A/E Addison Airport - Contract Documents and Specifications for Airport Improvement Project

2003

5

FEDERAL FY 2004

City & Airport	LOCID	Grant	Project Description	Project Costs				Project Codes
				Total	Federal	Apportionment	Discretionary	
Dallas	ADS	T	Construct westside parallel TW (7200 x 100) Phase 2	3,400,000	3,060,000	0	3,060,000	ST TW CO
Addison			Reconstruct apron	1,500,000	1,350,000	1,350,000	0	RE AP CO
				$4,900,000	**$4,410,000**	**$1,350,000**	**$3,060,000**	

FEDERAL FY 2005

City & Airport	LOCID	Grant	Project Description	Project Costs				Project Codes
				Total	Federal	Apportionment	Discretionary	
Dallas Addison	ADS	T	Complete west side parallel TW & assoc. improvements (Phase 3)	**$3,400,000**	**$3,060,000**	**$3,060,000**	**$0**	ST TW CO

FEDERAL FY 2006

City & Airport	LOCID	Grant	Project Description	Project Costs				Project Codes
				Total	Federal	Apportionment	Discretionary	
Dallas Addison	ADS	T	Acquire property west side	**$11,000,000**	**$9,900,000**	**$9,900,000**	**$0**	ST LA DV

FEDERAL FY 2008

City & Airport	LOCID	Grant	Project Description	Project Costs				Project Codes
				Total	Federal	Apportionment	Discretionary	
Dallas	ADS	T	Eng/Design for RW rehabilitation	**$100,000**	**$90,000**	**$90,000**	**$0**	RE RW IM
Addison								

FEDERAL FY 2009

City & Airport	LOCID	Grant	Project Description	Project Costs Total	Federal	Apportionment	Discretionary	Project Codes
Dallas	ADS	T	Widen east side TW & assoc. improvmets	4,800,000	4,320,000	4,320,000	0	ST TW IM
Addison			Overlay RW 15-33	1,500,000	1,350,000	1,350,000	0	RE RW IM
			Acquire property east side	9,000,000	8,100,000	8,100,000	0	ST LA DV
				$15,300,000	**$13,770,000**	**$13,770,000**	**$0**	

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

AIRPORT MASTER RECORD

PRINT DATE 10/04/00
AFD EFF DATE 08/10/2000
FORM APPROVED OMB 2120-0015

>1 ASSOC CITY: DALLAS
>2 AIRPORT NAME: ADDISON
3 CBD TO AIRPORT(NM): 09 N
4 STATE: TX
5 COUNTY: DALLAS TX
6 REG/ADO: ASW/NONE
FAA SITE NR: 23710.3*A
7 SECT AERO CHT: DALLAS-FT WORTH

GENERAL

10 OWNERSHIP: PUBLIC
>11 OWNER: CITY OF ADDISON
>12 ADDRESS: ~~BOX 144~~ 9010
ADDISON, TX 75001 - 9010
>13 PHONE NR: 972-450-7041
>14 MANAGER: ~~SAM STUART~~ Washington-Stanback
>15 ADDRESS: ~~4505 CLAIRE CHENNAULT~~ 4651 Airport Parkway
DALLAS, TX ~~75248~~ 75001
>16 PHONE NR: 972-~~248-7733~~ 392-4850
>17 ATTENDANCE SCHEDULE:

MONTHS	DAYS	HOURS
ALL	ALL	ALL

18 AIRPORT USE: PUBLIC
19 ARPT LAT: 32-58-06.814N ESTIMATED
20 ARPT LONG: 096-50-11.212W
21 ARPT-ELEV: 644 SURVEYED
22 ACREAGE: 368
>23 RIGHT TRAFFIC: NO
>24 NON-COMM LANDING FEE: NO
25 NASP/FEDERAL AGREEMENT: NGY
26 FAR 139 INDEX:

SERVICES

>70 FUEL: 100LLA
>71 AIRFRAME RPRS: MAJOR
>72 PWR PLANT RPRS: MAJOR
>73 BOTTLE OXYGEN: HIGH
>74 BULK OXYGEN: LOW
75 TSNT STORAGE: HGR TIE
76 OTHER SERVICES: AVNCS CHTR INSTR RNTL SALES SURV

FACILITIES

>80 ARPT BCN: CG
>81 APT LGT SKED: DUSK-DAWN
>82 UNICOM: 122.950
>83 WIND INDICATOR: YES -L
84 SEGMENTED CIRCLE: YES
85 CONTROL TWR: YES
86 FSS: FORT WORTH
87 FSS ON ARPT: NO
88 FSS PHONE NR: 817-740-3100
89 TOLL FREE NR: 1-800-WX-BRIEF

BASED AIRCRAFT

90 SINGLE ENG:	425
91 MULTI ENG:	225
92 JET:	65
TOTAL	715
93 HELICOPTERS:	13
94 GLIDERS:	0
95 MILITARY:	0
96 ULTRA-LIGHT:	0

OPERATIONS

100 AIR CARRIER:	0
101 COMMUTER:	0
102 AIR TAXI:	800
103 G A LOCAL:	20,000
104 G A ITNRNT:	139,170
105 MILITARY:	30
TOTAL	160,000

OPERATIONS FOR MOS ENDING

RUNWAY DATA

>30 RUNWAY IDENT	15/33				
>31 LENGTH:	7202				
>32 WIDTH:	100				
>33 SURF TYPE-COND	ASPH-G				
>34 SURF TREATMENT	GRVD				
35 GROSS WT: SW	80				
36 (IN THSDS) DW	100				
37 DTW	160				
38 DDTW					
LIGHTING/APCH AIDS					
>40 EDGE INTENSITY	MED				
41 NOW ELEMENT 81	/	/	/	/	/
>42 RWY MARK TYPE-COND	PIR-F / PIR-G	/	/	/	/
>43 VASI	V4R /	/	/	/	/
44 THR CROSSING HGT	51 /	/	/	/	/
45 VISUAL GLIDE ANGLE	3.00 /	/	/	/	/
>46 CNTRLN-TDZ	/	/	/	/	/
>47 RVR-RVV	/	/	/	/	/
>48 REIL	/ Y	/	/	/	/
>49 APCH LIGHTS	MALSR /	/	/	/	/
OBSTRUCTION DATA					
50 FAR 77 CATEGORY	PIR / PIR	/	/	/	/
>51 DISPLACED THR	979 / 771	/	/	/	/
>52 CTLG OBSTN	GND / ROAD	/	/	/	/
>53 OBSTN MARKED/LGTD	/	/	/	/	/
>54 HGT ABOVE RWY END	6 / 7	/	/	/	/
>55 DIST FROM RWY END	200 / 225	/	/	/	/
>56 CNTRLN OFFSET	500L / 503L	/	/	/	/
57 OBSTN CLNC SLOPE	0:1 / 3:1	/	/	/	/
58 CLOSE-IN OBSTN	Y / N	/	/	/	/
20:1 LANDING LENGTH					
60 LANDING RWY-LENGTH	/	/	/	/	/
61 CTLG OBSTACLE	/	/	/	/	/
62 HGT-ABOVE THR	/	/	/	/	/
63 DIST FROM THR	/	/	/	/	/
64 CNTRLN OFFSET	/	/	/	/	/

(>) ARPT MGR PLEASE ADVISE FSS IN ITEM 86 WHEN CHANGES OCCUR TO ITEMS PRECEDED BY >

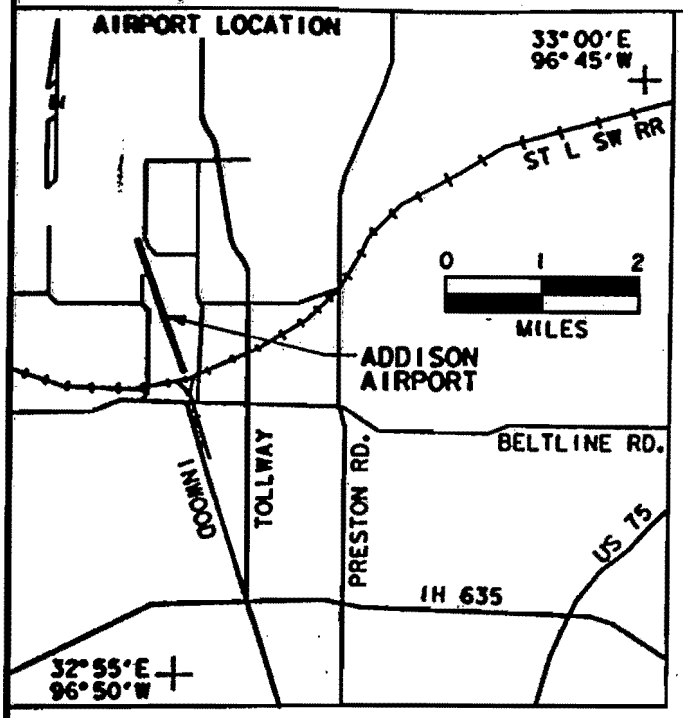
>110 REMARKS:
A037 RWY15/33 GROSS WT RESTRICTION 120K LBS BY ARPT MGR.
A044 RWY15 DSPLCD THR CROSSING HGT.
A057 RWY15 APCH RATIO 9:1 TO DSPLCD THR; +25 FT TREE 240 FT FM DSPLCD THR 480 FT L OF EXTDD CNTRLN.
A057 RWY33 APCH RATIO 22:1 TO DSPLCD THLD; +15 FT HGR 330 FT FM DSPLCD THLD 549 FT R OF EXTDD CNTRLN.
A058 RWY15 +6 FT GROUND 190 FT FM RY END 450 FT L; +10 FT FENCE 480 FT L AT THR.
A081 ACTVT MIRL RY 15/33 & MALSR RY 15 - CTAF. WHEN ATCT CLSD MIRL RY 15/33 PRESET MED INTST ONLY.
A110 -01 NUMEROUS 200 FT BLDGS WITHIN 1 MILE EAST AND SOUTH OF ARPT; TRANSMISSION TOWERS AND WATER TANKS WEST OF ARPT.
A110 -02 NO TGL WITHOUT AMGR APPROVAL.
A110 -03 FLIGHT NOTIFICATION SERVICE (ADCUS) AVBL.
A110 -04 (A89) FOR LOCAL CALL TO FSS DIAL 350-3311.
A110 -05 (E81) CENTERLINE REFLECTORS ONLY.

111 INSPECTOR: (S)
112 LAST INSP: 09/08/1997
113 LAST INFO REQ:

ADDISON , TEXAS

ADDISON AIRPORT

(ADS)



SITE NO. - 23710.3A
ACRES - 367.5

REMARKS:

1. AIRPORT SHOWN ON 7.5 MINUTE ADDISON QUAD
2. PARRALLEL TAXIWAY HAS CENTERLINE REFLECTORS.
3. NDB & ILS STRAIGHT-IN APPROACH TO RUNWAY 15.
   ILS STRAIGHT-IN APPROACH TO RUNWAY 33

CITY BLDGS
+25' TRANSMISSION LINES
CITY EQUIPMENT YARD
Ltd. OBSTRUCTION POLES
+6' GROUND
Several new Buildings in this area
ELEV. 638'
DISPLACED THRESHOLD 980'
+25' TREES
CLAIRE CHENNAULT DRIVE
+35' POLE LINE (M)
BLDG.
WESTGROVE RD.
TERMINAL
15
VASI
GS
DITCH
TUNNEL UNDER GOLF
HGRS
ROAD
+20' POLE LINE
NW-SE 100' x 7201'
KELLER SPRINGS RD.
TREES
CONTROL TOWER (BEACON ON TOP) 705' MSL
ELEV. 643'
ASPH MIRL
1
TIE DOWNS
5°51'E (1995)
INDUSTRIAL AREA
REILS
770' DISPLACED THRESHOLD
33
T-HGRS
FUEL STORAGE LOC
ELEV. 635'
LINDBERG DR.
RACING BRIDGE
+15' HGRS
+15' P-LINE
+18' POLE (Ltd)
+48' BLDG. AT 1600'

0 500 1000 2000
SCALE IN FEET

FTW
8-21-97

Texas Airport System Plan
Airport Development Worksheet
AIRPORT DESCRIPTION

Printed: 9/10/01 Revised: 09/07/2001

Airport: ADDISON **Associated City: DALLAS** **City Pop.: 1,188,580**
Airport ID: ADS **County : DALLAS** **County Pop.: 2,218,899**
FAA Site #: 23710.3*A **TxDOT District: DALLAS**
NPIAS Site #: 48-0063

Design Criteria

Time Period:	*Current*	*0 - 5*	*6 - 10*	*11 - 20*
Design Standards:	T	T	T	T
Airport Ref. Cd.:		C-II		
Runway Type:	P			
Aircraft Size:	L			
State Role:	T			
Federal Role:	RL			

Airport

Airport Status: EXISTING
Airport Functional Category: RELIEVER
Airport Elevation: 644' msl
Altimeter: YES
Temperature: 96
Days With Rainfall Greater than 1/10": 53

Sponsor

Sponsor: CITY
Publicly Owned: YES
Sponsor Interest:

Economic

Economic Development Impact: $

Primary Runway

Approach Rwy: 15/33
Approach Type: ILS
Wind Coverage (%): 97.
Prop. Driven Runway:

Through-The-Fence

Through-The-Fence Operations: YES

Zoning

Height Hazard Zoning Date: 11/25/1980

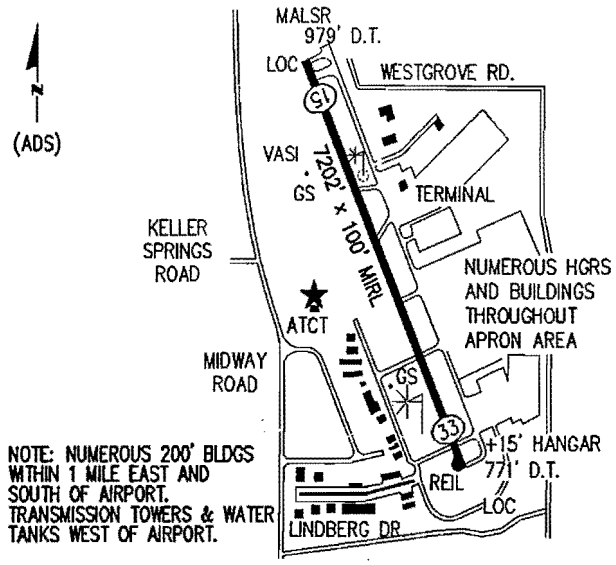
Property Lease

Lease Date:
Lease Length:

Maintenance

Maintenance Program:
Pavement Management Program Date:

Layout



Based Aircraft

Date Reported: 08/31/1997

Single Engine:	425
Multi Engine:	225
Jet:	65
Helicopter:	13
Gliders:	
Military:	
Ultra-Light:	
Total:	728

Annual Activity

Date Reported: 09/08/97

GA Local:	20,000
GA Itinerant:	139,170
Military:	30
Air Carrier:	
Air Taxi:	800
Commuter:	
Total:	160,000

Planning

Airport Master Plan Date: 07/01/1997
Airport Layout Plan Date: 06/01/1997
Regional Planning Meeting Date: 10/03/2001
Aerial Photo Date:

Legislative Districts

State Rep: 99 State Senator: 9
U.S. Rep: 26

Texas Airport System Plan
Airport Development Worksheet
DEVELOPMENT BY TIME PERIOD

Revised: 9/7/01
Printed: 9/10/01

Airport: ADDISON **Associated City: DALLAS** **23710.3*A**

Project Description	Time Period : 00-05	Project Cost	Const Type	Object Code	Airport Comp	Item Status*
Extend RW 15 safety area with drainage and grading improvements		630,000	PAVE	SAFE	PRWY	C
Construct westside parallel TW (7200x100) Phase I		3,400,000	PAVE	STDS	PTXY	U
Reconstruct apron		1,500,000	PAVE	RECN	APRN	C
Engineering/design for FY 2003/2004/2005 westside parallel TW		1,300,000	PAVE	STDS	PTXY	U
Construct westside parallel TW (7200x100) Phase III		3,400,000	PAVE	STDS	PTXY	U
Construct westside parallel TW (7200x100) Phase II		3,400,000	PAVE	STDS	PTXY	U
Engineering/design for FY 2004 apron reconstruction project		100,000	PAVE	RECN	APRN	C
Implement declared distances standards with specified lighting and signing requirements		140,000	LITE	STDS	OLSD	C
Upgrade two departure instruction signs		20,000	LITE	STDS	PRWY	C
Install PAPI-4 on RW 33		120,000	AAID	STDS	PRWY	C
Replace existing VASI on RW 15 with PAPI-4		35,000	AAID	RECN	PRWY	C
Update Airport Master Plan		230,000	OTHR	PLAN	AMP	A
Part 150 Noise Study		320,000	OTHR	PLAN	AMP	A
Engineering/design for 2001 construction		108,116	OTHR	PLAN	ENGR	A
Environmental Assessment for westside parallel TW		300,000	OTHR	PLAN	ANAS	U
Construct new Air Traffic Control Tower		8,265,000	BLDG	UPGR	OLSD	U
Time Period : 00-05	****Total Cost :**	**$ 20,065,000**				

Project Description	Time Period : 06-10	Project Cost	Const Type	Object Code	Airport Comp	Item Status*
Acquire existing east side aviation use development property (approximately 17.2 ac)		9,000,000	LAND	CAPT	OLSD	U
Acquire property for fuel storage facility (approx. 2 ac)		544,500	LAND	CAPT	OLSD	U
Acquire existing west side aviation use development property (approximately 21.74 ac)		11,000,000	LAND	CAPT	OLSD	U
Overlay RW 15-33 (7202x100)		1,500,000	PAVE	PRSV	PRWY	U
Engineering/design for RW 15-33 overlay		100,000	PAVE	PRSV	PRWY	U
Construct runup/holding apron at southeast corner of RW 33 end with drainage improvements		804,000	PAVE	CAPT	APRN	U
Implement eastside access TW pavement improvements		965,000	PAVE	PRSV	STXY	U
Construct new connector TW at RW 15 approach threshold to facilitate intersection departures		350,000	PAVE	CAPT	PTXY	U
Widen east side parallel TW to 75' and implement TW system pavement improvments		4,800,000	PAVE	CAPT	PTXY	U
Time Period : 06-10	****Total Cost :**	**$ 29,063,500**				

Project Description	Time Period : 11-20	Project Cost	Const Type	Object Code	Airport Comp	Item Status*
Rehabilitate west side partial parallel TW (2850 x 35) (south end)		100,000	PAVE	PRSV	PTXY	U
Implement east side access TW pavement improvements		1,394,000	PAVE	PRSV	STXY	U
Construct helipad with access TW adjacent to future ATCT		133,500	PAVE	CAPT	ANAS	U
Implement RW 15/33 pavement improvements		1,032,000	PAVE	PRSV	PRWY	U
Construct runup/holding apron at southwest corner of RW 33 departure threshold		440,000	PAVE	CAPT	APRN	U
Time Period : 11-20	****Total Cost :**	**$ 3,099,500**				
Time Period: 0-20	****Total Cost :**	**$ 52,228,000**				

*Item Status Codes: U - Unassigned, C - CIP, A - Active Project **Totals Only Include Items with Status Code = U - Unassigned

Texas Airport System Plan
Airport Development Worksheet
AIRPORT PROJECT HISTORY

Airport: ADDISON **Associated City: DALLAS** **23710.3*A**

FYR	Agency	Local ($)	State ($)	Federal ($)	Project Description
1976	FAA			4,900,000	Acquire land.
1977	FAA			2,300,000	Land.
1979	FAA			260,000	Land; reroute powerlines; install fencing, drainage, lighted wind cones, and lighting controls.
1980	FAA			500,000	Land;construct and mark TW.
1980	FAA			500,000	Land;construct and mark TW.
1987	FAA			162,000	FAR Part 150 Noise Compatibility Plan Study and Master Plan Study.
1990	FAA			400,000	Install security fencing.
1992	FAA			1,550,000	Rehab RW 15-33 & MIRL, upgrade MIAL System with RAIL (MALSR).
1998	FAA	247,930		2,231,373	Reconstruct west side partial parallel TW system (2850 x 35) with MITLs (south end); reimburse engineering/design
Total Project ($)		247,930		12,803,373	

ADS PLANNING SHEET

Bruce - Should be $ 2.09M - See attached Jim

NP_DATE	NP FYEAR	NP_DESC	NP_E	NP_E	NP_E	TOTAL COST
00-05	2001	Master Plan				$ 230,000 ~~150,000~~
00-05	2001	Part 150 Study				$ 320,000
00-05	2002	CONSTRUCT NEW ATCT	ST	BD	MS	$ 4,400,000 1,000,000
00-05	2002	INSTALL SIGNAGE FOR DECLARED DISTANCES	ST	OT	SG	$ 160,000
00-05	2002	INSTALL PAPI RW 33	ST	RW	VI	$ 95,000
00-05	2002	INSTALL PAPI RW 15				$ 35,000
00-05	2002	REGRAD RWY 15 SAFETY AREA	ST	RW	IM	$ 630,000
00-05	2002	Environmental Asasessment				$ 300,000
00-05	2003	Apron Reconstruciton (design)				$ 100,000
00-05	2004	Apron Reconstruction (construction)				$ 1,500,000
00-05	2002	ENGINEERING/DESIGN FOR WESTSIDE PARALLEL TW.				1,350,000
00-05	2003 ~~2005~~	CONSTRUCT TAXIWAY WEST SIDE PARALLEL ~~AND SSOCI (Design & Construction)~~	ST	TW	CO	$ 3,450,000 ~~1,200,000~~
00-05	2006 ~~2006~~	CONSTRUCT TAXIWAY WEST SIDE PARALLEL				$ 3,450,000 ~~4,500,000~~
06-10	2006	ACQUIRE LAND ON WEST SIDE	ST	LA	DV	$ 11,000,000
00-05	2005 ~~2007~~	CONSTRUCT TAXIWAY WEST SIDE PARALLEL				$ 3,400,000 ~~3,240,000~~
06-10	2008	REHABILITATE RUNWAY 15-33 Overlay (design)	RE	RW	IM	$ 100,000
06-10	2009	REHABILITATE RUNWAY 15-33 Overlay (construction)				$ 1,500,000
06-10	2009	ACQUIRE LAND FOR EAST SIDE DEVELOPMENT/RELOCATION	ST	LA	DV	$ 9,000,000
06-10	2009	WIDEN EAST SIDE TAXIWAY	ST	TW	IM	$ 4,800,000

0-05 2002 Box culvert @ N end.

HP LaserJet 3100
Printer/Fax/Copier/Scanner

SEND CONFIRMATION REPORT for
TOWN OF ADDISON
9724502837
Jan-25-01 3:25PM

Job	Start Time	Usage	Phone Number or ID	Type	Pages	Mode	Status
500	1/25 3:25PM	0'34"	512 416 4510	Send.....	1/ 1	EC 96	Completed.....

Total 0'34" Pages Sent: 1 Pages Printed: 0

Fax - 512-416-4510

TOWN OF ADDISON

OFFICE OF THE CITY MANAGER
Post Office Box 9010 Addison, Texas 75001-9010
(972) 450-7000 • FAX (972) 450-7043
5300 Belt Line Road

January 24, 2001

Mr. David S. Fulton
125 E. 11TH Street
Austin, Texas 78701-2483

Re: Your letter dated January 2, 2001-entitlement of $150,000

Dear Mr. Fulton:

We are thrilled about the funding generated under Air 21 and the specific entitlements that earmarked funding for airports by name. After careful review of the many needed airport capital improvements projects at the Addison Airport, we have decided to pursue our number one project: the General Aviation Terminal apron reconstruction. The current apron is unserviceable and impacts our ability to service international flights and support transient aircraft visitors to the Addison Airport. Our request is to apply the funds earmarked for the Addison Airport toward the engineering design of this project.

The Addison Airport General Aviation Terminal facility houses a User Fee Customs and airport administration. It is a municipal facility that should offer arriving and departing aircraft parking. Currently, the apron's serviceability does not accommodate either light aircraft or more importantly, the many design group 3 aircraft that need access to the customs facility.

One of your planners has inspected this apron and can expand on the conditions and serviceability of this area. Preliminary cost estimates of this project is about $1.9 million. It goes without saying that this project is vital to our ability to sustain support of transient and international arrivals/departures.

Because of the importance of this area, it is our desire to proceed with an engineering design and solicit support to construct this new aircraft parking apron in late FY 2002 or beginning of FY 2003. In the interim, we will be working with our Customs office to work around this situation with the understanding that we are taking the necessary actions toward correcting the deficiency. Your help and support would be most appreciated.

If I can be of further assistance, do not hesitate to call me at 972.450.7027 or our Airport Director, Dave Pearce at 972.392.4855. Thank you for your assistance.

Sincerely,

Ron Whitehead
City Manager

RW:jp:me
c: David C. Pearce, Airport Director

Fax - 512-416-4510

TOWN OF ADDISON®

OFFICE OF THE CITY MANAGER

(972) 450-7000 • FAX (972) 450-7043

Post Office Box 9010 Addison, Texas 75001-9010

5300 Belt Line Road

January 24, 2001

Mr. David S. Fulton
125 E. 11TH Street
Austin, Texas 78701-2483

Re: Your letter dated January 2, 2001-entitlement of $150,000

Dear Mr. Fulton:

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If I can be of further assistance, do not hesitate to call me at 972.450.7027 or our Airport Director, Dave Pearce at 972.392.4855. Thank you for your assistance.

Sincerely,

Ron Whitehead

Ron Whitehead
City Manager

RW:jp:mc
c: David C. Pearce, Airport Director

Texas Department of Transportation

AVIATION DIVISION
125 E. 11TH STREET • AUSTIN, TEXAS 78701-2483 • 512/416-4500 • FAX 512/416-4510

Ron Whitehead —
This is the letter
I spoke about in my
E-mail to you
Jim

January 2, 2001

Mr. Jim Pierce
Asst. City Engineer
Town of Addison
P.O. Box 9010
Addison, TX 75001-9010

Dear Mr. Pierce:

Recently, Congress passed and the president signed new legislation that significantly increased federal grants for airport improvements. One major feature of that legislation was the provision of grant funds specifically entitled for approximately 100 airports across the state, including yours. The Texas Department of Transportation, Aviation Division will administer these funds for your airport.

Your airport is now eligible for an entitlement of $150,000 for federal fiscal year 2001. Additionally, you may become eligible for entitlements up to a maximum of $150,000 per year for FY 2002 and FY 2003 if Congress appropriates sufficient funds at that time. The FY 2001 entitlement can be used this fiscal year and/or the next two fiscal years. Because your airport currently has a construction grant under development in the amount of $920,000, TxDOT CSJ Number 0018ADDSN, we recommend utilization of the entitlement funds in this upcoming grant. However, if there are other federally eligible planning or capital improvements needed at your airport, please contact Linda Howard at 512-416-4540 to discuss the matter further.

For your further consideration, the Aviation Division is proceeding with the continuation of the Automated Weather Observation System (AWOS) program. These federal entitlement funds may be used under the contracted state-wide AWOS program. Be aware that the AWOS program requires a 25% local match and the total cost of a system is estimated to be about $80,000 to $85,000. If you desire to utilize your entitlement funds for an AWOS, please contact Karon Wiedemann at 512-416-4520.

If we do not receive notification of a newly proposed project for these entitlement funds by January 24, 2001, we will include the funds in your upcoming grant.

Sincerely,

David S. Fulton
Director

cc: The Honorable R. Scott Wheeler, Mayor
Dave Pierce, Airport Manager

Addison!®

JIM PIERCE, P.E.
Assistant Public Works Director
(972) 450-2879
(972) 450-2837 FAX
jpierce@ci.addison.tx.us

Town of Addison 16801 Westgrove Dr. P.O. Box 9010, Addison, Texas 75001-9010

1-5-01

Chris -

Interesting letter. It is my understanding that TxDOT has funding for our Part 150 Study and the Design and Construction of our Drainage & Instrumentation improvements at the north end. Perhaps we could consider another project like AWOS.

Jim 1/1

Yes. You, Dave and Mark should visit about other potential projects. How about the W. side taxiway? CT

Jim

cc Mike

HP LaserJet 3100 Printer/Fax/Copier/Scanner	SEND CONFIRMATION REPORT for TOWN OF ADDISON 9724502837 Jan-11-01 10:15AM

Job	Start Time	Usage	Phone Number or ID	Type	Pages	Mode	Status
286	1/11 10:14AM	0'38"	9727889334	Send.....	2/ 2	EC144	Completed.....

Total 0'38" Pages Sent: 2 Pages Printed: 0

972-397-4855

CW 1-17-01

TOWN OF
ADDISON **PUBLIC WORKS**

To: David Pearce
Company: Washington –
FAX #: 972- 788- 9334
Date: 1-11-01
# of pages (including cover): 2

From: Jim Pierce, P.E.
Asst. Public Wks. Dir.
Phone: 972/450-2879
FAX: 972/450-2837
jpierce@ci.addison.tx.us

16801 Westgrove
P.O.Box 9010
Addison, TX 75001-9010

Re: Federal Grants for Airport Improvements

☐ Original in mail ☐ Per your request ☐ FYI ☐ Call me

Comments: Please see attached letter from TxDOT. Suggest a meeting between you, Mark & me to discuss. We need to notify TxDot by Jan 24 if we have any interest.

Jim

cc Mark Acevedo

Airport CIP ?
Copies

Addison!

JIM PIERCE, P.E.
Assistant Public Works Director
(972) 450-2879
(972) 450-2837 FAX
jpierce@ci.addison.tx.us

Town of Addison 16801 Westgrove Dr. P.O. Box 9010, Addison, Texas 75001-9010

1-5-01

Chris-

Interesting letter. It is my understanding that TxDOT has funding for our Part 150 Study and the Design and Construction of our Drainage & Instrumentation improvements at the north end. Perhaps we could consider another project like AWOS.

Jim

cc Mike

Texas Department of Transportation

AVIATION DIVISION
125 E. 11TH STREET • AUSTIN, TEXAS 78701-2483 • 512/416-4500 • FAX 512/416-4510

January 2, 2001

Mr. Jim Pierce
Asst. City Engineer
Town of Addison
P.O. Box 9010
Addison, TX 75001-9010

Dear Mr. Pierce:

Recently, Congress passed and the president signed new legislation that significantly increased federal grants for airport improvements. One major feature of that legislation was the provision of grant funds specifically entitled for approximately 100 airports across the state, including yours. The Texas Department of Transportation, Aviation Division will administer these funds for your airport.

Your airport is now eligible for an entitlement of $150,000 for federal fiscal year 2001. Additionally, you may become eligible for entitlements up to a maximum of $150,000 per year for FY 2002 and FY 2003 if Congress appropriates sufficient funds at that time. The FY 2001 entitlement can be used this fiscal year and/or the next two fiscal years. Because your airport currently has a construction grant under development in the amount of $920,000, TxDOT CSJ Number 0018ADDSN, we recommend utilization of the entitlement funds in this upcoming grant. However, if there are other federally eligible planning or capital improvements needed at your airport, please contact Linda Howard at 512-416-4540 to discuss the matter further.

For your further consideration, the Aviation Division is proceeding with the continuation of the Automated Weather Observation System (AWOS) program. These federal entitlement funds may be used under the contracted state-wide AWOS program. Be aware that the AWOS program requires a 25% local match and the total cost of a system is estimated to be about $80,000 to $85,000. If you desire to utilize your entitlement funds for an AWOS, please contact Karon Wiedemann at 512-416-4520.

If we do not receive notification of a newly proposed project for these entitlement funds by January 24, 2001, we will include the funds in your upcoming grant.

Sincerely,

David S. Fulton
Director

cc: The Honorable R. Scott Wheeler, Mayor
Dave Pierce, Airport Manager

APRON CONST. CONTRACT

Sponsor

ISSUED FOR CONSTRUCTION

Contract Documents and Specifications for Airport Improvement Project

FILE COPY

For

Addison Airport
Addison, Texas

SIGNED CONTRACT

TxDOT CSJ No. 0318ADDON

Texas Department of Transportation

AVIATION DIVISION
125 E. 11TH STREET • AUSTIN, TEXAS 78701-2483 • 512/ 416-4500 • FAX 512/416-4510

January 9, 2004

Mr. Jim Pierce
Asst. City Engineer,
Town of Addison
5300 Belt Line Rd.
Dallas, TX 75254

RE: Addison Airport: TxDOT # 0318ADDON

Dear Mr. Pierce:

Enclosed for your records is a copy of the construction document for TxDOT Project Number 0318ADDON, between the Texas Department of Transportation, agent for the Town of Addison and Site Concrete, Inc..

If you have any questions, please feel free to call me at 1800-687-4568 extension 4518.

Sincerely,

Edie Stimach

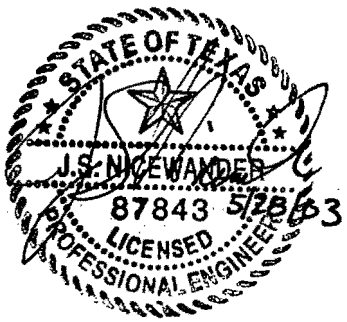
Edie Stimach
Grant Manager

TEXAS DEPARTMENT OF TRANSPORTATION

ADDISON AIRPORT
ADDISON, TEXAS

TxDOT CSJ No. 0318ADDON

MAY 2003



HNTB
ARCHITECTS ENGINEERS PLANNERS

The HNTB Companies
5910 W. Plano Parkway Suite 200
Plano, Texas 75093
972-661-5626
FAX 972-661-5614

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TABLE OF CONTENTS
ADDISON AIRPORT
CSJ# 0318ADDON
(Federally Funded Project)

BID PROPOSAL

PROPOSAL

Proposal TxDOT CSJ No. 0318ADDON
Project Description: Pavement Reconstruction of Apron 'A' and Hangars 'A', 'B' and 'C'.

Proposal by: Name of Bidder SITE CONCRETE, INC.

Address 3340 Roy Orr Blvd
GRAND PRAIRIE, TX 75050

Telephone (972) 313-0733 FAX 972 513-0661

Hereinafter called Bidder, a corporation organized and existing under the laws of the Sate of Texas doing business as SITE CONCRETE, INC.

To the Texas Department of Transportation hereinafter called the Agent.

Gentlemen:

Pursuant to the foregoing Instruction to Bidders, the undersigned bidder having examined the plans and specifications with related documents and the site of the proposed work, and being familiar with all the conditions surrounding the construction of the project hereby proposes to furnish all necessary superintendence labor, machinery, equipment, tools materials and supplies to complete all the work upon which is bid in accordance with the contract documents, within the time set forth and at the prices stated below.

SITE CONCRETE, INC.

AM 1002A ADDISON - AIRPORT IMPRVTS @ ADDISON AIRPORT
ADD INFO: TXDOT #0318ADDON
ESTIMATE: $1,250,995. ADDENDUM: 5
PREBID: 09/17/2003 10AM @ ADDISON SERV CTR, 16801 WESTGROVE DR.
BID DATE: 10/23/2003 2PM @ ADDISON FINANCE BLDG, (PP FRM 10/16 & 10/
ARCH/ENG: TXDOT AVIATION DIV., 150 E RIVERSIDE, 5TH FLR, AUSTIN 78704
800 687-4568, OR 512 416-4516 ANNA SALDANA, FAX 512 416-4510
OWNER: TXDOT AVIATION DIV, AUSTIN, EDIE STIMACH 512 416-4518
PLANS: DOWNLOAD @ N/C FRM TXDOT AVIATION WEB SITE
NOTES1: 2% BID BOND PROPOSAL ITEMS ON FILE
NOTES2: ENGR OF RECORD: HNTB, PLANO 972 661-5626, JENNY NICEWANDER

SITE CONCRETE, INC.

Item No.	Approx. Quantities	Unit of Measure	Bid Item Description	Unit Bid Price	Extended Amount
1	1.00	LS	MOBILIZATION	160,000.00	160,000.00
2	1.00	LS	MAINT OF TRAFFIC	19,050.00	19,050.00
3	10,100.00	SY	REM BIT PAVE (3"-4")	2.00	20,200.00
4	560.00	SY	REM CONC PAVE (7"-8")	10.00	5,600.00
5	5,200.00	CY	UNCLASS EXCAVA	7.00	36,400.00
6	11,750.00	SY	LIME TREAT SUBGRD 6"	1.70	19,975.00
7	211.00	TON	LIME 5%	85.00	17,935.00
8	550.00	LF	SILT FENCE	2.00	1,100.00
9	12,200.00	SY	CEMENT TREAT BASE COURSE 6"	12.50	152,500.00
10	110.00	TON	BIT SURF COURSE	100.00	11,000.00
11	7,625.00	SY	12" PCC PAVE, NON REINF	42.00	320,250.00
12	850.00	SY	12" PCC PAVE, REINF	50.00	42,500.00
13	2,250.00	SY	12-15" PCC PAVE, NON REINF	50.00	112,500.00
14	1,075.00	SY	12-15" PCC PAVE, REINF	48.00	51,600.00
15	92.00	GAL	BIT TACK COAT	20.00	1,840.00
16	410.00	SY	MILLING BIT PAVE. 1-1/2" DEPTH	10.00	4,100.00
17	42.00	EA	TIE DOWNS	350.00	14,700.00
18	8,100.00	SF	PAVE MARK, NON REFL, 4", YELLOW	5.00	40,500.00
19	250.00	SY	SODDING	5.00	1,250.00

Base Bid I - US Customs Pavement Reconstruction - Total Bid Amount: 1,033,000.00

Item No.	Approx. Quantities	Unit of Measure	Bid Item Description	Unit Bid Price	Extended Amount
1A1	1.00	LS	MOBILIZATION	30,000.00	30,000.00
1A2	1.00	LS	MAINT OF TRAFF	4,392.00	4,392.00
1A3	3,160.00	SY	REM BIT PAVE	5.00	15,800.00
1A4	250.00	CY	UNCLASS EXCAVA	7.00	1,750.00
1A5	315.00	LF	SILT FENCE	2.00	630.00
1A6	3,100.00	SY	CEMENT TREAT BASE COURSE 6"	12.50	38,750.00
1A7	35.00	TON	BIT SURF COURSE 6"	100.00	3,500.00
1A8	1,050.00	SY	8" PCC PAVE, NON REINF	30.00	31,500.00
1A9	972.00	SY	8" PCC PAVE, REINF	31.00	30,132.00
1A10	533.00	SY	8-10" PCC PAVE, NON REINF	37.00	19,721.00
1A11	575.00	SY	8-10" PCC PAVE, REINF	39.00	22,425.00
1A12	30.00	GAL	BIT TACK COAT	20.00	600.00
1A13	760.00	SY	SODDING	5.00	3,800.00

Additive Alternate No. 1 - Hanger A - Total Bid Amount: 203,000.00

Item No.	Approx. Quantities	Unit of Measure	Bid Item Description	Unit Bid Price	Extended Amount
1B1	1.00	LS	MOBILIZATION	40,000.00	40,000.00
1B2	1.00	LS	MAINT OF TRAFF	4,902.00	4,902.00
1B3	5,020.00	SY	REM BIT PAVE	5.00	25,100.00
1B4	250.00	CY	UNCLASS EXCAVA	7.00	1,750.00

1B5	1,115.00	LF	SILT FENCE	2.00	2,230.00
1B6	4,440.00	SY	CEMENT TREAT BASE COURSE 6"	12.50	55,500.00
1B7	100.00	TON	BIT SURF COURSE	100.00	10,000.00
1B8	30.00	TON	BIT SURF COURSE TEMP PAVE	100.00	3,000.00
1B9	1,650.00	SY	8" PCC PAVE, NON REINF	31.00	51,150.00
1B10	2,762.00	SY	8-10" PCC PAVE, REINF	39.00	107,718.00
1B11	90.00	GAL	BIT TACK COAT	20.00	1,800.00
1B12	170.00	SY	SODDING	5.00	850.00

Additive Alternate No. 2 - Hanger B - Total Bid Amount: 304,000.00

Item No.	Approx. Quantities	Unit of Measure	Bid Item Description	Unit Bid Price	Extended Amount
1C1	1.00	LS	MOBILIZATION	25,000.00	25,000.00
1C2	1.00	LS	MAINT OF TRAFF	4,802.00	4,802.00
1C3	3,120.00	SY	REM BIT PAVE	5.00	15,600.00
1C4	1.00	EA	REM DRAINAGE STRUCT	1,000.00	1,000.00
1C5	141.00	LF	REM PIPE	15.00	2,115.00
1C6	1,250.00	CY	UNCLASS EXCAVA	7.00	8,750.00
1C7	420.00	LF	SILT FENCE	2.00	840.00
1C8	1,750.00	SY	8" PCC PAVE, NON REINF	30.00	52,500.00
1C9	93.00	SY	8" PCC PAVE, REINF	31.00	2,883.00
1C10	790.00	SY	8-10" PCC PAVE, NON REINF	37.00	29,230.00
1C11	325.00	SY	8-10" PCC PAVE, REINF	39.00	12,675.00
1C12	141.00	LF	18" CL IV RCP	55.00	7,755.00
1C13	1.00	EA	INLET TY A	3,500.00	3,500.00
1C14	1.00	EA	TEMP GATE	3,500.00	3,500.00
1C15	570.00	SY	SODDING	5.00	2,850.00

Additive Alternate No. 3 - Hanger C - Total Bid Amount: 173,000.00

Item No.	Approx. Quantities	Unit of Measure	Bid Item Description	Unit Bid Price	Extended Amount
1D1	204.00	LF	12" CLASS IV RCP	50.00	10,200.00
1D2	2.00	EA	INLET TY B	3,500.00	7,000.00
1D3	2.00	EA	NEENAH R-3475	400.00	800.00

Ineligible Items - Total Bid Amount: 18,000.00

Base Bid I - US Customs Pavement Reconstruction - Total Bid Amount: 1,033,000.00
Additive Alternate No. 1 - Hanger A - Total Bid Amount: 203,000.00
Additive Alternate No. 2 - Hanger B - Total Bid Amount: 304,000.00
Additive Alternate No. 3 - Hanger C - Total Bid Amount: 173,000.00
Ineligible Items - Total Bid Amount: 18,000.00

Base Bid - Hanger A - Hange B - Hanger C - Other - Total Bid Amount: 1,731,000.00

SITE CONCRETE, INC. certifies that the unit prices shown on this complete computer print-out for all of the bid items and the alternates contained in this proposal are the unit prices intended and that its bid will be tabulated using these unit prices and no other information from this print-out. SITE CONCRETE, INC. acknowledges and agrees that the total bid amount shown will be read as its total bid and further agrees that the official total bid amount will be determined by multplying the unit bid prices shown in this print-out by the respective estimated quantities shown in the proposal and then totaling all of the extended amounts.

Signed: Jean Boney

Title: President

Date: October 23, 2003

Ineligible Items

Item	Spec	Qty	Unit	Description Written Unit Price	Numeric Unit Price	Total Price
1.	D-701-2	204	LF	12" Class IV RCP ____ DOLLARS and ____ cents	$ ____	$ ____
2.	D-751-2	2	EA	Inlet Type B ____ DOLLARS and ____ cents	$ ____	$ ____
3.	SP-23	2	EA	Neenah R-3475 ____ DOLLARS and ____ cents	$ ____	$ ____
				Sub Total Additive Alternate No. 3		

Sub Total Base Bid I	$ 1,033,000.00
Sub Total Additive Alternate No. 1	$ 203,000.00
Sub Total Additive Alternate No. 2	$ 304,000.00
Sub Total Additive Alternate No. 3	$ 173,000.00
Sub Total Ineligible Items	$ 18,000.00

TOTAL BID ONE MILLION SEVEN HUNDRED THIRTY-ONE THOUSAND DOLLARS - NO CENTS $ 1,731,000.00

It is understood the quantities of work to be done at unit prices are approximate and are intended for bidding purposes only. Amounts are to be shown in both words and figures. In case of discrepancy the amount shown in words shall govern.

The Bidder shall fill out the Base Bid as well as all three Additive Alternate Bids. Failure to fill out all the bid schedules and additive alternates will be a reason to reject the bid.

Funding availability will be considered in selecting the bid schedules and alternates to be awarded.

Bidder hereby agrees to commence work under this contract on or before a date to be specified in a written "Notice to Proceed" and to fully complete the project within 154 calendar days thereafter. Bidder further agrees to pay as liquidated damages the sum of $1000.00 for each consecutive calendar day to complete the work beyond the allotted time or as extended by an approved Change Order.

Bidders understand the Owner/Agent reserves the right to reject any and all bids and to waive any information in the bidding. The bidder agrees this bid shall be good and may not be withdrawn for a period of 60 calendar days after the scheduled closing time for receiving bids.

Upon receipt of the written "Notice of Award", the bidder will execute the formal contract agreement within 14 days and deliver a surety bond or bonds as required under the contract documents. The bid security attached, two percent (2%) of the total bid price stated in the proposal, in the sum of
$ 2% GAB is to become the property of the Owner/Agent in the event the contract is not executed as set forth in the contract documents as liquidated damages for the delay and additional expense caused thereby.

Receipt is hereby acknowledged of the following addenda to the contract documents.

Addendum No. 1 dated 9-18 Received AD
Addendum No. 2 dated 9-26 Received AD
Addendum No. 3 dated 9-29 Received AD
Addendum No. 4 dated 10-8 Received AD
Addendum No. 5 dated 10-13-03 AD

Respectfully submitted

By: [signature] Title: President

Address: 3340 Roy Orr Blvd.
Grand Prairie, TX 75050

Agents must provide evidence of authority to Bind Corporation

AGREEMENT

AGREEMENT
BETWEEN TXDOT, AGENT FOR
TOWN OF ADDISON AND SITE CONCRETE, INC.
TxDOT CSJ NO: 0318ADDON; CONTRACT NO.: 3X2AV097

STATE OF TEXAS §
COUNTY OF TRAVIS §

KNOW ALL MEN BY THESE PRESENTS

This Agreement is made by and between the Town of Addison, hereinafter called "Sponsor", acting by and through the Texas Department of Transportation, hereinafter called "Agent" and Site Concrete, Inc. and contractor's executors, administrators, heirs, successors or assigns hereinafter called "Contractor".

The Sponsor desires to enter into a contract for airport improvement as is more fully described in the Contract Documents and Plans & Specifications in accordance with the provisions of the state statutes.

The Contractor has been engaged in and now does such work and represents that Contractor is fully equipped, competent, and capable of performing the desired and herein outlined work and is ready and willing to perform such work in accordance with the Contract Documents.

The Sponsor and the Contractor for and in consideration of the mutual covenants set forth, agree as follows:

WORK
Contractor shall furnish all the materials, supplies, tools, equipment, labor and other services necessary for the construction and completion of the work indicated in the Contract Documents.

The Project and general work is described as follows:
Pavement reconstruction of Apron A and Hangars A, B and C at the Addison Airport

ENGINEER
The Project has been designed by HNTB who is hereinafter called "Engineer" and who is to act as Agent's representative, assume all duties and responsibilities and have the rights and authority assigned to Engineer in the Contract Documents in connection with completion of the work in accordance with the Contract Documents.

DBE REQUIREMENTS
DBE participation goal in Disadvantaged Business Enterprise Contract Provisions, as found in the General Construction Contract Provisions, is set at 7% for this contract.

CONTRACT TIME

The Contractor will commence the work required by the Contract Documents on the date indicated on the Notice to Proceed and will complete the work within 154 calendar days unless the period for completion is extended in accordance with the Contract Documents. If the Contractor does not complete the work within the specified time, the CONTRACTOR agrees to pay as liquidated damages the sum of **$1,000.00** for each calendar day thereafter until the work is completed in accordance with the Contract Documents.

CONTRACT PRICE

The Contractor agrees to perform all the work described in the Contract Documents not to exceed the sum of **$1,731,000.00**(One million, seven hundred thirty one thousand dollars and 00/100), as described in the proposal as base bid, Add alternates 1-3, and Ineligible bid items.

CONTRACT DOCUMENTS

The term Contract Documents means and includes the following which are incorporated herein by reference as if fully reproduced:

A. Proposal
B. Agreement Between Sponsor and Contractor
C. Performance Bond
D. Payment Bond
E. Bid Bond
F. Child Support Statement
G. Special Provisions
H. Disadvantaged Business Enterprises
I. Required Language in Proposals for AIP
J. Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion
K. Certification of Bidder Regarding Equal Employment Opportunity
L. Special Instructions to Bidders Regarding EEO
M. Technical Specifications
N. Geotechnical Report
O. Drawing Index
P. Wage Rates
Q. Addenda
R. General Construction Contract Provisions, Volume dated September 1997 (Available at TxDOT, Aviation Division, 150 E. Riverside Dr., South Tower, 5th Floor, Austin, Texas 78704)

DRAWINGS

Drawings, original numbered 1 through 32 and dated May 13, 2003, and Specifications, dated May 28, 2003 were prepared by the Engineer.

PAYMENT
The AGENT will pay the Contractor in the manner and at such times and in such amounts as required by the Contract Documents.

The Contractor expressly warrants that no third person has been employed to solicit or obtain this contract in Contractor's behalf, or to cause or procure the same to be obtained upon compensation in any way contingent, in whole or in part, upon such procurement, or in compensation for services in connection therewith, any brokerage commission or percentage upon the amount receivable by Contractor hereunder, and that Contractor has not in estimating the contract price demanded, included any sum by reason of any such brokerage, commission or percentage; and that all monies payable to Contractor hereunder are free from all obligations of any other person for services rendered, or supposed to have been rendered, in the procurement of this contract. Contractor further agrees that any breach of this warranty shall constitute adequate cause for the annulment of this contract or for the deduction from any sums due or to become due thereunder an amount equal to any brokerage, commission or percentage so paid or agreed to be paid or both.

It is acknowledged and agreed by the parties hereto that this contract is the full and complete contract for the construction of the work called for and described herein.

The Contractor hereby certifies that all franchise taxes are paid and in good standing or that Contractor is not subject to franchise taxes.

This Agreement shall be binding upon all parties hereto and their respective heirs, executors, administrators, successors, and assigns.

IN WITNESS WHEREOF, the parties hereto have executed, or caused to be executed by their duly authorized officials this agreement in triplicate, each of which shall be deemed an original on the date first written above.

CONTRACTOR

Name: JEAN S BONEY
Contractor (Print Name)

PRESIDENT
Title

Signature of Contractor

12/22/03
Date

3340 ROY ORR BLVD
Address:
GRAND PRAIRIE, TX 75050

Phone Number: 972-313-0733

Fax Number: 972-313-3146

THE STATE OF TEXAS

COUNTY OF DALLAS

Before me, the undersigned authority, on this day personally appeared JEAN S BONEY to be the Contractor named in this contract, and is the person whose name is subscribed to the foregoing instrument and acknowledged to me that he/she has authority to execute and has executed the same for the purposes and consideration therein expressed.

Given under my hand and seal of office this 22nd day of DEC A.D. 2003.

JODIE C. COUCH
MY COMMISSION EXPIRES
October 12, 2006

Notary Public, State of Texas

JODIE C COUCH
(Printed or typed name)

My Commission expires 10-12-06

Acceptance by the State:

Executed by and approved for the Texas Transportation Commission, agent for Sponsor, for the purpose and effect of activating and/or carrying out the orders, established policies, or work programs heretofore approved and authorized by the Texas Transportation Commission.

By: Laura Wiedemann Date: 1/7/04

PERFORMANCE BOND

CONTRACT NO. 3X2AV097
COUNTY Dallas
BOND NO. SU1004196

PERFORMANCE BOND

KNOW ALL PERSONS BY THESE PRESENTS: That we

Site Concrete, Inc as principal, and the other undersigned as surety, are held and firmly bound unto the State of Texas, in the penal sum of One million seven hundred thirty one thousand and 00/100

Dollars ($ 1,731,000.00) lawful money of the United States, well and truly to be paid tothe State of Texas, and we bind ourselves, our heirs, successors, executors, and administrators jointly and severally, firmly by these presents.

Whereas, the above bounden principal has entered into the foregoing contract with the State of Texas attached hereto, and whereas, under the law said PRINCIPAL is required before commencing the work provided for in said contract to execute a bond in the amount of said contract

Now, therefore, the condition of this obligation is such that if the above bounden principal, his or its heirs, successors, executors, and administrators shall well and faithfully do and perform each and every, all and singular, the work in accordance with the plans, specifications, and contract documents a provided in said contract aforesaid, and shall fully indemnify and save harmless the State of Texas from all costs and damages which the State of Texas may suffer by reason of the PRINCIPALS'S default or failure to do so and shall fully reimburse and repay the State of Texas all outlay and expense which the State of Texas may incur in making good any such default, then obligation shall be null and void, otherwise it shall remain in full force and effect.

Provided further, that the said surety(s) for value received, hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the Contract, or to the work to be performed thereunder, or the Specifications accompanying the same, shall in anywise affect its obligation on this bond. The surety(s) does hereby waive notice of any such change, extension of time, alteration or addition, to the terms of the Contract or to the work or to the Specifications, unless otherwise specified in the contract.

WITNESS our hand this the 19th day of December, 2003.

Arch Insurance Company
SURETY (Print Firm Name and Seal)

By: Michael B. Hill (Signature) Attorney-in-fact

William D. Baldwin
TEXAS RESIDENT AGENT

1201 Kas Dr. Ste. B
Address
Richardson TX 75081
City/State/Zip

Site Concrete, Inc
By: Contractor

By: (Signature) JEAN S BONEY-PRESIDENT

Arch Reinsurance Company
SURETY (Print Firm Name and Seal)

BY: Michael B. Hill
(Signature)
Michael B. Hill, Attorney-in-fact

*Note: A Power of Attorney, showing that the surety officer or Attorney-in-Fact has authority to sign such obligation, must be impressed with the corporate seal and attached behind the Payment Bond in each contract. This form has been approved by the ATTORNEY GENERAL OF TEXAS & TEXAS DEPT. OF INSURANCE.

PAYMENT BOND

CONTRACT NO. 3X2AV097
COUNTY Dallas
BOND NO. 34100496

PAYMENT BOND

KNOW ALL PERSONS BY THESE PRESENTS: That we

Site Concrete, Inc as principal, and the other undersigned as surety, are held and firmly bound unto the State of Texas, in the penal sum of one million seven hundred thirty one thousand & 00/100 Dollars ($ 1,731,000.00) lawful money of the United States, well and truly to be paid to the State of Texas, and we bind ourselves, our heirs, successors, executors, and administrators jointly and severally, firmly by these presents.

Whereas, the above bounden principal has entered into the foregoing contract with the State of Texas attached hereto, and whereas, under the law said PRINCIPAL is required before commencing the work provided for in said contract to execute a bond in the amount of said contract solely for the protection of all claimants, as defined by the Texas Government Code Title 10, Chapter 2253, or successor statutes, in the prosecution of the work provided for in said contract supplying labor and materials as defined by law, in the prosecution of the work provided for in said contract, for the use of each such claimant

The condition of this obligation is such that if the above bounden principal, his or its heirs, successors, executors, and administrators shall well and faithfully make payment to each and every claimant as defined by law, supplying labor and materials as defined by law, in the prosecution of the work provided for in said contract and any and all duly authorized changes to said contract that may hereafter be made, notice of such changes to the SURETY(S) being hereby waived, then this obligation shall be null and void, otherwise it shall remain in full force and effect.

WITNESS our hand this the 19th day of December, 2023.

Arch Insurance Company
SURETY (Print Firm Name and Seal)

By: Michael B. Hill (Signature) Attorney-in-Fact

William D. Baldwin
TEXAS RESIDENT AGENT

1201 Kas Dr, Ste B
Address

Richardson TX 75081
City/State/Zip

Site Concrete, Inc.
By: Contractor

By: (Signature) JEAN SBONEY-PRESIDENT

Arch Reinsurance Company
SURETY (Print Firm Name and Seal)

BY: (Signature)

Michael B. Hill, Attorney-in-Fact

*Note: A Power of Attorney, showing that the surety officer or Attorney-in-Fact has authority to sign such obligation, must be impressed with the corporate seal and attached behind the Payment Bond in each contract. This form has been approved by the ATTORNEY GENERAL OF TEXAS & TEXAS DEPT. OF INSURANCE.

POWER OF ATTORNEY

Know All Men By These Presents:

That the Arch Insurance Company, a corporation organized and existing under the laws of the State of Missouri, having its principal office in Kansas City, Missouri (hereinafter referred to as the "Company") does hereby appoint

Michael B. Hill, Cindy Fowler, William D. Baldwin, and Suzanne C. Bladwin of Richardson, TX (EACH)

its true and lawful Attorney(s)-in-Fact, to make, execute, seal, and deliver from the date of issuance of this power for and on its behalf as surety, and as its act and deed:

Any and all bonds and undertakings

EXCEPTION: NO AUTHORITY is granted to make, execute, seal and deliver bonds or undertakings that guarantee the payment or collection of any promissory note, check, draft or letter of credit.

This authority does not permit the same obligation to be split into two or more bonds in order to bring each such bond within the dollar limit of authority as set forth herein.

The Company may revoke this appointment at any time.

The execution of such bonds and undertakings in pursuance of these presents shall be as binding upon the said Company as fully and amply to all intents and purposes, as if the same had been duly executed and acknowledged by its regularly elected officers at its principal office in Kansas City, Missouri.

This Power of Attorney is executed by authority of resolutions adopted by unanimous consent of the Board of Directors of the Company on March 3, 2003, true and accurate copies of which are hereinafter set forth and are hereby certified to by the undersigned Secretary as being in full force and effect:

"VOTED, That the Chairman of the Board, the President, or any Vice President, or their appointees designated in writing and filed with the Secretary, or the Secretary shall have the power and authority to appoint agents and attorneys-in-fact, and to authorize them to execute on behalf of the Company, and attach the seal of the Company thereto, bonds and undertakings, recognizances, contracts of indemnity and other writings, obligatory in the nature thereof, and any such officers of the Company may appoint agents for acceptance of process."

This Power of Attorney is signed, sealed and certified by facsimile under and by authority of the following resolution adopted by the unanimous consent of the Board of Directors of the Company on March 3, 2003:

VOTED, That the signature of the Chairman of the Board, the President, or any Vice President, or their appointees designated in writing and filed with the Secretary, and the signature of the Secretary, the seal of the Company, and certifications by the Secretary, may be affixed by facsimile on any power of attorney or bond executed pursuant to the resolution adopted by the Board of Directors on March 3, 2003, and any such power so executed, sealed and certified with respect to any bond or undertaking to which it is attached, shall continue to be valid and binding upon the Company.

In Testimony Whereof, the Company has caused this instrument to be signed and its corporate seal to be affixed by their authorized officers, this 23rd day of May, 2003.

Arch Insurance Company

Attested and Certified

Arch Insurance Company CORPORATE SEAL 1971 Missouri

Joseph S. Labell, Corporate Secretary

Thomas P. Luckstone, Vice President

STATE OF CONNECTICUT SS

COUNTY OF FAIRFIELD SS

I Melissa B. Gilligan, a Notary Public, do hereby certify that Thomas P. Luckstone and Joseph S. Labell personally known to me to be the same persons whose names are respectively as Vice President and Corporate Secretary of the Arch Insurance Company, a Corporation organized and existing under the laws of the State of Missouri, subscribed to the foregoing instrument, appeared before me this day in person and severally acknowledged that they being thereunto duly authorized signed, sealed with the corporate seal and delivered the said instrument as the free and voluntary act of said corporation and as their own free and voluntary acts for the uses and purposes therein set forth.

OFFICIAL SEAL
MELISSA B. GILLIGAN, Notary Public
State of Connecticut
My Commission Expires February 28, 2005

Melissa B. Gilligan, Notary Public
My commission expires 2-28-05

CERTIFICATION

I, Joseph S. Labell, Corporate Secretary of the Arch Insurance Company, do hereby certify that the attached Power of Attorney dated May 23, 2003 on behalf of the person(s) as listed above is a true and correct copy and that the same has been in full force and effect since the date thereof and is in full force and effect on the date of this certificate; and I do further certify that the said Thomas P. Luckstone, who executed the Power of Attorney as Vice President, was on the date of execution of the attached Power of Attorney the duly elected Vice President of the Arch Insurance Company.

IN TESTIMONY WHEREOF, I have hereunto subscribed my name and affixed the corporate seal of the Arch Insurance Company on this 19th day of December, 2003.

Joseph S. Labell, Corporate Secretary

This Power of Attorney limits the acts of those named therein to the bonds and undertakings specifically named therein and they have no authority to bind the Company except in the manner and to the extent herein stated.

Arch Insurance Company CORPORATE SEAL 1971 Missouri

Home Office: Kansas City, MO

00ML0013 00 03 03

POWER OF ATTORNEY

Know All Men By These Presents:

That Arch Reinsurance Company, a corporation organized and existing under the laws of the State of Nebraska, having its home office in Omaha, Nebraska (hereinafter referred to as the "Company") does hereby appoint

Michael B. Hill, Cindy Fowler, William D. Baldwin and Glenn E. Ganci of Richardson, TX (EACH)

its true and lawful Attorney(s)-in-Fact, to make, execute, seal, and deliver from the date of issuance of this power for and on its behalf as surety, and as its act and deed:

Any and all bonds and undertakings

EXCEPTION: NO AUTHORITY is granted to make, execute, seal and deliver bonds or undertakings that guarantee the payment or collection of any promissory note, check, draft or letter of credit.

The Company may revoke this appointment at any time.

The execution of such bonds and undertakings in pursuance of these presents shall be as binding upon the said Company as fully and amply to all intents and purposes, as if the same had been duly executed and acknowledged by its regularly elected officers at its principal office in Omaha, Nebraska.

This Power of Attorney is executed by authority of resolutions adopted by unanimous consent of the Board of Directors of the Company on June 13, 2003, true and accurate copies of which are hereinafter set forth and are hereby certified to by the undersigned Secretary as being in full force and effect:

"VOTED, That the Chairman of the Board, the Managing Director, or any Vice President, or their appointees designated in writing and filed with the Secretary, or the Secretary shall have the power and authority to appoint agents and attorneys-in-fact, and to authorize them to execute on behalf of the Company, and attach the seal of the Company thereto, bonds and undertakings, recognizances, contracts of indemnity and other writings, obligatory in the nature thereof, and any such officers of the Company may appoint agents for acceptance of process."

This Power of Attorney is signed, sealed and certified by facsimile under and by authority of the following resolution adopted by the unanimous consent of the Board of Directors of the Company on June 13, 2003:

VOTED, That the signature of the Chairman of the Board, the Managing Director, or any Vice President, or their appointees designated in writing and filed with the Secretary, and the signature of the Secretary, the seal of the Company, and certifications by the Secretary, may be affixed by facsimile on any power of attorney or bond executed pursuant to the resolution adopted by the Board of Directors on June 13, 2003, and any such power so executed, sealed and certified with respect to any bond or undertaking to which it is attached, shall continue to be valid and binding upon the Company.

In Testimony Whereof, the Company has caused this instrument to be signed and its corporate seal to be affixed by their authorized officers, this 5th day of September, 20 03.

Arch Reinsurance Company

Attested and Certified

John F. Rathgeber, Managing Director and Chief Operating Officer

Mathilda A. Oostveen, Corporate Secretary

STATE OF NEW JERSEY SS

COUNTY OF MORRIS SS

I Elizabeth A. Rizzolo, a Notary Public, do hereby certify that John F. Rathgeber and Mathilda A.Oostveen personally known to me to be the same persons whose names are respectively as Managing Director and Chief Operating Officer and Corporate Secretary of Arch Reinsurance Company, a Corporation organized and existing under the laws of the State of Nebraska, subscribed to the foregoing instrument, appeared before me this day in person and severally acknowledged that they being thereunto duly authorized signed, sealed with the corporate seal and delivered the said instrument as the free and voluntary act of said corporation and as their own free and voluntary acts for the uses and purposes therein set forth.

ELIZABETH A. RIZZOLO
Notary Public of New Jersey
My Commission Expires
Aug

Elizabeth A. Rizzolo, Notary Public of New Jersey
My commission expires 8-21-06

CERTIFICATION

I, Mathilda A. Oostveen, Corporate Secretary of Arch Reinsurance Company, do hereby certify that the attached Power of Attorney dated September 5, 2003 on behalf of the person(s) as listed above is a true and correct copy and that the same has been in full force and effect since the date thereof and is in full force and effect on the date of this certificate; and I do further certify that the said John F. Rathgeber, who executed the Power of Attorney as Managing Director and Chief Operating Officer, was on the date of execution of the attached Power of Attorney the duly elected Managing Director and Chief Operating Officer of Arch Reinsurance Company.

IN TESTIMONY WHEREOF, I have hereunto subscribed my name and affixed the corporate seal of Arch Reinsurance Company on this 19th day of December, 20 03.

Mathilda A. Oostveen, Corporate Secretary

This Power of Attorney limits the acts of those named therein to the bonds and undertakings specifically named therein and they have no authority to bind the Company except in the manner and to the extent herein stated.

HOME OFFICE: Omaha, Nebraska

00ML0013 00 03 03

Printed in U.S.A.

IMPORTANT NOTICE

TO OBTAIN INFORMATION OR TO MAKE A COMPLAINT

You may contact the Texas Department of Insurance to obtain information on companies, coverages, rights or complaints at

1-800-252-3439

You may write the Texas Department of Insurance:

P.O. Box 149104
Austin, Texas 78714-9104
FAX No. (512) 475-1771

PREMIUM OR CLAIM DISPUTES

Should you have a dispute concerning your premium or about a claim, you should contact the company first. If the dispute is not resolved, you may contact the Texas Department of Insurance.

ATTACH THIS NOTICE TO YOUR POLICY

This notice is for information only and does not become a part or condition of the attached document.

BID BOND

THE AMERICAN INSTITUTE OF ARCHITECTS

AIA Document A310

Bid Bond

KNOW ALL MEN BY THESE PRESENTS, that we
(Here insert full name and address or legal title of Contractor)
Site Concrete, Inc.
3340 Roy Orr Blvd., Grand Prairie, Texas 75050
as Principal, hereinafter called the Principal, and
(Here insert full name and address or legal title of Surety)
Arch Insurance Company and Insurance Company of the West
12377 Merit Dr. , Dallas, Texas 75251
a corporation duly organized under the laws of the State of **Missouri & California**
as Surety, hereinafter called the Surety, are held and firmly bound unto
(Here insert full name and address or legal title of Owner)
Texas Department of Transportation,
Agent for the Town of Addison, 5350 Belt Line Rd., Dallas, TX, 75254
as Obligee, hereinafter called the Obligee, in the sum of Two percent of the greatest amount bid
Dollars ($2% G.A.B.),
for the payment of which sum well and truly to be made, the said Principal and the said Surety, bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, The Principal has submitted a bid for
(Here insert full name, address and description of project)
Construction of Airport Improvements at the Addison Airport TXDOT CSJ No. 0318ADDON

NOW, THEREFORE, if the Obligee shall accept the bid of the Principal and the Principal shall enter into a Contract with the Obligee in accordance with the terms of such bid, and give such bond or bonds as may be specified in the bidding or Contract Documents with good and sufficient surety for the faithful performance of such Contract and for the prompt payment of labor and material furnished in the prosecution thereof, or in the event of the failure of the Principal to enter such Contract and give such bond or bonds, if the Principal shall pay to the Obligee the difference not to exceed the penalty hereof between the amount specified in said bid and such larger amount for which the Obligee may in good faith contract with another party to perform the Work covered by said bid, then this obligation shall be null and void, otherwise to remain in full force and effect.

Signed and sealed this 23rd day of **October, 2003**

(Witness)

Site Concrete, Inc.
(Principal) *(Seal)*

Joseph S. Boney (Title) President

(Witness)

Arch Insurance Company and Insurance Company of the West
(Surety) *(Seal)*

(Title)
Michael B. Hill, Attorney-In-Fact

POWER OF ATTORNEY

Know All Men By These Presents:

That the Arch Insurance Company, a corporation organized and existing under the laws of the State of Missouri, having its principal office in Kansas City, Missouri (hereinafter referred to as the "Company") does hereby appoint

Michael B. Hill, Cindy Fowler, William D. Baldwin, and Suzanne C. Bladwin of Richardson, TX (EACH)

its true and lawful Attorney(s)-in-Fact, to make, execute, seal, and deliver from the date of issuance of this power for and on its behalf as surety, and as its act and deed:

Any and all bonds and undertakings

EXCEPTION: NO AUTHORITY is granted to make, execute, seal and deliver bonds or undertakings that guarantee the payment or collection of any promissory note, check, draft or letter of credit.

This authority does not permit the same obligation to be split into two or more bonds in order to bring each such bond within the dollar limit of authority as set forth herein.

The Company may revoke this appointment at any time.

The execution of such bonds and undertakings in pursuance of these presents shall be as binding upon the said Company as fully and amply to all intents and purposes, as if the same had been duly executed and acknowledged by its regularly elected officers at its principal office in Kansas City, Missouri.

This Power of Attorney is executed by authority of resolutions adopted by unanimous consent of the Board of Directors of the Company on March 3, 2003, true and accurate copies of which are hereinafter set forth and are hereby certified to by the undersigned Secretary as being in full force and effect:

"VOTED, That the Chairman of the Board, the President, or any Vice President, or their appointees designated in writing and filed with the Secretary, or the Secretary shall have the power and authority to appoint agents and attorneys-in-fact, and to authorize them to execute on behalf of the Company, and attach the seal of the Company thereto, bonds and undertakings, recognizances, contracts of indemnity and other writings, obligatory in the nature thereof, and any such officers of the Company may appoint agents for acceptance of process."

This Power of Attorney is signed, sealed and certified by facsimile under and by authority of the following resolution adopted by the unanimous consent of the Board of Directors of the Company on March 3, 2003:

VOTED, That the signature of the Chairman of the Board, the President, or any Vice President, or their appointees designated in writing and filed with the Secretary, and the signature of the Secretary, the seal of the Company, and certifications by the Secretary, may be affixed by facsimile on any power of attorney or bond executed pursuant to the resolution adopted by the Board of Directors on March 3, 2003, and any such power so executed, sealed and certified with respect to any bond or undertaking to which it is attached, shall continue to be valid and binding upon the Company.

In Testimony Whereof, the Company has caused this instrument to be signed and its corporate seal to be affixed by their authorized officers, this 23rd day of May, 2003.

Arch Insurance Company

Attested and Certified

Joseph S. Labell, Corporate Secretary

Thomas P. Luckstone, Vice President

STATE OF CONNECTICUT SS

COUNTY OF FAIRFIELD SS

I Melissa B. Gilligan, a Notary Public, do hereby certify that Thomas P. Luckstone and Joseph S. Labell personally known to me to be the same persons whose names are respectively as Vice President and Corporate Secretary of the Arch Insurance Company, a Corporation organized and existing under the laws of the State of Missouri, subscribed to the foregoing instrument, appeared before me this day in person and severally acknowledged that they being thereunto duly authorized signed, sealed with the corporate seal and delivered the said instrument as the free and voluntary act of said corporation and as their own free and voluntary acts for the uses and purposes therein set forth.

OFFICIAL SEAL
MELISSA B. GILLIGAN, Notary Public
State of Connecticut
My Commission Expires February 28, 2005

Melissa B. Gilligan, Notary Public
My commission expires 2-28-05

CERTIFICATION

I, Joseph S. Labell, Corporate Secretary of the Arch Insurance Company, do hereby certify that the attached Power of Attorney dated May 23, 2003 on behalf of the person(s) as listed above is a true and correct copy and that the same has been in full force and effect since the date thereof and is in full force and effect on the date of this certificate; and I do further certify that the said Thomas P. Luckstone, who executed the Power of Attorney as Vice President, was on the date of execution of the attached Power of Attorney the duly elected Vice President of the Arch Insurance Company.

IN TESTIMONY WHEREOF, I have hereunto subscribed my name and affixed the corporate seal of the Arch Insurance Company on this 23rd day of October, 2003.

Joseph S. Labell, Corporate Secretary

This Power of Attorney limits the acts of those named therein to the bonds and undertakings specifically named therein and they have no authority to bind the Company except in the manner and to the extent herein stated.

Home Office: Kansas City, MO

00ML0013 00 03 03

ICW GROUP
Power of Attorney
Insurance Company of the West
The Explorer Insurance Company Independence Casualty and Surety Company

KNOW ALL MEN BY THESE PRESENTS: That Insurance Company of the West, a Corporation duly organized under the laws of the State of California, The Explorer Insurance Company, a Corporation duly organized under the laws of the State of Arizona, and Independence Casualty and Surety Company, a Corporation duly organized under the laws of the State of Texas, (collectively referred to as the "Companies"), do hereby appoint

GLENN E. GANCI, MICHAEL B. HILL, WILLIAM D. BALDWIN, CINDY FOWLER

their true and lawful Attorney(s)-in-Fact with authority to date, execute, sign, seal, and deliver on behalf of the Companies, fidelity and surety bonds, undertakings, and other similar contracts of suretyship, and any related documents.

IN WITNESS WHEREOF, the Companies have caused these presents to be executed by its duly authorized officers this 16th day of January, 2001.

INSURANCE COMPANY OF THE WEST
THE EXPLORER INSURANCE COMPANY
INDEPENDENCE CASUALTY AND SURETY COMPANY

John H. Craig, Assistant Secretary

John L. Hannum, Executive Vice President

State of California
County of San Diego } ss.

On January 16, 2001, before me, Norma Porter, Notary Public, personally appeared John L. Hannum and John H. Craig, personally known to me to be the persons whose names are subscribed to the within instrument, and acknowledged to me that they executed the same in their authorized capacities, and that by their signatures on the instrument, the entity upon behalf of which the persons acted, executed the instrument.

Witness my hand and official seal.

NORMA PORTER
COMM. #1257540
NOTARY PUBLIC-CALIFORNIA
SAN DIEGO COUNTY
My Commission Expires
MARCH 19, 2004

Norma Porter, Notary Public

RESOLUTIONS

This Power of Attorney is granted and is signed, sealed and notarized with facsimile signatures and seals under authority of the following resolutions adopted by the respective Boards of Directors of each of the Companies:

"RESOLVED: That the President, an Executive or Senior Vice President of the Company, together with the Secretary or any Assistant Secretary, are hereby authorized to execute Powers of Attorney appointing the person(s) named as Attorney(s)-in-Fact to date, execute, sign, seal, and deliver on behalf of the Company, fidelity and surety bonds, undertakings, and other similar contracts of suretyship, and any related documents.

RESOLVED FURTHER: That the signatures of the officers making the appointment, and the signature of any officer certifying the validity and current status of the appointment, may be facsimile representations of those signatures; and the signature and seal of any notary, and the seal of the Company, may be facsimile representations of those signatures and seals, and such facsimile representations shall have the same force and effect as if manually affixed. The facsimile representations referred to herein may be affixed by stamping, printing, typing, or photocopying."

CERTIFICATE

I, the undersigned, Assistant Secretary of Insurance Company of the West, The Explorer Insurance Company, and Independence Casualty and Surety Company, do hereby certify that the foregoing Power of Attorney is in full force and effect, and has not been revoked, and that the above resolutions were duly adopted by the respective Boards of Directors of the Companies, and are now in full force.

IN WITNESS WHEREOF, I have set my hand this 23rd day of October, 2003.

John H. Craig, Assistant Secretary

To verify the authenticity of this Power of Attorney you may call 1-800-877-1111 and ask for the Surety Division. Please refer to the Power of Attorney Number, the above named individual(s) and details of the bond to which the power is attached. For information or filing claims, please contact Surety Claims, ICW Group, 11455 El Camino Real, San Diego, CA 92130-2045 or call (858) 350-2400.

CHILD SUPPORT STATEMENT

CHILD SUPPORT STATEMENT
FOR NEGOTIATED CONTRACTS AND GRANTS

Under Section 231.006, Family Code, the vendor or applicant certifies that the individual or business entity named in this contract, bid, or application is eligible to receive the specified grant, loan, or payment and acknowledges that this contract may be terminated and payment may be withheld if this certification is inaccurate.

List below the name and social security number of the individual or sole proprietor and each partner, shareholder, or owner with an ownership interest of at least 25% of the business entity submitting the bid or application.

JEAN S BONEY 455-96-1834

JM BONEY 465-80-7432

Section 231.006, Family Code, specifies that a child support obligor who is more than 30 days delinquent in paying child support and a business entity in which the obligor is a sole proprietor, partner, shareholder, or owner with an ownership interest of at least 25 percent is not eligible to receive payments from state funds under a contract to provide property, materials, or services; or receive a state-funded grant or loan.

A child support obligor or business entity ineligible to receive payments described above remains ineligible until all arreage have been paid or the obligor is in compliance with a written repayment agreement or court order as to any existing delinquency.

Except as provided by Section 231.302(d), Family Code, a social security number is confidential and may be disclosed only for the purposes of responding to a request for information from an agency operating under the provisions of Parts A and D of Title IV of the federal Social Security Act (42 USC Section 601-617 and 651-669).

GSD, 10-95

SPECIAL PROVISIONS

SPECIAL PROVISIONS

The following Special Provisions modify, amplify, or amend the General Provisions with respect to the clauses cited below and no other clauses or requirements of these items are waived or changed hereby. The Special Provisions shall take precedence over the General Provisions.

SP-1. Modify SECTION 10 - DEFINITION OF TERMS as follows:

In Paragraph 10-18 ENGINEER, add the following:

> The engineer shall be understood to be the Engineer of the Owner or the Owner's duly authorized representative.

In Paragraph 10-30 OWNER (SPONSOR), add the following:

> The Owner shall be acting by and through the Texas Department of Transportation.

Add Paragraph 10-48 AGENT as follows:

> The Agent is the Texas Department of Transportation acting as the "Agent" of the Owner in accordance with the duly executed Airport Project Participation Agreement.

Add Paragraph 10-49 DEPARTMENTAL MATERIALS SPECIFICATION D-9-6230 as follows:

> The Departmental Material Specification D-9-6230 refers to the Texas Department of Transportation, Materials and Tests Division, Departmental Materials Specification: D-9-6230,"Silt Fence".

SP-2. Modify Section 20 - PROPOSAL REQUIREMENTS AND CONDITIONS as follows:

In Paragraph 20-02 PREQUALIFICATION OF BIDDERS,

A. State Highway Division shall mean Texas Department of Transportation.

B. Add the following paragraph:

> Each bidder shall submit written evidence from the State Comptroller's Office that all applicable franchise taxes owed the State of Texas have been paid.

C. Delete the following paragraph:

Each bidder shall submit "evidence of competency" and "evidence of financial responsibility" to the owner no later than 10 days prior to the specified date for opening bids.

D. Add the following paragraph:

Each bidder shall submit "evidence of competency", "evidence of financial responsibility", and "evidence of franchise tax payment" to the Agent at the date, time, and location specified for opening bids. These items of evidence shall be submitted in an envelope identifying the bidder and marked "Bidder Qualification Statement". Qualifications will be submitted separately from the sealed proposal. The Owner reserves the right to refuse any proposal not accompanied by the "Bidder Qualification Statement".

In Paragraph 20-03 CONTENTS OF PROPOSAL FORMS change first paragraph as follows:

TxDOT shall furnish bidders with proposal forms. All papers with the proposal forms are necessary parts. Bidders may use electronically printed proposal forms given that the format is identical in wording and order as that of the proposal provided by TxDOT.

In Paragraph 20-07 PREPARATION OF PROPOSAL change the first sentence to read as follows:

The bidder shall submit his/her proposal on the forms furnished by the owner or on electronically printed forms as required by SP 20-03.

In paragraph 20-08 IRREGULAR PROPOSALS change paragraph (a) to read as follows:

(a) If the proposal is on a form other than that furnished by the owner, not including electronically printed forms as required in SP 20-03, or if the owner's form is altered, or if any pages are missing.

Add paragraph 20-08 (f) as follows:

(f) If the electronically printed form does not have identical wording for pay items or the order of the items differ from that of the owner provided form

SP-3. Modify SECTION 30 - AWARD AND EXECUTION OF CONTRACT as follows:

In Paragraph 30-02 AWARD OF CONTRACT, change the first sentence to read:

A. The award of a contract, if it is to be awarded, shall be made within 60 calendar days of the date specified for publicly opening proposals, unless otherwise specified herein. No award shall be made until TxDOT has concurred in the owner's recommendation to make such award and has approved the owner's proposed contract to the extent that such concurrence and approval are required by 49 CFR Part 26.

The Bidder shall also submit within the 15 days, a list of all supplies and subcontractors that quoted on the contract. This list shall include names, addresses, telephone numbers and type(s) of work quoted.

B. As the 76th Legislature amended Section 231.006, Family Code as follows:

Section 14.52 INELIGIBILITY TO RECEIVE STATE GRANTS OR LOANS OR BID ON STATE CONTRACTS

A child support obligator who is 30 or more days delinquent in paying child support is not eligible to:

1. Enter into a contract to provide property, materials or services under a contract with the state; or

2. Receive a state-funded grant or loan

The statue required each proposer for a state contract or applicant for a state funded loan or grant to submit a signed, sworn statement accompanying the proposal or offer or application affirming that the proposer or applicant is not 30 or more days delinquent in providing child support under a court order or a written repayment agreement.

Completion of the form title: CHILD SUPPORT STATEMENT FOR NEGOTIATED CONTRACTS AND GRANTS is necessary before execution of a contract.

Add to Section 30-08 FAILURE TO EXECUTE CONTRACT

Should the bidder to whom the contract is awarded refuse or neglect to execute the contract, bonds, and Certificate of Insurance, and furnish DBE/HUB information

and the list of quoting suppliers and subcontractors within 14 days after written notification of the award of the contract, the proposal guaranty filed with the bid shall become the property of the State, not as a penalty, but as liquidated damages. A bidder who forfeits his/her proposal guaranty in accordance with this article will not be considered in future proposals for the same work unless there has been a substantial change in design of the project subsequent to the forfeiture of the proposal guaranty.

Add to Paragraph 30-09 BEGINNING OF WORK as follows:

If a Storm Water Pollution Prevention Plan (SW3P) is included in this project, the Contractor, and all subcontractors implementing any measure identified on the SW3P, must submit to the Engineer a signed copy of the certification statement as described in Part IV.E.2 of the National Pollutant Discharge Elimination System permit (40 CFR Part 122) and in the Special Provision, SP-9 "Certification of NPDES Permit", no later than 48 hours prior to beginning work. The Contractor must participate in a pre-construction conference before work can begin, at which time these certifications will be required.

Add to Paragraph 30-10 CERTIFICATE OF INSURANCE as follows:

Within 14 days after receipt of written notification of conditional award of the contract the bidder shall furnish to the Aviation Division the TxDOT - Aviation Division Certificate of Insurance form covering the below listed insurance coverage's:

A. Worker's Compensation Insurance Amount - Statutory

B. Commercial General Liability Amount -
$500,000 combined single limit

C. Texas Business Automobile Amount - Bodily Injury -
$200,000 each person; - $500,000 each occurrence

D. Property Damage -
$20,000 each occurrence

This insurance shall be kept in force until the work described in this contract has been completed and accepted by the Department. If for any reason insurance coverage is not kept in force, all work will be stopped until an acceptable Certificate of Insurance is provided to the Department.

The Texas Department of Transportation (TxDOT) shall be included as an "Additional Insured" by Endorsement to policies issued for coverage's listed in B and C above. A "Waiver of Subrogation Endorsement" in favor of TxDOT shall be a part of each policy for coverage's listed in A, B and C above.

SP-4. Modify SECTION 40 - SCOPE OF WORK as follows:

In Paragraph 40-02 ALTERATION OF WORK AND QUANTITIES, add the following:

For AIP contracts all supplemental agreements shall be approved by TxDOT and shall include valid wage determinations of the U.S. Secretary of Labor when the amount of the supplemental agreement exceeds $2000. However, if the contractor elects to waive the limitations on work that increases or decreases the originally awarded contract or any major contract item by more than 25 percent, the supplemental agreement shall be subject to the same U.S. Secretary of Labor wage determination as was included in the originally awarded contract.

All supplemental agreements shall require consent of the Contractor's surety and separate performance and payment bonds.

SP-5. Modify SECTION 50 - CONTROL OF WORK as follows:

In Paragraph 50-02 CONFORMITY WITH PLANS AND SPECIFICATIONS, add the following to subparagraph 3:

All quality assurance costs associated with replacing or otherwise correcting any work item determined to be unacceptable shall be borne by the Contractor.

In Paragraph 50-02 CONFORMITY WITH PLANS AND SPECIFICATIONS, add the following paragraph:

If it is found that the material furnished, work performed, or the finished product is not in close conformity with the plans and specifications, the Contractors shall bear all the expenses of such recover, exposure, observation, inspection and testing and of satisfactory reconstruction including compensation for additional professional services and retesting, and an appropriate deductive change order shall be issued.

Modify Section 50-05 COOPERATION BETWEEN CONTRACTORS as follows:

The owner reserves the right to contract for and perform other or additional work

on or near the work covered by this contract.

Each Contractor involved shall assume all liability, financial or otherwise, in connection with his/her contract and shall protect and save harmless the owner from any and all damages or claims that may arise because of inconvenience, delays, or loss experienced by him because of the presence and operations of other Contractors working within the limits of the same project.

The Contractor shall arrange his/her work and shall place and dispose of the materials being used so as not to interfere with the operations of the other Contractors within the limits of the same project. He shall join his/her work with that of the others in an acceptable manner and shall perform it in proper sequence to that of the others.

SP-6. Add to SECTION 60 - CONTROL OF MATERIALS as follows:

60-09 - Operation and Maintenance Documentation

The Contractor shall furnish (3) three copies of all approved catalog cuts, warranties, operation instructions; maintenance data, schedules, and recommendations; parts lists, and names and addresses and telephone numbers of equipment and materials suppliers. Submittals shall be submitted, reviewed, and approved by the Engineer before final payment to the Contractor will be processed.

SP-7 Modify SECTION 70 - LEGAL REGULATIONS AND RESPONSIBILITY TO PUBLIC as follows:

Modify Section 70 - 01 LAWS TO BE OBSERVED as follows:

He shall at all times observe and comply with all such laws, ordinances, regulations, orders, and decrees; and shall protect and indemnify the owner and all his/her officers, agents, or servants against any claim or liability arising from or cased on the violation of any such law, ordinance, regulation, order, or decree, whether by himself or his/her employees

Modify Section 70-03 PATENTED DEVICES, MATERIALS, AND PROCESSES as follows:

If the Contractor is required or desires to use any design, device, material, or process covered by letters of patent or copyright, he shall provide for such use by suitable legal agreement with the patentee or owner.

Delete Paragraph 70-11 RESPONSIBILITY AND DAMAGE CLAIMS, and replace with the following:

> The Contractor shall indemnify and hold harmless and defend the Owner, Engineer and Agent and all of their officers, agents and employees from all suits, actions, claims, damages, personal injuries, losses, property damage and expenses of any character whatsoever, including attorney's fees, brought for or on account of any injuries or damages received or sustained by any person or persons or property, on account of any negligent act of the Contractor, their agents or employees, or any subcontractor, in the execution, supervision and operations growing out of or in any way connected with the performance of this contract, and the Contractor will be required to pay any judgment with costs which may be obtained against the Owner, Engineer and Agent or any of their officers, agents or employees, including attorney's fees.
>
> The Contractor agrees that he will indemnify and save the Owner, Engineer and Agent harmless form all claims growing out of any demands of subcontractors, laborers, workmen, mechanics materialmen, and furnisher of machinery and parts thereof, equipment, power tools, all supplies, including commissary incurred in the furtherance of the performance of this contract. When the Owner or Agent so desires the Contractor shall furnish satisfactory evidence that all obligations of the nature here in above designated have been paid, discharged or waived.

In Paragraph 70-14 CONTRACTOR'S RESPONSIBILITY FOR WORK, add the following subparagraph:

> Neither the final certificate of payment nor any provision in the Contract nor partial or entire use of the Improvements embraced in this contract by the Sponsor or the public shall constitute an acceptance of work not done in accordance with the Contract or relieve the Contractor of liability in respect to any express warranties or responsibility for faulty materials or workmanship. The Contractor shall promptly remedy any defects in the work and pay for any damage to other work resulting therefrom which appear within a period of twelve (12) months from the date of final acceptance of the work.

SP-8. Modify SECTION 80 - PROSECUTION AND PROGRESS as follows:

Add to Paragraph 80-01 SUBLETTING OF CONTRACT, the following:

> If a Storm Water Pollution Prevention Plan (SW3P) is included in this project, no

subcontractor who is to implement any measure identified on the Storm Water Pollution Prevention Plan, will be approved for work until the subcontractor has submitted a signed copy of the certification statement described in Part IV.E.2 of the National Pollutant Discharge Elimination System (NPDES) permit (40 CFR Part 122) and in the Special Provision SP-9, "Certification of NPDES Permit". If an approved subcontractor does not comply with the provisions of the NPDES permit, approval may be revoked.

Replace Section 80-01 to read as follows:

SUBLETTING OF CONTRACT: TxDOT may approve all subcontracts as determined by TxDOT. The owner will not recognize any subcontractor on the work. The Contractor shall at all times when work is in progress be represented either in person, by a qualified superintendent, or by other designated, qualified representative who is duly authorized to receive and execute orders of the Engineer

Should the Contractor elect to assign his/her contract, said assignment shall not be for more than sixty-nine percent (69%) of the contract amount unless approved in writing by TxDOT, shall be concurred in by the surety, shall be presented for the consideration and approval of the owner, and shall be consummated only on the written approval of the owner. In case of approval, the Contractor shall file copies of all subcontracts with the Engineer.

In Paragraph 80-02 NOTICE TO PROCEED, change the last sentence to read:

The contractor shall begin the work to be performed under the contract not later than the effective date by the Engineer in the written notice to proceed, but in any event, the Contractor shall notify the Engineer at least 48 hours in advance of the time actual construction operations will begin.

In Paragraph 80-03 PROSECUTION AND PROGRESS, change the fifth sentence to read:

Should the prosecution of the work be discontinued for any reason, the Contractor shall notify the Engineer at least 48 hours in advance of resuming operations.

Add to Paragraph 80-03 PROSECUTION AND PROGRESS, the following:

If a Storm Water Pollution Prevention Plan (SW3P) is included in this project, the Contractor, and all subcontractors implementing any measure identified on the SW3P, must submit to the Engineer a signed copy of the certification statement as

described in Part IV.E.2 of the NPDES permit (40 CFR Part 122) no later than 48 hours prior to beginning work.

SP-9. Modify SECTION 90 - MEASUREMENT AND PAYMENT as follows:

In Paragraph 90-06 PARTIAL PAYMENTS,

Replace all references to 10 percent retainage to 5 percent retainage.

The Contractor shall pay the subcontractor for work performed within 10 days after the Contractor receives payment for the work performed by the subcontractor. Also, any retained monies on a subcontractor's work shall be paid to the subcontractor within 10 days after satisfactory completion of all the subcontractor's work. Completion of the subcontractor's work shall include test, maintenance and other similar periods that are the responsibility of the subcontractor.

For purposes of this Section, satisfactory completion shall have been accomplished when:

(1) The subcontractor has fulfilled the contract requirements of both the Department and the subcontract for the subcontracted work, including the submission of all submittals required by the specifications and the Department, and

(2) The work done by the subcontract has been inspected and approved by the Engineer and the final quantities of the subcontractor's work have been validated.

The above requirements are also applicable to all sub-tier subcontractors and the above provisions shall be made a part of all subcontract agreements.

Failure to comply with any of the above requirements may result in postponement of contractor payments and/or suspension work until the deficiencies are remedied.

In Paragraph 90-08 PAYMENT OF WITHHELD FUNDS, change 90-08.b. to read:

The Contractor shall deposit to and maintain in such escrow only those securities or bank certificates of deposit as are acceptable to the owner and having a value of not less than twice the 5 percent of the retainage that would otherwise be withheld from partial payment. The Contractor shall maintain such deposits in escrow until the Agent authorizes in writing the release of such funds.

In Paragraph 90-09 ACCEPTANCE AND FINAL PAYMENT, Add to read:

The contractor shall furnish two bound copies of all approved catalog cuts, warranties, maintenance data, parts lists, and names of equipment and materials suppliers and an affidavit of all bills paid.

SP-10. CERTIFICATION OF NPDES PERMIT

If a Storm Water Pollution Prevention Plan (SW3P) is included in this project, the Contractor, and all subcontractors who are to implement any measure identified on the SW3P, will be required to sign a copy of the following certification statement no later than 48 hours prior to beginning work:

"I certify under penalty of Law that I understand the terms and conditions of the general National Pollutant Discharge Elimination System (NPDES) permit that authorizes the storm water discharges associated with industrial activity from the construction site identified as part of this certification."

In the event that the Contractor fails to comply with this requirement, the Contractor will be considered in default of contract, and the Department will exercise the provisions of General Provision Paragraph 80-09 "Default and Termination of Contract", of Section 80 "Prosecution and Progress".

DISADVANTAGED BUSINESS ENTERPRISE

DISADVANTAGED BUSINESS ENTERPRISE IN FEDERAL FUNDED CONSTRUCTION - Aviation

The purpose of this Special Provision is to carry out the U. S. Department of Transportation's (DOT) policy of ensuring nondiscrimination in the award and administration of DOT assisted contracts and creating a level playing field on which firms owned and controlled by minority or socially and economically disadvantaged individuals can compete fairly for DOT assisted contracts. If the Disadvantaged Business Enterprise (DBE) goal is greater than zero, Article A, "Disadvantaged Business Enterprise in Federal-Aid Construction," of this special provision shall apply to this contract. If there is no DBE goal, Article B "Race Neutral DBE Participation," of this Special Provision shall apply to this contract.

ARTICLE A: Disadvantaged Business Enterprise in Federal-Aid Construction

1. POLICY.

It is the policy of the DOT and the Texas Department of Transportation (henceforth the "Department") that DBEs, as defined in 49 CFR Part 26, Subpart A and the Department's DBE Program, shall have the opportunity to participate in the performance of contracts financed in whole or in part with Federal funds. Consequently, the DBE requirements of 49 CFR Part 26, and the Department's DBE Program, apply to this contract as follows.

A. The Contractor will offer DBEs, as defined in 49 CFR Part 26, Subpart A and the Department's DBE Program, the opportunity to compete fairly for contracts and subcontracts financed in whole or in part with Federal funds. In this regard, the Contractor shall make a good faith effort to meet the DBE goal for this contract.

B. The Contractor and any subcontractors shall not discriminate on the basis of race, color, national origin or sex in the performance of this contract. The Contractor shall carry out applicable requirements of 49 CFR Part 26 in the award and administration of DOT assisted contracts.

C. The requirements of this Provision shall be physically included in any subcontract.

D. After a conditional award is made to the low bidder, the Department will determine the adequacy of a Contractor's efforts to meet the contract goal, within 10 working days from receipt of information required under Section 4, "Contractor's Responsibilities." If the requirements of Section 4 are met, the conditional situation will be removed and the contract will be forwarded to the Contractor for execution.

The Contractor's performance, during the construction period of the contract, in meeting his approved goal will be monitored by the Department.

2. DEFINITIONS.

A. "Department" means the Texas Department of Transportation.

B. "Federal-Aid Contract" is any contract between the Texas Department of Transportation and a Contractor which is paid for in whole or in part with DOT financial assistance.

C. "DBE Joint Venture" means an association of a DBE firm and one (1) or more other firm(s) to carry out a single business enterprise for profit for which purpose they combine their property, capital, efforts, skills and knowledge, and in which the DBE is responsible for a distinct clearly defined portion of the work of the contract and whose share in the capital contribution, control, management, risks and profits of the joint venture are commensurate with its ownership interest.

D. "Disadvantaged Business Enterprise" or "DBE" means a firm certified as such by the Department in accordance with 49 CFR Part 26.

E. "Good Faith Effort" means efforts to achieve a DBE goal or other requirement of this special provision which, by their scope, intensity, and appropriateness to the objective, can reasonably be expected to fulfill the program requirements.

F. "Manufacturing Material Supplier" is a firm that operates or maintains a factory or establishment that produces or significantly alters on the premises the materials, supplies, articles or equipment required under the contract and of the general character described by the specifications. Brokers, packagers, manufacturers' representatives or persons who arrange or expedite transactions shall not be regarded as manufacturers.

G. "Regular Dealer" is a firm that owns, operates, or maintains a store, warehouse, or other establishment in which the materials, supplies, articles or equipment of the general character described by the specifications and required under the contract are bought, kept in stock, and regularly sold or leased to the public in the usual course of business. To be a regular dealer, the firm must be an established regular business that engages in, as its principal business and in its own name, the purchase and sale of the products in question.

A regular dealer in such bulk items as steel, cement, gravel, stone, and petroleum products need not keep such products in stock if it owns or operates distribution equipment for the product. Brokers, packagers, manufacturers' representatives or other persons who arrange or expedite transactions shall not be regarded as regular dealers. Any supplementing of a regular dealers own distribution equipment shall be by a long-term lease agreement and not on an adhoc or contract-by-contract basis.

H. "Broker" is an intermediary or middleman that does not take possession of a commodity or act as a regular dealer selling to the public.

I. "Race-neutral DBE Participation" means any participation by a DBE through customary competition procurement procedures.

3. PERCENTAGE GOAL. The percentage goal for DBE participation in the work to be performed under this contract is 7% of the contract amount.

4. CONTRACTOR'S RESPONSIBILITIES. These requirements must be satisfied by the Contractor.

A. After conditional award of the contract, the Contractor shall furnish the following information so as to arrive in the Aviation Division Office in Austin, Texas not later than 5:00 p.m. on the fourteenth (14th) day after the conditional award of the contract. When requested, additional time, not to exceed 15 days, may be granted based on documentation submitted by the Contractor.

(1) The names and addresses of the DBE subcontractors he intends to use to satisfy the DBE goal,

(2) An agreement for each proposed DBE containing:

→ The items of work to be performed

→ The quantities of work or materials

→ The unit of measure

→ The unit price

→ The total amount for each item

→ The total amount of the DBE commitment signed by an officer of the contracting firm and the proposed DBE agreeing that if the contract is signed by the Contractor, the proposed DBE will be given the opportunity to do the respective subcontract work.

→ Material Suppliers listed on Contractor commitments must give an explanation of the function they will perform on each project. Details of any arrangements made with other material suppliers, manufacturers, distributors, hauling firms, freight companies, etc. must be submitted to the Aviation Division with the commitment.

B. DBE Prime Contractors may receive credit toward the DBE goal for work performed by his/her own forces and work subcontracted to DBEs. A DBE prime must make a good faith effort to meet the goals. In the event a DBE prime subcontracts to a non-DBE, that information must be reported to the Department.

C. A Contractor who cannot meet the contract goal, in whole or in part, shall document the good faith efforts taken to obtain DBE participation. The following is a list of the types of actions that may be considered as good faith efforts. It is not intended to be a mandatory checklist nor is it intended to be exclusive or exhaustive. Other factors or types of efforts may be relevant in appropriate cases.

(1) Soliciting through all reasonable and available means the interest of all certified DBEs who have the capability to perform the work of the contract. The solicitation must be done within sufficient time to allow the DBEs to respond to it. Appropriate steps must be taken to follow up initial solicitations to determine, with certainty, if the DBEs are interested.

(2) Selecting portions of the work to be performed by DBEs in order to increase the likelihood that the DBE goals will be achieved. This includes, where appropriate, breaking out contract work items into economically feasible units to facilitate DBE participation, even when the Contractor might otherwise prefer to perform the work items with its own forces.

(3) Providing interested DBEs with adequate information about the plans, specifications, and requirements of the contract in a timely manner to assist them in responding to a solicitation.

(4) Negotiating in good faith with interested DBEs by making a portion of the work available to DBE subcontractors and suppliers and selecting those portions of the work or material needs consistent with the available DBE subcontractors and suppliers.

(5) The ability or desire of the Contractor to perform the work of a contract with its own organization does not relieve the Contractor's responsibility to make a good faith effort. Additional costs involved in finding and using DBEs is not in itself sufficient reason for a Contractor's failure to meet the contract DBE goal, as long as such costs are reasonable. Contractors are not, however, required to accept higher quotes from DBEs if the price difference is excessive or unreasonable.

(6) Not rejecting DBEs as being unqualified without sound reasons based on a thorough investigation of their capabilities.

(7) Making efforts to assist interested DBEs in obtaining bonding, lines of credit, or insurance as required by the Contractor.

(8) Making efforts to assist interested DBEs in obtaining necessary equipment, supplies, materials or related assistance or services.

(9) Effectively using the services of available minority/women community organizations; minority/women contractors' groups; local, state, and Federal minority/women business assistance offices; and other organizations as allowed on a case-by-case basis to provide assistance in the recruitment and placement of DBEs.

(10) If the Director of the Aviation Division determines that the Contractor has failed to meet the good faith effort requirements, the Contractor will be given an opportunity for reconsideration by the Director of the Construction Division.

D. The preceding information shall be submitted directly to the Aviation Division, Texas Department of Transportation; 125 E. 11th Street; Austin, Texas 78701-2483.

E. Should the bidder to whom the contract is conditionally awarded refuse, neglect or fail to meet the DBE goal or comply with good faith effort requirements, the proposal guaranty filed with the bid shall become the property of the State, not as a penalty, but a liquidated damages to the Department.

F. The Contractor shall make all reasonable efforts to honor commitments to DBE subcontractors named in the commitment submitted under Section 4. a. of this Provision. Prior to terminating or removing a DBE subcontractor named in the commitment, the Contractor must demonstrate to the satisfaction of the Department that the originally designated DBE was not able or willing to perform.

G. The Contractor shall also make a good faith effort to replace a DBE subcontractor that is unable to perform successfully with another DBE, to the extent needed to meet the contract goal. The Contractor shall submit a commitment agreement for the substitute DBE firm(s).

Any substitution of DBEs shall be subject to approval by the Aviation Division in Austin. Prior to approving the substitution, the Aviation Division in Austin may request a statement from the DBE concerning it being replaced.

H. The Contractor shall designate a DBE liaison officer who will administer the Contractor's DBE program and who will be responsible for maintenance of records of efforts and contacts made to subcontract with DBEs.

I. Contractors are encouraged to investigate the services offered by banks owned and controlled by disadvantaged individuals and to make use of these banks where feasible.

5. ELIGIBILITY OF DBEs

A. The Department certifies the eligibility of DBEs, DBE joint ventures and DBE truck-owner operators to perform subcontract work on DOT financially assisted contracts.

B. This certification will be accomplished through the use of the appropriate certification schedule contained in this Department's DBE Program.

C. The Department publishes annually a Directory of Disadvantaged Business Enterprises containing the names of firms that have been certified to be eligible to participate as DBEs on DOT financially assisted contracts. This Directory is available from the Department's Construction Division, Business Opportunity Programs Section. A monthly update of the Directory can be found on the Internet at www.dot.state.tx.us/insdtdot/orgchart/cmd/cserve/dbelst/.

D. Only DBE firms certified at the time commitments are submitted are eligible to be used in the information furnished by the Contractor as required under Section 4.a. and 4.g. above. For purposes of the DBE goal on this project, DBEs will only be allowed to perform work in the categories of work for which they are certified.

6. DETERMINATION OF DBE PARTICIPATION. DBE participation shall be counted toward meeting the DBE goal in this contract in accordance with the following:

A. Once a firm is determined to be an eligible DBE, the total eligible dollar amount paid on the contract or purchase order awarded to the DBE is counted toward the DBE goal. When a DBE subcontracts part of the work of its contract to another firm, the value of the subcontracted work may be counted toward DBE goals only if the subcontractor is itself a DBE. Work that a DBE subcontracts to a non-DBE firm does not count toward DBE goals.

B. A Contractor may count toward its DBE goal contract fees paid to disadvantaged truck owner-operators provided the following requirements are met:

(1) The contractor furnishes the following information on each owner-operator to be used:

→ name of owner-operator
→ social security number
→ DBE vendor number

(2) The record of payments to each disadvantaged Truck Owner-Operator, whether paid by the prime Contractor or one of his subcontractors, must be attached to the prime Contractor's monthly report for the respective month to receive credit toward the DBE goal.

C. A Contractor may count toward its DBE goal a portion of the dollar amount paid to a joint venture equal to the distinct, clearly defined portion of the work of the contract performed by the DBE.

D. Commercially Useful Function

(1) A Contractor may count toward its DBE goal only expenditures to DBEs that perform a commercially useful function in the work of a contract or purchase order. A DBE is considered to perform a commercially useful function when it is responsible for execution of the work of the contract and is carrying out its responsibilities by actually performing, managing, and supervising the work involved. To perform a commercially useful function, the DBE must also be responsible, with respect to materials and supplies used on the contract, for negotiating price, determining quality and quantity, ordering the material, and installing (where applicable) and paying for the material itself.

(2) Consistent with industry practices and the Department's DBE Program, a DBE subcontractor may enter into second-tier subcontracts, amounting to up to 70 percent of their contract. Work subcontracted to a non-DBE does not count towards DBE goals. Brokers and firms with brokerage-type operations will only receive credit for their commission.

(3) A DBE trucking firm is considered to be performing a commercially useful when the DBE is responsible for the management and supervision of the entire trucking operation for which it is responsible on a particular contract and the DBE itself owns and operates at least one fully licensed, insured, and operational truck used on the contract.

The Contractor receives credit for the total value of the transportation services the DBE provides on a contract using trucks it owns, insures, and operates using drivers it employs.
The DBE may lease trucks from another DBE firm, including certified disadvantaged truck owner-operators. The Contractor receives credit for the total value of the transportation services provided by the lessee.

The DBE may lease trucks from a non-DBE, including owner-operators; however, the Contractor may only receive credit for the fee or commission the DBE receives as a result of the lease arrangement.

A lease must indicate that the DBE has exclusive use of and control over the truck, giving the DBE absolute priority for use of the leased trucks. Leased trucks must display the name and identification number of the DBE.

(4) When a DBE is presumed not to be performing a commercially useful function, the DBE may present evidence to rebut this presumption.

E. A Contractor may count toward its DBE goal expenditures for materials and supplies obtained from DBE suppliers and manufacturers, provided that the DBEs assume the actual and contractual responsibility for the provision of the materials, goods and services.

(1) The Contractor may count its entire expenditure to a DBE manufacturing material supplier. In order to be considered a manufacturing firm, a DBE must conform to the definition given in Section 2.f. of this provision.

Should the DBE firm obtain the final product(s) provided to the Contractor from a source other than its own factory or establishment, then the DBE firm, for that case, will not be considered to be a manufacturing material supplier and its supply work will be credited toward the DBE goal using an adjustment percentage no greater than that used for a regular dealer.

(2) The Contractor may count 60 percent of its expenditures to a DBE regular dealer. In order to be considered as a regular dealer, the DBE must conform to the definition given in Section 2.g. of this provision.

F. A Contractor may count toward its DBE goal the following expenditures to DBE firms that are not manufacturing material suppliers or regular dealers, provided that the fee or commission is determined by the Department to be reasonable and not excessive as compared with fees customarily allowed for similar services:

(1) The fees or commissions charged by a DBE for providing a bona fide service, such as professional, technical, consultant, or managerial services, and assistance in the procurement of materials, or supplies required for performance of the contract.

(2) The fees charged for delivery of materials and supplies required on a job site (but not the cost of the materials and supplies themselves) when the hauler, trucker, or delivery service is not also the manufacturer of or a regular dealer in the materials and supplies.

(3) The fees or commissions charged for providing any bonds or insurance specifically required for the performance of the contract

G. If a Contractor chooses to assist a DBE firm, other than a manufacturing material supplier or regular dealer, by assuring payment for the materials to be placed in the DBE's work and wants to receive credit toward the DBE goal for the cost of the material, then the material supplier may invoice the DBE firm and be paid by remittance from the DBE firm or the material supplier may invoice the prime Contractor and the DBE firm jointly and be paid by the prime Contractor making remittance to the DBE firm and the material supplier jointly. The DBE firm must agree to the joint check arrangement. No credit will be given toward the DBE goal for the cost of the DBE's required materials paid by the prime Contractor directly to the material supplier.

H. No credit will be given toward the DBE goal for the cost of materials placed by a DBE firm or for the cost of equipment leased or rented and used in the DBE firm's work when payment for those costs is effected by making a deduction from the prime Contractor's payment(s) to the DBE firm.

7. RECORDS AND REPORTS.

A. The Contractor shall submit monthly reports, after work begins, on DBE payments to meet the DBE goal and for race neutral participation. One copy of each monthly report is to be sent to the Aviation Division of the Department. These reports will be due within fifteen (15) days after the end of a calendar month. These reports will be required until all DBE subcontracting or contracting or material supply activity is completed. The DBE Monthly Progress Report Form is to be used for monthly reporting. The DBE Final Report is to be used as a final summary of DBE activity submitted upon completion of the project. These forms may be obtained from the Aviation Division or may be reproduced by the Contractor. The Department may verify the amounts being reported as paid to DBEs by requesting copies of cancelled checks paid to DBEs on a random basis. Cancelled checks and invoices should reference the Department's project number.

B. DBE subcontractors and/or material suppliers should be identified on the monthly report by Vendor Number, name, and the amount of actual payment made to each during the monthly period.

C. Monthly reports for Truck Owner-Operators should be in the form of a list of Truck Owner-Operators paid that month, including Vendor Number and the amount of payment made to each.

D. All such records must be retained for a period of three years following completion of the contract work, and shall be available at reasonable times and places for inspection by authorized representatives of the Department or the DOT.

E. Prior to receiving final payment, the Contractor shall submit an affidavit detailing the DBE subcontract payments. The DBE Final Report is to be used for the Final Report. This form may be obtained from the Department or may be reproduced by the Contractor. If the DBE goal requirement is not met, documentation supporting Good Faith Efforts, as outlined in Section 4.c. of the Provision, must be submitted with the DBE Final Report.

8. COMPLIANCE OF CONTRACTOR. To ensure that DBE requirements of this DOT assisted contract are complied with, the Department will monitor the Contractor's efforts to involve DBEs during the performance of this contract. This will be accomplished by a review of monthly reports submitted to the Aviation Division by the Contractor indicating his progress in achieving the DBE contract goal, and by compliance reviews conducted on the project site by the Department.

The Contractor shall receive credit toward the DBE goal based on actual payments to the DBE subcontractor. The Contractor shall notify the Aviation Division if he/she withholds or reduces payment to any DBE subcontractor. The Contractor shall submit an affidavit detailing the DBE subcontract payments prior to receiving final payment for the contract.

Contractors' requests for substitutions of DBE subcontractors shall be accompanied by a detailed explanation, which should substantiate the need for a substitution. The Aviation Division may verify the explanation with the DBE firm being replaced before giving approval of the substitution. The Contractor may not be allowed to count work on those items being substituted toward the DBE goal prior to approval of the substitution from the Aviation Division.

The Contractor's providing work crews and equipment to DBEs is prohibited. The occasional formal leasing of a major piece of equipment with or without operator by the prime Contractor to a DBE will be considered on a case-by-case basis by the Aviation Division.

A Contractor's failure to comply with the requirements of this Special Provision shall constitute a material breach of this contract. In such a case, the Department reserves the right to terminate the contract; to deduct the amount of DBE goal not accomplished by DBEs from the money due or to become due the Contractor, not as a penalty but as liquidated damages to the Department; or such other remedy or remedies as the Department deems appropriate.

ARTICLE B: Race-Neutral Disadvantaged Business Enterprise

It is the policy of the DOT that Disadvantaged Business Enterprises (DBE) as defined in 49 CFR Part 26, Subpart A, be given the opportunity to compete fairly for contracts and subcontracts financed in whole or in part with Federal funds and that a maximum feasible portion of the Department's overall DBE goal be met using race-neutral means. Consequently, if there is no DBE goal, the DBE requirements of 49 CFR Part 26, apply to this contract as follows:

The Contractor will offer DBEs as defined in 49 CFR Part 26, Subpart A, the opportunity to compete fairly for contracts and subcontracts financed in whole or in part with Federal funds. Race-Neutral DBE participation on projects with no DBE goal should be reported to the Aviation Division. Payments to DBEs reported are subject to the requirements of Article A, Section 5, "Determination of DBE Participation".

The Contractor and any Subcontractors shall not discriminate on the basis of race, color, national origin or sex in the award and performance of contracts financed in whole or in part with Federal funds.

These requirements shall be physically included in any subcontract. Failure to carry out the requirements set forth above shall constitute a material breach of this contract and, may result in termination of the contract by the Department or other such remedy, as the Department deems appropriate.

REQUIRED LANGUAGE IN PROPOSALS FOR AIP CONTRACTS

REQUIRED LANGUAGE IN PROPOSALS FOR AIP CONTRACTS

Section 60-1.7(b) of the Regulations of the Secretary of Labor requires each bidder or prospective prime contractor and proposed subcontractor, where appropriate, to state in the bid or at the outset of negotiations for the contract whether it has participated in any previous contract or subcontract subject to the equal opportunity clause; and if so, whether it has filed with the Joint Reporting Committee, the Director, an agency, or the former President's Committee on Equal Employment Opportunity all reports due under the applicable filing requirements. In any case in which a bidder or prospective prime contractor or proposed subcontractor which participated in a previous contract subject to Executive Order 10925, 11114. or 11246 has not filed a report due under the applicable filing documents, no contract or subcontract shall be awarded unless such contractor submits a report covering the delinquent period or such other period specified by the FAA or the Director, OFCCP.

Bid or Proposal Form. To effectuate the foregoing requirements, the sponsor is required to include in the bid or proposal form a statement substantially as follows:

The bidder (proposer) shall complete the following statement by checking the appropriate space.

The bidder (proposer) has ✓ has not _____ participated in a previous contract subject to the equal opportunity clause prescribed by Executive Order 10925, or Executive Order 11114, or Executive Order 11246.

The bidder (proposer) has ✓ has not _____ submitted all compliance reports in connection with any such contract due under the applicable filing requirements; and that representations indicating submission of required compliance reports signed by proposed subcontractors will be obtained prior to award of subcontracts.

If the bidder (proposer) has participated in a previous contract subject to the equal opportunity clause and has not submitted compliance reports due under applicable filing requirements, the Bidder (Proposer) shall submit a compliance report on Standard Form 100, 'Employee Information Report EEO-1 prior to the award of contract.

Standard Form 100 is normally furnished to contractors annually, based on a mailing list currently maintained by the Joint Reporting Committee. In the event a contractor has not received the form, he may obtain it by writing to the following address:

Joint Reporting Committee
1800 G Street
Washington, DC 20506

(2/92)

CERTIFICATION REGARDING DEBARMENT, SUSPENSION, INELIGIBILITY AND VOLUNTARY EXCLUSION

Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion (49 CFR PART 29)

The bidder (offeror) certifies, by submission of this proposal or acceptance of this contract, that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntary excluded from participation in this transaction by any Federal department or agency. It further agrees that by submitting this proposal that it will include this clause without modification in all lower tier transactions, solicitations, proposals, contracts, and subcontracts. Where the bidder/offeror/contractor or any lower tier participant is unable to certify to this statement, it shall attach an explanation to this solicitation/proposal.

Certification Regarding Foreign Trade Restrictions (49 CFR PART 30)

The contractor or subcontractor, by submission of an offer and/or execution of a contract, certifies that it:

a. is not owned or controlled by one or more citizens or nationals of a foreign country included in the list of countries that discriminate against U.S. firms published by the Office of the United States Trade representative (USTR);

b. has not knowingly entered into any contract or subcontract for this project with a contractor that is a citizen or national of a foreign country on said list, or is owned or controlled directly or indirectly by one or more citizens or nationals of a foreign country on said list.

c. has not procured any product nor subcontracted for the supply of any product for use on the project that is produced in a foreign country on said list.

Unless the restrictions of this clause are waived by the Secretary of Transportation in accordance with 49 CFR 30.17, no contract shall be awarded to a contractor or subcontractor who is unable to certify to the above. If the contractor knowingly procures or subcontracts for the supply of any product or service of a foreign country on said list for use on the project, the Federal Aviation Administration may direct, through the sponsor, cancellation of the contract at no cost to the Government.

Further, the contractor agrees that, if awarded a contract resulting from this solicitation, it will incorporate this provision for certification without modification in each contract and in all lower tier subcontracts. The contractor may rely upon the certification of a prospective subcontractor unless it has knowledge that the certification is erroneous. The contractor shall provide immediate written notice to the sponsor if the contractor learns that its certification or that of a subcontractor was erroneous when submitted or has become erroneous by reason of changed circumstances. The subcontractor agrees to provide immediate written notice to the contractor, if at any time it learns that its certification was erroneous by reason of changed circumstances.

This certification is a material representation of fact upon which reliance was placed when making the award. If it is later determined that the contractor or subcontractor knowingly rendered an erroneous certification, the Federal Aviation Administration may direct through the sponsor, cancellation of the contract or subcontract for default at no cost to the Government.

Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render, in good faith, the certification required by this provision. The knowledge and information of a contractor is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

This certification concerns a matter within the jurisdiction of an agency of the United States of America and the making of a false, fictitious, or fraudulent certification may render the maker subject to prosecution under Title 18, United States Code, Section 1001.

Buy American Certification
(Aviation Safety and Capacity Expansion Act of 1990)

By submitting a bid/proposal under this solicitation, except for those items listed by the offeror below or on a separate and clearly identified attachment to this bid/proposal, the offeror certifies that steel and each manufactured product, is produced in the United States (as defined in the clause Buy American - Steel and Manufactured Products for Construction Contracts) and that components of unknown origin are considered to have been produced or manufactured outside the United States.

Offerors may obtain from _____ (insert sponsor representative) lists of articles, materials, and supplies excepted from this provision.

PRODUCT	COUNTRY OF ORIGIN

CERTIFICATION OF BIDDER REGARDING EQUAL EMPLOYMENT OPPORTUNITY

CERTIFICATION OF BIDDER REGARDING EQUAL EMPLOYMENT OPPORTUNITY

GENERAL

BIDDER'S NAME SITE CONCRETE, INC

ADDRESS 3340 ROYLOR BLVD, GRAND PRAIRIE, TX 75050

INTERNAL REVENUE SERVICE EMPLOYER IDENTIFICATION NO. 75-1982554

NONSEGREGATED FACILITIES

NOTICE TO PROSPECTIVE FEDERALLY ASSISTED CONSTRUCTION CONTRACTORS (41 CFR 60-1.8)

(1) A Certification of Nonsegregated Facilities must be submitted prior to the award of a federally assisted construction contract exceeding $10,000 which is not exempt from the provisions of the equal opportunity clause.

(2) Contractors receiving federally assisted construction contract awards exceeding $10,000 which are not exempt from the provisions of the equal opportunity clause will be required to provide for the forwarding of the following notice to prospective subcontractors for supplies and construction contracts where the subcontracts exceed $10,000 and are not exempt from the provisions of the equal opportunity clause.

NOTE: The penalty for making false statements in offers is prescribed in 18 U.S.C. 1001.

NOTICE TO PROSPECTIVE SUBCONTRACTORS OF REQUIREMENTS FOR CERTIFICATION OF NONSEGREGATED FACILITIES

(1) A Certification of Nonsegregated Facilities must be submitted prior to the award of a subcontract exceeding $10,000 which is not exempt from the provisions of the equal opportunity clause.

(2) Contractors receiving subcontract awards exceeding $10,000 which are not exempt from the provisions of the equal opportunity clause will be required to provide for the forwarding of this notice to prospective subcontractors for supplies and construction contracts where the subcontracts exceed $10,000 and are not exempt from the provisions of the equal opportunity clause.

NOTE: The penalty for making false statements in offers is prescribed in 18 U.S.C. 1001.

SPECIAL INSTRUCTION TO BIDDERS REGARDING EEO

SPECIAL INSTRUCTION TO BIDDERS REGARDING EEO

Notice of Requirement for Affirmative Action to Ensure Equal Employment Opportunity (Executive Order 11246, as amended)

1. The Offeror's or Bidder's attention is called to the "Equal Opportunity Clause" and the "Standard Federal Equal Employment Opportunity Construction Contract Specifications" set forth herein.

2. The goals and timetables for minority and female participation, expressed in percentage terms for the contractor's aggregate work force in each trade on all construction work in the covered area, are as follows:

Goals for minority participation in each trade	Goals for female participation in each trade
18.2%	6.9%

These goals are applicable to all the contractor's construction work (whether or not it is Federal or federally assisted) performed in the covered area. If the contractor performs construction work in a geographical area located outside of the covered area, it shall apply the goals established for such geographical area where the work is actually performed. With regard to this second area, the contractor is also is subject to the goals for both its federally involved and nonfederally involved construction.

The contractor's compliance with the executive order and the regulations in 41 CFR Part 60-4 shall be based on its implementation of the Equal Opportunity Clause, specific affirmative action obligations required by the specifications set forth in 41 CFR Part 60-4.3 (a), and its efforts to meet the goals established for the geographical area where the contract resulting from this solicitation is to be performed. The hours of minority and female employment and training must be substantially uniform throughout the length of the contract, and in each trade, and the contractor shall make a good faith effort to employ minorities and women evenly on each of its projects. The transfer of minority or female employees or trainees from contractor to contractor or from project to project, for the sole purpose of meeting the contractor's goals, shall be a violation of the contract, the executive order, and the regulations in 41 CFR Part 60-4. Compliance with the goals will be measured against the total work hours performed.

3. The contractor shall provide written notifications to the Director, OFCCP, within 10 working days of award of any construction subcontract in excess of $10,000 at any tier for construction work under the contract resulting from this solicitation. The notification shall list the name, address, and telephone number of the subcontractor; employee identification number; estimated dollar amount of the subcontract; estimated starting and completion dates of the subcontract; and the geographical area in which the contract is to be performed.

4. As used in this notice and in the contract resulting from this solicitation, the "covered area" is the Town of Addison, Texas, Dallas County.

TECHNICAL SPECIFICATIONS

TEXAS DEPARTMENT OF TRANSPORTATION
ADDISON AIRPORT
ADDISON, TEXAS
TxDOT CSJ No. 0318ADDON

Technical Specifications
Table of Contents

DEVIATIONS FROM STANDARD
FAA TECHNICAL SPECIFICATIONS

ITEM M-101 MOBILIZATION

(a) Non FAA standard specification developed and implemented on other similar airport projects and modified specifically for this project.

ITEM M-101 MOBILIZATION

DESCRIPTION

101-1.1 The work covered by this section consists of preparatory work and operations, including but not limited to those necessary for the movement of personnel, equipment, supplies, and incidentals to the project site; for the establishment of all offices, buildings, and other facilities necessary for work on the project; and for all other work and operations which must be performed or costs incurred prior to beginning work on the various items on the project site.

BASIS OF PAYMENT

101-2.1 All work covered by this section will be paid for at the contract lump sum price for "Mobilization."

Partial payments for the item of "Mobilization" will be made with the first and second partial pay estimates paid on the contract, and will be made at the rate of 50 percent of the lump sum price for "Mobilization" on each of these partial pay estimates, PROVIDED THE AMOUNT BID FOR "Mobilization" does not exceed 5 percent of the total amount bid for the contract. Where the amount bid for the item of "Mobilization" exceeds 5 percent of the total amount bid for the contract, 2-1/2 percent of the total amount bid will be paid on each of the first two partial pay estimates, and that portion exceeding 5 percent will be paid on the last partial pay estimate.

Payment will be made under:

Item M-101-1 Mobilization---------- Per Lump Sum.

END OF ITEM M-101

DEVIATIONS FROM STANDARD
FAA TECHNICAL SPECIFICATIONS

ITEM M-102 MAINTENANCE OF TRAFFIC

(a) Non FAA standard specification developed and implemented on other similar airport projects and modified specifically for this project.

ITEM M-102 MAINTENANCE OF TRAFFIC

DESCRIPTION

102-1.1 Work in this section includes providing, placing and maintaining temporary construction traffic delineation including barricades, runway and taxiway closure markers, and construction traffic signage. The work covered by this section consists of preparatory work, operations, temporary and portable traffic control devices, construction traffic signage, maintenance, flagmen, off-hour operations, out-of-sequence operations and all other items necessary and incidental to the safe conduct of traffic through the construction area during the life of the contract.

102-1.2 REFERENCE STANDARDS. All layout of these signs, barricades and closure markers shall conform to the plans and these specifications, FAA Advisory Circular AC's 150/5340-1G and 5370-2C, and all applicable sections of the Manual on Uniform Traffic Control Devices for Streets and Highways (MUTCD).

MATERIALS

102-2.1 TEMPORARY AND PORTABLE ROADWAY SIGNS. All temporary and portable roadway signs shall be of the size, configuration and color required in the MUTCD. Signs may be post-mounted or platform mounted.

102-2.2 BARRICADES. Barricades required will be of the type indicated. Barrels, wooden barricades, drums and other items shall all be in first class condition and meet the requirements of the plans and the MUTCD. Lighted barricades will be fixed with flashing or steady burning lights as required.

OPERATIONS

102-3.1 The Contractor shall erect all advance signing for this construction and maintain all approaches for the duration of the contract. The Contractor shall provide all materials and personnel necessary to maintain traffic through the project area throughout the contract to the satisfaction of the Engineer. The Contractor shall be responsible for maintaining all signs, barricades, lights, markings and other items necessary for safe operation during all phases.

BASIS OF PAYMENT

102-4.1 All work covered by this item will be paid the contract unit price for maintenance of traffic. This shall be full compensation for all preparation and planning, for providing all temporary and portable roadway and traffic signs, for all barricades of all types, for all lights, for maintenance of all devices, for all operations including shifts in sequence, disruptions to construction, working under or near traffic, flagmen where necessary, off-hour and odd-hour operations and other items as necessary and directed by the Engineer.

Partial payments of this item will be made on every partial payment estimate in equal amounts determined by dividing the lump sum amount bid for maintenance of traffic by the number of partial payments anticipated by the contract time. No additional payment for this item shall be made if the contract time is exceeded for any reason.

Payment will be made under:

Item M-102-1 Maintenance of Traffic .....Lump Sum.

END OF ITEM M-102

DEVIATIONS FROM STANDARD
FAA TECHNICAL SPECIFICATIONS

ITEM P-150 DEMOLITION

(a) Demolition specification, including provisions for pavement removal, has been developed specifically for this job.

ITEM P-150 DEMOLITION

DESCRIPTION

150-1.1 This item shall consist of demolishing, removing, and disposing of miscellaneous items and pavement within the limits of the work required to prepare the site for work in accordance with these specifications and in conformity with the plans.

DEMOLITION OF MISCELLANEOUS STRUCTURES

150-2.1 **DESCRIPTION.** The work covered by this subsection consists of the complete demolition, removal and disposal of structures and appurtenances within the project limits that conflict with the completion of the work.

All materials resulting from the removal of miscellaneous structures, except such materials as may be the property of utility companies or designated on the plans for being returned to the Owner or removed by the Owner, shall become the property of the Contractor and shall be disposed of off airport property. Should the Contractor encounter any material such as, but not restricted to, sand, gravel, slag, or concrete slabs within the established lines, grades, or grading sections, the use of which is intended by the terms of the contract to be either embankment or waste, he may at his option:

(a) Use such material in another contract item, providing such use is approved by the Engineer and is in conformance with the contract specifications applicable to such use;

(b) Remove such material from the site, upon written approval of the Engineer;

(c) Use such material for his own temporary construction on site; or,

(d) Use such material as intended by the terms of the contract.

Should the Contractor wish to exercise option (a), (b), or (c), he shall request the Engineer's approval in advance of such use.

All existing structures encountered within the established lines, grades, or grading sections and outside of any demolition pay limits shall be removed by the Contractor, unless such existing structures are otherwise specified to be relocated, adjusted up or down, salvaged, abandoned in place, reused in the work or to remain in place. The cost of removing such existing structures shall not be measured or paid for directly, but shall be included in the various contract items as incidental work.

Should the Contractor encounter an existing structure (above or below ground) in the work for which the disposition is not indicated on the plans, the Engineer shall be notified prior to disturbing such structure.

The disposition of existing structures so encountered shall be determined by the Engineer in accordance with the provisions of the contract.

It is intended that all existing materials or structures that may be encountered (within the lines, grades, or grading sections established for completion of the work) shall be utilized in the work as otherwise provided for in the contract and shall remain the property of the Owner when so utilized in the work.

150-2.2 DISPOSAL. Materials including, but not necessarily limited to pavements, conduits, steel reinforcing, wood products and other organic material, shall be disposed of off airport property.

REMOVAL OF EXISTING PAVEMENT

150-3.1 DESCRIPTION. The work covered by this subsection consists of the removal and disposal of Portland cement concrete pavements or bituminous concrete pavements of airfield pavement structures within the limits shown on the plans and designated for removal. Removal of miscellaneous concrete slabs is included in this section. The removal areas shall be laid out, measured by the Contractor's surveyor, and approved by the Engineer prior to the start of removal operations.

150-3.2 PAVEMENT REMOVAL AND DISPOSAL. The Contractor shall saw cut the pavement full depth at the limits of the pavement removal in order to provide a neat appearance. The pavement shall be broken up and removed for its entire depth including base materials that cannot be incorporated into the embankment. The materials shall be removed from airport property and disposed of properly.

PIPE REMOVAL

150-4.1 Drainage pipe, water pipe, and sewage pipe shall be removed and disposed of and the resulting excavation backfilled and compacted. There is no direct payment for this work as it will be considered incidental to other work items.

INLET AND MANHOLE REMOVAL

150-5.1 Existing manholes and/or inlets shown on the plans to be removed shall be totally removed including any foundation or base material. The resulting excavation shall be backfilled. All backfilling shall be in accordance with the provisions of backfilling new storm sewer trenches.

DISPOSAL OF WASTE AND DEBRIS

150-6.1 DESCRIPTION. The work covered by this subsection consists of the disposal of waste and debris in accordance with the requirements of these specifications.

Waste will be considered to be all materials removed by demolition that can not be incorporated into the work.

Insofar as possible, all materials shall be removed but shall be subject to the approval of the Engineer and to the limitations specified herein before. All materials which cannot be used in the work shall be disposed of by the Contractor off airport property.

METHOD OF MEASUREMENT

150-7.1 The square yardage of pavement removed to be measured for payment will be the actual yardage as measured in the field. The measurement of bituminous pavement removal will include the volume of underlying concrete pavements, where this occurs as a separate pay item. The item for concrete pavement removal will include random surface concrete slabs and foundations.

Drainage Structures will be measured on a per each basis.

No direct payment will be made for other incidental demolition and removals required by this project which includes but is not limited to pipe, poles, bollards, and curbs and gutter.

BASIS OF PAYMENT

150-8.1 Payment shall be made at the contract unit price per square yard of "Removal of Pavements". The price shall be full compensation for sawing neat edges at removal limits and breaking up of all designated pavements and for all materials removed and hauled off airport property, labor, equipment, and incidentals necessary to complete the item.

Payment will be made under:

Item P-150-1	-	Remove Bituminous Pavements ----------	Per Square Yard
Item P-150-2	-	Remove Concrete Pavements ----------	Per Square Yard
Item P-150-3	-	Remove Drainage Structure ----------	Per Each

END OF ITEM P-150

DEVIATIONS FROM STANDARD
FAA TECHNICAL SPECIFICATIONS

ITEM P-152 EXCAVATION AND EMBANKMENT

a) Section 2.1, General, area shall be cleared and grubbed of all topsoil and vegetation prior to beginning any excavation or embankment operations.

b) Section 2.2, Excavation, blasting will not be allowed.

c) Section 2.3, Borrow Excavation, paragraph added to specify borrow materials allowed.

d) Section 2.6 Formation of Embankments, the subgrade material shall be maintained at optimum to +3 percent of optimum moisture until permanently covered. Paragraph added to allow density testing with nuclear gauge.

e) Section 4.1, Basis of Payment, pay item added for In-Place Embankment, Off site Borrow

ITEM P-152 EXCAVATION AND EMBANKMENT

DESCRIPTION

152-1.1 This item covers excavation, disposal, placement, and compaction of all materials within the limits of the work required to construct safety areas, runways, taxiways, aprons, and intermediate as well as other areas for drainage, building construction, parking, or other purposes in accordance with these specifications and in conformity to the dimensions and typical section(s) shown on the plans.

152-1.2 CLASSIFICATION. All material excavated shall be classified as defined below:

a. Unclassified Excavation. Unclassified excavation shall consist of the excavation and disposal of all material, regardless of its nature, which is not otherwise classified and paid for under the following items.

152-1.3 UNSUITABLE EXCAVATION. Any material containing vegetable or organic matter, such as muck, peat, organic silt, or sod shall be considered unsuitable for use in embankment construction. Material, when approved by the Engineer as suitable to support vegetation, may be used on the embankment slope.

CONSTRUCTION METHODS

152-2.1 GENERAL. Before beginning excavation, grading, and embankment operations in any area, the area shall be completely cleared and grubbed of all surface of vegetation and topsoil within the grading limits to a depth of 4 inches as designated on the plans or as required by the Engineer. All suitable stripping materials shall be salvaged as topsoil for final placement on all shoulder areas.

The suitability of material to be placed in embankments shall be subject to approval by the Engineer. All unsuitable material shall be disposed of in waste areas shown on the plans or as directed by the Engineer. All waste areas shall be graded to allow positive drainage of the area and of adjacent areas. The surface elevation of waste areas shall not extend above the surface elevation of adjacent usable areas of the airport, unless specified on the plans or approved by the Engineer.

When the Contractor's excavating operations encounter artifacts of historical or archaeological significance, the operations shall be temporarily discontinued. At the direction of the Engineer, the Contractor shall excavate the site in such a manner as to preserve the artifacts encountered and allow for their removal. Such excavation will be paid for as extra work.

Those areas outside of the pavement areas in which the top layer of soil material has become compacted, by hauling or other activities of the Contractor shall be scarified and disked to a depth of 4 inches (100 mm), in order to loosen and pulverize the soil.

If it is necessary to interrupt existing surface drainage, sewers or underdrainage, conduits, utilities, or similar underground structures, the Contractor shall be responsible for and shall take all necessary precautions to preserve them or provide temporary services. When such facilities are encountered, the Contractor shall notify the Engineer, who shall arrange for their removal if necessary. The Contractor shall, at his/her own expense, satisfactorily repair or pay the cost of all damage to such facilities or structures which may result from any of the Contractor's operations during the period of the contract.

2.2 EXCAVATION. No excavation shall be started until the work has been staked out by the Contractor and the Engineer has obtained elevations and measurements of the ground surface. All suitable excavated material shall be used in the formation of embankment, subgrade, or for other purposes shown on the plans. All unsuitable material shall be disposed of as shown on the plans.

When the volume of the excavation exceeds that required to construct the embankments to the grades indicated, the excess shall be used to grade the areas of ultimate development or disposed of as directed. When the volume of excavation is not sufficient for constructing the fill to the grades indicated, the deficiency shall be obtained from borrow areas.

The grade shall be maintained so that the surface is well drained at all times. When necessary, temporary drains and drainage ditches shall be installed to intercept or divert surface water which may affect the work.

a. Selective Grading. When selective grading is indicated on the plans, the more suitable material as designated by the Engineer shall be used in constructing the embankment or in capping the pavement subgrade. If, at the time of excavation, it is not possible to place this material in its final location, it shall be stockpiled in approved areas so that it can be measured for payment for rehandling as specified in paragraph 3.3.

b. Undercutting. Rock, shale, hardpan, loose rock, boulders, or other material unsatisfactory for safety areas, subgrades, roads, shoulders, or any areas intended for turfing shall be excavated to a minimum depth of 12 inches (300 mm), or to the depth specified by the Engineer, below the subgrade. Muck, peat, matted roots, or other yielding material, unsatisfactory for subgrade foundation, shall be removed to the depth specified. Unsuitable materials shall be disposed of at locations shown on the plans. The excavated area shall be refilled with suitable material obtained from the grading operations or borrow areas and compacted to specified densities. The necessary refilling will constitute a part of the embankment. Where rock cuts are made and refilled with selected material, any pockets created in the rock surface shall be drained in accordance with the details shown on the plans.

c. Overbreak. Overbreak, including slides, is that portion of any material displaced or loosened beyond the finished work as planned or authorized by the Engineer. The Engineer shall determine if the displacement of such material was unavoidable and his/her decision shall be final. All overbreak shall be graded or removed by the Contractor and disposed of as directed; however, payment will not be made for the removal and disposal of overbreak which the Engineer determines as avoidable. Unavoidable overbreak will be classified as "Unclassified Excavation".

d. Removal of Utilities. The removal of existing structures and utilities required to permit the orderly progress of work will be accomplished by someone other than the Contractor, e.g., the utility unless otherwise shown on the plans. All existing foundations shall be excavated for at least 2 feet (60 cm) below the top of subgrade or as indicated on the plans, and the material disposed of as directed. All foundations thus excavated shall be backfilled with suitable material and compacted as specified herein.

e. Compaction Requirements. The subgrade under areas to be paved shall be compacted to a depth of 12 inches and to a density of not less than 95 percent of the maximum density as determined by ASTM D 698.

The in-place field density shall be determined in accordance with ASTM D 1556 or ASTM D 2167. Stones or rock fragments larger than 4 inches (100 mm) in their greatest dimension will not be permitted in top 6 inches (150 mm) of the subgrade. The finished grading operations, conforming to the typical cross section, shall be completed and maintained at least 1,000 feet (300 m) ahead of the paving operations or as directed by the Engineer.

In cuts, all loose or protruding rocks on the back slopes shall be barred loose or otherwise removed to line of finished grade of slope. All cut-and-fill slopes shall be uniformly dressed to the slope, cross section, and alignment shown on the plans or as directed by the Engineer.

Blasting will not be permitted.

152-2.3 BORROW EXCAVATION. Borrow area(s) within the airport property are indicated on the plans. Borrow excavation shall be made only at these designated locations and within the horizontal and vertical limits as staked or as directed.

When borrow sources are outside the boundaries of the airport property, it shall be the Contractor's responsibility to locate and obtain the supply, subject to the approval of the Engineer. The Contractor shall notify the Engineer, at least 15 days prior to beginning the excavation, so necessary measurements and tests can be made. All unsuitable material shall be disposed of by the Contractor. All borrow pits shall be opened up to expose the vertical face of various strata of acceptable material to enable obtaining a uniform product. Borrow pits shall be excavated to regular lines to permit accurate measurements, and they shall be drained and left in a neat, presentable condition with all slopes dressed uniformly.

Borrow materials used as structural fill under the ramp pavement should be a clean soil, free of any deleterious matter, with a Liquid Limit less than 40 and a Plasticity Index between 8 and 20. Soils with a USCS classification of SC, GC, CL, and combinations of these soils may be used as select structural fill for this project. Soils classified as CH, MH, OH, OL and Pt by USCS guidelines are not considered suitable for use as structural fill material at this site.

The structural fill should be properly compacted in accordance with section 2.6.

152-2.4 DRAINAGE EXCAVATION. Drainage excavation shall consist of excavating for drainage ditches such as intercepting; inlet or outlet, for temporary levee construction; or for any other type as designed or as shown on the plans. The work shall be performed in the proper sequence with the other construction. All satisfactory material shall be placed in fills; unsuitable material shall be placed in waste areas or as directed. Intercepting ditches shall be constructed prior to starting adjacent excavation operations. All necessary work shall be performed to secure a finish true to line, elevation, and cross section.

The Contractor shall maintain ditches constructed on the project to the required cross section and shall keep them free of debris or obstructions until the project is accepted.

152-2.5 PREPARATION OF EMBANKMENT AREA. Where an embankment is to be constructed to a height of 4 feet (120 cm) or less, all sod and vegetable matter shall be removed from the surface upon which the embankment is to be placed, and the cleared surface shall be completely broken up by plowing or scarifying to a minimum depth of 6 inches (150 mm). This area shall then be compacted as indicated in paragraph 2.6. When the height of fill is greater than 4 feet (120 cm), sod not required to be removed shall be thoroughly disked and recompacted to the density of the surrounding ground before construction of embankment.

Where embankments are to be placed on natural slopes steeper than 3 to 1, horizontal benches shall be constructed as shown on the plans.

No direct payment shall be made for the work performed under this section. The necessary clearing and grubbing and the quantity of excavation removed will be paid for under the respective items of work.

152-2.6 FORMATION OF EMBANKMENTS. Embankments shall be formed in successive horizontal layers of not more than 8 inches (200 mm) in loose depth for the full width of the cross section, unless otherwise approved by the Engineer.

The grading operations shall be conducted, and the various soil strata shall be placed, to produce a soil structure as shown on the typical cross section or as directed. Materials such as brush, hedge, roots, stumps, grass and other organic matter, shall not be incorporated or buried in the embankment.

Operations on earthwork shall be suspended at any time when satisfactory results cannot be obtained because of rain, freezing, or other unsatisfactory conditions of the field. The Contractor shall drag, blade, or slope the embankment to provide proper surface drainage.

The material in the layer shall be within optimum to +3 percent of optimum moisture content before rolling to obtain the prescribed compaction and maintained as such until subgrade is permanently covered. In order to achieve a uniform moisture content throughout the layer, wetting or drying of the material and manipulation shall be required when necessary. Should the material be too wet to permit proper compaction or rolling, all work on all of the affected portions of the embankment shall be delayed until the material has dried to the required moisture content. Sprinkling of dry material to obtain the proper moisture content shall be done with approved equipment that will sufficiently distribute the water. Sufficient equipment to furnish the required water shall be available at all times. Samples of all embankment materials for testing, both before and after placement and compaction, will be taken for each 500 cubic yards (380 cubic meters) of material placed per layer. Based on these tests, the Contractor shall make the necessary corrections and adjustments in methods, materials or moisture content in order to achieve the correct embankment density.

Rolling operations shall be continued until the embankment is compacted to not less than 95 percent of maximum density for noncohesive soils, and 90 percent of maximum density for cohesive soils as determined by ASTM D 698. Under all areas to be paved, the embankments shall be compacted to a minimum depth of 12 inches and to a density of not less than 95 percent of the maximum density as determined by ASTM D 698.

On all areas outside of the pavement areas, no compaction will be required on the top 4 inches (100 mm).

The in-place field density shall be determined in accordance with ASTM D 1556, ASTM D 2167 or ASTM D 2922 using the Direct Transmission method. The nuclear gauge shall be calibrated in accordance with ASTM D 2922, Annex A! and be operated by a certified technician in accordance with ASTM D 2922, paragraph 8. Use of ASTM D2922 results in a wet unit weight, and when using this method, ASTM D 3017 shall be used to determine the moisture content of the material. The moisture gauge shall be standardized daily in accordance with ASTM D 3017, paragraph 7.

Compaction areas shall be kept separate, and no layer shall be covered by another until the proper density is obtained.

During construction of the embankment, the Contractor shall route his/her equipment at all times, both when loaded and when empty, over the layers as they are placed and shall distribute the travel evenly over the entire width of the embankment. The equipment shall be operated in such a manner that hardpan, cemented gravel, clay, or other chunky soil material will be broken up into small particles and become incorporated with the other material in the layer.

In the construction of embankments, layer placement shall begin in the deepest portion of the fill; as placement progresses, layers shall be constructed approximately parallel to the finished pavement grade line.

When rock and other embankment material are excavated at approximately the same time, the rock shall be incorporated into the outer portion of the embankment and the other material shall be incorporated under the future paved areas. Stones or fragmentary rock larger than 4 inches (100 mm) in their greatest dimensions will not be allowed in the top 6 inches (150 mm) of the subgrade. Rockfill shall be brought up in layers as specified or as directed and every effort shall be exerted to fill the voids with the finer material forming a dense, compact mass. Rock or boulders shall not be disposed of outside the excavation or embankment areas, except at places and in the manner designated by the Engineer.

When the excavated material consists predominantly of rock fragments of such size that the material cannot be placed in layers of the prescribed thickness without crushing, pulverizing or further breaking down the pieces, such material may be placed in the embankment as directed in layers not exceeding 2 feet (60 cm) in thickness. Each layer shall be leveled and smoothed with suitable leveling equipment and by distribution of spalls and finer fragments of rock. These type lifts shall not be constructed above an elevation 4 feet (120 cm) below the finished subgrade. Density requirements will not apply to portions of embankments constructed of materials which cannot be tested in accordance with specified methods.

Frozen material shall not be placed in the embankment nor shall embankment be placed upon frozen material.

152-2.7 **FINISHING AND PROTECTION OF SUBGRADE.** After the subgrade has been substantially completed the full width shall be conditioned by removing any soft or other unstable material which will not compact properly. The resulting areas and all other low areas, holes or depressions shall be brought to grade with suitable select material. Scarifying, blading, rolling and other methods shall be performed to provide a thoroughly compacted subgrade shaped to the lines and grades shown on the plans.

Grading of the subgrade shall be performed so that it will drain readily. The Contractor shall take all precautions necessary to protect the subgrade from damage. He/she shall limit hauling over the finished subgrade to that which is essential for construction purposes.

All ruts or rough places that develop in a completed subgrade shall be smoothed and recompacted.

No subbase, base, or surface course shall be placed on the subgrade until the subgrade has been approved by the Engineer.

152-2.8 **Haul.** All hauling will be considered a necessary and incidental part of the work. Its cost shall be considered by the Contractor and included in the contract unit price for the pay of

items of work involved. No payment will be made separately or directly for hauling on any part of the work.

152-2.9 Tolerances. In those areas upon which a subbase or base course is to be placed, the top of the subgrade shall be of such smoothness that, when tested with a 16-foot (4.8 m) straightedge applied parallel and at right angles to the centerline, it shall not show any deviation in excess of 1/2-inch (12 mm), or shall not be more than 0.05-foot (.015 m) from true grade as established by grade hubs or pins. Any deviation in excess of these amounts shall be corrected by loosening, adding, or removing materials; reshaping; and recompacting by sprinkling and rolling.

On safety areas, intermediate and other designated areas, the surface shall be of such smoothness that it will not vary more than 0.10 foot (0.03 m) from true grade as established by grade hubs. Any deviation in excess of this amount shall be corrected by loosening, adding or removing materials, and reshaping.

152-2.10 Topsoil. When topsoil is specified or required as shown on the plans or under Item T-905, it shall be salvaged from stripping or other grading operations. The topsoil shall meet the requirements of Item T-905. If, at the time of excavation or stripping, the topsoil cannot be placed in its proper and final section of finished construction, the material shall be stockpiled at approved locations. Stockpiles shall not be placed within 200 feet of runway pavement or 100 feet of taxiway pavement and shall not be placed on areas which subsequently will require any excavation or embankment. If, in the judgment of the Engineer, it is practical to place the salvaged topsoil at the time of excavation or stripping, the material shall be placed in its final position without stockpiling or further rehandling.

Upon completion of grading operations, stockpiled topsoil shall be handled and placed as directed, or as required in Item T-905.

No direct payment will be made for topsoil as such under Item P-152. The quantity removed and placed directly or stockpiled shall be paid for at the contract unit price per cubic yard (cubic meter) for "Unclassified Excavation".

When stockpiling of topsoil and later rehandling of such material is directed by the Engineer, the material so rehandled shall be paid for at the contract unit price per cubic yard (cubic meter) for "Topsoiling", as provided in Item T-905.

METHOD OF MEASUREMENT

152-3.1 The quantity of unclassified excavation to be paid for shall be the number of cubic yards (cubic meters) measured in its original position. No separate measurement or payment will be made for drainage or utility excavation or embankment.

Measurement shall not include the quantity of materials excavated without authorization beyond normal slope lines, or the quantity of material used for purposes other than those directed.

152-3.3 Measurement for excavation or excavation spoil shall be computed by the average end area method. The end area is that bound by the original ground line established by field cross sections and the final theoretical pay line established by excavation cross sections shown on the plans, subject to verification by the Engineer. After completion of all excavation operations and prior to the placing of base or subbase material, the final excavation shall be verified by the Engineer by means of field cross sections taken randomly at intervals not exceeding 500 linear feet (150 meters).

Final field cross sections shall be employed if the following changes have been made:

a. Plan width of embankments or excavations are changed by more than plus or minus 1.0 foot (0.3 meter); or

b. Plan elevations of embankments or excavations are changed by more than plus or minus 0.5 foot (0.15 meter).

BASIS OF PAYMENT

152-4.1 For "Unclassified Excavation" payment shall be made at the contract unit price per cubic yard (cubic meter). This price shall be full compensation for furnishing all materials, labor, equipment, tools, and incidentals necessary to complete the item.

Payment will be made under:

Item P-152-1	Unclassified Excavation	per cubic yard

TESTING REQUIREMENTS

ASTM D 698	Test for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures, Using 5.5-pound (2.49 kg) Rammer and 12-inch (305 mm) Drop
ASTM D 1556	Test for Density of Soil In Place by the Sand-Cone Method

ASTM D 1557	Test for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures, Using 10-pound (4.5 kg) Rammer and 18-inch (45 cm) Drop
ASTM D 2167	Test for Density and Unit Weight of Soil In Place by the Rubber Balloon Method.

END OF ITEM P-152

DEVIATIONS FROM STANDARD
FAA TECHNICAL SPECIFICATIONS

ITEM P-155 LIME-TREATED SUBGRADE

(a) Section 2.5 - Bituminous Material. Specification requirements added for a bituminous curing material.

(b) Section 3.1 – Lime. The application rate for lime shall be 36 lbs/sy for the depth shown on the plans.

(c) Section 6.2a, Application, dry placing shall not be permitted.

(d) Section 6.4 - Paragraph added to allow nuclear density gage testing. The number of field density tests is defined.

(e) Section 6.5 - Finishing and Curing, added requirements for lime treated subgrade to be cured with a bituminous seal coat.

ITEM P-155 LIME-TREATED SUBGRADE

DESCRIPTION

155-1.1 This item shall consist of constructing one or more courses of a mixture of soil, lime, and water in accordance with this specification, and in conformity with the lines, grades, thicknesses, and typical cross sections shown on the plans.

MATERIALS

155-2.1 HYDRATED LIME. Hydrated lime shall conform to the requirements of ASTM C 977.

155-2.2 COMMERCIAL LIME SLURRY. Commercial lime slurry shall be a pumpable suspension of solids in water. The water or liquid portion of the slurry shall not contain dissolved material in sufficient quantity naturally injurious or objectionable for the purpose intended. The solids portion of the mixture, when considered on the basis of "solids content", shall consist principally of hydrated lime of a quality and fineness sufficient to meet the following requirements as to chemical composition and residue.

a. **Chemical Composition.** The "solids content" of the lime slurry shall consist of a minimum of 70 percent, by weight, of calcium and magnesium oxides.

b. **Residue.** The percent by weight of residue retained in the "solids content" of lime slurry shall conform to the following requirements:

Residue retained on a No. 6 (3360 micron) sieve ------ Max. 0.0%
Residue retained on a No. 10 (2000 micron) sieve ----- Max. 1.0%
Residue retained on a No. 30 (590 micron) sieve ------ Max. 2.5%

c. **Grade.** Commercial lime slurry shall conform to one of the following two grades:

Grade 1. The "dry solids content" shall be at least 31 percent, by weight, of the slurry.
Grade 2. The "dry solids content" shall be at least 35 percent, by weight, of the slurry.

155-2.3 WATER. Water used for mixing or curing shall be reasonably clean and free of oil, salt, acid, alkali, sugar, vegetable, or other substances injurious to the finished product. Water shall be tested in accordance with and shall meet the suggested requirements of AASHTO T 26. Water known to be of potable quality may be used without being tested.

155-2.4 SOIL. The soil for this work shall consist of materials on the site or selected materials from other sources and shall be uniform in quality and gradation, and shall be approved

by the Engineer. The soil shall be free of roots, sod, weeds, and stones larger than 2-1/2 inches (60 mm).

155-2.5 BITUMINOUS MATERIAL. The bituminous material shall be either cutback asphalt or emulsified asphalt and shall conform to the requirements of Table 1.

Table 1
Bituminous Material

Type and Grade	Specification	Application Temperature	
		Deg. F	Deg. C
Cutback Asphalt			
RC-70	ASTM D 2028	120-160	50-70
RC-250	ASTM D 2028	160-200	70-95
Emulsified Asphalt			
RS-1, SS-1	ASTM D 977	75-130	25-55
CRS-1	ASTM D 2397	75-130	25-55

COMPOSITION

155-3.1 LIME. Lime shall be applied at a rate of 36 lbs/sy for the depth of subgrade treatment shown on the plans.

155-3.2 TOLERANCES. At final compaction, the lime and water content for each course of subgrade treatment shall conform to the following tolerances:

Material	Tolerance
Lime	+ 0.5%
Water	+ 2%, -0%

WEATHER LIMITATIONS

155-4.1 WEATHER LIMITATION. The lime treated subgrade shall not be mixed while the atmospheric temperature is below 40°F (4°C) or when conditions indicate that temperatures may fall below 40°F (4°C) within 24 hours, when it is foggy or rainy, or when soil or subgrade is frozen.

EQUIPMENT

155-5.1 EQUIPMENT. The equipment required shall include all equipment necessary to complete this item such as: grading and scarifying equipment, a spreader for the lime or lime slurry, mixing or pulverizing equipment, sheepsfoot and pneumatic or vibrating rollers, sprinkling equipment, and trucks.

CONSTRUCTION METHODS

155-6.1 GENERAL. It is the primary requirement of this specification to secure a completed subgrade containing a uniform lime mixture, free from loose or segregated areas, of uniform density and moisture content, well bound for its full depth, and with a smooth surface suitable for placing subsequent courses. It shall be the responsibility of the Contractor to regulate the sequence of his/her work, to use the proper amount of lime, maintain the work, and rework the courses as necessary to meet the above requirements.

Prior to beginning any lime treatment the subgrade shall be constructed and brought to grade as specified in Item P-152 "Excavation and Embankment" and shall be shaped to conform to the typical sections, lines, and grades as shown on the plans. The material to be treated shall then be excavated to the secondary grade (proposed bottom of lime treatment) and removed or windrowed to expose the secondary grade. Any wet or unstable materials below the secondary grade shall be corrected, as directed by the Engineer, by scarifying, adding lime, and compacting until it is of uniform stability. The excavated material shall then be spread to the desired cross section.

If the Contractor elects to use a cutting and pulverizing machine that will remove the subgrade material accurately to the secondary grade and pulverize the material at the same time, he will not be required to expose the secondary grade nor windrow the material. However, the Contractor shall be required to roll the subgrade, as directed by the Engineer, and correct any soft areas that this rolling may reveal before using the pulverizing machine. This method will be permitted only where a machine is provided which will ensure that the material is cut uniformly to the proper depth and which has cutters that will plane the secondary grade to a smooth surface over the entire width of the cut. The machine must give visible indication at all times that it is cutting to the proper depth.

155-6.2 APPLICATION. Lime shall be spread only on that area where the first mixing operations can be completed during the same working day. The application and mixing of lime with the soil shall be accomplished by the methods hereinafter described as "Dry Placing" or "Slurry Placing". When hydrated lime is specified, the Contractor may use either method.

a. Dry Placing. Dry placing shall not be permitted.

b. Slurry Placing. The lime shall be mixed with water in trucks with approved distributors and applied as a thin water suspension or slurry. Commercial lime slurry shall be applied with a lime percentage not less than that applicable for the grade used. The distribution of lime shall be attained by successive passes over a measured section of subgrade until the proper

amount of lime has been spread. The distributor truck shall continually agitate the slurry to keep the mixture uniform.

6.3 **Mixing.** The mixing procedure shall be the same for "Dry Placing" or "Slurry Placing" as hereinafter described:

a. **First Mixing.** The full depth of the treated subgrade shall be mixed with an approved mixing machine. Lime shall not be left exposed for more than 6 hours. The mixing machine shall make two coverages. Water shall be added to the subgrade during mixing to provide a moisture content above the optimum moisture of the material and to ensure chemical action of the lime and subgrade. After mixing, the subgrade shall be lightly rolled to seal the surface and help prevent evaporation of moisture. The water content of the subgrade mixture shall be maintained at a moisture content above the optimum moisture content for a minimum of 48 hours or until the material becomes friable. During the curing period, the material shall be sprinkled as directed. During the interval of time between application and mixing, lime that has been exposed to the open air for 6 hours or more, or to excessive loss due to washing or blowing will not be accepted for payment.

b. **Final Mixing.** After the required curing time, the material shall be uniformly mixed by approved methods. If the mixture contains clods, they shall be reduced in size by blading, discing, harrowing, scarifying, or the use of other approved pulverization methods so that the remainder of the clods shall meet the following requirements when tested dry by laboratory sieves:

	Percent Passing
Minimum of clods passing 1-1/2 inch sieve	100
Minimum of clods passing No. 4 sieve	60

155-6.4 **COMPACTION.** Compaction of the mixture shall begin immediately after final mixing. The material shall be aerated or sprinkled as necessary to provide optimum moisture. The field density of the compacted mixture shall be at least 98 percent of the maximum density of laboratory specimens prepared from samples taken from the material in place. The specimens shall be compacted and tested in accordance with ASTM 698. The in place field density shall be determined by using a nuclear gage in accordance with ASTM D 2922. The gage shall be field calibrated in accordance with paragraph 4 of ASTM D 2922. Calibration tests shall be conducted on the first lot of material placed that meets the density requirements. Use of ASTM D 2922 results in a wet unit weight, and when using this calibration curve furnished with the moisture gages shall be checked as described in paragraph 7 of ASTM D 3017. The calibration checks of both the density and moisture gages shall be made at the beginning of a job and at intervals as determined by the Resident Engineer. Two random readings shall be made for each 2,000 square yards of Lime Treated Subgrade placed. Any mixture that has not been compacted shall not be left undisturbed for more than 30 minutes. The moisture content of the mixture at the start of compaction shall not be below nor more than 2 percentage points above the optimum moisture content. The optimum moisture content shall be determined in accordance with ASTM D 698 and shall be less than that amount which will cause the mixture to become unstable during compaction and finishing.

Field density tests shall be performed at a minimum rate of one for each 1,000 square yards of lime-treated subgrade placed or four test for each days production, whichever is greater.

The material shall be sprinkled and rolled as directed by the Engineer. All irregularities, depressions, or weak spots which develop shall be corrected immediately by scarifying the areas affected, adding or removing material as required, and reshaping and recompacting by sprinkling and rolling. The surface of the course shall be maintained in a smooth condition, free from undulations and ruts, until other work is placed thereon or the work is accepted.

In addition to the requirements specified for density, the full depth of the material shown on the plans shall be compacted to the extent necessary to remain firm and stable under construction equipment. After each section is completed, tests will be made by the Engineer. If the material fails to meet the density requirements, it shall be reworked to meet these requirements. Throughout this entire operation, the shape of the course shall be maintained by blading, and the surface upon completion shall be smooth and shall conform with the typical section shown on the plans and to the established lines and grades. Should the material, due to any reason or cause, lose the required stability, density, and finish before the next course is placed or the work is accepted, it shall be recompacted and refinished at the sole expense of the Contractor.

155-6.5 FINISHING AND CURING. After the final layer or course of lime treated subgrade has been compacted, it shall be brought to the required lines and grades in accordance with the typical sections. The completed section shall then be finished by rolling, as directed, with a pneumatic or other suitable roller sufficiently light to prevent hair cracking. The finished surface shall not vary more than 3/8 inch (9 mm) when tested with a 16 foot (4.8 meter) straightedge applied parallel with and at right angles to the pavement centerline. Any variations in excess of this tolerance shall be corrected by the Contractor, at his/her own expense, in a manner satisfactory to the Engineer.

The completed lime treated base shall be cured with a bituminous curing seal applied, as soon as possible, and in no case later than 24 hours after completion of the finishing operations. The surface of the subgrade course shall be kept moist until the bituminous material is applied.

Bituminous material shall be uniformly applied at a rate of between 0.10 and 0.25 gallons per square yard (0.47 and 1.20 liters per square meter) of surface. The rate of application shall be approved by the Engineer.

The completed section shall be cured for a minimum of 7 days before further courses are added or any traffic is permitted, unless otherwise directed by the Engineer. Subsequent courses shall be applied within 14 days after the lime treated subgrade is cured.

155-6.6 THICKNESS. The thickness of the lime treated subgrade shall be determined by depth tests or cores taken at intervals so that each test shall represent no more than 300 square yards (250 square meters). When the base deficiency is more than 1/2 inch (12 mm), the Contractor shall correct such areas in a manner satisfactory to the Engineer. The Contractor shall replace, at his/her expense, the base material where borings are taken for test purposes.

155-6.7 MAINTENANCE. The Contractor shall maintain, at his/her own expense, the entire lime treated subgrade in good condition from the start of work until all the work has been completed, cured, and accepted by the Engineer.

METHOD OF MEASUREMENT

155-7.1 The yardage of lime treated subgrade to be paid for shall be the number of square yards (square meters) completed and accepted.

155-7.2 The amount of lime to be paid for shall be the number of tons of hydrated lime (or the calculated dry lime content of the lime slurry) used as authorized.

155-7.3 The bituminous seal coat material shall not be measured and paid for directly.

BASIS OF PAYMENT

155-8.1 Payment shall be made at the contract unit price per square yard (square meter) for the lime treated subgrade of the thickness specified. The price shall be full compensation for furnishing all material, except the lime, and for all preparation, delivering, placing and mixing these materials, and all labor, equipment, tools and incidentals necessary to complete this item.

155-8.2 Payment shall be made at the contract unit price per ton of lime. This price shall be full compensation for furnishing this material; for all delivery, placing and incorporation of this material; and for all labor, equipment, tools, and incidentals necessary to complete this item.

Payment will be made under:

P-155-1 Lime Treated subgrade, 6 inch.....per square yard

P-155-2 Lime (5%).....per ton

TESTING REQUIREMENTS

ASTM D 698	Moisture Density Relations of Soils and Soil Aggregate Mixtures Using 5.5 lb (2.49 kg) Rammer and 12 in. (305 mm) Drop
ASTM D 1557	Test for Moisture Density Relations of Soils and Soil Aggregate Mixtures, Using 10 pound (4.5 kg) Rammer and 18 inch (45 cm) Drop
ASTM D 1556	Density of Soil in Place by the Sand Cone Method
ASTM D 2167	Density and Unit Weight of Soil in Place by the Rubber Balloon Method
AASHTO T 26	Quality of Water to be Used in Concrete

MATERIAL REQUIREMENTS

ASTM C 977	Quicklime and Hydrated Lime for Soil Stabilization

END OF ITEM P-155

ITEM P-156 TEMPORARY AIR AND WATER POLLUTION,SOIL EROSION, AND SILTATION CONTROL

DESCRIPTION

156-1.1 This item shall consist of temporary control measures as shown on the plans or as ordered by the Engineer during the life of a contract to control water pollution, soil erosion, and siltation through the use of berms, dikes, dams, sediment basins, fiber mats, gravel, mulches, grasses, slope drains, and other erosion control devices or methods.

The temporary erosion control measures contained herein shall be coordinated with the permanent erosion control measures specified as part of this contract to the extent practical to assure economical, effective, and continuous erosion control throughout the construction period.

Temporary control may include work outside the construction limits such as borrow pit operations, equipment and material storage sites, waste areas, and temporary plant sites.

MATERIALS

156-2.1 GRASS. Grass which will not compete with the grasses sown later for permanent cover shall be a quick-growing species (such as ryegrass, Italian ryegrass, or cereal grasses) suitable to the area providing a temporary cover.

156-2.2 MULCHES. Mulches may be hay, straw, fiber mats, netting, bark, wood chips, or other suitable material reasonably clean and free of noxious weeds and deleterious materials.

156-2.3 FERTILIZER. Fertilizer shall be a standard commercial grade and shall conform to all Federal and state regulations and to the standards of the Association of Official Agricultural Chemists.

156-2.4 SLOPE DRAINS. Slope drains may be constructed of pipe, fiber mats, rubble, portland cement concrete, bituminous concrete, or other materials that will adequately control erosion.

156-2.5 OTHER. All other materials shall meet commercial grade standards and shall be approved by the Engineer before being incorporated into the project.

CONSTRUCTION REQUIREMENTS

156-3.1 GENERAL. In the event of conflict between these requirements and pollution control laws, rules, or regulations of other Federal, state, or local agencies, the more restrictive laws, rules, or regulations shall apply.

The Engineer shall be responsible for assuring compliance to the extent that construction practices, construction operations, and construction work are involved.

156-3.2 SCHEDULE. Prior to the start of construction, the Contractor shall submit schedules for accomplishment of temporary and permanent erosion control work, as are applicable for clearing and grubbing; grading; construction; paving; and structures at watercourses. The Contractor shall also submit a proposed method of erosion and dust control on haul roads and borrow pits and a plan for disposal of waste materials. Work shall not be started until the erosion control schedules and methods of operation for the applicable construction have been accepted by the Engineer.

156-3.3 AUTHORITY OF ENGINEER. The Engineer has the authority to limit the surface area of erodible earth material exposed by clearing and grubbing, to limit the surface area of erodible earth material exposed by excavation, borrow and fill operations, and to direct the Contractor to provide immediate permanent or temporary pollution control measures to minimize contamination of adjacent streams or other watercourses, lakes, ponds, or other areas of water impoundment.

156-3.4 CONSTRUCTION DETAILS. The Contractor will be required to incorporate all permanent erosion control features into the project at the earliest practicable time as outlined in the accepted schedule. Except where future construction operations will damage slopes, the Contractor shall perform the permanent seeding and mulching and other specified slope protection work in stages, as soon as substantial areas of exposed slopes can be made available. Temporary erosion and pollution control measures will be used to correct conditions that develop during construction that were not foreseen during the design stage; that are needed prior to installation of permanent control features; or that are needed temporarily to control erosion that develops during normal construction practices, but are not associated with permanent control features on the project.

Where erosion is likely to be a problem, clearing and grubbing operations should be scheduled and performed so that grading operations and permanent erosion control features can follow immediately thereafter if the project conditions permit; otherwise, temporary erosion control measures may be required between successive construction stages.

The Engineer will limit the area of clearing and grubbing, excavation, borrow, and embankment operations in progress, commensurate with the Contractor's capability and progress in keeping the finish grading, mulching, seeding, and other such permanent control measures current in accordance with the accepted schedule. Should seasonal limitations make such coordination unrealistic, temporary erosion control measures shall be taken immediately to the extent feasible and justified.

In the event that temporary erosion and pollution control measures are required due to the Contractor's negligence, carelessness, or failure to install permanent controls as a part of the work as scheduled or are ordered by the Engineer, such work shall be performed by the Contractor at his/her own expense.

The Engineer may increase or decrease the area of erodible earth material to be exposed at one time as determined by analysis of project conditions.

The erosion control features installed by the Contractor shall be acceptably maintained by the Contractor during the construction period.

Whenever construction equipment must cross watercourses at frequent intervals, and such crossings will adversely affect the sediment levels, temporary structures should be provided.

Pollutants such as fuels, lubricants, bitumen, raw sewage, wash water from concrete mixing operations, and other harmful materials shall not be discharged into or near rivers, streams, and impoundments or into natural or manmade channels leading thereto.

METHOD OF MEASUREMENT

156-4.1 Temporary erosion and pollution control work will not be measured and paid for directly but shall be considered as a subsidiary obligation of the Contractor with costs included in the contract prices bid for the items to which they apply.

156-4.2 Control work performed for protection of construction areas outside the construction limits, such as borrow and waste areas, haul roads, equipment and material storage sites, and temporary plant sites, will not be measured and paid for directly but shall be considered as a subsidiary obligation of the Contractor with costs included in the contract prices bid for the items to which they apply.

BASIS OF PAYMENT

156-5.1 This item will not be paid for directly but shall be considered as a subsidiary obligation of the Contractor.

END OF ITEM P-156

DEVIATIONS FROM STANDARD
FAA TECHNICAL SPECIFICATIONS

P-157 SILT FENCE

(a) This original specification section entitled "Silt Fence" has been developed from previously used specifications.

ITEM P-157 SILT FENCE

DESCRIPTION

157-1.1 The work covered by this section consists of furnishing, installing, and maintaining a water permeable filter type of fence for the purpose of removing suspended particles from the water passing through it.

The quantity of silt fence to be installed will be affected by the actual conditions which occur during the construction of the project. The quantity of silt fence may be increased, decreased, or eliminated entirely at the direction of the Engineer.

MATERIALS

157-2.1 WOOD POSTS. Wood posts shall be a minimum of 6 feet long, at least 3 inches in diameter, and straight enough to provide a fence without noticeable misalignment.

157-2.2 STEEL POSTS. Steel posts shall be 5 feet long, 1-3/6" wide, and have projections for fastening the wire to the fence.

157-2.3 WIRE FABRIC. Wire fence fabric shall be at least 32 inches high and shall have at least 6 horizontal wires. Vertical wires shall be spaced 12 inches apart. The top and bottom wires shall be at least 10 gauge. All other wires shall be at least 12 gauge.

157-2.4 FILTER FABRIC.

(a) Burlap. Burlap shall weigh at least 6.7 ounces per square yard, and shall have a minimum width of 36 inches.

(b) Synthetic Fabrics: The fabric shall be composed of strong rot-proof synthetic fibers formed into a fabric of either the woven or nonwoven type. Either type of fabric shall be free of any treatment or coating which might significantly alter its physical properties after installation. The fabric shall contain stabilizers and/or inhibitors to make the filaments resistant to deterioration resulting from exposure to sunlight or heat. The fabric shall be a pervious sheet of synthetic fibers oriented into a stable network so that the fibers retain their relative position with respect to each other. The edges of the fabric shall be finished to prevent the outer yarn from pulling away from the fabric. The fabric shall be free of defects or flaws which significantly affect its physical and/or filtering properties. Sheets of fabric may be sewn or bonded together. No deviation from any physical requirements will be permitted due to the presence of the seam.

During all periods of shipment and storage, the fabric shall be wrapped in a heavy duty protective covering which will protect the fabric from sunlight, mud, dust, dirt, and debris. The fabric shall

not be exposed to temperatures greater than 140'F. After the protective covering has been removed, the fabric shall not be left uncovered under any circumstances for longer than 3 days.

The fabric shall meet the following physical requirements:

Physical Property	Test Method	Requirements
Tensile Strength	ASTM D1682 Grab Test Method using 1 inch square jaws and a travel rate of 12 inches per minute.	50 lb. min.
Grab Elongation	ASTM D1682 Grab Test Method using 1 inch square jaws and a travel rate of 12 inches per minute.	15% min.
Puncture Strength	ASTM D751 Tension Testing Machine with ring clamp; steel ball replaced with a 5/16 inch diameter solid steel cylinder with a hemispherical tip centered within the ring clamp.	60 lb. min.
Physical Property	**Test Method**	**Requirements**
EOS (Equivalent Sieve Opening Size)	Corps of Engineers Guide Specification CW 02215, November, 1977	No. 100 Sieve, Min. No. 40 Sieve, max.
Ultra Violet	ASTM D1682 Grab Test Method using 1 inch square jaws and a travel rate of 12 inches per	40 lb. min.

	minute. Tests to be made after 500 hours exposure on xenon are weatherometer as detailed in ASTM G26.	
Bursting Strength	ASTM D751 Diaphragm Bursting Tester.	100 psi min.

The Contractor shall furnish certified test reports with each shipment of material attesting that the fabric meets the requirements of this provision.

INSTALLATION AND REMOVAL

157-3.1 **General.** The silt fence shall be constructed at the locations shown on the plans or at locations directed by the Engineer.

Posts shall be installed so that no more than 3 feet of the post shall protrude above the ground. Fabric shall be attached to the wire fence fabric by wire or other acceptable means.

The Contractor shall maintain the silt fence and shall remove and dispose of silt accumulations at the silt fence when so directed by the Engineer. Fabric shall be removed and replaced whenever it has deteriorated to such extent that it reduces the effectiveness of the silt fence.

Silt fence shall remain in place unless the Engineer directs that it be removed. Silt fence which has been removed will remain the property of the Contractor and may be used at other locations provided it is in a condition acceptable to the Engineer. Upon removal of the silt fence, the Contractor shall dress the area to give a pleasing appearance.

METHOD OF MEASUREMENT

157-4.1 The quantity of silt fence to be paid for will be the actual number of linear feet of silt fence, measured in place from end post to end post of each separate installation, which has been completed and accepted.

BASIS OF PAYMENT

157-5.1 Payment will be made at the contract unit price per linear foot for silt fence. The above prices and payments will be full compensation for all work covered by this section, including but not limited to furnishing all fence posts, filter fabric, hardware, and other materials; installing, maintaining, and removing the silt fence; removal and disposal of silt accumulations from the silt fence.

Payment will be made under:

Item P-157-1 - Silt Fence .....Per Linear Foot.

TESTING AND MATERIAL REQUIREMENTS

Test and Short Title

ASTM D1682 - Grab Test

ASTM D751 - Tension Test

ASTM 626 - U.V. Stability

1/CW D2215 E.0.S.

END OF ITEM P-157

DEVIATION FROM STANDARD
FAA TECHNICAL SPECIFICATIONS

ITEM P-304 CEMENT-TREATED BASE COURSE

(a) Section 4.5 Placing. Clarification added to require single lift placement of material only

(b) Section 4.6 Compaction. Added minimum requirement for frequency of density testing. Testing method modified to allow nuclear gage testing.

(c) Section 4.11 Protection and Curing. Added section to require maintenance of in-place material and replacement of damaged material.

ITEM P-304 CEMENT-TREATED BASE COURSE

DESCRIPTION

304-1.1 This material shall consist of a base course composed of mineral aggregate and cement uniformly blended and mixed with water. The mixed material shall be spread, shaped, and compacted in accordance with these specifications and in conformity to the lines, grades, dimensions, and typical cross sections shown on the plans. Runway, taxiway, or apron pavements shall be built in a series of parallel lanes using a plan of processing that reduces longitudinal and transverse joints to a minimum.

MATERIALS

304-2.1 PORTLAND CEMENT. Portland cement shall conform to the requirements of ASTM C 150 Type I.

304-2.2 WATER. Water shall be clean, clear, and free from injurious amounts of sewage, oil, acid, strong alkalis, or vegetable matter, and it shall be free from clay or silt. If the water is of questionable quality, it shall be tested in accordance with the requirements of AASHO T 26.

304-2.3 AGGREGATE. The aggregate shall be select granular materials meeting the gradation requirements given in Table 1. The material shall be free of roots, sod, and weeds. The crushed or uncrushed aggregate shall consist of hard, durable particles of accepted quality, free from an excess of flat, elongated, soft, or disintegrated pieces, or objectionable matter. The method used in producing the aggregate shall be such that the finished product shall be as consistent as practicable. All stones and rocks of inferior quality shall be wasted.

Aggregates suspected of containing injurious quantities of sulfates shall be examined petrographically in accordance with ASTM C 295.

The aggregate shall conform to the gradation shown in Table 1 when tested in accordance with ASTM C 136.

Table 1
Aggregate cement-treated base course

Sieve Size	Percentage by Weight Passing Sieves	
	Gradation A	Gradation B
2 in. (50 mm)	100 [1]	100 [1]
No. 4 (4.75 mm)	45-100	55-100
No. 10 (1.80 mm)	37-80	45-100
No. 40 (450 micro-m)	15-50	25-80
No. 80 (210 micro-m)	0-25	10-35

[1] Maximum size of aggregate is 1 inch (25 mm) when used as a base course under Item P-501, Portland Cement Concrete Pavement.

The gradations in the table represent the limits which shall determine suitability of aggregate for use from the sources of supply. The final gradations decided on, within the limits designated in the table, shall be well graded from coarse to fine and shall not vary from the low limit on one sieve to the high limit on adjacent sieves, or vice versa. The portion of the base aggregate, including any blended material, passing the No. 40 sieve shall have a liquid limit of not more than 25 and a plasticity index of not more than 6 when tested in accordance with ASTM D 4318.

All aggregate samples required for testing shall be furnished by the Contractor at the expense of the Contractor. Sampling shall be in accordance with ASTM D 75 and will be observed by the Engineer. No aggregate shall be used in production of mixtures without prior approval.

304-2.4 BITUMINOUS MATERIAL. The types, grades, controlling specifications and application temperatures for the bituminous material are given in Table 2.

Table 2
Bituminous Material

Type and Grade	Specification	Application Temperature	
		Deg. F	Deg. C
Cutback Asphalt			
RC-70	ASTM D 2028	120-160	50-70
RC-250	ASTM D 2028	160-200	70-95
Emulsified Asphalt			
RS-1, SS-1	ASTM D 977	75-130	25-55
CRS-1	ASTM D 2397	75-130	25-55

CEMENT CONTENT

304-3.1 Prior to start of work, laboratory tests of materials submitted by the Contractor shall be made to determine the quantity of cement required in the mix. The cement content for construction shall be that at which the mix develops a 7-day compressive strength of at least 750 psi (5170 kPa). The testing procedure shall be as follows: mold and cure specimens in accordance with ASTM D 560; soak specimens in water for 4 hours; cap and break specimens in compression in accordance with ASTM D 1633.

CONSTRUCTION METHODS

304-4.1 WEATHER LIMITATIONS. The cement-treated base shall not be mixed or placed while the atmospheric temperature is below 40°F (4°C) or when conditions indicate that the temperature may fall below 35°F (2°C) within 24 hours or when the weather is rainy. Cement--treated base shall not be placed on frozen subgrade or mixed when aggregate is frozen.

304-4.2 OPERATION AT PITS. All work involved in clearing and stripping pits, including handling unsuitable material, shall be performed by the Contractor. The Contractor shall notify the Engineer sufficiently in advance of opening of any designated pit to permit staking of boundaries at the site, to take elevations and measurements of the ground surface before material is produced, to permit the Engineer to take samples of the material for tests to determine its quality and gradation, and to prepare a preliminary design of base mixture.

The pits, as utilized, shall be opened immediately to expose vertical faces of the various strata of acceptable material and, unless otherwise directed, the material shall be secured in successive vertical cuts extending through all the exposed strata in order to secure a uniform material.

304-4.3 PREPARING UNDERLYING COURSE. The underlying course shall be checked and accepted by the Engineer before placing and spreading operations are started. Any ruts or soft yielding places caused by improper drainage conditions, hauling, or any other cause shall be corrected before the base course is placed thereon.

304-4.4 MIXING. The aggregate shall be proportioned and mixed with cement and water in a central mixing plant. The plant shall be equipped with feeding and metering devices which will introduce the cement, aggregate, and water into the mixer in the quantities specified. Mixing shall continue until a thorough and uniform mixture has been obtained.

304-4.5 PLACING. The mixture shall be transported to the job site in suitable vehicles and shall be deposited on the moistened subbase in uniform layers by means of approved mechanical spreaders. Not more than 60 minutes shall elapse between the start of moist mixing and the start of compaction of the cement treated mixture on the prepared subgrade.

It is the intent of this Specification that the Contractor construct the plan depth of cement treated base in one homogenous mass. The addition of thin stabilized layers will not be permitted in order to provide the specified depth.

304-4.6 Compaction. Immediately upon completion of the spreading operations, the mixture shall be thoroughly compacted. The number, type, and weight of rollers shall be sufficient to compact the mixture to the required density.

Density tests will be required at a minimum rate of one test for every 500 SY of base constructed or four tests per days production, whichever is greater.

The field density of the compacted mixture shall be at least 98 percent of the maximum density of laboratory specimens prepared from samples of the cement treated base material taken from the material in place. The specimens shall be compacted and tested in accordance with ASTM D 558. The in place field density shall be determined in accordance with ASTM D 1556 or ASTM D 2167. Any mixture that has not been compacted shall not be left undisturbed for more than 30 minutes. The moisture content of the mixture at the start of compaction shall not be below nor more than 2 percentage points above the optimum moisture content. The optimum moisture content shall be determined in accordance with ASTM D 558 and shall be less than that amount which will cause the mixture to become unstable during compaction and finishing.

In lieu of the cone method of field density determination, acceptance testing may be accomplished using a nuclear gage in accordance with ASTM D 2922. The gage should be field calibrated in accordance with paragraph 4 of ASTM D 2922. Calibration tests shall be conducted on the first lot of material placed that meets the density requirements.

Use of ASTM D 2922 results in a wet unit weight, and when using this method, ASTM D 3017 shall be used to determine the moisture content of the material. The calibration curve furnished with the moisture gages shall be checked as described in paragraph 7 of ASTM D 3017. The calibration checks of both the density and moisture gages shall be made at the beginning of a job and at intervals as determined by the Engineer.

304-4.7 LAYER THICKNESS. The maximum depth of a compacted layer shall be 6 inches (150 mm), except where that total depth of the compacted base course is required to be greater than 6 inches (150 mm), no layer shall be in excess of 8 inches (200 mm) or less than 4 inches (100 mm) when compacted. In multilayer construction, the surface of the compacted material shall be kept moist until covered with the next layer. Successive layers shall be placed and compacted so that the required total depth of the base course is completed the same day.

304-4.8 FINISHING. Finishing operations shall be completed during daylight hours, and the completed base course shall conform to the required lines, grades, and cross section. If necessary, the surface shall be lightly scarified to eliminate any imprints made by the compacting or shaping equipment. The surface shall then be recompacted to the required density.

The compaction and finishing operations shall be completed within 2 hours of the time water is added to the mixture and shall produce a smooth, dense surface that is free of surface checking, ridges, or loose material.

304-4.9 SURFACE TOLERANCE. The finished surface shall not vary more than 3/8 inch (9 mm) when tested with a 16 foot (4.8 m) straightedge applied parallel with, or at right angles to, the centerline of the stabilized area. Any deviation in excess of this amount shall be corrected by the Contractor at the Contractor's expense.

304-4.10 CONSTRUCTION JOINTS. At the end of each day's construction, a transverse construction joint shall be formed by a header or by cutting back into the compacted material to form a true vertical face free of loose material.

Longitudinal joints shall be formed by cutting back into the compacted material to form a true vertical edge.

304-4.11 PROTECTION AND CURING. The completed cement treated base shall be cured with a bituminous curing seal applied as soon as possible, and in no case later than 24 hours after completion of the finishing operations. The surface of the base course shall be kept moist until the bituminous material is applied.

Bituminous material shall be uniformly applied at a rate of between 0.10 and 0.25 gallons per square yard (0.47 and 1.20 liters per square meter) of surface. The rate of application shall be approved by the Engineer.

The curing seal shall be maintained and protected for 7 days.

Finished portions of the base course that are used by equipment in the construction of an adjoining section shall be protected to prevent marring or damaging the completed work. The stabilized area shall be protected from freezing during the curing period.

The Contractor shall be required within the period of this Contract to maintain the Portland Cement treated base in good condition until all work has been completed and accepted. Maintenance shall include immediate repairs of any defects that may occur. This work shall be done by the Contractor at his own expense and repeated as often as necessary to keep the area continuously intact. Faulty work shall be replaced for the full depth of base.

METHOD OF MEASUREMENT

304-5.1 The quantity of cement treated base to be paid for will be determined by measurement of the number of square yards of base at the depths indicated on the Plans which are actually constructed and accepted by the Engineer as complying with the Plans and Specifications.

BASIS OF PAYMENT

304-6.1 Payment shall be made at the contract unit price per square yard at the depth indicated for cement treated base course. This price shall be full compensation for furnishing all materials, for all preparation, manipulation, and placing of these materials; and for all labor, equipment, tools, and incidentals necessary to complete the item.

Payment will be made under:

Cement Treated Base Course, 6" .....per square yard

TESTING REQUIREMENTS

ASTM C 136	Sieve or Screen Analysis of Fine and Coarse Aggregate
ASTM C 295	Petrographic Examination of Aggregates for Concrete
ASTM D 75	Sampling Aggregates
ASTM D 558	Moisture Density Relations of Soil Cement Mixtures
ASTM D 560	Freezing and Thawing Tests of Compacted Soil Cement Mixtures
ASTM D 1556	Density of Soil in Place by the Sand Cone Method
ASTM D 1633	Compressive Strength of Molded Soil Cement Cylinders
ASTM D 2167	Density of Soil in Place by the Rubber Balloon Method
ASTM D 3665	Random Sampling of Paving Materials
ASTM D 4318	Liquid Limit, Plastic Limit, and Plasticity Index of Soils
AASHTO T 26	Quality of Water to be Used in Concrete

MATERIAL REQUIREMENTS

ASTM C 150	Portland Cement
ASTM C 595	Blended Hydraulic Cements
ASTM D 977	Emulsified Asphalt
ASTM D 2028	Liquid Asphalt (Rapid Curing Type)
ASTM D 2397	Cationic Emulsified Asphalt

END OF ITEM P-304

DEVIATIONS FROM STANDARD
FAA TECHNICAL SPECIFICATIONS

ITEM P-401 - BITUMINOUS SURFACE COURSE

a. Non FAA standard specification referencing TxDOT standards for a transition wedge surface pavement.

b. reclaimed asphalt pavement (RAP) will not be allowed for use in bituminous pavements

ITEM P-401

BITUMINOUS PAVEMENTS

1. DESCRIPTION

1.1 General

This work shall consist of one or more courses of bituminous mixture constructed on the prepared foundation in accordance with these specifications and the specified requirements of the type under contract, and in reasonably close conformity with the lines, grades, thicknesses and typical sections shown on the plans within the tolerances specified or established.

1.2 Reference Standards

Work in this section includes providing and placing bituminous concrete pavement for a transition wedge between new concrete pavement and existing asphalt pavement as indicated on the plans. The pavement in designed to serve aircraft less than 12,500 lbs. In accordance with FAA Specification P-401, the use of a proven state highway bituminous pavement is acceptable. All work shall conform to the plans and unless noted otherwise, all applicable provisions of Section 340 of the Texas Department of Transportation Standard Specifications for Construction of Highways, Streets and Bridges, edition of 1993.

NO RECLAIMED ASPHALT PAVEMENT SHALL BE ALLOWED.

2. MATERIALS

All materials used for bituminous plant mixed pavements shall conform to the requirements for Type D Surface Course of Section 340 of the Texas Department of Transportation Standard Specifications for Construction of Highways, Streets and Bridges, edition of 1993.

RECLAIMED ASPHALT PAVEMENT (RAP) – Reclaimed asphalt pavement will not be allowed for use on this project.

3. CONSTRUCTION

All methods of construction of bituminous plant mixed pavements shall be as specified in Section 340 of the Texas Department of Transportation Standard Specifications for Construction of Highways, Streets and Bridges, edition of 1993.

4. METHOD OF MEASUREMENT

Asphalt plant mix surface measurement will be measured for payment as specified in subsection 340.7 of the Texas Department of Transportation Standard Specifications for Construction of Highways, Streets and Bridges, edition of 1993.

5. BASIS OF PAYMENT

The standard method for controlling, accepting and paving for asphalt plant mix surface will be used as provided in subsection 340.8 of the Texas Department of Transportation Standard Specifications for Construction of Highways, Streets and Bridges, edition of 1993.

Payment will be made under:

Item 401-1	Bituminous Surface Course .....per ton.
Item 401-2	Bituminous Surface Course, Temporary Pavement.....per ton

DEVIATIONS FROM STANDARD
FAA TECHNICAL SPECIFICATIONS

ITEM P-501 PORTLAND CEMENT CONCRETE PAVEMENT

(a) Section 2.9 – Deleted polyethylene film, burlap and paper from use as curing material.

(b) Section 3.1 – References acceptance criteria contained in paragraph 501-5.2b. Require mix design less than 90 days old.

(c) Section 3.4, Testing laboratory – Request evidence that the laboratory is accredited, for the test methods required herein, by a nationally recognized laboratory accreditation organization.

(d) Section 4.3 & 4.4 - Two coat cure compound used as a bond breaker

(e) Section 4.10 - Keyways not allowed. Note added to require dowel and/or tie bar installation procedures shall be adequate to insure that the area around dowels is completely filled with epoxy grout.

(f) Section 4.13 - Deleted requirement for skid resistant saw-cut grooving.

(g) Section 4.14 - Deleted polyethylene film, burlap and paper from use as curing material.

ITEM P-501 PORTLAND CEMENT CONCRETE PAVEMENT

DESCRIPTION

501-1.1 This work shall consist of pavement composed of portland cement concrete, with and without reinforcement constructed on a prepared underlying surface in accordance with these specifications and shall conform to the lines, grades, thickness, and typical cross sections shown on the plans.

MATERIALS

501-2.1 AGGREGATES.

a. Reactivity. Aggregates shall be tested for deleterious reactivity with alkalies in the cement in an amount sufficient to cause expansion of the concrete. Acceptance of aggregates shall be based on satisfactory evidence furnished by the Contractor that the aggregates, combined with other mixture constituents, do not produce excessive expansion in the concrete. This evidence shall include service records of concrete of comparable properties under similar conditions of exposure and/or certified records of tests by a testing laboratory that meets the requirements of ASTM C 1077 Tests shall be made in accordance with ASTM C 295 and ASTM C 289].

b. Fine Aggregate. Fine aggregate shall conform to the requirements of ASTM C 33. Gradation shall meet the requirements of Table 1 when tested in accordance with ASTM C 136, except as may otherwise be qualified under Section 5 of ASTM C 33.

TABLE 1.
GRADATION FOR FINE AGGREGATE ASTM C 33

Sieve Designation (square openings)	Percentage by Weight Passing Sieves
3/8 in. (9.5 mm)	100
No. 4 (4.75 mm)	95-100
No. 8 (2.36 mm)	80-100
No. 16 (1.18 mm)	50-85
No. 30 (600 micro-m)	25-60
No. 50 (300 micro-m)	10-30
No. 100 (150 micro-m)	2-10

c. Coarse Aggregate. Coarse aggregate shall conform to the requirements of ASTM C 33. Gradation, within the separated size groups, shall meet the requirements of Table 2 when tested in accordance with ASTM C 136. When the nominal maximum size of the aggregate is greater than 1 inch, the aggregates shall be furnished in two size groups.

Aggregates delivered to the mixer shall consist of crushed stone, crushed or uncrushed gravel, air-cooled blast furnace slag, or a combination thereof. The aggregate shall be composed of clean, hard, uncoated particles and shall meet the requirements for deleterious substances contained in ASTM C 33, Class 4M. Dust and other coating shall be removed from the aggregates by washing. The aggregate in any size group shall not contain more than 8 percent by weight of flat or elongated pieces when tested in accordance with ASTM D 4791. A flat or elongated particle is one having a ratio between the maximum and the minimum dimensions of a circumscribing rectangular prism exceeding 5 to 1.

The percentage of wear shall be no more than 40 percent when tested in accordance with ASTM C 131 or ASTM C 535.

TABLE 2.
GRADATION FOR COARSE AGGREGATE ASTM C 33

Sieve Designations (square openings)		From 1" to No.4 (25.0mm-4.75mm) Percentage by Weight Passing Sieves
in.	Mm	1"-No.4
2	50.8	-
1-1/2	38.1	100
1	25.0	95-100
¾	19.0	-
½	12.5	25-60
3/8	9.5	-
No. 4	4.75	0-10
No. 8	2.36	0-5

501-2.2 CEMENT. Cement shall conform to the requirements of ASTM C 150, Type I or Type II.

If for any reason, cement becomes partially set or contains lumps of caked cement, it shall be rejected. Cement salvaged from discarded or used bags shall not be used.

501-2.3 CEMENTITIOUS MATERIALS.

a. Fly Ash. Fly ash shall meet the requirements of ASTM C 618, Class C, F, or N with the exception of loss of ignition, where the maximum shall be less than 6 percent for Class F or N. The supplementary optional chemical and physical properties of Tables 1A and 2A contained in ASTM C618 shall apply.

b. Blast Furnace Slag. Ground blast furnace slag shall meet the requirements of ASTM C 989, Grade 100 or 120.

501-2.4 PREMOLDED JOINT FILLER. Premolded joint filler for expansion joints shall conform to the requirements of ASTM D 1752, Type II or III and shall be punched to admit the dowels where called for on the plans. The filler for each joint shall be furnished in a single piece for the full depth and width required for the joint, unless otherwise specified by the Engineer. When the use of more than one piece is required for a joint, the abutting ends shall be fastened securely and held accurately to shape by stapling or other positive fastening means satisfactory to the Engineer.

501-2.5 JOINT SEALER. The joint sealer for the joints in the concrete pavement shall meet the requirements of Item P-605 and shall be of the type(s) specified in the plans.

501-2.6 STEEL REINFORCEMENT. Reinforcing shall consist of welded deformed steel fabric conforming to the requirements of ASTM A 497 or bar mats conforming to the requirements of ASTM A 184.

501-2.7 DOWEL AND TIE BARS. Tie bars shall be deformed steel bars and conform to the requirements of ASTM A 615, ASTM A 616, or ASTM A 617, except that rail steel bars, Grade 50 or 60, shall not be used for tie bars that are to be bent or restraightened during construction. Tie bars designated as Grade 40 in ASTM A 615 can be used for construction requiring bent bars.

Dowel bars shall be plain steel bars conforming to ASTM A 615, ASTM A 616 or ASTM A 617 and shall be free from burring or other deformation restricting slippage in the concrete. High strength dowel bars shall conform to ASTM A 714, Class 2, Type S, Grade I, II or III, Bare Finish. Before delivery to the construction site each dowel bar shall be painted on all surfaces with one coat of paint meeting Federal Specification TT-P-664. If plastic or epoxy coated steel dowels are used no paint coating is required, except when specified for a particular situation on the contract plans. Coated dowels shall conform to the requirements of AASHTO M 254.

The sleeves for dowel bars used in expansion joints shall be metal or other type of an approved design to cover 2 to 3 inches (50 mm to 75 mm) of the dowel, with a closed end and with a suitable stop to hold the end of the bar at least 1 inch (25 mm) from the closed end of the sleeve. Sleeves shall be of such design that they will not collapse during construction.

501-2.8 WATER. Water used in mixing or curing shall be clean and free of oil, salt, acid, alkali, sugar, vegetable, or other substances injurious to the finished product. Water will be tested in accordance with the requirements of AASHTO T 26. Water known to be of potable quality may be used without testing.

501-2.9 COVER MATERIAL FOR CURING. Curing materials shall conform to one of the following specifications:

a. Liquid membrane forming compounds for curing concrete shall conform to the requirements of ASTM C 309, Type 2, Class B.

b. White polyethylene film - NOT ALLOWED.

c. White burlap polyethylene sheeting - NOT ALLOWED.

d. Waterproof paper – NOT ALLOWED.

501-2.10 ADMIXTURES. The use of any material added to the concrete mix shall be approved by the Engineer. The Contractor shall submit certificates indicating that the material to be furnished meets all of the requirements indicated below. In addition, the Engineer may require the Contractor to submit complete test data from an approved laboratory showing that the material to be furnished meets all of the requirements of the cited specifications. Subsequent tests may be made of samples taken by the Engineer from the supply of material being furnished or proposed for use on the work to determine whether the admixture is uniform in quality with that approved.

a. Air-Entraining Admixtures. Air entraining admixtures shall meet the requirements of ASTM C 260 and shall consistently entrain the air content in the specified ranges under field conditions. The air entrainment agent and any chemical admixtures shall be compatible.

b. Chemical Admixtures. Water reducing, set retarding, and set accelerating admixtures shall meet the requirements of ASTM C 494, including the flexural strength test.

501-2.11 EPOXY-RESIN. Epoxy resin used to anchor dowels and tie bars in pavements shall conform to the requirements of ASTM C 881, Type I, Grade 3, Class C. Class A or B shall be used when the surface temperature of the hardened concrete is below 60 degrees F (16 degrees C).

501-2.12 MATERIAL ACCEPTANCE. Prior to use of materials, the Contractor shall submit certified test reports to the Engineer for those materials proposed for use during construction. The certification shall show the appropriate ASTM test(s) for each material, the test results, and a statement that the material passed or failed.

The Engineer may request samples for testing, prior to and during production, to verify the quality of the materials and to ensure conformance with the applicable specifications.

MIX DESIGN

501-3.1 PROPORTIONS Concrete shall be designed to achieve a 28-day flexural strength that meets or exceeds the acceptance criteria contained in paragraph 501-5.2 for a flexural strength of 650 psi. The mix shall be designed using the procedures contained in Chapter 7 of the Portland Cement Association's manual, "Design and Control of Concrete Mixtures."

The Contractor shall note that to ensure that the concrete actually produced will meet or exceed the acceptance criteria for the specified strength, the mix design average strength must be higher than the specified strength. The amount of over-design necessary to meet specification

requirements depends on the producer's standard deviation of flexural test results and the accuracy which that value can be estimated from historic data for the same or similar materials.

The minimum cementitious material (cement plus fly ash) shall be 517 pounds per cubic yard. The ratio of water to cementitious material, including free surface moisture on the aggregates but not including moisture absorbed by the aggregates shall not be more than 0.45 by weight.

Prior to the start of paving operations and after approval of all material to be used in the concrete, the Contractor shall submit a mix design showing the proportions and flexural strength obtained from the concrete at 7 and 28 days. The mix design shall include copies of test reports, including test dates, and a complete list of materials including type, brand, source, and amount of; cement, fly ash, ground slag, coarse aggregate, fine aggregate, water, and admixtures. The fineness modulus of the fine aggregate and the air content shall also be shown. The mix design shall be submitted to the Engineer at least 15 days prior to the start of operations. The submitted mix design shall not be more than 90 days old. Production shall not begin until the mix design is approved in writing by the Engineer.

Should a change in sources be made, or admixtures added or deleted from the mix, a new mix design must be submitted to the Engineer for approval.

Flexural strength test specimens shall be prepared in accordance with ASTM C 31 and tested in accordance with ASTM C 78. The mix determined shall be workable concrete having a slump for side form concrete between 1 and 2 inches (25 mm and 50 mm) as determined by ASTM C 143. For vibrated slip form concrete, the slump shall be between 1/2 inch (13 mm) and 1-1/2 inches (38 mm).

501-3.2 CEMENTITIOUS MATERIALS.

a. Fly Ash. Fly ash may be used in the mix design. When fly ash is used as a partial replacement for cement, the minimum cement content may be met by considering portland cement plus fly ash as the total cementitious material. The replacement rate shall be determined from laboratory trial mixes, but shall not exceed 20 percent by weight of the total cementitious material.

b. Ground Slag. Ground blast furnace slag may be used in a mix design containing Type I or Type II cement. The slag, or slag plus fly ash if both are used, may constitute between 25 to 55 percent of the total cementitious material by weight. If the concrete is to be used for slipforming operations and the air temperature is expected to be lower than 55 degrees F (13 degrees C) the percent slag shall not exceed 30 percent by weight.

501-3.3 ADMIXTURES.

a. Air Entraining. Air entraining admixture shall be added in such a manner that will insure uniform distribution of the agent throughout the batch. The air content of freshly mix air entrained concrete shall be based upon trial mixes with the materials to be used in the work adjusted to produce concrete of the required plasticity and workability. The percentage of air in the

mix shall be 4.5 ±1.5 percent. Air content shall be determined by testing in accordance with ASTM C 231 for gravel and stone coarse aggregate and ASTM C 173 for slag and other highly porous coarse aggregate.

b. Chemical. Water reducing, set controlling, and other approved admixtures shall be added to the mix in the manner recommended by the manufacturer and in the amount necessary to comply with the specification requirements. Tests shall be conducted on trial mixes, with the materials to be used in the work, in accordance with ASTM C 494.

501-3.4 TESTING LABORATORY. The laboratory used to develop the mix design shall meet the requirements of ASTM C 1077. A certification that it meets these requirements shall be submitted to the Engineer prior to the start of mix design and shall contain as a minimum:

a. Qualifications of personnel; laboratory manager, supervising technician, and testing technicians.

b. A statement that the equipment used in developing the mix design is in calibration.

c. A statement that each test specified in developing the mix design is offered in the scope of the laboratory's services.

d. A copy of the laboratory's quality control system.

e. Evidence that the laboratory is accredited, for the test methods required herein, by a nationally recognized laboratory accreditation organization.

CONSTRUCTION METHODS

501-4.1 EQUIPMENT. The Contractor shall furnish all equipment and tools necessary for handling materials and performing all parts of the work.

a. Batch Plant and Equipment. The batch plant and equipment shall conform to the requirements of ASTM C 94.

b. Mixers and Transportation Equipment.

(1) General. Concrete may be mixed at a central plant, or wholly or in part in truck mixers. Each mixer shall have attached in a prominent place a manufacturer's nameplate showing the capacity of the drum in terms of volume of mixed concrete and the speed of rotation of the mixing drum or blades.

(2) Central Plant Mixer. Central plant mixers shall conform to the requirements of ASTM C 94.

The mixer shall be examined daily for changes in condition due to accumulation of hard concrete or mortar or wear of blades. The pickup and throwover blades shall be replaced when they have worn down 3/4 inch (19 mm) or more. The Contractor shall have a copy of the manufacturer's design on hand showing dimensions and arrangement of blades in reference to original height and depth.

(3) **Truck Mixers and Truck Agitators.** Truck mixers used for mixing and hauling concrete and truck agitators used for hauling central mixed concrete shall conform to the requirements of ASTM C 94.

(4) **Nonagitator Trucks.** Nonagitating hauling equipment shall conform to the requirements of ASTM C 94.

c. **Finishing Equipment.** The finishing equipment shall be of sufficient weight and power for proper finishing of the concrete. The finishing machine shall be designed and operated to strike off, screed and consolidate the concrete such that laitance on the surface is less than 1/8 inch (3 mm) thick.

d. **Vibrators.** Vibrator shall be either internal type with immersed tube or multiple spuds, or surface type vibrating pan or screed. For pavements 8 inches (20 cm) or more thick internal vibrators shall be used. They may be attached to the spreader or the finishing machine, or they may be mounted on a separate carriage. Operating frequency for internal vibrators shall be between 8,000 and 12,000 vibrations per minute. Average amplitude for internal vibrators shall be 0.025-0.05 inches (0.06-0.13 cm). For pavements less than 8 inches (20 cm) thick, vibrating surface pans or screeds shall be allowed. Operating frequencies for surface vibrators shall be between 3,000 and 6,000 vibrations per minute.

The number, spacing, and frequency shall be as necessary to provide a dense and homogeneous pavement. Adequate power to operate all vibrators shall be available on the paver. The vibrators shall be automatically controlled so that they shall be stopped as forward motion ceases.

Hand held vibrators may be used in irregular areas.

e. **Concrete Saws.** The Contractor shall provide sawing equipment adequate in number of units and power to complete the sawing to the required dimensions. The Contractor shall provide at least one standby saw in good working order and a supply of saw blades at the site of the work at all times during sawing operations.

f. **Side Forms.** Straight side forms shall be made of steel and shall be furnished in sections not less than 10 feet (3 m) in length. Forms shall have a depth equal to the pavement thickness at the edge. Flexible or curved forms of proper radius shall be used for curves of 100 foot (31 m) radius or less. Forms shall be provided with adequate devices for secure settings so that when in place they will withstand, without visible spring or settlement, the impact and vibration of the consolidating and finishing equipment. Forms with battered top surfaces and bent, twisted or broken forms shall not be used. Built up forms shall not be used, except as approved by the

Engineer. The top face of the form shall not vary from a true plane more than 1/8 inch (3 mm) in 10 feet (3 m), and the upstanding leg shall not vary more than 1/4 inch (6 mm). The forms shall contain provisions for locking the ends of abutting sections together tightly for secure setting. Wood forms may be used under special conditions, when approved by the Engineer.

g. **Pavers.** The paver shall be fully energized, self propelled, and designed for the specific purpose of placing, consolidating, and finishing the concrete pavement, true to grade, tolerances, and cross section. It shall be of sufficient weight and power to construct the maximum specified concrete paving lane width as shown in the plans, at adequate forward speed, without transverse, longitudinal or vertical instability or without displacement. The paver shall be equipped with electronic or hydraulic horizontal and vertical control devices.

501-4.2 FORM SETTING. Forms shall be set sufficiently in advance of the concrete placement to insure continuous paving operation. After the forms have been set to correct grade, the underlying surface shall be thoroughly tamped, either mechanically or by hand, at both the inside and outside edges of the base of the forms. Forms shall be staked into place sufficiently to maintain the form in position for the method of placement.

Form sections shall be tightly locked and shall be free from play or movement in any direction. The forms shall not deviate from true line by more than 1/8 inch (3 mm) at any joint. Forms shall be so set that they will withstand, without visible spring or settlement, the impact and vibration of the consolidating and finishing equipment. Forms shall be cleaned and oiled prior to the placing of concrete.

The alignment and grade elevations of the forms shall be checked and corrections made by the Contractor immediately before placing the concrete.

501-4.3 CONDITIONING OF UNDERLYING SURFACE, SLIP FORM CONSTRUCTION. The compacted underlying surface on which the pavement will be placed shall be widened approximately 3 feet (1 m) to extend beyond the paving machine track to support the paver without any noticeable displacement. After the underlying surface has been placed and compacted to the required density, the areas which will support the paving machine and the area to be paved shall be trimmed or graded to the plan grade elevation and profile by means of a properly designed machine. The grade of the underlying surface shall be controlled by a positive grade control system using lasers, stringlines, or guide wires. If the density of the underlying surface is disturbed by the trimming operations, it shall be corrected by additional compaction and retested at the option of the Engineer before the concrete is placed except when stabilized subbases are being constructed. If damage occurs on a stabilized subbase, it shall be corrected full depth by the Contractor. If traffic is allowed to use the prepared grade, the grade shall be checked and corrected immediately before the placement of concrete. Prior to paving, the underling surface course shall be sprayed with 2 coats of white pigmented curing compound, in accordance with paragraph 501-4.14a. There shall be a minimum of 2 days between the coats, to allow for curing, and the second coat shall be applied a minimum of 2 days prior to top paving. The prepared grade shall be moistened with water, without saturating, immediately ahead of concrete placement to prevent

rapid loss of moisture from concrete. The underlying surface shall be protected so that it will be entirely free of frost when concrete is placed.

501-4.4 CONDITIONING OF UNDERLYING SURFACE, SIDE FORM AND FILL IN LANE CONSTRUCTION. Prior to paving, the underling surface course shall be sprayed with 2 coats of white pigmented curing compound, in accordance with paragraph 501-4.14a. There shall be a minimum of 2 days between the coats, to allow for curing, and the second coat shall be applied a minimum of 2 days prior to top paving. The prepared underlying surface shall be moistened with water, without saturating, immediately ahead of concrete placement to prevent rapid loss of moisture from the concrete. Damage caused by hauling or usage of other equipment shall be corrected and retested at the option of the Engineers. If damage occurs to a stabilized subbase, it shall be corrected full depth by the Contractor. A template shall be provided and operated on the forms immediately in advance of the placing of all concrete. The template shall be propelled only by hand and not attached to a tractor or other power unit. Templates shall be adjustable so that they may be set and maintained at the correct contour of the underlying surface. The adjustment and operation of the templates shall be such as will provide an accurate retest of the grade before placing the concrete thereon. All excess material shall be removed and wasted. Low areas shall be filled and compacted to a condition similar to that of the surrounding grade. The underlying surface shall be protected so that it will be entirely free from frost when the concrete is placed. The use of chemicals to eliminate frost in the underlying surface shall not be permitted.

The template shall be maintained in accurate adjustment, at all times by the Contractor, and shall be checked daily.

501-4.5 HANDLING, MEASURING, AND BATCHING MATERIAL. The batch plant site, layout, equipment, and provisions for transporting material shall assure a continuous supply of material to the work. Stockpiles shall be constructed in such a manner that prevents segregation and intermixing of deleterious materials.

Aggregates that have become segregated or mixed with earth or foreign material shall not be used. All aggregates produced or handled by hydraulic methods, and washed aggregates, shall be stockpiled or binned for draining at least 12 hours before being batched. Rail shipments requiring more than 12 hours will be accepted as adequate binning only if the car bodies permit free drainage.

Batching plants shall be equipped to proportion aggregates and bulk cement, by weight, automatically using interlocked proportioning devices of an approved type. When bulk cement is used, the Contractor shall use a suitable method of handling the cement from weighing hopper to transporting container or into the batch itself for transportation to the mixer, such as a chute, boot, or other approved device, to prevent loss of cement. The device shall be arranged to provide positive assurance that the cement content specified is present in each batch.

501-4.6 MIXING CONCRETE. The concrete may be mixed at the work site, in a central mix plant or in truck mixers. The mixer shall be of an approved type and capacity. Mixing time shall be measured from the time all materials, except water, are emptied into the drum. All concrete shall be mixed and delivered to the site in accordance with the requirements of ASTM C

94. Mixed concrete from the central mixing plant shall be transported in truck mixers, truck agitators, or nonagitating trucks. The elapsed time from the addition of cementitious material to the mix until the concrete is deposited in place at the work site shall not exceed 30 minutes when the concrete is hauled in nonagitating trucks, nor 90 minutes when the concrete is hauled in truck mixers or truck agitators. Retempering concrete by adding water or by other means will not be permitted, except when concrete is delivered in transit mixers. With transit mixers additional water may be added to the batch materials and additional mixing performed to increase the slump to meet the specified requirements provided the addition of water is performed within 45 minutes after the initial mixing operations and provided the water/cementitious ratio specified in the mix design is not exceeded.

501-4.7 LIMITATIONS ON MIXING AND PLACING. No concrete shall be mixed, placed, or finished when the natural light is insufficient, unless an adequate and approved artificial lighting system is operated.

a. Cold Weather. Unless authorized in writing by the Engineer, mixing and concreting operations shall be discontinued when a descending air temperature in the shade and away from artificial heat reaches 40 degrees F (4 degrees C) and shall not be resumed until an ascending air temperature in the shade and away from artificial heat reaches 35 degrees F (2 degrees C).

The aggregate shall be free of ice, snow, and frozen lumps before entering the mixer. The temperature of the mixed concrete shall not be less than 50 degrees F (10 degrees C) at the time of placement. Concrete shall not be placed on frozen material nor shall frozen aggregates be used in the concrete.

When concreting is authorized during cold weather, water and/or the aggregates may be heated to not more than 150 degrees F (66 degrees C). The apparatus used shall heat the mass uniformly and shall be arranged to preclude the possible occurrence of overheated areas which might be detrimental to the materials.

b. Hot Weather. During periods of hot weather when the maximum daily air temperature exceeds 85 degrees F (30 degrees C), the following precautions shall be taken.

The forms and/or the underlying surface shall be sprinkled with water immediately before placing the concrete. The concrete shall be placed at the coolest temperature practicable, and in no case shall the temperature of the concrete when placed exceed 90 degrees F (35 degrees C). The aggregates and/or mixing water shall be cooled as necessary to maintain the concrete temperature at or not more than the specified maximum.

The finished surfaces of the newly laid pavement shall be kept damp by applying a water-fog or mist with approved spraying equipment until the pavement is covered by the curing medium. If necessary, wind screens shall be provided to protect the concrete from an evaporation rate in excess of 0.2 psf per hour as determined in accordance with Figure 2.1.5 in ACI 305R, Hot Weather Concreting, which takes into consideration relative humidity, wind velocity, and air temperature.

When conditions are such that problems with plastic cracking can be expected, and particularly if any plastic cracking begins to occur, the Contractor shall immediately take such additional measures as necessary to protect the concrete surface. Such measures shall consist of wind screens, more effective fog sprays, and similar measures commencing immediately behind the paver. If these measures are not effective in preventing plastic cracking, paving operations shall be immediately stopped.

501-4.8 PLACING CONCRETE. The Contractor has the option of side (fixed) form or slip form paving. At any point in concrete conveyance, the free vertical drop of the concrete from one point to another or to the underlying surface shall not exceed 3 feet (1 m).

Hauling equipment or other mechanical equipment can be permitted on adjoining previously constructed pavement when the concrete strength reaches a flexural strength of 550 psi, based on the average of four field cured specimens per 2,000 cubic yards of concrete placed. Subgrade and subbase planers, concrete pavers, and concrete finishing equipment may be permitted to ride upon the edges of previously constructed pavement when the concrete has attained a minimum flexural strength of 400 psi.

a. Side-form Method. For the side form method, the concrete shall be deposited on the moistened grade to require as little rehandling as possible. Unless truck mixers, truck agitators, or nonagitating hauling equipment are equipped with means for discharge of concrete without segregation of the materials, the concrete shall be placed and spread using an approved mechanical spreading device that prevents segregation of the materials. Placing shall be continuous between transverse joints without the use of intermediate bulkheads. Necessary hand spreading shall be done with shovels, not rakes. Workers shall not be allowed to walk in the freshly mixed concrete with boots or shoes coated with earth or foreign substances.

Concrete shall be deposited as near to expansion and contraction joints as possible without disturbing them but shall not be dumped from the discharge bucket or hopper onto a joint assembly unless the hopper is centered above the joint assembly.

Concrete shall be thoroughly consolidated against and along the faces of all forms and previously placed concrete and along the full length and on both sides of all joint assemblies by means of vibrators inserted in the concrete. Vibrators shall not be permitted to come in contact with a joint assembly, the grade, or a side form. In no case shall the vibrator be operated longer than 20 seconds in any one location, nor shall the vibrators be used to move the concrete.

b. Slip form Method. For the slip form method, the concrete shall be placed with an approved crawler mounted, slip form paver designed to spread, consolidate and shape the freshly placed concrete in one complete pass of the machine so that a minimum of hand finishing will be necessary to provide a dense and homogeneous pavement in conformance with requirements of the plans and specifications. The concrete shall be placed directly on top of the joint assemblies to prevent them from moving when the paver moves over them. Side forms and finishing screeds shall be adjustable to the extent required to produce the specified pavement edge and surface

tolerance. The side forms shall be of dimensions, shape, and strength to support the concrete laterally for a sufficient length of time so that no edge slumping exceeds the requirements of paragraph 501 5.2e(5). Final finishing shall be accomplished while the concrete is still in the plastic state.

In the event that slumping or sloughing occurs behind the paver or if there are any other structural or surface defects which, in the opinion of the Engineer, cannot be corrected within permissible tolerances, paving operations shall be immediately stopped until proper adjustment of the equipment or procedures have been made. In the event that satisfactory procedures and pavement are not achieved after not more than 2,000 lineal feet (600 m) of single lane paving, the Contractor shall complete the balance of the work with the use of standard metal forms and the formed method of placing and curing. Any concrete not corrected to permissible tolerances shall be removed and replaced at the Contractor's expense.

501-4.9 STRIKE OFF OF CONCRETE AND PLACEMENT OF REINFORCEMENT. Following the placing of the concrete, it shall be struck off to conform to the cross section shown on the plans and to an elevation such that when the concrete is properly consolidated and finished, the surface of the pavement shall be at the elevation shown on the plans. When reinforced concrete pavement is placed in two layers, the bottom layer shall be struck off to such length and depth that the sheet of reinforcing steel fabric or bar mat may be laid full length on the concrete in its final position without further manipulation. The reinforcement shall then be placed directly upon the concrete, after which the top layer of the concrete shall be placed, struck off, and screeded. If any portion of the bottom layer of concrete has been placed more than 30 minutes without being covered with the top layer or if initial set has taken place, it shall be removed and replaced with freshly mixed concrete at the Contractor's expense. When reinforced concrete is placed in one layer, the reinforcement may be positioned in advance of concrete placement or it may be placed in plastic concrete by mechanical or vibratory means after spreading.

Reinforcing steel, at the time concrete is placed, shall be free of mud, oil, or other organic matter that may adversely affect or reduce bond. Reinforcing steel with rust, mill scale or a combination of both will be considered satisfactory, provided the minimum dimensions, weight, and tensile properties of a hand wire brushed test specimen are not less than the applicable ASTM specification requirements.

501-4.10 JOINTS. Joints shall be constructed as shown on the plans and in accordance with these requirements. All joints shall be constructed with their faces perpendicular to the surface of the pavement and finished or edged as shown on the plans. Joints shall not vary more than 1/2 inch (13 mm) from their designated position and shall be true to line with not more than 1/4 inch (6 mm) variation in 10 feet (3 m). The surface across the joints shall be tested with a Contractor furnished 10 foot (3 m) straightedge as the joints are finished and any irregularities in excess of 1/4 inch (6 mm) shall be corrected before the concrete has hardened. All joints shall be so prepared, finished, or cut to provide a groove of uniform width and depth as shown on the plans.

a. Construction. Longitudinal construction joints shall be slip formed or formed against side forms without keyways, as shown in the plans.

Transverse construction joints shall be installed at the end of each day's placing operations and at any other points within a paving lane when concrete placement is interrupted for more than 30 minutes or it appears that the concrete will obtain its initial set before fresh concrete arrives. The installation of the joint shall be located at a planned contraction or expansion joint. If placing of the concrete is stopped, the Contractor shall remove the excess concrete back to the previous planned joint.

b. Contraction. Contraction joints shall be installed at the locations and spacing as shown on the plans. Contraction joints shall be installed to the dimensions required by forming a groove or cleft in the top of the slab while the concrete is still plastic or by sawing a groove into the concrete surface after the concrete has hardened. When the groove is formed in plastic concrete the sides of the grooves shall be finished even and smooth with an edging tool. If an insert material is used, the installation and edge finish shall be according to the manufacturer's instructions. The groove shall be finished or cut clean so that spalling will be avoided at intersections with other joints. Grooving or sawing shall produce a slot at least 1/8 inch (3 mm) wide and to the depth shown on the plans.

c. Expansion. Expansion joints shall be installed as shown on the plans. The premolded filler of the thickness as shown on the plans, shall extend for the full depth and width of the slab at the joint, except for space for sealant at the top of the slab. The filler shall be securely staked or fastened into position perpendicular to the proposed finished surface. A cap shall be provided to protect the top edge of the filler and to permit the concrete to be placed and finished. After the concrete has been placed and struck off, the cap shall be carefully withdrawn leaving the space over the premolded filler. The edges of the joint shall be finished and tooled while the concrete is still plastic. Any concrete bridging the joint space shall be removed for the full width and depth of the joint.

d. Keyways. Keyways shall not be used.

e. Tie Bars. Tie bars shall consist of deformed bars installed in joints as shown on the plans. Tie bars shall be placed at right angles to the centerline of the concrete slab and shall be spaced at intervals shown on the plans. They shall be held in position parallel to the pavement surface and in the middle of the slab depth. When tie bars extend into an unpaved lane, they may be bent against the form at longitudinal construction joints, unless threaded bolt or other assembled tie bars are specified. These bars shall not be painted, greased, or enclosed in sleeves.

f. Dowel Bars. Dowel bars or other load transfer units of an approved type shall be placed across joints in the manner as shown on the plans. They shall be of the dimensions and spacings as shown and held rigidly in the middle of the slab depth in the proper horizontal and vertical alignment by an approved assembly device to be left permanently in place. The dowel or load-transfer and joint devices shall be rigid enough to permit complete assembly as a unit ready to be lifted and placed into position. A metal, or other type, dowel expansion cap or sleeve shall be furnished for each dowel bar used with expansion joints. These caps shall be substantial enough to prevent collapse and shall be placed on the ends of the dowels as shown on the plans. The caps or

sleeves shall fit the dowel bar tightly and the closed end shall be watertight. The portion of each dowel painted with rust preventative paint, as required under paragraph 501 2.7, and as shown on the plans to receive a debonding lubricant, shall be thoroughly coated with asphalt MC 70, or an approved lubricant, to prevent the concrete from bonding to that portion of the dowel. If free sliding plastic coated or epoxy coated steel dowels are used, a lubrication bond breaker shall be used except when approved pullout tests indicate it is not necessary. Where butt type joints with dowels are designated, the exposed end of the dowel shall be oiled.

Dowel bars at contraction joints may be placed in the full thickness of pavement by a mechanical device approved by the Engineer. The device shall be capable of installing dowel bars within the maximum permissible alignment tolerances. Dowels bars at longitudinal construction joints shall be bonded in drilled holes.

g. Installation of Joint Devices. All joint devices shall be approved by the Engineer.

The top of an assembled joint device shall be set at the proper distance below the pavement surface and the elevation shall be checked. Such devices shall be set to the required position and line and shall be securely held in place by stakes or other means to the maximum permissible tolerances during the placing and finishing of the concrete. Where premolded joint material is used, it shall be placed and held in a vertical position; if constructed in sections, there shall be no offsets between adjacent units.

Dowel bars and assemblies shall be checked for position and alignment. The maximum permissible tolerances on dowel bar alignment shall be in accordance with paragraph 501 5.2e(6). During the concrete placement operation, it is advisable to place plastic concrete directly on dowel assemblies immediately prior to passage of the paver to help maintain dowel position and alignment within maximum permissible tolerances.

When concrete is placed using slip form pavers, dowels and tie bars shall be placed in longitudinal construction joints by bonding the dowels or tie bars into holes drilled into the hardened concrete. Holes approximately 1/8 inch to ¼ inch (3 to 6 mm) greater in diameter than the dowel or tie bar shall be drilled with rotary type core drills that must be held securely in place to drill perpendicularly into the vertical face of the pavement slab. Rotary type percussion drills may be used provided that spalling of concrete does not occur. Any damage of the concrete shall be repaired by the Contractor in a method approved by the Engineer. Dowels or tie bars shall be bonded in the drilled holes using an epoxy resin material. Installation procedures shall be adequate to insure that the area around dowels is completely filled with epoxy grout. Epoxy shall be injected into the back of the hole and displaced by the insertion of the dowel bar. Bars shall be completely inserted into the hole and shall not be withdrawn and reinserted creating air pockets in the epoxy around the bar. The Contractor shall furnish a template for checking the position and alignment of the dowels. Dowel bars shall not be less than 10 inches (25 cm) from a transverse joint and shall not interfere with dowels in the transverse direction.

h. Sawing of Joints. Joints shall be cut as shown on the plans. Equipment shall be as described in paragraph 501 4.1. The circular cutter shall be capable of cutting a groove in a straight

line and shall produce a slot at least 1/8 inch (3 mm) wide and to the depth shown on the plans. The top portion of the slot shall be widened by sawing to provide adequate space for joint sealers as shown on the plans. Sawing shall commence as soon as the concrete has hardened sufficiently to permit cutting without chipping, spalling, or tearing and before uncontrolled shrinkage cracking of the pavement occurs. Sawing shall be carried on both during the day and night as required. The joints shall be sawed at the required spacing, consecutively in sequence of the concrete placement.

501-4.11 FINAL STRIKE OFF, CONSOLIDATION, AND FINISHING.

a. Sequence. The sequence of operations shall be the strike off, floating and removal of laitance, straightedging, and final surface finish. The addition of superficial water to the surface of the concrete to assist in finishing operations will not be permitted.

b. Finishing at Joints. The concrete adjacent to joints shall be compacted or firmly placed without voids or segregation against the joint material; it shall be firmly placed without voids or segregation under and around all load transfer devices, joint assembly units, and other features designed to extend into the pavement. Concrete adjacent to joints shall be mechanically vibrated as required in paragraph 501 4.8a. After the concrete has been placed and vibrated adjacent to the joints, the finishing machine shall be operated in a manner to avoid damage or misalignment of joints. If uninterrupted operations of the finishing machine, to, over, and beyond the joints, cause segregation of concrete, damage to, or misalignment of the joints, the finishing machine shall be stopped when the screed is approximately 8 inches (20 cm) from the joint. Segregated concrete shall be removed from the front of and off the joint; and the forward motion of the finishing machine shall be resumed. Thereafter, the finishing machine may be run over the joint without lifting the screed, provided there is no segregated concrete immediately between the joint and the screed or on top of the joint.

c. Machine Finishing. The concrete shall be spread as soon as it is placed, and it shall be struck off and screeded by a finishing machine. The machine shall go over each area as many times and at such intervals as necessary to give to proper consolidation and to leave a surface of uniform texture. Excessive operation over a given area shall be avoided. When side forms are used, the tops of the forms shall be kept clean by an effective device attached to the machine, and the travel of the machine on the forms shall be maintained true without lift, wobbling, or other variation tending to affect the precision finish. During the first pass of the finishing machine, a uniform ridge of concrete shall be maintained ahead of the front screed for its entire length. When in operation, the screed shall be moved forward with a combined longitudinal and transverse shearing motion, always moving in the direction in which the work is progressing, and so manipulated that neither end is raised from the side forms during the striking off process. If necessary, this shall be repeated until the surface is of uniform texture, true to grade and cross section, and free from porous areas.

d. Hand Finishing. Hand finishing methods will not be permitted, except under the following conditions: in the event of breakdown of the mechanical equipment, hand methods may be used to finish the concrete already deposited on the grade; in areas of narrow widths or of irregular dimensions where operation of the mechanical equipment is impractical. Concrete, as soon as placed, shall be struck off and screeded. An approved portable screed shall be used. A

second screed shall be provided for striking off the bottom layer of concrete when reinforcement is used.

The screed for the surface shall be a least 2 feet (0.6 m) longer than the maximum width of the slab to be struck off. It shall be of approved design, sufficiently rigid to retain its shape, and shall be constructed either of metal or of other suitable material covered with metal. Consolidation shall be attained by the use of suitable vibrators.

e. **Floating.** After the concrete has been struck off and consolidated, it shall be further smoothed and trued by means of a longitudinal float using one of the following methods:

(1) **Hand Method.** Long handled floats shall not be less than 12 feet (3.6 m) in length and 6 inches (15 cm) in width, stiffened to prevent flexibility and warping. The float shall be operated from foot bridges spanning but not touching the concrete or from the edge of the pavement. Floating shall pass gradually from one side of the pavement to the other. Forward movement along the centerline of the pavement shall be in successive advances of not more than one half the length of the float. Any excess water or laitance in excess of 1/8 inch (3 mm) thick shall be removed and wasted.

(2) **Mechanical Method.** The Contractor may use a machine composed of a cutting and smoothing float(s), suspended from and guided by a rigid frame and constantly in contact with, the side forms or underlying surface. If necessary, long handled floats having blades not less than 5 feet (1.5 m) in length and 6 inches (15 cm) in width may be used to smooth and fill in open textured areas in the pavement. When the crown of the pavement will not permit the use of the mechanical float, the surface shall be floated transversely by means of a long handled float. Care shall be taken not to work the crown out of the pavement during the operation. After floating, any excess water and laitance in excess of 1/8 inch (3 mm) thick shall be removed and wasted. Successive drags shall be lapped one-half the length of the blade.

f. **Straight edge Testing and Surface Correction.** After the pavement has been struck off and while the concrete is still plastic, it shall be tested for trueness with a Contractor furnished 16-foot (4.8 m) straightedge swung from handles 3 feet (1 m) longer than one-half the width of the slab. The straightedge shall be held in contact with the surface in successive positions parallel to the centerline and the whole area gone over from one side of the slab to the other, as necessary. Advancing shall be in successive stages of not more than one half the length of the straightedge. Any excess water and laitance in excess of 1/8 inch (3 mm) thick shall be removed from the surface of the pavement and wasted. Any depressions shall be immediately filled with freshly mixed concrete, struck off, consolidated, and refinished. High areas shall be cut down and refinished. Special attention shall be given to assure that the surface across joints meets the smoothness requirements of paragraph 501 -5.2e(3). Straightedge testing and surface corrections shall continue until the entire surface is found to be free from observable departures from the straightedge and until the slab conforms to the required grade and cross section. The use of long handled wood floats shall be confined to a minimum; they may be used only in emergencies and in areas not accessible to finishing equipment.

501-4.12 SURFACE TEXTURE. The surface of the pavement shall be finished with either a broom, burlap drag, or artificial turf finish for all newly constructed concrete pavements.

a. Brush or Broom Finish. If the pavement surface texture is to be a type of brush or broom finish, it shall be applied when the water sheen has practically disappeared. The equipment shall operate transversely across the pavement surface, providing corrugations that are uniform in appearance and approximately 1/16 of an inch (2 mm) in depth. It is important that the texturing equipment not tear or unduly roughen the pavement surface during the operation. Any imperfections resulting from the texturing operation shall be corrected.

b. Burlap Drag Finish. If a burlap drag is used to texture the pavement surface, it shall be at least 15 ounces per square yard (555 grams per square meter). To obtain a textured surface, the transverse threads of the burlap shall be removed approximately 1 foot (0.3 m) from the trailing edge. A heavy buildup of grout on the burlap threads produces the desired wide sweeping longitudinal striations on the pavement surface. The corrugations shall be uniform in appearance and approximately 1/16 of an inch (2 mm) in depth.

c. Artificial Turf Finish. If artificial turf is used to texture the surface, it shall be applied by dragging the surface of the pavement in the direction of concrete placement with an approved full-width drag made with artificial turf. The leading transverse edge of the artificial turf drag will be securely fastened to a lightweight pole on a traveling bridge. At least 2 feet of the artificial turf shall be in contact with the concrete surface during dragging operations. A variety of different types of artificial turf are available and approval of any one type will be done only after it has been demonstrated by the Contractor to provide a satisfactory texture. One type that has provided satisfactory texture consists of 7,200 approximately 0.85 inches long polyethylene turf blades per square foot. The corrugations shall be uniform in appearance and approximately 1/16 of an inch (2 mm) in depth.

501-4.13 Not Used.

501-4.14 CURING. Immediately after finishing operations are completed and marring of the concrete will not occur, the entire surface of the newly placed concrete shall be cured in accordance with one of the methods below. Failure to provide sufficient cover material of whatever kind the Contractor may elect to use, or lack of water to adequately take care of both curing and other requirements, shall be cause for immediate suspension of concreting operations. The concrete shall not be left exposed for more than 1/2 hour during the curing period.

a. Impervious Membrane Method. The entire surface of the pavement shall be sprayed uniformly with white pigmented curing compound immediately after the finishing of the surface and before the set of the concrete has taken place. The curing compound shall not be applied during rainfall. Curing compound shall be applied by mechanical sprayers under pressure at the rate of 1 gallon (4 liters) to not more than 150 square feet (14 square meters). The spraying equipment shall be of the fully atomizing type equipped with a tank agitator. At the time of use, the compound shall be in a thoroughly mixed condition with the pigment uniformly dispersed throughout the vehicle. During application the compound shall be stirred continuously by

mechanical means. Hand spraying of odd widths or shapes and concrete surfaces exposed by the removal of forms will be permitted. The curing compound shall be of such character that the film will harden within 30 minutes after application. Should the film become damaged from any cause, including sawing operations, within the required curing period, the damaged portions shall be repaired immediately with additional compound or other approved means. Upon removal of side forms, the sides of the exposed slabs shall be protected immediately to provide a curing treatment equal to that provided for the surface.

b. **Polyethylene Films. Not Used.**

c. **Waterproof Paper. Not Used.**

d. **White Burlap-Polyethylene Sheets. Not Used.**

e. **Curing in Cold Weather.** The concrete shall be maintained at a temperature of at least 50 degrees F (10 degrees C) for a period of 72 hours after placing and at a temperature above freezing for the remainder of the curing time. The Contractor shall be responsible for the quality and strength of the concrete placed during cold weather, and any concrete injured by frost action shall be removed and replaced at the Contractor's expense.

501-4.15 REMOVING FORMS. Unless otherwise specified, forms shall not be removed from freshly placed concrete until it has hardened sufficiently to permit removal without chipping, spalling, or tearing. After the forms have been removed, the sides of the slab shall be cured as outlined in one of the methods indicated in paragraph 501 -4.14. Major honeycombed areas shall be considered as defective work and shall be removed and replaced in accordance with paragraph 501-5.2(f).

501-4.16 SEALING JOINTS. The joints in the pavement shall be sealed in accordance with Item P-605.

501-4.17 PROTECTION OF PAVEMENT. The Contractor shall protect the pavement and its appurtenances against both public traffic and traffic caused by the Contractor's employees and agents. This shall include workers to direct traffic and the erection and maintenance of warning signs, lights, pavement bridges, crossovers, and protection of unsealed joints from intrusion of foreign material, etc. Any damage to the pavement occurring prior to final acceptance shall be repaired or the pavement replaced at the Contractor's expense. The Contractor shall have available at all times, materials for the protection of the edges and surface of the unhardened concrete. Such protective materials shall consist of rolled polyethylene sheeting at least 4 mils (0.1 mm) thick of sufficient length and width to cover the plastic concrete slab and any edges. The sheeting may be mounted on either the paver or a separate movable bridge from which it can be unrolled without dragging over the plastic concrete surface. When rain appears imminent, all paving operations shall stop and all available personnel shall begin covering the surface of the unhardened concrete with the protective covering.

501-4.18 OPENING TO TRAFFIC. The pavement shall not be opened to traffic until test specimens molded and cured in accordance with ASTM C 31 have attained a flexural strength of

550 pounds per square inch (3792 kPa) when tested in accordance with ASTM C 78. If such tests are not conducted, the pavement shall not be opened to traffic until 14 days after the concrete was placed. Prior to opening the pavement to construction or aircraft traffic the pavement shall be cleaned, and all joints shall either be sealed or protected from damage to the joint edge and intrusion of foreign materials into the joint. As a minimum, backer rod or tape may be used to protect the joints from foreign matter intrusion.

MATERIAL ACCEPTANCE

501-5.1 ACCEPTANCE SAMPLING AND TESTING. All acceptance sampling and testing, with the exception of coring for thickness determination, necessary to determine conformance with the requirements specified in this section will be performed by the Engineer. Concrete shall be accepted for strength and thickness on a lot basis.

A lot shall consist of 800 cubic yards.

Testing organizations performing these tests shall meet the requirements of ASTM C 1077. The Contractor shall bear the cost of providing curing facilities for the strength specimens, per paragraph 501-5.1a(3), and coring and filling operations, per paragraph 501-5.1b(1).

a. Flexural Strength.

(1) Sampling. Each lot shall be divided into four equal sublots and may consist of more than one days production (see Paragraph 5.1.c., Partial Lots.) One sample shall be taken for each sublot from the plastic concrete delivered to the job site. Sampling locations shall be determined by the Engineer in accordance with random sampling procedures contained in ASTM D 3665. The concrete shall be sampled in accordance with ASTM C 172

(2) Testing. Two (2) specimens shall be made from each sample. Specimens shall be made in accordance with ASTM C 31 and the flexural strength of each specimen shall be determined in accordance with ASTM C 78. The flexural strength for each sublot shall be computed by averaging the results of the two test specimens representing that sublot.

(3) Curing. The Contractor shall provide adequate facilities for the initial curing of beams. During the 24 hours after molding, the temperature immediately adjacent to the specimens must be maintained in the range of 60 to 80 degrees F (16 to 27 degrees C), and loss of moisture from the specimens must be prevented. The specimens may be stored in tightly constructed wooden boxes, damp sand pits, temporary buildings at construction sites, under wet burlap in favorable weather or in heavyweight closed plastic bags, or use other suitable methods, provided the temperature and moisture loss requirements are met.

(4) Acceptance. Acceptance of pavement for flexural strength will be determined by the Engineer in accordance with paragraph 501-5.2b.

b. Pavement Thickness.

(1) **Sampling.** Each lot shall be divided into four equal sublots and one core shall be taken by the Contractor for each sublot. Sampling locations shall be determined by the Engineer in accordance with random sampling procedures contained in ASTM D 3665. Areas, such as thickened edges, with planned variable thickness, shall be excluded from sample locations.

Cores shall be neatly cut with a core drill. The Contractor shall furnish all tools, labor, and materials for cutting samples and filling the cored hole. Core holes shall be filled by the Contractor with a nonshrink grout approved by the Engineer within one day after sampling.

(2) **Testing.** The thickness of the cores shall be determined by the Engineer by the average caliper measurement in accordance with ASTM C 174.

(3) **Acceptance.** Acceptance of pavement for thickness shall be determined by the Engineer in accordance with paragraph 501-5.2c.

c. **Partial Lots.** When operational conditions cause a lot to be terminated before the specified number of tests have been made for the lot, or when the Contractor and Engineer agree in writing to allow overages or minor placements to be considered as partial lots, the following procedure will be used to adjust the lot size and the number of tests for the lot.

Where three sublots have been produced, they shall constitute a lot. Where one or two sublots have been produced, they shall be incorporated into the next lot or the previous lot and the total number of sublots shall be used in the acceptance criteria calculation, i.e., n=5 or n=6.

d. **Outliers.** All individual flexural strength tests within a lot shall be checked for an outlier (test criterion) in accordance with ASTM E 178, at a significance level of 5 percent. Outliers shall be discarded, and the PWL shall be determined using the remaining test values.

501-5.2 ACCEPTANCE CRITERIA.

a. **General.** Acceptance will be based on the following characteristics of the completed pavement:

(1) Flexural strength
(2) Thickness
(3) Smoothness
(4) Grade
(5) Edge slump
(6) Dowel bar alignment

Flexural strength and thickness shall be evaluated for acceptance on a lot basis using the method of estimating percentage of material within specification limits (PWL). Acceptance using PWL considers the variability (standard deviation) of the material and the testing procedures, as well as

the average (mean) value of the test results to calculate the percentage of material that is above the lower specification tolerance limit (L).

Acceptance for flexural strength will be based on the criteria contained in paragraph 501-5.2e(1). Acceptance for thickness will be based on the criteria contained in paragraph 501-5.2e(2). Acceptance for smoothness will be based on the criteria contained in paragraph 501-5.2e(3). Acceptance for grade will be based on the criteria contained in paragraph 501-5.2e(4).

The Engineer may at any time, not withstanding previous plant acceptance, reject and require the Contractor to dispose of any batch of concrete mixture which is rendered unfit for use due to contamination, segregation, or improper slump. Such rejection may be based on only visual inspection. In the event of such rejection, the Contractor may take a representative sample of the rejected material in the presence of the Engineer, and if he can demonstrate in the laboratory, in the presence of the Engineer, that such material was erroneously rejected, payment will be made for the material at the contract unit price.

b. Flexural Strength. Acceptance of each lot of in-place pavement for flexural strength shall be based on PWL. The Contractor shall target production quality to achieve 90 PWL or higher.

c. Pavement Thickness. Acceptance of each lot of in-place pavement shall be based on PWL. The Contractor shall target production quality to achieve 90 PWL or higher.

d. Percentage of Material Within Specification Limits (PWL). The percentage of material within specification limits shall be determined in accordance with procedures specified in Section 110 of the General Provisions.

The lower specification limit (L) for flexural strength and thickness shall be:

Lower Specification Limit (L)

Flexural Strength	0.93 x strength specified in paragraph 501-3.1.
Thickness	Lot Plan Thickness in inches - 0.50 inches

e. Acceptance Criteria.

(1) **Flexural Strength.** If the PWL of the lot equals or exceeds 90 percent, the lot shall be acceptable. Acceptance and payment for the lot shall be determined in accordance with paragraph 501-8.1..

(2) **Thickness** If the PWL of the lot equals or exceeds 90 percent, the lot shall be acceptable. Acceptance and payment for the lot shall be determined in accordance with paragraph 501-8.1.

(3) **Smoothness.** As soon as the concrete has hardened sufficiently, the pavement surface shall be tested in the transverse direction with a 16 foot straightedge or other specified device. Surface smoothness deviations shall not exceed 1/4 inch from a 16 foot straightedge at any location, including placement along and spanning any pavement joint or edge.

Areas in the slab showing high spots of more than 1/4 inch but not exceeding 1/2 inch in 16 feet shall be marked and immediately ground down with an approved grinding machine to an elevation that falls within the tolerance of 1/4 inch or less. Where the departure from the correct cross section exceeds 1/2 inch, the pavement shall be removed and replaced at the expense of the Contractor when so directed by the Engineer.

(4) **Grade.** An evaluation of the surface grade shall be made by the Engineer for compliance to the tolerances contained below.

Lateral Deviation. Lateral deviation from established alignment of the pavement edge shall not exceed plus or minus 0.10 foot (30 mm) in any lane.

Vertical Deviation. Vertical deviation from established grade shall not exceed plus or minus 0.04 foot (12 mm) at any point.

(5) **Edge Slump.** When slip form paving is used, not more than 15 percent of the total free edge of each five hundred feet (500) (152 m) of pavement, or fraction thereof, shall have an edge slump exceeding 1/4 inch (6 mm), and none of the free edge of the pavement shall have an edge slump exceeding 3/8 inch (10 mm). (The total free edge of 500 feet (152 m) of pavement will be considered the cumulative total linear measurement of pavement edge originally constructed as nonadjacent to any existing pavement; i.e., 500 feet (152 m) of paving lane originally constructed as a separate lane will have 1,000 feet (305 m) of free edge, 500 feet (152 m) of fill-in lane will have no free edge, etc.) The area affected by the downward movement of the concrete along the pavement edge shall be limited to not more than 18 inches (457 mm) from the edge. When excessive edge slump cannot be corrected before the concrete has hardened, the area with excessive edge slump shall be removed and replaced at the expense of the Contractor when so directed by the Engineer.

(6) **Dowel Bar Alignment.** Dowel bars and assemblies shall be checked for position and alignment. The maximum permissible tolerance on dowel bar alignment in each plane, horizontal and vertical, shall not exceed 2 percent or 1/4 inch (6 mm) per foot of dowel bar.

f. **Removal and Replacement of Concrete.** Any area or section of concrete that is removed and replaced shall be removed and replaced back to planned joints. The Contractor shall replace damaged dowels and the requirements for doweled longitudinal construction joints in paragraph 501 -4.10 shall apply to all contraction joints exposed by concrete removal.

CONTRACTOR QUALITY CONTROL

501-6.1 QUALITY CONTROL PROGRAM. The Contractor shall develop a Quality Control Program in accordance with Section 100 of the General Provisions. The program shall address all elements which effect the quality of the pavement including, but not limited to:

- **a.** Mix Design
- **b.** Aggregate Gradation
- **c.** Quality of Materials
- **d.** Stockpile Management
- **e.** Proportioning
- **f.** Mixing and Transportation
- **g.** Placing and Consolidation
- **h.** Joints
- **i.** Dowel Placement and Alignment
- **j.** Flexural or Compressive Strength
- **k.** Finishing and Curing
- **l.** Surface Smoothness

501-6.2 QUALITY CONTROL TESTING. The Contractor shall perform all quality control tests necessary to control the production and construction processes applicable to this specification and as set forth in the Quality Control Program. The testing program shall include, but not necessarily be limited to, tests for aggregate gradation, aggregate moisture content, slump, and air content.

A Quality Control Testing Plan shall be developed as part of the Quality Control Program.

a. Fine Aggregate.

(1) Gradation. A sieve analysis shall be made at least twice daily in accordance with ASTM C 136 from randomly sampled material taken from the discharge gate of storage bins or from the conveyor belt.

(2) Moisture Content. If an electric moisture meter is used, at least two direct measurements of moisture content shall be made per week to check the calibration. If direct measurements are made in lieu of using an electric meter, two tests shall be made per day. Tests shall be made in accordance with ASTM C 70 or ASTM C 566.

b. Coarse Aggregate.

(1) Gradation. A sieve analysis shall be made at least twice daily for each size of aggregate. Tests shall be made in accordance with ASTM C 136 from randomly sampled material taken from the discharge gate of storage bins or from the conveyor belt.

(2) **Moisture Content.** If an electric moisture meter is used, at least two direct measurements of moisture content shall be made per week to check the calibration. If direct measurements are made in lieu of using an electric meter, two tests shall be made per day. Tests shall be made in accordance with ASTM C 566.

c. Slump. Four slump tests shall be performed for each lot of material produced in accordance with the lot size defined in Section 501-5.1. One test shall be made for each sublot. Slump tests shall be performed in accordance with ASTM C 143 from material randomly sampled from material discharged from trucks at the paving site. Material samples shall be taken in accordance with ASTM C 172.

d. Air Content. Four air content tests, shall be performed for each lot of material produced in accordance with the lot size defined in Section 501-5.1. One test shall be made for each sublot. Air content tests shall be performed in accordance with ASTM C 231 for gravel and stone coarse aggregate and ASTM C 173 for slag or other porous coarse aggregate, from material randomly sampled from trucks at the paving site. Material samples shall be taken in accordance with ASTM C 172.

501-6.3 CONTROL CHARTS. The Contractor shall maintain linear control charts for fine and course aggregate, gradation, slump, and air content.

Control charts shall be posted in a location satisfactory to the Engineer and shall be kept up to date at all times. As a minimum, the control charts shall identify the project number, the contract item number, the test number, each test parameter, the Action and Suspension Limits, or Specification limits, applicable to each test parameter, and the Contractor's test results. The Contractor shall use the control charts as part of a process control system for identifying potential problems and assignable causes before they occur. If the Contractor's projected data during production indicates a potential problem and the Contractor is not taking satisfactory corrective action, the Engineer may halt production or acceptance of the material.

a. Fine and Coarse Aggregate Gradation. The Contractor shall record the running average of the last five gradation tests for each control sieve on linear control charts. Specification limits contained in Tables 1 and 2 shall be superimposed on the Control Chart for job control.

b. Slump and Air Content. The Contractor shall maintain linear control charts both for individual measurements and range (i.e., difference between highest and lowest measurements) for slump and air content in accordance with the following Action and Suspension Limits.

The individual measurement control charts shall use the mix design target values as indicators of central tendency.

CONTROL CHART LIMITS

Control Parameter	Individual Measurements		Range Suspension Limit
	Action Limit	Suspension Limit	
Slump	± 1 inch (25mm)	± 1.5 inch (38mm)	± 2.4 inch (61mm)
Air Content	± 1.2%	± 1.8%	± 2.8%

501-6.4 CORRECTIVE ACTION. The Quality Control Plan shall indicate that appropriate action shall be taken when a process is believed to be out of control. The Plan shall detail what action will be taken to bring a process into control and shall contain sets of rules to gauge when a process is out of control. As a minimum, a process shall be deemed out of control and corrective action taken if any one of the following conditions exists.

a. Fine and Coarse Aggregate Gradation. When two consecutive averages of five tests are outside of the Tables 1 or 2 specification limits, immediate steps, including a halt to production, shall be taken to correct the gradation.

b. Fine and Coarse Aggregate Moisture Content. Whenever the moisture content of the fine or coarse aggregate changes by more than 0.5 percent, the scale settings for the aggregate batcher(s) and water batcher shall be adjusted.

c. Slump. The Contractor shall halt production and make appropriate adjustments whenever:

(1) one point falls outside the Suspension Limit line for individual measurements or range; or

(2) two points in a row fall outside the Action Limit line for individual measurements.

d. Air Content. The Contractor shall halt production and adjust the amount of air entraining admixture whenever:

(1) one point falls outside the Suspension Limit line for individual measurements or range; or

(2) two points in a row fall outside the Action Limit line for individual measurements.

Whenever a point falls outside the Action Limits line, the air-entraining admixture dispenser shall be calibrated to ensure that it is operating correctly and with good reproducibility.

METHOD OF MEASUREMENT

501-7.1 Portland cement concrete pavement shall be measured by the number of square yards (square meters), of each thickness, of either reinforced or non-reinforced pavement as specified in place, completed and accepted.

BASIS OF PAYMENT

501-8.1 GENERAL. Payment for accepted concrete pavement shall be made at the contract unit price per square yard (square meter) adjusted in accordance with paragraph 501-8.1a, subject to the limitation that:

> The total project payment for concrete pavement shall not exceed 106 percent of the product of the contract unit price and the total number of cubic yards (cubic meters) of concrete pavement used in the accepted work (See Note 2 under Table 3).

Payment shall be full compensation for all labor, materials, tools, equipment, and incidentals required to complete the work as specified herein and on the drawings, except for saw-cut grooving.

a. Basis of Adjusted Payment. The pay factor for each individual lot shall be calculated in accordance with Table 3. A pay factor shall be calculated for both flexural strength and thickness. The lot pay factor shall be the higher of the two values when calculations for both flexural strength and thickness are 100 percent or higher. The lot pay factor shall be the product of the two values when only one of the calculations for either flexural strength or thickness is 100 percent or higher. The lot pay factor shall be the lower of the two values when calculations for both flexural strength and thickness are less than 100 percent .

For each lot accepted, the adjusted contract unit price shall be the product of the lot pay factor for the lot and the contract unit price. Payment shall be subject to the total project payment limitation specified in paragraph 501-8.1. Payment in excess of 100 percent for accepted lots of concrete pavement shall be used to offset payment for accepted lots of concrete pavement that achieve a lot pay factor less than 100 percent.

TABLE 3
PRICE ADJUSTMENT SCHEDULE [1]

Percentage of Material Within Specification Limits (PWL)	Lot Pay Factor (Percent of Contract Unit Price)
96 – 100	106
90 – 95	PWL + 10
75 – 90	0.5PWL + 55
55 – 74	1.4PWL – 12
Below 55	Reject [2]

[1] ALTHOUGH IT IS THEORETICALLY POSSIBLE TO ACHIEVE A PAY FACTOR OF 106 PERCENT FOR EACH LOT, ACTUAL PAYMENT IN EXCESS OF 100 PERCENT SHALL BE SUBJECT TO THE TOTAL PROJECT PAYMENT LIMITATION SPECIFIED IN PARAGRAPH 501-8.1.

[2] The lot shall be removed and replaced. However, the Engineer may decide to allow the rejected lot to remain. In that case, if the Engineer and Contractor agree in writing that the lot shall not be removed, it shall be paid for at 50 percent of the contract unit price AND THE TOTAL PROJECT PAYMENT LIMITATION SHALL BE REDUCED BY THE AMOUNT WITHHELD FOR THE REJECTED LOT.

Payment will be made under:

P-501-1	12 Inch PCC Pavement, Non-Reinforced	per square yard
P-501-2	12 Inch PCC Pavement, Reinforced	per square yard
P-501-3	12-15 Inch PCC Pavement, Non-Reinforced	per square yard
P-501-4	12-15 Inch PCC Pavement, Reinforced	per square yard
P-501-5	8 Inch PCC Pavement, Non-Reinforced	per square yard
P-501-6	8 Inch PCC Pavement, Reinforced	per square yard
P-501-7	8-10 Inch PCC Pavement, Non-Reinforced	per square yard
P-501-8	8-10 Inch PCC Pavement, Reinforced	per square yard

TESTING REQUIREMENTS

ASTM C 31	Making and Curing Concrete Test Specimens in the Field
ASTM C 39	Compressive Strength of Cylindrical Concrete Specimens
ASTM C 70	Surface Moisture in Fine Aggregate
ASTM C 78	Test for Flexural Strength of Concrete (Using Simple Beam with Third-Point Loading)
ASTM C 131	Test for Resistance to Abrasion of Small Size Coarse Aggregate by Use of the Los Angeles Machine
ASTM C 136	Sieve Analysis of Fine and Coarse Aggregates
ASTM C 138	Test for Unit Weight, Yield, and Air Content (Gravimetric) of Concrete
ASTM C 143	Test for Slump of Portland Cement Concrete
ASTM C 172	Sampling Freshly Mixed Concrete
ASTM C 173	Test for Air Content of Freshly Mixed Concrete by the Volumetric Method
ASTM C 174	Measuring Length of Drilled Concrete Cores
ASTM C 227	Potential Alkali Reactivity of Cement-Aggregate Combinations (Mortar-Bar Method)
ASTM C 231	Test for Air Content of Freshly Mixed Concrete by the Pressure Method
ASTM C 289	Potential Reactivity of Aggregates (Chemical Method)
ASTM C 295	Petrographic Examination of Aggregates for Concrete
ASTM C 311	Sampling and Testing Fly Ash for Use as an Admixture in Portland Cement Concrete
ASTM C 535	Test for Resistance to Abrasion of Large Size Coarse Aggregate by Use of the Los Angeles Machine
ASTM C 566	Total Moisture Content of Aggregates by Drying
ASTM C 1077	Standard Practice for Laboratories Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Laboratory Evaluation
ASTM D 3665	Random Sampling of Construction Materials
ASTM D 4791	Test Method for Flat or Elongated Particles in Coarse Aggregate
AASHTO T 26	Quality of Water to be Used in Concrete

MATERIAL REQUIREMENTS

ASTM A 184	Specification for Fabricated Deformed Steel Bar Mats for Concrete Reinforcement
ASTM A 185	Specification for Welded Steel Wire Fabric for Concrete Reinforcement
ASTM A 497	Specification for Welded Deformed Steel Wire Fabric for Concrete Pavement
ASTM A 615	Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement
ASTM A 616	Specification for Rail-Steel Deformed and Plain Bars for Concrete Reinforcement
ASTM A 617	Specification for Axle-Steel Deformed and Plain Bars for Concrete Reinforcement
ASTM A 704	Specification for Welded Steel Plain Bar or Rod Mats for Concrete Reinforcement
ASTM A 714	Specification for High-Strength Low-Alloy Welded and Seamless Steel Pipe
ASTM C 33	Specification for Concrete Aggregates
ASTM C 94	Specification for Ready-Mixed Concrete
ASTM C 150	Specification for Portland Cement
ASTM C 171	Specification for Sheet Materials for Curing Concrete
ASTM C 260	Specification for Air-Entraining Admixtures for Concrete
ASTM C 309	Specification for Liquid Membrane-Forming Compounds
ASTM C 494	Specification for Chemical Admixtures for Concrete
ASTM C 595	Specification for Blended Hydraulic Cements
ASTM C 618	Specification for Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Portland Cement Concrete
ASTM C 881	Specification for Epoxy-Resin Base Bonding System for Concrete
ASTM C 989	Specification for Ground Granulated Blast-Furnace Slag for Use in Concrete and Mortars
ASTM D 1751	Specification for Preformed Expansion Joint Fillers for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types)
ASTM D 1752	Specification for Preformed Sponge Rubber and Cork Expansion Joint Fillers for Concrete Paving and Structural Construction
AASHTO M 254	Specification for Coated Dowel Bars
ACI 305R	Hot Weather Concreting
ACI 306R	Cold Weather Concreting
TT-P-644 (Rev. D)	Federal Specification for Primer Coating, Alkyd, Corrosion-Inhibiting, Lead and Chromate Free, VOC-Compliant

END OF ITEM P-501

ITEM P-603 BITUMINOUS TACK COAT

DESCRIPTION

603-1.1 This item shall consist of preparing and treating a bituminous or concrete surface with bituminous material in accordance with these specifications and in reasonably close conformity to the lines shown on the plans.

MATERIALS

603-2.1 BITUMINOUS MATERIALS. The bituminous material shall be either cutback asphalt, emulsified asphalt, or tar and shall conform to the requirements of Table 1. The type, grade, controlling specification, and application temperature of bituminous material to be used shall be specified by the Engineer.

Table 1
Bituminous Material

Type and Grade	Application Specification	Temperature	
		Deg. F	Deg. C
Emulsified Asphalt			
SS-1, SS-1h	ASTM D 977	75-130	25-55
CSS-1, CSS-1h	ASTM D 2397	75-130	25-55
Cutback Asphalt			
RC-70	ASTM D 2028	120-160	50-70
Tar			
RTCB 5, RTCB 6	AASHTO M 52	60-120	15-50

CONSTRUCTION METHODS

603-3.1 WEATHER LIMITATIONS. The tack coat shall be applied only when the existing surface is dry and the atmospheric temperature is above 60°F (15°C). The temperature requirements may be waived, but only when so directed by the Engineer.

603-3.2 EQUIPMENT. The Contractor shall provide equipment for heating and applying the bituminous material.

The distributor shall be designed, equipped, maintained, and operated so that bituminous material at even heat may be applied uniformly on variable widths of surface at the specified rate. The allowable variation from the specified rate shall not exceed 10 percent. Distributor equipment shall

include a tachometer, pressure gages, volume-measuring devices or a calibrated tank, and a thermometer for measuring temperatures of tank contents. The distributor shall be self-powered and shall be equipped with a power unit for the pump and full circulation spray bars adjustable laterally and vertically.

A power broom and/or blower shall be provided for any required cleaning of the surface to be treated.

603-3.3 APPLICATION OF BITUMINOUS MATERIAL. Immediately before applying the tack coat, the full width of surface to be treated shall be swept with a power broom and/or airblast to remove all loose dirt and other objectionable material.

Emulsified asphalt shall be diluted by the addition of water when directed by the Engineer and shall be applied a sufficient time in advance of the paver to ensure that all water has evaporated before any of the overlying mixture is placed on the tacked surface.

The bituminous material including vehicle or solvent shall be uniformly applied with a bituminous distributor at the rate of 0.05 to 0.15 gallons per square yard depending on the condition of the existing surface. The type of bituminous material and application rate shall be approved by the Engineer prior to application.

Following the application, the surface shall be allowed to cure without being disturbed for such period of time as may be necessary to permit drying out and setting of the tack coat. This period shall be determined by the Engineer. The surface shall then be maintained by the Contractor until the next course has been placed. Suitable precautions shall be taken by the Contractor to protect the surface against damage during this interval.

603-3.4 BITUMINOUS MATERIAL-CONTRACTOR'S RESPONSIBILITY. Samples of the bituminous material that the Contractor proposes to use, together with a statement as to its source and character, must be submitted and approved before use of such material begins. The Contractor shall require the manufacturer or producer of the bituminous material to furnish material subject to this and all other pertinent requirements of the contract. Only satisfactory materials so demonstrated by service tests, shall be acceptable.

The Contractor shall furnish the vendor's certified test reports for each carload, or equivalent, of bituminous material shipped to the project. The report shall be delivered to the Engineer before permission is granted for use of the material. The furnishing of the vendor's certified test report for the bituminous material shall not be interpreted as a basis for final acceptance. All such test reports shall be subject to verification by testing samples of material received for use on the project.

603-3.5 FREIGHT AND WEIGH BILLS. Before the final estimate is allowed, the Contractor shall file with the Engineer receipted bills when railroad shipments are made, and certified weigh bills when materials are received in any other manner, of the bituminous materials actually used in the construction covered by the contract. The Contractor shall not remove bituminous material from the tank car or storage tank until the initial outage and temperature

measurements have been taken by the Engineer, nor shall the car or tank be released until the final outage has been taken by the Engineer. Copies of freight bills and weigh bills shall be furnished to the Engineer during the progress of the work.

METHOD OF MEASUREMENT

603-4.1 The bituminous material for tack coat shall be measured by the gallon. Volume shall be corrected to the volume at 60°F (15°C) in accordance with ASTM D 1250 for cutback asphalt, ASTM D 633 for tar, and Table IV-3 of The Asphalt Institute's Manual MS-6 for emulsified asphalt. Water added to emulsified asphalt will not be measured for payment.

BASIS OF PAYMENT

603-5-1 Payment shall be made at the contract unit price per gallon of bituminous material. This price shall be full compensation for furnishing all materials, for all preparation, delivery, and application of these materials, and for all labor, equipment, tools, and incidentals necessary to complete the item.

Payment will be made under:

Item P-603-1 Bituminous Tack Coat..... per gallon

MATERIAL REQUIREMENTS

ASTM D 633	Volume Correction Table for Road Tar
ASTM D 977	Emulsified Asphalt
ASTM D 1250	Petroleum Measurement Tables
ASTM D 2028	Liquid Asphalt (Rapid-Curing Type)
ASTM D 2397	Cationic Emulsified Asphalt
AASHTO M 52	Tar for Use in Road Construction
Asphalt Institute Manual MS-6 Table IV-3	Temperature-Volume Corrections for Emulsified Asphalts

END OF ITEM P-603

DEVIATIONS FROM STANDARD
FAA TECHNICAL SPECIFICATIONS

ITEM P-612 - MILLING BITUMINOUS PAVEMENT

This specification was developed from previous projects for the specific need of this project which is not addressed by the FAA Technical Specifications.

ITEM P-612 MILLING BITUMINOUS PAVEMENT

DESCRIPTION

612-1.1 The work covered by this section consists of milling bituminous pavement at locations, depths, widths, and typical sections indicated in the plans and special provisions or as directed by the Engineer.

The work also includes disposing of excess milled material and cleaning the milled pavement surface.

The milled material shall become the property of the Contractor. All milled material shall be disposed of by the Contractor in areas which are outside Airport property.

EQUIPMENT

612-2.1 Equipment shall include a self-propelled unit capable of removing the existing bituminous pavement to the depths, widths, and typical sections shown in the plans. The equipment shall have been designed and built exclusively for pavement milling operations and shall have a past history of satisfactory performance. The milling machine shall be equipped with a grade control system which will automatically control the longitudinal profile and cross slope of the milled surface by the use of one or more skid sensors moving along the pavement surface. The machine shall be capable of leaving a uniform surface suitable for handling traffic without excessive damage to the underlying pavement structure. The milling machine and other loading equipment shall be capable of loading milled material to be used in other parts of the work without excessive segregation.

Additional equipment necessary to satisfactorily remove the pavement in the area of manholes, water valves, curb and gutter, and other obstructions shall be provided.

The milling equipment shall be equipped with a means of effectively limiting the amount of dust escaping from the removal operation in accordance with local, State, and Federal air pollution control laws and regulations.

CONSTRUCTION REQUIREMENTS

612-3.1 The existing pavement shall be milled in a manner which will restore the pavement surface to a uniform longitudinal profile and cross section at the locations and in accordance with typical sections shown in the plans. Where indicated in the plans, removal shall be to a specified depth and shall produce a specified cross slope.

The Contractor may elect to make multiple cuts to achieve the required depth of cut or cross slope required by the plans.

The longitudinal profile of the milled surface shall be established by a mobile string line on the side of the cut nearest the centerline of the road. The cross slope of the milled surface shall be established by an automatic cross slope control mechanism or by a second skid sensing device located on the outside edge of the cut. The Engineer may waive the requirement for automatic grade and cross slope controls where conditions warrant.

The milling equipment shall be operated in such a manner as to prevent damage to the underlying pavement structure, utilities, drainage facilities, curb and gutter, paved surfaces outside the milled area, and any other appurtenances. The milled pavement surface shall be reasonably smooth and free of excessive scarification marks or other damage as determined by the Engineer. Any leveling or patching required as a result of negligence by the Contractor shall be repaired with hot bituminous plant mix at no cost to the Owner and in a manner acceptable to the Engineer. The Contractor shall coordinate the adjustment of manholes, meter boxes, and valve boxes with the milling operation.

The Engineer may require remilling any area where surface laminations or defects resulting from the Contractor's operations cause a non-uniform surface to occur. The milled pavement surface shall be thoroughly cleaned of all loose aggregate particles, dust, and other objectionable material by the use of power brooms, power blowers, power vacuums, or other means. Disposal or wasting of oversize pieces of pavement or loose aggregate material will not be permitted within the right of way.

The pavement removal operations shall be conducted to effectively minimize the amount of dust being emitted. The operation shall be planned and conducted so that it is safe for persons and property adjacent to the work including the traveling public.

METHOD OF MEASUREMENT

612-4.1 The quantity of milled bituminous pavement to be paid for will be the actual number of square yards of pavement surface which has been milled in accordance with the requirements of this section. In measuring this quantity, the length will be the actual length milled, measured along the pavement surface. The width will be the width required by the plans or directed by the Engineer, measured along the pavement surface. No additional measurement will be made for pavement milled beyond the depth specified.

BASIS OF PAYMENT

612-5.1 The quantity of milled bituminous pavement, measured as provided above, will be paid for at the contract unit price per square yard for "Milling Bituminous Pavement, 1-1/2 Inch Depth".

The above price and payment will be full compensation for all work covered by this section, including but not limited to milling the pavement, cleaning the milled surface, loading, hauling, and disposal of all milled material.

Pavement will be made under:

Item P-612-1 Milling Bituminous Pavement, 1-1/2 Inch Depth..... per square yard.

END OF ITEM P-612

DEVIATIONS FROM STANDARD
FAA TECHNICAL SPECIFICATIONS

ITEM P-620 RUNWAY, TAXIWAY AND APRON PAINTING

(a) Section 2.3 - Reflective Media. Paragraph changed to not allow reflective media
(b) Section 3.4, Layout of Markings, paragraph is revised to requiring Contractor to have an experienced technician supervise all work related to this item.

ITEM P-620 RUNWAY AND TAXIWAY PAINTING

DESCRIPTION

620-1.1 This item shall consist of the painting of numbers, markings, and stripes on the surface of runways and taxiways applied in accordance with these specifications and at the locations shown on the plans, or as directed by the Engineer.

MATERIALS

620-2.1 MATERIALS ACCEPTANCE. The Contractor shall furnish manufacturer's certified test reports for the materials shipped to the project. The certified test reports shall include a statement that the materials meet the specification requirements. The reports can be used for material acceptance or the Engineer may perform verification testing. The reports shall not be interpreted as a basis for payment. The Contractor shall notify the Engineer upon arrival of a shipment of materials to the site

620-2.2 PAINT. Paint shall be Waterborne meeting the requirements of Federal Specification TT-P-1952 or Solvent Based meeting the requirements of Federal Specification TT-P-85 or TT-P-110. Paint shall be furnished in White - 37925, Yellow - 33538 or 33655, and Black - 37038 in accordance with Federal Standard No. 595. Paint shall be furnished in Type I – Standard Drying time for no-pick-up when tested in accordance with ASTM D 711.

620-2.3 REFLECTIVE MEDIA. Reflective media will not be allowed.

CONSTRUCTION METHODS

620-3.1 WEATHER LIMITATIONS. The painting shall be performed only when the surface is dry, when the atmospheric temperature is above 45 degrees F (7 degrees C), and when the weather is not foggy or windy. Markings will not be applied when the pavement temperature is greater than 120 degrees F.

620-3.2 EQUIPMENT. All equipment for the work shall be approved by the Engineer and shall include the apparatus necessary to properly clean the existing surface, a mechanical marking machine, a bead dispensing machine, and such auxiliary hand-painting equipment as may be necessary to satisfactorily complete the job.

The mechanical marker shall be an atomizing spray-type marking machine suitable for application of traffic paint. It shall produce an even and uniform film thickness at the required coverage and shall be designed so as to apply markings of uniform cross sections and clear-cut edges without running or spattering and without over spray.

620-3.3 PREPARATION OF SURFACE. Immediately before application of the paint, the surface shall be dry and free from dirt, grease, oil, laitance, or other foreign material which would

reduce the bond between the paint and the pavement. The area to be painted shall be cleaned by sweeping and blowing or by other methods as required to remove all dirt, laitance, and loose materials.

Paint shall not be applied to portland cement concrete pavement until the concrete in the areas to be painted is clean of curing material. Sandblasting or high pressure water shall be used to remove curing material from concrete surfaces.

620-3.4 LAYOUT OF MARKINGS. On those sections of pavement where no previously applied markings are available to serve as a guide, the proposed markings shall be laid out in advance of the paint application.

The Contractor shall provide an experienced technician to supervise the location, alignment, layout, dimensions, and application of all paint marking.

620-3.5 APPLICATION. Markings shall be applied at the locations and to the dimensions and spacing shown on the plans. All paint, except black, shall have glass beads applied at the rate of 7 pounds/gallon. Paint shall not be applied until the layout and condition of the surface have been approved by the Engineer.

The paint shall be mixed in accordance with the manufacturer's instructions and applied to the pavement with a marking machine at the rate of 100 to 110 square feet (9 to 10 square meters) per gallon (liter). The addition of thinner will not be permitted. A period of 30 days shall elapse between placement of a bituminous surface course or seal coat and application of the paint. If the pavement requires marking prior to the recommended waiting period, the paint may be applied in two applications. The first application may be applied immediately with the second application occurring after the appropriate waiting period. The two applications should be applied at fifty percent of the specified coverage.

The edges of the markings shall not vary from a straight line more than 1/2 inch (12 mm) in 50 feet (15 m), and the dimensions shall be within a tolerance of plus or minus 5 percent.

Glass beads shall be distributed upon the markings immediately after application of the paint. A dispenser shall be furnished which is properly designed for attachment to the marking machine and suitable for dispensing glass beads. Glass beads shall be applied at the rate of 7 pounds/gallon. **Glass beads shall not be applied to black paint.**. Glass beads shall adhere to the cured paint or all marking operations shall cease until corrections are made.

620-3.6 PROTECTION. After application of the paint, all markings shall be protected from damage until the paint is dry. All surfaces shall be protected from disfiguration by spatter, splashes, spillage, or drippings of paint.

METHOD OF MEASUREMENT

620-4.1 The quantity of Apron markings to be paid for shall be the number of square feet of painting performed in accordance with the specifications and accepted by the Engineer.

No separate measurement will be made for removal of temporary or existing pavement markings. Such work shall be considered included as incidental to the items for which direct payment is made.

BASIS OF PAYMENT

620-5.1 Payment shall be made at the contract unit price per square foot for Apron painting. This price shall be full compensation for furnishing all materials, (including glass beads) for removing pavement markings, and for all labor, equipment, tools, and incidentals necessary to complete the item.

Payment will be made under:

Item P-620-1 Pavement Marking, Non-Reflective 4" Yellow ..... per square foot

TESTING REQUIREMENTS

ASTM C-146	Chemical Analysis of Glass Sand
ASTM D 711	No-Pick-Up Time of Traffic Paint
Federal Test Method Standard No. 141	Paint, Varnish, Lacquer and Related Materials; Methods of Inspection, Sampling and Testing

MATERIAL REQUIREMENTS

Fed. Spec. TT-B-1125	Beads (Glass Spheres) Retroreflective
Fed. Spec. TT-P-85	Paint, Traffic and Airfield Marking, Solvent Base
Fed. Spec. TT-P-110	Paint, Traffic Black (Nonreflectorized)
Fed. Spec. TT-P-1952	Paint, Traffic and Airfield Marking, Waterborne
Federal Standard 595	Colors used in Government Procurement

END OF ITEM P-620

MAS-TEK ENGINEERING & ASSOCIATES, INC.
GEOTECHNICAL CONSULTING AND MATERIALS TESTING
2550 Bekleymeade, Suite 105 Dallas, Texas 75237 Phone: (972) 709-7384

CALIFORNIA BEARING RATIO (CBR) TEST

CLIENT:	The HNTB Companies
PROJECT:	Addison Airport Improvements
AGG REPORT #:	E02-1111
REPORT DATE:	02/03/2003

CBR TEST RESULTS

Sample Location:	Boring B-4 (12" to 18" below grade)
Sample Description:	Dark Gray CLAY
Plastic Limit:	77
Liquid Limit:	26
Plasticity Index:	51
Initial M.C.	30.6
Final M.C. (top 1")	33.8
Initial P.P.	2.25
Final P.P.	1.25
CBR:	**3.6**

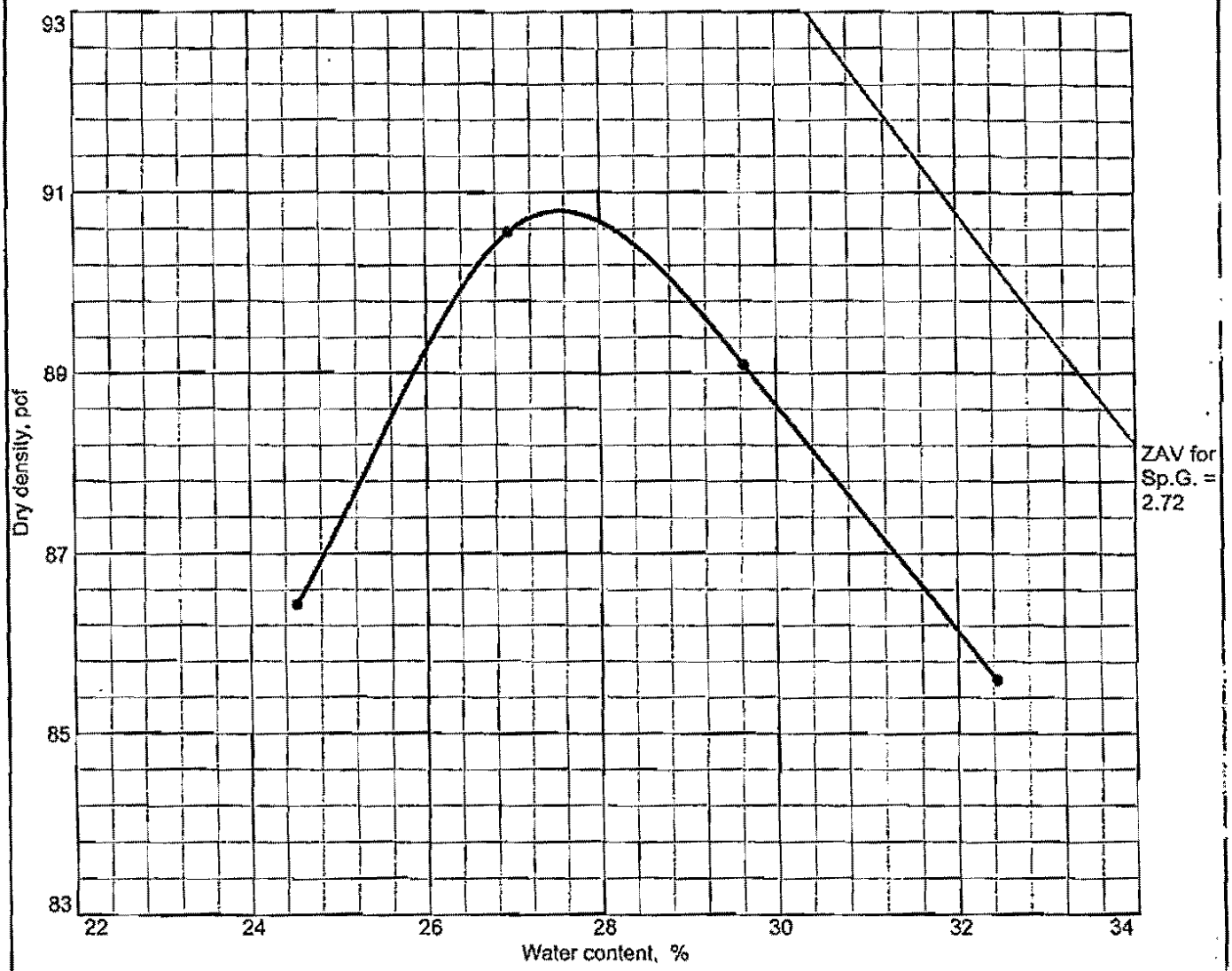
Sample Location:	Boring B-9 (10" to 18" below grade)
Sample Description:	Dark Grayish Brown CLAY
Plastic Limit:	71
Liquid Limit:	24
Plasticity Index:	47
Initial M.C.	27.5
Final M.C. (top 1")	29.7
Initial P.P.	1.75
Final P.P.	1.0
CBR:	**3.3**

Surcharge Load: 90 psf

Remolded Condition: Samples remolded to approximately 95% of Standard Proctor at approximately +3% above optimum moisture (see Figures 13 and 14).

FIGURE 15

MOISTURE DENSITY RELATIONSHIP REPORT



Test specification: ASTM D 698-91 Procedure A Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > No.4	% < No.200
	USCS	AASHTO						
12" - 18"					74	48		

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 90.8 pcf Optimum moisture = 27.6 %	DARK GRAY CLAY

Project No. E02-1111 **Client:** THE HNTB COMPANIES
Project: ADDISON AIRPORT IMPROVEMENTS

● **Location:** BORING B-4 (12" TO 18" DEPTH)

MOISTURE DENSITY RELATIONSHIP REPORT

Remarks:

Figure 13

MAS-TEK ENGINEERING & ASSOCIATES, INC.
GEOTECHNICAL CONSULTING AND MATERIALS TESTING
2550 Bekleymeade, Suite 105 Dallas, Texas 75237 Phone: (972) 709-7384

LIME SERIES RESULTS

CLIENT: The HNTB Companies
PROJECT: Addison Airport Improvements
AGG REPORT NO.: E02-1111
REPORT DATE: 02/03/2003

BORING NUMBER	DEPTH (feet)	% LIME ADDED	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX
B-6	2 - 3	0	85	29	56
B-6	2 - 3	4	68	46	22
B-6	2 - 3	6	66	50	16
B-6	2 - 3	8	63	51	12

FIGURE 12

LOG OF BORING B-9

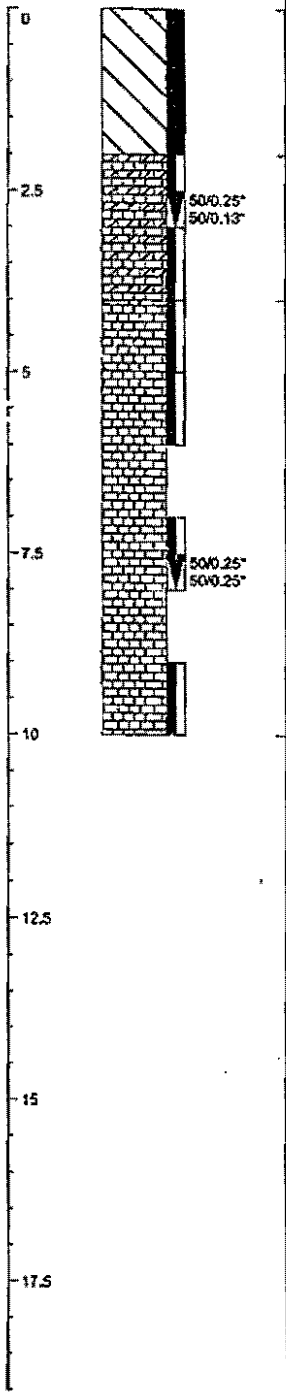
Project: **Addison Airport - Addison, Texas** Project No.: **E02-1111**

Date: **1/17/03** Elev.: **na** Location: **See Figure 1**

Depth to water at completion of boring: **Dry**

Depth to water when checked: **End of Day** was: **Dry**

Depth to caving when checked: was:



ELEVATION/ DEPTH (feet)	SOIL SYMBOLS SAMPLER SYMBOLS & FIELD TEST DATA	DESCRIPTION	MC %	LL %	PL %	PI	-200 %	DD pcf	P.PEN tsf	UNCON ksf	Strain %
		Olive gray CLAY w/ some tan broken limestone (FILL)							3.5		
			27	71	24	47			1.75		
		Moderately hard to hard tan WEATHERED LIMESTONE, fractured, w/ clay seams									
		Hard gray LIMESTONE									
		Boring terminated at 10 feet									

Notes: **Completion Depth: 10'**

FIGURE:10

KEY TO LOG TERMS & SYMBOLS

Symbol	Description
Strata symbols	
	Asphaltic Paving
	BASE
	CLAY
	LIMESTONE, weathered
	Limestone
	CALCAREOUS CLAY
	CONCRETE
Misc. Symbols	
	Water table when checked

Symbol	Description
Soil Samplers	
	Auger
	Thin Wall Shelby Tube
	THD Cone Penetration Test
	Rock Core

Notes:

1. Exploratory borings were drilled on dates indicated using truck mounted drilling equipment.

2. Water level observations are noted on boring logs.

3. Results of tests conducted on samples recovered are reported on the boring logs. Abbreviations used are:

DD = natural dry density (pcf)	LL = liquid limit (%)
MC = natural moisture content (%)	PL = plastic limit (%)
Uncon.= unconfined compression (tsf)	PI = plasticity index
P.Pen.= hand penetrometer (tsf)	-200 = percent passing #200

4. Rock Cores
   - REC = (Recovery) sum of core sample recovered divided by length of run, expressed as percentage.
   - RQD = (Rock Quality Designation) sum of core sample recovery 4" or greater in length divided by the run, expressed as percentage.

FIGURE 11

LOG OF BORING B-8

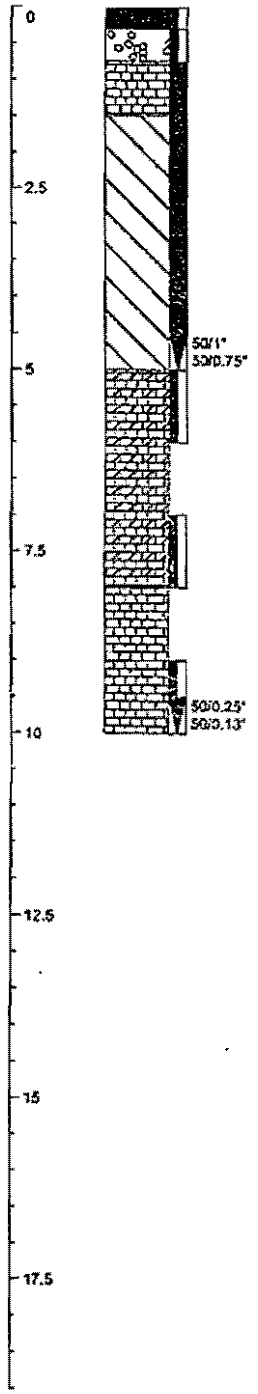
Project: **Addison Airport - Addison, Texas** Project No.: **E02-1111**

Date: **1/17/03** Elev.: **na** Location: **See Figure 1**

Depth to water at completion of boring: **Dry**

Depth to water when checked: **End of Day** was: **Dry**

Depth to caving when checked: was:



ELEVATION/ DEPTH (feet)	SOIL SYMBOLS SAMPLER SYMBOLS & FIELD TEST DATA	DESCRIPTION	MC %	LL %	PL %	PI	-200 %	DD pcf	P.PEN tsf	UNCON ksf	Strain %
		3 1/2" ASPHALT									
		5 1/2" tan very sandy crushed stone (BASE)									
		Tan broken LIMESTONE w/ some clay seams (FILL)									
		Dark gray CLAY							2.4		
			36	77	26	51			1.8		
			35						2.2		
			37						1.8		
		Moderately hard to hard tan WEATHERED LIMESTONE, fractured, w/ clay seams									
		Hard gray LIMESTONE									
		Boring terminated at 10 feet									

Notes: **Completion Depth: 10'**

FIGURE:9

LOG OF BORING B-7

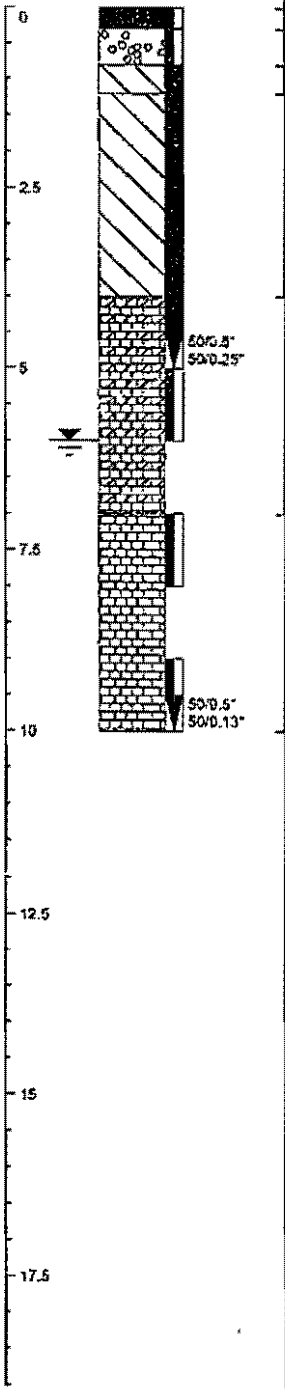
Project: **Addison Airport - Addison, Texas** Project No.: **E02-1111**

Date: **1/17/03** Elev.: **na** Location: **See Figure 1**

Depth to water at completion of boring: **Dry**

Depth to water when checked: **End of Day** was: **6'**

Depth to caving when checked: was:



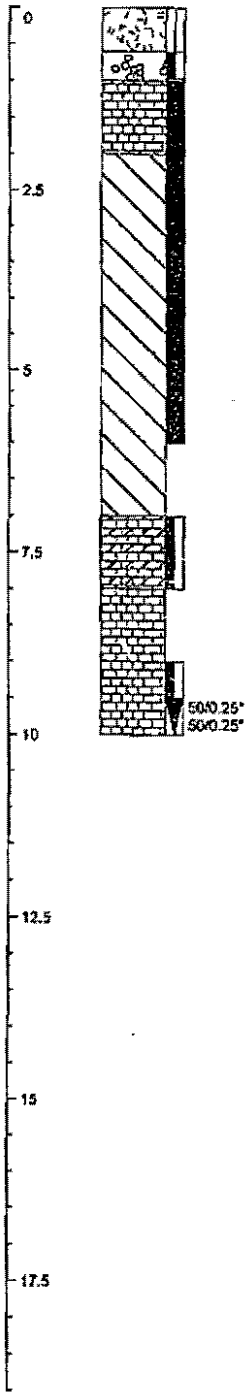
ELEVATION/ DEPTH (feet)	SOIL SYMBOLS SAMPLER SYMBOLS & FIELD TEST DATA	DESCRIPTION	MC %	LL %	PL %	PI	-200 %	DD pcf	P.PEN tsf	UNCON ksf	Strain %
		3 3/8" ASPHALT									
		6 5/8" tan sand w/ some crushed stone (BASE)									
		Dark gray CLAY w/ tan broken limestone (FILL)							3.25		
		Dark gray CLAY	37	75	25	50			2.2		
			41						2.0		
			39						1.7		
		Moderately hard to hard tan WEATHERED LIMESTONE, fractured, w/ clay seams							4.5++		
		Hard gray LIMESTONE									
		Boring terminated at 10 feet									

Notes: **Completion Depth: 10'**

FIGURE:8

LOG OF BORING B-6

Project: Addison Airport - Addison, Texas
Project No.: E02-1111
Date: 1/17/03 Elev.: na Location: See Figure 1
Depth to water at completion of boring: Dry
Depth to water when checked: End of Day was: Dry
Depth to caving when checked: was:



DESCRIPTION	MC %	LL %	PL %	PI	-200 %	DD pcf	P.PEN tsf	UNCON ksf	Strain %
7 5/8" CONCRETE									
5" tan sandy crushed stone (BASE)									
Tan broken LIMESTONE w/ clay seams (FILL)									
Dark gray CLAY	33	85	29	56			1.8		
	44						1.9		
	42						1.6		
							2.0		
Moderately hard to hard tan WEATHERED LIMESTONE, fractured, w/ clay seams									
Hard gray LIMESTONE									
Boring terminated at 10 feet									

Notes: Completion Depth: 10'

FIGURE:7

LOG OF BORING B-5

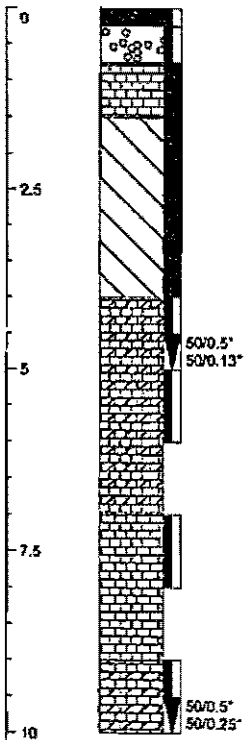
Project: **Addison Airport - Addison, Texas** Project No.: **E02-1111**

Date: **1/17/03** Elev.: **na** Location: **See Figure 1**

Depth to water at completion of boring: **Dry**

Depth to water when checked: **End of Day** was: **Dry**

Depth to caving when checked: was:



ELEVATION/ DEPTH (feet)	SOIL SYMBOLS SAMPLER SYMBOLS & FIELD TEST DATA	DESCRIPTION	MC %	LL %	PL %	PI	-200 %	DD pcf	P.PEN tsf	UNCON ksf	Strain %
		3" ASPHALT									
		5 3/4" tan crushed stone (BASE)									
		Tan and gray broken LIMESTONE w/ clay seams (FILL)							4.5+		
		Dark gray CLAY							3.25		
			41	82	28	54			2.1		
			37						2.3		
		Moderately hard to hard tan WEATHERED LIMESTONE, fractured, w/ clay seams									
		Hard gray LIMESTONE									
		Moderately hard to hard tan WEATHERED LIMESTONE, fractured, w/ clay seams									
		Boring terminated at 10 feet									

Notes: **Completion Depth: 10'**

FIGURE:6

LOG OF BORING B-4

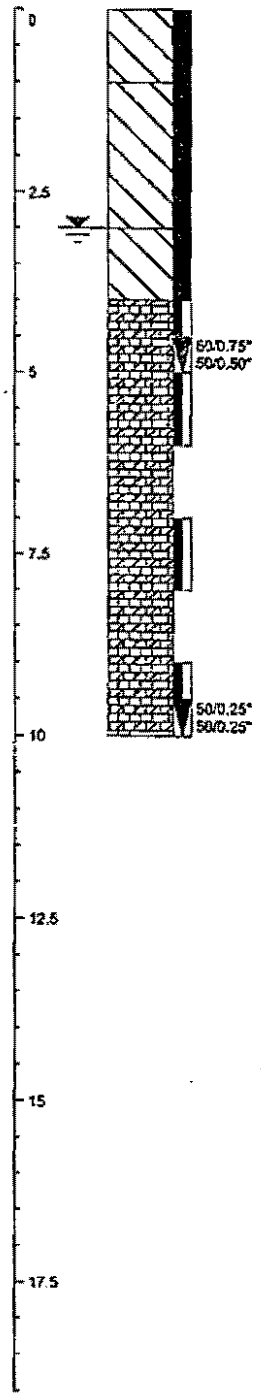
Project: **Addison Airport - Addison, Texas** Project No.: **E02-1111**

Date: **1/17/03** Elev.: **na** Location: **See Figure 1**

Depth to water at completion of boring: **Dry**

Depth to water when checked: **End of Day** was: **3'**

Depth to caving when checked: was:



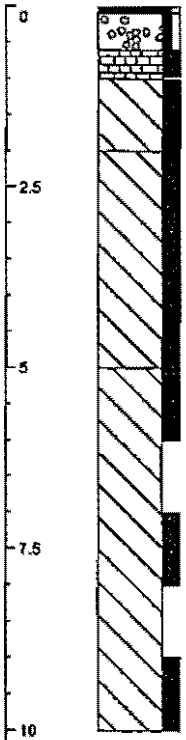
DESCRIPTION	MC %	LL %	PL %	PI	-200 %	DD pcf	P.PEN tsf	UNCON ksf	Strain %
Dark gray CLAY w/ some tan broken LIMESTONE (FILL)							2.2		
Dark gray CLAY	38	77	26	51			1.9		
	43						1.3		
Tan and gray CLAY, calcareous w/ limestone seams							1.5		
Moderately hard to hard tan WEATHERED LIMESTONE, fractured, w/ clay seams and gray limestone layers									
Boring terminated at 10 feet									

Notes: **Completion Depth: 10'**

FIGURE:5

LOG OF BORING B-3

Project: Addison Airport - Addison, Texas
Project No.: E02-1111
Date: 1/17/03 Elev.: na Location: See Figure 1
Depth to water at completion of boring: Dry
Depth to water when checked: End of Day was: Dry
Depth to caving when checked: was:



ELEVATION/ DEPTH (feet)	SOIL SYMBOLS SAMPLER SYMBOLS & FIELD TEST DATA	DESCRIPTION	MC %	LL %	PL %	PI	-200 %	DD pcf	P.PEN tsf	UNCON ksf	Strain %
		1 1/4" ASPHALT	15	NP	NP	NP					
		6 1/4" tan cemented sand w/ gravel (BASE)							4.0		
		Tan broken LIMESTONE w/ clay seams (FILL)	30	62	20	42			3.4		
		Dark gray CLAY w/ some tan broken limestone (FILL)									
		Dark gray CLAY	38						2.0		
									1.9		
			37						1.75		
		Dark brownish gray CLAY w/ trace calcareous nodules							2.25		
			38						2.4		
									2.5		
		Boring terminated at 10 feet									

Notes: Completion Depth: 10'

FIGURE:4

LOG OF BORING B-2

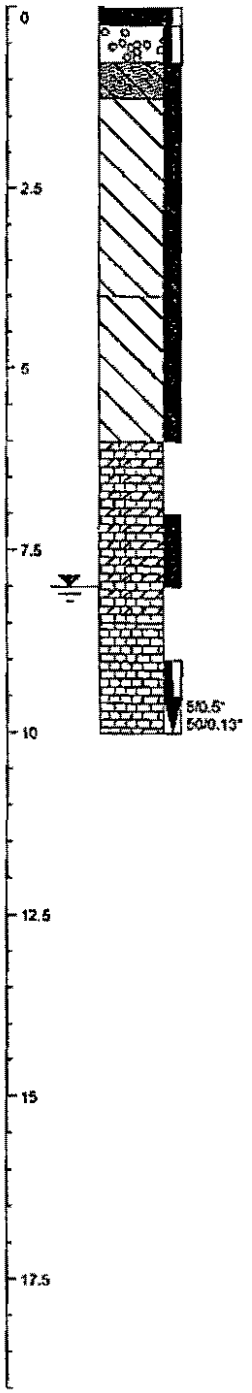
Project: **Addison Airport - Addison, Texas** Project No.: **E02-1111**

Date: **1/17/03** Elev.: **na** Location: **See Figure 1**

Depth to water at completion of boring: **Dry**

Depth to water when checked: **End of Day** was: **8'**

Depth to caving when checked: was:



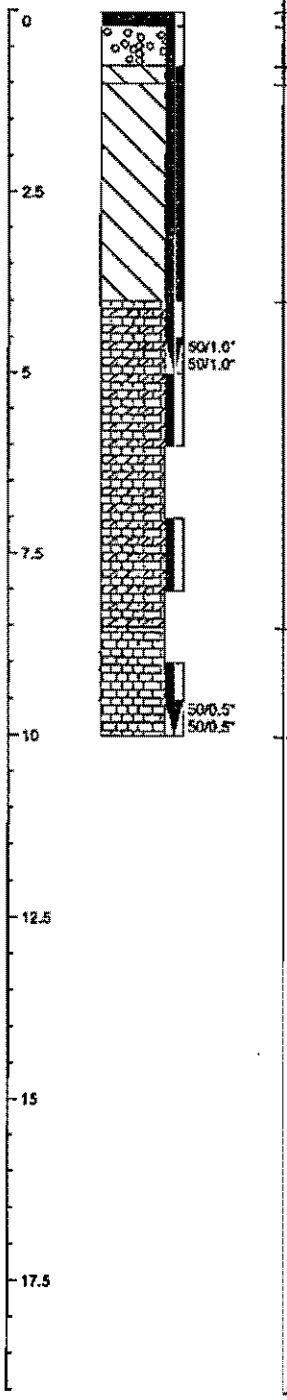
ELEVATION/ DEPTH (feet)	SOIL SYMBOLS SAMPLER SYMBOLS & FIELD TEST DATA	DESCRIPTION	MC %	LL %	PL %	PI	-200 %	DD pcf	P.PEN tsf	UNCON ksf	Strain %
		2 3/4" ASPHALT									
		6" tan cement-stabilized gravelly sand (BASE)									
		Tan calcareous CLAY and dark gray clay w/ limestone fragments (FILL)							1.3 2.5		
2.5		Dark gray CLAY	35	73	25	48			2.2		
			35						1.9		
5		Olive gray CLAY w/ limestone seams	39						1.4 1.75		
7.5		Soft to moderately hard tan extremely WEATHERED LIMESTONE, highly fractured w/ clay layers							4.5++		
10	5/0.5" 50/0.13"	Hard gray LIMESTONE									
		Boring terminated at 10 feet									

Notes: **Completion Depth: 10'**

FIGURE:3

LOG OF BORING B-1

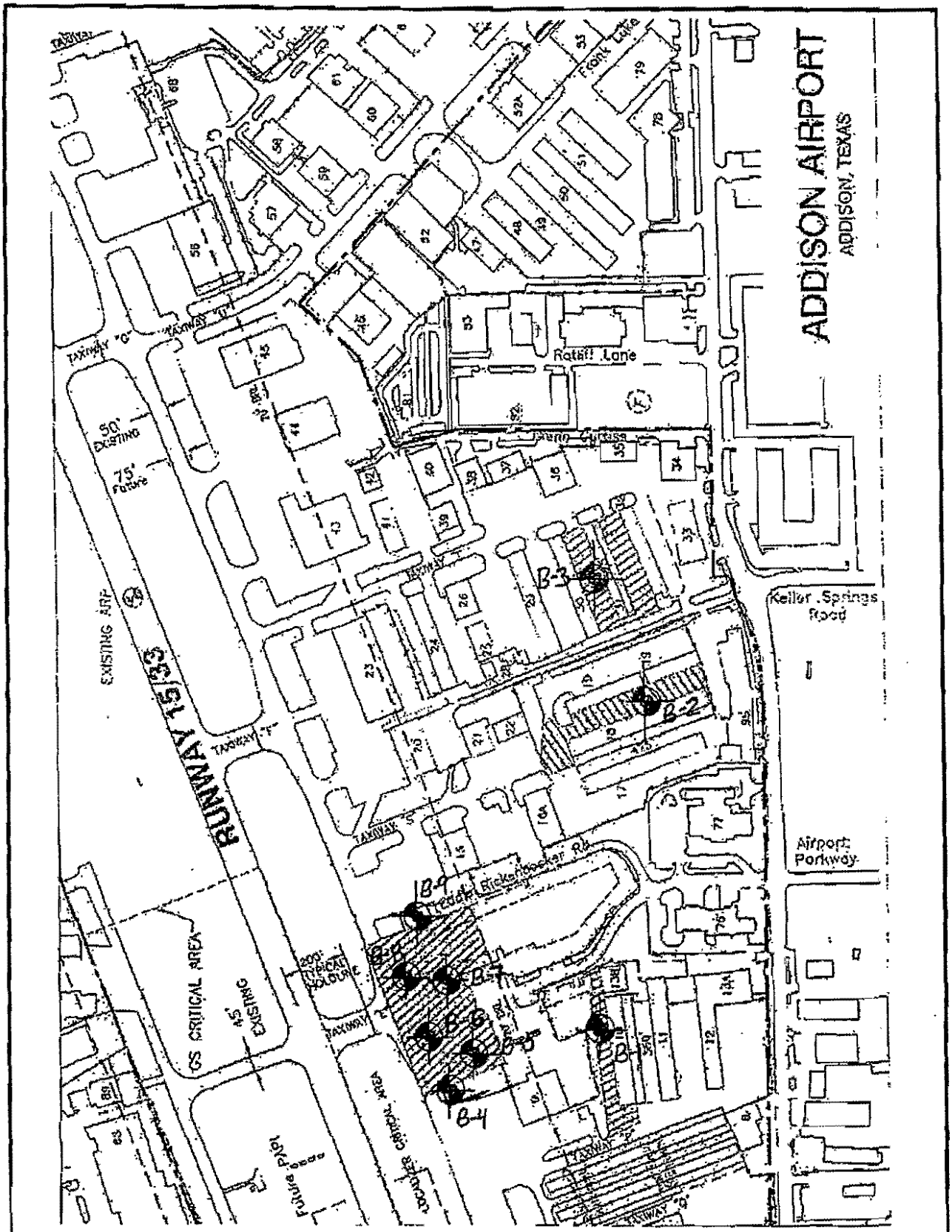
Project: Addison Airport - Addison, Texas
Project No.: E02-1111
Date: 1/17/03 Elev.: na Location: See Figure 1
Depth to water at completion of boring: Dry
Depth to water when checked: End of Day was: Dry
Depth to caving when checked: was:



ELEVATION DEPTH (feet)	SOIL SYMBOLS SAMPLER SYMBOLS & FIELD TEST DATA	DESCRIPTION	MC %	LL %	PL %	PI	-200 %	DD pcf	P.PEN tsf	UNCON ksf	Strain %
		2 1/4" ASPHALT									
		6 3/4" tan cement-stabilized gravelly sand (BASE)									
		Dark gray CLAY w/ limestone fragments (FILL)							1.75		
		Dark gray CLAY	37	77	26	51			2.25		
			38						2.25		
			38						2.2		
		Moderately hard to hard tan WEATHERED LIMESTONE, fractured, w/ clay seams									
		Hard gray LIMESTONE									
		Boring terminated at 10 feet									

Notes: Completion Depth: 10'

FIGURE:



Mas-Tek Engineering & Associates, Inc.	Addison Airport Improvements Addison Airport			PLAN OF BORINGS		FIGURE 1
	Drawn by MDR	Date 1/30/03	Revised N/A	Scale not to scale	Project No. E02-1111	

The recommendations given in this report were prepared exclusively for the use of The HNTB Companies, their client, and their consultants. The information supplied herein is applicable only for the design of the previously described development to be constructed at locations indicated at this site and should not be used for any other structures, locations, or for any other purpose.

We will retain the samples acquired for this project for a period of 30 days subsequent to the submittal date printed on the report. After this period, the samples will be discarded unless otherwise notified by the owner in writing.

5.5 FILL PLACEMENT IN PAVEMENT AREAS

The on-site surficial clays may be used for general grading and filling. The fill materials should be free of surficial vegetation or debris. Clay materials should be spread in loose lifts, less than 8 inches thick and uniformly compacted to a minimum of 95 percent of the maximum density as determined by ASTM D 698 (Standard Proctor) between optimum and +4 percentage points above its optimum moisture content.

5.6 FIELD SUPERVISION AND DENSITY TESTING

Field density and moisture content determinations should be made on each lift of fill and for the compacted lime-stabilized subgrade with a minimum of 1 test per 3,000 to 5,000 sf. Supervision by the field technician and the project engineer is required. Some adjustments in the test frequencies may be required based upon the general fill types and soil conditions at the time of fill placement.

Many problems can be avoided or solved in the field if proper inspection and testing services are provided. It is recommended that all site and subgrade preparation be monitored by a qualified engineering technician. Density tests should be performed to verify compaction and moisture content of any earthwork. Inspection should be performed prior to and during concrete placement operations. Mas-Tek Engineering & Assoicates, Inc. employs a group of experienced, well-trained technicians for inspection and construction materials testing who would be pleased to assist you on this project.

6.0 LIMITATIONS

The professional services, which have been performed, the findings obtained, and the recommendations prepared were accomplished in accordance with currently accepted geotechnical engineering principles and practices. The possibility always exists that the subsurface conditions at the site may vary somewhat from those encountered in the test borings. The number and spacing of test borings were chosen in such a manner as to decrease the possibility of undiscovered abnormalities, while considering the nature of loading, size, and cost of the project. If there are any unusual conditions differing significantly from those described herein, Mas-Tek Engineering & Associates, Inc. should be notified to review the effects on the performance of the recommended foundation system.

Project specifications should allow a curing period between initial and final mixing of the lime/soil mixture. After initial mixing, the lime treated subgrade should be lightly rolled and maintained at or to 5 percentage points above the soil's optimum moisture content until final mixing and compaction. We recommend a 3-day curing period for these soils. The following gradation requirements are recommended for the stabilized materials before final compaction:

	Percent
Minimum Passing 1 3/4" Sieve	100
Minimum Passing No. 4 Sieve	60

All non-slaking aggregates retained on the No. 4 sieve should be removed before testing.

The stabilized subgrade should be protected and moist cured or sealed with a bituminous material for a minimum of 7 days or until the pavement materials are placed. Pavement areas should be graded to prevent ponding and infiltration of excessive moisture on or adjacent to the pavement areas.

5.3 SITE GRADING AND DRAINAGE

All grading should provide positive drainage away from the proposed pavements and should prevent water from collecting or discharging near the pavements. Water must not be permitted to pond adjacent to the aircraft pavements during or after construction. Otherwise, differential soil swell movements could exceed estimates contained within this report.

The pavements will be subject to some post construction movement. Joints in the pavements should be sealed to prevent the infiltration of water. Since some post construction movement of pavement may occur, joints should be periodically inspected and resealed where necessary.

5.4 PROOFROLLING AND SUBGRADE PREPARATION

Prior to placing fill, the exposed subgrade in areas to receive fill should be stripped and proofrolled using a fully loaded dump truck under the direction of a Mas-Tek Engineer. Soft areas should be undercut and replaced with compacted on-site soils. The surface should then be scarified to a depth of 8 inches and recompacted to levels specified in Section 5.4.

5.2 SUBGRADE PREPARATION

The clay soils that will be exposed are active and have a high to very high shrink/swell potential. However, they react with hydrated lime, which serves to improve their support value and provide a firm, uniform subgrade beneath the paving.

As indicated above, it is anticipated that broken limestone fill will be exposed at subgrade level in many areas. Lime stabilization is difficult to perform where a thick layer of broken limestone fill is present. Also, the presence of porous rock fill underlain by clay is not preferred. In order to provide more uniform subgrade support, we recommend that broken limestone fill present at pavement subgrade be removed and replaced with on-site clay soils prior to stabilization in order to allow a mixture of clay and rock fill having at least 50% clay. For example, if a 6 inch depth of stabilization is to be used and rock fill is exposed at the subgrade elevation, the rock fill could be undercut 3 inches and replaced with clay prior to stabilization for a 50% clay / rock mixture.

Based on the Lime / Atterberg series tests (see Figure 12), 8 percent hydrated lime by dry weight (36 pounds per square yard for 6-inch depth of treatment and 48 pounds per square yard for 8-inch depth of treatment) would be required to stabilize the existing clay soils. The lime should be thoroughly mixed and blended with the subgrade (TxDOT Item 260). The lime-treated soil should be compacted in 6-inch lifts to a minimum of 98 percent of maximum dry density as determined in accordance with ASTM D 698, within 2 percentage points of the soil's optimum moisture content. If FAA or TxDOT requirements require a higher compaction level this would govern. We recommend that this lime stabilization extend 1 to 2 feet beyond exposed pavement edges, if possible, in order to reduce the effects of shrinkage during extended dry periods.

Sand should be specifically prohibited beneath pavement areas during final grading (after stabilization), since these more porous soils can allow water inflow, resulting in heave and strength loss of subgrade soils. It should be specified that only lime-stabilized soil will be allowed for fine grading. After fine grading each area in preparation for paving, the subgrade surface should be lightly moistened, as needed, and re-compacted to obtain a tight non-yielding subgrade.

groundwater was encountered during drilling. However, water was present at the end of day in three of the borings (Borings B-2, B-4, and B-7) at depths ranging from 3 to 8 feet below the existing ground surface.

It is not possible to accurately predict the magnitude of subsurface water fluctuations that might occur based upon short-term observations. The subsurface water conditions are subject to change with variations in climatic conditions and are functions of subsurface soil conditions.

5.0 ANALYSES AND RECOMMENDATIONS

5.1 ANTICIPATED SUBGRADE CONDITIONS

We assume that the reconstructed pavement grades will be similar to the current pavement grades with little to no grade changes. Based upon the anticipated cuts required to construct the new pavements and based upon the subsurface soils encountered in the test borings, we anticipate that clay soils will be exposed in most areas. However, broken limestone fill will be exposed at many areas. The broken limestone fill is anticipated to be about 3 to 12 inches thick after the required cutting has been performed. This will require some undercutting and replacement with on-site clay as specified below in Section 5.2.

California Bearing Ratio (CBR) tests were performed on the on-site clay soils (see Figure 15). Based upon the results of these tests, we recommend that a raw CBR value of 3 be used for the on-site clay soils. Likewise, we recommend that a subgrade modulus value of 100 pci be used for the raw on-site clay soils.

It should be noted that the clay soils are currently in a moist to average condition. This includes the clay soils that are present in the landscaping areas just north and south of the existing apron. Currently, differential swell potential between paved areas and unpaved areas is estimated to be less than 2 inches. However, if the clay soils are allowed to dry prior to construction, the new pavements could be subjected to differential upward movements of up to 4 to 6 inches due to soil swelling.

4.2 SUBSURFACE CONDITIONS

Subsurface conditions encountered in the borings, including descriptions of the various strata and their depths and thickness, are presented on the Logs of Borings. Note that depth on all borings refers to the depth from the existing grade or ground surface present at the time of the investigation. Boundaries between the various soil types are approximate.

The areas that are to be reconstructed generally consist of asphaltic concrete pavement over base. The asphalt pavement was encountered at Borings B-1, B-2, B-3, B-5, B-6, and B-8 and varies in thickness from 1 ¼" to 3 $^{3}/_{8}$". Borings B-4 and B-9 were drilled in landscaped areas just outside of the apron. Boring B-7 was located within a reinforced concrete drive (7 $^{5}/_{8}$" of concrete) that is present within the apron. The base materials underlying the asphaltic concrete vary significantly between borings. The base materials range from a cement-stabilized sand to a crushed stone base. The base materials are typically about 6 inches thick (5 $^{1}/_{2}$" to 6 $^{3}/_{4}$" at the boring locations).

Fill of up to 1.5 feet thick was present beneath the base materials, concrete pavement, and at the ground surface at Borings B-4 and B-9. The fill ranged from highly expansive clay soils to broken limestone. Highly expansive clay soils underlie the fill soils. The clay soils are 2.5 to 5.5 feet thick and are underlain by tan weathered limestone.

4.3 SITE GEOLOGY AND SOIL SURVEY

As shown on the Dallas sheet of the Geologic Atlas of Texas, the site is located in an area where the Austin Chalk Formation is present. The Austin Chalk Formation typically consists of gray chalky limestone with some interbeds and partings of calcareous clay. This unit weathers to a light tan, which is typically overlain by a layer of residual, dark colored clay.

As shown on the Soils Survey of Dallas County, Texas developed by the Soil Conservation Service of the United States Department of Agriculture, the site is located in an area where 14 to 35 inches of clay and silty clay are underlain by weathered bedrock.

4.4 GROUNDWATER CONDITIONS

The borings were advanced using continuous flight auger methods. Advancement of the borings using these methods allows observation of the initial zones of seepage. No

The HNTB Companies staked the borings in the field. The borings were located at the approximate locations shown on the Plan of Borings (Figure 1).

Undisturbed samples of cohesive soils were obtained at intermittent intervals with standard, thin-walled, seamless tube samplers. These samples were extruded in the field, logged, sealed, and packaged to protect them from disturbance and maintain their in-situ moisture content during transportation to our laboratory.

The limestone encountered in the test borings was evaluated by the Texas Department of Transportation Penetrometer (TxDOT Cone) tests. The TxDOT Cone is driven with the resulting penetration in inches recorded for 100 blows. The results of the TxDOT Cone test are recorded at the respective testing depths on the Logs of Borings.

The results of the boring program are presented on the Logs of Borings, Figures 2 through 10. A key to the descriptive terms and symbols used on the logs is presented on Figure 11.

3.0 LABORATORY TESTING

Laboratory tests were performed on representative samples of the soil to aid in classification of the soil materials. These tests included Atterberg limits tests and moisture content tests. Hand penetrometer tests were performed on the clay soil samples to provide indications of the swell potential and the foundation bearing properties of the subsurface strata. The results of these tests are presented on the Logs of Borings (Figures 2 through 10).

Lime / Atterberg series tests were performed on a selected clay soil sample to determine optimum amount of lime required for stabilization (see Figure 12). In addition, standard Proctor compaction tests (see Figures 13 and 14) and California Bearing Ratio (CBR) tests (see Figure 15) were performed on two selected clay soil samples.

4.0 SITE AND SUBSURFACE CONDITIONS

4.1 GENERAL SITE CONDITIONS

The project site is located at Addison Airport, which is located west of Addison Road in Addison, Texas. The project consists of replacing an existing apron located adjacent to and east of Taxiway E. In addition, the project will consist of replacing pavements adjacent to existing patio hangers. See Plan of Borings (Figure 1) for site configuration and location.

GEOTECHNICAL INVESTIGATION
ADDISON AIRPORT IMPROVEMENTS
ADDISON, TEXAS

1.0 INTRODUCTION

1.1 PROJECT DESCRIPTION

The project site is located at Addison Airport, which is located west of Addison Road in Addison, Texas. The project consists of replacing an existing apron located adjacent to and east of Taxiway E. In addition, the project will consist of replacing pavements adjacent to existing patio hangers. We understand that the anticipated pavement thickness of the new pavements will be approximately 9 inches for pavements adjacent to the hangers and approximately 12 inches for pavement at the apron.

1.2 PURPOSE AND SCOPE

The purposes of this geotechnical investigation were to: 1) explore the subsurface conditions at the site, 2) provide boring logs that present subsurface conditions encountered including water level observations and laboratory test results, 3) provide site Geology and Soil Survey, 4) provide recommended raw CBR value and subgrade modulus values to be used for design of aircraft pavement, 5) provide recommended subgrade preparation requirements considering new pavements must support single wheel aircraft loads, 6) provide subgrade stabilization recommendations, and 7) provide control of subgrade moisture and any drainage or sub-drainage requirements during construction and/or post construction airport operations. Pavement evaluations and design studies were not within the scope of our services. This report was prepared in general accordance with our proposal number P02-0923E-R2 dated November 18, 2002.

2.0 FIELD INVESTIGATION

The field investigation consisted of drilling three (3) sample borings (Borings B-1 thru B-3) in pavement areas adjacent to patio hangers and drilling six (6) sample borings (Borings B-4 thru B-9) within the subject apron area. Prior to drilling, the existing pavement was cored using a coring machine and a 6-inch diameter core barrel. The borings were drilled to depths of 10 feet below the existing grades. A truck-mounted drilling rig was used to advance these borings and to obtain samples for laboratory evaluation. Representatives of

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ILLUSTRATIONS

FIGURES

MAS-TEK Engineering
& Associates, Inc.

February 5, 2003

Ms. Jenny Nicewander
The HNTB Companies
5910 West Plano Parkway, Suite 200
Plano, Texas 75093

Phone: (972) 661-5626
Fax: (972) 661-5614

Re: Geotechnical Investigation
Addison Airport Improvements
Addison, Texas
MTE Report No. E02-1111

Dear Ms. Nicewander:

Please find enclosed our report summarizing the results of the geotechnical investigation performed at the above referenced project. We trust the recommendations derived from this investigation will provide you with the information necessary to complete your proposed project successfully.

For your future construction materials testing and related quality control requirements, it is recommended that the work be performed by Mas-Tek Engineering & Associates, Inc. in order to maintain continuity of inspection and testing services for the project under the direction of the geotechnical project engineer.

We thank you for the opportunity to provide you with our professional services. If we can be of further assistance, please do not hesitate to contact us.

Sincerely,

MAS-TEK ENGINEERING & ASSOCIATES

Michael D. Roland
Senior Project Manager

Mark J. Farrow, P.E.
Principal Engineer

STATE OF TEXAS
MARK J. FARROW
46059
REGISTERED
PROFESSIONAL ENGINEER

MAS-TEK ENGINEERING & ASSOCIATES

GEOTECHNICAL INVESTIGATION
ADDISON AIRPORT IMPROVEMENTS
ADDISON, TEXAS

MAS-TEK NO: E02-1111

FEBRUARY 5, 2003

PRESENTED TO:

THE HNTB COMPANIES
PLANO, TEXAS

PRESENTED BY:

MAS-TEK Engineering
& Associates, Inc.

GEOTECHNICAL REPORT

SP-22

GATE ASSEMBLY

1. DESCRIPTION

1.1 This item shall consist of furnishing and constructing a wiring system to work in conjunction with the existing security gate,the removal of existing wiring in accordance with these specifications and the details shown on the plans and in conformity with the lines and grades shown on the plans or established by the Engineer. Gate assembly item will not be accepted until the security gate is tested with an owner's representative and is found to be working order.

2. MATERIALS

2.1 Loop Wire Type. Loop wire will be XLPE 16 gauge wire with minimum 0.080-inch insulation or approved equal.

2.2 Sealant. Self leveling SL1 or equivalent shall be used. NO backer rods will be allowed.

3. CONSTRUCTION METHODS

3.1 Installing Wire. Lead-in wire must be twisted at least 6 twists per foot. All corners of loop to be mitered to relieve stress. Location for the layout of the gate assembly shall be verified in the field with an owner's representative prior to installation

4. METHOD OF MEASUREMENT

4.1 The gate assembly will be measured for payment by the lump sum.

5. BASIS OF PAYMENT

5.1 Payment for the gate assembly will be made at the contract unit price per lump sum.

The price shall be full compensation for furnishing all materials, and for all preparation, and installation of these materials, and for all labor equipment, tools, and incidentals necessary to complete the item.

Payment will be made under:

SP-22 Gate Assembly ..... per lump sum

MATERIAL REQUIREMENTS

ASTM A 121	Zinc-Coated (Galvanized) Steel Barbed Wire
ASTM A 123	Zinc (Hot Galvanized) Coatings on Products Fabricated from Rolled, Pressed, and Forged Steel Shapes, Plates, Bars, and Strip
ASTM A 153	Zinc Coating (Hot-Dip) on Iron and Steel Hardware
ASTM A 392	Zinc-Coated Steel Chain-Link Fence Fabric
ASTM A 446	Specification for Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process, Structural (Physical) Quality
ASTM A 585	Aluminum-Coated Steel Barbed Wire
ASTM A 824	Metallic-Coated Steel Marcelled Tension Wire for Use With Chain Link Fence
ASTM B 117	Standard Test Method of Salt Spray (Fog) Testing
ASTM B 221	Aluminum-Alloy Extruded Bars, Rods, Wire Shapes and Tubes
ASTM F 1083	Pipe, Steel, Hot-Dipped Zinc-coated (galvanized) Welded, for Fence Structures
ASTM F 1183	Aluminum Alloy Chain Link Fence Fabric
ASTM F 1234	Protective Coatings on Steel Framework for Fences
Fed. Spec. RR-F-191/3	Fencing, Wire and Post, Metal (Chain-Link Fence Posts, Top Rails and Braces)
Fed. Spec. RR-F-191/4	Fencing, Wire and Post, Metal (Chain-Link Fence Accessories)

placing the temporary fencing. The temporary fencing shall be constructed to a height of at least 6 feet and shall generally follow the contour of the ground, with the bottom of the fence fabric no less than 1 inch (25 mm) or more than 4 inches (100 mm) from the ground surface

4. METHOD OF MEASUREMENT

4.1 Chain-link fence will be measured for payment by the linear foot (meter). Measurement will be along the top of the fence from center to center of end posts, excluding the length occupied by gate openings.

4.2 Gates or pipe bollards will be measured as complete units.

5. BASIS OF PAYMENT

5.1 Payment for chain-link fence will be made at the contract unit price per linear foot (meter).

Payment for driveway or walkway gates or pipe bollards will be made at the contract unit price for each.

The price shall be full compensation for furnishing all materials, and for all preparation, erection, and installation of these materials, and for all labor equipment, tools, and incidentals necessary to complete the item.

Payment will be made under:

Item F-162-1	Temporary Fence	per linear foot
Item F-162-2	Temporary Gate	per each

pavement shall be set in a minimum of 36 inches (90 cm) in concrete footings. Temporary fencing posts shall be set in compacted earth. The posts holes shall be in proper alignment so that there is a minimum of 3 inches (75 mm) of concrete on all sides of the posts.

The concrete shall be thoroughly compacted around the posts by tamping or vibrating and shall have a smooth finish slightly higher than the ground and sloped to drain away from the posts. All posts shall be set plumb and to the required grade and alignment. No materials shall be installed on the posts, nor shall the posts be disturbed in any manner within 7 days after the individual post footing is completed.

Should rock be encountered at a depth less than the planned footing depth, a hole 2 inches (50 mm) larger than the greatest dimension of the posts shall be drilled to a depth of 12 inches (300 mm). After the posts are set, the remainder of the drilled hole shall be filled with grout, composed of one part Portland cement and two parts mortar sand. Any remaining space above the rock shall be filled with concrete in the manner described above.

In lieu of drilling, the rock may be excavated to the required footing depth. No extra compensation shall be made for rock excavation.

3.3 **Installing Top Rails.** The top rail shall be continuous and shall pass through the post tops. The coupling used to join the top rail lengths shall allow for expansion. Top rails are not required for temporary fencing.

3.4 **Installing Braces.** Horizontal brace rails, with diagonal truss rods and turnbuckles, shall be installed at all terminal posts.

3.5 **Installing Fabric.** The permanent fencing wire fabric shall be firmly attached to the posts and braced in the manner shown on the plans. All wire shall be stretched taut and shall be installed to the required elevations. The fence shall generally follow the contour of the ground, with the bottom of the fence fabric no less than 1 inch (25 mm) or more than 4 inches (100 mm) from the ground surface. Grading shall be performed where necessary to provide a neat appearance.

At locations of small natural swales or drainage ditches and where it is not practical to have the fence conform to the general contour of the ground surface, longer posts may be used and multiple strands of barbed wire stretched thereon to span the opening below the fence. The vertical clearance between strands of barbed wire shall be 6 inches (150 mm) or less.

A non-metallic fabric may be used for temporary fencing. The Contractor shall submit material specifications and construction tie details for approval prior to

2.4 **Gates.** Gate frames shall consist of galvanized steel and shall conform to the specifications for the same material under paragraph 162-2.3. The fabric shall be of the same type material as used in the fence.

2.5 **Wire Ties And Tension Wires.** Wire ties for use in conjunction with a given type of fabric shall be of the same material and coating weight identified with the fabric type. Tension wire shall be 7-gauge marcelled steel wire with the same coating as the fabric type and shall conform to ASTM A 824.

All material shall conform to Fed. Spec. RR-F-191/4.

2.6 **Miscellaneous Fittings And Hardware.** Miscellaneous steel fittings and hardware for use with zinc-coated steel fabric shall be of commercial grade steel or better quality, wrought or cast as appropriate to the article, and sufficient in strength to provide a balanced design when used in conjunction with fabric posts, and wires of the quality specified herein. All steel fittings and hardware shall be protected with a zinc coating applied in conformance with ASTM A 153. Barbed wire support arms shall withstand a load of 250 pounds (113 kg) applied vertically to the outermost end of the arm.

2.7 **Concrete.** Concrete shall be of a commercial grade with a minimum 28-day compressive strength of 2500 psi (17 240 kPa).

2.8 **Marking.** Each roll of fabric shall carry a tag showing the kind of base metal (steel, aluminum, or aluminum alloy number), kind of coating, the gauge of the wire, the length of fencing in the roll, and the name of the manufacturer. Posts, wire, and other fittings shall be identified as to manufacturer, kind of base metal (steel, aluminum, or aluminum alloy number), and kind of coating.

3. CONSTRUCTION METHODS

3.1 **Clearing Fence Line.** All trees, brush, stumps, logs, and other debris which would interfere with the proper construction of the fence in the required location shall be removed a minimum width of 2 feet (61 cm) on each side of the fence centerline before starting fencing operations. The cost of removing and disposing of the material shall not constitute a pay item and shall be considered incidental to fence construction.

3.2 **Installing Posts.** All permanent fencing posts shall be set in concrete or welded to a steel base plate and anchored on the finished ramp pavement as detailed and spaced not more than 10 feet (3 m) apart. Drilling of the pavement for the base plate anchor bolts shall not begin within 7 days of PCC being placed, or as approved by the Engineer. Permanent fence post not anchored on the finished ramp

ITEM F-162

CHAIN-LINK FENCES

1. DESCRIPTION

1.1 This item shall consist of furnishing and erecting a permanent chain-link fence, temporary non-metallic fence, a double swing gate and the removal of existing fencing in accordance with these specifications and the details shown on the plans and in conformity with the lines and grades shown on the plans or established by the Engineer.

2. MATERIALS

2.1 **Fabric.** The fabric shall be woven with a 9-gauge galvanized steel wire in a 2-inch (50 mm) mesh and shall meet the requirements of ASTM A 392, Class 2.

2.2 **Barbed Wire.** Barbed wire shall be 2-strand 12-1/2 gauge zinc-coated wire with 4-point barbs and shall conform to the requirements of ASTM A 121, Class 3.

2.3 **Posts, Rails And Braces.** Posts, rails, and braces furnished for use in conjunction with zinc-coated, zinc-5% aluminum mischmetal alloy coated, or aluminum-coated steel fabric shall be of zinc-coated steel, zinc/polymer-coated steel, or zinc-5% aluminum mischmetal alloy coated steel framework. Those furnished for use in conjunction with aluminum alloy fabric shall be aluminum alloy.

Line posts, rails, and braces shall be galvanized steel pipe conforming to the requirements of ASTM F 1083.

Post, rails, and braces shall demonstrate the ability to withstand testing in salt spray in accordance with ASTM B 117 as follows:

Exterior: 1,000 hours with a maximum of 5% red rust.
Interior: 650 hours with a maximum of 5% red rust.

The dimensions of the posts, rails, and braces shall be in accordance with Tables I through VI of Fed. Spec. RR-F-191/3.

Temporary fencing posts shall be 4"x4"x8' treated wood.

DEVIATIONS FROM STANDARD
FAA TECHNICAL SPECIFICATIONS

ITEM F-162 - CHAIN-LINK FENCES

a) Specification was modified to include provisions for a 6' temporary, non metallic fence and gate.

ASTM A 123	Zinc (Hot-Galvanized) Coatings on Products Fabricated from Rolled, Pressed, and Forged Steel Shapes, Plates, Bars and Strip
ASTM A 283	Low and Intermediate Tensile Strength Carbon Steel Plates, Shapes, and Bars
ASTM A 536	Ductile Iron Castings
ASTM C 32	Sewer and Manhole Brick
ASTM C 144	Aggregate for Masonry Mortar
ASTM C 150	Portland Cement
AASHTO M 36	Zinc Coated (Galvanized) Corrugated Iron or Steel Culverts and Underdrains

END OF ITEM D-751

c. Backfill shall not be measured for direct payment. Performance of this work shall be considered as a subsidiary obligation of the Contractor covered under the contract unit price for the structure involved.

751-3.10 **CLEANING AND RESTORATION OF SITE.** After the backfill is completed, the Contractor shall dispose of all surplus material, dirt, and rubbish from the site. Surplus dirt may be deposited in embankments, shoulders, or as ordered by the Engineer. The Contractor shall restore all disturbed areas to their original condition.

After all work is completed, the Contractor shall remove all tools and equipment, leaving the entire site free, clear, and in good condition.

METHOD OF MEASUREMENT

751-4.1 Inlets shall be measured by the unit.

BASIS OF PAYMENT

751-5.1 The accepted quantities of manholes, catch basins, and inlets will be paid for at the contract unit price per each, complete and in place. This price shall be full compensation for furnishing all materials and for all preparation, excavation, backfilling and placing of the materials; furnishing and installation of such specials and connections to pipes and other structures as may be required to complete the item as shown on the plans; and for all labor equipment, tools and incidentals necessary to complete the structure.

Payment will be made under:

Item D-751-1 Inlet, Type A ..... per each

MATERIAL REQUIREMENT

ASTM A 27	Mild to Medium-Strength Carbon-Steel Castings for General Application
ASTM A 47	Malleable Iron Castings
ASTM A 48	Gray Iron Castings

or fittings are to be set in concrete or cement mortar, all anchors or bolts shall be in place and position before the concrete or mortar is placed. The unit shall not be disturbed until the mortar or concrete has set.

When frames or fittings are to be placed upon previously constructed masonry, the bearing surface or masonry shall be brought true to line and grade and shall present an even bearing surface in order that the entire face or back of the unit will come in contact with the masonry. The unit shall be set in mortar beds and anchored to the masonry as indicated on the plans or as directed and approved by the Engineer. All units shall set firm and secure.

After the frames or fittings have been set in final position and the concrete or mortar has been allowed to harden for 7 days, then the grates or covers shall be placed and fastened down.

751-3.8 INSTALLATION OF STEPS. The steps shall be installed as indicated on the plans or as directed by the Engineer. When the steps are to be set in concrete, they shall be placed and secured in position before the concrete is poured. When the steps are installed in brick masonry, they shall be placed as the masonry is being built. The steps shall not be disturbed or used until the concrete or mortar has hardened for at least 7 days. After this period has elapsed, the steps shall be cleaned and painted, unless they have been galvanized.

When steps are required with precast concrete pipe structures, they shall be cast into the sides of the pipe at the time the pipe sections are manufactured or set in place after the structure is erected by drilling holes in the concrete and cementing the steps in place.

When steps are required with corrugated metal structures, they shall be welded into aligned position at a vertical spacing of 12 inches (300 mm).

In lieu of steps, prefabricated ladders may be installed. In the case of brick or concrete structures, the ladder shall be held in place by grouting the supports in drilled holes. In the case of metal structures, the ladder shall be secured by welding the top support and grouting the bottom support into drilled holes in the foundation or as directed.

751-3.9 BACKFILLING

a. After a structure has been completed, the area around it shall be filled with approved material, in horizontal layers not to exceed 8 inches (200 mm) in loose depth, and compacted to the density required in Item P-152. Each layer shall be deposited all around the structure to approximately the same elevation. The top of the fill shall meet the elevation shown on the plans or as directed by the Engineer.

b. Backfilling shall not be placed against any structure until permission is given by the Engineer. In the case of concrete, such permission shall not be given until the concrete has been in place 7 days, or until tests made by the laboratory under supervision of the Engineer establish that the concrete has attained sufficient strength to provide a factor of safety against damage or strain in withstanding any pressure created by the backfill or the methods used in placing it.

e. After each excavation is completed, the Contractor shall notify the Engineer to that effect; and concrete or reinforcing steel shall be placed after the Engineer has approved the depth of the excavation and the character of the foundation material.

751-3.2 BRICK STRUCTURES. Brick structures will not be allowed for this project.

751-3.3 CONCRETE STRUCTURES. Concrete structures shall be built on prepared foundations, conforming to the dimensions and form indicated on the plans. The construction shall conform to the requirements specified in Item P-610. Any reinforcement required shall be placed as indicated on the plans and shall be approved by the Engineer before the concrete is poured.

All invert channels shall be constructed and shaped accurately so as to be smooth, uniform, and cause minimum resistance to flowing water. The interior bottom shall be sloped downward toward the outlet.

751-3.4 PRECAST CONCRETE PIPE STRUCTURES. Precast concrete pipe structures shall be constructed on prepared, or previously placed slab, foundations and shall conform to the dimensions and locations shown on the plans. All precast concrete pipe sections necessary to build a completed structure shall be furnished by the Contractor. The different sections shall fit together readily, and all jointing and connections shall be cemented with mortar. The top of the upper precast concrete pipe member shall be suitably formed and dimensioned to receive the metal frame and cover or grate, or other cap, as required. Provision shall be made for any connections for lateral pipe, including drops and leads that may be installed in the structure. The flow lines shall be smooth, uniform, and cause minimum resistance to flow. The metal steps which are embedded or built into the side walls shall be aligned and placed at vertical intervals of 12 inches (300 mm). When a metal ladder replaces the steps, it shall be securely fastened into position.

When required by the Engineer, the precast manufacturer shall provide detailed structural analysis of the structure being provided that considers the live and dead loads exposed to the structure. The analysis shall be signed and sealed be an engineer registered in the state of Texas normally performing structural engineering.

751-3.5 CORRUGATED METAL STRUCTURES. Corrugated metal structures will not be allowed for this project.

751-3.6 INLET AND OUTLET PIPES. Inlet and outlet pipes shall extend through the walls of the structures for a sufficient distance beyond the outside surface to allow for connections but shall be cut off flush with the wall on the inside surface, unless otherwise directed. For concrete or brick structures, the mortar shall be placed around these pipes so as to form a tight, neat connection.

751-3.7 PLACEMENT AND TREATMENT OF CASTINGS, FRAMES, AND FITTINGS. All castings, frames, and fittings shall be placed in the positions indicated on the plans or as directed by the Engineer, and shall be set true to line and to correct elevation. If frames

All castings or structural steel units shall conform to the dimensions shown on the plans and shall be designed to support the loadings specified.

Each frame and cover or grate unit shall be provided with fastening members to prevent it from being dislodged by traffic but which will allow easy removal for access to the structure.

All castings shall be thoroughly cleaned and given two coats of approved bituminous paint. After fabrication, structural steel units shall be galvanized to meet the requirements of ASTM A 123.

751-2.7 STEPS. The steps or ladder bars shall be gray or malleable cast iron or galvanized steel. The steps shall be the size, length, and shape shown on the plans and those steps that are not galvanized shall be given a coat of bituminous paint, when directed.

751-2.8 REINFORCING STEEL. All reinforcing steel shall conform to ASTM A-615, grade 60.

CONSTRUCTION METHODS

751-3.1 UNCLASSIFIED EXCAVATION

a. The Contractor shall do all excavation for structures and structure footings to the lines and grades or elevations, shown on the plans, or as staked by the Engineer. The excavation shall be of sufficient size to permit the placing of the full width and length of the structure or structure footings shown. The elevations of the bottoms of footings, as shown on the plans, shall be considered as approximately only; and the Engineer may order, in writing, changes in dimensions or elevations of footings necessary to secure a satisfactory foundation.

b. Boulders, logs, or any other objectionable material encountered in excavation shall be removed. All rock or other hard foundation material shall be cleaned of all loose material and cut to a firm surface either level, stepped, or serrated, as directed by the Engineer. All seams or crevices shall be cleaned out and grouted. All loose and disintegrated rock and thin strata shall be removed. When concrete is to rest on a surface other than rock, special care shall be taken not to disturb the bottom of the excavation, and excavation to final grade shall not be made until just before the concrete or reinforcing is to be placed.

c. The Contractor shall do all bracing, sheathing, or shoring necessary to implement and protect the excavation and the structure as required for safety or conformance to governing laws. The cost of bracing, sheathing, or shoring shall be included in the unit price bid for the structure.

d. Unless otherwise provided, bracing, sheathing, or shoring involved in the construction of this item shall be removed by the Contractor after the completion of the structure. Removal shall be effected in a manner which will not disturb or mar finished masonry. The cost of removal shall be included in the unit price bid for the structure.

ITEM D-751 MANHOLES, CATCH BASINS, INLETS AND TRENCH DRAINS

DESCRIPTION

751-1.1 This item shall consist of construction of manholes, catch basins, inlets, and trench drains, in accordance with these specifications, at the specified locations and conforming to the lines, grades, and dimensions shown on the plans or required by the Engineer.

MATERIALS

751-2.1 BRICK. The brick shall conform to the requirements of ASTM C 32, Grade SM.

751-2.2 MORTAR. Mortar shall consist of one part portland cement and two parts sand. The portland cement shall conform to the requirements of ASTM C 150, Type I. The sand shall conform to the requirements of ASTM C 144.

751-2.3 CONCRETE. Plain and reinforced concrete used in structures, connections of pipes with structures, and the support of structures or frames shall conform to the requirements of Item P-610.

751-2.4 PRECAST CONCRETE PIPE MANHOLE RINGS. Precast concrete pipe manhole rings shall conform to the requirements of ASTM C 478. Unless otherwise specified, the risers and offset cone sections shall have an inside diameter of not less than 36 inches (90 cm) nor more than 48 inches (120 cm).

751-2.5 CORRUGATED METAL. Corrugated metal shall conform to the requirements of AASHTO M 36.

751-2.6 FRAMES, COVERS, AND GRATES. The castings shall conform to one of the following requirements:

a. Gray iron castings shall meet the requirements of ASTM A 48, Class 30B and 35B.

b. Malleable iron castings shall meet the requirements of ASTM A 47.

c. Steel castings shall meet the requirements of ASTM A 27.

d. Structural steel for grates and frames shall conform to the requirements of ASTM A 283, Grade D.

e. Ductile iron castings shall conform to the requirements of ASTM A 536.

DEVIATIONS FROM STANDARD
FAA TECHNICAL SPECIFICATIONS

ITEM D-751 MANHOLES, CATCH BASINS, INLETS AND TRENCH DRAINS

a) Section 2, Materials modified to not allow brick or corrugated metal structures.

ASTM D 1056	Flexible Cellular Materials--Sponge or Expanded Rubber
ASTM D 1190	Concrete Joint Sealer, Hot Poured Elastic Type
ASTM D 3034	Type PSMPoly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings
ASTM D 3212	Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals
ASTM F 477	Elastomeric Seals (Gaskets) for Joining Plastic Pipe
AASHTO M 190	Bituminous-Coated Corrugated Metal Culvert Pipe and Pipe Arches
AASHTO M 196	Corrugated Aluminum Alloy Culverts and Underdrains
AASHTO M 198	Joints for Circular Concrete Sewer and Culvert Pipe Using Flexible Watertight Gaskets
AASHTO M 219	Aluminum Alloy Structural Plate for Pipe, Pipe-Arches, and Arches
AASHTO M 243	Field Applied Coating of Corrugated Metal Structural Plate for Pipe, Pipe-Arches, and Arches
AASHTO M 252	Corrugated Polyethylene Drainage Tubing
AASHTO M 294	Corrugated Polyethylene Pipe

END OF ITEM D-701

MATERIAL REQUIREMENTS

ASTM A 760	Corrugated Steel Pipe, Metallic-Coated for Sewers and Drains
ASTM A 761	Steel Galvanized, Corrugated Structural Plates and Fasteners for Pipe, Pipe-Arches, and Arches
ASTM A 762	Precoated (Polymeric) Galvanized Steel Sewer and Drainage Pipe
ASTM A 849	Post-Coated and Lined (Bituminous or Concrete) Corrugated Steel Sewer and Drainage Pipe
ASTM A 885	Steel Sheet, Zinc and Aramid Fiber Composite Coated for Corrugated Steel Sewer, Culvert, and Underdrain Pipe
ASTM B 745	Corrugated Aluminum Alloy Culvert Pipe
ASTM C 14	Concrete Sewer, Storm Drain, and Culvert Pipe
ASTM C 76	Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe
ASTM C 94	Ready Mixed Concrete
ASTM C 144	Aggregate for Masonry Mortar
ASTM C 150	Portland Cement
ASTM C 425	Compression Joints for Vitrified Clay Pipe
ASTM C 443	Joints for Circular Concrete Sewer and Culvert Pipe, Using Rubber Gaskets
ASTM C 506	Reinforced Concrete Arch Culvert, Storm Drain, and Sewer Pipe
ASTM C 507	Reinforced Concrete Elliptical Culvert, Storm Drain and Sewer Pipe
ASTM C 655	Reinforced Concrete D-Load Culvert, Storm Drain and Sewer Pipe
ASTM C 700	Vitrified Clay Pipe, Extra Strength, Standard Strength, and Perforated
ASTM C 789	Precast Reinforced Concrete Box Sections for Culverts, Storm Drains, and Sewers
ASTM C 850	Precast Reinforced Concrete Box Sections for Culverts, Storm Drains, and Sewers with Less than 2 feet of Cover

f. No separate payment will be made for the removal and replacement of support of existing utilities necessary during the construction of storm sewers. The cost of this work will be considered incidental to the construction of the storm sewer pipe.

g. No separate payment will be made for exceptional costs incurred by the Contractor in conforming to construction schedules established in the plans nor for duplicated work required by these schedules. The cost of this work will be considered incidental to the storm sewer item.

h. No separate payment will be made for the removal and disposal of trash, rubble and garbage removed from the pipe trench, nor for replacement backfill. All costs, therefore, shall be included in the prices bid for the pipe item.

i. No separate payment will be made for the placement or removal of temporary CMP storm drain. No payment will be made for pipe bedding for temporary CMP storm drains.

j. No separate payment will be made for dewatering operations required due to high elevation of ground water or other conditions.

These prices shall fully compensate the Contractor for furnishing all materials and for all preparation, excavation, and installation of these materials; and for all labor, equipment, tools, and incidentals necessary to complete the item.

Payment will be made under:

Item D-701-1 18-inch RCP, Class IV RCP .....per linear foot

All backfill shall be compacted to the density required under Item P-152.

710-3.6 TRENCHING. The Contractor shall do such trench bracing, sheathing, or shoring necessary to perform and protect the excavation as required for safety and conformance to governing laws. The bracing, sheathing, or shoring shall not be removed in one operation but shall be done in successive stages as determined by the Engineer to prevent overloading of the pipe during backfilling operations. The cost of the bracing, sheathing, or shoring and the removal of same shall be included in the unit price bid per foot for the pipe.

METHOD OF MEASUREMENT

710-4.1 The length of pipe shall be measured in linear feet (meters) of pipe in place, completed, and approved. It shall be measured along the centerline of the pipe from end or inside face of structure to the end or inside face of structure, whichever is applicable. The several classes, types and size shall be measured separately. All fittings, wyes, bends, pipe collars, and connections shall be included in the footage as typical pipe sections in the pipe being measured.

No separate measurement or payment shall be made for excavation, backfill or spoil, concrete encasement, connections to structures, RCP couplers, pipe bedding, manufactured bends or pipe inspections.

BASIS OF PAYMENT

710-5.1 Payment will be made at the contract unit price per linear foot (meter) for each kind of pipe of the type and size designated.

a. No separate payment will be made for demolishing portions of walls of existing structures to make connection with new pipe.

b. Hauling and placement of excess material removed in the pipe trench excavation process and not used as backfill will not be measured for payment under this item. Payment for this work will be made under the appropriate embankment item as specified.

c. No separate payment will be made for common trench excavation, rock excavation or trench backfill. The cost of this work will be considered incidental to the construction of the storm sewer pipe.

d. No separate payment will be made for any sheeting, shoring, bracing, pumping and counter-floatation measures which are required during construction, whether or not such work is indicated on the plans.

e. No separate payment will be made for constructing concrete pipe collars for the purpose of joining two pipes.

Concrete pipe shall be tongue and groove. The method of joining pipe sections shall be such that the ends are fully entered and the inner surfaces are reasonably flush and even. Joints shall be thoroughly wetted if mortar or grout are required. Where concrete collars are required for joining different size pipes they shall be constructed according to the details on the plans. The cost of the concrete collars shall be considered incidental to the cost of the pipe being laid.

b. Metal Pipe

Metal pipe shall be firmly joined by form fitting bands conforming to the requirements of ASTM A 760 for steel pipe and AASHTO M 196 for aluminum pipe.

c. PVC and Polyethylene Pipe

Joints for PVC pipe shall conform to the requirements of ASTM D 3212. Fittings for polyethylene pipe shall conform to the requirements of AASHTO M 252.

d. Vitrified Clay Pipe

Fittings for vitrified clay pipe shall conform to the requirements of ASTM C 700. Materials for compression joints shall conform to the requirements of ASTM C 425.

710-3.5BACKFILLING. Pipes shall be inspected before any backfill is placed; any pipes found to be out of alignment, unduly settled, or damaged shall be removed and relaid or replaced at the Contractor's expense.

Material for backfill shall be fine, readily compatible soil, or granular material selected from the excavation or a source of the Contractor's choosing. It shall not contain frozen lumps, stones that would be retained on a 2-inch (50.0 mm) sieve, chunks of highly plastic clay, or other objectionable material. No less than 95 percent of a granular backfill material shall pass through a 1/2 inch (12 mm) sieve, and no less than 95 percent of it shall be retained on a No. 4 (4.75 mm) sieve.

When the top of the pipe is even with or below the top of the trench, the backfill shall be compacted in layers not exceeding 6 inches (150 mm) on both sides of the pipe and shall be brought up one foot (30 cm) above the top of the pipe or to natural ground level, whichever is greater. Care shall be exercised to thoroughly compact the backfill material under the haunches of the pipe. Material shall be brought up evenly on both sides of the pipe.

When the top of the pipe is above the top of the trench, the backfill shall be compacted in layers not exceeding 6 inches (150 mm) and shall be brought up evenly on both sides of the pipe to 1 foot (30 cm) above the top of the pipe. The width of backfill on each side of the pipe for the portion above the top of the trench shall be equal to twice the pipe's diameter of 12 feet (3.5 m), whichever is less.

For PVC and polyethylene pipe, the backfill shall be placed in two stages; first to the top of the pipe and then at least 12 inches (300 mm) over the top of the pipe. The backfill material shall meet the requirements of paragraph 701-3.2c.

Pipe Corrugation Depth		Minimum Bedding Depth	
in.	mm	in.	mm
½	12.5	1	25.0
1	25.0	2	50.0
2	50.0	3	75.0
2-1/2	62.5	3-1/2	87.5

c. PVC and Polyethylene Pipe

For PVC and polyethylene pipe, the bedding material shall consist of coarse sands and gravels with a maximum particle size of 3/4-inch (13 mm). For pipes installed under paved areas, no more than 12 percent of the material shall pass the No. 200 (0.075 mm) sieve. For all other areas, no more than 50 percent of the material shall pass the No. 200 (0.075 mm) sieve. The bedding shall have a thickness of at least 6 inches (150 mm) below the bottom of the pipe and extend up around the pipe for a depth of not less than 50 percent of the pipe's vertical outside diameter.

710-3.3LAYING PIPE. The pipe laying shall begin at the lowest point of the trench and proceed upgrade. The lower segment of the pipe shall be in contact with the bedding throughout its full length. Bell or groove ends of rigid pipes and outside circumferential laps of flexible pipes shall be placed facing upgrade.

Paved or partially lined pipe shall be placed so that the longitudinal center line of the paved segment coincides with the flow line.

Elliptical and elliptically reinforced pipes shall be placed with the manufacturer's top of pipe mark within five degrees of a vertical plane through the longitudinal axis of the pipe.

710-3.4JOINING PIPE. Joints shall be made with (1) portland cement mortar, (2) portland cement grout, (3) rubber gaskets, (4) oakum and mortar, (5) oakum and joint compound, or (6) plastic gaskets.

Mortar joints shall be made with an excess of mortar to form a continuous bead around the outside of the pipe and shall be finished smooth on the inside. Molds or runners shall be used for grouted joints in order to retain the poured grout. Rubber ring gaskets shall be installed to form a flexible watertight seal. Where oakum is used, the joint shall be caulked with the oakum and then sealed with joint compound or mortar.

a. Concrete Pipe

full trench width. The Engineer shall determine the depth of removal necessary. The granular material shall be compacted to provide adequate support for the pipe.

In the event of ground water invasion of the trench, the contractor shall be responsible for all dewatering work as subsidiary to the contract pay items. There will be no additional payment for pumping, dewatering wells, over excavation, etc. due to ground water.

The excavation for pipes that are placed in embankment fill shall not be made until the embankment has been completed to a height above the top of the pipe as shown on the plans.

710-3.2BEDDING. The pipe bedding shall conform to the class specified on the plans. When no bedding class is specified or detailed on the plans, the requirements for Class B bedding shall apply.

a. Rigid Pipe.

Class A bedding shall consist of a continuous concrete cradle conforming to the plan details.

Class B bedding shall consist of a bed of granular material having a thickness of at least 6 inches (150 mm) below the bottom of the pipe and extending up around the pipe for a depth of not less than 30 percent of the pipe's vertical outside diameter. The layer of bedding material shall be shaped to fit the pipe for at least 10 percent of the pipe's vertical diameter and shall have recesses shaped to receive the bell of bell and spigot pipe. The bedding material shall be sand or selected sandy soil, all of which passes a 3/8 inch (9 mm) sieve and not more than 10 percent of which passes a No. 200 (0.075 mm) sieve.

Class C bedding shall consist of bedding the pipe in its natural foundation to a depth of not less than 10 percent of the pipe's vertical outside diameter. The bed shall be shaped to fit the pipe and shall have recesses shaped to receive the bell of bell and spigot pipe.

b. Flexible Pipe

For flexible pipe, the bed shall be roughly shaped to fit the pipe, and a bedding blanket of sand or fine granular material shall be provided as follows:

710-2.3CONCRETE. Concrete for pipe cradles and/or collars shall have a minimum compressive strength of 2,000 psi (13 780 kPa) at 28 days and conform to the requirements of ASTM C 94.

710-2.4RUBBER GASKETS. Rubber gaskets for rigid pipe shall conform to the requirements of ASTM C 443. Rubber gaskets for PVC pipe shall conform to the requirements of ASTM F 477. Rubber gaskets for zinc-coated steel pipe and precoated galvanized pipe shall conform to the requirements of ASTM D 1056, for the "RE" closed cell grades.

710-2.5JOINT MORTAR. Pipe joint mortar shall consist of one part portland cement and two parts sand. The portland cement shall conform to the requirements of ASTM C 150, Type I. The sand shall conform to the requirements of ASTM C 144.

710-2.6OAKUM. Oakum for joints in bell and spigot pipe shall be made from hemp (Cannabis Sativa) line, or Benares Sunn fiber, or from a combination of these fibers. The oakum shall be thoroughly corded and finished.

710-2.7JOINT FILLERS. Poured filler for joints shall conform to the requirements of ASTM D 1190.

710-2.8PLASTIC GASKETS. Plastic gaskets shall conform to the requirements of AASHTO M 198 (Type B).

710-2.9COMPRESSION JOINTS. Materials for compression joints for vitrified clay pipe shall meet the requirements of ASTM C 425.

CONSTRUCTION METHODS

710-3.1EXCAVATION. The width of the pipe trench shall be sufficient to permit satisfactory jointing of the pipe and thorough tamping of the bedding material under and around the pipe, but it shall not be less than the external diameter of the pipe plus 6 inches (150 mm) on each side. The trench walls shall be in accordance with the Trench Safety Requirements of this contract..

Where hardpan, or other unyielding material is encountered, the Contractor shall remove it from below the foundation grade for a depth of at least 12 inches (300 mm) or one-half inch (12 mm) for each foot of fill over the top of the pipe (whichever is greater) but for no more than three-quarters of the nominal diameter of the pipe. The width of the excavation shall be at least 1 foot (30 cm) greater than the horizontal outside diameter of the pipe. The excavation below grade shall be backfilled with selected fine compressible material, such as silty clay or loam, and lightly compacted in layers not over 6 inches (150 mm) in uncompacted depth to form a uniform but yielding foundation.

Where a firm foundation is not encountered at the grade established, due to soft, spongy, or other unstable soil, the unstable soil shall be removed and replaced with approved granular material for the

ITEM D-701 PIPE FOR STORM DRAINS AND CULVERTS

DESCRIPTION

701-1.1 This item shall consist of the construction of pipe culverts and storm drains in accordance with these specifications and in reasonably close conformity with the lines and grades shown on the plans.

MATERIALS

701-2.1 Materials shall meet the requirements shown on the plans and specified below.

701-2.2 PIPE

Metallic Coated Corrugated Steel Pipe (Type I, IR or II)	ASTM A 760
Galvanized Steel Corrugated Structural Plates and Fasteners for Pipe, Pipe-Arches, and Arches	ASTM A 761
Polymer Precoated Corrugated Steel Pipe for Sewers and Drains	ASTM A 672
Post-Coated and Lined (Bituminous or Concrete) Corrugated Steel Sewer and Drainage Pipe	ASTM A 899
Fiber-Bonded Asphalt, Composite Coated, Corrugated Steel Pipe	ASTM A 885
Corrugated Aluminum Alloy Culvert Pipe	ASTM B 745
Vitrified Clay Pipe	ASTM C 700
Non-Reinforced Concrete Pipe	ASTM C 14
Reinforced Concrete Pipe	ASTM C 76
Reinforced Concrete D-Load Pipe	ASTM C 655
Reinforced Concrete Arch Pipe	ASTM C 506
Reinforced Concrete Elliptical Pipe	ASTM C 507
Precast Reinforced Concrete Box Sections	ASTM C 789 & C 850
Bituminous-Coated Corrugated Metal Pipe and Pipe Arches	AASHTO M 190
Corrugated Aluminum Alloy Culvert Pipe	AASHTO M 196
Bituminous-Coated Corrugated Aluminum Alloy Culvert Pipe and M 196	AASHTO M 190
Bituminous-Coated Structural Plate Pipe, Pipe Arch, and Arches and M 243	AASHTO M 167
Aluminum Alloy Structural Plate for Pipe, Pipe Arch, and Arches	AASHTO M 219
Polyvinyl Chloride (PVC) Pipe, (Sewer)	ASTM D 3034
Corrugated Polyethylene Drainage Tubing	AASHTO M 252

DEVIATIONS FROM STANDARD
FAA TECHNICAL SPECIFICATIONS

ITEM D-701 PIPE FOR STORM DRAINS AND CULVERTS

a) Section 3.2 Bedding, Class B bedding is required for all rigid pipe when not specified otherwise on the plans.

b) Section 3.6 - Trenching, paragraph added to require bracing, sheathing, or shoring to protect excavation as required for safety and in conformance with governing laws.

establish the grade and the condition of the soil, as directed by the Engineer, and shall then be sodded as specified in 904-3.5.

METHOD OF MEASUREMENT

904-4.1 This item shall be measured on the basis of the area in square yards (square meters) of the surface covered with sod and accepted.

BASIS OF PAYMENT

904-5.1 This item will be paid for on the basis of the contract unit price per square yard (square meter) for sodding, which price shall be full compensation for all labor, equipment, material, staking, and incidentals necessary to satisfactorily complete the items as specified.

Payment will be made under:

Item T-904-5.1 Sodding--per square yard (square meter)

END OF ITEM T-904

The sod shall be moist and shall be placed on a moist earth bed. pitch forks shall not be used to handle sod, and dumping from vehicles shall not be permitted. The sod shall be carefully placed by hand, edge to edge and with staggered joints, in rows at right angles to the slopes, commencing at the base of the area to be sodded and working upward. The sod shall immediately be pressed firmly into contact with the sod bed by tamping or rolling with approved equipment to provide a true and even surface, and insure knitting without displacement of the sod or deformation of the surfaces of sodded areas. Where the sod may be displaced during sodding operations, the workmen when replacing it shall work from ladders or treaded planks to prevent further displacement. Screened soil of good quality shall be used to fill all cracks between sods. The quantity of the fill soil shall not cause smothering of the grass. Where the grades are such that the flow of water will be from paved surfaces across sodded areas, the surface of the soil in the sod after compaction shall be set approximately 1 inch (25 mm) below the pavement edge. Where the flow will be over the sodded areas and onto the paved surfaces around manholes and inlets, the surface of the soil in the sod after compaction shall be placed flush with pavement edges.

On slopes steeper than 1 vertical to 2-1/2 horizontal and in v-shaped or flat-bottom ditches or gutters, the sod shall be pegged with wooden pegs not less than 12 inches (300 mm) in length and have a cross-sectional area of not less than 3/4 square inch (18 square millimeter). The pegs shall be driven flush with the surface of the sod.

904-3.6 WATERING. Adequate water and watering equipment must be on hand before sodding begins, and sod shall be kept moist until it has become established and its continued growth assured. In all cases, watering shall be done in a manner which will avoid erosion from the application of excessive quantities and will avoid damage to the finished surface.

904-3.7 ESTABLISHING TURF.

a. General. The Contractor shall provide general care for the sodded areas as soon as the sod has been laid and shall continue until final inspection and acceptance of the work.

b. Protection. All sodded areas shall be protected against traffic or other use by warning signs or barricades approved by the Engineer.

c. Mowing. The Contractor shall mow the sodded areas with approved mowing equipment, depending upon climatic and growth conditions and the needs for mowing specific areas. In the event that weeds or other undesirable vegetation are permitted to grow to such an extent that, either cut or uncut, they threaten to smother the sodded species, they shall be mowed and the clippings raked and removed from the area.

904-3.8 REPAIRING. When the surface has become bullied or otherwise damaged during the period covered by this contract, the affected areas shall be repaired to re-

Contractor shall demonstrate to the Engineer before starting the various operations that the application of required materials will be made at the specified rates.

904-3.2 PREPARING THE GROUND SURFACE. After grading of areas has been completed and before applying fertilizer and limestone, areas to be sodded shall be raked or otherwise cleared of stones larger than 2 inches (50 mm) in any diameter, sticks, stumps, and other debris which might interfere with sodding, growth of grasses, or subsequent maintenance of grass-covered areas. If any damage by erosion or other causes occurs after grading of areas and before beginning the application of fertilizer and ground limestone, the Contractor shall repair such damage. This may include filling gullies, smoothing irregularities, and repairing other incidental damage.

904-3.3 APPLYING FERTILIZER AND GROUND LIMESTONE. Following ground surface preparation, fertilizer shall be uniformly spread at a rate which will provide not less than the minimum quantity of each fertilizer ingredient, as stated in the special provisions. If use of ground limestone is required, it shall then be spread at a rate which will provide not less than the minimum quantity stated in the special provisions. These materials shall be incorporated into the soil to a depth of not less than 2 inches (50 mm) by discing, raking, or other methods acceptable to the Engineer. Any stones larger than 2 inches (50 mm) in any diameter, large clods, roots, and other litter brought to the surface by this operation shall be removed.

904-3.4 OBTAINING AND DELIVERING SOD. After inspection and approval of the source of sod by the Engineer, the sod shall be cut with approved sod cutters to such a thickness that after it has been transported and placed on the prepared bed, but before it has been compacted, it shall have a uniform thickness of not less than 2 inches (50 mm). Sod sections or strips shall be cut in uniform widths, not less than 10 inches (250 mm), and in lengths of not less than 18 inches (45 cm), but of such length as may be readily lifted without breaking, tearing, or loss of soil. Where strips are required, the sod must be rolled without damage with the grass folded inside. The Contractor may be required to mow high grass before cutting sod.

The sod shall be transplanted within 24 hours from the time it is stripped, unless circumstances beyond the Contractor's control make storing necessary. In such cases, sod shall be stacked, kept moist, and protected from exposure to the air and sun and shall be kept from freezing. Sod shall be cut and moved only when the soil moisture conditions are such that favorable results can be expected. Where the soil is too dry, permission to cut sod may be granted only after it has been watered sufficiently to moisten the soil to the depth the sod is to be cut.

904-3.5 LAYING SOD. Sodding shall be performed only during the seasons when satisfactory results can be expected. Frozen sod shall not be used and sod shall not be placed upon frozen soil. Sod may be transplanted during periods of drought with the approval of the Engineer, provided the sod bed is watered to moisten the soil to a depth of at least 4 inches (100 mm) immediately prior to laying the sod.

ITEM T-904 SODDING

DESCRIPTION

904-1.1 This item shall consist of furnishing, hauling, and placing approved live sod on prepared areas in accordance with this specification at the locations shown on the plans or as directed by the Engineer.

MATERIALS

904-2.1 SOD. Sod furnished by the Contractor shall have a good cover of living or growing grass. This shall be interpreted to include grass that is seasonally dormant during the cold or dry seasons and capable of renewing growth after the dormant period. All sod shall be obtained from areas where the soil is reasonably fertile and contains a high percentage of loamy topsoil. Sod shall be cut or stripped from living, thickly matted turf relatively free of weeds or other undesirable foreign plants, large stones, roots, or other materials which might be detrimental to the development of the sod or to future maintenance. At least 70% of the plants in the cut sod shall be composed of the species stated in the special provisions, and any vegetation more than 6 inches (150 mm) in height shall be mowed to a height of 3 inches (75 mm) or less before sod is lifted. Sod, including the soil containing the roots and the plant growth showing above, shall be cut uniformly to a thickness not less than that stated in the special provisions.

904-2.2 LIME. Deleted
904-2.3 FERTILIZER. Fertilizer shall conform to the requirements of 901-2.3.

904-2.4 WATER. The water shall be sufficiently free from oil, acid, alkali, salt, or other harmful materials that would inhibit the growth of grass. It shall be subject to the approval of the Engineer prior to use.

904-2.5 SOIL FOR REPAIRS. The soil for fill and topsoiling of areas to be repaired shall conform to the requirements of 901-2.4.

CONSTRUCTION METHODS

904-3.1 GENERAL. Areas to be solid, strip, or spot sodded shall be shown on the plans. Areas requiring special ground surface preparation such as tilling and those areas in a satisfactory condition which are to remain undisturbed shall also be shown on the plans.

Suitable equipment necessary for proper preparation of the ground surface and for the handling and placing of all required materials shall be on hand, in good condition, and shall be approved by the Engineer before the various operations are started. The

DEVIATIONS FROM STANDARD
T-904 SODDING FAA TECHNICAL SPECIFICATIONS

a) Specification was modified to delete lime from the materials section.

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9. Apron 'A' Demolition And Boring Plan
10. Apron 'A' Paving And Joint Layout Plan
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WAGE RATES

WAGE RATES

GENERAL DECISION TX020045 03/01/2002 TX45

Date: March 1, 2002
General Decision Number TX020045

Superseded General Decision No. TX010045

State: TEXAS

Construction Type:
HEAVY
HIGHWAY

County(ies):

COLLIN	GRAYSON	ROCKWALL
DALLAS	JOHNSON	TARRANT
DENTON	KAUFMAN	WICHITA
ELLIS	PARKER	

HEAVY AND HIGHWAY CONSTRUCTION PROJECTS IN WICHITA COUNTY ONLY.

HIGHWAY CONSTRUCTION PROJECTS ONLY FOR REMAINING COUNTIES

Modification Number	Publication Date
0	03/01/2002

COUNTY(ies):

COLLIN	GRAYSON	ROCKWALL
DALLAS	JOHNSON	TARRANT
DENTON	KAUFMAN	WICHITA
ELLIS	PARKER	

SUTX2043A 03/26/1998

	Rates	Fringes
AIR TOOL OPERATOR	$ 9.00	
ASPHALT RAKER	9.55	
ASPHALT SHOVELER	8.80	
BATCHING PLANT WEIGHER	11.51	
CARPENTER	10.30	
CONCRETE FINISHER-PAVING	10.50	
CONCRETE FINISHER-STRUCTURES	9.83	
CONCRETE RUBBER	8.84	
ELECTRICIAN	15.37	
FLAGGER	7.55	
FORM BUILDER-STRUCTURES	9.82	
FORM LINER-PAVING & CURB	9.00	
FORM SETTER-PAVING & CURB	9.24	
FORM SETTER-STRUCTURES	9.09	
LABORER-COMMON	7.32	
LABORER-UTILITY	8.94	
MECHANIC	12.68	

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29 CFR 5.5(a)(1)(v)).

In the listing above, the "SU" designation means that rates listed under that identifier do not reflect collectively bargained wage and fringe benefit rates. Other designations indicate unions whose rates have been determined to be prevailing.

WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can be:

* an existing published wage determination
* a survey underlying a wage determination
* a Wage and Hour Division letter setting forth a position on a wage determination matter
* a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour Regional Office for the area in which the survey was conducted because those Regional Offices have responsibility for the Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write to:

Branch of Construction Wage Determinations
Wage and Hour Division
U. S. Department of Labor
200 Constitution Avenue, N. W.
Washington, D. C. 20210

2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator
U.S. Department of Labor
200 Constitution Avenue, N. W.
Washington, D. C. 20210

The request should be accompanied by a full statement of the interested party's position and by any information (wage payment

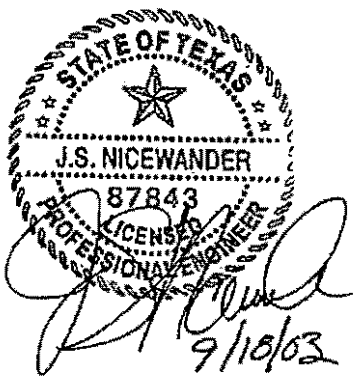
ADDENDA

Addison Airport
Addison Texas
TxDOT CSJ No. 0318 ADDON

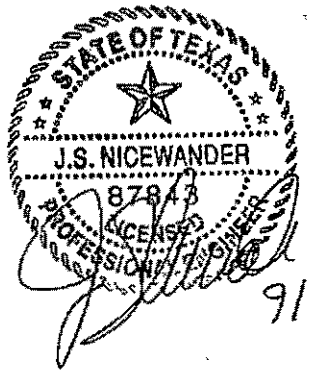
Addendum #1

The bid opening date has changed FROM 2:00 PM, October 2, 2003 **TO 2:00 PM, October 16, 2003, at the same location.**

J.S. Nicewander, P.E.



Addison Airport
Addison Texas
TxDOT CSJ No. 0318 ADDON



9/26/03

Addendum #2

1) There have been changes to the proposal form. For your convenience a new proposal has been attached to this Addendum. Replace the proposal in its entirety. Changes to the proposal are as follows:

   Page P9 the second sentence of the fourth paragraph should read "Bidder agrees to pay as liquidated damages the sum of ***$1000.00*** for each consecutive calendar day to complete the work beyond the allotted time or as extended by an approved change order."

   Base Bid:
   Item 17 SP-21 – Tie-Downs – Quantity changed to 42
   Item 21 SP-22 – Gate Assembly – This item has been taken out of the project

   Hangars 'C'
   Item 8 P-304-1 – Cement Treated Base, 6"- This item has been taken out of the project
   Item 9 P-401-1 – Bituminous Surface Course - This item has been taken out of the project
   Item 14 P-603-1 –Bituminous Tack Coat -This item has been taken out of the project

   The following Ineligible Items have been added to the Proposal
   Item 1 – D-701-2 12" Class IV RCP 204 L.F.
   Item 2 – D-751-2 Inlet Type B, 2 each
   Item 3 – SP 23 - NEENAH R-3475, 2 each

2) For your convenience all drawings that have been changed or modified have been added to this addendum. Replace all of the following drawings in their entirety. Changes to the drawings are as follows:

Cover – Added sheet 28A – Type 'B' Inlet
Sheet 2, Project Layout, – new location of temporary gate shown for Hangar 'C', revisions to legend.
Sheet 4, General Notes, - Various notes edited/clarified. Sheet Reissued.
Sheet 5, Quantities, Changes are as follows:

Base Bid:
Item 17 SP-21 – Tie-Downs – Quantity changed to 42
Item 21 SP-22 – Gate Assembly – This item has been taken out of the project

Hangars 'C'

Item 8 P-304-1 – Cement Treated Base, 6"- This item has been taken out of the project

Item 9 P-401-1 – Bituminous Surface Course - This item has been taken out of the project

Item 14 P-603-1 –Bituminous Tack Coat -This item has been taken out of the project

The following ineligible items have been added to the Quantity Sheet

Item 1 – D-701-2 12" Class IV RCP 204 L.F.

Item 2 – D-751-2 Inlet Type B, 2 each

Item 3 – SP 23 - NEENAH R-3475, 2 each

Sheet 6, Project Phasing Plan, - shows new location of temporary security gate for hangar 'C', notes modified to clarify number of days work is to be completed in and where the haul route for hangar 'A' is to located.

Sheet 7 Apron and Hangar Typical Sections - Added Apron Strom Drain detail.

Sheet 8, Apron 'A' Construction Phasing Plan, notes changed to clarify number of days to finish work in phase I

Sheet 10, Apron 'A' Paving and Joint Layout Plan removed reference to gate assembly in plan view, note 5 eliminated, added a note "Gate loop detector system shall be relocated to a new location under a separate contract."

Sheet 11, Apron 'A' Grading, Drainage and SW3P Plan – Sheet reissued. Changes to the grading plan and addition of storm drain pipes and inlet

Sheet 12, Apron 'A' Tie Down Layout Plan – removal of 12 tie downs, (4 plane parking positions)

Sheet 16 Hangar 'A' Grading, drainage and SW3P plan – Added note "Contractor to regrade ditches and sod disturbed areas"

Sheet 20, Hangar 'B' Grading, drainage and SW3P plan – Added note "Contractor to regrade ditches and sod disturbed areas"

Sheet 21, Hangar 'C' Construction Phasing Plan, shows new location of temporary security gate. Removing haul route from this contract and show it's new location.

Sheet 23, Hangar 'C' Paving and Joint Layout Plan, Showing location for drainage structure, showing new location of haul route.

Sheet 24, Hangar 'C Grading, drainage and SW3P plan, Added note "Contractor to regrade ditches and sod disturbed areas"

Sheet 28A – Type 'B' Inlet – Sheet added.

PROPOSAL

Proposal TxDOT CSJ No. 0318ADDON
Project Description: Pavement Reconstruction of Apron 'A' and Hangars 'A', 'B' and 'C'.

Proposal by: Name of Bidder

Address

Telephone FAX

Hereinafter called Bidder, a corporation organized and existing under the laws of the Sate of Texas doing business as _____.

To the Texas Department of Transportation hereinafter called the Agent.

Gentlemen:

Pursuant to the foregoing Instruction to Bidders, the undersigned bidder having examined the plans and specifications with related documents and the site of the proposed work, and being familiar with all the conditions surrounding the construction of the project hereby proposes to furnish all necessary superintendence labor, machinery, equipment, tools materials and supplies to complete all the work upon which is bid in accordance with the contract documents, within the time set forth and at the prices stated below.

Base Bid U.S. Customs Pavement Reconstruction

Item	Spec	Qty	Unit	Description Written Unit Price	Numeric Unit Price	Total Price
1.	M-101-1	1	LS	Mobilization _____ DOLLARS and _____ cents	$ _____	$ _____
2.	M-102	1	LS	Maintenance of _____ DOLLARS and _____ cents	$ _____	$ _____
3.	P-150-1	10,100	SY	Remove Bituminous Pavements _____ DOLLARS and _____ cents	$ _____	$ _____

Item	Spec	Qty	Unit	Description Written Unit Price	Numeric Unit Price	Total Price
4.	P-150-2	560	SY	Removal Concrete Pavement _____ DOLLARS and _____ cents	$ _____	$ _____
5.	P-152-1	5,200	CY	Unclassified Excavation _____ DOLLARS and _____ cents	$ _____	$ _____
6.	P-155-1	11,750	SY	Lime Treated Subgrade, 6" depth _____ DOLLARS and _____ cents	$ _____	$ _____
7.	P-155-2	211	TON	Lime (5%) _____ DOLLARS and _____ cents	$ _____	$ _____
8.	P-157-1	550	LF	Silt Fence _____ DOLLARS and _____ cents	$ _____	$ _____
9.	P-304-1	12,200	SY	Cement Treated Base Course, 6" _____ DOLLARS and _____ cents	$ _____	$ _____
10.	P-401-1	110	TON	Bituminous Surface Course _____ DOLLARS and _____ cents	$ _____	$ _____
11.	P-501-1	7,625	SY	12 Inch PCC Pavement, Non-Reinforced _____ DOLLARS and _____ cents	$ _____	$ _____
12.	P-501-2	850	SY	12 inch PCC Pavement, Reinforced _____ DOLLARS and _____ cents	$ _____	$ _____
13.	P-501-3	2,250	SY	12-15 inch PCC Pavement, Non-Reinforced _____ DOLLARS and _____ cents	$ _____	$ _____

Item	Spec	Qty	Unit	Description Written Unit Price	Numeric Unit Price	Total Price
14.	P-501-4	1,075	SY	12-15 inch PCC Pavement, Reinforced _____ DOLLARS and _____ cents	$ _____	$ _____
15.	P-603-1	92	GAL	Bituminous Tack Coat _____ DOLLARS and _____ cents	$ _____	$ _____
16.	P-612-1	410	SY	Milling Bituminous Pavement. 1 ½ depth _____ DOLLARS and _____ cents	$ _____	$ _____
17.	SP-21	42	EA	Tie Downs-Neenah R-3490-A, _____ DOLLARS and _____ cents	$ _____	$ _____
18.	P-620-1	8,100	SF	Pavement Marking, Non Reflective 4" Yellow _____ DOLLARS and _____ cents	$ _____	$ _____
19.	T-904-1	250	SY	Sodding _____ DOLLARS and _____ cents	$ _____	$ _____
				Sub Total Base Bid		

Additive Alternate No.1 – Hangars 'A'

Item	Spec	Qty	Unit	Description Written Unit Price	Numeric Unit Price	Total Price
1.	M-101-1	1	LS	Mobilization _____ DOLLARS and _____ cents	$ _____	$ _____
2.	M-102	1	LS	Maintenance of Traffic _____ DOLLARS and _____ cents	$ _____	$ _____
3.	P-150-1	3,160	SY	Remove Bituminous Pavements _____ DOLLARS and _____ cents	$ _____	$ _____
4.	P-152-1	250	CY	Unclassified Excavation _____ DOLLARS and _____ cents	$ _____	$ _____
5.	P-157-1	315	LF	Silt Fence _____ DOLLARS and _____ cents	$ _____	$ _____
6.	P-304-1	3,100	SY	Cement Treated Base Course, 6" _____ DOLLARS and _____ cents	$ _____	$ _____
7.	P-401-1	35	TON	Bituminous Surface Course, 6" _____ DOLLARS and _____ cents	$ _____	$ _____
8.	P-501-5	1,050	SY	8 inch PCC Pavement, Non Reinforced _____ DOLLARS and _____ cents	$ _____	$ _____
9.	P-501-6	972	SY	8 inch PCC Pavement, Reinforced _____ DOLLARS and _____ cents	$ _____	$ _____

Item	Spec	Qty	Unit	Description Written Unit Price	Numeric Unit Price	Total Price
10.	P-501-7	533	SY	8 - 10 inch PCC Pavement, Non-Reinforced	$ _____	$ _____
				_____ DOLLARS and _____ cents	$ _____	$ _____
11.	P-501-8	575	SY	8-10 inch PCC Pavement, Reinforced _____ DOLLARS and _____ cents	$ _____	$ _____
12.	P-603-1	30	GAL	Bituminous Tack Coat _____ DOLLARS and _____ cents	$ _____	$ _____
13.	T-904-1	760	SY	Sodding _____ DOLLARS and _____ cents	$ _____	$ _____
				Sub Total Additive Alternate No. 1		

Additive Alternate No. 2 – Hangars 'B'

Item	Spec	Qty	Unit	Description Written Unit Price	Numeric Unit Price	Total Price
1.	M-101-1	1	LS	Mobilization _____ DOLLARS and _____ cents	$ _____	$ _____
2.	M-102	1	LS	Maintenance of Traffic _____ DOLLARS and _____ cents	$ _____	$ _____
3.	P-150-1	5,020	SY	Remove Bituminous Pavements _____ DOLLARS and _____ cents	$ _____	$ _____
4.	P-152-1	250	CY	Unclassified Excavation _____ DOLLARS and _____ cents	$ _____	$ _____
5.	P-157-1	1,115	LF	Silt Fence _____ DOLLARS and _____ cents	$ _____	$ _____

Item	Spec	Qty	Unit	Description Written Unit Price	Numeric Unit Price	Total Price
6.	P-304-1	4,440	SY	Cement Treated Base Course, 6" _____ DOLLARS and _____ cents	$ _____	$ _____
7.	P-401-1	100	TON	Bituminous Surface Course _____ DOLLARS and _____ cents	$ _____	$ _____
8.	P-401-2	30	TON	Bituminous Surface Course Temporary Pavement _____ DOLLARS and _____ cents	$ _____	$ _____
9.	P-501-5	1,650	SY	8 inch PCC Pavement, Non Reinforced _____ DOLLARS and _____ cents	$ _____	$ _____
10.	P-501-7	2,762	SY	8 - 10 inch PCC Pavement, Non-Reinforced _____ DOLLARS and _____ eents	$ _____	$ _____
11.	P-603-1	90	GAL	Bituminous Tack Coat _____ DOLLARS and _____ cents	$ _____	$ _____
12.	T-904-1	170	SY	Sodding _____ DOLLARS and _____ cents	$ _____	$ _____
				Sub Total Additive Alternate No. 2		

Additive Alternate No. 3 – Hangars 'C'

Item	Spec	Qty	Unit	Description Written Unit Price	Numeric Unit Price	Total Price
1.	M-101-1	1	LS	Mobilization _____ DOLLARS and _____ cents	$ _____	$ _____
2.	M-102-1	1	LS	Maintenance of Traffic _____ DOLLARS and _____ cents	$ _____	$ _____
3.	P-150-1	3,120	SY	Remove Bituminous Pavements _____ DOLLARS and _____ cents	$ _____	$ _____
4.	P-150-3	1	EA	Remove Drainage Structure _____ DOLLARS and _____ cents	$ _____	$ _____
5.	P-150-4	141	LF	Remove Pipe _____ DOLLARS and _____ cents	$ _____	$ _____
6.	P-152-1	1,250	CY	Unclassified Excavation _____ DOLLARS and _____ cents	$ _____	$ _____
7.	P-157-1	420	LF	Silt Fence _____ DOLLARS and _____ cents	$ _____	$ _____
8.	P-501-5	1,750	SY	8 inch PCC Pavement, Non Reinforced _____ DOLLARS and _____ cents	$ _____	$ _____

Item	Spec	Qty	Unit	Description Written Unit Price	Numeric Unit Price	Total Price
9.	P-501-6	93	SY	8 inch PCC Pavement, Reinforced _____ DOLLARS and _____ cents	$ _____	$ _____
10.	P-501-7	790	SY	8 - 10 inch PCC Pavement, Non-Reinforced _____ DOLLARS and _____ cents	$ _____	$ _____
11.	P-501-8	325	SY	8-10 inch PCC Pavement, Reinforced _____ DOLLARS and _____ cents	$ _____	$ _____
12.	D-701-1	141	LF	18" Class IV RCP _____ DOLLARS and _____ cents	$ _____	$ _____
13.	D-751-1	1	EA	Inlet, Type A _____ DOLLARS and _____ cents	$ _____	$ _____
14.	F-162-1	1	EA	Temporary Gate _____ DOLLARS and _____ cents	$ _____	$ _____
15.	T-904-1	570	SY	Sodding _____ DOLLARS and _____ cents	$ _____	$ _____
				Sub Total Additive Alternate No. 3		

Ineligible Items

Item	Spec	Qty	Unit	Description Written Unit Price	Numeric Unit Price	Total Price
1.	D-701-2	204	LF	12" Class IV RCP _____ DOLLARS and _____ cents	$ _____	$ _____
2.	D-751-2	2	EA	Inlet Type B _____ DOLLARS and _____ cents	$ _____	$ _____
3.	SP-23	2	EA	Neenah R-3475 _____ DOLLARS and _____ cents	$ _____	$ _____
				Sub Total Additive Alternate No. 3		

Sub Total Base Bid I $ _____

Sub Total Additive Alternate No. 1 $ _____

Sub Total Additive Alternate No. 2 $ _____

Sub Total Additive Alternate No. 3 $ _____

Sub Total Ineligible Items $ _____

TOTAL BID $ _____

It is understood the quantities of work to be done at unit prices are approximate and are intended for bidding purposes only. Amounts are to be shown in both words and figures. In case of discrepancy the amount shown in words shall govern.

The Bidder shall fill out the Base Bid as well as all three Additive Alternate Bids. Failure to fill out all the bid schedules and additive alternates will be a reason to reject the bid.

Funding availability will be considered in selecting the bid schedules and alternates to be awarded.

Bidder hereby agrees to commence work under this contract on or before a date to be specified in a written "Notice to Proceed" and to fully complete the project within 154 calendar days thereafter. Bidder further agrees to pay as liquidated damages the sum of $1000.00 for each consecutive calendar day to complete the work beyond the allotted time or as extended by an approved Change Order.

Bidders understand the Owner/Agent reserves the right to reject any and all bids and to waive any information in the bidding. The bidder agrees this bid shall be good and may not be withdrawn for a period of 60 calendar days after the scheduled closing time for receiving bids.

Upon receipt of the written "Notice of Award", the bidder will execute the formal contract agreement within 14 days and deliver a surety bond or bonds as required under the contract documents. The bid security attached, two percent (2%) of the total bid price stated in the proposal, in the sum of
$_____ is to become the property of the Owner/Agent in the event the contract is not executed as set forth in the contract documents as liquidated damages for the delay and additional expense caused thereby.

Receipt is hereby acknowledged of the following addenda to the contract documents.

Addendum No. 1 dated _____	Received _____
Addendum No. 2 dated _____	Received _____
Addendum No. 3 dated _____	Received _____
Addendum No. 4 dated _____	Received _____

Respectfully submitted

By:_____ Title:_____

Address:

Agents must provide evidence of authority to Bind Corporation

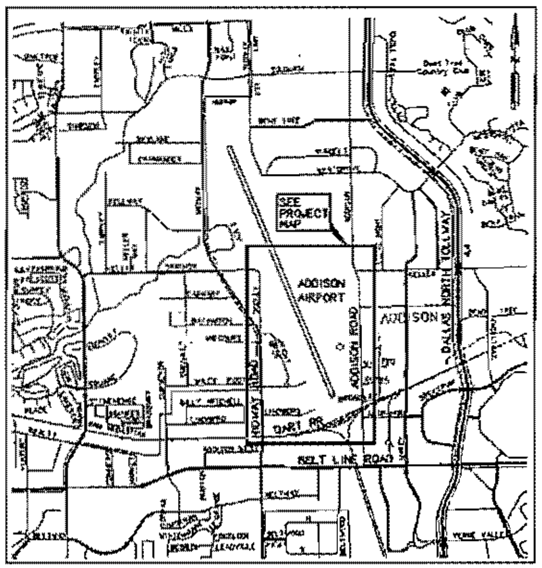
PLANS FOR DEMOLITION, GRADING, PAVING, DRAINAGE AND STORM WATER POLLUTION PREVENTION

ADDISON AIRPORT

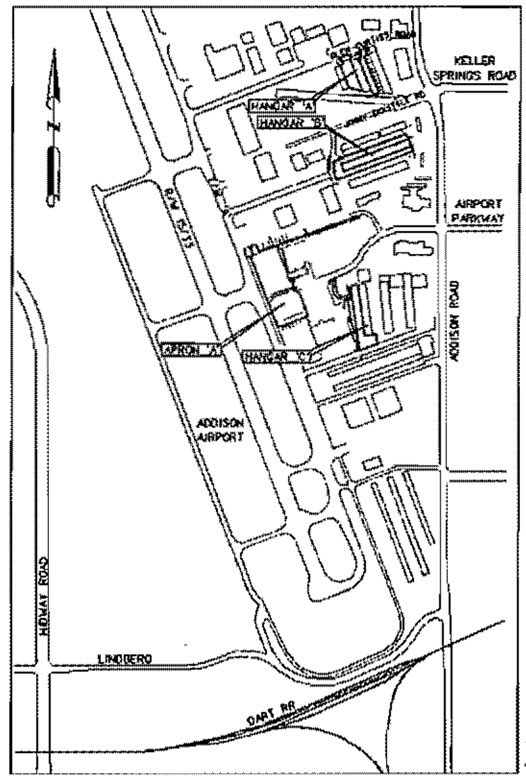
PAVEMENT RECONSTRUCTION OF APRON 'A' AND HANGARS 'A', 'B' AND 'C'

TxDOT CSJ No. 0318ADDON

SHEET NO.	INDEX OF SHEETS
1	COVER SHEET / LOCATION MAP
2	PROJECT LAYOUT
3	GENERAL NOTES
4	GENERAL NOTES
5	QUANTITIES
6	PROJECT PHASING PLAN
7	APRON AND HANGAR TYPICAL SECTIONS
8	APRON 'A' CONSTRUCTION PHASING PLAN
9	APRON 'A' DEMOLITION AND BORING PLAN
10	APRON 'A' PAVING AND JOINT LAYOUT PLAN
11	APRON 'A' GRADING/DRAINAGE/SW3P PLAN
12	APRON 'A' TIE DOWN LAYOUT PLAN
13	HANGAR 'A' CONSTRUCTION PHASING PLAN
14	HANGAR 'A' DEMOLITION AND BORING PLAN
15	HANGAR 'A' PAVING AND JOINT LAYOUT PLAN
16	HANGAR 'A' GRADING/DRAINAGE/SW3P PLAN
17	HANGAR 'B' CONSTRUCTION PHASING PLAN
18	HANGAR 'B' DEMOLITION AND BORING PLAN
19	HANGAR 'B' PAVING AND JOINT LAYOUT PLAN
20	HANGAR 'B' GRADING/DRAINAGE/SW3P PLAN
21	HANGAR 'C' CONSTRUCTION PHASING PLAN
22	HANGAR 'C' DEMOLITION AND BORING PLAN
23	HANGAR 'C' PAVING AND JOINT LAYOUT PLAN
24	HANGAR 'C' GRADING/DRAINAGE/SW3P PLAN
25	BARRICADE DETAILS
26	PAVING JOINT DETAILS
27	PAVING DETAILS
28	TYPE 'A' INLET DETAILS
28A	TYPE 'B' INLET DETAILS
29	DRAINAGE DETAILS
30	STORM WATER POLLUTION PREVENTION NOTES
31	STORM WATER POLLUTION PREVENTION DETAILS
32	FENCING DETAILS

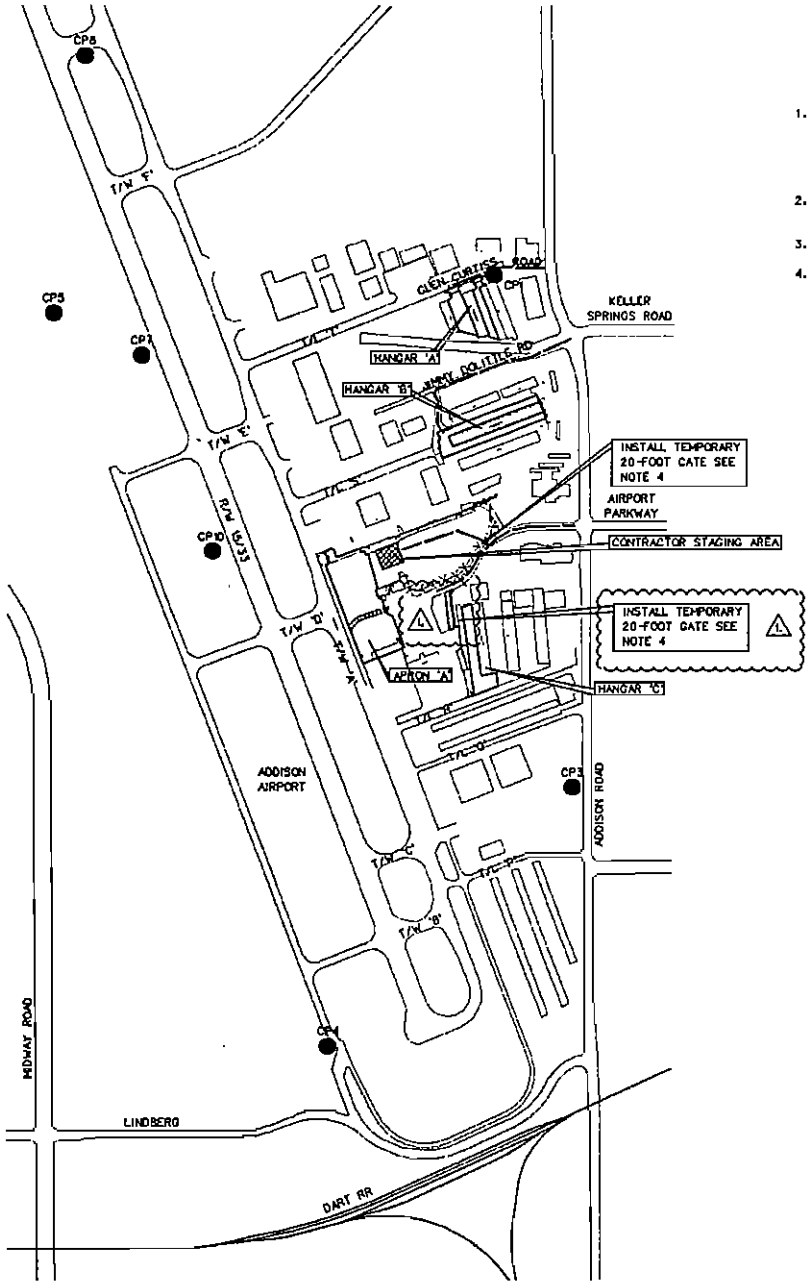


LOCATION MAP
NOT TO SCALE



PROJECT MAP
NOT TO SCALE

HNTB



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SCALE IN FEET

N

NOTES:

1. THE CONTRACTOR WILL NEED TO COORDINATE WITH ADDISON AIRPORT OPERATIONS THROUGHOUT THE CONSTRUCTION PROCESS. THE CONTRACTOR IS TO KEEP AIRPORT OPERATIONS UPDATED REGARDING THE SCHEDULE ON A WEEKLY BASIS. THE AIRPORT OPERATIONS WILL NEED 14 DAYS NOTICE BEFORE WORK CAN BEGIN ON THE NEXT PHASE OF THE PROJECT.
2. CONTRACTOR TO VERIFY THE LIMITS OF THE STAGING AREA WITH THE ADDISON AIRPORT PRIOR TO BEGINNING WORK.
3. CONTROL MONUMENTS (NAD83, TEXAS NORTH CENTRAL - 4202)
4. CONTRACTOR TO COORDINATE WITH THE TOWN OF ADDISON PRIOR TO INSTALLATION OF TEMPORARY GATE. EXISTING IRRIGATION SYSTEM TO BE CUT AND PLUGGED BY THE TOWN OF ADDISON WITHIN THE LIMITS OF THE GATE. CONTRACTOR TO PROVIDE ASPHALT TRANSITION AGAINST THE BACK CURBS FOR TEMPORARY CONSTRUCTION ACCESS

HORIZONTAL AND VERTICAL CONTROL MONUMENTATION IS BASED ON A DAL-TECH, 2002, SURVEY PROVIDED BY THE ADDISON AIRPORT

CP#	NORTH	EAST	ELEV	DESC.
1	7,039,689.076	2,480,245.882	638.30	AA-1
2	7,041,501.126	2,480,144.750	641.92	AA-2
3	7,037,202.352	2,480,832.193	638.03	AA-3
4	7,035,957.986	2,479,444.822	632.41	AA-4
5	7,039,508.883	2,478,102.183	637.40	AA-5
6	7,043,649.891	2,477,497.499	652.26	AA-6
7	7,039,305.132	2,478,531.857	640.77	AB2786
8	7,040,772.156	2,478,253.153	633.02	AB7846
9	7,043,042.492	2,477,532.021	637.40	AH7852
10	7,038,354.486	2,478,875.925	642.02	CS1308

LEGEND

- CONTRACTOR HAUL ROUTE
- CONTRACTOR STAGING AREA
- CP# CONTROL POINT (SEE GENERAL NOTES FOR DETAILS)
- T/W TAXIWAY
- T/L TAXILANE

J.S. RICHARDSON 67843 REGISTERED PROFESSIONAL ENGINEER

NO.	DATE	REVISION	APPROV.
1	9/23/03	Notes and Legend Revision	JSR

HNTB

TOWN OF ADDISON

ADDISON AIRPORT PAVEMENT RECONSTRUCTION OF APRON 'A' AND HANGARS 'A', 'B' AND 'C'

PROJECT LAYOUT

TOWN OF ADDISON, TEXAS

Design JSH	Drawn CFE	DATE	PROJECT NO.	SHEET
Check JSH	Check JSH	MAY 2003	31345	2

25-SEP-2003 08:40
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B. WORK ADJACENT TO AND ON RUNWAYS

THE CONTRACTOR SHALL:

1. NOT ALLOW ANY WORK TO BE UNDERTAKEN INSIDE OF, OR ANY PERSONNEL, EQUIPMENT, OR VEHICLES TO ENTER THE TAXIWAY OR RUNWAY RESTRICTED ZONE (OBJECT FREE AREA) WHILE ANY TAXIWAY OR RUNWAY IS "OPEN". THE RESTRICTED ZONE FOR TAXIWAY 'A' IS DEFINED AS THE AREA WITHIN 93-FEET OF THE TAXIWAY CENTERLINE. THE RESTRICTED ZONE FOR TAXIWAYS 'R', 'S' AND 'T' IS DEFINED AS THE AREA WITHIN 57.5-FEET OF THE TAXIWAY CENTERLINES. THE ENGINEER SHALL, WHEN REQUESTED BY THE CONTRACTOR AND WHEN IN CONFORMANCE TO THE APPROVED CONSTRUCTION SCHEDULE, ARRANGE FOR THE CLOSURE OF AFFECTED TAXIWAYS AND RUNWAYS. A MINIMUM OF 24 HOURS ADVANCE NOTICE IS REQUIRED TO SCHEDULE ANY AIRFIELD PAVEMENT CLOSURES.

2. BE RESPONSIBLE FOR PROVIDING ALL TEMPORARY LIGHTING AND OTHER SPECIAL EQUIPMENT THAT MAY BE NEEDED FOR NIGHTTIME CONSTRUCTION IF REQUESTED BY CONTRACTOR AND APPROVED BY ENGINEER. THE COST OF THIS EQUIPMENT SHALL BE INCLUDED IN THE GENERAL COST OF THE WORK. NO SEPARATE PAYMENT WILL BE MADE.

REQUEST THROUGH THE ENGINEER AND IN CONFORMITY WITH THE PHASING PLANS THE CLOSURES OF ANY AIRFIELD PAVEMENTS. THE AIRPORT MANAGER, IN COOPERATION WITH THE FAA, WILL CLOSE THE TAXIWAYS AND RUNWAYS TO AIRCRAFT ACTIVITY TO ALLOW CONSTRUCTION ACTIVITY WITHIN THE RUNWAY/TAXIWAY RESTRICTION ZONE. THESE ZONES ARE DEFINED AS AN AREA WITHIN 250-FEET OF A RUNWAY CENTERLINE AND 93-FEET OF A TAXIWAY 'A' CENTERLINE. THE CLOSURE PERIOD WILL BE SUBJECT TO THE FOLLOWING CRITERIA:

THE CLOSURE PERIODS WILL BE SCHEDULED IN GENERAL CONFORMANCE WITH THE PHASING PLANS. ADDITIONALLY, THE RUNWAY CLOSURE WILL BE DEPENDENT UPON THE WEATHER FORECAST; THE CONTRACTOR BEING FULLY MOBILIZED TO PURSUE THE WORK AT MAXIMUM EFFICIENCY (IN THE ENGINEER'S OPINION); AND ANY UNFORESEEN EMERGENCY WHICH, IN THE ENGINEER'S AND CITY'S OPINIONS, MAKES THE CLOSURE FEASIBLE.

THE CONTRACTOR WILL BE REQUIRED TO FURNISH ALL BARRIERS, BARRICADES, AND TAXIWAY/RUNWAY CLOSED SYMBOLS AS NECESSARY. THESE ITEMS WILL NOT BE PAID FOR SEPARATELY, BUT WILL BE INCLUDED IN THE PRICE BID FOR M-101, MOBILIZATION.

AT THE CONCLUSION OF ANY TAXIWAY CLOSURE, THE TAXIWAY SAFETY AREA AND ASSOCIATED NAVAID CRITICAL AREA SHALL BE RESTORED TO ORIGINAL ELEVATIONS AND GRADES. THE CONTRACTOR MAY NOT CONCLUDE A DAYS WORK AND REMOVE HIS FORCES FROM A WORK AREA WITHOUT RESTORING THE TAXIWAY OR EXISTING TAXIWAY TO OPERATIONAL STATUS.

THE CONTRACTOR SHALL MAINTAIN AT THE JOB SITE AT ALL TIMES WHILE THE CONSTRUCTION UNDER THIS CONTRACT IS IN PROCESS A SELF-PROPELLED, SELF-CONTAINED VACUUM SWEEPER WITH NOT LESS THAN A 10-FOOT (3-M) BROOM (4 CUBIC YARD (3 CU.M) CAPACITY) APPROVED BY THE ENGINEER. THE SWEEPER SHALL OPERATE AS NECESSARY TO KEEP AIRCRAFT PAVEMENTS, ACCESS ROADS AND THE WORK AREAS CLEAN. AT THE CLOSE OF EACH DAY'S WORK, ALL AIRFIELD PAVEMENTS USED OR DIRTIED BY THE CONTRACTOR, SHALL AGAIN BE SWEPT AND CLEANED OF ALL LOOSE AGGREGATE, SAND, DIRT OR DEBRIS FOR APPROVAL BY THE AIRPORT OPERATIONS PRIOR TO REOPENING THE PAVEMENTS FOR AIRCRAFT.

V. STAGING AREAS - GENERAL REQUIREMENTS

A. THE LOCATION AND SIZE OF THE CONTRACTOR'S STAGING AREA IS SHOWN FOR REFERENCE ONLY. THE ACTUAL SIZE AND EXACT LOCATION WILL BE ESTABLISHED PRIOR TO CONSTRUCTION. THE FOLLOWING REQUIREMENTS WILL APPLY:

ACCESS TO THE STAGING AREA SHALL BE OFF AIRPORT PARKWAY. ALL CONSTRUCTION SITE ACCESS SHALL BE VIA THE SECURITY GATE ADJACENT THE CUSTOMS FACILITY AND THROUGH THE STAGING AREA OR AS DIRECTED BY AIRPORT OPERATIONS. THE CONTRACTOR SHALL NOT PREVENT ACCESS TO THE SECURITY GATE BY AIRPORT STAFF, FAA PERSONNEL, THE ENGINEER OR THE ENGINEER'S SUBCONSULTANTS. ALL OF THE CONTRACTOR'S ACTIVITY WILL BE STAGED FROM THIS AREA. ALL FIELD OFFICE AND EMPLOYEE PARKING WILL BE LIMITED TO THE AREA ALONG AIRPORT PARKWAY. ONLY VEHICLES REQUIRED TO PERFORM LEGITIMATE FUNCTIONS BY THE CONTRACTOR ON THIS PROJECT AND FULLY COVERED UNDER THE CONTRACTOR'S INSURANCE AS SPECIFIED WITHIN THE SPECIAL PROVISIONS, WILL BE ALLOWED WITHIN THE AOA. THE CONTRACTOR WILL BE RESPONSIBLE FOR TRANSPORTING EMPLOYEES FROM THE STAGING AREA TO AND FROM THE WORK AREAS.

THE STAGING AREA WILL REMAIN THROUGHOUT THE CONSTRUCTION. THE COST OF ANY FENCING AND ANY OTHER WORK REQUIRED TO PREPARE THE STAGING AREA SHALL BE INCLUDED IN THE PRICE BID FOR ITEM M-101, MOBILIZATION.

THE STAGING AREA WILL BE ESTABLISHED ON AN ABANDONED AIRFIELD PAVEMENT. THE CONTRACTOR MAY DO GRADING AND DRAINAGE WORK TO ADAPT THE INGRESS/EGRESS AREA TO HIS SPECIFIC NEEDS. UPON COMPLETION OF THE WORK, HOWEVER, THE AREA WILL BE RESTORED TO THE ORIGINAL CONDITION.

IT IS NOT ANTICIPATED THAT THE AIRPORT'S OBSTRUCTION HEIGHT REQUIREMENTS, AS DEFINED IN FAA'S FAR PART 77, WILL RESTRICT THE CONTRACTOR'S ACTIVITIES IN THE STAGING AREA. IT IS REQUIRED, HOWEVER, THAT THIS ASSUMPTION BE VERIFIED BY THE CONTRACTOR THROUGH THE ENGINEER PRIOR TO BEGINNING WORK. APPROVAL BY THE FAA IS REQUIRED. WILL BE RESTRICTED TO A HEIGHT OF 110' FOR HANGAR 'A', 75' FOR HANGAR 'B', AND 40' FOR HANGAR 'C'

FOR CONTRACTOR'S NEEDING TO USE A CRANE DURING THE COURSE OF CONSTRUCTION. THIS APPROVAL MUST BE REQUESTED WELL IN ADVANCE BY THE SUBMISSION OF FAA FORM 7460 THROUGH THE ENGINEER.

THE CONTRACTOR WILL BE REQUIRED TO OBSERVE ALL EXISTING TRAFFIC FLOW DIRECTIONS WHEN ENTERING AND LEAVING THE STAGING AREA. NO COUNTER FLOW WILL BE ALLOWED ANY TIME.

THE CONTRACTOR SHALL PROVIDE PROFESSIONALLY-MADE SIGNS INDICATING THE NAME OF THE CONTRACTOR AND A MESSAGE DIRECTING ALL MATERIALS DELIVERIES TO THE STAGING AREA.

VI. SCHEDULES

A. THE WORK IN THIS CONTRACT HAS BEEN SEQUENCED IN A MANNER WHICH WILL MINIMIZE DISRUPTION TO NORMAL AIRPORT OPERATION AND COMPLY WITH APPROPRIATE FAA SAFETY CRITERIA. THE CONTRACTOR'S DETAILED SCHEDULING OF HIS WORK MUST BE DONE WITHIN THE FRAMEWORK OF THE SPECIFIED SEQUENCE OF CONSTRUCTION AND THESE CONSTRUCTION CONTROL NOTES. FAILURE BY THE CONTRACTOR TO APPRECIATE AND UNDERSTAND THE COMPLEXITY OF THE WORK IN HIS SCHEDULING WILL NOT BE REASON FOR HIM/HER TO CLAIM FOR ADDITIONAL TIME AND/OR COMPENSATION.

B. BECAUSE OF THE CIRCUMSTANCES OF THIS WORK, THE CONTRACTOR IS ADVISED THAT THE CONTRACT REQUIREMENTS FOR SCHEDULING OF THE WORK AND THE PENALTIES FOR FAILURE TO MAINTAIN AN APPROVED REALISTIC CONSTRUCTION SCHEDULE WILL BE STRICTLY ENFORCED. SHOULD THE CONTRACTOR FAIL TO MAINTAIN A CONSTRUCTION SCHEDULE THAT REASONABLY REFLECTS ACTUAL AND ANTICIPATED PROGRESS, ANY ADDITIONAL COSTS NECESSARY TO RESOLVE CONFLICTS WITH THE WORK THAT, IN THE ENGINEER'S OPINION, COULD HAVE OTHERWISE BEEN FORESEEN AND AVOIDED, WILL BE BORNE BY THE CONTRACTOR.

VII. DUST CONTROL

A. THE CONTRACTOR SHALL PAY PARTICULAR ATTENTION TO THE DUST CONTROL REQUIREMENTS OF THIS CONTRACT. THE OPERATION OF RUNWAYS, TAXIWAYS, AND ASSOCIATED NAVAIDS ARE ESPECIALLY SENSITIVE TO DUST. THE ENGINEER RESERVES THE RIGHT TO STOP CONTRACTOR OPERATIONS, IF NECESSARY TO BRING DUST UNDER CONTROL. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DUST CONTROL WITHIN THE CONSTRUCTION LIMITS AS WELL AS ALONG ANY ROADWAYS USED BY THE EQUIPMENT AND VEHICLES.

B. WATER TRUCKS SHALL BE MAINTAINED AT ALL TIMES SUCH THAT THE ACCESS ROADS AND CONSTRUCTION AREAS CAN BE WETTED AS NECESSARY. THE CONTRACTOR SHALL BE PREPARED, AT NO EXTRA COST TO THE OWNER, TO USE ADDITIONAL WATER TRUCKS OR OTHER MEANS SHOULD IT BE NECESSARY TO MAINTAIN DUST TO AN ACCEPTABLE LEVEL. ALL WATER TRUCKS SHALL BE SUBSIDIARY TO THE VARIOUS BID ITEMS ON THE PROJECT.

VIII. LIQUIDATED DAMAGES

FAILURE TO REOPEN A RUNWAY AT THE DESIGNATED TIME WILL RESULT IN LIQUIDATED DAMAGES OF $500 PER 15 MINUTE INCREMENT BEYOND THE SCHEDULED REOPENING TIME.

$100 PER 30-MINUTE INCREMENT FOR EACH 30-MINUTE INTERVAL A TAXIWAY IS DELAYED FROM ITS SCHEDULED REOPENING.

$1,000 PER DAY FOR EACH DAY THE PROJECT COMPLETION IS DELAYED FROM ITS SCHEDULED COMPLETION DATE.

IX. DEMOBILIZATION

CONDITIONS OF THE PROJECT AREA UPON COMPLETION OF THE JOB SHALL BE AS GOOD AS OR BETTER THAN THE CONDITIONS PRIOR TO STARTING WORK, IN ADDITION TO THE WORK ITEMS LISTED.

THE PROJECT AREA SHALL BE FREE OF ANY CONTRACTOR STOCKPILE MATERIALS UPON COMPLETION OF THE JOB UNLESS OTHERWISE DIRECTED BY THE ENGINEER.

UPON COMPLETION OF THE PROJECT, ALL OF THE HAUL ROUTES SHALL BE PROPERLY CLEANED TO PREVENT OBSTRUCTION AND/OR CAUSE INCONVENIENCE TO NORMAL REGULAR TRAFFIC. ALL TEMPORARY HAUL ROUTES SHALL BE REMOVED AND BROUGHT BACK TO ORIGINAL CONDITION OR BETTER.

THE RPR TRAILER, ALL OF THE CONSTRUCTION EQUIPMENT, AND ANY FACILITIES TEMPORARILY PLACED ON SITE FOR THE PROJECT SHALL BE REMOVED FROM THE SITE.

ANY PROPERTIES BELONGING TO THE AIRPORT SHALL BE RETURNED TO THE AIRPORT OWNER.

PROPER DRAINAGE (NO LOCALIZED PONDING) SHALL BE MAINTAINED, PRIOR TO, DURING AND AFTER MOBILIZATION.

DEMOBILIZATION SHALL BE DONE TO THE SATISFACTION OF THE ENGINEER.

DEMOBILIZATION SHALL BE DONE IN A MANNER THAT WILL NOT CAUSE ANY INCONVENIENCE TO AIRPORT OPERATIONS.

ANY DAMAGE TO THE AIRPORT PROPERTIES DURING DEMOBILIZATION SHALL BE REPAIRED AND PAID FOR AT THE CONTRACTOR'S OWN EXPENSE.

SAFETY REGULATIONS SHALL BE OBSERVED AT ALL TIMES DURING DEMOBILIZATION.

THE COST FOR DEMOBILIZATION SHALL BE CONSIDERED SUBSIDIARY TO ITEM 1, M-101, MOBILIZATION.

THE CONTRACTOR SHALL VIDEO TAPE THE ENTIRE WORK AREA AFTER THE CONSTRUCTION ACTIVITIES HAVE BEEN COMPLETED. THE CONTRACTOR SHALL PROVIDE ONE (1) COPY OF THIS VIDEO TAPE(S) TO BOTH THE AIRPORT MANAGER AND THE ENGINEER. THE COST OF PREPARING VIDEO SHALL BE SUBSIDIARY TO THE OTHER BID ITEMS.

J.S. WICKHAMER 87843

NO.	DATE	REVISION	APPROV.
1	9/25/03	SHEET REISSUED	JSW

HNTB ARCHITECTS ENGINEERS PLANNERS

TOWN OF ADDISON

ADDISON AIRPORT PAVEMENT RECONSTRUCTION OF APRON 'A' AND HANGARS 'A', 'B' AND 'C'

GENERAL NOTES

TOWN OF ADDISON, TEXAS

Design JSW	Drawn GFB	DATE	PROJECT NO.	SHEET
Check JSW	Check JSW	MAY 2003	37545	4

DESCRIPTION - APRON 'A'
BASE BID

ITEM	SPEC	DESCRIPTION	QUANTITY	UNIT
1	SP-M-101	MOBILIZATION	1	LS
2	SP-M-102	MAINTENANCE OF TRAFFIC	1	LS
3	P-150-1	REMOVE BITUMINOUS PAVEMENTS	10,100	SY
4	P-150-2	REMOVE CONCRETE PAVEMENT	560	SY
5	P-152-1	UNCLASSIFIED EXCAVATION	5,200	CY
6	P-155-1	LIME-TREATED SUBGRADE, 6" DEPTH	11,750	SY
7	P-155-2	LIME (5%)	211	TON
8	P-157-1	SILT FENCE	550	LF
9	P-304-1	CEMENT TREATED BASE COURSE, 6"	12,200	SY
10	P-401-1	BITUMINOUS SURFACE COURSE	110	TON
11	P-501-1	12 INCH PCC PAVEMENT, NON-REINFORCED	7,625	SY
12	P-501-2	12 INCH PCC PAVEMENT, REINFORCED	850	SY
13	P-501-3	12-15 INCH PCC PAVEMENT, NON-REINFORCED	2,250	SY
14	P-501-4	12-15 INCH PCC PAVEMENT, REINFORCED	1,075	SY
15	P-603-1	BITUMINOUS TACK COAT	92	GAL
16	P-612-1	MILLING BITUMINOUS PAVEMENT, 1 ½" DEPTH	410	SY
17	P-620-1	PAVEMENT MARKING, NON REFLECTIVE 4" YELLOW	8,100	SF
18	F-162-1	20-FOOT TEMPORARY GATE	1	EA
19	T-904-1	SODDING	250	SY
20	SP-21	TIE DOWNS - NEENAH R-3490-A	42	EA
21				

DESCRIPTION - HANGARS 'B'
ADDITIVE ALTERNATE NO. 2

ITEM	SPEC	DESCRIPTION	QUANTITY	UNIT
1	SP-M-101	MOBILIZATION	1	LS
2	SP-M-102	MAINTENANCE OF TRAFFIC	1	LS
3	P-150-1	REMOVE BITUMINOUS PAVEMENTS	5,020	SY
4	P-152-1	UNCLASSIFIED EXCAVATION	250	CY
5	P-157-1	SILT FENCE	1,115	LF
6	P-304-1	CEMENT TREATED BASE, 6"	4,440	SY
7	P-401-1	BITUMINOUS SURFACE COURSE	100	TON
8	P-401-2	BITUMINOUS SURFACE COURSE - TEMPORARY PVMT	30	TON
9	P-501-5	8 INCH PCC PAVEMENT, NON-REINFORCED	1,850	SY
10	P-501-7	8-10 INCH PCC PAVEMENT, NON-REINFORCED	2,762	SY
11	P-603-1	BITUMINOUS TACK COAT	90	GAL
12	T-904-1	SODDING	170	SY

DESCRIPTION - HANGARS 'A'
ADDITIVE ALTERNATE NO. 1

ITEM	SPEC	DESCRIPTION	QUANTITY	UNIT
1	SP-M-101	MOBILIZATION	1	LS
2	SP-M-102	MAINTENANCE OF TRAFFIC	1	LS
3	P-150-1	REMOVE BITUMINOUS PAVEMENTS	3,160	SY
4	P-152-1	UNCLASSIFIED EXCAVATION	250	CY
5	P-157-1	SILT FENCE	315	LF
6	P-304-1	CEMENT TREATED BASE, 6"	3,100	SY
7	P-401-1	BITUMINOUS SURFACE COURSE	35	TON
8	P-501-5	8 INCH PCC PAVEMENT, NON-REINFORCED	1,050	SY
9	P-501-6	8 INCH PCC PAVEMENT, REINFORCED	972	SY
10	P-501-7	8-10 INCH PCC PAVEMENT, NON-REINFORCED	533	SY
11	P-501-8	8-10 INCH PCC PAVEMENT, REINFORCED	575	SY
12	P-603-1	BITUMINOUS TACK COAT	30	GAL
13	T-904-1	SODDING	760	SY

DESCRIPTION - HANGARS 'C'
ADDITIVE ALTERNATE NO. 3

ITEM	SPEC	DESCRIPTION	QUANTITY	UNIT
1	SP-M-101	MOBILIZATION	1	LS
2	SP-M-102	MAINTENANCE OF TRAFFIC	1	LS
3	P-150-1	REMOVE BITUMINOUS PAVEMENTS	3,120	SY
4	P-150-3	REMOVE DRAINAGE STRUCTURE	1	EA
5	P 150-4	REMOVE PIPE	141	LF
6	P-152-1	UNCLASSIFIED EXCAVATION	1,250	CY
7	P-157-1	SILT FENCE	420	LF
8	P-501-5	8 INCH PCC PAVEMENT, NON-REINFORCED	1,750	SY
9	P-501-6	8 INCH PCC PAVEMENT, REINFORCED	93	SY
10	P-501-7	8-10 INCH PCC PAVEMENT, NON-REINFORCED	790	SY
11	P-501-8	8-10 INCH PCC PAVEMENT, REINFORCED	325	SY
12	D-701-1	18" CLASS IV RCP	141	LF
13	D-751-1	INLET, TYPE A	1	EA
14	F-162-1	20-FOOT TEMPORARY SECURITY GATE	1	EA
15	T-904-1	SODDING	570	SY

DESCRIPTION △
INELIGIBLE ITEMS

ITEM	SPEC	DESCRIPTION	QUANTITY	UNIT
1	D-701-2	12" CLASS IV RCP	204	LF
2	D-751-2	TYPE B INLET	2	EA
3	SP-23	NEENAH R-3475	2	EA

BASIS OF ESTIMATE*

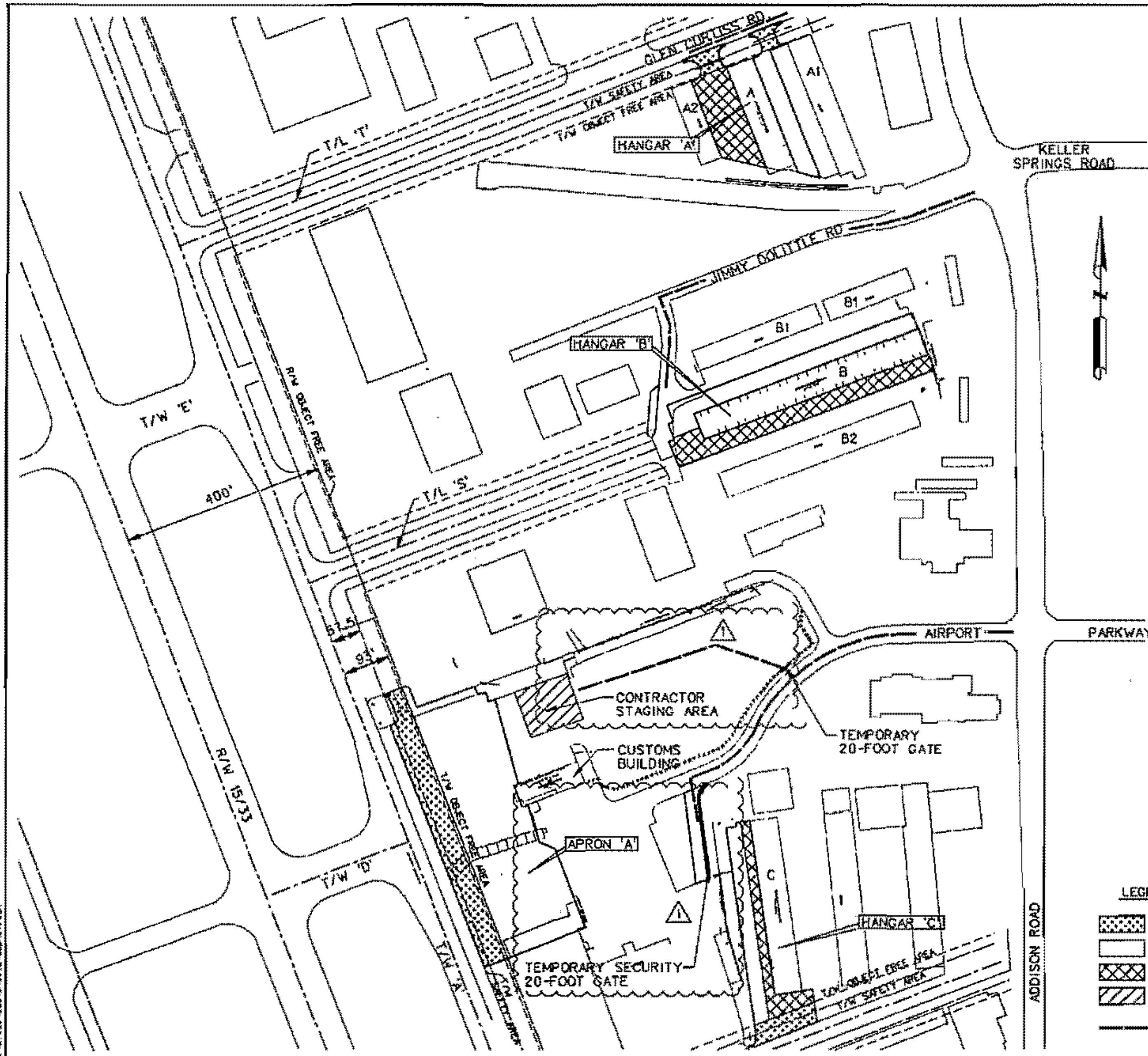
SPEC	DESCRIPTION	BASIS	UNIT
P-401	BITUMINOUS SURFACE COURSE	110 #/SY/IN X PVMT THICKNESS (IN) X AREA (SY) / 2000 (LB/TON)	TON
P-155	LIME	36 LB/SY PER THE SOILS REPORT X SY / 2000 (LB/TON)	TON
P-603	BITUMINOUS TACK COAT	0.15 GAL/SY OF PVMT X SY	GAL

*FOR CONTRACTOR INFORMATION ONLY. EXAMPLES SHOWN DO NOT NECESSARILY REFLECT ACTUAL PROJECT QUANTITIES, BUT ARE SHOWN TO DEMONSTRATE HOW THOSE QUANTITIES WERE DERIVED.

J.L. BILDMAKER
67143

HNTB
TOWN OF ADDISON
ADDISON AIRPORT PAVEMENT RECONSTRUCTION OF APRON 'A' AND HANGARS 'A', 'B' AND 'C'
QUANTITIES
TOWN OF ADDISON, TEXAS
MAY 2003 | 31340 | 5

26-SEP-2003 15:25



SCALE IN FEET: 0 100 200 300 400

LEGEND

- NIGHT WORK
- PHASE I
- PHASE II
- STAGING AREA
- CONTRACTOR HAUL ROUTE

NOTES:

CONTRACTOR WILL BE ALLOWED TO WORK ON THE APRON AND PORTIONS OF EACH OF THE HANGARS SIMULTANEOUSLY.

(1) WORK IN PHASE I WILL BEGIN ON THE DATE SPECIFIED IN THE NOTICE TO PROCEED (NTP) AND COMPLETED WITHIN 84 CALENDAR DAYS (12 WEEKS). WORK IN PHASE II WILL BE COMPLETED WITHIN AN ADDITIONAL 70 CALENDAR DAYS. FOR A TOTAL OF 154 CALENDAR DAYS

(1) WORK ON THE APRON WILL INCLUDE THE REPLACEMENT OF EXISTING ASPHALT PAVEMENT WITH CONCRETE PAVEMENT.

WORK IN BOTH PHASES WILL INCLUDE THE REMOVAL OF EXISTING ASPHALT PAVEMENT ON ONE SIDE OF EACH OF THE IDENTIFIED HANGARS AND REPLACEMENT WITH CONCRETE PAVEMENT.

THE CONTRACTOR WILL BE REQUIRED TO NOTIFY MR. DAVE FOSTER, 972-392-4852, ADDISON AIRPORT OPERATIONS 14 DAYS PRIOR TO CONSTRUCTION TO ALLOW THE AIRPORT TO RELOCATE ANY AIRPLANES NECESSARY PRIOR TO CONSTRUCTION. CONTRACTOR WILL COORDINATE WITH THE ADDISON AIRPORT CONCERNING THE TEMPORARY RELOCATION OF AIRPLANES PARKED IN EFFECTED AREAS.

ALL OF APRON 'A' SHALL BE CONSTRUCTED IN PHASE I.

ALL WORK WITHIN 93' OF TAXIWAY 'A' AND 58' OF TAXILANES 'R' AND 'T' CENTERLINES CAN ONLY BE PERFORMED DURING PERIODS WHEN THE TAXIWAY/TAXILANE IS CLOSED, BETWEEN 10:00 P.M. AND 6:00 A.M. LIGHTED BARRICADES ARE REQUIRED TO BE INSTALLED AND MAINTAINED ALONG THE TAXIWAYS ADJACENT TO THE WORK AREA.

CONTRACTOR TO VERIFY LIMITS OF THE STAGING AREA WITH THE ADDISON AIRPORT AT THE PRE-CONSTRUCTION MEETING.

SEE SHEET 2, PROJECT LAYOUT FOR CONTRACTOR HAUL ROUTE AT HANGAR 'A'

CONTRACTOR WILL COORDINATE WITH THE TOWN OF ADDISON FIRE DEPARTMENT DURING CONSTRUCTION OF APRON 'A' TO ESTABLISH AN ALTERNATE EMERGENCY ROUTE DURING CONSTRUCTION.

(1) HAUL ROUTE TO HANGAR 'A' WILL BE OFF OF GLEN CURTISS ROAD.

J.S. BIEDENBACH
87643

NO.	DATE	REVISION	APPROV.
1	9/25/03	NEW SECURITY GATE LOCATION AND HAUL ROUTE	JSH

HNTB ARCHITECTS ENGINEERS PLANNERS

TOWN OF ADDISON

ADDISON AIRPORT PAVEMENT RECONSTRUCTION OF APRON 'A' AND HANGARS 'A', 'B' AND 'C'

PROJECT PHASING PLAN

TOWN OF ADDISON, TEXAS

Design JSH	Drawn CFS	DATE	PROJECT NO.	SHEET
Check JSH	Check JSH	MAY 2003	37343	6

25-SEP-2003 08:56
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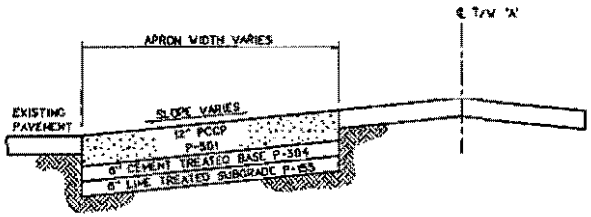
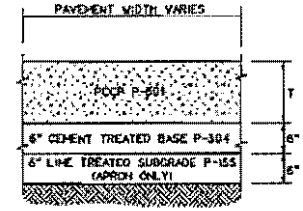
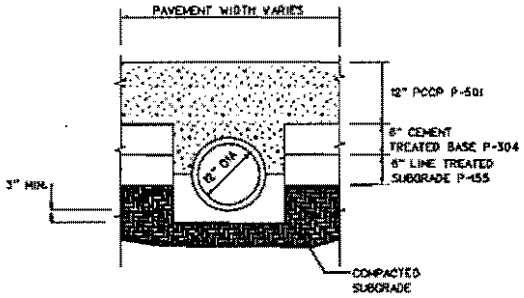


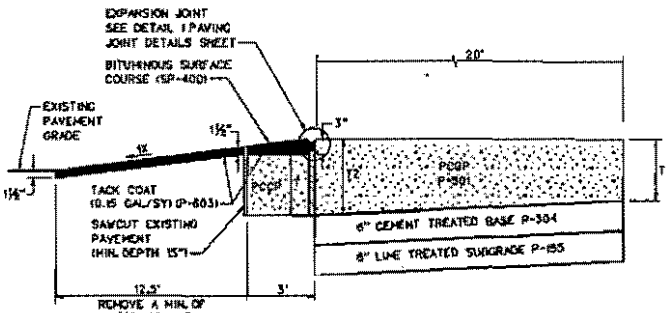
APRON 'A' PAVEMENT DETAIL
NOT TO SCALE



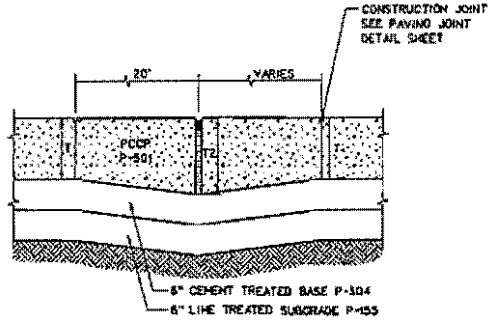
NON-REINFORCED PAVEMENT
SEE NOTES 1 AND 2
NOT TO SCALE



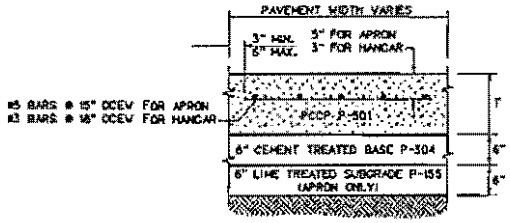
APRON STORM DRAIN DETAIL
NOT TO SCALE



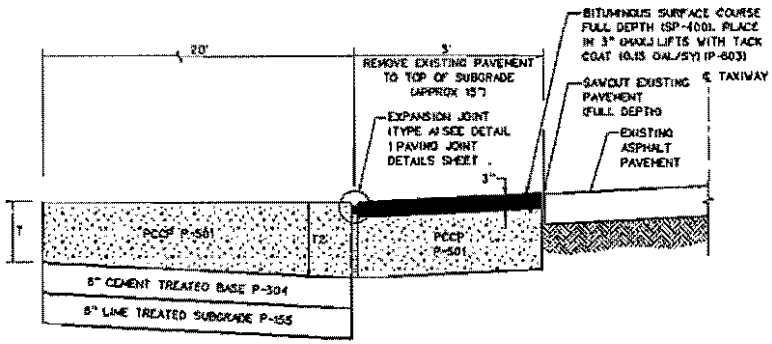
SECTION B-B
ASPHALT OVERLAY
NOT TO SCALE



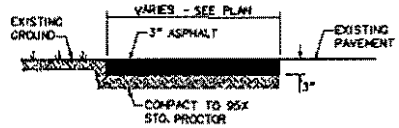
SECTION C-C
THICKENED EDGE NON-REINFORCED PAVEMENT
SEE NOTE 1
NOT TO SCALE



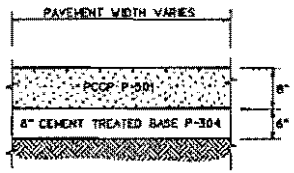
REINFORCED PAVEMENT
SEE NOTES 1 AND 2
NOT TO SCALE



SECTION A-A
EXISTING ASPHALT / PROPOSED CONCRETE PAVEMENT DETAIL
SEE NOTES 1 AND 2
NOT TO SCALE



TEMPORARY PAVEMENT
NOT TO SCALE



HANGAR PAVEMENT
NOT TO SCALE

NOTES:

1. APRON PAVEMENT THICKNESS
   T=12"
   T2=15"

2. HANGAR PAVEMENT THICKNESS
   (6" LIME TREATED SUBGRADE NOT USED)
   T=8"
   T2=10"

3. ALL SAWCUTTING ON THIS PROJECT SHALL BE SUBSIDIARY TO THE VARIOUS BID ITEMS ON THIS PROJECT.

4. SEE PAVING PLANS FOR LOCATION OF SECTIONS.

J.S. RICHARDSON 87845 REGISTERED PROFESSIONAL ENGINEER

NO.	DATE	REVISION	APPROV.
1	8/15/23	ADDED STORM DRAIN CROSSMENT DETAIL	JSR

HNTB

TOWN OF ADDISON

ADDISON AIRPORT PAVEMENT RECONSTRUCTION OF APRON 'A' AND HANGARS 'A', 'B' AND 'C'

APRON AND HANGAR TYPICAL SECTIONS

TOWN OF ADDISON, TEXAS

Design JSR	Drawn DFB	DATE	PROJECT NO.	SHEET
Check JSR	Check JSR	MAY 2023	37345	7

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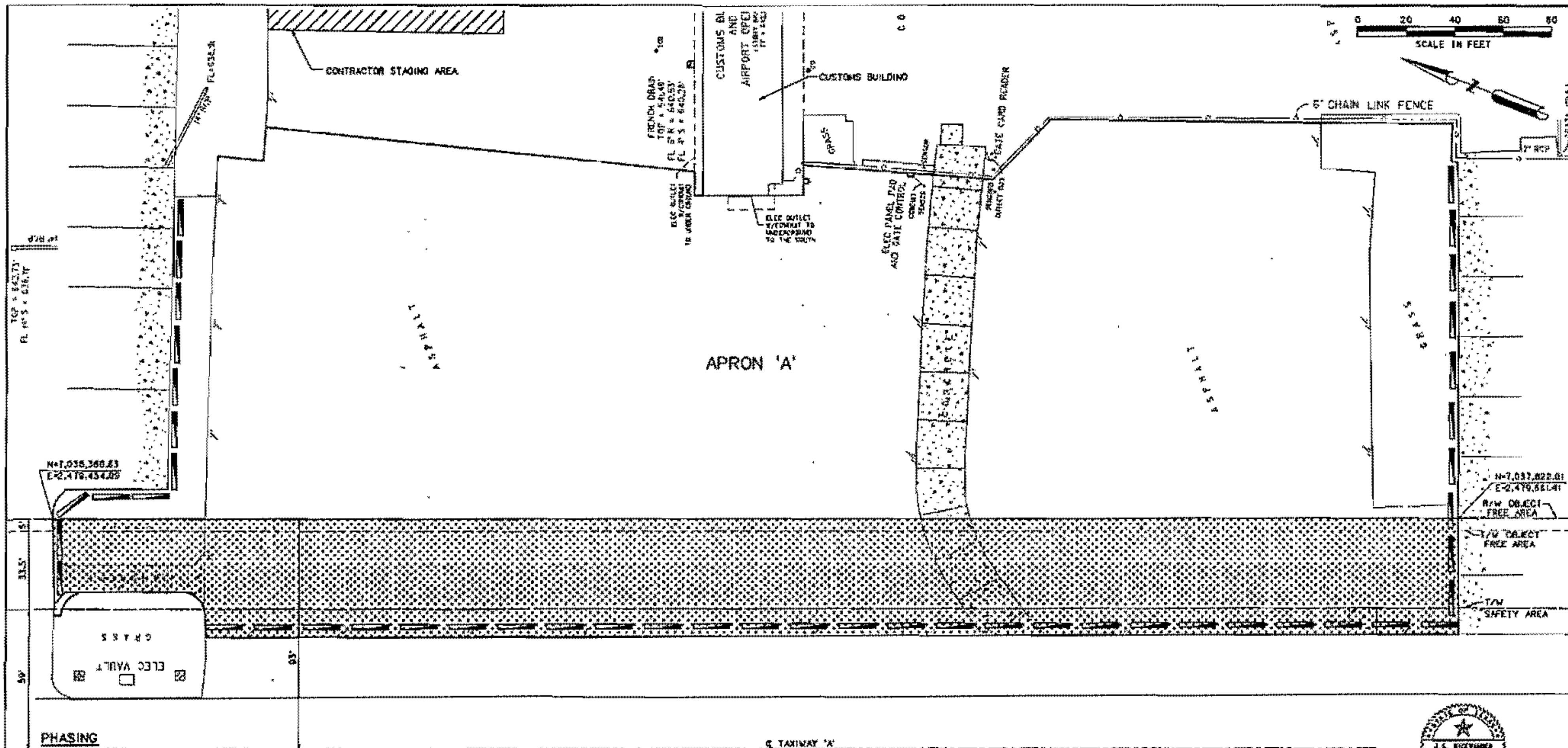

PHASING

1. HANGAR 'A' WORK (SEE SHEETS 13-16)
2. HANGAR 'B' WORK (SEE SHEETS 17-20)
3. HANGAR 'C' WORK (SEE SHEETS 21-24)
4. INCLUDED IN THIS PHASE IS THE REPLACEMENT OF EXISTING ASPHALT PAVEMENT ON APRON 'A' WITH CONCRETE PAVEMENT. ALL WORK WITHIN 93' OF THE TAXIWAY 'A' CENTERLINE CAN ONLY BE PERFORMED DURING PERIODS WHEN THE TAXIWAY IS CLOSED, BETWEEN 10:00 PM AND 6:00 AM. LIGHTED BARRICADES ARE REQUIRED TO BE INSTALLED AND MAINTAINED ALONG TAXIWAY 'A' ADJACENT TO THE WORK AREA.
5. CONTRACTOR TO VERIFY THE STAGING AREA LIMITS WITH THE ADDISON AIRPORT AT THE PRE-CONSTRUCTION MEETING.
6. IT IS THE INTENT OF THE PHASING PLAN TO FINISH ALL WORK ON THE APRON IN THE FIRST PHASE THAT CONSISTES OF 84 CALENDAR DAYS

LEGEND

- LIGHTED BARRICADE
- NIGHT WORK IN THIS AREA TO BE DONE DURING TAXIWAY CLOSURE ONLY
- PHASE I
- PHASE II

NO.	DATE	REVISION	APPROV.
1	9/24/03	NOTE REVISION	JLH

HNTB

TOWN OF ADDISON

ADDISON AIRPORT PAVEMENT RECONSTRUCTION OF APRON 'A' AND HANGARS 'A', 'B' AND 'C'

APRON 'A'
CONSTRUCTION PHASING PLAN

TOWN OF ADDISON, TEXAS

Design	Drawn	DATE	PROJECT NO.	SHEET
JDH	GFS	MAY 2003	31188	8

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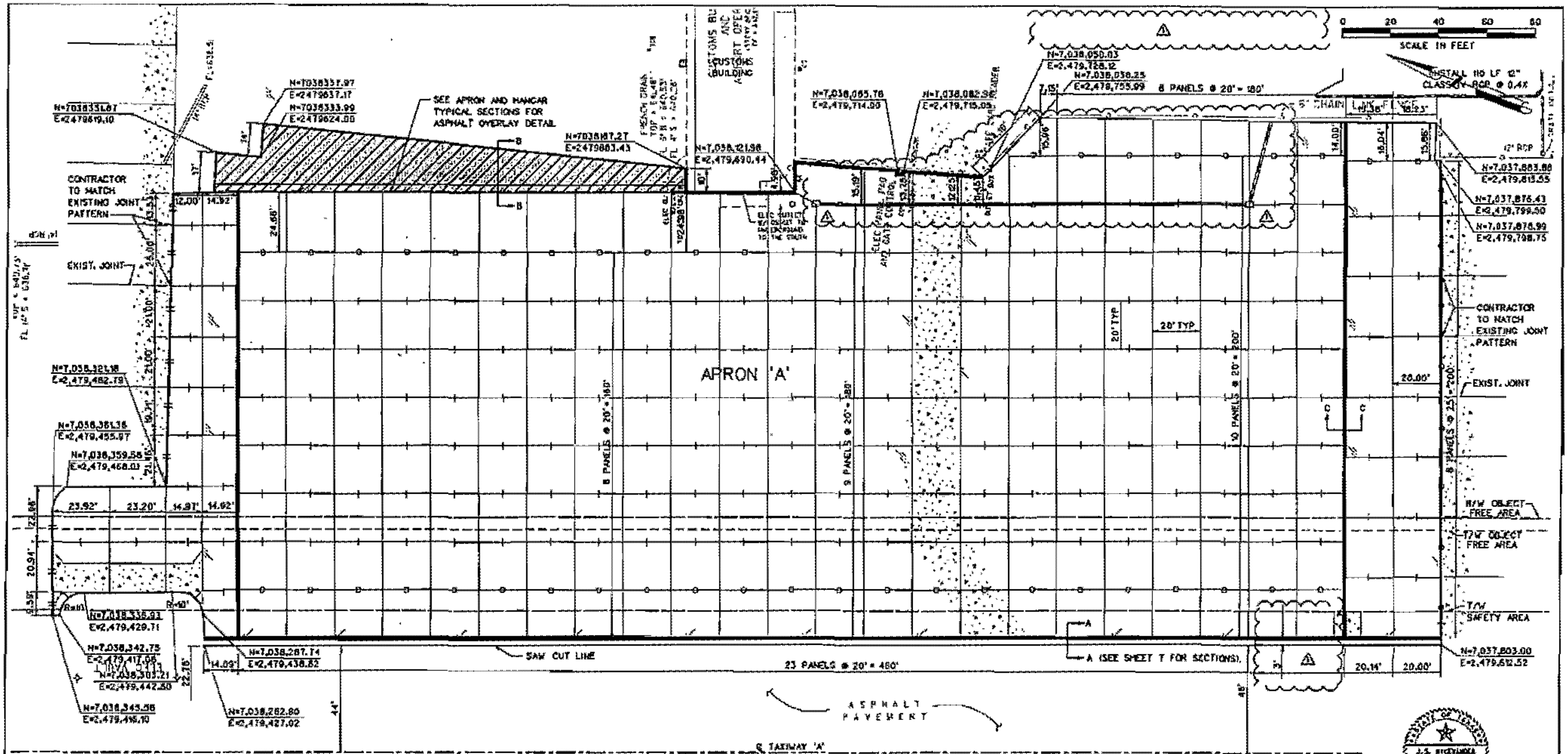


NOTES:

1. EXTREME CARE SHALL BE EXERCISED AROUND ~~THE APRON AND AIRCRAFT. APRON SHALL~~ BE VACANT OF AIRCRAFT AND OTHER EQUIPMENT BEFORE OPERATIONS BEGIN. ANY AND ALL DAMAGE TO APRON AND AIRCRAFT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.

2. SEE PAVING DETAILS SHEET FOR ODD SHAPED PANEL JOINT CONSTRUCTION.

3. SEE "APRON AND HANGAR TYPICAL SECTIONS" SHEET FOR SECTIONS "A-A", "B-B", AND "C-C".

4. SEE "PAVING JOINT DETAILS" SHEET FOR PAVING JOINTS DETAILS.

5. GATE LOOP DETECTOR SYSTEM SHALL BE RELOCATED TO A NEW LOCATION UNDER A SEPARATE CONTRACT.

LEGEND

- TYPE "B" THICKENED EDGE EXPANSION JOINT
- TYPE "D" DOWELED CONSTRUCTION JOINT
- TYPE "E" HINGED (TIED) CONSTRUCTION JOINT
- TYPE "F" DOWELED CONTRACTION JOINT
- TYPE "G" HINGED (TIED) CONTRACTION JOINT
- TYPE "H" DUMMY CONTRACTION JOINT
- REINFORCED SLAB
- NON-REINFORCED SLAB
- ASPHALT PAVEMENT

NO.	DATE	REVISION	APPROV.
1	8/13/03	DISPLAY DRAINAGE SYSTEM NOTE REVISIONS	JEH

HNTB

TOWN OF ADDISON

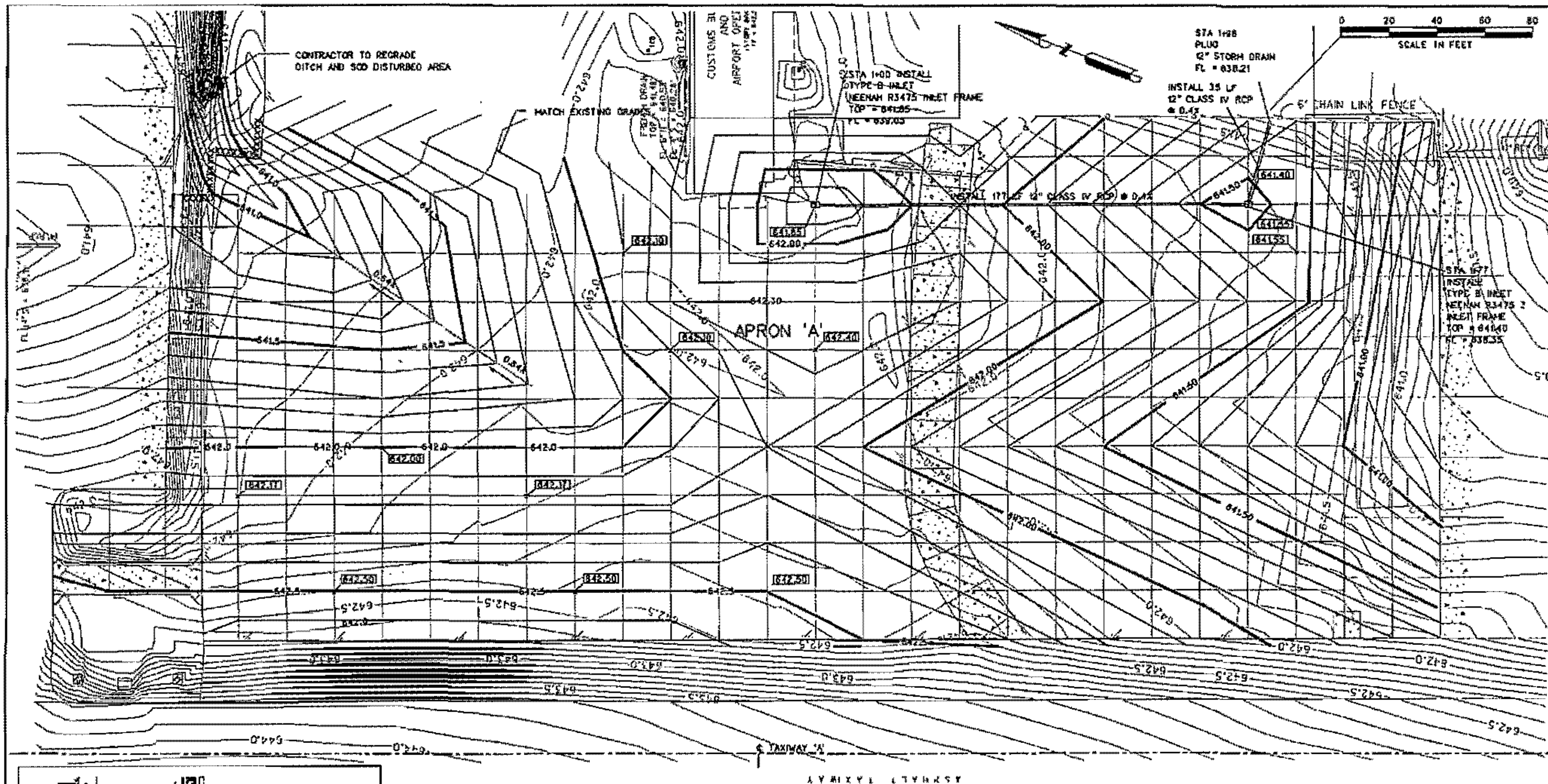
ADDISON AIRPORT PAVEMENT RECONSTRUCTION OF APRON 'A' AND HANGARS 'A', 'B' AND 'C'

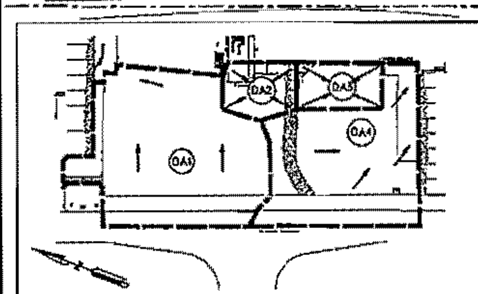
APRON 'A' PAVING AND JOINT LAYOUT PLAN

TOWN OF ADDISON, TEXAS

Design JGH	Drawn CFS	DATE MAY 2003	PROJECT NO. 31395	SHEET 10
Drawn JGH	Checked JGH			

25-SEP-2003 09:11





DRAINAGE AREA MAP
NOT TO SCALE

APRON DRAINAGE TABLE					
DRAINAGE AREA	AREA (ACRES)	C	Tc* (min)	I-100 (in/hr)	Q (cfs)
DA1	1.518	0.90	10	8.74	11.94
DA3	1.189	0.90	10	8.74	9.35
DA4	0.234	0.90	10	8.74	1.84
DA5	0.242	0.90	10	8.74	1.90

*BASED ON TOWN OF ADDISON DRAINAGE GUIDELINES

LEGEND

642.50 — FINISHED GRADE ELEVATION

641.5 — PROPOSED 0.5' CONTOUR

PROPOSED 0.1' CONTOUR

641.5 — EXISTING 0.5' CONTOUR

EXISTING 0.1' CONTOUR

DRAINAGE AREA DIVIDE

XXXXXXXXX SILT FENCE

NO.	DATE	REVISION	APPR.
1	9/25/03	REISSUE SHEET	JSR

HNTB

TOWN OF ADDISON

ADDISON AIRPORT PAVEMENT RECONSTRUCTION OF APRON 'A' AND HANGARS 'A', 'B' AND 'C'

APRON 'A' GRADING, DRAINAGE AND SW3P PLAN

TOWN OF ADDISON, TEXAS

Design	Drawn	DATE	PROJECT NO.	SHEET
Check	Check	MAY 2003	[illegible]	11

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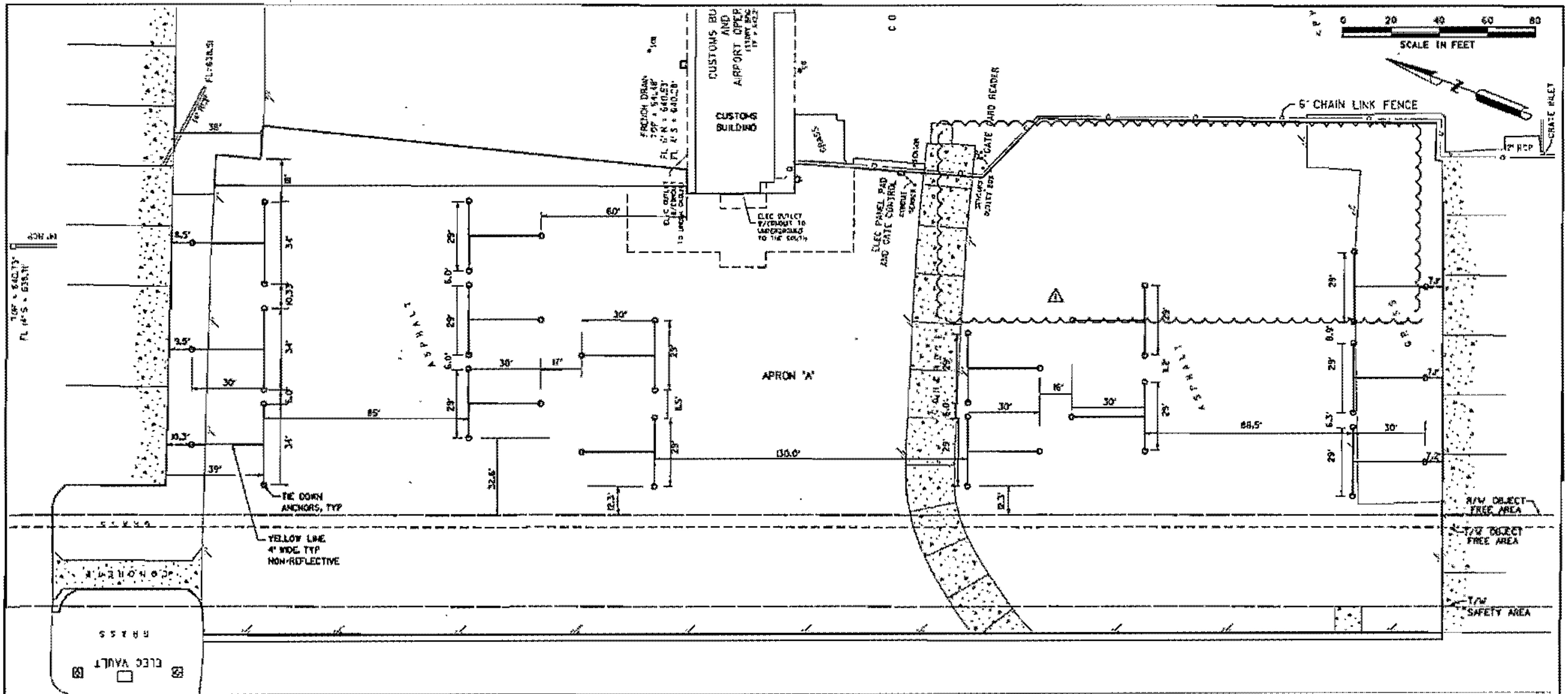
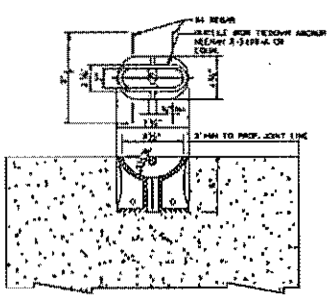




TYPE II TIEDOWN ANCHOR DETAIL
NOT TO SCALE

NOTES

1. TIE DOWN IS PLACED ON SUBGRADE AND FILLED WITH SAND TO EXCLUDE CONCRETE DURING THE POURING AND FINISHING OPERATION. SAND SHALL BE WASHED OUT WHEN COMPLETED. A WOOD OR METAL STAKE IS PLACED IN THE SQUARE SOCKET TO PREVENT DISPLACEMENT DURING THE POUR. AN ALTERNATIVE METHOD OF SETTING THE TIE DOWN ANCHOR IS TO PUSH THE ANCHOR IN POSITION IN THE WET CONCRETE. BOTH METHODS ARE APPROVED.

2. TIE DOWN ANCHORS SHALL BE NO CLOSER THEN 3-FEET TO A PROPOSED JOINT LINE.

℄ TAXIWAY 'A'

ASPHALT TAXIWAY

SAFETY AREA

T/W 'D'
℄ TAXIWAY 'D'

LEGEND

⊙ TIE DOWN ANCHOR LOCATION

HNTB

TOWN OF ADDISON

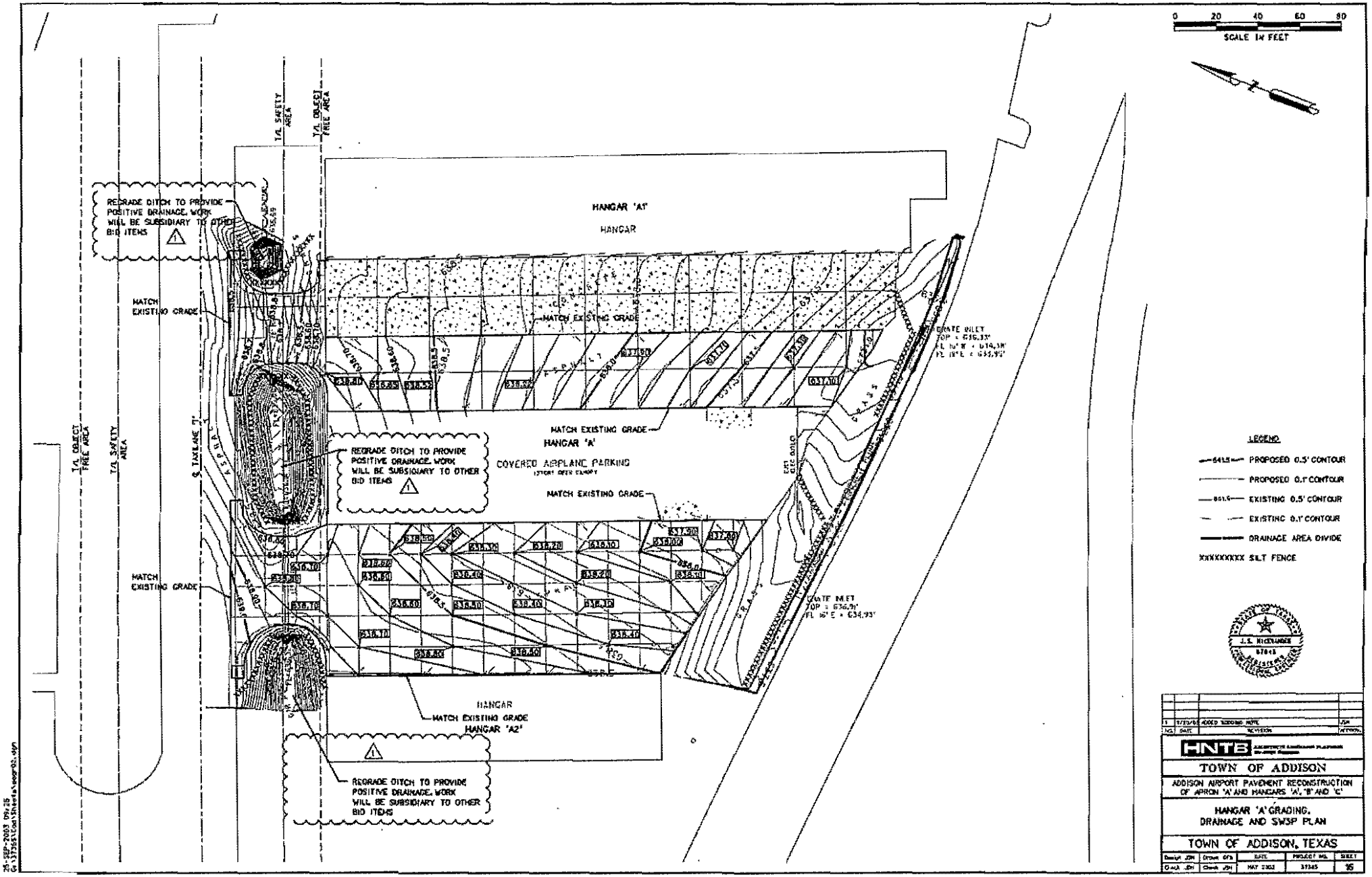
ADDISON AIRPORT PAVEMENT RECONSTRUCTION OF APRON 'A' AND HANGARS 'A', 'B' AND 'C'

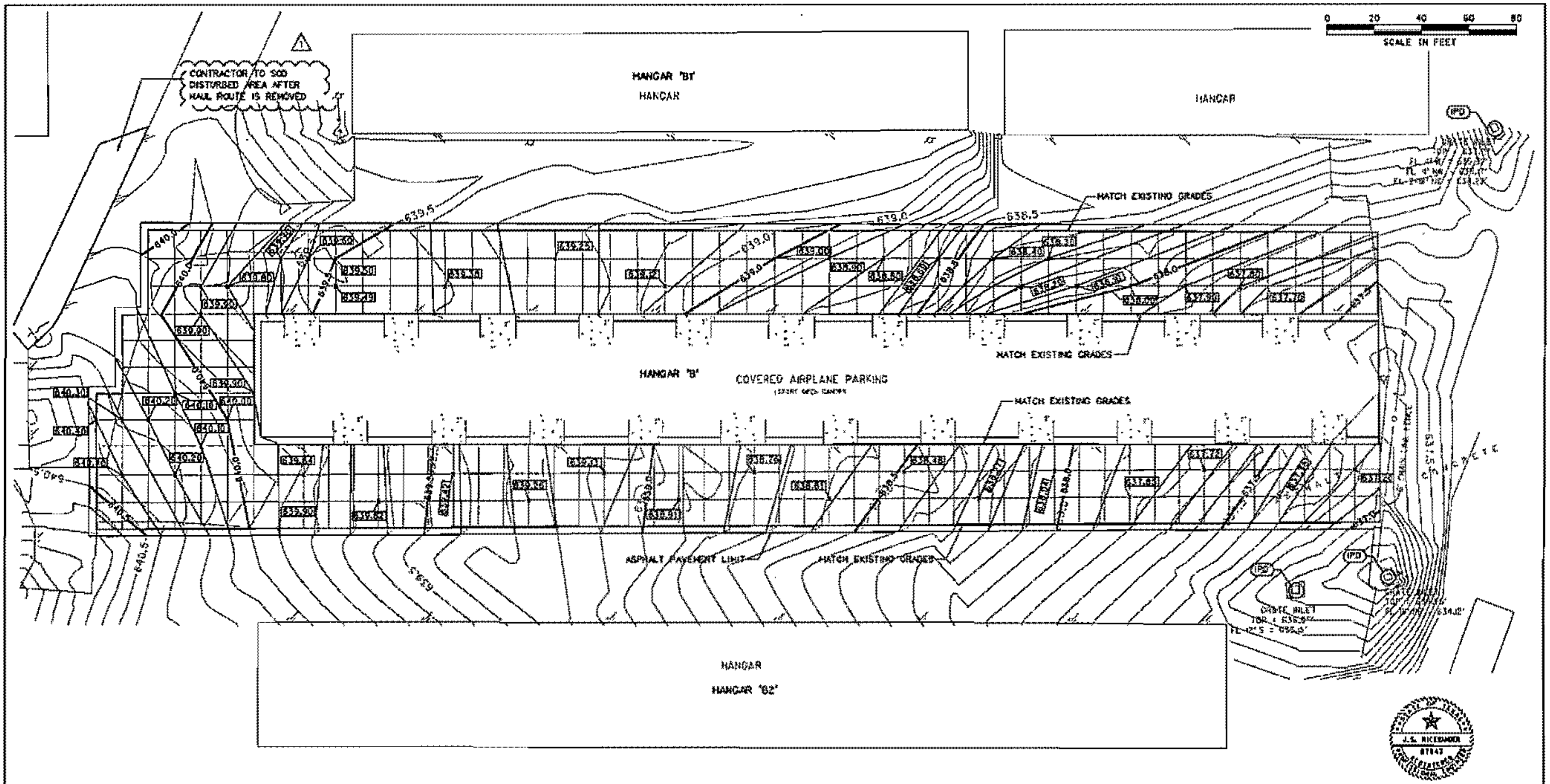
APRON 'A' TIE DOWN LAYOUT PLAN

TOWN OF ADDISON, TEXAS

MAY 2003 | SHEET 12

25-SEP-2003 09:22


0 20 40 60 80
SCALE IN FEET
HANGAR 'A1'
HANGAR
HANGAR 'A'
COVERED AIRPLANE PARKING
HANGAR
HANGAR 'A2'
MATCH EXISTING GRADE
REGRADE DITCH TO PROVIDE POSITIVE DRAINAGE. WORK WILL BE SUBSIDIARY TO OTHER BID ITEMS
GRATE INLET
T/A SAFETY AREA
T/A OBJECT FREE AREA
T/L TAXILANE 'F'
LEGEND
PROPOSED 0.5' CONTOUR
PROPOSED 0.1' CONTOUR
EXISTING 0.5' CONTOUR
EXISTING 0.1' CONTOUR
DRAINAGE AREA DIVIDE
XXXXXXXX SILT FENCE
J.S. RICHARDS
87045
HNTB
TOWN OF ADDISON
ADDISON AIRPORT PAVEMENT RECONSTRUCTION OF APRON 'A' AND HANGARS 'A', 'B' AND 'C'
HANGAR 'A' GRADING, DRAINAGE AND SWSP PLAN
TOWN OF ADDISON, TEXAS
MAY 2003
37345
15



NOTES:

1. CONTRACTOR TO MATCH EXISTING ELEVATIONS AT ALL CONCRETE PADS UNDERNEATH HANGAR B

LEGEND

- PROPOSED 0.5' CONTOUR
- PROPOSED 0.1' CONTOUR
- EXISTING 0.5' CONTOUR
- EXISTING 0.1' CONTOUR
- DRAINAGE AREA DIVIDE
- (IPD) INLET PROTECTION (DROP)

NO.	DATE	REVISION	APP'D
1	8/23/03	ADDED SODDING NOTE	

HNTB

TOWN OF ADDISON

ADDISON AIRPORT PAVEMENT RECONSTRUCTION OF APRON 'A' AND HANGARS 'A', 'B' AND 'C'

HANGAR 'B' GRADING, DRAINAGE AND SW3P PLAN

TOWN OF ADDISON, TEXAS

Design JDH	Drawn SPS	DATE	PROJECT NO.	SHEET
Check JDH	Check JDH	MAY 2003		20

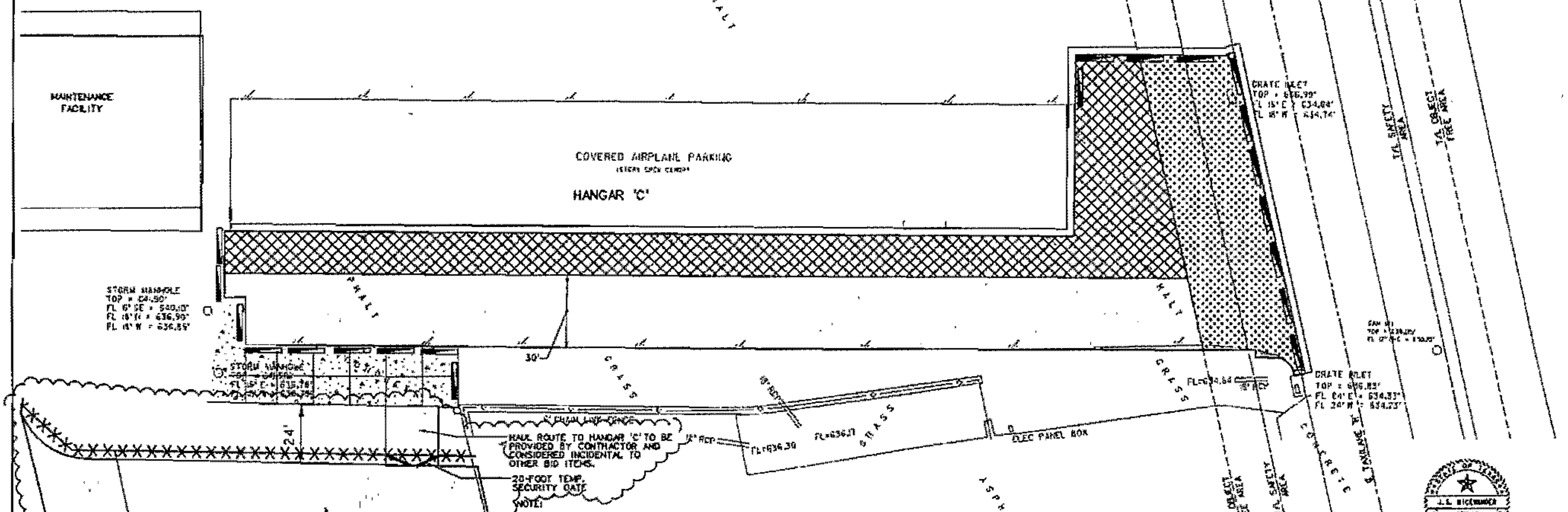
25-SEP-2003 09:28

PHASING

INCLUDED IN THIS PHASE IS THE REMOVAL OF EXISTING ASPHALT PAVEMENT ON THE WEST AND SOUTH SIDES OF HANGAR 'C' AND REPLACEMENT WITH CONCRETE PAVEMENT. IN ORDER TO MAINTAIN ACCESS TO THE MAINTENANCE FACILITY AT THE NORTH END OF HANGAR 'C', THE WORK IS DIVIDED INTO TWO PHASES, I & II. ALL WORK AT THE SOUTH END OF HANGAR C, WITHIN 57.5' OF THE TAXILANE 'B' CENTERLINE, MUST BE PERFORMED DURING PERIODS WHEN THE HANGAR TAXIWAY CAN BE CLOSED, BETWEEN THE HOURS OF 10:00 P.M. AND 6:00 A.M. BARRICADES WILL BE PLACED ON TAXILANE 'B' ALONG THE LIMITS OF THE WORK.

PHASE I - THE WORK INCLUDES THE CONSTRUCTION OF NEW CONCRETE PAVEMENT ON PORTIONS OF THE SOUTH AND WEST SIDES OF HANGAR 'C'. THE CONTRACTOR WILL MAINTAIN ACCESS TO THE MAINTENANCE FACILITY NORTH OF HANGAR 'C' FOR AIRCRAFT UNDER TOW. AIRCRAFT MOVEMENTS WILL BE COORDINATED WITH THE CONTRACTOR. ALL WORK IN THIS PHASE WILL BE COMPLETED WITHIN 84 CALENDAR DAYS. PRIOR TO THE START OF WORK IN THIS PHASE, ALL AIRCRAFT HANGARED IN THE WEST HALF OF HANGAR 'C' WILL BE TEMPORARILY RELOCATED. BARRICADES WILL BE INSTALLED AROUND THE LIMITS OF THE WORK AND ALONG TAXILANE 'B'. WORK IN THIS PHASE WILL INCLUDE WORK ON THE RAMP AND HANGARS 'A' AND 'B'.

PHASE II - WORK IN THIS PHASE WILL START UPON COMPLETION OF PHASE I AND BE COMPLETED WITHIN 70 CALENDAR DAYS. THE WORK INCLUDES THE CONSTRUCTION OF THE REMAINING PORTION OF THE CONCRETE PAVEMENT ON THE SOUTH AND WEST SIDES OF HANGAR 'C' THAT WAS CONSTRUCTED DURING PHASE I. THE CONTRACTOR WILL MAINTAIN ACCESS TO THE MAINTENANCE FACILITY NORTH OF HANGAR 'C' FOR AIRCRAFT UNDER TOW. AIRCRAFT MOVEMENTS WILL BE COORDINATED WITH THE CONTRACTOR. WORK IN THIS PHASE WILL INCLUDE WORK ON THE RAMP AND HANGARS 'A' AND 'B'.



NOTE:

1. CONTRACTOR TO MAINTAIN ACCESS TO THE MAINTENANCE FACILITY NORTH OF HANGAR "C" AT ALL TIMES.

2. CONTRACTOR SHALL CONSTRUCT TEMPORARY HAUL ROUTE. CONSTRUCTION SHALL BE OF ASPHALT OR CRUSHED STONE. IF CRUSHED STONE IS USED, MINIMUM DIAMETER OF 2-INCH ROCK SHALL BE REQUIRED. THICKNESS OF HAUL ROAD SHALL BE DETERMINED BY THE CONTRACTOR. MATERIALS AND LABOR TO CONSTRUCT, MAINTAIN, REMOVE, GRADE AND SOD HAUL ROAD AREA SHALL NOT BE A SEPARATE PAY ITEM, BUT SHALL BE CONSIDERED SUBSIDIARY TO ITEM M-101 MOBILIZATION.

3. A TEMPORARY GATE SHALL BE CONSTRUCTED ALONG AIRPORT PARKWAY AT THE HAUL ROAD LOCATION. THE GATE SHALL BE OF THE SAME HEIGHT AND MATERIAL AS THE EXISTING FENCE. MATERIALS AND LABOR TO CONSTRUCT, MAINTAIN, AND REMOVE THE TEMPORARY GATE, ALONG WITH THE REPAIR OF THE FENCE AFTER THE GATE IS REMOVED SHALL NOT BE A SEPARATE PAY ITEM, BUT SHALL BE CONSIDERED SUBSIDIARY TO ITEM M-101 MOBILIZATION. THE FENCE SHALL BE IN AS GOOD OR BETTER CONDITION AFTER THE GATE IS REMOVED AS IT WAS PRIOR TO CONSTRUCTION.

LEGEND

- LIGHTED BARRICADES
- NIGHT WORK IN THIS AREA TO BE DONE DURING TAXILANE CLOSURE ONLY
- PHASE I
- PHASE II

NO.	DATE	REVISION	APPROV.
1	8/25/03	TEMPORARY SECURITY GATE LOCATION	JSH

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TOWN OF ADDISON

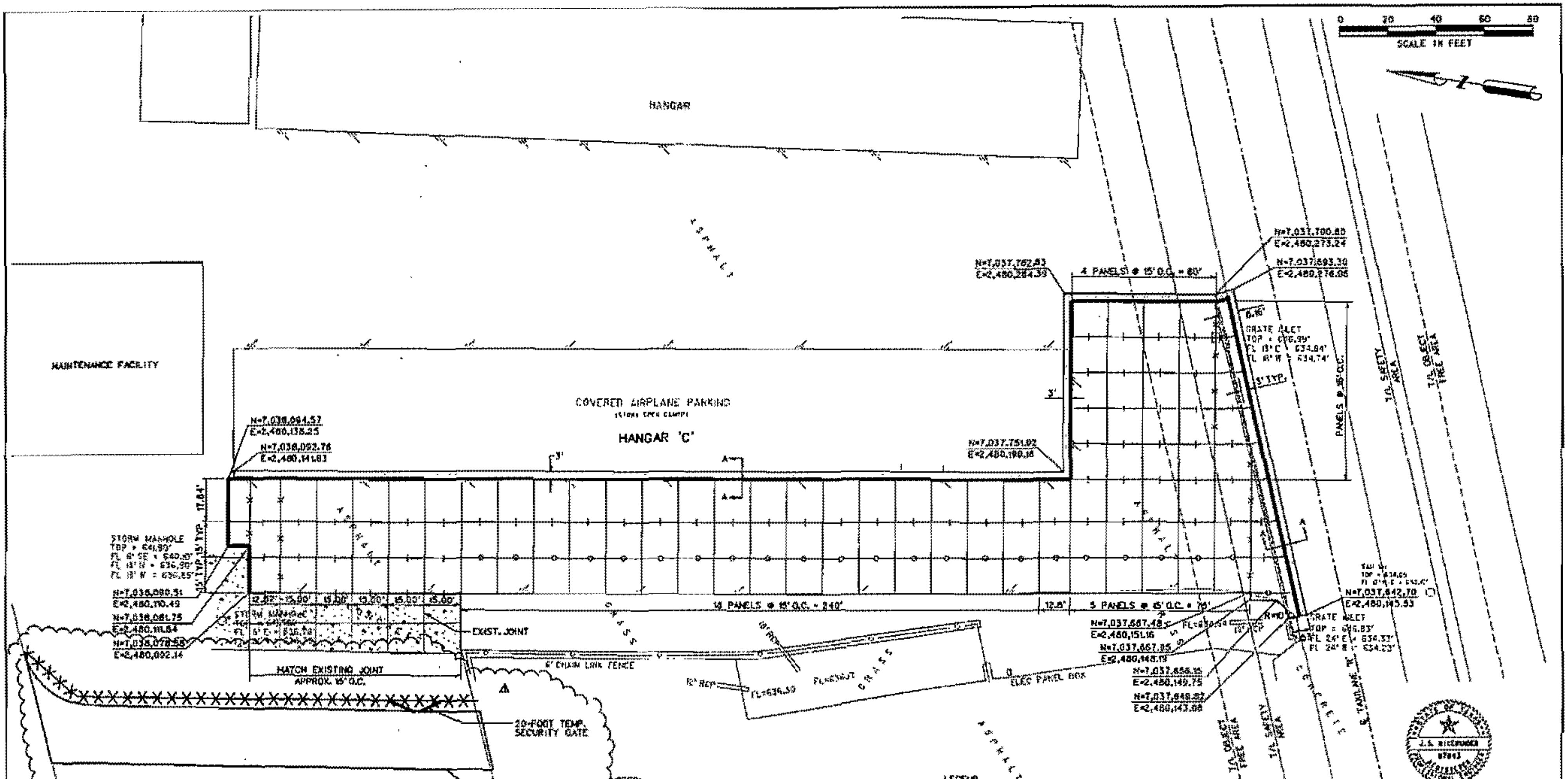
ADDISON AIRPORT PAVEMENT RECONSTRUCTION OF APRON 'A' AND HANGARS 'A', 'B' AND 'C'

HANGAR 'C'
CONSTRUCTION PHASING PLAN

TOWN OF ADDISON, TEXAS

Design JSH	Drawn CFE	DATE	PROJECT NO.	SHEET
Check JDK	Check JSH	MAY 2003	31141	21

25-SEP-2003 09:32



NOTES:

1. EXTREME CARE SHALL BE EXERCISED AROUND THE HANGARS AND AIRCRAFT. HANGAR SHALL BE VACANT OF AIRCRAFT AND OTHER EQUIPMENT BEFORE OPERATIONS BEGIN. ANY AND ALL DAMAGE TO HANGARS AND AIRCRAFT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.

2. CONTRACTOR TO MATCH EXISTING JOINT LINES ALONG THE MAINTENANCE FACILITY PAVEMENT.

3. SEE "APRON AND HANGAR TYPICAL SECTIONS" SHEET FOR SECTION 'A-A'.

4. SEE "PAVING JOINT DETAILS" SHEET FOR PAVING JOINTS DETAILS.

LEGEND

- TYPE "B" THICKENED EDGE EXPANSION JOINT
- TYPE "D" DOWELED CONSTRUCTION JOINT
- TYPE "E" HINGED (TIED) CONSTRUCTION JOINT
- TYPE "F" DOWELED CONTRACTION JOINT
- TYPE "G" HINGED (TIED) CONTRACTION JOINT
- TYPE "H" DUMMY CONTRACTION JOINT
- REINFORCED SLAB
- NON-REINFORCED SLAB
- ASPHALT PAVEMENT

NO.	DATE	REVISION	APPR'D.
1	8/19/03	HAUL ROUTE REVISION	JSR

HNTB

TOWN OF ADDISON

ADDISON AIRPORT PAVEMENT RECONSTRUCTION OF APRON 'A' AND HANGARS 'A', 'B' AND 'C'

HANGAR 'C' PAVING AND JOINT LAYOUT PLAN

TOWN OF ADDISON, TEXAS

Design JDH	Drawn CFS	DATE	PROJECT NO.	SHEET
Drawn JDH	Check JDH	MAY 2003	33345	23

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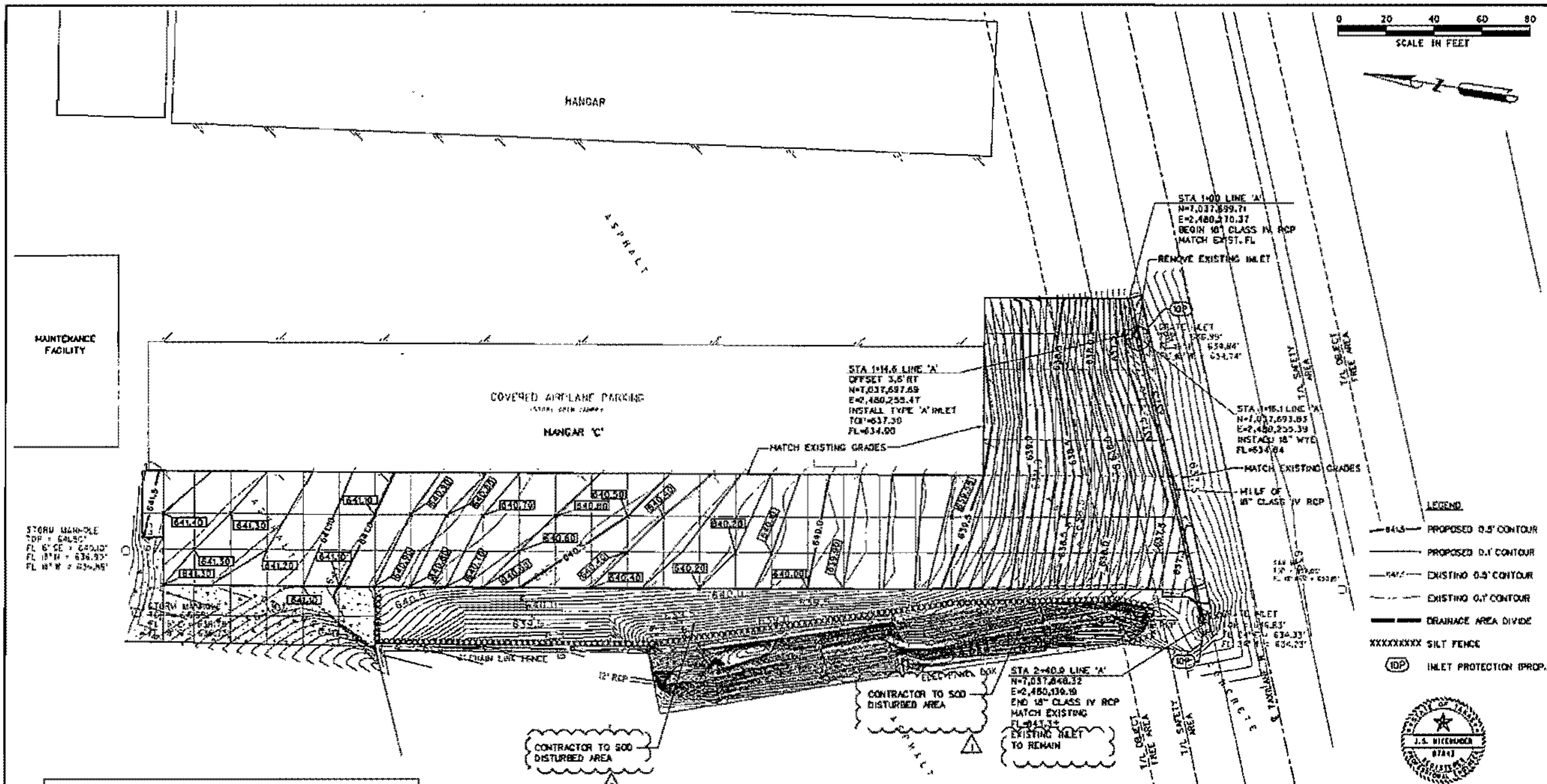
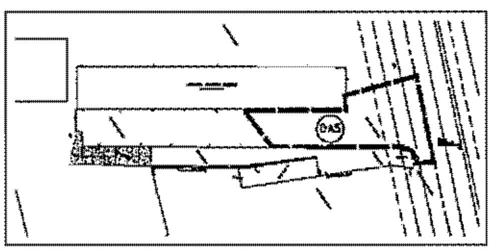


HANGAR 'C' DRAINAGE TABLE					
DRAINAGE AREA	AREA (ACRES)	C	Tc (min)	I-100 (in/hr)	Q (cfs)
DA5	0.325	0.90	10	8.74	2.54



DRAINAGE AREA MAP
NOT TO SCALE

NO.	DATE	REVISION	APPROV.
1	8/15/03	ADDED SODDING NOTE, MODIFIED DRAINAGE NOTE	JSH

HNTB

TOWN OF ADDISON

ADDISON AIRPORT PAVEMENT RECONSTRUCTION OF APRON 'A' AND HANGARS 'A', 'B' AND 'C'

HANGAR 'C' GRADING, DRAINAGE AND SW3P PLAN

TOWN OF ADDISON, TEXAS

Design	Drawn	DATE	PROJECT NO.	SHEET
JSH / Check JSH	CFS / Check JSH	MAY 2003	35365	24

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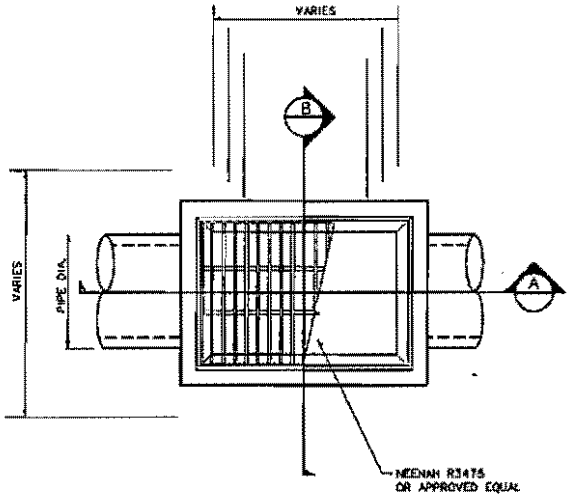
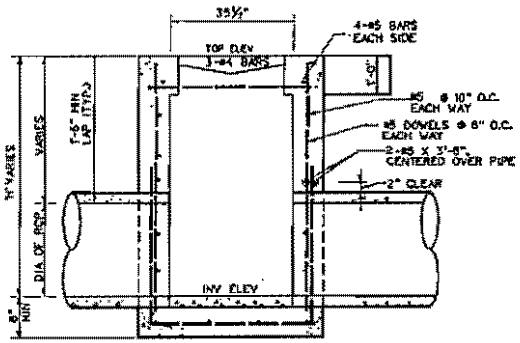
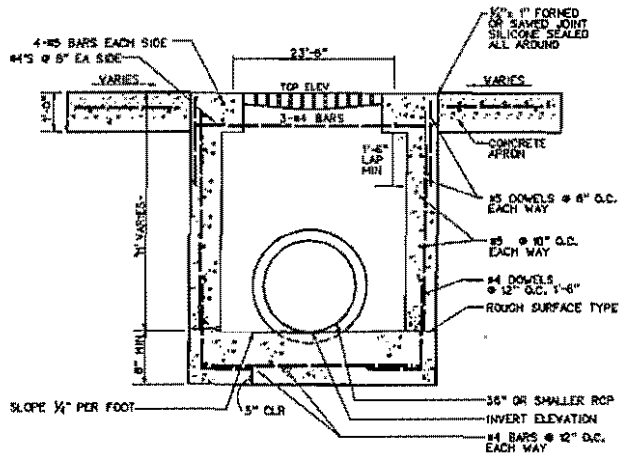


TYPE 'B' INLET PLAN VIEW
NOT TO SCALE



A SECTION TYPE 'B' INLET
NOT TO SCALE



B SECTION TYPE 'B' INLET
NOT TO SCALE

GENERAL NOTES

1. CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 4000 POUNDS PER SQUARE INCH AT 28 DAYS, DESIGN MIX FOR 4,000 POUND CONCRETE SHALL CONTAIN A MINIMUM OF 500 POUNDS OF CEMENTICIOUS MATERIAL PER CUBIC YARD AND SHALL CONFORM TO THE REQUIREMENTS OF ITEM P-610 OF THE SPECIFICATIONS.
2. REINFORCING STEEL SHALL CONFORM TO ASTM DESIGNATION A-615, GRADE 60.
3. REINFORCING BARS SHALL BE SUPPORTED, SPACED AND ACCURATELY SECURED IN PLACE BY BOLSTERS, SPACERS OR CHAIRS IN ACCORDANCE WITH ITEM P-610 OF THE SPECIFICATIONS, AND IN ACCORDANCE WITH ACI "MANUAL OF STANDARD PRACTICE FOR DETAILING REINFORCED CONCRETE STRUCTURES".
4. ALL REINFORCING STEEL SHALL BE LAPPED A MINIMUM OF 36 BAR DIAMETERS AT ALL CORNERS AND AT ALL SPLICE POINTS UNLESS OTHERWISE NOTED ON THE PLANS.
5. ALL REINFORCING STEEL SHALL BE CUT AND BENT AS REQUIRED TO CLEAR PIPES.
6. ALL INLETS OVER A DEPTH OF 5 FEET SHALL BE FURNISHED WITH MANHOLE STEPS, STEPS SHALL CONFORM TO DETAILS SHOWN ON THE PLANS AND TO THE SPECIFICATIONS.
7. CONSTRUCTION JOINTS WILL BE PERMITTED AS SHOWN ON THE PLANS.
8. CONSTRUCTION JOINTS SHOWN AT THE BASE OF STRUCTURES MAY BE RAISED A MAXIMUM OF 6" AT THE OPTION OF THE CONTRACTOR, IF THE CONSTRUCTION JOINT IS RAISED THE LENGTH OF VERTICAL STEEL MUST BE ADJUSTED ACCORDINGLY.
9. PIPE LINES WILL ENTER GRATE INLETS AT LOCATIONS INDICATED ON THE PLANS.
10. CHAMFER ALL EXPOSED CONCRETE CORNERS ¾".
11. ALL MATERIALS FOR GRATING SHALL BE HOT DIP GALVANIZED AFTER FABRICATION.
12. PRE-MANUFACTURE INLETS WITH H-20 LOADING MAY BE BROOKS 24-24-CS, UTILITY PRECAST CB2424 OR APPROVED EQUAL.

J.E. KECKHAVER
87843
REGISTERED PROFESSIONAL ENGINEER

NO.	DATE	REVISION	APPROV.
1	8/13/03		JEK

HNTB ARCHITECTS ENGINEERS PLANNERS

TOWN OF ADDISON

ADDISON AIRPORT PAVEMENT RECONSTRUCTION OF APRON 'A' AND HANGARS 'A', 'B' AND 'C'

TYPE 'B' INLET DETAILS

TOWN OF ADDISON, TEXAS

Design JEK	Drawn EFS	DATE	PROJECT NO.	SHEET
Check JEK	Check JEK	MAY 2003	37345	28A

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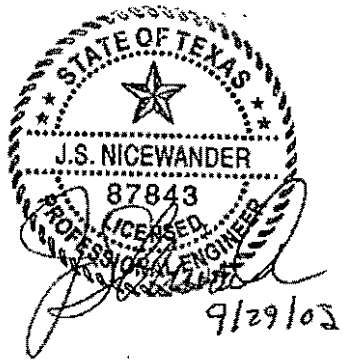
Addison Airport
Addison Texas
TxDOT CSJ No. 0318 ADDON



Addendum #3

Questions from the Pre-Bid Meeting
For clarification purposes only

- There is an apparent discrepancy in the DBE participation in the specifications.
  - DBE participation for this project will be 7%.
- Will TxDOT be administering the contract?
  - Yes.
- Will there be any building demolition in the project (referencing general structure demolition language in the specification)?
  - No.
- Discrepancy in liquidated damages in specifications and plans, which is correct?
  - Liquidated damages will be $1000.00 per day.
- Will materials testing be through TxDOT?
  - Materials testing will be contracted through the engineer.
- Will there be night work?
  - Yes, all night work will need to be coordinated with the air traffic control tower.
- There are two proposals on the web site – which is correct?
  - The proposal has changed per these addenda and the updated version is on the web site.
- Schedule allows for 154 days does this include the additive alternates?
  - Yes. 154 days is for all apron and hangar work.
- How will rock undercut be paid for? Change order?
  - Rock undercut, if encountered, will be subsidiary to other bid items in the project.
- Who will be providing the quality control program?
  - The quality control program will be the contractor's responsibility.
- How will work inside the AOA be handled?
  - Contractor to be in continuous contact with the tower.
  - All personnel who will operate motorized vehicles will be required to take a driving class put on through the Addison Airport.
  - Fences to be either locked or watched by workers on a continuous basis.
  - Refer to the general notes in the plans for additional information.

Texas Department of Transportation

AVIATION DIVISION
125 E. 11TH STREET • AUSTIN, TEXAS 78701-2483 • 512/ 416-4500 • FAX 512/416-4510

Addendum No. 4

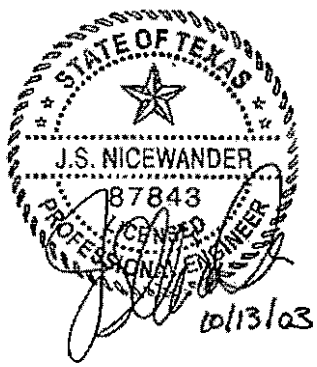
ADDISON AIRPORT
TxDOT CSJ No. 0318ADDON
Issued October 8, 2003

THIS ADDENDUM SHALL BE ATTACHED TO AND BECOME A PART OF THE SUBJECT PLANS AND SPECIFICATIONS AND ALL REFERENCES INCONSISTENT OR IN CONFLICT WITH THESE ADDITIONS AND CHANGES ARE HEREBY MODIFIED

The bid opening date has changed FROM 2:00 pm, October 16, 2003
TO 2:00 pm, October 23, 2003, at the same location.

Any questions concerning this Addendum may be directed to Edie Stimach @ 512-416-4518.

Addison Airport
Addison Texas
TxDOT CSJ No. 0318 ADDON



Addendum #5

To: All Bidders

This addendum becomes a part of the TxDOT CSJ # 0318ADDON **"ADDISON AIRPORT PAVEMENT RECONSTRUCTION OF APRON 'A' AND HANGRS 'A', 'B' AND 'C'"** plans and specifications. Page P-9 of the contract documents must be filled out by the bidder acknowledging the receipt of this addendum. **Bids will not be accepted if the above instructions are not followed.**

All provisions of the original **"ADDISON AIRPORT PAVEMENT RECONSTRUCTION OF APRON 'A' AND HANGRS 'A', 'B' AND 'C'"** plans and specifications shall remain in full force and effect, except as modified by this addendum No. 5

Changes To The Specifications:
Technical Specification P-501 – Replace in its entirety
Technical Specification P-605 – has been added to this project.

For clarification purposes only:

1. Spec p-501 and plan sheet 26 refer to P605 spec for silicone sealant. No spec P605 was included. Please list the type of silicone sealant required.
    a. Spec P-605 has been added to the project per this addendum. Refer to that specification for sealant type.
2. Spec P501 requires a two coat membrane cure "bond breaker" on the subgrade before the concrete pavement operations commence. For the same surface, Spec P304 requires a bituminous curing seal application. It would appear hat one of these applications is not needed
    a. The bond breaker has been removed from the P501 spec per this addendum.
3. Sheet 26, detail 3 shows use "if required" of a backer rod or rope in the bottom of the initial saw cut. Will this backer rod or rope be required?
    a. The back rod will be required if the saw cut is required.
4. How will the owner determine the basis of awarding the additive alternates?
    a. The award of the base bid and any alternative alternates will be dependant on funding availability and sponsor selection.

DEVIATIONS FROM STANDARD
FAA TECHNICAL SPECIFICATIONS

ITEM P-501 PORTLAND CEMENT CONCRETE PAVEMENT

(a) Section 2.9 – Deleted polyethylene film, burlap and paper from use as curing material.

(b) Section 3.1 – References acceptance criteria contained in paragraph 501-5.2b. Require mix design less than 90 days old.

(c) Section 3.4, Testing laboratory – Request evidence that the laboratory is accredited, for the test methods required herein, by a nationally recognized laboratory accreditation organization.

(d) Section 4.10 - Keyways not allowed. Note added to require dowel and/or tie bar installation procedures shall be adequate to insure that the area around dowels is completely filled with epoxy grout.

(e) Section 4.13 - Deleted requirement for skid resistant saw-cut grooving.

(f) Section 4.14 - Deleted polyethylene film, burlap and paper from use as curing material.

ITEM P-501 PORTLAND CEMENT CONCRETE PAVEMENT

DESCRIPTION

501-1.1 This work shall consist of pavement composed of portland cement concrete, with and without reinforcement constructed on a prepared underlying surface in accordance with these specifications and shall conform to the lines, grades, thickness, and typical cross sections shown on the plans.

MATERIALS

501-2.1 AGGREGATES.

a. **Reactivity.** Aggregates shall be tested for deleterious reactivity with alkalies in the cement in an amount sufficient to cause expansion of the concrete. Acceptance of aggregates shall be based on satisfactory evidence furnished by the Contractor that the aggregates, combined with other mixture constituents, do not produce excessive expansion in the concrete. This evidence shall include service records of concrete of comparable properties under similar conditions of exposure and/or certified records of tests by a testing laboratory that meets the requirements of ASTM C 1077 Tests shall be made in accordance with ASTM C 295 and ASTM C 289].

b. **Fine Aggregate.** Fine aggregate shall conform to the requirements of ASTM C 33. Gradation shall meet the requirements of Table 1 when tested in accordance with ASTM C 136, except as may otherwise be qualified under Section 5 of ASTM C 33.

TABLE 1.
GRADATION FOR FINE AGGREGATE ASTM C 33

Sieve Designation (square openings)	Percentage by Weight Passing Sieves
3/8 in. (9.5 mm)	100
No. 4 (4.75 mm)	95-100
No. 8 (2.36 mm)	80-100
No. 16 (1.18 mm)	50-85
No. 30 (600 micro-m)	25-60
No. 50 (300 micro-m)	10-30
No. 100 (150 micro-m)	2-10

c. **Coarse Aggregate.** Coarse aggregate shall conform to the requirements of ASTM C 33. Gradation, within the separated size groups, shall meet the requirements of Table 2 when tested in accordance with ASTM C 136. When the nominal maximum size of the aggregate is greater than 1 inch, the aggregates shall be furnished in two size groups.

Aggregates delivered to the mixer shall consist of crushed stone, crushed or uncrushed gravel, air-cooled blast furnace slag, or a combination thereof. The aggregate shall be composed of clean, hard, uncoated particles and shall meet the requirements for deleterious substances contained in ASTM C 33, Class 4M. Dust and other coating shall be removed from the aggregates by washing. The aggregate in any size group shall not contain more than 8 percent by weight of flat or elongated pieces when tested in accordance with ASTM D 4791. A flat or elongated particle is one having a ratio between the maximum and the minimum dimensions of a circumscribing rectangular prism exceeding 5 to 1.

The percentage of wear shall be no more than 40 percent when tested in accordance with ASTM C 131 or ASTM C 535.

TABLE 2.
GRADATION FOR COARSE AGGREGATE ASTM C 33

Sieve Designations (square openings)		From 1" to No.4 (25.0mm-4.75mm) Percentage by Weight Passing Sieves
in.	Mm	1"-No.4
2	50.8	-
1-1/2	38.1	100
1	25.0	95-100
¾	19.0	-
½	12.5	25-60
3/8	9.5	-
No. 4	4.75	0-10
No. 8	2.36	0-5

501-2.2 CEMENT. Cement shall conform to the requirements of ASTM C 150, Type I or Type II.

If for any reason, cement becomes partially set or contains lumps of caked cement, it shall be rejected. Cement salvaged from discarded or used bags shall not be used.

501-2.3 CEMENTITIOUS MATERIALS.

a. Fly Ash. Fly ash shall meet the requirements of ASTM C 618, Class C, F, or N with the exception of loss of ignition, where the maximum shall be less than 6 percent for Class F or N. The supplementary optional chemical and physical properties of Tables 1A and 2A contained in ASTM C618 shall apply.

b. Blast Furnace Slag. Ground blast furnace slag shall meet the requirements of ASTM C 989, Grade 100 or 120.

501-2.4 PREMOLDED JOINT FILLER. Premolded joint filler for expansion joints shall conform to the requirements of ASTM D 1752, Type II or III and shall be punched to admit the dowels where called for on the plans. The filler for each joint shall be furnished in a single piece for the full depth and width required for the joint, unless otherwise specified by the Engineer. When the use of more than one piece is required for a joint, the abutting ends shall be fastened securely and held accurately to shape by stapling or other positive fastening means satisfactory to the Engineer.

501-2.5 JOINT SEALER. The joint sealer for the joints in the concrete pavement shall meet the requirements of Item P-605 and shall be of the type(s) specified in the plans.

501-2.6 STEEL REINFORCEMENT. Reinforcing shall consist of welded deformed steel fabric conforming to the requirements of ASTM A 497 or bar mats conforming to the requirements of ASTM A 184.

501-2.7 DOWEL AND TIE BARS. Tie bars shall be deformed steel bars and conform to the requirements of ASTM A 615, ASTM A 616, or ASTM A 617, except that rail steel bars, Grade 50 or 60, shall not be used for tie bars that are to be bent or restraightened during construction. Tie bars designated as Grade 40 in ASTM A 615 can be used for construction requiring bent bars.

Dowel bars shall be plain steel bars conforming to ASTM A 615, ASTM A 616 or ASTM A 617 and shall be free from burring or other deformation restricting slippage in the concrete. High strength dowel bars shall conform to ASTM A 714, Class 2, Type S, Grade I, II or III, Bare Finish. Before delivery to the construction site each dowel bar shall be painted on all surfaces with one coat of paint meeting Federal Specification TT-P-664. If plastic or epoxy coated steel dowels are used no paint coating is required, except when specified for a particular situation on the contract plans. Coated dowels shall conform to the requirements of AASHTO M 254.

The sleeves for dowel bars used in expansion joints shall be metal or other type of an approved design to cover 2 to 3 inches (50 mm to 75 mm) of the dowel, with a closed end and with a suitable stop to hold the end of the bar at least 1 inch (25 mm) from the closed end of the sleeve. Sleeves shall be of such design that they will not collapse during construction.

501-2.8 WATER. Water used in mixing or curing shall be clean and free of oil, salt, acid, alkali, sugar, vegetable, or other substances injurious to the finished product. Water will be tested in accordance with the requirements of AASHTO T 26. Water known to be of potable quality may be used without testing.

501-2.9 COVER MATERIAL FOR CURING. Curing materials shall conform to one of the following specifications:

a. Liquid membrane forming compounds for curing concrete shall conform to the requirements of ASTM C 309, Type 2, Class B.

b. White polyethylene film - NOT ALLOWED.

c. White burlap polyethylene sheeting - NOT ALLOWED.

d. Waterproof paper – NOT ALLOWED.

501-2.10 ADMIXTURES. The use of any material added to the concrete mix shall be approved by the Engineer. The Contractor shall submit certificates indicating tbat the material to be furnished meets all of the requirements indicated below. In addition, the Engineer may require the Contractor to submit complete test data from an approved laboratory showing that the material to be furnisbed meets all of the requirements of the cited specifications. Subsequent tests may be made of samples taken by the Engineer from the supply of material being furnished or proposed for use on the work to determine whether the admixture is uniform in quality with that approved.

a. Air-Entraining Admixtures. Air entraining admixtures shall meet the requirements of ASTM C 260 and shall consistently entrain the air content in the specified ranges under field conditions. The air entrainment agent and any chemical admixtures shall be compatible.

b. Chemical Admixtures. Water reducing, set retarding, and set accelerating admixtures shall meet the requirements of ASTM C 494, including the flexural strength test.

501-2.11 EPOXY-RESIN. Epoxy resin used to anchor dowels and tie bars in pavements shall conform to the requirements of ASTM C 881, Type I, Grade 3, Class C. Class A or B shall be used when the surface temperature of the hardened concrete is below 60 degrees F (16 degrees C).

501-2.12 MATERIAL ACCEPTANCE. Prior to use of materials, the Contractor shall submit certified test reports to the Engineer for those materials proposed for use during construction. The certification shall show the appropriate ASTM test(s) for each material, the test results, and a statement that the material passed or failed.

The Engineer may request samples for testing, prior to and during production, to verify the quality of the materials and to ensure conformance with the applicable specifications.

MIX DESIGN

501-3.1 PROPORTIONS Concrete shall be designed to achieve a 28-day flexural strength that meets or exceeds the acceptance criteria contained in paragraph 501-5.2 for a flexural strength of 650 psi. The mix shall be designed using the procedures contained in Chapter 7 of the Portland Cement Association's manual, "Design and Control of Concrete Mixtures."

The Contractor shall note that to ensure that the concrete actually produced will meet or exceed the acceptance criteria for the specified strength, the mix design average strength must be higher than the specified strength. The amount of over-design necessary to meet specification

requirements depends on the producer's standard deviation of flexural test results and the accuracy which that value can be estimated from historic data for the same or similar materials.

The minimum cementitious material (cement plus fly ash) shall be 517 pounds per cubic yard. The ratio of water to cementitious material, including free surface moisture on the aggregates but not including moisture absorbed by the aggregates shall not be more than 0.45 by weight.

Prior to the start of paving operations and after approval of all material to be used in the concrete, the Contractor shall submit a mix design showing the proportions and flexural strength obtained from the concrete at 7 and 28 days. The mix design shall include copies of test reports, including test dates, and a complete list of materials including type, brand, source, and amount of; cement, fly ash, ground slag, coarse aggregate, fine aggregate, water, and admixtures. The fineness modulus of the fine aggregate and the air content shall also be shown. The mix design shall be submitted to the Engineer at least 15 days prior to the start of operations. The submitted mix design shall not be more than 90 days old. Production shall not begin until the mix design is approved in writing by the Engineer.

Should a change in sources be made, or admixtures added or deleted from the mix, a new mix design must be submitted to the Engineer for approval.

Flexural strength test specimens shall be prepared in accordance with ASTM C 31 and tested in accordance with ASTM C 78. The mix determined shall be workable concrete having a slump for side form concrete between 1 and 2 inches (25 mm and 50 mm) as determined by ASTM C 143. For vibrated slip form concrete, the slump shall be between 1/2 inch (13 mm) and 1-1/2 inches (38 mm).

501-3.2 CEMENTITIOUS MATERIALS.

a. Fly Ash. Fly ash may be used in the mix design. When fly ash is used as a partial replacement for cement, the minimum cement content may be met by considering portland cement plus fly ash as the total cementitious material. The replacement rate shall be determined from laboratory trial mixes, but shall not exceed 20 percent by weight of the total cementitious material.

b. Ground Slag. Ground blast furnace slag may be used in a mix design containing Type I or Type II cement. The slag, or slag plus fly ash if both are used, may constitute between 25 to 55 percent of the total cementitious material by weight. If the concrete is to be used for slipforming operations and the air temperature is expected to be lower than 55 degrees F (13 degrees C) the percent slag shall not exceed 30 percent by weight.

501-3.3 ADMIXTURES.

a. Air Entraining. Air entraining admixture shall be added in such a manner that will insure uniform distribution of the agent throughout the batch. The air content of freshly mix air entrained concrete shall be based upon trial mixes with the materials to be used in the work adjusted to produce concrete of the required plasticity and workability. The percentage of air in the

mix shall be 4.5 ±1.5 percent. Air content shall be determined by testing in accordance with ASTM C 231 for gravel and stone coarse aggregate and ASTM C 173 for slag and other highly porous coarse aggregate.

b. Chemical. Water reducing, set controlling, and other approved admixtures shall be added to the mix in the manner recommended by the manufacturer and in the amount necessary to comply with the specification requirements. Tests shall be conducted on trial mixes, with the materials to be used in the work, in accordance with ASTM C 494.

501-3.4 TESTING LABORATORY. The laboratory used to develop the mix design shall meet the requirements of ASTM C 1077. A certification that it meets these requirements shall be submitted to the Engineer prior to the start of mix design and shall contain as a minimum:

a. Qualifications of personnel; laboratory manager, supervising technician, and testing technicians.

b. A statement that the equipment used in developing the mix design is in calibration.

c. A statement that each test specified in developing the mix design is offered in the scope of the laboratory's services.

d. A copy of the laboratory's quality control system.

e. Evidence that the laboratory is accredited, for the test methods required herein, by a nationally recognized laboratory accreditation organization.

CONSTRUCTION METHODS

501-4.1 EQUIPMENT. The Contractor shall furnish all equipment and tools necessary for handling materials and performing all parts of the work.

a. Batch Plant and Equipment. The batch plant and equipment shall conform to the requirements of ASTM C 94.

b. Mixers and Transportation Equipment.

(1) General. Concrete may be mixed at a central plant, or wholly or in part in truck mixers. Each mixer shall have attached in a prominent place a manufacturer's nameplate showing the capacity of the drum in terms of volume of mixed concrete and the speed of rotation of the mixing drum or blades.

(2) Central Plant Mixer. Central plant mixers shall conform to the requirements of ASTM C 94.

The mixer shall be examined daily for changes in condition due to accumulation of hard concrete or mortar or wear of blades. The pickup and throwover blades shall be replaced when they have worn down 3/4 inch (19 mm) or more. The Contractor shall have a copy of the manufacturer's design on hand showing dimensions and arrangement of blades in reference to original height and depth.

(3) **Truck Mixers and Truck Agitators.** Truck mixers used for mixing and hauling concrete and truck agitators used for hauling central mixed concrete shall conform to the requirements of ASTM C 94.

(4) **Nonagitator Trucks.** Nonagitating hauling equipment shall conform to the requirements of ASTM C 94.

c. **Finishing Equipment.** The finishing equipment shall be of sufficient weight and power for proper finishing of the concrete. The finishing machine shall be designed and operated to strike off, screed and consolidate the concrete such that laitance on the surface is less than 1/8 inch (3 mm) thick.

d. **Vibrators.** Vibrator shall be either internal type with immersed tube or multiple spuds, or surface type vibrating pan or screed. For pavements 8 inches (20 cm) or more thick internal vibrators shall be used. They may be attached to the spreader or the finishing machine, or they may be mounted on a separate carriage. Operating frequency for internal vibrators shall be between 8,000 and 12,000 vibrations per minute. Average amplitude for internal vibrators shall be 0.025-0.05 inches (0.06-0.13 cm). For pavements less than 8 inches (20 cm) thick, vibrating surface pans or screeds shall be allowed. Operating frequencies for surface vibrators shall be between 3,000 and 6,000 vibrations per minute.

The number, spacing, and frequency shall be as necessary to provide a dense and homogeneous pavement. Adequate power to operate all vibrators shall be available on the paver. The vibrators shall be automatically controlled so that they shall be stopped as forward motion ceases.

Hand held vibrators may be used in irregular areas.

e. **Concrete Saws.** The Contractor shall provide sawing equipment adequate in number of units and power to complete the sawing to the required dimensions. The Contractor shall provide at least one standby saw in good working order and a supply of saw blades at the site of the work at all times during sawing operations.

f. **Side Forms.** Straight side forms shall be made of steel and shall be furnished in sections not less than 10 feet (3 m) in length. Forms shall have a depth equal to the pavement thickness at the edge. Flexible or curved forms of proper radius shall be used for curves of 100 foot (31 m) radius or less. Forms shall be provided with adequate devices for secure settings so that when in place they will withstand, without visible spring or settlement, the impact and vibration of the consolidating and finishing equipment. Forms with battered top surfaces and bent, twisted or broken forms shall not be used. Built up forms shall not be used, except as approved by

the Engineer. The top face of the form shall not vary from a true plane more than 1/8 inch (3 mm) in 10 feet (3 m), and the upstanding leg shall not vary more than 1/4 inch (6 mm). The forms shall contain provisions for locking the ends of abutting sections together tightly for secure setting. Wood forms may be used under special conditions, when approved by the Engineer.

g. **Pavers.** The paver shall be fully energized, self propelled, and designed for the specific purpose of placing, consolidating, and finishing the concrete pavement, true to grade, tolerances, and cross section. It shall be of sufficient weight and power to construct the maximum specified concrete paving lane width as shown in the plans, at adequate forward speed, without transverse, longitudinal or vertical instability or without displacement. The paver shall be equipped with electronic or hydraulic horizontal and vertical control devices.

501-4.2 FORM SETTING. Forms shall be set sufficiently in advance of the concrete placement to insure continuous paving operation. After the forms have been set to correct grade, the underlying surface shall be thoroughly tamped, either mechanically or by hand, at both the inside and outside edges of the base of the forms. Forms shall be staked into place sufficiently to maintain the form in position for the method of placement.

Form sections shall be tightly locked and shall be free from play or movement in any direction. The forms shall not deviate from true line by more than 1/8 inch (3 mm) at any joint. Forms shall be so set that they will withstand, without visible spring or settlement, the impact and vibration of the consolidating and finishing equipment. Forms shall be cleaned and oiled prior to the placing of concrete.

The alignment and grade elevations of the forms shall be checked and corrections made by the Contractor immediately before placing the concrete.

501-4.3 CONDITIONING OF UNDERLYING SURFACE, SLIP FORM CONSTRUCTION. The compacted underlying surface on which the pavement will be placed shall be widened approximately 3 feet (1 m) to extend beyond the paving machine track to support the paver without any noticeable displacement. After the underlying surface has been placed and compacted to the required density, the areas which will support the paving machine and the area to be paved shall be trimmed or graded to the plan grade elevation and profile by means of a properly designed machine. The grade of the underlying surface shall be controlled by a positive grade control system using lasers, stringlines, or guide wires. If the density of the underlying surface is disturbed by the trimming operations, it shall be corrected by additional compaction and retested at the option of the Engineer before the concrete is placed except when stabilized subbases are being constructed. If damage occurs on a stabilized subbase, it shall be corrected full depth by the Contractor. If traffic is allowed to use the prepared grade, the grade shall be checked and corrected immediately before the placement of concrete. The prepared grade shall be well moistened with water, without saturating, immediately ahead of concrete placement to prevent rapid loss of moisture from concrete. The underlying surface shall be protected so that it will be entirely free of frost when concrete is placed.

501-4.4 CONDITIONING OF UNDERLYING SURFACE, SIDE FORM AND FILL IN LANE CONSTRUCTION. The prepared underlying surface shall be well moistened with water, without saturating, immediately ahead of concrete placement to prevent rapid loss of moisture from the concrete. Damage caused by hauling or usage of other equipment shall be corrected and retested at the option of the Engineers. If damage occurs to a stabilized subbase, it shall be corrected full depth by the Contractor. A template shall be provided and operated on the forms immediately in advance of the placing of all concrete. The template shall be propelled only by hand and not attached to a tractor or other power unit. Templates shall be adjustable so that they may be set and maintained at the correct contour of the underlying surface. The adjustment and operation of the templates shall be such as will provide an accurate retest of the grade before placing the concrete thereon. All excess material shall be removed and wasted. Low areas may be filled and compacted to a condition similar to that of the surrounding grade. The underlying surface shall be protected so that it will be entirely free from frost when the concrete is placed. The use of chemicals to eliminate frost in the underlying surface will not be permitted.

The template shall be maintained in accurate adjustment, at all times by the Contractor, and shall be checked daily.

501-4.5 HANDLING, MEASURING, AND BATCHING MATERIAL. The batch plant site, layout, equipment, and provisions for transporting material shall assure a continuous supply of material to the work. Stockpiles shall be constructed in such a manner that prevents segregation and intermixing of deleterious materials.

Aggregates that have become segregated or mixed with earth or foreign material shall not be used. All aggregates produced or handled by hydraulic methods, and washed aggregates, shall be stockpiled or binned for draining at least 12 hours before being batched. Rail shipments requiring more than 12 hours will be accepted as adequate binning only if the car bodies permit free drainage.

Batching plants shall be equipped to proportion aggregates and bulk cement, by weight, automatically using interlocked proportioning devices of an approved type. When bulk cement is used, the Contractor shall use a suitable method of handling the cement from weighing hopper to transporting container or into the batch itself for transportation to the mixer, such as a chute, boot, or other approved device, to prevent loss of cement. The device shall be arranged to provide positive assurance that the cement content specified is present in each batch.

501-4.6 MIXING CONCRETE. The concrete may be mixed at the work site, in a central mix plant or in truck mixers. The mixer shall be of an approved type and capacity. Mixing time shall be measured from the time all materials, except water, are emptied into the drum. All concrete shall be mixed and delivered to the site in accordance with the requirements of ASTM C 94. Mixed concrete from the central mixing plant shall be transported in truck mixers, truck agitators, or nonagitating trucks. The elapsed time from the addition of cementitious material to the mix until the concrete is deposited in place at the work site shall not exceed 30 minutes when the concrete is hauled in nonagitating trucks, nor 90 minutes when the concrete is hauled in truck mixers or truck agitators. Retempering concrete by adding water or by other means will not be

permitted, except when concrete is delivered in transit mixers. With transit mixers additional water may be added to the batch materials and additional mixing performed to increase the slump to meet the specified requirements provided the addition of water is performed within 45 minutes after the initial mixing operations and provided the water/cementitious ratio specified in the mix design is not exceeded.

501-4.7 LIMITATIONS ON MIXING AND PLACING. No concrete shall be mixed, placed, or finished when the natural light is insufficient, unless an adequate and approved artificial lighting system is operated.

a. Cold Weather. Unless authorized in writing by the Engineer, mixing and concreting operations shall be discontinued when a descending air temperature in the shade and away from artificial heat reaches 40 degrees F (4 degrees C) and shall not be resumed until an ascending air temperature in the shade and away from artificial heat reaches 35 degrees F (2 degrees C).

The aggregate shall be free of ice, snow, and frozen lumps before entering the mixer. The temperature of the mixed concrete shall not be less than 50 degrees F (10 degrees C) at the time of placement. Concrete shall not be placed on frozen material nor shall frozen aggregates be used in the concrete.

When concreting is authorized during cold weather, water and/or the aggregates may be heated to not more than 150 degrees F (66 degrees C). The apparatus used shall heat the mass uniformly and shall be arranged to preclude the possible occurrence of overheated areas which might be detrimental to the materials.

b. Hot Weather. During periods of hot weather when the maximum daily air temperature exceeds 85 degrees F (30 degrees C), the following precautions shall be taken.

The forms and/or the underlying surface shall be sprinkled with water immediately before placing the concrete. The concrete shall be placed at the coolest temperature practicable, and in no case shall the temperature of the concrete when placed exceed 90 degrees F (35 degrees C). The aggregates and/or mixing water shall be cooled as necessary to maintain the concrete temperature at or not more than the specified maximum.

The finished surfaces of the newly laid pavement shall be kept damp by applying a water-fog or mist with approved spraying equipment until the pavement is covered by the curing medium. If necessary, wind screens shall be provided to protect the concrete from an evaporation rate in excess of 0.2 psf per hour as determined in accordance with Figure 2.1.5 in ACI 305R, Hot Weather Concreting, which takes into consideration relative humidity, wind velocity, and air temperature.

When conditions are such that problems with plastic cracking can be expected, and particularly if any plastic cracking begins to occur, the Contractor shall immediately take such additional measures as necessary to protect the concrete surface. Such measures shall consist of wind screens, more effective fog sprays, and similar measures commencing immediately behind the paver. If

these measures are not effective in preventing plastic cracking, paving operations shall be immediately stopped.

501-4.8 PLACING CONCRETE. The Contractor has the option of side (fixed) form or slip form paving. At any point in concrete conveyance, the free vertical drop of the concrete from one point to another or to the underlying surface shall not exceed 3 feet (1 m).

Hauling equipment or other mechanical equipment can be permitted on adjoining previously constructed pavement when the concrete strength reaches a flexural strength of 550 psi, based on the average of four field cured specimens per 2,000 cubic yards of concrete placed. Subgrade and subbase planers, concrete pavers, and concrete finishing equipment may be permitted to ride upon the edges of previously constructed pavement when the concrete has attained a minimum flexural strength of 400 psi.

a. Side-form Method. For the side form method, the concrete shall be deposited on the moistened grade to require as little rehandling as possible. Unless truck mixers, truck agitators, or nonagitating hauling equipment are equipped with means for discharge of concrete without segregation of the materials, the concrete shall be placed and spread using an approved mechanical spreading device that prevents segregation of the materials. Placing shall be continuous between transverse joints without the use of intermediate bulkheads. Necessary hand spreading shall be done with shovels, not rakes. Workers shall not be allowed to walk in the freshly mixed concrete with boots or shoes coated with earth or foreign substances.

Concrete shall be deposited as near to expansion and contraction joints as possible without disturbing them but shall not be dumped from the discharge bucket or hopper onto a joint assembly unless the hopper is centered above the joint assembly.

Concrete shall be thoroughly consolidated against and along the faces of all forms and previously placed concrete and along the full length and on both sides of all joint assemblies by means of vibrators inserted in the concrete. Vibrators shall not be permitted to come in contact with a joint assembly, the grade, or a side form. In no case shall the vibrator be operated longer than 20 seconds in any one location, nor shall the vibrators be used to move the concrete.

b. Slip form Method. For the slip form method, the concrete shall be placed with an approved crawler mounted, slip form paver designed to spread, consolidate and shape the freshly placed concrete in one complete pass of the machine so that a minimum of hand finishing will be necessary to provide a dense and homogeneous pavement in conformance with requirements of the plans and specifications. The concrete shall be placed directly on top of the joint assemblies to prevent them from moving when the paver moves over them. Side forms and finishing screeds shall be adjustable to the extent required to produce the specified pavement edge and surface tolerance. The side forms shall be of dimensions, shape, and strength to support the concrete laterally for a sufficient length of time so that no edge slumping exceeds the requirements of paragraph 501 5.2e(5). Final finishing shall be accomplished while the concrete is still in the plastic state.

In the event that slumping or sloughing occurs behind the paver or if there are any other structural or surface defects which, in the opinion of the Engineer, cannot be corrected within permissible tolerances, paving operations shall be immediately stopped until proper adjustment of the equipment or procedures have been made. In the event that satisfactory procedures and pavement are not achieved after not more than 2,000 lineal feet (600 m) of single lane paving, the Contractor shall complete the balance of the work with the use of standard metal forms and the formed method of placing and curing. Any concrete not corrected to permissible tolerances shall be removed and replaced at the Contractor's expense.

501-4.9 STRIKE OFF OF CONCRETE AND PLACEMENT OF REINFORCEMENT. Following the placing of the concrete, it shall be struck off to conform to the cross section shown on the plans and to an elevation such that when the concrete is properly consolidated and finished, the surface of the pavement shall be at the elevation shown on the plans. When reinforced concrete pavement is placed in two layers, the bottom layer shall be struck off to such length and depth that the sheet of reinforcing steel fabric or bar mat may be laid full length on the concrete in its final position without further manipulation. The reinforcement shall then be placed directly upon the concrete, after which the top layer of the concrete shall be placed, struck off, and screeded. If any portion of the bottom layer of concrete has been placed more than 30 minutes without being covered with the top layer or if initial set has taken place, it shall be removed and replaced with freshly mixed concrete at the Contractor's expense. When reinforced concrete is placed in one layer, the reinforcement may be positioned in advance of concrete placement or it may be placed in plastic concrete by mechanical or vibratory means after spreading.

Reinforcing steel, at the time concrete is placed, shall be free of mud, oil, or other organic matter that may adversely affect or reduce bond. Reinforcing steel with rust, mill scale or a combination of both will be considered satisfactory, provided the minimum dimensions, weight, and tensile properties of a hand wire brushed test specimen are not less than the applicable ASTM specification requirements.

501-4.10 JOINTS. Joints shall be constructed as shown on the plans and in accordance with these requirements. All joints shall be constructed with their faces perpendicular to the surface of the pavement and finished or edged as shown on the plans. Joints shall not vary more than 1/2 inch (13 mm) from their designated position and shall be true to line with not more than 1/4 inch (6 mm) variation in 10 feet (3 m). The surface across the joints shall be tested with a Contractor furnished 10 foot (3 m) straightedge as the joints are finished and any irregularities in excess of 1/4 inch (6 mm) shall be corrected before the concrete has hardened. All joints shall be so prepared, finished, or cut to provide a groove of uniform width and depth as shown on the plans.

a. **Construction.** Longitudinal construction joints shall be slip formed or formed against side forms without keyways, as shown in the plans.

Transverse construction joints shall be installed at the end of each day's placing operations and at any other points within a paving lane when concrete placement is interrupted for more than 30 minutes or it appears that the concrete will obtain its initial set before fresh concrete arrives. The installation of the joint shall be located at a planned contraction or expansion joint. If placing of

the concrete is stopped, the Contractor shall remove the excess concrete back to the previous planned joint.

b. **Contraction.** Contraction joints shall be installed at the locations and spacing as shown on the plans. Contraction joints shall be installed to the dimensions required by forming a groove or cleft in the top of the slab while the concrete is still plastic or by sawing a groove into the concrete surface after the concrete has hardened. When the groove is formed in plastic concrete the sides of the grooves shall be finished even and smooth with an edging tool. If an insert material is used, the installation and edge finish shall be according to the manufacturer's instructions. The groove shall be finished or cut clean so that spalling will be avoided at intersections with other joints. Grooving or sawing shall produce a slot at least 1/8 inch (3 mm) wide and to the depth shown on the plans.

c. **Expansion.** Expansion joints shall be installed as shown on the plans. The premolded filler of the thickness as shown on the plans, shall extend for the full depth and width of the slab at the joint, except for space for sealant at the top of the slab. The filler shall be securely staked or fastened into position perpendicular to the proposed finished surface. A cap shall be provided to protect the top edge of the filler and to permit the concrete to be placed and finished. After the concrete has been placed and struck off, the cap shall be carefully withdrawn leaving the space over the premolded filler. The edges of the joint shall be finished and tooled while the concrete is still plastic. Any concrete bridging the joint space shall be removed for the full width and depth of the joint.

d. **Keyways.** Keyways shall not be used.

e. **Tie Bars.** Tie bars shall consist of deformed bars installed in joints as shown on the plans. Tie bars shall be placed at right angles to the centerline of the concrete slab and shall be spaced at intervals shown on the plans. They shall be held in position parallel to the pavement surface and in the middle of the slab depth. When tie bars extend into an unpaved lane, they may be bent against the form at longitudinal construction joints, unless threaded bolt or other assembled tie bars are specified. These bars shall not be painted, greased, or enclosed in sleeves.

f. **Dowel Bars.** Dowel bars or other load transfer units of an approved type shall be placed across joints in the manner as shown on the plans. They shall be of the dimensions and spacings as shown and held rigidly in the middle of the slab depth in the proper horizontal and vertical alignment by an approved assembly device to be left permanently in place. The dowel or load-transfer and joint devices shall be rigid enough to permit complete assembly as a unit ready to be lifted and placed into position. A metal, or other type, dowel expansion cap or sleeve shall be furnished for each dowel bar used with expansion joints. These caps shall be substantial enough to prevent collapse and shall be placed on the ends of the dowels as shown on the plans. The caps or sleeves shall fit the dowel bar tightly and the closed end shall be watertight. The portion of each dowel painted with rust preventative paint, as required under paragraph 501 2.7, and as shown on the plans to receive a debonding lubricant, shall be thoroughly coated with asphalt MC 70, or an approved lubricant, to prevent the concrete from bonding to that portion of the dowel. If free sliding plastic coated or epoxy coated steel dowels are used, a lubrication bond breaker shall be

used except when approved pullout tests indicate it is not necessary. Where butt type joints with dowels are designated, the exposed end of the dowel shall be oiled.

Dowel bars at contraction joints may be placed in the full thickness of pavement by a mechanical device approved by the Engineer. The device shall be capable of installing dowel bars within the maximum permissible alignment tolerances. Dowels bars at longitudinal construction joints shall be bonded in drilled holes.

g. **Installation of Joint Devices.** All joint devices shall be approved by the Engineer.

The top of an assembled joint device shall be set at the proper distance below the pavement surface and the elevation shall be checked. Such devices shall be set to the required position and line and shall be securely held in place by stakes or other means to the maximum permissible tolerances during the placing and finishing of the concrete. Where premolded joint material is used, it shall be placed and held in a vertical position; if constructed in sections, there shall be no offsets between adjacent units.

Dowel bars and assemblies shall be checked for position and alignment. The maximum permissible tolerances on dowel bar alignment shall be in accordance with paragraph 501 5.2e(6). During the concrete placement operation, it is advisable to place plastic concrete directly on dowel assemblies immediately prior to passage of the paver to help maintain dowel position and alignment within maximum permissible tolerances.

When concrete is placed using slip form pavers, dowels and tie bars shall be placed in longitudinal construction joints by bonding the dowels or tie bars into holes drilled into the hardened concrete. Holes approximately 1/8 inch to ¼ inch (3 to 6 mm) greater in diameter than the dowel or tie bar shall be drilled with rotary type core drills that must be held securely in place to drill perpendicularly into the vertical face of the pavement slab. Rotary type percussion drills may be used provided that spalling of concrete does not occur. Any damage of the concrete shall be repaired by the Contractor in a method approved by the Engineer. Dowels or tie bars shall be bonded in the drilled holes using an epoxy resin material. Installation procedures shall be adequate to insure that the area around dowels is completely filled with epoxy grout. Epoxy shall be injected into the back of the hole and displaced by the insertion of the dowel bar. Bars shall be completely inserted into the hole and shall not be withdrawn and reinserted creating air pockets in the epoxy around the bar. The Contractor shall furnish a template for checking the position and alignment of the dowels. Dowel bars shall not be less than 10 inches (25 cm) from a transverse joint and shall not interfere with dowels in the transverse direction.

h. **Sawing of Joints.** Joints shall be cut as shown on the plans. Equipment shall be as described in paragraph 501 4.1. The circular cutter shall be capable of cutting a groove in a straight line and shall produce a slot at least 1/8 inch (3 mm) wide and to the depth shown on the plans. The top portion of the slot shall be widened by sawing to provide adequate space for joint sealers as shown on the plans. Sawing shall commence as soon as the concrete has hardened sufficiently to permit cutting without chipping, spalling, or tearing and before uncontrolled shrinkage cracking of

the pavement occurs. Sawing shall be carried on both during the day and night as required. The joints shall be sawed at the required spacing, consecutively in sequence of the concrete placement.

501-4.11 FINAL STRIKE OFF, CONSOLIDATION, AND FINISHING.

a. Sequence. The sequence of operations shall be the strike off, floating and removal of laitance, straightedging, and final surface finish. The addition of superficial water to the surface of the concrete to assist in finishing operations will not be permitted.

b. Finishing at Joints. The concrete adjacent to joints shall be compacted or firmly placed without voids or segregation against the joint material; it shall be firmly placed without voids or segregation under and around all load transfer devices, joint assembly units, and other features designed to extend into the pavement. Concrete adjacent to joints shall be mechanically vibrated as required in paragraph 501 4.8a. After the concrete has been placed and vibrated adjacent to the joints, the finishing machine shall be operated in a manner to avoid damage or misalignment of joints. If uninterrupted operations of the finishing machine, to, over, and beyond the joints, cause segregation of concrete, damage to, or misalignment of the joints, the finishing machine shall be stopped when the screed is approximately 8 inches (20 cm) from the joint. Segregated concrete shall be removed from the front of and off the joint; and the forward motion of the finishing machine shall be resumed. Thereafter, the finishing machine may be run over the joint without lifting the screed, provided there is no segregated concrete immediately between the joint and the screed or on top of the joint.

c. Machine Finishing. The concrete shall be spread as soon as it is placed, and it shall be struck off and screeded by a finishing machine. The machine shall go over each area as many times and at such intervals as necessary to give to proper consolidation and to leave a surface of uniform texture. Excessive operation over a given area shall be avoided. When side forms are used, the tops of the forms shall be kept clean by an effective device attached to the machine, and the travel of the machine on the forms shall be maintained true without lift, wobbling, or other variation tending to affect the precision finish. During the first pass of the finishing machine, a uniform ridge of concrete shall be maintained ahead of the front screed for its entire length. When in operation, the screed shall be moved forward with a combined longitudinal and transverse shearing motion, always moving in the direction in which the work is progressing, and so manipulated that neither end is raised from the side forms during the striking off process. If necessary, this shall be repeated until the surface is of uniform texture, true to grade and cross section, and free from porous areas.

d. Hand Finishing. Hand finishing methods will not be permitted, except under the following conditions: in the event of breakdown of the mechanical equipment, hand methods may be used to finish the concrete already deposited on the grade; in areas of narrow widths or of irregular dimensions where operation of the mechanical equipment is impractical. Concrete, as soon as placed, shall be struck off and screeded. An approved portable screed shall be used. A second screed shall be provided for striking off the bottom layer of concrete when reinforcement is used.

The screed for the surface shall be a least 2 feet (0.6 m) longer than the maximum width of the slab to be struck off. It shall be of approved design, sufficiently rigid to retain its shape, and shall be constructed either of metal or of other suitable material covered with metal. Consolidation shall be attained by the use of suitable vibrators.

e. **Floating.** After the concrete has been struck off and consolidated, it shall be further smoothed and trued by means of a longitudinal float using one of the following methods:

(1) **Hand Method.** Long handled floats shall not be less than 12 feet (3.6 m) in length and 6 inches (15 cm) in width, stiffened to prevent flexibility and warping. The float shall be operated from foot bridges spanning but not touching the concrete or from the edge of the pavement. Floating shall pass gradually from one side of the pavement to the other. Forward movement along the centerline of the pavement shall be in successive advances of not more than one half the length of the float. Any excess water or laitance in excess of 1/8 inch (3 mm) thick shall be removed and wasted.

(2) **Mechanical Method.** The Contractor may use a machine composed of a cutting and smoothing float(s), suspended from and guided by a rigid frame and constantly in contact with, the side forms or underlying surface. If necessary, long handled floats having blades not less than 5 feet (1.5 m) in length and 6 inches (15 cm) in width may be used to smooth and fill in open textured areas in the pavement. When the crown of the pavement will not permit the use of the mechanical float, the surface shall be floated transversely by means of a long handled float. Care shall be taken not to work the crown out of the pavement during the operation. After floating, any excess water and laitance in excess of 1/8 inch (3 mm) thick shall be removed and wasted. Successive drags shall be lapped one-half the length of the blade.

f. **Straight edge Testing and Surface Correction.** After the pavement has been struck off and while the concrete is still plastic, it shall be tested for trueness with a Contractor furnished 16-foot (4.8 m) straightedge swung from handles 3 feet (1 m) longer than one-half the width of the slab. The straightedge shall be held in contact with the surface in successive positions parallel to the centerline and the whole area gone over from one side of the slab to the other, as necessary. Advancing shall be in successive stages of not more than one half the length of the straightedge. Any excess water and laitance in excess of 1/8 inch (3 mm) thick shall be removed from the surface of the pavement and wasted. Any depressions shall be immediately filled with freshly mixed concrete, struck off, consolidated, and refinished. High areas shall be cut down and refinished. Special attention shall be given to assure that the surface across joints meets the smoothness requirements of paragraph 501 -5.2e(3). Straightedge testing and surface corrections shall continue until the entire surface is found to be free from observable departures from the straightedge and until the slab conforms to the required grade and cross section. The use of long handled wood floats shall be confined to a minimum; they may be used only in emergencies and in areas not accessible to finishing equipment.

501-4.12 SURFACE TEXTURE. The surface of the pavement shall be finished with either a broom, burlap drag, or artificial turf finish for all newly constructed concrete pavements.

a. **Brush or Broom Finish.** If the pavement surface texture is to be a type of brush or broom finish, it shall be applied when the water sheen has practically disappeared. The equipment shall operate transversely across the pavement surface, providing corrugations that are uniform in appearance and approximately 1/16 of an inch (2 mm) in depth. It is important that the texturing equipment not tear or unduly roughen the pavement surface during the operation. Any imperfections resulting from the texturing operation shall be corrected.

b. **Burlap Drag Finish.** If a burlap drag is used to texture the pavement surface, it shall be at least 15 ounces per square yard (555 grams per square meter). To obtain a textured surface, the transverse threads of the burlap shall be removed approximately 1 foot (0.3 m) from the trailing edge. A heavy buildup of grout on the burlap threads produces the desired wide sweeping longitudinal striations on the pavement surface. The corrugations shall be uniform in appearance and approximately 1/16 of an inch (2 mm) in depth.

c. **Artificial Turf Finish.** If artificial turf is used to texture the surface, it shall be applied by dragging the surface of the pavement in the direction of concrete placement with an approved full-width drag made with artificial turf. The leading transverse edge of the artificial turf drag will be securely fastened to a lightweight pole on a traveling bridge. At least 2 feet of the artificial turf shall be in contact with the concrete surface during dragging operations. A variety of different types of artificial turf are available and approval of any one type will be done only after it has been demonstrated by the Contractor to provide a satisfactory texture. One type that has provided satisfactory texture consists of 7,200 approximately 0.85 inches long polyethylene turf blades per square foot. The corrugations shall be uniform in appearance and approximately 1/16 of an inch (2 mm) in depth.

501-4.13 Not Used.

501-4.14 CURING. Immediately after finishing operations are completed and marring of the concrete will not occur, the entire surface of the newly placed concrete shall be cured in accordance with one of the methods below. Failure to provide sufficient cover material of whatever kind the Contractor may elect to use, or lack of water to adequately take care of both curing and other requirements, shall be cause for immediate suspension of concreting operations. The concrete shall not be left exposed for more than 1/2 hour during the curing period.

a. **Impervious Membrane Method.** The entire surface of the pavement shall be sprayed uniformly with white pigmented curing compound immediately after the finishing of the surface and before the set of the concrete has taken place. The curing compound shall not be applied during rainfall. Curing compound shall be applied by mechanical sprayers under pressure at the rate of 1 gallon (4 liters) to not more than 150 square feet (14 square meters). The spraying equipment shall be of the fully atomizing type equipped with a tank agitator. At the time of use, the compound shall be in a thoroughly mixed condition with the pigment uniformly dispersed throughout the vehicle. During application the compound shall be stirred continuously by mechanical means. Hand spraying of odd widths or shapes and concrete surfaces exposed by the removal of forms will be permitted. The curing compound shall be of such character that the film will harden within 30 minutes after application. Should the film become damaged from any cause,

including sawing operations, within the required curing period, the damaged portions shall be repaired immediately with additional compound or other approved means. Upon removal of side forms, the sides of the exposed slabs shall be protected immediately to provide a curing treatment equal to that provided for the surface.

b. **Polyethylene Films. Not Used.**

c. **Waterproof Paper. Not Used.**

d. **White Burlap-Polyethylene Sheets. Not Used.**

e. **Curing in Cold Weather.** The concrete shall be maintained at a temperature of at least 50 degrees F (10 degrees C) for a period of 72 hours after placing and at a temperature above freezing for the remainder of the curing time. The Contractor shall be responsible for the quality and strength of the concrete placed during cold weather, and any concrete injured by frost action shall be removed and replaced at the Contractor's expense.

501-4.15 REMOVING FORMS. Unless otherwise specified, forms shall not be removed from freshly placed concrete until it has hardened sufficiently to permit removal without chipping, spalling, or tearing. After the forms have been removed, the sides of the slab shall be cured as outlined in one of the methods indicated in paragraph 501 -4.14. Major honeycombed areas shall be considered as defective work and shall be removed and replaced in accordance with paragraph 501-5.2(f).

501-4.16 SEALING JOINTS. The joints in the pavement shall be sealed in accordance with Item P-605.

501-4.17 PROTECTION OF PAVEMENT. The Contractor shall protect the pavement and its appurtenances against both public traffic and traffic caused by the Contractor's employees and agents. This shall include workers to direct traffic and the erection and maintenance of warning signs, lights, pavement bridges, crossovers, and protection of unsealed joints from intrusion of foreign material, etc. Any damage to the pavement occurring prior to final acceptance shall be repaired or the pavement replaced at the Contractor's expense. The Contractor shall have available at all times, materials for the protection of the edges and surface of the unhardened concrete. Such protective materials shall consist of rolled polyethylene sheeting at least 4 mils (0.1 mm) thick of sufficient length and width to cover the plastic concrete slab and any edges. The sheeting may be mounted on either the paver or a separate movable bridge from which it can be unrolled without dragging over the plastic concrete surface. When rain appears imminent, all paving operations shall stop and all available personnel shall begin covering the surface of the unhardened concrete with the protective covering.

501-4.18 OPENING TO TRAFFIC. The pavement shall not be opened to traffic until test specimens molded and cured in accordance with ASTM C 31 have attained a flexural strength of 550 pounds per square inch (3792 kPa) when tested in accordance with ASTM C 78. If such tests are not conducted, the pavement shall not be opened to traffic until 14 days after the concrete was placed. Prior to opening the pavement to construction or aircraft traffic the pavement shall be cleaned, and all joints shall either be sealed or protected from damage to the joint edge and

intrusion of foreign materials into the joint. As a minimum, backer rod or tape may be used to protect the joints from foreign matter intrusion.

MATERIAL ACCEPTANCE

501-5.1 ACCEPTANCE SAMPLING AND TESTING. All acceptance sampling and testing, with the exception of coring for thickness determination, necessary to determine conformance with the requirements specified in this section will be performed by the Engineer. Concrete shall be accepted for strength and thickness on a lot basis.

A lot shall consist of 800 cubic yards.

Testing organizations performing these tests shall meet the requirements of ASTM C 1077. The Contractor shall bear the cost of providing curing facilities for the strength specimens, per paragraph 501-5.1a(3), and coring and filling operations, per paragraph 501-5.1b(1).

a. Flexural Strength.

(1) Sampling. Each lot shall be divided into four equal sublots and may consist of more than one days production (see Paragraph 5.1.c., Partial Lots.) One sample shall be taken for each sublot from the plastic concrete delivered to the job site. Sampling locations shall be determined by the Engineer in accordance with random sampling procedures contained in ASTM D 3665. The concrete shall be sampled in accordance with ASTM C 172

(2) Testing. Two (2) specimens shall be made from each sample. Specimens shall be made in accordance with ASTM C 31 and the flexural strength of each specimen shall be determined in accordance with ASTM C 78. The flexural strength for each sublot shall be computed by averaging the results of the two test specimens representing that sublot.

(3) Curing. The Contractor shall provide adequate facilities for the initial curing of beams. During the 24 hours after molding, the temperature immediately adjacent to the specimens must be maintained in the range of 60 to 80 degrees F (16 to 27 degrees C), and loss of moisture from the specimens must be prevented. The specimens may be stored in tightly constructed wooden boxes, damp sand pits, temporary buildings at construction sites, under wet burlap in favorable weather or in heavyweight closed plastic bags, or use other suitable methods, provided the temperature and moisture loss requirements are met.

(4) Acceptance. Acceptance of pavement for flexural strength will be determined by the Engineer in accordance with paragraph 501-5.2b.

b. Pavement Thickness.

(1) Sampling. Each lot shall be divided into four equal sublots and one core shall be taken by the Contractor for each sublot. Sampling locations shall be determined by the Engineer in accordance with random sampling procedures contained in ASTM D 3665. Areas,

such as thickened edges, with planned variable thickness, shall be excluded from sample locations.

Cores shall be neatly cut with a core drill. The Contractor shall furnish all tools, labor, and materials for cutting samples and filling the cored hole. Core holes shall be filled by the Contractor with a nonshrink grout approved by the Engineer within one day after sampling.

(2) Testing. The thickness of the cores shall be determined by the Engineer by the average caliper measurement in accordance with ASTM C 174.

(3) Acceptance. Acceptance of pavement for thickness shall be determined by the Engineer in accordance with paragraph 501-5.2c.

c. Partial Lots. When operational conditions cause a lot to be terminated before the specified number of tests have been made for the lot, or when the Contractor and Engineer agree in writing to allow overages or minor placements to be considered as partial lots, the following procedure will be used to adjust the lot size and the number of tests for the lot.

Where three sublots have been produced, they shall constitute a lot. Where one or two sublots have been produced, they shall be incorporated into the next lot or the previous lot and the total number of sublots shall be used in the acceptance criteria calculation, i.e., n=5 or n=6.

d. Outliers. All individual flexural strength tests within a lot shall be checked for an outlier (test criterion) in accordance with ASTM E 178, at a significance level of 5 percent. Outliers shall be discarded, and the PWL shall be determined using the remaining test values.

501-5.2 ACCEPTANCE CRITERIA.

a. General. Acceptance will be based on the following characteristics of the completed pavement:

(1) Flexural strength
(2) Thickness
(3) Smoothness
(4) Grade
(5) Edge slump
(6) Dowel bar alignment

Flexural strength and thickness shall be evaluated for acceptance on a lot basis using the method of estimating percentage of material within specification limits (PWL). Acceptance using PWL considers the variability (standard deviation) of the material and the testing procedures, as well as the average (mean) value of the test results to calculate the percentage of material that is above the lower specification tolerance limit (L).

Acceptance for flexural strength will be based on the criteria contained in paragraph 501-5.2e(1). Acceptance for thickness will be based on the criteria contained in paragraph 501-5.2e(2). Acceptance for smoothness will be based on the criteria contained in paragraph 501-5.2e(3). Acceptance for grade will be based on the criteria contained in paragraph 501-5.2e(4).

The Engineer may at any time, not withstanding previous plant acceptance, reject and require the Contractor to dispose of any batch of concrete mixture which is rendered unfit for use due to contamination, segregation, or improper slump. Such rejection may be based on only visual inspection. In the event of such rejection, the Contractor may take a representative sample of the rejected material in the presence of the Engineer, and if he can demonstrate in the laboratory, in the presence of the Engineer, that such material was erroneously rejected, payment will be made for the material at the contract unit price.

b. Flexural Strength. Acceptance of each lot of in-place pavement for flexural strength shall be based on PWL. The Contractor shall target production quality to achieve 90 PWL or higher.

c. Pavement Thickness. Acceptance of each lot of in-place pavement shall be based on PWL. The Contractor shall target production quality to achieve 90 PWL or higher.

d. Percentage of Material Within Specification Limits (PWL). The percentage of material within specification limits shall be determined in accordance with procedures specified in Section 110 of the General Provisions.

The lower specification limit (L) for flexural strength and thickness shall be:

Lower Specification Limit (L)

Flexural Strength	0.93 x strength specified in paragraph 501-3.1.
Thickness	Lot Plan Thickness in inches - 0.50 inches

e. Acceptance Criteria.

(1) Flexural Strength. If the PWL of the lot equals or exceeds 90 percent, the lot shall be acceptable. Acceptance and payment for the lot shall be determined in accordance with paragraph 501-8.1..

(2) Thickness If the PWL of the lot equals or exceeds 90 percent, the lot shall be acceptable. Acceptance and payment for the lot shall be determined in accordance with paragraph 501-8.1.

(3) Smoothness. As soon as the concrete has hardened sufficiently, the pavement surface shall be tested in the transverse direction with a 16 foot straightedge or other specified device. Surface smoothness deviations shall not exceed 1/4 inch from a 16 foot straightedge at any location, including placement along and spanning any pavement joint or edge.

Areas in the slab showing high spots of more than 1/4 inch but not exceeding 1/2 inch in 16 feet shall be marked and immediately ground down with an approved grinding machine to an elevation that falls within the tolerance of 1/4 inch or less. Where the departure from the correct cross section exceeds 1/2 inch, the pavement shall be removed and replaced at the expense of the Contractor when so directed by the Engineer.

(4) **Grade.** An evaluation of the surface grade shall be made by the Engineer for compliance to the tolerances contained below.

Lateral Deviation. Lateral deviation from established alignment of the pavement edge shall not exceed plus or minus 0.10 foot (30 mm) in any lane.

Vertical Deviation. Vertical deviation from established grade shall not exceed plus or minus 0.04 foot (12 mm) at any point.

(5) **Edge Slump.** When slip form paving is used, not more than 15 percent of the total free edge of each five hundred feet (500) (152 m) of pavement, or fraction thereof, shall have an edge slump exceeding 1/4 inch (6 mm), and none of the free edge of the pavement shall have an edge slump exceeding 3/8 inch (10 mm). (The total free edge of 500 feet (152 m) of pavement will be considered the cumulative total linear measurement of pavement edge originally constructed as nonadjacent to any existing pavement; i.e., 500 feet (152 m) of paving lane originally constructed as a separate lane will have 1,000 feet (305 m) of free edge, 500 feet (152 m) of fill-in lane will have no free edge, etc.) The area affected by the downward movement of the concrete along the pavement edge shall be limited to not more than 18 inches (457 mm) from the edge. When excessive edge slump cannot be corrected before the concrete has hardened, the area with excessive edge slump shall be removed and replaced at the expense of the Contractor when so directed by the Engineer.

(6) **Dowel Bar Alignment.** Dowel bars and assemblies shall be checked for position and alignment. The maximum permissible tolerance on dowel bar alignment in each plane, horizontal and vertical, shall not exceed 2 percent or 1/4 inch (6 mm) per foot of dowel bar.

f. **Removal and Replacement of Concrete.** Any area or section of concrete that is removed and replaced shall be removed and replaced back to planned joints. The Contractor shall replace damaged dowels and the requirements for doweled longitudinal construction joints in paragraph 501 -4.10 shall apply to all contraction joints exposed by concrete removal.

CONTRACTOR QUALITY CONTROL

501-6.1 QUALITY CONTROL PROGRAM. The Contractor shall develop a Quality Control Program in accordance with Section 100 of the General Provisions. The program shall address all elements which effect the quality of the pavement including, but not limited to:

a. Mix Design

b. Aggregate Gradation
c. Quality of Materials
d. Stockpile Management
e. Proportioning
f. Mixing and Transportation
g. Placing and Consolidation
h. Joints
i. Dowel Placement and Alignment
j. Flexural or Compressive Strength
k. Finishing and Curing
l. Surface Smoothness

501-6.2 QUALITY CONTROL TESTING. The Contractor shall perform all quality control tests necessary to control the production and construction processes applicable to this specification and as set forth in the Quality Control Program. The testing program shall include, but not necessarily be limited to, tests for aggregate gradation, aggregate moisture content, slump, and air content.

A Quality Control Testing Plan shall be developed as part of the Quality Control Program.

a. Fine Aggregate.

(1) Gradation. A sieve analysis shall be made at least twice daily in accordance with ASTM C 136 from randomly sampled material taken from the discharge gate of storage bins or from the conveyor belt.

(2) Moisture Content. If an electric moisture meter is used, at least two direct measurements of moisture content shall be made per week to check the calibration. If direct measurements are made in lieu of using an electric meter, two tests shall be made per day. Tests shall be made in accordance with ASTM C 70 or ASTM C 566.

b. Coarse Aggregate.

(1) Gradation. A sieve analysis shall be made at least twice daily for each size of aggregate. Tests shall be made in accordance with ASTM C 136 from randomly sampled material taken from the discharge gate of storage bins or from the conveyor belt.

(2) Moisture Content. If an electric moisture meter is used, at least two direct measurements of moisture content shall be made per week to check the calibration. If direct measurements are made in lieu of using an electric meter, two tests shall be made per day. Tests shall be made in accordance with ASTM C 566.

c. Slump. Four slump tests shall be performed for each lot of material produced in accordance with the lot size defined in Section 501-5.1. One test shall be made for each sublot. Slump tests shall be performed in accordance with ASTM C 143 from material randomly sampled

from material discharged from trucks at the paving site. Material samples shall be taken in accordance with ASTM C 172.

d. Air Content. Four air content tests, shall be performed for each lot of material produced in accordance with the lot size defined in Section 501-5.1. One test shall be made for each sublot. Air content tests shall be performed in accordance with ASTM C 231 for gravel and stone coarse aggregate and ASTM C 173 for slag or other porous coarse aggregate, from material randomly sampled from trucks at the paving site. Material samples shall be taken in accordance with ASTM C 172.

501-6.3 CONTROL CHARTS. The Contractor shall maintain linear control charts for fine and course aggregate, gradation, slump, and air content.

Control charts shall be posted in a location satisfactory to the Engineer and shall be kept up to date at all times. As a minimum, the control charts shall identify the project number, the contract item number, the test number, each test parameter, the Action and Suspension Limits, or Specification limits, applicable to each test parameter, and the Contractor's test results. The Contractor shall use the control charts as part of a process control system for identifying potential problems and assignable causes before they occur. If the Contractor's projected data during production indicates a potential problem and the Contractor is not taking satisfactory corrective action, the Engineer may halt production or acceptance of the material.

a. Fine and Coarse Aggregate Gradation. The Contractor shall record the running average of the last five gradation tests for each control sieve on linear control charts. Specification limits contained in Tables 1 and 2 shall be superimposed on the Control Chart for job control.

b. Slump and Air Content. The Contractor shall maintain linear control charts both for individual measurements and range (i.e., difference between highest and lowest measurements) for slump and air content in accordance with the following Action and Suspension Limits.

The individual measurement control charts shall use the mix design target values as indicators of central tendency.

CONTROL CHART LIMITS

Control Parameter	Individual Measurements		Range Suspension Limit
	Action Limit	Suspension Limit	
Slump	± 1 inch (25mm)	± 1.5 inch (38mm)	± 2.4 inch (61mm)
Air Content	± 1.2%	± 1.8%	± 2.8%

501-6.4 CORRECTIVE ACTION. The Quality Control Plan shall indicate that appropriate action shall be taken when a process is believed to be out of control. The Plan shall detail what action will be taken to bring a process into control and shall contain sets of rules to gauge when a process is out of control. As a minimum, a process shall be deemed out of control and corrective action taken if any one of the following conditions exists.

a. **Fine and Coarse Aggregate Gradation.** When two consecutive averages of five tests are outside of the Tables 1 or 2 specification limits, immediate steps, including a halt to production, shall be taken to correct the gradation.

b. **Fine and Coarse Aggregate Moisture Content.** Whenever the moisture content of the fine or coarse aggregate changes by more than 0.5 percent, the scale settings for the aggregate batcher(s) and water batcher shall be adjusted.

c. **Slump.** The Contractor shall halt production and make appropriate adjustments whenever:

(1) one point falls outside the Suspension Limit line for individual measurements or range; or

(2) two points in a row fall outside the Action Limit line for individual measurements.

d. **Air Content.** The Contractor shall halt production and adjust the amount of air entraining admixture whenever:

(1) one point falls outside the Suspension Limit line for individual measurements or range; or

(2) two points in a row fall outside the Action Limit line for individual measurements.

Whenever a point falls outside the Action Limits line, the air-entraining admixture dispenser shall be calibrated to ensure that it is operating correctly and with good reproducibility.

METHOD OF MEASUREMENT

501-7.1 Portland cement concrete pavement shall be measured by the number of square yards (square meters), of each thickness, of either reinforced or non-reinforced pavement as specified in place, completed and accepted.

BASIS OF PAYMENT

501-8.1 GENERAL. Payment for accepted concrete pavement shall be made at the contract unit price per square yard (square meter) adjusted in accordance with paragraph 501-8.1a, subject to the limitation that:

> The total project payment for concrete pavement shall not exceed 106 percent of the product of the contract unit price and the total number of cubic yards (cubic meters) of concrete pavement used in the accepted work (See Note 2 under Table 3).

Payment shall be full compensation for all labor, materials, tools, equipment, and incidentals required to complete the work as specified herein and on the drawings, except for saw-cut grooving.

a. Basis of Adjusted Payment. The pay factor for each individual lot shall be calculated in accordance with Table 3. A pay factor shall be calculated for both flexural strength and thickness. The lot pay factor shall be the higher of the two values when calculations for both flexural strength and thickness are 100 percent or higher. The lot pay factor shall be the product of the two values when only one of the calculations for either flexural strength or thickness is 100 percent or higher. The lot pay factor shall be the lower of the two values when calculations for both flexural strength and thickness are less than 100 percent .

For each lot accepted, the adjusted contract unit price shall be the product of the lot pay factor for the lot and the contract unit price. Payment shall be subject to the total project payment limitation specified in paragraph 501-8.1. Payment in excess of 100 percent for accepted lots of concrete pavement shall be used to offset payment for accepted lots of concrete pavement that achieve a lot pay factor less than 100 percent.

TABLE 3
PRICE ADJUSTMENT SCHEDULE [1]

Percentage of Material Within Specification Limits (PWL)	Lot Pay Factor (Percent of Contract Unit Price)
96 – 100	106[1]
90 – 95	PWL + 10
75 – 90	0.5PWL + 55
55 – 74	1.4PWL – 12
Below 55	Reject [2]

[1] Although it is theoretically possible to achieve a pay factor of 106 percent for each lot, actual payment in excess of 100 percent shall be subject to the total project payment limitation specified in paragraph 501-8.1.

[2] The lot shall be removed and replaced. However, the engineer may decide to allow the rejected lot to remain. In that case, if the engineer and contractor agree in writing that the lot shall not be removed, it shall be paid for at 50 percent of the contract unit price and the total project payment limitation shall be reduced by the amount withheld for the rejected lot.

Payment will be made under:

P-501-1	12 Inch PCC Pavement, Non-Reinforced	per square yard
P-501-2	12 Inch PCC Pavement, Reinforced	per square yard
P-501-3	12-15 Inch PCC Pavement, Non-Reinforced	per square yard
P-501-4	12-15 Inch PCC Pavement, Reinforced	per square yard
P-501-5	8 Inch PCC Pavement, Non-Reinforced	per square yard
P-501-6	8 Inch PCC Pavement, Reinforced	per square yard
P-501-7	8-10 Inch PCC Pavement, Non-Reinforced	per square yard
P-501-8	8-10 Inch PCC Pavement, Reinforced	per square yard

TESTING REQUIREMENTS

ASTM C 31	Making and Curing Concrete Test Specimens in the Field
ASTM C 39	Compressive Strength of Cylindrical Concrete Specimens
ASTM C 70	Surface Moisture in Fine Aggregate
ASTM C 78	Test for Flexural Strength of Concrete (Using Simple Beam with Third-Point Loading)
ASTM C 131	Test for Resistance to Abrasion of Small Size Coarse Aggregate by Use of the Los Angeles Machine
ASTM C 136	Sieve Analysis of Fine and Coarse Aggregates
ASTM C 138	Test for Unit Weight, Yield, and Air Content (Gravimetric) of Concrete
ASTM C 143	Test for Slump of Portland Cement Concrete
ASTM C 172	Sampling Freshly Mixed Concrete
ASTM C 173	Test for Air Content of Freshly Mixed Concrete by the Volumetric Method
ASTM C 174	Measuring Length of Drilled Concrete Cores
ASTM C 227	Potential Alkali Reactivity of Cement-Aggregate Combinations (Mortar-Bar Method)
ASTM C 231	Test for Air Content of Freshly Mixed Concrete by the Pressure Method
ASTM C 289	Potential Reactivity of Aggregates (Chemical Method)
ASTM C 295	Petrographic Examination of Aggregates for Concrete
ASTM C 311	Sampling and Testing Fly Ash for Use as an Admixture in Portland Cement Concrete
ASTM C 535	Test for Resistance to Abrasion of Large Size Coarse Aggregate by Use of the Los Angeles Machine
ASTM C 566	Total Moisture Content of Aggregates by Drying
ASTM C 1077	Standard Practice for Laboratories Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Laboratory Evaluation
ASTM D 3665	Random Sampling of Construction Materials
ASTM D 4791	Test Method for Flat or Elongated Particles in Coarse Aggregate
AASHTO T 26	Quality of Water to be Used in Concrete

MATERIAL REQUIREMENTS

ASTM A 184	Specification for Fabricated Deformed Steel Bar Mats for Concrete Reinforcement
ASTM A 185	Specification for Welded Steel Wire Fabric for Concrete Reinforcement
ASTM A 497	Specification for Welded Deformed Steel Wire Fabric for Concrete Pavement
ASTM A 615	Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement
ASTM A 616	Specification for Rail-Steel Deformed and Plain Bars for Concrete Reinforcement
ASTM A 617	Specification for Axle-Steel Deformed and Plain Bars for Concrete Reinforcement
ASTM A 704	Specification for Welded Steel Plain Bar or Rod Mats for Concrete Reinforcement
ASTM A 714	Specification for High-Strength Low-Alloy Welded and Seamless Steel Pipe
ASTM C 33	Specification for Concrete Aggregates
ASTM C 94	Specification for Ready-Mixed Concrete
ASTM C 150	Specification for Portland Cement
ASTM C 171	Specification for Sheet Materials for Curing Concrete
ASTM C 260	Specification for Air-Entraining Admixtures for Concrete
ASTM C 309	Specification for Liquid Membrane-Forming Compounds
ASTM C 494	Specification for Chemical Admixtures for Concrete
ASTM C 595	Specification for Blended Hydraulic Cements
ASTM C 618	Specification for Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Portland Cement Concrete
ASTM C 881	Specification for Epoxy-Resin Base Bonding System for Concrete
ASTM C 989	Specification for Ground Granulated Blast-Furnace Slag for Use in Concrete and Mortars
ASTM D 1751	Specification for Preformed Expansion Joint Fillers for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types)
ASTM D 1752	Specification for Preformed Sponge Rubber and Cork Expansion Joint Fillers for Concrete Paving and Structural Construction
AASHTO M 254	Specification for Coated Dowel Bars
ACI 305R	Hot Weather Concreting
ACI 306R	Cold Weather Concreting
TT-P-644 (Rev. D)	Federal Specification for Primer Coating, Alkyd, Corrosion-Inhibiting, Lead and Chromate Free, VOC-Compliant

END OF ITEM P-501

DEVIATIONS FROM STANDARD
FAA TECHNICAL SPECIFICATIONS

ITEM P-605 JOINT SEALING FILLER

(a) Section 3.3 – Added section to require joints be inspected by construction manager after being cleaned

(b) Section 3.4 – Equipment section added to require the proper equipment be used for the project.

(c) Section 3.5 – Warranty section added to require the contractor to require a written 1-year warranty on materials and all sealed joints.

ITEM P-605 JOINT SEALING FILLER

DESCRIPTION

605-5.1 This item shall consist of providing and installing a resilient and adhesive joint sealing filler capable of effectively sealing joints and cracks in pavements.

MATERIALS

605-2.1 JOINT SEALERS. Joint sealing materials shall meet the following requirements.

a. Silicone Joint Sealants. The joint sealing materials shall be low modulus silicone rubber meeting the following requirements, as specified on the plans.

Low Modulus Silicone Rubber Dow Corning 888 Silicone Joint Sealant, or Approved Equal		
Properties	Limits	Reference
Appearance	Smooth, Uniform, grey paste	Visual
Flow, inches	0.2 maximum	MIL-S-8802
Extrusion Rate, grams/minute	90-250	MIL-S-8802
Tack Free Time, minutes	35-75	MIL-S-8802
Cure Time	7 days @ 75 - 90 and 45 - 55% R.H.	
Specific Gravity	1.450 - 1.515	
Durometer, Shore A	15 - 25	ASTM D 2240
Modulus @ 150%	54 maximum	ASTM D 412 Die C
Elongation, %	1200 minimum	ASTM D 412 Die C

b. Preformed Joint Sealants. The Contractor may use preformed Polychloroprene Elastomeric Joint Seals as approved by the Engineer and by the Construction Manager. Preformed joint sealers shall conform to the requirements of ASTM D 2628.

Each lot or batch of sealing compound shall be delivered to the jobsite in the manufacturer's original sealed container. Each container shall be marked with the manufacturer's name, batch or lot number, and the safe heating temperature and shall be accompanied by the manufacturer's certification stating that the compound meets the requirements of this specification.

Each lot of preformed joint sealer delivered to the jobsite shall be accompanied by the manufacturer's certification stating that it meets the requirements of this specification.

605-2.2 LUBRICANT. Lubricant for installation of preformed joint seal shall be a one-eomponent polychloroprene compound containing only soluble phenolic resins blended together with anti-oxidants and acid acceptors in aromatic hydrocarbon solvent mixture and shall meet the following requirements:

	Requirements	ASTM
Average Weight per Gallon pounds	7.8	
Solids Content, Percent by Weight	22-88	D1644, Method A
Film Strength, psi	2,300 min.	D412
Elongation, percent	750 min.	D412

Each shipment of lubricant shall be delivered to the jobsite in the manufacturer's original sealed container. Each container shall be marked with the manufacturer's name, batch or lot number, and the date of manufacture and shall be accompanied by the manufacturer's certification stating that the lubricant meets the requirements of the specification.

This lubricant shall be stored at a temperature between 50 F (10 C) and 80 F (30 C) and shall be used within 270 days of its manufacture.

CONSTRUCTION METHODS

605-3.1 TIME OF APPLICATION. Joints shall be sealed as soon after completion of the curing period as feasible and before the pavement is opened to traffic, including construction equipment. The pavement temperature shall be above 40 F (4 C) at the time of installation of the preformed joint seal and above 50 F (10 C) for the installation of poured joint sealing material.

605-3.2 PREPARATION OF JOINTS. Immediately before sealing, the joints shall be thoroughly cleaned of all laitance, curing compound, and other foreign material. Cleaning shall be accomplished by sandblasting. Upon completion of cleaning, the joints shall be blown out with compressed air. The joint faces shall be surface dry when the seal is applied.

Prior to resealing joints, the existing joint material shall be removed to the depth as shown on the plans. If joint sealer other than that originally used is specified, all existing joint sealer shall be removed.

The cleaning process shall include sandblasting of vertical sides of joint void.

605-3.3 INSTALLATION OF SEALANTS. Joints shall be inspected for proper width, depth, alignment, and preparation, and shall be approved by the Engineer before sealing is allowed. Sealants shall be installed in accordance with the following requirements:

a. Cold Applied Sealants. Cold applied joint sealing compound shall be applied by means of pressure equipment that will force the sealing material to the bottom of the joint and completely fill the joint without spilling the material on the surface of the pavement. A backing material shall be placed as shown on the plans and shall be nonadhesive to the concrete or the sealant material. Sealant which does not bond to the concrete surface of the joint walls, contains voids, or fails to set to a tack-free condition will be rejected and replaced by the Contractor at no additional cost. Before sealing the joints, the Contractor shall demonstrate that the equipment and procedures for preparing, mixing, and placing the sealant will produce a satisfactory joint seal. This shall include the preparation of two small batches and the application of the resulting material.

b. Preformed Elastomeric Joint Seals. Preformed joint sealer shall be placed using equipment capable of installing the sealer in the upright position, without cutting, nicking, distorting, or otherwise damaging the seal. Lubricant shall be applied to the concrete or the preformed seal, or both, and the seal shall be installed in a substantially compressed condition and at the depth below the surface of the pavement as shown in the plans. The method of installation shall be such that the joint sealer will not be stretched more than 5 percent of the minimum theoretical length, or compressed more than 2 percent. The method of installation shall be checked for stretching or compression, using transverse joint sealer. The check shall consist of installing sealer in five joints of at least 25 feet (7.5 m) in length, removing the sealer immediately after installation, and checking the length. This check may be modified by premarking or precutting the sealer to length prior to installation if this is compatible with the equipment being used. If the measured length of any of these five sealers indicated that the sealer is stretched or compressed beyond these limits, the installation shall be modified to correct the situation. Once satisfactory sealing operations have started, one joint length per every hundred shall be removed and checked. If the limits are exceeded, the joint sealers on either side should be removed until the condition disappears. The affected joints shall be resealed in a satisfactory manner at no cost to the owner, and the method of installation shall be checked again for satisfactory procedure. The seal shall be installed in the longest practicable lengths in longitudinal joints and shall be cut at the joint intersections for continuous installation of the seal in the transverse joints.

No joint sealer shall be installed until the cleaned joints have been inspected and approved by the Construction Manager. Sufficient joint sealer shall be placed into the joints so that upon completion of the work, the surface of the sealer in the joint shall be within 1/4 inch but below the level of the adjacent pavement surface, or at the elevation as directed by the Construction Manager. The Contractor shall "spot up" or refill all unsatisfactory joints before final acceptance. Any excess filler on the surface of the pavement shall be removed and the surface shall be left in a clean condition.
All joint sealant shall be installed using machines and equipment specially designed for joint sealing work and operated by skilled personnel experienced in joint sealing operations.

605-3.4 EQUIPMENT. All equipment necessary for the proper construction of this work shall be on the project and in first-class working condition. The equipment shall be as recommended by the manufacturer of the filler and approved by the Construction Manager before construction is permitted to start.

The equipment for cleaning joint openings shall consist of such plows, powered and hand brooms or wire brushes, air compressors, sand blasters, and, if necessary, joint cleaning and grooving machines as are necessary to produce a satisfactory clean and dry joint. Similar equipment shall be provided for cleaning joints previously sealed.

Any sand blasting, shot blasting or similar equipment shall be equipped with a system for recovering blasting material and laitance removed by the blasting operation, which is acceptable to the Engineer.

605-3.5 WARRANTY. The Contractor must provide a manufacturer's written guarantee on all joint sealing materials. As such, the Contractor agrees to provide, free of charge to the owner, any replacement material required in case of failure. Further, the contractor shall provide a warranty on all sealed joints. As such, the Contractor agrees to provide, free of charge to the Owner, all materials, equipment, and labor required to replace any joints which fail for any reason. Both warranties shall be for one (1) year after final acceptance of completed work.

The Contractor shall ensure a manufacturer's representative is present at the site of the work at the beginning of sealing operations to demonstrate the proper technique to the Contractor and the Engineer.

METHOD OF MEASUREMENT

605-4.1 No direct measurement or payment will be made for the work to be done under this item, but all costs in connection therewith shall be considered subsidiary to the bid item "Portland Cement Concrete Pavements".

BASIS OF PAYMENT

605-5.1 No separate payment will be made for joint sealing filler. The cost of sealing will be included in the bid items of Portland Cement Concrete Pavement.

TESTING REQUIREMENTS

ASTM D 412	Tests for Rubber Properties in Tension
ASTM D 1644	Tests for Nonvolatile Content of Varnishes

MATERIAL REQUIREMENTS

ASTM D 1854	Jet-Fuel-Resistant Concrete Joint Sealer, Hot-Poured Elastic Type
ASTM D 2628	Preformed Polychloroprene Elastomeric Joint Seals for Concrete Pavements
ASTM D 3405	Joint Sealants, Hot-Poured, for Concrete and Asphalt Pavements
ASTM D 3406	Joint Sealants, Hot-Poured, Elastomeric-Type, for Portland Cement Concrete Pavements
ASTM D 3569	Joint Sealant, Hot-Poured, Elastomeric, Jet-Fuel-Resistant Type, for Portland Cement Concrete Pavements
ASTM D 3581	Joint Sealant, Hot-Poured, Jet-Fuel-Resistant Type, for Portland Cement Concrete and Tar-Concrete Pavements
Fed. Spec. SS-S-200	Sealing Compounds, Two Component, Elastomeric, Polymer Type, Jet-Fuel Resistant, Cold Applied

END OF ITEM