

APPENDIX F

Sheet Pile Material

*Mr. Johnston
No Interlock strength
test For any Z
pile. See
Below*

SKYLINE STEEL CORPORATION

SHEET PILING • H PILES • PIPE PILING • STRUCTURALS
P.O. Box # 208, St-Bruno, Qc Can. J3V 4P9

Tel: (450) 461-6366
Fax: (450) 461-6342

Denis Guimond
Eng. / Product mgr

<<<< **TELEFAX** >>>>

Firm: AMERICAN BRIDGE

Ref: Interlock tension

Attn: Louis B. Wehar P.E.

Date: Oct. 10, 2001

**REF: FLORIDA AVENUE BRIDGE REPAIRS
SUPPLY OF STEEL SHEET PILING**

We understand that the specification for steel sheet piling requires interlock tension tests for both "Z" piles and Flat web Piles.

Interlock tension tests are not performed on "Z" piles. None of the Sheet Piling Mills will publish or offer interlock tension for piles other than Flat Web piles. "Z" piles are generally submitted to bending forces and as a result, no interlock tension is required by design.

On the portion of this project calling for a "Z" section, we shall propose to ignore the interlock tension test requirement of the specification.

The Flat Web piles are used in circular cells where interlock tension becomes a design requirement. We shall offer interlock tension tests for the flat web piles only.

Best regards

NOV. 13. 2001 3:29PM

SKYLINE STEEL/VA

NUCOR-YAMATO STEEL CO.
P.O. BOX 1228 • BLYTHEVILLE, AR 72316

NO. 3290 P. 2

CERTIFIED MILL TEST REPORT
100% MELTED AND MANUFACTURED IN U.S.A.

All shapes produced by Nucor-Yamato Steel are cast and rolled to a fully killed and fine grain practice.

DATE	10/11/01
INVOICE NO.	677912
NO. OF LADING	545009
CUSTOMER NO.	4046
CUSTOMER P.O.	17518

SHIP SKYLINE STEEL

5610 G SANDY LEWIS DRIVE
FAIRFAX, VA

22032-0000

SPECIFICATIONS

GRADE: ASTM A572GR50-00
GRADE: ASTM A709-00A GR50

SOLD TO

SKYLINE STEEL

5610 G SANDY LEWIS DRIVE
FAIRFAX, VA

22032-0000

MECHANICAL PROPERTIES										CHEMICAL PROPERTIES												
ITEM #	ITEM DESCRIPTION	QTY	HEAT #	YIELD TO TENSILE RATIO	YIELD STRENGTH	TENSILE STRENGTH	ELONG	CHARPY IMPACT		C	Mn	P	S	Si	Cu	Ni	Cr	Mo	V	Cb	CE	
					PSI	PSI	%	TEMP	IMPACT ENERGY									Sn	Pcm	CI		
					MPa	MPa	%	°C	FT-LBS									Joules				
1	P2X22- 40.3 32' P2558x 59.9 9.754 H	4	176159	.81 .84	56000 59000	69000 70000	26 24			.05	72	.010	.035	.21	.32	.10	.06	.02 .01	.00 .12	.015	.22	
2	P2X22- 40.3 32' P2558x 59.9 9.754 H	4	176180	.83 .86	59000 60000	71000 70000	23 25			.04	71	.012	.036	.22	.33	.10	.05	.02 .01	.00 .11	.015	.20	

Formula: $C = \frac{Si}{30} + \frac{Mn}{30} + \frac{Cu}{20} + \frac{Ni}{60} + \frac{Cr}{50} + \frac{Mo}{15} + \frac{V}{10} + \frac{Nb}{10} + \frac{Ti}{10}$ 588 Approx. 2003 CARBON EQUIVALENT: $CE = CE(EN) = C + Mn/6 + (Cr+Mo+V)/5 + (Ni + Cu)/15$

Corrosion Index: $CI = 28.0[(\%Cu) + 3.00(\%Ni)] + 1.20(\%Cr) + 1.40(\%Mo) + 17.20(\%P) + 7.20(\%Cu)(\%Ni) + 2.10(\%Mn)(\%P) + 31.30(\%C)$

ELONGATION BASED ON 8.00 INCH GAUGE LENGTH

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

QUALITY ASSURANCE
CUSTOMER COPY

STATE OF ARKANSAS COUNTY OF MISSISSIPPI
SWORN TO AND SUBSCRIBED BEFORE ME THIS
11 Day of 10/01

Charlene Wallis NOTARY PUBLIC
MY COMMISSION EXPIRES 10/21/2003

NOV. 13. 2001 3:30PM

SKYLINE STEEL/VA

NUCOR YAMATO STEEL CO.

P.O. BOX 1228 • BLYTHEVILLE, AR 72316

NO. 3296 P. 4
CERTIFIED MILL TEST REPORT
100% MELTED AND MANUFACTURED IN U.S.A.All shapes produced by Nucor-Yamato Steel are cast
and rolled to a fully killed and fine grain practice.

DATE	11/01/01
INVOICE NO.	601250
NO. OF LADING	548501
CUSTOMER NO.	4046
CUSTOMER P.O.	17518

SHIP TO

SKYLINE STEEL

5610 D SANDY LEWIS DRIVE
FAIRFAX, VA

22032-0000

SPECIFICATIONS

GRADE: ASTM A572GR50-00
GRADE: ASTM A709-00A GR50

SOLD TO

SKYLINE STEEL

5610 D SANDY LEWIS DRIVE
FAIRFAX, VA

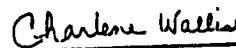
22032-0000

				MECHANICAL PROPERTIES							CHEMICAL PROPERTIES													
ITEM #	ITEM DESCRIPTION	QTY	HEAT #	YIELD TO TENSILE RATIO	YIELD STRENGTH	TENSILE STRENGTH	ELONG	CHARPY IMPACT		C	N	P	S	Si	Cu	Ni	Cr	Mo	V	Cb	CE			
					PSI	PSI	%	TEMP	IMPACT ENERGY															
					MPa	MPa	%	°F	FT-LBS															
																		Sn	Pcm		Cl			
1	PZX22- 40.3 32'	1	176157	.85	62000	73000	23			.05	.74	.013	.035	.20	.47	.11	.07	.02	.06	.016	.23			
	PZ558x 59.9 9.754 H			.84	61000	73000	23											.01	.12					
2	PZX22- 40.3 32'	6	176159	.81	56000	67000	26			.05	.72	.010	.035	.21	.32	.10	.06	.02	.09	.015	.22			
	PZ558x 59.9 9.754 H			.84	59000	70000	24											.01	.12					
3	PZX22- 40.3 32'	23	176162	.82	58000	71000	26			.04	.72	.012	.035	.18	.29	.11	.06	.03	.00	.014	.21			
	PZ558x 59.9 9.754 H			.81	56000	69000	28											.01	.10					
4	PZX22- 40.3 32'	2	176172	.82	56000	68000	22			.04	.74	.014	.038	.17	.28	.10	.07	.02	.00	.013	.21			
	PZ558x 59.9 9.754 H			.82	54000	66000	24											.01	.10					
					386	469	22																	
					372	455	24																	

$$W = C + \frac{Mn}{10} + \frac{Mo}{10} + \frac{Cu}{10} + \frac{Ni}{10} + \frac{Cr}{10} + \frac{Nb}{10} + \frac{V}{10} + \frac{Ti}{10} + \frac{Al}{10} + \frac{Si}{10} + \frac{P}{10} + \frac{S}{10} + \frac{Fe}{10}$$

ELONGATION BASED ON 8.00 INCH GAUGE LENGTH

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QUALITY ASSURANCE
CUSTOMER COPYSTATE OF ARKANSAS COUNTY OF MISSISSIPPI
SWORN TO AND SUBSCRIBED BEFORE ME THIS
1 Day of 11/01
 NOTARY PUBLIC
MY COMMISSION EXPIRES 10/21/2003

NOV. 13. 2001 3:30PM

SKYLINE STEEL/VA

NUCOR YAMATO STEEL CO.

P.O. BOX 1228 • BLYTHEVILLE, AR 72316

NO. 3296
CERTIFIED MILL TEST REPORT
100% MELTED AND MANUFACTURED IN U.S.A.

All shapes produced by Nucor-Yamato Steel are cast and rolled to a fully killed and fine grain practice.

DATE	11/05/01
INVOICE NO.	683847
NO. OF LADING	548885
CUSTOMER NO.	4046
CUSTOMER PO.	17518

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SKYLINE STEEL

5610 B SANDY LEWIS DRIVE
FAIRFAX, VA

22032-0000

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GRADE: ASTM A572GR50-00

GRADE: ASTM A709-00A GR50

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SKYLINE STEEL

5610 B SANDY LEWIS DRIVE
FAIRFAX, VA

22032-0000

				MECHANICAL PROPERTIES					CHEMICAL PROPERTIES												
ITEM #	ITEM DESCRIPTION	QTY	HEAT #	YIELD TO TENSILE RATIO	YIELD STRENGTH	TENSILE STRENGTH	ELONG	CHARPY IMPACT		C	Mn	P	S	Si	Cu	Ni	Cr	Mo	V	Cb	CE
					PSI	PSI	%	TEMP	IMPACT ENERGY												
					MPa	MPa	%	°F	FT-LBS												
																		Sn	Pcm		CI
1	PZX22- 40.3 32' PZ558x 59.9 9.754 H	4	176157	.85 .84	62000 61000	73000 73000	23 23			.05	.74	.013	.035	.20	.47	.11	.07	.02 .01	.00 .12	.016	.23
2	PZX22- 40.3 32' PZ558x 59.9 9.754 H	8	176159	.81 .84	56000 59000	69000 70000	26 24			.05	.72	.010	.035	.21	.32	.10	.06	.02 .01	.00 .12	.015	.22
3	PZX22- 40.3 32' PZ558x 59.9 9.754 H	8	176162	.82 .81	58000 56000	71000 69000	26 28			.04	.72	.012	.035	.18	.29	.11	.06	.03 .01	.00 .10	.014	.21
4	PZX22- 40.3 32' PZ558x 59.9 9.754 H	4	176163	.83 .80	58000 57000	70000 71000	25 24			.05	.71	.013	.040	.20	.33	.10	.08	.02 .01	.00 .12	.015	.22
5	PZX22- 40.3 32' PZ558x 59.9 9.754 H	8	176172	.82 .82	56000 54000	68000 66000	22 24			.04	.74	.014	.038	.17	.28	.10	.07	.02 .01	.00 .10	.013	.21

Wt % C = $\frac{Si}{30} + \frac{Mn}{30} + \frac{Cu}{30} + \frac{Ni}{30} + \frac{Cr}{30} + \frac{Mo}{30} + \frac{V}{10} + .35B$ Approx. .0005 CARBON EQUIVALENT: $CE = C + Mn/6 + (Cr+Mo+V)/5 + (Ni+Cu)/10$

ELONGATION BASED ON 8.00 INCH GAUGE LENGTH

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QUALITY ASSURANCE
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STATE OF ARKANSAS COUNTY OF MISSISSIPPI
SWORN TO AND SUBSCRIBED BEFORE ME THIS

Day of 11/01

Charlene Wallis NOTARY PUBLIC
MY COMMISSION EXPIRES 10/21/2003

NOV. 13. 2001 3:31PM

SKYLINE STEEL/VA

NUCOR-YAMATO STEEL CO.

P.O. BOX 1228 • BLYTHEVILLE, AR 72316

NO. 3296 P. 5
CERTIFIED MILL TEST REPORT
100% MELTED AND MANUFACTURED IN U.S.A.All shapes produced by Nucor-Yamato Steel are cast
and rolled to a fully killed and fine grain practice.

DATE	11/01/01
INVOICE NO.	683249
BOOK OF LADING	548498
CUSTOMER NO.	4046
CUSTOMER PO.	17518

S H I P
T O
SKYLINE STEEL5610 D SANDY LEWIS DRIVE
FAIRFAX, VA

22032-0000

S P E C I F I C A T I O N S

GRADE: ASTM A572GR50-01
GRADE: ASTM A709-00A GR50S O L D
T O

SKYLINE STEEL

5610 D SANDY LEWIS DRIVE
FAIRFAX, VA

22032-0000

MECHANICAL PROPERTIES											CHEMICAL PROPERTIES												
ITEM #	ITEM DESCRIPTION	QTY	HEAT #	YIELD TO TENSILE RATIO	YIELD STRENGTH	TENSILE STRENGTH	ELONG	CHARPY IMPACT		C	Mn	P	S	Si	Cu	Ni	Cr	Mo	V	Cb	CE		
					PSI	PSI	%	TEMP	IMPACT ENERGY														
					MPa	MPa	%	°F	FT-LBS														
																		Sn	Pcm		CI		
1	PZX22- 40.3	14	176159	.81	56000	69000	26			.05		72	.010	.035	.21	.32	.10	.06	.02	.00	.015	.22	
	J2"			.84	59000	70000	24																
	PZ558x 59.9				386	476	26																
	9.754 H				407	483	24																
2	PZX22- 40.3	10	176162	.82	58000	71000	26			.04	72	.012	.035	.18	.29	.11	.06	.03	.00	.014	.21		
	J2"			.81	56000	69000	28																
	PZ558x 59.9				400	490	26																
	9.754 H				386	476	28																
3	PZX22- 40.3	8	176163	.83	58000	70000	25			.05	71	.013	.040	.20	.33	.10	.08	.02	.00	.015	.22		
	J2"			.80	57000	71000	24																
	PZ558x 59.9				400	483	23																
	9.754 H				393	490	24																

$$CE = \frac{C}{12} + \frac{Mn}{6} + \frac{Cr}{12} + \frac{Ni}{12} + \frac{Cu}{12} + \frac{Nb}{12} + \frac{V}{12} + \frac{Ti}{12} + \frac{Al}{12} + \frac{Si}{12} + \frac{P}{12} + \frac{S}{12} + \frac{B}{12} + \frac{As}{12} + \frac{Se}{12} + \frac{Te}{12} + \frac{Ge}{12} + \frac{Zn}{12} + \frac{Fe}{12} + \frac{Co}{12} + \frac{Ni}{12} + \frac{Cu}{12} + \frac{Nb}{12} + \frac{V}{12} + \frac{Ti}{12} + \frac{Al}{12} + \frac{Si}{12} + \frac{P}{12} + \frac{S}{12} + \frac{B}{12} + \frac{As}{12} + \frac{Se}{12} + \frac{Te}{12} + \frac{Ge}{12} + \frac{Zn}{12} + \frac{Fe}{12} + \frac{Co}{12}$$

$$C = 0.25 + 0.008(Cu) + 0.008(Nb) + 0.008(Ni) + 0.008(Cr) + 0.008(Mn) + 0.008(P) + 0.008(S) + 0.008(B) + 0.008(As) + 0.008(Se) + 0.008(Te) + 0.008(Ge) + 0.008(Zn) + 0.008(Fe) + 0.008(Co) + 0.008(Ni) + 0.008(Cu) + 0.008(Nb) + 0.008(V) + 0.008(Ti) + 0.008(Al) + 0.008(Si) + 0.008(P) + 0.008(S) + 0.008(B) + 0.008(As) + 0.008(Se) + 0.008(Te) + 0.008(Ge) + 0.008(Zn) + 0.008(Fe) + 0.008(Co)$$

ELONGATION BASED ON 8.00 INCH GAUGE LENGTH

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STATE OF ARKANSAS COUNTY OF MISSISSIPPI
SWORN TO AND SUBSCRIBED BEFORE ME THIS

1 Day of 11/01

Charlene Wallis

NOTARY PUBLIC

MY COMMISSION EXPIRES 10/21/2003

NOV. 13. 2001 3:31PM

SKYLINE STEEL/VA
NUCOR-YAMATO STEEL CO.
 P.O. BOX 1228 • BLYTHEVILLE, AR 72318

CERTIFIED NO. 3296 **TEMP. REPORT**
 100% MELTED AND MANUFACTURED IN U.S.A.

All shapes produced by Nucor-Yamato Steel are cast and rolled to a fully killed and fine grain practice.

DATE	11/01/01
INVOICE NO	683248
OF LADING	348176
CUSTOMER NO.	4046
CUSTOMER PO.	17518

SHIP TO
SKYLINE STEEL
 5610 B SANDY LEWIS DRIVE
 FAIRFAX, VA 22032-0000

SPECIFICATIONS
 GRADE: ASTM A572GR50-00
 GRADE: ASTM A709-00A GR50

SOLD TO
SKYLINE STEEL
 5610 B SANDY LEWIS DRIVE
 FAIRFAX, VA 22032-0000

MECHANICAL PROPERTIES										CHEMICAL PROPERTIES												
ITEM #	ITEM DESCRIPTION	QTY	HEAT #	YIELD TO TENSILE RATIO	YIELD STRENGTH	TENSILE STRENGTH	ELONG	CHARPY IMPACT		C	Mn	P	S	Si	Cu	Ni	Cr	Mo	V	Cb	CE	
					PSI	PSI	%	TEMP	IMPACT ENERGY													
					MPa	MPa	%	°F	FT - LBS													
																			Sn	Pcm		CI
1	PZX22- 40.3 32'	15	176162	.82	58000	71000	26			.04	72	.012	.035	.18	.29	.11	.06	.03	.00	.014	.21	
	P2558x 59.9 9.754 H			.81	56000	69000	20											.01	.10			
					400	490	26															
					386	476	28															
2	PZX22- 40.3 32'	14	176163	.83	58000	70000	25			.05	71	.012	.040	.20	.33	.10	.08	.02	.00	.015	.22	
	P2558x 59.9 9.754 H			.80	57000	71000	24											.01	.12			
					400	483	25															
					393	490	24															
3	PZX22- 40.3 32'	3	176165	.84	56000	67000	23			.05	75	.011	.036	.21	.30	.09	.07	.02	.00	.016	.23	
	P2558x 59.9 9.754 H			.84	63000	75000	24											.01	.12			
					386	462	23															
					434	517	24															

Formula: $CE = \frac{C}{100} + \frac{Mn}{15} + \frac{Cr}{20} + \frac{Ni}{60} + \frac{Cu}{100} + \frac{Nb}{100} + \frac{V}{100} + \frac{Ti}{100}$
 ELONGATION BASED ON 8.00 INCH GAUGE LENGTH

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

Greg Lennell
 QUALITY ASSURANCE
 CUSTOMER COPY

STATE OF ARKANSAS COUNTY OF MISSISSIPPI
 SWORN TO AND SUBSCRIBED BEFORE ME THIS
 1 Day of 11/01

Charlene Wallis NOTARY PUBLIC
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