

CITY OF O'FALLON
Winghaven
Saint Charles County

Bridge No. 3210014

Design Calculations

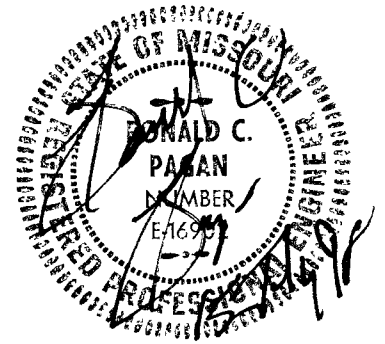
KDG Project No. 980100-0001

CITY OF O'FALLON
Bridge No. 3210014
Design Calculations
Winghaven
KdG Project No. 980100-0001

INDEX

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2. Design Scope
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10. Quantities
11. Specifications

CITY OF O'FALLON
Bridge No. 3210014
Design Calculations
Winghaven
KdG Project No. 980100-0001



ENGINEERING CALCULATION COVER SHEET

PROJECT: Bridge No. 3210014 DISCIPLINE: Bridge
Winghaven CALCULATION NO.: Final
_____ NO. OF SHEETS: See Index
JOB NO.: 980100-0001 CALCULATED BY: JVS RCP
CONTRACT NO.: _____ CHECKED BY: [Signature] 15 July 98
DESIGN CODE: AASHTO 1996 APPROVED BY: _____
_____ APPROVED BY: _____

CALCULATION DESCRIPTION: _____

Substructure Design
Quantities

DESIGN BASIS OR REFERENCES: _____

AASHTO 16th Edition, 1996
Missouri Highway & Transportation Department Bridge Manual of Design

CITY OF O'FALLON
Bridge No. 3210012
Design Calculations
Winghaven
KdG Project No. 980100-0001

DESIGN SCOPE

Structure Type Rigid
Box Design
Single Cell
(10.0 Ft. Wide X 7.0 Ft. High)

Loading:
HS20-44
Service Load Design
Earth 120#/Cu. Ft.
Equivalent Fluid Pressure 45#/Cu.Ft.

DESIGN CRITERIA

DESIGN SPECIFICATIONS

AASHTO - 1996 Sixteenth Edition

DESIGN LOADING

HS20
Earth 120#/cu.ft.
Equivalent Fluid Pressure 45#/Cu.Ft.

DESIGN UNIT STRESSES

Class B Concrete (Culverts)	$f'c = 3,000$ psi
Reinforcing Steel (Grade 60)	$f'y = 60,000$ psi

REINFORCING STEEL

Minimum clearance to reinforcing steel shall be 1-1/2", unless otherwise shown.

BAR COVER - AASHTO 8.22

Clear Dimensions to be shown on plans:

Top Slab	- Top Reinforcing	= 2" clear
	- Bottom Reinforcing	= 1-1/2" clear
Bottom Slab	- Top Reinforcing	= 1-1/2" clear
	- Bottom Reinforcing	= 3" clear
Sidewalls	- Reinforcement Stream Face	= 1-1/2" clear
	- Reinforcement Fill Face	= 2" clear

MAXIMUM BAR LENGTHS

Longitudinal bars should be made full length without splicing up to about 40'-0"; splice if longer.
Bars #5 and larger may be used to a length of 60'-0" without splicing.

BAR SPLICES

See Section 2.4 for minimum bar lap and tension splices in reinforcement. Use a Class C splice for longitudinal bar (22" min.).

JOINT FILLER

All joint filler shall meet requirements of Standard Specification 1057.2.5, except as noted.

CITY OF O'FALLON
Bridge No. 3210014
Design Calculations
Winghaven
KdG Project No. 980100-0001

DRAWING LIST

Sheet No.	Title
1	Plan, Elevation, General Notes, and Quantities
2	Reinforcement
3	Cross Section and Wing Wall Details
4	Fence Details

DESIGN LAYOUT

Division of Bridges

No. 3210014
Job. _____

Route Winghaven Drive County Saint Charles Rte. Winghaven Drive

STRUCTURE

SUPERSTRUCTURE Four Cell (12.0W x 10.0H) (Rigid)

Skew Square
Roadway..... 2 - 12 foot lanes each direction with a 20 foot median.
Loading HS20
Beg. Sta.
Alignment Tangent
Grade..... P.I. Sta. 60+49.26 (Elev. 516.66) Bk. -6.00%, Ahd. +6.00%, Length = 1080.00

SUBSTRUCTURE

Ftg Loads..... 3,000 lbs per square foot
Pile Type N/A
Length N/A
Elev Ftg, Bott. 517.0 High 516.50 Low

GENERAL

Revetment/Slope Sideslope 3:1 (Normal)
End Fills..... Earth
Traffic Handling
Present Bridge None

SPECIAL REQUIREMENTS

Profile Grade Centerline of Winghaven Drive (Centerline Median)
Rail Road Alignment N/A
Tie Station..... 59 + 00
Final Allowable Clearances N.A.

Estimate includes 10% for Engineering and Contingencies and 5% for Preliminary Engineering

Dated: By: Estm. \$

Date: <hr/> Initials:	Notes or Revisions in Conference
--------------------------	----------------------------------

Notes and Revisions after Conference (All revisions to be dated and initialed)

CORRESPONDENCE

PICKETT RAY & SILVER

CIVIL ENGINEERS

PLANNERS

LAND SURVEYORS

KDG, MH FILE

980100

July 14, 1998

Revised July 15, 1998

JUL 15 1998

Mr. Ron Pagan
Kuhlmann Design Group, Inc.
66 Progress Parkway
St. Louis Missouri 63043

RE WINGHAVEN - BOX CULVERT
PR&S PROJECT NO 97-034

Dear Ron

Per our meeting today, I am sending you "sealed" confirmation of box culvert information.

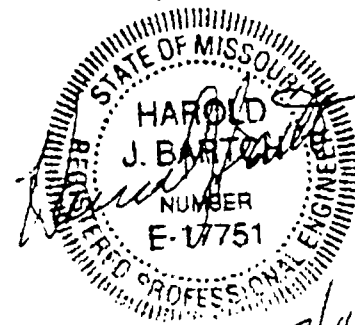
	"S"	"H"	Elev 1	Elev 2	A Rt	A Lt	B	Des-Fill	Des-Fill
Winghaven Station 17+15	10	7	575.42	574.58	60	60	<u>24</u>	1	4
Winghaven Station 30+49	10	7							
Winghaven Station 59+00	12	10	516.39	517.11	70	70	<u>30</u>	1	5
Charlie (Phoenix) Station 62+53.89	12	12	488.91	490.09	43	43	37	1	4
David (Red Hawk) Station 5-29 73	8	7	511.20	510.45	60	60	30	1	7

We will send Winghaven Station 30+49 as soon as the street is revised back to the previous grade. If you need anything else, please contact me or Mr. Jim Cannady.

Very truly yours,
PICKETT, RAY & SILVER, INC.

Tanya J. Dietz
Tanya J. Dietz
Project Design Supervisor

bjs
cc Mr. Joe McKee, Parc Corporation
Mr. Dave Rogers, Fred Weber



7/14/98

PICKETT RAY & SILVER

CIVIL ENGINEERS

PLANNERS

LAND SURVEYORS



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PLEASE DELIVER THE FOLLOWING PAGES:

TO:

Ron

FROM:

Jany

PROJECT:

Winghaven

FR&S PROJECT NO.:

97034

DATE AND TIME:

7/14/98

TOTAL NO. OF PAGES, INCLUDING COVER SHEET:

22

TELECOPY OPERATOR:

15

PLEASE NOTIFY US IMMEDIATELY IF THE MESSAGE IS INCOMPLETE OR UNCLEAR. THANK YOU.

PICKETT RAY & SILVER

CIVIL ENGINEERS

PLANNERS

LAND SURVEYORS

July 14, 1998

KDG, MH FILE 980100

JUL 15 1998

Mr. Ron Papan
 Kuhlmann Design Group, Inc
 60 Progress Parkway
 St. Louis, Missouri 63043

RE WINGHAVEN - BOX CULVERT
 PRA'S PROJECT NO 97-034

Dear Ron:

Per our meeting today, I am sending you "sealed" confirmation of box culvert information

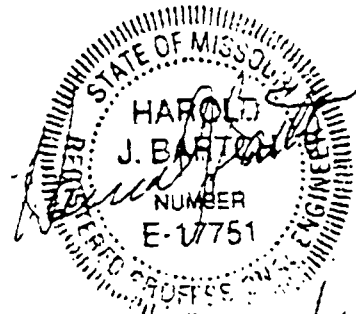
	"S"	"H"	Elev 1	Elev 2	A Rt	A Lt	B	Des-Fill	Des-Fill
Winghaven Station 12+49	10	7	575.42	574.58	60	60		1	4
Winghaven Station 11+49	10	7							
Winghaven Station 14+49	12	10	516.39	517.11	70	70		1	5
Charlie (Phoenix) Station 62-53.89	12	12	488.91	490.09	43	43	37	1	4
David (Red Hawk) Station 5+24.73	8	7	511.20	510.45	60	60	30	1	7

We will send Winghaven Station 30+49 as soon as the street is revised back to the previous grade. If you need anything else, please contact me or Mr. Jim Cannady

Very truly yours,
 PICKETT RAY & SILVER, INC.

Tanva J. Dietz
 Tanva J. Dietz
 Project Design Supervisor

bjs
 cc: Mr. Joe McKee, Panco Corporation
 Mr. Dave Rogers, Fred Weber



7/14/98

PICKETT RAY & SILVER

CIVIL ENGINEERS

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TO *Kon*

FROM *Jany*

PROJECT: *W. 2nd St. -*

PK&S PROJECT NO.: *9703A*

DATE AND TIME: *7.14.98*

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PICKETT RAY & SILVER

CIVIL ENGINEERS

PLANNERS

LAND SURVEYORS

July 14, 1998

Mr. Ron Pagan
Kuhlmann Design Group, Inc
66 Progress Parkway
St. Louis, Missouri 63043

ADD. MH FILE 980100

RE WINGHAVEN - BOX CULVERT
PR&S PROJECT NO 97-034

JUL 12 1998

Dear Ron

Per our meeting today, I am sending you "sealed" confirmation of box culvert information

	"S"	"H"	Elev 1	Elev 2	A Rt	A Lt	B	De	Dr
Winghaven Station 17+15	10	7	575.42	574.58	60	60			
Winghaven Station 30+49	10	7							
Winghaven Station 59+00	12	10	516.39	517.11	70	70			
Charlie (Phoenix) Station 62+53.89	12	12	488.91	490.09	43	43	37		
David (Red Hawk) Station 5+29.73	8	7	511.20	510.45	60	60	30		

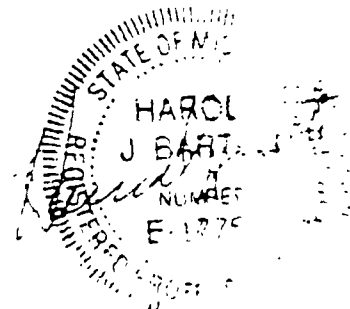
We will send Winghaven Station 30+49 as soon as the ~~sheet~~ is revised back to the previous ~~revision~~.
need anything else, please contact me or Mr. Jim Cannady.

Very truly yours,
PICKETT, RAY & SILVER, INC

Tanya J. Dietz
Tanya J. Dietz
Project Design Supervisor

bjs

cc: Mr. Joe McKee, Parc Corporation
Mr. Dave Rogers, Fred Weber



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Ron

FROM:

Jany

PROJECT:

Wingfield

PR&S PROJECT NO.:

97034

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7.14.98

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2

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PICKETT RAY & SILVER

CIVIL ENGINEERS

PLANNERS

LAND SURVEYORS



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PLEASE DELIVER THE FOLLOWING PAGES:

TO: **RON PAGAN** (434 8280)

FROM: **TANYA**

PROJECT: **WINGHAVEN**

PR&S PROJECT NO.: **97034**

DATE AND TIME: **7.10.94**

TOTAL NO. OF PAGES, INCLUDING COVER SHEET: **5**

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COPY TO MIKE HARMAN - WEBER 3440970

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Golf Course Structures

REINFORCEMENT

BAR COVER - AASHTO 8.22

CLEAR DIMENSIONS TO BE SHOWN ON PLANS:

- TOP SLAB - TOP REINFORCING = 2" CL. 2"
 - BOTTOM REINFORCING = ~~1" CL.~~ 2"
- BOTTOM - TOP REINFORCING = ~~1 1/2" CL.~~ 2"
 - BOTTOM REINFORCING = 3" CL.
- SIDEWALLS - REINFORCEMENT STREAM FACE = ~~1 1/2" CL.~~ 2"
 - REINFORCEMENT FILL FACE = 2" CL.

MAXIMUM BAR LENGTHS

LONGITUDINAL BARS SHOULD BE MADE FULL LENGTH WITHOUT SPLICING UP TO ABOUT 40'-0"; SPLICE IF LONGER. BARS #5 AND LARGER MAY BE USED TO A LENGTH OF 60'-0" WITHOUT SPLICING.

BAR SPLICES

SEE SECTION 2.4 FOR MINIMUM BAR LAP AND TENSION SPLICES IN REINFORCEMENT. USE A CLASS C SPLICE FOR LONGITUDINAL BAR (22" MIN.).

BOX CULVERTS ON ROCK

VERTICAL BARS IN THE WALLS SHALL SET ON ROCK. E1 & E2 BARS IN THE WING SHALL BE SET 12" INTO ROCK AND GROUTED (SEE SEC. 4 F1 FOR NOTE FOR PLANS).

REINFORCEMENT

BAR COVER - AASHTO 8.22

CLEAR DIMENSIONS TO BE SHOWN ON PLANS:

TOP SLAB - TOP REINFORCING = 2" CL.
BOTTOM REINFORCING = 1" CL.

BOTTOM - TOP REINFORCING = 1-1/2" CL.
BOTTOM REINFORCING = 3" CL.

SIDEWALLS - REINFORCEMENT STREAM FACE = 1-1/2" CL.
REINFORCEMENT FILL FACE = 2" CL.

1 1/2"

MAXIMUM BAR LENGTHS

LONGITUDINAL BARS SHOULD BE MADE FULL LENGTH WITHOUT SPLICING UP TO ABOUT 40'-0"; SPLICE IF LONGER. BARS #5 AND LARGER MAY BE USED TO A LENGTH OF 60'-0" WITHOUT SPLICING.

BAR SPLICES

SEE SECTION 2.4 FOR MINIMUM BAR LAP AND TENSION SPLICES IN REINFORCEMENT. USE A CLASS C SPLICE FOR LONGITUDINAL BAR (22" MIN.).

BOX CULVERTS ON ROCK

VERTICAL BARS IN THE WALLS SHALL SET ON ROCK. E1 & E2 BARS IN THE WING SHALL BE SET 12" INTO ROCK AND GROUTED (SEE SEC. 4 F1 FOR NOTE FOR PLANS).

GENERAL NOTES:

CONSTRUCTION SPECIFICATIONS:

All materials and methods of construction shall meet the requirements of MoDot Standard Specifications for Highway Construction 1996.

DESIGN SPECIFICATIONS:

A.A.S.H.T.O. - 1996
Service Load Design

DESIGN LOADING:

HS20
Earth 120#/Cu. Ft.,
Equivalent Fluid Pressure 30#/Cu Ft.

DESIGN UNIT STRESSES:

Class B Concrete (Substructure) $f'c = 3,000$ psi
Reinforcing Steel (Grade 60) $f_y = 60,000$ psi

JOINT FILLER:

All Joint Filler shall meet the requirements of Std. Spec. 1057.2.4, except as noted.

Joint filler shall be securely stitched to one face of the concrete with No. 10 gage copper wire or No. 12 gage soft drawn galvanized steel wire.

REINFORCING STEEL:

Minimum clearance to reinforcing steel shall be 1-1/2", unless otherwise shown.

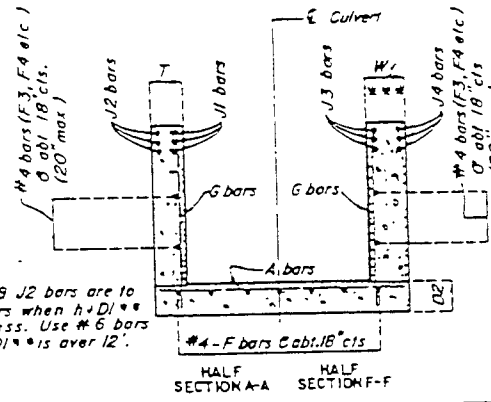
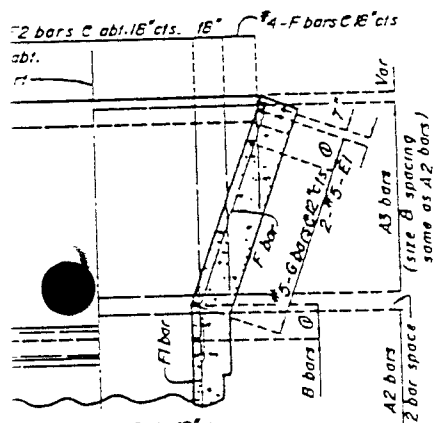
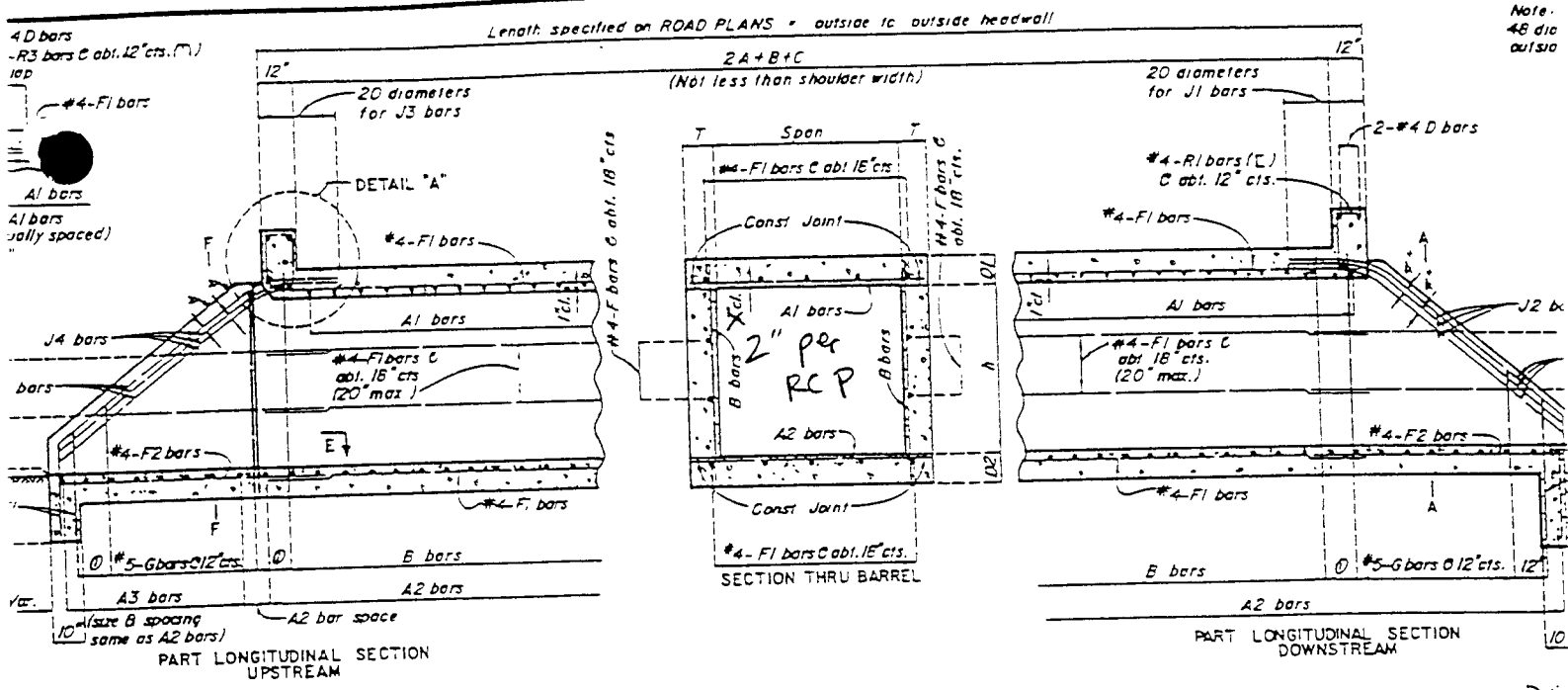
Lap all reinforcing 24 bar diameters unless otherwise noted.

ST. LOUIS

COUNTY

A100

Note:
48 dia
outside

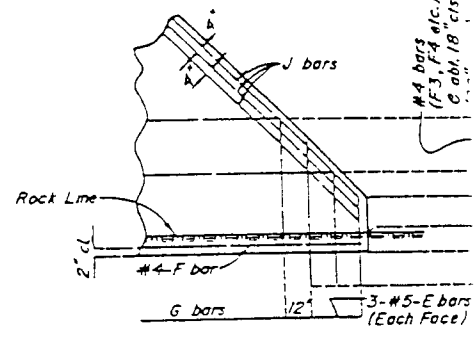


Note: J1 & J2 bars are to be #5 bars when h+D is 12 or less. Use #6 bars when h+D is over 12.

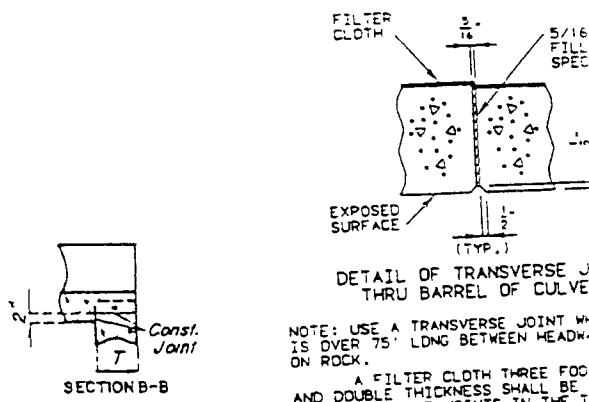
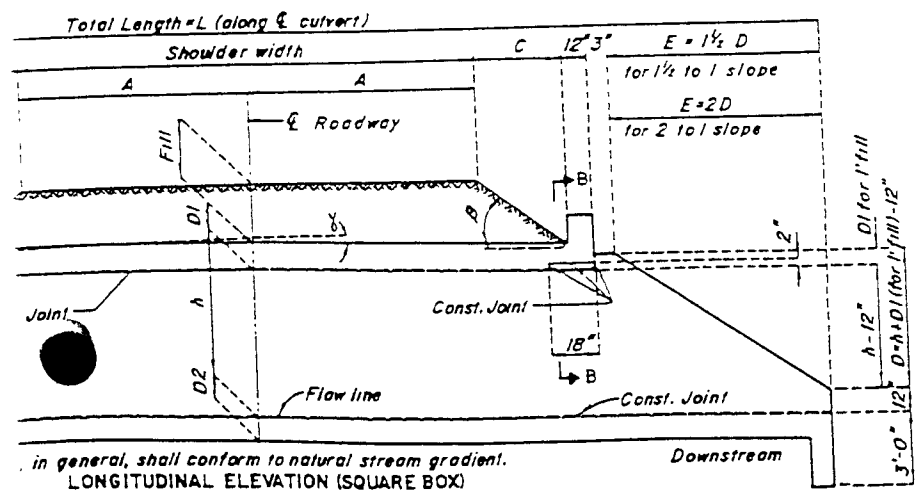
MINIMUM WING BEAM THICKNESS FOR FLARED WINGS

h + D	2:1 SLOPE				1 1/2:1 SLOPE					
	4	5	6	7	8	9	10	11	12	13
J3 & J4 bars	3-#5					3-#5	3-#6	3-#7		
*** h	6.5	6.5	6.5	6.5	6.5	10.0	10.5	11.0	12.0	14.0

*** h for 1' fill
*** Not less than T



Notes: Holes to be drilled 12" into solid rock and grouted in.
Omit bottom slab and carry full length and wings 6" into and cast against vertical solid undisturbed rock.
Details not shown are same as for box with slab.
MODIFICATIONS REQUIRED FOR BOX ON F



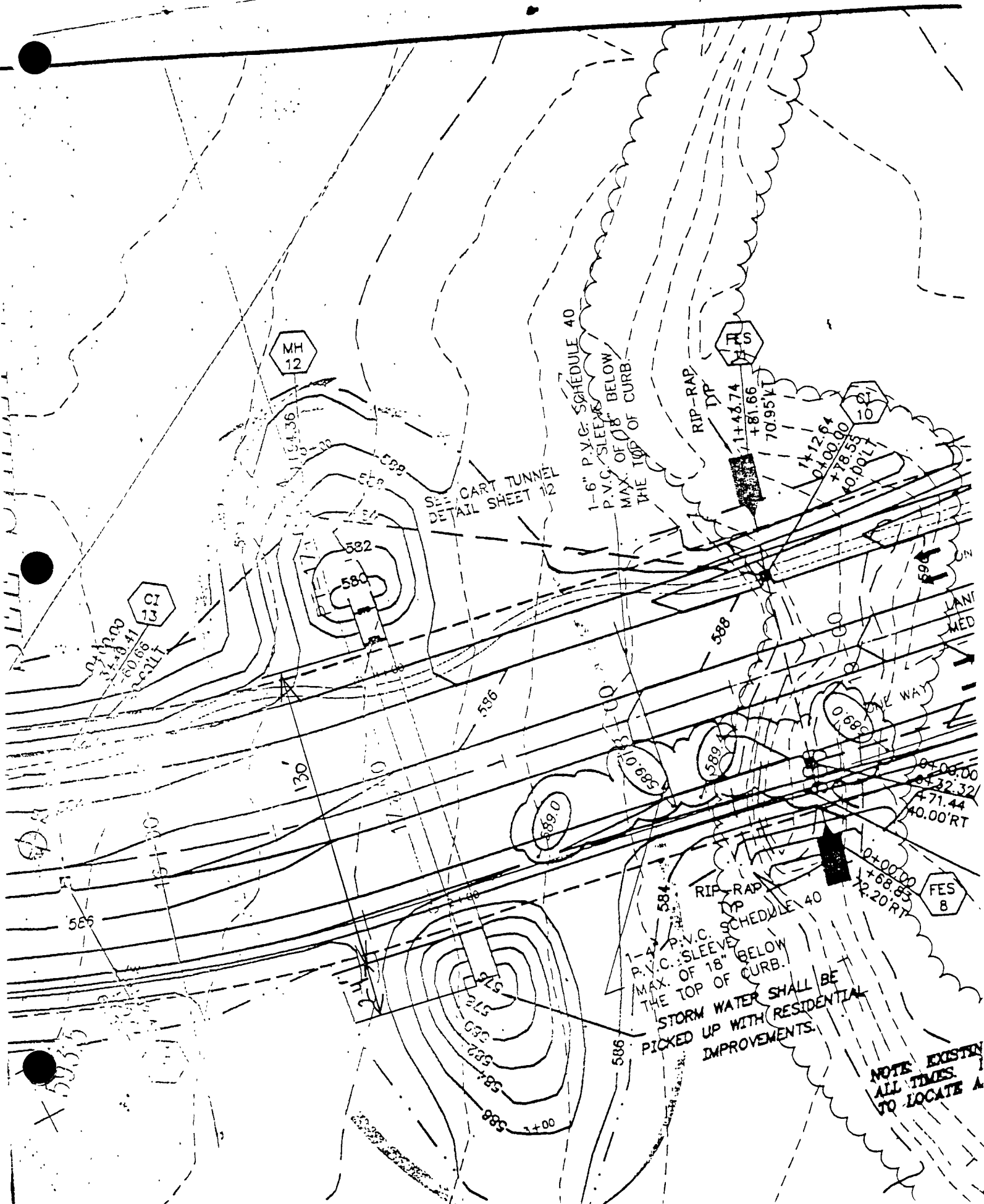
NOTE: USE A TRANSVERSE JOINT WHICH IS OVER 75' LONG BETWEEN HEADWALLS ON ROCK.

A FILTER CLOTH THREE FEET AND DOUBLE THICKNESS SHALL BE USED AT ALL TRANSVERSE JOINTS IN THE SIDEWALLS. THE MATERIAL SHALL BE A MASTIC DR WITH TWO SIDED TAPE. CLOTH SHALL BE A GEOTEXTILE ME APPROVAL OF THE ENGINEER AND TENSILE STRENGTH OF 180 LBS. (APPARENT OPENING SIZE OF 50 TO D-4751). NO DIRECT PAYMENT WILL BE FOR FURNISHING AND INSTALLING CLOTH.

USE ADDITIONAL TRANSVERSERS PROVIDE 50' MAXIMUM SPACING BE



76/12/21



MH 12

FES 10

FES 10

FES 8

SEE CART TUNNEL
DETAIL SHEET 12

1-6" P.V.C. SCHEDULE 40
P.V.C. SLEEVES
MAX. OF 18" BELOW
THE TOP OF CURB.

RIP-RAP
TP

+143.74
+81.66
70.95'±

+12.84
+0+00.00
+78.55
40.00'±

ONE WAY

0+08.00
0+32.32
+71.44
40.00'±

RIP-RAP
TP

1-6" P.V.C. SCHEDULE 40
P.V.C. SLEEVES
MAX. OF 18" BELOW
THE TOP OF CURB.

0+00.00
+68.85
72.20'±

STORM WATER SHALL BE
PICKED UP WITH RESIDENTIAL
IMPROVEMENTS.

NOTE: EXISTING
ALL TIMES
TO LOCATE A

LOW POINT ELEV = 585.01
 LOW POINT STA = 15+60.66
 PVI STA = 15+65
 PVI ELEV = 582.70
 A.D. = 3.93
 K = 119.67

170.00'-VC

EVCS: 18+00
 EVOE: 587.40

PROPOSED GROUND

CI 13 (40'RT)
 STA 15+60.66 TOP=584.06
 CI 13 A(6'RT)
 STA 15+60.47 TOP=585.90

CI 9 (40'RT)
 STA 18+71.44 TOP=588.61

TOP=585.29

STA 17+15.00
 CART TUNNEL
 17'x10'-2" W/ ARCHED CMP #
 SEE PROFILE SHEETS FOR DETAILS

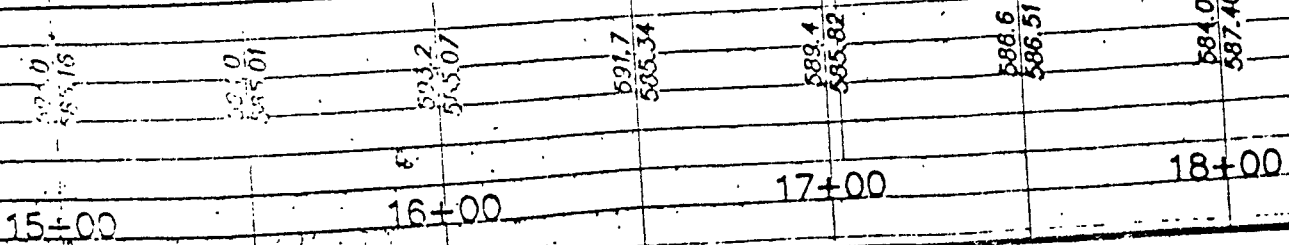
PT STA 17+03.34
 ELEV. 585.86

STA 18+53.34

TRANSITION FROM FULL SUPERELEVATION

SUPERELEVATION

TO NORMAL CROWN



KDG. MH FILE

980100

JUL 02 1998

Kuhlmann design Group, Inc.

6 Westbury Drive, St. Charles, MO 63301-2571
Phone 314.946.5566 • Fax 314.946.6713

FACSIMILE TRANSMISSION

PLEASE DELIVER IMMEDIATELY

CONNECTION JULY 2, 98

DATE: 7/2/98

TO: Mr. Ron Pagan

COMPANY:

FROM: Sam Elkott *SELW*

TIME

FAX #

PROJECT = 970231

SENT BY

Date	7-2-98	# of pages	1
From	SAM ELKOTT		
Co	KDG		
Phone #			
Fax #			
Post-it* Fax Note	7671		
To	JIM CANNADY		
Co/Dept	PRS		
Phone #			
Fax #			

These are the floor elevations for the Wingham Drive tunnel as designed by Pickett Ray and Silver (PRS). These are based on PRS plans dated December 1997 and last revised on March 27, 1998. Mr. Jim Cannady verified these elevations for me this morning. In addition, He said that even though the tunnel floor elevations are not called out on the plans (you have correctly stated), PRS' intent is for the tunnels to slope at one half of one percent (0.005 foot per foot). At this slope and the centerline tunnel floor elevation that is shown on the roadway profile one can verify these elevations:

- North tunnel: Length = 128' Centerline floor elevation = 575.00
 - West Side floor elevation = 574.68 (measured at end of tunnel 64' away from roadway centerline)
 - East Side floor elevation = 575.32 (measured at end of tunnel 64' away from roadway centerline)
- South tunnel: Length = 100' centerline floor elevation = 580.30
 - West Side floor elevation = 580.05 (measured at end of tunnel 50' away from roadway centerline)
 - East Side floor elevation = 580.55 (measured at end of tunnel 50' away from roadway centerline)

It is understood that you may need to change these lengths by few feet and the elevations by few tenths. It would be necessary to let Jim and us know of these changes. We at the St. Charles office have to design for the drainage of these tunnels.

Copy: Jim Cannady, Frank Bauer, Jim Poole

Attachment: Draw COVER PAGE One

IF YOU ENCOUNTER DIFFICULTIES IN RECEIVING THIS TRANSMISSION
PLEASE CALL 314.946.5566

WARNING

This communication is confidential, may constitute non-public information, and is intended only for the use of the addressee. Unauthorized use, disclosure, or distribution is strictly prohibited and may be unlawful. If you have received this communication in error, please immediately notify us at 314.946.5566 and return the message to the address above via the U.S. Postal Service. We will reimburse nominal costs you incur in notifying and returning the message to us. Thank you.

Kuhlmann *design* Group, Inc.

Transportation Department
66 Progress Parkway
St. Louis, Missouri 63043

Telephone: (314) 434-8898

Fax: (314) 434-8280

E-Mail: kdgmh@kdginc.com

FAX TRANSMITTAL COVER SHEET

TO: MR. FRANK GODWIN P.E.

FAX No. 314 240 5511

CITY OF OFALLON

DATE: 25 JUNE 1998

138 SOUTH MAIN STREET

PHONE 314 240 2000

OFALLON MISSOURI 63366

FROM: RONALD C. PAGAN, P.E.

PROJECT No. 980100

MESSAGE: ATTACHED IS CULVERT DESIGN CRITERIA WE DISCUSSED.

THANK YOU

TOTAL NUMBER OF PAGED TRANSMITTED INCLUDING COVER PAGE: 2

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HYDRAULIC ANALYSIS

PICKETT RAY & SILVER

323 Mid River Mall Dr
St. Pateric, MD 21159

Civil Engineers
Planners
Land Surveyors

357-1211

PROJECT NAME _____
PROJECT #/JOB ORDER # _____
DATE _____
DESIGNER _____
PAGE _____

RON -

7.10.98

• BM @ Box(s) HAS NOT BEEN SET.

• HW ELEV - PER MY CALC :

WINGHAVEN 524.3

PHOENIX 496.3

RED HAWK 520.6

F.P.

WINGHAVEN 522.0

PHOENIX 496.3

RED HAWK N/A

UTILITY SURVEY - DELIVERED (THIS WK)

COMPLETE SET PLANS - READY FRI. (7.10.98)

HW CALCS - ENCLOSED

" ELEV - ABOVE

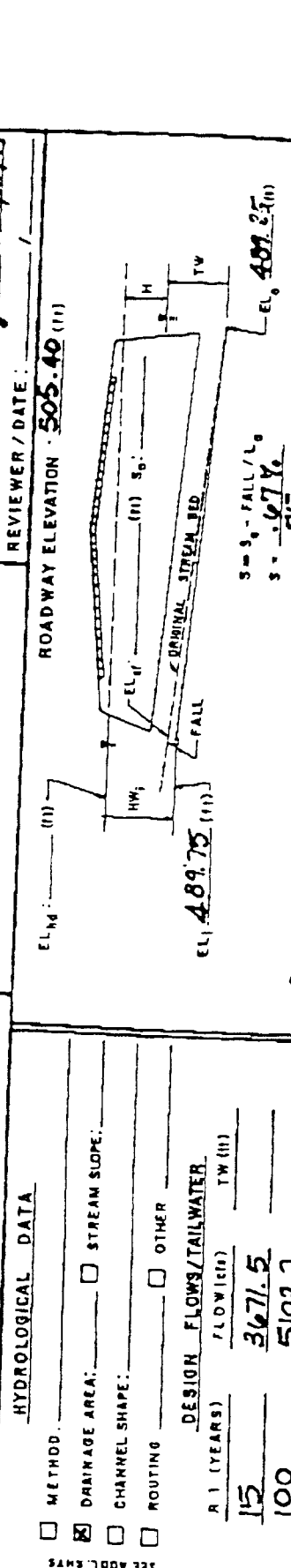
PROJECT: Winghaven - Cherie Dr

STATION: 62+50

SHEET OF

DESIGNER/DATE: Edy, 12/21/17

REVIEWER/DATE: ,



HYDROLOGICAL DATA

METHOD: SEE ADD. SHEET

DRAINAGE AREA: STREAM SLOPE:

CHANNEL SHAPE:

ROUTING OTHER

DESIGN FLOWS/TAILWATER

R 1 (YEARS) 15 FLOW (CFS) 3671.5 TW (11)

100 5102.7

CULVERT DESCRIPTION:

MATERIAL - SHAPE - SIZE - ENTRANCE

Q (cfs)	HW (ft)	FALL (ft)	EL (ft)	TW (ft)	d_c	$\frac{d_c D}{2}$	h_0	h_0	H	EL (ft)	COMMENTS
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
3672	7.4	-	498.2	-	4.8	8.4	8.4	0.5	.7	498.4	Outlet
5103	10.3	-	500.0	-	6.1	9.0	9.0	0.5	1.4	499.6	Outlet
2495	6.5	-	496.3	-	3.7	7.9	7.9	0.5	.3	496.3	Inlet control

HEADWATER CALCULATIONS

INLET CONTROL

OUTLET CONTROL

(1) $EL_1 = HW_1 + EL_1$ (INVERT OF INLET CONTROL SECTION)

(2) $HW_1 / D = HW_1 / D$ OR HW_1 / D FROM DESIGN CHARTS

(3) $FALL = HW_1 - (EL_1 - EL_2)$; FALL IS ZERO FOR CULVERTS ON GRADE

(4) $EL_1 = HW_1 + EL_1$ (INVERT OF INLET CONTROL SECTION)

(5) TW BASED ON DOWN STREAM CONTROL OR FLOW DEPTH IN CHANNEL.

(6) $h_0 = TW \times (0.1 D / 2)$ (WHICHEVER IS GREATER)

(7) $H = \left[1 + h_0 (29 \frac{L}{R L 35}) \right] V^2 / 2g$

(8) $EL_2 = EL_1 + H + h_0$

TECHNICAL FOOTNOTES:

(1) USE Q/HB FOR BOX CULVERTS

(2) $HW_1 / D = HW_1 / D$ OR HW_1 / D FROM DESIGN CHARTS

(3) $FALL = HW_1 - (EL_1 - EL_2)$; FALL IS ZERO FOR CULVERTS ON GRADE

SUBSCRIPT DEFINITIONS:

1. APPROXIMATE

2. CULVERT FACE

3. DESIGN HEADWATER

4. HEADWATER IN INLET CONTROL SECTION

5. HEADWATER IN OUTLET CONTROL SECTION

6. INLET CONTROL SECTION

7. OUTLET

8. STREAMBED AT CULVERT FACE

9. TAILWATER

CULVERT BARREL SELECTED:

SIZE: 5-12 x 12 Box

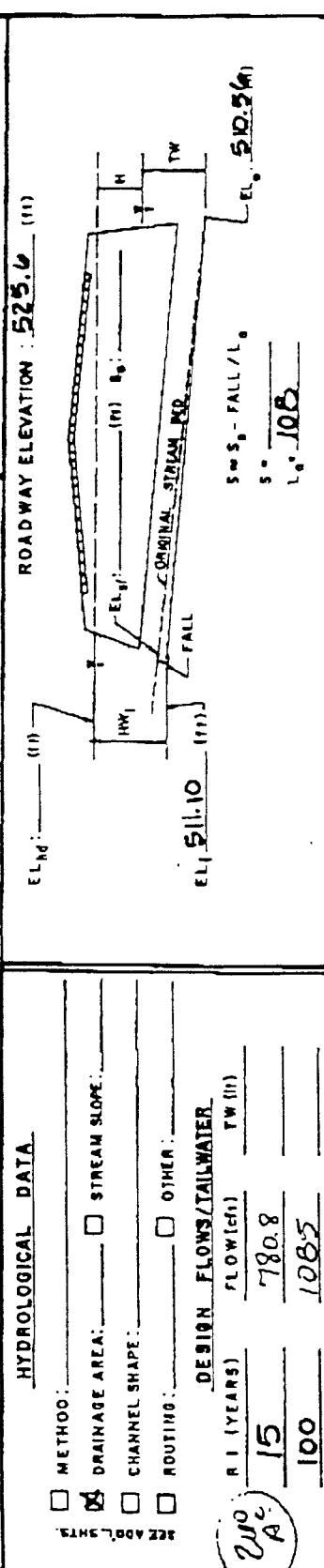
SHAPE: SQUARE

MATERIAL: Concrete

ENTRANCE: .013

5/11/18
using
& from
& from
(in)

PROJECT: Winghaven - David Dr. STATION: 5+30 CULVERT DESIGN FORM
 SHEET OF DESIGNER/DATE: / 12/21/97
 REVIEWER/DATE: /



HYDROLOGICAL DATA

METHOD: DRAINAGE AREA: STREAM SLOPE:
 CHANNEL SHAPE: OTHER:
 ROUTING:

DESIGN FLOWS/TAILWATER

R 1 (YEARS) 15 FLOW (cfs) 780.8 TW (ft)
200 A 100 1085

CULVERT DESCRIPTION: MATERIAL - SHAPE - SIZE - ENTRANCE	TOTAL FLOW PER CHANNEL Q (cfs)	INLET CONTROL			OUTLET CONTROL			COMMENTS			
		HW ₁ /D (ft)	HW ₁ (ft)	FALL (ft)	EL ₁ (ft)	TW (ft)	h ₀ (ft)		h ₀ (ft)		
2 - 7' h x 8' w (15yr)	780.8	1.2	8.4	-	519.5	4.2	5.6	5.6	1:32	517.4	inlet control
2 - 7' x 8	1065	1.36	9.52	-	520.6	5.2	6.1	6.1	2:58	519.24	inlet control

TECHNICAL FOOTNOTES:

(1) USE Q/NB FOR BOX CULVERTS
 (2) HW₁/D = HW₁ / D OR HW₁/D FROM DESIGN CHARTS
 (3) FALL = HW₁ - (EL₁ - EL₂); FALL IS ZERO FOR OPENINGS ON GRADE

HEADWATER CALCULATIONS

(4) EL_{hd} = HW₁; EL₁ (INVERT OF INLET CONTROL SECTION)
 (5) TW BASED ON DOWNSTREAM CONTROL OR FLOW DEPTH IN CHANNEL.
 (6) h₀ = TW or (L_c + D/2) (WHICHEVER IS GREATER)
 (7) H = [(1 + h₀ (29n² L) / A^{1.33})] V² / 2g
 (8) EL_{N2} = EL₂ + H + h₀

SUBSCRIPT DEFINITIONS:

1. APPROXIMATE
 2. CULVERT FACE
 3. BEGINNING HEADWATER
 4. HEADWATER IN INLET CONTROL
 5. HEADWATER IN OUTLET CONTROL
 6. MULT. CONTROL SECTION
 7. OUTLET
 8. STREAMBED AT CULVERT FACE
 9. TAILWATER

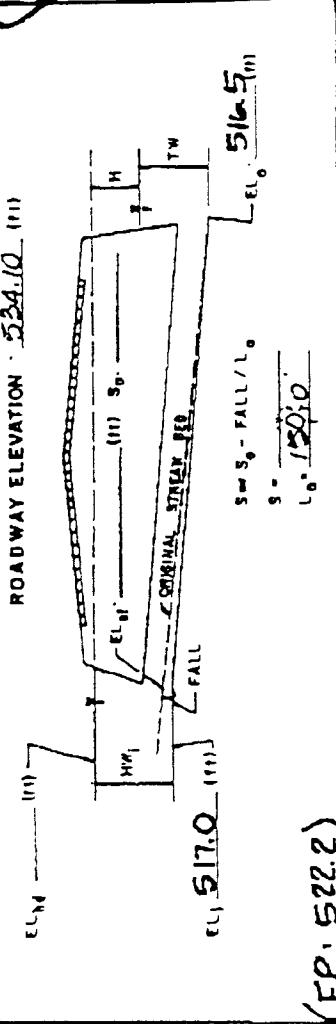
COMMENTS / DISCUSSION:

CULVERT BARNEL SELECTED: 7' h x 8' w - 2
 SHAPE:
 MATERIAL: CONCRETE
 ENTRANCE: RIP

3264
 53

PROJECT: Winghaven - Winghaven Dr.
 STATION: 59+00
 SHEET _____ OF _____

CULVERT DESIGN FORM
 DESIGNER/DATE: Toby / 12/24/17
 REVIEWER/DATE: _____



HYDROLOGICAL DATA
 METHOD: DRAINAGE AREA: STREAM SLOPE:
 CHANNEL SHAPE: OTHER:
 ROUTING:
 DESIGN FLOWS/TAILWATER
 R₁ (YEARS) FLOW (cfs) TW (ft)
15 3019
100 4196

(FP, 522.2)

CULVERT DESCRIPTION: MATERIAL - SHAPE - SIZE - ENTRANCE	TOTAL FLOW PER BARREL Q (11) / O/N (12)	INLET CONTROL			OUTLET CONTROL			ELEVATION EL (10)	VELOCITY V (ft/s)	COMMENTS
		HW ₁ /D (13)	EL ₁ (14)	TW (15)	q _c (16)	H ₀ (17)	H (18)			
4-10'h x 12'w (15)	3019	0.85	525.5	4.9	7.45	0.5	1.1	524.1	526.5	Inlet Control
4-10'h x 12'w (100)	4196	1.08	527.8	6.2	8.1	0.15	2.01	526.6	527.8	"
Use # from FEMA										
4-10'h x 12'w	244	0.73	524.3							

TECHNICAL FOOTNOTES:
 (1) USE Q/HB FOR BOX CULVERTS
 (2) HW₁/D = HW₁/D OR HW₁/D FROM DESIGN CHARTS
 (3) FALL = HW₁ - (EL_M - EL₀); FALL IS ZERO FOR CULVERTS ON GRADE
 (4) EL_M = HW₁ EL₁ (INVERT OF INLET CONTROL SECTION)
 (5) TW BASED ON DOWN STREAM CONTROL OR FLOW DEPTH IN CHANNEL
 (6) H₀ = TW OR (D_c + D/2) (WHICHEVER IS GREATER)
 (7) H₀ = [1 + k₀ (28π² L) / R^{1.33}] V² / 2g
 (8) EL₁ = EL₀ + H₀

SUBSCRIPT DEFINITIONS:
 1. APPROXIMATE
 2. CULVERT FACE
 3. DESIGN HEADWATER
 4. HEADWATER IN INLET CONTROL
 5. HEADWATER IN OUTLET CONTROL
 6. INLET CONTROL SECTION
 7. OUTLET
 8. STREAMBED AT CULVERT FACE
 9. TAILWATER

COMMENTS / DISCUSSION:

CULVERT BARREL SELECTED:
 SIZE: 4-10'h x 12'w
 SHAPE:
 MATERIAL: Concrete
 ENTRANCE: R.O.D.

50/11/15/16

PICKETT RAY & SILVER

CIVIL ENGINEERS

PLANNERS

LAND SURVEYORS



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FROM: **TANYA**

PROJECT: **WINGHAVEN**

PR&S PROJECT NO.: **97034**

DATE AND TIME: **7.10.98**

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PICKETT RAY & SILVER

322 Mid River Mall Dr
St. Robert, MO 63378

Civil Engineers
Planners
Land Surveyors

397-1211

PROJECT NAME _____
PROJECT #/JOB ORDER # _____
DATE _____
DESIGNER _____
PAGE _____

RON -

7.10.98

• BM @ Box(s) HAS NOT BEEN SET.

• HW ELEV - PER MY CALC :

WINGHAVEN 524.3

PHOENIX 496.3

RED HAWK 520.6

F.P.

WINGHAVEN 522.0

PHOENIX 496.3

RED HAWK N/A

UTILITY SURVEY - DELIVERED (THIS WK)

COMPLETE SET PLANS - READY FRI. (7.10.98)

HW CALCS - ENCLOSED

" ELEV: ABOVE

PROJECT: Winghaven - Cherie Dr

STATION: 62+50

CULVERT DESIGN FORM

SHEET OF

DESIGNER/DATE: Eby / 12/22/17

REVIEWER/DATE: /

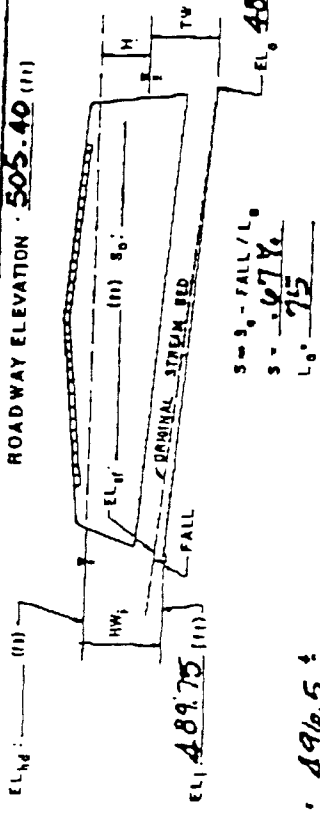
HYDROLOGICAL DATA

- METHOD
- DRAINAGE AREA: STREAM SLOPE:
- CHANNEL SHAPE:
- ROUTING OTHER

DESIGN FLOWS/TAIWATER

R 1 (YEARS) 15 / FLOW (CFS) 3671.5 TW (IN)

100 / FLOW (CFS) 5102.7 TW (IN)



F.P. 496.5

CULVERT DESCRIPTION:

MATERIAL - SHAPE - SIZE - ENTRANCE

5-12' x 12' Box

5-12' x 12' Box

Use FEMA Q.

5-12' x 12' Box

TECHNICAL FOOTNOTES:

- (1) USE Q/NB FOR BOX CULVERTS
- (2) HW1/D - HW /D OR HW1/D FROM DESIGN CHARTS
- (3) FALL = HW1 - (ELM - EL1) ; FALL IS ZERO FOR CULVERTS ON GRADE

HEADWATER CALCULATIONS

TOTAL FLOW Q (cfs)	FLOW PER BARREL Q/N	INLET CONTROL			OUTLET CONTROL				COMMENTS				
		HW1/D	HW1	FALL	EL1	EL1	h0	h0		h0			
3672	73.4	9.4	498.2	-	498.2	4.8	8.4	8.4	0.5	0.7	498.9	498.4	Outlet
5103	102.1	0.86	10.3	-	5000	6.1	9.0	9.0	0.5	1.4	499.6	500.0	inlet control
2495	499	5.4	6.5	-	496.3	3.7	7.9	7.9	0.5	0.3	494.3	496.3	inlet control

- (4) $ELM - HW1$; $EL1$ INVERT OF INLET CONTROL SECTION
- (5) TW BASED ON DOWN STREAM CONTROL OR FLOW DEPTH IN CHANNEL
- (6) $EL_{NB} = EL_0 + H_0 + h_0$
- (7) $H_0 = \left[\frac{1}{2} h_0 + \frac{1}{2} (28.0^2 \cdot L) / R \cdot L \right] V^2 / 2g$
- (8) $EL_{NB} = EL_0 + H_0 + h_0$

SUBSCRIPT DEFINITIONS:

- 0 APPROXIMATE
- 1 CULVERT FACE
- 2 DESIGN HEADWATER
- 3 HEADWATER IN INLET CONTROL
- 4 HEADWATER IN OUTLET CONTROL
- 5 INLET CONTROL SECTION
- 6 OUTLET CONTROL SECTION
- 7 TREATMENT AT CULVERT FACE
- 8 TAILWATER

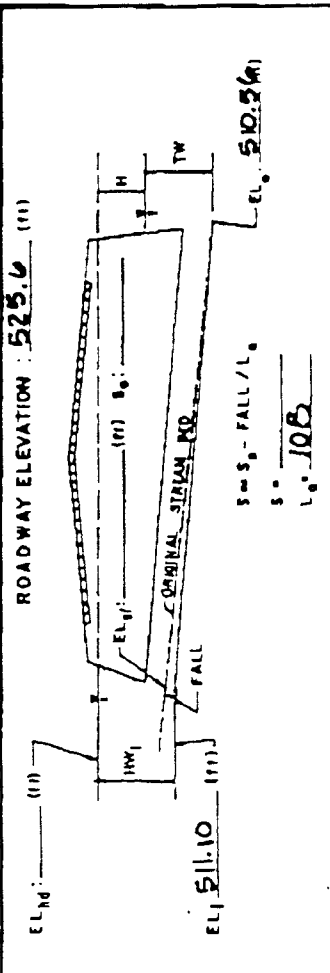
COMMENTS / DISCUSSION:

CULVERT BARREL SELECTED:
 SIZE 5-12' x 12' Box
 SHAPE SQUARE
 MATERIAL: Concrete n.013
 ENTRANCE:

5/14/18
 11:50 AM
 4 hours checked
 +
 FEMA
 (12/22/17)

PROJECT: Winghaven - David Dr
 STATION: 5+30
 SHEET OF

CULVERT DESIGN FORM
 DESIGNER/DATE: 1865 / 12/22/97
 REVIEWER/DATE: /



HYDROLOGICAL DATA
 METHOD: DRAINAGE AREA: STREAM SLOPE:
 CHANNEL SHAPE:
 ROUTING: OTHER:
 DESIGN FLOWS/TAILWATER
 R1 (YEARS) 15 FLOW(CH) 780.8 TW (H)
240 A 100 1085

CULVERT DESCRIPTION: MATERIAL - SHAPE - SIZE - ENTRANCE	TOTAL FLOW PER BARREL Q (cfs)	INLET CONTROL				OUTLET CONTROL				HEADWATER ELEVATION	VELOCITY	COMMENTS		
		HW1/D (1)	HW1 (2)	FALL (3)	ELIN (4)	TW (5)	d5/D (6)	h0 (7)	H (8)				ELH0 (9)	
2.7 ft x 8' W (15 yr)	780.8	240.8	1.2	8.4	-	519.5		4.2	5.6	.5	1.32	517.4		Initial Culvert
2.7 ft x 8' (100 yr)	1065	342.5	1.36	9.52	-	520.6		5.2	6.1	.5	2.58	519.24		Initial Culvert

TECHNICAL FOOTNOTES:
 (1) USE Q/NB FOR BOX CULVERTS
 (2) HW1/D = HW / D OR HW1/D FROM DESIGN CHARTS
 (3) FALL = HW1 - (ELIN - ELH0), FALL IS ZERO FOR GRADES ON GRADE
 (4) ELIN = HW1, ELH0 (INVERT OF INLET CONTROL SECTION)
 (5) H0 = TW OR (4 * D / 2) (WHICHEVER IS GREATER)
 (6) d5/D = TW BASED ON DOWNSTREAM CONTROL OR FLOW DEPTH CHANNEL
 (7) H = [1 + h0^2 (29n^2 L) / R133] V^2 / 2g
 (8) ELH0 = EL0 + H + h0

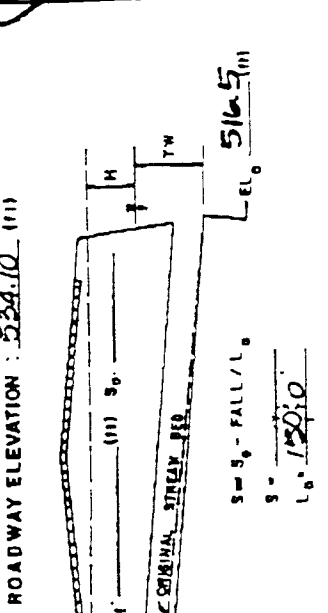
SUBSCRIPT DEFINITIONS:
 0 - APPROXIMATE
 1 - CULVERT FACE
 2 - BEGIN HEADWATER
 3 - HEADWATER IN INLET CONTROL
 4 - HEADWATER IN OUTLET CONTROL
 5 - INLET CONTROL SECTION
 6 - OUTLET
 7 - STREAMBED AT CULVERT FACE
 8 - TAILWATER

COMMENTS / DISCUSSION:
 CULVERT BARREL SELECTED:
 SIZE: 7H x 8W, 2
 SHAPE:
 MATERIAL: CONC.
 ENTRANCE: R013

3204
 53

PROJECT: Winghaven - Winghaven Dr.
 STATION: 59+00
 SHEET: OF

CULVERT DESIGN FORM
 DESIGNER / DATE: Tobias / 12/27/17
 REVIEWER / DATE: _____



HYDROLOGICAL DATA
 METHOD _____
 DRAINAGE AREA _____
 CHANNEL SHAPE _____
 ROUTING _____
 DESIGN FLOWS/TAIWATER
 R. I. (YEARS) 15 FLOW (CFS) 3019
100 4196
 T.W. (FT) _____

HEADWATER CALCULATIONS

CULVERT DESCRIPTION: MATERIAL - SHAPE - SIZE - ENTRANCE	INLET CONTROL			OUTLET CONTROL					COMMENTS			
	FLOW PER CHANNEL Q/N (11.6)	NW ₁ /D (12)	HW ₁ (13)	FALL (14)	EL. H ₁ (15)	T.W. (16)	d _c (17)	h ₀ (18)		h ₀ (19)	EL. H ₀ (20)	
4-10'h x 12'w (15)	3019	752	0.85	9.5	525.2	4.9	7.45	0.5	1.1	524.1	526.5	Outlet Control
4-10'h x 12'w (100)	4196	1049	1.08	10.8	527.8	6.2	8.1	0.5	2.01	526.6	527.8	
USE # FROM FEMA												
4-10'h x 12'w	244	605	.73	7.3	524.3							

TECHNICAL FOOTNOTES:
 (1) USE Q/NB FOR BOX CULVERTS
 (2) NW₁/D = HW₁/D OR HW₁/D FROM DESIGN CHARTS
 (3) FALL = HW₁ - (EL. H₁ - EL. H₀); FALL IS ZERO FOR CULVERTS ON GRADE
 (4) EL. H₁ = HW₁ + EL₁ (INVERT OF INLET CONTROL SECTION)
 (5) h₀ = TW OR (d_c + D/2) (WHICHEVER IS GREATER)
 (6) H₀ = [1 + 3.3 * (28 * h₀ L) / N^{1.33}] * V² / 2g
 (7) EL. H₀ = EL. H₀ + H₀

CULVERT BARREL SELECTED:
 SIZE: 4-10'h x 12'w
 SHAPE: _____
 MATERIAL: Concrete
 ENTRANCE: _____

COMMENTS / DISCUSSION:

SUBSCRIPT DEFINITIONS:
 1 APPROXIMATE
 2 CULVERT FACE
 3 DESIGN HEADWATER
 4 HEADWATER IN INLET CONTROL
 5 HEADWATER IN OUTLET CONTROL
 6 INLET CONTROL SECTION
 7 OUTLET CONTROL SECTION
 8 STREAMBED AT CULVERT FACE
 9 TAILWATER

6/1/18

GEOTECHNICAL REPORT



July 9, 1998

ADD. MH FILE 980100

Mr. David Rogers
Fred Webb, Inc.
c/o Mr. Ronald C. Pagan, P.E.
Kuhlman Design Group, Inc.
60 Progress Parkway
Maryland Heights, MO 63043-3706

JUL 10 1998

RE: Appendix No. 1
Winghaven Box Culverts
Charlton, Missouri
SC11-980495.11

Dear Mr. Pagan:

This letter provides the additional geotechnical information for the Winghaven Box Culverts you requested to supplement our letter to you dated June 29, 1998. Three specific items presented herein pertain to the following:

- 1) Rock mats for structural slab base footings.
- 2) Anticipated settlements.
- 3) Backfill and fluid pressures for below-grade walls.

We understand that the bearing capacity required for the box culverts in the lowland areas will be 1,500 pounds per square foot (psf) and we provided an allowable bearing capacity of 1,100 psf for one box culvert that will pass under Charlie Drive near station 62+50. We recommend that 2 feet of soil be removed below the footing subgrade elevation and replaced with compacted granular material for this culvert. The replacement material should consist of a 3 inch minus gradation crushed stone. This rock mat will help to bridge the soft and wet foundation soils. A similar procedure of varying depths may be utilized for the other culverts in the lowland areas since we anticipate construction difficulties due to the high groundwater elevation.

The box culverts in the highland areas (culverts A and B) will likely be constructed on excavated rock. We anticipate negligible settlements of the foundation rock due to the weight of the structures and fills. In the lowland areas, however, we anticipate total settlement of the foundation soils due to the weight of the structure and fill to be placed to be about 3 to 6 inches. Some of this settlement will likely occur during construction. If construction of the culverts in the lowland areas is not delayed until after the settlement due to the fill has occurred, the structure will likely settle. However, we anticipate this settlement will likely be relatively uniform across the footprint due to the rigidity of the reinforced concrete base mat and structure. A differential settlement of less than 1½ inches can be anticipated across the whole footprint for these structures.

Our letter dated June 29, 1998 states that to use the "granular" values of equivalent fluid unit weight to earth pressures that the granular backfill material should extend horizontally from the

wall at least half of the wall height. This distance is not required to provide positive foundation drainage to prevent buildup of hydrostatic pressures. A minimum horizontal distance of about 18 inches with a perforated drain pipe should be sufficient to provide this drainage. Therefore, an equivalent fluid unit weight of 60 pounds per cubic foot may be used to design the below-grade walls assuming the hydrostatic pressures are relieved through proper drainage.

We appreciate the opportunity to be of service to you on this project. If you have any questions or comments, please call.

Respectfully,

SL

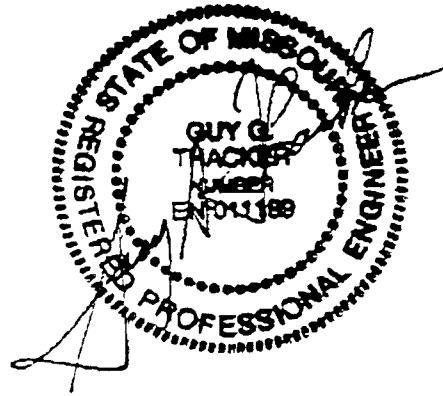
Fred H. Held II

Fred H. Held II
Project Engineer

Guy G. Tracker

Guy G. Tracker P.E.
Manager

FHH/GCT



cc: Mr. David Rogers, Fred Weber, Inc. (1)



333 Mid Rivers Mall Drive
St. Peters, MO 63376
Tele: (314) 397-6600
Fax: (314) 397-2600

FAX COVER SHEET

Please deliver the following pages to:

FIRM NAME Kuhlmann Design Group DATE: 07/09/98
ATTENTION Mr. Ron Pagan TIME: 3:27 PM
FAX NO 434-8280
FROM Fred Held SCI PROJECT NO: 980495
PROJECT Winghaven Box Culverts SCI FAX NO: 397-2600
TOTAL NO. PAGES (INCLUDING COVER SHEET): 3

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Thank you

FAX OPERATOR Terry Lynett

MESSAGE:

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will not be mailed	<input type="checkbox"/>

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980100

SCI



June 29, 1998

Mr. David Rogers
Fred Weber, Inc.
% Mr. Ronald C. Pagan, P.E.
Kuhlmann Design Group, Inc.
66 Progress Parkway
Maryland Heights, MO 63043-3706

RE: Winghaven Box Culverts
O'Fallon, Missouri
SCI № 980495.11

Dear Mr. Pagan:

At the request of Mr. David Rogers with Fred Weber, Inc., this letter provides geotechnical design recommendations for five box culverts planned for the Winghaven development roadways. Plan and Profile sheets prepared by Picket, Ray & Silver, Inc. (PRS), revised March 25 or 27, 1998, depict the locations and elevations of the culverts. Three of the culverts will cross under Winghaven Drive near stations 17+00, 30+50, 59+00. One culvert will pass under David Drive near station 5+50, and one culvert will pass under Charlie Drive near station 62+50. In this letter the box culverts will be named A, B, C, D and E, respectively. Culverts A and B will be tunnels for golf carts to underpass Winghaven Drive in the uplands part of the Winghaven development. The remaining will be multiple cell box culverts for existing creeks in lowland areas to pass under planned roadways. We understand that these culverts will be cast-in-place, reinforced concrete structures that will have light to moderate loads.

We previously explored parts of the Winghaven development in our report, "Preliminary Exploration of Subsurface Conditions and Foundation Recommendations - WINGHAVEN PROJECT SITE COMMERCIAL, RESIDENTIAL, AND GOLF COURSE COMMUNITY - O'FALLON, MISSOURI," dated July 1997 (Revised January 1998). In that exploration we drilled B2 and B3 in the uplands near the golf cart underpasses, B21 in the lowland area near culvert C, and B14 in the bottoms land near culvert E. The four boring logs are included in the Appendix of this letter. These borings indicate that excavations for culverts A and B will encounter rock in the form of weathered siltstone or shale for the full depths of the structures. Also, B2 encountered auger refusal near El. 576.5 and the planned bottom of culvert A is near El. 574. Some or all of this rock may be removed in open-cut excavations with bull dozers equipped with rippers. However, intact ledges of hard rock, boulders, or sound bedrock may be encountered that could require blasting.

SCI explored the subsurface conditions near culverts C, D and E on June 25, 1998 using hand auger methods. The hand auger borings, TH1, TH2, and TH3, were located near culverts C, D and E, respectively, by measuring from existing site features and improvements shown of the plans prepared by PRS. The hand augers were advanced to termination depths of 5, 6, and 7½ feet in TH1, TH2, and TH3, respectively. The soils generally encountered were soft to medium stiff, low plastic silty clays and clayey silts. TH1 terminated in a mixture of silty clay, gravel and sand at a depth of 5 feet, which is about 3 feet above the anticipated bearing elevation of culvert C. TH2 and TH3 terminated at depths of 6 and 7½ feet, respectively, due to caving conditions in the holes. We estimate the termination elevations were near the bearing

elevations of culverts D and E. Groundwater was encountered in the hand auger borings at depths of 4 or 5 feet. The nature and thickness of the soils encountered and the results of the field sampling and testing are shown on the Borings Logs, Figures 1-1 through 1-3.

The varied conditions at the culvert locations require different allowable bearing capacities for the locations. An allowable bearing capacity of 10,000 pounds per square foot (psf) may be used to design the structural base slab for culverts A and B if they bear on the weathered siltstone or shale as indicated by B2 and B3 or if they encounter bedrock. An allowable bearing capacity of 3,000 psf may be used to design culvert C if it bears on the anticipated mixture of gravel and sand with some or no clay. An allowable bearing capacity of 1,500 psf may be used to design culvert D if it bears on the silty clay encountered in TH2. An allowable bearing capacity of 1,200 psf may be used to design culvert E.

We understand that higher bearing capacities will be required for culverts D and E. The soft soils below the base of the culverts may be removed and replaced with compacted, crushed rock, such as MODOT Type I Aggregate. The area of removal should extend down and outside the base footprint at an angle of 45 degrees to form a larger area to bear on the soft soils. The depth of removal will vary depending on the allowable bearing capacity required. We anticipate about 5 feet of soft soil will need to be removed and replaced with crushed rock to increase the allowable bearing capacity of the culverts to 2,000 or 3,000 psf.

In the lowland areas, placing fill to raise the roadway above existing grade will result in settlement as consolidation of the soft, underlying soils occurs. A delay in construction is anticipated to allow some or most of that settlement to occur prior to construction. We anticipate this delay to be about 30 to 120 days. This delay will likely not apply to culvert C since we anticipate it will bear on sand and gravel near bedrock elevations. Culverts D and E should not be constructed until most of the settlement due to the weight of the fills has occurred. Surcharging can be used as a means to accelerate consolidation due to the weight of fill. Deep fill in the lowland areas should be monitored with settlement plates to assess when most of the settlement has occurred and construction can continue.

The below-grade walls of the box culverts will be required to resist earth pressures. These include the outside walls of the culverts and the wing-walls that may extend from the culverts designed to accommodate surface grade changes.

The equivalent fluid unit weights tabulated below provide recommended lateral earth pressures for design of these walls. Values for granular material should only be used if the granular backfill extends from the wall a lateral distance of at least one-half the wall height. This table assumes that positive foundation drainage is provided to prevent buildup of hydrostatic pressure. The below-grade walls should be designed to resist an additional uniform lateral load of one-half of the surface loads.

Backfill Type	Fixed-Headed Walls (pcf)	Free-Headed Walls (pcf)
Cohesive Soil	60	50
Granular Material	45	40

A fixed-headed wall is a wall which is not permitted to deflect at the top after backfilling. A free-headed wall is designed to deflect at the top and remain fixed at the base, such as a retaining wall. A wing-wall attached to a fixed-headed wall should be considered fixed-headed unless the structural design permits independent rotation.

The maximum toe pressures for wing-walls should not exceed the bearing capacities recommended in this letter. Walls bearing in soil can be designed with a coefficient of friction between the base of a concrete footing and the subgrade soil of 0.3. A passive soil resistance equal to a uniform pressure of 300 psf may be used for natural soil against the face of the exterior base or a key below the base of a retaining wall. Soil backfilled against the exterior face of a retaining wall should not be assumed to provide any lateral resistance.

We recommend that all below-grade walls and retaining walls be provided with a foundation drainage system. A typical below-grade wall drain detail is shown in Figure 2. It should consist of a perforated pipe to transport the fluids collected from the granular backfill to daylight. Granular drainage material around the pipe should consist of 1-inch clean, "GP" classified crushed rock. A synthetic filter fabric indicated on Figure 2 should be Mirafli 140N or equivalent. A minimum 4-inch diameter perforated drain pipe should be used.

We appreciate the opportunity to be of service to you on this project. If you have any questions or comments, please call.

Respectfully,

SCI

Fred H. Held III

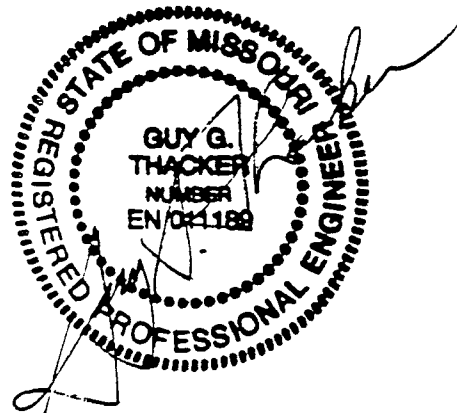
Fred H. Held III
Project Engineer

Jerry Thacker

Jerry Thacker, P.E.
Manager

FHH/GGT/tal

c: Mr. Dave Rogers, Fred Weber, Inc. (1)



BORING LOG**LEGEND AND NOMENCLATURE**

Items shown in Boring Logs refer to the following:

(Where shown in parenthesis, sampling and testing were performed in general accordance with applicable ASTM standard methods or practices.)

1. **Depth** - Depth below ground surface (feet).
2. **Sample** - Types designated by letters.
 - SS** - Split-spoon sample, disturbed, obtained by driving 2-inch O.D. split-spoon sampler (ASTM D 1586).
 - NX** - Diamond core bit sample, nominal 2-inch diameter rock sample (ASTM D 2113).
 - ST** - Thin-walled tube sample, undisturbed, obtained by penetration of a 3-inch diameter tube (ASTM D 1587).
 - CS** - Continuous sample tube system, undisturbed, obtained by split barrel sampler in conjunction with auger advancement.
 - SV** - Shear vane, field test to determine strength of cohesive soil by pushing or driving a 2-inch diameter vane then shearing by torquing soil in existing and remolded states (ASTM D 2573).
 - AS** - Disturbed samples obtained from auger cuttings.
 - Recovery** - Recovery is expressed as a ratio of the length recovered to the total length pushed, driven, or cored (inches), e.g. - 9/12.
 - Blows** - Numbers indicate blows per six inches of sampler penetration when driven by a 140-pound hammer falling freely 30 inches (ASTM D 1586). When number of blows reaches 50 without six inches of sampler penetration, the result is shown as a ratio of 50 to the actual penetration, e.g. - 50/2 inches.
 - Vane Shear Strength** - Shear strength of soil expressed as the peak strength (existing state)/residual strength (remolded state).
3. **Description** - Description according to the Unified Soil Classification: Description indicates soil constituents and other classification characteristics (ASTM D 2488). A solid line indicates approximate location of stratigraphic change between soil types and the transition may be gradual.
4. **Laboratory Test Results**
 - Natural moisture content in percent (ASTM D 2216).
 - Dry density of sample tested in pounds per cubic foot (pcf).
 - Unconfined compressive strength (ASTM D 2166) in kips per square foot (ksf).
 - Liquid limit (ASTM D 4318) in percent.
 - Plastic limit (ASTM D 4318) in percent.
5. **Remarks/Other Data** - See notation at bottom of log for description of data entries.
 - RQD** - Rock Quality Designation; the ratio between the total length of core segments greater than 4 inches in length and the total length of core drilled (expressed as percentage).



PROJECT WINGHAVEN BOX CULVERTS

TEST PIT NO. TH-1

LOCATION O'Fallon, Missouri

SHEET 1 OF 1

EXCAVATOR SCI

PROJECT NO. 980495.11

SURFACE ELEVATION 524 +/-

EQUIPMENT Hand auger

DATE EXCAVATED 6-25-98

DEPTH (FT.)	FIELD SAMPLE / TEST				DESCRIPTION	UNIFIED SOIL CLASSIFICATION	SEE REMARK NO.	LABORATORY TEST RESULTS					DEPTH (FT.)
	NUMBER	SAMPLE TYPE	FIELD TEST TYPE	SHEAR STRENGTH (KSF)				MOISTURE CONTENT (%)	DRY DENSITY (PCF)	UNCONFINED COMPRESSIVE STRENGTH (KSF)	LIQUID LIMIT	PLASTIC LIMIT	
0					Grayish brown, low plastic SILTY CLAY with trace of fine roots	CL							0
1	1	BS						29					
2.5	2	BS			Brown, low plastic SILTY CLAY with trace of fine gravel	CL		19					2.5
3	3	BS			Brown, low plastic SILTY CLAY and coarse SAND to fine GRAVEL	CL.GC		19					
5					Hand auger refusal at 5.0 ft.								5
7.5													7.5
10													10
12.5													12.5
15													15
17.5													17.5

WATER LEVEL:

NO GROUNDWATER NOTED AT TIME OF EXCAVATION
 5 FT WHILE EXCAVATING
 FT HRS AFTER EXCAVATING

REMARKS:

FIGURE 1-1

PROJECT WINGHAVEN BOX CULVERTS

TEST PIT NO. TH-2

LOCATION O'Fallon, Missouri

SHEET 1 OF 1

EXCAVATOR SCI

PROJECT NO. 980495.11

SURFACE ELEVATION 516+/- EQUIPMENT Hand auger

DATE EXCAVATED 6-25-98

DEPTH (FT.)	FIELD SAMPLE / TEST				DESCRIPTION	UNIFIED SOIL CLASSIFICATION	SEE REMARK NO.	LABORATORY TEST RESULTS					DEPTH (FT.)
	NUMBER	SAMPLE TYPE	FIELD TEST TYPE	SHEAR STRENGTH (KSF)				MOISTURE CONTENT (%)	DRY DENSITY (PCF)	UNCONFINED COMPRESSIVE STRENGTH (KSF)	LIQUID LIMIT	PLASTIC LIMIT	
0					4 inches TOPSOIL								0
1	1	BS			Brown with gray, low plastic SILTY CLAY with some gray silt and trace of organics	CL		23					
2.5	2	BS	SV	2.8/ 1.4	Brown and gray, low plastic CLAYEY SILT with trace of fine sand and organics	ML		25					2.5
	3	BS						21					
	4	BS			Gray with brown, low plastic SILTY CLAY with trace of fine gravel	CL		24					
5													5
					Hand auger terminated at 6.0 ft.								
7.5													7.5
10													10
12.5													12.5
15													15
17.5													17.5

WATER LEVEL:
 _____ NO GROUNDWATER NOTED AT TIME OF EXCAVATION
4 FT WHILE EXCAVATING
 _____ FT _____ HRS AFTER EXCAVATING

REMARKS:

FIGURE 1-2



PROJECT WINGHAVEN BOX CULVERTS

TEST PIT NO. TH-3

LOCATION O'Fallon, Missouri

SHEET 1 OF 1

EXCAVATOR SCI

PROJECT NO. 980495.11

SURFACE ELEVATION 494 +/-

EQUIPMENT Hand auger

DATE EXCAVATED 6-25-98

DEPTH (FT.)	FIELD SAMPLE / TEST				DESCRIPTION	UNIFIED SOIL CLASSIFICATION	SEE REMARK NO.	LABORATORY TEST RESULTS					DEPTH (FT.)
	NUMBER	SAMPLE TYPE	FIELD TEST TYPE	SHEAR STRENGTH (KSF)				MOISTURE CONTENT (%)	DRY DENSITY (PCF)	UNCONFINED COMPRESSIVE STRENGTH (KSF)	LIQUID LIMIT	PLASTIC LIMIT	
0					Brown, low plastic SILTY CLAY	CL							0
1	1	BS			Grayish brown, fine SANDY SILTY CLAY with some fine gravel	SC		21					
2.5	2	BS			Grayish brown, low plastic CLAYEY SILT with fine sand	ML		19					2.5
5	3	BS			Brown and gray, low plastic CLAYEY SILT with some fine sand to fine gravel	ML		35					5
7.5	4	BS			Gray, low plastic CLAYEY SILT with trace of fine gravel	ML		29					7.5
					Hand auger terminated at 7.5 ft.								

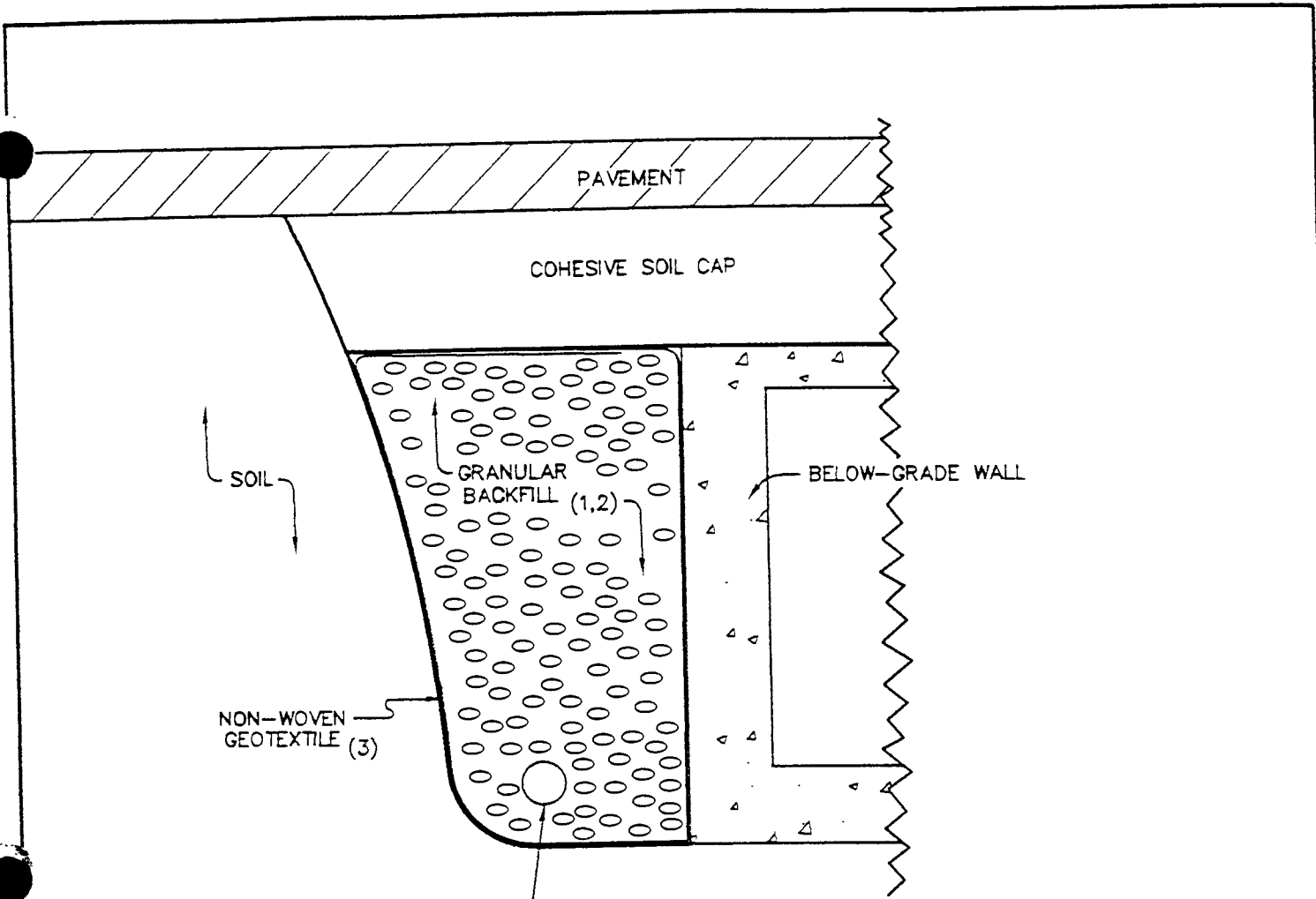
WATER LEVEL:

NO GROUNDWATER NOTED AT TIME OF EXCAVATION

4 FT WHILE EXCAVATING

FT _____ HRS AFTER EXCAVATING

REMARKS:



NOTES:

1. MINIMUM 6" FILTER MATERIAL AROUND PIPE.
2. 1" CLEAN CRUSHED LIMESTONE.
3. TYPICALLY FOUR-OUNCE PER SQUARE YARD


	333 MID RIVERS MALL DRIVE ST. PETERS, MISSOURI 63376
	WINGHAVEN BOX CULVERT O'FALLON, MISSOURI
BELOW-GRADE WALL DRAIN DETAIL	
JUNE 1998	SCI NO. 980495.11

FIGURE 2

APPENDIX

SCI BORING LOG

PROJECT WINGHAVEN PROJECT SITE

BORING NO. B-2

LOCATION O'Fallon, Missouri

SHEET 1 OF 1

DRILLER Midwest Drilling, Inc.

PROJECT NO. 97-384-411

SURFACE ELEVATION 595+/-

DRILLING METHOD 4" CFA

DATE DRILLED 6-11-97

DEPTH (FT.)	SAMPLE				DESCRIPTION	UNIFIED SOIL CLASSIFICATION	SEE REMARK NO.	LABORATORY TEST RESULTS					DEPTH (FT.)
	NUMBER	TYPE	RECOVERY (IN/IN)	BLOWS (PER 6 IN.)				MOISTURE CONTENT (%)	DRY DENSITY (PCF)	UNCONFINED COMPRESSIVE STRENGTH (KSF)	LIQUID LIMIT	PLASTIC LIMIT	
0					6 inches TOPSOIL	CL/CH							0
2	1	SS		2 3	Brown and gray, medium plastic SILTY CLAY	CL		26					2
4	2	SS		2 3	Brown with some gray, low plastic SILTY CLAY	CL		28					4
6	3	SS		2 3	Brown with some gray, medium plastic SILTY CLAY	CL/CH		25					6
8	4	SS		3 5 7	Brown with some gray, high plastic CLAY	CH		29					8
12					Tan, WEATHERED SILTSTONE								12
14	5	SS		50/3				10					14
16	6	AS			Gray with some brown, SILTSTONE								16
18					Auger refusal at 17.5 ft.								18
20													20

WATER LEVEL:

- NO GROUND WATER NOTED AT TIME OF DRILLING
- FT WHILE DRILLING
- FT _____ HRS AFTER DRILLING
- FT _____ HRS AFTER DRILLING

REMARKS:

PROJECT WINGHAVEN PROJECT SITE

BORING NO. B-3

LOCATION O'Fallon, Missouri

SHEET 1 OF 2

DRILLER Midwest Drilling, Inc.

PROJECT NO. 97-384-411

SURFACE ELEVATION 602+/-

DRILLING METHOD 4" CFA

DATE DRILLED 6-11-97

DEPTH (FT.)	SAMPLE				DESCRIPTION	UNIFIED SOIL CLASSIFICATION	SEE REMARK NO.	LABORATORY TEST RESULTS					DEPTH (FT.)
	NUMBER	TYPE	RECOVERY (IN/IN)	BLOWS (PER 6 IN.)				MOISTURE CONTENT (%)	DRY DENSITY (PCF)	UNCONFINED COMPRESSIVE STRENGTH (KSF)	LIQUID LIMIT	PLASTIC LIMIT	
0					1 inch TOPSOIL	CL/CH	1						0
2	1	SS		3 3	Brown with some gray, medium plastic SILTY CLAY	CL		26					2
4	2	SS		2 3 3	Brown with some gray, low plastic SILTY CLAY	CL		25					4
6	3	SS		2 3 4				22					6
8	4	SS		3 3 5	Brown with some gray, high plastic CLAY	CH		33					8
14	5	SS		3 6 15	Tan, high plastic SHALEY CLAY	CH		30					14
16					Brown, WEATHERED SHALE								16
18													18
20	6	SS		27 50/3				10					20

Continued on sheet 2 of 2

WATER LEVEL:

- NO GROUND WATER NOTED AT TIME OF DRILLING
- _____ FT WHILE DRILLING
- _____ FT _____ HRS AFTER DRILLING
- _____ FT _____ HRS AFTER DRILLING

REMARKS:

1) Driller's observation



BORING LOG

PROJECT WINGHAVEN PROJECT SITEBORING NO. B-2LOCATION O'Fallon, MissouriSHEET 1 OF 1DRILLER Midwest Drilling, Inc.PROJECT NO. 97-384-411SURFACE ELEVATION 595+/-DRILLING METHOD 4" CFADATE DRILLED 6-11-97

DEPTH (FT.)	SAMPLE				DESCRIPTION	UNIFIED SOIL CLASSIFICATION	SEE REMARK NO.	LABORATORY TEST RESULTS					DEPTH (FT.)
	NUMBER	TYPE	RECOVERY (IN/IN)	BLOWS (PER 6 IN.)				MOISTURE CONTENT (%)	DRY DENSITY (PCF)	UNCONFINED COMPRESSIVE STRENGTH (KSF)	LIQUID LIMIT	PLASTIC LIMIT	
0					6 inches TOPSOIL	CL/CH							0
2	1	SS		2 3	Brown and gray, medium plastic SILTY CLAY	CL		26					2
4	2	SS		2 3	Brown with some gray, low plastic SILTY CLAY	CL		28					4
6	3	SS		2 3	Brown with some gray, medium plastic SILTY CLAY	CL/CH		25					6
8	4	SS		3 5 7	Brown with some gray, high plastic CLAY	CH		29					8
12					Tan, WEATHERED SILTSTONE								12
14	5	SS		50/3				10					14
16	6	AS			Gray with some brown, SILTSTONE								16
18					Auger refusal at 17.5 ft.								18
20													20

WATER LEVEL:
 NO GROUND WATER NOTED AT TIME OF DRILLING
 _____ FT WHILE DRILLING
 _____ FT _____ HRS AFTER DRILLING
 _____ FT _____ HRS AFTER DRILLING

REMARKS:

SCB BORING LOG

PROJECT WINGHAVEN PROJECT SITE

LOCATION O'Fallon, Missouri

DRILLER Midwest Drilling, Inc.

SURFACE ELEVATION 602+/-

DRILLING METHOD 4" CFA

BORING NO. B-3

SHEET 1 OF 2

PROJECT NO. 97-384-411

DATE DRILLED 6-11-97

DEPTH (FT.)	SAMPLE				DESCRIPTION	UNIFIED SOIL CLASSIFICATION	SEE REMARK NO.	LABORATORY TEST RESULTS					DEPTH (FT.)
	NUMBER	TYPE	RECOVERY (IN/IN)	BLOWS (PER 6 IN.)				MOISTURE CONTENT (%)	DRY DENSITY (PCF)	UNCONFINED COMPRESSIVE STRENGTH (KSF)	LIQUID LIMIT	PLASTIC LIMIT	
0					1 inch TOPSOIL	CL/CH	1						0
2	1	SS		3 3 4	Brown with some gray, medium plastic SILTY CLAY			26					2
4	2	SS		2 3 3	Brown with some gray, low plastic SILTY CLAY	CL		25					4
6	3	SS		2 3 4				22					6
8	4	SS		3 3 5	Brown with some gray, high plastic CLAY	CH		33					8
14	5	SS		3 6 15	Tan, high plastic SHALEY CLAY	CH		30					14
16					Brown, WEATHERED SHALE								16
18													18
20	6	SS		27 50/3				10					20

Continued on sheet 2 of 2

WATER LEVEL:

- NO GROUND WATER NOTED AT TIME OF DRILLING
- FT _____ WHILE DRILLING
- FT _____ HRS AFTER DRILLING
- FT _____ HRS AFTER DRILLING

REMARKS:

- 1) Driller's observation



BORING LOG

PROJECT WINGHAVEN PROJECT SITEBORING NO. B-3LOCATION O'Fallon, MissouriSHEET 2 OF 2DRILLER Midwest Drilling, Inc.PROJECT NO. 97-384-411SURFACE ELEVATION 602+/-DRILLING METHOD 4" CFADATE DRILLED 6-11-97

DEPTH (FT.)	SAMPLE				DESCRIPTION	UNIFIED SOIL CLASSIFICATION	SEE REMARK NO.	LABORATORY TEST RESULTS					DEPTH (FT.)
	NUMBER	TYPE	RECOVERY (IN/IN)	BLOWS (PER 6 IN.)				MOISTURE CONTENT (%)	DRY DENSITY (PCF)	UNCONFINED COMPRESSIVE STRENGTH (KSF)	LIQUID LIMIT	PLASTIC LIMIT	
22					Brown, WEATHERED SHALE								22
24	7	SS		50/3			12						24
26					Drilling terminated at 25.0 ft.								26
28													28
30													30
32													32
34													34
36													36
38													38
40													40
42													42

WATER LEVEL:

NO GROUND WATER NOTED AT TIME OF DRILLING

_____ FT WHILE DRILLING

_____ FT _____ HRS AFTER DRILLING

_____ FT _____ HRS AFTER DRILLING

REMARKS:



BORING LOG

PROJECT WINGHAVEN PROJECT SITE

BORING NO. B-14

LOCATION O'Fallon, Missouri

SHEET 1 OF 1

DRILLER Midwest Drilling, Inc.

PROJECT NO. 97-384-411

SURFACE ELEVATION 494+/-

DRILLING METHOD 4" CFA

DATE DRILLED 6-9-97

DEPTH (FT.)	SAMPLE				DESCRIPTION	UNIFIED SOIL CLASSIFICATION	SEE REMARK NO.	LABORATORY TEST RESULTS					DEPTH (FT.)
	NUMBER	TYPE	RECOVERY (IN/IN)	BLOWS (PER 6 IN.)				MOISTURE CONTENT (%)	DRY DENSITY (PCF)	UNCONFINED COMPRESSIVE STRENGTH (KSF)	LIQUID LIMIT	PLASTIC LIMIT	
0					5 inches TOPSOIL	CL	1						0
2	1	SS		3 2	Gray and brown, low plastic SILTY CLAY		23						2
4	2	SS		2 2 4			22						4
6	3	SS		0 1 2			28						6
8													8
10	4	SS		0 1 1			31						10
10					Drilling terminated at 10.0 ft.								
12													
14													
16													
18													
20													

WATER LEVEL:

_____ NO GROUND WATER NOTED AT TIME OF DRILLING

5.5 FT WHILE DRILLING

_____ FT _____ HRS AFTER DRILLING

_____ FT _____ HRS AFTER DRILLING

REMARKS:

1) Driller's observation



BORING LOG

PROJECT WINGHAVEN PROJECT SITE

LOCATION O'Fallon, Missouri

DRILLER Midwest Drilling, Inc.

BORING NO. B-21

SHEET 1 OF 1

PROJECT NO. 97-384-411

DATE DRILLED 6-10-97

SURFACE ELEVATION 524+/-

DRILLING METHOD 4" CFA

DEPTH (FT.)	SAMPLE				DESCRIPTION	UNIFIED SOIL CLASSIFICATION	SEE REMARK NO.	LABORATORY TEST RESULTS					DEPTH (FT.)
	NUMBER	TYPE	RECOVERY (IN/IN)	BLOWS (PER 6 IN.)				MOISTURE CONTENT (%)	DRY DENSITY (PCF)	UNCONFINED COMPRESSIVE STRENGTH (KSF)	LIQUID LIMIT	PLASTIC LIMIT	
0					3 inches TOPSOIL	ML/CL	1						0
2	1	SS		3 2 1	Brown and gray, low plastic CLAYEY SILT to SILTY CLAY			25					2
4	2	SS		3 2 5	Brown and gray, low plastic SILTY CLAY with some rock fragments	CL		22					4
6	3	SS		15 18 8	ROCK FRAGMENTS with some brown and gray, low plastic silty clay	GC		21					6
8	4	SS		50/1	ROCK and ROCK FRAGMENTS		2						8
10					Drilling terminated at 10.0 ft.								10

WATER LEVEL:

NO GROUND WATER NOTED AT TIME OF DRILLING
 6 FT WHILE DRILLING
 FT _____ HRS AFTER DRILLING
 FT _____ HRS AFTER DRILLING

REMARKS:

- 1) Driller's observation
- 2) Driller's observation



GEOTECHNICAL • ENVIRONMENTAL • WETLANDS • MATERIAL TESTING

333 Mid Rivers Mall Drive
St. Peters, MO 63376
Tele: (314) 397-6600
Fax: (314) 397-2600

KDG, MH FILE 980100

JUN 29 1998

FAX COVER SHEET

Please deliver the following pages to:

FIRM NAME KDG DATE: 6/29/98
 ATTENTION Ron Pagan TIME: _____
 FAX NO 434-8280
 FROM: Fred Held SCI PROJECT NO 980495
 PROJECT Winghaven Box Culverts SCI FAX NO 397-2600
 TOTAL NO. OF PAGES (INCLUDING COVER SHEET): 15

Please notify us immediately if the message is incomplete or unclear.
Thank you

FAX OPERATOR _____

MESSAGE: Please find letter and detail for your review.

ORIGINALS	
will be mailed	<input checked="" type="checkbox"/>
will not be mailed	<input type="checkbox"/>

After your comments from review are addressed.

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June 29, 1998

Mr. David Rogers
Fred Weber, Inc.
% Mr. Ronald C. Pagan, P.E.
Kuhlmann Design Group, Inc.
66 Progress Parkway
Maryland Heights, MO 63043-3705

RE. Winghaven Box Culverts
O'Fallon, Missouri
SCI #: 980495.11

Dear Mr. Pagan,

At the request of Mr. David Rogers with Fred Weber, Inc., this letter provides geotechnical design recommendations for five box culverts planned for the Winghaven development roadways. Plan and Profile sheets prepared by Pickett, Ray & Silver, Inc. (PRS), revised March 25 or 27, 1998, depict the locations and elevations of the culverts. Three of the culverts will cross under Winghaven Drive near stations 17+00, 30+50, 59+00. One culvert will pass under David Drive near station 5+50, and one culvert will pass under Charlie Drive near station 62+50. In this letter the box culverts will be named A, B, C, D and E, respectively. Culverts A and B will be tunnels for golf carts to underpass Winghaven Drive in the uplands part of the Winghaven development. The remaining will be multiple cell box culverts for existing creeks in lowland areas to pass under planned roadways. We understand that these culverts will be cast-in-place reinforced concrete structures that will have light to moderate loads.

We previously explored parts of the Winghaven development in our report, "Preliminary Exploration of Subsurface Conditions and Foundation Recommendations - WINGHAVEN PROJECT SITE COMMERCIAL, RESIDENTIAL, AND GOLF COURSE COMMUNITY - O'FALLON, MISSOURI," dated July 1997 (Revised January 1998). In that exploration we drilled B2 and B3 in the uplands near the golf cart underpasses, B21 in the lowland area near culvert C, and B14 in the bottoms land near culvert E. The four boring logs are included in the Appendix of this letter. These borings indicate that excavations for culverts A and B will encounter rock in the form of weathered siltstone or shale for the full depths of the structures. Also, B2 encountered auger refusal near El. 576.5 and the planned bottom of culvert A is near El. 574. Some or all of this rock may be removed in open-cut excavations with bull dozers equipped with rippers. However, intact ledges of hard rock, boulders, or sound bedrock may be encountered that could require blasting.

SCI explored the subsurface conditions near culverts C, D and E on June 25, 1998 using hand auger methods. The hand auger borings, TH1, TH2, and TH3, were located near culverts C, D and E, respectively, by measuring from existing site features and improvements shown of the plans prepared by PRS. The hand augers were advanced to termination depths of 5, 6, and 7½ feet in TH1, TH2, and TH3, respectively. The soils generally encountered were soft to medium stiff, low plastic silty clays and clayey silts. TH1 terminated in a mixture of silty clay, gravel and sand at a depth of 5 feet, which is about 3 feet above the anticipated bearing elevation of culvert C. TH2 and TH3 terminated at depths of 6 and 7½ feet, respectively, due to caving conditions in the holes. We estimate the termination elevations were near the bearing

elevations of culverts D and E. Groundwater was encountered in the hand auger borings at depths of 4 or 5 feet. The nature and thickness of the soils encountered and the results of the field sampling and testing are shown on the Borings Logs, Figures 1-1 through 1-3.

The varied conditions at the culvert locations require different allowable bearing capacities for the locations. An allowable bearing capacity of 10,000 pounds per square foot (psf) may be used to design the structural base slab for culverts A and B if they bear on the weathered siltstone or shale as indicated by B2 and B3 or if they encounter bedrock. An allowable bearing capacity of 3,000 psf may be used to design culvert C if it bears on the anticipated mixture of gravel and sand with some or no clay. An allowable bearing capacity of 1,500 psf may be used to design culvert D if it bears on the silty clay encountered in TH2. An allowable bearing capacity of 1,200 psf may be used to design culvert E.

We understand that higher bearing capacities will be required for culverts D and E. The soft soils below the base of the culverts may be removed and replaced with compacted, crushed rock, such as MODOT Type I Aggregate. The area of removal should extend down and outside the base footprint at an angle of 45 degrees to form a larger area to bear on the soft soils. The depth of removal will vary depending on the allowable bearing capacity required. We anticipate about 5 feet of soft soil will need to be removed and replaced with crushed rock to increase the allowable bearing capacity of the culverts to 2,000 or 3,000 psf.

In the lowland areas, placing fill to raise the roadway above existing grade will result in settlement as consolidation of the soft, underlying soils occurs. A delay in construction is anticipated to allow some or most of that settlement to occur prior to construction. We anticipate this delay to be about 30 to 120 days. This delay will likely not apply to culvert C since we anticipate it will bear on sand and gravel near bedrock elevations. Culverts D and E should not be constructed until most of the settlement due to the weight of the fills has occurred. Surcharging can be used as a means to accelerate consolidation due to the weight of fill. Deep fill in the lowland areas should be monitored with settlement plates to assess when most of the settlement has occurred and construction can continue.

The below-grade walls of the box culverts will be required to resist earth pressures. These include the outside walls of the culverts and the wing-walls that may extend from the culverts designed to accommodate surface grade changes.

The equivalent fluid unit weights tabulated below provide recommended lateral earth pressures for design of these walls. Values for granular material should only be used if the granular backfill extends from the wall a lateral distance of at least one-half the wall height. This table assumes that positive foundation drainage is provided to prevent buildup of hydrostatic pressure. The below-grade walls should be designed to resist an additional uniform lateral load of one-half of the surface loads.

Backfill Type	Fixed-Headed Walls (pcf)	Free-Headed Walls (pcf)
Cohesive Soil	60	50
Granular Material	45	40

A fixed-headed wall is a wall which is not permitted to deflect at the top after backfilling. A free-headed wall is designed to deflect at the top and remain fixed at the base, such as a retaining wall. A wing-wall attached to a fixed-headed wall should be considered fixed-headed unless the structural design permits independent rotation.

Maximum toe pressures for wing-walls should not exceed the bearing capacities recommended in this letter. Walls bearing in soil can be designed with a coefficient of friction on the base of a concrete footing and the subgrade soil of 0.3. A passive soil resistance to a uniform pressure of 300 psf may be used for natural soil against the face of the wall or base or a key below the base of a retaining wall. Soil backfilled against the exterior of a retaining wall should not be assumed to provide any lateral resistance.

We recommend that all below-grade walls and retaining walls be provided with a foundation drainage system. A typical below-grade wall drain detail is shown in Figure 2. It should consist of a perforated pipe to transport the fluids collected from the granular backfill to daylight. The granular drainage material around the pipe should consist of 1-inch clean, "GP" classified washed rock. A synthetic filter fabric indicated on Figure 2 should be Mirafi 140N or equivalent. A 4-inch diameter perforated drain pipe should be used.

We appreciate the opportunity to be of service to you on this project. If you have any questions or comments, please call.

Sincerely,

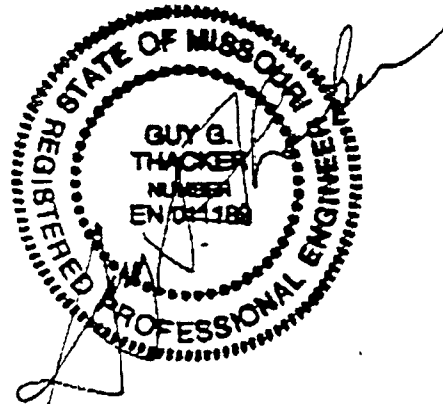
H. Held III

H. Held III
Civil Engineer

G. Thacker

G. Thacker, P.E.
Manager

GGT/tar



Mr. Dave Rogers, Fred Weber, Inc. (1)

**BORING LOG
LEGEND AND NOMENCLATURE**

Items shown in Boring Logs refer to the following:
(Where shown in parenthesis, sampling and testing were performed in general accordance with applicable ASTM standard methods or practices.)

- 1 Depth - Depth below ground surface (feet).
- 2 Sample - Types designated by letters.
 - SS - Split-spoon sample, disturbed, obtained by driving 2-inch O.D. split-spoon sampler (ASTM D 1586).
 - NX - Diamond core bit sample, nominal 2-inch diameter rock sample (ASTM D 2113).
 - ST - Thin-walled tube sample, undisturbed, obtained by penetration of a 3-inch diameter tube (ASTM D 1587).
 - CS - Continuous sample tube system, undisturbed, obtained by split barrel sampler in conjunction with auger advancement.
 - SV - Shear vane, field test to determine strength of cohesive soil by pushing or driving a 2-inch diameter vane then shearing by torquing soil in existing and remolded states (ASTM D 2573).
 - AS - Disturbed samples obtained from auger cuttings.
 - Recovery - Recovery is expressed as a ratio of the length recovered to the total length pushed, driven, or cored (inches), e.g. - 9/12.
 - Blows - Numbers indicate blows per six inches of sampler penetration when driven by a 140-pound hammer falling freely 30 inches (ASTM D 1586). When number of blows reaches 50 without six inches of sampler penetration, the result is shown as a ratio of 50 to the actual penetration, e.g. - 50/2 inches.
 - Vane Shear Strength - Shear strength of soil expressed as the peak strength (existing state)/residual strength (remolded state).
- 3 Description - Description according to the Unified Soil Classification: Description indicates soil constituents and other classification characteristics (ASTM D 2488). A solid line indicates approximate location of stratigraphic change between soil types and the transition may be gradual.
- 4 Laboratory Test Results
 - Natural moisture content in percent (ASTM D 2216).
 - Dry density of sample tested in pounds per cubic foot (pcf).
 - Unconfined compressive strength (ASTM D 2166) in kips per square foot (ksf).
 - Liquid limit (ASTM D 4318) in percent.
 - Plastic limit (ASTM D 4318) in percent.
- 5 Remarks/Other Data - See notation at bottom of log for description of data entries.
 - RQD - Rock Quality Designation; the ratio between the total length of core segments greater than 4 inches in length and the total length of core drilled (expressed as percentage).

PROJECT WINGHAMEN BOX CULVERTS

TEST PIT NO. TH-1

LOCATION O'Fallon Missouri

SHEET 1 OF 1

EXCAVATOR SCI

PROJECT NO. 980495.11

SURFACE ELEVATION 524 +/-

EQUIPMENT Hand auger

DATE EXCAVATED 6-25-98

DEPTH (FT.)	FIELD SAMPLE / TEST			DESCRIPTION	UNITED SOIL CLASSIFICATION	SEE REMARK NO.	LABORATORY TEST RESULTS					DEPTH (FT.)
	NUMBER	SAMPLE TYPE	SHEAR STRENGTH (KSF)				MOISTURE CONTENT (%)	DRY DENSITY (PCF)	UNCONFINED COMPRESSIVE STRENGTH (KSF)	LIQUID LIMIT	PLASTIC LIMIT	
0	1	BS		Grayish brown, low plastic SILTY CLAY with trace of fine roots	CL		29					0
2.5	2	BS		Brown, low plastic SILTY CLAY with trace of fine gravel	CL		19					2.5
5	3	BS		Brown, low plastic SILTY CLAY and coarse SAND to fine GRAVEL	CL,GC		19					5
5				Hand auger refusal at 5.0 ft								5
7.5												7.5
10												10
12.5												12.5
15												15
17.5												17.5

WATER LEVEL

NO GROUNDWATER NOTED AT TIME OF EXCAVATION
 5 FT WHILE EXCAVATING
 FT _____ HRS AFTER EXCAVATING

REMARKS:



TEST PIT LOG

PROJECT WINGHAM EN BOX CULVERTS

TEST PIT NO. TH-2

LOCATION O'Fallon Missouri

SHEET 1 OF 1

ELEVATOR SCI

PROJECT NO. 980495.11

GRADE ELEVATION 516 +/-

EQUIPMENT Hand auger

DATE EXCAVATED 6-25-98

DEPTH (FT.)	FIELD SAMPLE / TEST		SHEAR STRENGTH (KSF)	DESCRIPTION	UNIFIED SOIL CLASSIFICATION	SEE REMARK NO.	LABORATORY TEST RESULTS					
	NUMBER	SAMPLE TYPE					MOISTURE CONTENT (%)	DRY DENSITY (PCF)	UNCONFINED COMPRESSIVE STRENGTH (KSF)	LIQUID LIMIT	PLASTIC LIMIT	DEPTH (FT.)
0	1	BS		4 inches TOPSOIL Brown with gray, low plastic SILTY CLAY with some gray, silt and trace of organics	CL		23					0
2.5	2	BS	2.8 / 1.4	Brown and gray, low plastic CLAYEY SILT with trace of fine sand and organics	ML		25					2.5
	3	BS					21					
5	4	BS		Gray with brown, low plastic SILTY CLAY with trace of fine gravel	CL		24					5
6.0	Hand auger terminated at 6.0 ft.											

WATER LEVEL

REMARKS:

NO GROUNDWATER NOTED AT
 TIME OF EXCAVATION
 FT WHILE EXCAVATING
 FT HRS AFTER EXCAVATING



TEST PIT LOG

PROJECT WINGHAMEN BOX CULVERTS

TEST PIT NO. TH-3

LOCATION O'Fallon, Missouri

SHEET 1 OF 1

EXCAVATOR SCI

PROJECT NO. 980495.11

SURFACE ELEVATION 494 +/-

EQUIPMENT Hand auger

DATE EXCAVATED 6-25-98

DEPTH (FT.)	FIELD SAMPLE / TEST		SHEAR STRENGTH (KSF)	DESCRIPTION	UNIFIED SOIL CLASSIFICATION	SEE REMARK NO.	LABORATORY TEST RESULTS					
	NUMBER	SAMPLE TYPE					MOISTURE CONTENT (%)	DRY DENSITY (PCF)	UNCONFINED COMPRESSIVE STRENGTH (KSF)	LIQUID LIMIT	PLASTIC LIMIT	DEPTH (FT.)
0				Brown, low plastic SILTY CLAY	CL							
1	1	BS		Grayish brown, fine SANDY SILTY CLAY with some fine gravel	SC		21					
2.5	2	BS		Grayish brown, low plastic CLAYEY SILT with fine sand	ML		19					
5	3	BS		Brown and gray, low plastic CLAYEY SILT with some fine sand to fine gravel	ML		35					
7.5	4	BS		Gray, low plastic CLAYEY SILT with trace of fine gravel Hand auger terminated at 7.5 ft.	ML		29					
10												
12.5												
15												
17.5												

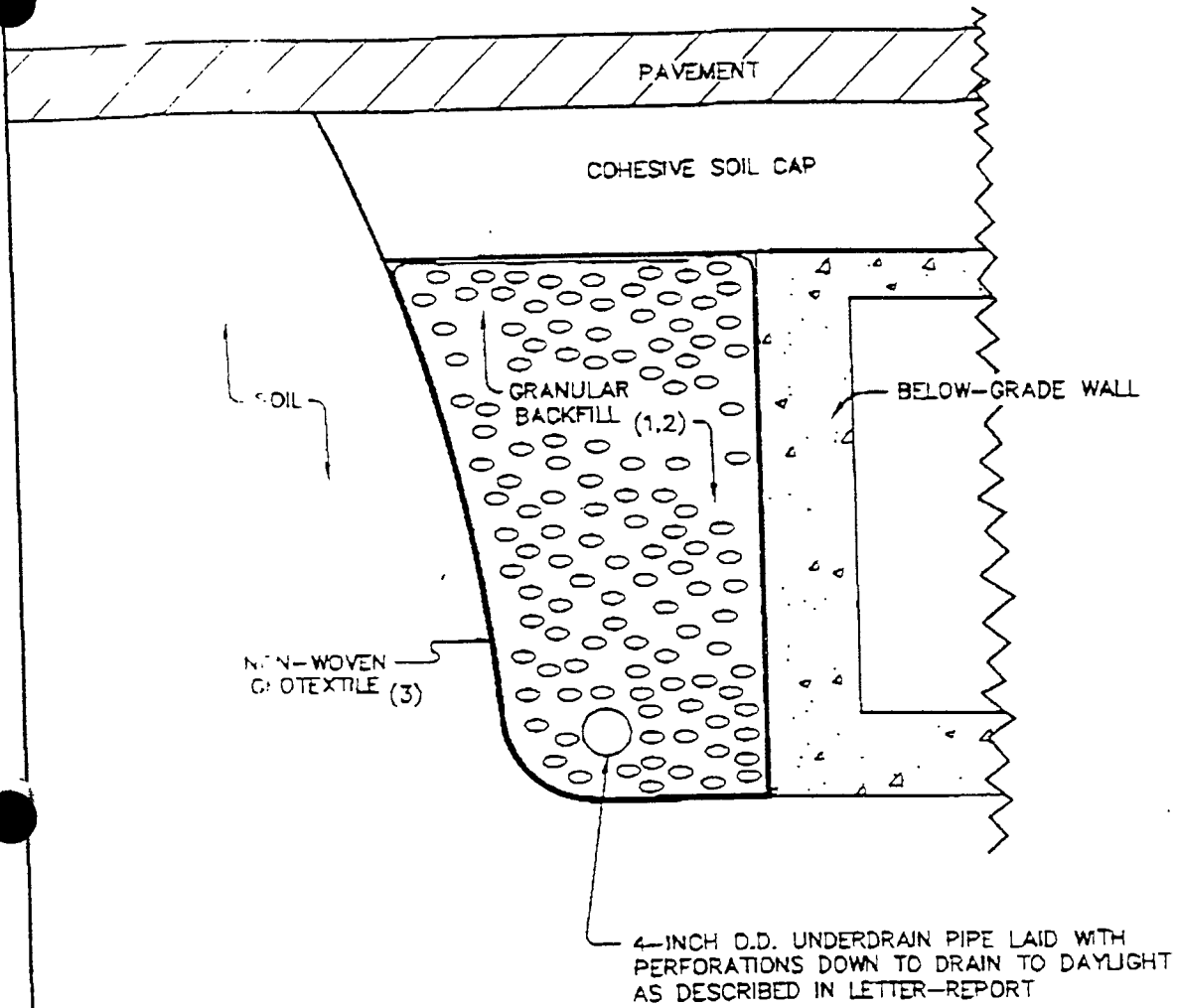
WATER LEVEL:

NO GROUNDWATER NOTED AT TIME OF EXCAVATION

4 FT WHILE EXCAVATING

FT _____ HRS AFTER EXCAVATING

REMARKS:



NOTES:

1. MINIMUM 6" FILTER MATERIAL AROUND PIPE.
2. 1" CLEAN CRUSHED LIMESTONE.
3. TYPICALLY FOUR-OUNCE PER SQUARE YARD

	333 MID RIVERS MALL DRIVE ST. PETERS, MISSOURI 63378
WINGHAVEN BOX CULVERT O'FALLON, MISSOURI	
BELOW-GRADE WALL DRAIN DETAIL	
JUNE 1998	SCI NO. 980495.11

FIGURE 2

APPENDIX



BORING LOG

PROJECT WINGHAVLN PROJECT SITE

BORING NO. B-2

LOCATION O'Fallon, Missouri

SHEET 1 OF 1

DRILLER Midwest Drilling, Inc.

PROJECT NO. 97-384-411

SURFACE ELEVATION 595+/-

DRILLING METHOD 4" CFA

DATE DRILLED 6-11-97

DEPTH (FT.)	SAMPLE			DESCRIPTION	UNIFIED SOIL CLASSIFICATION	LABORATORY TEST RESULTS					DEPTH (FT.)	
	NUMBER	TYPE	RECOVERY (%)			BLOWS (PER 6 IN.)	SEE REMARK NO.	MOISTURE CONTENT (%)	DRY DENSITY (PCF)	UNCONFINED COMPRESSIVE STRENGTH (KSF)		LIQUID LIMIT
0					6 inches TOPSOIL							0
1	1	SS		2 3	Brown and gray, medium plastic SILTY CLAY	CL/CH	26					2
2				3								
3					Brown with some gray, low plastic SILTY CLAY	CL						
4	2	SS		2 3			28					4
5												
6					Brown with some gray, medium plastic SILTY CLAY	CL/CH	25					6
7												
8					Brown with some gray, high plastic CLAY	CH						8
9												
10												
11												
12					Tan, WEATHERED SILTSTONE							12
13												
14	5	SS		50/3			10					14
15												
16					Gray with some brown, SILTSTONE							16
17	6	AS			Auger refusal at 17.5 ft.							17
18												
19												
20												20

WATER LEVEL:

- NO GROUND WATER NOTED AT TIME OF DRILLING
- FT WHILE DRILLING
- FT HRS AFTER DRILLING
- FT HRS AFTER DRILLING

REMARKS:



BORING LOG

PROJECT WINGHAVEN PROJECT SITEBORING NO. B-3LOCATION O'Fallon, MissouriSHEET 1 OF 2DRILLER Midwest Drilling, Inc.PROJECT NO. 97-384-411SURFACE ELEVATION 602+/-DRILLING METHOD 4" CFADATE DRILLED 6-11-97

DEPTH (FT.)	SAMPLE			DESCRIPTION	UNIFIED SOIL CLASSIFICATION	LABORATORY TEST RESULTS					DEPTH (FT.)	
	NUMBER	TYPE	BLOWS (PER 6 IN.)			SEE REMARK NO.	MOISTURE CONTENT (%)	DRY DENSITY (PCF)	UNCONFINED COMPRESSIVE STRENGTH (KSF)	LIQUID LIMIT		PLASTIC LIMIT
0				1 inch TOPSOIL		1						0
1	1	SS	3 3	Brown with some gray, medium plastic SILTY CLAY	CL/CH		26					2
2	2	SS	2 3	Brown with some gray, low plastic SILTY CLAY	CL		25					4
3	3	SS	2 3				22					6
4	4	SS	3 3	Brown with some gray, high plastic CLAY	CH		33					8
5	5	SS	3 6	Tan, high plastic SHALEY CLAY	CH		30					14
6	6	SS	15 27 50/3	Brown, WEATHERED SHALE			10					20

Continued on sheet 2 of 2

WATER LEVEL:

- NO GROUND WATER NOTED AT TIME OF DRILLING
 FT WHILE DRILLING
 HRS AFTER DRILLING
 HRS AFTER DRILLING

REMARKS:

- 1) Driller's observation



BORING LOG

PROJECT WINGHAMPTON PROJECT SITE

BORING NO. B-3

LOCATION O'Fallon, Missouri

SHEET 2 OF 2

DRILLER Midwest Drilling, Inc.

PROJECT NO. 97-384-411

SURFACE ELEVATION 602+/-

DRILLING METHOD 4" CFA

DATE DRILLED 6-11-97

DEPTH (FT.)	NUMBER	TYPE	RECOVERY (%)	BLOWS (PER 6 IN.)	DESCRIPTION	UNITED SOIL CLASSIFICATION	SEE REMARK NO.	LABORATORY TEST RESULTS					DEPTH (FT.)
								MOISTURE CONTENT (%)	DRY DENSITY (PCF)	UNCONFINED COMPRESSIVE STRENGTH (KSF)	LIQUID LIMIT	PLASTIC LIMIT	
22					Brown, WEATHERED SHALE								22
24	3	SS		50/3			12						24
25					Drilling terminated at 25.0 ft.								25
26													26
28													28
30													30
32													32
34													34
36													36
38													38
40													40
42													42

WATER LEVEL:

NO GROUND WATER NOTED AT TIME OF DRILLING
 FT WHILE DRILLING
 FT _____ HR. AFTER DRILLING
 FT _____ HR. AFTER DRILLING

REMARKS:



BORING LOG

PROJECT WINGHAVEN PROJECT SITE

BORING NO. B-14

LOCATION O'Fallon, Missouri

SHEET 1 OF 1

DRILLER Midwest Drilling, Inc.

PROJECT NO. 97-384-411

SURFACE ELEVATION 494+/-

DRILLING METHOD 4" CFA

DATE DRILLED 6-9-97

DEPTH (FT.)	SAMPLE				DESCRIPTION	UNIFIED SOIL CLASSIFICATION	SEE REMARK NO.	LABORATORY TEST RESULTS					DEPTH (FT.)	
	NO. DRILL	TYPE	RECOVERY (IN, IN)	BLOWS (PER 6 IN.)				MOISTURE CONTENT (%)	DRY DENSITY (PCF)	UNCONFINED COMPRESSIVE STRENGTH (KSF)	LIQUID LIMIT	PLASTIC LIMIT		
0					5 inches TOPSOIL	CL	1						0	
1	SS		3	2	Gray and brown, low plastic SILTY CLAY				23					2
2	SS		2	2					22					4
3	SS		0	1					28					6
4	SS		0	1					31					8
10					Drilling terminated at 10.0 ft.								10	

WATER LEVEL:

NO GROUND WATER NOTED AT TIME OF DRILLING
 0.5 FT WHILE DRILLING
 FT _____ HRS AFTER DRILLING
 FT _____ HRS AFTER DRILLING

REMARKS:

1) Driller's observation



BORING LOG

PROJECT WINGHAVEN PROJECT SITEBORING NO. B-21LOCATION O'Fallon, MissouriSHEET 1 OF 1DRILLER Midwest Drilling, Inc.PROJECT NO. 97-384-411SURFACE ELEVATION 524+/-DRILLING METHOD 4" CFADATE DRILLED 6-10-97

DEPTH (FT.)	NUMBER	TYPE	RECOVERY IN (%)	BLOWS (PER 6 IN.)	DESCRIPTION	UNIFIED SOIL CLASSIFICATION	SEE REMARK NO.	LABORATORY TEST RESULTS					DEPTH (FT.)
								MOISTURE CONTENT (%)	DRY DENSITY (PCF)	UNCONFINED COMPRESSIVE STRENGTH (KSF)	LIQUID LIMIT	PLASTIC LIMIT	
0					3 inches TOPSOIL		1						0
1	1	SS		3	Brown and gray, low plastic CLAYEY SILT to SILTY CLAY	ML/CL		25					2
2				2									
3				1									
4				3									
5	2	SS		2	Brown and gray, low plastic SILTY CLAY with some rock fragments	CL		22					4
6				5									
7													
8	3	SS		15	ROCK FRAGMENTS with some brown and gray, low plastic silty clay	GC		21					6
9				18									
10				8									
11													
12	4	SS		50/1	ROCK and ROCK FRAGMENTS		2						8
13													
14													
15													
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18													
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100													

WATER LEVEL:
 _____ NO GROUND WATER NOTED AT TIME OF DRILLING
 _____ FT WHILE DRILLING
 _____ FT _____ HRS. AFTER DRILLING
 _____ FT _____ HRS. AFTER DRILLING

REMARKS:
 1) Driller's observation
 2) Driller's observation

FIGURE 2-21



GEOTECHNICAL • ENVIRONMENTAL • WETLANDS • MATERIAL TESTING

333 Mid Rivers Mall Drive
St. Peters, MO 63376
Tele: (314) 397-6600
Fax: (314) 397-2600

KDE, MH FILE 980100

JUN 29 1998

FAX COVER SHEET

Please deliver the following pages to:

FIRM NAME KDG DATE: 6/29/98
ATTENTION Ron Pagan TIME: 4:00
FAX NO: 434-8280
FROM Fred Held SCI PROJECT NO: 97384411 +
PROJECT Winghaven Subsurface Report SCI FAX NO: 97-385-711
TOTAL NO. OF PAGES (INCLUDING COVER SHEET): 13 SCI FAX NO: 397-2600

Please notify us immediately if the message is incomplete or unclear
Thank you

FAX OPERATOR: *Kerry Lynett*
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Preliminary Exploration of Subsurface Conditions
and
Foundation Recommendations

WINGHAVEN PROJECT SITE
COMMERCIAL, RESIDENTIAL, AND
GOLF COURSE COMMUNITY
O'FALLON, MISSOURI

NOVUS CORPORATION
Owner

MCEAGLE
Project Manager

LOOMIS BOULTON PICKETT
Commercial Development Consultant

PICKETT, RAY & SILVER, INC.
Commercial Civil Engineer/Surveyor

STONEWOLF II
Residential Developer

KUHLMANN DESIGN GROUP, INC.
Residential/Golf Course Civil Engineer/Surveyor

July 1997

SCI N^o 97-384-411 & 97-385-111

SCI
333 Mid Rivers Mall Drive
Saint Peters, Missouri 63376-1516



July 23 1997

Mr. Lloyd Schneider
c/o Mr. Paul McKee
Panc Corporation
689 Craig Road
St. Louis, Missouri 63141-7124

RE Preliminary Report of Subsurface Exploration
Winghaven Project Site
Commercial, Residential, and Golf Course Community
O'Fallon, Missouri
SCI # 97-384-411 & 97-385-111

Dear Mr. Schneider,

Enclosed is our report "Preliminary Exploration of Subsurface Conditions and Foundation Recommendations - WINGHAVEN PROJECT SITE - COMMERCIAL, RESIDENTIAL, AND GOLF COURSE COMMUNITY - O'FALLON, MISSOURI" dated July 1997.

We appreciate the opportunity to be of service to you on this project. If you have any questions or comments, please call

Very truly yours,

SCI

Fred H. Held III
Project Engineer

Carl L. Jacobi, P.E.
Director of Geotechnical Services

FHH/CLJ/al, jf

Enclosures

Three copies submitted

- c Mr. Lloyd Schneider; Novus Corporation (1)
- Mr. Joe McKee; McEagle Corporation (1)
- Mr. Jack Wolfner; c/o Mr. Tom Glosier; Stonewolf II (1)
- Mr. Ken Ingram; Kuhlmann Design Group, Inc. (1)
- Mr. Jerry Loomis; Loomis Boulton Pickett (1)
- Mr. Hal Barch; Pickett, Ray & Silver, Inc. (1)
- Mr. Mike Harmon; Fred Weber, Inc. (1)

Preliminary Exploration of Subsurface Conditions
and
Foundation Recommendations

WINGHAVEN PROJECT SITE
COMMERCIAL, RESIDENTIAL, AND GOLF COURSE COMMUNITY
O'FALLON, MISSOURI

INTRODUCTION

At the request of Mr. Paul McKee with McEagle Corporation, on behalf of Mr. Lloyd Schneider with Novus Corporation, we conducted a preliminary subsurface exploration for a future commercial, residential and golf course development. The purpose of our exploration was to generally characterize and evaluate the subsurface conditions to provide general recommendations for foundations and to address other geotechnical aspects of the proposed project. Our services were provided in general accordance with our proposal dated May 20, 1997.

PROJECT AND SITE CHARACTERISTICS

The Winghaven project site is about 1100 acres and is the combination of several large properties in O'Fallon, Missouri. The site extends from Highway N on the north to Dardenne Creek on the south, and lays north and east of U.S. Highway 40/61. The eastern boundary is comprised partly by Bates Road and partly by the boundary line between the City's of O'Fallon and Dardenne Prairie. The property has frontage on Post Road near the northwestern corner and has extensive frontage along Highway 40/61, Highway N, and Bates Road. The property and surrounding road pattern is shown on the Vicinity Map, Figure 1.

In general the property slopes from north to south with drainage being tributary to Dardenne Creek, along the southernmost boundary line. A deep, wide draw drains southeastward through the south central part of the site. Numerous smaller draws drain into the major draw or directly into the floodplain. Approximately 120 acres of the property lies in the floodplain of Dardenne Creek. Total elevation difference across the project site is approximately 140 feet with the high at El. 620 and the low at El. 480.

of the property site has remained undeveloped and appears to have been used mostly for agricultural purposes. However, the Monsanto Company owned a majority of the property and constructed an animal research facility near the center of the tract. A laboratory building and numerous buildings housing poultry and livestock were constructed for this facility. Driveways and parking areas were constructed to serve the Monsanto facilities. In the northern portion of the property along Dardenne Creek, a wildlife theme park was once proposed and some preliminary grading and development was undertaken to create the park. This involved a manmade lake near the southeast corner of the property, and some grading was performed in that general area.

The concept plan which you provided indicates the tract will be developed for both residential and business usage in the higher portions of the property. This will entail single-family and multi-family residential areas and several business park areas, offering a wide variety of lot sizes for industrial and commercial development. A golf course is proposed in the floodplain area near the south property line and in the major draw. Much of the residential development will surround the golf course to the north. Most of the commercial development will be near Highway 40/61. A major roadway is planned through the central and northern portions of the property which will connect Highway 40/61 with Highway N and will eventually extend eastward to connect with the Page Avenue extension (Highway D). This development is a concept plan at this time, and numerous changes will likely be made in further planning for the phased development of both the residential and business portions of the property.

We understand the property has been used for agricultural purposes and that your intention is to continue farming the property as the development is phased over several years.

FIELD EXPLORATION

The field exploration for the residential and commercial developments consisted of drilling twenty-seven borings at the approximate locations shown on the Site Plan. Three proposed borings (B: 5, B120, and B121) were inaccessible, and therefore, not drilled. B1 through B15 were drilled for proposed commercial roadways. B16 through B29, excluding B25, were drilled for proposed commercial development areas. B101 through B119 were drilled in areas of proposed residential or golf course development.

The boring locations were established in the field by SCI engineer relative to existing roads, improvements, and topographic features. Approximate boring elevations were determined from Topographic Maps derived from aerial surveys prepared by Walker and Associates, Inc., dated March 21, 1986.

The borings were drilled on June 7 through 14, 1997. Continuous-flight augers powered by a DMF-550 drilling rig were used to advance the borings to predetermined depths of 10 to 30 feet or to auger refusal at depths ranging from 8½ to 44 feet. Standard penetration tests were performed at 2½- and 5-foot intervals throughout the soil overburden. The standard penetration test provides a guide to soil strength and a disturbed sample for laboratory testing. The nature and thickness of the soils encountered and the results of the field sampling and testing are shown on the Boring Logs, Figures 2-1 through 2-29 (commercial development and roads) and Figures 3-1 through 3-19 (residential and golf course development). Table 1 summarizes some of the drilling information.

LABORATORY TESTING

The samples obtained were described and classified in our laboratory by a soil technician using manual-visual methods. Moisture contents were determined for each of the samples. The results of these laboratory tests are shown on the Boring Logs.

SOIL PROFILE

Presented herein is the general description of the soils encountered. Detailed information regarding the soil type and interpretive soil stratigraphy is presented on the Boring Logs. A Boring Log Legend is included as Figure 2 to aid in the interpretation of the Boring Logs.

Two and three feet of fill was encountered in B8 and B19, respectively. In general, medium-stiff to very-stiff residual soils and glacial tills were found in the upland parts of the property and soft alluvial soils were found in the lowland or floodplain areas. The upland soils were generally capped with wind blown silt that has weathered to silty clay (modified loess). Topsoil 1 to 6 inches thick was usually underlain by a layer of low plastic silty clay that was underlain by high plastic clay. Some of the borings did not encounter the low plastic silty clay soil layer. The high plastic clays generally consisted of glacial tills or residual soils with various amounts of sand, gravel, and rock fragments that generally increased with depth.

Auger refusal was encountered in 12 of the borings at depths ranging from 8½ to 44 feet. Excluding the high and low of 44 and 8½ feet, the average refusal depth was about 16 feet in the borings that refused. However, very rocky soils were encountered at relatively shallow depths in most of the borings. The materials encountered just before refusal were weathered siltstones, gravelly clays, rock and fragments, or clayey shales. Auger refusal is a designation applied to any material which cannot be further penetrated by the power auger. This material is usually indicative of a very hard or very dense material, such as boulders or the upper surface of bedrock. Rock coring was beyond the scope of this exploration, therefore, the character and continuity of the refusal materials could not be determined.

Groundwater was encountered in five of the borings generally in the lowland areas (B11, B14, B15, B29, and B110) at depths of 11½ to 14 feet, and one upland area (B118) at a depth of 16 feet. The other borings were dry upon completion of drilling. In relatively impervious soils, a suitable estimate of the groundwater level may not be possible, even after several days of observation. The groundwater table will fluctuate throughout the year depending on climate and rainfall conditions. It is not anticipated that groundwater will influence the construction phase of projects in the upland areas. However, excavations in the lowland areas may experience construction problems.

GENERAL DESIGN CONSIDERATIONS AND RECOMMENDATIONS

Heavily loaded commercial buildings may require deep foundations and bearing on rock due to concentrated column loads that make spread footing foundations uneconomical. The upland areas are conducive to the use of drilled piers. Estimating allowable bearing pressures for rock bearing foundations require rock coring which was beyond the scope of this exploration.

Shallow spread foundations will be suitable for support of light to moderately loaded residences and commercial buildings. Allowable bearing pressures for structures in upland areas will likely be 2,000 to 3,000 pounds per square foot (psf). Allowable bearing pressures for structures in lowland areas on soft soils will be about 1,200 to 1,500 psf. Allowable bearing pressures may be increased in the lowland areas if sufficient depths of fill are placed.

Settlements of foundations can be less than 1-inch excluding settlements induced by filling. Fill settlements should be minor in the upland areas and substantially occur in about 30 to

of soft and compressible soils were encountered in the lowland areas. It is our opinion excessive total and differential settlements will occur beneath column and wall loads placed on these natural, soft soils, if precautions are not taken to reduce the post-construction settlement. Shallow foundations with low contact pressures, however, should be used for support of most of the proposed improvements in the lowland areas with little compaction of the soil. Moderate contact pressures will require a sufficient thickness of compacted structural fill in the building area. The thickness of fill will be determined by the actual loading. Surcharging can also be used to reduce post-construction settlement if the grades for the proposed improvements must remain at or near existing grades or as a means to accelerate consolidation due to the weight of fill.

In lowland areas, placing fill to raise the site above existing grade will result in settlement and consolidation of the soft, underlying soils occurs. A delay in construction is anticipated to occur. Most of that settlement to occur prior to construction. The delay recommended on the building location, building loads and the amount of fill placed in this area anticipate this delay to be about 30 to 120 days. Deep fill in the lowland areas should be placed with settlement plates to assess when most of the settlement has occurred and construction can continue.

Deep foundations are also acceptable foundation types for construction in the lowland areas; however, we anticipate these options will not be economical compared to the suggested foundation. A deeper exploration will be required if deep foundations are to be considered.

Although only a small amount of existing fill was encountered in our limited exploration, other types of fill will likely be encountered on the site due to existing development. Further investigations will be required to better identify the extent of existing fill located on the site. In general, existing fill located in areas to be developed should be removed to naturally occurring soil and replaced with properly compacted structural fill.

Seismic Design Considerations. The 1996 BOCA National Building Code requires the seismic design of the proposed structures. A site coefficient is required for the calculation of minimum earthquake design forces. The coefficient is a function of the soil type, consistency,

and bedrock depth. The site can be essentially divided into two areas seismically, uplands and lowlands. Due to the depth to rock and the relatively stiff consistency of the soil in the uplands, the soil-profile type is S₁ and the upland site coefficient (S) is 1.0. The lowlands, which are generally in the southern part of the site and in some of the wide draws, do not fit any of the BOCA standard soil-profile types. Therefore, as required by the code, the soil-profile type is S₂ and the lowland site coefficient (S) is 2.0.

High Plastic Clay Considerations. High plastic clay soils are present at depths which may impact construction. High plastic clay soils have the potential for volume change with fluctuations in soil moisture content. This volume change is normally evidenced by the heaving and cracking of concrete floor slabs and, in severe cases, by the movement and cracking of footings and foundation walls. Remedial measures, if necessary to avoid such distress, may require overexcavation and replacement of these materials with low plastic silty clay soils or crushed stone to a minimum depth of 2 or 3 feet below the base of footings and floor slabs.

Heave of soils with a marginal potential for soil heave can be reduced by not allowing the soils to desiccate prior to pouring the concrete slab. Maintaining the natural moisture content can be accomplished by placing a thin polyethylene vapor barrier over these soils immediately after excavation. Other measures that may be utilized to reduce this problem include, but are not limited to: the addition of extra steel reinforcement in the top and bottom of foundation walls, the "floating" of floor slabs such that they are not structurally connected to or bonded to foundation walls or interior columns, the placement of foundation drains to reduce the possibility of water reaching the subgrade soils, and the placement of woven wire mesh to reinforce the floor slab.

Site Drainage and Grading. Positive site drainage should be provided to reduce infiltration of surface water around the perimeter of the buildings, residences, and beneath the floor slabs. All grades should be sloped away from the structures, and roof and surface drainage should be collected and discharged such that water is not permitted to infiltrate the backfill of the structures.

GENERAL SITE DEVELOPMENT RECOMMENDATIONS AND CONSIDERATIONS

Auger refusal was encountered at depths of 8½ and 14 feet in B9 and B8, respectively. Rock

excavation will likely be required to achieve the proposed grades in those areas. The central part of the site and several ridge tops around the site will likely require rock excavation for general grading, utility trenches, and/or basement excavations. The rocky clay materials encountered prior to auger refusal can usually be excavated in open cuts, sometimes using large dozers equipped with rippers. However, large rock fragments, intact rock ledges or boulders are sometimes encountered in soils of this type. These materials can also prove very difficult in trench excavations and may require blasting. Further exploration can help to delineate the extent of rock excavation required for specific road and utility alignments, and building sites. A contingency fund should be established for rock excavation.

The surface soils at the site are silty. Such soils may exhibit a significant loss in strength when they become saturated and disturbed, as may occur due to trafficking of construction equipment. This may complicate construction of paved streets, parking areas, and foundations.

Erosion control measures should be taken during the general grading to prevent the transportation of these soils by surface runoff onto adjoining properties. Timely sodding or seeding of the sloped areas will reduce this potential problem.

Site Preparation. All existing vegetation in the cut and fill areas should be removed prior to placing fill. Trees and brush may be burned on site as approved by local ordinances. Burn pits should be located outside of building areas, street areas, or areas designed as slopes steeper than 1 vertical to 5 horizontal. Stumps should be removed from the site or buried in locations approved by the geotechnical engineer.

Soft soils are likely to be encountered in the bottoms of the draws, drainage swales, and in the floodplain or lowland areas. These soils should be removed to firm materials before placement of fill. The existing ponds should be drained, and soft soils removed from the bottom before placement of fill. If removal of soft soils is impractical due to their excessive depth, they should be stabilized or "bridged over" in a manner approved by SCI.

In areas to be developed, the existing buildings and related below-grade components must be properly demolished and the debris removed from the site. Existing foundation walls, cisterns,

septic fields and associated backfill must be removed entirely along with footings and below-grade utilities. Masonry rubble generated by the demolition may be placed in the deeper portions of fill areas as approved by a representative of SCI. Where the removal creates excavations below the final proposed grade, the excavations should be brought to final grade with engineered fill.

Our borings do not indicate any highly organic topsoil of any significant thickness on this site. However, if such organic soils are encountered, they should be stripped from the site and stockpiled for later use in lawn or landscaped areas. After stripping, the subgrade and fill areas should be scarified and proofrolled to a minimum depth of 1-foot and to a minimum dry density of 87 percent of the maximum dry density as determined by the modified Proctor compaction test (ASTM D 1557)

Fill Materials and Compaction. The available low to medium plastic silty clay soils encountered at the site may be used as structural fill. Large rubble pieces due to the demolition of the existing structures, in excess of three inches, should not be used as structural fill.

We recommend that all fill placed in building areas near the footing and floor slab elevations have a liquid limit less than 45. Acceptable non-organic fill soils include materials designated CH, ML, CL, ML, SP, SW, GP, and GW soils by ASTM D 2487. Where practical, high plastic soils should be placed in deeper portions of fill areas or in landscaped areas. If high plastic clays are placed or are located within three feet of footing or floor slab elevations, remediation may be recommended. Such measures could range from ensuring that the soils do not dry out during construction to overexcavating below structural members and slabs.

Fill should be placed in horizontal lifts not exceeding 8 inches in loose thickness and compacted with a sheepsfoot or tamping roller to minimum dry density of 90 percent of the maximum dry density as determined by the modified Proctor compaction test (ASTM D 1557). Higher densities may be required for deep fills.

Some of the fill materials at the project site may be rocky clay or shaley materials that are traditionally not tested by conventional nuclear densimeter or drive-tube methods. Rock

fragments that are ripped or blasted would also fall into that category. Such materials are typically compacted by several passes of a heavy vibratory roller. The number of passes and minimum roller weight should be determined in the field. Density tests on the rocky material are generally not performed due to the varying quantities of soil and rock materials at any one location. Poorly compacted areas can generally be detected by observing the fill subgrade during passing of a loaded scraper or compactor over the fill area. Any poorly compacted areas detected should be recompactd with additional passes of the vibratory roller.

Cut and Fill Slopes. We recommend that all cut and fill slopes be no steeper than 1 vertical to 3 horizontal. Properly compacted fill slopes and cut slopes of less than 20 feet in height should be stable at this inclination. SCI should evaluate the stability of slopes higher than 20 feet. Slopes to receive fill which are steeper than 1 vertical to 5 horizontal should be benched prior to placement of fill. Benching will provide level surfaces for compaction and avoid the development of an inclined plane of weakness between the virgin soils and compacted fill. The benches should be spaced such that the maximum height of cut at the up-slope ridge of the bench is 5 feet.

PAVEMENT SUBGRADE CONSIDERATIONS

Pavement design recommendations are beyond the scope of work for this report. However, certain aspects should be considered in the design and construction of the paved areas. We suggest that the soil subgrade be compacted to a dry density of at least 90 percent of the material's modified Proctor maximum dry density (ASTM D 1557). The crushed rock base should be compacted to 92 percent of the same criteria. The asphaltic surface course and Portland Concrete pavements should be checked during placement to verify compliance with the specifications.

The natural soils encountered on the site, to a depth of approximately 3 feet below the present ground surface, are silty and exhibit a significant loss of strength when they become saturated and disturbed. The strength of these compacted, silty soils is dependent on the moisture content. Significant construction problems may be incurred if pavement construction takes

place in the wetter portions of the year (November through April). Special measures may be required to facilitate construction during these periods.

The performance of a pavement section is dependent on the design life, traffic loads, subgrade strength, drainage characteristics, and the desired maintenance level. Pavement recommendations and/or materials testing services can be provided on request.

ADDITIONAL EXPLORATION PROGRAM

Many items should be addressed in one or more detailed subsurface explorations for the proposed development. Detailed explorations should be based on proposed grades, the site layout, and specific building clusters, or individual large or heavily loaded buildings. These explorations will include additional and possible deeper borings and more extensive laboratory testing. The detailed explorations should address the following:

- Recommendations for foundation support.
- Seismic coefficients for building design according to the BOCA code.
- Estimation of the shrink/swell potential of subgrade soils.
- Site development recommendations.
- Geotechnical construction considerations.
- Anticipated settlement based on general soil characteristics or based on laboratory consolidation tests.
- Influence of ground water on design and construction.
- Locations and descriptions of existing fill materials within the proposed building areas, if encountered.
- Structural fill considerations.
- Suitability of on-site soils for use as structural fill.
- Engineering criteria for placement of structural fill.
- Pavement subgrade recommendations.
- Lateral earth pressures for the design of below grade and retaining walls.
- Recommendations for design and construction of slopes.
- Provide lake and detention basin and dam design recommendations.
- Recommend a construction monitoring program.

LIMITATIONS

The recommendations provided herein are preliminary and are based on the information obtained at forty-seven specific drilling locations within the project area and regionally accepted practice. These recommendations should be reevaluated after a more detailed exploration is performed.

BOX CULVERT DESIGN

JVS 15 Jul 98

Old
15 July 98

OM CULVERT BR#A400
OM file: A406LRF1.pol
OM Date: 15Jul98
OM Hydraulic Deisgn
OM Quadruple Box Culvert (No Haunch)
OM 4-Cell Box 12'W X10'H
OM Load Factor Design
OM Rigid Frame Method
OM Top and Bot Slab Different
OM Exterior and Interior Wall Different
OM Minumum Fill Ht Condition (1.0 Ft)
OM

STDLOD 2, 0, 0, 0, 0
SWPRES 1, 2, 60, 15, 62.4
BOXDIM 1, 4, 12, 10, 1, 10
SLBTHK 1, 11.5, 12.5, 8, 8, 1111
H&SKEW 1, 90, 90, 0, 0, 0
REEBAR 18, 9, 1, 11, 4, .016
CONCOV 2, 3, 2, 1.5, .5, .5
MATPRP 120, 60, 24, 3, 0, 0
PRTCTL 1, 1, 1, 0
F&HCTL 1, 1, 1
DESCTL 1, 0, 1, 0, 0, 9

CONSTANT DATA

STANDARD LIVE LOAD	-	DESIGN METHOD	-	PRINT CONTROL
TRUCK OMIT STRESS OVERLD	-	SERVICE LOAD	-	10th Pt INFL LOC. NEG
CODE L.L. 0-FILL AXLE	-	LOAD FACTOR	-	MOMENT LINE MOMENT
HS20 NO NO 0.		NO YES		YES YES 1.00

MATERIAL PROPERTIES						-	THICKNESS
SOIL WEIGHT	STEEL Fy	STEEL Fs	CONCRETE STRENGTH	CONCRETE SHEAR	CON.SHEAR W/ STIRRUP	-	INCREMENTS SLAB WALL
120.	60000.	24000.	3000.	0.	0.		0.50 0.50

CONCRETE COVER				-	DESIGN	-	PRINT	-	REINFORCING
EXTERIOR		INTERIOR		-	SAME	-	BAR	-	BAR SPACING BAR SIZE
TOP	BOT	WALL	(ALL)	-	THICKNESS	-	TABLE	-	MAX MIN MAX MIN
SLAB	SLAB			-	SLAB WALL	-		-	
2.00	3.00	2.00	1.50		NO NO		YES		18.0 9.0 11 4

CRACK PARAMETER Z = 98.0
 MODULAR RATIO N = 9.0

SUPERIMPOSED DEAD LOADS						-	SPECIAL LIVE LOADS
UNIFORM LOAD	CONCENTRATED LOAD					-	WHEEL FILL OVERSTRESS
LOAD	WT.	X1	WT.	X2	WT.	X3	LOAD HEIGHT FACTOR
0.000	0.00	0.0	0.00	0.0	0.00	0.0	0.000 0.000 1.00

DATA FOR STRUCTURE NUMBER 1

CULVERT TYPE	-	SPAN LENGTH	-	CLEAR HEIGHT	-	DESIGN FILL	-	CENTERLINE LENGTH	-	SKEW LEFT	-	SKEW RIGHT	-	FLOOR TYPE
QDRPLE		12.00		10.00		1.00		10.00		90		90		FULL

SLAB THICKNESSES				-	LIVE LOAD	-	SOIL SURCHARGE	-	WATER PRESSURE
TOP	BOT.	EXT.	INT.	-	LOAD	-	PRESSURE	-	PRESSURE
SLAB	SLAB	WALL	WALL	-	SURCHARGE	-	MAX MIN	-	
11.50F	12.50F	8.00F	8.00F		2.00		60.0 15.0		62.4

TOP HAUNCH HEIGHT	BOTTOM HAUNCH HEIGHT	-	RIGID OR FLEXIBLE	-	CHECK MILITARY	-	BAR SPACING INCREMENT
0.0	0.0		RIGID		NO		1 INCH

BOTH HEADWALLS ELIMINATED.

***** LOAD FACTOR DESIGN *****
 ***** STRESSES AT CRITICAL SECTIONS *****

*** MAXIMUM REINFORCEMENT RATIO (As/bd) = .016

MEMBER NUMBER = 1
 MEMBER THICKNESS = 8.00
 EXTERIOR WAL

	-MOMENT-	-AXIAL-	-SHEAR-	-Po-	-Mu-	-Mbal-	-Pbal-	-STEEL-	-SHEAR-	-ALL.-	-ALL.-
	FORCE							AREA	STRESS	MOM.	SHEAR
LT	-16.1	9.1	5.6	207.5	15.3	19.0	33.9	0.74	105.2	16.3	109.5
MID	5.7	10.3	2.5	187.8	5.7	17.0	63.5	0.26	43.2	7.5	109.5
MID-	-6.1	7.7	2.5	189.5	6.1	16.0	55.3	0.26	47.2	7.5	109.5
RT	-14.0	3.8	3.9	204.7	14.0	18.0	37.2	0.64	73.6	14.4	109.5

MEMBER NUMBER = 2
 MEMBER THICKNESS = 11.50
 TOP SLAB

	-MOMENT-	-AXIAL-	-SHEAR-	-Po-	-Mu-	-Mbal-	-Pbal-	-STEEL-	-SHEAR-	-ALL.-	-ALL.-
	FORCE							AREA	STRESS	MOM.	SHEAR
LT	-14.7	4.4	9.4	272.7	14.7	39.0	98.4	0.51	102.2	15.8	109.5
MID	26.2	0.1	5.1	283.9	26.2	45.0	90.7	0.80	52.5	26.3	109.5
RT	-20.5	-2.2	8.9	281.2	22.4	42.0	87.6	0.69	96.9	21.9	109.5

MEMBER NUMBER = 3
 MEMBER THICKNESS = 8.00
 INTERIOR WAL

	-MOMENT-	-AXIAL-	-SHEAR-	-Po-	-Mu-	-Mbal-	-Pbal-	-STEEL-	-SHEAR-	-ALL.-	-ALL.-
	FORCE							AREA	STRESS	MOM.	SHEAR
LT	-13.5	4.2	2.0	201.3	13.5	17.0	41.5	0.55	39.8	13.9	109.5
MID	2.8	4.4	2.0	186.8	5.0	14.0	56.6	0.19	39.8	5.7	109.5
RT	-12.5	5.7	2.1	199.5	12.5	16.0	43.4	0.51	40.9	13.0	109.5

MEMBER NUMBER = 4
 MEMBER THICKNESS = 12.50
 BOTTOM SLAB

	-MOMENT-	-AXIAL-	-SHEAR-	-Po-	-Mu-	-Mbal-	-Pbal-	-STEEL-	-SHEAR-	-ALL.-	-ALL.-
	FORCE							AREA	STRESS	MOM.	SHEAR
LT	-17.4	2.5	6.1	298.0	17.4	44.0	94.7	0.61	66.2	18.1	109.5
MID	12.9*	-3.6	2.4	291.9	13.8	46.0	122.1	0.40	22.0	12.8	109.5
RT	-30.6	0.3	6.6	313.2	30.6	48.0	75.4	1.01	71.7	30.7	109.5

MEMBER NUMBER = 5
 MEMBER THICKNESS = 11.50
 TOP SLAB

	-MOMENT-	-AXIAL-	-SHEAR-	-Po-	-Mu-	-Mbal-	-Pbal-	-STEEL-	-SHEAR-	-ALL.-	-ALL.-
	FORCE							AREA	STRESS	MOM.	SHEAR
LT	-17.4	0.9	9.7	275.5	17.4	40.0	94.8	0.58	105.6	17.6	109.5
MID	25.2	-1.4	5.5	285.3	27.5	45.0	89.0	0.73	56.9	27.2	109.5
RT	-17.2	0.4	9.0	275.4	17.2	40.0	95.0	0.54	98.3	17.3	109.5

MEMBER NUMBER = 6
 MEMBER THICKNESS = 8.00
 INTERIOR WAL

	-MOMENT-	-AXIAL-	-SHEAR-	-Po-	-Mu-	-Mbal-	-Pbal-	-STEEL-	-SHEAR-	-ALL.-	-ALL.-
	FORCE							AREA	STRESS	MOM.	SHEAR
LT	-10.7	4.7	1.6	196.2	10.7	16.0	46.8	0.47	32.6	11.2	109.5
MID	1.7	3.4	1.6	186.8	5.0	14.0	56.6	0.19	32.6	5.6	109.5
RT	-0.3	3.2	1.7	186.8	5.0	14.0	56.6	0.19	34.5	5.5	110.7

MEMBER NUMBER = 7
 MEMBER THICKNESS = 12.50
 BOTTOM SLAB

	-MOMENT-	-AXIAL-	-SHEAR-	-Po-	-Mu-	-Mbal-	-Pbal-	-STEEL-	-SHEAR-	-ALL.-	-ALL.-
	FORCE							AREA	STRESS	MOM.	SHEAR
LT	-31.3	-3.2	5.0	317.4	34.0	50.0	70.1	1.03	54.6	33.3	109.5
MID	10.4	9.1	2.3	291.9	13.8	46.0	122.1	0.30	21.3	16.2	109.5
RT	-30.7	6.1	5.9	313.4	30.7	48.0	75.2	1.01	64.5	32.1	109.5

NOTE: ASTERISK IMPLIES DESIGN VALUES EXCEED CRITICAL VALUES

***** ATTENTION: OVERSTRESS DUE TO FIXED THICKNESS

A CORNER BAR(T)				A CORNER BAR(B)				A TSLAB+		A TSLAB-	
H	V	SZ	SPG	H	V	SZ	SPG	SZ	SPG	SZ	SPG
45	39	7	9.0	69	63	9	9.0	8	9.0	8	9.0
<i>5651 8 9.0</i>											
A BSLAB+		A BSLAB-		B EXTIN		B EXTOUT		B INTWL		C1	
SZ	SPG	SZ	SPG	SZ	SPG	SZ	SPG	SZ	SPG	BARS	
5	9.0	9	9.0	5	9.0	8	9.0	7	9.0	182	
<i>6 9.0</i>											

** THE HEIGHT OF C.H.C.U. ** BOTTOM SLAB = 6.00 IN
 TOP SLAB = 5.75 IN

** T.SLAB *	B.SLAB *	WALL *	INWALL *	*** VOLUME ***	*** STEEL ***
IN	IN	IN	IN	CY/FT	LB/FT
11.50	12.50	8.00	8.00	5.037	1210

** REINFORCING STEEL BAR SCHEDULE **

* LOCATN *	BAR	* NO.	* SZ	* TYP	* LNTH *	* WT.	* H LEG	* V LEG
TOP SLAB POSV	MAIN A100	14	8	STR	50-11	1903		
BOT SLAB POSV	MAIN A200	14	5	STR	50-11	743		
TOP SLAB NEGV	MAIN A300	14	8	STR	50-11	1903		
BOT SLAB NEGV	MAIN A400	14	9	STR	50-11	2424		
CORNER (TOP)	A1	28	7	6	7- 0	401	3- 9	3- 3
CORNER (BOTTOM)	A2	28	9	6	11- 0	1047	5- 9	5- 3
EXTWALL IN	B1	28	5	STR	11- 6	336		
EXTWALL OUT	B2	28	8	STR	9- 4	698		
INTWALL	B3	42	7	STR	11- 6	987		
LONGTD (1)	C1	182	4	STR	9- 8	1175		
TOTAL						11617		

***** SPLICE LENGTHS CHART *****

BAR	SIZE	SPLICE LENGTH
A200	5	1- 8
A400	9	4-11
B1	5	1- 8
B3	7	3- 0
C1	4	2- 2

** MOMENT * AXIAL FORCE * SHEAR FOR LOAD FACTOR DESIGN AT TENTH POINT **

M-PT	+MOMENT	-MOMENT	+A.F.	-A.F.	+SHEAR	-SHEAR
1- 0	11.334	-19.105	10.560	9.107	6.543	-3.475
1- 1	7.626	-12.776	10.560	9.107	5.430	-2.905
1- 2	6.666	-9.779	11.314	8.353	4.412	-2.402
1- 3	6.646	-8.271	11.314	8.353	3.488	-1.963
1- 4	5.661	-6.098	10.298	7.695	2.658	-1.591
1- 5	4.045	-4.868	2.739	5.989	2.490	-1.851
1- 6	5.010	-4.953	9.107	5.207	2.731	-2.492
1- 7	6.111	-6.136	9.107	3.949	2.907	-3.039
1- 8	6.774	-7.301	8.758	3.749	3.017	-3.491
1- 9	10.011	-11.435	8.353	3.901	3.061	-3.849
1-10	13.372	-15.929	8.353	3.665	3.040	-4.112
2- 0	13.372	-15.929	-3.040	4.417	10.352	-1.548
2- 1	18.713	-11.397	-2.422	4.380	9.223	-1.684
2- 2	22.811	-8.375	0.858	4.380	8.128	-2.603
2- 3	25.829	-6.018	0.829	3.636	7.071	-3.541
2- 4	26.224	-4.030	0.794	3.541	6.055	-4.487
2- 5	26.227	-3.060	0.112	2.640	5.083	-5.423
2- 6	24.102	-3.842	0.419	1.662	4.159	-6.337
2- 7	21.079	-6.024	-0.055	0.925	3.284	-7.214
2- 8	18.496	-7.854	4.270	-3.040	2.464	-8.040
2- 9	15.726	-14.957	0.565	-3.040	1.700	-8.800
2-10	12.538	-22.505	0.902	-1.870	1.002	-9.479
3- 0	10.041	-15.037	5.744	4.408	2.007	-2.061
3- 1	8.022	-11.884	6.266	3.886	2.007	-2.061
3- 2	5.715	-8.775	6.715	3.437	2.007	-2.061
3- 3	3.665	-5.692	6.715	3.437	2.007	-2.061
3- 4	2.809	-2.609	4.403	9.566	2.007	-2.061
3- 5	1.710	-1.329	10.490	8.902	2.007	-2.061
3- 6	4.369	-3.508	8.687	6.667	2.007	-2.061
3- 7	7.337	-5.963	7.739	6.123	2.007	-2.061
3- 8	10.412	-8.509	7.278	5.860	2.007	-2.061
3- 9	13.513	-11.066	7.278	5.860	2.007	-2.061
3-10	16.670	-13.688	6.834	5.608	2.007	-2.061
4- 0	11.545	-19.105	-3.663	2.502	6.846	0.716
4- 1	12.605	-12.690	0.299	2.502	5.949	0.055
4- 2	12.761	-7.274	0.299	2.502	5.052	-0.605
4- 3	12.168	-2.694	0.299	2.616	4.155	-1.265
4- 4	12.625	0.763	-3.052	4.337	3.258	-1.969
4- 5	12.909	-1.797	-3.614	4.807	2.360	-2.866
4- 6	12.285	-5.705	-3.644	6.252	1.463	-3.763
4- 7	11.701	-10.634	-3.644	6.252	0.652	-4.660
4- 8	7.958	-16.486	-3.662	6.543	-0.008	-5.558
4- 9	7.218	-24.064	2.583	0.299	-0.669	-6.455
4-10	5.943	-32.930	2.583	0.299	-1.329	-7.352
5- 0	11.291	-18.809	3.620	1.182	10.533	-0.248
5- 1	15.576	-13.274	4.037	0.025	9.550	-0.915
5- 2	19.482	-9.383	4.390	0.025	8.545	-2.219
5- 3	22.786	-5.805	6.138	-0.046	7.529	-3.060
5- 4	24.522	-4.766	-0.983	-4.142	6.514	-3.961
5- 5	25.158	-5.565	-1.396	-4.430	5.513	-4.909
5- 6	24.421	-6.618	-1.814	-4.722	4.535	-5.889
5- 7	22.501	-7.951	6.298	-5.018	3.595	-6.887
5- 8	19.494	-9.730	-5.693	0.008	2.702	-7.889

5- 9	15.997	-13.407	1.268	0.008	1.869	-8.880
5-10	12.473	-18.579	0.747	0.494	1.114	-9.848
6- 0	0.000	-11.822	4.943	5.311	1.641	-1.737
6- 1	0.000	-9.410	4.563	4.051	1.641	-1.737
6- 2	0.000	-7.001	4.563	4.051	1.641	-1.737
6- 3	0.000	-4.652	3.902	3.806	1.641	-1.737
6- 4	1.738	-2.386	3.355	9.487	1.641	-1.737
6- 5	1.275	-1.275	7.933	7.498	1.641	-1.737
6- 6	2.812	-0.004	5.440	3.217	1.641	-1.737
6- 7	5.250	-0.004	5.440	3.217	1.641	-1.737
6- 8	7.689	-0.004	5.440	3.217	1.641	-1.737
6- 9	10.127	-0.005	5.440	3.217	1.641	-1.737
6-10	12.565	-0.005	5.440	3.217	1.641	-1.737
7- 0	5.032	-33.458	3.462	-3.488	5.580	1.187
7- 1	7.498	-25.078	3.410	-2.476	4.920	0.527
7- 2	8.947	-17.766	3.082	-2.476	4.259	-0.134
7- 3	9.223	-11.557	2.768	-1.955	3.599	-0.794
7- 4	8.371	-6.567	1.872	2.277	2.939	-1.454
7- 5	10.358	-4.342	9.120	2.277	2.278	-2.199
7- 6	11.788	-4.815	9.120	2.277	1.618	-3.096
7- 7	12.455	-11.760	-5.295	6.874	0.957	-3.993
7- 8	12.187	-17.681	-5.295	6.874	0.297	-4.890
7- 9	11.031	-24.681	-4.851	6.732	-0.363	-5.787
7-10	9.702	-32.895	-4.851	5.930	-1.024	-6.685

***** INFLUENCE LINES FOR MOMENT *****

***** MEMBER NO. 1 *****

	.0	.1	.2	.3	.4	.5	.6	.7	.8	.9	1.0
100	-1.28	-1.03	-0.78	-0.53	-0.29	-0.04	0.21	0.46	0.71	0.96	1.21
105	-1.15	-0.93	-0.72	-0.51	-0.30	-0.09	0.13	0.34	0.55	0.76	0.97
110	-1.01	-0.83	-0.66	-0.48	-0.30	-0.13	0.05	0.23	0.40	0.58	0.76
115	-0.88	-0.73	-0.59	-0.45	-0.30	-0.16	-0.02	0.13	0.27	0.42	0.56
120	-0.75	-0.63	-0.52	-0.41	-0.30	-0.18	-0.07	0.04	0.16	0.27	0.38
125	-0.62	-0.53	-0.45	-0.37	-0.28	-0.20	-0.12	-0.03	0.05	0.13	0.22
130	-0.49	-0.43	-0.38	-0.32	-0.26	-0.21	-0.15	-0.10	-0.04	0.01	0.07
135	-0.36	-0.33	-0.30	-0.27	-0.24	-0.21	-0.18	-0.15	-0.12	-0.09	-0.06
140	-0.24	-0.24	-0.23	-0.22	-0.22	-0.21	-0.20	-0.20	-0.19	-0.18	-0.18
145	-0.13	-0.14	-0.16	-0.17	-0.19	-0.20	-0.22	-0.23	-0.25	-0.27	-0.28
150	-0.02	-0.05	-0.09	-0.12	-0.16	-0.19	-0.23	-0.26	-0.30	-0.34	-0.37
155	0.09	0.04	-0.02	-0.07	-0.13	-0.18	-0.23	-0.29	-0.34	-0.39	-0.45
160	0.19	0.12	0.05	-0.02	-0.09	-0.16	-0.23	-0.30	-0.37	-0.44	-0.51
165	0.28	0.20	0.11	0.03	-0.06	-0.14	-0.23	-0.31	-0.40	-0.48	-0.57
170	0.37	0.27	0.17	0.07	-0.03	-0.12	-0.22	-0.32	-0.42	-0.52	-0.61
175	0.44	0.34	0.23	0.12	0.01	-0.10	-0.21	-0.32	-0.43	-0.54	-0.65
180	0.51	0.39	0.28	0.16	0.04	-0.08	-0.20	-0.32	-0.44	-0.56	-0.67
185	0.57	0.45	0.32	0.19	0.07	-0.06	-0.19	-0.31	-0.44	-0.57	-0.69
190	0.62	0.49	0.36	0.22	0.09	-0.04	-0.17	-0.31	-0.44	-0.57	-0.70
195	0.66	0.52	0.39	0.25	0.11	-0.02	-0.16	-0.30	-0.43	-0.57	-0.71
200	0.69	0.55	0.41	0.27	0.13	-0.01	-0.15	-0.29	-0.42	-0.56	-0.70
205	0.71	0.57	0.43	0.29	0.15	0.01	-0.14	-0.28	-0.42	-0.56	-0.70
210	0.72	0.58	0.44	0.30	0.16	0.02	-0.13	-0.27	-0.41	-0.55	-0.69
215	0.74	0.59	0.45	0.31	0.17	0.02	-0.12	-0.26	-0.40	-0.55	-0.69
220	0.75	0.60	0.46	0.32	0.17	0.03	-0.11	-0.26	-0.40	-0.54	-0.69
225	0.75	0.61	0.46	0.32	0.18	0.03	-0.11	-0.25	-0.40	-0.54	-0.68
230	0.75	0.61	0.47	0.32	0.18	0.04	-0.11	-0.25	-0.39	-0.54	-0.68
235	0.75	0.61	0.46	0.32	0.18	0.04	-0.10	-0.25	-0.39	-0.53	-0.67
240	0.74	0.60	0.46	0.32	0.18	0.04	-0.10	-0.25	-0.39	-0.53	-0.67
245	0.74	0.60	0.46	0.32	0.18	0.04	-0.10	-0.24	-0.38	-0.52	-0.66
250	0.72	0.59	0.45	0.31	0.17	0.03	-0.10	-0.24	-0.38	-0.52	-0.66
255	0.71	0.57	0.44	0.30	0.17	0.03	-0.11	-0.24	-0.38	-0.51	-0.65
260	0.69	0.56	0.43	0.29	0.16	0.03	-0.11	-0.24	-0.37	-0.51	-0.64
265	0.67	0.54	0.41	0.28	0.15	0.02	-0.11	-0.24	-0.37	-0.50	-0.63
270	0.65	0.52	0.40	0.27	0.14	0.02	-0.11	-0.24	-0.36	-0.49	-0.62
275	0.63	0.50	0.38	0.26	0.13	0.01	-0.11	-0.23	-0.36	-0.48	-0.60
280	0.60	0.48	0.36	0.24	0.12	0.01	-0.11	-0.23	-0.35	-0.47	-0.59
285	0.57	0.46	0.34	0.23	0.11	0.00	-0.11	-0.23	-0.34	-0.45	-0.57
290	0.54	0.43	0.32	0.21	0.10	0.00	-0.11	-0.22	-0.33	-0.44	-0.55
295	0.50	0.40	0.30	0.20	0.09	-0.01	-0.11	-0.21	-0.32	-0.42	-0.52
300	0.47	0.37	0.27	0.18	0.08	-0.01	-0.11	-0.20	-0.30	-0.40	-0.49
305	0.43	0.34	0.25	0.16	0.07	-0.02	-0.11	-0.20	-0.28	-0.37	-0.46
310	0.39	0.31	0.23	0.15	0.06	-0.02	-0.10	-0.18	-0.27	-0.35	-0.43
315	0.36	0.28	0.20	0.13	0.05	-0.02	-0.10	-0.17	-0.25	-0.32	-0.40
320	0.32	0.25	0.18	0.11	0.04	-0.02	-0.09	-0.16	-0.23	-0.30	-0.37
325	0.28	0.22	0.16	0.10	0.04	-0.03	-0.09	-0.15	-0.21	-0.27	-0.33
330	0.24	0.19	0.13	0.08	0.03	-0.03	-0.08	-0.14	-0.19	-0.24	-0.30
335	0.20	0.16	0.11	0.06	0.02	-0.03	-0.07	-0.12	-0.17	-0.21	-0.26
340	0.17	0.13	0.09	0.05	0.01	-0.03	-0.07	-0.11	-0.15	-0.18	-0.22
345	0.13	0.10	0.06	0.03	0.00	-0.03	-0.06	-0.09	-0.12	-0.15	-0.19
350	0.09	0.06	0.04	0.02	-0.01	-0.03	-0.05	-0.08	-0.10	-0.12	-0.15
355	0.05	0.03	0.02	0.00	-0.01	-0.03	-0.04	-0.06	-0.08	-0.09	-0.11
360	0.01	0.00	-0.01	-0.01	-0.02	-0.03	-0.04	-0.04	-0.05	-0.06	-0.07
365	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.02
370	-0.07	-0.06	-0.06	-0.05	-0.04	-0.03	-0.02	-0.01	0.00	0.01	0.02

375	-0.11	-0.10	-0.08	-0.06	-0.05	-0.03	-0.01	0.01	0.02	0.04	0.06
380	-0.16	-0.13	-0.11	-0.08	-0.05	-0.03	0.00	0.02	0.05	0.08	0.10
385	-0.20	-0.17	-0.13	-0.10	-0.06	-0.03	0.01	0.04	0.08	0.11	0.15
390	-0.24	-0.20	-0.16	-0.11	-0.07	-0.03	0.02	0.06	0.10	0.15	0.19
395	-0.29	-0.24	-0.18	-0.13	-0.08	-0.03	0.03	0.08	0.13	0.18	0.24
400	-0.33	-0.27	-0.21	-0.15	-0.09	-0.03	0.04	0.10	0.16	0.22	0.28
405	-0.38	-0.31	-0.24	-0.17	-0.10	-0.03	0.05	0.12	0.19	0.26	0.33
410	-0.42	-0.34	-0.26	-0.19	-0.11	-0.03	0.05	0.13	0.21	0.29	0.37
415	-0.47	-0.38	-0.29	-0.20	-0.11	-0.03	0.06	0.15	0.24	0.33	0.42
420	-0.52	-0.42	-0.32	-0.22	-0.12	-0.03	0.07	0.17	0.27	0.37	0.46
425	-0.56	-0.46	-0.35	-0.24	-0.13	-0.03	0.08	0.19	0.30	0.40	0.51
430	-0.61	-0.49	-0.38	-0.26	-0.14	-0.03	0.09	0.21	0.32	0.44	0.56
435	-0.66	-0.53	-0.40	-0.28	-0.15	-0.03	0.10	0.22	0.35	0.48	0.60
440	-0.70	-0.57	-0.43	-0.30	-0.16	-0.03	0.11	0.24	0.38	0.51	0.65
445	-0.75	-0.61	-0.46	-0.32	-0.17	-0.03	0.12	0.26	0.40	0.55	0.69
450	-0.80	-0.64	-0.49	-0.34	-0.18	-0.03	0.12	0.28	0.43	0.58	0.74
455	-0.85	-0.68	-0.52	-0.36	-0.19	-0.03	0.13	0.30	0.46	0.62	0.78
460	-0.89	-0.72	-0.55	-0.38	-0.20	-0.03	0.14	0.31	0.49	0.66	0.83
465	-0.94	-0.76	-0.58	-0.40	-0.21	-0.03	0.15	0.33	0.51	0.69	0.88
470	-0.99	-0.80	-0.61	-0.42	-0.22	-0.03	0.16	0.35	0.54	0.73	0.92
475	-1.04	-0.84	-0.64	-0.44	-0.24	-0.03	0.17	0.37	0.57	0.77	0.97
480	-1.09	-0.88	-0.67	-0.46	-0.25	-0.04	0.17	0.38	0.60	0.81	1.02
485	-1.14	-0.92	-0.70	-0.48	-0.26	-0.04	0.18	0.40	0.62	0.84	1.06
490	-1.18	-0.96	-0.73	-0.50	-0.27	-0.04	0.19	0.42	0.65	0.88	1.11
495	-1.23	-0.99	-0.76	-0.52	-0.28	-0.04	0.20	0.44	0.68	0.92	1.16
500	-1.28	-1.03	-0.79	-0.54	-0.29	-0.04	0.21	0.46	0.71	0.95	1.20

***** MEMBER NO. 2 *****

	.0	.1	.2	.3	.4	.5	.6	.7	.8	.9	1.0
100	1.21	0.96	0.72	0.47	0.23	-0.01	-0.26	-0.50	-0.75	-0.99	-1.24
105	0.97	1.32	1.03	0.74	0.46	0.17	-0.12	-0.41	-0.70	-0.98	-1.27
110	0.76	1.69	1.36	1.03	0.70	0.36	0.03	-0.30	-0.63	-0.97	-1.30
115	0.56	1.45	1.70	1.33	0.95	0.57	0.19	-0.18	-0.56	-0.94	-1.32
120	0.38	1.22	2.07	1.64	1.22	0.79	0.37	-0.05	-0.48	-0.90	-1.33
125	0.22	1.01	1.81	1.97	1.50	1.03	0.56	0.09	-0.38	-0.85	-1.32
130	0.07	0.82	1.57	2.32	1.80	1.28	0.77	0.25	-0.27	-0.79	-1.30
135	-0.06	0.64	1.34	2.05	2.12	1.55	0.99	0.42	-0.14	-0.71	-1.27
140	-0.18	0.48	1.13	1.79	2.45	1.83	1.22	0.61	0.00	-0.61	-1.22
145	-0.28	0.33	0.94	1.55	2.16	2.13	1.48	0.82	0.16	-0.49	-1.15
150	-0.37	0.19	0.76	1.32	1.89	2.45	1.75	1.05	0.35	-0.36	-1.06
155	-0.45	0.07	0.59	1.11	1.63	2.15	2.04	1.29	0.55	-0.20	-0.95
160	-0.51	-0.04	0.44	0.92	1.39	1.87	2.35	1.56	0.77	-0.02	-0.81
165	-0.57	-0.13	0.30	0.74	1.17	1.61	2.05	1.85	1.02	0.19	-0.65
170	-0.61	-0.22	0.18	0.57	0.97	1.37	1.76	2.16	1.29	0.42	-0.45
175	-0.65	-0.29	0.07	0.43	0.78	1.14	1.50	1.86	1.58	0.67	-0.23
180	-0.67	-0.35	-0.03	0.29	0.61	0.94	1.26	1.58	1.90	0.96	0.02
185	-0.69	-0.40	-0.11	0.18	0.46	0.75	1.04	1.33	1.62	1.28	0.30
190	-0.70	-0.44	-0.19	0.07	0.33	0.59	0.85	1.11	1.37	1.63	0.62
195	-0.71	-0.47	-0.24	-0.01	0.22	0.45	0.68	0.91	1.14	1.37	0.97
200	-0.70	-0.50	-0.29	-0.08	0.12	0.33	0.54	0.74	0.95	1.16	1.36
205	-0.70	-0.51	-0.33	-0.14	0.04	0.23	0.41	0.60	0.78	0.97	1.15
210	-0.69	-0.53	-0.36	-0.19	-0.03	0.14	0.31	0.47	0.64	0.81	0.97
215	-0.69	-0.54	-0.39	-0.24	-0.09	0.06	0.21	0.36	0.51	0.66	0.81
220	-0.69	-0.55	-0.41	-0.28	-0.14	0.00	0.13	0.27	0.40	0.54	0.68
225	-0.68	-0.56	-0.43	-0.31	-0.18	-0.06	0.06	0.19	0.31	0.44	0.56
230	-0.68	-0.56	-0.45	-0.34	-0.22	-0.11	0.01	0.12	0.24	0.35	0.46
235	-0.67	-0.57	-0.46	-0.36	-0.25	-0.14	-0.04	0.07	0.17	0.28	0.39
240	-0.67	-0.57	-0.47	-0.37	-0.27	-0.17	-0.07	0.02	0.12	0.22	0.32
245	-0.66	-0.57	-0.48	-0.38	-0.29	-0.20	-0.10	-0.01	0.09	0.18	0.27
250	-0.66	-0.57	-0.48	-0.39	-0.30	-0.21	-0.12	-0.03	0.06	0.15	0.24
255	-0.65	-0.56	-0.48	-0.39	-0.31	-0.22	-0.13	-0.05	0.04	0.12	0.21
260	-0.64	-0.56	-0.47	-0.39	-0.31	-0.22	-0.14	-0.06	0.03	0.11	0.19
265	-0.63	-0.55	-0.47	-0.39	-0.30	-0.22	-0.14	-0.06	0.02	0.10	0.18
270	-0.62	-0.54	-0.46	-0.38	-0.30	-0.22	-0.14	-0.06	0.02	0.10	0.18

275	-0.60	-0.52	-0.45	-0.37	-0.29	-0.21	-0.13	-0.05	0.02	0.10	0.18
280	-0.59	-0.51	-0.43	-0.36	-0.28	-0.20	-0.12	-0.05	0.03	0.11	0.18
285	-0.57	-0.49	-0.42	-0.34	-0.27	-0.19	-0.11	-0.04	0.04	0.11	0.19
290	-0.55	-0.47	-0.40	-0.32	-0.25	-0.18	-0.10	-0.03	0.04	0.12	0.19
295	-0.52	-0.45	-0.38	-0.31	-0.24	-0.17	-0.10	-0.02	0.05	0.12	0.19
300	-0.49	-0.43	-0.36	-0.29	-0.22	-0.15	-0.09	-0.02	0.05	0.12	0.18
305	-0.46	-0.40	-0.34	-0.27	-0.21	-0.14	-0.08	-0.02	0.05	0.11	0.17
310	-0.43	-0.37	-0.31	-0.25	-0.20	-0.14	-0.08	-0.02	0.04	0.10	0.16
315	-0.40	-0.35	-0.29	-0.24	-0.18	-0.13	-0.08	-0.02	0.03	0.08	0.14
320	-0.37	-0.32	-0.27	-0.22	-0.17	-0.13	-0.08	-0.03	0.02	0.07	0.11
325	-0.33	-0.29	-0.25	-0.21	-0.17	-0.12	-0.08	-0.04	0.00	0.04	0.08
330	-0.30	-0.26	-0.23	-0.19	-0.16	-0.12	-0.09	-0.05	-0.02	0.02	0.05
335	-0.26	-0.23	-0.21	-0.18	-0.15	-0.12	-0.10	-0.07	-0.04	-0.01	0.02
340	-0.22	-0.20	-0.18	-0.16	-0.14	-0.12	-0.10	-0.08	-0.06	-0.04	-0.02
345	-0.19	-0.17	-0.16	-0.15	-0.14	-0.13	-0.11	-0.10	-0.09	-0.08	-0.07
350	-0.15	-0.14	-0.14	-0.14	-0.13	-0.13	-0.12	-0.12	-0.12	-0.11	-0.11
355	-0.11	-0.11	-0.12	-0.12	-0.13	-0.13	-0.14	-0.14	-0.15	-0.15	-0.15
360	-0.07	-0.08	-0.09	-0.11	-0.12	-0.13	-0.15	-0.16	-0.17	-0.19	-0.20
365	-0.02	-0.05	-0.07	-0.09	-0.11	-0.14	-0.16	-0.18	-0.20	-0.23	-0.25
370	0.02	-0.01	-0.05	-0.08	-0.11	-0.14	-0.17	-0.20	-0.24	-0.27	-0.30
375	0.06	0.02	-0.02	-0.06	-0.10	-0.14	-0.18	-0.22	-0.27	-0.31	-0.35
380	0.10	0.05	0.00	-0.05	-0.10	-0.15	-0.20	-0.25	-0.30	-0.35	-0.40
385	0.15	0.09	0.03	-0.03	-0.09	-0.15	-0.21	-0.27	-0.33	-0.38	-0.44
390	0.19	0.12	0.06	-0.01	-0.08	-0.15	-0.22	-0.29	-0.35	-0.42	-0.49
395	0.24	0.16	0.08	0.00	-0.07	-0.15	-0.23	-0.30	-0.38	-0.46	-0.53
400	0.28	0.20	0.11	0.02	-0.06	-0.15	-0.23	-0.32	-0.41	-0.49	-0.58
405	0.33	0.23	0.14	0.04	-0.05	-0.15	-0.24	-0.34	-0.43	-0.53	-0.62
410	0.37	0.27	0.17	0.06	-0.04	-0.14	-0.25	-0.35	-0.45	-0.56	-0.66
415	0.42	0.31	0.20	0.08	-0.03	-0.14	-0.25	-0.36	-0.48	-0.59	-0.70
420	0.46	0.34	0.22	0.10	-0.02	-0.14	-0.26	-0.38	-0.50	-0.62	-0.74
425	0.51	0.38	0.25	0.13	0.00	-0.13	-0.26	-0.39	-0.52	-0.64	-0.77
430	0.56	0.42	0.28	0.15	0.01	-0.13	-0.26	-0.40	-0.54	-0.67	-0.81
435	0.60	0.46	0.31	0.17	0.02	-0.12	-0.26	-0.41	-0.55	-0.70	-0.84
440	0.65	0.49	0.34	0.19	0.04	-0.11	-0.27	-0.42	-0.57	-0.72	-0.88
445	0.69	0.53	0.37	0.21	0.05	-0.11	-0.27	-0.43	-0.59	-0.75	-0.91
450	0.74	0.57	0.40	0.24	0.07	-0.10	-0.27	-0.44	-0.60	-0.77	-0.94
455	0.78	0.61	0.43	0.26	0.08	-0.09	-0.27	-0.44	-0.62	-0.79	-0.97
460	0.83	0.65	0.46	0.28	0.10	-0.09	-0.27	-0.45	-0.63	-0.82	-1.00
465	0.88	0.69	0.50	0.30	0.11	-0.08	-0.27	-0.46	-0.65	-0.84	-1.03
470	0.92	0.72	0.53	0.33	0.13	-0.07	-0.27	-0.46	-0.66	-0.86	-1.06
475	0.97	0.76	0.56	0.35	0.15	-0.06	-0.27	-0.47	-0.68	-0.88	-1.09
480	1.02	0.80	0.59	0.38	0.16	-0.05	-0.26	-0.48	-0.69	-0.90	-1.12
485	1.06	0.84	0.62	0.40	0.18	-0.04	-0.26	-0.48	-0.70	-0.92	-1.14
490	1.11	0.88	0.65	0.42	0.20	-0.03	-0.26	-0.49	-0.72	-0.94	-1.17
495	1.16	0.92	0.68	0.45	0.21	-0.02	-0.26	-0.49	-0.73	-0.96	-1.20
500	1.20	0.96	0.72	0.47	0.23	-0.01	-0.26	-0.50	-0.74	-0.99	-1.23

***** MEMBER NO. 3 *****

	.0	.1	.2	.3	.4	.5	.6	.7	.8	.9	1.0
100	-1.11	-0.89	-0.67	-0.44	-0.22	0.00	0.22	0.44	0.66	0.89	1.11
105	-1.11	-0.88	-0.66	-0.44	-0.21	0.01	0.24	0.46	0.68	0.91	1.13
110	-1.10	-0.87	-0.65	-0.42	-0.20	0.03	0.25	0.48	0.70	0.93	1.15
115	-1.08	-0.86	-0.63	-0.41	-0.18	0.04	0.26	0.49	0.71	0.94	1.16
120	-1.06	-0.84	-0.62	-0.39	-0.17	0.05	0.28	0.50	0.72	0.95	1.17
125	-1.03	-0.81	-0.59	-0.37	-0.15	0.07	0.29	0.51	0.73	0.95	1.17
130	-1.00	-0.78	-0.57	-0.35	-0.14	0.08	0.29	0.51	0.73	0.95	1.17
135	-0.96	-0.75	-0.54	-0.33	-0.12	0.09	0.30	0.51	0.72	0.93	1.14
140	-0.91	-0.71	-0.51	-0.30	-0.10	0.10	0.30	0.50	0.71	0.91	1.11
145	-0.86	-0.67	-0.47	-0.28	-0.09	0.11	0.30	0.50	0.69	0.88	1.08
150	-0.80	-0.62	-0.44	-0.25	-0.07	0.11	0.30	0.48	0.66	0.85	1.03
155	-0.74	-0.57	-0.40	-0.23	-0.05	0.12	0.29	0.46	0.63	0.81	0.98
160	-0.68	-0.52	-0.36	-0.20	-0.04	0.12	0.28	0.44	0.60	0.76	0.92
165	-0.61	-0.46	-0.32	-0.17	-0.03	0.12	0.26	0.41	0.55	0.70	0.84
170	-0.54	-0.41	-0.28	-0.15	-0.02	0.11	0.24	0.37	0.50	0.63	0.76

175	-0.46	-0.35	-0.23	-0.12	-0.01	0.10	0.22	0.33	0.44	0.56	0.67
180	-0.38	-0.28	-0.19	-0.10	0.00	0.09	0.19	0.28	0.38	0.47	0.57
185	-0.30	-0.22	-0.15	-0.07	0.00	0.08	0.15	0.23	0.30	0.38	0.45
190	-0.21	-0.16	-0.10	-0.05	0.00	0.06	0.11	0.16	0.22	0.27	0.33
195	-0.12	-0.09	-0.06	-0.03	0.00	0.03	0.06	0.09	0.13	0.16	0.19
200	-0.03	-0.03	-0.02	-0.01	0.00	0.00	0.01	0.02	0.03	0.03	0.04
205	0.06	0.04	0.02	0.01	-0.01	-0.03	-0.04	-0.06	-0.08	-0.09	-0.11
210	0.14	0.10	0.07	0.03	-0.01	-0.05	-0.09	-0.13	-0.17	-0.20	-0.24
215	0.23	0.17	0.11	0.05	-0.01	-0.07	-0.13	-0.19	-0.25	-0.31	-0.36
220	0.31	0.23	0.15	0.07	0.00	-0.08	-0.16	-0.24	-0.32	-0.40	-0.47
225	0.39	0.29	0.19	0.10	0.00	-0.09	-0.19	-0.28	-0.38	-0.48	-0.57
230	0.46	0.35	0.24	0.12	0.01	-0.10	-0.21	-0.32	-0.43	-0.55	-0.66
235	0.53	0.40	0.28	0.15	0.02	-0.10	-0.23	-0.35	-0.48	-0.61	-0.73
240	0.60	0.46	0.32	0.18	0.04	-0.10	-0.24	-0.38	-0.52	-0.66	-0.80
245	0.66	0.51	0.35	0.20	0.05	-0.10	-0.25	-0.40	-0.55	-0.70	-0.85
250	0.71	0.55	0.39	0.23	0.07	-0.09	-0.25	-0.41	-0.58	-0.74	-0.90
255	0.76	0.59	0.42	0.25	0.08	-0.08	-0.25	-0.42	-0.59	-0.76	-0.93
260	0.81	0.63	0.45	0.28	0.10	-0.08	-0.25	-0.43	-0.61	-0.78	-0.96
265	0.85	0.66	0.48	0.30	0.12	-0.07	-0.25	-0.43	-0.61	-0.80	-0.98
270	0.88	0.69	0.51	0.32	0.13	-0.05	-0.24	-0.43	-0.61	-0.80	-0.99
275	0.91	0.72	0.53	0.34	0.15	-0.04	-0.23	-0.42	-0.61	-0.80	-0.99
280	0.92	0.73	0.54	0.35	0.16	-0.03	-0.22	-0.41	-0.60	-0.79	-0.99
285	0.94	0.75	0.55	0.36	0.17	-0.02	-0.21	-0.40	-0.59	-0.78	-0.97
290	0.94	0.75	0.56	0.37	0.18	-0.01	-0.20	-0.39	-0.58	-0.77	-0.96
295	0.94	0.75	0.56	0.38	0.19	0.00	-0.18	-0.37	-0.56	-0.75	-0.93
300	0.92	0.74	0.56	0.38	0.19	0.01	-0.17	-0.35	-0.54	-0.72	-0.90
305	0.91	0.73	0.55	0.37	0.20	0.02	-0.16	-0.34	-0.52	-0.69	-0.87
310	0.89	0.71	0.54	0.37	0.20	0.02	-0.15	-0.32	-0.49	-0.67	-0.84
315	0.86	0.70	0.53	0.36	0.20	0.03	-0.14	-0.31	-0.47	-0.64	-0.81
320	0.84	0.68	0.52	0.35	0.19	0.03	-0.13	-0.29	-0.45	-0.61	-0.77
325	0.81	0.65	0.50	0.34	0.19	0.03	-0.12	-0.28	-0.43	-0.59	-0.74
330	0.78	0.63	0.48	0.33	0.18	0.04	-0.11	-0.26	-0.41	-0.56	-0.71
335	0.75	0.60	0.46	0.32	0.18	0.04	-0.11	-0.25	-0.39	-0.53	-0.68
340	0.71	0.58	0.44	0.31	0.17	0.04	-0.10	-0.24	-0.37	-0.51	-0.64
345	0.67	0.55	0.42	0.29	0.16	0.03	-0.09	-0.22	-0.35	-0.48	-0.61
350	0.64	0.52	0.39	0.27	0.15	0.03	-0.09	-0.21	-0.33	-0.45	-0.57
355	0.59	0.48	0.37	0.26	0.14	0.03	-0.08	-0.19	-0.31	-0.42	-0.53
360	0.55	0.45	0.34	0.24	0.13	0.03	-0.08	-0.18	-0.28	-0.39	-0.49
365	0.51	0.41	0.31	0.22	0.12	0.03	-0.07	-0.17	-0.26	-0.36	-0.45
370	0.46	0.37	0.28	0.20	0.11	0.02	-0.06	-0.15	-0.24	-0.32	-0.41
375	0.41	0.33	0.25	0.18	0.10	0.02	-0.06	-0.14	-0.21	-0.29	-0.37
380	0.36	0.29	0.22	0.15	0.08	0.02	-0.05	-0.12	-0.19	-0.26	-0.32
385	0.30	0.25	0.19	0.13	0.07	0.01	-0.04	-0.10	-0.16	-0.22	-0.28
390	0.25	0.20	0.15	0.11	0.06	0.01	-0.04	-0.08	-0.13	-0.18	-0.23
395	0.19	0.16	0.12	0.08	0.04	0.01	-0.03	-0.07	-0.10	-0.14	-0.18
400	0.13	0.11	0.08	0.06	0.03	0.01	-0.02	-0.05	-0.07	-0.10	-0.12
405	0.07	0.06	0.05	0.03	0.02	0.00	-0.01	-0.03	-0.04	-0.05	-0.07
410	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00	-0.01	-0.01	-0.01
415	-0.05	-0.04	-0.03	-0.02	-0.01	0.00	0.01	0.02	0.03	0.04	0.04
420	-0.11	-0.08	-0.06	-0.04	-0.02	0.00	0.02	0.04	0.06	0.08	0.10
425	-0.17	-0.13	-0.10	-0.07	-0.04	0.00	0.03	0.06	0.09	0.13	0.16
430	-0.23	-0.18	-0.14	-0.09	-0.05	0.00	0.04	0.09	0.13	0.17	0.22
435	-0.29	-0.23	-0.17	-0.12	-0.06	0.00	0.05	0.11	0.16	0.22	0.28
440	-0.35	-0.28	-0.21	-0.14	-0.07	0.00	0.06	0.13	0.20	0.27	0.34
445	-0.41	-0.33	-0.25	-0.17	-0.09	-0.01	0.08	0.16	0.24	0.32	0.40
450	-0.47	-0.38	-0.28	-0.19	-0.10	-0.01	0.09	0.18	0.27	0.37	0.46
455	-0.53	-0.43	-0.32	-0.22	-0.11	-0.01	0.10	0.21	0.31	0.42	0.52
460	-0.60	-0.48	-0.36	-0.24	-0.12	-0.01	0.11	0.23	0.35	0.47	0.58
465	-0.66	-0.53	-0.40	-0.27	-0.14	-0.01	0.13	0.26	0.39	0.52	0.65
470	-0.72	-0.58	-0.44	-0.29	-0.15	0.00	0.14	0.28	0.43	0.57	0.71
475	-0.79	-0.63	-0.47	-0.32	-0.16	0.00	0.15	0.31	0.46	0.62	0.78
480	-0.85	-0.68	-0.51	-0.34	-0.17	0.00	0.16	0.33	0.50	0.67	0.84
485	-0.91	-0.73	-0.55	-0.37	-0.19	0.00	0.18	0.36	0.54	0.72	0.91
490	-0.98	-0.78	-0.59	-0.39	-0.20	0.00	0.19	0.39	0.58	0.78	0.97
495	-1.04	-0.84	-0.63	-0.42	-0.21	0.00	0.21	0.41	0.62	0.83	1.04
500	-1.11	-0.89	-0.67	-0.45	-0.22	0.00	0.22	0.44	0.66	0.88	1.11

***** MEMBER NO. 4 *****

	.0	.1	.2	.3	.4	.5	.6	.7	.8	.9	1.0
100	1.28	0.91	0.57	0.26	-0.02	-0.27	-0.48	-0.67	-0.82	-0.94	-1.03
105	1.15	0.80	0.49	0.20	-0.05	-0.27	-0.45	-0.61	-0.73	-0.83	-0.89
110	1.01	0.69	0.41	0.16	-0.07	-0.26	-0.41	-0.54	-0.64	-0.70	-0.73
115	0.88	0.59	0.34	0.11	-0.08	-0.24	-0.37	-0.47	-0.53	-0.57	-0.57
120	0.75	0.49	0.26	0.07	-0.09	-0.22	-0.32	-0.39	-0.42	-0.43	-0.40
125	0.62	0.39	0.20	0.03	-0.10	-0.20	-0.27	-0.30	-0.31	-0.28	-0.22
130	0.49	0.29	0.13	0.00	-0.10	-0.17	-0.21	-0.21	-0.19	-0.13	-0.04
135	0.36	0.20	0.07	-0.03	-0.10	-0.14	-0.15	-0.12	-0.06	0.03	0.15
140	0.24	0.11	0.01	-0.06	-0.10	-0.11	-0.08	-0.03	0.06	0.18	0.33
145	0.13	0.02	-0.05	-0.09	-0.10	-0.07	-0.02	0.07	0.19	0.34	0.52
150	0.02	-0.06	-0.10	-0.11	-0.09	-0.04	0.05	0.16	0.31	0.49	0.70
155	-0.09	-0.14	-0.15	-0.13	-0.08	0.00	0.11	0.26	0.43	0.64	0.88
160	-0.19	-0.21	-0.19	-0.15	-0.07	0.04	0.18	0.35	0.55	0.79	1.05
165	-0.28	-0.27	-0.24	-0.16	-0.06	0.07	0.24	0.44	0.67	0.93	1.22
170	-0.37	-0.34	-0.27	-0.18	-0.05	0.11	0.30	0.52	0.77	1.06	1.37
175	-0.44	-0.39	-0.31	-0.19	-0.04	0.14	0.35	0.60	0.87	1.18	1.52
180	-0.51	-0.44	-0.33	-0.20	-0.03	0.17	0.40	0.67	0.96	1.29	1.65
185	-0.57	-0.48	-0.36	-0.21	-0.02	0.20	0.45	0.73	1.04	1.38	1.76
190	-0.62	-0.52	-0.38	-0.21	-0.01	0.22	0.49	0.78	1.11	1.47	1.86
195	-0.66	-0.54	-0.39	-0.21	0.00	0.24	0.52	0.83	1.16	1.53	1.94
200	-0.69	-0.56	-0.40	-0.22	0.01	0.26	0.54	0.86	1.21	1.58	2.00
205	-0.71	-0.58	-0.41	-0.22	0.01	0.27	0.56	0.88	1.23	1.61	2.03
210	-0.72	-0.59	-0.42	-0.23	0.00	0.26	0.56	0.88	1.24	1.62	2.04
215	-0.74	-0.60	-0.44	-0.24	-0.01	0.25	0.55	0.87	1.23	1.62	2.04
220	-0.75	-0.61	-0.45	-0.25	-0.02	0.24	0.53	0.85	1.20	1.59	2.01
225	-0.75	-0.62	-0.46	-0.27	-0.04	0.21	0.50	0.82	1.17	1.55	1.97
230	-0.75	-0.63	-0.47	-0.29	-0.07	0.18	0.46	0.78	1.12	1.50	1.91
235	-0.75	-0.63	-0.49	-0.31	-0.10	0.15	0.42	0.73	1.06	1.43	1.83
240	-0.74	-0.64	-0.50	-0.33	-0.13	0.11	0.37	0.67	1.00	1.36	1.75
245	-0.74	-0.64	-0.51	-0.35	-0.16	0.06	0.32	0.60	0.92	1.27	1.65
250	-0.72	-0.64	-0.52	-0.38	-0.20	0.02	0.26	0.53	0.84	1.18	1.55
255	-0.71	-0.64	-0.53	-0.40	-0.23	-0.03	0.20	0.46	0.76	1.08	1.44
260	-0.69	-0.63	-0.54	-0.42	-0.27	-0.08	0.14	0.39	0.67	0.98	1.32
265	-0.67	-0.63	-0.55	-0.44	-0.30	-0.13	0.07	0.31	0.58	0.87	1.21
270	-0.65	-0.62	-0.56	-0.46	-0.34	-0.18	0.01	0.23	0.48	0.77	1.09
275	-0.63	-0.61	-0.56	-0.48	-0.37	-0.23	-0.05	0.16	0.39	0.66	0.97
280	-0.60	-0.60	-0.56	-0.50	-0.40	-0.27	-0.11	0.08	0.31	0.56	0.85
285	-0.57	-0.58	-0.56	-0.51	-0.43	-0.31	-0.17	0.01	0.22	0.46	0.74
290	-0.54	-0.56	-0.56	-0.52	-0.45	-0.35	-0.22	-0.05	0.14	0.37	0.63
295	-0.50	-0.54	-0.55	-0.53	-0.47	-0.38	-0.26	-0.11	0.07	0.28	0.53
300	-0.47	-0.52	-0.54	-0.53	-0.48	-0.41	-0.30	-0.16	0.01	0.21	0.44
305	-0.43	-0.49	-0.53	-0.53	-0.49	-0.43	-0.34	-0.21	-0.05	0.14	0.36
310	-0.39	-0.47	-0.51	-0.52	-0.50	-0.45	-0.37	-0.25	-0.11	0.07	0.28
315	-0.36	-0.44	-0.49	-0.52	-0.51	-0.47	-0.39	-0.29	-0.15	0.01	0.21
320	-0.32	-0.41	-0.48	-0.51	-0.51	-0.48	-0.42	-0.32	-0.20	-0.04	0.15
325	-0.28	-0.39	-0.46	-0.50	-0.51	-0.49	-0.44	-0.35	-0.23	-0.09	0.09
330	-0.24	-0.36	-0.44	-0.49	-0.51	-0.50	-0.45	-0.38	-0.27	-0.13	0.04
335	-0.20	-0.33	-0.42	-0.48	-0.51	-0.50	-0.47	-0.40	-0.30	-0.17	-0.01
340	-0.17	-0.30	-0.40	-0.46	-0.50	-0.50	-0.48	-0.42	-0.33	-0.20	-0.05
345	-0.13	-0.27	-0.37	-0.45	-0.49	-0.50	-0.48	-0.43	-0.35	-0.24	-0.09
350	-0.09	-0.23	-0.35	-0.43	-0.48	-0.50	-0.49	-0.45	-0.37	-0.26	-0.13
355	-0.05	-0.20	-0.32	-0.41	-0.47	-0.50	-0.49	-0.46	-0.39	-0.29	-0.16
360	-0.01	-0.17	-0.30	-0.40	-0.46	-0.49	-0.50	-0.47	-0.41	-0.31	-0.19
365	0.03	-0.14	-0.27	-0.38	-0.45	-0.49	-0.50	-0.48	-0.42	-0.34	-0.22
370	0.07	-0.10	-0.24	-0.35	-0.43	-0.48	-0.50	-0.48	-0.43	-0.36	-0.24
375	0.11	-0.07	-0.22	-0.33	-0.42	-0.47	-0.50	-0.49	-0.45	-0.37	-0.27
380	0.16	-0.03	-0.19	-0.31	-0.40	-0.46	-0.49	-0.49	-0.46	-0.39	-0.29
385	0.20	0.01	-0.16	-0.29	-0.39	-0.46	-0.49	-0.50	-0.47	-0.41	-0.32
390	0.24	0.04	-0.13	-0.26	-0.37	-0.45	-0.49	-0.50	-0.48	-0.43	-0.34
395	0.29	0.08	-0.10	-0.24	-0.35	-0.43	-0.48	-0.50	-0.49	-0.44	-0.37
400	0.33	0.12	-0.07	-0.22	-0.34	-0.42	-0.48	-0.51	-0.50	-0.46	-0.39

405	0.38	0.16	-0.03	-0.19	-0.32	-0.41	-0.48	-0.51	-0.51	-0.48	-0.42
410	0.42	0.19	0.00	-0.17	-0.30	-0.41	-0.48	-0.52	-0.52	-0.50	-0.44
415	0.47	0.23	0.03	-0.14	-0.29	-0.40	-0.47	-0.52	-0.54	-0.52	-0.47
420	0.52	0.27	0.06	-0.12	-0.27	-0.39	-0.47	-0.53	-0.55	-0.54	-0.50
425	0.56	0.31	0.09	-0.10	-0.25	-0.38	-0.47	-0.53	-0.56	-0.56	-0.53
430	0.61	0.35	0.12	-0.07	-0.24	-0.37	-0.47	-0.54	-0.58	-0.59	-0.56
435	0.66	0.39	0.15	-0.05	-0.22	-0.36	-0.47	-0.55	-0.60	-0.61	-0.59
440	0.70	0.43	0.18	-0.03	-0.21	-0.36	-0.47	-0.56	-0.61	-0.63	-0.62
445	0.75	0.47	0.22	0.00	-0.19	-0.35	-0.47	-0.57	-0.63	-0.66	-0.66
450	0.80	0.51	0.25	0.02	-0.18	-0.34	-0.47	-0.58	-0.65	-0.68	-0.69
455	0.85	0.55	0.28	0.04	-0.16	-0.34	-0.48	-0.59	-0.66	-0.71	-0.72
460	0.89	0.59	0.31	0.07	-0.15	-0.33	-0.48	-0.60	-0.68	-0.74	-0.76
465	0.94	0.63	0.34	0.09	-0.13	-0.32	-0.48	-0.61	-0.70	-0.76	-0.79
470	0.99	0.67	0.37	0.11	-0.12	-0.31	-0.48	-0.61	-0.72	-0.79	-0.83
475	1.04	0.71	0.40	0.14	-0.10	-0.31	-0.48	-0.62	-0.74	-0.81	-0.86
480	1.09	0.75	0.44	0.16	-0.09	-0.30	-0.48	-0.63	-0.75	-0.84	-0.90
485	1.14	0.79	0.47	0.18	-0.07	-0.29	-0.49	-0.64	-0.77	-0.87	-0.93
490	1.18	0.83	0.50	0.21	-0.06	-0.29	-0.49	-0.65	-0.79	-0.89	-0.97
495	1.23	0.87	0.53	0.23	-0.04	-0.28	-0.49	-0.66	-0.81	-0.92	-1.00
500	1.28	0.91	0.57	0.25	-0.02	-0.27	-0.49	-0.67	-0.83	-0.95	-1.04

***** MEMBER NO. 5 *****

	.0	.1	.2	.3	.4	.5	.6	.7	.8	.9	1.0
100	-0.13	-0.20	-0.27	-0.34	-0.41	-0.48	-0.55	-0.62	-0.69	-0.76	-0.83
105	-0.14	-0.21	-0.28	-0.35	-0.41	-0.48	-0.55	-0.62	-0.69	-0.76	-0.83
110	-0.15	-0.21	-0.28	-0.35	-0.42	-0.48	-0.55	-0.62	-0.69	-0.75	-0.82
115	-0.15	-0.22	-0.29	-0.35	-0.42	-0.48	-0.55	-0.61	-0.68	-0.75	-0.81
120	-0.16	-0.22	-0.29	-0.35	-0.41	-0.48	-0.54	-0.61	-0.67	-0.74	-0.80
125	-0.15	-0.22	-0.28	-0.34	-0.41	-0.47	-0.53	-0.60	-0.66	-0.72	-0.79
130	-0.15	-0.21	-0.27	-0.34	-0.40	-0.46	-0.52	-0.59	-0.65	-0.71	-0.77
135	-0.13	-0.19	-0.26	-0.32	-0.38	-0.45	-0.51	-0.57	-0.63	-0.70	-0.76
140	-0.11	-0.17	-0.24	-0.30	-0.36	-0.43	-0.49	-0.55	-0.62	-0.68	-0.75
145	-0.07	-0.14	-0.20	-0.27	-0.34	-0.40	-0.47	-0.53	-0.60	-0.67	-0.73
150	-0.03	-0.10	-0.16	-0.23	-0.30	-0.37	-0.44	-0.51	-0.58	-0.65	-0.72
155	0.03	-0.04	-0.11	-0.19	-0.26	-0.34	-0.41	-0.48	-0.56	-0.63	-0.71
160	0.11	0.03	-0.05	-0.13	-0.21	-0.29	-0.37	-0.46	-0.54	-0.62	-0.70
165	0.20	0.11	0.02	-0.07	-0.16	-0.25	-0.33	-0.42	-0.51	-0.60	-0.69
170	0.31	0.21	0.11	0.01	-0.09	-0.19	-0.29	-0.39	-0.49	-0.58	-0.68
175	0.43	0.32	0.21	0.10	-0.01	-0.12	-0.24	-0.35	-0.46	-0.57	-0.68
180	0.58	0.45	0.33	0.20	0.08	-0.05	-0.18	-0.30	-0.43	-0.56	-0.68
185	0.75	0.61	0.46	0.32	0.17	0.03	-0.11	-0.26	-0.40	-0.55	-0.69
190	0.94	0.78	0.61	0.45	0.29	0.12	-0.04	-0.21	-0.37	-0.54	-0.70
195	1.16	0.97	0.79	0.60	0.41	0.22	0.03	-0.15	-0.34	-0.53	-0.72
200	1.40	1.19	0.98	0.76	0.55	0.33	0.12	-0.09	-0.31	-0.52	-0.74
205	1.05	1.44	1.19	0.95	0.70	0.46	0.22	-0.03	-0.27	-0.52	-0.76
210	0.73	1.72	1.44	1.16	0.88	0.61	0.33	0.05	-0.23	-0.51	-0.78
215	0.45	1.40	1.72	1.40	1.09	0.77	0.46	0.14	-0.17	-0.49	-0.80
220	0.20	1.11	2.03	1.67	1.31	0.96	0.60	0.25	-0.11	-0.46	-0.82
225	-0.01	0.86	1.73	1.96	1.56	1.17	0.77	0.37	-0.03	-0.42	-0.82
230	-0.19	0.63	1.45	2.28	1.84	1.39	0.95	0.51	0.07	-0.38	-0.82
235	-0.35	0.43	1.21	1.99	2.13	1.64	1.15	0.66	0.18	-0.31	-0.80
240	-0.48	0.25	0.98	1.72	2.45	1.91	1.37	0.84	0.30	-0.24	-0.77
245	-0.58	0.10	0.78	1.47	2.15	2.20	1.61	1.03	0.44	-0.14	-0.73
250	-0.66	-0.03	0.61	1.24	1.87	2.51	1.87	1.24	0.61	-0.03	-0.66
255	-0.72	-0.14	0.45	1.03	1.62	2.20	2.15	1.47	0.79	0.11	-0.57
260	-0.77	-0.23	0.31	0.84	1.38	1.92	2.45	1.72	0.99	0.26	-0.47
265	-0.79	-0.30	0.18	0.67	1.16	1.65	2.14	2.00	1.22	0.44	-0.33
270	-0.81	-0.36	0.08	0.52	0.97	1.41	1.85	2.30	1.47	0.65	-0.17
275	-0.81	-0.41	-0.01	0.39	0.79	1.19	1.59	1.99	1.75	0.89	0.02
280	-0.80	-0.44	-0.09	0.27	0.63	0.99	1.34	1.70	2.06	1.15	0.24
285	-0.79	-0.47	-0.15	0.17	0.49	0.80	1.12	1.44	1.76	1.44	0.49
290	-0.77	-0.49	-0.20	0.08	0.36	0.64	0.92	1.21	1.49	1.77	0.79
295	-0.74	-0.49	-0.25	0.00	0.25	0.50	0.75	1.00	1.25	1.50	1.11
300	-0.72	-0.50	-0.28	-0.06	0.16	0.38	0.60	0.82	1.04	1.26	1.48

305	-0.70	-0.50	-0.31	-0.11	0.08	0.28	0.47	0.67	0.86	1.06	1.25
310	-0.68	-0.51	-0.33	-0.16	0.01	0.19	0.36	0.53	0.70	0.88	1.05
315	-0.67	-0.51	-0.36	-0.21	-0.05	0.10	0.26	0.41	0.57	0.72	0.87
320	-0.66	-0.52	-0.38	-0.25	-0.11	0.03	0.17	0.31	0.44	0.58	0.72
325	-0.66	-0.53	-0.41	-0.28	-0.16	-0.03	0.09	0.22	0.34	0.47	0.59
330	-0.66	-0.54	-0.43	-0.32	-0.20	-0.09	0.03	0.14	0.25	0.37	0.48
335	-0.66	-0.55	-0.45	-0.35	-0.24	-0.14	-0.03	0.07	0.18	0.28	0.39
340	-0.66	-0.57	-0.47	-0.37	-0.27	-0.18	-0.08	0.02	0.12	0.22	0.31
345	-0.67	-0.58	-0.49	-0.39	-0.30	-0.21	-0.12	-0.02	0.07	0.16	0.25
350	-0.68	-0.59	-0.50	-0.41	-0.32	-0.24	-0.15	-0.06	0.03	0.12	0.21
355	-0.69	-0.60	-0.51	-0.43	-0.34	-0.26	-0.17	-0.08	0.00	0.09	0.17
360	-0.70	-0.61	-0.53	-0.44	-0.36	-0.27	-0.19	-0.10	-0.02	0.06	0.15
365	-0.70	-0.62	-0.54	-0.45	-0.37	-0.29	-0.20	-0.12	-0.03	0.05	0.13
370	-0.71	-0.63	-0.54	-0.46	-0.38	-0.29	-0.21	-0.13	-0.04	0.04	0.12
375	-0.72	-0.63	-0.55	-0.47	-0.38	-0.30	-0.22	-0.13	-0.05	0.03	0.12
380	-0.72	-0.64	-0.55	-0.47	-0.39	-0.30	-0.22	-0.14	-0.05	0.03	0.11
385	-0.72	-0.64	-0.55	-0.47	-0.39	-0.30	-0.22	-0.14	-0.05	0.03	0.11
390	-0.72	-0.63	-0.55	-0.47	-0.39	-0.30	-0.22	-0.14	-0.06	0.03	0.11
395	-0.71	-0.63	-0.55	-0.47	-0.39	-0.30	-0.22	-0.14	-0.06	0.03	0.11
400	-0.70	-0.62	-0.54	-0.46	-0.38	-0.30	-0.22	-0.14	-0.06	0.02	0.10
405	-0.69	-0.61	-0.53	-0.46	-0.38	-0.30	-0.23	-0.15	-0.07	0.00	0.09
410	-0.67	-0.60	-0.53	-0.45	-0.38	-0.31	-0.23	-0.16	-0.09	-0.01	0.06
415	-0.65	-0.59	-0.52	-0.45	-0.38	-0.31	-0.24	-0.17	-0.10	-0.03	0.03
420	-0.63	-0.57	-0.51	-0.44	-0.38	-0.32	-0.25	-0.19	-0.12	-0.06	0.00
425	-0.61	-0.55	-0.50	-0.44	-0.38	-0.32	-0.26	-0.21	-0.15	-0.09	-0.03
430	-0.59	-0.54	-0.49	-0.43	-0.38	-0.33	-0.28	-0.23	-0.17	-0.12	-0.07
435	-0.56	-0.52	-0.47	-0.43	-0.38	-0.34	-0.29	-0.25	-0.20	-0.16	-0.11
440	-0.54	-0.50	-0.46	-0.42	-0.39	-0.35	-0.31	-0.27	-0.23	-0.19	-0.16
445	-0.51	-0.48	-0.45	-0.42	-0.39	-0.36	-0.33	-0.30	-0.27	-0.24	-0.20
450	-0.48	-0.46	-0.43	-0.41	-0.39	-0.37	-0.35	-0.32	-0.30	-0.28	-0.26
455	-0.45	-0.43	-0.42	-0.41	-0.39	-0.38	-0.36	-0.35	-0.34	-0.32	-0.31
460	-0.42	-0.41	-0.41	-0.40	-0.40	-0.39	-0.39	-0.38	-0.37	-0.37	-0.36
465	-0.38	-0.39	-0.39	-0.39	-0.40	-0.40	-0.41	-0.41	-0.41	-0.42	-0.42
470	-0.35	-0.36	-0.37	-0.39	-0.40	-0.41	-0.43	-0.44	-0.45	-0.47	-0.48
475	-0.31	-0.33	-0.36	-0.38	-0.40	-0.43	-0.45	-0.47	-0.49	-0.52	-0.54
480	-0.28	-0.31	-0.34	-0.37	-0.40	-0.44	-0.47	-0.50	-0.53	-0.57	-0.60
485	-0.24	-0.28	-0.32	-0.36	-0.41	-0.45	-0.49	-0.53	-0.57	-0.62	-0.66
490	-0.20	-0.25	-0.30	-0.36	-0.41	-0.46	-0.51	-0.56	-0.61	-0.67	-0.72
495	-0.16	-0.22	-0.28	-0.35	-0.41	-0.47	-0.53	-0.59	-0.65	-0.72	-0.78
500	-0.12	-0.19	-0.26	-0.34	-0.41	-0.48	-0.55	-0.62	-0.69	-0.76	-0.84

***** MEMBER NO. 6 *****

	.0	.1	.2	.3	.4	.5	.6	.7	.8	.9	1.0
100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
105	-0.06	-0.05	-0.04	-0.03	-0.02	0.00	0.01	0.02	0.03	0.04	0.05
110	-0.12	-0.10	-0.08	-0.05	-0.03	-0.01	0.01	0.04	0.06	0.08	0.10
115	-0.18	-0.14	-0.11	-0.08	-0.04	-0.01	0.02	0.05	0.09	0.12	0.15
120	-0.23	-0.19	-0.15	-0.10	-0.06	-0.02	0.03	0.07	0.12	0.16	0.20
125	-0.29	-0.23	-0.18	-0.13	-0.07	-0.02	0.03	0.09	0.14	0.20	0.25
130	-0.34	-0.28	-0.21	-0.15	-0.09	-0.02	0.04	0.10	0.17	0.23	0.29
135	-0.39	-0.32	-0.24	-0.17	-0.10	-0.03	0.05	0.12	0.19	0.27	0.34
140	-0.44	-0.35	-0.27	-0.19	-0.11	-0.03	0.05	0.14	0.22	0.30	0.38
145	-0.48	-0.39	-0.30	-0.21	-0.12	-0.03	0.06	0.15	0.24	0.33	0.42
150	-0.53	-0.43	-0.33	-0.23	-0.13	-0.03	0.07	0.17	0.26	0.36	0.46
155	-0.57	-0.46	-0.35	-0.25	-0.14	-0.03	0.07	0.18	0.29	0.39	0.50
160	-0.61	-0.49	-0.38	-0.26	-0.15	-0.03	0.08	0.20	0.31	0.43	0.54
165	-0.64	-0.52	-0.40	-0.28	-0.16	-0.03	0.09	0.21	0.33	0.46	0.58
170	-0.68	-0.55	-0.42	-0.29	-0.16	-0.03	0.10	0.23	0.36	0.49	0.61
175	-0.71	-0.58	-0.44	-0.30	-0.17	-0.03	0.11	0.24	0.38	0.51	0.65
180	-0.74	-0.60	-0.46	-0.31	-0.17	-0.03	0.12	0.26	0.40	0.54	0.69
185	-0.77	-0.62	-0.47	-0.32	-0.17	-0.02	0.13	0.27	0.42	0.57	0.72
190	-0.80	-0.64	-0.49	-0.33	-0.18	-0.02	0.14	0.29	0.45	0.60	0.76
195	-0.82	-0.66	-0.50	-0.34	-0.18	-0.01	0.15	0.31	0.47	0.63	0.80
200	-0.84	-0.68	-0.51	-0.34	-0.17	-0.01	0.16	0.33	0.50	0.66	0.83

205	-0.86	-0.69	-0.52	-0.34	-0.17	0.00	0.17	0.35	0.52	0.69	0.86
210	-0.87	-0.69	-0.52	-0.34	-0.16	0.01	0.19	0.36	0.54	0.72	0.89
215	-0.87	-0.69	-0.51	-0.33	-0.16	0.02	0.20	0.38	0.56	0.74	0.91
220	-0.86	-0.68	-0.50	-0.33	-0.15	0.03	0.21	0.39	0.57	0.75	0.93
225	-0.85	-0.67	-0.49	-0.31	-0.13	0.04	0.22	0.40	0.58	0.76	0.94
230	-0.83	-0.65	-0.47	-0.30	-0.12	0.06	0.23	0.41	0.59	0.76	0.94
235	-0.80	-0.63	-0.45	-0.28	-0.11	0.07	0.24	0.41	0.59	0.76	0.93
240	-0.77	-0.60	-0.43	-0.26	-0.09	0.08	0.25	0.41	0.58	0.75	0.92
245	-0.73	-0.57	-0.40	-0.24	-0.08	0.09	0.25	0.41	0.57	0.74	0.90
250	-0.68	-0.53	-0.37	-0.22	-0.06	0.09	0.25	0.40	0.56	0.71	0.87
255	-0.63	-0.49	-0.34	-0.19	-0.05	0.10	0.24	0.39	0.54	0.68	0.83
260	-0.58	-0.44	-0.31	-0.17	-0.04	0.10	0.24	0.37	0.51	0.64	0.78
265	-0.52	-0.40	-0.27	-0.15	-0.02	0.10	0.23	0.35	0.47	0.60	0.72
270	-0.46	-0.34	-0.23	-0.12	-0.01	0.10	0.21	0.32	0.43	0.54	0.65
275	-0.39	-0.29	-0.20	-0.10	0.00	0.09	0.19	0.28	0.38	0.48	0.57
280	-0.32	-0.24	-0.16	-0.08	0.00	0.08	0.16	0.24	0.32	0.40	0.48
285	-0.24	-0.18	-0.12	-0.05	0.01	0.07	0.13	0.19	0.26	0.32	0.38
290	-0.16	-0.12	-0.08	-0.03	0.01	0.05	0.09	0.14	0.18	0.22	0.27
295	-0.08	-0.06	-0.04	-0.02	0.01	0.03	0.05	0.07	0.09	0.12	0.14
300	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
305	0.08	0.06	0.04	0.02	-0.01	-0.03	-0.05	-0.07	-0.09	-0.12	-0.14
310	0.16	0.12	0.08	0.03	-0.01	-0.05	-0.09	-0.14	-0.18	-0.22	-0.27
315	0.24	0.18	0.12	0.05	-0.01	-0.07	-0.13	-0.19	-0.26	-0.32	-0.38
320	0.32	0.24	0.16	0.08	0.00	-0.08	-0.16	-0.24	-0.32	-0.40	-0.48
325	0.39	0.29	0.20	0.10	0.00	-0.09	-0.19	-0.28	-0.38	-0.48	-0.57
330	0.46	0.34	0.23	0.12	0.01	-0.10	-0.21	-0.32	-0.43	-0.54	-0.65
335	0.52	0.40	0.27	0.15	0.02	-0.10	-0.23	-0.35	-0.47	-0.60	-0.72
340	0.58	0.44	0.31	0.17	0.04	-0.10	-0.24	-0.37	-0.51	-0.64	-0.78
345	0.63	0.49	0.34	0.19	0.05	-0.10	-0.24	-0.39	-0.54	-0.68	-0.83
350	0.68	0.53	0.37	0.22	0.06	-0.09	-0.25	-0.40	-0.56	-0.71	-0.87
355	0.73	0.57	0.40	0.24	0.08	-0.09	-0.25	-0.41	-0.57	-0.74	-0.90
360	0.77	0.60	0.43	0.26	0.09	-0.08	-0.25	-0.41	-0.58	-0.75	-0.92
365	0.80	0.63	0.45	0.28	0.11	-0.07	-0.24	-0.41	-0.59	-0.76	-0.93
370	0.83	0.65	0.47	0.30	0.12	-0.06	-0.23	-0.41	-0.59	-0.76	-0.94
375	0.85	0.67	0.49	0.31	0.13	-0.04	-0.22	-0.40	-0.58	-0.76	-0.94
380	0.86	0.68	0.50	0.33	0.15	-0.03	-0.21	-0.39	-0.57	-0.75	-0.93
385	0.87	0.69	0.51	0.33	0.16	-0.02	-0.20	-0.38	-0.56	-0.74	-0.91
390	0.87	0.69	0.52	0.34	0.16	-0.01	-0.19	-0.36	-0.54	-0.72	-0.89
395	0.86	0.69	0.52	0.34	0.17	0.00	-0.17	-0.35	-0.52	-0.69	-0.86
400	0.84	0.68	0.51	0.34	0.17	0.01	-0.16	-0.33	-0.50	-0.66	-0.83
405	0.82	0.66	0.50	0.34	0.18	0.01	-0.15	-0.31	-0.47	-0.63	-0.80
410	0.80	0.64	0.49	0.33	0.18	0.02	-0.14	-0.29	-0.45	-0.60	-0.76
415	0.77	0.62	0.47	0.32	0.17	0.02	-0.13	-0.27	-0.42	-0.57	-0.72
420	0.74	0.60	0.46	0.31	0.17	0.03	-0.12	-0.26	-0.40	-0.54	-0.69
425	0.71	0.58	0.44	0.30	0.17	0.03	-0.11	-0.24	-0.38	-0.51	-0.65
430	0.68	0.55	0.42	0.29	0.16	0.03	-0.10	-0.23	-0.36	-0.49	-0.61
435	0.64	0.52	0.40	0.28	0.16	0.03	-0.09	-0.21	-0.33	-0.46	-0.58
440	0.61	0.49	0.38	0.26	0.15	0.03	-0.08	-0.20	-0.31	-0.43	-0.54
445	0.57	0.46	0.35	0.25	0.14	0.03	-0.07	-0.18	-0.29	-0.39	-0.50
450	0.53	0.43	0.33	0.23	0.13	0.03	-0.07	-0.17	-0.26	-0.36	-0.46
455	0.48	0.39	0.30	0.21	0.12	0.03	-0.06	-0.15	-0.24	-0.33	-0.42
460	0.44	0.35	0.27	0.19	0.11	0.03	-0.05	-0.14	-0.22	-0.30	-0.38
465	0.39	0.32	0.24	0.17	0.10	0.03	-0.05	-0.12	-0.19	-0.27	-0.34
470	0.34	0.28	0.21	0.15	0.09	0.02	-0.04	-0.10	-0.17	-0.23	-0.29
475	0.29	0.23	0.18	0.13	0.07	0.02	-0.03	-0.09	-0.14	-0.20	-0.25
480	0.23	0.19	0.15	0.10	0.06	0.02	-0.03	-0.07	-0.12	-0.16	-0.20
485	0.18	0.14	0.11	0.08	0.04	0.01	-0.02	-0.05	-0.09	-0.12	-0.15
490	0.12	0.10	0.08	0.05	0.03	0.01	-0.01	-0.04	-0.06	-0.08	-0.10
495	0.06	0.05	0.04	0.03	0.02	0.00	-0.01	-0.02	-0.03	-0.04	-0.05
500	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

***** MEMBER NO. 7 *****

.0 .1 .2 .3 .4 .5 .6 .7 .8 .9 1.0

100 0.08 -0.15 -0.35 -0.51 -0.65 -0.75 -0.82 -0.86 -0.87 -0.85 -0.80

105	0.22	-0.03	-0.24	-0.43	-0.58	-0.70	-0.79	-0.85	-0.87	-0.86	-0.83
110	0.37	0.10	-0.13	-0.33	-0.50	-0.64	-0.75	-0.82	-0.87	-0.88	-0.86
115	0.51	0.23	-0.02	-0.24	-0.42	-0.58	-0.70	-0.80	-0.86	-0.89	-0.88
120	0.66	0.36	0.10	-0.14	-0.35	-0.52	-0.66	-0.77	-0.85	-0.89	-0.91
125	0.81	0.50	0.21	-0.04	-0.26	-0.45	-0.61	-0.74	-0.83	-0.90	-0.93
130	0.96	0.63	0.33	0.06	-0.18	-0.39	-0.56	-0.71	-0.82	-0.90	-0.95
135	1.11	0.76	0.44	0.15	-0.10	-0.32	-0.51	-0.67	-0.80	-0.89	-0.96
140	1.25	0.88	0.55	0.25	-0.02	-0.26	-0.46	-0.64	-0.78	-0.89	-0.97
145	1.38	1.00	0.66	0.34	0.06	-0.19	-0.41	-0.60	-0.75	-0.88	-0.97
150	1.51	1.12	0.76	0.43	0.14	-0.13	-0.36	-0.56	-0.73	-0.86	-0.97
155	1.62	1.22	0.85	0.52	0.21	-0.06	-0.31	-0.52	-0.70	-0.84	-0.96
160	1.73	1.32	0.94	0.60	0.28	0.00	-0.26	-0.48	-0.67	-0.82	-0.95
165	1.83	1.41	1.02	0.67	0.34	0.05	-0.21	-0.43	-0.63	-0.79	-0.93
170	1.91	1.48	1.09	0.73	0.40	0.11	-0.16	-0.39	-0.59	-0.76	-0.90
175	1.97	1.55	1.15	0.79	0.46	0.16	-0.11	-0.35	-0.55	-0.73	-0.87
180	2.02	1.60	1.20	0.84	0.50	0.20	-0.07	-0.30	-0.51	-0.68	-0.83
185	2.06	1.63	1.24	0.87	0.54	0.24	-0.02	-0.26	-0.46	-0.64	-0.78
190	2.07	1.65	1.26	0.90	0.57	0.28	0.02	-0.22	-0.42	-0.58	-0.72
195	2.06	1.65	1.26	0.91	0.59	0.31	0.05	-0.17	-0.37	-0.53	-0.66
200	2.03	1.63	1.25	0.91	0.61	0.33	0.08	-0.13	-0.31	-0.46	-0.58
205	1.98	1.59	1.23	0.90	0.61	0.35	0.11	-0.08	-0.25	-0.39	-0.49
210	1.90	1.53	1.19	0.88	0.61	0.36	0.15	-0.03	-0.18	-0.30	-0.39
215	1.81	1.46	1.14	0.85	0.60	0.38	0.18	0.02	-0.10	-0.20	-0.26
220	1.70	1.38	1.08	0.82	0.59	0.39	0.22	0.09	-0.02	-0.09	-0.13
225	1.58	1.28	1.01	0.78	0.57	0.40	0.26	0.15	0.07	0.03	0.02
230	1.45	1.18	0.94	0.73	0.56	0.41	0.30	0.22	0.17	0.16	0.17
235	1.30	1.06	0.85	0.68	0.53	0.42	0.34	0.29	0.27	0.29	0.33
240	1.15	0.94	0.77	0.62	0.51	0.43	0.38	0.36	0.37	0.42	0.50
245	1.00	0.82	0.68	0.56	0.48	0.43	0.42	0.43	0.48	0.56	0.67
250	0.84	0.69	0.58	0.50	0.46	0.44	0.46	0.50	0.58	0.69	0.83
255	0.67	0.57	0.49	0.44	0.43	0.44	0.49	0.57	0.68	0.83	1.00
260	0.51	0.44	0.39	0.38	0.39	0.44	0.52	0.64	0.78	0.96	1.16
265	0.36	0.31	0.30	0.31	0.36	0.44	0.56	0.70	0.88	1.08	1.32
270	0.21	0.19	0.21	0.25	0.33	0.44	0.58	0.76	0.96	1.20	1.47
275	0.06	0.07	0.12	0.19	0.30	0.44	0.61	0.81	1.04	1.31	1.61
280	-0.08	-0.04	0.03	0.13	0.27	0.43	0.63	0.86	1.12	1.41	1.73
285	-0.20	-0.14	-0.04	0.08	0.24	0.43	0.65	0.90	1.18	1.50	1.84
290	-0.31	-0.23	-0.11	0.03	0.21	0.42	0.66	0.93	1.23	1.57	1.94
295	-0.41	-0.31	-0.18	-0.01	0.18	0.41	0.66	0.95	1.27	1.63	2.01
300	-0.48	-0.37	-0.23	-0.05	0.16	0.39	0.67	0.97	1.30	1.67	2.07
305	-0.55	-0.43	-0.27	-0.09	0.13	0.38	0.66	0.97	1.31	1.69	2.09
310	-0.60	-0.47	-0.32	-0.12	0.10	0.35	0.64	0.96	1.31	1.69	2.10
315	-0.65	-0.52	-0.36	-0.16	0.06	0.32	0.61	0.93	1.28	1.67	2.08
320	-0.69	-0.55	-0.39	-0.20	0.03	0.29	0.58	0.90	1.25	1.63	2.05
325	-0.72	-0.59	-0.43	-0.23	-0.01	0.24	0.53	0.85	1.20	1.58	2.00
330	-0.74	-0.61	-0.46	-0.27	-0.05	0.20	0.48	0.79	1.14	1.52	1.92
335	-0.75	-0.64	-0.49	-0.31	-0.10	0.15	0.42	0.73	1.07	1.44	1.84
340	-0.76	-0.65	-0.51	-0.34	-0.14	0.10	0.36	0.66	0.99	1.35	1.74
345	-0.76	-0.67	-0.54	-0.38	-0.18	0.04	0.30	0.58	0.90	1.25	1.64
350	-0.76	-0.68	-0.56	-0.41	-0.23	-0.02	0.23	0.50	0.81	1.15	1.52
355	-0.75	-0.68	-0.58	-0.44	-0.27	-0.08	0.16	0.42	0.71	1.04	1.39
360	-0.74	-0.68	-0.59	-0.47	-0.32	-0.13	0.08	0.33	0.61	0.92	1.27
365	-0.72	-0.68	-0.61	-0.50	-0.36	-0.19	0.01	0.24	0.51	0.80	1.13
370	-0.70	-0.68	-0.62	-0.52	-0.40	-0.25	-0.06	0.16	0.40	0.69	1.00
375	-0.68	-0.67	-0.62	-0.55	-0.44	-0.30	-0.13	0.07	0.30	0.57	0.86
380	-0.65	-0.66	-0.63	-0.57	-0.48	-0.36	-0.20	-0.02	0.20	0.45	0.73
385	-0.62	-0.64	-0.63	-0.59	-0.51	-0.40	-0.27	-0.10	0.11	0.34	0.60
390	-0.59	-0.63	-0.63	-0.60	-0.54	-0.45	-0.33	-0.17	0.01	0.23	0.48
395	-0.56	-0.61	-0.63	-0.61	-0.57	-0.49	-0.38	-0.24	-0.07	0.13	0.37
400	-0.52	-0.59	-0.62	-0.62	-0.59	-0.53	-0.43	-0.31	-0.15	0.04	0.26
405	-0.49	-0.57	-0.61	-0.63	-0.61	-0.56	-0.48	-0.36	-0.22	-0.04	0.17
410	-0.46	-0.55	-0.60	-0.63	-0.62	-0.59	-0.52	-0.42	-0.28	-0.12	0.08
415	-0.43	-0.53	-0.60	-0.63	-0.64	-0.61	-0.55	-0.46	-0.34	-0.19	-0.01
420	-0.39	-0.51	-0.59	-0.63	-0.65	-0.63	-0.59	-0.51	-0.40	-0.26	-0.08
425	-0.36	-0.49	-0.58	-0.63	-0.66	-0.66	-0.62	-0.55	-0.45	-0.32	-0.16
430	-0.33	-0.47	-0.57	-0.63	-0.67	-0.67	-0.65	-0.59	-0.50	-0.38	-0.22

435	-0.31	-0.45	-0.55	-0.63	-0.68	-0.69	-0.67	-0.62	-0.54	-0.43	-0.28
440	-0.28	-0.43	-0.54	-0.63	-0.68	-0.70	-0.70	-0.65	-0.58	-0.48	-0.34
445	-0.25	-0.40	-0.53	-0.62	-0.69	-0.72	-0.72	-0.68	-0.62	-0.52	-0.39
450	-0.22	-0.38	-0.52	-0.62	-0.69	-0.73	-0.73	-0.71	-0.65	-0.56	-0.44
455	-0.19	-0.36	-0.50	-0.61	-0.69	-0.74	-0.75	-0.73	-0.68	-0.60	-0.49
460	-0.16	-0.34	-0.49	-0.61	-0.69	-0.74	-0.76	-0.75	-0.71	-0.64	-0.53
465	-0.13	-0.32	-0.47	-0.60	-0.69	-0.75	-0.78	-0.77	-0.74	-0.67	-0.57
470	-0.11	-0.30	-0.46	-0.59	-0.69	-0.75	-0.79	-0.79	-0.76	-0.70	-0.61
475	-0.08	-0.28	-0.44	-0.58	-0.68	-0.76	-0.80	-0.80	-0.78	-0.73	-0.64
480	-0.05	-0.25	-0.43	-0.57	-0.68	-0.76	-0.80	-0.82	-0.80	-0.75	-0.67
485	-0.02	-0.23	-0.41	-0.56	-0.67	-0.76	-0.81	-0.83	-0.82	-0.78	-0.71
490	0.01	-0.21	-0.39	-0.54	-0.67	-0.76	-0.82	-0.84	-0.84	-0.80	-0.74
495	0.04	-0.18	-0.37	-0.53	-0.66	-0.76	-0.82	-0.86	-0.86	-0.83	-0.77
500	0.08	-0.15	-0.35	-0.52	-0.65	-0.76	-0.83	-0.87	-0.87	-0.85	-0.80

	.0	.1	.2	.3	.4	.5	.6	.7	.8	.9	1.0	A.F.
100	-0.31	-0.28	-0.26	-0.23	-0.21	-0.18	-0.16	-0.13	-0.11	-0.08	-0.06	-0.23
105	-0.29	-0.26	-0.24	-0.21	-0.19	-0.16	-0.14	-0.11	-0.09	-0.06	-0.04	-0.19
110	-0.26	-0.24	-0.21	-0.19	-0.16	-0.14	-0.11	-0.09	-0.06	-0.04	-0.01	-0.16
115	-0.24	-0.21	-0.19	-0.16	-0.14	-0.11	-0.09	-0.06	-0.04	-0.01	0.01	-0.13
120	-0.22	-0.19	-0.17	-0.14	-0.12	-0.09	-0.07	-0.04	-0.02	0.01	0.03	-0.10
125	-0.19	-0.17	-0.14	-0.12	-0.09	-0.07	-0.04	-0.02	0.01	0.03	0.06	-0.08
130	-0.17	-0.14	-0.12	-0.09	-0.07	-0.04	-0.02	0.01	0.03	0.06	0.08	-0.05
135	-0.14	-0.12	-0.09	-0.07	-0.04	-0.02	0.01	0.03	0.06	0.08	0.11	-0.03
140	-0.12	-0.09	-0.07	-0.04	-0.02	0.01	0.03	0.06	0.08	0.11	0.13	-0.01
145	-0.09	-0.07	-0.04	-0.02	0.01	0.03	0.06	0.08	0.11	0.13	0.16	0.01
150	-0.07	-0.05	-0.02	0.00	0.03	0.05	0.08	0.10	0.13	0.15	0.18	0.03
155	-0.05	-0.02	0.00	0.03	0.05	0.08	0.10	0.13	0.15	0.18	0.20	0.05
160	-0.03	0.00	0.02	0.05	0.07	0.10	0.12	0.15	0.17	0.20	0.22	0.06
165	-0.01	0.02	0.04	0.07	0.09	0.12	0.14	0.17	0.19	0.22	0.24	0.08
170	0.01	0.04	0.06	0.09	0.11	0.14	0.16	0.19	0.21	0.24	0.26	0.09
175	0.03	0.05	0.08	0.10	0.13	0.15	0.18	0.20	0.23	0.25	0.28	0.10
180	0.05	0.07	0.10	0.12	0.15	0.17	0.20	0.22	0.25	0.27	0.30	0.11
185	0.06	0.08	0.11	0.13	0.16	0.18	0.21	0.23	0.26	0.28	0.31	0.11
190	0.07	0.10	0.12	0.15	0.17	0.20	0.22	0.25	0.27	0.30	0.32	0.12
195	0.08	0.11	0.13	0.16	0.18	0.21	0.23	0.26	0.28	0.31	0.33	0.12
200	0.09	0.11	0.14	0.16	0.19	0.21	0.24	0.26	0.29	0.31	0.34	0.13
205	0.09	0.12	0.14	0.17	0.19	0.22	0.24	0.27	0.29	0.32	0.34	0.13
210	0.09	0.12	0.14	0.17	0.19	0.22	0.24	0.27	0.29	0.32	0.34	0.13
215	0.09	0.12	0.14	0.17	0.19	0.22	0.24	0.27	0.29	0.32	0.34	0.13
220	0.09	0.12	0.14	0.17	0.19	0.22	0.24	0.27	0.29	0.32	0.34	0.13
225	0.09	0.11	0.14	0.16	0.19	0.21	0.24	0.26	0.29	0.31	0.34	0.13
230	0.08	0.11	0.13	0.16	0.18	0.21	0.23	0.26	0.28	0.31	0.33	0.13
235	0.08	0.10	0.13	0.15	0.18	0.20	0.23	0.25	0.28	0.30	0.33	0.13
240	0.07	0.10	0.12	0.15	0.17	0.20	0.22	0.25	0.27	0.30	0.32	0.13
245	0.06	0.09	0.11	0.14	0.16	0.19	0.21	0.24	0.26	0.29	0.31	0.13
250	0.05	0.08	0.10	0.13	0.15	0.18	0.20	0.23	0.25	0.28	0.30	0.13
255	0.04	0.07	0.09	0.12	0.14	0.17	0.19	0.22	0.24	0.27	0.29	0.12
260	0.03	0.06	0.08	0.11	0.13	0.16	0.18	0.21	0.23	0.26	0.28	0.12
265	0.02	0.05	0.07	0.10	0.12	0.15	0.17	0.20	0.22	0.25	0.27	0.12
270	0.01	0.04	0.06	0.09	0.11	0.14	0.16	0.19	0.21	0.24	0.26	0.12
275	0.00	0.03	0.05	0.08	0.10	0.13	0.15	0.18	0.20	0.23	0.25	0.11
280	-0.01	0.01	0.04	0.06	0.09	0.11	0.14	0.16	0.19	0.21	0.24	0.11
285	-0.02	0.00	0.03	0.05	0.08	0.10	0.13	0.15	0.18	0.20	0.23	0.10
290	-0.03	-0.01	0.02	0.04	0.07	0.09	0.12	0.14	0.17	0.19	0.22	0.10
295	-0.04	-0.02	0.01	0.03	0.06	0.08	0.11	0.13	0.16	0.18	0.21	0.09
300	-0.05	-0.03	0.00	0.02	0.05	0.07	0.10	0.12	0.15	0.17	0.20	0.09
305	-0.06	-0.04	-0.01	0.01	0.04	0.06	0.09	0.11	0.14	0.16	0.19	0.08
310	-0.07	-0.05	-0.02	0.00	0.03	0.05	0.08	0.10	0.13	0.15	0.18	0.07
315	-0.08	-0.05	-0.03	0.00	0.02	0.05	0.07	0.10	0.12	0.15	0.17	0.07
320	-0.09	-0.06	-0.04	-0.01	0.01	0.04	0.06	0.09	0.11	0.14	0.16	0.06
325	-0.10	-0.07	-0.05	-0.02	0.00	0.03	0.05	0.08	0.10	0.13	0.15	0.06
330	-0.10	-0.08	-0.05	-0.03	0.00	0.02	0.05	0.07	0.10	0.12	0.15	0.05
335	-0.11	-0.08	-0.06	-0.03	-0.01	0.02	0.04	0.07	0.09	0.12	0.14	0.04
340	-0.12	-0.09	-0.07	-0.04	-0.02	0.01	0.03	0.06	0.08	0.11	0.13	0.04
345	-0.12	-0.10	-0.07	-0.05	-0.02	0.00	0.03	0.05	0.08	0.10	0.13	0.03
350	-0.13	-0.10	-0.08	-0.05	-0.03	0.00	0.02	0.05	0.07	0.10	0.12	0.02
355	-0.13	-0.11	-0.08	-0.06	-0.03	-0.01	0.02	0.04	0.07	0.09	0.12	0.01
360	-0.14	-0.11	-0.09	-0.06	-0.04	-0.01	0.01	0.04	0.06	0.09	0.11	0.01
365	-0.14	-0.12	-0.09	-0.07	-0.04	-0.02	0.01	0.03	0.06	0.08	0.11	0.00
370	-0.15	-0.13	-0.10	-0.08	-0.05	-0.03	0.00	0.02	0.05	0.07	0.10	-0.01
375	-0.16	-0.13	-0.11	-0.08	-0.06	-0.03	-0.01	0.02	0.04	0.07	0.09	-0.02
380	-0.16	-0.14	-0.11	-0.09	-0.06	-0.04	-0.01	0.01	0.04	0.06	0.09	-0.02
385	-0.17	-0.14	-0.12	-0.09	-0.07	-0.04	-0.02	0.01	0.03	0.06	0.08	-0.03
390	-0.17	-0.15	-0.12	-0.10	-0.07	-0.05	-0.02	0.00	0.03	0.05	0.08	-0.04
395	-0.18	-0.15	-0.13	-0.10	-0.08	-0.05	-0.03	0.00	0.02	0.05	0.07	-0.05
400	-0.18	-0.16	-0.13	-0.11	-0.08	-0.06	-0.03	-0.01	0.02	0.04	0.07	-0.06

205	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	-0.13
210	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	-0.15
215	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	-0.18
220	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	-0.21
225	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	-0.25
230	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	-0.28
235	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	-0.32
240	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	-0.36
245	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	-0.39
250	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	-0.43
255	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	-0.47
260	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	-0.50
265	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	-0.53
270	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	-0.56
275	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	-0.59
280	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	-0.61
285	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	-0.63
290	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	-0.64
295	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	-0.65
300	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.65
305	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.65
310	-0.04	-0.04	-0.04	-0.04	-0.04	-0.04	-0.04	-0.04	-0.04	-0.04	-0.04	-0.64
315	-0.06	-0.06	-0.06	-0.06	-0.06	-0.06	-0.06	-0.06	-0.06	-0.06	-0.06	-0.63
320	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.61
325	-0.09	-0.09	-0.09	-0.09	-0.09	-0.09	-0.09	-0.09	-0.09	-0.09	-0.09	-0.59
330	-0.10	-0.10	-0.10	-0.10	-0.10	-0.10	-0.10	-0.10	-0.10	-0.10	-0.10	-0.56
335	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.53
340	-0.12	-0.12	-0.12	-0.12	-0.12	-0.12	-0.12	-0.12	-0.12	-0.12	-0.12	-0.50
345	-0.13	-0.13	-0.13	-0.13	-0.13	-0.13	-0.13	-0.13	-0.13	-0.13	-0.13	-0.47
350	-0.14	-0.14	-0.14	-0.14	-0.14	-0.14	-0.14	-0.14	-0.14	-0.14	-0.14	-0.43
355	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.39
360	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.36
365	-0.16	-0.16	-0.16	-0.16	-0.16	-0.16	-0.16	-0.16	-0.16	-0.16	-0.16	-0.32
370	-0.16	-0.16	-0.16	-0.16	-0.16	-0.16	-0.16	-0.16	-0.16	-0.16	-0.16	-0.28
375	-0.16	-0.16	-0.16	-0.16	-0.16	-0.16	-0.16	-0.16	-0.16	-0.16	-0.16	-0.25
380	-0.16	-0.16	-0.16	-0.16	-0.16	-0.16	-0.16	-0.16	-0.16	-0.16	-0.16	-0.21
385	-0.16	-0.16	-0.16	-0.16	-0.16	-0.16	-0.16	-0.16	-0.16	-0.16	-0.16	-0.18
390	-0.16	-0.16	-0.16	-0.16	-0.16	-0.16	-0.16	-0.16	-0.16	-0.16	-0.16	-0.15
395	-0.16	-0.16	-0.16	-0.16	-0.16	-0.16	-0.16	-0.16	-0.16	-0.16	-0.16	-0.13
400	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.11
405	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.09
410	-0.14	-0.14	-0.14	-0.14	-0.14	-0.14	-0.14	-0.14	-0.14	-0.14	-0.14	-0.07
415	-0.14	-0.14	-0.14	-0.14	-0.14	-0.14	-0.14	-0.14	-0.14	-0.14	-0.14	-0.06
420	-0.13	-0.13	-0.13	-0.13	-0.13	-0.13	-0.13	-0.13	-0.13	-0.13	-0.13	-0.05
425	-0.12	-0.12	-0.12	-0.12	-0.12	-0.12	-0.12	-0.12	-0.12	-0.12	-0.12	-0.04
430	-0.12	-0.12	-0.12	-0.12	-0.12	-0.12	-0.12	-0.12	-0.12	-0.12	-0.12	-0.04
435	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.03
440	-0.10	-0.10	-0.10	-0.10	-0.10	-0.10	-0.10	-0.10	-0.10	-0.10	-0.10	-0.03
445	-0.10	-0.10	-0.10	-0.10	-0.10	-0.10	-0.10	-0.10	-0.10	-0.10	-0.10	-0.03
450	-0.09	-0.09	-0.09	-0.09	-0.09	-0.09	-0.09	-0.09	-0.09	-0.09	-0.09	-0.04
455	-0.08	-0.08	-0.08	-0.08	-0.08	-0.08	-0.08	-0.08	-0.08	-0.08	-0.08	-0.04
460	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.05
465	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.05
470	-0.06	-0.06	-0.06	-0.06	-0.06	-0.06	-0.06	-0.06	-0.06	-0.06	-0.06	-0.06
475	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.07
480	-0.04	-0.04	-0.04	-0.04	-0.04	-0.04	-0.04	-0.04	-0.04	-0.04	-0.04	-0.08
485	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.09
490	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.09
495	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.10
500	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.11

***** MEMBER NO. 7 *****

.0 .1 .2 .3 .4 .5 .6 .7 .8 .9 1.0 A.F.

100 -0.19 -0.17 -0.14 -0.12 -0.09 -0.07 -0.04 -0.02 0.01 0.03 0.06 -0.43

105	-0.21	-0.18	-0.16	-0.13	-0.11	-0.08	-0.06	-0.03	-0.01	0.02	0.04	-0.40
110	-0.22	-0.20	-0.17	-0.15	-0.12	-0.10	-0.07	-0.05	-0.02	0.00	0.03	-0.37
115	-0.24	-0.21	-0.19	-0.16	-0.14	-0.11	-0.09	-0.06	-0.04	-0.01	0.01	-0.34
120	-0.25	-0.22	-0.20	-0.17	-0.15	-0.12	-0.10	-0.07	-0.05	-0.02	0.00	-0.31
125	-0.26	-0.24	-0.21	-0.19	-0.16	-0.14	-0.11	-0.09	-0.06	-0.04	-0.01	-0.28
130	-0.28	-0.25	-0.23	-0.20	-0.18	-0.15	-0.13	-0.10	-0.08	-0.05	-0.03	-0.25
135	-0.29	-0.26	-0.24	-0.21	-0.19	-0.16	-0.14	-0.11	-0.09	-0.06	-0.04	-0.22
140	-0.30	-0.27	-0.25	-0.22	-0.20	-0.17	-0.15	-0.12	-0.10	-0.07	-0.05	-0.19
145	-0.31	-0.29	-0.26	-0.24	-0.21	-0.19	-0.16	-0.14	-0.11	-0.09	-0.06	-0.16
150	-0.32	-0.30	-0.27	-0.25	-0.22	-0.20	-0.17	-0.15	-0.12	-0.10	-0.07	-0.13
155	-0.33	-0.30	-0.28	-0.25	-0.23	-0.20	-0.18	-0.15	-0.13	-0.10	-0.08	-0.11
160	-0.34	-0.31	-0.29	-0.26	-0.24	-0.21	-0.19	-0.16	-0.14	-0.11	-0.09	-0.08
165	-0.34	-0.32	-0.29	-0.27	-0.24	-0.22	-0.19	-0.17	-0.14	-0.12	-0.09	-0.05
170	-0.35	-0.32	-0.30	-0.27	-0.25	-0.22	-0.20	-0.17	-0.15	-0.12	-0.10	-0.03
175	-0.35	-0.32	-0.30	-0.27	-0.25	-0.22	-0.20	-0.17	-0.15	-0.12	-0.10	0.00
180	-0.35	-0.33	-0.30	-0.28	-0.25	-0.23	-0.20	-0.18	-0.15	-0.13	-0.10	0.02
185	-0.35	-0.32	-0.30	-0.27	-0.25	-0.22	-0.20	-0.17	-0.15	-0.12	-0.10	0.05
190	-0.35	-0.32	-0.30	-0.27	-0.25	-0.22	-0.20	-0.17	-0.15	-0.12	-0.10	0.07
195	-0.34	-0.31	-0.29	-0.26	-0.24	-0.21	-0.19	-0.16	-0.14	-0.11	-0.09	0.10
200	-0.33	-0.31	-0.28	-0.26	-0.23	-0.21	-0.18	-0.16	-0.13	-0.11	-0.08	0.12
205	-0.32	-0.29	-0.27	-0.24	-0.22	-0.19	-0.17	-0.14	-0.12	-0.09	-0.07	0.14
210	-0.31	-0.28	-0.26	-0.23	-0.21	-0.18	-0.16	-0.13	-0.11	-0.08	-0.06	0.16
215	-0.29	-0.26	-0.24	-0.21	-0.19	-0.16	-0.14	-0.11	-0.09	-0.06	-0.04	0.18
220	-0.27	-0.24	-0.22	-0.19	-0.17	-0.14	-0.12	-0.09	-0.07	-0.04	-0.02	0.20
225	-0.25	-0.22	-0.20	-0.17	-0.15	-0.12	-0.10	-0.07	-0.05	-0.02	0.00	0.22
230	-0.23	-0.20	-0.18	-0.15	-0.13	-0.10	-0.08	-0.05	-0.03	0.00	0.02	0.23
235	-0.20	-0.18	-0.15	-0.13	-0.10	-0.08	-0.05	-0.03	0.00	0.02	0.05	0.24
240	-0.18	-0.15	-0.13	-0.10	-0.08	-0.05	-0.03	0.00	0.02	0.05	0.07	0.26
245	-0.15	-0.13	-0.10	-0.08	-0.05	-0.03	0.00	0.02	0.05	0.07	0.10	0.26
250	-0.13	-0.10	-0.08	-0.05	-0.03	0.00	0.02	0.05	0.07	0.10	0.12	0.27
255	-0.10	-0.07	-0.05	-0.02	0.00	0.03	0.05	0.08	0.10	0.13	0.15	0.28
260	-0.07	-0.05	-0.02	0.00	0.03	0.05	0.08	0.10	0.13	0.15	0.18	0.28
265	-0.05	-0.02	0.00	0.03	0.05	0.08	0.10	0.13	0.15	0.18	0.20	0.28
270	-0.03	0.00	0.02	0.05	0.07	0.10	0.12	0.15	0.17	0.20	0.22	0.29
275	0.00	0.02	0.05	0.07	0.10	0.12	0.15	0.17	0.20	0.22	0.25	0.28
280	0.02	0.04	0.07	0.09	0.12	0.14	0.17	0.19	0.22	0.24	0.27	0.28
285	0.04	0.06	0.09	0.11	0.14	0.16	0.19	0.21	0.24	0.26	0.29	0.28
290	0.05	0.08	0.10	0.13	0.15	0.18	0.20	0.23	0.25	0.28	0.30	0.27
295	0.07	0.09	0.12	0.14	0.17	0.19	0.22	0.24	0.27	0.29	0.32	0.26
300	0.08	0.10	0.13	0.15	0.18	0.20	0.23	0.25	0.28	0.30	0.33	0.25
305	0.08	0.11	0.13	0.16	0.18	0.21	0.23	0.26	0.28	0.31	0.33	0.24
310	0.09	0.11	0.14	0.16	0.19	0.21	0.24	0.26	0.29	0.31	0.34	0.23
315	0.09	0.12	0.14	0.17	0.19	0.22	0.24	0.27	0.29	0.32	0.34	0.22
320	0.09	0.12	0.14	0.17	0.19	0.22	0.24	0.27	0.29	0.32	0.34	0.21
325	0.09	0.11	0.14	0.16	0.19	0.21	0.24	0.26	0.29	0.31	0.34	0.20
330	0.09	0.11	0.14	0.16	0.19	0.21	0.24	0.26	0.29	0.31	0.34	0.18
335	0.08	0.10	0.13	0.15	0.18	0.20	0.23	0.25	0.28	0.30	0.33	0.17
340	0.07	0.10	0.12	0.15	0.17	0.20	0.22	0.25	0.27	0.30	0.32	0.16
345	0.06	0.09	0.11	0.14	0.16	0.19	0.21	0.24	0.26	0.29	0.31	0.14
350	0.05	0.08	0.10	0.13	0.15	0.18	0.20	0.23	0.25	0.28	0.30	0.13
355	0.04	0.07	0.09	0.12	0.14	0.17	0.19	0.22	0.24	0.27	0.29	0.12
360	0.03	0.06	0.08	0.11	0.13	0.16	0.18	0.21	0.23	0.26	0.28	0.10
365	0.02	0.05	0.07	0.10	0.12	0.15	0.17	0.20	0.22	0.25	0.27	0.09
370	0.01	0.03	0.06	0.08	0.11	0.13	0.16	0.18	0.21	0.23	0.26	0.07
375	0.00	0.02	0.05	0.07	0.10	0.12	0.15	0.17	0.20	0.22	0.25	0.05
380	-0.02	0.01	0.03	0.06	0.08	0.11	0.13	0.16	0.18	0.21	0.23	0.04
385	-0.03	0.00	0.02	0.05	0.07	0.10	0.12	0.15	0.17	0.20	0.22	0.02
390	-0.04	-0.02	0.01	0.03	0.06	0.08	0.11	0.13	0.16	0.18	0.21	0.00
395	-0.05	-0.03	0.00	0.02	0.05	0.07	0.10	0.12	0.15	0.17	0.20	-0.01
400	-0.06	-0.04	-0.01	0.01	0.04	0.06	0.09	0.11	0.14	0.16	0.19	-0.03
405	-0.07	-0.05	-0.02	0.00	0.03	0.05	0.08	0.10	0.13	0.15	0.18	-0.05
410	-0.08	-0.06	-0.03	-0.01	0.02	0.04	0.07	0.09	0.12	0.14	0.17	-0.07
415	-0.09	-0.07	-0.04	-0.02	0.01	0.03	0.06	0.08	0.11	0.13	0.16	-0.09
420	-0.10	-0.08	-0.05	-0.03	0.00	0.02	0.05	0.07	0.10	0.12	0.15	-0.11
425	-0.11	-0.08	-0.06	-0.03	-0.01	0.02	0.04	0.07	0.09	0.12	0.14	-0.13
430	-0.12	-0.09	-0.07	-0.04	-0.02	0.01	0.03	0.06	0.08	0.11	0.13	-0.15

435	-0.12	-0.10	-0.07	-0.05	-0.02	0.00	0.03	0.05	0.08	0.10	0.13	-0.17
440	-0.13	-0.11	-0.08	-0.06	-0.03	-0.01	0.02	0.04	0.07	0.09	0.12	-0.19
445	-0.14	-0.11	-0.09	-0.06	-0.04	-0.01	0.01	0.04	0.06	0.09	0.11	-0.20
450	-0.14	-0.12	-0.09	-0.07	-0.04	-0.02	0.01	0.03	0.06	0.08	0.11	-0.22
455	-0.15	-0.12	-0.10	-0.07	-0.05	-0.02	0.00	0.03	0.05	0.08	0.10	-0.24
460	-0.15	-0.13	-0.10	-0.08	-0.05	-0.03	0.00	0.02	0.05	0.07	0.10	-0.26
465	-0.16	-0.13	-0.11	-0.08	-0.06	-0.03	-0.01	0.02	0.04	0.07	0.09	-0.28
470	-0.16	-0.14	-0.11	-0.09	-0.06	-0.04	-0.01	0.01	0.04	0.06	0.09	-0.30
475	-0.17	-0.14	-0.12	-0.09	-0.07	-0.04	-0.02	0.01	0.03	0.06	0.08	-0.32
480	-0.17	-0.15	-0.12	-0.10	-0.07	-0.05	-0.02	0.00	0.03	0.05	0.08	-0.34
485	-0.18	-0.15	-0.13	-0.10	-0.08	-0.05	-0.03	0.00	0.02	0.05	0.07	-0.37
490	-0.18	-0.16	-0.13	-0.11	-0.08	-0.06	-0.03	-0.01	0.02	0.04	0.07	-0.39
495	-0.19	-0.16	-0.14	-0.11	-0.09	-0.06	-0.04	-0.01	0.01	0.04	0.06	-0.41
500	-0.19	-0.17	-0.14	-0.12	-0.09	-0.07	-0.04	-0.02	0.01	0.03	0.06	-0.43



VS 15/0/98

ADD
15 July 98

OM CULVERT BR#A400
OM file: A406LRF5.pol
OM Date: 15ul98
OM Hydraulic Deisgn
OM Quadruple Box Culvert (No Haunch)
OM 4-Cell Box 12'W X10'H
OM Load Factor Design
OM Rigid Frame Method
OM Top and Bot Slab Different
OM Exterior and Interior Wall Different
OM Maximum Fill Ht Condition (5.0 Ft)
OM
STDLOD 2, 0, 0, 0, 0
SWPRES 1, 2, 60, 15, 62.4
BOXDIM 1, 4, 12, 10, 5, 10
SLBTHK 1, 11.5, 12.5, 8, 8, 1111
H&SKEW 1, 90, 90, 0, 0, 0
REEBAR 18, 9, 1, 11, 4, .016
CONCOV 2, 3, 2, 1.5, .5, .5
MATPRP 120, 60, 24, 3, 0, 0
PRTCTL 1, 1, 1, 0
F&HCTL 1, 1, 1
DESCTL 1, 0, 1, 0, 0, 9

CONSTANT DATA

STANDARD LIVE LOAD	-	DESIGN METHOD	-	PRINT CONTROL
TRUCK OMIT STRESS OVERLD	-	SERVICE LOAD	-	10th Pt INFL LOC. NEG
CODE L.L. 0-FILL AXLE	-	LOAD FACTOR	-	MOMENT LINE MOMENT
HS20 NO NO 0.		NO YES		YES YES 1.00

MATERIAL PROPERTIES						-	THICKNESS
SOIL WEIGHT	STEEL Fy	STEEL Fs	CONCRETE STRENGTH	CONCRETE SHEAR	CON.SHEAR W/ STIRRUP	-	INCREMENTS SLAB WALL
120.	60000.	24000.	3000.	0.	0.	-	0.50 0.50

CONCRETE COVER		-	DESIGN	-	PRINT	-	REINFORCING
EXTERIOR	INTERIOR	-	SAME	-	BAR	-	BAR SPACING BAR SIZE
TOP BOT WALL	(ALL)	-	THICKNESS	-	TABLE	-	MAX MIN MAX MIN
SLAB SLAB		-	SLAB WALL	-		-	
2.00 3.00	2.00 1.50		NO NO		YES		18.0 9.0 11 4

CRACK PARAMETER Z = 98.0
 MODULAR RATIO N = 9.0

SUPERIMPOSED DEAD LOADS						-	SPECIAL LIVE LOADS
UNIFORM LOAD	CONCENTRATED LOAD				-	WHEEL LOAD	FILL HEIGHT OVERSTRESS
	WT.	X1	WT.	X2	WT.	X3	LOAD HEIGHT FACTOR
0.000	0.00	0.0	0.00	0.0	0.00	0.0	0.000 0.000 1.00

DATA FOR STRUCTURE NUMBER 1

CULVERT TYPE	-	SPAN LENGTH	-	CLEAR HEIGHT	-	DESIGN FILL	-	CENTERLINE LENGTH	-	SKEW LEFT	-	SKEW RIGHT	-	FLOOR TYPE
QDRPLE		12.00		10.00		5.00		10.00		90		90		FULL

SLAB THICKNESSES				-	LIVE LOAD	-	SOIL SURCHARGE	-	WATER PRESSURE
TOP SLAB	BOT. SLAB	EXT. WALL	INT. WALL	-		-	MAX MIN	-	
11.50F	12.50F	8.00F	8.00F		2.00		60.0 15.0		62.4

TOP HAUNCH HEIGHT	BOTTOM HAUNCH HEIGHT	-	RIGID OR FLEXIBLE	-	CHECK MILITARY	-	BAR SPACING INCREMENT
0.0	0.0		RIGID		NO		1 INCH

BOTH HEADWALLS ELIMINATED.

***** LOAD FACTOR DESIGN *****
 ***** STRESSES AT CRITICAL SECTIONS *****

*** MAXIMUM REINFORCEMENT RATIO (As/bd) = .016

MEMBER NUMBER = 1
 MEMBER THICKNESS = 8.00
 EXTERIOR WAL

	-MOMENT-	-AXIAL-	-SHEAR-	-Po-	-Mu-	-Mbal-	-Pbal-	-STEEL-	-SHEAR-	-ALL.-	-ALL.-
	FORCE							AREA	STRESS	MOM.	SHEAR
LT	-13.6	3.9	5.9	203.9	13.6	18.0	38.2	0.87	111.0	14.0	125.7
MID	5.0	5.5	1.4	187.2	5.3	16.0	64.2	0.30	24.0	6.2	118.9
MID-	-5.3	7.3	1.4	188.0	5.3	16.0	57.1	0.26	26.1	6.7	119.1
RT	-13.7	6.8	4.9	204.2	13.7	18.0	37.8	0.84	93.1	14.5	124.4

MEMBER NUMBER = 2
 MEMBER THICKNESS = 11.50
 TOP SLAB

	-MOMENT-	-AXIAL-	-SHEAR-	-Po-	-Mu-	-Mbal-	-Pbal-	-STEEL-	-SHEAR-	-ALL.-	-ALL.-
	FORCE							AREA	STRESS	MOM.	SHEAR
LT	-14.1	5.4	7.8	272.0	14.1	39.0	99.3	0.56	85.3	15.5	123.6
MID	19.6*	-0.5	1.7	276.9	19.6	42.0	99.7	0.53	18.0	19.5	118.6
RT	-22.5*	-0.7	9.6	281.3	22.5	42.0	87.5	0.59	104.1	22.3	125.3

MEMBER NUMBER = 3
 MEMBER THICKNESS = 8.00
 INTERIOR WAL

	-MOMENT-	-AXIAL-	-SHEAR-	-Po-	-Mu-	-Mbal-	-Pbal-	-STEEL-	-SHEAR-	-ALL.-	-ALL.-
	FORCE							AREA	STRESS	MOM.	SHEAR
LT	-5.1	13.3	1.2	187.2	5.3	14.0	56.2	0.20	24.1	7.3	118.7
MID	1.6	14.9	1.2	186.8	5.0	14.0	56.6	0.19	24.1	7.4	121.9
RT	-6.3	14.0	1.2	188.9	6.3	15.0	54.4	0.24	24.0	8.5	118.7

MEMBER NUMBER = 4
 MEMBER THICKNESS = 12.50
 BOTTOM SLAB

	-MOMENT-	-AXIAL-	-SHEAR-	-Po-	-Mu-	-Mbal-	-Pbal-	-STEEL-	-SHEAR-	-ALL.-	-ALL.-
	FORCE							AREA	STRESS	MOM.	SHEAR
LT	-14.4	4.9	7.1	294.7	14.4	43.0	98.9	0.60	76.9	15.8	123.0
MID	16.6	-1.4	0.8	295.9	18.2	48.0	117.0	0.42	7.3	17.8	117.8
RT	-25.8*	-0.4	9.1	307.5	25.8	47.0	82.7	0.69	99.3	25.7	125.0

MEMBER NUMBER = 5
 MEMBER THICKNESS = 11.50
 TOP SLAB

	-MOMENT-	-AXIAL-	-SHEAR-	-Po-	-Mu-	-Mbal-	-Pbal-	-STEEL-	-SHEAR-	-ALL.-	-ALL.-
	FORCE							AREA	STRESS	MOM.	SHEAR
LT	-20.9	1.1	8.7	279.5	20.9	41.0	89.7	0.55	95.1	21.2	124.5
MID	15.3	5.8	2.5	272.4	15.3	40.0	105.3	0.48	25.8	16.7	119.2
RT	-17.2	4.0	8.2	275.4	17.2	40.0	95.0	0.45	88.9	18.2	124.0

MEMBER NUMBER = 6
 MEMBER THICKNESS = 8.00
 INTERIOR WAL

	-MOMENT-	-AXIAL-	-SHEAR-	-Po-	-Mu-	-Mbal-	-Pbal-	-STEEL-	-SHEAR-	-ALL.-	-ALL.-
	FORCE							AREA	STRESS	MOM.	SHEAR
LT	-6.0	12.8	1.3	188.4	6.0	15.0	54.9	0.23	25.4	8.1	118.8
MID	1.2	14.3	1.3	186.8	5.0	14.0	56.6	0.19	25.4	7.3	123.8
RT	-6.7	13.2	1.3	189.5	6.7	15.0	53.8	0.26	25.0	8.7	118.8

MEMBER NUMBER = 7
 MEMBER THICKNESS = 12.50
 BOTTOM SLAB

	-MOMENT-	-AXIAL-	-SHEAR-	-Po-	-Mu-	-Mbal-	-Pbal-	-STEEL-	-SHEAR-	-ALL.-	-ALL.-
	FORCE							AREA	STRESS	MOM.	SHEAR
LT	-25.3	-1.4	7.9	309.7	27.6	47.0	79.9	0.74	85.8	27.3	124.6
MID	11.8	4.2	1.6	291.9	13.8	46.0	122.1	0.30	15.1	14.9	118.5
RT	-22.4	7.0	7.7	303.6	22.4	46.0	87.6	0.59	83.7	24.3	123.7

NOTE: ASTERISK IMPLIES DESIGN VALUES EXCEED CRITICAL VALUES

***** ATTENTION: OVERSTRESS DUE TO FIXED THICKNESS

A CORNER BAR(T)				A CORNER BAR(B)				A TSLAB+		A TSLAB-	
H	V	SZ	SPG	H	V	SZ	SPG	SZ	SPG	SZ	SPG
56	51	8	9.0	56	51	8	9.0	7	9.0	8	9.0

A BSLAB+		A BSLAB-		B EXTIN		B EXTOUT		B INTWL		C1
SZ	SPG	SZ	SPG	SZ	SPG	SZ	SPG	SZ	SPG	BARS
6	9.0	8	9.0	5	9.0	8	9.0	5	9.0	182

** THE HEIGHT OF C.H.C.U. ** BOTTOM SLAB = 6.00 IN
 TOP SLAB = 5.75 IN

** T.SLAB *	B.SLAB *	WALL *	INWALL *	*** VOLUME ***	*** STEEL **
IN	IN	IN	IN	CY/FT	LB/FT
11.50	12.50	8.00	8.00	5.037	1046

** REINFORCING STEEL BAR SCHEDULE **

* LOCATN *	BAR	* NO.	* SZ	* TYP	* LNPTH *	* WT.	* H LEG	* V LEG
TOP SLAB POSV	MAIN A100	14	7	STR	50-11	1457		
BOT SLAB POSV	MAIN A200	14	6	STR	50-11	1071		
TOP SLAB NEGV	MAIN A300	14	8	STR	50-11	1903		
BOT SLAB NEGV	MAIN A400	14	8	STR	50-11	1903		
CORNER (TOP)	A1	28	8	6	8-11	667	4- 8	4- 3
CORNER (BOTTOM)	A2	28	8	6	8-11	667	4- 8	4- 3
EXTWALL IN	B1	28	5	STR	11- 6	336		
EXTWALL OUT	B2	28	8	STR	9- 4	698		
INTWALL	B3	42	5	STR	11- 6	504		
LONGTD (1)	C1	182	4	STR	9- 8	1175		
TOTAL						10381		

***** SPLICE LENGTHS CHART *****

BAR	SIZE	SPLICE LENGTH
A200	6	2- 3
A400	8	3-11
B1	5	1- 8
B3	5	1- 8
C1	4	2- 2

WYOMING DEPARTMENT OF TRANSPORTATION
 BRIDGE BRANCH
 CULVERT DESIGN

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 DATE 07/15/98

** MOMENT * AXIAL FORCE * SHEAR FOR LOAD FACTOR DESIGN AT TENTH POINT **

M-PT	+MOMENT	-MOMENT	+A.F.	-A.F.	+SHEAR	-SHEAR
1- 0	5.441	-16.919	5.879	3.928	7.158	-2.658
1- 1	2.789	-9.855	5.879	3.928	5.702	-2.174
1- 2	3.056	-6.763	6.835	2.972	4.340	-1.756
1- 3	4.635	-5.991	6.725	2.972	3.073	-1.404
1- 4	4.991	-5.279	5.461	7.346	1.900	-1.117
1- 5	4.459	-4.444	5.461	7.005	1.380	-1.455
1- 6	4.295	-4.640	3.928	6.628	1.535	-2.439
1- 7	3.618	-5.305	3.928	6.236	1.625	-3.329
1- 8	2.125	-6.069	3.578	6.585	1.650	-4.124
1- 9	3.493	-10.543	2.972	6.835	1.608	-4.825
1-10	5.209	-16.193	2.972	6.835	1.501	-5.432
2- 0	5.209	-16.193	-1.501	5.432	9.014	2.972
2- 1	9.420	-8.192	-0.898	5.432	7.634	1.936
2- 2	14.984	-2.236	-0.730	5.338	6.118	0.901
2- 3	18.394	1.529	-0.730	5.164	4.629	-0.134
2- 4	19.633	3.502	-0.470	4.942	3.170	-1.170
2- 5	18.872	3.929	-0.249	4.605	1.742	-3.197
2- 6	16.196	2.554	-0.068	3.358	0.349	-4.843
2- 7	11.730	-0.866	0.074	3.156	-1.069	-6.363
2- 8	6.773	-6.644	5.432	-1.501	-2.469	-7.868
2- 9	0.513	-14.338	5.379	-0.739	-3.754	-9.349
2-10	-7.404	-25.408	5.310	-0.739	-4.900	-10.795
3- 0	6.438	-5.745	14.098	13.307	1.216	-1.207
3- 1	5.166	-4.455	14.098	13.307	1.216	-1.207
3- 2	3.912	-3.183	14.547	12.857	1.216	-1.207
3- 3	2.686	-1.937	15.128	12.857	1.216	-1.207
3- 4	1.582	-0.858	14.921	15.214	1.216	-1.207
3- 5	1.326	-0.470	15.349	14.430	1.216	-1.207
3- 6	2.318	-1.587	14.501	13.970	1.216	-1.207
3- 7	3.644	-2.914	14.090	13.970	1.216	-1.207
3- 8	4.982	-4.242	14.090	13.970	1.216	-1.207
3- 9	6.321	-5.569	14.090	13.970	1.216	-1.207
3-10	7.659	-6.897	14.090	13.970	1.216	-1.207
4- 0	5.441	-16.919	-0.382	4.882	8.368	4.558
4- 1	10.711	-7.299	-0.382	4.882	6.839	3.153
4- 2	14.135	-0.080	-0.985	4.882	5.323	1.748
4- 3	15.839	4.393	-0.985	5.465	3.809	0.340
4- 4	16.612	6.697	-1.439	5.799	2.294	-1.188
4- 5	16.333	5.992	-2.091	6.691	0.779	-2.716
4- 6	14.924	3.411	-2.091	7.083	-0.735	-4.245
4- 7	11.730	-0.915	-2.091	7.083	-2.250	-5.773
4- 8	6.599	-7.130	-2.179	7.083	-3.744	-7.320
4- 9	0.599	-16.815	4.882	-0.382	-5.059	-8.889
4-10	-7.047	-28.967	4.882	-0.382	-6.273	-10.459
5- 0	-7.087	-23.278	4.580	1.243	10.045	4.785
5- 1	0.446	-14.382	4.757	0.678	8.508	3.643
5- 2	6.671	-8.105	5.075	-1.244	6.972	2.456
5- 3	11.299	-4.087	5.203	-1.397	5.454	1.203
5- 4	14.182	-1.559	5.714	-1.397	3.962	-0.157
5- 5	15.324	-0.343	5.804	-1.397	2.497	-1.568
5- 6	14.544	-0.438	5.853	-1.397	1.069	-3.048
5- 7	11.912	-1.854	2.595	1.870	-0.316	-4.866
5- 8	7.854	-4.898	1.089	3.344	-1.644	-6.404

5- 9	2.227	-10.279	1.022	3.335	-2.907	-7.935
5-10	-4.774	-19.694	0.807	4.220	-4.133	-9.478
6- 0	6.578	-6.680	13.205	12.814	1.281	-1.259
6- 1	5.193	-5.271	13.205	12.814	1.281	-1.259
6- 2	3.808	-3.862	13.205	12.814	1.281	-1.259
6- 3	2.423	-2.452	13.205	12.814	1.281	-1.259
6- 4	1.090	-1.061	14.290	12.393	1.281	-1.259
6- 5	0.713	-0.729	13.558	12.939	1.281	-1.259
6- 6	1.801	-1.732	13.178	13.205	1.281	-1.259
6- 7	3.210	-3.117	13.178	13.205	1.281	-1.259
6- 8	4.620	-4.501	13.178	13.205	1.281	-1.259
6- 9	6.029	-5.886	13.178	13.205	1.281	-1.259
6-10	7.439	-7.271	13.178	13.205	1.281	-1.259
7- 0	-7.267	-28.109	6.094	-1.462	9.193	5.831
7- 1	-0.013	-17.528	6.094	-1.057	7.651	4.426
7- 2	5.599	-9.396	5.734	-0.209	6.109	3.021
7- 3	9.489	-3.043	4.466	-0.209	4.567	1.615
7- 4	11.556	0.575	4.243	-0.005	3.053	0.206
7- 5	11.761	2.143	4.243	-0.005	1.618	-1.325
7- 6	10.055	1.621	4.173	-0.062	0.254	-2.857
7- 7	8.584	-1.767	-2.876	6.648	-1.110	-4.389
7- 8	5.581	-7.296	-2.876	6.648	-2.475	-5.925
7- 9	0.624	-14.981	-2.809	6.648	-3.839	-7.463
7-10	-5.587	-25.046	-2.865	7.180	-5.203	-9.002

***** INFLUENCE LINES FOR MOMENT *****

***** MEMBER NO. 1 *****

	.0	.1	.2	.3	.4	.5	.6	.7	.8	.9	1.0
100	-1.28	-1.03	-0.78	-0.53	-0.29	-0.04	0.21	0.46	0.71	0.96	1.21
105	-1.15	-0.93	-0.72	-0.51	-0.30	-0.09	0.13	0.34	0.55	0.76	0.97
110	-1.01	-0.83	-0.66	-0.48	-0.30	-0.13	0.05	0.23	0.40	0.58	0.76
115	-0.88	-0.73	-0.59	-0.45	-0.30	-0.16	-0.02	0.13	0.27	0.42	0.56
120	-0.75	-0.63	-0.52	-0.41	-0.30	-0.18	-0.07	0.04	0.16	0.27	0.38
125	-0.62	-0.53	-0.45	-0.37	-0.28	-0.20	-0.12	-0.03	0.05	0.13	0.22
130	-0.49	-0.43	-0.38	-0.32	-0.26	-0.21	-0.15	-0.10	-0.04	0.01	0.07
135	-0.36	-0.33	-0.30	-0.27	-0.24	-0.21	-0.18	-0.15	-0.12	-0.09	-0.06
140	-0.24	-0.24	-0.23	-0.22	-0.22	-0.21	-0.20	-0.20	-0.19	-0.18	-0.18
145	-0.13	-0.14	-0.16	-0.17	-0.19	-0.20	-0.22	-0.23	-0.25	-0.27	-0.28
150	-0.02	-0.05	-0.09	-0.12	-0.16	-0.19	-0.23	-0.26	-0.30	-0.34	-0.37
155	0.09	0.04	-0.02	-0.07	-0.13	-0.18	-0.23	-0.29	-0.34	-0.39	-0.45
160	0.19	0.12	0.05	-0.02	-0.09	-0.16	-0.23	-0.30	-0.37	-0.44	-0.51
165	0.28	0.20	0.11	0.03	-0.06	-0.14	-0.23	-0.31	-0.40	-0.48	-0.57
170	0.37	0.27	0.17	0.07	-0.03	-0.12	-0.22	-0.32	-0.42	-0.52	-0.61
175	0.44	0.34	0.23	0.12	0.01	-0.10	-0.21	-0.32	-0.43	-0.54	-0.65
180	0.51	0.39	0.28	0.16	0.04	-0.08	-0.20	-0.32	-0.44	-0.56	-0.67
185	0.57	0.45	0.32	0.19	0.07	-0.06	-0.19	-0.31	-0.44	-0.57	-0.69
190	0.62	0.49	0.36	0.22	0.09	-0.04	-0.17	-0.31	-0.44	-0.57	-0.70
195	0.66	0.52	0.39	0.25	0.11	-0.02	-0.16	-0.30	-0.43	-0.57	-0.71
200	0.69	0.55	0.41	0.27	0.13	-0.01	-0.15	-0.29	-0.42	-0.56	-0.70
205	0.71	0.57	0.43	0.29	0.15	0.01	-0.14	-0.28	-0.42	-0.56	-0.70
210	0.72	0.58	0.44	0.30	0.16	0.02	-0.13	-0.27	-0.41	-0.55	-0.69
215	0.74	0.59	0.45	0.31	0.17	0.02	-0.12	-0.26	-0.40	-0.55	-0.69
220	0.75	0.60	0.46	0.32	0.17	0.03	-0.11	-0.26	-0.40	-0.54	-0.69
225	0.75	0.61	0.46	0.32	0.18	0.03	-0.11	-0.25	-0.40	-0.54	-0.68
230	0.75	0.61	0.47	0.32	0.18	0.04	-0.11	-0.25	-0.39	-0.54	-0.68
235	0.75	0.61	0.46	0.32	0.18	0.04	-0.10	-0.25	-0.39	-0.53	-0.67
240	0.74	0.60	0.46	0.32	0.18	0.04	-0.10	-0.25	-0.39	-0.53	-0.67
245	0.74	0.60	0.46	0.32	0.18	0.04	-0.10	-0.24	-0.38	-0.52	-0.66
250	0.72	0.59	0.45	0.31	0.17	0.03	-0.10	-0.24	-0.38	-0.52	-0.66
255	0.71	0.57	0.44	0.30	0.17	0.03	-0.11	-0.24	-0.38	-0.51	-0.65
260	0.69	0.56	0.43	0.29	0.16	0.03	-0.11	-0.24	-0.37	-0.51	-0.64
265	0.67	0.54	0.41	0.28	0.15	0.02	-0.11	-0.24	-0.37	-0.50	-0.63
270	0.65	0.52	0.40	0.27	0.14	0.02	-0.11	-0.24	-0.36	-0.49	-0.62
275	0.63	0.50	0.38	0.26	0.13	0.01	-0.11	-0.23	-0.36	-0.48	-0.60
280	0.60	0.48	0.36	0.24	0.12	0.01	-0.11	-0.23	-0.35	-0.47	-0.59
285	0.57	0.46	0.34	0.23	0.11	0.00	-0.11	-0.23	-0.34	-0.45	-0.57
290	0.54	0.43	0.32	0.21	0.10	0.00	-0.11	-0.22	-0.33	-0.44	-0.55
295	0.50	0.40	0.30	0.20	0.09	-0.01	-0.11	-0.21	-0.32	-0.42	-0.52
300	0.47	0.37	0.27	0.18	0.08	-0.01	-0.11	-0.20	-0.30	-0.40	-0.49
305	0.43	0.34	0.25	0.16	0.07	-0.02	-0.11	-0.20	-0.28	-0.37	-0.46
310	0.39	0.31	0.23	0.15	0.06	-0.02	-0.10	-0.18	-0.27	-0.35	-0.43
315	0.36	0.28	0.20	0.13	0.05	-0.02	-0.10	-0.17	-0.25	-0.32	-0.40
320	0.32	0.25	0.18	0.11	0.04	-0.02	-0.09	-0.16	-0.23	-0.30	-0.37
325	0.28	0.22	0.16	0.10	0.04	-0.03	-0.09	-0.15	-0.21	-0.27	-0.33
330	0.24	0.19	0.13	0.08	0.03	-0.03	-0.08	-0.14	-0.19	-0.24	-0.30
335	0.20	0.16	0.11	0.06	0.02	-0.03	-0.07	-0.12	-0.17	-0.21	-0.26
340	0.17	0.13	0.09	0.05	0.01	-0.03	-0.07	-0.11	-0.15	-0.18	-0.22
345	0.13	0.10	0.06	0.03	0.00	-0.03	-0.06	-0.09	-0.12	-0.15	-0.19
350	0.09	0.06	0.04	0.02	-0.01	-0.03	-0.05	-0.08	-0.10	-0.12	-0.15
355	0.05	0.03	0.02	0.00	-0.01	-0.03	-0.04	-0.06	-0.08	-0.09	-0.11
360	0.01	0.00	-0.01	-0.01	-0.02	-0.03	-0.04	-0.04	-0.05	-0.06	-0.07
365	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.02
370	-0.07	-0.06	-0.06	-0.05	-0.04	-0.03	-0.02	-0.01	0.00	0.01	0.02

375	-0.11	-0.10	-0.08	-0.06	-0.05	-0.03	-0.01	0.01	0.02	0.04	0.06
380	-0.16	-0.13	-0.11	-0.08	-0.05	-0.03	0.00	0.02	0.05	0.08	0.10
385	-0.20	-0.17	-0.13	-0.10	-0.06	-0.03	0.01	0.04	0.08	0.11	0.15
390	-0.24	-0.20	-0.16	-0.11	-0.07	-0.03	0.02	0.06	0.10	0.15	0.19
395	-0.29	-0.24	-0.18	-0.13	-0.08	-0.03	0.03	0.08	0.13	0.18	0.24
400	-0.33	-0.27	-0.21	-0.15	-0.09	-0.03	0.04	0.10	0.16	0.22	0.28
405	-0.38	-0.31	-0.24	-0.17	-0.10	-0.03	0.05	0.12	0.19	0.26	0.33
410	-0.42	-0.34	-0.26	-0.19	-0.11	-0.03	0.05	0.13	0.21	0.29	0.37
415	-0.47	-0.38	-0.29	-0.20	-0.11	-0.03	0.06	0.15	0.24	0.33	0.42
420	-0.52	-0.42	-0.32	-0.22	-0.12	-0.03	0.07	0.17	0.27	0.37	0.46
425	-0.56	-0.46	-0.35	-0.24	-0.13	-0.03	0.08	0.19	0.30	0.40	0.51
430	-0.61	-0.49	-0.38	-0.26	-0.14	-0.03	0.09	0.21	0.32	0.44	0.56
435	-0.66	-0.53	-0.40	-0.28	-0.15	-0.03	0.10	0.22	0.35	0.48	0.60
440	-0.70	-0.57	-0.43	-0.30	-0.16	-0.03	0.11	0.24	0.38	0.51	0.65
445	-0.75	-0.61	-0.46	-0.32	-0.17	-0.03	0.12	0.26	0.40	0.55	0.69
450	-0.80	-0.64	-0.49	-0.34	-0.18	-0.03	0.12	0.28	0.43	0.58	0.74
455	-0.85	-0.68	-0.52	-0.36	-0.19	-0.03	0.13	0.30	0.46	0.62	0.78
460	-0.89	-0.72	-0.55	-0.38	-0.20	-0.03	0.14	0.31	0.49	0.66	0.83
465	-0.94	-0.76	-0.58	-0.40	-0.21	-0.03	0.15	0.33	0.51	0.69	0.88
470	-0.99	-0.80	-0.61	-0.42	-0.22	-0.03	0.16	0.35	0.54	0.73	0.92
475	-1.04	-0.84	-0.64	-0.44	-0.24	-0.03	0.17	0.37	0.57	0.77	0.97
480	-1.09	-0.88	-0.67	-0.46	-0.25	-0.04	0.17	0.38	0.60	0.81	1.02
485	-1.14	-0.92	-0.70	-0.48	-0.26	-0.04	0.18	0.40	0.62	0.84	1.06
490	-1.18	-0.96	-0.73	-0.50	-0.27	-0.04	0.19	0.42	0.65	0.88	1.11
495	-1.23	-0.99	-0.76	-0.52	-0.28	-0.04	0.20	0.44	0.68	0.92	1.16
500	-1.28	-1.03	-0.79	-0.54	-0.29	-0.04	0.21	0.46	0.71	0.95	1.20

***** MEMBER NO. 2 *****

	.0	.1	.2	.3	.4	.5	.6	.7	.8	.9	1.0
100	1.21	0.96	0.72	0.47	0.23	-0.01	-0.26	-0.50	-0.75	-0.99	-1.24
105	0.97	1.32	1.03	0.74	0.46	0.17	-0.12	-0.41	-0.70	-0.98	-1.27
110	0.76	1.69	1.36	1.03	0.70	0.36	0.03	-0.30	-0.63	-0.97	-1.30
115	0.56	1.45	1.70	1.33	0.95	0.57	0.19	-0.18	-0.56	-0.94	-1.32
120	0.38	1.22	2.07	1.64	1.22	0.79	0.37	-0.05	-0.48	-0.90	-1.33
125	0.22	1.01	1.81	1.97	1.50	1.03	0.56	0.09	-0.38	-0.85	-1.32
130	0.07	0.82	1.57	2.32	1.80	1.28	0.77	0.25	-0.27	-0.79	-1.30
135	-0.06	0.64	1.34	2.05	2.12	1.55	0.99	0.42	-0.14	-0.71	-1.27
140	-0.18	0.48	1.13	1.79	2.45	1.83	1.22	0.61	0.00	-0.61	-1.22
145	-0.28	0.33	0.94	1.55	2.16	2.13	1.48	0.82	0.16	-0.49	-1.15
150	-0.37	0.19	0.76	1.32	1.89	2.45	1.75	1.05	0.35	-0.36	-1.06
155	-0.45	0.07	0.59	1.11	1.63	2.15	2.04	1.29	0.55	-0.20	-0.95
160	-0.51	-0.04	0.44	0.92	1.39	1.87	2.35	1.56	0.77	-0.02	-0.81
165	-0.57	-0.13	0.30	0.74	1.17	1.61	2.05	1.85	1.02	0.19	-0.65
170	-0.61	-0.22	0.18	0.57	0.97	1.37	1.76	2.16	1.29	0.42	-0.45
175	-0.65	-0.29	0.07	0.43	0.78	1.14	1.50	1.86	1.58	0.67	-0.23
180	-0.67	-0.35	-0.03	0.29	0.61	0.94	1.26	1.58	1.90	0.96	0.02
185	-0.69	-0.40	-0.11	0.18	0.46	0.75	1.04	1.33	1.62	1.28	0.30
190	-0.70	-0.44	-0.19	0.07	0.33	0.59	0.85	1.11	1.37	1.63	0.62
195	-0.71	-0.47	-0.24	-0.01	0.22	0.45	0.68	0.91	1.14	1.37	0.97
200	-0.70	-0.50	-0.29	-0.08	0.12	0.33	0.54	0.74	0.95	1.16	1.36
205	-0.70	-0.51	-0.33	-0.14	0.04	0.23	0.41	0.60	0.78	0.97	1.15
210	-0.69	-0.53	-0.36	-0.19	-0.03	0.14	0.31	0.47	0.64	0.81	0.97
215	-0.69	-0.54	-0.39	-0.24	-0.09	0.06	0.21	0.36	0.51	0.66	0.81
220	-0.69	-0.55	-0.41	-0.28	-0.14	0.00	0.13	0.27	0.40	0.54	0.68
225	-0.68	-0.56	-0.43	-0.31	-0.18	-0.06	0.06	0.19	0.31	0.44	0.56
230	-0.68	-0.56	-0.45	-0.34	-0.22	-0.11	0.01	0.12	0.24	0.35	0.46
235	-0.67	-0.57	-0.46	-0.36	-0.25	-0.14	-0.04	0.07	0.17	0.28	0.39
240	-0.67	-0.57	-0.47	-0.37	-0.27	-0.17	-0.07	0.02	0.12	0.22	0.32
245	-0.66	-0.57	-0.48	-0.38	-0.29	-0.20	-0.10	-0.01	0.09	0.18	0.27
250	-0.66	-0.57	-0.48	-0.39	-0.30	-0.21	-0.12	-0.03	0.06	0.15	0.24
255	-0.65	-0.56	-0.48	-0.39	-0.31	-0.22	-0.13	-0.05	0.04	0.12	0.21
260	-0.64	-0.56	-0.47	-0.39	-0.31	-0.22	-0.14	-0.06	0.03	0.11	0.19
265	-0.63	-0.55	-0.47	-0.39	-0.30	-0.22	-0.14	-0.06	0.02	0.10	0.18
270	-0.62	-0.54	-0.46	-0.38	-0.30	-0.22	-0.14	-0.06	0.02	0.10	0.18

275	-0.60	-0.52	-0.45	-0.37	-0.29	-0.21	-0.13	-0.05	0.02	0.10	0.18
280	-0.59	-0.51	-0.43	-0.36	-0.28	-0.20	-0.12	-0.05	0.03	0.11	0.18
285	-0.57	-0.49	-0.42	-0.34	-0.27	-0.19	-0.11	-0.04	0.04	0.11	0.19
290	-0.55	-0.47	-0.40	-0.32	-0.25	-0.18	-0.10	-0.03	0.04	0.12	0.19
295	-0.52	-0.45	-0.38	-0.31	-0.24	-0.17	-0.10	-0.02	0.05	0.12	0.19
300	-0.49	-0.43	-0.36	-0.29	-0.22	-0.15	-0.09	-0.02	0.05	0.12	0.18
305	-0.46	-0.40	-0.34	-0.27	-0.21	-0.14	-0.08	-0.02	0.05	0.11	0.17
310	-0.43	-0.37	-0.31	-0.25	-0.20	-0.14	-0.08	-0.02	0.04	0.10	0.16
315	-0.40	-0.35	-0.29	-0.24	-0.18	-0.13	-0.08	-0.02	0.03	0.08	0.14
320	-0.37	-0.32	-0.27	-0.22	-0.17	-0.13	-0.08	-0.03	0.02	0.07	0.11
325	-0.33	-0.29	-0.25	-0.21	-0.17	-0.12	-0.08	-0.04	0.00	0.04	0.08
330	-0.30	-0.26	-0.23	-0.19	-0.16	-0.12	-0.09	-0.05	-0.02	0.02	0.05
335	-0.26	-0.23	-0.21	-0.18	-0.15	-0.12	-0.10	-0.07	-0.04	-0.01	0.02
340	-0.22	-0.20	-0.18	-0.16	-0.14	-0.12	-0.10	-0.08	-0.06	-0.04	-0.02
345	-0.19	-0.17	-0.16	-0.15	-0.14	-0.13	-0.11	-0.10	-0.09	-0.08	-0.07
350	-0.15	-0.14	-0.14	-0.14	-0.13	-0.13	-0.12	-0.12	-0.12	-0.11	-0.11
355	-0.11	-0.11	-0.12	-0.12	-0.13	-0.13	-0.14	-0.14	-0.15	-0.15	-0.15
360	-0.07	-0.08	-0.09	-0.11	-0.12	-0.13	-0.15	-0.16	-0.17	-0.19	-0.20
365	-0.02	-0.05	-0.07	-0.09	-0.11	-0.14	-0.16	-0.18	-0.20	-0.23	-0.25
370	0.02	-0.01	-0.05	-0.08	-0.11	-0.14	-0.17	-0.20	-0.24	-0.27	-0.30
375	0.06	0.02	-0.02	-0.06	-0.10	-0.14	-0.18	-0.22	-0.27	-0.31	-0.35
380	0.10	0.05	0.00	-0.05	-0.10	-0.15	-0.20	-0.25	-0.30	-0.35	-0.40
385	0.15	0.09	0.03	-0.03	-0.09	-0.15	-0.21	-0.27	-0.33	-0.38	-0.44
390	0.19	0.12	0.06	-0.01	-0.08	-0.15	-0.22	-0.29	-0.35	-0.42	-0.49
395	0.24	0.16	0.08	0.00	-0.07	-0.15	-0.23	-0.30	-0.38	-0.46	-0.53
400	0.28	0.20	0.11	0.02	-0.06	-0.15	-0.23	-0.32	-0.41	-0.49	-0.58
405	0.33	0.23	0.14	0.04	-0.05	-0.15	-0.24	-0.34	-0.43	-0.53	-0.62
410	0.37	0.27	0.17	0.06	-0.04	-0.14	-0.25	-0.35	-0.45	-0.56	-0.66
415	0.42	0.31	0.20	0.08	-0.03	-0.14	-0.25	-0.36	-0.48	-0.59	-0.70
420	0.46	0.34	0.22	0.10	-0.02	-0.14	-0.26	-0.38	-0.50	-0.62	-0.74
425	0.51	0.38	0.25	0.13	0.00	-0.13	-0.26	-0.39	-0.52	-0.64	-0.77
430	0.56	0.42	0.28	0.15	0.01	-0.13	-0.26	-0.40	-0.54	-0.67	-0.81
435	0.60	0.46	0.31	0.17	0.02	-0.12	-0.26	-0.41	-0.55	-0.70	-0.84
440	0.65	0.49	0.34	0.19	0.04	-0.11	-0.27	-0.42	-0.57	-0.72	-0.88
445	0.69	0.53	0.37	0.21	0.05	-0.11	-0.27	-0.43	-0.59	-0.75	-0.91
450	0.74	0.57	0.40	0.24	0.07	-0.10	-0.27	-0.44	-0.60	-0.77	-0.94
455	0.78	0.61	0.43	0.26	0.08	-0.09	-0.27	-0.44	-0.62	-0.79	-0.97
460	0.83	0.65	0.46	0.28	0.10	-0.09	-0.27	-0.45	-0.63	-0.82	-1.00
465	0.88	0.69	0.50	0.30	0.11	-0.08	-0.27	-0.46	-0.65	-0.84	-1.03
470	0.92	0.72	0.53	0.33	0.13	-0.07	-0.27	-0.46	-0.66	-0.86	-1.06
475	0.97	0.76	0.56	0.35	0.15	-0.06	-0.27	-0.47	-0.68	-0.88	-1.09
480	1.02	0.80	0.59	0.38	0.16	-0.05	-0.26	-0.48	-0.69	-0.90	-1.12
485	1.06	0.84	0.62	0.40	0.18	-0.04	-0.26	-0.48	-0.70	-0.92	-1.14
490	1.11	0.88	0.65	0.42	0.20	-0.03	-0.26	-0.49	-0.72	-0.94	-1.17
495	1.16	0.92	0.68	0.45	0.21	-0.02	-0.26	-0.49	-0.73	-0.96	-1.20
500	1.20	0.96	0.72	0.47	0.23	-0.01	-0.26	-0.50	-0.74	-0.99	-1.23

***** MEMBER NO. 3 *****

	.0	.1	.2	.3	.4	.5	.6	.7	.8	.9	1.0
100	-1.11	-0.89	-0.67	-0.44	-0.22	0.00	0.22	0.44	0.66	0.89	1.11
105	-1.11	-0.88	-0.66	-0.44	-0.21	0.01	0.24	0.46	0.68	0.91	1.13
110	-1.10	-0.87	-0.65	-0.42	-0.20	0.03	0.25	0.48	0.70	0.93	1.15
115	-1.08	-0.86	-0.63	-0.41	-0.18	0.04	0.26	0.49	0.71	0.94	1.16
120	-1.06	-0.84	-0.62	-0.39	-0.17	0.05	0.28	0.50	0.72	0.95	1.17
125	-1.03	-0.81	-0.59	-0.37	-0.15	0.07	0.29	0.51	0.73	0.95	1.17
130	-1.00	-0.78	-0.57	-0.35	-0.14	0.08	0.29	0.51	0.73	0.94	1.16
135	-0.96	-0.75	-0.54	-0.33	-0.12	0.09	0.30	0.51	0.72	0.93	1.14
140	-0.91	-0.71	-0.51	-0.30	-0.10	0.10	0.30	0.50	0.71	0.91	1.11
145	-0.86	-0.67	-0.47	-0.28	-0.09	0.11	0.30	0.50	0.69	0.88	1.08
150	-0.80	-0.62	-0.44	-0.25	-0.07	0.11	0.30	0.48	0.66	0.85	1.03
155	-0.74	-0.57	-0.40	-0.23	-0.05	0.12	0.29	0.46	0.63	0.81	0.98
160	-0.68	-0.52	-0.36	-0.20	-0.04	0.12	0.28	0.44	0.60	0.76	0.92
165	-0.61	-0.46	-0.32	-0.17	-0.03	0.12	0.26	0.41	0.55	0.70	0.84
170	-0.54	-0.41	-0.28	-0.15	-0.02	0.11	0.24	0.37	0.50	0.63	0.76

175	-0.46	-0.35	-0.23	-0.12	-0.01	0.10	0.22	0.33	0.44	0.56	0.67
180	-0.38	-0.28	-0.19	-0.10	0.00	0.09	0.19	0.28	0.38	0.47	0.57
185	-0.30	-0.22	-0.15	-0.07	0.00	0.08	0.15	0.23	0.30	0.38	0.45
190	-0.21	-0.16	-0.10	-0.05	0.00	0.06	0.11	0.16	0.22	0.27	0.33
195	-0.12	-0.09	-0.06	-0.03	0.00	0.03	0.06	0.09	0.13	0.16	0.19
200	-0.03	-0.03	-0.02	-0.01	0.00	0.00	0.01	0.02	0.03	0.03	0.04
205	0.06	0.04	0.02	0.01	-0.01	-0.03	-0.04	-0.06	-0.08	-0.09	-0.11
210	0.14	0.10	0.07	0.03	-0.01	-0.05	-0.09	-0.13	-0.17	-0.20	-0.24
215	0.23	0.17	0.11	0.05	-0.01	-0.07	-0.13	-0.19	-0.25	-0.31	-0.36
220	0.31	0.23	0.15	0.07	0.00	-0.08	-0.16	-0.24	-0.32	-0.40	-0.47
225	0.39	0.29	0.19	0.10	0.00	-0.09	-0.19	-0.28	-0.38	-0.48	-0.57
230	0.46	0.35	0.24	0.12	0.01	-0.10	-0.21	-0.32	-0.43	-0.55	-0.66
235	0.53	0.40	0.28	0.15	0.02	-0.10	-0.23	-0.35	-0.48	-0.61	-0.73
240	0.60	0.46	0.32	0.18	0.04	-0.10	-0.24	-0.38	-0.52	-0.66	-0.80
245	0.66	0.51	0.35	0.20	0.05	-0.10	-0.25	-0.40	-0.55	-0.70	-0.85
250	0.71	0.55	0.39	0.23	0.07	-0.09	-0.25	-0.41	-0.58	-0.74	-0.90
255	0.76	0.59	0.42	0.25	0.08	-0.08	-0.25	-0.42	-0.59	-0.76	-0.93
260	0.81	0.63	0.45	0.28	0.10	-0.08	-0.25	-0.43	-0.61	-0.78	-0.96
265	0.85	0.66	0.48	0.30	0.12	-0.07	-0.25	-0.43	-0.61	-0.80	-0.98
270	0.88	0.69	0.51	0.32	0.13	-0.05	-0.24	-0.43	-0.61	-0.80	-0.99
275	0.91	0.72	0.53	0.34	0.15	-0.04	-0.23	-0.42	-0.61	-0.80	-0.99
280	0.92	0.73	0.54	0.35	0.16	-0.03	-0.22	-0.41	-0.60	-0.79	-0.99
285	0.94	0.75	0.55	0.36	0.17	-0.02	-0.21	-0.40	-0.59	-0.78	-0.97
290	0.94	0.75	0.56	0.37	0.18	-0.01	-0.20	-0.39	-0.58	-0.77	-0.96
295	0.94	0.75	0.56	0.38	0.19	0.00	-0.18	-0.37	-0.56	-0.75	-0.93
300	0.92	0.74	0.56	0.38	0.19	0.01	-0.17	-0.35	-0.54	-0.72	-0.90
305	0.91	0.73	0.55	0.37	0.20	0.02	-0.16	-0.34	-0.52	-0.69	-0.87
310	0.89	0.71	0.54	0.37	0.20	0.02	-0.15	-0.32	-0.49	-0.67	-0.84
315	0.86	0.70	0.53	0.36	0.20	0.03	-0.14	-0.31	-0.47	-0.64	-0.81
320	0.84	0.68	0.52	0.35	0.19	0.03	-0.13	-0.29	-0.45	-0.61	-0.77
325	0.81	0.65	0.50	0.34	0.19	0.03	-0.12	-0.28	-0.43	-0.59	-0.74
330	0.78	0.63	0.48	0.33	0.18	0.04	-0.11	-0.26	-0.41	-0.56	-0.71
335	0.75	0.60	0.46	0.32	0.18	0.04	-0.11	-0.25	-0.39	-0.53	-0.68
340	0.71	0.58	0.44	0.31	0.17	0.04	-0.10	-0.24	-0.37	-0.51	-0.64
345	0.67	0.55	0.42	0.29	0.16	0.03	-0.09	-0.22	-0.35	-0.48	-0.61
350	0.64	0.52	0.39	0.27	0.15	0.03	-0.09	-0.21	-0.33	-0.45	-0.57
355	0.59	0.48	0.37	0.26	0.14	0.03	-0.08	-0.19	-0.31	-0.42	-0.53
360	0.55	0.45	0.34	0.24	0.13	0.03	-0.08	-0.18	-0.28	-0.39	-0.49
365	0.51	0.41	0.31	0.22	0.12	0.03	-0.07	-0.17	-0.26	-0.36	-0.45
370	0.46	0.37	0.28	0.20	0.11	0.02	-0.06	-0.15	-0.24	-0.32	-0.41
375	0.41	0.33	0.25	0.18	0.10	0.02	-0.06	-0.14	-0.21	-0.29	-0.37
380	0.36	0.29	0.22	0.15	0.08	0.02	-0.05	-0.12	-0.19	-0.26	-0.32
385	0.30	0.25	0.19	0.13	0.07	0.01	-0.04	-0.10	-0.16	-0.22	-0.28
390	0.25	0.20	0.15	0.11	0.06	0.01	-0.04	-0.08	-0.13	-0.18	-0.23
395	0.19	0.16	0.12	0.08	0.04	0.01	-0.03	-0.07	-0.10	-0.14	-0.18
400	0.13	0.11	0.08	0.06	0.03	0.01	-0.02	-0.05	-0.07	-0.10	-0.12
405	0.07	0.06	0.05	0.03	0.02	0.00	-0.01	-0.03	-0.04	-0.05	-0.07
410	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00	-0.01	-0.01	-0.01
415	-0.05	-0.04	-0.03	-0.02	-0.01	0.00	0.01	0.02	0.03	0.04	0.04
420	-0.11	-0.08	-0.06	-0.04	-0.02	0.00	0.02	0.04	0.06	0.08	0.10
425	-0.17	-0.13	-0.10	-0.07	-0.04	0.00	0.03	0.06	0.09	0.13	0.16
430	-0.23	-0.18	-0.14	-0.09	-0.05	0.00	0.04	0.09	0.13	0.17	0.22
435	-0.29	-0.23	-0.17	-0.12	-0.06	0.00	0.05	0.11	0.16	0.22	0.28
440	-0.35	-0.28	-0.21	-0.14	-0.07	0.00	0.06	0.13	0.20	0.27	0.34
445	-0.41	-0.33	-0.25	-0.17	-0.09	-0.01	0.08	0.16	0.24	0.32	0.40
450	-0.47	-0.38	-0.28	-0.19	-0.10	-0.01	0.09	0.18	0.27	0.37	0.46
455	-0.53	-0.43	-0.32	-0.22	-0.11	-0.01	0.10	0.21	0.31	0.42	0.52
460	-0.60	-0.48	-0.36	-0.24	-0.12	-0.01	0.11	0.23	0.35	0.47	0.58
465	-0.66	-0.53	-0.40	-0.27	-0.14	-0.01	0.13	0.26	0.39	0.52	0.65
470	-0.72	-0.58	-0.44	-0.29	-0.15	0.00	0.14	0.28	0.43	0.57	0.71
475	-0.79	-0.63	-0.47	-0.32	-0.16	0.00	0.15	0.31	0.46	0.62	0.78
480	-0.85	-0.68	-0.51	-0.34	-0.17	0.00	0.16	0.33	0.50	0.67	0.84
485	-0.91	-0.73	-0.55	-0.37	-0.19	0.00	0.18	0.36	0.54	0.72	0.91
490	-0.98	-0.78	-0.59	-0.39	-0.20	0.00	0.19	0.39	0.58	0.78	0.97
495	-1.04	-0.84	-0.63	-0.42	-0.21	0.00	0.21	0.41	0.62	0.83	1.04
500	-1.11	-0.89	-0.67	-0.45	-0.22	0.00	0.22	0.44	0.66	0.88	1.11

***** MEMBER NO. 4 *****

	.0	.1	.2	.3	.4	.5	.6	.7	.8	.9	1.0
100	1.28	0.91	0.57	0.26	-0.02	-0.27	-0.48	-0.67	-0.82	-0.94	-1.03
105	1.15	0.80	0.49	0.20	-0.05	-0.27	-0.45	-0.61	-0.73	-0.83	-0.89
110	1.01	0.69	0.41	0.16	-0.07	-0.26	-0.41	-0.54	-0.64	-0.70	-0.73
115	0.88	0.59	0.34	0.11	-0.08	-0.24	-0.37	-0.47	-0.53	-0.57	-0.57
120	0.75	0.49	0.26	0.07	-0.09	-0.22	-0.32	-0.39	-0.42	-0.43	-0.40
125	0.62	0.39	0.20	0.03	-0.10	-0.20	-0.27	-0.30	-0.31	-0.28	-0.22
130	0.49	0.29	0.13	0.00	-0.10	-0.17	-0.21	-0.21	-0.19	-0.13	-0.04
135	0.36	0.20	0.07	-0.03	-0.10	-0.14	-0.15	-0.12	-0.06	0.03	0.15
140	0.24	0.11	0.01	-0.06	-0.10	-0.11	-0.08	-0.03	0.06	0.18	0.33
145	0.13	0.02	-0.05	-0.09	-0.10	-0.07	-0.02	0.07	0.19	0.34	0.52
150	0.02	-0.06	-0.10	-0.11	-0.09	-0.04	0.05	0.16	0.31	0.49	0.70
155	-0.09	-0.14	-0.15	-0.13	-0.08	0.00	0.11	0.26	0.43	0.64	0.88
160	-0.19	-0.21	-0.19	-0.15	-0.07	0.04	0.18	0.35	0.55	0.79	1.05
165	-0.28	-0.27	-0.24	-0.16	-0.06	0.07	0.24	0.44	0.67	0.93	1.22
170	-0.37	-0.34	-0.27	-0.18	-0.05	0.11	0.30	0.52	0.77	1.06	1.37
175	-0.44	-0.39	-0.31	-0.19	-0.04	0.14	0.35	0.60	0.87	1.18	1.52
180	-0.51	-0.44	-0.33	-0.20	-0.03	0.17	0.40	0.67	0.96	1.29	1.65
185	-0.57	-0.48	-0.36	-0.21	-0.02	0.20	0.45	0.73	1.04	1.38	1.76
190	-0.62	-0.52	-0.38	-0.21	-0.01	0.22	0.49	0.78	1.11	1.47	1.86
195	-0.66	-0.54	-0.39	-0.21	0.00	0.24	0.52	0.83	1.16	1.53	1.94
200	-0.69	-0.56	-0.40	-0.22	0.01	0.26	0.54	0.86	1.21	1.58	2.00
205	-0.71	-0.58	-0.41	-0.22	0.01	0.27	0.56	0.88	1.23	1.61	2.03
210	-0.72	-0.59	-0.42	-0.23	0.00	0.26	0.56	0.88	1.24	1.62	2.04
215	-0.74	-0.60	-0.44	-0.24	-0.01	0.25	0.55	0.87	1.23	1.62	2.04
220	-0.75	-0.61	-0.45	-0.25	-0.02	0.24	0.53	0.85	1.20	1.59	2.01
225	-0.75	-0.62	-0.46	-0.27	-0.04	0.21	0.50	0.82	1.17	1.55	1.97
230	-0.75	-0.63	-0.47	-0.29	-0.07	0.18	0.46	0.78	1.12	1.50	1.91
235	-0.75	-0.63	-0.49	-0.31	-0.10	0.15	0.42	0.73	1.06	1.43	1.83
240	-0.74	-0.64	-0.50	-0.33	-0.13	0.11	0.37	0.67	1.00	1.36	1.75
245	-0.74	-0.64	-0.51	-0.35	-0.16	0.06	0.32	0.60	0.92	1.27	1.65
250	-0.72	-0.64	-0.52	-0.38	-0.20	0.02	0.26	0.53	0.84	1.18	1.55
255	-0.71	-0.64	-0.53	-0.40	-0.23	-0.03	0.20	0.46	0.76	1.08	1.44
260	-0.69	-0.63	-0.54	-0.42	-0.27	-0.08	0.14	0.39	0.67	0.98	1.32
265	-0.67	-0.63	-0.55	-0.44	-0.30	-0.13	0.07	0.31	0.58	0.87	1.21
270	-0.65	-0.62	-0.56	-0.46	-0.34	-0.18	0.01	0.23	0.48	0.77	1.09
275	-0.63	-0.61	-0.56	-0.48	-0.37	-0.23	-0.05	0.16	0.39	0.66	0.97
280	-0.60	-0.60	-0.56	-0.50	-0.40	-0.27	-0.11	0.08	0.31	0.56	0.85
285	-0.57	-0.58	-0.56	-0.51	-0.43	-0.31	-0.17	0.01	0.22	0.46	0.74
290	-0.54	-0.56	-0.56	-0.52	-0.45	-0.35	-0.22	-0.05	0.14	0.37	0.63
295	-0.50	-0.54	-0.55	-0.53	-0.47	-0.38	-0.26	-0.11	0.07	0.28	0.53
300	-0.47	-0.52	-0.54	-0.53	-0.48	-0.41	-0.30	-0.16	0.01	0.21	0.44
305	-0.43	-0.49	-0.53	-0.53	-0.49	-0.43	-0.34	-0.21	-0.05	0.14	0.36
310	-0.39	-0.47	-0.51	-0.52	-0.50	-0.45	-0.37	-0.25	-0.11	0.07	0.28
315	-0.36	-0.44	-0.49	-0.52	-0.51	-0.47	-0.39	-0.29	-0.15	0.01	0.21
320	-0.32	-0.41	-0.48	-0.51	-0.51	-0.48	-0.42	-0.32	-0.20	-0.04	0.15
325	-0.28	-0.39	-0.46	-0.50	-0.51	-0.49	-0.44	-0.35	-0.23	-0.09	0.09
330	-0.24	-0.36	-0.44	-0.49	-0.51	-0.50	-0.45	-0.38	-0.27	-0.13	0.04
335	-0.20	-0.33	-0.42	-0.48	-0.51	-0.50	-0.47	-0.40	-0.30	-0.17	-0.01
340	-0.17	-0.30	-0.40	-0.46	-0.50	-0.50	-0.48	-0.42	-0.33	-0.20	-0.05
345	-0.13	-0.27	-0.37	-0.45	-0.49	-0.50	-0.48	-0.43	-0.35	-0.24	-0.09
350	-0.09	-0.23	-0.35	-0.43	-0.48	-0.50	-0.49	-0.45	-0.37	-0.26	-0.13
355	-0.05	-0.20	-0.32	-0.41	-0.47	-0.50	-0.49	-0.46	-0.39	-0.29	-0.16
360	-0.01	-0.17	-0.30	-0.40	-0.46	-0.49	-0.50	-0.47	-0.41	-0.31	-0.19
365	0.03	-0.14	-0.27	-0.38	-0.45	-0.49	-0.50	-0.48	-0.42	-0.34	-0.22
370	0.07	-0.10	-0.24	-0.35	-0.43	-0.48	-0.50	-0.48	-0.43	-0.36	-0.24
375	0.11	-0.07	-0.22	-0.33	-0.42	-0.47	-0.50	-0.49	-0.45	-0.37	-0.27
380	0.16	-0.03	-0.19	-0.31	-0.40	-0.46	-0.49	-0.49	-0.46	-0.39	-0.29
385	0.20	0.01	-0.16	-0.29	-0.39	-0.46	-0.49	-0.50	-0.47	-0.41	-0.32
390	0.24	0.04	-0.13	-0.26	-0.37	-0.45	-0.49	-0.50	-0.48	-0.43	-0.34
395	0.29	0.08	-0.10	-0.24	-0.35	-0.43	-0.48	-0.50	-0.49	-0.44	-0.37
400	0.33	0.12	-0.07	-0.22	-0.34	-0.42	-0.48	-0.51	-0.50	-0.46	-0.39

405	0.38	0.16	-0.03	-0.19	-0.32	-0.41	-0.48	-0.51	-0.51	-0.48	-0.42
410	0.42	0.19	0.00	-0.17	-0.30	-0.41	-0.48	-0.52	-0.52	-0.50	-0.44
415	0.47	0.23	0.03	-0.14	-0.29	-0.40	-0.47	-0.52	-0.54	-0.52	-0.47
420	0.52	0.27	0.06	-0.12	-0.27	-0.39	-0.47	-0.53	-0.55	-0.54	-0.50
425	0.56	0.31	0.09	-0.10	-0.25	-0.38	-0.47	-0.53	-0.56	-0.56	-0.53
430	0.61	0.35	0.12	-0.07	-0.24	-0.37	-0.47	-0.54	-0.58	-0.59	-0.56
435	0.66	0.39	0.15	-0.05	-0.22	-0.36	-0.47	-0.55	-0.60	-0.61	-0.59
440	0.70	0.43	0.18	-0.03	-0.21	-0.36	-0.47	-0.56	-0.61	-0.63	-0.62
445	0.75	0.47	0.22	0.00	-0.19	-0.35	-0.47	-0.57	-0.63	-0.66	-0.66
450	0.80	0.51	0.25	0.02	-0.18	-0.34	-0.47	-0.58	-0.65	-0.68	-0.69
455	0.85	0.55	0.28	0.04	-0.16	-0.34	-0.48	-0.59	-0.66	-0.71	-0.72
460	0.89	0.59	0.31	0.07	-0.15	-0.33	-0.48	-0.60	-0.68	-0.74	-0.76
465	0.94	0.63	0.34	0.09	-0.13	-0.32	-0.48	-0.61	-0.70	-0.76	-0.79
470	0.99	0.67	0.37	0.11	-0.12	-0.31	-0.48	-0.61	-0.72	-0.79	-0.83
475	1.04	0.71	0.40	0.14	-0.10	-0.31	-0.48	-0.62	-0.74	-0.81	-0.86
480	1.09	0.75	0.44	0.16	-0.09	-0.30	-0.48	-0.63	-0.75	-0.84	-0.90
485	1.14	0.79	0.47	0.18	-0.07	-0.29	-0.49	-0.64	-0.77	-0.87	-0.93
490	1.18	0.83	0.50	0.21	-0.06	-0.29	-0.49	-0.65	-0.79	-0.89	-0.97
495	1.23	0.87	0.53	0.23	-0.04	-0.28	-0.49	-0.66	-0.81	-0.92	-1.00
500	1.28	0.91	0.57	0.25	-0.02	-0.27	-0.49	-0.67	-0.83	-0.95	-1.04

***** MEMBER NO. 5 *****

	.0	.1	.2	.3	.4	.5	.6	.7	.8	.9	1.0
100	-0.13	-0.20	-0.27	-0.34	-0.41	-0.48	-0.55	-0.62	-0.69	-0.76	-0.83
105	-0.14	-0.21	-0.28	-0.35	-0.41	-0.48	-0.55	-0.62	-0.69	-0.76	-0.83
110	-0.15	-0.21	-0.28	-0.35	-0.42	-0.48	-0.55	-0.62	-0.69	-0.75	-0.82
115	-0.15	-0.22	-0.29	-0.35	-0.42	-0.48	-0.55	-0.61	-0.68	-0.75	-0.81
120	-0.16	-0.22	-0.29	-0.35	-0.41	-0.48	-0.54	-0.61	-0.67	-0.74	-0.80
125	-0.15	-0.22	-0.28	-0.34	-0.41	-0.47	-0.53	-0.60	-0.66	-0.72	-0.79
130	-0.15	-0.21	-0.27	-0.34	-0.40	-0.46	-0.52	-0.59	-0.65	-0.71	-0.77
135	-0.13	-0.19	-0.26	-0.32	-0.38	-0.45	-0.51	-0.57	-0.63	-0.70	-0.76
140	-0.11	-0.17	-0.24	-0.30	-0.36	-0.43	-0.49	-0.55	-0.62	-0.68	-0.75
145	-0.07	-0.14	-0.20	-0.27	-0.34	-0.40	-0.47	-0.53	-0.60	-0.67	-0.73
150	-0.03	-0.10	-0.16	-0.23	-0.30	-0.37	-0.44	-0.51	-0.58	-0.65	-0.72
155	0.03	-0.04	-0.11	-0.19	-0.26	-0.34	-0.41	-0.48	-0.56	-0.63	-0.71
160	0.11	0.03	-0.05	-0.13	-0.21	-0.29	-0.37	-0.46	-0.54	-0.62	-0.70
165	0.20	0.11	0.02	-0.07	-0.16	-0.25	-0.33	-0.42	-0.51	-0.60	-0.69
170	0.31	0.21	0.11	0.01	-0.09	-0.19	-0.29	-0.39	-0.49	-0.58	-0.68
175	0.43	0.32	0.21	0.10	-0.01	-0.12	-0.24	-0.35	-0.46	-0.57	-0.68
180	0.58	0.45	0.33	0.20	0.08	-0.05	-0.18	-0.30	-0.43	-0.56	-0.68
185	0.75	0.61	0.46	0.32	0.17	0.03	-0.11	-0.26	-0.40	-0.55	-0.69
190	0.94	0.78	0.61	0.45	0.29	0.12	-0.04	-0.21	-0.37	-0.54	-0.70
195	1.16	0.97	0.79	0.60	0.41	0.22	0.03	-0.15	-0.34	-0.53	-0.72
200	1.40	1.19	0.98	0.76	0.55	0.33	0.12	-0.09	-0.31	-0.52	-0.74
205	1.05	1.44	1.19	0.95	0.70	0.46	0.22	-0.03	-0.27	-0.52	-0.76
210	0.73	1.72	1.44	1.16	0.88	0.61	0.33	0.05	-0.23	-0.51	-0.78
215	0.45	1.40	1.72	1.40	1.09	0.77	0.46	0.14	-0.17	-0.49	-0.80
220	0.20	1.11	2.03	1.67	1.31	0.96	0.60	0.25	-0.11	-0.46	-0.82
225	-0.01	0.86	1.73	1.96	1.56	1.17	0.77	0.37	-0.03	-0.42	-0.82
230	-0.19	0.63	1.45	2.28	1.84	1.39	0.95	0.51	0.07	-0.38	-0.82
235	-0.35	0.43	1.21	1.99	2.13	1.64	1.15	0.66	0.18	-0.31	-0.80
240	-0.48	0.25	0.98	1.72	2.45	1.91	1.37	0.84	0.30	-0.24	-0.77
245	-0.58	0.10	0.78	1.47	2.15	2.20	1.61	1.03	0.44	-0.14	-0.73
250	-0.66	-0.03	0.61	1.24	1.87	2.51	1.87	1.24	0.61	-0.03	-0.66
255	-0.72	-0.14	0.45	1.03	1.62	2.20	2.15	1.47	0.79	0.11	-0.57
260	-0.77	-0.23	0.31	0.84	1.38	1.92	2.45	1.72	0.99	0.26	-0.47
265	-0.79	-0.30	0.18	0.67	1.16	1.65	2.14	2.00	1.22	0.44	-0.33
270	-0.81	-0.36	0.08	0.52	0.97	1.41	1.85	2.30	1.47	0.65	-0.17
275	-0.81	-0.41	-0.01	0.39	0.79	1.19	1.59	1.99	1.75	0.89	0.02
280	-0.80	-0.44	-0.09	0.27	0.63	0.99	1.34	1.70	2.06	1.15	0.24
285	-0.79	-0.47	-0.15	0.17	0.49	0.80	1.12	1.44	1.76	1.44	0.49
290	-0.77	-0.49	-0.20	0.08	0.36	0.64	0.92	1.21	1.49	1.77	0.79
295	-0.74	-0.49	-0.25	0.00	0.25	0.50	0.75	1.00	1.25	1.50	1.11
300	-0.72	-0.50	-0.28	-0.06	0.16	0.38	0.60	0.82	1.04	1.26	1.48

305	-0.70	-0.50	-0.31	-0.11	0.08	0.28	0.47	0.67	0.86	1.06	1.25
310	-0.68	-0.51	-0.33	-0.16	0.01	0.19	0.36	0.53	0.70	0.88	1.05
315	-0.67	-0.51	-0.36	-0.21	-0.05	0.10	0.26	0.41	0.57	0.72	0.87
320	-0.66	-0.52	-0.38	-0.25	-0.11	0.03	0.17	0.31	0.44	0.58	0.72
325	-0.66	-0.53	-0.41	-0.28	-0.16	-0.03	0.09	0.22	0.34	0.47	0.59
330	-0.66	-0.54	-0.43	-0.32	-0.20	-0.09	0.03	0.14	0.25	0.37	0.48
335	-0.66	-0.55	-0.45	-0.35	-0.24	-0.14	-0.03	0.07	0.18	0.28	0.39
340	-0.66	-0.57	-0.47	-0.37	-0.27	-0.18	-0.08	0.02	0.12	0.22	0.31
345	-0.67	-0.58	-0.49	-0.39	-0.30	-0.21	-0.12	-0.02	0.07	0.16	0.25
350	-0.68	-0.59	-0.50	-0.41	-0.32	-0.24	-0.15	-0.06	0.03	0.12	0.21
355	-0.69	-0.60	-0.51	-0.43	-0.34	-0.26	-0.17	-0.08	0.00	0.09	0.17
360	-0.70	-0.61	-0.53	-0.44	-0.36	-0.27	-0.19	-0.10	-0.02	0.06	0.15
365	-0.70	-0.62	-0.54	-0.45	-0.37	-0.29	-0.20	-0.12	-0.03	0.05	0.13
370	-0.71	-0.63	-0.54	-0.46	-0.38	-0.29	-0.21	-0.13	-0.04	0.04	0.12
375	-0.72	-0.63	-0.55	-0.47	-0.38	-0.30	-0.22	-0.13	-0.05	0.03	0.12
380	-0.72	-0.64	-0.55	-0.47	-0.39	-0.30	-0.22	-0.14	-0.05	0.03	0.11
385	-0.72	-0.64	-0.55	-0.47	-0.39	-0.30	-0.22	-0.14	-0.05	0.03	0.11
390	-0.72	-0.63	-0.55	-0.47	-0.39	-0.30	-0.22	-0.14	-0.06	0.03	0.11
395	-0.71	-0.63	-0.55	-0.47	-0.39	-0.30	-0.22	-0.14	-0.06	0.02	0.10
400	-0.70	-0.62	-0.54	-0.46	-0.38	-0.30	-0.22	-0.14	-0.06	0.01	0.09
405	-0.69	-0.61	-0.53	-0.46	-0.38	-0.30	-0.23	-0.15	-0.07	0.00	0.08
410	-0.67	-0.60	-0.53	-0.45	-0.38	-0.31	-0.23	-0.16	-0.09	-0.01	0.06
415	-0.65	-0.59	-0.52	-0.45	-0.38	-0.31	-0.24	-0.17	-0.10	-0.03	0.03
420	-0.63	-0.57	-0.51	-0.44	-0.38	-0.32	-0.25	-0.19	-0.12	-0.06	0.00
425	-0.61	-0.55	-0.50	-0.44	-0.38	-0.32	-0.26	-0.21	-0.15	-0.09	-0.03
430	-0.59	-0.54	-0.49	-0.43	-0.38	-0.33	-0.28	-0.23	-0.17	-0.12	-0.07
435	-0.56	-0.52	-0.47	-0.43	-0.38	-0.34	-0.29	-0.25	-0.20	-0.16	-0.11
440	-0.54	-0.50	-0.46	-0.42	-0.39	-0.35	-0.31	-0.27	-0.23	-0.19	-0.16
445	-0.51	-0.48	-0.45	-0.42	-0.39	-0.36	-0.33	-0.30	-0.27	-0.24	-0.20
450	-0.48	-0.46	-0.43	-0.41	-0.39	-0.37	-0.35	-0.32	-0.30	-0.28	-0.26
455	-0.45	-0.43	-0.42	-0.41	-0.39	-0.38	-0.36	-0.35	-0.34	-0.32	-0.31
460	-0.42	-0.41	-0.41	-0.40	-0.39	-0.39	-0.38	-0.38	-0.37	-0.37	-0.36
465	-0.38	-0.39	-0.39	-0.39	-0.40	-0.40	-0.41	-0.41	-0.41	-0.42	-0.42
470	-0.35	-0.36	-0.37	-0.39	-0.40	-0.41	-0.43	-0.44	-0.45	-0.47	-0.48
475	-0.31	-0.33	-0.36	-0.38	-0.40	-0.43	-0.45	-0.47	-0.49	-0.52	-0.54
480	-0.28	-0.31	-0.34	-0.37	-0.40	-0.44	-0.47	-0.50	-0.53	-0.57	-0.60
485	-0.24	-0.28	-0.32	-0.36	-0.41	-0.45	-0.49	-0.53	-0.57	-0.62	-0.66
490	-0.20	-0.25	-0.30	-0.36	-0.41	-0.46	-0.51	-0.56	-0.61	-0.67	-0.72
495	-0.16	-0.22	-0.28	-0.35	-0.41	-0.47	-0.53	-0.59	-0.65	-0.72	-0.78
500	-0.12	-0.19	-0.26	-0.34	-0.41	-0.48	-0.55	-0.62	-0.69	-0.76	-0.84

MEMBER NO. 6

	.0	.1	.2	.3	.4	.5	.6	.7	.8	.9	1.0
100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
105	-0.06	-0.05	-0.04	-0.03	-0.02	0.00	0.01	0.02	0.03	0.04	0.05
110	-0.12	-0.10	-0.08	-0.05	-0.03	-0.01	0.01	0.04	0.06	0.08	0.10
115	-0.18	-0.14	-0.11	-0.08	-0.04	-0.01	0.02	0.05	0.09	0.12	0.15
120	-0.23	-0.19	-0.15	-0.10	-0.06	-0.02	0.03	0.07	0.12	0.16	0.20
125	-0.29	-0.23	-0.18	-0.13	-0.07	-0.02	0.03	0.09	0.14	0.20	0.25
130	-0.34	-0.28	-0.21	-0.15	-0.09	-0.02	0.04	0.10	0.17	0.23	0.29
135	-0.39	-0.32	-0.24	-0.17	-0.10	-0.03	0.05	0.12	0.19	0.27	0.34
140	-0.44	-0.35	-0.27	-0.19	-0.11	-0.03	0.05	0.14	0.22	0.30	0.38
145	-0.48	-0.39	-0.30	-0.21	-0.12	-0.03	0.06	0.15	0.24	0.33	0.42
150	-0.53	-0.43	-0.33	-0.23	-0.13	-0.03	0.07	0.17	0.26	0.36	0.46
155	-0.57	-0.46	-0.35	-0.25	-0.14	-0.03	0.07	0.18	0.29	0.39	0.50
160	-0.61	-0.49	-0.38	-0.26	-0.15	-0.03	0.08	0.20	0.31	0.43	0.54
165	-0.64	-0.52	-0.40	-0.28	-0.16	-0.03	0.09	0.21	0.33	0.46	0.58
170	-0.68	-0.55	-0.42	-0.29	-0.16	-0.03	0.10	0.23	0.36	0.49	0.61
175	-0.71	-0.58	-0.44	-0.30	-0.17	-0.03	0.11	0.24	0.38	0.51	0.65
180	-0.74	-0.60	-0.46	-0.31	-0.17	-0.03	0.12	0.26	0.40	0.54	0.69
185	-0.77	-0.62	-0.47	-0.32	-0.17	-0.02	0.13	0.27	0.42	0.57	0.72
190	-0.80	-0.64	-0.49	-0.33	-0.18	-0.02	0.14	0.29	0.45	0.60	0.76
195	-0.82	-0.66	-0.50	-0.34	-0.18	-0.01	0.15	0.31	0.47	0.63	0.80
200	-0.84	-0.68	-0.51	-0.34	-0.17	-0.01	0.16	0.33	0.50	0.66	0.83

205	-0.86	-0.69	-0.52	-0.34	-0.17	0.00	0.17	0.35	0.52	0.69	0.86
210	-0.87	-0.69	-0.52	-0.34	-0.16	0.01	0.19	0.36	0.54	0.72	0.89
215	-0.87	-0.69	-0.51	-0.33	-0.16	0.02	0.20	0.38	0.56	0.74	0.91
220	-0.86	-0.68	-0.50	-0.33	-0.15	0.03	0.21	0.39	0.57	0.75	0.93
225	-0.85	-0.67	-0.49	-0.31	-0.13	0.04	0.22	0.40	0.58	0.76	0.94
230	-0.83	-0.65	-0.47	-0.30	-0.12	0.06	0.23	0.41	0.59	0.76	0.94
235	-0.80	-0.63	-0.45	-0.28	-0.11	0.07	0.24	0.41	0.59	0.76	0.93
240	-0.77	-0.60	-0.43	-0.26	-0.09	0.08	0.25	0.41	0.58	0.75	0.92
245	-0.73	-0.57	-0.40	-0.24	-0.08	0.09	0.25	0.41	0.57	0.74	0.90
250	-0.68	-0.53	-0.37	-0.22	-0.06	0.09	0.25	0.40	0.56	0.71	0.87
255	-0.63	-0.49	-0.34	-0.19	-0.05	0.10	0.24	0.39	0.54	0.68	0.83
260	-0.58	-0.44	-0.31	-0.17	-0.04	0.10	0.24	0.37	0.51	0.64	0.78
265	-0.52	-0.40	-0.27	-0.15	-0.02	0.10	0.23	0.35	0.47	0.60	0.72
270	-0.46	-0.34	-0.23	-0.12	-0.01	0.10	0.21	0.32	0.43	0.54	0.65
275	-0.39	-0.29	-0.20	-0.10	0.00	0.09	0.19	0.28	0.38	0.48	0.57
280	-0.32	-0.24	-0.16	-0.08	0.00	0.08	0.16	0.24	0.32	0.40	0.48
285	-0.24	-0.18	-0.12	-0.05	0.01	0.07	0.13	0.19	0.26	0.32	0.38
290	-0.16	-0.12	-0.08	-0.03	0.01	0.05	0.09	0.14	0.18	0.22	0.27
295	-0.08	-0.06	-0.04	-0.02	0.01	0.03	0.05	0.07	0.09	0.12	0.14
300	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
305	0.08	0.06	0.04	0.02	-0.01	-0.03	-0.05	-0.07	-0.09	-0.12	-0.14
310	0.16	0.12	0.08	0.03	-0.01	-0.05	-0.09	-0.14	-0.18	-0.22	-0.27
315	0.24	0.18	0.12	0.05	-0.01	-0.07	-0.13	-0.19	-0.26	-0.32	-0.38
320	0.32	0.24	0.16	0.08	0.00	-0.08	-0.16	-0.24	-0.32	-0.40	-0.48
325	0.39	0.29	0.20	0.10	0.00	-0.09	-0.19	-0.28	-0.38	-0.48	-0.57
330	0.46	0.34	0.23	0.12	0.01	-0.10	-0.21	-0.32	-0.43	-0.54	-0.65
335	0.52	0.40	0.27	0.15	0.02	-0.10	-0.23	-0.35	-0.47	-0.60	-0.72
340	0.58	0.44	0.31	0.17	0.04	-0.10	-0.24	-0.37	-0.51	-0.64	-0.78
345	0.63	0.49	0.34	0.19	0.05	-0.10	-0.24	-0.39	-0.54	-0.68	-0.83
350	0.68	0.53	0.37	0.22	0.06	-0.09	-0.25	-0.40	-0.56	-0.71	-0.87
355	0.73	0.57	0.40	0.24	0.08	-0.09	-0.25	-0.41	-0.57	-0.74	-0.90
360	0.77	0.60	0.43	0.26	0.09	-0.08	-0.25	-0.41	-0.58	-0.75	-0.92
365	0.80	0.63	0.45	0.28	0.11	-0.07	-0.24	-0.41	-0.59	-0.76	-0.93
370	0.83	0.65	0.47	0.30	0.12	-0.06	-0.23	-0.41	-0.59	-0.76	-0.94
375	0.85	0.67	0.49	0.31	0.13	-0.04	-0.22	-0.40	-0.58	-0.76	-0.94
380	0.86	0.68	0.50	0.33	0.15	-0.03	-0.21	-0.39	-0.57	-0.75	-0.93
385	0.87	0.69	0.51	0.33	0.16	-0.02	-0.20	-0.38	-0.56	-0.74	-0.91
390	0.87	0.69	0.52	0.34	0.16	-0.01	-0.19	-0.36	-0.54	-0.72	-0.89
395	0.86	0.69	0.52	0.34	0.17	0.00	-0.17	-0.35	-0.52	-0.69	-0.86
400	0.84	0.68	0.51	0.34	0.17	0.01	-0.16	-0.33	-0.50	-0.66	-0.83
405	0.82	0.66	0.50	0.34	0.18	0.01	-0.15	-0.31	-0.47	-0.63	-0.80
410	0.80	0.64	0.49	0.33	0.18	0.02	-0.14	-0.29	-0.45	-0.60	-0.76
415	0.77	0.62	0.47	0.32	0.17	0.02	-0.13	-0.27	-0.42	-0.57	-0.72
420	0.74	0.60	0.46	0.31	0.17	0.03	-0.12	-0.26	-0.40	-0.54	-0.69
425	0.71	0.58	0.44	0.30	0.17	0.03	-0.11	-0.24	-0.38	-0.51	-0.65
430	0.68	0.55	0.42	0.29	0.16	0.03	-0.10	-0.23	-0.36	-0.49	-0.61
435	0.64	0.52	0.40	0.28	0.16	0.03	-0.09	-0.21	-0.33	-0.46	-0.58
440	0.61	0.49	0.38	0.26	0.15	0.03	-0.08	-0.20	-0.31	-0.43	-0.54
445	0.57	0.46	0.35	0.25	0.14	0.03	-0.07	-0.18	-0.29	-0.39	-0.50
450	0.53	0.43	0.33	0.23	0.13	0.03	-0.07	-0.17	-0.26	-0.36	-0.46
455	0.48	0.39	0.30	0.21	0.12	0.03	-0.06	-0.15	-0.24	-0.33	-0.42
460	0.44	0.35	0.27	0.19	0.11	0.03	-0.05	-0.14	-0.22	-0.30	-0.38
465	0.39	0.32	0.24	0.17	0.10	0.03	-0.05	-0.12	-0.19	-0.27	-0.34
470	0.34	0.28	0.21	0.15	0.09	0.02	-0.04	-0.10	-0.17	-0.23	-0.29
475	0.29	0.23	0.18	0.13	0.07	0.02	-0.03	-0.09	-0.14	-0.20	-0.25
480	0.23	0.19	0.15	0.10	0.06	0.02	-0.03	-0.07	-0.12	-0.16	-0.20
485	0.18	0.14	0.11	0.08	0.04	0.01	-0.02	-0.05	-0.09	-0.12	-0.15
490	0.12	0.10	0.08	0.05	0.03	0.01	-0.01	-0.04	-0.06	-0.08	-0.10
495	0.06	0.05	0.04	0.03	0.02	0.00	-0.01	-0.02	-0.03	-0.04	-0.05
500	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

***** MEMBER NO. 7 *****

	.0	.1	.2	.3	.4	.5	.6	.7	.8	.9	1.0
100	0.08	-0.15	-0.35	-0.51	-0.65	-0.75	-0.82	-0.86	-0.87	-0.85	-0.80

105	0.22	-0.03	-0.24	-0.43	-0.58	-0.70	-0.79	-0.85	-0.87	-0.86	-0.83
110	0.37	0.10	-0.13	-0.33	-0.50	-0.64	-0.75	-0.82	-0.87	-0.88	-0.86
115	0.51	0.23	-0.02	-0.24	-0.42	-0.58	-0.70	-0.80	-0.86	-0.89	-0.88
120	0.66	0.36	0.10	-0.14	-0.35	-0.52	-0.66	-0.77	-0.85	-0.89	-0.91
125	0.81	0.50	0.21	-0.04	-0.26	-0.45	-0.61	-0.74	-0.83	-0.90	-0.93
130	0.96	0.63	0.33	0.06	-0.18	-0.39	-0.56	-0.71	-0.82	-0.90	-0.95
135	1.11	0.76	0.44	0.15	-0.10	-0.32	-0.51	-0.67	-0.80	-0.89	-0.96
140	1.25	0.88	0.55	0.25	-0.02	-0.26	-0.46	-0.64	-0.78	-0.89	-0.97
145	1.38	1.00	0.66	0.34	0.06	-0.19	-0.41	-0.60	-0.75	-0.88	-0.97
150	1.51	1.12	0.76	0.43	0.14	-0.13	-0.36	-0.56	-0.73	-0.86	-0.97
155	1.62	1.22	0.85	0.52	0.21	-0.06	-0.31	-0.52	-0.70	-0.84	-0.96
160	1.73	1.32	0.94	0.60	0.28	0.00	-0.26	-0.48	-0.67	-0.82	-0.95
165	1.83	1.41	1.02	0.67	0.34	0.05	-0.21	-0.43	-0.63	-0.79	-0.93
170	1.91	1.48	1.09	0.73	0.40	0.11	-0.16	-0.39	-0.59	-0.76	-0.90
175	1.97	1.55	1.15	0.79	0.46	0.16	-0.11	-0.35	-0.55	-0.73	-0.87
180	2.02	1.60	1.20	0.84	0.50	0.20	-0.07	-0.30	-0.51	-0.68	-0.83
185	2.06	1.63	1.24	0.87	0.54	0.24	-0.02	-0.26	-0.46	-0.64	-0.78
190	2.07	1.65	1.26	0.90	0.57	0.28	0.02	-0.22	-0.42	-0.58	-0.72
195	2.06	1.65	1.26	0.91	0.59	0.31	0.05	-0.17	-0.37	-0.53	-0.66
200	2.03	1.63	1.25	0.91	0.61	0.33	0.08	-0.13	-0.31	-0.46	-0.58
205	1.98	1.59	1.23	0.90	0.61	0.35	0.11	-0.08	-0.25	-0.39	-0.49
210	1.90	1.53	1.19	0.88	0.61	0.36	0.15	-0.03	-0.18	-0.30	-0.39
215	1.81	1.46	1.14	0.85	0.60	0.38	0.18	0.02	-0.10	-0.20	-0.26
220	1.70	1.38	1.08	0.82	0.59	0.39	0.22	0.09	-0.02	-0.09	-0.13
225	1.58	1.28	1.01	0.78	0.57	0.40	0.26	0.15	0.07	0.03	0.02
230	1.45	1.18	0.94	0.73	0.56	0.41	0.30	0.22	0.17	0.16	0.17
235	1.30	1.06	0.85	0.68	0.53	0.42	0.34	0.29	0.27	0.29	0.33
240	1.15	0.94	0.77	0.62	0.51	0.43	0.38	0.36	0.37	0.42	0.50
245	1.00	0.82	0.68	0.56	0.48	0.43	0.42	0.43	0.48	0.56	0.67
250	0.84	0.69	0.58	0.50	0.46	0.44	0.46	0.50	0.58	0.69	0.83
255	0.67	0.57	0.49	0.44	0.43	0.44	0.49	0.57	0.68	0.83	1.00
260	0.51	0.44	0.39	0.38	0.39	0.44	0.52	0.64	0.78	0.96	1.16
265	0.36	0.31	0.30	0.31	0.36	0.44	0.56	0.70	0.88	1.08	1.32
270	0.21	0.19	0.21	0.25	0.33	0.44	0.58	0.76	0.96	1.20	1.47
275	0.06	0.07	0.12	0.19	0.30	0.44	0.61	0.81	1.04	1.31	1.61
280	-0.08	-0.04	0.03	0.13	0.27	0.43	0.63	0.86	1.12	1.41	1.73
285	-0.20	-0.14	-0.04	0.08	0.24	0.43	0.65	0.90	1.18	1.50	1.84
290	-0.31	-0.23	-0.11	0.03	0.21	0.42	0.66	0.93	1.23	1.57	1.94
295	-0.41	-0.31	-0.18	-0.01	0.18	0.41	0.66	0.95	1.27	1.63	2.01
300	-0.48	-0.37	-0.23	-0.05	0.16	0.39	0.67	0.97	1.30	1.67	2.07
305	-0.55	-0.43	-0.27	-0.09	0.13	0.38	0.66	0.97	1.31	1.69	2.09
310	-0.60	-0.47	-0.32	-0.12	0.10	0.35	0.64	0.96	1.31	1.69	2.10
315	-0.65	-0.52	-0.36	-0.16	0.06	0.32	0.61	0.93	1.28	1.67	2.08
320	-0.69	-0.55	-0.39	-0.20	0.03	0.29	0.58	0.90	1.25	1.63	2.05
325	-0.72	-0.59	-0.43	-0.23	-0.01	0.24	0.53	0.85	1.20	1.58	2.00
330	-0.74	-0.61	-0.46	-0.27	-0.05	0.20	0.48	0.79	1.14	1.52	1.92
335	-0.75	-0.64	-0.49	-0.31	-0.10	0.15	0.42	0.73	1.07	1.44	1.84
340	-0.76	-0.65	-0.51	-0.34	-0.14	0.10	0.36	0.66	0.99	1.35	1.74
345	-0.76	-0.67	-0.54	-0.38	-0.18	0.04	0.30	0.58	0.90	1.25	1.64
350	-0.76	-0.68	-0.56	-0.41	-0.23	-0.02	0.23	0.50	0.81	1.15	1.52
355	-0.75	-0.68	-0.58	-0.44	-0.27	-0.08	0.16	0.42	0.71	1.04	1.39
360	-0.74	-0.68	-0.59	-0.47	-0.32	-0.13	0.08	0.33	0.61	0.92	1.27
365	-0.72	-0.68	-0.61	-0.50	-0.36	-0.19	0.01	0.24	0.51	0.80	1.13
370	-0.70	-0.68	-0.62	-0.52	-0.40	-0.25	-0.06	0.16	0.40	0.69	1.00
375	-0.68	-0.67	-0.62	-0.55	-0.44	-0.30	-0.13	0.07	0.30	0.57	0.86
380	-0.65	-0.66	-0.63	-0.57	-0.48	-0.36	-0.20	-0.02	0.20	0.45	0.73
385	-0.62	-0.64	-0.63	-0.59	-0.51	-0.40	-0.27	-0.10	0.11	0.34	0.60
390	-0.59	-0.63	-0.63	-0.60	-0.54	-0.45	-0.33	-0.17	0.01	0.23	0.48
395	-0.56	-0.61	-0.63	-0.61	-0.57	-0.49	-0.38	-0.24	-0.07	0.13	0.37
400	-0.52	-0.59	-0.62	-0.62	-0.59	-0.53	-0.43	-0.31	-0.15	0.04	0.26
405	-0.49	-0.57	-0.61	-0.63	-0.61	-0.56	-0.48	-0.36	-0.22	-0.04	0.17
410	-0.46	-0.55	-0.60	-0.63	-0.62	-0.59	-0.52	-0.42	-0.28	-0.12	0.08
415	-0.43	-0.53	-0.60	-0.63	-0.64	-0.61	-0.55	-0.46	-0.34	-0.19	-0.01
420	-0.39	-0.51	-0.59	-0.63	-0.65	-0.63	-0.59	-0.51	-0.40	-0.26	-0.08
425	-0.36	-0.49	-0.58	-0.63	-0.66	-0.66	-0.62	-0.55	-0.45	-0.32	-0.16
430	-0.33	-0.47	-0.57	-0.63	-0.67	-0.67	-0.65	-0.59	-0.50	-0.38	-0.22

435	-0.31	-0.45	-0.55	-0.63	-0.68	-0.69	-0.67	-0.62	-0.54	-0.43	-0.28
440	-0.28	-0.43	-0.54	-0.63	-0.68	-0.70	-0.70	-0.65	-0.58	-0.48	-0.34
445	-0.25	-0.40	-0.53	-0.62	-0.69	-0.72	-0.72	-0.68	-0.62	-0.52	-0.39
450	-0.22	-0.38	-0.52	-0.62	-0.69	-0.73	-0.73	-0.71	-0.65	-0.56	-0.44
455	-0.19	-0.36	-0.50	-0.61	-0.69	-0.74	-0.75	-0.73	-0.68	-0.60	-0.49
460	-0.16	-0.34	-0.49	-0.61	-0.69	-0.74	-0.76	-0.75	-0.71	-0.64	-0.53
465	-0.13	-0.32	-0.47	-0.60	-0.69	-0.75	-0.78	-0.77	-0.74	-0.67	-0.57
470	-0.11	-0.30	-0.46	-0.59	-0.69	-0.75	-0.79	-0.79	-0.76	-0.70	-0.61
475	-0.08	-0.28	-0.44	-0.58	-0.68	-0.76	-0.80	-0.80	-0.78	-0.73	-0.64
480	-0.05	-0.25	-0.43	-0.57	-0.68	-0.76	-0.80	-0.82	-0.80	-0.75	-0.67
485	-0.02	-0.23	-0.41	-0.56	-0.67	-0.76	-0.81	-0.83	-0.82	-0.78	-0.71
490	0.01	-0.21	-0.39	-0.54	-0.67	-0.76	-0.82	-0.84	-0.84	-0.80	-0.74
495	0.04	-0.18	-0.37	-0.53	-0.66	-0.76	-0.82	-0.86	-0.86	-0.83	-0.77
500	0.08	-0.15	-0.35	-0.52	-0.65	-0.76	-0.83	-0.87	-0.87	-0.85	-0.80

MEMBER NO. 4

	.0	.1	.2	.3	.4	.5	.6	.7	.8	.9	1.0	A.F.
100	-0.31	-0.28	-0.26	-0.23	-0.21	-0.18	-0.16	-0.13	-0.11	-0.08	-0.06	-0.23
105	-0.29	-0.26	-0.24	-0.21	-0.19	-0.16	-0.14	-0.11	-0.09	-0.06	-0.04	-0.19
110	-0.26	-0.24	-0.21	-0.19	-0.16	-0.14	-0.11	-0.09	-0.06	-0.04	-0.01	-0.16
115	-0.24	-0.21	-0.19	-0.16	-0.14	-0.11	-0.09	-0.06	-0.04	-0.01	0.01	-0.13
120	-0.22	-0.19	-0.17	-0.14	-0.12	-0.09	-0.07	-0.04	-0.02	0.01	0.03	-0.10
125	-0.19	-0.17	-0.14	-0.12	-0.09	-0.07	-0.04	-0.02	0.01	0.03	0.06	-0.08
130	-0.17	-0.14	-0.12	-0.09	-0.07	-0.04	-0.02	0.01	0.03	0.06	0.08	-0.05
135	-0.14	-0.12	-0.09	-0.07	-0.04	-0.02	0.01	0.03	0.06	0.08	0.11	-0.03
140	-0.12	-0.09	-0.07	-0.04	-0.02	0.01	0.03	0.06	0.08	0.11	0.13	-0.01
145	-0.09	-0.07	-0.04	-0.02	0.01	0.03	0.06	0.08	0.11	0.13	0.16	0.01
150	-0.07	-0.05	-0.02	0.00	0.03	0.05	0.08	0.10	0.13	0.15	0.18	0.03
155	-0.05	-0.02	0.00	0.03	0.05	0.08	0.10	0.13	0.15	0.18	0.20	0.05
160	-0.03	0.00	0.02	0.05	0.07	0.10	0.12	0.15	0.17	0.20	0.22	0.06
165	-0.01	0.02	0.04	0.07	0.09	0.12	0.14	0.17	0.19	0.22	0.24	0.08
170	0.01	0.04	0.06	0.09	0.11	0.14	0.16	0.19	0.21	0.24	0.26	0.09
175	0.03	0.05	0.08	0.10	0.13	0.15	0.18	0.20	0.23	0.25	0.28	0.10
180	0.05	0.07	0.10	0.12	0.15	0.17	0.20	0.22	0.25	0.27	0.30	0.11
185	0.06	0.08	0.11	0.13	0.16	0.18	0.21	0.23	0.26	0.28	0.31	0.11
190	0.07	0.10	0.12	0.15	0.17	0.20	0.22	0.25	0.27	0.30	0.32	0.12
195	0.08	0.11	0.13	0.16	0.18	0.21	0.23	0.26	0.28	0.31	0.33	0.12
200	0.09	0.11	0.14	0.16	0.19	0.21	0.24	0.26	0.29	0.31	0.34	0.13
205	0.09	0.12	0.14	0.17	0.19	0.22	0.24	0.27	0.29	0.32	0.34	0.13
210	0.09	0.12	0.14	0.17	0.19	0.22	0.24	0.27	0.29	0.32	0.34	0.13
215	0.09	0.12	0.14	0.17	0.19	0.22	0.24	0.27	0.29	0.32	0.34	0.13
220	0.09	0.12	0.14	0.17	0.19	0.22	0.24	0.27	0.29	0.32	0.34	0.13
225	0.09	0.11	0.14	0.16	0.19	0.21	0.24	0.26	0.29	0.31	0.34	0.13
230	0.08	0.11	0.13	0.16	0.18	0.21	0.23	0.26	0.28	0.31	0.33	0.13
235	0.08	0.10	0.13	0.15	0.18	0.20	0.23	0.25	0.28	0.30	0.33	0.13
240	0.07	0.10	0.12	0.15	0.17	0.20	0.22	0.25	0.27	0.30	0.32	0.13
245	0.06	0.09	0.11	0.14	0.16	0.19	0.21	0.24	0.26	0.29	0.31	0.13
250	0.05	0.08	0.10	0.13	0.15	0.18	0.20	0.23	0.25	0.28	0.30	0.13
255	0.04	0.07	0.09	0.12	0.14	0.17	0.19	0.22	0.24	0.27	0.29	0.12
260	0.03	0.06	0.08	0.11	0.13	0.16	0.18	0.21	0.23	0.26	0.28	0.12
265	0.02	0.05	0.07	0.10	0.12	0.15	0.17	0.20	0.22	0.25	0.27	0.12
270	0.01	0.04	0.06	0.09	0.11	0.14	0.16	0.19	0.21	0.24	0.26	0.12
275	0.00	0.03	0.05	0.08	0.10	0.13	0.15	0.18	0.20	0.23	0.25	0.11
280	-0.01	0.01	0.04	0.06	0.09	0.11	0.14	0.16	0.19	0.21	0.24	0.11
285	-0.02	0.00	0.03	0.05	0.08	0.10	0.13	0.15	0.18	0.20	0.23	0.10
290	-0.03	-0.01	0.02	0.04	0.07	0.09	0.12	0.14	0.17	0.19	0.22	0.10
295	-0.04	-0.02	0.01	0.03	0.06	0.08	0.11	0.13	0.16	0.18	0.21	0.09
300	-0.05	-0.03	0.00	0.02	0.05	0.07	0.10	0.12	0.15	0.17	0.20	0.09
305	-0.06	-0.04	-0.01	0.01	0.04	0.06	0.09	0.11	0.14	0.16	0.19	0.08
310	-0.07	-0.05	-0.02	0.00	0.03	0.05	0.08	0.10	0.13	0.15	0.18	0.07
315	-0.08	-0.05	-0.03	0.00	0.02	0.05	0.07	0.10	0.12	0.15	0.17	0.07
320	-0.09	-0.06	-0.04	-0.01	0.01	0.04	0.06	0.09	0.11	0.14	0.16	0.06
325	-0.10	-0.07	-0.05	-0.02	0.00	0.03	0.05	0.08	0.10	0.13	0.15	0.06
330	-0.10	-0.08	-0.05	-0.03	0.00	0.02	0.05	0.07	0.10	0.12	0.15	0.05
335	-0.11	-0.08	-0.06	-0.03	-0.01	0.02	0.04	0.07	0.09	0.12	0.14	0.04
340	-0.12	-0.09	-0.07	-0.04	-0.02	0.01	0.03	0.06	0.08	0.11	0.13	0.04
345	-0.12	-0.10	-0.07	-0.05	-0.02	0.00	0.03	0.05	0.08	0.10	0.13	0.03
350	-0.13	-0.10	-0.08	-0.05	-0.03	0.00	0.02	0.05	0.07	0.10	0.12	0.02
355	-0.13	-0.11	-0.08	-0.06	-0.03	-0.01	0.02	0.04	0.07	0.09	0.12	0.01
360	-0.14	-0.11	-0.09	-0.06	-0.04	-0.01	0.01	0.04	0.06	0.09	0.11	0.01
365	-0.14	-0.12	-0.09	-0.07	-0.04	-0.02	0.01	0.03	0.06	0.08	0.11	0.00
370	-0.15	-0.13	-0.10	-0.08	-0.05	-0.03	0.00	0.02	0.05	0.07	0.10	-0.01
375	-0.16	-0.13	-0.11	-0.08	-0.06	-0.03	-0.01	0.02	0.04	0.07	0.09	-0.02
380	-0.16	-0.14	-0.11	-0.09	-0.06	-0.04	-0.01	0.01	0.04	0.06	0.09	-0.02
385	-0.17	-0.14	-0.12	-0.09	-0.07	-0.04	-0.02	0.01	0.03	0.06	0.08	-0.03
390	-0.17	-0.15	-0.12	-0.10	-0.07	-0.05	-0.02	0.00	0.03	0.05	0.08	-0.04
395	-0.18	-0.15	-0.13	-0.10	-0.08	-0.05	-0.03	0.00	0.02	0.05	0.07	-0.05
400	-0.18	-0.16	-0.13	-0.11	-0.08	-0.06	-0.03	-0.01	0.02	0.04	0.07	-0.06

205	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	-0.13
210	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	-0.15
215	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	-0.18
220	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	-0.21
225	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	-0.25
230	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	-0.28
235	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	-0.32
240	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	-0.36
245	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	-0.39
250	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	-0.43
255	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	-0.47
260	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	-0.50
265	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	-0.53
270	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	-0.56
275	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	-0.59
280	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	-0.61
285	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	-0.63
290	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	-0.64
295	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	-0.65
300	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.65
305	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.65
310	-0.04	-0.04	-0.04	-0.04	-0.04	-0.04	-0.04	-0.04	-0.04	-0.04	-0.04	-0.64
315	-0.06	-0.06	-0.06	-0.06	-0.06	-0.06	-0.06	-0.06	-0.06	-0.06	-0.06	-0.63
320	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.61
325	-0.09	-0.09	-0.09	-0.09	-0.09	-0.09	-0.09	-0.09	-0.09	-0.09	-0.09	-0.59
330	-0.10	-0.10	-0.10	-0.10	-0.10	-0.10	-0.10	-0.10	-0.10	-0.10	-0.10	-0.56
335	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.53
340	-0.12	-0.12	-0.12	-0.12	-0.12	-0.12	-0.12	-0.12	-0.12	-0.12	-0.12	-0.50
345	-0.13	-0.13	-0.13	-0.13	-0.13	-0.13	-0.13	-0.13	-0.13	-0.13	-0.13	-0.47
350	-0.14	-0.14	-0.14	-0.14	-0.14	-0.14	-0.14	-0.14	-0.14	-0.14	-0.14	-0.43
355	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.39
360	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.36
365	-0.16	-0.16	-0.16	-0.16	-0.16	-0.16	-0.16	-0.16	-0.16	-0.16	-0.16	-0.32
370	-0.16	-0.16	-0.16	-0.16	-0.16	-0.16	-0.16	-0.16	-0.16	-0.16	-0.16	-0.28
375	-0.16	-0.16	-0.16	-0.16	-0.16	-0.16	-0.16	-0.16	-0.16	-0.16	-0.16	-0.25
380	-0.16	-0.16	-0.16	-0.16	-0.16	-0.16	-0.16	-0.16	-0.16	-0.16	-0.16	-0.21
385	-0.16	-0.16	-0.16	-0.16	-0.16	-0.16	-0.16	-0.16	-0.16	-0.16	-0.16	-0.18
390	-0.16	-0.16	-0.16	-0.16	-0.16	-0.16	-0.16	-0.16	-0.16	-0.16	-0.16	-0.15
395	-0.16	-0.16	-0.16	-0.16	-0.16	-0.16	-0.16	-0.16	-0.16	-0.16	-0.16	-0.13
400	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.11
405	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.09
410	-0.14	-0.14	-0.14	-0.14	-0.14	-0.14	-0.14	-0.14	-0.14	-0.14	-0.14	-0.07
415	-0.14	-0.14	-0.14	-0.14	-0.14	-0.14	-0.14	-0.14	-0.14	-0.14	-0.14	-0.06
420	-0.13	-0.13	-0.13	-0.13	-0.13	-0.13	-0.13	-0.13	-0.13	-0.13	-0.13	-0.05
425	-0.12	-0.12	-0.12	-0.12	-0.12	-0.12	-0.12	-0.12	-0.12	-0.12	-0.12	-0.04
430	-0.12	-0.12	-0.12	-0.12	-0.12	-0.12	-0.12	-0.12	-0.12	-0.12	-0.12	-0.04
435	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.03
440	-0.10	-0.10	-0.10	-0.10	-0.10	-0.10	-0.10	-0.10	-0.10	-0.10	-0.10	-0.03
445	-0.10	-0.10	-0.10	-0.10	-0.10	-0.10	-0.10	-0.10	-0.10	-0.10	-0.10	-0.03
450	-0.09	-0.09	-0.09	-0.09	-0.09	-0.09	-0.09	-0.09	-0.09	-0.09	-0.09	-0.04
455	-0.08	-0.08	-0.08	-0.08	-0.08	-0.08	-0.08	-0.08	-0.08	-0.08	-0.08	-0.04
460	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.05
465	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.05
470	-0.06	-0.06	-0.06	-0.06	-0.06	-0.06	-0.06	-0.06	-0.06	-0.06	-0.06	-0.06
475	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.07
480	-0.04	-0.04	-0.04	-0.04	-0.04	-0.04	-0.04	-0.04	-0.04	-0.04	-0.04	-0.08
485	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.09
490	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.09
495	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.10
500	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.11

***** MEMBER NO. 7 *****

	.0	.1	.2	.3	.4	.5	.6	.7	.8	.9	1.0	A.F.
100	-0.19	-0.17	-0.14	-0.12	-0.09	-0.07	-0.04	-0.02	0.01	0.03	0.06	-0.43

105	-0.21	-0.18	-0.16	-0.13	-0.11	-0.08	-0.06	-0.03	-0.01	0.02	0.04	-0.40
110	-0.22	-0.20	-0.17	-0.15	-0.12	-0.10	-0.07	-0.05	-0.02	0.00	0.03	-0.37
115	-0.24	-0.21	-0.19	-0.16	-0.14	-0.11	-0.09	-0.06	-0.04	-0.01	0.01	-0.34
120	-0.25	-0.22	-0.20	-0.17	-0.15	-0.12	-0.10	-0.07	-0.05	-0.02	0.00	-0.31
125	-0.26	-0.24	-0.21	-0.19	-0.16	-0.14	-0.11	-0.09	-0.06	-0.04	-0.01	-0.28
130	-0.28	-0.25	-0.23	-0.20	-0.18	-0.15	-0.13	-0.10	-0.08	-0.05	-0.03	-0.25
135	-0.29	-0.26	-0.24	-0.21	-0.19	-0.16	-0.14	-0.11	-0.09	-0.06	-0.04	-0.22
140	-0.30	-0.27	-0.25	-0.22	-0.20	-0.17	-0.15	-0.12	-0.10	-0.07	-0.05	-0.19
145	-0.31	-0.29	-0.26	-0.24	-0.21	-0.19	-0.16	-0.14	-0.11	-0.09	-0.06	-0.16
150	-0.32	-0.30	-0.27	-0.25	-0.22	-0.20	-0.17	-0.15	-0.12	-0.10	-0.07	-0.13
155	-0.33	-0.30	-0.28	-0.25	-0.23	-0.20	-0.18	-0.15	-0.13	-0.10	-0.08	-0.11
160	-0.34	-0.31	-0.29	-0.26	-0.24	-0.21	-0.19	-0.16	-0.14	-0.11	-0.09	-0.08
165	-0.34	-0.32	-0.29	-0.27	-0.24	-0.22	-0.19	-0.17	-0.14	-0.12	-0.09	-0.05
170	-0.35	-0.32	-0.30	-0.27	-0.25	-0.22	-0.20	-0.17	-0.15	-0.12	-0.10	-0.03
175	-0.35	-0.32	-0.30	-0.27	-0.25	-0.22	-0.20	-0.17	-0.15	-0.12	-0.10	0.00
180	-0.35	-0.33	-0.30	-0.28	-0.25	-0.23	-0.20	-0.18	-0.15	-0.13	-0.10	0.02
185	-0.35	-0.32	-0.30	-0.27	-0.25	-0.22	-0.20	-0.17	-0.15	-0.12	-0.10	0.05
190	-0.35	-0.32	-0.30	-0.27	-0.25	-0.22	-0.20	-0.17	-0.15	-0.12	-0.10	0.07
195	-0.34	-0.31	-0.29	-0.26	-0.24	-0.21	-0.19	-0.16	-0.14	-0.11	-0.09	0.10
200	-0.33	-0.31	-0.28	-0.26	-0.23	-0.21	-0.18	-0.16	-0.13	-0.11	-0.08	0.12
205	-0.32	-0.29	-0.27	-0.24	-0.22	-0.19	-0.17	-0.14	-0.12	-0.09	-0.07	0.14
210	-0.31	-0.28	-0.26	-0.23	-0.21	-0.18	-0.16	-0.13	-0.11	-0.08	-0.06	0.16
215	-0.29	-0.26	-0.24	-0.21	-0.19	-0.16	-0.14	-0.11	-0.09	-0.06	-0.04	0.18
220	-0.27	-0.24	-0.22	-0.19	-0.17	-0.14	-0.12	-0.09	-0.07	-0.04	-0.02	0.20
225	-0.25	-0.22	-0.20	-0.17	-0.15	-0.12	-0.10	-0.07	-0.05	-0.02	0.00	0.22
230	-0.23	-0.20	-0.18	-0.15	-0.13	-0.10	-0.08	-0.05	-0.03	0.00	0.02	0.23
235	-0.20	-0.18	-0.15	-0.13	-0.10	-0.08	-0.05	-0.03	0.00	0.02	0.05	0.24
240	-0.18	-0.15	-0.13	-0.10	-0.08	-0.05	-0.03	0.00	0.02	0.05	0.07	0.26
245	-0.15	-0.13	-0.10	-0.08	-0.05	-0.03	0.00	0.02	0.05	0.07	0.10	0.26
250	-0.13	-0.10	-0.08	-0.05	-0.03	0.00	0.02	0.05	0.07	0.10	0.12	0.27
255	-0.10	-0.07	-0.05	-0.02	0.00	0.03	0.05	0.08	0.10	0.13	0.15	0.28
260	-0.07	-0.05	-0.02	0.00	0.03	0.05	0.08	0.10	0.13	0.15	0.18	0.28
265	-0.05	-0.02	0.00	0.03	0.05	0.08	0.10	0.13	0.15	0.18	0.20	0.28
270	-0.03	0.00	0.02	0.05	0.07	0.10	0.12	0.15	0.17	0.20	0.22	0.29
275	0.00	0.02	0.05	0.07	0.10	0.12	0.15	0.17	0.20	0.22	0.25	0.28
280	0.02	0.04	0.07	0.09	0.12	0.14	0.17	0.19	0.22	0.24	0.27	0.28
285	0.04	0.06	0.09	0.11	0.14	0.16	0.19	0.21	0.24	0.26	0.29	0.28
290	0.05	0.08	0.10	0.13	0.15	0.18	0.20	0.23	0.25	0.28	0.30	0.27
295	0.07	0.09	0.12	0.14	0.17	0.19	0.22	0.24	0.27	0.29	0.32	0.26
300	0.08	0.10	0.13	0.15	0.18	0.20	0.23	0.25	0.28	0.30	0.33	0.25
305	0.08	0.11	0.13	0.16	0.18	0.21	0.23	0.26	0.28	0.31	0.33	0.24
310	0.09	0.11	0.14	0.16	0.19	0.21	0.24	0.26	0.29	0.31	0.34	0.23
315	0.09	0.12	0.14	0.17	0.19	0.22	0.24	0.27	0.29	0.32	0.34	0.22
320	0.09	0.12	0.14	0.17	0.19	0.22	0.24	0.27	0.29	0.32	0.34	0.21
325	0.09	0.11	0.14	0.16	0.19	0.21	0.24	0.26	0.29	0.31	0.34	0.20
330	0.09	0.11	0.14	0.16	0.19	0.21	0.24	0.26	0.29	0.31	0.34	0.18
335	0.08	0.10	0.13	0.15	0.18	0.20	0.23	0.25	0.28	0.30	0.33	0.17
340	0.07	0.10	0.12	0.15	0.17	0.20	0.22	0.25	0.27	0.30	0.32	0.16
345	0.06	0.09	0.11	0.14	0.16	0.19	0.21	0.24	0.26	0.29	0.31	0.14
350	0.05	0.08	0.10	0.13	0.15	0.18	0.20	0.23	0.25	0.28	0.30	0.13
355	0.04	0.07	0.09	0.12	0.14	0.17	0.19	0.22	0.24	0.27	0.29	0.12
360	0.03	0.06	0.08	0.11	0.13	0.16	0.18	0.21	0.23	0.26	0.28	0.10
365	0.02	0.05	0.07	0.10	0.12	0.15	0.17	0.20	0.22	0.25	0.27	0.09
370	0.01	0.03	0.06	0.08	0.11	0.13	0.16	0.18	0.21	0.23	0.26	0.07
375	0.00	0.02	0.05	0.07	0.10	0.12	0.15	0.17	0.20	0.22	0.25	0.05
380	-0.02	0.01	0.03	0.06	0.08	0.11	0.13	0.16	0.18	0.21	0.23	0.04
385	-0.03	0.00	0.02	0.05	0.07	0.10	0.12	0.15	0.17	0.20	0.22	0.02
390	-0.04	-0.02	0.01	0.03	0.06	0.08	0.11	0.13	0.16	0.18	0.21	0.00
395	-0.05	-0.03	0.00	0.02	0.05	0.07	0.10	0.12	0.15	0.17	0.20	-0.01
400	-0.06	-0.04	-0.01	0.01	0.04	0.06	0.09	0.11	0.14	0.16	0.19	-0.03
405	-0.07	-0.05	-0.02	0.00	0.03	0.05	0.08	0.10	0.13	0.15	0.18	-0.05
410	-0.08	-0.06	-0.03	-0.01	0.02	0.04	0.07	0.09	0.12	0.14	0.17	-0.07
415	-0.09	-0.07	-0.04	-0.02	0.01	0.03	0.06	0.08	0.11	0.13	0.16	-0.09
420	-0.10	-0.08	-0.05	-0.03	0.00	0.02	0.05	0.07	0.10	0.12	0.15	-0.11
425	-0.11	-0.08	-0.06	-0.03	-0.01	0.02	0.04	0.07	0.09	0.12	0.14	-0.13
430	-0.12	-0.09	-0.07	-0.04	-0.02	0.01	0.03	0.06	0.08	0.11	0.13	-0.15

435	-0.12	-0.10	-0.07	-0.05	-0.02	0.00	0.03	0.05	0.08	0.10	0.13	-0.17
440	-0.13	-0.11	-0.08	-0.06	-0.03	-0.01	0.02	0.04	0.07	0.09	0.12	-0.19
445	-0.14	-0.11	-0.09	-0.06	-0.04	-0.01	0.01	0.04	0.06	0.09	0.11	-0.20
450	-0.14	-0.12	-0.09	-0.07	-0.04	-0.02	0.01	0.03	0.06	0.08	0.11	-0.22
455	-0.15	-0.12	-0.10	-0.07	-0.05	-0.02	0.00	0.03	0.05	0.08	0.10	-0.24
460	-0.15	-0.13	-0.10	-0.08	-0.05	-0.03	0.00	0.02	0.05	0.07	0.10	-0.26
465	-0.16	-0.13	-0.11	-0.08	-0.06	-0.03	-0.01	0.02	0.04	0.07	0.09	-0.28
470	-0.16	-0.14	-0.11	-0.09	-0.06	-0.04	-0.01	0.01	0.04	0.06	0.09	-0.30
475	-0.17	-0.14	-0.12	-0.09	-0.07	-0.04	-0.02	0.01	0.03	0.06	0.08	-0.32
480	-0.17	-0.15	-0.12	-0.10	-0.07	-0.05	-0.02	0.00	0.03	0.05	0.08	-0.34
485	-0.18	-0.15	-0.13	-0.10	-0.08	-0.05	-0.03	0.00	0.02	0.05	0.07	-0.37
490	-0.18	-0.16	-0.13	-0.11	-0.08	-0.06	-0.03	-0.01	0.02	0.04	0.07	-0.39
495	-0.19	-0.16	-0.14	-0.11	-0.09	-0.06	-0.04	-0.01	0.01	0.04	0.06	-0.41
500	-0.19	-0.17	-0.14	-0.12	-0.09	-0.07	-0.04	-0.02	0.01	0.03	0.06	-0.43

15 JUL 98
KSW 14 JULY 98

WINGHAVEN BEARING PRESSURES (MAX FILL) (MIN FILL)
 BRIDGE # A3210012 A3210013 A3210014 A3210015 A3210016 A3210012 A3210013 A3210014 A3210015 A3210016
 1 CELL 1 CELL 4 CELL 5 CELL 2 CELL 1 CELL 1 CELL 4 CELL 5 CELL 2 CELL

CULVERTP 13-JUL-98

LIVE LOAD	TWO HS20 AXLE	64000	64000	64000	64000	64000	64000	64000	64000	64000	64000
	LBS PER SQ FT	57	57	44	31	43	92	92	60	47	96
	LANE LOAD	64	64	64	64	64	64	64	64	64	64

FILL HEIGHT (FT)		5	5	4	6	8	1	1	1	1	1
------------------	--	---	---	---	---	---	---	---	---	---	---

CULVERT DIMENSIONS

NUMBER OF CELLS N =		1	1	4	5	2	1	1	4	5	2
OPENING WIDTH (FT) S =		10	10	12	12	8	10	10	12	12	8
OPENING HEIGHT (FT) H =		7	7	10	12	7	7	7	10	12	7
TOP SLAB THICK (IN) D1 =		11.5	11.5	11.5	11.5	10.5	11.5	11.5	11.5	11.5	10.5
BOTTOM SLAB THICK (IN) D2 =		11	11	12.5	11.5	9.5	11	11	12.5	11.5	9.5
EXTERIOR WALL THICK (IN) T =		8	8	8	8.5	7	8	8	8	8.5	7
INTERIOR WALL THICK (IN) TI =		0	0	8	7	6	0	0	8	7	6
TOTAL WIDTH(IN) C =		136	136	616	765	212	136	136	616	765	212
TOTAL WIDTH(FT) C =		11.333	11.333	51.333	63.750	17.667	11.333	11.333	51.333	63.750	17.667

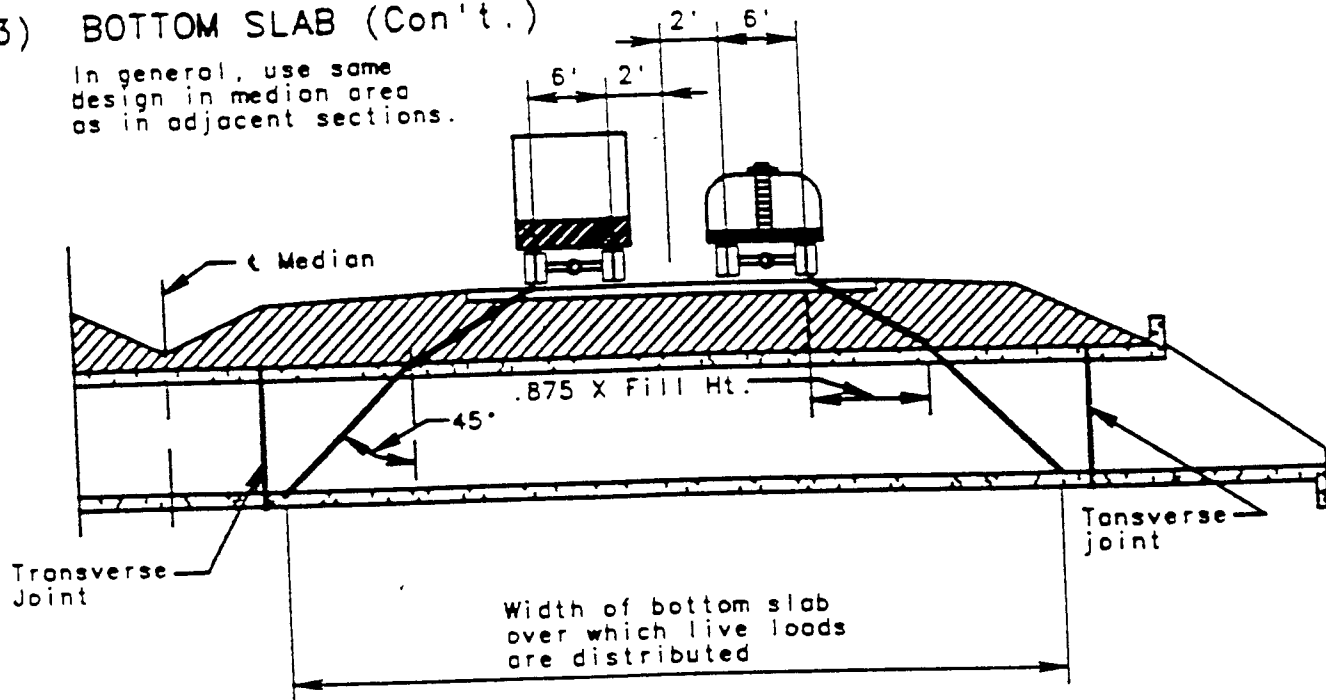
WEIGHT PER FT OF LENGTH

LIVE LOAD		64	64	64 ✓	64 ✓	64 ✓	92 ✓	92	64	64	96
FILL		600	600	480 ✓	720 ✓	960 ✓	120 ✓	120 ✓	120 ✓	120 ✓	120 ✓
CULVERT		405	405	397	393	349 ✓	405 ✓	405	397	393	349
TOTAL	<u>LBS PER SQ FT</u>	1069	1069	941	1177	1373	617 ✓	617	581	577	565

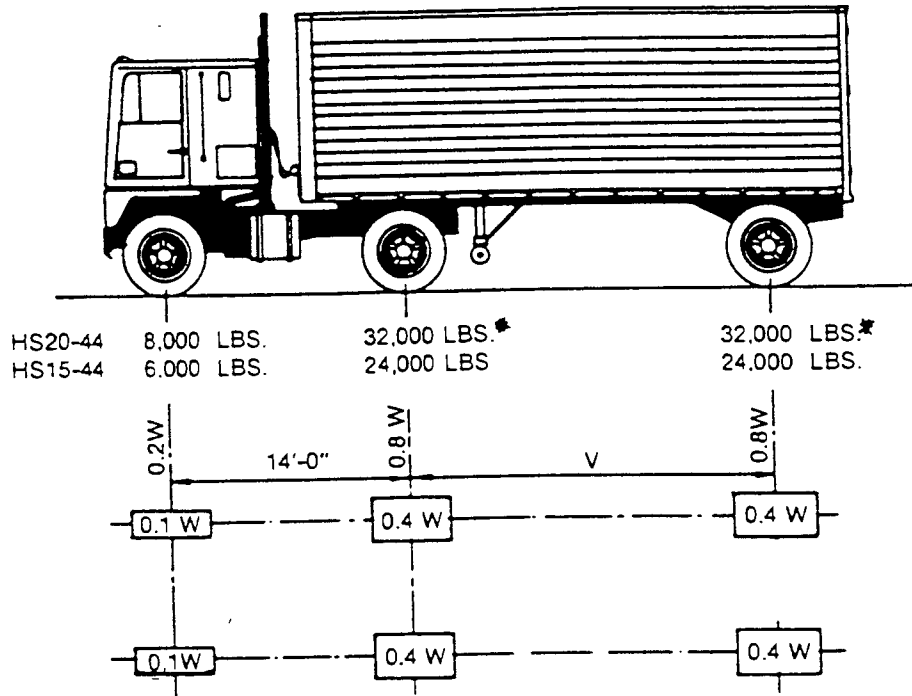
DISTRIBUTION OF LOADS

3) BOTTOM SLAB (Con't.)

In general, use same design in median area as in adjacent sections.



LOADING CONDITION - INTERIOR SECTION OF BOXES WITH TRANSVERSE JOINTS



W = COMBINED WEIGHT ON THE FIRST TWO AXLES WHICH IS THE SAME AS FOR THE CORRESPONDING H. TRUCK.
 V = VARIABLE SPACING — 14 FEET TO 30 FEET INCLUSIVE. SPACING TO BE USED IS THAT WHICH PRODUCES MAXIMUM STRESSES.

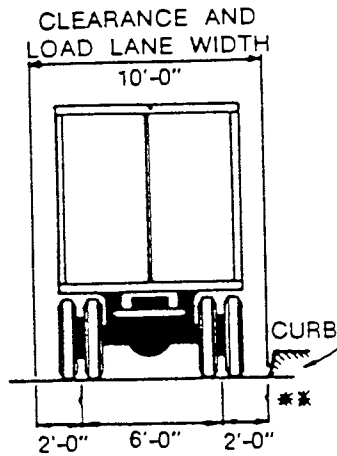
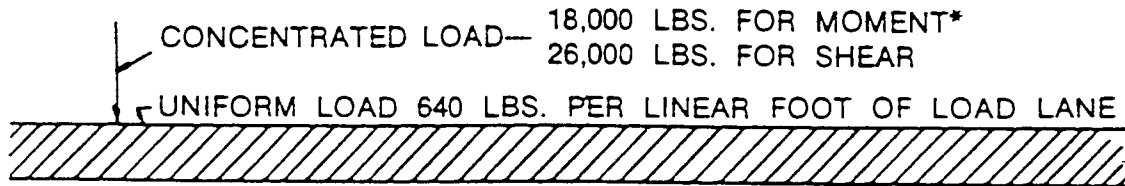


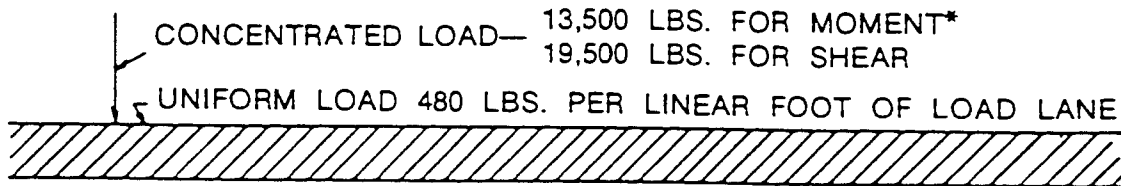
FIGURE 3.7.7A. Standard HS Trucks

*In the design of timber floors and orthotropic steel decks (excluding transverse beams) for H 20 loading, one axle load of 24,000 pounds or two axle loads of 16,000 pounds each, spaced 4 feet apart may be used, whichever produces the greater stress, instead of the 32,000-pound axle shown.

**For slab design, the center line of wheels shall be assumed to be 1 foot from face of curb. (See Article 3.24.2.)



H20-44 LOADING
HS20-44 LOADING



H15-44 LOADING
HS15-44 LOADING

FIGURE 3.7.6B. Lane Loading

*For the loading of continuous spans involving lane loading refer to Article 3.11.3 which provides for an additional concentrated load.

L = length in feet of the portion of the span that is loaded to produce the maximum stress in the member.

3.8.2.2 For uniformity of application, in this formula, the loaded length, L, shall be as follows:

- (a) For roadway floors: the design span length.
- (b) For transverse members, such as floor beams: the span length of member center to center of supports.
- (c) For computing truck load moments: the span length, or for cantilever arms the length from the moment center to the farthest axle.
- (d) For shear due to truck loads: the length of the loaded portion of span from the point under consideration to the far reaction; except, for cantilever arms, use a 30 percent impact factor.
- (e) For continuous spans: the length of span under consideration for positive moment, and the average of two adjacent loaded spans for negative moment.

3.8.2.3 For culverts with cover

0'-0" to 1'-0" inc. I = 30%
1'-1" to 2'-0" inc. I = 20%
2'-1" to 2'-11" inc. I = 10%

3.9 LONGITUDINAL FORCES

Provision shall be made for the effect of a longitudinal force of 5 percent of the live load in all lanes carrying traffic headed in the same direction. All lanes shall be loaded for bridges likely to become one directional in the future. The load used, without impact, shall be the lane load plus the concentrated load for moment specified in Article 3.7, with reduction for multiple-loaded lanes as specified in Article 3.12. The center of gravity of the longitudinal force shall be assumed to be located 6 feet above the floor slab and to be transmitted to the substructure through the superstructure.

WYOMING DEPARTMENT OF TRANSPORTATION
Program for the Design of Reinforced
Concrete Box Culverts

BRASS - CULVERT

Version 1

User Manual
January, 1995

BRASS-CULVERT	COMMAND DESCRIPTION										
COMMAND NAME	STDLOD										
PURPOSE	STDLOD defines the standard truck loads to be used.										
5 COMMAND PARAMETERS											
2 Truck Code (1-8)	<p>Enter the code for the desired truck load to be applied. The codes are:</p> <table border="0"> <tr> <td>1) HS 25</td> <td>6) HS 10</td> </tr> <tr> <td>2) HS 20</td> <td>7) H 10</td> </tr> <tr> <td>3) H 20</td> <td>8) Special Live Load Only</td> </tr> <tr> <td>4) HS 15</td> <td>9) No Live Load</td> </tr> <tr> <td>5) H 15</td> <td></td> </tr> </table> <p>Special live loads are defined with the SPLLOD command.</p>	1) HS 25	6) HS 10	2) HS 20	7) H 10	3) H 20	8) Special Live Load Only	4) HS 15	9) No Live Load	5) H 15	
1) HS 25	6) HS 10										
2) HS 20	7) H 10										
3) H 20	8) Special Live Load Only										
4) HS 15	9) No Live Load										
5) H 15											
1 Check Military Load (0,1)	<p>When HS 25 or HS 20 truck loading is specified, the standard military load in two adjacent lanes will be checked if specified here. Enter 1 to check military load as a separate load case, else enter 0.</p>										
0 Neglect Live Load (0,1)	<p>Live load may be neglected for single culverts if fill depth is more than 8 feet and exceeds barrel span length. For multiple culverts, it may be neglected if fill depth exceeds the distance between end supports or abutments. (See AASHTO 6.4.2.)</p> <p>Enter 1 to neglect live load according to AASHTO 6.4.2.</p> <p>Enter 0 to use live load regardless of fill height.</p>										
0 Stress at Zero Fill (0,1)	<p>Enter 1 for stress check at zero fill (top of top slab) to be performed, else enter 0.</p>										
0 Overload Axle Weight, kip	<p>Enter the axle weight for the overload standard truck, kips.</p>										

EXAMPLE

To define an HS 25 truck load to be applied to the culvert with live load distribution based on AASHTO 6.4.2, no stress check at zero fill or overload truck effects to be calculated, and military load will not be checked as a separate load case, code:

STDLOD 1, 0, 0, 0, 0

FIGURES

NOTES

BRASS-CULVERT		COMMAND DESCRIPTION
COMMAND NAME	SWPRES	
PURPOSE	SWPRES defines soil and water pressure parameters.	
5 COMMAND PARAMETERS		
1 Structure Number (1-10)	Enter the reference number for the culvert to be described by the following data. Culverts must be numbered sequentially beginning with 1, 2, 3 ...etc.	
2 Live Load Surcharge, ft.	Enter the depth of surcharge to be used for calculating the effects of lateral earth pressure. Surcharge load is applied as a uniform load on the exterior walls and is calculated as the depth of surcharge times the maximum or minimum soil pressure as applicable.	
45 Maximum Soil Pressure, pcf	Enter the maximum soil equivalent fluid pressure for lateral earth pressure calculations. Standard maximum is 30 pcf by AASHTO 6.2.1.	
15 Minimum Soil Pressure, pcf	Enter the minimum soil equivalent fluid pressure for lateral earth pressure calculations. A minimum of 15 pcf is used for checking positive moments unless otherwise defined.	
62.4 Water Pressure, pcf	Enter the unit weight of water (62.4 pcf standard). Enter 0 for no water pressure to be considered. When considered, BRASS-CULVERT uses full height of water and no water as two loading cases.	

EXAMPLE

For standard values:

SWPRES 1, 2.0, 30.0, 15.0, 62.4

FIGURES

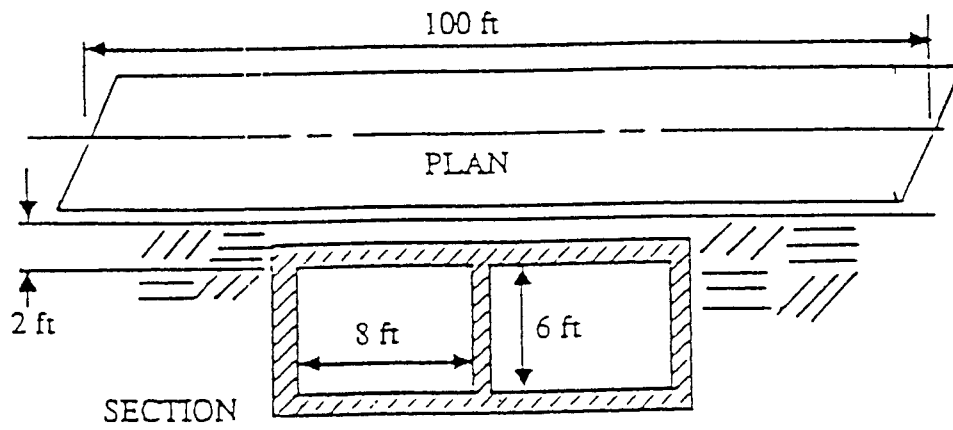
NOTES

BRASS-CULVERT		COMMAND DESCRIPTION
COMMAND NAME	BOXDIM	
PURPOSE	BOXDIM defines the geometry of the box culvert.	
6 COMMAND PARAMETERS		
Structure Number (1-10)	Enter the reference number for the culvert to be described by the following data. Culverts must be numbered sequentially beginning with 1, 2, 3 ...etc.	
1, 1, 2, 4, 5	Number of Barrels (1-4)	Enter the number of barrels for the culvert, four maximum.
10, 10, 8, 12, 12	Clear Span, ft.	Enter the clear span of the barrels, feet. All barrels have the same span.
7, 7, 7, 10, 12	Clear Height, ft.	Enter the clear height of the barrels, feet. All barrels have the same height.
4, 10, 8, 8, 6	Design Fill, ft.	Enter the depth of fill to be used for design. Fill is measured from the bottom of the top slab to the top of fill, feet. Live loads will be applied to the top of this fill.
30, 105, 108, 150, 78	Centerline Length, ft.	Enter the length of the culvert along its centerline, feet.

EXAMPLE

BOXDIM 1, 2, 8, 6, 2, 100

FIGURES



NOTES

BRASS-CULVERT		COMMAND DESCRIPTION
COMMAND NAME	SLBTHK	
PURPOSE	SLBTHK defines the thickness for the top and bottom slabs, and the exterior and interior walls.	
6 COMMAND PARAMETERS		
1	Structure Number (1-10)	Enter the reference number for the culvert to be defined by the following data. Culverts must be numbered sequentially beginning with 1, 2, 3 ...etc.
6	Top Slab Thickness, in.	Enter the thickness for the top slab. Unless this value is specified as fixed value (see below), BRASS-CULVERT uses this value as minimum thickness.
6	Bottom Slab Thickness, in.	Enter the thickness for the bottom slab. Unless this value is specified as fixed value (see below), BRASS-CULVERT uses this value as minimum thickness.
6	Exterior Wall Thickness, in.	Enter the thickness for the exterior wall. Unless this value is specified as fixed value (see below), BRASS-CULVERT uses this value as minimum thickness.
6	Interior Wall Thickness, in.	Enter the thickness for the interior wall. Unless this value is specified as fixed value (see below), BRASS-CULVERT uses this value as minimum thickness.
0000	Fixed Thickness Code (0 - 1111)	BRASS-CULVERT will use the thicknesses defined above as minimum values unless otherwise specified here. Each digit of the code is for the top slab, bottom slab, exterior walls, and interior walls respectively. Enter 1 to fix the thickness, else enter 0. For example to fix the top slab and exterior wall thicknesses only, enter a code of 1010.

EXAMPLE

For a culvert with a fixed slab and wall thickness of 7 inches, code:

SLBTHK 1, 7, 7, 7, 7, 1111

For a culvert with a fixed top slab of 8 inches and fixed exterior walls of 10 inches, bottom slab and interior wall thicknesses are used as minimum values, code:

SLBTHK 1, 8, 8, 10, 10, 1010

For a culvert with no fixed thicknesses and it is desired for the program to set the thicknesses as required, code:

SLBTHK 1, 0, 0, 0, 0, 0000

FIGURES

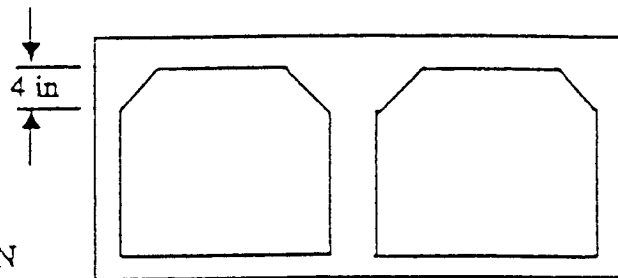
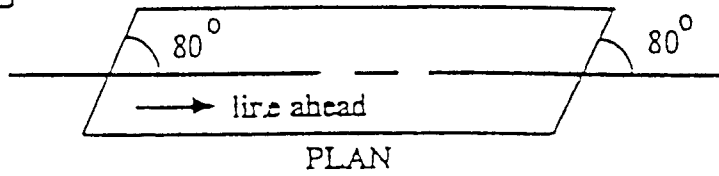
NOTES

BRASS-CULVERT		COMMAND DESCRIPTION
COMMAND NAME	H&SKEW	
PURPOSE	H&SKEW defines haunches and end skews.	
6 COMMAND PARAMETERS		
1 Structure Number (1-10)	Enter the reference number for the culvert to be described by the following data. Culverts must be numbered sequentially beginning with 1, 2, 3 ...etc.	
90 Skew Angle Left, deg.	Enter the skew angle at the left end of the culvert, degrees. See Note.	
90 Skew Angle Right, deg.	Enter the skew angle at the right end of the culvert, degrees. See Note.	
0 Top Haunch Height, in.	Enter the height of the top haunch, inches. Enter 0 for no top haunch.	
0 Bottom Haunch Height, in.	Enter the height of the bottom haunch, inches. Enter 0 for no bottom haunch.	
0 Haunches by AASHTO 0 or 1	Enter 1 for haunches to be considered in effective span length calculations, as per AASHTO Section 8.8, else enter 0.	

EXAMPLE

H&SKEW 80, 80, 4, 0, 1

FIGURES



NOTES

Skew angles are measured from line ahead to skew as shown above. Positive angles only.

BRASS-CULVERT		COMMAND DESCRIPTION
COMMAND NAME	REEBAR	
PURPOSE	REEBAR defines allowable bar sizes and spacings, and maximum steel ratio.	
6 COMMAND PARAMETERS		
12 Maximum Bar Spacing, in. Default = 12	Enter the maximum allowable bar spacing.	
9 Minimum Bar Spacing, in. Default = 12	Enter the minimum allowable bar spacing.	
1 Bar Spacing Increment (0,1)	Steel design bar spacings will be rounded to the increment defined here. Enter 1 to round spacings to 1 inch increments, or enter 0 to round bar spacings to 1/2 inch increments.	
11 Maximum Bar Size (#) Default = 11	Enter the maximum bar size to be used in design.	
4 Minimum Bar Size (#) Default = 4	Enter the minimum bar size to be used in design.	
.016 Maximum Steel Ratio Default = 0.012	Enter the maximum ratio of area of steel to area for concrete (A_s / bd) in decimal form. $\rho_{MAX} = .75 \rho_b = \frac{.85(.85)3000}{60000} \left(\frac{87000}{87000 + 60000} \right)$ $= .016$	

EXAMPLE

For a culvert with a maximum bar spacing of 12 inches, a minimum bar spacing of 4 inches, bar spacing increments of 1/2 inch, a maximum bar size of #11, a minimum bar size of #4, and a maximum reinforcement ratio of 0.012, code:

REEBAR 12, 4, 0, 4, 0.012
12 0.016

FIGURES

NOTES

BRASS-CULVERT		COMMAND DESCRIPTION
COMMAND NAME	CONCOV	
PURPOSE	CONCOV defines the depth of concrete cover for reinforcement and the slab thickness round off increment.	
6 COMMAND PARAMETERS		
2	Exterior Top Slab, in.	Enter the distance from the face of steel bars to the face of concrete for the top steel of the top slab, inches. See Note.
3	Exterior Bottom Slab, in.	Enter the distance from the face of steel bars to the face of concrete for the bottom steel of the bottom slab, inches. See Note.
2	Exterior Wall, in.	Enter the distance from the face of steel bars to the exterior face of the exterior walls, inches. See Note.
2	Interior Cover, in.	Enter the distance from the face of steel bars to the face of concrete for the interior faces of slabs and walls, inches. See Note. NOTE: Default values are 3 inches for bottom slab cover and 2 inches for all other covers.
1/2	Slab Thickness Increment, in.	BRASS-CULVERT "rounds up" slab thickness to the nearest increment defined. Default values are 1/2 inch.
1/2	Wall Thickness Increment, in.	BRASS-CULVERT "rounds up" wall thickness to the nearest increment defined. Default values are 1/2 inch.

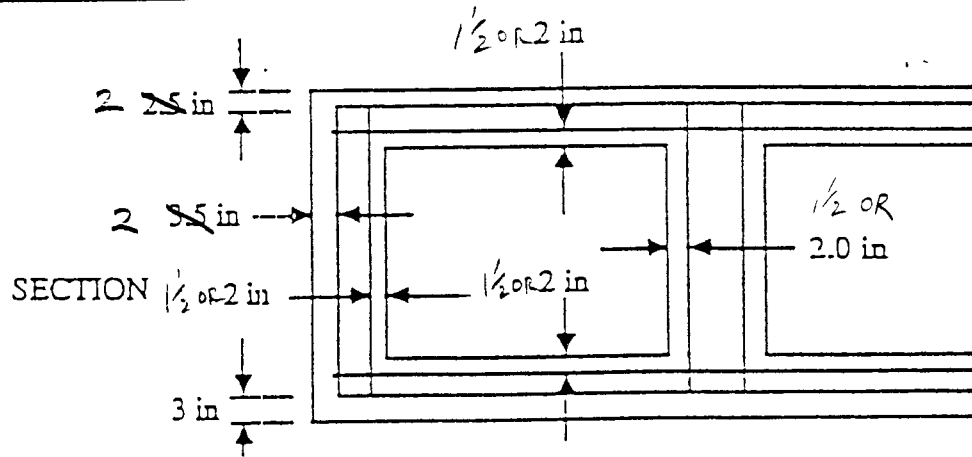
HYDR GULF

EXAMPLE

2.0 2.0
CONCOV ~~2.5~~, 3.0, ~~3.5~~, 2.0, 0.5, 0.5

HYDR → 1.5
ONLY

FIGURES



NOTES

All covers are measured from the outer face of steel to face of slab.

BRASS-CULVERT		COMMAND DESCRIPTION
COMMAND NAME	MATPRP	
PURPOSE	MATPRP defines material properties for steel and concrete.	
6 COMMAND PARAMETERS		
120	Soil Unit Weight, pcf	Enter the unit weight of the soil fill in pounds per cubic foot. BRASS-CULVERT uses 100% of soil weight for both rigid and flexible box designs.
60	Reinforcing Yield, Fy, ksi	Enter the yield strength for steel reinforcement, ksi.
24	Allowable Steel Stress, ksi	Enter the allowable steel stress, ksi.
3	Concrete Strength, ksi	Enter the 28 day compressive strength for concrete, ksi.
0	Allowable Concrete Shear, ksi	Enter the allowable concrete shear stress, ksi. Enter 0 for BRASS-CULVERT to calculate the concrete shear strength according to AASHTO 8.16.
0	Allowable Concrete Shear, with Stirrups, ksi	Enter the allowable concrete shear stress when stirrups are used. <u>Enter 0 for no stirrups.</u>

EXAMPLE

For a culvert with a soil unit weight of 120 pcf, 40 ksi reinforcing steel, an allowable steel stress of 20 ksi, a concrete strength of 3000 psi, and to have the program calculate the allowable concrete shear stress, code:

MATPRP 120, 40, 20, 3, 0, 0

60 24

FIGURES

NOTES

COMMAND NAME	PRTCTL
PURPOSE	PRTCTL controls the output produced.
4 COMMAND PARAMETERS	
0 1 Bar Schedule (0,1)	Enter 1 for printing the bar schedule, <u>else enter 0.</u>
0 1 Tenth Point Actions (0,1)	Enter 1 for printing <u>moments</u> , shears, and axial forces at tenth points, <u>else enter 0.</u> These are factored actions for ultimate strength design.
0 1 Influence Lines (0,1)	Enter 1 for printing live load influence line ordinates at tenth points, <u>else enter 0.</u>
0 0 ↑ FINAL RUN Debug Printout (0,1)	This parameter is to be used for debugging purposes only. Enter 1 for <u>special printout</u> of dead load, soil pressure, and live load moments and shears, <u>else enter 0.</u> These are unfactored actions for ultimate strength design.

EXAMPLE

To print the bar schedule, tenth point actions, and influence line ordinates, code:

```
PRTCTL 1, 1, 1, 0  
      0 0 0
```

FIGURES

NOTES

BRASS-CULVERT		COMMAND DESCRIPTION
COMMAND NAME	F&HCTL	
PURPOSE	F&HCTL defines floor type and headwall configuration.	
3 COMMAND PARAMETERS		
1 Structure Number (1-10)	Enter the reference number for the culvert to be described by the following data. Culverts must be numbered sequentially beginning with 1, 2, 3 ...etc.	
1 Floor Type (1,2,3)	Enter <u>1</u> for full floor. Enter 2 for no floor with fixed end supports. Enter 3 for no floor with pinned end supports.	
2 Headwall Steel (0-3)	Enter 0 to generate headwall steel as per North Carolina standard. Enter 1 to suppress headwall steel generation. Enter <u>2</u> to generate left headwall steel only. Enter 3 to generate right headwall steel only.	

EXAMPLE

To suppress a full floor and headwall steel design, code:

F&HCTL 1, 1, ~~x~~
2

FIGURES

NOTES

BRASS-CULVERT		COMMAND DESCRIPTION
COMMAND NAME	DESCTL	
PURPOSE	DESCTL defines design control parameters.	
6 COMMAND PARAMETERS		
0, 1 Design Method (0,1)	Enter 0 for service load design method, or enter 1 for load factor design method.	
1, 0 Rigid or Flexible (0,1)	Enter 0 for rigid box culvert design, else enter 1 for flexible box culvert design.	
0 Design Negative Moment Position (0.0 - 1.0)	The position of design negative moment is defined by a value from zero to one where <u>0.0 represents the centerline of the wall or slab</u> , 0.5 represents half way between center of the wall or slab and face of the wall or slab, and 1.0 represents the face of the wall or slab.	
0 Design Same Slabs (0,1)	Enter 1 for BRASS-CULVERT to design the same thicknesses and steel for top and bottom slabs, <u>else enter 0</u> . See Note.	
0 Design Same Walls (0,1)	Enter 1 for BRASS-CULVERT to design the same exterior and interior wall thicknesses, <u>else enter 0</u> . See Note.	
9 Modular Ratio (N) Default = 9	Enter the ratio of the modulus of elasticity of steel to that of concrete.	

QUANTITIES

QUANTITIES

HEU 7-15-98

JVS 15 JUL 98

CONCRETE QUANTITIES

DESCRIPTION	QUANT.	WIDTH	LENGTH	DEPTH	FACTOR	TOTAL (CU. FT.)	TOTAL (CU. YD.)
TOP SLAB	1.00	51.33	143.00	0.96	1.00	7034.81	260.55
EXTERIOR WALL	2.00	0.67	143.00	10.00	1.00	1906.67	70.62
INTERIOR WALL	3.00	0.67	143.00	10.00	1.00	2860.00	105.93
BOTTOM SLAB	1.00	51.33	200.00	1.04	1.00	10694.44	396.09
BOTTOM SLAB TRIANGLE	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HEADWALL	2.00	51.33	1.50	0.50	1.00	77.00	2.85
CUT OFF WALL DOWNSTREAM	1.00	51.33	0.83	1.96	1.00	83.77	3.10
CUT OFF WALL UPSTREAM	1.00	51.33	0.83	0.96	1.00	41.00	1.52
INT. WING DOWNSTREAM	3.00	0.67	28.50	10.96	1.00	624.62	23.13
INT. WING DOWNSTREAM DEDUCT	3.00	0.67	28.25	9.96	-0.50	-281.32	-10.42
EXT. WING DOWNSTREAM	2.00	0.67	28.50	10.96	1.00	416.42	15.42
EXT. WING DOWNSTREAM DEDUCT	2.00	0.67	28.25	9.96	-0.50	-187.55	-6.95
INT. WING UPSTREAM	3.00	0.67	28.50	10.96	1.00	624.62	23.13
INT. WING UPSTREAM DEDUCT	3.00	0.67	28.25	9.96	-0.50	-281.32	-10.42
EXT. WING UPSTREAM	2.00	0.67	28.50	10.96	1.00	416.42	15.42
EXT. WING UPSTREAM DEDUCT	2.00	0.67	28.25	9.96	-0.50	-187.55	-6.95
						23842.02	883.04
EXCAVATION	1.00	54.33	200.00	17.00	1.00	184733.33	6841.98

REINFORCING CEMENT QUANTITY

WYOMING DEPARTMENT OF TRANSPORTATION

PAGE 4

BRIDGE BRANCH

DATE 07/15/98

CULVERT DESIGN

4 CELL 1 FT FILL

JV-5 15JVL98

** REINFORCING STEEL BAR SCHEDULE **

* LOCATN *	BAR	* NO.	* SZ *	* TYP *	* LNTH *	WT.	* H LEG *	* V LEG
TOP SLAB POSV	MAIN A100	14	8	STR	50-11	1903		
BOT SLAB POSV	MAIN A200	14	5	STR	50-11	743 1071		
TOP SLAB NEGV	MAIN A300	14	8	STR	50-11	1903		
BOT SLAB NEGV	MAIN A400	14	9	STR	50-11	2424		
CORNER (TOP)	A1	28	7	6	7- 0	404 3- 9	3- 3	
CORNER (BOTTOM)	A2	28	9	6	11- 0	1047	5- 9	5- 3
EXTWALL IN	B1	28	5	STR	11- 6	336		
EXTWALL OUT	B2	28	8	STR	9- 4	698		
INTWALL	B3	42	7	STR	11- 6	987		
LONGTD	(1) C1	182	4	STR	9- 8	1175		

TOTAL 11617

$$1903 \times \left(\frac{0.5 + 6.4}{2} \right) \times \frac{3}{50-11} = 2883$$

$$2424 \times \frac{8-4}{11-6} \times 3 = 1190$$

$$667 \times \frac{28}{42} = 658$$

$$1175 \times \frac{(34 \times 2 + 2 \times 4 + 5 \times 3 + 3 \times 3 + 6 \times 2) \times 5}{182} = 1059$$

$$\frac{10163}{10} \times (70 + 70 + 30) = 172771$$

$$= 172800$$

***** SPLICE LENGTHS CHART *****

BAR	SIZE	SPLICE LENGTH
A200	5	1- 8
A400	9	4- 11
B1	5	1- 8
B3	7	3- 0
C1	4	2- 2

WYOMING DEPARTMENT OF TRANSPORTATION
 BRIDGE BRANCH
 CULVERT DESIGN

PAGE 3
 DATE 07/15/98

JVS 15 JUL 98

4 CELL 1 FT FILL

A CORNER BAR(T)				A CORNER BAR(B)				A TSLAB+		A TSLAB-	
H	V	SZ	SPG	H	V	SZ	SPG	SZ	SPG	SZ	SPG
45	39	7	9.0	69	63	9	9.0	8	9.0	8	9.0

A BSLAB+		A BSLAB-		B EXTIN		B EXTOUT		B INTWL		C1
SZ	SPG	SZ	SPG	SZ	SPG	SZ	SPG	SZ	SPG	BARS
5	9.0	9	9.0	5	9.0	8	9.0	7	9.0	182

** THE HEIGHT OF C.H.C.U. **
 ** BOTTOM SLAB = 6.00 IN
 TOP SLAB = 5.75 IN

** T.SLAB *	B.SLAB *	WALL *	INWALL *	*** VOLUME ***	*** STEEL **
IN	IN	IN	IN	CY/FT	LB/FT
11.50	12.50	8.00	8.00	5.037	1210

REINFORCEMENT QUANTITY

WYOMING DEPARTMENT OF TRANSPORTATION

PAGE 4

BRIDGE BRANCH

DATE 07/15/98

CULVERT DESIGN

4 CELL

1 FT FILL

JVS 15JVL98

**** REINFORCING STEEL BAR SCHEDULE ****

* LOCATN *	BAR	* NO. *	* SZ *	* TYP *	* LNTH *	WT.	* H LEG *	* V LEG
TOP SLAB POSV	MAIN A100	14	8	STR	50-11	1903		
BOT SLAB POSV	MAIN A200	14	5	STR	50-11	743 1071		
TOP SLAB NEGV	MAIN A300	14	8	STR	50-11	1903		
BOT SLAB NEGV	MAIN A400	14	9	STR	50-11	2424		
CORNER (TOP)	A1	28	7	6	7-0	404 667	3-9	3-3
CORNER (BOTTOM)	A2	28	9	6	11-0	1047	5-9	5-3
EXTWALL IN	B1	28	5	STR	11-6	336		
EXTWALL OUT	B2	28	8	STR	9-4	698		
INTWALL	B3	42	7	STR	11-6	987		
LONGTD	(1) C1	182	4	STR	9-8	1175		

TOTAL 11617

$$1903 \times \frac{(9.5 + 6.4)}{2} \times \frac{3}{50-11} = 283$$

$$1071 \times \frac{8-4}{50-11} \times 3 = 1190$$

$$667 \times \frac{28}{42} = 658$$

$$1175 \times \frac{(34 \times 2 + 3 \times 4 + 5 \times 3 + 3 \times 2 + 6 \times 2 \times 5)}{182} = 1059$$

$$\frac{10163}{10} \times (70 + 70 + 30) = 172771$$

$$= 172800$$

***** SPLICE LENGTHS CHART *****

BAR	SIZE	SPLICE LENGTH
A200	5	1- 8
A400	9	4-11
B1	5	1- 8
B3	7	3- 0
C1	4	2- 2

VS 15 JUL 98

WYOMING DEPARTMENT OF TRANSPORTATION
BRIDGE BRANCH
CULVERT DESIGN

PAGE 3
DATE 07/15/98

4 CELL 5 FT FILL

A CORNER BAR(T)				A CORNER BAR(B)				A TSLAB+		A TSLAB-	
H	V	SZ	SPG	H	V	SZ	SPG	SZ	SPG	SZ	SPG
56	51	8	9.0	56	51	8	9.0	7	9.0	8	9.0

A BSLAB+		A BSLAB-		B EXTIN		B EXTOUT		B INTWL		C1
SZ	SPG	SZ	SPG	SZ	SPG	SZ	SPG	SZ	SPG	BARS
6	9.0	8	9.0	5	9.0	8	9.0	5	9.0	182

** THE HEIGHT OF C.H.C.U. ** BOTTOM SLAB = 6.00 IN
TOP SLAB = 5.75 IN

** T.SLAB *	B.SLAB *	WALL *	INWALL *	*** VOLUME ***	*** STEEL ***
IN	IN	IN	IN	CY/FT	LB/FT
11.50	12.50	8.00	8.00	5.037	1046

JVS 15JUL98

** REINFORCING STEEL BAR SCHEDULE **

* LOCATN *	BAR	* NO. *	* SZ *	* TYP *	* LNGTH *	WT.	* H LEG *	* V LEG
TOP SLAB POSV	MAIN A100	14	7	STR	50-11	1457		
BOT SLAB POSV	MAIN A200	14	6	STR	50-11	1071		
TOP SLAB NEGV	MAIN A300	14	8	STR	50-11	1903		
BOT SLAB NEGV	MAIN A400	14	8	STR	50-11	1903		
CORNER (TOP)	A1	28	8	6	8-11	667	4- 8	4- 3
CORNER (BOTTOM)	A2	28	8	6	8-11	667	4- 8	4- 3
EXTWALL IN	B1	28	5	STR	11- 6	336		
EXTWALL OUT	B2	28	8	STR	9- 4	698		
INTWALL	B3	42	5	STR	11- 6	504		
LONGTD (1)	C1	182	4	STR	9- 8	1175		
TOTAL						10381		

***** SPLICE LENGTHS CHART *****

BAR	SIZE	SPLICE LENGTH
A200	6	2- 3
A400	8	3-11
B1	5	1- 8
B3	5	1- 8
C1	4	2- 2



2.4.11.3. Development and Tension Lap Splice Lengths -

Other Than Top Bars ($F_y = 60$ ksi)

**N
O
T

T
O
P

B
A
R
S**

Step 1	Step 2	Step 3	Step 4	Step 5									
		f'_c	Bars	#3	#4	#5	#6	#7	#8	#9	#10	#11	
<p>< 6 in. on Center (Dir. of Spacing ● →)</p>	<p>NON-EPOXY</p>	3 ksi	ld	12	12	15	20	27	35	44	56	69	
			B	12	16	20	26	35	45	57	73	89	
			C	16	21	26	33	45	59	75	95	117	
		4 ksi	ld	12	12	15	18	23	30	38	49	60	
			B	12	16	20	24	30	39	50	63	78	
			C	16	21	26	31	39	51	65	82	101	
		<p>EPOXY 1 (<6db Clear spacing OR <3db Cover (any direction))</p> 	3 ksi	ld	14	18	23	30	40	52	66	84	103
				B	18	24	30	38	52	68	86	109	134
				C	23	31	39	50	68	88	112	142	175
	4 ksi		ld	14	18	23	27	35	45	57	73	89	
			B	18	24	30	36	45	59	74	94	116	
			C	23	31	39	46	59	76	97	123	152	
	<p>EPOXY 2 (All Other Situations)</p>		3 ksi	ld	12	14	18	23	31	40	51	64	79
				B	14	18	23	29	40	52	66	83	103
				C	18	24	30	38	52	68	86	109	134
		4 ksi	ld	12	14	18	21	27	35	44	56	69	
			B	14	18	23	27	35	45	57	72	89	
			C	18	24	30	36	45	59	75	94	116	
<p>≥ 6 in. on Center (Dir. of Spacing ● →)</p>		<p>NON-EPOXY</p>	3 ksi	ld	12	12	12	16	22	28	36	45	55
				B	12	13	16	21	28	36	46	58	72
				C	13	17	21	27	36	47	60	76	94
	4 ksi		ld	12	12	12	15	19	24	31	39	48	
			B	12	13	16	19	24	31	40	50	62	
			C	13	17	21	25	32	41	52	66	81	
	<p>EPOXY 1 (<6db Clear spacing OR <3db Cover (any direction))</p> 		3 ksi	ld	12	15	18	24	32	42	53	67	83
				B	15	19	24	31	42	54	69	87	107
				C	19	25	31	40	54	71	90	114	140
		4 ksi	ld	12	15	18	22	28	36	46	58	72	
			B	15	19	24	29	36	47	60	75	93	
			C	19	25	31	37	47	61	78	99	121	
		<p>EPOXY 2 (All Other Situations)</p>	3 ksi	ld	12	12	14	18	25	32	41	52	63
				B	12	15	18	24	32	42	53	67	82
				C	15	19	24	31	42	54	69	87	108
	4 ksi		ld	12	12	14	17	21	28	35	45	55	
			B	12	15	18	22	28	36	46	58	71	
			C	15	19	24	29	36	47	60	76	93	

Use development and tension lap splices of $f'_c = 4$ ksi for concrete strengths greater than 4 ksi.

AREA OF STEEL

SPACING

SIZE	4"	4½"	5"	5½"	6"	6½"	7"	7½"	8"	8½"	9"	9½"	10"	10½"	11"	11½"	12"	SIZE
3	.332	.295	.265	.241	.221	.204	.189	.177	.166	.156	.147	.140	.133	.126	.121	.115	.111	3
4	.589	.524	.471	.429	.393	.363	.337	.314	.295	.277	.262	.248	.236	.224	.214	.205	.196	4
5	.920	.818	.736	.669	.614	.566	.526	.491	.460	.433	.409	.388	.368	.351	.335	.320	.307	5
6	1.325	1.178	1.050	.964	.884	.816	.757	.707	.663	.624	.589	.558	.530	.505	.482	.461	.442	6
7	1.804	1.603	1.443	1.312	1.203	1.110	1.031	.962	.902	.849	.802	.760	.722	.687	.656	.627	.601	7
8	2.356	2.094	1.885	1.714	1.571	1.450	1.346	1.257	1.178	1.109	1.047	.992	.942	.898	.857	.820	.785	8
9	3.00	2.67	2.40	2.18	2.00	1.85	1.71	1.60	1.50	1.41	1.33		1.20		1.09		1.00	9
10		3.37	3.04	2.76	2.53	2.34	2.17	2.02	1.90	1.79	1.69		1.52		1.38		1.27	10
11			3.75	3.41	3.13	2.88	2.63	2.50	2.34	2.21	2.08		1.88		1.70		1.56	11

NUMBER OF BARS

SIZE	Perimeter	Wt. per Ft. (lbs)	Diameter (inches)	1	2	3	4	5	6	7	8	9	10	SIZE
3	1.178	.376	.375	.1105	0.22	0.33	0.44	0.55	0.66	0.77	0.88	0.99	1.105	3
4	1.571	.658	.500	.1963	0.39	0.59	0.79	0.98	1.18	1.37	1.57	1.77	1.96	4
5	1.963	1.043	.625	.3068	0.61	0.92	1.23	1.53	1.84	2.15	2.45	2.76	3.07	5
6	2.356	1.502	.750	.4418	0.88	1.33	1.77	2.21	2.65	3.09	3.53	3.98	4.42	6
7	2.749	2.044	.875	.6013	1.20	1.80	2.41	3.01	3.61	4.21	4.81	5.41	6.01	7
8	3.142	2.670	1.000	.7854	1.57	2.36	3.14	3.93	4.71	5.50	6.28	7.07	7.85	8
9	3.544	3.400	1.128	1.0000	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00	9
10	3.990	4.303	1.270	1.2656	2.53	3.80	5.06	6.33	7.59	8.86	10.12	11.39	12.66	10
11	4.430	5.313	1.410	1.5625	3.12	4.69	6.25	7.81	9.37	10.94	12.50	14.06	15.63	11
145	5.32	7.65	1.693	2.2500	4.50	6.75	9.00	11.25	13.50	15.75	18.00	20.25	22.50	145
185	7.09	13.60	2.257	4.0000	8.00	12.00	16.00	20.00	24.00	28.00	32.00	36.00	40.00	185

SPECIFICATIONS

SEE PLAN SHEETS