi
Length	1/2" and 3/4"

The above is in addition to and not in substitution for our standard Conditions of Sale printed on the reverse side hereof.

Lawrence R. Roberts
Director of Technology, Planning and Transfer
Cement & Concrete Products

Concrete

PRODUCT INFORMATION

WRDA® with HYCOL®

Water-Reducing Admixture ASTM C 494, Type A

WRDX" with HYCOL® water-reducing admixture is an aqueous solution of complex organic compounds, one of which is HYCOL, a patented pordand cement hydration control agent. WRDA with HYCOL water-reducing admixture is a ready to use low viscosity liquid which is factory premixed in exact proporrions to minimize handling, eliminate mistakes and guesswork. One Liter weighs appro-ximarely 1.15 kg (1 gal weighs 9.6 lb). WRDA with HYCOL contains no calcium chloride.

Uses

WRDA with HYCOL produces a concrete with lower water content (typically S to 10% reduction), greater plasticity and higher strength. It is used in ready mix plants, block and concrere products plants. in lightweight and prestressed work . . . wherever concrere is produced. It is also used by conrracrors in field equipment such as job sire plants and pavers.

Advantages

Most calcium-chloride-free warer-reducing admixtures on the market today produce some significant degree of set retardation. Minimal extension of setting time has been experienced in field concrere containing WRDX with HYCOL. Under closely controlled laboratory conditions, the retardation observed wirh the addition of 3 fl oz of WRDA with HYCOL per 100 lb (190 mL/100 kg) of cement is in the range of 15 to 20 minutes, well within the limit of the accuracy of the method of test. It is through the acrion of the patented HYdration COntroL (HYCOL)agent in the admixture that irs effect on the setting time of concrete is reduced to an insignificant degree.

The use of WRDA with HYCOL produces a plastic concrete that is mort workable, easier to place. more pumpable, and has better finishability than plain or other admixtured concrete. In the hardened state, WRDA with HYCOL concrete has higher compressive and flexural srrengrhs at all ages than untreated or conventionally admixtured concrere.

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GRACE

The greater degree of plasticity achieved, compared with conventional warer-reducing admixtures, allows improved finishability.

HYCOL acts io oocimize the rate and degree oi hydration of the portland cement in ihe concrete. This optimization gives concrete strength advantages at ail ages without appreciably altering its setting time.

WRDA wich **HYCOL** also acts as a dispersing agent and lessens the natural interparticle attraction berween cemenr grains in water. This reduces their tendency to clump together, making the mix more workable, placeable and finishable with less water.

The combination of warer reduction and controlled hydration by HYCOL optimizes the rare of formation of rhe gel, the paste or binder char "glues" the concrete aggregates together. This controlled rare of gel formacion adds to the water retention and internal cohesiveness or the mix. reducing the bleeding and segregation while increasing or improving the workability. placeability and finishability of concrete.

Finishers have stated that the cement paste, or mortar, in WRDA with HYCOL admixtured concrete has improved trowelability. The influence of WRDA with HYCOL on the finishability of lean mixes has been particularly noticeable. Floating and troweling. by machine or hand, easily imparts a smooth, ciose tolerance surface wich iess machine time and labor.

Excellent results are obtained using addition rates of 3 co *6* fl oz of WRDA with HYCOL per 100 lb (190 to 375 mL/100 kg) or cement. In some cases it may be necessary co slightly modify the addition rare due to variations in cemenr, aggregate or ocher job conditions.

A complete line of accurate dispensing equipment is available. WRDA with HYCOL may be inrroduced to rhe mis on the sand or in the water.

WRDA with HYCOL is compatible in concrete **with** all air entrainers such as Daravair or Darex air-entraining admixtures. Due to a synergistic effecr of WRDA wirh HYCOL, the quantity of air entrainer admixtured in concrere may be reduced by about 25%. By combining the separate effects of air entrainment and dispersion, the water requirement of concrere may be reduced up to 15%. EACH ADMIXTURE SHOULD BE ADDED SEPARATELY. While WRDA with HYCOL contains no calcium chloride, it is comparible with calcium chioride in concrere mixes. Again, each should be added separately.

WRDA with HYCOL is available in bulk, delivered by merered tank trucks, and 210 L (55 gal) drums. WRDA with HYCOL conrains no flammable ingredienrs. IT WILL FREEZE AT ABOUT -2°C (28°F), BUT WILL RETURN TO FULL STRENGTH AFTER THAWING AND THOROUGH AGITATION.

Concrete shall be designed in accordance with ACI Standard Recommended Practice for Selecting Proportions for Concrere ACI 211.1.

The water-reducing admixture shall be WRDA with **HYCOL,** as manufactured by Grace Construction Products, or equal. The admixture shall nor contain calcium chloride. It shall be used in strict accordance with the manufacturer's recommendations. The admixture shall comply with ASTM Designation C 494, Type A water-reducing admixtures. Certification of compliance shall be made available upon requesr.

The admixture shall be considered as part of the total water. The admixture shall be delivered as a ready to use liquid product and shall require no mixing at the batching plant or job sire.

W.R. Grace & Co.-Conn. 62 Whittemore Avenue Cambridge, MA 02140

PRODUCT INFORMATION

Darex® II AEA

Air-Entraining Admixture ASTM C 260

Description

Darex® II AEA is an air-entraining admixture which generates a highly stable air void system for increased protection against damage from freezing and thawing, severe weathering, or deicer chemicals. Darex II AEA is a complex mixture of organic acid salts in an aqueous solucion specifically formulated for use as an air-enrraining admixture for concrete and is manufactured under rigid control which provides uniform, predicrable performance. It is supplied ready to use and does not require pre-mixing with water. Darex II AEA is a dark brown liquid. One Liter weighs 1.04 kg (8.7 lb/gal). Darex II XEA complies to ASTM C 260 Standard Specifications for Air-Entraining Admixtures for Concrete.

Uses

Darex II AEA is used in ready-mix, block, and concrere products plants to improve air entrainment stability. It is particularly effective in maintaining air contenr during longer haul times. Darex II AEX performs well in conventional concrete and is effective in plasticizing mixes and with slag, lightweight, or manufacrured aggregates which tend to produce harsh concrete.

Darex II AEA entrains air effectively wirh microsilica concrete and wirh fly ash concrete.

Air-entraining Action

By agitation of concrete misers, Darex II AEA disperses and generates millions of discrete semi-microscopic bubbles throughout the concrete composite. Once thoroughly mixed, the concrete contains a stable network of bubbles which act much like bail bearings increasing mobility, or plasticity, of the concrete. This aids workability to the mix and permits a reduction of water with no loss of slump. Placeability is improved. Bleeding, segregation, and green shrinkage are minimized.

Through the purposeful entrainment of air, Darex II AEA markedly increases the durabiliry of concrere to all exposures.

Compatibility with Other Admixtures

Darex II AEA is fully effective and compatible in concrere with ocher admixtures and may be used with water-reducing admixtures. accelerators, and initial set retarders such as WRDX™ with HYCOL™, WRDX, PolarSet® and Daratard®. Darex II AEA also effectively entrains air wirh microsilica admixtures such as Force 10,000® and calcium nirrite admixtures such as DCI®.

Each admixrure should be added separarely to rhe concrete.

Addition Rates

There is no standard addition rate for Darex II AEA. The amount to be used will depend upon the amount of air required under **job** conditions, **usually** in the range of 4 to 7%. Typical factors which might influence the amount of air entrained are temperature, cement, sand gradation, and use of extra fine materials such as fly ash. Typical Darex II **AEA** addition rates generally range from 30 to 320 mL/100 kg (½ to 5 fl oz/100 lb) of cement.

The air-enrraining efficiency of Darex II AEA becomes even greater when used wirh water-reducing and ser-retarding agents. This may allow a reduction of up to ⅔ in rhe amount of Dares II AEX required for rhe specified air conrenr.

Entrained air results in increased yields with a conscquenr decrease in the cement content of rhe placed concrete. This condition calls for **a** mix adjustment, usually accomplished by reducing the fine aggregate conrent. This is in addition to rhe reduction in warer conrent brought about by the increase in plasticity.

Dispensing Equipment

A complete line of accurate dispensing equipment is available. These dispensers can be located to discharge into the warer line, rhe mixer, or on the sand.

Packaging

Darex II **AEA** is available in bulk, delivered by merered tank trucks and in 210 L (55 gal) drums. Darex II AEA conrains no flammable ingredienrs. Darex II AEA WILL FREEZE AT ABOUT -1°C (30°F), BUT ITS AIR-ENTRAINING PROPERTIES ARE COMPLETELY RESTORED BY THAWING AND THOROUGH MECHANICAL AGITATION.

Concrete shall be air entrained concrete. containing 4 to 7% entrained air. The air contents in the concrete shall be determined by the pressure method (ASTM Designacion C 231), gravimetric mrchod (ASTM Designacion C 138) or volume metric merhod (ASTM.Designation C 173).The air-entraining admixture shall be Darex II AEA as manufactured by Grace Construction Products, or equal. The air-entraining admixture shall be added at the concrete mixer or batching plant at approximately 30 to 320 mL/100 kg (½ to 5 fl oz/100 lb) of cemenr, or in such quantities as to give rhe specified air contems.

W.R. Grace & Co.-Conn. 62 Whittemore Avenue Cambridge, MA 02140

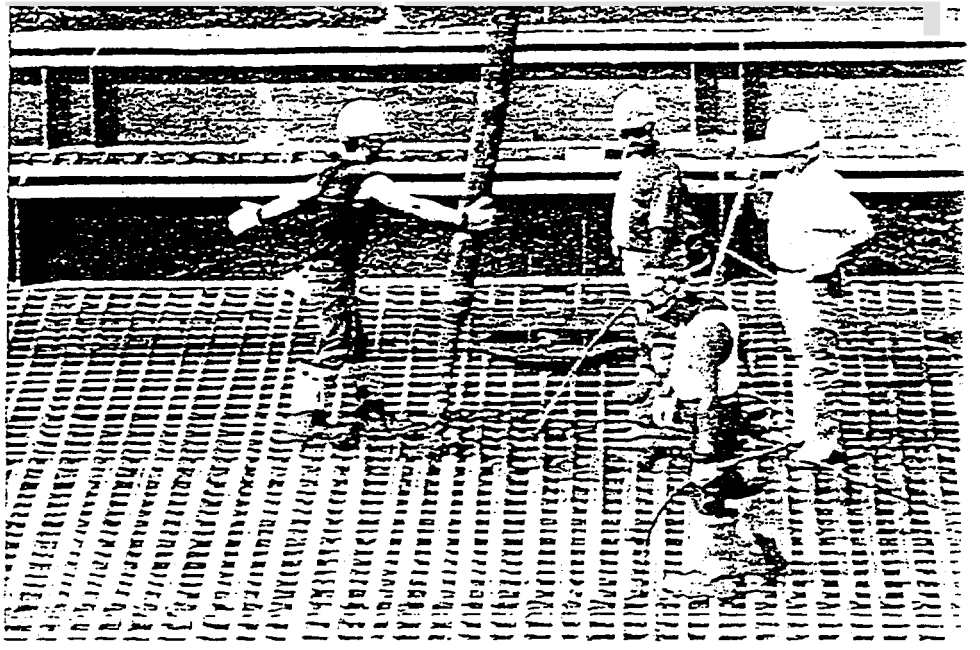
GRACE

Concrete

PRODUCT INFORMATION

Daracem® 19

Superplasticizer ASTM C 494, Type A and Type F; ASTM C 1017, Type I



Description

Daracem® 19 is a high range water reducer, commonly referred to as a superplasticizer. It is an aqueous solution of a modified naphthalene sulfonare. It is a low viscosity liquid which has been formulared by the manufacturer for use as received. Daracem 19 conrains no added chloride. Daracern 19 is formulated to comply wirh specifications for Chemical Admixtures for Concrete, ASTM Designation C ***494*** as a Type A and Type F admixcure; C1017 as a Tvpe I admixture.

One Lire: of Daracern 19 weighs approximately 1.2 kg (10 lbs/gal).

Dispersion

Daracem 19 is a superior dispers-ing admixture having a marked capacity to disperse the cement agglomerates normally found in a cement-water suspension. The capability of Daracem 19, in rhis respect, exceeds chat of normal warer-reducing adrnixrures.

Uses

Daracem 19 produces concrere wirh extremely workable charac-teristics referred to as high slump, flowing concrete. Daracem 19 also allows concrete to be pro-duced wirh very low water/cement rarios at low or normal slumps.

Daracem 19 is ideal for use in prestress, precast, bridge deck or any concrete where ir is desired to keep the water/cement rario to a minimum and srill achieve the degree of workability necessary ro provide easy placement and con-solidation. Daracem 19 **will** also fluidize concrere making ir ideal for tremie concrering or ocher applications where high slumps are desired.

Advantages

1. Daracem 19 can produce high slump flowable concrete at no loss in strength.
2. Daracem 19 can produce low water/cement rario concrete and therefore, high strengths.
3. Daracem 19, in prestress/pre-casr work, can be used to sub-stantially reduce or eliminare the high energy requirements of external hear for accelerared curing.

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GRACE

4. Daracem **19** concrere produced with Type I cement may be substituted for normal concrere produced with Type III cement io achieve early release strengths.
5. Daracem 19 concrete, ever, at high slum?, exhibits no significant segregation in Comparison to concrete without a superplasticizer at rile same slump.
6. Daracem 19 aids in rapid discharge of concrete from truck mixers thereby reducing on the job time and improving mixer utilization.

[illegible]

Addition rates or Daracem 19 can vary with type of application, but will normally range from 390 co 1300 mL/100 kg (6 to 20 fl oz/ 100 Ibs) of cement. **In** most insrances the addition of 650 to 1040 mL/100 kg (10 to 16 fl oz/ 100 Ibs) of cemcnc will be sufficient. **At** a given water/cement ratio, the slump required for placement can be controiled by varying the addition rate. Should job sire conditions require using more than recommended zddirion rates, please consult your Grace Representative.

Compatibility with Other Admixtures

In concrere containing Dzracem 19, the use of an air-entraining agent (such as Daravair® or Dares" II AEA) is recommended to provide suitable air void parameters for resistance against freeze-thaw attack.

Most Type **A** water reducers or Type D water-reducing retarders are compatible wirh Daracem **19** as long as they are separately added to the concrete. Preresring of the concrete should be performed to optimize dosages and addition **times** of these admixtures. Caution should be exercised when using Daracem 19 together wich a retarder, as excessive retardation can occur if the admixture dosages are too high.

Preresting of the concrete should be performed to determine dosages and addition rimes of these admixtures. The admixtures should not contact each other before they enter rhe concrete.

Packaging

Daracem 19 is avaiiable in bulk, delivered by merered rank trucks,, and in 210 L (55 **gal)** drums. Daracem 19 contains no flammable ingredients.

It **will** begin to freeze at approximately 0°C (32°F), but will return io full strength after thawing and thorough agitanon.

In storage, and for proper dispensing; Daracem 19 should be maintained **at** temperatures above 0°C (32°F).

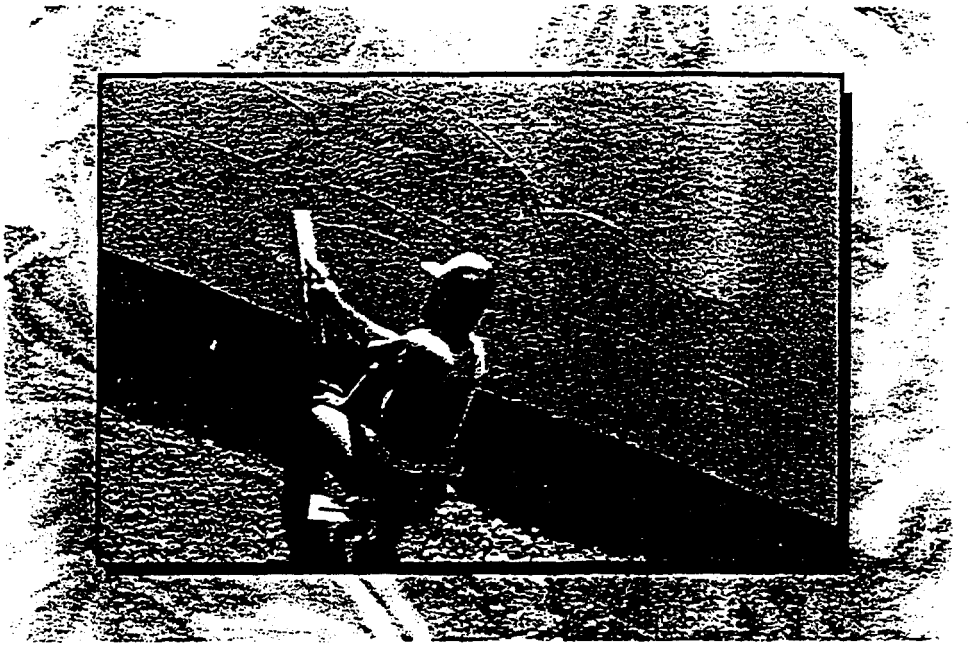
PRODUCT INFORMATION

Grace Fibers"

Fiber Reinforcement

Description

Grace Fibers™ are synthetic fibers for concrete, manufactured from 100% virgin polypropylene in collated, fibrillated form. Designed specifically for use in concrete, they are alkali resistant, non-absorptive and completely non-corrosive. Their use provides secondary reinforcement and protects concrete from stresses which cause cracking while it is most vulnerable during the first **24** hours afrer placement. Grace Fibers comply with ASTM Designation C 1116 Standard Specification for Fiber-Reinforced Concrete and Shotcrete, Type III Synthetic Fiber-Reinforced Concrete or Shotcrete. They are available in 20 mm (¾ in.) length.



uses

Grace Fibers may be used in any application where decreased cracking and improved durabiliry are desired. Specifically such applications include bur are nor limited to. slabs on grade, elevar-**ed** slabs, pavements, overlays, sloped walls, pools, shotcrete, stucco, precast and prestressed concrere products. **As** secondary reinforcemenr for crack protection and control Grace Fibers are a superior alternative to, and can eliminate rhr need for welded wire fabric. Grace Fibers are not recommended to increase joinr spacing or as a substitute tor any reinforcement required by rhe Model Building Codes and Standards.

Advantages

Grace Fibers uniformly distribute multi-dimensionally throughout the concrete mixture. The small fibrillated fibers mechanically lock in the fresh concrete matrix providing reinforcement for the mixture while its tensile strength is the weakest. This reinforcement reduces the formation of all types of early cracking. This cracking caused by plastic shrinkage, settlement. and other internal srresses would otherwise permanently weaken the resulting concretes. The concrete permeability is decreased, while rhe surface characteristics, impact, and toughness properties are improved. Together these effects work synergistically to produce a Iong-term better quality, more durable and serviceable concrete.

GRACE

Typical Properties

Specific Gravity	0.91
Absorption	None
Modulus of Elasticity	500 ksi
Melt Point	160°C
Ignition Point	590°C
Alkali, Acid and Salt Resisrsnce	High

[illegible] and [illegible]

Grace Fibers may be added to concrere at any point during rhe barching or mixing process. Grace Fibers may be added to the aggregare during weighing or charging, or to the central mixer or truck before, during, or after charging. The load must be mixed at high speed for 5 minutes, or 70 revolutions, after the addirion of rhe Grace Fibers to ensure uniform disrribucion. The standard range of addition for Grace Fibers is 450 to 1800 g/m^3 (¾ to 3 lbs/yd^3) of concrere. Typically. 900 g/m^3 (1½ lbs/yd^3) of Grace Fibers provides excellent results. Higher addition rates may be used to produce concrete when special properties are required.

Compatibility with Other Admixtures

Grace Fibers are compatible with all Grace admixtures. Their acrion in concrere is purely mechanical and will nor affect the hydration process. Each admixrure should be added separately.

Packaging

Grace Fibers are available in convenient Concrete-Ready™ Bags which are added, unopened, to rhe truck drum or central mixer. The specially designed cellulose fiber bag disinregrares and disperses its contenrs, 900 g (1½ lbs) of Grace Fibers, throughout rhe mix.

Architects' Specifications

Fibers shall be 20 mm (¾ in.) collared, fibrillated polypropylene fibers as supplied by Grace Consrruction Producrs, Cambridge, MA 02140. Required dosage rare shall be as specified by the design engineer or architect. Grace Fibers shall be used in strict accordance with the supplier's recommendations and within time as specified in XSTM C 94. The fibers shall comply with ASTM Designation C 1116 Type III 4.1.3 and with applicable building codes. Cerrification of compliance shall be made available on request. Standard ACI 302 procedures for placing, finishing and curing shall be followed when using Grace Fibers.

References

Building Codes:
- BOCA National Building Codes, SBCCI Standard Building Code, ICBO Uniform Building Code and all supplements as adopted by rhe Council of American Building Officials

Fire Classifications:
- Underwriters' Laborarories (U.L.) on Series D700 and D800 metal deck assemblies

American Concrete Institute (ACI):
- ACI 544 "State of rhe Art Report of Fiber-Reinforced Concrete"
- ACI 302 "Guide for Concrete Floor and Slab Construction"

American Society of Tesring and Materials (ASTM):
- ASTM C 1116 "Standard Specification for Fiber-Reinforced Concrere and Shotcrete"
- ASTM C 94 "Standard Specificarion for Ready-Mixed Concrere"

W.R. Grace & Co.-Conn. 62 Whittemore Avenue Cambridge, MA 02140

GRACE
Construction Products

The Professional ADVANTAGE
A H HARRIS
CONSTRUCTION SPECIALTIES

HARRIS POLYETHYLENE FILM

DESCRIPTION

HARRJS POLYETHYLENE FILM is blown into standard "full gauge" quality thicknesses of .004, .006, .008 and .010 inches. It is inert to molds and fungi as well as food chemicals, sea water and salt spray.

USE

HARRIS POLYETHYLENE FILM provides a light-weight and economical vapor barrier under slabs on grade, an effective moisture retention device to prevent rapid evaporation of freshly poured concrete, and a quick temporary protection for moisture sensitive materials on the jobsite.

ADVANTAGES

- Full gauge weight provides top quality product.
- @ Provides effective moisture vapor barrier for under slabs on grade.
- Prevents rapid evaporation of water in freshly poured concrete.
- Protects moisture sensitive materials.
- In stock, ready for immediate use.

PROPERTIES

HARRIS POLYETHYLENE **FILM** is manufactured in conformance to all of the specification requirements of ASTM D 4397-84. The table below defines the minimum and maximum values of that Standard.

Mil Thickness, nominal ASTM D 374-C	.004	.006	.008	.010
Density, g/cc	0.92	0.92	0.92	0.92
Net Weight, lbs/1000sf	19.1	28.7	38.3	47.8
Tensile Strength, psi, lengthwise ASTM D 882-A	1700	1700	1700	1700
Tensile Strength, psi, crosswise ASTM D 882-A	1200	1200	1200	1200
Break Elongation, % lengthwise ASTM D 882-A	225	225	225	225
Break Elongation, % crosswise ASTM D 882-A	350	350	350	350
Maximum Water Vapor Permeance, Perms ASTM E 96-E	0.19	0.14	0.10	0.07
Impact strength, grams by dart drop ASTM D 1709	165	260	370	475
Reflectance, % ASTM E 97 (for white opaque only)	70	70	70	70

Unless otherwise indicated, all values are minimum properties.

A H HARRIS POLYETHYLENE FILM

PACKAGING

HARRIS **CLEAR POLYETHYLENE** FILM is stocked in 100 foot rolls; in 4 mil and 6 mil thicknesses. stocked widths are 10', 12', 16', 20 and 40'; in 8 mil and 10 mil thicknesses, stocked width is 20'. HARRIS BLACK **POLYETHYLENE FILM** is stocked in .004 and .006 mil by 20 X 100' rolls. Other widths or mil thicknesses available on special order.

PRECAUTIONS

Product may become swollen by chlorinated, aliphatic and aromatic hydrocarbons. product dissolves in Xylene, Benzene, Toluene, Trichloroethylene, turpentine and lubricating oils at 160°F. Keep away from open flame. In case of fire, extinguish with C02 fog and ventilate area.

LIMITATIONS

Specifier and user shall determine suitability of HARRIS **POLYETHYLENE** FILM for specific applications and assume responsibility for its application.

LIMITED WARRANTY

A.H. Harris & Sons, Incorporated ("Harris") warrants that, at the time of shipment to its customers, the product it sells or rents conform to its usual standards and are free from defects which would materially affect the products' ability to perform as represented. IF ANY HARRIS PRODUCT IS PROVEN TO BE DEFECTIVE, THE CUSTOMER'S EXCLUSIVE REMEDY IS TO HAVE HARRIS REPLACE THE DEFECTIVE PRODUCT WITH A PRODUCT OF LIKE QUALITY OR AT HARRIS' OPTION, TO REFUND THE PURCHASE PRICE. IN NO EVENT SHALL HARRIS' LIABILITY, IF ANY, WHETHER FOUNDED IN CONTRACT OR TORT (INCLUDING NEGLIGENCE) EXCEED THE PURCHASE PRICE OF THE DEFECTIVE PRODUCTS NOR SHALL HARRIS BE LIABLE FOR ANY SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES OR FOR ANY CLAIM BROUGHT MORE THAN ONE YEAR AFTER THE SALE OF THE PRODUCT BY HARRIS TO ITS CUSTOMER. THE FOREGOING WARRANTIES ARE EXCLUSIVE AND HARRIS MAKES NO OTHER WARRANTIES WITH RESPECT TO ITS PRODUCTS, EXPRESS OR IMPLIED, INCLUDING NO WARRANTY OF MERCHANTABILITY OR OF FITNESS FOR A PARTICULAR PURPOSE. Harris does not intend any of its products to be used in a way that would infringe any patent or copyright.

04230 Reinforced Masonry

04230.1 Reinforced Masonry Inspection Reports

BECKER
structural enaineers

Date: February 15,2002
Time: 1:00pm
Temp: 30's
Weather: Cloudy

Project: Avis **Rental Car Facility**
South Portland, Maine

inspection Report - Masonry

Location: General Review of Building CMU

Satisfactory	Unsatisfactory	Not Completed	N/A		Satisfactory	Unsatisfactory	Not Completed	N/A	
x				Reinforcement Size	x				CMU Size
x				Quanity	x				Layout/Fitup
x				Condition	x				Mortar/Grouting Procedures
x				Placement	x				Lift Heights
x				Embed/Anchors	x				Cleanouts
x				Lap Splice	x				Bond Beams
			x	Reinf. Weld	x				Plumbness
			x	Hot Weather					
x				Cold Weather					

Notes: **No** Comments.

Signed: Ethan A. Rhile. P. E. Date: 3/1/02

WO **768.01**

BECKER
structural engineers

Date: February 21,2002
Time: 11:00am
Temp: 40's
Weather: Foa

Project: **Avis Rental Car Facility**
South Portland, Maine

Inspection Report - Masonry

Location: General Review of Building CMU

Satisfactory	Unsatisfactory	Not Completed	N/A	
x				Reinforcement Size
x				Quanity
x				Condition
x				Placement
x				Embed/Anchors
x				Lap Splice
			x	Reinf. Weld
			x	Hot Weather
x				Cold Weather

Satisfactory	Unsatisfactory	Not Completed	N/A	
x				CMU Size
x				Layout/Fitup
x				Mortar/Grouting Procedures
x				Lift Heights
x				Cleanouts
x				Bond Beams
x				Plumbness

Notes: No Comments.

Signed: Ethan A. Rhile, P. E.

Date: 3/1/02

WO 768.01

Becker Structural Engineers
19 Commerical Street
Ponland. Maine 04101
Phone: (207) 879-1838
Fax(207) 879-1822

BECKER
structural engineers

Date: March 8,2002
Time: 10:00am
Temp: 30's
Weather: Cloudy

Project: **Avis Rental Car Facility**
South Portland, Maine

Inspection Report - Masonry

Location: General Review of Building CMU- Brick work started on Main Building
Beginning **of** work on Fuel Island

Satisfactory	Unsatisfactory	Not Completed	N/A		Satisfactory	Unsatisfactory	Not Completed	N/A	
x				Reinforcement Size	x				CMU Size
x				Quanity	x				Layout/Fitup
x				Condition	x				Mortar/Grouting Procedures
x				Placement	x				Lift Heights
x				Embed/Anchors	x				Cleanouts
x				Lap Splice	x				Bond Beams
			x	Reinf. Weld	x				Plumbness
			x	Hot Weather					
x				Cold Weather					

Notes: No Comments.

Signed: Ethan **A.** Rhile, P. E. Date: 4/19/02

WO 768.01

BECKER
structural engineers

Date: April 19, 2002
Time: 8:30am
Temp: **40's**
Weather: Fog

Project: **Avis Rental Car Facility**
South Portland, Maine

Inspection Report - Masonry

Location: All Masonry

Satisfactory	Unsatisfactory	Not Completed	N/A		Satisfactory	Unsatisfactory	Not Completed	N/A	
x				Reinforcement Size	x				CMU Size
x				Quanity	x				Layout/Fitup
x				Condition	x				Mortar/Grouting Procedures
x				Placement	x				Lift Heights
x				Embed/Anchors	x				Cleanouts
x				Lap Splice	x				Bond Beams
			x	Reinf. Weld	x				Plumbness
			x	Hot Weather					
x				Cold Weather					

Notes: Masonry work completed.
Control Joints not yet chaulked (not structural).

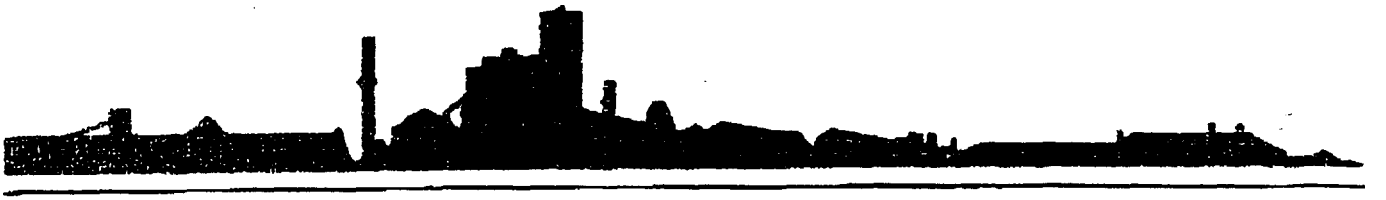
Signed: Ethan A. Rhile. P. E. Date: 4/19/02

WO 768.01

Becker Structural Engineers
19 Commerical Street
Portland. Maine 04101
Phone: (207) 879-1838
Fax(207) 879-1822

04230 Reinforced Masonry

04230.2 Masonry Grout & Mortar Mixes/ Material Certifications



Ciment Québec

148,BOULEVARD CENTENAIRE, ST-BASILE
COMTÉ DE PORTNEUF, QUÉBEC, CANADA, G0A 3G0
TÉLÉPHONE : (418) 329-2100
TÉLÉCOPIEUR : (418) 329-3436

CERTIFICATE OF COMPLIANCE

Cirnent Québec Inc. certifies that *the* Type S Portland - Lime cement contains, by volume, one part ASTM C 150 Type I Portland cement and ¼ to ½ ASTM C 207 Type S hydrated lime.

When a 75 lb. (one cubic foot) bag is mixed with 2-¼ *to* 3 cubic feet *of* masons sand meeting ASTM C 144 and clean water *the* resulting mortar will meet the requirements of ASTM C 270.

Please note ASTM C 270 is for laboratory prepared and tested mortars. For field prepared mortars, test in accordance with ASTM C 780.

If there are any questions, please phone me at 418-329-2100.

Very truly yours,

Freddy Slim
Chief Chemist
Ciment Quebec Inc.

FS:rp

Ciment Québec
146, BOULEVARD CENTENAIRE, ST-BASILE
COMTÉ DE PORTNEUF, QUÉBEC, CANADA, G0A 3G0
TÉLÉPHONE (418) 329-2100
TÉLÉCOPIEUR (418) 329-3448

ANALYSIS CERTIFICATE

Date		**August 1999**
Cement type	:	**S Portland/Hydrated Lime**
Destination	:	

RECEIVED
APR 2 2 2002
BECKER
STRUCTURAL ENGINEERS

PHYSICAL TESTS

Time of setting, Gillmore		
Initial setting	**225 minutes**	
Compressive strength		
7 days	**21.9 MPa**	**3180 psi**
28 days	26.6 MPa	3860 psi
Water retention	**78 %**	
Fineness (Air permeability)	**652 m2/kg**	

CHEMICAL ANALYSIS

Loss on ignition	**5.5 %**
Sulfur trioxide (SO3)	**3.6 %**

We hereby certify that the Masonry cement delivered complies with current requirements of U.S. standard specification ASTM C-270, type S (Portland/Hydrated lime) and ASTM C-91.

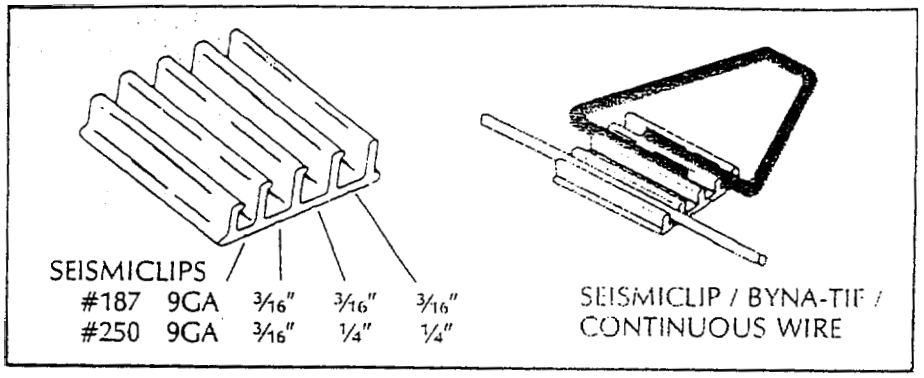
*ASTM C-270 tests are performed with a field sand meeting the requirements of ASTM C-144.

Freddy Slim
Chief Chemist

* For any information regarding this certificate, please contact our Technical Service at (418) 329-2100, ext. 220.

AVEC LE BÉTON, ON FAIT DU CHEMIN

2



U S PAT. NOS. 4,021,990
4,598,518
4,875,319

CAN. PAT. NOS. 1,099,94
1,247,39

Other PATS. pending.

neer on metal stud), please contact Hohmann & Barnard Inc.'s Technical Department.

6. AVAILABILITY AND COST

The DW-10 Series Anchoring System is manufactured in the following main headquarters and branch locations:
Hohmann & Barnard, Inc.

30 Rasons Court
P.O. Box 270
Hauppauge (Long Island), NY
11788-4206
(516) 234-0600

8251 Preston Court
Jessup, MD 20794
(301) 317-0090

2475 Cold Springs Road
Fort Worth, TX 76106
(817) 625-9787

Cost: Varies according to product, quantity, size, shape, grade and finish.

7. WARRANTY

System components will comply with ASTM specifications and certificates of compliance issued with shipments upon request.

8. MAINTENANCE

None required after installation.

9. TECHNICAL SERVICES

Complete technical services are available. For information or assistance, write or call Hohrnann & Barnard, Inc.

?0. FILING SYSTEMS

Electronic SPEC-DATA®
SPEC-DATA® II
Sweets Catalog

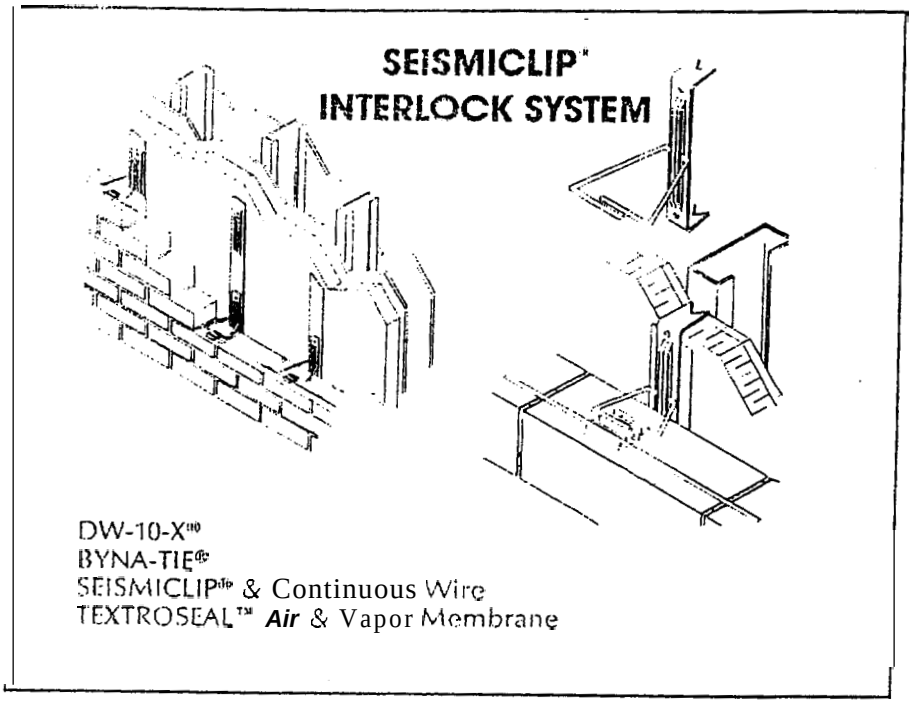


Diagram 8

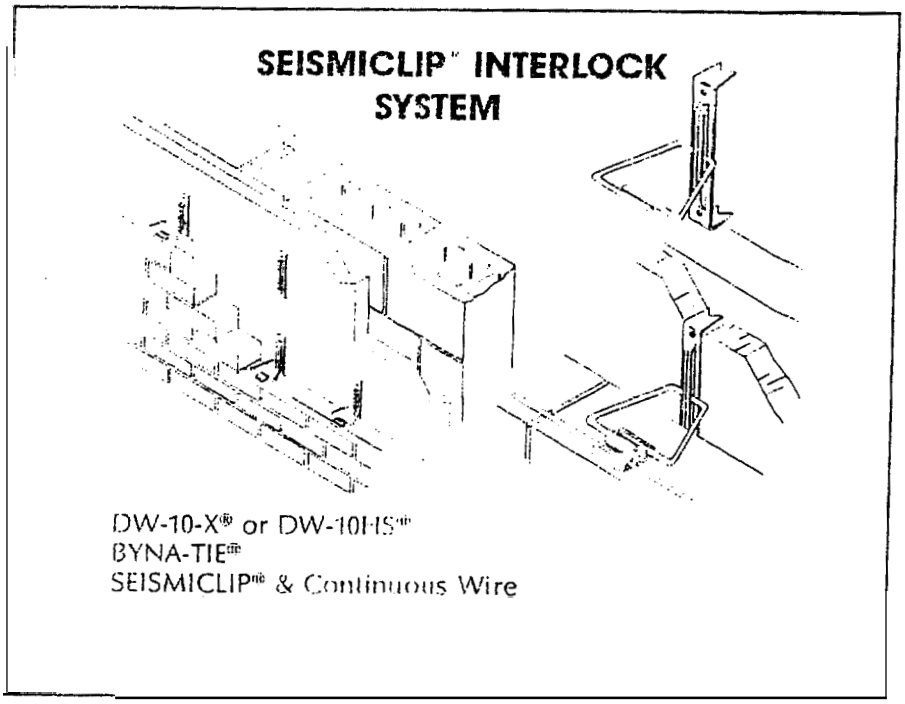
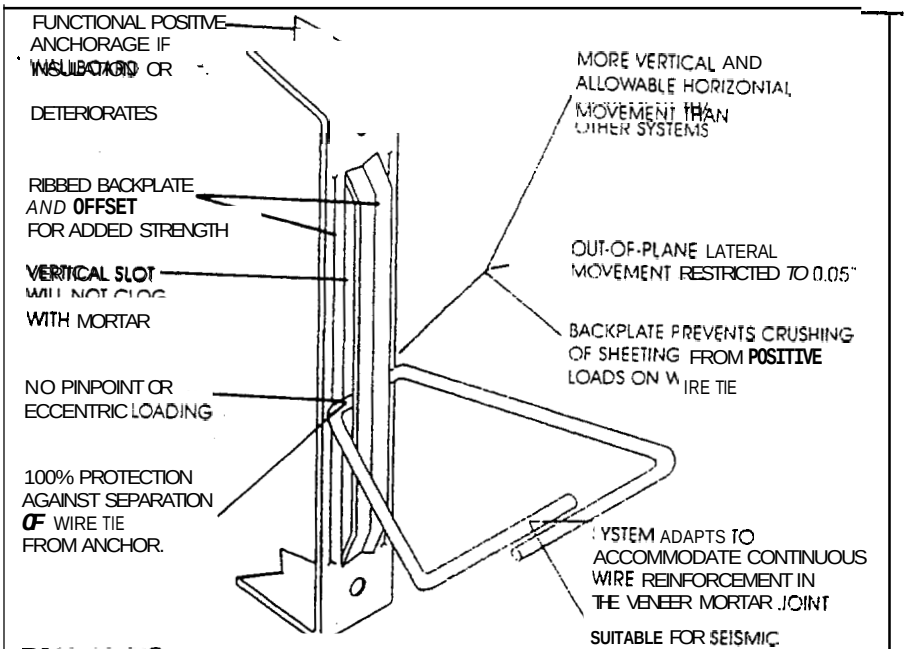


Diagram 9



DW-10-X® ANCHOR

Shown with Byna-Tie®)

OTHER FEATURES

- Bend sizes from ½" to 3" available
- 3⅝" vertical adjustability
- Installation after insulation is in place
- Available mill galvanized, hot dip galvanized, or stainless steel
- Available in **2** styles: to accept 1/16" or ¼" dia. wire tie (State when ordering.)

Conformance to applicable specifications

TESTED AND EVALUATED FOR USE IN SEISMIC ZONES 3 & 4 IN ACCORDANCE WITH ICBO GUIDELINES

Diagram 1

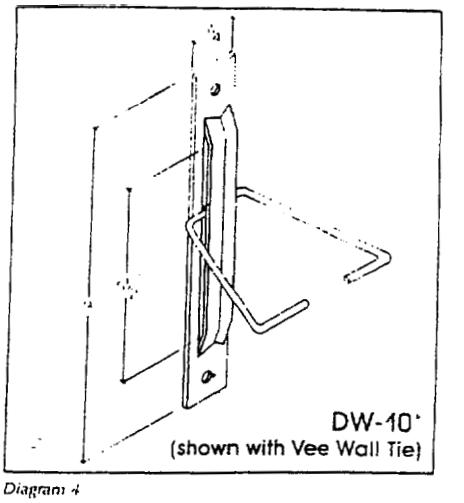


Diagram 4

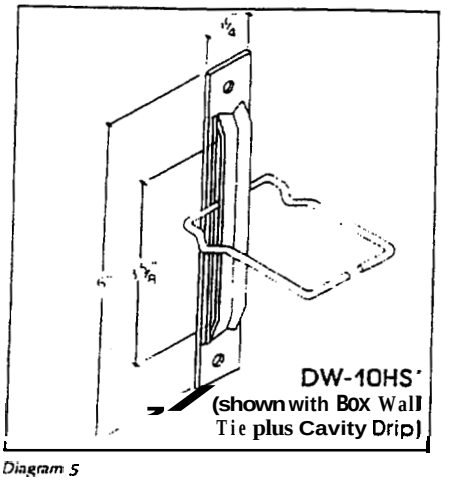


Diagram 5

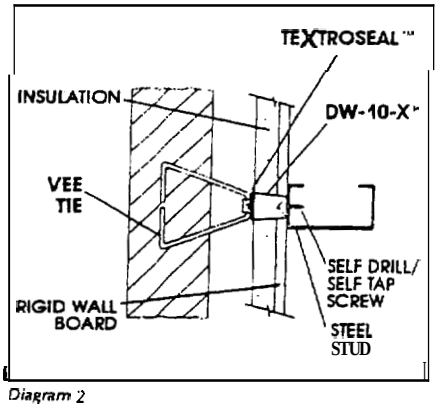


Diagram 2

stud backup with self-drilling, self-tapping screws. The BYNA-TIE is then attached to the DW-10 Series Anchor and the parallel legs are snapped into the Seismiclip as is the 9 gauge knurled reinforcing wire. The reinforcing wire should be installed continuously in the horizontal mortar joint and should be lapped a minimum of 6" to form proper splices. The Seismiclip and continuous wire are fully surrounded by mortar allowing all components to function as a single integrated unit fastened to the steel stud back-up.

Spacing of reinforcing and ties should be in compliance with local building code requirements.

For information on installation of the Seismiclip Interlock System with compatible Hohmann & Barnard, Inc. products other than DW-IO Series Anchors (and for construction other than brick ve-

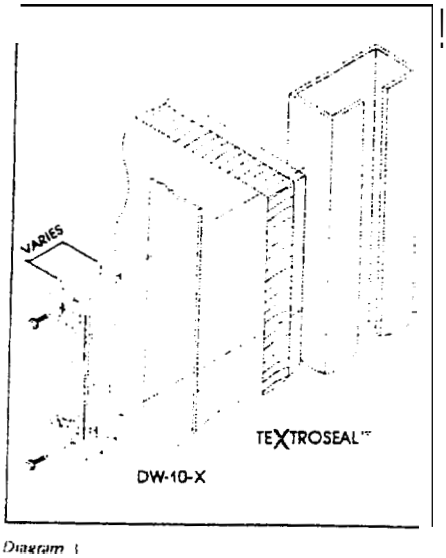


Diagram 3

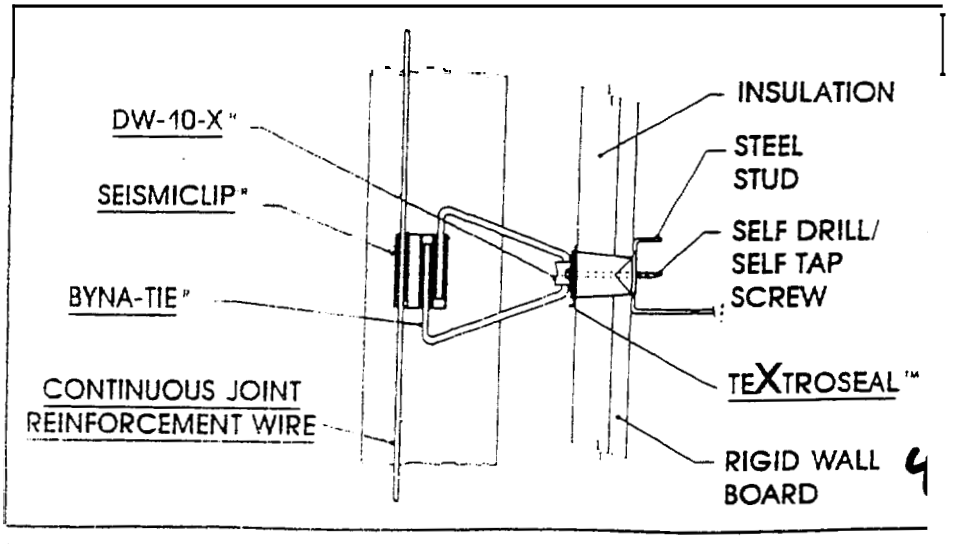


Diagram 6 - Seismiclip Interlock System: Reinforced masonry veneer wall applications with DW-10® Series Anchors

GAGNE & SON GAGNE PRECAST
concrete blocks • construction supplies • precast products

Date: December 6,2001

Team Masonry & Co.
385 Main Street
South Portland, ME 04106

Attn: Rocco

Re: **Avis** Vehicle Service Center
Jet Port Boulevard
Portland, ME 04102

This is the certification that you requested on our masonry units to be supplied to the above-named project.

It is hereby certified that all masonry units manufactured by GAGNE & SON CONCRETE BLOCK, **INC.** do meet **and** exceed ASTM-C90-01, Grade N. Type I **as** required.

Sincerely,

Kenny Beaulieu
Sales - Belgrade

KB:pjm

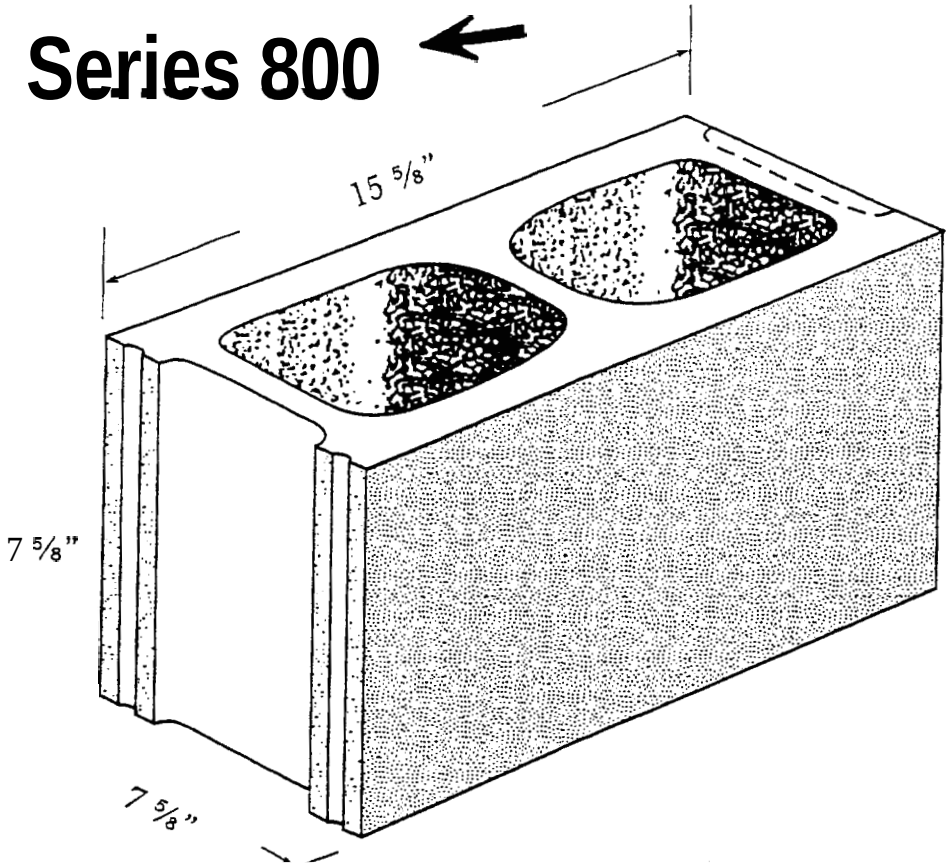
270 RIVERSIDE DRIVE, AUBURN, ME 04210 • 1-800-339-1132
RT. 27, BELGRADE, ME 04917 • 1-800-339-3313
1506 STATE STREET, VEAZIE, ME 04401 • 1-800-649-7393
70 WARREN AVENUE, WESTBROOK, ME 04902 • 1-800-339-9184

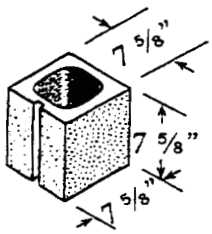
GAGNE & SON GAGNE PRECAST
concrete blocks • construction supplies • precast products
Email: gagneblock@aol.com Website: gagneandson.com

Series 800

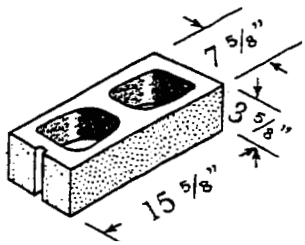
G&S
2C-SM
2 Core Smooth

MEETS
- ASTM C90-00 for concrete
- ASTM C-331 for lightweight

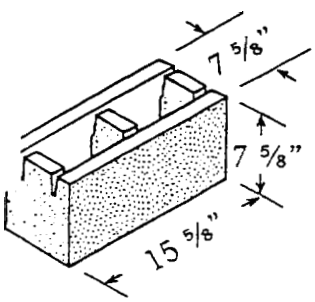




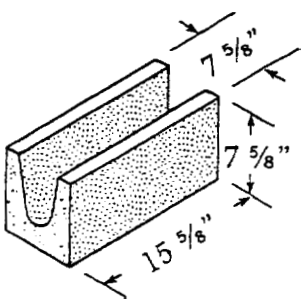
HALF SASH
8" x 8" x 16"



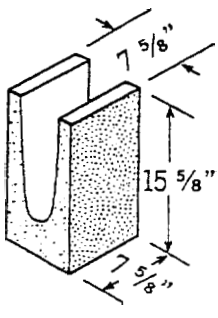
HALF HEIGHT 2 CORE
8" x 4" x 16"



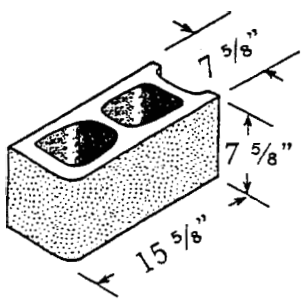
KNOCK OUT BOND BEAM
8" x 8" x 16"



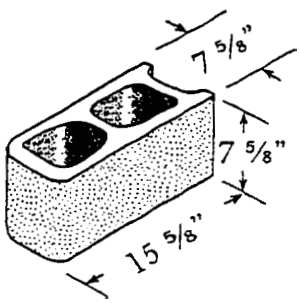
BOND BEAM
8" x 8" x 16"



LINTEL
8" x 16" x 8"



SINGLE BULLNOSE
8" x 8" x 16"



DOUBLE END BULLNOSE
8" x 8" x 16"

7/2001

APPROVALS:	COMMENTS:

270 RIVERSIDE DRIVE, AUBURN, ME 04210 • 1-800-339-1132
RT. 27, **BELGRADE,** ME 04917 • 1-800-339-3313
1506 STATE STREET, VEAZIE, ME 04401 • 1-800-649-7393
70 WARREN AVENUE, WESTBROOK, ME 04902 • 1-800-339-9784

WIRE-BOND®

MASONRY REINFORCING CORPORATION OF AMERICA

Core Clear Ladder Design

Description:

16" O.C. ladder design positions cross rods on web of block to allow core clearance. This simplifies rebar installation; centering utilizes strength of grout. Allows unrestricted flow of grout or loose fill insulation into CMU cells. Minimizes resetting of joint reinforcement around rebar. Improves resistance to shrinkage cracking. Provides stronger bond with cross rods in web of block. Less time devoted to rebar installation, grout pouring.

Ladder design is a prefabricated reinforcement for embedment in the horizontal mortar joints of masonry. It is manufactured in 10' 8" lengths from wire conforming to ASTM A 82 for cold drawn steel wire. It consists of two or more parallel and deformed longitudinal wires welded to perpendicular cross wire spaced 16" O.C. Out-to-out spacing is approximately two inches less than the nominal thickness of the wall.

All products conform to:

- ASTM A641 - (Mill galvanized wire)
- ASTM A153 Class B2 - (Hot dipped afterfabrication)
- ASTM A 82 - (Cold drawn steel wire)
- ASTM A951-96 - (Masonry wall reinforcing)
- ASTM 580 Type 304 - (Stainless steel)
- ACI/ASCE 530 (Building code requirements for masonry structures)

Wire Gauges:

	Side Rod	Cross Rod
Standard	9 Gauge (.148 in)	9 Gauge
Medium	8 Gauge (.162 in)	9 Gauge
Heavy Duty	3/16" (.187 in)	9 Gauge
Extra Heavy Duty	3/16" (.187 in)	3/16"

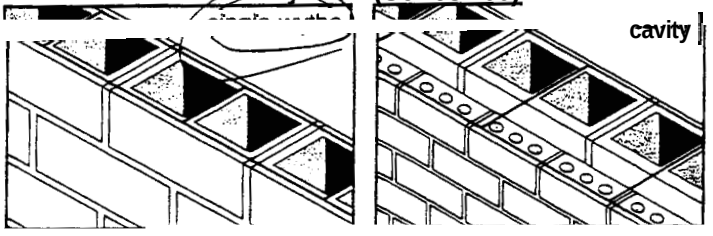
Finishes:

Plain	Uncoated
Mill Galvanized	Zinc Coated (0.10 oz per sq ft)
Hot Dipped Galvanized After Fabrication	Zinc Coated ASTM A 153 Class B2 (1.50 oz per sq ft
Stainless Steel	ASTM 580 Type 304

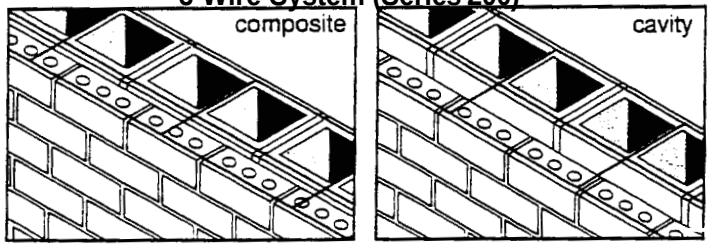
Class I ASTM A641 (0.4 oz/ft^2) and Class III (0.8 oz/ft^2) are no longer recommended by ASI 530 for interior walls.

Epoxy coating is not recommended as a protected coating for joint reinforcement, anchors and ties. Manufacturer recommends Stainless Steel Type 304 for maximum corrosion protection.

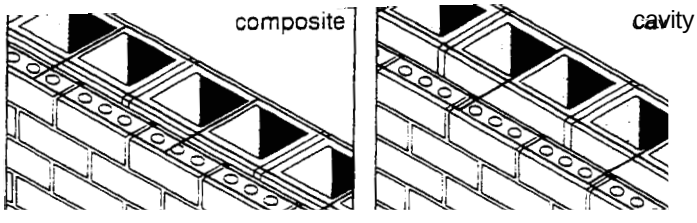
2 Wire System (Series 200)



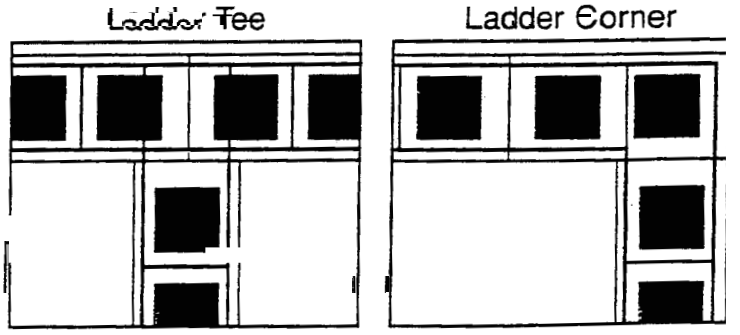
3 Wire System (Series 200)



4 Wire System (Series 200)



Prefabricated Corners and Tees:



Approvals:

Comments:

WIRE-BOND®

MASONRY REINFORCING CORPORATION OF AMERICA

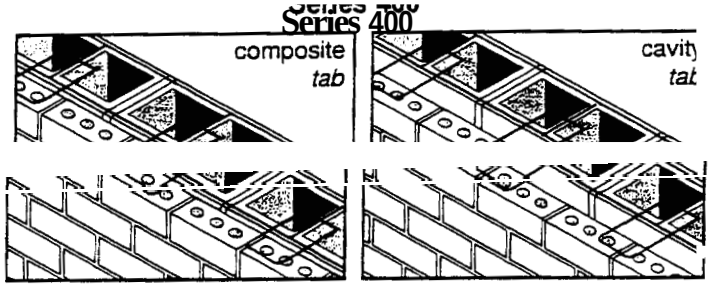
PRODUCT SUBMITTAL

Ladder Design with Ties

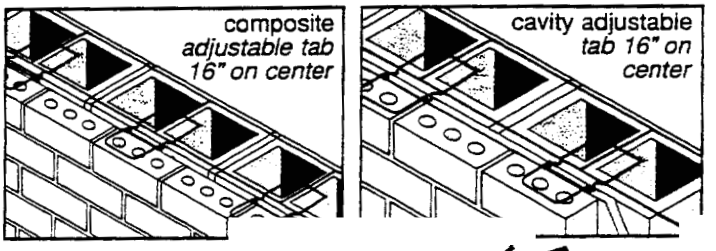
Description:

WIREBOND" ladder tab (options: adjustable tab, hook, and eye) is manufactured by *Masonry Reinforcing Corporation of America*. Ladder design consists of *two* or more deformed 9 ga. (option 3/16") longitudinal wires welded not more than 16" O.C. to a 9 ga. cross wire (option for 3/16" cross wire if so specified).

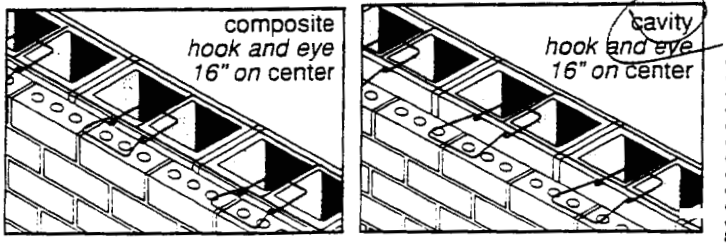
Ladder Double Hook & Eye is manufactured with Double Eyes welded 16" O.C. Out-to-out spacing of longitudinal wires shall be approximately 2" less than the nominal thickness of the block. Eye lengths are designed to span *just* beyond block or varying widths of insulation. All hooks and eyes are made of 3/16" diameter wire.



Series 600



Series 800



Specifications:

All products conform to:

ASTM A641 - (Mill galvanized wire)
ASTM A153 Class B2 - (Hot dipped after fabrication)
ASTM A 82 - (Cold drawn steel wire)
ASTM A951-96 - (Masonry wall reinforcing)
ASTM 580 Type 304 - (Stainless steel)
ACI/ASCE 530 -(Building code requirements for masonry structures)

Wire Gauges:

	Side Rods	*Cross Rods*
Standard	9 Gauge (.148 in)	9 Gauge
Medium	8 Gauge (.162 in)	9 Gauge
Heavy Duty	3/16" (.187 in)	9 Gauge
Extra Heavy Duty	3/16" (.187 in)	3/16"

Finishes:

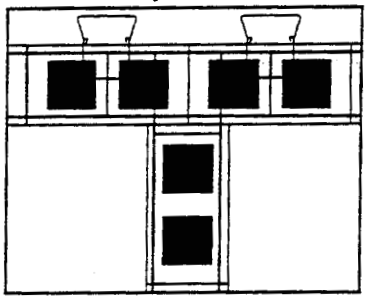
Plain	Uncoated
Mill Galvanized	Zinc Coated (0.10 oz per sq ft)
Hot Dipped Galvanized After Fabrication	Zinc Coated ASTM A 153 Class B2(1.50 oz per sq ft
Stainless Steel	ASTM 580 Type 304

Class I ASTM A641 (0.4 oz/ft^2) and Class III (0.8 oz/ft^2) are no longer recommended by ASI 530 for interior walls.

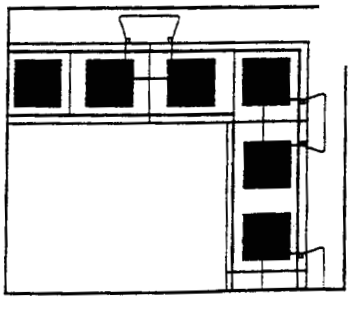
Epoxy coating is not recommended as a protected coating for joint reinforcement, anchors and ties. Manufacturer recommends Stainless Steel Type 304 for maximum corrosion protection.

Prefabricated Corners and Tees:

Ladder Hook & Eye Tee



Ladder Hook & Eye Corner



Approvals:

Comments:

DRAGON®
PRODUCTS COMPANY
P.O. Box 191, U.S. Route 1 • Thomaston, Maine 04861 • 207-594-5555

February 21,2001

Gagne and Son
P.O. Box 85
Belgrade, ME 04917

Attn: Kenny

At your request, we are supplying the following certification in accordance with the proposed usage of Dragon Products Company's Dragon Blend Masonry Cement.

It is herein certified that Dragon Products Company's Dragon Blend, as manufactured at Thomaston, Maine, meets the requirements of ASTM Specification C-91-99 for Type "S" Masonry Cement.

Dragon Blend Masonry Cement conforms to both the proportion **and** property requirements of ASTM Specification C-270 when used with sand conforming to ASTM Specification C-144.

Very truly yours,

J Kimball

Jennifer Kimball
Plant Chemist

JK/cp

Enclosure

SHOP DRAWING REVIEW
REVIEW IS FOR GENERAL COMPLIANCE WITH CONTRACT DOCUMENTS
NO RESPONSIBILITY IS ASSUMED FOR CORRECTNESS OF DIMENSIONS OR DETAILS

NO EXCEPTIONS TAKEN	✓
MAKE CORRECTIONS NOTED	
AMEND & RESUBMIT	
REJECTED-SEE REMARKS	

GAWRON ARCHITECTS
Date 12/14/01 By

9

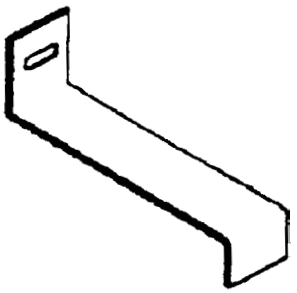
SUBMITTAL SHEET :#295 Z-TYPE GRANITE ANCHOR WITH SLOT

Bend Length: Minimum 3/4" recommended (specify as i.d. dimension). 1-1/4" for 3/16" and heavier.
Available in Stainless Steel, Hotdip Galvanized After Fabrication, Electro Galvanized After Fabrication, or Plain Steel. Stainless Steel recommended for any exterior stone application.

HECKMANN BUILDING PRODUCTS INC.
4015 W. CARROLL AVENUE
CHICAGO IL 60624
800-621-4140
FAX: 773-826-4919

SUBMITTAL **SHEET:** #295 2-TYPE **GRANITE** ANCHOR **WITH** SLOT

MADE **TO** ORDER



295

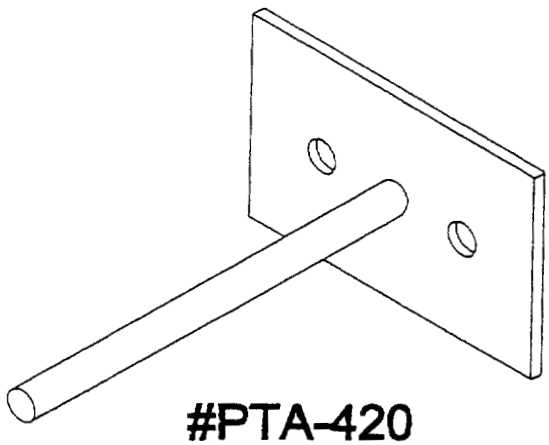
Thickness: ¼", 3/16", 1/8", 11 gage, 12 gage, & 16 gage.
Strap Width: 1-1/4" minimum recommended.
Length: Specify length as the inside dimensions between the bends.
Bend with Slot: 1-1/2" minimum recommended. The bend should be at least ½" longer than the slot length for 1/8" thick and lighter, and 1" longer for 3/16" and ¼". Specify exact location of slot in bend. (Slots are available horizontal or vertical)
Standard slot *sizes:*

3/16" x 5/8"	3/16" x ¾"	3/16" x 1"	
¼" x ¾"	¼" x 1"		
5/16" x 5/8"	5/16" x ¾"	5/16" x 1"	5/16" x 1¼"
3/8" x %-	3/8" x ¾"		
7/16" x 1"	7/16" x 1 ¼"	7/16" x 1 ½"	
9/16" x 1"	9/16" x 1 ½"		
5/8" x 1 9/16"	11/16" x 1 ½"		
¾" x 1 9/16"	13/16" x 1 ½"	7/8" x 1 9/16"	1" x 1 ½"

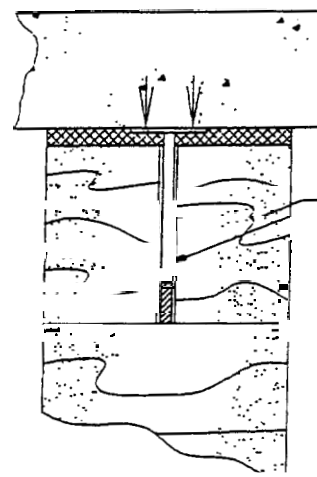
GAGNE & SON CONCRETE BLOCKS
& MASONRY SUPPLIES
RT. 27 BELGRADE ME, 04917

04082/HOH
BuyLine 1823

#PTA-420



#PTA-420



PTA ANCHOR

INSERTED INTO TUBE WITH FILLER

Standard Size

- ☐ 4" Block
- ☐ 6" Block
- ☑ 8" Block
- ☐ 10" Block
- ☐ 12" Block
- ☐ Other Sizes **Available Upon Request**

Finish

- ☐ Mill Galvanized (ASTM A525, A36, A653, B633, B638, B695
- ☑ Hot Dip Galvanized (ASTM A366)
- ☐ stainless Steel (ASTM A580)

12

Hohmann & Barnard, Inc.
30 Rasons Court
Hauppauge, New York 11788
TEL:(800) 645-0616 FAX: (631) 234-0683

WEBSITE: www.h-b.com
E-MAIL: weanchor@h-b.com

P.O. Box 191, U.S. *Route* 1 · Thomaston, Maine 04867 · 207-594-5555 ·

February 21, 2001

Gagne and Son
P.O. Box 85
Belgrade, ME 04917

Attn: Kenny

At your request, we are supplying the following certification in accordance with the proposed usage of Dragon Products Company's Dragon Blend Masonry Cement.

It is herein certified that Dragon Products Company's Dragon Blend, as manufactured at Thomaston, Maine, meets the requirements of ASTM Specification C-91-99 for Type "S" Masonry Cement.

Dragon Blend Masonry Cement conforms to both the proportion and property requirements of ASTM Specification C-270 when used with sand conforming to ASTM Specification C-144.

Very truly yours,

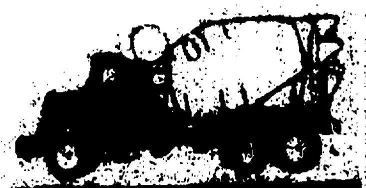
Jennifer Kimball
Plant Chemist

JK/cp

Enclosure

FAX TRANSMITTAL # of Pages
TO: Kenny Gagne FROM: Roger
CO: RDCCO LED II, INC.
DATE: PHONE: (207) 776-6583
FAX #: FAX # (207) 774-1768
COMMENTS

SHOP DRAWING REVIEW
REVIEWED FOR GENERAL COMPLIANCE WITH CONTRACT DOCUMENTS
NO RESPONSIBILITY IS ASSUMED FOR CORRECTNESS OF DIMENSIONS OR DETAILS
NO EXCEPTIONS TAKEN
MAKE CORRECTIONS NOTED
AMEND & RESUBMIT
RECEIVED/DOES NOT APPLY
GAWRON ARCHITECTS
Date 12/14/01 By



48 Goldthwaite Road • P.O. Box 1747 • Auburn, Maine 04210 Phone: (207) 777-7100 • Fax: (207) 777-7177

98 Scott Drive • Westbrook, Maine 04092 Phone: (207) 780-0523 • Fax: (207) 780-1521

ROCCO LEO TEAM MASONRY

Mix Design Submittal

4000 PSI GROUT

AMBIENT TEMPERTURE

CEMENT	658 Lbs	CEMENT QUEBEC
[illegible]		
COARSE AGGREGATE 3/8" CRUSHED STONE	675 Lbs	[illegible] EXCAVATION
FINE AGGREGATE	2,300 Lbs	GORHAM S&G
WATER	33.0 Gal	PORTLAND WATER
DARACEM 19	43.0 Oz	W.R. GRACE
DARATARD 17	0.0 OZ	W.R. GRACE
DAREX II	0.0 Oz	W.R. GRACE
WATER/CEMENT RATIO	0.55 Lbs	
SLUMP (inches)	4.00 in	
AIR CONTENT (%)	2% entrapped	

FAX TRANSMITTAL # of Pages ________

TO: Auburn Conc'd FROM: Rocco

CC: MARK ROCCO LEO II, INC.

DATE: ________ PHONE (207) 775-5583

FAX# ________ FAX# (207) 774-1768

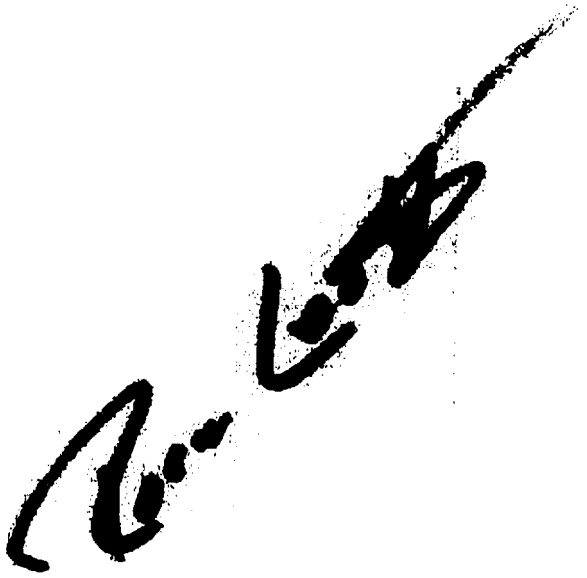
COMMENTS ________

ROCCO LEO II, INC.
TEAM MASONRY & CONSTRUCTION
385 MAIN STREET, SOUTH PORTLAND, MAINE 04106
775-5583 FAX 774-1768

To; Horne Construction
Attn: Mark E Geuther
Re Avis

Mortar Proportions By Volume
as per ASTM , BIA M1-72

Mortar Type	Volume Portland Cement	Volume Hydrated Lime	Sand
S	1	1/2	Not less than 2 1/4 and not more than 3 times the sum of the volumes



05 120 Structural Steel

5 120.1 Inspection Reports

BECKER
structural engineers

Date: January 29,2002
Time: 1:00pm
Temp: Upper 30's
Weather: Cloudy

Project: **Avis Rental Car Facility**
South Portland, Maine

Inspection Report - Structural Steel

Location: At the erector's request, the anchor bolts were reviewed. Some of the structural steel was in place, and some of the connections were made.

Satisfactory	Unsatisfactory	Not Completed	N/A		Satisfactory	Unsatisfactory	Not Completed	N/A	
x				Bolt Condition			x		Stl Jst Brg Lengths
		x		Weld Condition			x		Bolts
x				AB's, Nuts & Wash			x		Weld Condition
		x		Grout/Level PLs			x		Brg Plates/Surfaces
		x		Plumbness/Fitup			x		Bridging Layout
		x		Mtl Deck Welds			x		Bridging Connections
		x		Pour Stops					
x				Bracing					

Notes: No comments.

Signed: Ethan A. Rhile, P. E. Date: 2/4/02

WO 768.01

BECKER
structural engineers

Date: March 8, 2002
Time: 10:00am
Temp: 30's
Weather: Cloudy

Project: **Avis Rental Car Facility**
South Portland, Maine

Inspection Report - Structural Steel

Location: Fuel Island Steel

Satisfactory	Unsatisfactory	Not Completed	N/A		Satisfactory	Unsatisfactory	Not Completed	N/A	
x				Bolt Condition				x	Stl Jst Brg Lengths
x				Weld Condition				x	Bolts
x				AB's, Nuts &Wash				x	Weld Condition
x				Grout/Level PLs				x	Brg Plates/Surfaces
x				Plumbness/Fitup				x	Bridging Layout
			x	Mtl Deck Welds				x	Bridging Connections
			x	Pour **Stops**					
x				Bracing					

Notes: No comments.

Signed: Ethan **A.** Rhile, P. **E.** Date: 4/19/02

WO 768.01

BECKER
structural engineers

Date: April 19. 2002
Time: 8:30am
Temp: 40's
Weather: Fog

Project: **Avis Rental Car Facility**
South Portland, Maine

Inspection Report - Structural Steel

Location: Mezzanine

Satisfactory	Unsatisfactory	Not Competed	N/A	
			x	Bolt Condition
			x	Weld Condition
			x	AB's, Nuts & Wash
			x	Grout/Level PLs
			x	Plumbness/Fitup
x				Mtl Deck Welds
x				Pour Stops
			x	Bracing

Satisfactory	Unsatisfactory	Not Completed	N/A	
x				Stl Jst Brg Lengths
x				Bolts
x				Weld Condition
x				Brg Plates/Surfaces
x				Bridging Layout
x				Bridging Connections

Notes: No comments.

Signed: Ethan A. Rhile, P. E. Date: 4/19/02

WO 768.01

Becker Structural **Engineers**
19 Cornmerical Street
Portland. Maine 04101
Phone: (207) 879-1838
Fax(207) 879-1822

Offices:
Dover, NH
Manchester, NH
N. Chelmsford, MA

GEOTECHNICAL CONSULTING
SITE INSPECTIONS
MATERIAL TESTING

JOHN TURNER CONSULTING, INC.

FIELD OBSERVATION REPORT

CLIENT:	**Becker Structural Engineers, Inc.** **Attn: Mr. Paul Becker** **19 Commercial Street** **Portland, ME 04101**	**PROJECT:**	**Avis Rent A Car System** **Portland Jetport** **Portland, NH**

DATE: **March 8,2002** **REPORT #:** **01-196-020**

As requested by our client a visit was made on this date for inspection of steel framings. Structural steel framing was completed and work was in progress on roof trusses. We met with the superintendent from Home Construction and reviewed engineering drawings, Precision Welding approval drawings (1/17/02). All drawings had been initialized by Becker Engineers.

Completed structural steel was inspected and found acceptable with the exception of a weld missing on each of two horizontal HSS braces at gussets (one in the South room and the other in the north room). Inspection was conducted from grade so we could not ascertain if top welds were also missing. No discrepancies were observed on remaining field welds, shop welds, bolting and anchoring. Except for the missing welds work conformed to approved drawings and applicable codes. The mezzanine was not erected yet.

Visual inspection was performed on the cold formed steel truss system. In the middle room the PAF and screw fasteners for the truss to steel anchor clips were found incomplete. The contractor will return to all areas and complete anchor fastening, replace construction bridging with new rows of mid-point lateral bracing, terminate design bracing at end walls only where specified in drawings and install new rows of bottom chord bracings at ten foot intervals as specified by Wood Structures Design drawings. **All** bracing will span two trusses with screens installed on flanges (All items per discussion with foreman). Inspection was performed on exterior stud walls and no discrepancies were found with work in progress.

Inspector: Chris Puritan

05 120 Structural Steel
05 120.2 Welder Certifications/ Shop QA Certificate

AWS Certified Welder
Welders, Brazers, & Operators

Qualifications
G-D1.1-SMAW-F4-P1-A-U

ID# 004-74-4372 Issued 10/24/97

Michael D. Schroeder

Valid Only If Accompanied By Photo ID

AWS Certified Welder
Welders, Brazers, & Operators

Qualifications D1.1-SM-F4-P-A-L

ID# 007-44-1265 Issued 6/7/96

Ronald H. Moody

Valid Only If Accompanied By Photo ID

G-D1.1-SM-F4-P-A-L

ID# 397-54-1403 Issued 6/27/96

Gary H. Zarate

Valid Only If Accompanied By Photo ID

AWS Certified Welder
Welders, Brazers, & Operators

Qualifications G-D1.1-SM-F4-P-A-L

ID# 007-72-9877 Issued 8/2/96

Solomon R. Gay

Valid Only If Accompanied By Photo ID

AWS Certified Welder
Welders, Brazers, & Operators

Qualifications G-B2.1-SMAN-E7018-A36-3G/4G-U

ID# 004-44-9539 Issued 6/12/95

David W. Sargent, Sr.

Valid Only If Accompanied By Photo ID

WELDER CERTS

WELDER, WELDING OPRATOR, OR TACK WELDER QUALIFICATION TEST RECORO

Name of Welder: William Masters
Name: Precision Welding — Identification No. 117-70-6852
Welding Procedure Specification No.: 1 Rev. N/A — Date March 12, 2001

Variables	Record Actual Values Used in Qualification	Qualification Range
Process/Type [Table 4.10, Item (1)]	SMAW	
Electrode (single or multiple) [Table 4.10, Item (5	1/8 E7018	ALL
Current Polarity	125 A DC+	
Position [Table 4.10, Item (6)]	1G , 2G	1G , 2G
Weld Progression [Table 4.10, Item (6)]	n/a	n/a
Backing (YES or NO) [Table 4.10 Item (7)]	YES	YES
Material/Spec.	Group 1 to Group 1	
Base Metal		
Thickness: (Plate)		
Groove	3/8 "	1/8 - 3/4 inch
Fillet	N/A	F & H
Thickness: (Pipe/Tube)		
Groove	N/A	F & H
Fillet	N/A	F & H
Diameter :(Pipe)		
Groove	N/A	F & H OVER 24" DIA.
Fillet	N/A	F & H OVER 24" DIA.
Filler Metal [Table 4.10, Item (3)]		
Spec. No.	A5.1	
Class	E7018	
F-No. [Table 4.10, Item (2)]	F 4	F4, F3, F2, F1
Gas/Flux Type [Table 4.10Item (3)]	N/A	
Other	N/A	N/A

VISUAL INSPECTION (4.8.1)

Acceptable YES or NO: YES

Guided Bend Test Results (4.30.5)

Type	Result	Type	Result
2G SIDE BEND	ACCEPTABLE	2G SIDE BEND	ACCEPTABLE

Fillet Test Results (4.30.2.3 and 4.30.4.1)

Appearance	N/A	Fillet Size	N/A
Fracture Test Root Penetration	N/A	Macroetch	N/A

(Describe the location, nature, and size of any crack or tearing of the specimen.)

Inspected by: Brad Wells CWI # 00050221 — Test Number: N/A
Organization: Maine Oxy — Date: March 12, 2001

RADIOGRAPHIC TEST RESULTS (4.30.3.1)

Film Identification Number	Results	Remarks	Film Identification Number	Results	Remarks
N/A	N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A

Interpreted by: N/A — Test Number: N/A
Organization: N/A — Date: N/A

We, the undersigned, certify that the statements in this record are correct and that the test welds were prepared, welded, and tested in accordance with the requirements of section 4 of AWS D1.1, (2000) Structural Welding Code — Steel.

Manufacturer or Contractor: _____ Authorized By: _____
Date: _____

2

Quality Assurance Level II
NON-DESTRUCTIVE TESTING AND CONSULTING SERVICES
80 PLEASANT AVENUE • SOUTH PORTLAND, MAINE 04106 • TEL: (207) 799-8911 • FAX: (207) 799-7251

CUSTOMER'S NAME: Precision Welding | P.O. NO.: | PAGE 1 OF 1

RADIOGRAPHY REPORT NO.: QAL-01-705 | PROCEDURE NO.: 1003 | QUANTITY: 3

PART NO.: Test Plates | JOB NO.:

SOURCE: TYPE Iridium 192 | SIZE: .077 X .107 | CURIES: 68 | KV: NA | MA: NA | SFD: 20"

SINGLE ☑ | DOUBLE ☐ | FRONT ☑

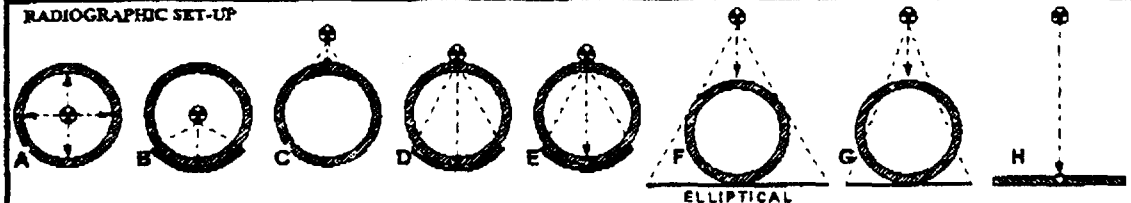
FILM: TYPE I | SPEED: 80 | SIZE: 4½ x 10 | SCREENS: 0.005" | BACK ☑

FILM SIDE ☐

IQI: SIZE ASTM B | GROUP: 1 | SENSITIVITY: .010 | SHIM: NA | SOURCE SIDE ☑

MATERIAL: TYPE CS | THICKNESS: 1" | ACCEPTANCE STANDARD: AWS D1.1

RADIOGRAPHIC SET-UP



OTHER

SERIAL NUMBER	VIEW NUMBER	CONDITION OF PART (See Definitions)	ACCEPT	REJECT	SERIAL NUMBER	VIEW NUMBER	CONDITION OF PART (See Definitions)	ACCEPT	REJECT
DWS	0-1	12	✓						
WM	0-1	12	✓						
BB	0-1	12	✓						

REMARKS

DWS-9539 Dan Sargent, BB-3649 Bruce Bragg, WM-6852 William Masters

DEFINITIONS:
1. Crack
2. Porosity
3. Incomplete Fusion
4. Incomplete penetration
5. Slag
6. Inclusions
7. Gas Holes
8. Shrink
9. No Apparent Defects
10. Film Artifacts
11. HI/Lo
12. Surface
13. Undercut
14. Void
15. Internal concavity

SIGNATURE: W. Crawford #2569702

DATE: M / D / Y 11/09/2001 LEVEL: II

FORM XXXX REV 01

ANNEX E

AWS D1.1:2000

WELDER, WELDING OPERATOR, OR TACK WELDER QUALIFICATION TEST RECORD

Type of Welder Precision Welding
Name Bruce M Bragg Identification No. 007-48-3649
Welding Procedure Specification No. 1 Rev N/A Date Nov 8, 2001

Variables	Record Actual Values Used in Qualification	Qualification Range
Process/Type [Table 4.10, Item (1)]	FCAW	
Electrode (single or multiple) [Table 4.10, Item (8)]	.045 E71T-1	ALL
Current/Polarity	DC+	
Position [Table 4.10, Item (4)]	2G	1G, 2G
Weld Progression [Table 4.10, Item (6)]		
Backing (YES or NO) [Table 4.10, Item (7)]	Yes	YES
Base Metal	to	
Thickness: (Plate)		
Groove	1"	UNLIMITED
Fillet	N/A	UNLIMITED
Thickness: (Pipe/tube)		
Groove	N/A	UNLIMITED
Fillet	N/A	UNLIMITED
Diameter: (Pipe)	N/A	
Groove	N/A	
Fillet	N/A	
Filler Metal [Table 4.10, Item (3)]		
Spec. No.	A5.20	
Class	E71T-1	
F-No. [Table 4.10, Item (2)]	F6	F6
Gas/Flux Type [Table 4.10, Item (3)]	75% Argon / 25% CO2	
Other	N/A	N/A

VISUAL INSPECTION (4.8.1)
Acceptable YES or NO ____

Guided Bend Test Results (4.345)

Type	Result	Type	Result

Fillet Test Results (4.30.2.3 and 4.30.4.1)
Appearance ____ Fillet Size ____
Fracture Test Root Penetration ____ Macroetch ____
(Describe the location, nature, and size of any crack or tearing of the specimen.)

Inspected by ____ Test Number ____
Organization ____ Date ____

RADIOGRAPHIC TEST RESULTS (4.30.3.1)

Film Identification Number	Results	Remarks	Film Identification Number	Results	Remarks
01-705 BB	ACCEPT				

Interpreted by W. CRAWFORD Test Number 01-705
Organization QUALITY ASSURANCE LABS Date 11/9/01

We, the undersigned, certify that the statements in this record are correct and that the test welds were prepared, welded, and tested in accordance with the requirements of section 4 of AWS D1.1, (2000) (year) Structural Welding Code—Steel.

Manufacturer or Contractor ____ Authorized By ____
Form E-4 Date ____

4

ANNEX E

WELDING PROCEDURE SPECIFICATION (WPS) Yes ☒

PREQUALIFIED ✓ QUALIFIED BY TESTING ____

or PROCEDURE QUALIFICATION RECORDS (PQR) Yes ☐

Bruce B

Identification # ____

Revision 1 Date 11/08/01 By M Schweitzer

Company Name Precision Welding + Fabrication

Welding Process(es) FCAW

Supporting PQR No.(s) PREQUALIFIED

Authorized by ____ Date ____

Type—Manual ☐ Semi-Automatic ☒

Machine ☐ Automatic ☐

JOINT DESIGN USED

Type:

Single ☒ Double Weld ☐

Backing: Yes ☒ No ☐

Backing Material: ASTM A36

Root Opening 1/4" Root Face Dimension —

Groove Angle: 45° Radius (J-U) —

Back Gouging: Yes ☐ No ☐ Method —

POSITION

Position of Groove: 2G Fillet: ____

Vertical Progression: Up ☐ Down ☐

BASE METALS

Material Spec. ASTM A36

Type or Grade ____

Thickness: Groove 1" Fillet ____

Diameter (Pipe) ____

ELECTRICAL CHARACTERISTICS

Transfer Mode (GMAW) Short-Circuiting ☐ Globular ☐ Spray ☒

Current AC ☐ DCEP ☒ DCEN ☐ Pulsed ☐

Other ____

Tungsten Electrode (GTAW)

Size: ____

Type: ____

FILLER METALS

AWS Specification AWS 5.20

AWS Classification E71T-1

TECHNIQUE

Stringer or *Weave* Bead: STRINGER / WEAVE ROOT

Multi-pass or Single Pass (per side) Multi Pass

Number *of* Electrodes ONE

Electrode Spacing Longitudinal —

Lateral —

Angle ____

SHIELDING

Flux —

Gas Argon / CO2

Composition 75%-25%

Electrode-Flux(Class) —

Flow Rate 35-40 CFH

Gas Cup Size 5/8"

Contact Tube to Work Distance 3/4"

Peening NONE

Interpass Cleaning; hand wire brush, chipping hammer, grinder on ?

PREHEAT

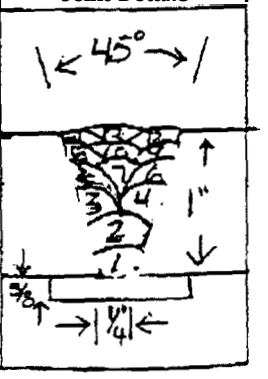
Preheat Temp.. Min —

Interpass Temp.. Min — Max —

POSTWELD HEAT TREATMENT

Temp. ____

Time ____

Pass or Weld Layer(s)	Process	Filler Metals Class	Filler Metals Diam.	Current Type & Polarity	Current Amps or *Wire* Feed Speed	Volts	Travel Speed	Joint Details
1-13	FCAW	E71T-1	.045	Vertical DC+	200 AMPS	26.5		

S

WELDER, WELDING OPERATOR, OR TACK WELDER QUALIFICATION TEST RECORD

Type of Welder Precision Welding
Name William Marsters Identification No. 117-70-6852
Welding Procedure Specification No. 1 Rev N/A Date Nov 8, 2001

Variables	Record Actual Values Used in Qualification	Qualification Range
Process/Type [Table 4.10, Item (1)]	FCAW	
Electrode (single or multiple) [Table 4.10, Item (8)]	045 E71T-1	ALL
Current/Polarity	DC+	
Position [Table 4.10, Item (4)]	1G, 2G	1G, 2G
Weld Progression [Table 4.10, Item (6)]		
Backing (YES or NO) [Table 4.10, Item (7)]	YES	YES
Material/Spec.	10	
Base Metal		
Thickness: (Plate)	1"	
Groove		UNLIMITED
Fillet	N/A	UNLIMITED
Thickness: (Pipe/tube)		
Groove	N/A	UNLIMITED
Fillet	N/A	UNLIMITED
Diameter: (Pipe)	N/A	
Groove		
Fillet	N/A	
Filler Metal [Table 4.10, Item (3)]		
Spec. No.	A5.20	
Class	E71T-1	
F-No. [Table 4.10, Item (2)]	F6	F6
Gas/Flux Type [Table 4.10, Item (3)]	75% Argon / 25% CO_2	
Other	NA	

VISUAL INSPECTION (4.8.1)
Acceptable YES or NO ____

Guided Bend Test Results (4.30.5)

Type	Result	Type	Result

Fillet Test Results (4.30.2.3 and 4.30.4.1)
Appearance ____ Fillet Size ____
Fracture Test Root Penetration ____ Macroetch ____
(Describe the location, nature, and size of any crack or tearing of the specimen.)

Inspected by ____ Test Number ____
Organization ____ Date ____

RADIOGRAPHIC TEST RESULTS (4.30.3.1)

Film Identification Number	Results	Remarks	Film Identification Number	Results	Remarks
01-705 WM	ACCEPT				

Interpreted by W. CRAWFORD Test Number 01-705
Organization QUALITY ASSURANCE LABS Date 11/9/01

We, the undersigned, certify that the statements in this record are correct and that the test welds were prepared, welded, and tested in accordance with the requirements of section 4 of AWS D1.1, (2000) Structural Welding Code—Steel.
(year)

Manufacturer or Contractor ____ Authorized By ____
Form E-4 Date ____

WELDING PROCEDURE SPECIFICATION (WPS) Yes ☒

PREQUALIFIED ✓ QUALIFIED BY TESTING _____
or PROCEDURE QUALIFICATION RECORDS (PQR) Yes ☐

Bill M

Company Name Precision Welding + Fabrication
Welding Process(es) FCAW
Supporting PQR No.(s) PREQUALIFIED

Identification # 1
Revision _____ Date 11/08/01 By M Schmidt
Authorized by _____ Date _____
Type—Manual ☐ Semi-Automatic ☒
Machine ☐ Automatic ☐

JOINT DESIGN USED

Type:
Single ☒ Double Weld ☐
Backing: Yes ☒ No ☐
Baaing Material: ASTM A36
Root Opening 1/4" Root Face Dimension _____
Groove Angle: 45° Radius (J–U) —
Back Gouging: Yes ☐ No ☐ Method —

POSITION

Position of Groove: 2G Fillet: _____
Vertical Progression: Up ☐ Down ☐

ELECTRICAL CHARACTERISTICS

Transfer Mode (GMAW) Short-Circuiting ☐
Globular ☐ Spray ☒
Current: AC ☐ DCEP ☒ DCEN ☐ Pulsed ☐
Other _____
Tungsten Electrode (GTAW)
Size: _____
Type: _____

BASE METALS

Material Spec. ASTM A36
Type or Grade _____
Thickness: Groove 1" Fillet _____
Diameter (Pipe) _____

FILLER METALS

AWS Specification AWS 5.20
AWS Classification E71T-1

TECHNIQUE

Stringer or weave Bead: STRINGER / WEAVE BEAD
Multi-pass or Single Pass (per side) Multi Pass
Number of Electrodes ONE
Electrode Spacing Longitudinal —
Lateral —
Angle _____

SHIELDING

Flux —
Gas Argon/CO2
Composition 75%-25%
Electrode-Flux (Class) —
Flow Rate 35-40 CFH
Gas Cup Size 5/8"

Contact Tube to Work Distance 3/4"
Peening NONE
Interpass Cleaning: hand wire brush, Chipping hammer, grinder on Spatter

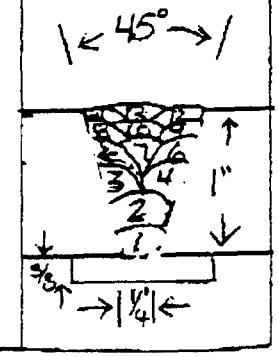
PREHEAT

Preheat Temp., Min —
Interpass Temp., Min _____ Max —

POSTWELD HEAT TREATMENT

Temp. _____
Time _____

WELDING PROCEDURE

Pass or Weld Layer(s)	Process	Filler Metals		Current: Type & Polarity	Current: Amps or Wire Feed Speed	Volts	Travel Speed	Joint Details
1-13	FCAW	E71T-1	.045	Verticore DC+	450 IPM	30.5		

Form E-1 (Front)

WELDER, WELDING OPERATOR, OR TACK WELDER QUALIFICATION TEST RECORD

Type of Welder Precision Welding
Name Dave Sargent Identification No. 004-44-9539
Welding Procedure Specification No. 1 Rev N/A Date Nov 8 2001

	Record Actual Values Used in Qualification	Qualification Range
Variables		
Process/Type [Table 4.10, Item (1)]	FCAW	
Electrode (single or multiple) [Table 4.10, Item (8)]	045 E71T-1	ALL
Current/Polarity	DC+	
Position [Table 4.10, Item (4)]	2G, 1G	2G, 1G
Weld Progression [Table 4.10, Item (6)]		
Backing (YES or NO) [Table 4.10, Item (7)]	YES	YES
Material/Spec.	to	
Base Metal		
Thickness: (Plate)		
Groove	1"	UNLIMITED
Fillet	N/A	UNLIMITED
Thickness: (Pipe/tube)		
Groove	N/A	UNLIMITED
Fillet	N/A	UNLIMITED
Diameter: (Pipe)	N/A	
Groove	N/A	
Fillet	N/A	
Filler Metal [Table 4.10, Item (3)]		
Spec. No.	A5.20	
Class	E71T-1	
F-No. [Table 4.10, Item (2)]	F6	F6
Gas/Flux Type [Table 4.10, Item (3)]	75% Argon/25% CO_2	
Other	N/A	N/A

VISUAL INSPECTION (4.8.1)
Acceptable YES or NO ____

Guided Bend Test Results (4.30.5)

Type	Result	Type	Result

Fillet Test Results (4.30.2.3 and 4.30.4.1)
Appearance ____ Fillet Size ____
Fracture Test Root Penetration ____ Macroetch ____
(Describe the location, nature, and size of any crack or tearing of the specimen.)

Inspected by ____ Test Number ____
Organization ____ Date ____

RADIOGRAPHIC TEST RESULTS (4.30.3.1)

Film Identification Number	Results	Remarks	Film Identification Number	Results	Remarks
01-705	ACCEPT				
QWS					

Interpreted by W. CRAWFORD Test Number 01-705
Organization QUALITY ASSURANCE LABS Date 11/9/01

We, the undersigned, certify that the statements in this record are correct and that the test welds were prepared, welded, and tested in accordance with the requirements of section 4 of AWS D1.1, (2000) (year) Structural Welding Code—Steel.

Manufacturer or Contractor ____ Authorized By ____
Form E-4 Date ____

8

ANNEX E

WELDING PROCEDURE SPECIFICATION (WPS) Yes ☒

PREQUALIFIED ✓ QUALIFIED BY TESTING ____
or PROCEDURE QUALIFICATION RECORDS (PQR) Yes ☐

David S.

Company Name: Precision Welding & Fabrication

Identification # 1
Revision — Date —/—/— By ____
Authorized by ____ Date ____

Welding Process(es): PREQUALIFIED

Type—Manual ☐ Semi-Automatic ☒
Machine ☐ Automatic ☐

JOINT DESIGN USED

Type:
Single ☐ Double Weld ☐
Backing: Yes ☒ No ☐
Backing Material: ASTM A36
Root Opening 1/4" Root face Dimension —
Groove Angle: 45° Radius (J–U) —
Back Gouging: Yes ☐ No ☐ Method —

POSITION

Position of Groove: 2G Fillet: ____
Vertical Progression: Up ☐ Down ☐

ELECTRICAL CHARACTERISTICS

Transfer Mode (GMAW) Short-circuiting ☐ Globular ☐ Spray ☐
Current: AC ☐ DCEP ☒ DCEN ☐ Pulsed ☐
Other ____
Tungsten Electrode (GTAW)
Size: ____
Type: ____

BASE METALS

Material Spec. ASTM A36
Type or Grade ____
Thickness: Groove 1" Fillet ____
Diameter (Pipe) ____

TECHNIQUE

Stringer or Weave Bead: Stringer/Weave Bead
Multi-pass or Single Pass (per side) Multi Pass
Number of Electrodes ONE
Electrode Spacing Longitudinal — Lateral — Angle —
Contact Tube to Work Distance 3/4"
Peening NONE
Interpass Cleaning: hand wire brush, Chipping hammer, grinder on Spatter

FILLER METALS

AWS Specification AWS 5.20
AWS Classification E71T-1

SHIELDING

Flux — Gas Argon/CO2
Composition 75/25
Flow Rate 40 CFH
Gas cup Size 5/8

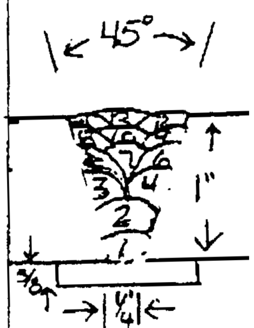
PREHEAT

Preheat Temp., Min —
Interpass Temp., Min — Max —

POSTWELD HEAT TREATMENT

Temp. ____
Time ____

WELDING PROCEDURE

Pass or Weld Layer(s)	Process	Filler Metals: Class	Filler Metals: Diam.	Current: Type & Polarity	Current: Amps or Wire Feed Speed	Volts	Travel Speed	Joint Details
1-13	FCAW	E71T-1	.045	Verticore DC+	250-270 AMPS Variable readout 400 IPM	30.6		

WELDER, WELDING OPRATOR, OR TACK **WELDER QUALIFICATION TEST** RECORD

Name of Welder: Mike Schroder
Name: Precision Welding — Identification No. 004-74-4372
Welding Procedure Specification No.: 1 — Rev.: N/A — Date: Sept. 21, 2000

Variables	Record Actual Values	
Process/Type [Table 4.10. Item (1)]	FCAW	
Electrode (single or multiple) [Table 4.10, Item (8	.045 E71T-1	ALL
Current Polarity	275 ipm DC+	
Position [Table 4.10, Item (6)] (26)	3G	1G, 2G, 3G
Weld Progression [Table 4.10, Item (6)]	UP	UP
Backing (YES or NO) [Table 4.10 Item (7)]	~~YES~~ backing w/or w/out	~~YES~~
Material/Spec.	Group 1 to Group 1	
Base Metal		
Thickness: (Plate)		
Groove	1	UNLIMITED
Filler	N/A	UNLIMITED
Thickness: (Pipe/Tube)		
Groove	N/A	UNLIMITED
Fillet	N/A	UNLIMITED
Diameter :(Pipe)		
Groove	N/A	OVER 24" DIA.
Fillet	N/A	OVER 24" DIA.
Filler Metal [Table 4.10, Item (3)]		
Spec, No.	A5.20	
Class	E71T-1	
F-No. [Table 4.10, Item (2)]	F8	F6
Gas/Flux Type [Table 4.10item (3)]	75%Argon/25% C02	
Other	N/A	N/A

VISUAL. INSPECTION (4.8.1)
Acceptable YES of NO YES

Type	Result	Type	Result
3G SIDE BEND	ACCEPTABLE	3G SIDE BEND	ACCEPTABLE
4G SIDE BEND	N/A	4G SIDE BEND	N/A

Appearance: N/A — Fillet Size: N/A
Fracture Test Root Penetration: N/A — Macroetch: N/A
(Describe the location, nature, and size of any crack or tearing of the specimen.)

Radiograph

RADIOGRAPHIC TEST RESULTS (4.8.2.1)

N/A	N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A

Interpreted by N/A — Test Number N/A
Organization N/A — Date N/A

We, me undersigned, certify that the statements in this record are correct and mat the test welds were prepared, welded, and tested in accordance with the requirements of section 4 of AWS D1.1, (2000) Structural Welding Code — Steel.

Manufacturer or Contractor _____ Authorized By _____
Date _____

?

298/Annex E

WELDING PROCEDURE SPECIFICATION (WPS) Yes ☒
PREQUALIFIED ✓ QUALIFIED BY TESTING ____
or PROCEDURE QUALIFICATION RECORDS (PQR) Yes ☐

Identification # 1
Revision – Date – By –
Authorized by ____ Date ____
Type—Manual ☐ Semi-Automatic ☒
Machine ☐ Automatic ☐

Company Name O/O—— [illegible]
Welding Process(es) FCAW
Supporting PQR No.(s) prequalified

JOINT DESIGN USED
Type:
Single ☒ Double Weld ☐
Backing: Yes ☒ No ☐
Backing Material: ASTM A36
Root Opening 1/4" Root Face Dimension –
Groove Angle: 45° Radius (J–U) –
Back Gouging: Yes ☐ No ☒ Method –

BASE METALS
Material Spec. ASTM A36
Type or Grade –
Thickness: Groove 1 Fillet ____
Diameter (Pipe) ____

FILLER METALS
AWS Specification AWS 5.20
AWS Classification E71T-1

SHIELDING
Flux – Gas Argon/CO_2
Composition 75%-25%
Electrode-Flux (Class) – Flow Rate 35-40 cfh
Gas Cup Size 5/8"

PREHEAT
Preheat Temp., Min –
Interpass Temp., Min – Max –

POSITION
Position of Groove: 3G Fillet: ____
Vertical Progression: Up ☒ Down ☐

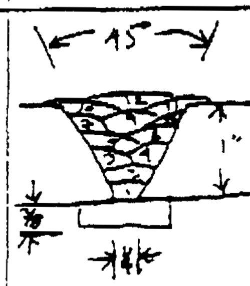
ELECTRICAL CHARACTERISTICS
Transfer Mode (GMAW) Short-Circuiting ☐
Globular ☐ Spray ☒
Current: AC ☐ DCEP ☒ DCEN ☐ Pulsed ☐
Other –
Tungsten Electrode (GTAW)
Size: –
Type: –

TECHNIQUE
Stringer or Weave Bead: STRINGER/WEAVE ROOT
Multi-pass or Single Pass (per side) MULTIPASS
Number of Electrodes ONE
Electrode Spacing Longitudinal –
Lateral –
Angle –

Contact Tube to Work Distance 3/4"
Peening NONE
Interpass Cleaning: hand wire brush, chipping hammer, grinder on spatter

POSTWELD HEAT TREATMENT
Temp. –
Time –

WELDING PROCEDURE

Pass or Weld Layer(s)	Process	Filler Metals Class	Filler Metals Diam.	Current Type & Polarity	Current Amps or Wire Feed Speed	Volts	Travel Speed	Joint Details
1-12	FCAW	E71T-1	.045	MULTICORE DC+	275 ipm	24.5	8 ipm	

Form E-1 (Front)

11

STRUCTURAL STEEL FABRICATORS OF NEW ENGLAND

BY AUTHORITY OF THE BOARD OF DIRECTORS

Precision Welding & Fabricating, Inc.

having been duly elected to membership
is hereby certified as

Member

and entitled to all privileges thereof

Elected September 1989

12

Consultant

President

05 120 Structural Steel
05 120.3 Material Certifications

NUCOR STEEL - BERKELEY
P.O. Box 2259
Mt. Pleasant, S.C. 29465
Phone: (843) 336-6000

CERTIFIED MILL TEST REPORT

Lynch Inv. 8380
Precwire PO 9407

12/04/01 12:30:3

100% MELTED AND MANUFACTURED IN THE USA
All beams produced by Nucor-Berkeley are cast and rolled to a fully killed and fine grain practice

Customer #.: 502 - 1
Customer PO: C10776
S.O.I. #...: 203941
Invoice #..: 276712

SPECIFICATIONS: Tested in accordance with ASTM specification A6/A6M and A370.
AASHTO : M270-36
ASTM : A992-00:/A36-00A/A572-00-50/A709-00-50/A709-01-36/A709-01-50
CSA : G40.21-50W

Description	Heat# Grade(s) Test	Yield/ Tensile Ratio	Yield (PSI) (MPa)	Tensile (PSI) (MPa)	Elong %	C / Cr / Pb	Mo / Ni / Ti	P / Sn / Ca	S / Al / B	Si / V / W	Cu / Nb / Zr	Mn / ------ / Cl	CE1 / CE2 / Pcm
W14x22	2115154	.80	56800	70600	23.31	.0740	.8500	.0066	.0127	.2770	.0670	.0390	.2275
040' 00.00"	A992-00		390	487		.0270	.0000	.0034	.0008	.0001	.0301		.2797
W360X32.9		.80	55200	68700	23.10	.0001	.0012	.0001	.0001	.0061	.0000	2.2486	.1314
012.1920m			381	474		7 Piece(s)							
W14X22	2115158	.80	52300	65500	26.15	.0690	.8660	.0065	.0173	.2180	.1090	.0360	.2282
040' 00.00"	A992-00		361	452		.0250	.0010	.0046	.0006	.0001	.0299		.2705
W360X32.9		.81	57900	71200	24.65	.0001	.0010	.0002	.0001	.0069	.0000	3.0145	.1274
012.1920m			399	491		63 Piece(s)							
W14X22	2115139	.82	58100	70400	24.85	.0790	.8640	.0065	.0123	.1840	.0600	.0270	.2343
045' 00.00"	A992-00		401	487		.0250	.0020	.0032	.0009	.0048	.0292		.2708
W360X32.9		.82	57500	70200	25.40	.0024	.0010	.0001	.0002	.0067	.0000	1.9482	.1342
013.7160m			396	484		21 Piece(s)							
W14x22	2115143	.79	58800	70300	28.36	.0710	.7900	.0077	.0139	.1840	.0630	.0280	.2136
045' 00.00"	A992-00		385	485		.0190	.0000	.0037	.0012	.0006	.0278		.2498
W360X32.9		.82	56000	70700	25.61	.0004	.0012	.0002	.0001	.0055	.0000	2.0267	.1220
013.7160m			400	487		7 Piece(s)							

4 Heat(s) for this MTR.

Elongation based on 8" (20.32cm) gauge length.
Cl = 26.01Cu+3.88Mi+1.20Cr+1.49Si+17.28P-(7.29Cu*Ni)-(9.10Ni*P)-33.39(Cu*Cu)
Pcm = C+(Si/30)+(Mn/20)+(Cu/20)+(Ni/60)+(Cr/20)+(Mo/15)+(V/10)+5B

CE1 = C+(Mn/6)+((Cr+Mo+V)/5)+((Ni+Cu)/15)
CE2 = C+((Mn+Si)/6)+((Cr+Mo+V+Cb)/5)+((Ni+Cu)/15)

I hereby certify that the contents of this report are accurate and correct. All test results and operations performed by the material manufacturer are in compliance with material specifications, and when designated by the Purchaser, most applicable specifications.

Bruce A. Work
Metallurgist

Bruce A Work

(State of South Carolina
(County of Berkeley
Sworn and subscribed before me
4 day of Dec 01

Clara L Davis

Commission Expires October 5, 2004

**END

METALLURGICAL DIVISION - EN TEST CERTIFICATE

C7162

HIGHVELD
STEEL AND VANADIUM CORPORATION LIMITED
Registration No. [illegible]

TELEPHONE
National (013) [illegible]
International 27 13 [illegible]
FAX (013) [illegible]

Page No: 1

Test Certificate No: 5000140057 TO WHOM IT MAY CONCERN Account No: OREP 01 Date: 2000-06-23

Sales Order No: 1024057 44 Customer Order: 4256P LOT 6 Quality: ASTM A572 GRADE 50 TYPE II - 1997; ASTM A992 - 1998

Product: PRIME HOT ROLLED MILD STEEL STRUCTURAL SECTIONS
Dimensions: 16" X 5 1/2" X 26LB/FT
Length: 35' Total Pieces:

Cast No: Z1301 Slab No: 0 Sub Slab No: *
Chem: C 0,104% Si 0,198% S 0,031% P 0,006% Mn 0,854% V 0,015% Ni 0,112% Cr 0,036% Cu 0,049% Al
0,003% N 0,003% Sn 0,002% Mo 0,003% Nb 0,002% W.C.E. 0,268%
Mech: AREA 0,399 SQ IN, ELG 28 %, GL 8 INCH, UTS 80 KSI, YP 62 KSI, YP:UTS RAT 0,774

Cast No: Z1303 Slab No: 0 Sub Slab No: *
Chem: C 0,103% Si 0,195% S 0,030% P 0,008% Mn 0,856% V 0,020% Ni 0,114% Cr 0,052% Cu 0,076% Al
0,008% N 0,003% Sn 0,002% Mo 0,003% Nb 0,002% W.C.E. 0,273%
Mech: AREA 0,404 SQ IN, ELG 26 %, GL 8 INCH, UTS 77 KSI, YP 63 KSI, YP:UTS RAT 0,813

Cast No: Z1305 Slab No: 0 Sub Slab No: *
Chem: C 0,091% Si 0,134% S 0,017% P 0,007% Mn 0,864% V 0,029% Ni 0,113% Cr 0,061% Cu 0,056% Al
0,006% N 0,003% Sn 0,002% Mo 0,003% Nb 0,002% W.C.E. 0,265%
Mech: AREA 0,401 SQ IN, ELG 26 %, GL 8 INCH, UTS 79 KSI, YP 62 KSI, YP:UTS RAT 0,782

Cast No: Z1316 Slab No: 0 Sub Slab No: *
Chem: C 0,106% Si 0,270% S 0,032% P 0,007% Mn 0,841% V 0,026% Ni 0,111% Cr 0,072% Cu 0,062% Al
0,007% N 0,003% Sn 0,003% Mo 0,003% Nb 0,002% W.C.E. 0,278%
Mech: AREA 0,398 SQ IN, ELG 27 %, GL 8 INCH, UTS 75 KSI, YP 56 KSI, YP:UTS RAT 0,745

Cast No: Z1367 Slab No: 0 Sub Slab No: *
Chem: C 0,109% Si 0,229% S 0,039% P 0,007% Mn 0,792% V 0,030% Ni 0,113% Cr 0,051% Cu 0,058% Al
0,004% N 0,004% Sn 0,003% Mo 0,003% Nb 0,002% W.C.E. 0,263%
Mech: AREA 0,435 SQ IN, ELG 26 %, GL 8 INCH, UTS 72 KSI, YP 61 KSI, YP:UTS RAT 0,850

REMARKS GL = GAUGE LENGTH, YP = YIELD POINT, UTS = ULTIMATE TENSILE STRENGTH, ELG = ELONGATION, W.C.E. = WELDABILITY CARBON EQUIVALENT.
MATERIAL TESTED AND SUPPLIED IN THE AS ROLLED CONDITION.
PRODUCED IN THE REPUBLIC OF SOUTH AFRICA
ROLLING TOLERANCE CONFORMS TO ASTM A6 - 1998
TEST CERTIFICATE CONFORMS TO DIN 50049 3.1B/EN 10204 3.1B
WE HEREBY CERTIFY THAT THE MATERIAL HEREIN HAS BEEN TESTED PRIOR TO DESPATCH FROM MILLS.

METALLURGIST

ELECTRONICALLY SIGNED TEST CERTIFICATE AVAILABLE ON REQUEST

2

Stahlwerk Thüringen GmbH
Postfach 27
07331 Unterwellenborn
Germany

INSPECTION CERTIFICATE

ASTM A6 par18.

No. 2809/3

STAHLWERK THÜRINGEN

X

Purchaser

TRADEARBED NEW YORK FOR ACCOUNT OF
TRADEARBED INC., NEW YORK

Advice Na A2003012

Order No. 00ZE1104/02

Customer No. L-783I

Quality A992 TRI

according to ASTM A992/98 - A572 GR50
PER AISC TB3 - ASTM A572/97C GR50-
ASTM A36 FINE GRAIN SILICON KILLED

Lot No.	Heat No.	Dimension	Length	Bars	Weight [t]
013	55042	W 18X6X35	55'	37	32,309

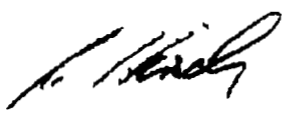
Chemical composition [%]

Heat No.	C	Si	Mn	P	S	N	Al	Nb	V	Nb+V
	Cr	Cu	Ni	Mo	Ti	B	CEV	PCM		
55042	0,09	0.20	1,13	,024	,024	,008		,015	,005	,020

Mechanical properties

Heat No.	Yield stress [PSI]	Tensile strength [PSI]	Elongation 50mm [%]	Impact energy [Joule]
55042/1	52.635	74.530	23,0	
55042/2	56,115	72.500	25,8	

tatertal for galvanigation.



HUTA KATOWICE SA

HUTA KATOWICE SA
41-308 DĄBROWA GÓRNICZA
AL. JÓZEFA PIŁSUDSKIEGO 92
POLAND
tel.: (048-32) 794 53 33
fax: (048-32) 795 52 00
fax: (048-32) 795 53 09
tlx: 0315365

TEST REPORT Duplikat C7781

No 4561/E/2000

QUALITY SYSTEM OF OUR COMPANY WAS BEEN CERTYFIED BY THE TÜV CERT ACC. DIN EN ISO 9002

Exporter :HUTA KATOWICE S.A.
41-308 DĄBROWA GORNICZA,AL.JÓZEFA PIŁSUDSKIEGO 92 POLAND
Importer :DUFERCO S.A.
VIA BAGUTTI 9, LUGANO 6900 SWITZERLAND
Order : NEW HAVEN / K 876 / ONE BLUE STRIP

Contract No. : PL/270545061/97-6262

Manuf.Order No.: 1611264/00
Advice No. : P-15/01929/2
Wagon No. : 315139446979
PKWiU : 27.10.70-13.12
KTWH : 2710701312-DC0030-A0485-3

Product description as per contract:
PRIME HOT ROLLED PROFILES WIDE INCH FLANGE BEAMS.
ACCORDING TO THE CONTRACT NO. PL/270545061/97/6262 ANNEX 10,11.
FOR:QUALITIES ASTM A36/ASTM A572,GR.50-TYPE 2 AND SIZE TOLERANCES ACC.
TO ASTM A6-DUAL CERTIFICATION.

Product description as per standard: 'W' - SHAPES
Dimension : W18"X35 ASTM A6/A6M-96B
Length /m/: 45FT
Steel grade: ASTM A572/M

Quantity Bundles/Pieces		Weight Kg	Heat No.	Chemical composition - % C	Mn	Si	P	S	Cu	Cr	Ni	V	Mo	Mechanical Properties Re [MPa]	Rm [MPa]	A200 [%]
11/	55	89220	010698	0,19	0,77	0,18	0,020	0,022				0,040		395	518	25,0
/			010698											389	514	26,8
1/	6	3566	030449	0,20	0,82	0,22	0,024	0,024				0,050		390	515	24,4
/			030449											399	528	26,8
1/	5	3566	030453	0,18	0,74	0,21	0,018	0,018				0,040		385	494	25,7
/			030453											389	498	24,8
18/	65	46360														

THIS IS TO CERTIFY, THAT THE A.M. PRODUCTS HAVE BEEN MANUFACTURED AND TESTED IN ACCORDANCE WITH THE INDICATED SPECIFICATIONS AND COMPLY WITH THEIR REQUIREMENTS

Certificate Section Prepared by: [illegible] Checked by : [illegible]
HEAD OF ATTESTATION DIVISION
Jan KOEST M.Sc. Eng.

DĄBROWA GÓRNICZA 15-06-2000

DELEGATED BY THE HUTA KATOWICE SA BOARD
- 94 -
Quality Control Manager
Jerzy MUSKA M. Sc. Eng.

4

Salim C8393

TEST CERTIFICATE

P.O.#/Ref.# : 305/2974

Trading Co. : SALZGITTER INTERNATIONAL GMBH

Customer :

Commodity : Hot Rolled Wide Flange Beam

Spec.: ASTM A992-98 / A572GR50-97 / A36-97 / A6-99

KIEI YI INDUSTRIAL CO., LTD.

ADDRESS: NO. 100 LUNG CHANG ROAD, LI SHUI TILLAGE, LUNG CHING TOWN, TAICHUNG HSIEN, TAIWAN 434 ROC

TEL No.: 886-4-6300088 FAX No.: 886-4-6300086

Certificate No.: 200008186061

Issue Date: 2000/08/18

Lot No.	Dimensions	Heat No.	Length (ft)	Qty pc.	Weight (lbs)	C (x100)	Si (x100)	Mn (x100)	P (x1000)	S (x1000)	Cu (x100)	Sn (x100)	Ni (x100)	Cr (x100)	Mo (x100)	V (x1000)	Nb (x1000)	Al (x1000)	N (ppm)	Ceq (x100)
22631	W18"X35	65115	35	1	1225	16	23	82	26	20	23	1·6	8	13	1	22	11	0	75	34·8
22637	W18"X35	65096	40	1	1400	17	20	84	23	18	19	1	7	19	1	23	12	0	80	35·4
22631	W18"X35	65477	40	1	1400	16	21	80	26	18	15	1·1	8	19	1	20	9	0	105	33·5
22637	W18"X35	65114	40	1	1400	16	24	85	21	17	23	1·1	8	21	1	22	11	1	80	34·5
22617	W18"X35	65085	50	1	1750	17	21	80	21	15	19	1·2	7	19	1	21	08	0	102	30·3
22637	W18"X35	65473	55	1	1925	18	24	83	20	21	23	1·8	8	23	1	22	13	0	59	36·1
22637	W18"X35	65083	55	1	1925	17	21	82	20	24	21	1	8	21	1	23	12	0	130	36·9
22637	W18"X35	65083	60	1	2100	17	21	82	20	24	20	1	0	21	1	23	12	0	130	30·9
22631	W18"X35	65077	60	2	4202	16	23	84	14	27	21	1·5	8	21	1	21	11	0	129	34·2
22636	W18"X35	65075	30	14	14692	16	23	81	18	15	23	1·6	8	23	2	21	10	0	99	34·2

Lot No.	Y.S. (Ksi)	T.S. (Ksi)	E.L. (%)	Y.R. (%)	Visual & Dimension	Remarks
22631	61·8 / 61·5	76·4 / 76·2	25·7 / 25·1	81·0 / 80·6	G	
22637	64·5 / 60·0	75·2 / 76·0	26·0 / 25·2	81·5 / 81·1	G	
22631	62·9 / 62·6	76·1 / 75·5	25·6 / 24·7	82·7 / 82·9	G	
22637	59·9 / 59·5	74·0 / 74·5	28·8 / 27·8	80·2 / 79·9	G	
22617	59·5 / 59·7	76·4 / 76·7	23·9 / 23·6	77·8 / 77·8	G	
22637	60·8 / 61·1	74·9 / 74·5	26·2 / 25·9	81·1 / 80·8	G	
22637	63·8 / 63·6	77·0 / 77·6	24·3 / 25·1	82·1 / 81·9	G	
22637	63·0 / 63·6	77·0 / 77·6	26·3 / 25·1	82·1 / 81·9	G	
22631	64·5 / 61·0	77·3 / 76·7	24·7 / 25·0	79·6 / 79·5	G	
22636	61·4 / 60·7	75·8 / 75·5	25·7 / 25·4	80·5 / 80·4	G	

Note: Ceq = C + Mn/6 + (Cr + Mo + V)/5 + (Ni + Cu)/15 Y.R.: Yield Ratio G: Good

SURVEYOR TO

WE HEREBY CERTIFY THAT MATERIAL DESCRIBED HEREIN HAS BEEN MANUFACTURED AND TESTED WITH SATISFACTORY RESULTS IN ACCORDANCE WITH THE REQUIREMENT OF THE ABOVE MATERIAL SPECIFICATION, CONFIRM THAT ALL OUR PRODUCTS ARE MADE WITH MATERIALS WHICH ARE FREE OF RADIOACTIVE CONTAMINATION, AND CERTIFY THAT THE PALLETS, DUNNAGE OR OTHER SOLID WOOD PACKING MATERIAL ARE TOTALLY FREE FROM BARK AND APPARENTLY FREE FROM LIVE PLANT PEST.

CHIEF OF INSPECTION

5

LTV COPPERWELD
TUBULAR PRODUCTS

LTV COPPERWELD
1855 E. 122nd Street
CHICAGO, IL 60633
(773) 646-4606

TEST REPORT

Customer Order No. B10152
Internal Order No. 511898
Invoice No. 19010661
Date 08/29/01

Customer:	Specification: TR1246x33 12 IN, 6 IN, 3/8 33 Ft ASTM A500 GRB 99

CHEMICAL ANALYSIS, %

HEAT NO.		C	Mn	P	S	SI	AL	CE	V	CU	NI	CR
D20937*	C.E. .38	.22	.80	.012	.009	.02	.053	.001	.00	.016	.010	.020
E24644*	C.E. .33	.20	.73	.017	.007	.01	.042	.001	.00	.010	.010	.040
T33866*	C.E. .a5	.22	.74	.017	.007	03	.043	.001	.00	.010	.010	.040

MECHANICAL PROPERTIES

HEAT NO.	LAB NO.	YIELD STRENGTH PSI	TENSILE STRENGTH PSI	ELONGATION %	HARDNESS Rb
D20937	765A	61200	77200	38	
E24644	624B	54000	71100	38	
T33866	625B	52800	76400	36	

YIELD STRENGTH IS 0.2% OFFSET - ELONGATION IN 2 INCHES

Other Tests
* MELTED & MANUFACTURED IN THE U.S.A. (D)

LTV Copperweld certifies that the material purchased on this order meets all chemical and physical requirements in accordance with the latest applicable ASTM standards.

BLAINE REDE, QUALITY ASSURANCE MANAGER

6

Atlas TUBE

[redacted]

Mat.B/L:20084589
Date:12.18.2000
Customer:81

Sold to

Shipped to

Material. 10.0x10.0x375x50'0"0(2x2)

Material No.	Heat	C	Mn	P	S	Si	Al	Cu	Cb	Mo	Ni
100100375	2A7841	0.05	0.37	0.008	0.006	0.178	0.044				

P.order	S.Order	Bundle No	Yield	Tensile	Eln.2in	Rb	Certification
88360	65279	M200005882	060651 Psi	072300 Psi	34.4 %	83	ASTM A500 GR.B & C

Material Notes:
Sales Or.Notes:

Material. 10.0x10.0x375x30'0"0(2x2)

Material No.	Heat	C	Mn	P	S	Si	Al	Cu	Cb	Mo	Ni
100100375	2A7841	0.05	0.37	0.008	0.006	0.178	0.044				

P.order	S.Order	Bundle No	Yield	Tensile	Eln.2in	Rb	Certification
88360	65279	M20000588?	060651 Psi	072300 Psi	34.4 %	83	ASTM A500 GR.B & C

Material Notes:
Sales Or.Notes:

Material. 10.0x10.0x375x30'0"0(2x2)

Material No.	Heat	C	Mn	P	S	Si	Al	Cu	Cb	Mo	Ni
100100375	2A7841	0.05	0.37	0.008	0.006	0.178	0.044				

P.order	S.Order	Bundle No	Yield	Tensile	Eln.2in	Rb	Certification
88360	65279	M200005889	060651 Psi	072300 Psi	34.4 %	83	ASTM A500 GR.B & C

Material Notes:
Sales Or.Notes:

Material. 10.0x10.0x375x30'0"0(2x2).

Material No.	Heat	C	Mn	P	S	Si	Al	Cu	Cb	Mo	Ni
100100375	8234P	0.16	0.74	0.008	0.007	0.020	0.040				

P.order	S.Order	Bundle No	Yield	Tensile	Eln.2in	Rb	Certification
88360	65279	M200003158	060329 Psi	065621 Psi	34.4 %	78	ASTM A500 GR.B & C

Material Notes:
Sales Or.Notes:

Material. 6.0x3.0x312x40'0"0(3x4).

Material No.	Heat	C	Mn	P	S	Si	Al	Cu	Cb	Mo	Ni
600605134003	251865	0.170	0.680	0.012	0.017	0.710	0.400	0.040			

P.order	S.Order	Bundle No	Yield	Tensile	Eln.2in	Rb	Certification
88239	65342	M100001585	70632 Psi	72860 Psi	25 %	84	ASTM A500 GR.B & C

Material Notes:
Sales Or.Notes:

Authorized by Quality Assurance: ______________

200 CLARK ST., P.O. BOX 970, HARROW, ONTARIO N0R 1G0
HARROW - (519) 738-3541 FAX - (519) 738-3537
Website: www.atlastube.com

7

Atlas Tube Inc.

200 Clark Street, Harrow, Ontario, Canada N0R 1G0
Tel. (519) 738-5000 Fax (519) 738-5004

[redacted]

Ref.B/L:50075306
Date:08.11.2001
Customer:81

Shipped to

Material. TR944 X 45	8.0x4.0x250x45'0"0(2x3).											
Material No. R093845	Heat		C	Mn	P	S	Si	Al	Cu	Cb	Mo	Ni
50040250	458066		0.19	0.800	0.010	0.009	0.007	0.038	0.007	0.005	0.009	0.008
P.order	S.Order	Bundle No	Yield		Tensile		Elo.2in		Rb	Certification		
C10884	80221	M100084766	059387 Psi		071385 Psi		25.4 %			ASTM A500 GR.B & C		
Material Note:												
Sales Or.Note:												

Material. TR946 X 50	8.0x4.0x375x50'0"0(2x1).											
Material No. R043844	Heat		C	Mn	P	S	Si	Al	Cu	Cb	Mo	Ni
50040375	54400		0.17	0.78	0.027	0.009	0.037	0.032				
P.order	S.Order	Bundle No	Yield		Tensile		Elo.2in		Rb	Certification		
C10884	80221	M100084873	060482 Psi		071807 Psi		24.8 %			ASTM A500 GR.B & C		
Material Note:												
Sales Or.Note:												

Material.	8.0x4.0x375x50'0"0(2x2).											
Material No.	Heat		C	Mn	P	S	Si	Al	Cu	Cb	Mo	Ni
50040375	54400		0.17	0.78	0.027	0.009	0.037	0.032				
P.order	S.Order	Bundle No	Yield		Tensile		Elo.2in		Rb	Certification		
C10884	80221	M100084872	060482 Psi		071807 Psi		24.8 %			ASTM A500 GR.B & C		
Material Note:												
Sales Or.Note:												

Material. TR946 X 35	8.0x4.0x375x35'0"0(2x2).											
Material No. R043843	Heat		C	Mn	P	S	Si	Al	Cu	Cb	Mo	Ni
50040375	003D5257		0.145	0.78	0.018	0.015	0.023	0.053				
P.order	S.Order	Bundle No	Yield		Tensile		Elo.2in		Rb	Certification		
C10884	80221	M100084859	060750 Psi		071044 Psi		28.4 %			ASTM A500 GR.B & C		
Material Note:												
Sales Or.Note:												

Material. TR944 X 40	8.0x4.0x250x40'0"0(2x4).											
Material No. R043841	Heat		C	Mn	P	S	Si	Al	Cu	Cb	Mo	Ni
500402504000	V98310		0.19	0.77	0.012	0.009	0.012	0.080				
P.order	S.Order	Bundle No	Yield		Tensile		Elo.2in		Rb	Certification		
C10884	80221	M100084798	058565 Psi		081456 Psi		23.0 %			ASTM A500 GR.B & C		
Material Note:												
Sales Or.Note:												

Steve Stevenson
Shipping Clerk

Authorized by Quality Assurance: ____________

Steel Tube Institute of North America

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Atlas Tube Inc.

800 Clark Street, Harrow, Ontario, Canada N0R 1G0
Tel. (519) 738-5000 Fax (519) 738-5006

Material Test Report

Ref.B/L:80084183
Date:10.15.2001
Customer:81

Shipped to

7284 6 x 50

Material.	8.0x4.0x375x50'0"0(2x2).				Material No.	80040375				
Heat	C	Mn	P	S	Si	Al	Cu	Cb	Mo	Ni
724918	0.190	0.800	0.010	0.004	0.040	0.034	0.019	0.006	0.002	0.011
P.order		S.Order	Bundle No	Yield	Tensile	El.2in	Certification			
C10837 RAIL		84318	M100081718	067102 Psi	076734 Psi	28.7 %	ASTM A500 GR.B & C			

Material Note:
Sales Or.Note:

7284 8 x 50

Material.	8.0x6.0x500x50'0"0(2x1).				Material No.	80040500				
Heat	C	Mn	P	S	Si	Al	Cu	Cb	Mo	Ni
00282847	0.158	0.880	0.020	0.020	0.018	0.041	0.000	0.000	0.000	0.000
P.order		S.Order	Bundle No	Yield	Tensile	El.2in	Certification			
C10837 RAIL		84318	M100081701	061397 Psi	085000 Psi	28.3 %	ASTM A500 GR.B & C			

Material Note:
Sales Or.Note:

7084 x 50

Material.	8.0x8.0x250x50'0"0(2x2).				Material No.	80080250				
Heat	C	Mn	P	S	Si	Al	Cu	Cb	Mo	Ni
887483	0.018	0.790	0.013	0.008	0.011	0.044	0.000	0.000	0.000	0.000
P.order		S.Order	Bundle No	Yield	Tensile	El.2in	Certification			
C10837 RAIL		84318	M200056566	064606 Psi	078031 Psi	24.8 %	ASTM A500 GR.B & C			

Material Note:
Sales Or.Note:

7086 x 35

Material.	8.0x8.0x375x35'0"0(2x2).				Material No.	80080375				
Heat	C	Mn	P	S	Si	Al	Cu	Cb	Mo	Ni
724789	0.180	0.800	0.012	0.008	0.050	0.040	0.000	0.000	0.000	0.000
P.order		S.Order	Bundle No	Yield	Tensile	El.2in	Certification			
C10837 RAIL		84318	M200056474	068134 Psi	081185 Psi	23.5 %	ASTM A500 GR.B & C			

Material Note:
Sales Or.Note:

7086 x 45

Material.	8.0x8.0x375x45'0"0(2x2).				Material No.	80080375				
Heat	C	Mn	P	S	Si	Al	Cu	Cb	Mo	Ni
887812	0.180	0.820	0.011	0.005	0.050	0.041	0.000	0.000	0.000	0.000
P.order		S.Order	Bundle No	Yield	Tensile	El.2in	Certification			
C10837 RAIL		84318	M200056477	058852 Psi	072891 Psi	28.0 %	ASTM A500 GR.B & C			

Material Note:
Sales Or.Note:

Authorized by Quality Assurance: ____________

Steel Tube Institute — Steel Service Center Institute — Standards Council of Canada / Conseil canadien des normes

Form AT 001 Rev 0 (MAR 01)

9

NOVA TUBE AND STEEL CORPORATION
600 Dean Sievers Place
Morrisville, PA, 19067
Tel: 215-295-8813 Fax: 215-295-8798

TEST CERTIFICATE

Sold to:
Ship to:

DATE SHIPPED: 04/04/01
B/L #: 100519
P.O. #:C9941
SALES ORDER #: 100390

Description	Dimensions	Pcs	Mill/Heat Number	Specifications
HSS Square Tubing	4x4x0.250x600 7044 x 50	32	/412K5901	N/A R039106
HSS Square Tubing	4x4x0.375x420 7044 x 35	12	/412K3651	N/A R039107
HSS Square Tubing	4x4x0.375x480 x 40	8	/412K3651	N/A R039108
HSS Square Tubing	4x4x0.375x540 x 45	8	BETH/412J8942	N/A R039109
HSS Square Tubing	4x4x0.375x600 x 50	8	BETH/412J9051	N/A R039110

Chemical Analysis

Heat Number	C	Mn	P	S	Si	Cu	Ni	Cr	Nb	Mo	V	Al	N	Sn	B	Ti
412K5901	0.230	0.780	0.014	0.014	0.011	0.040	0.030	0.030	-	0.001	0.002	0.054	0.001	-	-	-
412K3651	0.230	0.800	0.022	0.015	-	-	-	-	-	-	-	-	-	-	-	-
BETH/412J8942	0.200	0.760	0.009	0.018	0.016	0.020	0.020	0.020	-	0.003	0.001	0.057	0.001	-	-	-
BETH/412J9051	0.230	0.740	0.010	0.017	0.012	0.020	0.030	0.030	-	0.001	0.001	0.060	0.003	-	-	-

APR 4, 2001 10:11:24

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NOVA TUBE AND STEEL CORPORATION
600 Dean Sievers Place
Morrisville, PA, 19067
Tel: 215-295-8813 Fax: 215-295-8798

T E S T C E R T I F I C A T E

Sold to:
Ship to:

DATE SHIPPED: 08/30/01
B/L #: 102121
P.O. #:C10872
SALES ORDER #: 101381

Description	Dimensions	Pcs	Mill/Heat Number	Specifications
Hot Roll Rectangular Tub	6x2x0.250x288 7624 x 24	15	HETH/411K5251	ASTM A500 Grade C
Cold Square Tubing	4x4x0.313x480 7045 x 40	8	HETH/422K5511	ASTM A500 Grade C
Cold Square Tubing	4x4x0.375x600 7046 x 50	24	HETH/422K3312	ASTM A500 Grade C

Chemical Analysis

Heat Number	C	Mn	P	S	Si	Cu	Ni	Cr	Cb	Mo	V	Al	N	Sn	B	Ti
HETH/411K5251	0.220	0.790	0.016	0.015	0.007	0.030	0.030	0.030		0.001	0.001	0.050	0.004	-	-	-
7044757	Melted & Manufactured in U.S.A.															
HETH/422K3312	0.210	0.730	0.012	0.012	0.015	0.040	0.020	0.030	-	0.001	0.001	0.060	0.003	-	-	-
2044758	Melted & Manufactured in U.S.A.															

Mechanical Test Results

Heat Number/Size	Yield Strength	Tensile Strength	Elong.%	Hardness
HETH/411K5251 6x2x0.250	61,000	69,000	26.00	
HETH/422K5511 4x4x0.313	57,500	64,500	32.00	
HETH/422K3312 4x4x0.375	59,500	70,000	29.00	

G 30, 2001 12:48:19

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PRODUCT 91

ALIGN TYPE DIRECTLY ON THIS LINE ______ WHEN USING A TYPEWRITER SET TAB STOPS AS SHOWN ON THIS STUB Fold at (>) to fit 771 DUO-VUE Envelope

PRECISION WELDING & FABRICATION, INC.
690 Stroudwater Street P.O. Box 880
WESTBROOK, MAINE 04098-0880

(207) 854-9330
FAX (207) 854-9694

PURCHASE ORDER

Show this Purchase Order Number on all correspondence, invoices, shipping papers and packages.

9467

TO K-C Tech
Texas

DATE	REQUISITION NO.
1-22-02	1973 AWS

SHIP TO

>							
112		3/4ϕ A325 T.C x 1 3/4"					
105		" " x 2 1/2"					
105		x 2 3/4"					
132		x 2"					
31		3/4ϕ expansion x 0-5"					

1. Please send ______ copies of your invoice.
2. Order is to be entered in accordance with prices, delivery and specifications shown above.
3. Notify us immediately if you are unable to ship as specified.

To Reorder: 800-225-6380 or nebs.com

AUTHORIZED BY

4522

TO: Becker Structural ENG.
ATTN: Ethan Price
From: Sol

5-2-02 **12**

Abstract of ASTM A325 1985

HIGH-STRENGTH BOLTS FOR STRUCTURAL STEEL JOINTS

STRUCTURAL BOLTING

IFI Notes:

1. *ASTM A325 is a specification developed through the procedures of ASTM. A325 is under the jurisdiction of ASTM Committee F-16 on Fasteners.*
2. *This abstract presents the chemical and mechanical requirements of various types of carbon and alloy steel bolts commonly known as "A325 high strength structural bolts." It omits those requirements dealing with quality assurance and inspection, and a listing of applicable documents. For the omitted information, refer to the complete A325.*
3. *The paragraph numbers throughout this abstract are those of the complete A325 - 85.*
4. *For a discussion of high-strength structural bolting, refer to page E-7.*

1. Scope.

1.1 This specification covers the chemical and mechanical requirements of various types of quenched and tempered Steel bolts commonly known as "high-strength structural bolts," intended for use in structural joints that are covered under requirements of the Specifications for Structural Joints Using ASTM A325 or A490 Bolts, issued by the Research Council on Structural Connections of the Engineering Foundation. Types of bolts covered in this specification are:

1.1.1 *Type 1* — Bolts made of medium-carbon steel, supplied in sizes ½ to 1½ in., inclusive, in diameter.

1.1.2 *Type 2* — Bolts made from what is generally described as low-carbon martensite steel, supplied in sizes ½ to 1½ in. inclusive, in diameter.

1.1.3 *Type 3* — Bolts. ½ to 1½ in., inclusive in diameter having atmospheric corrosion resistance and weathering characteristics comparable to that of the steels covered in ASTM A242, A588/A588M, and A709 (these steels have atmospheric corrosion resistance approximately two times that of carbon structural steel, with copper).

1.2 When the bolt *type* is not specified, either Type 1 or Type 2 may be supplied at the option of the manufacturer Type 3 bolts may be supplied by the manufacturer if agreed by the purchaser. Where elevated temperature applications are involved, Type 1 bolts shall be specified by the purchaser on the order.

1.3 When atmospheric corrosion resistance is required, Type 3 bolts shall be specified by the purchaser in any inquiry or order.

1.4 This specification provides that heavy hex structural bolts shall be furnished unless other dimensional requirements are stipulated in the purchase inquiry and order (see S.1).

1.6 When zinc-coated high-strength structural bolts are specified, the bolts shall be either Type 1 or 2, at the manufacturer's option, unless otherwise ordered by the purchaser. Zinc-coated bolts and nuts shall be shipped in the same container.

1.6 Unless otherwise specified, all nuts used on these bolts shall conform to the requirements of ASTM A194/A194M, page B-115, or A563, page B-108, shall be heavy hex, end shall be of the class and surface finish for each type of bolt as follows:

Bolt Type and Finish	Nut Class and Finish
1 and 2, plain (noncoated)	A563 - C, C3, D, DH, DH3, plain
	A194 - 2, 2H plain
1 and 2, galvanized	A563 - DH galvanized A194 - 2H, galvanized
3, plain	A563 - C3, DH3, plain

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[redacted]TRUCTURAL BOLTING

HIGH-STRENGTH BOLTS FOR STRUCTURAL STEEL JOINTS

Abstract of ASTM A325 1985

Table 3 Hardness Requirements for Bolts

Bolt Size, in.	Hardness Number			
	Brinell		Rockwell C	
	min	max	min	max
½ to 1, incl.	248	331	24	35
1⅛ to 1½, incl.	223	293	19	31

4.5 If heat treatment is performed by a subcontractor the heat-treated material shall be returned to the manufacturer for testing.

4.6 If zinc coating is performed by a subcontractor, all bolts shall be returned to the manufacturer for sampling and testing in accordance with 92.8 (and with 6.6 if Type 2).

5. Chemical Composition.

5.1 Type 1 and 2 bolts shall conform to the requirements as to chemical composition prescribed in Table 1.

5.2 Type 3 bolts shall conform to one of the chemical compositions prescribed in Table 2. the selection of the chemical composition, A, B, C, D, E, or F, shall be at the option of the bolt manufacturer.

6.3 Product analyses may be made by the purchaser from finished material representing each lot of bolts. The chemical composition thus determined shall *conform to* the requirements prescribed in 5.1 or 5.2.

5.4. Application of heats of steel to which bismuth, selenium, tellurium or lead has been intentionally added shall not be permitted for bolts.

Table 4 Tensile Requirements for Full Size Bolts

Bolt Size, Threads per Inch and Series Designation	Stress Area,[A] in.²	Tensile Strength,[B] min, lbf	Proof Load,[B] Length Measurement Method	Alternative Proof Load,[B] Yield Strength Method, min
Column 1	Column 2	Column 3	Column 4	Column 5
½-13 UNC	0.142	17,050	12,050	13,050
⅝-11 UNC	0.226	27,100	19,200	20,800
¾-10 UNC	0.334	40,100	28,400	30,700
⅞-9 UNC	0.462	55,450	39,250	42,500
1-8 UNC	0.606	72,700	51,500	55,750
1⅛-7 UNC	0.763	90,100	56,450	61,800
1⅛-8 UN	0.790	82,950	58,450	64,000
1¼-7 UNC	0.969	101,700	71,700	78,500
1¼-8 UN	1.000	105,000	74,000	81,000
1⅜-6 UNC	1.155	121,300	85,450	93,550
1⅜-8 UN	1.233	129,500	91,250	99,870
1½-6 UNC	1.405	147,500	104,000	113,800
1½-8 UN	1.492	156,700	110,400	120,850

[A] The stress area is calculated as follows:

$$A_s = 0.7854\,[D - (0.9743/n)]^2$$

where:

A_s = stress area, in.²,
D = nominal bolt size, and
n = threads per inch.

[B] Loads tabulated are based on the following:

Bolt Size, in.	Column 3	Column 4	Column 5
½ to 1, incl.	120,000 psi	85,000 psi	92,000 psi
1⅛ to 1½, incl.	105,000 psi	74,000 psi	81,000 psi

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TRUCTURAL BOLTING

COMMENTARY ON HIGH STRENGTH STRUCTURAL BOLTING

IFI

Table 4 High Strength Structural Bolts

Item No.	Designation	Material Description	Surface Finish	Head Identification Marking
1	A325, Type 1	Medium carbon steel, quenched and tempered	plain	A325
2	A325, Type 2	Low carbon martensite steel, quenched and tempered	plain	A325
3	A325, Type 3	Weathering steel, quenched and tempered	plain	A325
4	A325, Type 1	Medium carbon steel, quenched and tempered	galvanized	A325
5	A325, Type 2	Low carbon martensite steel, quenched and tempered	galvanized	A325
6	A490, Type 1	Alloy steel, quenched and tempered	plain	A490
7	A490, Type 2	Low carbon martensitic steel, quenched and tempered	plain	A490
8	A490, Type 3	Weathering steel, quenched and tempered	plain	A490
See Note 1	3		2, 3	4

Notes:

1. Each Item No. is a combination of a material (specification number and steel type) and a surface finish.
2. "Galvanized" includes zinc coating by either the hot-dip or mechanical deposition method.
3. In the interests of potential economies to the purchaser, ASTM A325 and A490 provide for certain substitutions of bolt types and plating methods as follows:
   a) The purchaser retains the right to specify the material type and galvanizing process.
   b) For A325 plain bolts, if the purchaser does not specify the material type, the supplier, at his option, may furnish either Type 1 or Type 2; and further, if the purchaser agrees, the supplier may furnish Type 3.
   c) For A325 galvanized bolts, if the purchaser does not specify the material type, the supplier, at his option, may furnish either Type 1 or Type 2.
   d) For A325 galvanized bolts, if the purchaser does not specify the plating or coating method, the supplier, at his option, may supply hot-dip galvanized bolts or bolts with mechanically deposited zinc coatings.
   e) For A490 bolts, if the purchaser does not specify the material type, the supplier, at his option, may furnish Type 1, Type 2 or Type 3.
4. In addition to the identification markings shown in the table, all bolts must be marked with the manufacturer's symbol.

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IF1

COMMENTARY ON HIGH STRENGTH STRUCTURAL BOLTING

STRUCTURAL BOLTING

Table 5 Nuts for High Strength Structural Bolts

Item No.	Designation	Material Description	Nut Identification Marking
A	A563, Grade C	Carbon steel, may be heat treated	○
B	A563, Grade C3	Weathering steel, may be heat treated	○3
C	A563, Grade D	Carbon steel, may be heat treated	D
D, DG	A563, Grade DH	Carbon steel, quenched and tempered	DH
E	A563, Grade DH3	Weathering steel, quenched and tempered	DH3
F	A194/A194M, Grade 2	Carbon steel	2
G, GG	A194/A194M, Grade 2H	Carbon steel, quenched and tempered	2H
See Note 1	2		3

Notes:

1. Single letter item Nos. are grades of nuts furnished plain, i.e. non-plated or non-coated. Item Nos. suffixed with the letter "G" are the same grade of nut but furnished overtapped and either hot-dip galvanized or with a mechanically deposited zinc coating.
2. In the interests of potential economies to the purchaser, ASTM permits the supplier to furnish a stronger grade of nut as a substitute for the grade ordered providing the purchaser is notified and agrees with the substitution. ASTM A563 also permits the substitution of A194/A194M Grade 2 nuts for A563 Grades C or D nuts, and A194/A194M Grade 2H nuts for A563 Grades C, D, or DH nuts.
3. In addition to the identification markings shown in the table, all nuts must be marked with the manufacturer's symbol.

medium carbon steel (e.g. AISI 1035 or 1038), low carbon martensite steel (e.g. AISI 10B18 or 10B21), and atmospheric corrosion resistant steel, commonly known as "weathering" steel.

ASTM A490, page *E-18,* also recognizes 3 types of steel — carbon alloy steel (e.g. AISI 4037, 4140 and 8635), low carbon martensite steel (for sizes 1 in. and smaller only), and atmospheric corrosion resistant steel.

For fuller information on these various steel types, refer to page B-9.

Table 4 details the material types and surface finishes recognized in each specification. Footnotes explain the purchaser/supplier options with respect to material choice and plating methods.

B. Nuts.

Nuts for A325 and A490 bolts are heavy hex nuts with dimensions as given in ANSI/ASME 018.22, page D-14.

ASTM A563, page B-108, covers the various strength grades of carbon steel nuts. Five of its grades — C, C3, D, DH, and DH3 — are suited for use with A325 and/or A490 bolts. ASTM A194/A194M, page B-115, covers several grades of carbon and alloy steel nuts. Two of its grades — 2 and 2H — are frequently used with high strength structural bolts.

Table 5 details the various nut strength grades and explains, in footnotes, permissible substitutions

C. Washers.

Hardened flat circular washers and beveled washers are covered in ASTM F436, page L-23.

The Research Council in its assembly specification specifies these rules regarding use of hardened washers —

1) When using A325 bolts, washers are not required if a) the holes in the outer plies are of standard size, b) fasteners are to be tightened using the turn-of-nut method, and c) neither outer face of the connected parts has a slope greater than 16

COMMENTARY ON HIGH STRENGTH STRUCTURAL BOLTING

1:20 with *respect* to a plane normal to the boll axis

2) A325 bolts tightened by techniques other than the turn-of-nut method shall have a hardened washer under the bolt Aead or nut whichever is the element turned 1 tightening.

3) When using A490 bolts, a hardened washer must be used under the element turned in tightening. Additionally, a hardened washer must be used under the non-turned element if the material against which it bears has a specified minimum yield strength less than 40 ksi

4) Hardened washers of standard thickness shall be installed over oversize and short slotted hales in outer plies of the connected material. Hardened washers of special thickness (5/16 in. min) shall be installed over long slotted holes and also over oversize and short slotted holes when using A490 bolts of sizes 1-1/8 in and larger.

5) A hardened beveled washer shall be used *to* compensate for lack of parallelism when an outer face has a slope greater than 1:20 with respect to a plane normal to the bolt axis.

D. Platings.

When corrosion resistant protection for A325 bolts and nuts is needed, the fasteners are normally either hot-dip galvanized (ASTM A153, page B-165) or provided with a mechanically deposited zinc coating (ASTM B695, page B-168). Rarely are A325 bolts electroplated or coated by chemical conversion methods.

ASTM A325 permits the plating of bolts made of either Type 1 or Type 2 steels. Type 3 steels, because of their "built in" corrosion protection, are supplied bare without any need for additive finishes. Suitable nuts for zinc coated *A325* bolts are ASTM *A563* Grade DH or A194/ A194M Grade 2H.

The Research Council on Structural Connections, supported by ASTM Committee F-16, strongly advises against galvanizing or *zinc* coating A490 bolts. The reason is their higher strength (and higher hardness) gives them an unacceptability high risk of embrittlement and the possibility of failure In service by stress corrosion. (Refer to page 8-35 for a fuller discussion.) ASTM A490 prohibits the plating of bolts. When corrosion protection is needed. A490 Type 3 bolts should be considered.

The performance of hot-dip galvanized fasteners versus those with mechanically deposited zinc coatings has been under close examination for well over 25 years. Research has satisfactorily demonstrated an equivalency of corrosion protection of fasteners having an eqcal thickness of zinc coating. Substituting one for the other should not affect the ultimate survivability of a fastener in a corrosive atmosphere. However, it Is well recognized that other concerns may influence a purchaser areference Consequently, ASTM *A325* carefully preserves the purchaser's right to specify which *of* the two deposition methods must be used. In the absence of purchaser instructions, the option reverts to the supplier. In such case:;, competitive economics usually dictate the decision.

Plating increases the size (maximum material condition) of both externally and internally threaded fasteners. Standard zinc: coatings deposited by either the hot-dip process or by mechanical deposition have an average thickness of about 0.002 *in.* Consequently, without some adjustment of thread *size* mating fasteners would not assemble.

High strength structural bolt and nut plating practice is to plate standard bolts (having threads within Class 2A tolerances before plating) and to provide *the* needed assemble-ability by increasing the thread diameters of the internal thread by overtapping the nut. me diametral amounts that nuts are tapped oversize are specified in ASTM A563. Normal practice Is *to* tap hot-dip galvanized nuts following galvanizing and to tap mechanically deposited zinc coated nuts prior to coating. This means that the threads of galvanized nuts are bare, but tnis doesn't diminish corrosion protection because or the sacrificially supporting plating on the bolt threads, coupled with the sealing effect of *nigh* bolt preload.

For fuller information refer to page A-10 and B-44.

E. Bolt/Nut Combinations.

Table *6* details the various bolt/nut combinations permitted by ASTM Specifications A325, A490 and A563. The recommended combination

17

IFI

COMMENTARY ON HIGH STRENGTH STRUCTURAL BOLTING

STRUCTURAL BOLTING

Table 6 High Strength Structural Bolt/Nut Combinations

Recommended Combinations				Alternative Combinations Item Nos
Item Nos.	Description			
	Bolt	Nut	Finish	
1-A	A325, Type 1	A563, Grade C	Plain	1-B, 1-C, 1-D, 1-E, 1-F, 1-G 2-A, 2-B, 2-C, 2-D, 2-E, 2-F, 2-G 3-A, 3-B, 3-C, 3-D, 3-E, 3-F, 3-G
2-A	A325, Type 2	A563, Grade C	Plain	2-B, 2-C, 2-D, 2-E, 2-F, 2-G 1-A, 1-B, 1-C, 1-D 1-E, 1-F, 1-G 3 A, 3-B, 3-C, 3-D, 3-E, 3-F, 3-G
3-B	A325, Type 3	A563, Grade C3	Plain	3-E
4-DG	A325, Type 1	A563, Grade DH	Galvanized	4-GG, 5-DG, 5-GG
5-DG	A325, Type 2	A563, Grade DH	Galvanized	5-GG, 4-DG, 4-GG
6-D	A490, Type 1	A563, Grade DH	Plain	6-E, 6-G, 7-D, 7-E, 7-G, 8-D, 8-E, 8 G
7-D	A490, Type 2	A563, Grade DH	Plain	7-E, 7-G, 6-D, 6-E, 6-G, 8-D, 8-E, 8-G
8-E	A490, Type 3	A563, Grade DH3	Plain	None

Note: Item No. numerals identify bolt types described in Table 4 and Item No. letters identify nut grades described in Table 5.

is a "first choice;" the alternate combinations are those permitted by the ASTM Specifications when purchaser/supplier options are exercised (refer to footnotes of Tables 4 and 5). The bolt/nut *performance* of any alternate combination, when used in a structural joint, will equal or be better than the recommended combination. Numbers (1 thru 8) are the bolt item numbers given in Table 4, letters (A thru G) are the nut item numbers given *in* Table 5.

F. Shear Planes.

In bearing-type structural connections — those in which the service loads are supported in shear by the bolts — allowable shear stresses for the bolts are reduced by 30 percent if a shear plan occurs through its threaded *section.* Consequently, it is frequently important for the designer *to* check *shear* plane locations *to* learn where they occur in the Dolt length. tt is easily done.

For each bolt length there is a specified body length. Body length is the minimum distance from the underhead bearing surface of the bolt *to* the last scratch of thread or top of the extrusion angle. This means that at least this length of full diameter unthreaded body is available. By formula, the minimum body length equals the bolt's nominal length minus its thread transition length, $L_B \text{ min} = L \text{nom} - L_T = Y \text{ max}$. For L_T and Y values, refer to page E-30;

Using the specified body length the designer can quickly check the location of shear planes in any joint. A6 an example —

A structural joint is comprised of 3 plies, the outer plates are each ½ in. thick and the interior plate is 1 in. Hardened flat washers will be used under Wth the bolt head and nul and 7/8 in. bolts will be used. The grip is 2 x 0.5 + 1.0 + 2 x 0.136 = 2.272 in, Referring to Table 7, a 7/8 x 3.5 in. boll is the correct choice. Its specified body length is 1.72 in. The two shear planes occur at distances of 0.136 + 0.5 = 0.636 In. and 0.136 + 0.5 + 1.0 = 1.636 in. from the underside of the bolt head, regardless from which side of the joint the bolt is installed. Both shear planes occur through full body and not through the threaded length.

Another example —

Assume again a joint of 3 plies with the *outer* plates 5/8 *in.* and 5/16 in. and the interior plate 1 In. Only one washer is needed, to be placed under the turned member. Again, 7/8 in. bolts will be used. The grip is 0.312 + 1.0 +

18

The Lincoln Electric Company
22801 St. Clair Avenue
Cleveland, Ohio 44117-1199

CERTIFICATE OF CONFORMANCE
(APPLIES ONLY TO U.S. PRODUCTS)

SUPPLIED TO:
Order No.:
Production Code No.:
Size:

Product: Code-Arc® 7018 MR™
Classification: E7018 (ALSO MEETS THE REQUIREMENTS OF E7018H4R)
Specification: AWS A5.1-91, ASME SFA-5.1 **[1 Year]**
Date Completed: May 1, 2000

This is to certify that the product named above and supplied on the referenced order number is of the same classification, manufacturing process, and material requirements as the material which was used for the test that was concluded on the date shown, the results of which are shown below. All tests required by the specifications shown for classification were performed at that time and the material tested met all requirements. It was manufactured and supplied according to the Quality System Program of the Lincoln Electric Company, Cleveland, Ohio, U.S.A., which meets the requirements of ISO9002, NCA3800, ANSI/AWS A5.01, JIS Z 9902, and other specification and Military requirements, as applicable. The Quality System Program has been approved by ASME, ABS, and VdTUV.

Operating Settings, Mechanical Properties (*In the as-welded condition*) and Chemical Analyses of the weld deposit were as follows:

	AWS/ASME REQUIREMENTS	5/32 AC	5/32 DC+	3/16 AC	3/16 DC+	1/4 AC	1/4 DC+
Current (amps)		190	175	250	220	365	325
Plate Thickness (in.)		3/4	3/4	3/4	3/4	1	1
Passes/Layers		18/8	18/8	14/7	14/7	18/9	18/9
Preheat Temp. (°F)	225 min.	225	225	225	225	225	225
Interpass Temp. (°F)	225 to 350	350	350	325	325	325	325
Tensile Strength (psi)	70,000 min.	92,800	82,700	84,400	81,800	81,700	76,900
Yield Strength (psi)	58,000 min.	78,300	69,200	68,000	66,700	66,200	65,200
Elongation, % in 2"	22 min.	28	30	28	30	31	31
Hardness, Rockwell B (avg)	Not Required	91	87	88	87	87	88
Impacts Properties (Charpy V-notch) ft-lbs at -20°F	20 min.	78 (84, 84, 88)	162 (138, 141, 208)	84 (81, 84, 88)	104 (78, 116, 120)	105 (98, 104, 118)	168 (108, 140, 251)
% C	Not Req.	.08	.05	.06	.06	.06	.04
Mn	1.60 max	1.28	1.24	1.11	1.10	1.09	1.15
Si	.75 max	.54	.56	.54	.55	.48	.51
Ni	.30 max	.06	.06	.06	.06	.03	.03
Cr	.20 max	.04	.04	.06	.06	.04	.04
Mo	.30 max	.01	.01	.01	.01	<.01	<.01
V	.08 max	<.01	<.01	<.01	<.01	.01	.01
Total alloys (-C,Si)	1.75 max	1.37	1.36	1.35	1.30	1.18	1.24
Coating Moisture (%)	0.6 max.	.07		.09		.10	

RADIOGRAPHIC TEST, Grade 1: Met requirements.
Fillet Weld Test (positions as required): Met requirements.
3/32" SIZES ARE CLASSIFIED AS E7018H4, PER AWS A5.1-91.
The electrode diameters required to be tested for this classification are 5/32", 3/16" and 1/4". The 3/32" and [illegible] sizes [illegible] requirements.

	3/32"	1/4"
Diffusible Hydrogen (1) (AWS A4.3-93) ml/100g	.8	1.4

(1) [illegible] atmospheric condition of 30% relative humidity at 73°F. Total of 21 grains of moisture per pound of dry air.

[illegible] COUNTY OF CUYAHOGA
[illegible] TO BEFORE ME THIS
[illegible] of May, 2000
[signature]
[illegible] EXPIRES: September 23, 2004

[signature]
DONALD L. BILL, CERTIFICATION SUPERVISOR

[signature]
DAVID A. FINK, MANAGER, MATURE PRODUCTS
CONSUMABLE R&D DEPT.

Cert. No. 61500

19

ELECTRODES

VULCRAFT SALES CORPORATION
New England Sales District
8848 N. BROADWAY, SUITE 304, SALEM, NH 03079
TELEPHONE 603/894-1148
FAX 603/894-1148

DATE : May 2, 2002

*NORTHLAND STEEL CORP.
148 PARK STREET
N. READING, MA 01864

Reference: AVIS AUTOMOBILE SERV
P.O. 01-318
VULCRAFT # 26-01-0501

Gentlemen:

This is to certify that Vulcraft, Division of Nucor Corporation, Florence, S.C., is a member of the Steel Deck Institute.

As members of the Steel Deck Institute, Vulcraft's section properties are determined using the appropriate provisions of the latest edition of the American Iron and Steel Institute's specification for the design of cold-formed steel structural members and is built with strict adherence to the standard specifications of the Steel Deck Institute.

Sincerely,

Vulcraft Division

ALPHONSO LUCAS
N.E. District Sales Manager

VULCRAFT SALES CORPORATION
New England Sales District
[illegible] BROADWAY, SUITE 3DA, SALEM, NH [illegible]
TELEPHONE [illegible]
FAX [illegible]

DATE: May 2, 2002

*NORTHLAND STEEL CORP
148 PARK STREET
N READING, MA 01864

Reference: AVIS AUTOMOBILE SERF
P.O. 01-318
VULCRAFT # 26-01-0501

Gentlemen:

Vulcraft Division, Nucor Corporation, hereby certifies that we are a member of the Steel Joist Institute and the Vulcraft open web steel joists are designed and manufactured in accordance with the standard joist specifications of the Steel Joist Institute.

These joists will safely support a uniformly distributed load as designated in the applicable Steel Joist Institute load table, for the particular type and span, when field applications are in accordance with these specifications.

Sincerely,

Vulcraft Division

ALPHONSO LUCAS
N E District Sales Manager

05425 Light Gauge Roof Trusses

05425 Light Gauge Roof Trusses Inspection Reports

BECKER
structural engineers

Date: February 21,2002
Time: 11:00am
Temp: **40's**
Weather: Fog

Project: **Avis Rental Car Facility**
South Portland, Maine

Inspection Report - Trusses Material: Light Gage
Location: Main Building Trusses

Satisfactory	Unsatisfactory	Not Completed	N/A		Satisfactory	Unsatisfactory	Not Completed	N/A	
x				Spacing					
x				Condition					
			x	Anchorage					
			x	Temp Bracing					
			x	Perm Bracing					
			x	Sheathing Attach					
			x	Size					

Notes: Truss erection at main buildingjust begun.

Signed: Ethan A. Rhile, P. E. Date: 3/1/02

WO 768 01

Becker Structural Engineers
19 Commerical Street
Portland, Maine 04101
Phone: (207) 879-1838
Fax(207) 879-1822

BECKER
structural engineers

Date: March 8,2002
Time: 10:00am
Temp: 30's
Weather: Cloudy

Project: **Avis Rental Car Facility**
South Portland, Maine

Inspection Report - Trusses Material: Light Gage
Location: Main Building Trusses-Erected
Fuel Island Trusses-Just Beginning

Satisfactory	Unsatisfactory	Not Completed	N/A		Satisfactory	Unsatisfactory	Not Completed	N/A	
x				Spacing					
x				Condition					
x				Anchorage					
x				Temp Bracing					
		x		Perm Bracing					
x				Sheathing Attach					
x				Size					

Notes: Work was commencing on permanent bracing while **I was** on the site.

Signed: [signature] Date: 4/19/02

WO 768.01

Offices:
Dover, NH
Manchester, NH
N. Chelmsford, MA

GEOTECHNICAL CONSULTING
SITE INSPECTIONS
MATERIAL, TESTING

JOHN **TURNER** CONSULTING, INC.

FIELD OBSERVATION REPORT

CLIENT:	**Becker Structural Engineers, Inc.** **Attn: Mr. Paul Becker** **19 Commercial Street** **Portland, ME 04101**	**PROJECT:**	**Avis Rent A Car System** **Portland Jetport** **Portland, NH**

DATE: **March 8,2002** **REPORT #:** **01-196-020**

As requested by our client a visit was made on this date for inspection of steel framings. Structural steel framing was completed and work was in progress on roof trusses. We met with the superintendent from Home Construction and reviewed engineering drawings, Precision Welding approval drawings (1/17/02). **All** drawings had been initialized by Becker Engineers.

Completed structural steel was inspected and found acceptable with the exception of a weld missing on each of two horizontal HSS braces at gussets (one in the South room and the other in the north room). Inspection was conducted from grade so we could not ascertain if top welds were also missing. No discrepancies were observed on remaining field welds, shop welds, bolting and anchoring. Except for the missing welds work conformed to approved drawings and applicable codes. The mezzanine was not erected yet.

Visual inspection was performed on the cold formed steel truss system. In the middle room the **PAF** and screw fasteners for the truss to steel anchor clips were found incomplete. The contractor will return to all areas and complete anchor fastening, replace construction bridging with new rows of mid-point lateral bracing, terminate design bracing at end walls only where specified in drawings and install new rows of bottom chord bracings at ten foot intervals as specified by Wood Structures Design drawings. **All** bracing will span two trusses with screens installed on flanges (All items per discussion with foreman). Inspection was performed on exterior stud walls and no discrepancies were found with work in progress.

Inspector: Chris Puritan

05425 Light Gauge Roof Trusses

05425.2 Material Certifications/ Shop QA Program

United States Steel LLC

P.O Date	Purchase Order No.
	P30864(08/01)

Shippers No.	Mill Order No.	Invoice No.
124342 07 19 01	GA84541	161-067289

Vehicle Identity 0006948

VENDOR TO

GARY WORKS
GARY,INDIANA 46402
** MELTED AND MANUFACTURED IN THE USA **
MITEK INDUSTRIES INC
P O BOX 7359
SAINT LOUIS MO 63177-1359

SHIP TO

MITEK INDUSTRIES INC
1391 BOONE INDUSTRIAL DR
COLUMBIA MO 65202-3352

THIS IS TO CERTIFY THAT THE PRODUCT DESCRIBED HEREIN WAS MFGD., SAMPLED, TESTED AND/OR INSPECTED IN ACCORDANCE WITH THE SPECIFICATION AND FULFILLS REQUIREMENTS IN SUCH RESPECT.

PREPARED BY THE OFFICE OF:
D.L.KRUSZKA MGR, SHEET TECH

Date 07-23-01

PART NO: 18-M50000

Spec. & Insp. GALVANIZE CARBON ASTM A653-00 GR 40 APPROVED SS AS COATED GP40SK55 UNEXPOSED G60 REGULAR SPANGLE CHEM TREAT DRY PICKLE WELDS OK RB 55/70 YS MIN 40. KSI TS MIN 55. KSI EL MIN 16. % EL DIST 2 INCHES

INSP:01 MILL INSPECTION CERTIFIED RA/SN ALSO RA/LT CERTIFIED TEST REPORT REPORT TEST RESULTS PER PRODUCT SPECN CAPTION ,

Item No.	Material Description: Thickness or Section	Width, Dia. or Ft. Wt.	Length	Quantity	Weight	Heat No.	Test or Piece Identity	Yield Pt.	Tensile Str.	Elongation % In 8"	Elongation % In 2"	% Red. of Area	Bend
01	.0470 MIN CTG WGT	50.0000 AVG TOP =	COIL .328 AVG-BOTTOM =	01	18500 .353 OZ / SQ FT	Y27500	W948258						
							NMS/MPA =	351.39	423.74		35.0		
							KMS =	35.9	43.3				
							KSI =	51.0	61.5				
							N VALUE =		.241				
01	.0470 MIN CTG WGT	50.0000 AVG TOP =	COIL .328 AVG-BOTTOM =	01	19200 .353 OZ / SQ FT	W24627	W948259						
							NMS/MPA =	354.84	413.40		35.0		
							KMS =	36.2	42.2				
							KSI =	51.5	60.0				
							N VALUE =		.214				

"YIELD STRENGTH @ 0.2% OFFSET

Heat No.	Type	C	Mn	P	S	Si	Cu	Ni	Cr	Mo	Sn	Al	N	V	B	Ti	Cb	Co
Y27500	HEAT	13	042	007	006	011	02	01	03	00	008							
W24627	HEAT	12	042	007	005	010	02	01	03	01	007							

END OF DATA

ALL TEST RESULTS WERE CONDUCTED AND RECORDED IN ACCORDANCE WITH TEST METHODS ACCREDITED BY A2LA

MATRIX Decimal Positions For Elements Are Indicated By The Left Margin, Vertical Dotted Line Or Decimal Point. 01.000.0772 REV. 391

010719 MV47 1327 300531020 071901 4288883036 HBF CAE 0 1 1 PAGE 1

Ste pup

USS
A unit of USX Corporation

P.O. Date	Purchase Order No.
	P32159(7/16)

Shippers No.	Mill Order No.	Invoice No.
122931 06 29 01	GA86740	161-061160

Vehicle Identity 0007612

GARY WORKS
GARY, INDIANA 46402
** MELTED AND MANUFACTURED IN THE USA **

MITEK INDUSTRIES INC
P O BOX 7359
SAINT LOUIS MO 63177-1359

SHIP TO
MITEK INDUSTRIES INC
1391 BOONE INDUSTRIAL DR
COLUMBIA MO 65202-3352

THIS IS TO CERTIFY THAT THE PRODUCT DESCRIBED HEREIN WAS MFGD., SAMPLED, TESTED AND/OR INSPECTED IN ACCORDANCE WITH THE SPECIFICATION AND FULFILLS REQUIREMENTS IN SUCH RESPECT.

PREPARED BY THE OFFICE OF:
D.L.KRUSZKA MGR, SHEET TECH

Date 07-02-01

PART NO: 16-M48310

SC: GALVANIZE CARBON ASTM A653-00 GR 40 APPROVED SS AS COATED
SP: GP40SK55 UNEXPOSED PRIME SIDE OUT G60 REGULAR SPANGLE CHEM TREAT DRY NO PICKLE WELDS RB 55/70 YS MIN 40. KSI TS MIN 55. KSI EL MIN 16. % EL DIST 2 INCHES
INSP:01 MILL INSPECTION CERTIFIED RA/SN ALSO RA/LT CERTIFIED TEST REPORT REPORT TEST RESULTS PER PRODUCT SPECN CAPTION ,

Item No.	Material Description: Thickness or Section	Width, Dia. or Ft. Wt	Length	Quantity	Weight	Heat No.	Test or Piece Identity	Yield Pt	Tensile Str.	Elongation % In 8"	Elongation % In 2"	% Red. of Area	Bend
01	.0580 MIN CTG WGT	48.3100 AVG TOP = .333	COIL AVG-BOTTOM = .335	01	19870 OZ / SQ FT	T23293	W948347						
							NMS/MPA =	351.39	413.40		34.0		
							KMS =	35.9	42.2				
							KSI =	51.0	60.0				
							N VALUE =		.237				
01	.0580 MIN CTG WGT	48.3100 AVG TOP = .333	COIL AVG-BOTTOM = .335	01	20220 OZ / SQ FT	T23293	W948348						
							NMS/MPA =	344.50	423.74		35.8		
							KMS =	35.2	43.3				
							KSI =	50.0	61.5				
							N VALUE =		.203				

"YIELD STRENGTH @ 0.2% OFFSET

Heat No.	Type	C	Mn	P	S	Si	Cu	Ni	Cr	Mo	Sn	Al	N	V	B	Ti	Cb	Co
T23293	HEAT	13	041	007	006	009	02	01	03	00	006							

END OF DATA

ALL TEST RESULTS WERE CONDUCTED AND RECORDED IN ACCORDANCE WITH TEST METHODS ACCREDITED BY A2LA

MATRIX Decimal Positions For Elements Are Indicated By The Left Margin, Vertical Dotted Line Or Decimal Point.

010629 MV47 0914 301371010 062901 4288883036 HBF CAE 0 1 1 PAGE 1

01 000.0772 REV 398

2

U. S. Steel Group
A unit of USX Corporation

P.O. Date	Purchase Order No.
	P30138(6/08)

Shippers No.	Mill Order No.	Invoice No.
120236 05 21 01	GA82995	161-047731

Vehicle Identity 0007467

VENDOR SOLD TO

GARY WORKS
GARY, INDIANA 46402
** MELTED AND MANUFACTURED IN THE USA **

MITEK INDUSTRIES INC
P O BOX 66702
SAINT LOUIS MO 63166-6702

SHIP TO

MITEK INDUSTRIES INC
1391 BOONE INDUSTRIAL DR
COLUMBIA MO 65202-3352

THIS IS TO CERTIFY THAT THE PRODUCT DESCRIBED HEREIN WAS MFGD., SAMPLED, TESTED AND/OR INSPECTED IN ACCORDANCE WITH THE SPECIFICATION AND FULFILLS REQUIREMENTS IN SUCH RESPECT.

PREPARED BY THE OFFICE OF:
D.L.KRUSZKA MGR, SHEET TECH

Date 05-22-01

** TOTAL PAGE.06 **

PART NO: 20-M48430

Spec. & nsp. GALVANIZE CARBON ASTM A653-00 GR 40 APPROVED SS AS COATED GP40SK55 UNEXPOSED G60 REGULAR SPANGLE CHEM TREAT DRY NO PICKLE WELDS RB 55/70 YS MIN 40. KSI TS MIN 55. KSI EL MIN 16. % EL DIST 2 INCHES

INSP: 01 MILL INSPECTION CERTIFIED RA/SN ALSO RA/LT CERTIFIED TEST REPORT REPORT TEST RESULTS PER PRODUCT SPECN CAPTION ,

Item No.	Material Description: Thickness or Section	Width, Dia. or FL Wt.	Length	Quantity	Weight	Heat No.	Test or Piece Identity	Yield Pt.	Tensile Str.	Elongation % In 8"	Elongation % In 2"	% Red. of Area	Bend
01	.0360 MIN CTG WGT	48.4300 AVG TOP =	COIL .347 AVG-BOTTOM =	01	19890 .336 OZ / SQ FT	T22363	W946387						
							NMS/MPA =	344.50	403.07		36.0		
							KMS =	35.2	41.1				
							KSI =	50.0	58.5				
							N VALUE =	.210					
01	.0360 MIN CTG WGT	48.4300 AVG TOP =	COIL .347 AVG-BOTTOM =	01	19960 .336 OZ / SQ FT	T22363	W946388						
							NMS/MPA =	344.50	403.07		36.0		
							KMS =	35.2	41.1				
							KSI =	50.0	58.5				
							N VALUE =	.210					

"YIELD STRENGTH @ 0.2% OFFSET

Heat No.	Type	C	Mn	P	S	Si	Cu	Ni	Cr	Mo	Sn	Al	N	V	B	Ti	Cb	Co
T22363	HEAT	13	040	007	007	008	03	03	02	00	002							

END OF DATA

ALL TEST RESULTS WERE CONDUCTED AND RECORDED IN ACCORDANCE WITH TEST METHODS ACCREDITED BY A2LA

MATRIX Decimal Positions For Elements Are Indicated By The Left Margin, Vertical Dotted Line Or Decimal Point. 01.000.0772 REV. 398

010521 MV47 0924 300787010 052101 4288883036 HBF CAE 0 1 1 PAGE 1

3

INTRODUCTION

The purpose of this manual is to instruct and assist, as well as reinforce and remind our employees of the need for quality production. This manual addresses quality assurance from a product flow perspective, and will address quality as it applies to sales, design, production, delivery, and costs. **A** separate section presents the quality standards and procedures needed to keep Wood Structures in the forefront of quality production and assure our customers of " Quality you can build on."

A glossary of terms is also presented to help the user identify the specific terms used at Wood Structures in its quality assurance program.

QUALITY & SALES

Wood Structures; Inc. is the largest manufacturer of roof and floor trusses in the northeast. We are a strictly wholesale company, distributing our products through a network of retail lumberyards throughout Eastern New England.

We depend heavily upon repeat business. Thus it's important **OUT** customers receive the highest quality product we have to offer so they will continue to use Wood Structures as their source of supply for the future.

When an order is placed, we expect customer will receive a high quality product, at a fair price, delivered on time. It is everyone's task at WSI to assure that this happens.

Most of our order information comes to us by telephone. Our Outside sales force works in conjunction with the retail lumberyard salesmen to get complete and accurate take-off from blueprints or plans for a given project. The specifications for trusses are relayed to our Inside Sales force that double check the information and ask the appropriate questions to make sure that the order is correct.

Delivery dates are assigned the day the order is placed. The Sales office has a list of each production machine and its capabilities, thus allowing the Sales person to select the proper machine. With that information, the delivery date can be given. Due to varied machine capabilities, length, height, and quantity are all factors that affect the delivery date.

Pricing is done by computer, which minimizes mistakes in costing and gives the least expensive truss configuration to do a given job.

Quality plays an important role for all of us. It begins with the accuracy and professionalism necessary to market and sell our product, but it surely does not end there. With a quality truss comes a satisfied customer, and a satisfied customer ineans orders in the future.

OUALITY & DESIGN

A large and important segment of our company is devoted to design. The strict requirements of the building industry make it mandatory that our product designs meet building codes, as well as many special conditions. Our Design Department, therefore, requires that the work done at Wood Structures be ofthe highest quality and built to the specifications of the customer and to job requirements.

Our skilled designers, with tlie aid of computers, give us clear, concise shop orders to work with. The Quality Department works closely with the Design Department to assure that the customer receives a truss designed exactly for his application. Quality Control also works with Design on problems that may arise in the field. Should in-house or field repair be necessary, tlie Quality Department is responsible for the follow-up and verification. An example of our field quality follow up is demonstrated by our long-span package, which is a special program to assure that trusses over 54, are handled and braced with special care.

The safety of all who live on and under our trusses depends, to a great degree, on design. In order that we continue to build a safe and reliable product, all employees are made aware of the design aspects of the business.

QUALITY & PRODUCTION

Our goal is "quality production", meaning that we do not inspect quality into the product, but rather we "build it in" as part of the manufacturing process. Our quality program is unique in that we involve not only the production organization, but also all other company departments.

One way to insure quality production is continuous operator training, which is provided by a full-time quality trainer/inspector. Another requirement is that every production supervisor will do a rough check on set-ups. He should put his ID on orders that he has checked. An additional system, which can be helpful, is our production workforce "Quality Participation Program" (QPP). In this program, each production employee is assigned, for two weeks, to serve as a floor and yard quality inspector. Providing coverage for as much of our three shifts as possible.

Our quality production program is an action program with participants who are given quality responsibilities under the direction ofthe Quality Department. The program encompasses production aspects dealing with manufacturing, handling, storage, and transportation of our products. In addition, the company licenses ail forklift drivers. Truck drivers and special equipment operators (crane) are thoroughly trained by the company.

QUALITY & COST

When quality assurance is considered, we often neglect to evaluate the cost of equipment, materials, and transportation. In addition to direct labor, we have a number of additional expenses to consider. Nearly half the cost of a finished truss is made up of lumber and connector plates. This is a significant amount, and an expenditure over which you have direct responsibility. Therefore, it is necessary that you be aware of material costs.

For example, the incorrect identitication of grade stamp could add as much as 30% to the cost of the material in our product. Another example, which shows the importance of careful quality control, would be when extreme field repair costs are incurred, and/or back charges are made because we failed to follow design specifications (shop order). **A** situation ofthis kind may cost the Company more inoney than the product was sold for.

A large and expensive inventory of raw material and finished products requires the need for careful handling, storage, and transfer. Your understanding of inaterial costs will assist you in being quality conscious.

QUALITY STANDARDS

This section of the manual is devoted to defining the Company specific quality assurance functions and activities. The standards included may differ from the general industrial standards, but they are the best and most workable guidelines developed through nearly four decades of quality truss production.

INTRODUCTION TO WOOD QUALITY

All wood used for chords and webs must be of equal or better grade to those grades listed on the front of the shop order. Substitution of wood grades MUST always be to a higher grade.

Grades-each board used at Wood Structures is grade stamped at the mill of' origin. The stamp lists grade, moisture content, mill number, and mill inspection authority. Whenever possible, lumber should be cut to retain the mill grade stamp on the wood to be used in assembly.

Lumber Grades – The list of lumber grades below indicates the values of lumber from it lowest value to it highest value by species and by size.

MSR – Machine Stress Rated
SPF – Spruce Pine Fur
SYP – Southern Yellow Pine

2x4
Stud SPF
#2 or #1 SPF
#2 SYP
1650 SPF MSR
2100 SPF MSR
2400 SYP MSR
2700 SYP MSR

2x6
1650 SPF MSR
M23 SYP

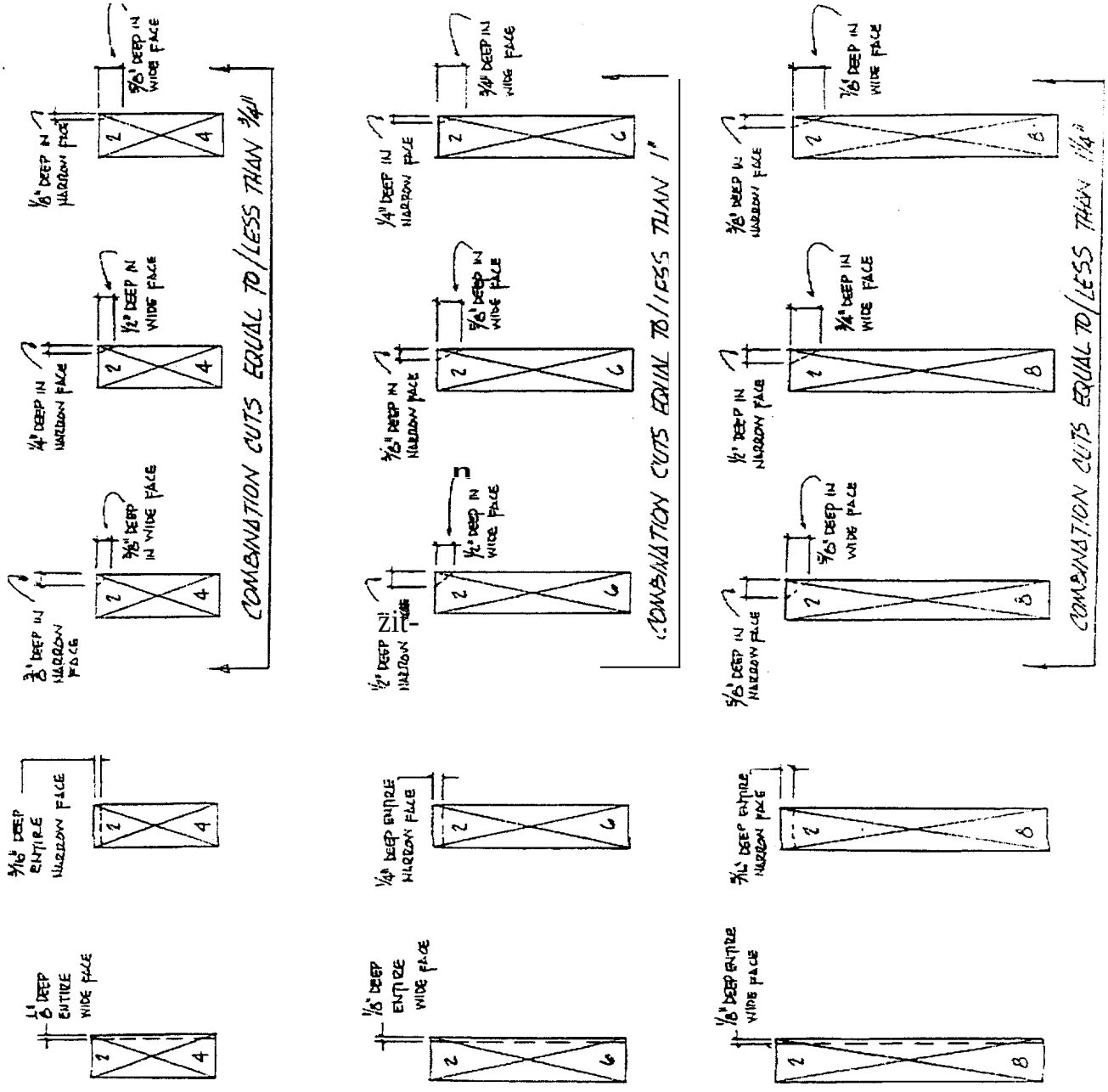
2x8
M23 SYP

2x10
M23 SYP

WOOD DEFECTS

SAW CUTS – maximum allowable see tables 1 & 2

Saw cuts larger than those listed in tables 1 and 2 should be rejected except: saw cuts in chord splice panels may be spliced, both sides of chords, with plates one size longer than those used as splices in that panel. Larger than allowable saw cuts may not be plated in webs or panels with bearing locations.



WANE ON LUMBER

Wane: Bark or lack of wood along the edges of a piece.
If the waned member can be overplated enough to maintain the required plating area then that inember can be used. Except:

a. Bearing locations on roofs must have a minimum of 1" good wood for the length of the bearing surface area.

b. Bearing locations on floors must have a minimum of 2 ½" good wood for the entire length of the bearing surface area.

c. The outside perimeter must have a minimum of ¾" good wood for the entire length of the truss perimeter.

Splits: Length of thru splits allowed is equal to the wide face dimension of the board.

Forklift Stabs: Not useable must be rejected.

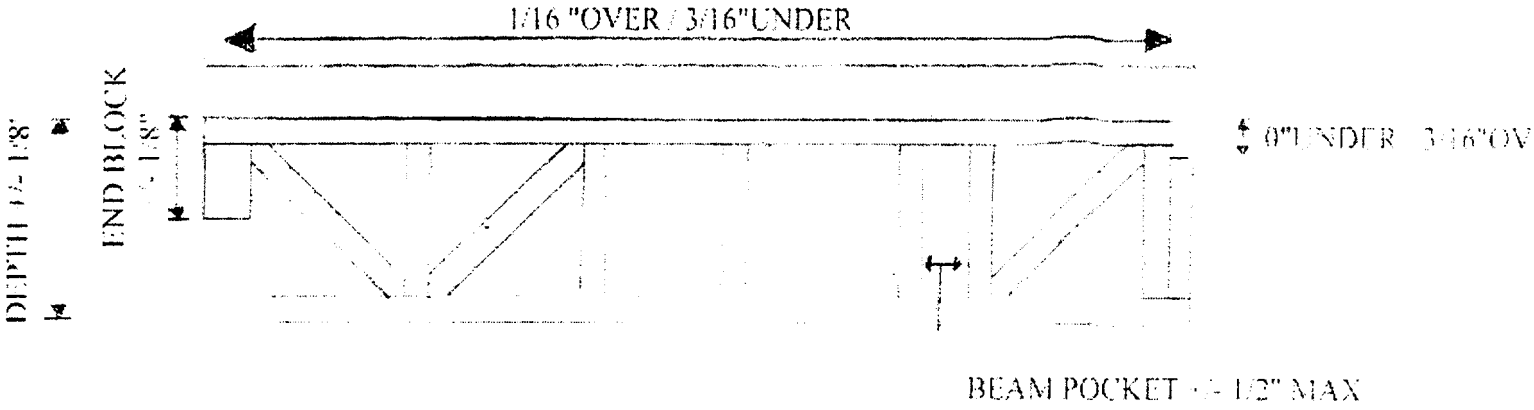
Moisture: Moisture content of wood at the time of assembly may not be greater than 20%.

Wedges: Wedges must be a minimum grade of #2 SPF. Length of wedge at square end -4" max. The grain of wedges must be parallel to the grain of the bottom chord.

Dry Rot: Not useable must be rejected.

INTRODUCTION TO FLOOR& FLAT TRUSS QUALITY

Overall depth: ± 1/8
Overall length: 0" over. + 3/16 under
Maximum duct opening in floor truss: 24"
Maximum panel length in floor truss: 60"
End block height: ± 1/8"
End Ribbon: 0" under, ¼ over
Beam Pocket: 1/8 **tinder,** + ½ over
"Must be" Dimension: ± 1/8



INTRODUCTION ROOF TRUSS QUALITY

When quality questions arise the first place to seek answers is the front sheet (Plot) of the work order. The crewleader quality checklist is also a helpful guide in solving problems. If the question cannot be answered by using these quality control guidelines, a supervisor should be consulted.

This section covers truss perimeters & dimensions and includes specifications for:

Overall length

Overall height

Over the wall height

Overhangs

Butt cuts

Beam pockets

Web alignment

Gable stud location

Splice blocks

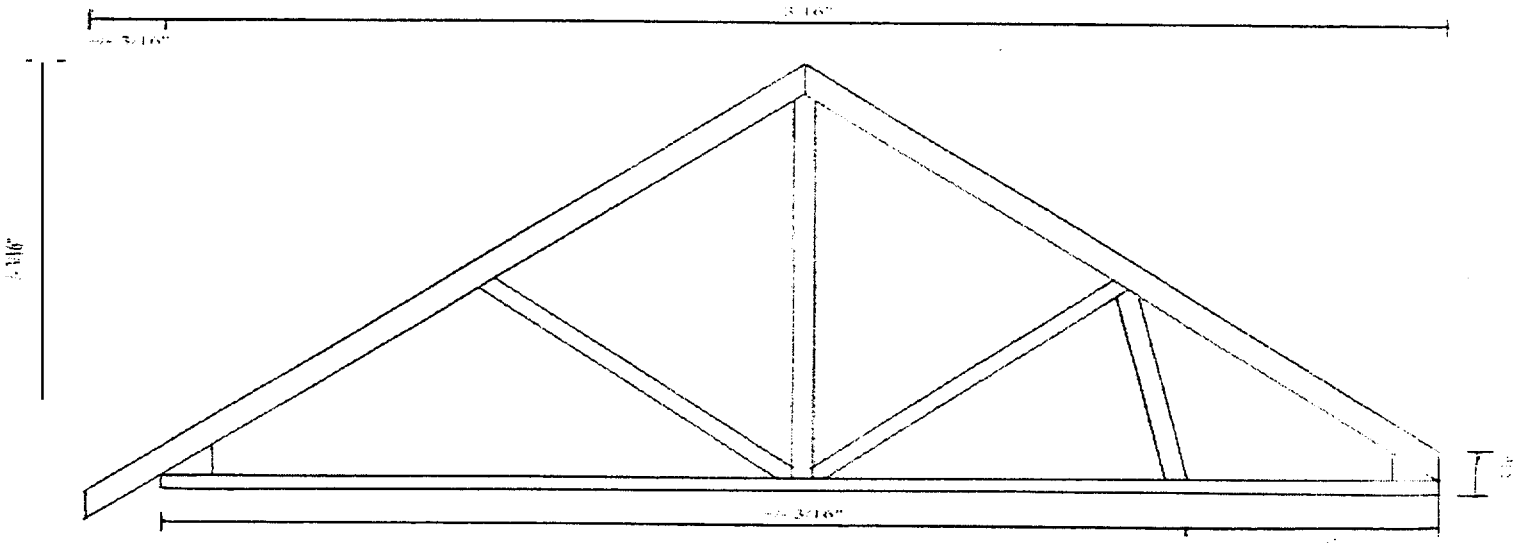
Cantilever web location

Attic post

Square ness

Maximum Variation from Shop Order
Roof Trusses

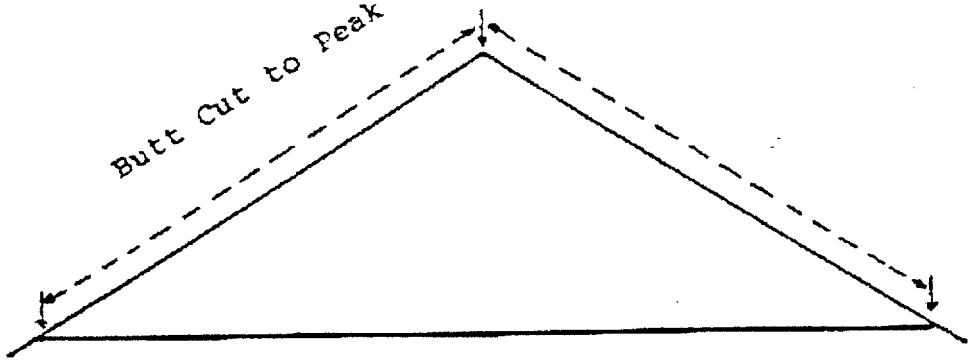
Overall height:	± 3/16"
Overall length:	± 3/16"
Over the wall height:	± 3/16"
"Must be" dimension:	± 1/8"
Overhangs:	± 3/16"
Butt cuts:	± 1/8"
Alignment of webs:	± 1/4"
Truss must be square:	± 1/8"
Truss perimeter or heel to peak:	± 1/4"
Alignment of cantilever Webs at bearing location:	± 1"



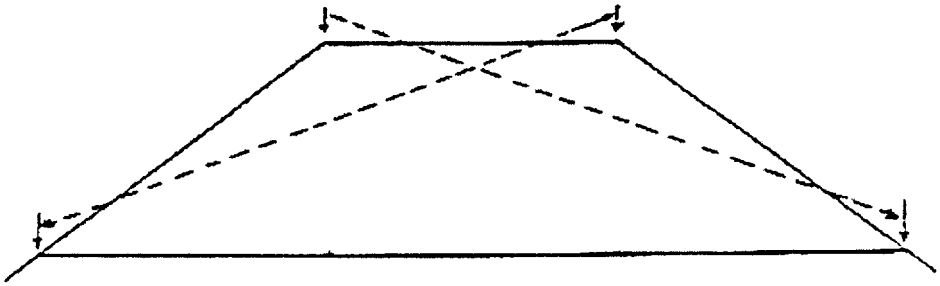
Chord splices must be in panels shown on shop order.
Overhangs must be cut as shown on shop order.
Top chords MUST BE crowned **up.**

METHORDS OF SQUAREING

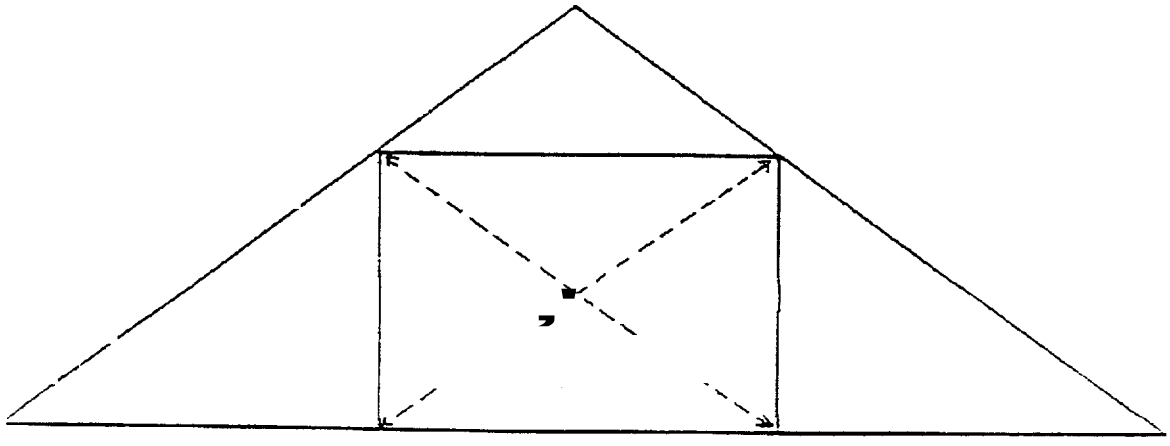
Regular



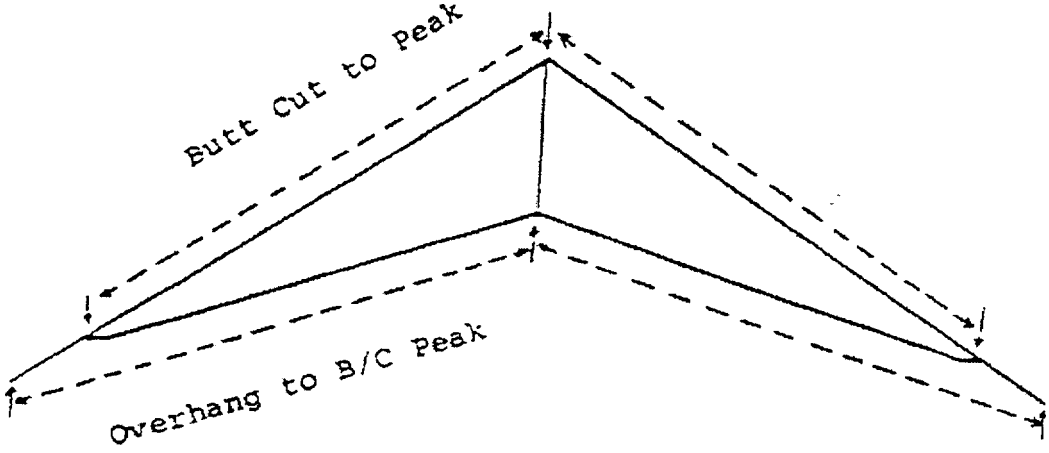
Hip



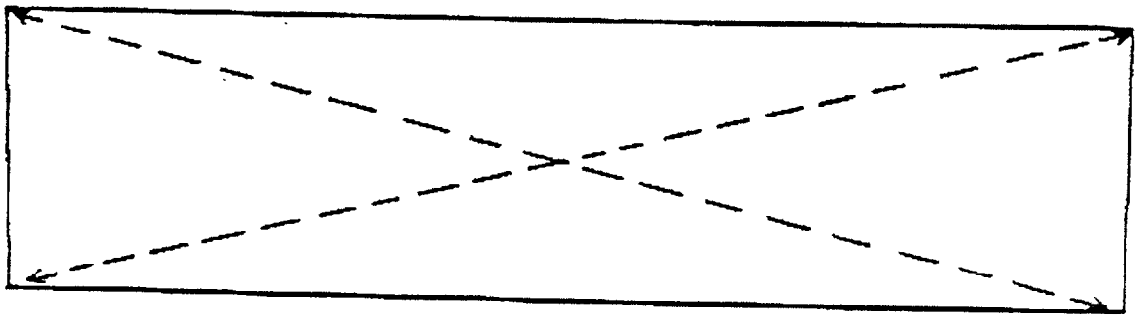
Attic Opening



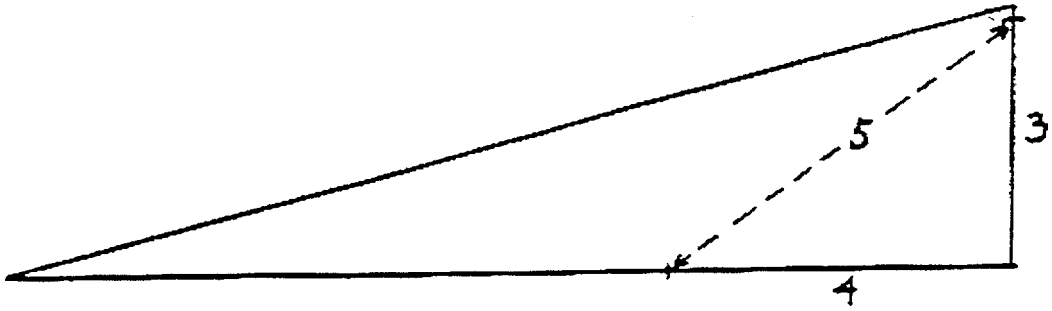
Scissor



Flat or Floor



Mono



ATTIC TRUSSES

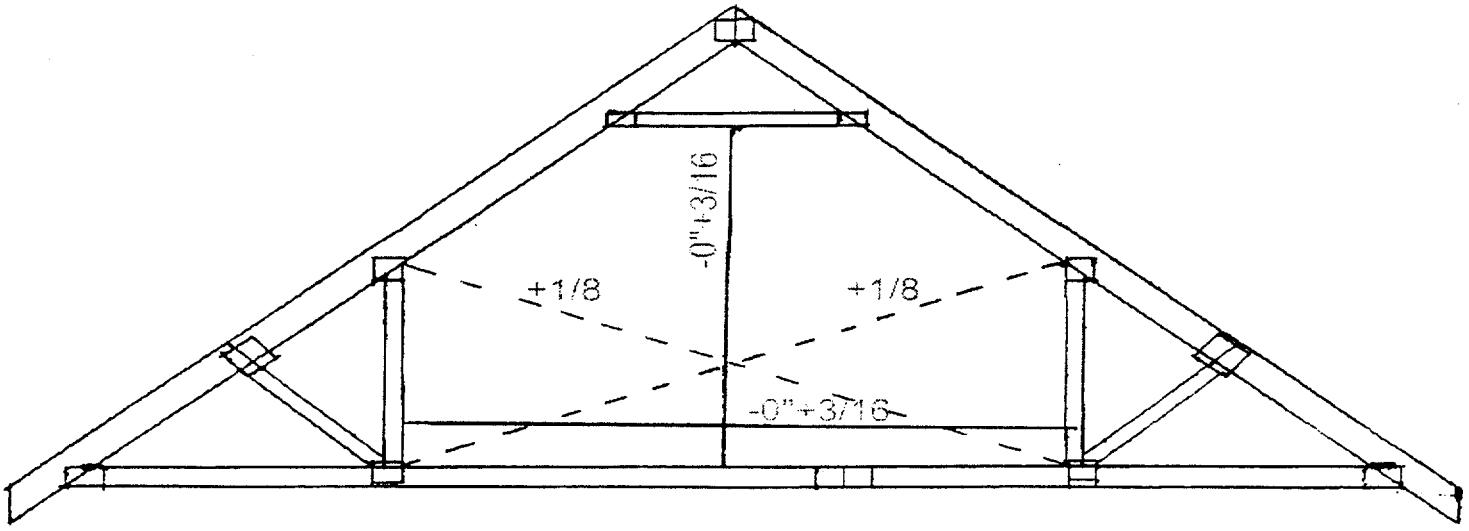
Attic posts must align: + 1/8

Attic opening height must be per shop order: -0" +3/16

Attic opening width must be per shop order: -0" +3/16

Attic opening must be square: +1/8

All other Roof Truss guideline must followed



SECTION PLATES

This section covers truss-plating specifications.

All joints and splices ofevesy ti-uss must be plated on both sides.

Plate size inust be equal to or greater than the plate size listed on the shop order for each joint or splice.

Plate slot direction must be the same as the slot direction shown on tlie shop order. Exceptions must be cleared by design department and noted on the shop order.

Plate gauge must be the same as shown on the shop order. Exceptions must be cleared by the Design Department and noted on the shop order.

Plate placement must be the same as shown on the shop order. See table **"A"** for maximum allowable variances.

Special plate placement details must be the same as those shown on the shop order: ± ¼".

Plates must be fully seated into all wood members: less than 1/16" openness between wood and the underside ofthe plate is allowed.

Plates may not extend above a top chord or below a bottom chord. Plates, which do extend outside tlie perimeter ofthe truss 3/16" or less, may be peened over.

Plates may not extend into attic openings, duct openings, or beam pockets.

Plates may not be cocked.

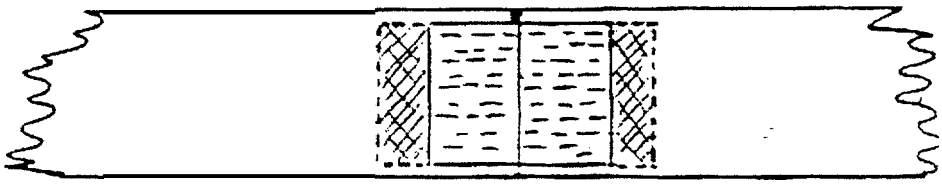
Plates which are rolled back during the assembly or rolling process are unacceptable and must be repaired.

Plate size or gauge may not be increased from that shown on the shop order without a supervisor written authorization.
Except:

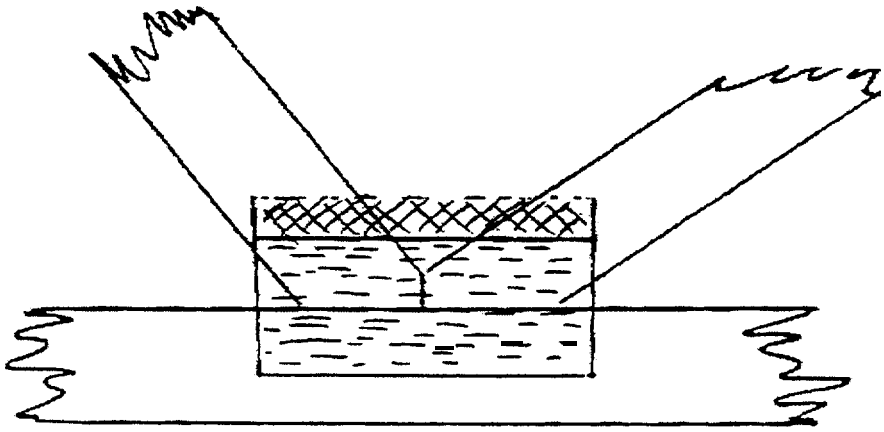
1. When wane affects the plating area.
2. When openness of 1/8" or less is present. See table B for over plating openness.
3. When a gable end heel, peak, or splice calls for a 3x4 on the shop order. (Minimums Heel Plate 4x6 gable, Peak plate gable 5x6, Splice Plates all trusses 3x6)
4. When a 3-web joint on a floor truss calls for a 3x4 on the shop order.

OVER PLATING FOR WANE

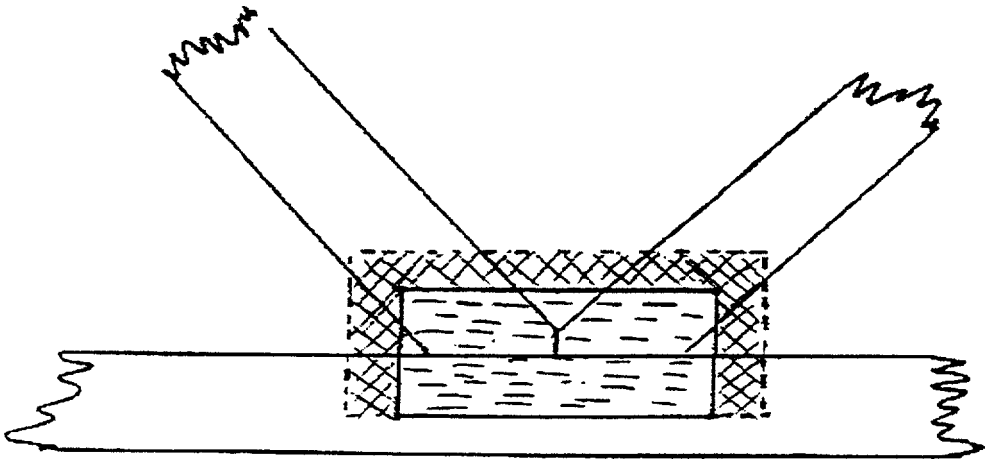
Over plating for wane on a Splice.



Over plating for wane on Webs.

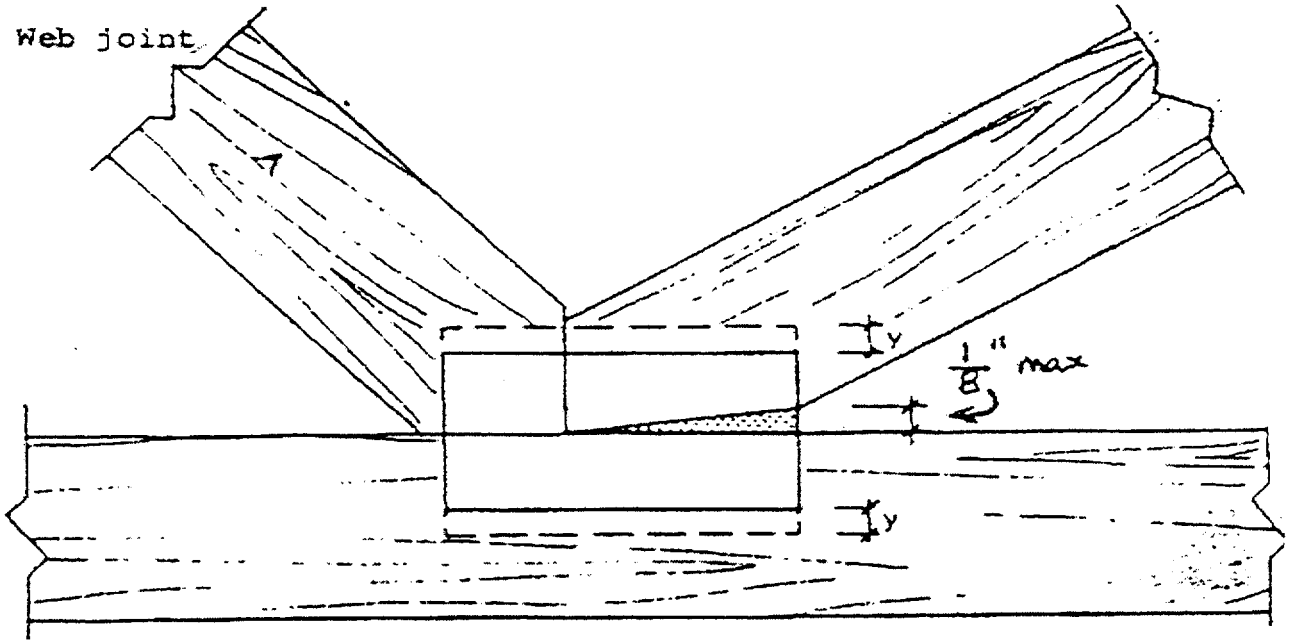


Over plating for Web and Cord Wane.

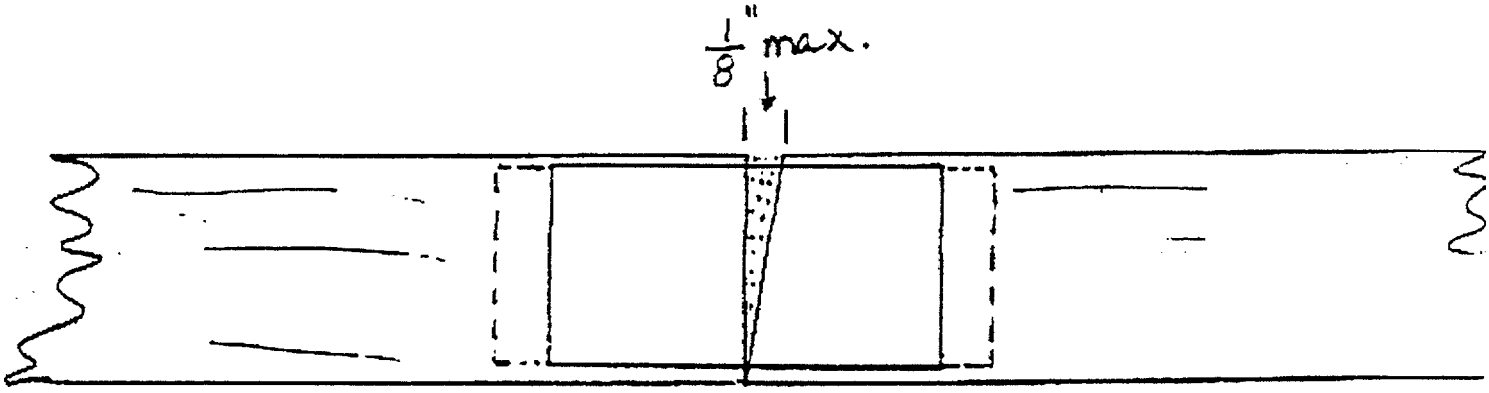


OVER PLATEING FOR GAPS

Over plating a Gap in a Joint



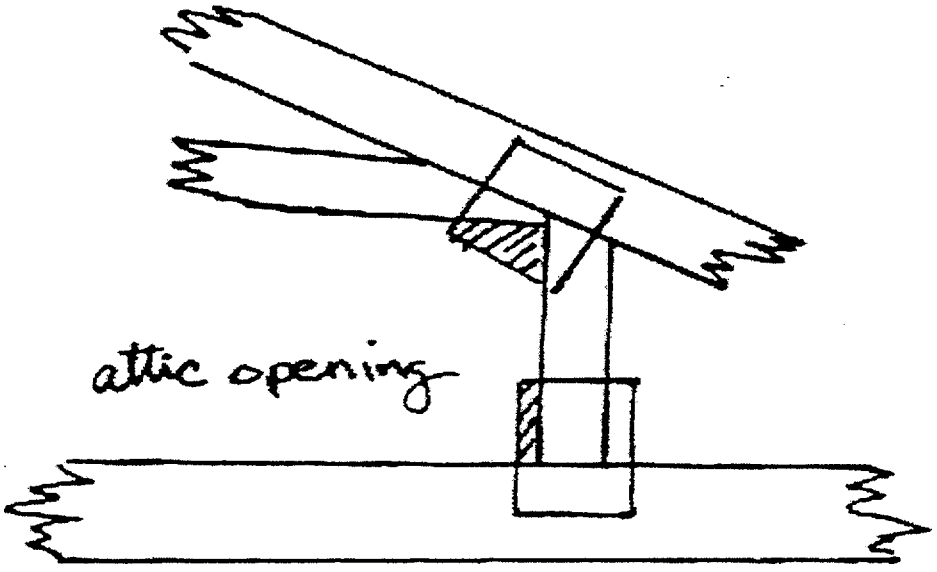
Over plating a Gap in Splice



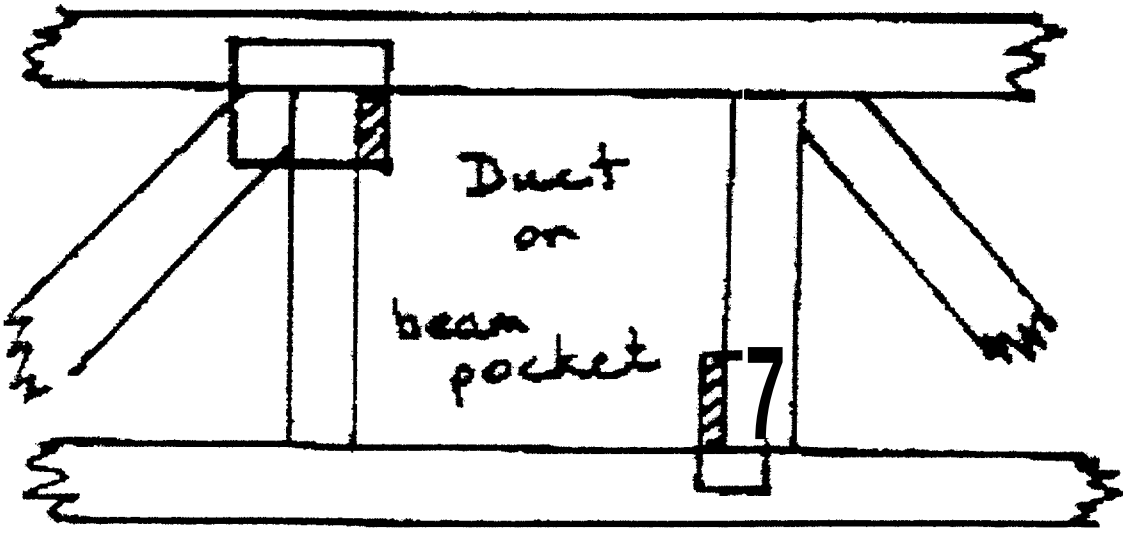
to

UNACCEPTABLE PLATE PLACEMENT

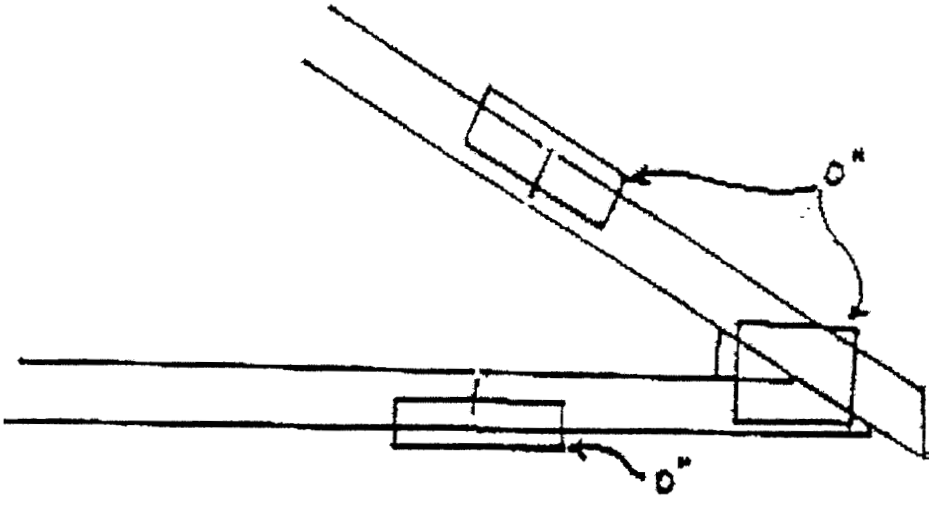
Overhang Plates in Room



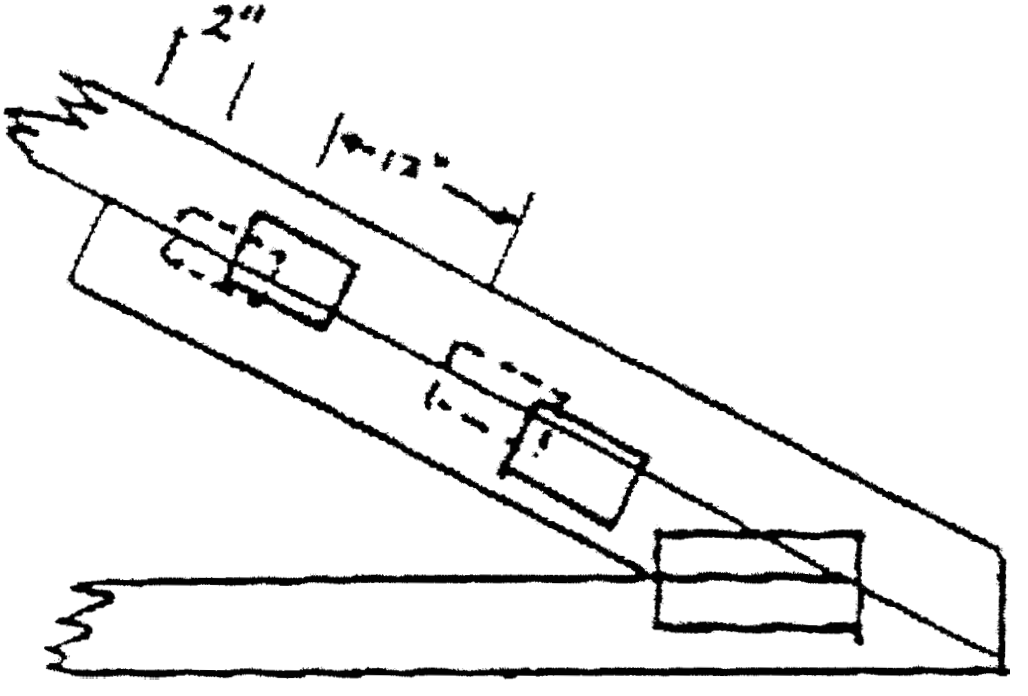
Overhang Plates in Duct opening or Beam Pocket



UNACCEPTABLE PLATE PLACEMENT

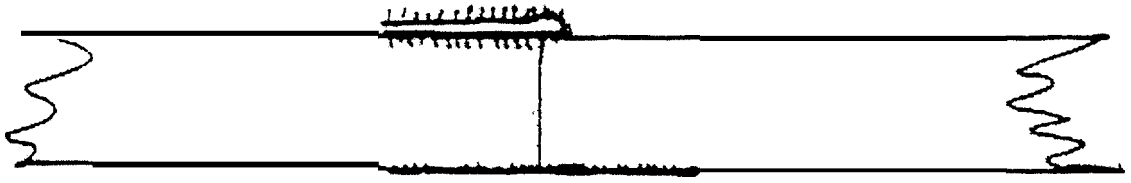


Slider Plate placement

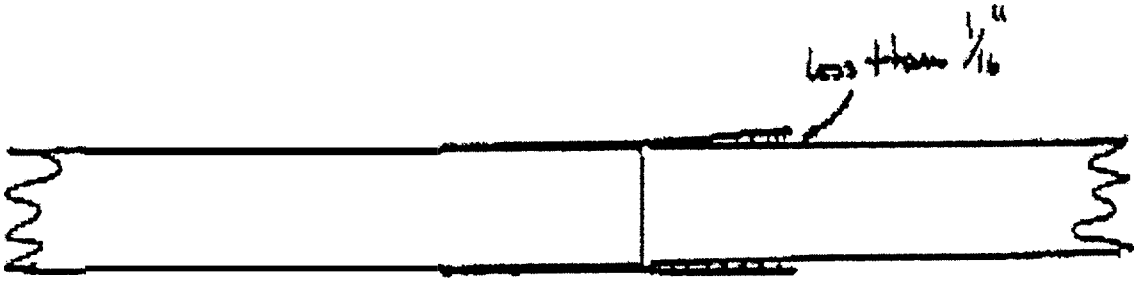


UNACCEPTABLE PLATE PLACEMENT
OTHERS

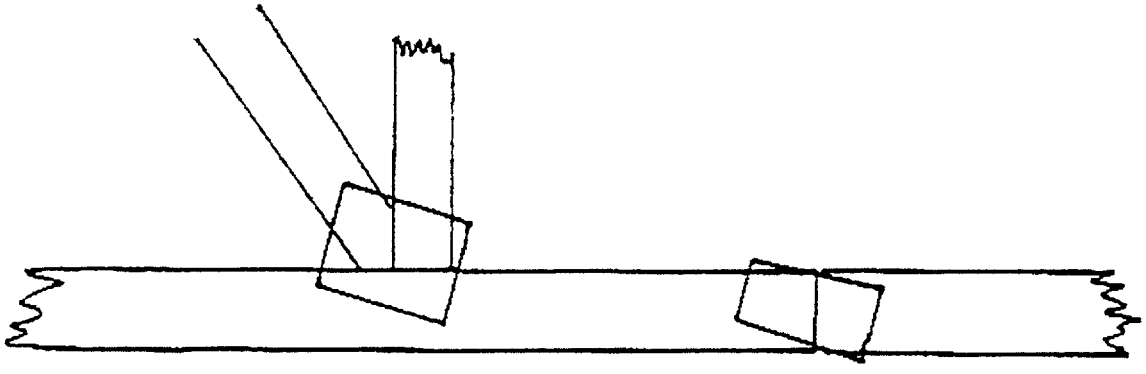
Rolled or Crinkled Plates



Plates not firm to within 1/16



Cocked Plates



MARKING TRUSSES

The cop of the top chord of the first truss of each bundle of roof trusses should be marked with the order number and T-type done by the crew leader.

The side (1 ½" face) of the top chord or bottom chord of the first bundle of floor trusses should be marked in the duct opening with the order number and T-type.

Each bundle should be clearly marked by yard person upon strapping in large numbers with order number and T-type on the 3 ½" face. The T-type needs to be marked on each truss opposite white tag side of the truss (1 ½ face) this is to be done by the yard personnel.

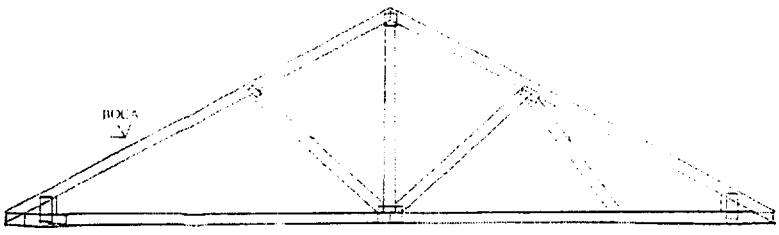
STAMPING TRUSSES

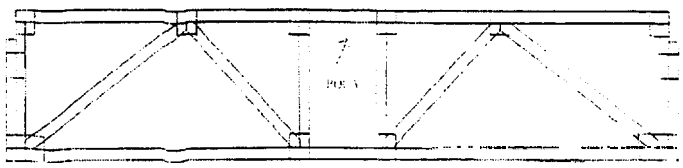
Every truss must be stamped with a current **BOCA** code stamp. Suggested stamp locations:

1) Roof trusses- on the wide face of the top chord, between joint 1 and joint

2) Floor trusses- in the duct opening on the bottom of the top chord.

SEE B.O.C.A.
RESEARCH REPORT
#8693





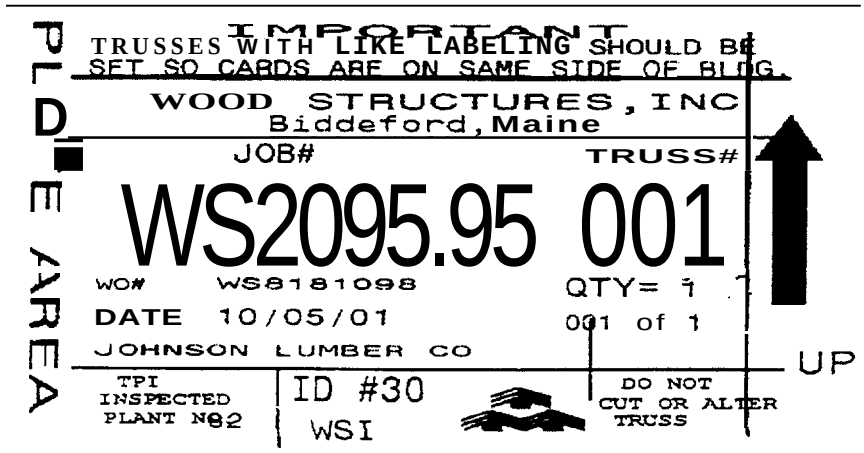
MARKING AND TAGGING

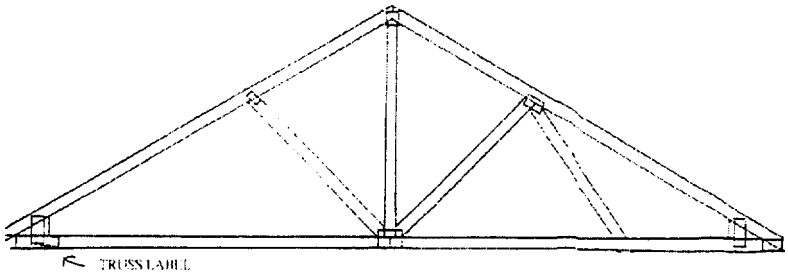
1) WHITE TAGS

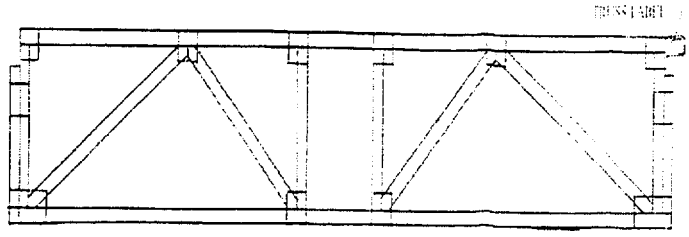
Every truss produced at Wood Structures shall have a white "up" tag. On roof trusses this tag will be located at joint one. On floor trusses this tag will be located at the end of the trusses, which will show the T-number and the up arrow.

Information on the white tag:

a. Order number and T-number
b. Ship date
c. Truss count i.e. truss #13 (of 20)
d. Customer name
e. Crew leaders employee number on the back of the tag







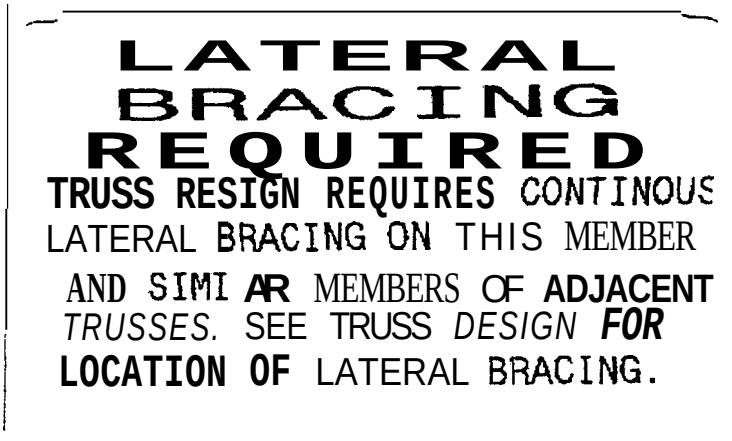
LATERAL BRACING REQUIRED TAGS

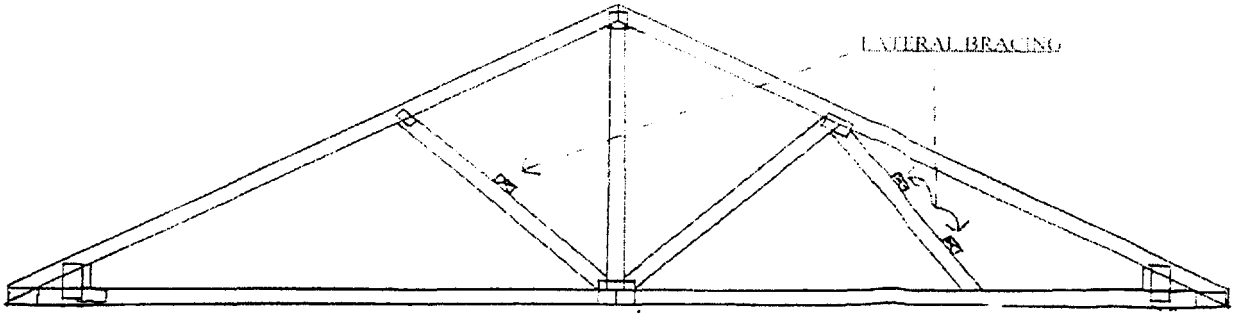
Red lateral bracing tags must be used at the approximate midpoint (One tag per web required) on 3rd points (2 tags per web required) of all webs, which have the lateral bracing symbol in the shop order.

On large truss runs, it is required that we put tags on every fourth truss. If there is an order of five trusses, then lateral bracing is required be put on four of the five trusses. Orders of four or less trusses require each truss to be tagged. Stock orders that require lateral-bracing tags needs to have a tag on each truss.

Symbol for Lateral Bracing:

Note: Lateral bracing appears on interior of truss only

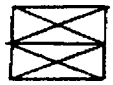




BEARING LOCATION TAGS

Red bearing locatioii tags must be used at every bearing location whenever a truss has bearing locations other than the outside joints or has more than 2 bearing locations. In the cases that bearing tags are require, a tag wi[l]l be applied to each joint that requires the tag and all trusses in the order will have the tags applied.

The symbol for Bearing Location is:

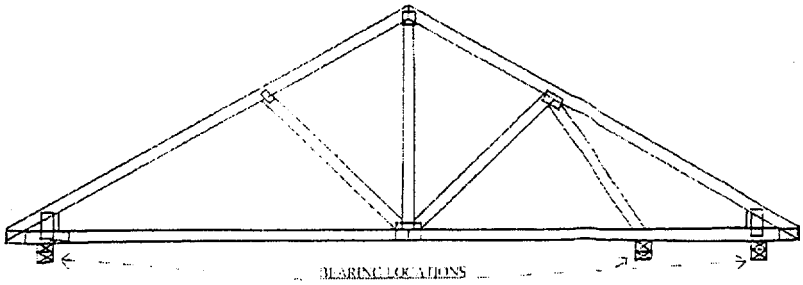


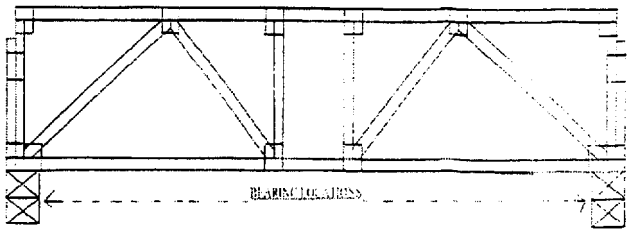
Located on the exterior of the truss.

BEARING LOCATION

FOR THIS AND ALL

SIMILAR TRUSSES



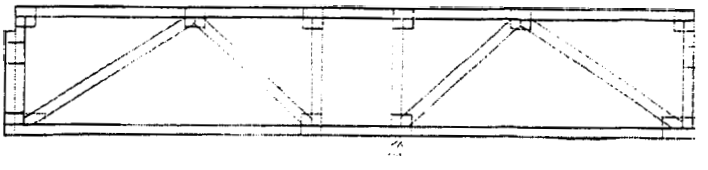


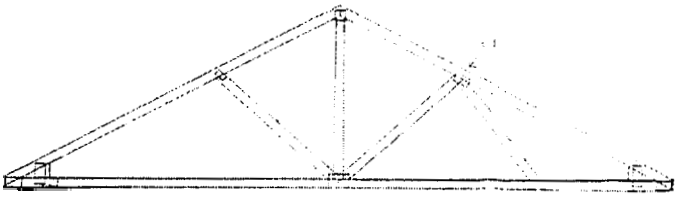
DESIGNED FOR CONCENTRATED LOAD TAGS

Red concentrated load tags must be used at the joint where the additional load will be applied. In the case that a concentrated load tag is required, a tag will be applied to each joint that requires the tag and all trusses in the order will have the tags applied.

The Symbol for Concentrated Load is: C/L

DESIGNED FOR CONCENTRATED LOAD AT THIS JOINT

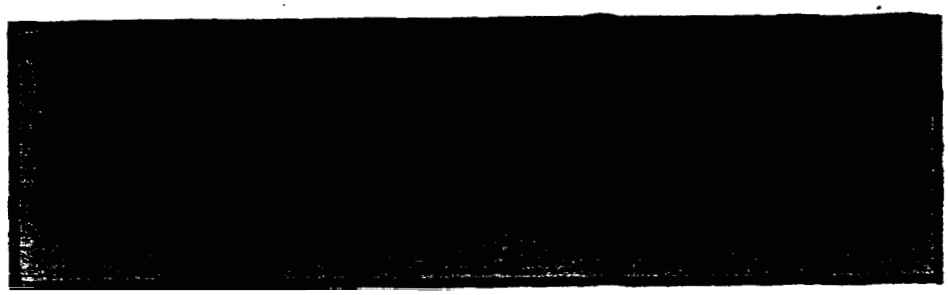




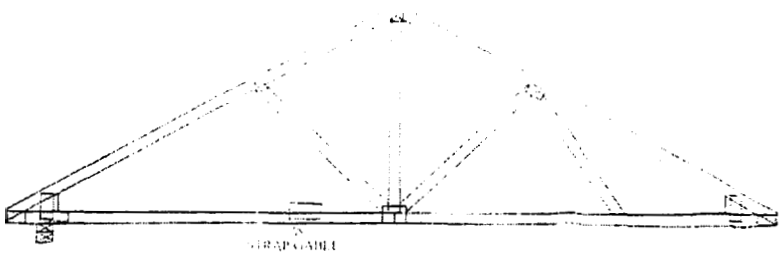
*Note: In the case of multi ply girder trusses, tags should be applied so that each girder truss is clearly tagged with all called for tags on the first truss of the order. All tags in the order should be applied with a 1.5x4 plate so that it is unlikely that the tag will be removed because of handling of the trusses.

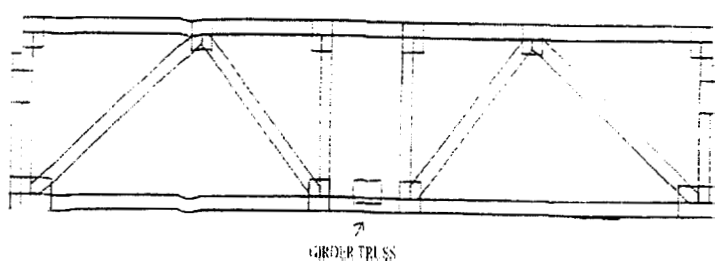
GIRDER TRUSS

Orange girder truss tags must be applied so that each completed multi-ply truss or single ply truss has a girder truss tag i.e. The tags should be applied in the center of the truss with a 1.5x4 plate on the first truss of the order.



A yellow-strapped gable tag must be applied to each truss that requires strapping to be added to the front ofthe truss. The tag should be applied to each truss that requires strapping; the tag should be applied with a 1.5x4 plate.





GLOSSARY

ALIGNMENT: Uniformity of chords, webs (all members), in a truss bundle.

BEAM POCKET: An opening (other than the duct opening) designed into a floor truss for the purpose of supporting concentrated loads created by headers tying in at the location.

BEARING **A** structural support, usually a wall, which occurs at tlie top or bottom chord or between the end points of a roof or floor truss.

BOCA: Building Officials Council of America.

BOTTOM CHORD: **A** horizontal or inclined member (e.g. scissor truss) that establishes the lower edge of a truss, usually carrying combined tension and bending stresses.

BUTT CUT: Slight vertical cut at outside edge of truss bottom chord made to insure uniform nominal span and tight-joints. Usually ¼ inch.

CAMBER: An upward vertical displacement built into a truss bottom chord to compensate for deflection due to dead load.

CANTILEVER: The part of the bottom chord of the truss that extents beyond its support, exclusive of overhangs.

CLEAR SPAN: Horizontal distance between interior edges of supports.

CONCENTRATEDLOAD: Superimposed load centered at given point; e.g. roof mounted air conditioners.

CRACK: **A** defect or opening which is generally diagonally positioned as opposed to a split, which is more longitudinal.

CROWN: **A** slight deflection on the narrow face from the centerline of a piece of lumber (important that trusses are cut and built with the TC and BC crown up).

DEAD LOAD: Any permanent load such as tlie weight of the truss itself, purling, sheathing, roofing, and ceiling.

DEFLECTION: Downward vertical movement of a truss (when in place) due to dead and live loads.

DUAL PITCH TRUSS: A truss that has two different top chord pitches.

DUCT OPENING: An open panel in a floor truss for the purpose of running utilities through, such as heating and air conditioning ducts.

ENGINEERED TRUSS DESIGN: trusses designs where loading requirements, lumber species, sizes, grades, and plate requirements are detailed.

FASCIA: Trim board applied to ends of overhangs.

GABLE ENDS: nailing or plating has affixed Trusses to which exterior or interior studs so that sheathing can be added.

JACKS: Small mono-type trusses used on corners and perimeters.

JIG STOPS: Mechanical stops used on various truss manufacturing machines to hold wood in place.

GRADE MARKINGS: Markings, which are stamped on lumber, indicating the visual or machine grading for strength and quality purposes.

HEEL: Point on truss at which the top and bottom chords intersect.

HIP TRUSS: **A** truss with a flat top and one or more sloping sides.

IDENTIFICATION: Markings in saw area to identify production order # and component.

JOINT: Points in a truss where two or more distinct pieces connect.

JOINT TIGHTNESS: Good wood-to-wood contact. Openness of no more than 1/8"

LATERAL BRACE: **A** member placed and connected at right angles to a chord or web member of a truss.

LEVEL RETURN: Lumber placed Iiorizontally from the end of an overhang to the outside wall, to form a soffit or a horizontal cut on the bottom side of the top chord overhang.

LIVE LOAD: Any loading, which is not of permanent nature, such as snow, wind, and temporary construction loads.

OPENNESS: A truss joint where only partial wood-to-wood contact exists.

OPEN JOINT: A joint where no wood-to-wood contact exists.

OVERALL TRUSS HEIGTH: Vertical distance from bottom-most part of the truss to tlie uppermost point ofthe peak.

OVERHANG: The extension of tlie top chord of a truss beyond the end of the bottom chord.

OVERPLATING: Use of a plate larger than called for by the design.

PANEL: The chord segment defined by two adjacent joints.

PANEL LENGTH: The centerline distance between joints measured horizontally along the chords.

PANEL POINT: The point of intersection where a web (or webs) meets a chord.

PEAK: Point on truss where the sloped top chords meet.

Pitch: Inches of vertical rise for each twelve inches of horizontal run.

PLATE GUAGE: The gauge, or thickness, of metal used in the plate.

PLATE GAP: The condition that exists when a plate is not fully seated into the wood, and there is no solid wood-to-plate contact (generally 1/16" is tlie largest allowable plate gap).

PLATE PLACEMENT: The position or orientation of a plate on a joint, as described in the plot.

PLOT: The design drawing showing all connector plates, sizes, plate locations, grade and species of lumber.

PLUMB CUT: Top chord end cut to provide for vertical (plumb) installation of fascia.

RIBBON BLOCKS: The end post of a floor truss designed to carry the dimensional lumber that extends around the perimeter of the building to support floor sheathing and exterior wall framing.

SCAKF: The saw cut at the point of connection of truss members, usually referring to the cut of the bottom chord.

SHEAR PLATE: Located directly over bearing (required for high compression conditions)

SHOP ORDER: All required information for fabrication of trusses, including cutting, plating, and quantity.

SLIDER: **A** supplemental chord, which gives continuity to heel, joints where the top and bottom chords do not touch or where a cantilever situation exists.

SPAN: The out to out measurement ofthe bearing wall.

SPECIAL DETAIL: Unusual conditions requiring special attention by shop personnel.

SPLICE POINT: The point at which two chord ineinbers are joined together to form a single member. It may occur at a panel point or between panel points.

SPLIT: A longitudinal opening running with the grain, which inay cause weakness in the member.

SQUARE CUT: The end of top chord is cut perpendicular to the slope of member.

SYMMETRICAL TRUSS: Truss with the same configuration of members occurring on each side of truss centerline.

TOP CHORD: An inclined or horizontal member that establishes the upper edge of a truss.

Truss: An engineered, pre-built structural component, assembled from wood members and metal connector plates, and designed to carry superimposed dead and live loads. The truss members form a rigid, plane, structural component, and are usually assembled such that the inembers forin triangles.

TPI: Truss Plate Institute.

WANE: **A** condition existing in lumber, usually cut from the outside of the log, which creates a round edge. May be large enough to be rejected.

WARP: **A** permanent bends or twist in a piece of lumber, which may render it unusable for truss purposes.

WEBS: Members that join the top and bottom chords to form the triangular patterns that give truss actions. usually carrying tension or compression stresses.

WEDGES: Triangular shaped pieces of wood used in various configurations to strengthen bearing areas.

WTCA: Wood Truss Council of America.

End of Report