

ATKINS
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REVISIONS		
NO.	DESCRIPTION	DATE BY

WILLIAM P. HOBBY AIRPORT / HOUSTON (HOU)
METRO BUS DRIVE LANE RECONSTRUCTION
COVER SHEET

PROJECT MGR:	JLV
DESIGNER:	EW
DRAWN BY:	KJV
CHECK BY:	RE
SCALE:	
DATE:	06/29/2020



APPROVED BY:	
DIRECTOR HOUSTON AIRPORT SYSTEM	
PROJECT NO.	100068156
A.I.P. NO.	
C.I.P. NO.	
H.A.S. NO.	236
SHEET NO.	

G-001



MAYOR
 SYLVESTER TURNER

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PLANS FOR CONSTRUCTION
 OF
METRO BUS DRIVE LANE RECONSTRUCTION
 AT
WILLIAM P. HOBBY AIRPORT (HOU) / HOUSTON

PROJECT NO. 236
 TIP-20-101-HOU

PREPARED BY



JUNE 29, 2020
 100% SUBMITTAL

WILLIAM P. HOBBY AIRPORT (HOU) BUS LANE RECONSTRUCTION

Table with 3 columns: NO., NAME, SHEET TITLE. Lists sheets 1-50 including Cover Sheet, Index of Drawings, General Notes, Safety and Security Notes, Overall Project Site Plan, Phasing Plans (Phases 1, 2, 3, 4, 5), Civil Demolition Plans, Pavement and Marking Plans, and Typical Pavement Details.

Table with 3 columns: NO., NAME, SHEET TITLE. Lists sheets 51-59 including Typical Pavement Details, SWPPP Plans, Electrical Plans, and Electrical Details.

PROJECT SCOPE:

THE WILLIAM P. HOBBY AIRPORT BUS LANE RECONSTRUCTION PROJECT CONSISTS OF THE FOLLOWING MAJOR WORK ELEMENTS:

- 1. REHABILITATION OF CONCRETE PAVEMENT IN BUS LANE WHILE KEEPING ONE LANE TRAFFIC OPEN DURING CONSTRUCTION.
2. REPLACEMENT OF IN-PAVEMENT LIGHTS AND ASSOCIATED ELECTRICAL CONDUIT & CONDUCTORS.
3. CROSSWALK STRIPING AND ASSIGN SIGNAGE AND ADA RAMP REPAIR IF NEEDED.
4. REHABILITATION OF CONCRETE PAVEMENT SLABS AROUND HOBBY AIRPORT LOOP WHILE KEEPING AT LEAST ONE LANE OF TRAFFIC OPEN DURING CONSTRUCTION.

ABBREVIATIONS:

- BP BASE POINT
EB EASTBOUND
EP END POINT
HAS HOUSTON AIRPORT SYSTEM
HOU WILLIAM P. HOBBY AIRPORT
OH OVERHEAD
PC POINT OF CURVATURE
PCC POINT OF COMPOUND CURVATURE
PIP PROTECT IN PLACE
PT POINT OF TANGENCY
RD ROAD
SB SOUTHBOUND
TYP TYPICAL
WB WESTBOUND

METRO BUS DRIVE LANES RECONSTRUCTION SUMMARY OF BID QUANTITIES

Table with 6 columns: Item No., CoH Section Number, Spec. Number, Description, Unit, Estimated Quantities. Lists 22 items including Mobilization, Concrete Removal, Pavement, and Markings.

Alternative: Removal/Reconstruction of Planter/Curbs



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Table with 3 columns: NO., DESCRIPTION, DATE BY. Revisions section.

WILLIAM P. HOBBY AIRPORT / HOUSTON (HOU) METRO BUS DRIVE LANE RECONSTRUCTION INDEX OF DRAWINGS

Table with 2 columns: PROJECT MGR., DESIGNER, DRAWN BY, CHECK BY, SCALE, DATE. Values: JLJV, EW, KJV, RE, 06/29/2020.



Table with 2 columns: APPROVED BY, PROJECT NO., I.P. NO., C.I.P. NO., H.A.S. NO., SHEET NO. Values: 100068156, 236, G-002.

HAS FILE: PLOT DATE:

GENERAL NOTES

1. THE EXISTING CONDITIONS ILLUSTRATED WITHIN THESE PROJECT PLANS ARE DEVELOPED FROM AS-BUILT INFORMATION SUPPLEMENTED BY A PROJECT SITE VISIT. THE DESIGNER DOES NOT WARRANT THESE EXISTING CONDITIONS INFORMATION AS ALL-INCLUSIVE OR EXACT BUT RATHER AS THE BEST AVAILABLE KNOWLEDGE TRANSFER AT THE TIME OF PROJECT DEVELOPMENT.
2. THE CONTRACTOR SHALL FIELD VERIFY EXISTING CONDITIONS PRIOR TO COMMENCING WORK. SHOULD THE CONTRACTOR DISCOVER ANY CONDITIONS NOT REFLECTED WITHIN THE PROJECT DOCUMENTS, HE SHALL NOTIFY THE ENGINEER OF RECORD IMMEDIATELY.
3. THE PROJECT PAY ITEMS PROVIDED SHALL BE INCLUSIVE OF ALL WORK TO BE PERFORMED AS SHOWN IN THESE PROJECT PLANS. WORK NOT IDENTIFIED WITH A SPECIFIC PAY ITEMS SHALL BE INCLUDED IN THE COST OF THE PROJECT PAY ITEMS OF WHICH IT IS A COMPONENT.
4. THE LOCATION FOR THE CONTRACTOR'S STAGING AREA IS INDICATED ON THE PLANS. THE CONTRACTOR IS RESPONSIBLE FOR SECURING ALL UTILITY CONNECTIONS AND SERVICE TO AND WITHIN THE STAGING AREA AS MAY BE NECESSARY. THE CONTRACTOR SHALL PROVIDE SECURITY FENCING AROUND THE STAGING AREA(S). THE CONTRACTOR SHALL RESTORE THE STAGING AREA UPON PROJECT COMPLETION, INCLUDING REPAIR OF EXISTING FACILITIES, REMOVAL OF INSTALLED UTILITIES, REGRADING, TOP SOILING AND RESEEDING, COMPLETE AND TO THE SATISFACTION OF THE ENGINEER AND AIRPORT MANAGER. THE WORK ASSOCIATED WITH ESTABLISHING, MAINTAINING, DEMOBILIZING AND RESTORING THE CONTRACTOR'S STAGING AREA IS NOT MEASURED FOR SEPARATE PAYMENT.
5. ACCESS TO THE PROJECT SITE TO/FROM THE STAGING AREA SHALL BE AS SHOWN ON THE PROJECT PLANS.
6. THE CONTRACTOR SHALL SECURE MATERIALS STOCKPILED WITHIN THE CONSTRUCTION AREA TO PREVENT ITS MOVEMENT OR EROSION RESULTING FROM WIND CONDITION AND/OR RAINFALL. THE CONTRACTOR IS RESPONSIBLE FOR THE IMMEDIATE CLEANUP OF ANY DEBRIS ON PAVEMENTS WITHIN THE PROJECT WORK AREA. THE CONTRACTOR SHALL SWEEP AND/OR VACUUM ALL ACTIVE PAVEMENT AREAS AFFECTED BY THE WORK ON A DAILY BASIS. IN ADDITION, THE CONTRACTOR SHALL SWEEP/CLEAN PAVED ROADWAYS ALONG THE PROJECT HAUL ROUTES AND IMMEDIATELY CLEAN UP MUD FALLING ON ANY PAVEMENTS OUTSIDE OF THE LIMITS OF CONSTRUCTION OR RESULTING FROM HIS HAULING ACTIVITIES.
7. THE CONTRACTOR SHALL COMPLY WITH ALL LOCAL, STATE AND FEDERAL LAWS AND REGULATIONS THAT ARE PERTINENT TO THIS WORK. IT IS THE CONTRACTOR'S RESPONSIBILITY TO OBTAIN, MAINTAIN AND PAY ALL COSTS ASSOCIATED WITH ANY PERMITS AND LICENSES REQUIRED TO ACCOMPLISH THE WORK. THESE COSTS ARE INCIDENTAL TO THE WORK AND WILL NOT BE PAID FOR SEPARATELY.
8. MATERIAL PRODUCED AS A RESULT OF THE CONTRACTOR'S OPERATIONS THAT ARE NOT OTHERWISE USEABLE BY THE AIRPORT SHALL BE DISPOSED OF OFF AIRPORT PROPERTY IN ACCORDANCE WITH FEDERAL, STATE AND LOCAL REGULATIONS. THE WILL BE NO SEPARATE PAY ITEM FOR WASTE MATERIAL DISPOSAL.
9. MECHANICAL SWEEPER AND VACUUM TRUCK SHALL BE ON-SITE AT ALL TIMES TO CLEAN ANY DEBRIS OFF THE ROADWAY PAVEMENTS FOR THE DURATION OF ALL CONSTRUCTION ACTIVITIES.
10. CONTRACTOR SHALL OBTAIN ALL REQUIRED PERMITS FOR THE CONSTRUCTION OF THE PROJECT.
11. CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATION OF ACTIVITIES WITH THE APPROPRIATE ENTITY, INCLUDING BUT NOT LIMITED TO HAS, CITY OF HOUSTON, AND CENTERPOINT.

HOBBY OPERATIONS: 713-845-6555
HAS PROJECT ENGINEER (DAVID LESLIE): 281-233-1774
CENTERPOINT: 713-207-1111
12. CONTRACTOR SHALL REFER TO CONSTRUCTION SAFETY AND ACCESS PLAN FOR TEMPORARY SAFETY ITEMS AND OTHER INFORMATION NECESSARY TO COMPLETE THE PROJECT.
13. ALL VEHICLES AND EQUIPMENT IN THE WORK SITE MUST HAVE COMPANY IDENTIFICATION ON BOTH SIDES.
14. NO UNATTENDED VEHICLES IN THE WORK ZONE AFTER HOURS.
15. ALL OTHER EQUIPMENT THAT IS NOT A VEHICLE MUST BE IDENTIFIED WITH COMPANY MARKINGS AND BE LOCKED/SECURED WHEN NOT IN WORK HOURS.
16. EQUIPMENT, MATERIALS, AND STORED ITEMS AT THE WORK SITE MAY BE SUBJECT TO VISUAL AND K-8 INSPECTIONS.
17. ALL SIGNAGE PLACEMENT NEEDS TO BE COORDINATED WITH HOU PM AND HOU LANDSIDE OPS PRIOR TO BEING PLACED.

PHASING NOTES

1. THE GENERAL INTENT OF THE CONSTRUCTION PHASING IS TO MINIMIZE THE CLOSURE OF ROADWAYS, REDUCE CONSTRUCTION DURATION AND DECREASE DISRUPTIONS TO THE AIRPORT OPERATIONS. IN ORDER TO ACCOMPLISH DRAWINGS, MATERIAL AND EQUIPMENT BE PROCURED PRIOR TO COMMENCEMENT OF CONSTRUCTION ACTIVITIES.
2. PROCUREMENT PHASE (PHASE 0): PRIOR TO COMMENCEMENT OF PHASE 1 CONSTRUCTION, THERE WILL BE A PROCUREMENT PHASE. WITHIN THE PROCUREMENT PHASE THE CONTRACTOR SHALL SUBMIT ALL SHOP DRAWINGS REQUIRED BY THE SPECIFICATIONS SUCH THAT ALL SUBMITTALS CAN BE APPROVED PRIOR TO COMMENCEMENT OF HIS EROSION CONTROL DEVICES (SWPPP); ESTABLISHING HIS ACCESS/HAUL ROUTES. ESTABLISHING HIS STAGING AREA; INSTALL AND HAVE INSPECTED ALL TRAFFIC CONTROL DEVICES; CONSTRUCT HAUL ROAD.
 - A. SWPPP: PRIOR TO THE START OF CONSTRUCTION PHASE 1, THE CONTRACTOR WILL INSTALL AND HAVE INSPECTED ALL THE EROSION CONTROL DEVICES FOR THE ENTIRE PROJECT AS OUTLINED ON THE SWPPP PLANS.
 - B. TRAFFIC CONTROL: ONLY THE CONSTRUCTION LIMITS, AS DEPICTED ON THE CONSTRUCTION SAFETY AND PHASING PLANS, FOR A PHASE WILL BE CLOSED TO TRAFFIC. ALL OTHER ROADWAYS WILL REMAIN OPEN TO AIR TRAFFIC DURING CONSTRUCTION.
 - C. CONSTRUCTION PHASES: THERE ARE 5 CONSTRUCTION PHASES IN THIS PROJECT. EACH CONSTRUCTION PHASE WILL COMMENCE WITH THE INSTALLATION OF SAFETY BARRICADES AND TEMPORARY SIGNAGE AS IDENTIFIED ON THE CONSTRUCTION SAFETY AND PHASING PLANS.
 - D. MECHANICAL SWEEPER SHALL BE ON-SITE AT ALL TIMES TO CLEAN ANY DEBRIS OFF THE ROADWAY PAVEMENTS FOR THE DURATION OF ALL CONSTRUCTION ACTIVITIES.
3. ALL CONTRACTOR VEHICLES AND TRAFFIC SHALL REMAIN WITHIN THE LIMITS OF THE CONSTRUCTION AREA, STAGING AREA, OR HAUL ROUTES UNLESS OTHERWISE DIRECTED BY THE HOUSTON AIRPORT SYSTEM (HAS). OPERATIONS.

EROSION AND SEDIMENT CONTROL NOTES

1. EROSION CONTROLS SHALL BE IN ACCORDANCE WITH THE STORM WATER POLLUTION PREVENTION PLAN DRAWINGS.
2. PROVIDE AND MAINTAIN SILT FENCE AROUND THE SITE ACCESS FOR EROSION CONTROL.
3. CONTRACTOR SHALL INSTALL ALL EROSION AND SEDIMENT CONTROL MEASURES PRIOR TO DEMOLITION ACTIVITIES.
4. DEMOLITION ACTIVITIES SHALL NOT START UNTIL THE EROSION AND SEDIMENT CONTROL MEASURE HAVE BEEN ACCEPTED.
5. CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTENANCE OF ALL EROSION AND SEDIMENT CONTROL MEASURES REQUIRED.
6. CONTRACTOR SHALL NOT INITIATE CONSTRUCTION UNLESS APPROVED BY RESIDENT ENGINEER.
7. NO AREA SHALL BE LEFT UNSTABILIZED OVERNIGHT UNLESS RUNOFF IS DIRECTED TO AN APPROVED SEDIMENT CONTROL DEVICE.
8. SEE SHEET CG101 TO CG201 FOR EROSION AND SEDIMENT CONTROL NOTES AND DETAILS.



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REVISIONS

NO.	DESCRIPTION	DATE BY

WILLIAM P. HOBBY AIRPORT / HOUSTON (HOU)

METRO BUS DRIVE LANE RECONSTRUCTION

GENERAL NOTES

PROJECT MGR:	JLV
DESIGNER:	EW
DRAWN BY:	KJV
CHECK BY:	RE
SCALE:	
DATE:	06/29/2020



APPROVED BY:

DIRECTOR
HOUSTON AIRPORT SYSTEM

PROJECT NO.	100068156
A.I.P. NO.	
C.I.P. NO.	
H.A.S. NO.	236
SHEET NO.	

G-003

HAS FILE:
PLOT DATE:

SECURITY REQUIREMENTS

1. GENERAL INTENT: IT IS INTENDED THAT THE CONTRACTOR SHALL COMPLY WITH ALL REQUIREMENTS OF THE AIRPORT SECURITY PLAN AND WITH THE SECURITY REQUIREMENTS SPECIFIED HEREIN BY HOUSTON AIRPORT SYSTEM (HAS) OPERATIONS. THE CONTRACTOR SHALL DESIGNATE TO THE ENGINEER AND AIRPORT OPERATIONS, IN WRITING, THE NAME OF HIS "CONTRACTOR SECURITY AND SAFETY OFFICER (CSSO)." THE CSSO SHALL REPRESENT THE CONTRACTOR ON THE SECURITY REQUIREMENTS FOR THE CONTRACT.
2. CONTRACTOR PERSONNEL SECURITY ORIENTATION: THE CSSO SHALL BE RESPONSIBLE FOR BRIEFING ALL CONTRACTOR PERSONNEL ON SECURITY REQUIREMENTS. ALL CONTRACTOR EMPLOYEES SHALL BE BRIEFED ON SECURITY REQUIREMENTS PRIOR TO WORKING IN THE CONSTRUCTION AREA.
3. ACCESS TO THE SITE: CONTRACTOR'S ACCESS TO THE SITE SHALL BE AS SHOWN ON THE PLANS. NO OTHER ACCESS POINTS SHALL BE ALLOWED UNLESS APPROVED BY AIRPORT OPERATIONS. ALL CONTRACTOR TRAFFIC AUTHORIZED TO ENTER THE SITE SHALL BE EXPERIENCED IN THE ROUTE OR GUIDED BY CONTRACTOR PERSONNEL. THE CONTRACTOR SHALL BE RESPONSIBLE FOR TRAFFIC CONTROL TO AND FROM THE VARIOUS CONSTRUCTION AREAS ON THE SITE, AND FOR THE OPERATION AND SECURITY OF THE ACCESS GATE TO THE SITE. A CONTRACTOR'S FLAGMAN OR TRAFFIC CONTROL PERSON SHALL MONITOR AND COORDINATE ALL CONTRACTOR TRAFFIC AT THE ACCESS GATE WITH SECURITY. THE CONTRACTOR SHALL NOT PERMIT ANY UNAUTHORIZED CONSTRUCTION PERSONNEL OR TRAFFIC ON THE SITE. ACCESS GATES TO THE SITE SHALL BE LOCKED AND SECURED AT ALL TIMES WHEN NOT ATTENDED BY THE CONTRACTOR. IF THE CONTRACTOR CHOOSES TO LEAVE ANY ACCESS GATE OPEN, IT SHALL BE ATTENDED BY THE CONTRACTOR PERSONNEL WHO ARE FAMILIAR WITH THE REQUIREMENTS OF THE AIRPORT OPERATIONS SECURITY PROGRAM. THE CONTRACTOR IS RESPONSIBLE FOR THE IMMEDIATE CLEANUP OF ANY DEBRIS DEPOSITED ALONG THE ACCESS ROUTE AS A RESULT OF HIS CONSTRUCTION TRAFFIC. DIRECTIONAL SIGNING FROM THE ACCESS GATE ALONG THE DELIVERY ROUTE TO THE STORAGE AREA, PLANT SITE OR WORK SITE SHALL BE AS DIRECTED BY AIRPORT OPERATIONS.
4. MATERIALS DELIVERY TO THE SITE: ALL CONTRACTOR'S MATERIAL ORDERS FOR DELIVERY TO THE WORK SITE WILL USE A DELIVERY ADDRESS, THE STREET NAME ASSIGNED TO THE ACCESS POINT AT THE CONTRACTOR'S STAGING SITE. THE NAME "WILLIAM P. HOBBY AIRPORT" SHALL NOT BE USED IN THE DELIVERY ADDRESS AT ANY TIME. HAS WILL NOT BE RESPONSIBLE FOR ACCEPTING OR DIRECTING CONTRACTOR MATERIAL DELIVERIES. CONSTRUCTION ACCESS SHALL BE ONLY VIA DESIGNATED ROUTING AND LOCATIONS.
5. CONSTRUCTION AREA LIMITS: FOR THE LIMITS OF CONSTRUCTION, THE CONTRACTOR SHALL ERECT AND MAINTAIN AROUND THE PERIMETER OF THESE AREAS, SUITABLE FENCING, MARKING AND/OR WARNING DEVICES VISIBLE FOR DAY/NIGHT USE. TEMPORARY BARRICADES, FLAGGING AND FLASHING WARNING LIGHTS, WILL BE REQUIRED AT CRITICAL ACCESS POINTS. TYPE OF MARKING AND WARNING DEVICES SHALL BE APPROVED BY AIRPORT OPERATIONS.

AIRPORT SAFETY REQUIREMENTS

1. THE CONTRACTOR SHALL CONDUCT THE CONSTRUCTION ACTIVITIES TO CONFORM TO ALL ROUTINE EMERGENCY REQUIREMENTS AND GUIDELINES ON SAFETY.
2. STOCKPILE EROSION AND DUST CONTROL – STOCKPILED MATERIAL AND OPEN EXCAVATIONS SHALL BE TREATED IN SUCH A MANNER AS TO PREVENT MOVEMENT RESULTING FROM WIND CONDITIONS IN EXCESS OF 10 KNOTS.
3. PRIOR TO OPENING FOR PUBLIC TRANSIT USE, THE OWNER'S AUTHORIZED REPRESENTATIVE WILL ARRANGE FOR INSPECTION BY HAS OPERATIONS OF ANY PAVEMENT THAT HAS BEEN CLOSED FOR WORK, OR THAT HAS BEEN USED FOR A CROSSING POINT OR HAUL ROUTE BY THE CONTRACTOR. THIS AREA MUST COMPLY WITH THE SAFETY REQUIREMENTS, AND INTERPRETED BY THE DESIGNATED OPERATION'S INSPECTOR, BEFORE PERMISSION FOR THE CONTRACTOR'S WORK CREWS TO DEPART WILL BE GRANTED.
4. THE CONTRACTOR SHALL SUBMIT A DESTRUCTIVE/INCLEMENT WEATHER PLAN TO SET FORTH GENERAL GUIDANCE AND INFORMATION FOR THE CONTRACTOR TO COORDINATE PREPAREDNESS PLANS WHEN DESTRUCTIVE WEATHER THREATENS THE WILLIAM P. HOBBY AIRPORT.
5. MATERIALS STORED OR STOCKPILED ON THE SITE SHALL BE SO PLACED, AND THE WORK SHALL, AT ALL TIMES, BE SO CONDUCTED AS TO CAUSE NO GREATER OBSTRUCTION TO THE TRAFFIC THAN IS CONSIDERED NECESSARY BY THE OWNER'S REPRESENTATIVE.
6. THE CONTRACTOR SHALL CONFINE HIS/HER PERSONNEL, EQUIPMENT, OPERATIONS AND TRAVEL, TO THE AREA WITHIN THE DEFINED WORK LIMITS SHOWN ON THE PLANS.
7. THE CONTRACTOR SHALL INFORM ALL CONSTRUCTION PERSONNEL AS TO THE PROPER ROUTES, SPEEDS, AND PROCEDURES, FOR TRANSPORTING EQUIPMENT AND MATERIALS TO THE CONSTRUCTION SITE. DELIVERIES SHALL BE AS SHOWN IN THE PLANS.

8. MEASURES SHALL BE ADOPTED TO PREVENT POTENTIAL POLLUTANTS FROM ENTERING ANY DRAINAGE SYSTEM OR WATERWAY. MATERIALS AND DEBRIS SHALL NOT BE STORED IN THE WORK AREA IN A MANNER THAT WOULD ALLOW THEM TO ENTER THE DRAINAGE SYSTEM AS A RESULT OF SPILLAGE, NATURAL RUNOFF OR FLOODING. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO IMMEDIATELY NOTIFY THE SPONSOR SHOULD THERE BE A SPILLAGE OF MATERIAL WHICH MIGHT CONTAMINATE THE DRAINAGE SYSTEM. IT SHALL ALSO BE THE CONTRACTOR'S RESPONSIBILITY TO REMOVE AND CLEAR UP SUCH SPILLAGE IN A MANNER ACCEPTABLE TO THE SPONSOR. MATERIAL SHALL BE SECURED SO THAT IT WILL NOT BE BLOWN BY THE WIND ONTO THE ADJACENT ROADWAYS.
9. SPECIAL ATTENTION TO DUST CONTROL WILL BE REQUIRED WHEN EARTHWORK OR HAULING OPERATIONS ARE IN PROGRESS OR WHEN WIND AND WEATHER CONDITIONS CAUSE EXCESSIVE BLOWING OF DUST. IN THIS REGARD, THE CONTRACTOR SHALL APPLY WATER TO THE AFFECTED SITES AS DIRECTED.
10. THE CONTRACTOR SHALL SUBMIT A SAFETY AND SECURITY PLAN TO THE HAS PROJECT MANAGER FOR REVIEW AND APPROVAL BY THE AIRPORT PRIOR TO CONSTRUCTION COMMENCING.
11. IT IS THE CONTRACTOR'S RESPONSIBILITY TO SEE THAT ALL SHEETING, SHORING AND BRACING IS DONE IN ACCORDANCE WITH CURRENT O.S.H.A REGULATIONS AND REQUIREMENTS. SHEETING, SHORING AND BRACING (EXCEPT TRENCH SAFETY), IS CONSIDERED TO BE AS AN INCIDENTAL PART OF THE WORK AND NO SEPARATE PAYMENT WILL BE ALLOWED.

UTILITY NOTES

3. THE CONTRACTOR SHALL NOTIFY ALL UTILITY COMPANIES INVOLVED, A MINIMUM OF 72 HOURS IN ADVANCE OF ANY EXCAVATION OR BORINGS, TO HAVE THEIR UTILITIES LOCATED AND MARKED IN THE FIELD.
 - A. THE CONTRACTOR SHALL CONTACT TEXAS ONE CALL (811) AND THE FOLLOWING LOCAL UTILITY OWNERS (LIST NOT INCLUSIVE OF ALL POTENTIAL UTILITY OWNERS) TO VERIFY ALL UNDERGROUND UTILITY LOCATIONS IN THE VICINITY OF THE PROPOSED WORK:

CABLE OWNER	CONTACT PERSON	PHONE NUMBER
HOUSTON AIRPORT SYSTEM OPERATIONS	713-845-6555	
CENTERPOINT ENERGY SYSTEM	UTILITY COORDINATION	713-207-1111
 - B. ALL UNDERGROUND UTILITIES SHALL THEN BE LOCATED BY THE CONTRACTOR TO VERIFY LOCATION AND ELEVATION PRIOR TO COMMENCING CONSTRUCTION OPERATIONS.
 - C. THE CONTRACTOR SHALL COORDINATE WITH THE RESPECTIVE UTILITY OWNER IF A UTILITY INSPECTOR MUST BE ON SITE WHEN LOCATING OR EXCAVATING NEAR UTILITIES.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR SETTING UP HIS/HER OWN WATER SOURCES WITH THE CITY. ALL CONSTRUCTION WATER WILL BE METERED BY THE CITY-OWNED METERS AND ONLY THOSE METERS. THE CONTRACTOR WILL BE RESPONSIBLE FOR PAYING ALL RELATED FEES TO THE CITY.
3. THE CONTRACTOR SHALL TAKE ALL STEPS TO PROTECT ALL COMMERCIAL AND AIRPORT UTILITIES DURING CONSTRUCTION IN ORDER TO ENSURE CONTINUOUS OPERATION WHEN NEEDED. THE CONTRACTOR SHALL, AT HIS/HER OWN EXPENSE, MAINTAIN IN PROPER WORKING ORDER AND WITHOUT INTERRUPTION OF SERVICE ALL EXISTING UTILITIES AND SERVICES WHICH MAY BE ENCOUNTERED IN THE WORK. WITH THE CONSENT OF THE OWNER'S REPRESENTATIVE, ENGINEER, AND/OR UTILITY OWNER, AS APPROPRIATE, SUCH SERVICE CONNECTIONS MAY BE TEMPORARILY INTERRUPTED TO PERMIT THE CONTRACTOR TO REMOVE DESIGNATED LINES OR TO MAKE TEMPORARY CHANGES IN THE LOCATIONS OF SERVICES. THE COST OF MAKING CHANGES SHALL BE AT THE CONTRACTOR'S EXPENSE, UNLESS OTHERWISE NOTED IN THE PLANS OR SPECIFICATIONS.
4. ALL DAMAGED UTILITIES SHALL BE REPAIRED EXPEDITIOUSLY AT NO ADDITIONAL EXPENSE TO THE OWNER.
5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING INSPECTIONS, AS NECESSARY, OF ANY UTILITY WORK BY THE UTILITY OWNER THROUGHOUT THE PROJECT. THIS SHALL BE CONSIDERED SUBSIDIARY TO THE VARIOUS BID ITEMS OF THE PROJECT.



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WILLIAM P. HOBBY AIRPORT / HOUSTON (HOU)

**METRO BUS DRIVE LANE RECONSTRUCTION
SAFETY AND SECURITY NOTES**

PROJECT MGR:	JLV
DESIGNER:	EW
DRAWN BY:	KJV
CHECK BY:	RE
SCALE:	
DATE:	06/29/2020



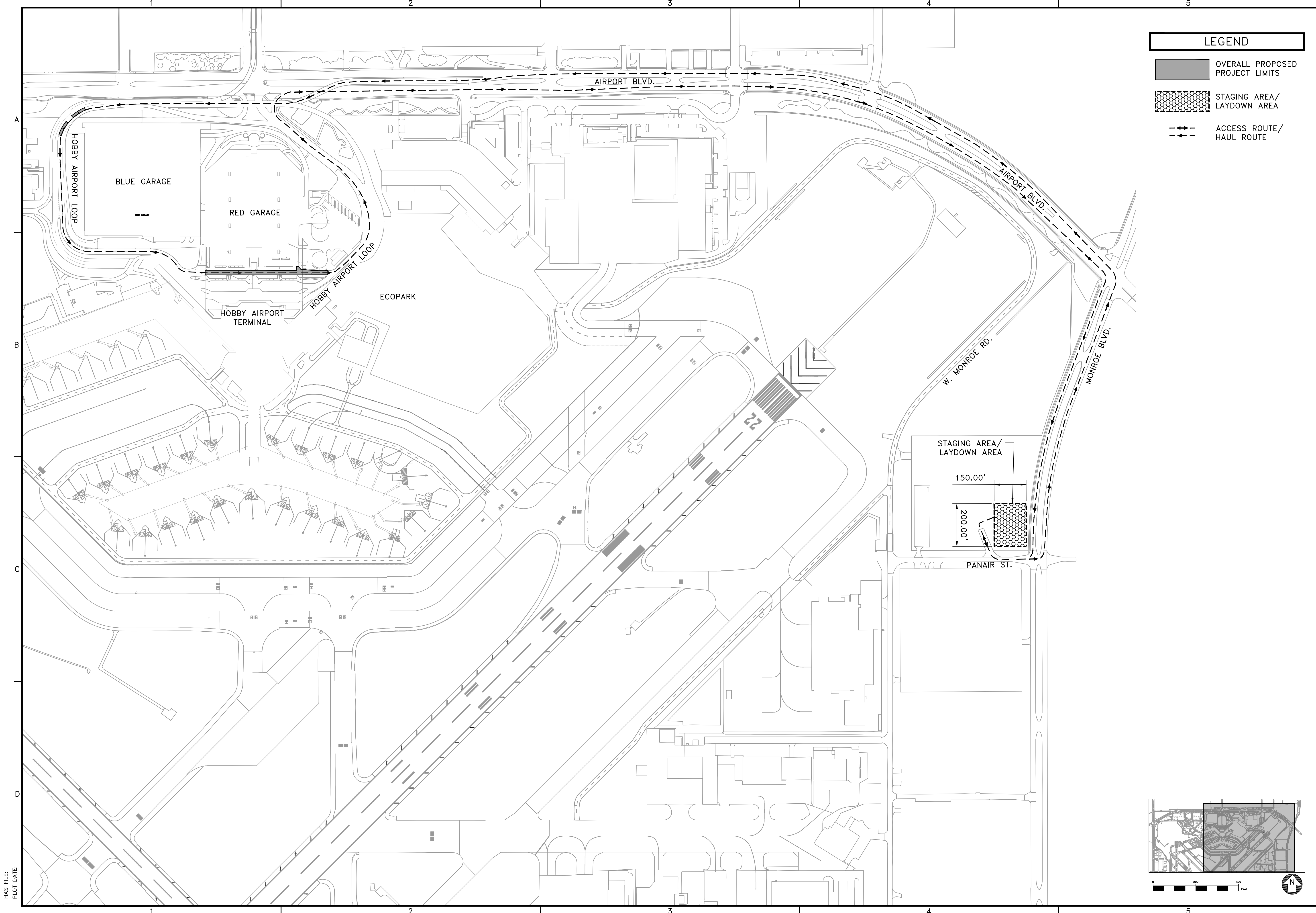
APPROVED BY:

DIRECTOR
HOUSTON AIRPORT SYSTEM

PROJECT NO.	100068156
A.I.P. NO.	
C.I.P. NO.	
H.A.S. NO.	236
SHEET NO.	

G-004

HAS FILE:
PLOT DATE:



LEGEND

- OVERALL PROPOSED PROJECT LIMITS
- STAGING AREA/LAYDOWN AREA
- ACCESS ROUTE/HAUL ROUTE

Houston Airport System
 WILLIAM P. HOBBY AIRPORT / HOUSTON, TX

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NO.	DESCRIPTION	DATE BY

WILLIAM P. HOBBY AIRPORT / HOUSTON (HOU)
METRO BUS DRIVE LANE RECONSTRUCTION
OVERALL PROJECT SITE PLAN
AND ACCESS PLAN

PROJECT MGR:	JLV
DESIGNER:	EW
DRAWN BY:	KJV
CHECK BY:	RE
SCALE:	
DATE:	06/29/2020



APPROVED BY: _____

DIRECTOR
 HOUSTON AIRPORT SYSTEM

PROJECT NO.
 100068156

A.I.P. NO. _____

C.I.P. NO. _____

H.A.S. NO.
 236

SHEET NO.

HAS FILE:
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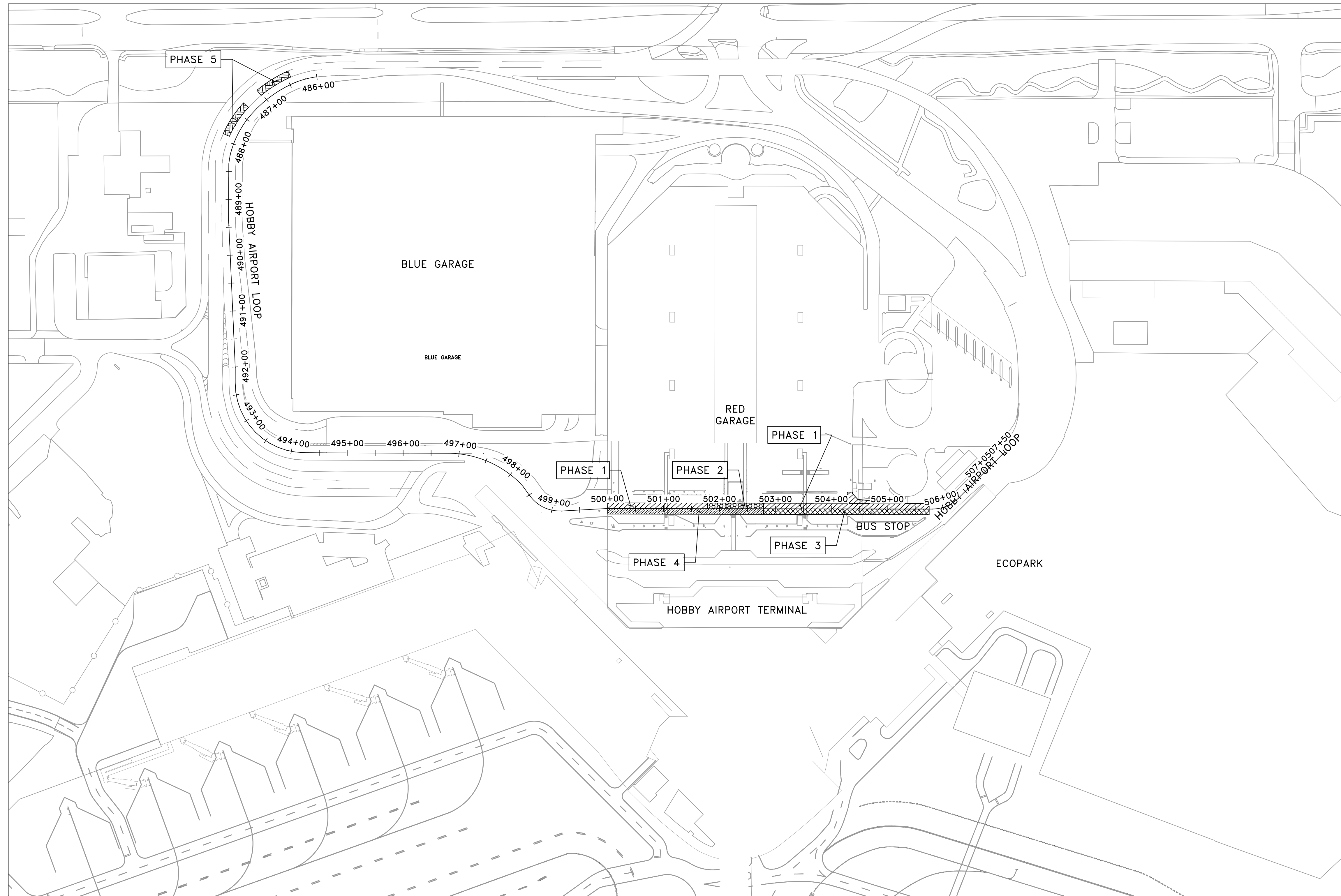
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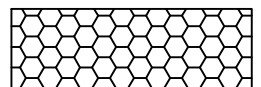



B

C

D



LEGEND

-  PHASE 1
-  PHASE 2
-  PHASE 3
-  PHASE 4
-  PHASE 5

REVISIONS

NO.	DESCRIPTION	DATE	BY

**WILLIAM P. HOBBY AIRPORT / HOUSTON (HOU)
 METRO BUS DRIVE LANE RECONSTRUCTION
 OVERALL PHASING PLAN**

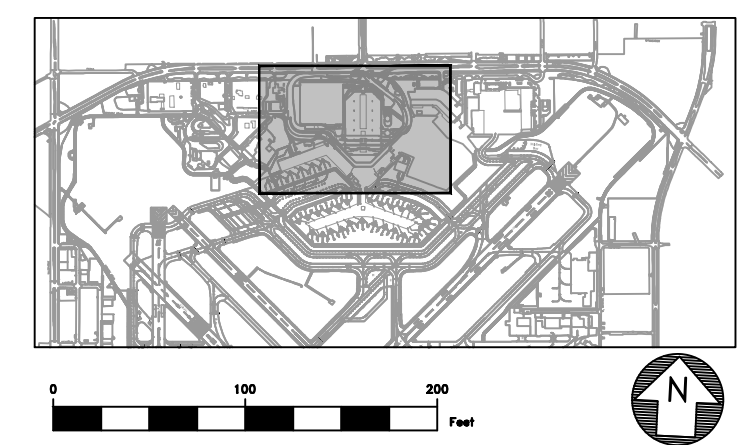
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APPROVED BY: _____
 DIRECTOR
 HOUSTON AIRPORT SYSTEM

PROJECT NO. 100068156
 A.I.P. NO. _____
 C.I.P. NO. _____
 H.A.S. NO. 236
 SHEET NO. _____

Major Work Item	Construction Time Allowable - Total: 93 Calendar Days																																																																																												
	Phase 1									Phase 2									Phase 3									Phase 4									Phase 5																																																								
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93
Mobilization	[Blue bar]																																																																																												
Install and Maintain TCP	[Blue bar]																																																																																												
Concrete Removal	[Blue bar]																																																																																												
Removing Stabilized Base	[Blue bar]																																																																																												
Lime Treated Stab. Base Construction	[Green bar]																																																																																												
Concrete Pavement Construction	[Green bar]																																																																																												
Electrical Installation	[Red bar]																																																																																												
Pavement Marking Installation	[Red bar]																																																																																												
Demobilization	[Blue bar]																																																																																												



HAS FILE:
 PLOT DATE:

1

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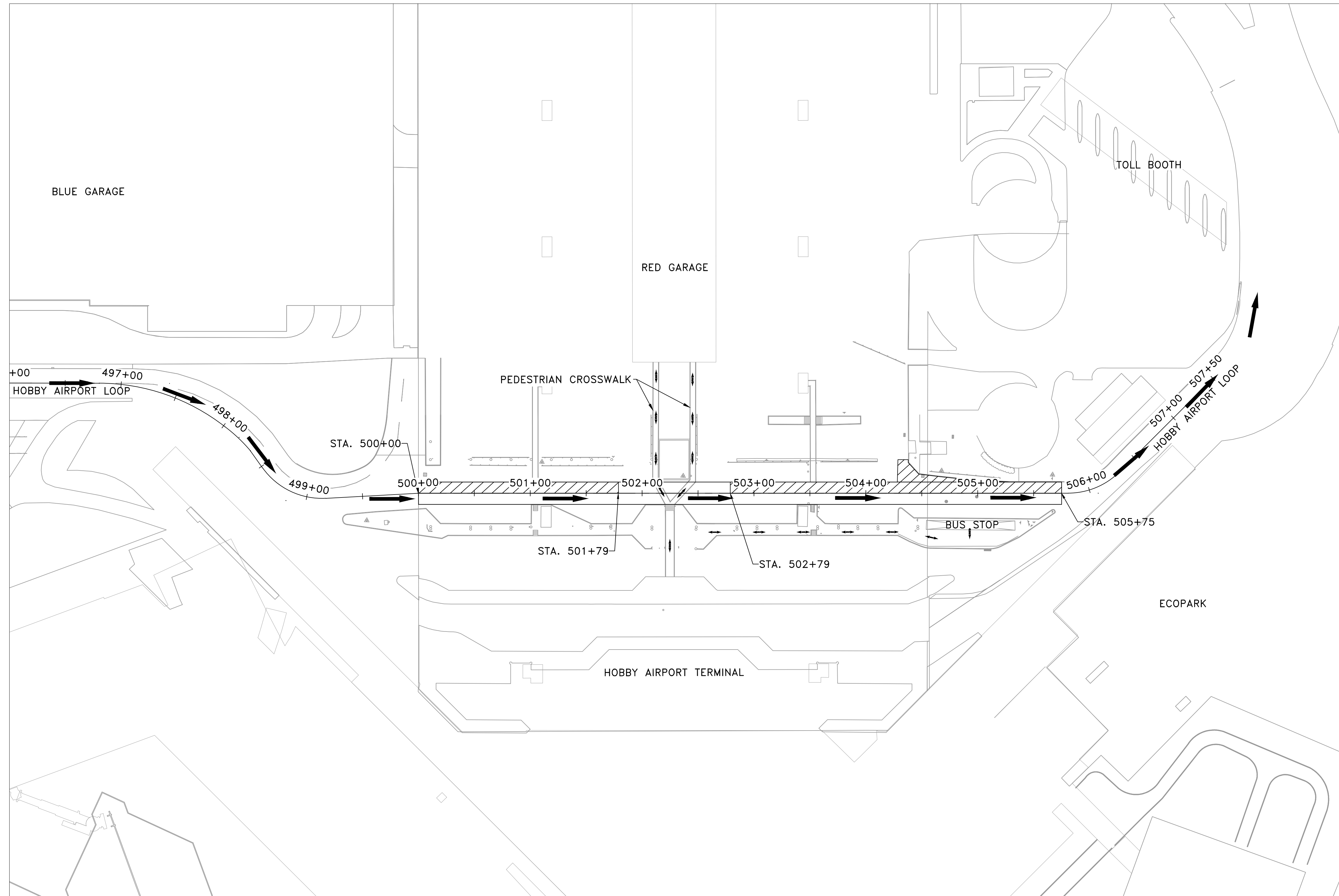
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LEGEND

PHASE 1

TRAFFIC FLOW

PEDESTRIAN PATH

HOUSTON AIRPORT SYSTEM
WILLIAM P. HOBBY AIRPORT / HOUSTON, TX

ATKINS
Member of the SNC-Lavalin Group

LOCAL OFFICE:
200 WESTLAKE PARK BLVD.,
STE. 1100
HOUSTON, TX 77079
TEL: (713) 576-8500
ATKINS NORTH
AMERICA PE FIRM REG.
#F-000474
WWW.ATKINSGLOBAL.COM

REVISIONS

NO.	DESCRIPTION	DATE	BY

WILLIAM P. HOBBY AIRPORT / HOUSTON (HOU)

**METRO BUS DRIVE LANE RECONSTRUCTION
PHASING PLAN - PHASE 1**

PROJECT MGR:	JLV
DESIGNER:	EW
DRAWN BY:	KJV
CHECK BY:	RE
SCALE:	
DATE:	06/29/2020



APPROVED BY:

DIRECTOR
HOUSTON AIRPORT SYSTEM

PROJECT NO.
100068156

A.I.P. NO. _____

C.I.P. NO. _____

H.A.S. NO.
236

SHEET NO.

Major Work Item	Construction Time Allowable - Phase 1: 22 Calendar Days																																																																																												
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93
Mobilization	[Blue bar]																																																																																												
Install and Maintain TCP	[Blue bar]																																																																																												
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Electrical Installation	[Blue bar]																																																																																												
Pavement Marking Installation	[Blue bar]																																																																																												
Demobilization	[Blue bar]																																																																																												

0 50 100 Feet

HAS FILE:
PLOT DATE:

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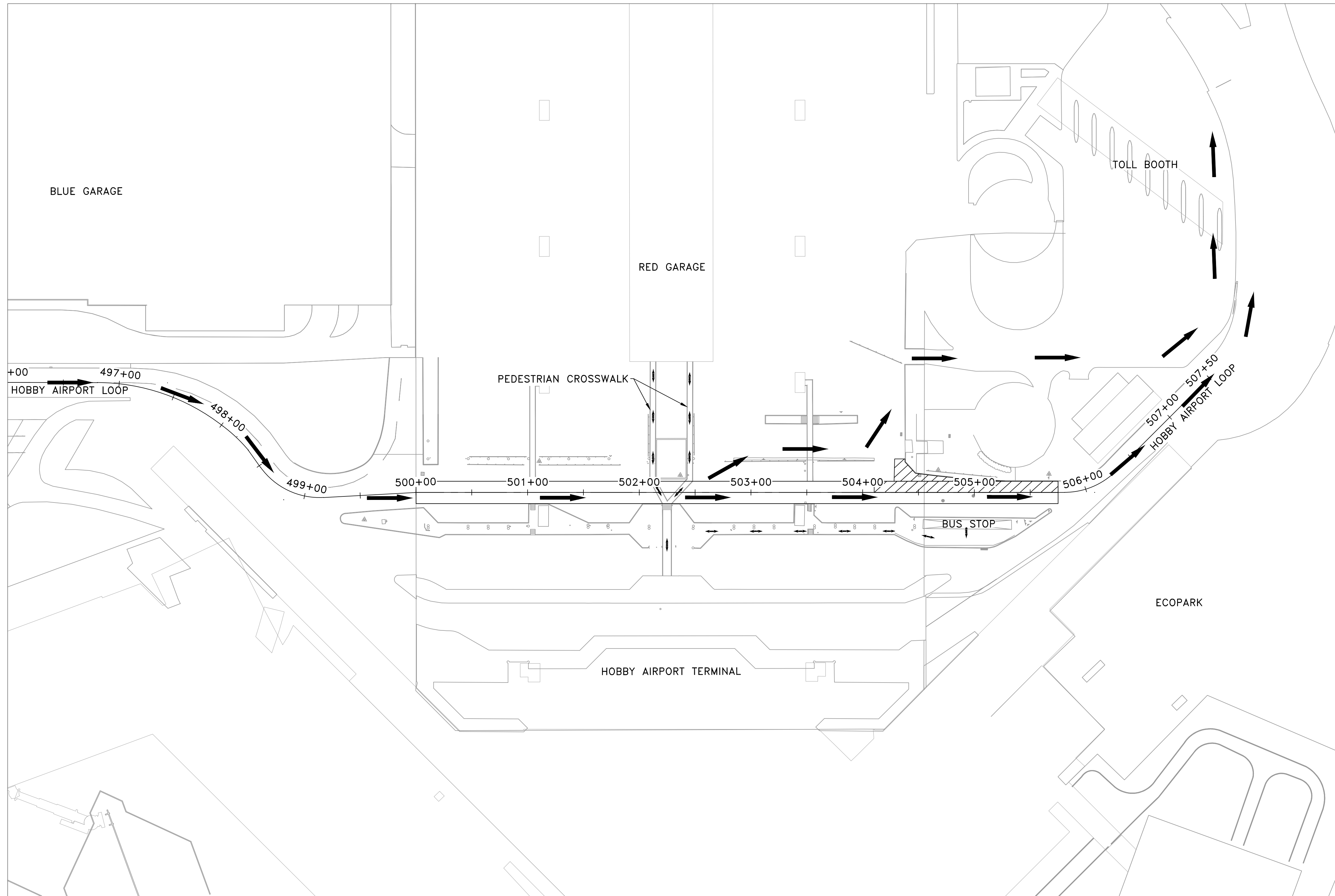
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LEGEND

PHASE 1

TRAFFIC FLOW

PEDESTRIAN PATH

HOUSTON AIRPORT SYSTEM
WILLIAM P. HOBBY AIRPORT / HOUSTON, TX

ATKINS
Member of the SNC-Lavalin Group

LOCAL OFFICE:
200 WESTLAKE PARK BLVD.,
STE. 1100
HOUSTON, TX 77079
TEL: (713) 576-8500
ATKINS NORTH
AMERICA PE FIRM REG.
#F-000474
WWW.ATKINSGLOBAL.COM

REVISIONS

NO.	DESCRIPTION	DATE	BY

WILLIAM P. HOBBY AIRPORT / HOUSTON (HOU)

**METRO BUS DRIVE LANE RECONSTRUCTION
PHASING PLAN - PHASE 1
SUB-PHASE A**

PROJECT MGR: JLV
 DESIGNER: EW
 DRAWN BY: KJV
 CHECK BY: RE
 SCALE:
 DATE: 06/29/2020



APPROVED BY: _____

DIRECTOR
HOUSTON AIRPORT SYSTEM

PROJECT NO. 100068156
 A.I.P. NO. _____
 C.I.P. NO. _____
 H.A.S. NO. 236
 SHEET NO. _____

Major Work Item	Construction Time Allowable - Phase 1: 22 Calendar Days																																																																																												
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Mobilization	[Blue bar]																																																																																												
Install and Maintain TCP	[Blue bar]																																																																																												
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Concrete Pavement Construction	[Blue bar]																																																																																												
Electrical Installation	[Blue bar]																																																																																												
Pavement Marking Installation	[Blue bar]																																																																																												
Demobilization	[Blue bar]																																																																																												

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HAS FILE:
PLOT DATE:

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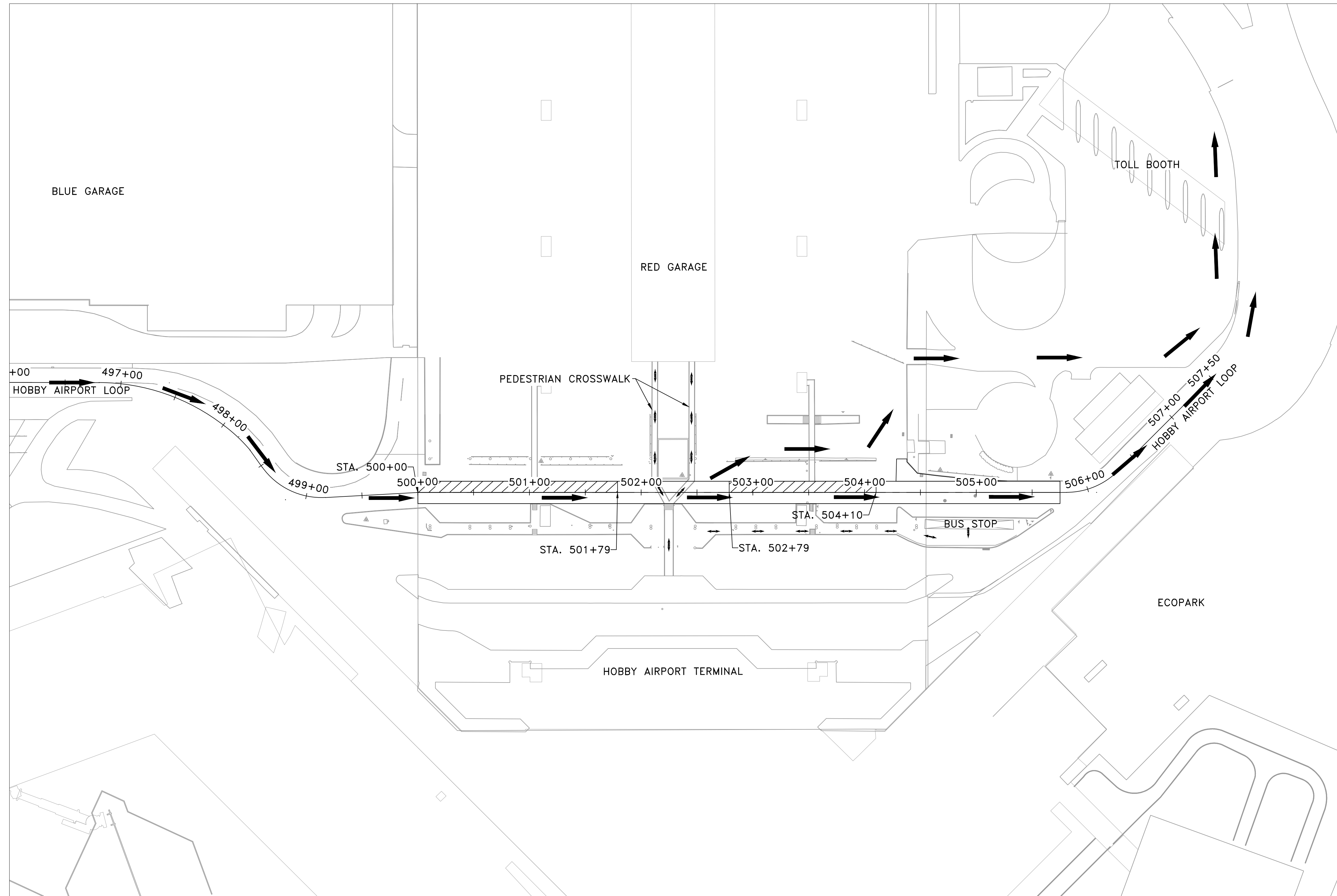
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LEGEND

PHASE 1

TRAFFIC FLOW

PEDESTRIAN PATH

HOUSTON AIRPORT SYSTEM
WILLIAM P. HOBBY AIRPORT / HOUSTON, TX

ATKINS
Member of the SNC-Lavalin Group

LOCAL OFFICE:
200 WESTLAKE PARK BLVD.,
STE. 1100
HOUSTON, TX 77079
TEL: (713) 576-8500
ATKINS NORTH
AMERICA PE FIRM REG.
#F-000474
WWW.ATKINSGLOBAL.COM

REVISIONS

NO.	DESCRIPTION	DATE	BY

WILLIAM P. HOBBY AIRPORT / HOUSTON (HOU)

**METRO BUS DRIVE LANE RECONSTRUCTION
PHASING PLAN - PHASE 1
SUB-PHASE B**

PROJECT MGR: JLV
 DESIGNER: EW
 DRAWN BY: KJV
 CHECK BY: RE
 SCALE:
 DATE: 06/29/2020



APPROVED BY: _____

DIRECTOR
HOUSTON AIRPORT SYSTEM

PROJECT NO.
100068156

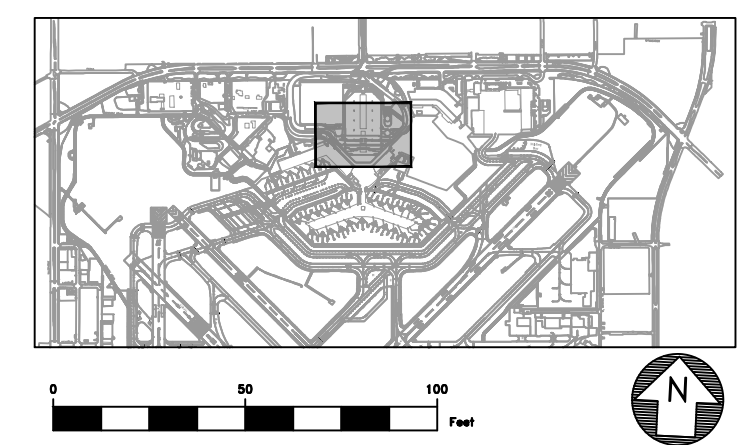
A.I.P. NO. _____

C.I.P. NO. _____

H.A.S. NO.
236

SHEET NO.

Major Work Item	Construction Time Allowable - Phase 1: 22 Calendar Days																																																																																												
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Mobilization	[Blue bar]																																																																																												
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Electrical Installation	[Blue bar]																																																																																												
Pavement Marking Installation	[Blue bar]																																																																																												
Demobilization	[Blue bar]																																																																																												



HAS FILE:
PLOT DATE:

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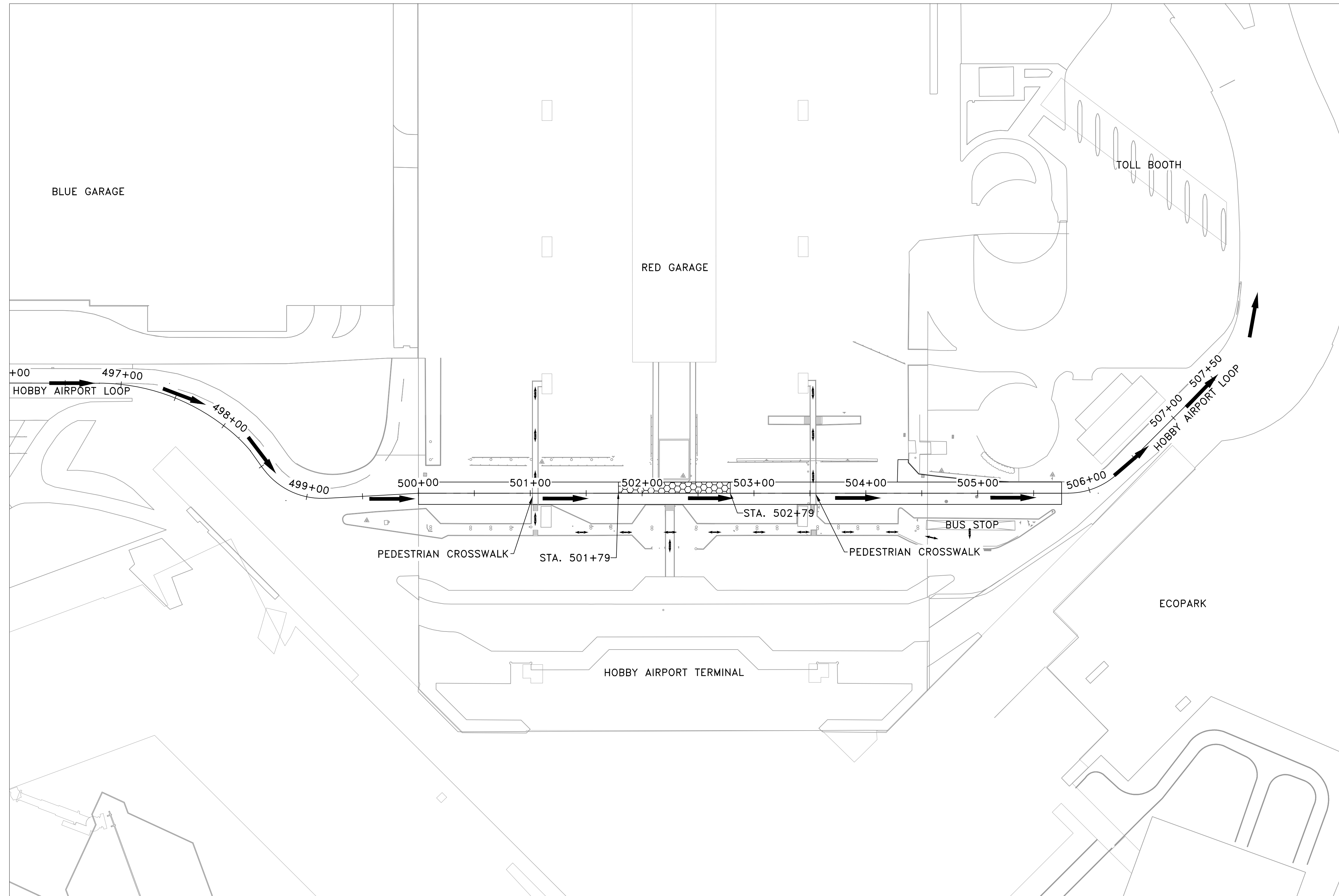
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LEGEND

PHASE 2

TRAFFIC FLOW

PEDESTRIAN PATH

Houston Airport System
WILLIAM P. HOBBY AIRPORT / HOUSTON, TX

ATKINS
Member of the SNC-Lavalin Group

LOCAL OFFICE:
200 WESTLAKE PARK BLVD.,
STE. 1100
HOUSTON, TX 77079
TEL: (713) 576-8500
ATKINS NORTH
AMERICA PE FIRM REG.
#F-000474
WWW.ATKINSGLOBAL.COM

REVISIONS

NO.	DESCRIPTION	DATE	BY

WILLIAM P. HOBBY AIRPORT / HOUSTON (HOU)

**METRO BUS DRIVE LANE RECONSTRUCTION
PHASING PLAN - PHASE 2**

PROJECT MGR: JLW
 DESIGNER: EW
 DRAWN BY: KJV
 CHECK BY: RE
 SCALE:
 DATE: 06/29/2020

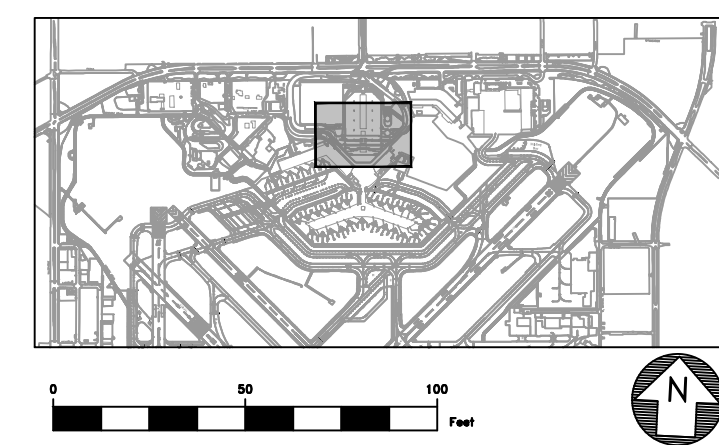


APPROVED BY: _____

DIRECTOR
HOUSTON AIRPORT SYSTEM

PROJECT NO. 100068156
 A.I.P. NO. _____
 C.I.P. NO. _____
 H.A.S. NO. 236
 SHEET NO. _____

Major Work Item	Construction Time Allowable - Phase 2: 17 Calendar Days																																																																																												
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Pavement Marking Installation	[Blue bar]																																																																																												
Demobilization	[Blue bar]																																																																																												



HAS FILE:
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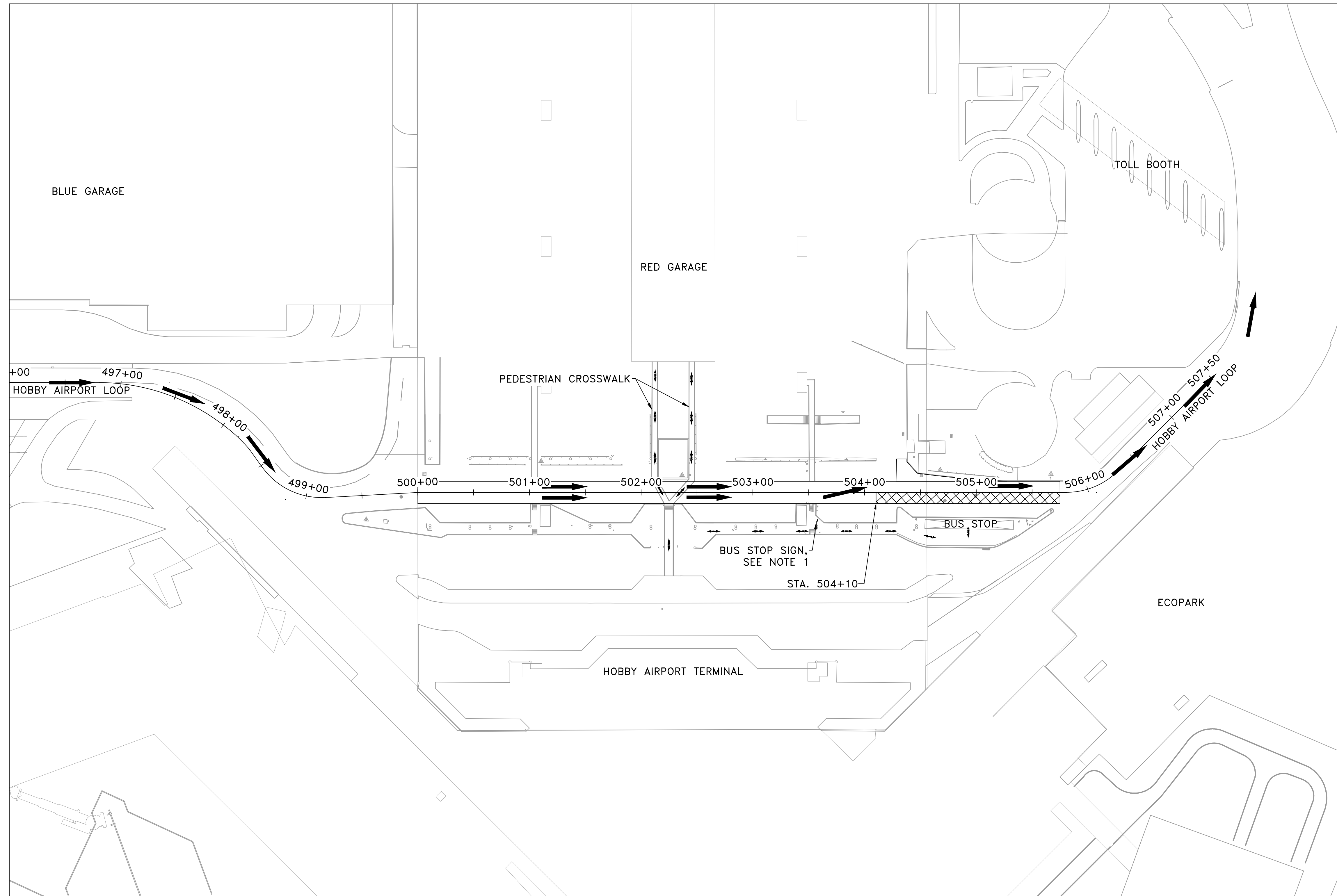
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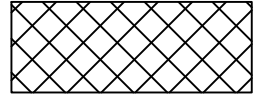


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LEGEND

-  PHASE 3
-  TRAFFIC FLOW
-  PEDESTRIAN PATH

NOTES

1. BUS STOP TO BE TEMPORARY LOCATED DURING THIS PHASE TO THE ADJACENT CROSSWALK AS SHOWN ON THE PLANS. BUS STOP SHALL BE RESTORED TO THE ORIGINAL LOCATION AFTER THIS SUBPHASE IS COMPLETED.



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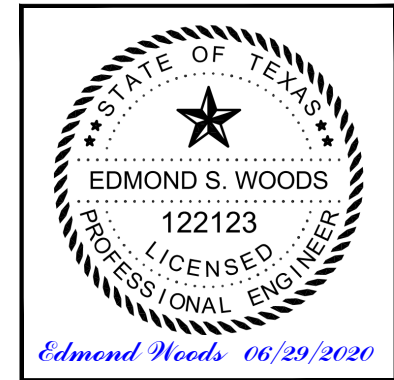
LOCAL OFFICE:
200 WESTLAKE PARK BLVD.,
STE. 1100
HOUSTON, TX 77079
TEL: (713) 576-8500
ATKINS NORTH
AMERICA PE FIRM REG.
#F-000474
WWW.ATKINSGLOBAL.COM

REVISIONS

NO.	DESCRIPTION	DATE BY

WILLIAM P. HOBBY AIRPORT / HOUSTON (HOU)
METRO BUS DRIVE LANE RECONSTRUCTION
PHASING PLAN - PHASE 3
SUB-PHASE A

PROJECT MGR: JLW
 DESIGNER: EW
 DRAWN BY: KJV
 CHECK BY: RE
 SCALE:
 DATE: 06/29/2020

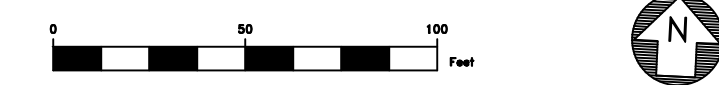
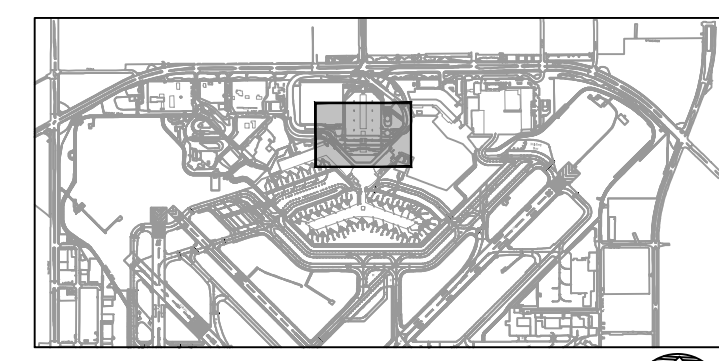


APPROVED BY:

 DIRECTOR
 HOUSTON AIRPORT SYSTEM

PROJECT NO. 100068156
 A.I.P. NO. _____
 C.I.P. NO. _____
 H.A.S. NO. 236
 SHEET NO. _____

Major Work Item	Construction Time Allowable - Phase 3: 18 Calendar Days																																																																																												
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Concrete Removal	[Blue bar]																																																																																												
Removing Stabilized Base	[Blue bar]																																																																																												
Lime Treated Stab. Base Construction	[Blue bar]																																																																																												
Concrete Pavement - CRCP Construction	[Blue bar]																																																																																												
Electrical Installation	[Blue bar]																																																																																												
Pavement Marking Installation	[Blue bar]																																																																																												
Demobilization	[Blue bar]																																																																																												



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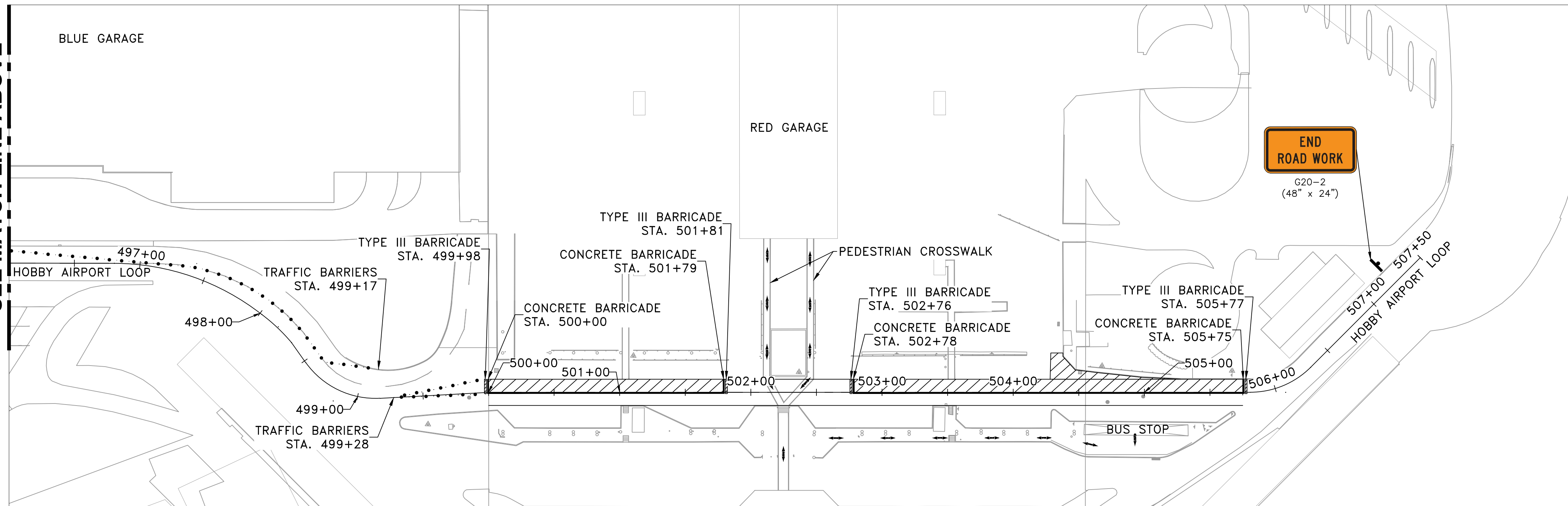
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SEE MATCH LINE BELOW



SEE MATCH LINE ABOVE

LEGEND

- TRAFFIC CONTROL SIGN
- CONCRETE BARRICADE
- TRAFFIC BARRIERS
- TYPE III BARRICADE
- PEDESTRIAN PATH
- WORK ZONE - PHASE 1
- WORK ZONE - PHASE 2
- WORK ZONE - PHASE 3
- WORK ZONE - PHASE 4
- WORK ZONE - PHASE 5

NOTES

1. ALL WORK, SIGNING AND TRAFFIC CONTROL DEVICES SHALL BE IN ACCORDANCE WITH TXDOT SPECIFICATIONS, AS WELL AS THE MANUAL UNIFORM OF TRAFFIC CONTROL DEVICES (MUTCD).
2. INSTALL AND OPERATE TRAFFIC CONTROLS SIGNAL TO DIRECT AND MAINTAIN ORDERLY FLOW OF TRAFFIC IN AREAS UNDER CONTRACTOR'S CONTROL, AND AREAS AFFECTED BY CONTRACTOR'S OPERATIONS.
3. SEE SHEETS CP201 TO CP207 FOR TRAFFIC CONTROL DETAILS AND NOTES.
4. LONGITUDINAL CHANNELIZED DEVICES (LCD) BARRICADES SHALL ACT AS CONSTRUCTION SAFETY ZONE DURING CONSTRUCTION, EFFECTIVELY SEPARATING THE WORK ZONE FROM THE TRAFFIC.
5. SEE SHEET CP202 FOR TRAFFIC CONTROL SIGN DETAILS AND CALLOUT INFORMATION.
6. CONTRACTOR SHALL PROVIDE FLAG PERSON AS NEEDED FOR CONSTRUCTION VEHICLES TO ACCESS CONSTRUCTION AREA.
7. CONTRACTOR SHALL PROVIDE AND INSTALL TRAFFIC CONTROL DEVICES IN CONFORMANCE WITH PART VI OF THE TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (TRAFFIC MUTCD, MOST RECENT EDITION WITH REVISIONS) DURING CONSTRUCTION.
8. IF THE CONTRACTOR CHOOSES TO USE A DIFFERENT METHOD OF "TRAFFIC CONTROL PLANS" DURING THE CONSTRUCTION THAN WHAT IS OUTLINED IN THE CONTRACT DRAWINGS, HE/SHE SHALL BE RESPONSIBLE FOR PREPARING AND SUBMITTING AN ALTERNATE SET OF PLANS TO THE HAS TRAFFIC ENGINEER FOR APPROVAL 14 WORKING DAYS PRIOR TO IMPLEMENTATION.
9. APPROVED COPIES OF TRAFFIC CONTROL PLANS AND MOBILITY PERMITS SHALL BE MADE AVAILABLE FOR INSPECTION AT THE JOB SITE AT ALL TIMES. CONTRACTOR MUST SECURE MOBILITY PERMITS FROM THE CITY'S TRAFFIC MANAGEMENT AND MAINTENANCE BRANCH BEFORE CLOSING A LANE/SIDEWALK. THE REQUEST MUST BE MADE AT LEAST 10 DAYS IN ADVANCE OF THE CLOSURE. NOTE THAT WORKING HOURS MAY BE RESTRICTED OR REQUEST MAY BE DENIED. CALL 832-395-3020 FOR AN APPLICATION OR LOG ON TO WWW.GIMS.HOUSTONTX.GOV.



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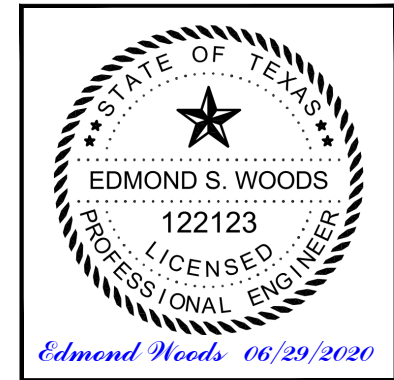
LOCAL OFFICE:
200 WESTLAKE PARK BLVD.,
STE. 1100
HOUSTON, TX 77079
TEL: (713) 576-8500
ATKINS NORTH
AMERICA PE FIRM REG.
#F-000474
WWW.ATKINSGLOBAL.COM

REVISIONS

NO.	DESCRIPTION	DATE BY

WILLIAM P. HOBBY AIRPORT / HOUSTON (HOU)
**METRO BUS DRIVE LANE RECONSTRUCTION
TRAFFIC CONTROL PLAN - PHASE 1**

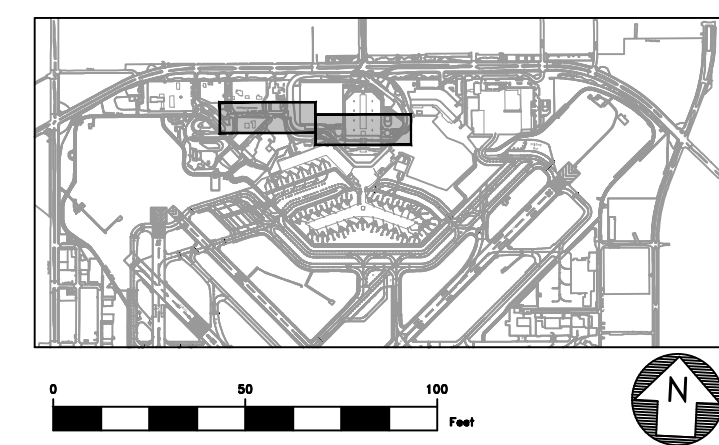
PROJECT MGR: JLW
DESIGNER: EW
DRAWN BY: KJV
CHECK BY: RE
SCALE:
DATE: 06/29/2020



APPROVED BY:

DIRECTOR
HOUSTON AIRPORT SYSTEM

PROJECT NO. 100068156
A.I.P. NO. _____
C.I.P. NO. _____
H.A.S. NO. 236
SHEET NO. _____



HAS FILE:
PLOT DATE:

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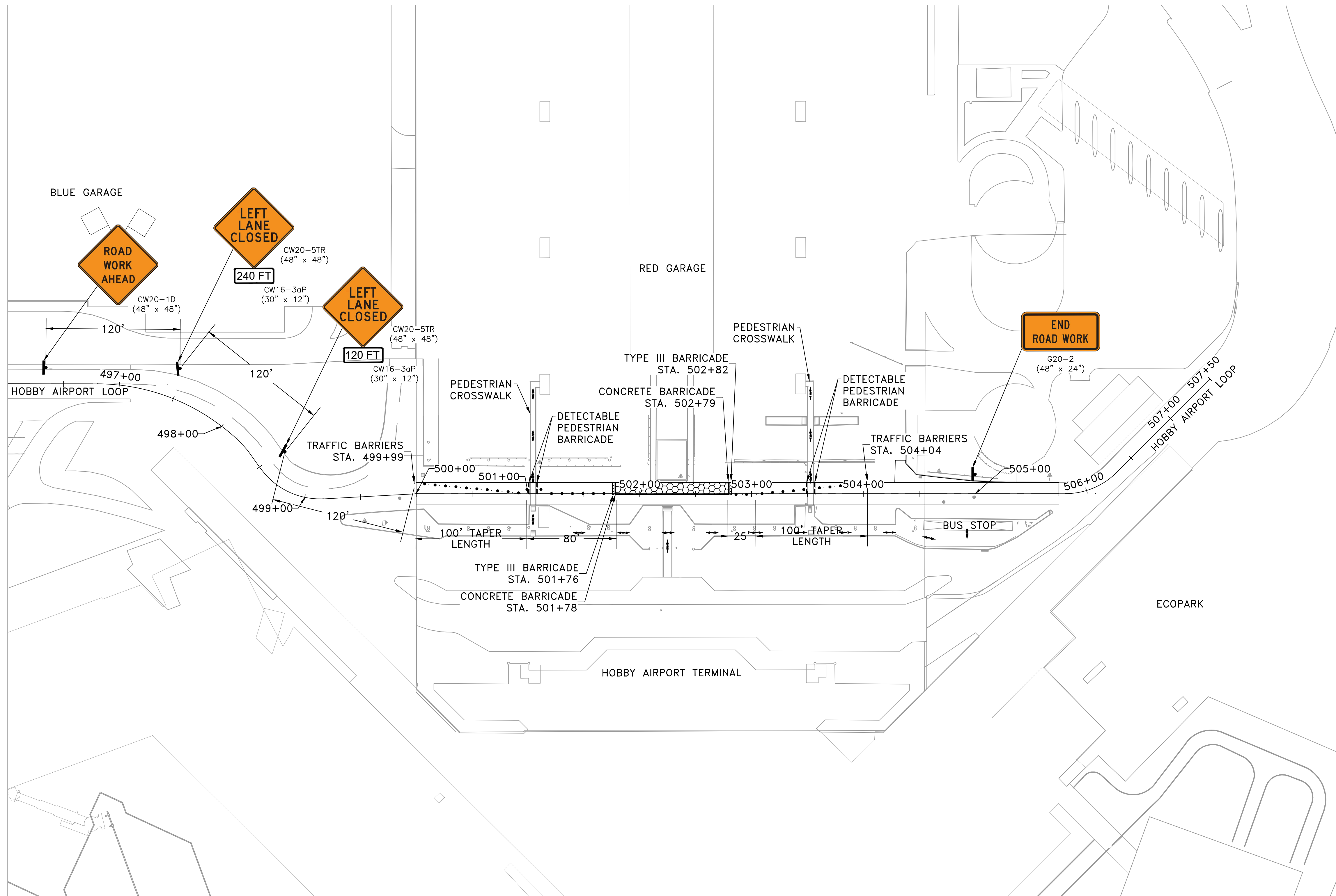
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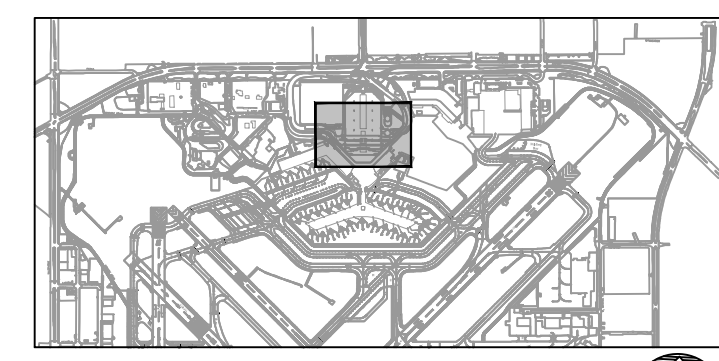


LEGEND

- TRAFFIC CONTROL SIGN
- CONCRETE BARRICADE
- TRAFFIC BARRIERS
- TYPE III BARRICADE
- DETECTABLE PEDESTRIAN BARRICADE (SEE SHEET CP206)
- PEDESTRIAN PATH
- WORK ZONE - PHASE 1
- WORK ZONE - PHASE 2
- WORK ZONE - PHASE 3
- WORK ZONE - PHASE 4
- WORK ZONE - PHASE 5

NOTES

1. ALL WORK, SIGNING AND TRAFFIC CONTROL DEVICES SHALL BE IN ACCORDANCE WITH TXDOT SPECIFICATIONS, AS WELL AS THE MANUAL UNIFORM OF TRAFFIC CONTROL DEVICES (MUTCD).
2. INSTALL AND OPERATE TRAFFIC CONTROLS SIGNAL TO DIRECT AND MAINTAIN ORDERLY FLOW OF TRAFFIC IN AREAS UNDER CONTRACTOR'S CONTROL, AND AREAS AFFECTED BY CONTRACTOR'S OPERATIONS.
3. SEE SHEETS CP201 TO CP207 FOR TRAFFIC CONTROL DETAILS AND NOTES.
4. LONGITUDINAL CHANNELIZED DEVICES (LCD) BARRICADES SHALL ACT AS CONSTRUCTION SAFETY ZONE DURING CONSTRUCTION, EFFECTIVELY SEPARATING THE WORK ZONE FROM THE TRAFFIC.
5. START TRAFFIC BARRIERS AT THE EDGE OF THE PEDESTRIAN CROSSWALK AS TO NOT BLOCK THE ABILITY OF THE PASSENGERS TO USE THE CROSSWALK.
6. SEE SHEET CP202 FOR TRAFFIC CONTROL SIGN DETAILS AND CALLOUT INFORMATION.
7. CONTRACTOR SHALL PROVIDE FLAG PERSON AS NEEDED FOR CONSTRUCTION VEHICLES TO ACCESS CONSTRUCTION AREA.
8. CONTRACTOR SHALL PROVIDE AND INSTALL TRAFFIC CONTROL DEVICES IN CONFORMANCE WITH PART VI OF THE TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (TRAFFIC MUTCD, MOST RECENT EDITION WITH REVISIONS) DURING CONSTRUCTION.
9. IF THE CONTRACTOR CHOOSES TO USE A DIFFERENT METHOD OF "TRAFFIC CONTROL PLANS" DURING THE CONSTRUCTION THAN WHAT IS OUTLINED IN THE CONTRACT DRAWINGS, HE/SHE SHALL BE RESPONSIBLE FOR PREPARING AND SUBMITTING AN ALTERNATE SET OF PLANS TO THE HAS TRAFFIC ENGINEER FOR APPROVAL 14 WORKING DAYS PRIOR TO IMPLEMENTATION.
10. APPROVED COPIES OF TRAFFIC CONTROL PLANS AND MOBILITY PERMITS SHALL BE MADE AVAILABLE FOR INSPECTION AT THE JOB SITE AT ALL TIMES. CONTRACTOR MUST SECURE MOBILITY PERMITS FROM THE CITY'S TRAFFIC MANAGEMENT AND MAINTENANCE BRANCH BEFORE CLOSING A LANE/SIDEWALK. THE REQUEST MUST BE MADE AT LEAST 10 DAYS IN ADVANCE OF THE CLOSURE. NOTE THAT WORKING HOURS MAY BE RESTRICTED OR REQUEST MAY BE DENIED. CALL 832-395-3020 FOR AN APPLICATION OR LOG ON TO WWW.GIMS.HOUSTONTX.GOV.

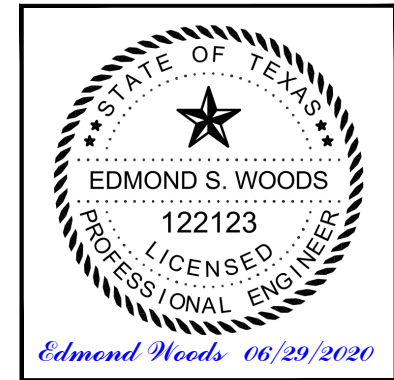


REVISIONS

NO.	DESCRIPTION	DATE BY

WILLIAM P. HOBBY AIRPORT / HOUSTON (HOU)
METRO BUS DRIVE LANE RECONSTRUCTION
TRAFFIC CONTROL PLAN - PHASE 2

PROJECT MGR:	JLV
DESIGNER:	EW
DRAWN BY:	KJV
CHECK BY:	RE
SCALE:	
DATE:	06/29/2020



APPROVED BY: _____
 DIRECTOR
 HOUSTON AIRPORT SYSTEM

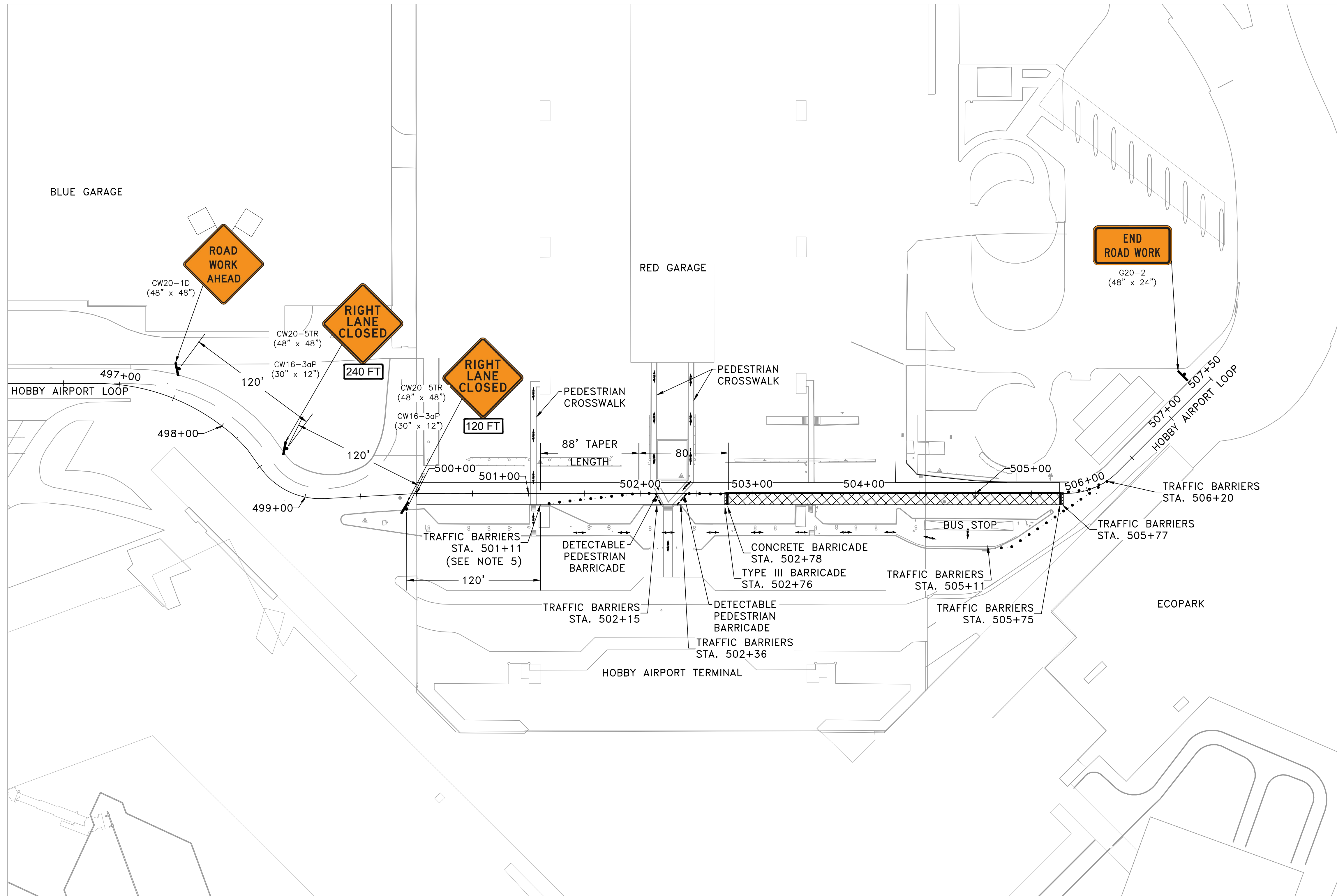
PROJECT NO.	100068156
A.I.P. NO.	
C.I.P. NO.	
H.A.S. NO.	236
SHEET NO.	

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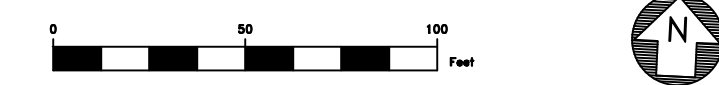
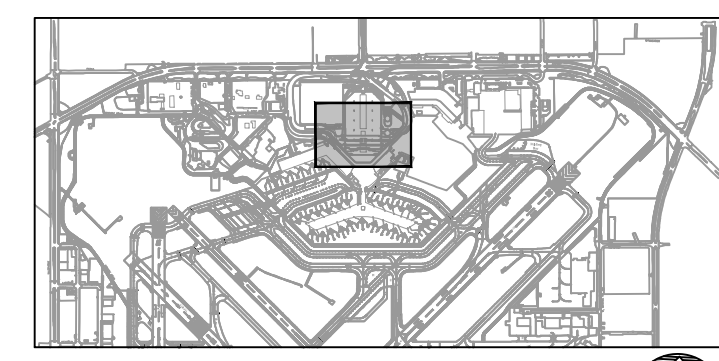


LEGEND

- TRAFFIC CONTROL SIGN
- CONCRETE BARRICADE
- TRAFFIC BARRIERS
- TYPE III BARRICADE
- DETECTABLE PEDESTRIAN BARRICADE (SEE SHEET CP206)
- PEDESTRIAN PATH
- WORK ZONE - PHASE 1
- WORK ZONE - PHASE 2
- WORK ZONE - PHASE 3
- WORK ZONE - PHASE 4
- WORK ZONE - PHASE 5

NOTES

1. ALL WORK, SIGNING AND TRAFFIC CONTROL DEVICES SHALL BE IN ACCORDANCE WITH TXDOT SPECIFICATIONS, AS WELL AS THE MANUAL UNIFORM OF TRAFFIC CONTROL DEVICES (MUTCD).
2. INSTALL AND OPERATE TRAFFIC CONTROLS SIGNAL TO DIRECT AND MAINTAIN ORDERLY FLOW OF TRAFFIC IN AREAS UNDER CONTRACTOR'S CONTROL, AND AREAS AFFECTED BY CONTRACTOR'S OPERATIONS.
3. SEE SHEETS CP201 TO CP207 FOR TRAFFIC CONTROL DETAILS AND NOTES.
4. LONGITUDINAL CHANNELIZED DEVICES (LCD) BARRICADES SHALL ACT AS CONSTRUCTION SAFETY ZONE DURING CONSTRUCTION, EFFECTIVELY SEPARATING THE WORK ZONE FROM THE TRAFFIC.
5. START TRAFFIC BARRIERS AT THE EDGE OF THE PEDESTRIAN CROSSWALK AS TO NOT BLOCK THE ABILITY OF THE PASSENGERS TO USE THE CROSSWALK.
6. SEE SHEET CP202 FOR TRAFFIC CONTROL SIGN DETAILS AND CALLOUT INFORMATION.
7. CONTRACTOR SHALL PROVIDE FLAG PERSON AS NEEDED FOR CONSTRUCTION VEHICLES TO ACCESS CONSTRUCTION AREA.
8. CONTRACTOR SHALL PROVIDE AND INSTALL TRAFFIC CONTROL DEVICES IN CONFORMANCE WITH PART VI OF THE TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (TRAFFIC MUTCD, MOST RECENT EDITION WITH REVISIONS) DURING CONSTRUCTION.
9. IF THE CONTRACTOR CHOOSES TO USE A DIFFERENT METHOD OF "TRAFFIC CONTROL PLANS" DURING THE CONSTRUCTION THAN WHAT IS OUTLINED IN THE CONTRACT DRAWINGS, HE/SHE SHALL BE RESPONSIBLE FOR PREPARING AND SUBMITTING AN ALTERNATE SET OF PLANS TO THE HAS TRAFFIC ENGINEER FOR APPROVAL 14 WORKING DAYS PRIOR TO IMPLEMENTATION.
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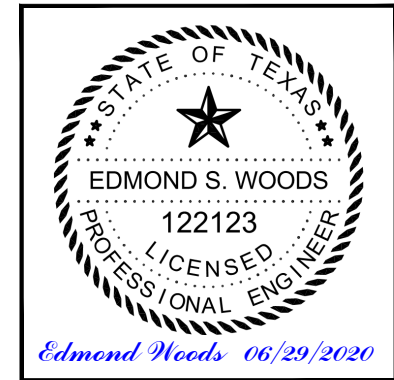


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NO.	DESCRIPTION	DATE BY

WILLIAM P. HOBBY AIRPORT / HOUSTON (HOU)
METRO BUS DRIVE LANE RECONSTRUCTION
TRAFFIC CONTROL PLAN - PHASE 3

PROJECT MGR:	JLV
DESIGNER:	EW
DRAWN BY:	KJV
CHECK BY:	RE
SCALE:	
DATE:	06/29/2020



APPROVED BY: _____
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PROJECT NO.	100068156
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C.I.P. NO.	
H.A.S. NO.	236
SHEET NO.	

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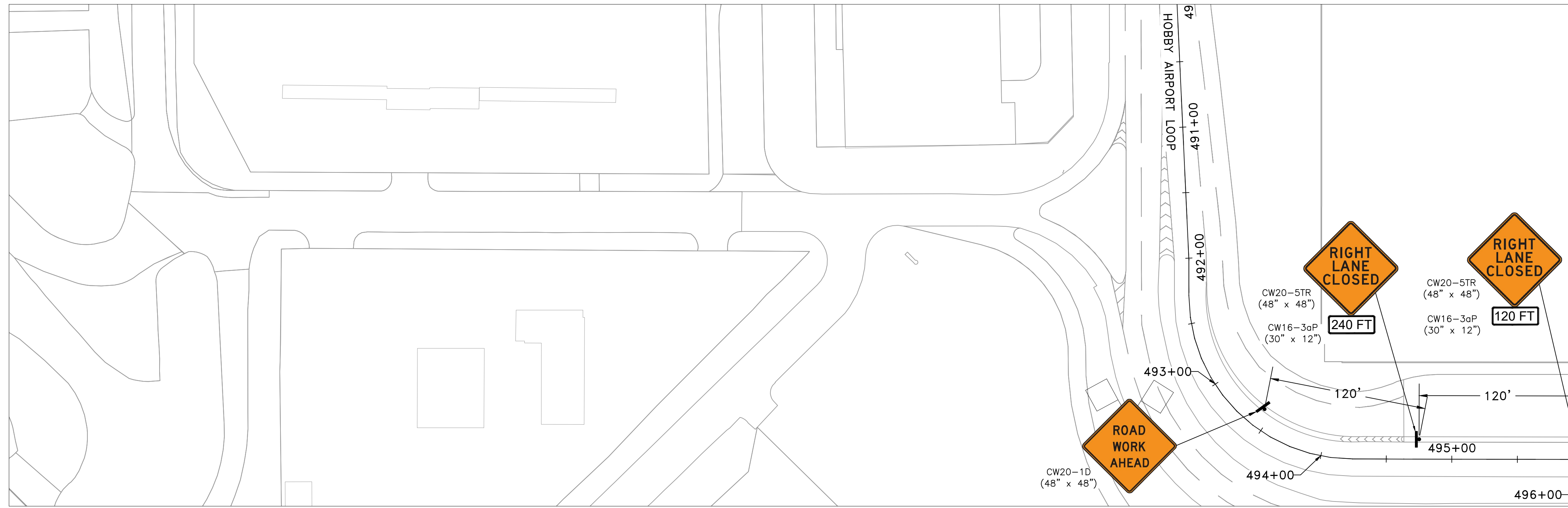
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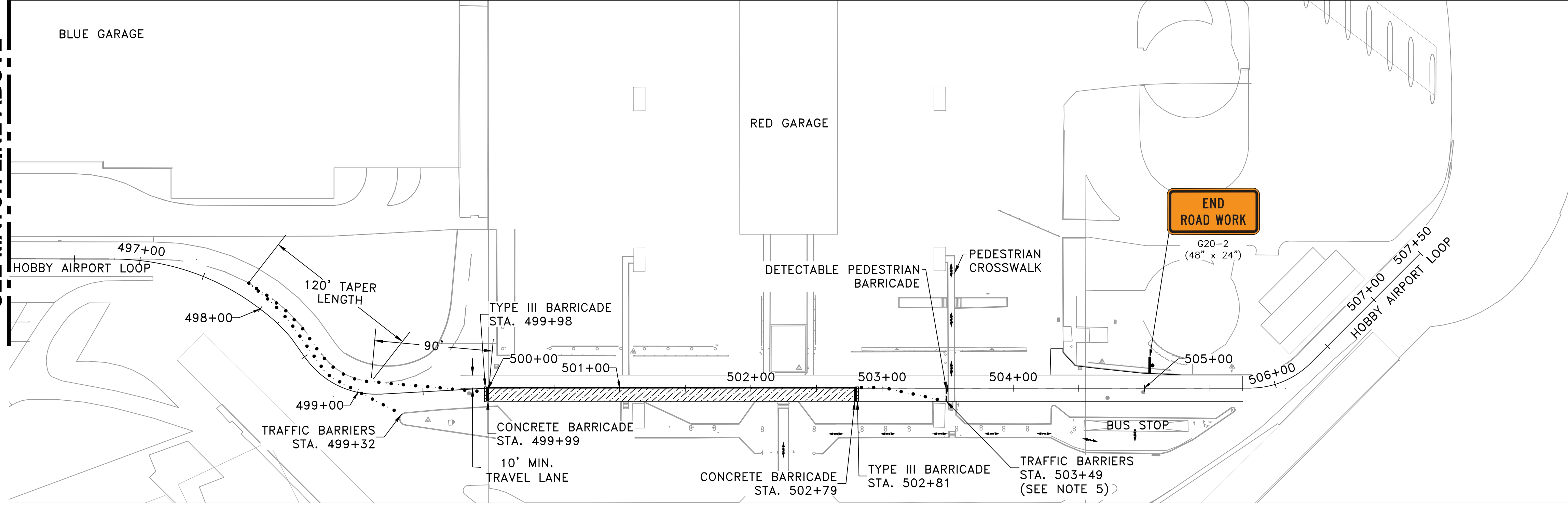
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SEE MATCH LINE BELOW



SEE MATCH LINE ABOVE

LEGEND

- TRAFFIC CONTROL SIGN
- CONCRETE BARRICADE
- TRAFFIC BARRIERS
- TYPE III BARRICADE
- DETECTABLE PEDESTRIAN BARRICADE (SEE SHEET CP206)
- PEDESTRIAN PATH
- WORK ZONE - PHASE 1
- WORK ZONE - PHASE 2
- WORK ZONE - PHASE 3
- WORK ZONE - PHASE 4
- WORK ZONE - PHASE 5

NOTES

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2. INSTALL AND OPERATE TRAFFIC CONTROLS SIGNAL TO DIRECT AND MAINTAIN ORDERLY FLOW OF TRAFFIC IN AREAS UNDER CONTRACTOR'S CONTROL, AND AREAS AFFECTED BY CONTRACTOR'S OPERATIONS.
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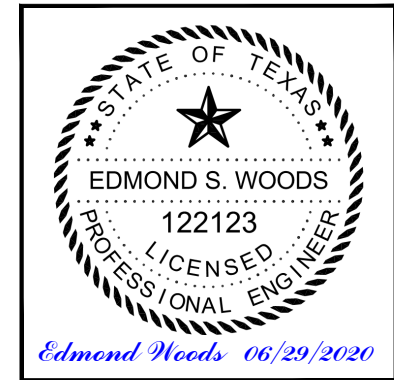
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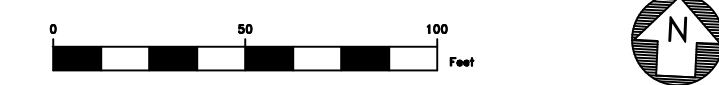
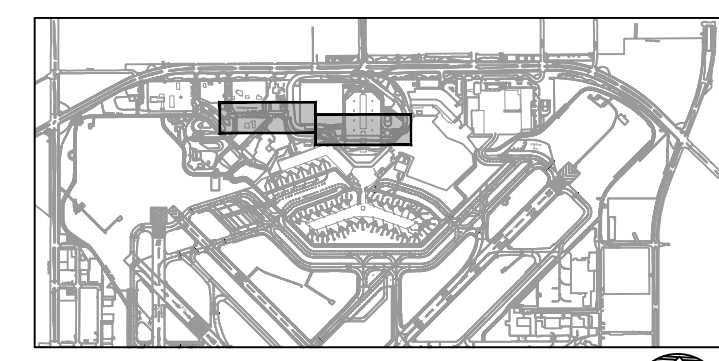
WILLIAM P. HOBBY AIRPORT / HOUSTON (HOU)
**METRO BUS DRIVE LANE RECONSTRUCTION
TRAFFIC CONTROL PLAN - PHASE 4**

PROJECT MGR: JLV
DESIGNER: EW
DRAWN BY: KJV
CHECK BY: RE
SCALE:
DATE: 06/29/2020



APPROVED BY:
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HOUSTON AIRPORT SYSTEM

PROJECT NO. 100068156
A.I.P. NO.
C.I.P. NO.
H.A.S. NO. 236
SHEET NO.



HAS FILE:
PLOT DATE:

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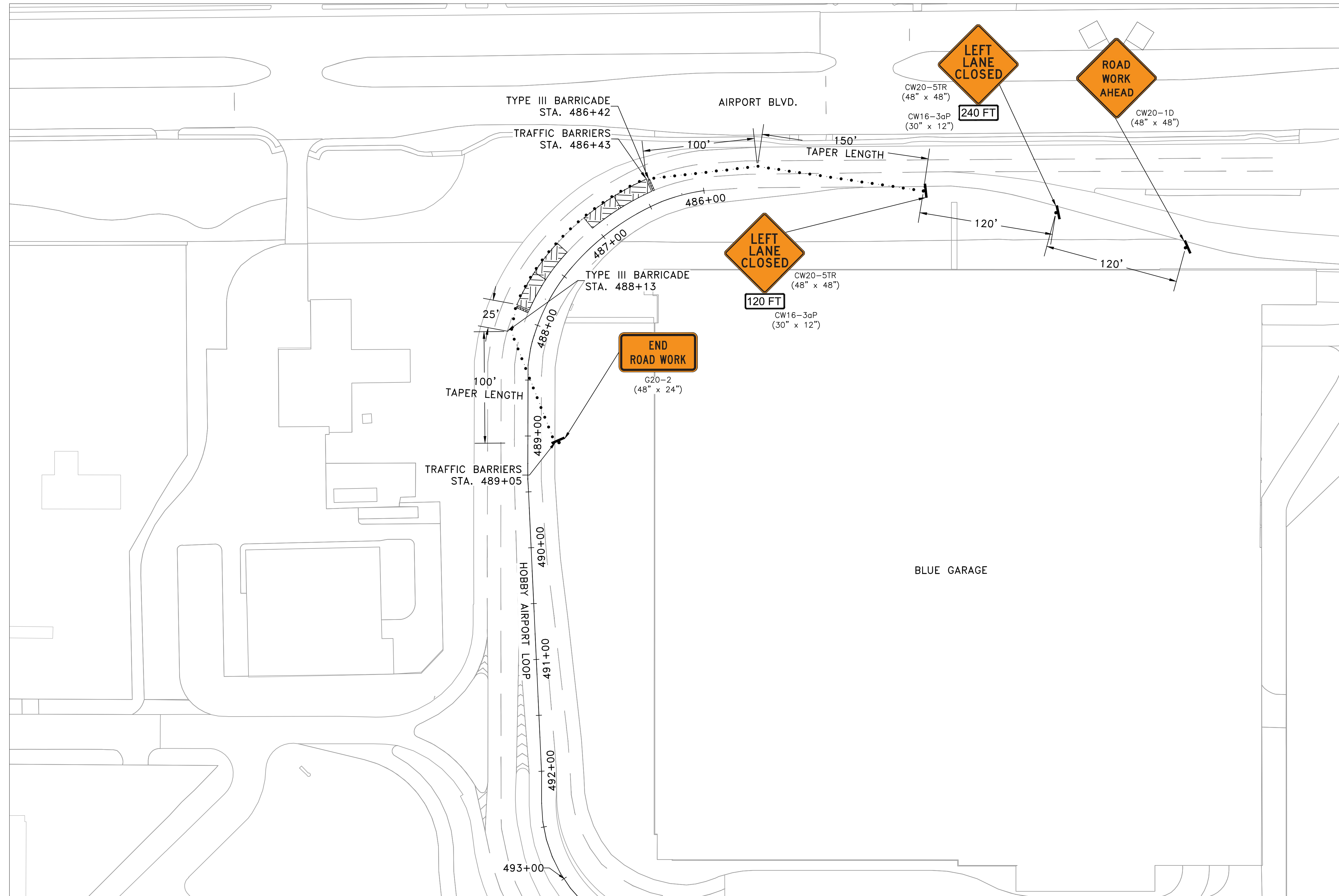
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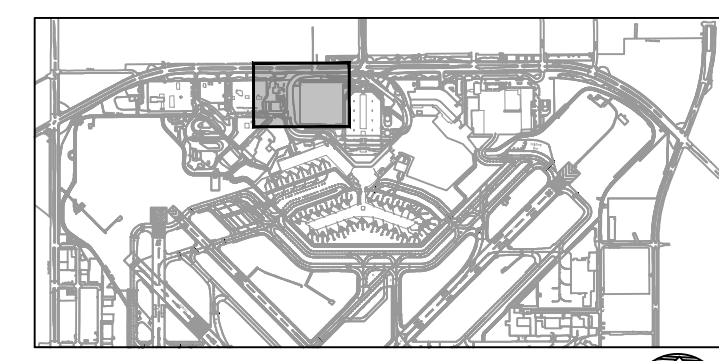


LEGEND

- TRAFFIC CONTROL SIGN
- CONCRETE BARRICADE
- TRAFFIC BARRIERS
- TYPE III BARRICADE
- PEDESTRIAN PATH
- WORK ZONE - PHASE 1
- WORK ZONE - PHASE 2
- WORK ZONE - PHASE 3
- WORK ZONE - PHASE 4
- WORK ZONE - PHASE 5

NOTES

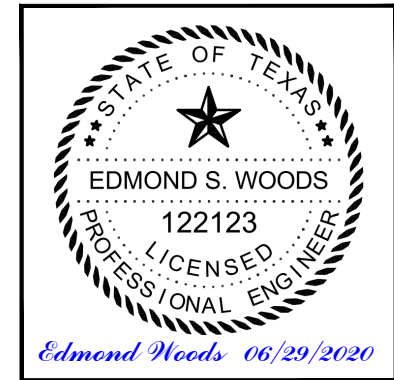
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NO.	DESCRIPTION	DATE BY

WILLIAM P. HOBBY AIRPORT / HOUSTON (HOU)
METRO BUS DRIVE LANE RECONSTRUCTION
TRAFFIC CONTROL PLAN - PHASE 5

PROJECT MGR:	JLV
DESIGNER:	EW
DRAWN BY:	KJV
CHECK BY:	RE
SCALE:	
DATE:	06/29/2020



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A.I.P. NO.	
C.I.P. NO.	
H.A.S. NO.	236
SHEET NO.	

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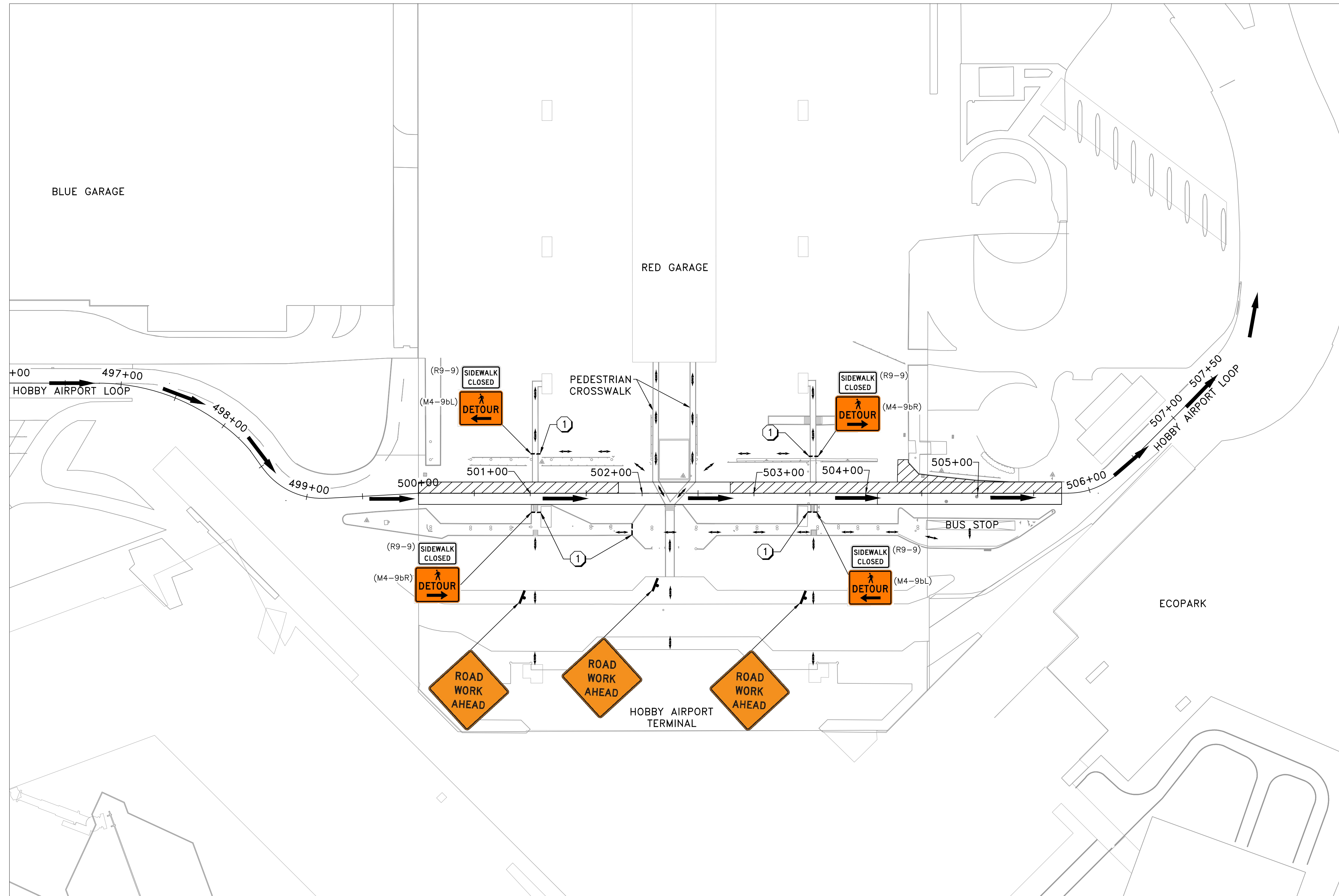
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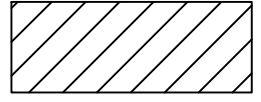



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LEGEND

-  PHASE 1
-  TRAFFIC FLOW
-  PEDESTRIAN PATH
-  DETECTABLE PEDESTRIAN BARRICADE (SEE SHEET CP206)

KEYNOTE LEGEND

-  1 DETECTABLE PEDESTRIAN BARRICADE (SEE SHEET CS206)

NOTES

1. ALL SIGNAGE PLACEMENT NEEDS TO BE COORDINATED WITH HOU PROJECT MANAGER AND HOU LANDSIDE OPERATIONS PRIOR TO BEING PLACED.



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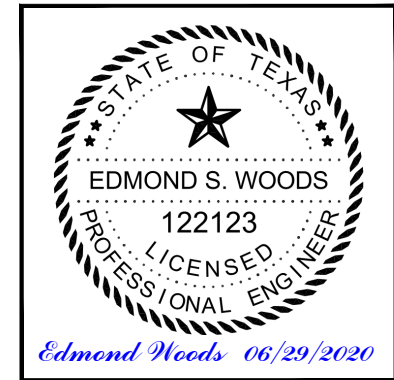
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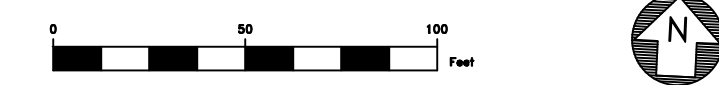
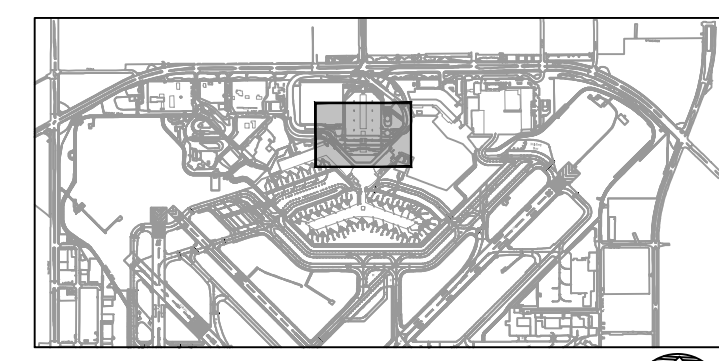
WILLIAM P. HOBBY AIRPORT / HOUSTON (HOU)
METRO BUS DRIVE LANE RECONSTRUCTION
PEDESTRIAN WAYFINDING
SIGNAGE PLAN - PHASE 1

PROJECT MGR:	JLV
DESIGNER:	EW
DRAWN BY:	KJV
CHECK BY:	RE
SCALE:	
DATE:	06/29/2020



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PROJECT NO.	100068156
A.I.P. NO.	
C.I.P. NO.	
H.A.S. NO.	236
SHEET NO.	



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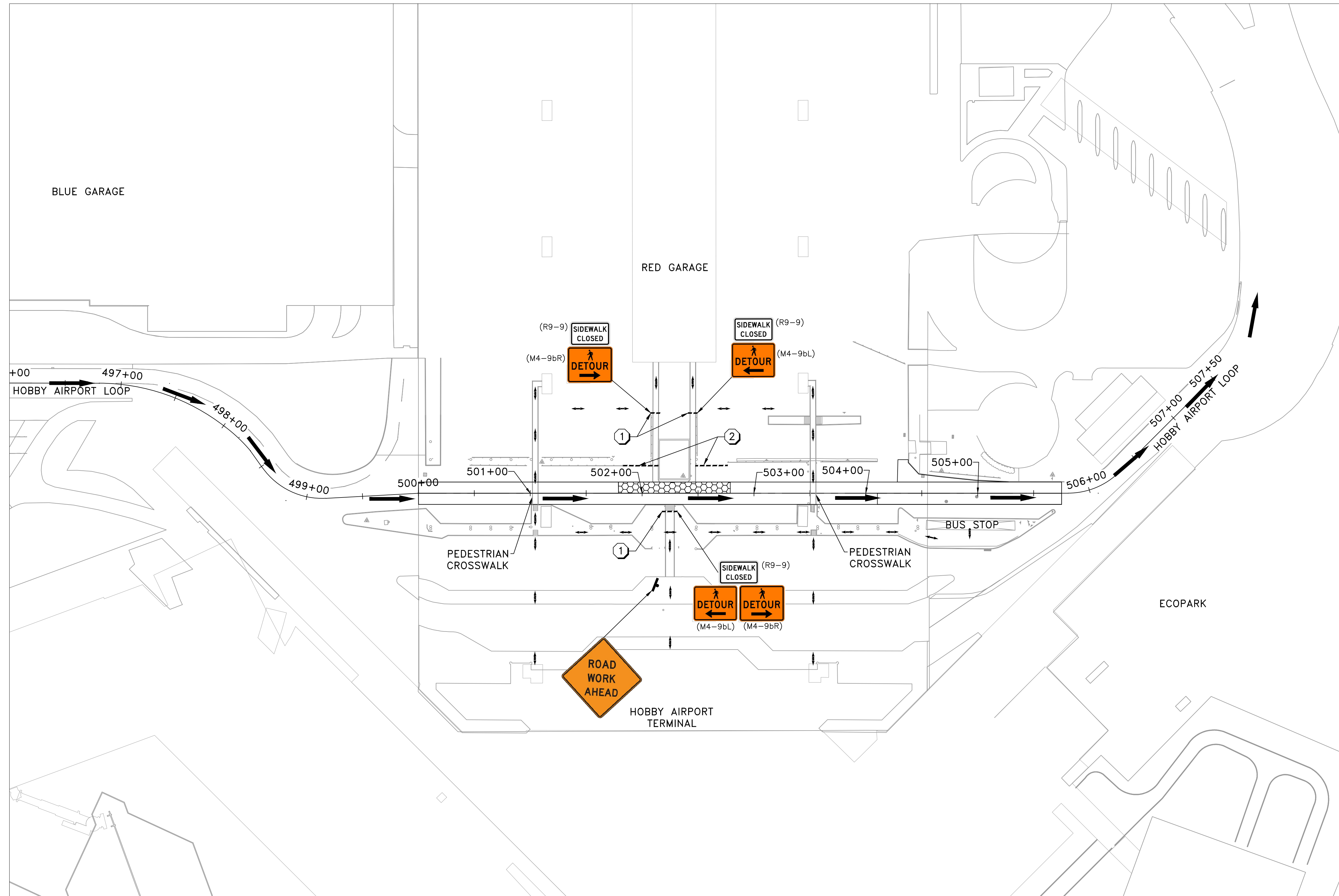
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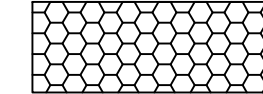



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LEGEND

-  PHASE 2
-  TRAFFIC FLOW
-  PEDESTRIAN PATH
-  DETECTABLE PEDESTRIAN BARRICADE (SEE SHEET CP206)

KEYNOTE LEGEND

- ① DETECTABLE PEDESTRIAN BARRICADE (SEE SHEET CS206)
- ② DETECTABLE PEDESTRIAN BARRICADE (SEE SHEET CS206) OR LCD. SEE NOTE 2

NOTES

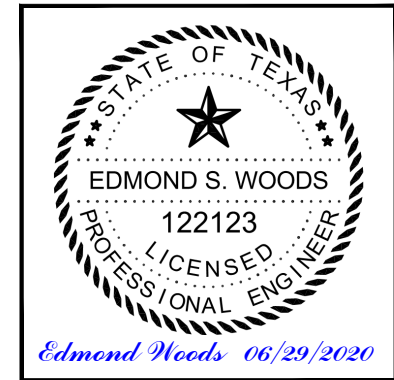
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REVISIONS

NO.	DESCRIPTION	DATE	BY

**WILLIAM P. HOBBY AIRPORT / HOUSTON (HOU)
METRO BUS DRIVE LANE RECONSTRUCTION
PEDESTRIAN WAYFINDING
SIGNAGE PLAN - PHASE 2**

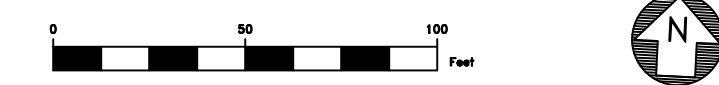
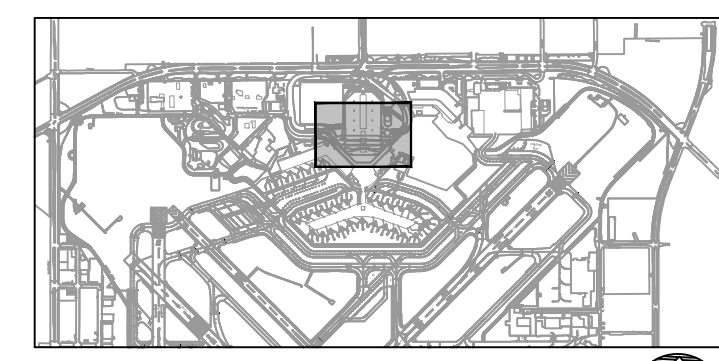
PROJECT MGR:	JLV
DESIGNER:	EW
DRAWN BY:	KJV
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SCALE:	
DATE:	06/29/2020



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DIRECTOR
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PROJECT NO.	100068156
A.I.P. NO.	
C.I.P. NO.	
H.A.S. NO.	236
SHEET NO.	



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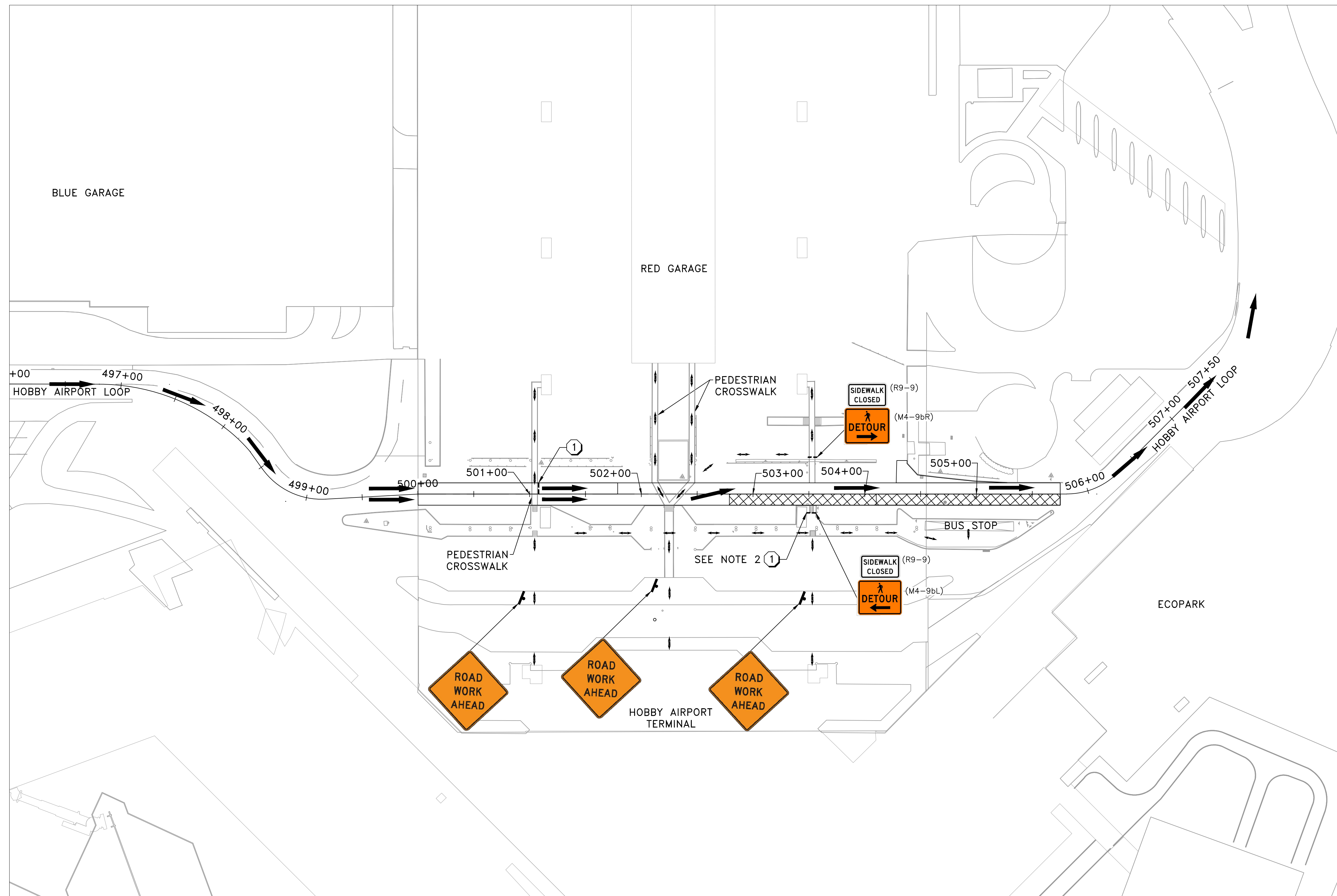
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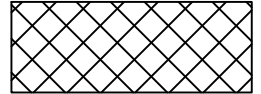



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LEGEND

-  PHASE 3
-  TRAFFIC FLOW
-  PEDESTRIAN PATH
-  DETECTABLE PEDESTRIAN BARRICADE (SEE SHEET CP206)

KEYNOTE LEGEND

- ① DETECTABLE PEDESTRIAN BARRICADE. (SEE SHEET CS206)

NOTES

1. ALL SIGNAGE PLACEMENT NEEDS TO BE COORDINATED WITH HOU PROJECT MANAGER AND HOU LANDSIDE OPERATIONS PRIOR TO BEING PLACED.
2. BUS STOP TO BE TEMPORARY LOCATED DURING THIS PHASE (SUBPHASE A) TO THE ADJACENT CROSSWALK AS SHOWN ON THE PLANS. SEE SHEET G-012 FOR BUS STOP RELOCATION. BUS STOP SHALL BE RESTORED TO THE ORIGINAL LOCATION AFTER SUBPHASE A IS COMPLETED. THE DETECTABLE BARRICADE SHALL BE PLACED AT THIS LOCATION DURING SUBPHASE B. IT SHOULD NOT BE PLACED DURING SUBPHASE A.



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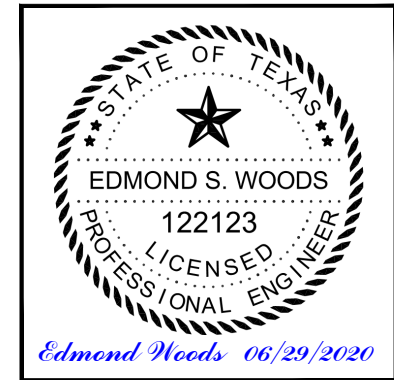
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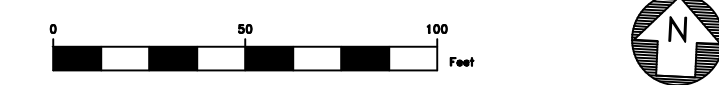
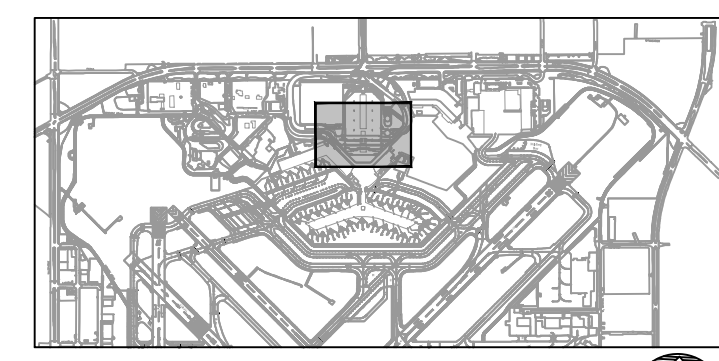
WILLIAM P. HOBBY AIRPORT / HOUSTON (HOU)
METRO BUS DRIVE LANE RECONSTRUCTION
PEDESTRIAN WAYFINDING
SIGNAGE PLAN - PHASE 3

PROJECT MGR:	JLV
DESIGNER:	EW
DRAWN BY:	KJV
CHECK BY:	RE
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DATE:	06/29/2020



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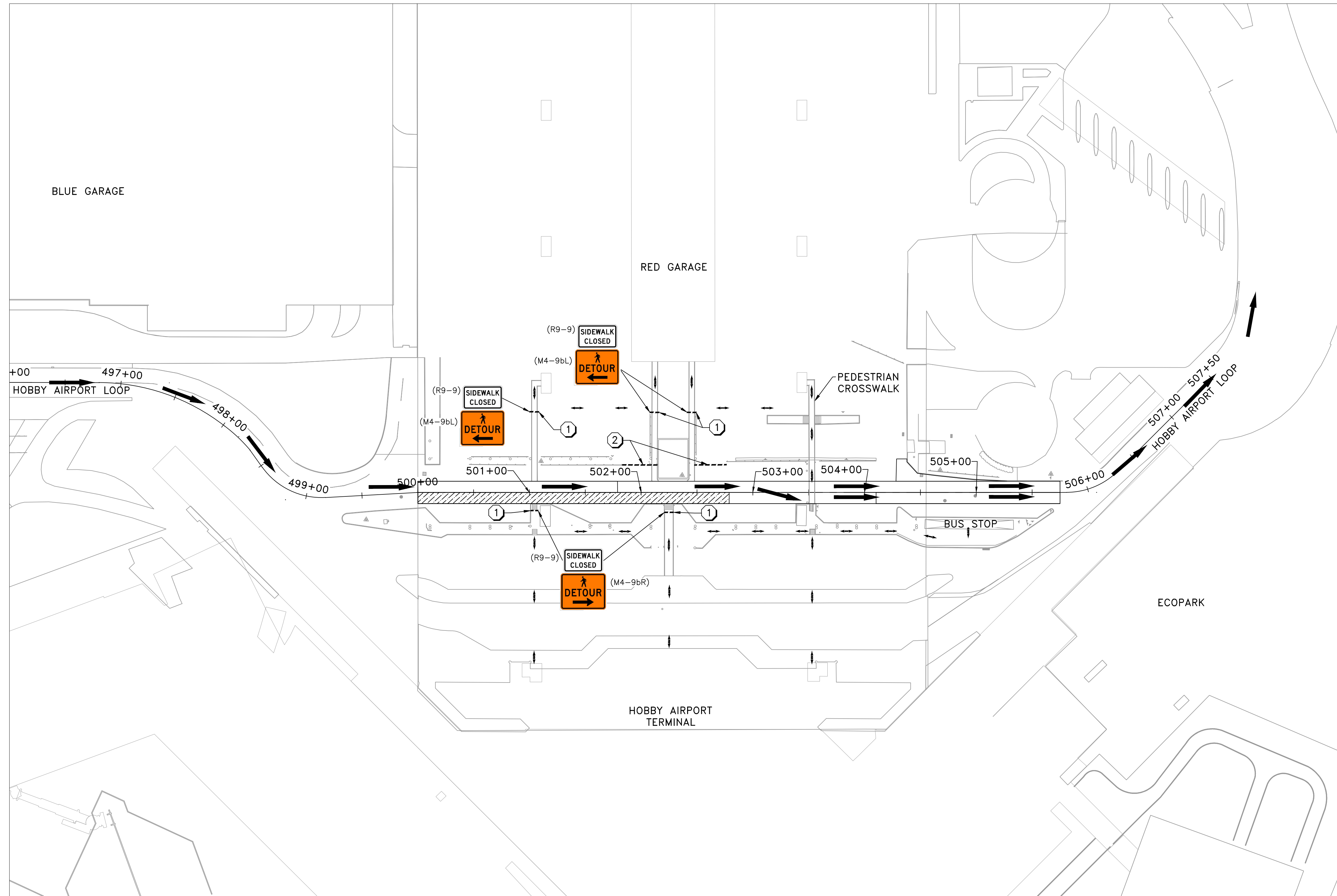
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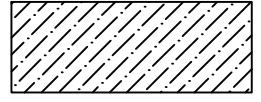



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LEGEND

-  PHASE 4
-  TRAFFIC FLOW
-  PEDESTRIAN PATH
-  DETECTABLE PEDESTRIAN BARRICADE (SEE SHEET CP206)

KEYNOTE LEGEND

- ① DETECTABLE PEDESTRIAN BARRICADE (SEE SHEET CS206)
- ② DETECTABLE PEDESTRIAN BARRICADE (SEE SHEET CS206) OR LCD. SEE NOTE 2

NOTES

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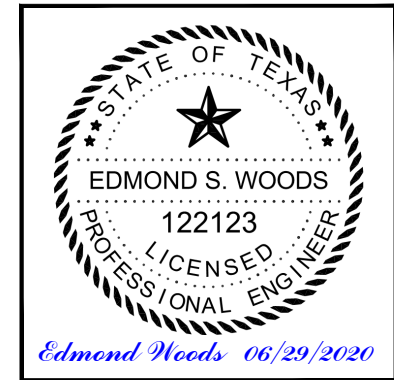
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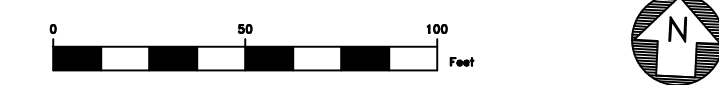
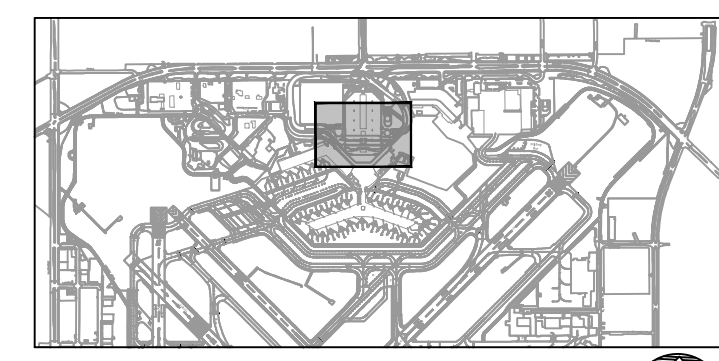
WILLIAM P. HOBBY AIRPORT / HOUSTON (HOU)
**METRO BUS DRIVE LANE RECONSTRUCTION
 PEDESTRIAN WAYFINDING
 SIGNAGE PLAN - PHASE 4**

PROJECT MGR:	JLV
DESIGNER:	EW
DRAWN BY:	KJV
CHECK BY:	RE
SCALE:	
DATE:	06/29/2020



APPROVED BY: _____
 DIRECTOR
 HOUSTON AIRPORT SYSTEM

PROJECT NO.	100068156
A.I.P. NO.	
C.I.P. NO.	
H.A.S. NO.	236
SHEET NO.	



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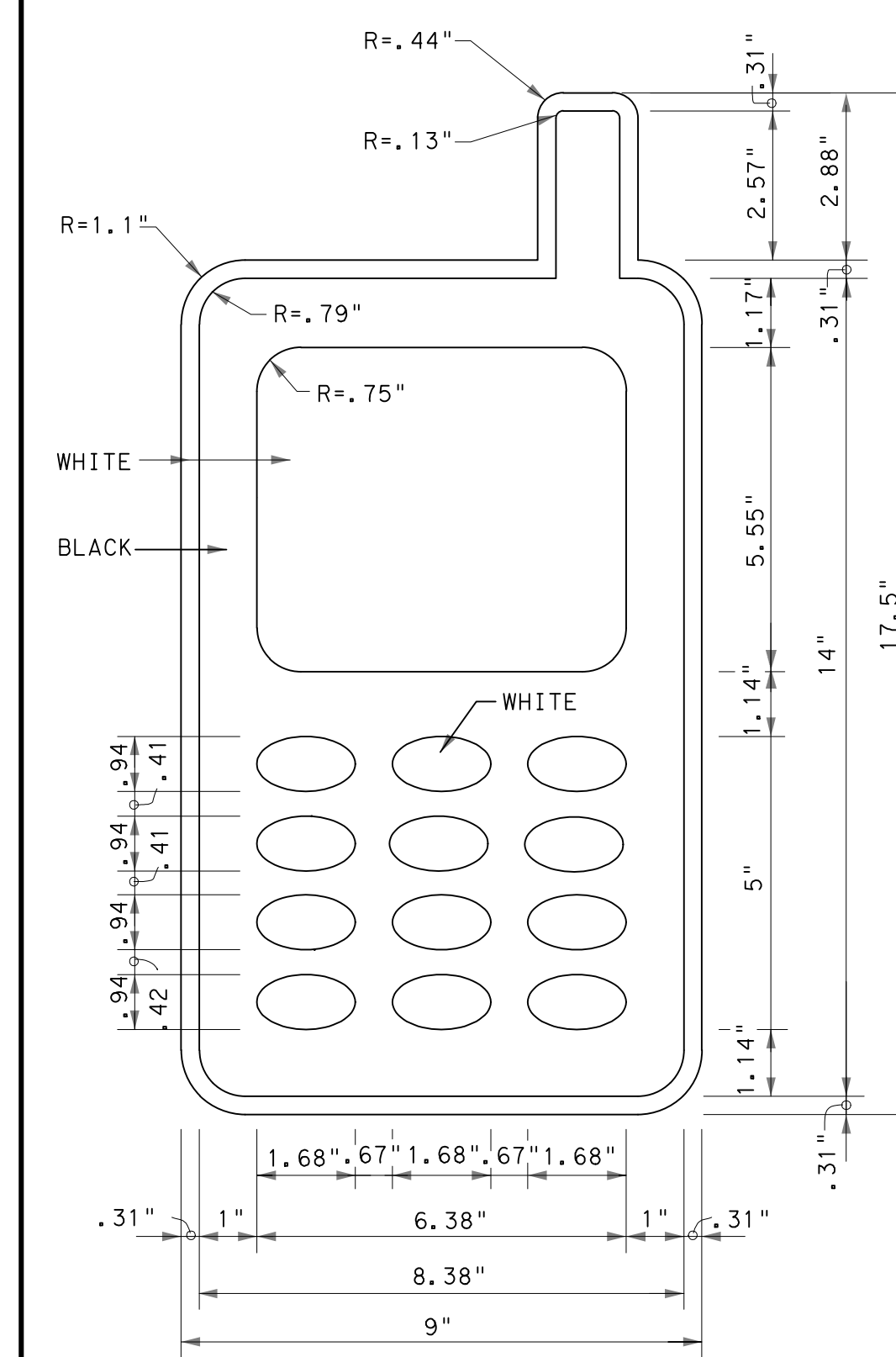
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BARRICADE AND CONSTRUCTION (BC) STANDARD SHEETS GENERAL NOTES:

- The Barricade and Construction Standard Sheets (BC sheets) are intended to show typical examples for placement of temporary traffic control devices, construction pavement markings, and typical work zone signs. The information contained in these sheets meet or exceed the requirements shown in the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD).
- The development and design of the Traffic Control Plan (TCP) is the responsibility of the Engineer.
- The Contractor may propose changes to the TCP that are signed and sealed by a licensed professional engineer for approval. The Engineer may develop, sign and seal Contractor proposed changes.
- The Contractor is responsible for installing and maintaining the traffic control devices as shown in the plans. The Contractor may not move or change the approximate location of any device without the approval of the Engineer.
- Geometric design of lane shifts and detours should, when possible, meet the applicable design criteria contained in manuals such as the American Association of State Highway and Transportation Officials (AASHTO), "A Policy on Geometric Design of Highways and Streets," the TxDOT "Roadway Design Manual" or engineering judgment.
- When projects abut, the Engineer(s) may omit the END ROAD WORK, TRAFFIC FINES DOUBLE, and other advance warning signs if the signing would be redundant and the work areas appear continuous to the motorists. If the adjacent project is completed first, the Contractor shall erect the necessary warning signs as shown on these sheets, the TCP sheets or as directed by the Engineer. The BEGIN ROAD WORK NEXT X MILES sign shall be revised to show appropriate work zone distance.
- The Engineer may require duplicate warning signs on the median side of divided highways where median width will permit and traffic volumes justify the signing.
- All signs shall be constructed in accordance with the details found in the "Standard Highway Sign Designs for Texas," latest edition. Sign details not shown in this manual shall be shown in the plans or the Engineer shall provide a detail to the Contractor before the sign is manufactured.
- The temporary traffic control devices shown in the illustrations of the BC sheets are examples. As necessary, the Engineer will determine the most appropriate traffic control devices to be used.
- As shown on BC(2), the OBEY WARNING SIGNS STATE LAW sign, STAY ALERT TALK OR TEXT LATER (see Sign Detail G20-10T) and the WORK ZONE TRAFFIC FINES DOUBLE sign with plaque shall be erected in advance of the CSJ limits. However, the TRAFFIC FINES DOUBLE sign will not be required on projects consisting solely of mobile operation work, such as striping or milling edgeline rumble strips. The BEGIN ROAD WORK NEXT X MILES, CONTRACTOR and END ROAD WORK signs shall be erected at or near the CSJ limits.
- Except for devices required by Note 10, traffic control devices should be in place only while work is actually in progress or a definite need exists.
- The Engineer has the final decision on the location of all traffic control devices.
- Inactive equipment and work vehicles, including workers' private vehicles must be parked away from travel lanes. They should be as close to the right-of-way line as possible, or located behind a barrier or guardrail, or as approved by the Engineer.

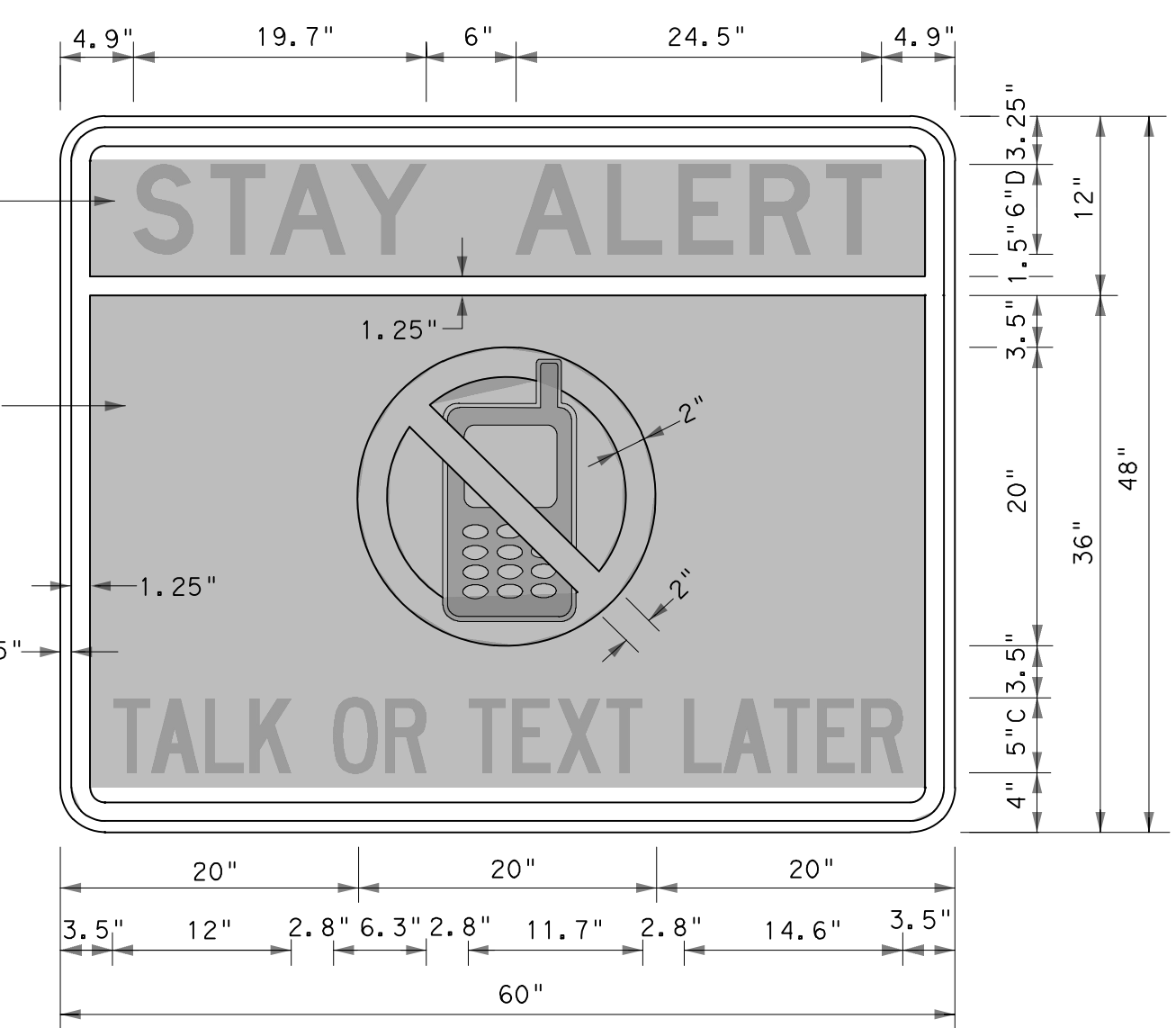
WORKER SAFETY APPAREL NOTES:

- Workers on foot who are exposed to traffic or to construction equipment within the right-of-way shall wear high-visibility safety apparel meeting the requirements of ISEA "American National Standard for High-Visibility Apparel," or equivalent revisions, and labeled as ANSI 107-2004 standard performance for Class 2 or 3 risk exposure. Class 3 garments should be considered for high traffic volume work areas or night time work.



COLORS:
FLUORESCENT
YELLOW
BACKGROUND
BLACK
BORDER AND
LEGEND

ORANGE
FLUORESCENT
BACKGROUND
BLACK
LEGEND,
BORDER
AND SYMBOL



3.0" Radius, 1.25" Border, 0.75" Indent, Black on Yellow;
[STAY ALERT] Font: D
3.0" Radius, 1.25" Border, 0.75" Indent, Black on Orange;
[TALK OR TEXT LATER] Font: C specified length;

SIGN DETAIL (G20-10T)

Only pre-qualified products shall be used. The "Compliant Work Zone Traffic Control Devices List" (CWZTCD) describes pre-qualified products and their sources and may be found on-line at the web address given below or by contacting:

Texas Department of Transportation
Traffic Operations Division - TE
Phone (512) 416-3118

THE DOCUMENTS BELOW CAN BE FOUND ON-LINE AT http://www.txdot.gov
COMPLIANT WORK ZONE TRAFFIC CONTROL DEVICES LIST (CWZTCD)
DEPARTMENTAL MATERIAL SPECIFICATIONS (DMS)
MATERIAL PRODUCER LIST (MPL)
ROADWAY DESIGN MANUAL - SEE "MANUALS (ONLINE MANUALS)"
STANDARD HIGHWAY SIGN DESIGNS FOR TEXAS (SHSD)
TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (TMUTCD)
TRAFFIC ENGINEERING STANDARD SHEETS

BARRICADE AND CONSTRUCTION GENERAL NOTES AND REQUIREMENTS			
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4-03 5-10 8-14	DIST	COUNTY	SHEET NO.
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ATKINS
Member of the SNC-Lavalin Group

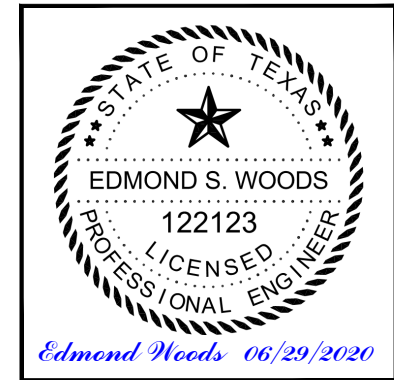
LOCAL OFFICE:
200 WESTLAKE PARK BLVD.,
STE. 1100
HOUSTON, TX 77079
TEL: (713) 576-8500
ATKINS NORTH
AMERICA PE FIRM REG.
#F-000474
WWW.ATKINSGLOBAL.COM

REVISIONS

NO.	DESCRIPTION	DATE BY

**WILLIAM P. HOBBY AIRPORT / HOUSTON (HOU)
METRO BUS DRIVE LANE RECONSTRUCTION
TRAFFIC CONTROL DETAILS**

PROJECT MGR:	JLV
DESIGNER:	EW
DRAWN BY:	KJV
CHECK BY:	RE
SCALE:	
DATE:	06/29/2020



APPROVED BY:

DIRECTOR
HOUSTON AIRPORT SYSTEM

PROJECT NO.
100068156

A.I.P. NO.

C.I.P. NO.

H.A.S. NO.
236

SHEET NO.

REVISIONS

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WILLIAM P. HOBBY AIRPORT / HOUSTON (HOU)
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DIRECTOR
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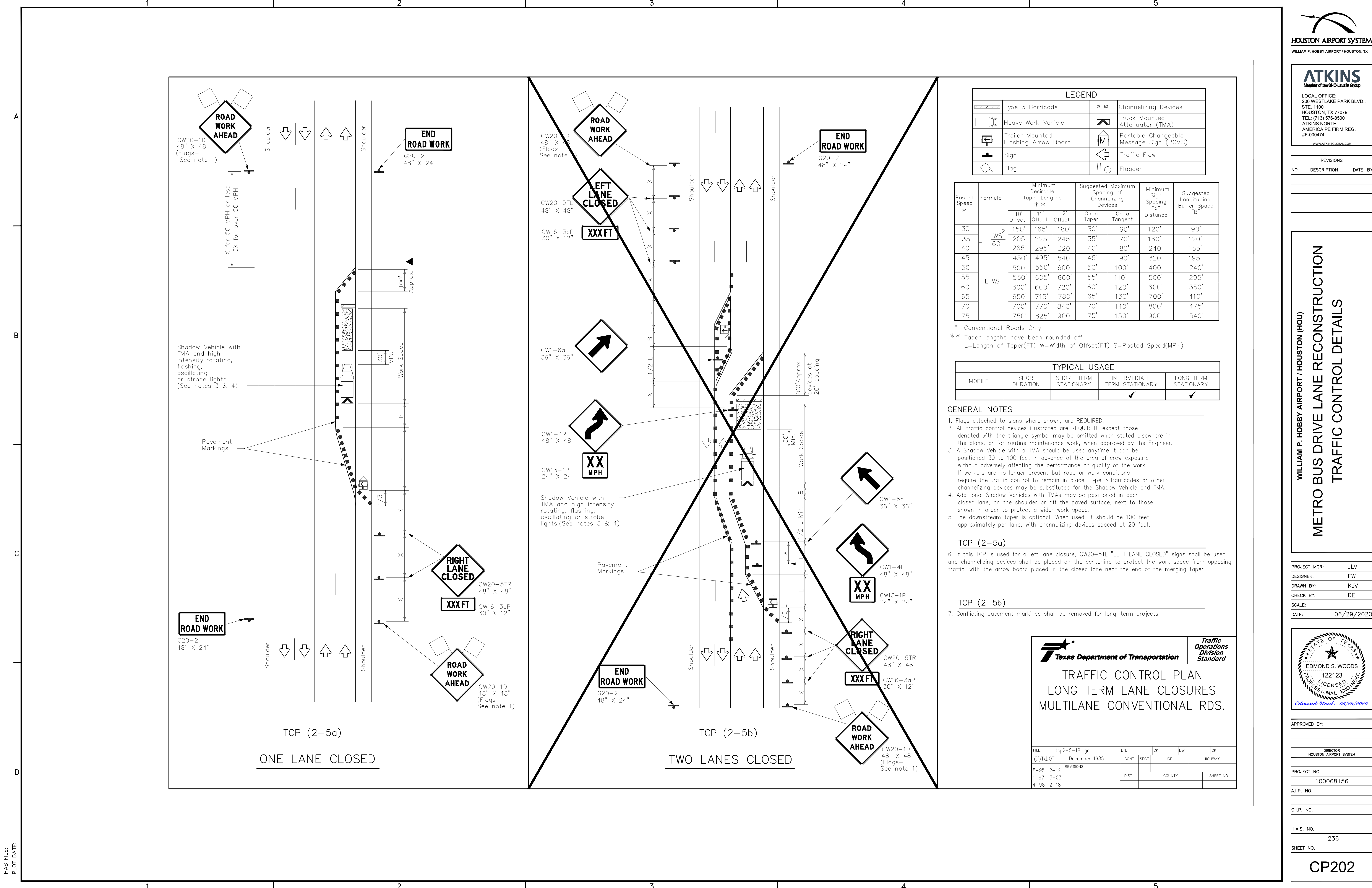
PROJECT NO.
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C.I.P. NO.

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SHEET NO.



LEGEND

	Type 3 Barricade		Channelizing Devices
	Heavy Work Vehicle		Truck Mounted Attenuator (TMA)
	Trailer Mounted Flashing Arrow Board		Portable Changeable Message Sign (PCMS)
	Sign		Traffic Flow
	Flag		Flagger

Posted Speed *	Formula	Minimum Desirable Taper Lengths **			Suggested Maximum Spacing of Channelizing Devices		Minimum Sign Spacing "x" Distance	Suggested Longitudinal Buffer Space "b"
		10' Offset	11' Offset	12' Offset	On a Taper	On a Tangent		
30	$L = \frac{WS^2}{60}$	150'	165'	180'	30'	60'	120'	90'
35		205'	225'	245'	35'	70'	160'	120'
40		265'	295'	320'	40'	80'	240'	155'
45		450'	495'	540'	45'	90'	320'	195'
50		500'	550'	600'	50'	100'	400'	240'
55		550'	605'	660'	55'	110'	500'	295'
60		600'	660'	720'	60'	120'	600'	350'
65	650'	715'	780'	65'	130'	700'	410'	
70	700'	770'	840'	70'	140'	800'	475'	
75	750'	825'	900'	75'	150'	900'	540'	

* Conventional Roads Only
 ** Taper lengths have been rounded off.
 L=Length of Taper(FT) W=Width of Offset(FT) S=Posted Speed(MPH)

TYPICAL USAGE

MOBILE	SHORT DURATION	SHORT TERM STATIONARY	INTERMEDIATE TERM STATIONARY	LONG TERM STATIONARY

- GENERAL NOTES**
- Flags attached to signs where shown, are REQUIRED.
 - All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
 - A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and TMA.
 - Additional Shadow Vehicles with TMAs may be positioned in each closed lane, on the shoulder or off the paved surface, next to those shown in order to protect a wider work space.
 - The downstream taper is optional. When used, it should be 100 feet approximately per lane, with channelizing devices spaced at 20 feet.
- TCP (2-5a)**
- If this TCP is used for a left lane closure, CW20-5TL "LEFT LANE CLOSED" signs shall be used and channelizing devices shall be placed on the centerline to protect the work space from opposing traffic, with the arrow board placed in the closed lane near the end of the merging taper.
- TCP (2-5b)**
- Conflicting pavement markings shall be removed for long-term projects.

Texas Department of Transportation Traffic Operations Division Standard

TRAFFIC CONTROL PLAN
 LONG TERM LANE CLOSURES
 MULTILANE CONVENTIONAL RDS.

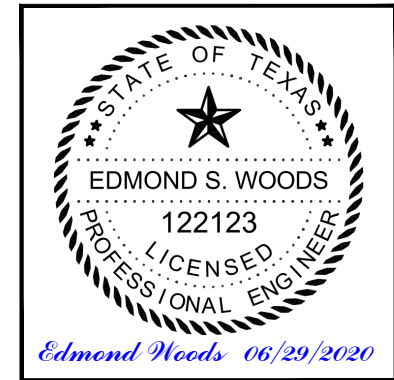
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 4-98 2-18

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NO.	DESCRIPTION	DATE BY

WILLIAM P. HOBBY AIRPORT / HOUSTON (HOU)
METRO BUS DRIVE LANE RECONSTRUCTION
TRAFFIC CONTROL DETAILS

PROJECT MGR: JLV
 DESIGNER: EW
 DRAWN BY: KJV
 CHECK BY: RE
 SCALE: _____
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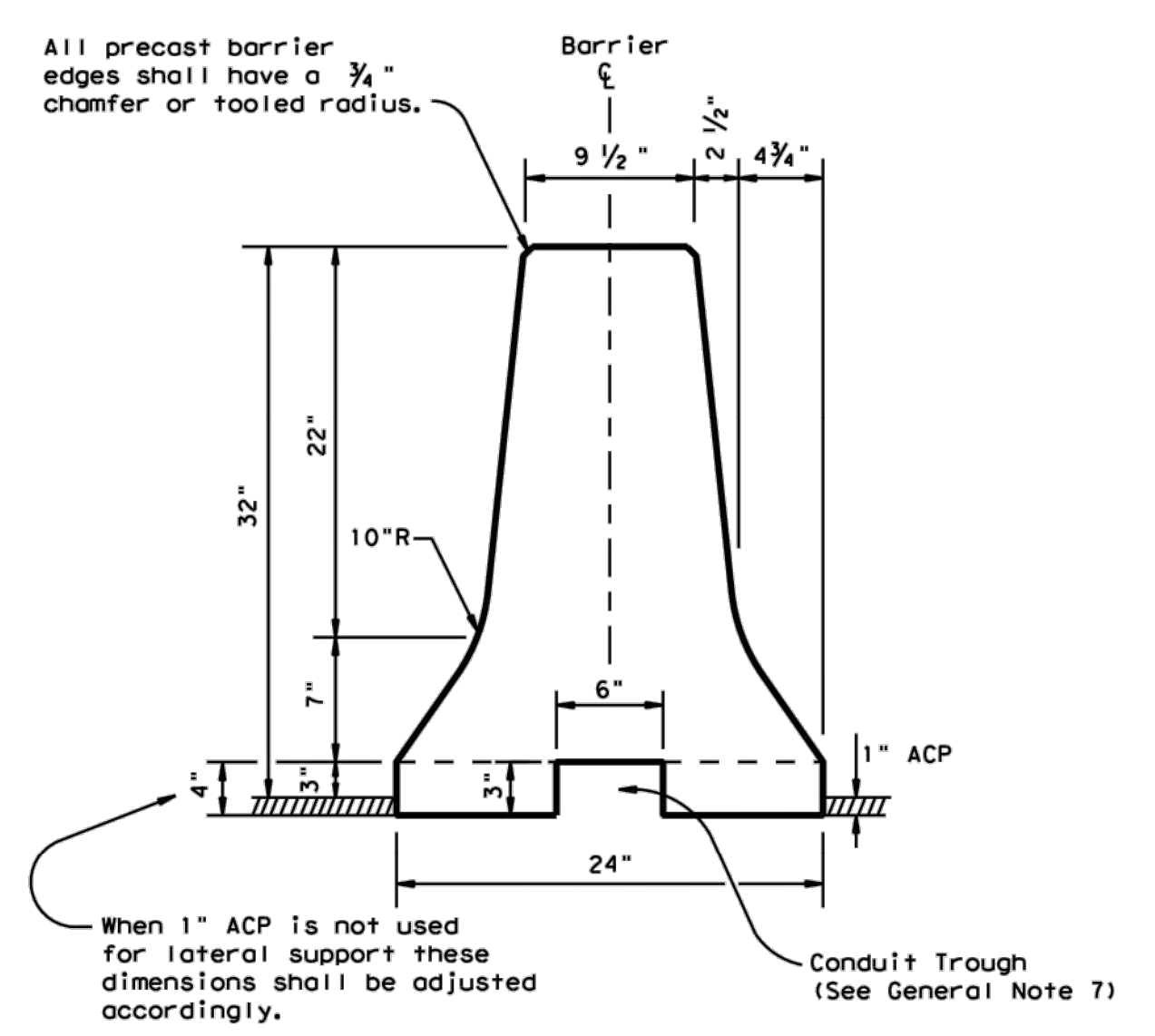
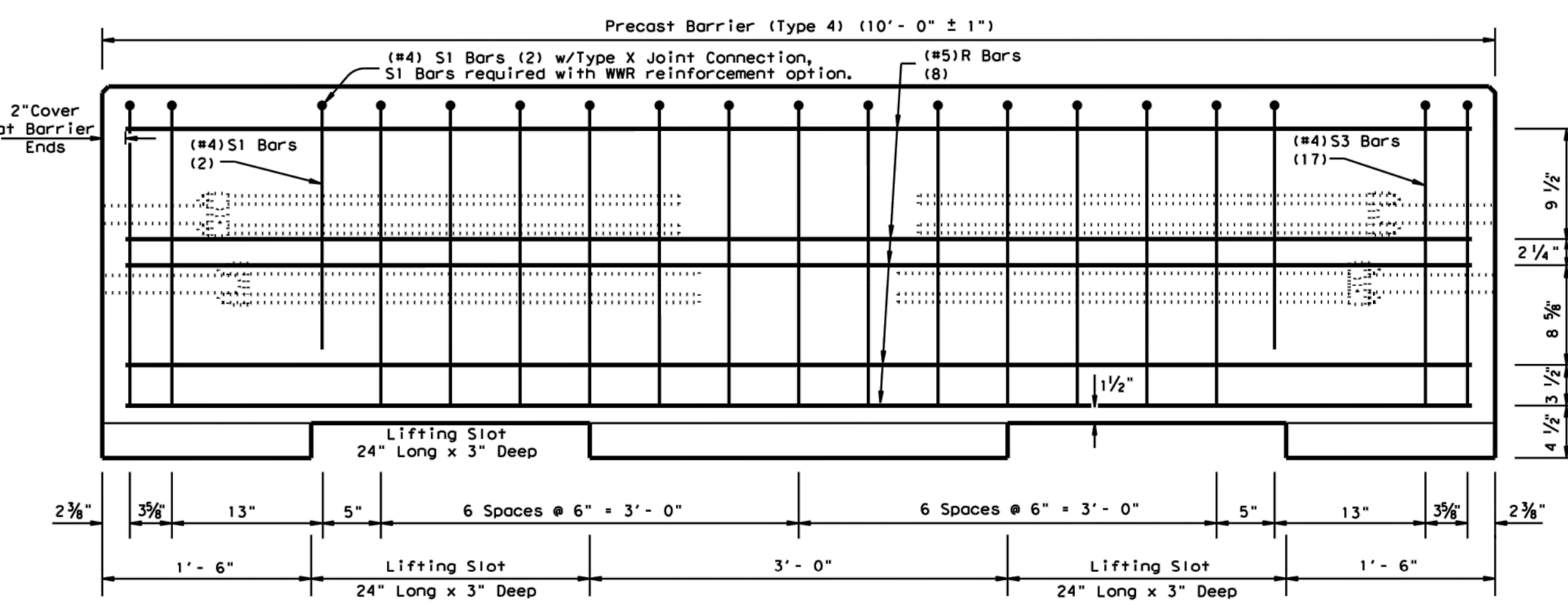
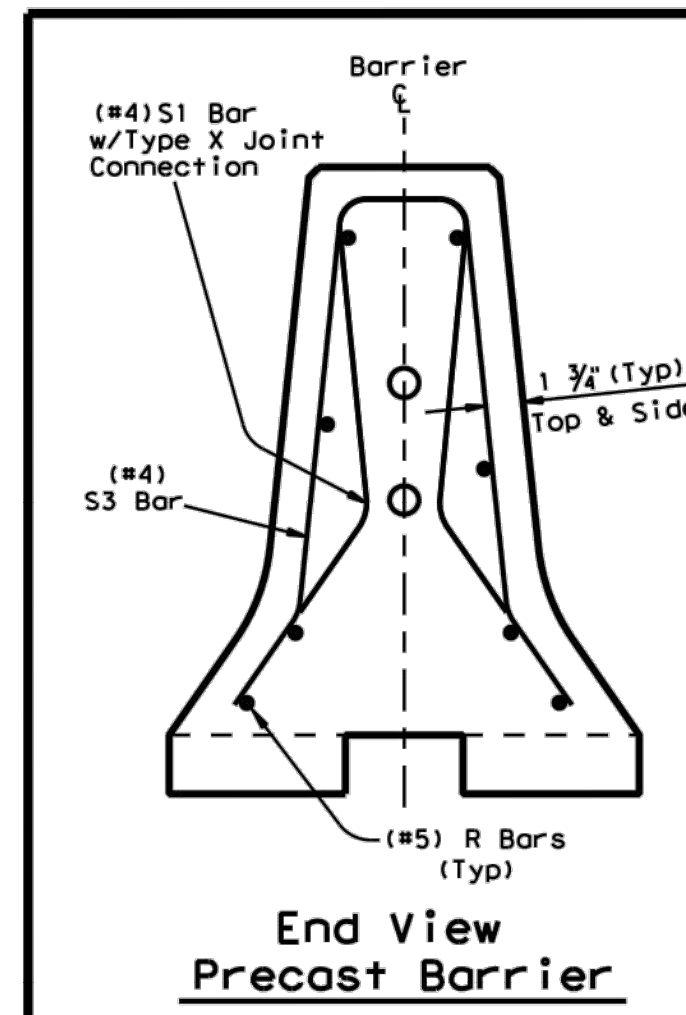
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SHEET NO. _____

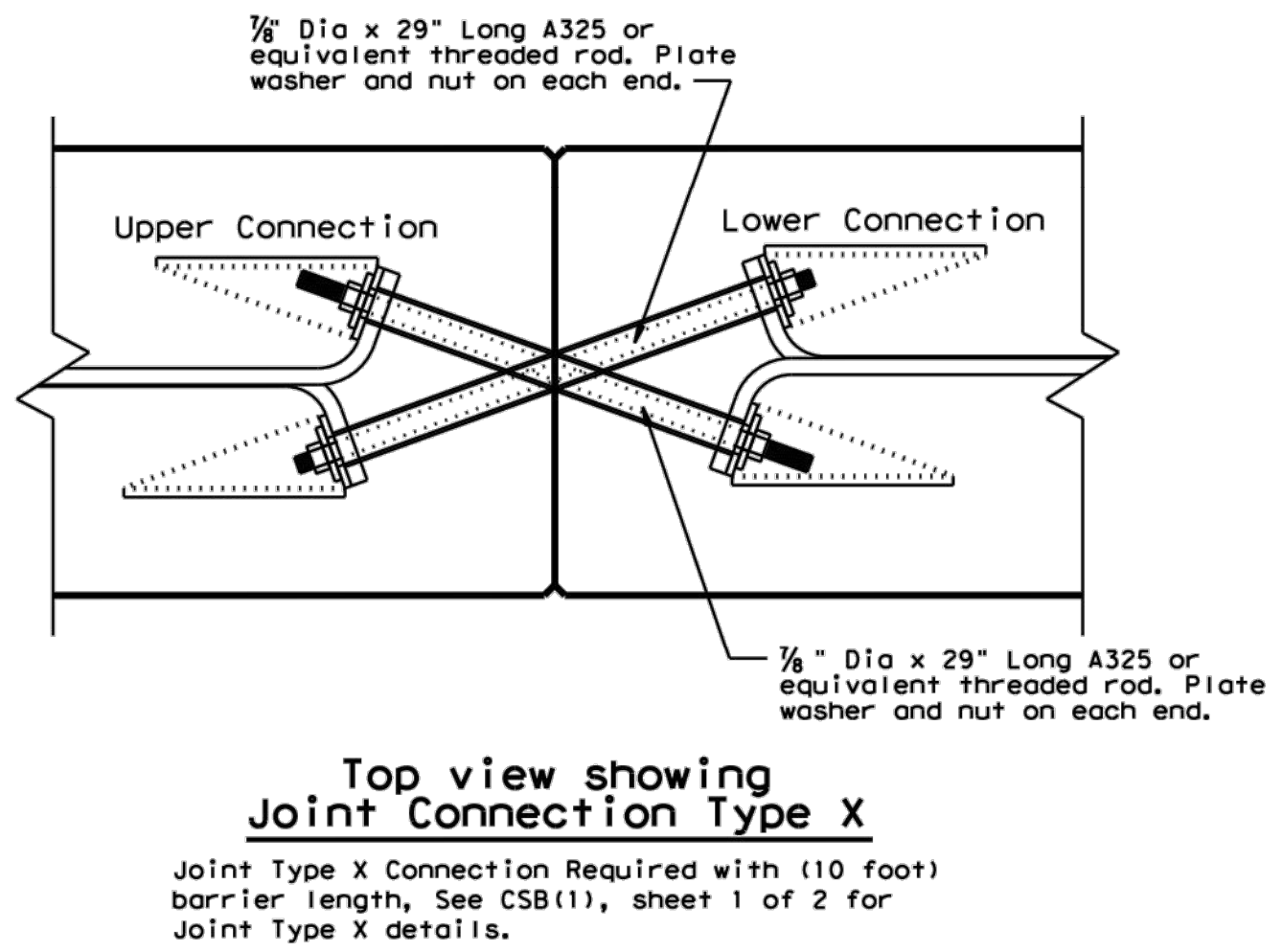
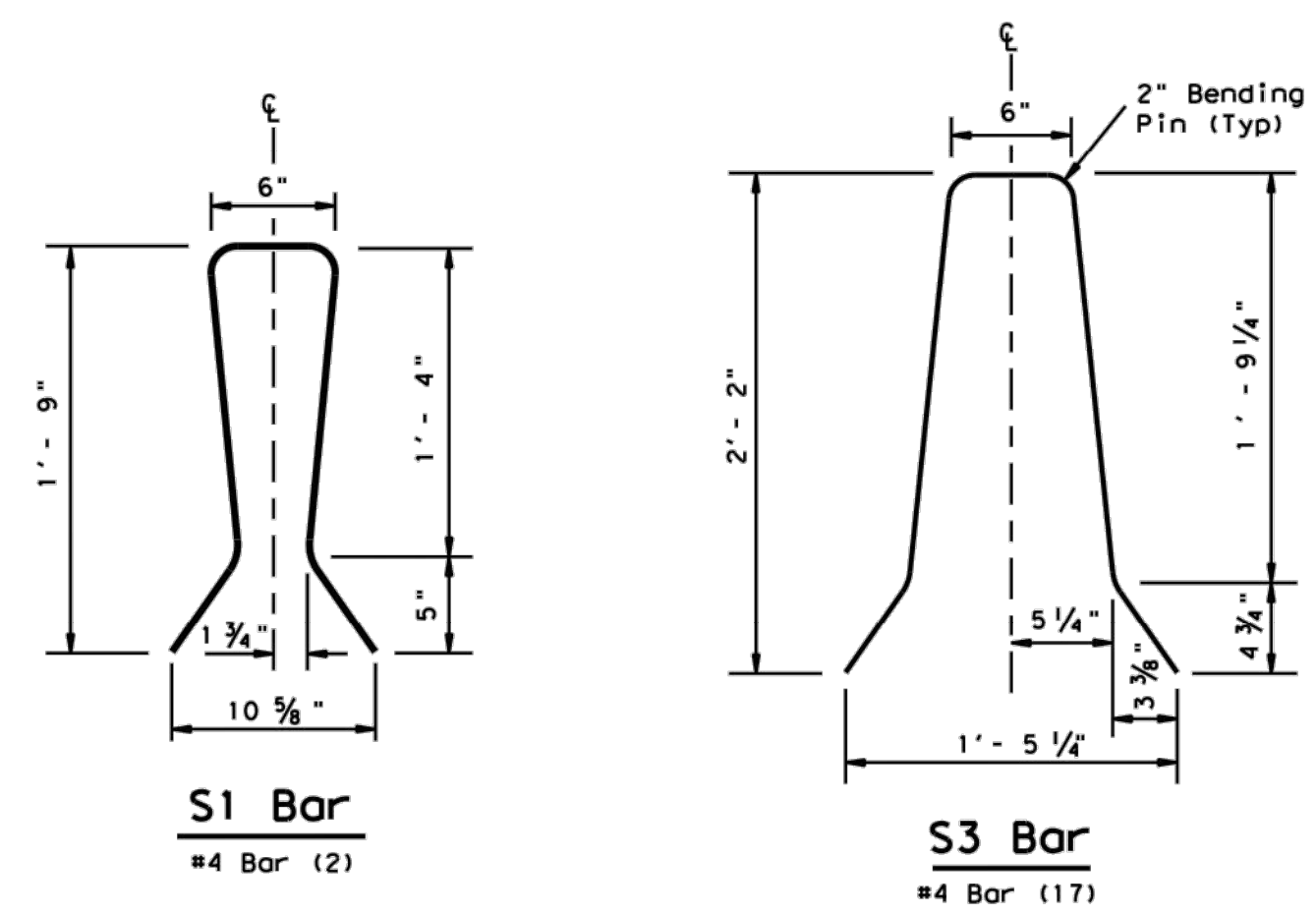
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Schedule of reinforcement for each 10 foot precast section.

BAR	SIZE	QUANTITY
S1	#4	2
R3	#4	17
R	#5	8

Note:
 Two S1 Bars are required with the use of WWR reinforcement option. The S1 Bars may need a slight modification to fit within the WWR cage, as directed by the Engineer.



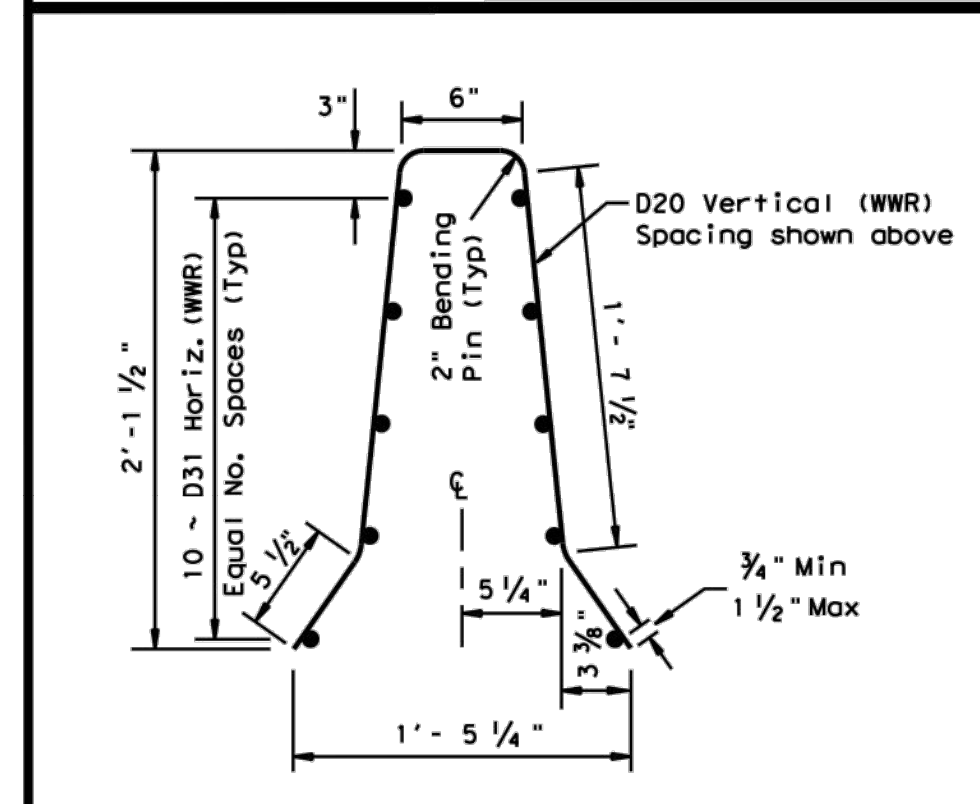
Approximate Per L.F. Quantities

	Precast
Concrete	0.108
Rebar	14.8

For Contractor's information only
 Weight of one Precast 10 ft. unit = Approx. 2 Tons

- General Notes**
- The 10 foot barrier is intended for maintenance applications of short duration periods. The 10 foot barrier is limited to use in temporary work zone conditions not to exceed 2 calendar months, unless approved in writing by the TxDOT engineer, noting the duration and location of the barrier placement in the written approval.
 - 30 ft. (Type 1) barrier and 10 ft. (Type 4) barrier sections shall not be mixed in a single run of barrier.
 - Barrier lengths other than 10 ft. for (Type 4) barrier are not allowed.
 - Concrete shall be Class H, with a minimum compressive strength of 3,600 psi.
 - Where used, rebar reinforcement shall be Grade 60 and conform to ASTM A615.
 - Only the Type X joint connection system is to be used with Type 4 barrier and is considered subsidiary. See CSB(1), Sheet 1 of 2, for (Type X) connection details.
 - Conduit trough may be omitted, as shown elsewhere or as directed by the Engineer.

NOTE:
 USAGE OF THE 10 FT (TYPE 4) CSB BARRIER REQUIRES A MINIMUM OF 100 LINEAR FEET.
 SHORTER LENGTHS THAN THESE SHOULD BE DISCUSSED WITH THE DESIGN DIVISION.



- (WWR) General Notes**
- Deformed Welded Wire Reinforcement (WWR) shall conform to ASTM A497.
 - Welded wire cage may be cut or bent to accommodate the Type X joint connection and drainage slots, as directed by the Engineer.
 - All reinforcement shall comply with Item 440, "Reinforcing Steel."
 - Combinations of reinforcing steel and WWR will be permitted, as directed by the Engineer. The dimension from the end of the barrier section to the first wire shall not exceed 3".

Texas Department of Transportation
 Design Division Standard

CONCRETE SAFETY BARRIER (F-SHAPE) PRECAST BARRIER (TYPE 4) (10 FOOT, BARRIER SEGMENT) CSB(8) - 10

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WILLIAM P. HOBBY AIRPORT / HOUSTON (HOU)
**METRO BUS DRIVE LANE RECONSTRUCTION
TRAFFIC CONTROL DETAILS**

PROJECT MGR:	JLV
DESIGNER:	EW
DRAWN BY:	KJV
CHECK BY:	RE
SCALE:	
DATE:	06/29/2020



APPROVED BY:

DIRECTOR
HOUSTON AIRPORT SYSTEM

PROJECT NO.
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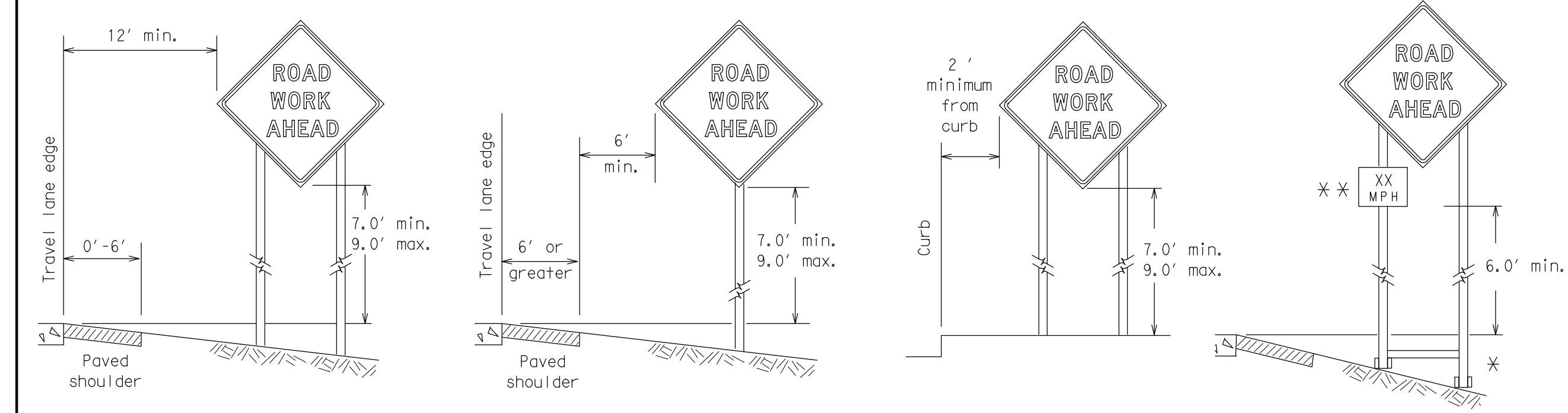
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H.A.S. NO.
236

SHEET NO.

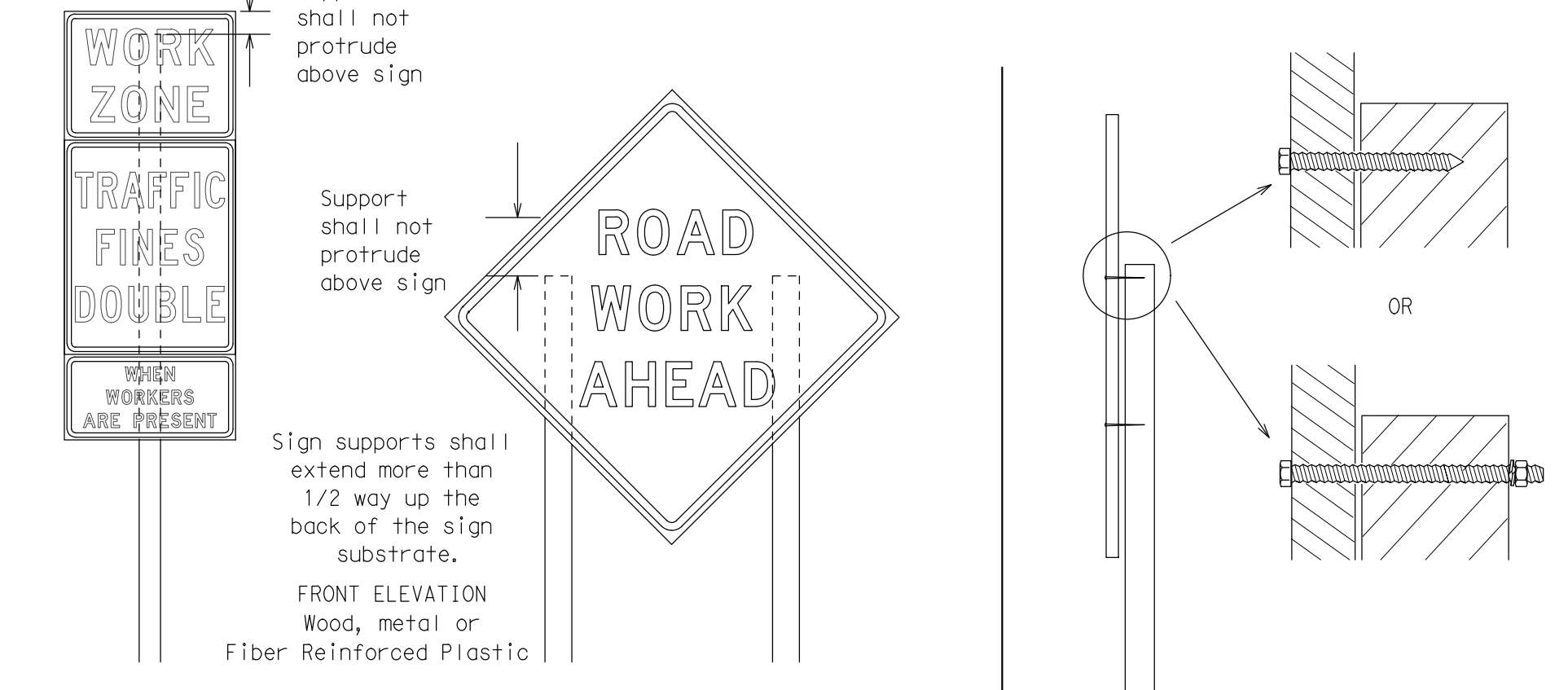
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS



* When placing skid supports on unlevel ground, the leg post lengths must be adjusted so the sign appears straight and plumb. Objects shall NOT be placed under skids as a means of leveling.

** When plaques are placed on dual-leg supports, they should be attached to the upright nearest the travel lane. Supplemental plaques (advisory or distance) should not cover the surface of the parent sign.

ATTACHMENT FOR SIGN SUPPORTS

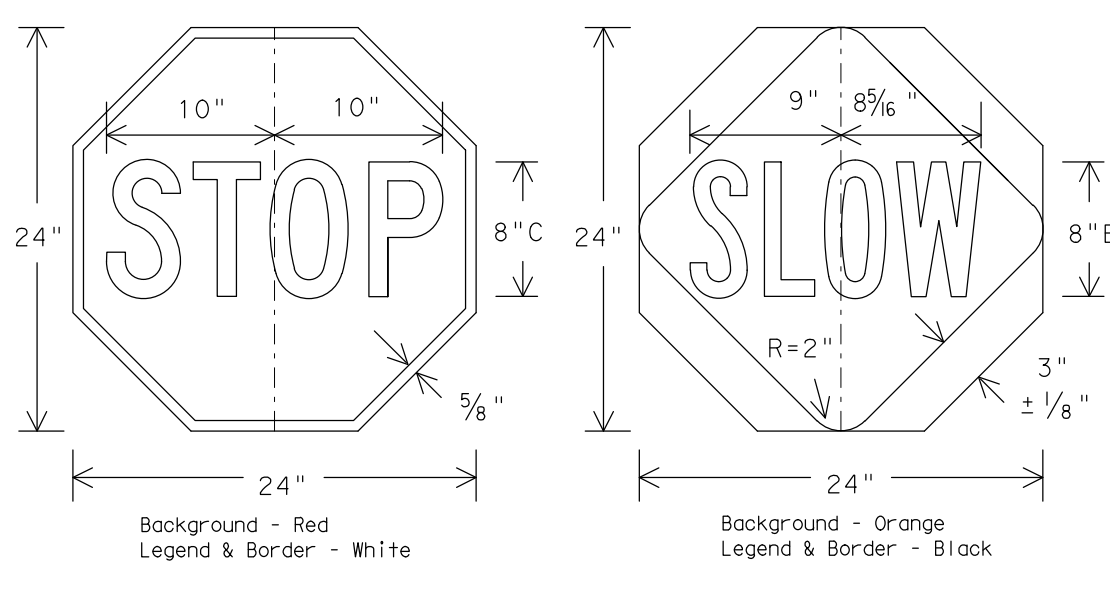


Attachment to wooden supports will be by bolts and nuts or screws. Use TxDOT's or manufacturer's recommended procedures for attaching sign substrates to other types of sign supports

Nails shall NOT be allowed. Each sign shall be attached directly to the sign support. Multiple signs shall not be joined or spliced by any means. Wood supports shall not be extended or repaired by splicing or other means.

STOP/SLOW PADDLES

- STOP/SLOW paddles are the primary method to control traffic by flaggers. The STOP/SLOW paddle size should be 24" x 24" as detailed below.
- When used at night, the STOP/SLOW paddle shall be retroreflectORIZED.
- STOP/SLOW paddles may be attached to a staff with a minimum length of 6' to the bottom of the sign.
- Any lights incorporated into the STOP or SLOW paddle faces shall only be as specifically described in Section 6E.03 Hand Signaling Devices in the TMUTCD.



CONTRACTOR REQUIREMENTS FOR MAINTAINING PERMANENT SIGNS WITHIN THE PROJECT LIMITS

- Permanent signs are used to give notice of traffic laws or regulations, call attention to conditions that are potentially hazardous to traffic operations, show route designations, destinations, directions, distances, services, points of interest, and other geographical, recreational, or cultural information. Drivers proceeding through a work zone need the same, if not better route guidance as normally installed on a roadway without construction.
- When permanent regulatory or warning signs conflict with work zone conditions, remove or cover the permanent signs until the permanent sign message matches the roadway condition.
- When existing permanent signs are moved and relocated due to construction purposes, they shall be visible to motorists at all times.
- If existing signs are to be relocated on their original supports, they shall be installed on crashworthy bases as shown on the SMD Standard sheets. The signs shall meet the required mounting heights shown on the BC Sheets or the SMD Standards. This work should be paid for under the appropriate pay item for relocating existing signs.
- If permanent signs are to be removed and relocated using temporary supports, the Contractor shall use crashworthy supports as shown on the BC sheets or the CWZTCD. The signs shall meet the required mounting heights shown on the BC Sheets or the SMD Standards during construction. This work should be paid for under the appropriate pay item for relocating existing signs.
- Any sign or traffic control device that is struck or damaged by the Contractor or his/her construction equipment shall be replaced as soon as possible by the Contractor to ensure proper guidance for the motorists. This will be subsidiary to Item 502.

GENERAL NOTES FOR WORK ZONE SIGNS

- Contractor shall install and maintain signs in a straight and plumb condition and/or as directed by the Engineer.
- Wooden sign posts shall be painted white.
- Barricades shall NOT be used as sign supports.
- All signs shall be installed in accordance with the plans or as directed by the Engineer. Signs shall be used to regulate, warn, and guide the traveling public safely through the work zone.
- The Contractor may furnish either the sign design shown in the plans or in the "Standard Highway Sign Designs for Texas" (SHSD). The Engineer/Inspector may require the Contractor to furnish other work zone signs that are shown in the TMUTCD but may have been omitted from the plans. Any variation in the plans shall be documented by written agreement between the Engineer and the Contractor's Responsible Person. All changes must be documented in writing before being implemented. This can include documenting the changes in the Inspector's TxDOT diary and having both the Inspector and Contractor initial and date the agreed upon changes.
- The Contractor shall furnish sign supports listed in the "Compliant Work Zone Traffic Control Device List" (CWZTCD). The Contractor shall install the sign support in accordance with the manufacturer's recommendations. If there is a question regarding installation procedures, the Contractor shall furnish the Engineer a copy of the manufacturer's installation recommendations so the Engineer can verify the correct procedures are being followed.
- The Contractor is responsible for installing signs on approved supports and replacing signs with damaged or cracked substrates and/or damaged or marred reflective sheeting as directed by the Engineer/Inspector.
- Identification markings may be shown only on the back of the sign substrate. The maximum height of letters and/or company logos used for identification shall be 1 inch.
- The Contractor shall replace damaged wood posts. New or damaged wood sign posts shall not be spliced.

DURATION OF WORK (as defined by the "Texas Manual on Uniform Traffic Control Devices" Part 6)

- The types of sign supports, sign mounting height, the size of signs, and the type of sign substrates can vary based on the type of work being performed. The Engineer is responsible for selecting the appropriate size sign for the type of work being performed. The Contractor is responsible for ensuring the sign support, sign mounting height and substrate meets manufacturer's recommendations in regard to crashworthiness and duration of work requirements.
 - Long-term stationary - work that occupies a location more than 3 days.
 - Intermediate-term stationary - work that occupies a location more than one daylight period up to 3 days, or nighttime work lasting more than one hour.
 - Short-term stationary - daytime work that occupies a location for more than 1 hour in a single daylight period.
 - Short, duration - work that occupies a location up to 1 hour.
 - Mobile - work that moves continuously or intermittently (stopping for up to approximately 15 minutes.)

SIGN MOUNTING HEIGHT

- The bottom of Long-Term/Intermediate-term signs shall be at least 7 feet, but not more than 9 feet, above the paved surface, except as shown for supplemental plaques mounted below other signs.
- The bottom of Short-term/Short Duration signs shall be a minimum of 1 foot above the pavement surface but no more than 2 feet above the ground.
- Long-term/Intermediate-term Signs may be used in lieu of Short-term/Short Duration signing.
- Short-term/Short Duration signs shall be used only during daylight and shall be removed at the end of the workday or raised to appropriate Long-term/Intermediate sign height.
- Regulatory signs shall be mounted at least 7 feet, but not more than 9 feet, above the paved surface regardless of work duration.

SIZE OF SIGNS

- The Contractor shall furnish the sign sizes shown on BC (2) unless otherwise shown in the plans or as directed by the Engineer.

SIGN SUBSTRATES

- The Contractor shall ensure the sign substrate is installed in accordance with the manufacturer's recommendations for the type of sign support that is being used. The CWZTCD lists each substrate that can be used on the different types and models of sign supports.
- "Mesh" type materials are NOT an approved sign substrate, regardless of the tightness of the weave.
- All wooden individual sign panels fabricated from 2 or more pieces shall have one or more plywood cleat, 1/2" thick by 6" wide, fastened to the back of the sign and extending fully across the sign. The cleat shall be attached to the back of the sign using wood screws that do not penetrate the face of the sign panel. The screws shall be placed on both sides of the splice and spaced at 6" centers. The Engineer may approve other methods of splicing the sign faces.

REFLECTIVE SHEETING

- All signs shall be retroreflective and constructed of sheeting meeting the color and retro-reflectivity requirements of DMS-8300 for rigid signs or DMS-8310 for roll-up signs. The web address for DMS specifications is shown on BC(1).
- White sheeting, meeting the requirements of DMS-8300 Type A, shall be used for signs with a white background.
- Orange sheeting, meeting the requirements of DMS-8300 Type B_{FL} or Type C_{FL}, shall be used for rigid signs with orange backgrounds.

SIGN LETTERS

- All sign letters and numbers shall be clear, and open rounded type uppercase alphabet letters as approved by the Federal Highway Administration (FHWA) and as published in the "Standard Highway Sign Design for Texas" manual. Signs, letters and numbers shall be of first class workmanship in accordance with Department Standards and Specifications.

REMOVING OR COVERING

- When sign messages may be confusing or do not apply, the signs shall be removed or completely covered.
- Long-term stationary or intermediate stationary signs installed on square metal tubing may be turned away from traffic 90 degrees when the sign message is not applicable. This technique may not be used for signs installed in the median of divided highways or near any intersections where the sign may be seen from approaching traffic.
- Signs installed on wooden skids shall not be turned at 90 degree angles to the roadway. These signs should be removed or completely covered when not required.
- When signs are covered, the material used shall be opaque, such as heavy mil black plastic, or other materials which will cover the entire sign face and maintain their opaque properties under automobile headlights at night, without damaging the sign sheeting.
- Burlap shall NOT be used to cover signs.
- Duct tape or other adhesive material shall NOT be affixed to a sign face.
- Signs and anchor stubs shall be removed and holes backfilled upon completion of work.

SIGN SUPPORT WEIGHTS

- Where sign supports require the use of weights to keep from turning over, the use of sandbags with dry, cohesionless sand should be used.
- The sandbags will be tied shut to keep the sand from spilling and to maintain a constant weight.
- Rock, concrete, iron, steel or other solid objects shall not be permitted for use as sign support weights.
- Sandbags should weigh a minimum of 35 lbs and a maximum of 50 lbs.
- Sandbags shall be made of a durable material that tears upon vehicular impact. Rubber (such as tire inner tubes) shall NOT be used.
- Rubber ballasts designed for channelizing devices should not be used for ballast on portable sign supports. Sign supports designed and manufactured with rubber bases may be used when shown on the CWZTCD list.
- Sandbags shall only be placed along or laid over the base supports of the traffic control device and shall not be suspended above ground level or hung with rope, wire, chains or other fasteners. Sandbags shall be placed along the length of the skids to weigh down the sign support.
- Sandbags shall NOT be placed under the skid and shall not be used to level sign supports placed on slopes.

FLAGS ON SIGNS

- Flags may be used to draw attention to warning signs. When used the flag shall be 16 inches square or larger and shall be orange or fluorescent red-orange in color. Flags shall not be allowed to cover any portion of the sign face.



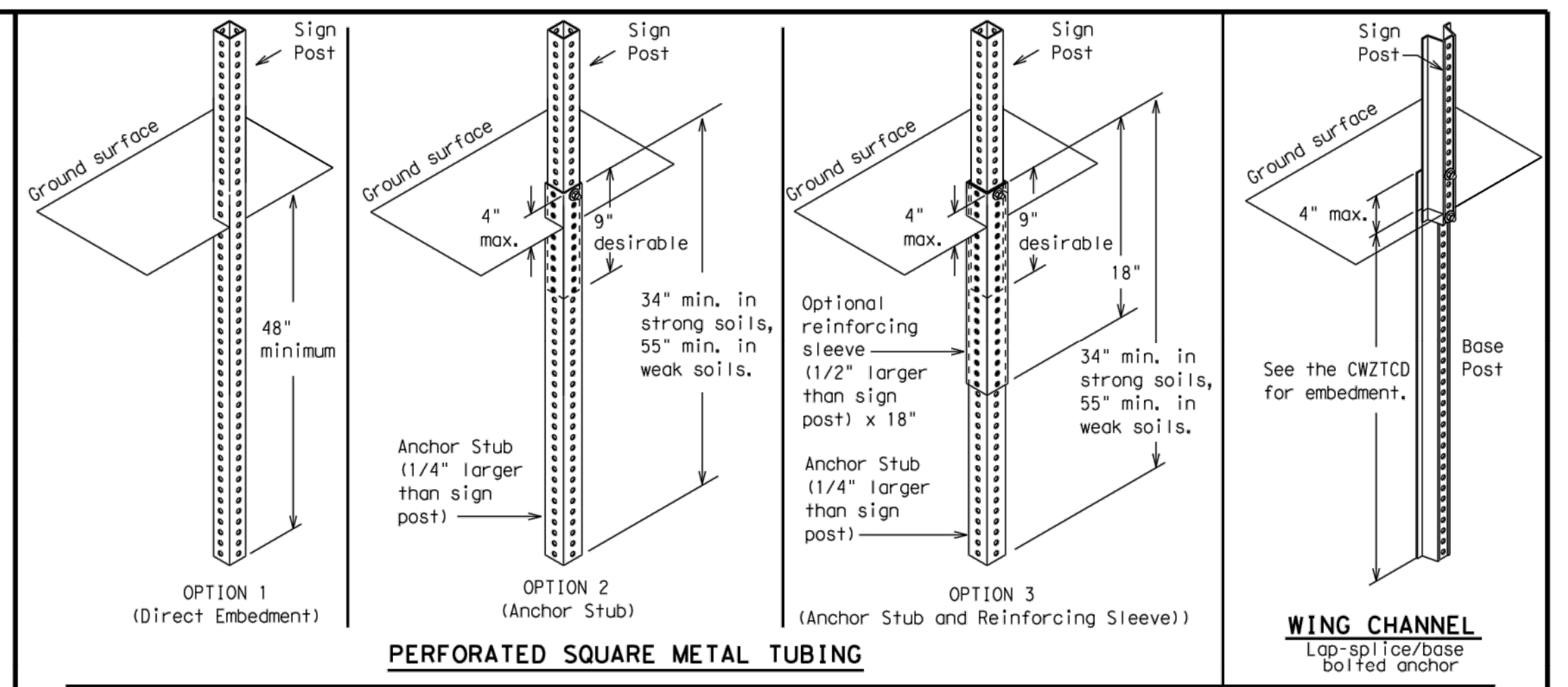
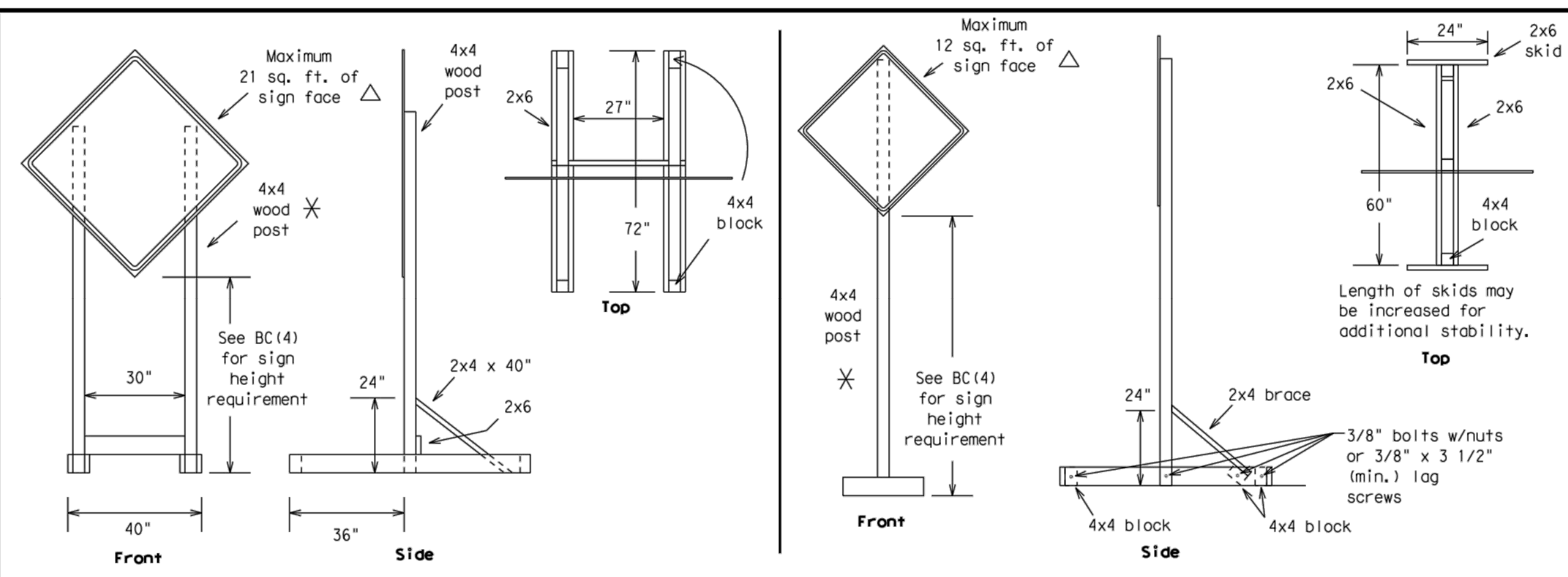
BARRICADE AND CONSTRUCTION
TEMPORARY SIGN NOTES

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7-13									

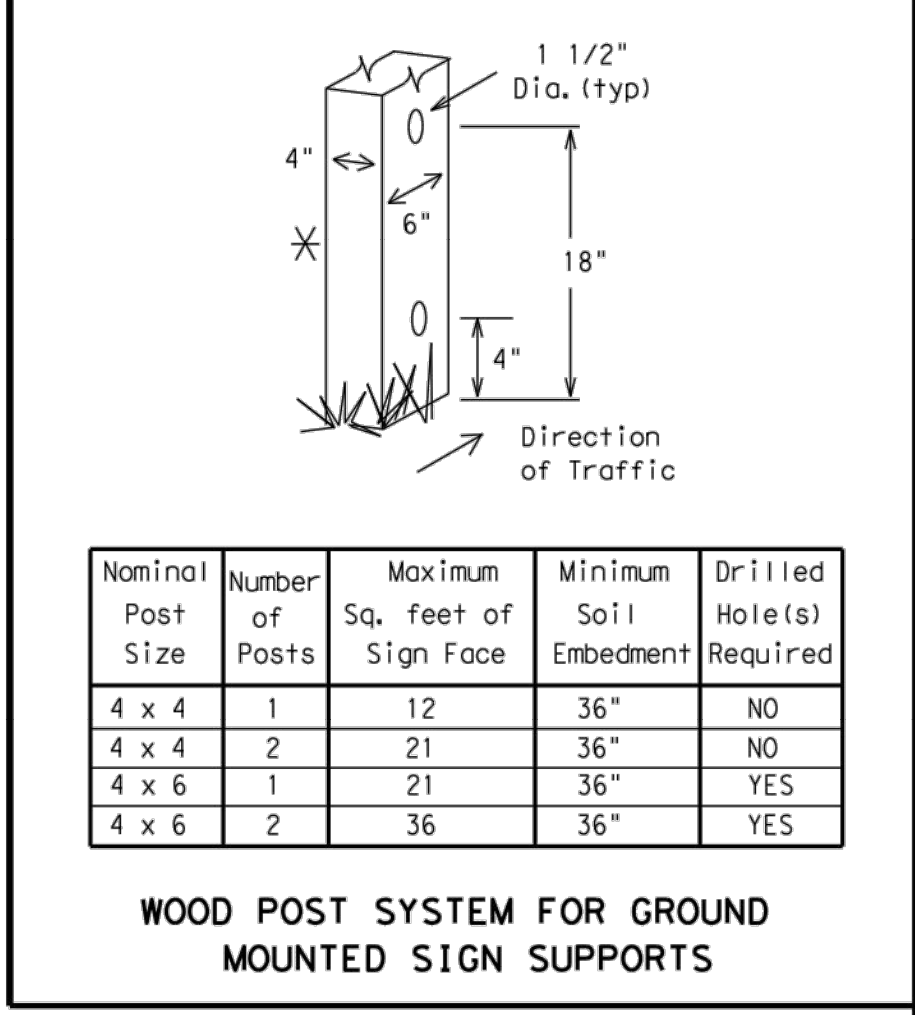
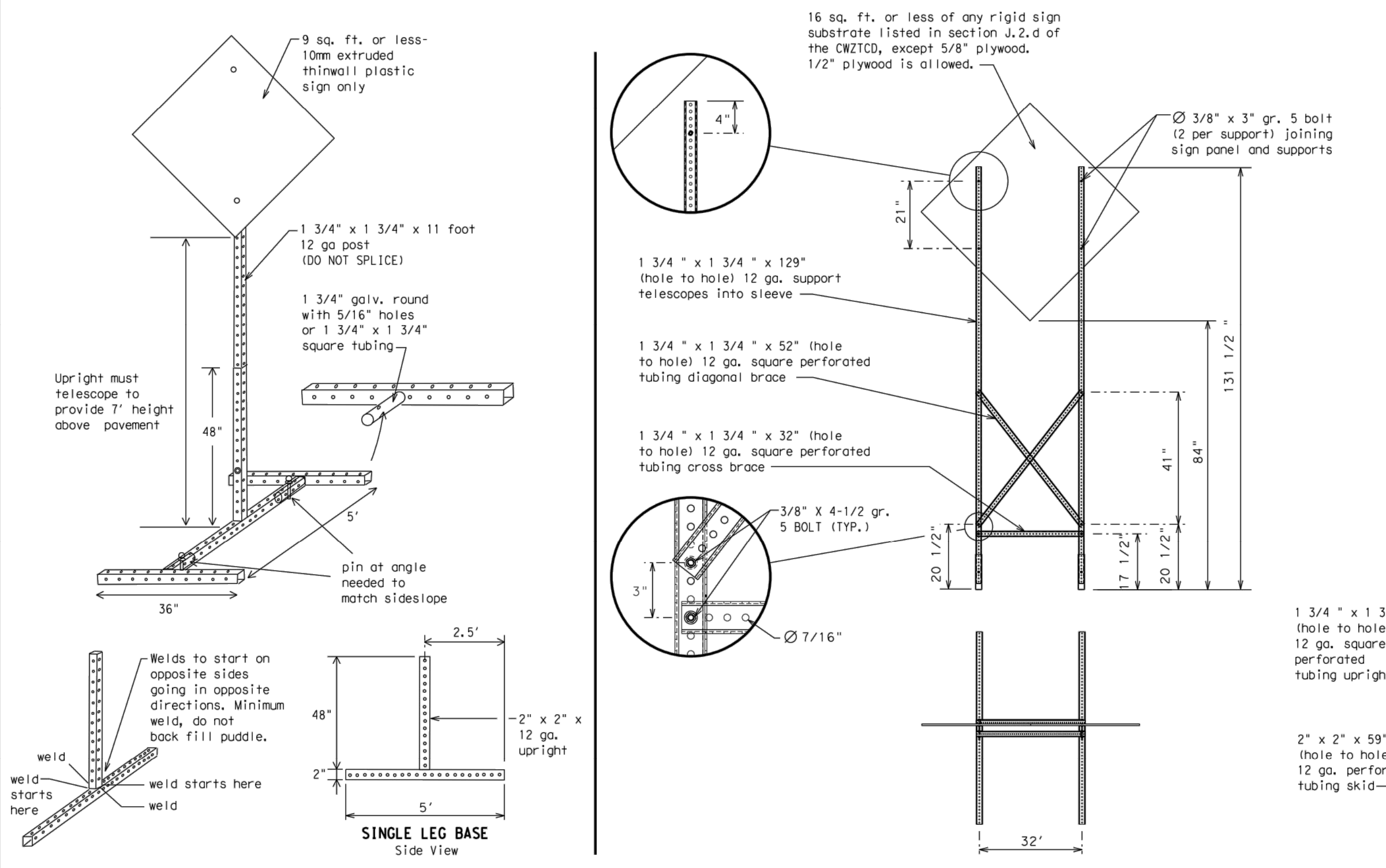
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Refer to the CWZTCD and the manufacturer's installation procedure for each type sign support. The maximum sign square footage shall adhere to the manufacturer's recommendation. Two post installations can be used for larger signs.



WEDGE ANCHORS
Both steel and plastic Wedge Anchor Systems as shown on the SMD Standard Sheets may be used as temporary sign supports for signs up to 10 square feet of sign face. They may be set in concrete or in sturdy soils if approved by the Engineer. (See web address for "Traffic Engineering Standard Sheets" on BC(1)).

OTHER DESIGNS
MORE DETAILS OF APPROVED LONG/INTERMEDIATE AND SHORT TERM SUPPORTS CAN BE FOUND ON THE CWZTCD LIST. SEE BC(1) FOR WEBSITE LOCATION.

- GENERAL NOTES**
- Nails may be used in the assembly of wooden sign supports, but 3/8" bolts with nuts or 3/8" x 3 1/2" lag screws must be used on every joint for final connection.
 - No more than 2 sign posts shall be placed within a 7 ft. circle, except for specific materials noted on the CWZTCD List.
 - When project is completed, all sign supports and foundations shall be removed from the project site. This will be considered subsidiary to Item 502.

- See BC(4) for definition of "Work Duration."
- ✱ Wood sign posts MUST be one piece. Splicing will NOT be allowed. Posts shall be painted white.
- △ See the CWZTCD for the type of sign substrate that can be used for each approved sign support.

SHEET 5 OF 12



BARRICADE AND CONSTRUCTION TYPICAL SIGN SUPPORT

BC(5) - 14

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WILLIAM P. HOBBY AIRPORT / HOUSTON (HOU)
METRO BUS DRIVE LANE RECONSTRUCTION
TRAFFIC CONTROL DETAILS

PROJECT MGR: JLV
DESIGNER: EW
DRAWN BY: KJV
CHECK BY: RE
SCALE:
DATE: 06/29/2020



APPROVED BY:
DIRECTOR
HOUSTON AIRPORT SYSTEM

PROJECT NO. 100068156
A.I.P. NO.
C.I.P. NO.
H.A.S. NO. 236
SHEET NO.

GENERAL NOTES

- 1. For long term stationary work zones on freeways, drums shall be used as the primary channelizing device.
2. For intermediate term stationary work zones on freeways, drums should be used as the primary channelizing device but may be replaced in tangent sections by vertical panels, or 42" two-piece cones.
3. For short term stationary work zones on freeways, drums are the preferred channelizing device but may be replaced in tapers, transitions and tangent sections by vertical panels, two-piece cones or one-piece cones as approved by the Engineer.
4. Drums and all related items shall comply with the requirements of the current version of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) and the "Compliant Work Zone Traffic Control Devices List" (CWZTCD).
5. Drums, bases, and related materials shall exhibit good workmanship and shall be free from objectionable marks or defects that would adversely affect their appearance or serviceability.
6. The Contractor shall have a maximum of 24 hours to replace any plastic drums identified for replacement by the Engineer/Inspector. The replacement device must be an approved device.

GENERAL DESIGN REQUIREMENTS

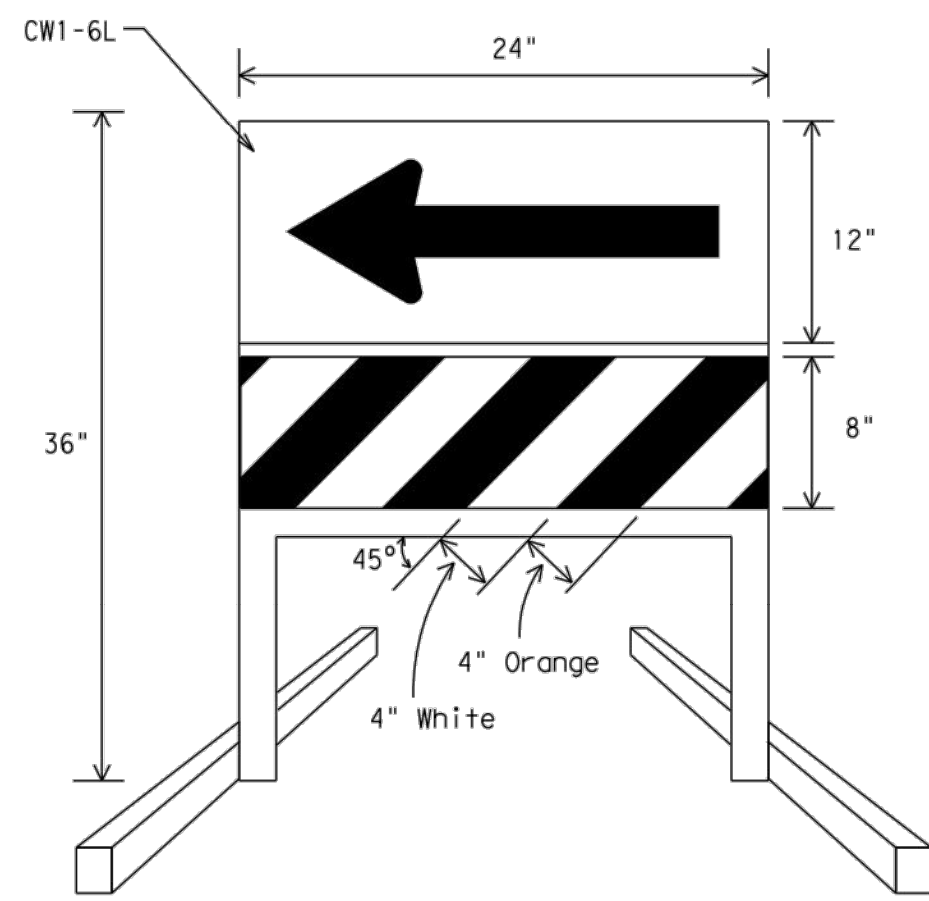
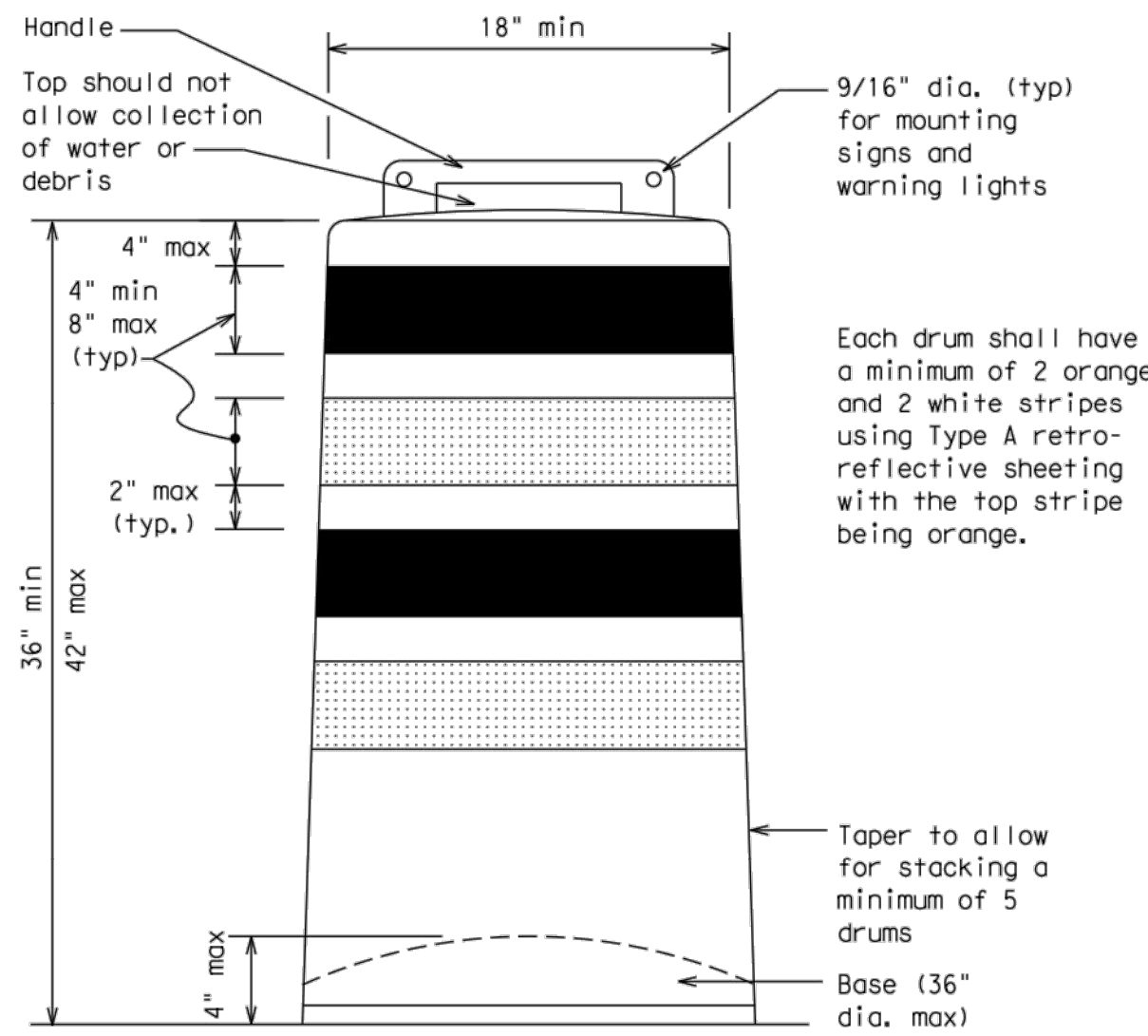
- Pre-qualified plastic drums shall meet the following requirements:
1. Plastic drums shall be a two-piece design; the "body" of the drum shall be the top portion and the "base" shall be the bottom.
2. The body and base shall lock together in such a manner that the body separates from the base when impacted by a vehicle traveling at a speed of 20 MPH or greater but prevents accidental separation due to normal handling and/or air turbulence created by passing vehicles.
3. Plastic drums shall be constructed of lightweight flexible, and deformable materials. The Contractor shall NOT use metal drums or single piece plastic drums as channelization devices or sign supports.
4. Drums shall present a profile that is a minimum of 18 inches in width at the 36 inch height when viewed from any direction. The height of drum unit (body installed on base) shall be a minimum of 36 inches and a maximum of 42 inches.
5. The top of the drum shall have a built-in handle for easy pickup and shall be designed to drain water and not collect debris. The handle shall have a minimum of two widely spaced 9/16 inch diameter holes to allow attachment of a warning light, warning reflector unit or approved compliant sign.
6. The exterior of the drum body shall have a minimum of four alternating orange and white retroreflective circumferential stripes not less than 4 inches nor greater than 8 inches in width. Any non-reflectORIZED space between any two adjacent stripes shall not exceed 2 inches in width.
7. Bases shall have a maximum width of 36 inches, a maximum height of 4 inches, and a minimum of two footholds of sufficient size to allow base to be held down while separating the drum body from the base.
8. Plastic drums shall be constructed of ultra-violet stabilized, orange, high-density polyethylene (HDPE) or other approved material.
9. Drum body shall have a maximum unballasted weight of 11 lbs.
10. Drum and base shall be marked with manufacturer's name and model number.

RETROREFLECTIVE SHEETING

- 1. The stripes used on drums shall be constructed of sheeting meeting the color and retroreflectivity requirements of Departmental Materials Specification DMS-8300, "Sign Face Materials." Type A reflective sheeting shall be supplied unless otherwise specified in the plans.
2. The sheeting shall be suitable for use on and shall adhere to the drum surface such that, upon vehicular impact, the sheeting shall remain adhered in-place and exhibit no delaminating, cracking, or loss of retroreflectivity other than that loss due to abrasion of the sheeting surface.

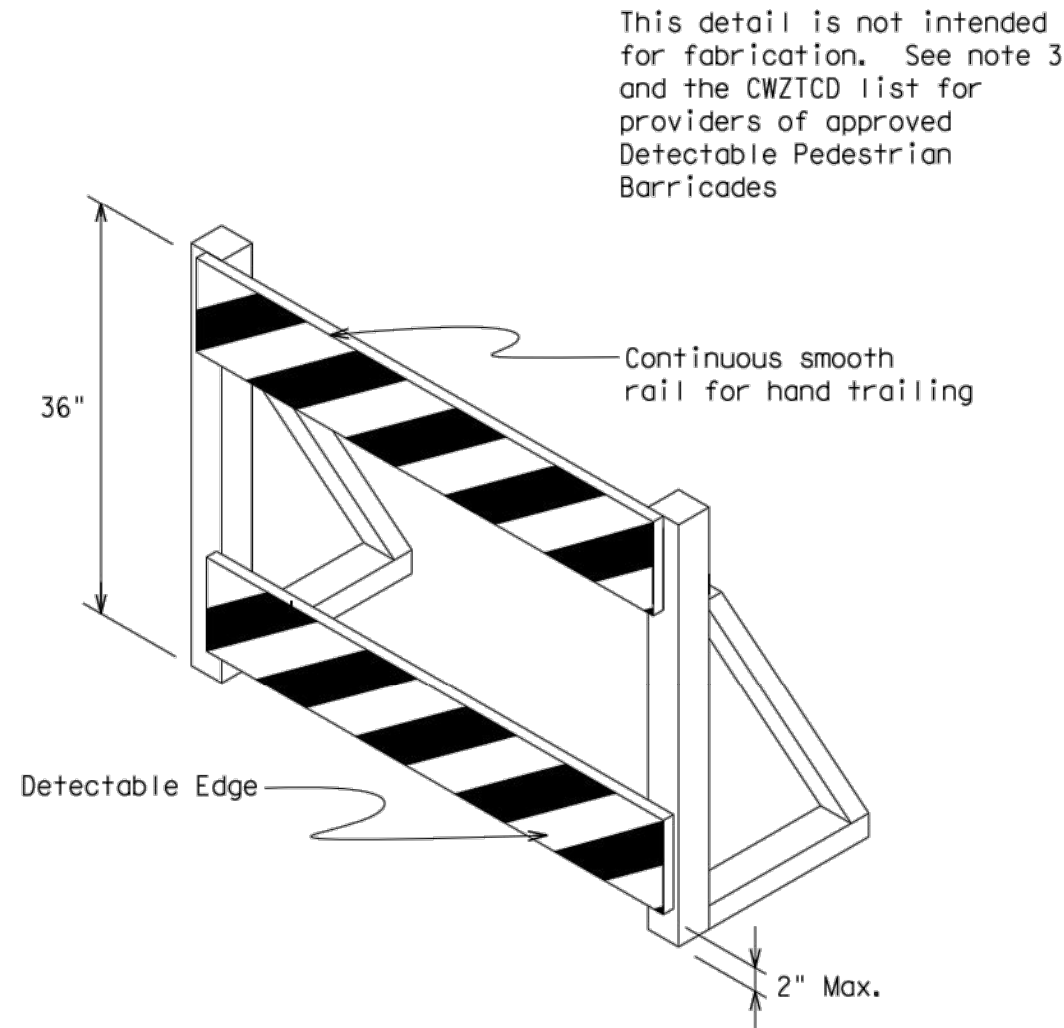
BALLAST

- 1. Unballasted bases shall be large enough to hold up to 50 lbs. of sand. This base, when filled with the ballast material, should weigh between 35 lbs (minimum) and 50 lbs (maximum). The ballast may be sand in one to three sandbags separate from the base, sand in a sand-filled plastic base, or other ballasting devices as approved by the Engineer. Stacking of sandbags will be allowed, however height of sandbags above pavement surface may not exceed 12 inches.
2. Bases with built-in ballast shall weigh between 40 lbs. and 50 lbs. Built-in ballast can be constructed of an integral crumb rubber base or a solid rubber base.
3. Recycled truck tire sidewalls may be used for ballast on drums approved for this type of ballast on the CWZTCD list.
4. The ballast shall not be heavy objects, water, or any material that would become hazardous to motorists, pedestrians, or workers when the drum is struck by a vehicle.
5. When used in regions susceptible to freezing, drums shall have drainage holes in the bottoms so that water will not collect and freeze becoming a hazard when struck by a vehicle.
6. Ballast shall not be placed on top of drums.
7. Adhesives may be used to secure base of drums to pavement.



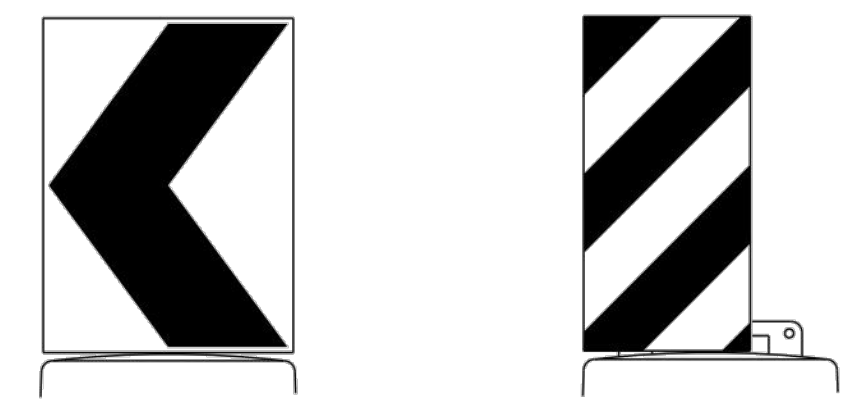
DIRECTION INDICATOR BARRICADE

- 1. The Direction Indicator Barricade may be used in tapers, transitions, and other areas where specific directional guidance to drivers is necessary.
2. If used, the Direction Indicator Barricade should be used in series to direct the driver through the transition and into the intended travel lane.
3. The Direction Indicator Barricade shall consist of One-Direction Large Arrow (CWI-6) sign in the size shown with a black arrow on a background of Type BFL or Type CFL Orange retroreflective sheeting above a rail with Type A retroreflective sheeting in alternating 4" white and orange stripes sloping downward at an angle of 45 degrees in the direction road users are to pass. Sheet types shall be as per DMS 8300.
4. Double arrows on the Direction Indicator Barricade will not be allowed.
5. Approved manufacturers are shown on the CWZTCD List. Ballast shall be as approved by the manufacturers instructions.



DETECTABLE PEDESTRIAN BARRICADES

- 1. When existing pedestrian facilities are disrupted, closed, or relocated in a TTC zone, the temporary facilities shall be detectable and include accessibility features consistent with the features present in the existing pedestrian facility.
2. Where pedestrians with visual disabilities normally use the closed sidewalk, a device that is detectable by a person with a visual disability traveling with the aid of a long cane shall be placed across the full width of the closed sidewalk.
3. Detectable pedestrian barricades similar to the one pictured above, longitudinal channelizing devices, some concrete barriers, and wood or chain link fencing with a continuous detectable edging can satisfactorily delineate a pedestrian path.
4. Tape, rope, or plastic chain strung between devices are not detectable, do not comply with the design standards in the "Americans with Disabilities Act Accessibility Guidelines for Buildings and Facilities (ADAAG)" and should not be used as a control for pedestrian movements.
5. Warning lights shall not be attached to detectable pedestrian barricades.
6. Detectable pedestrian barricades may use 8" nominal barricade rails as shown on BC(10) provided that the top rail provides a smooth continuous rail suitable for hand trailing with no splinters, burrs, or sharp edges.



18" x 24" Sign (Maximum Sign Dimension) Chevron CW1-8, Opposing Traffic Lane Divider, Driveway sign D70a, Keep Right R4 series or other signs as approved by Engineer
12" x 24" Vertical Panel mount with diagonals sloping down towards travel way

Plywood, Aluminum or Metal sign substrates shall NOT be used on plastic drums

SIGNS, CHEVRONS, AND VERTICAL PANELS MOUNTED ON PLASTIC DRUMS

- 1. Signs used on plastic drums shall be manufactured using substrates listed on the CWZTCD.
2. Chevrons and other work zone signs with an orange background shall be manufactured with Type BFL or Type CFL Orange sheeting meeting the color and retroreflectivity requirements of DMS-8300, "Sign Face Material," unless otherwise specified in the plans.
3. Vertical Panels shall be manufactured with orange and white sheeting meeting the requirements of DMS-8300 Type A Diagonal stripes on Vertical Panels shall slope down toward the intended traveled lane.
4. Other sign messages (text or symbolic) may be used as approved by the Engineer. Sign dimensions shall not exceed 18 inches in width or 24 inches in height, except for the R9 series signs discussed in note 8 below.
5. Signs shall be installed using a 1/2 inch bolt (nominal) and nut, two washers, and one locking washer for each connection.
6. Mounting bolts and nuts shall be fully engaged and adequately torqued. Bolts should not extend more than 1/2 inch beyond nuts.
7. Chevrons may be placed on drums on the outside of curves, on merging tapers or on shifting tapers. When used in these locations they may be placed on every drum or spaced not more than on every third drum. A minimum of three (3) should be used at each location called for in the plans.
8. R9-9, R9-10, R9-11 and R9-11a Sidewalk Closed signs which are 24 inches wide may be mounted on plastic drums, with approval of the Engineer.

SHEET 8 OF 12

Complex block containing Texas Department of Transportation logo, Traffic Operations Division Standard, BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES, BC(8) - 14, and a table with columns for FILE#, DWT, TXDOT, CK, TXDOT, DW, TXDOT, CK, TXDOT, CONT, SECT, JOB, HIGHWAY, REVISIONS, DIST, COUNTY, SHEET NO.

ATKINS logo and contact information: LOCAL OFFICE: 200 WESTLAKE PARK BLVD., STE. 1100 HOUSTON, TX 77079 TEL: (713) 576-8500

Table with columns: NO., DESCRIPTION, DATE BY

WILLIAM P. HOBBY AIRPORT / HOUSTON (HOU) METRO BUS DRIVE LANE RECONSTRUCTION TRAFFIC CONTROL DETAILS

Table with project management details: PROJECT MGR: JLV, DESIGNER: EW, DRAWN BY: KJV, CHECK BY: RE, SCALE: DATE: 06/29/2020

Professional Engineer seal for Edmund S. Woods, License No. 122123, State of Texas, Professional Engineering, License No. 06/29/2020

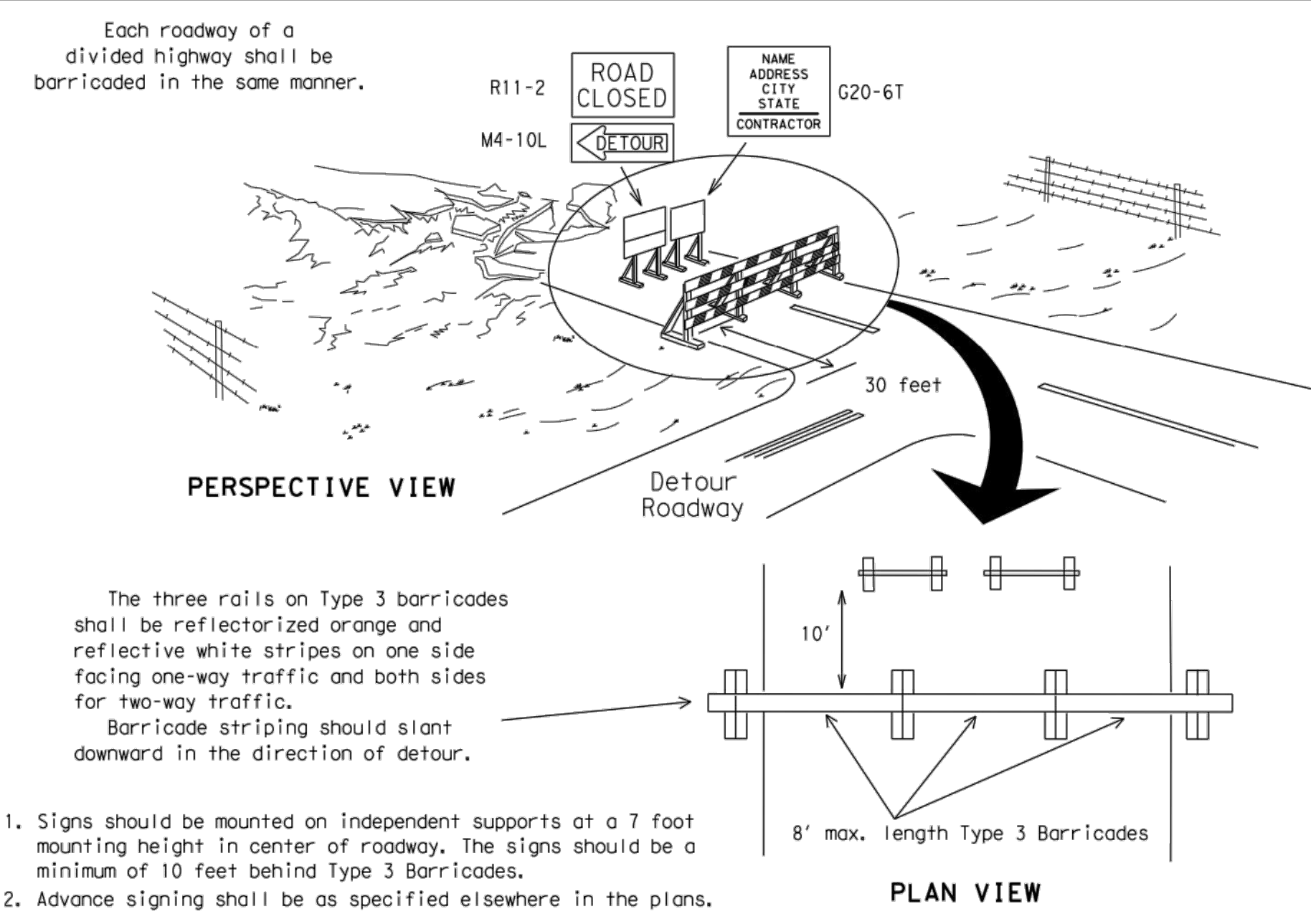
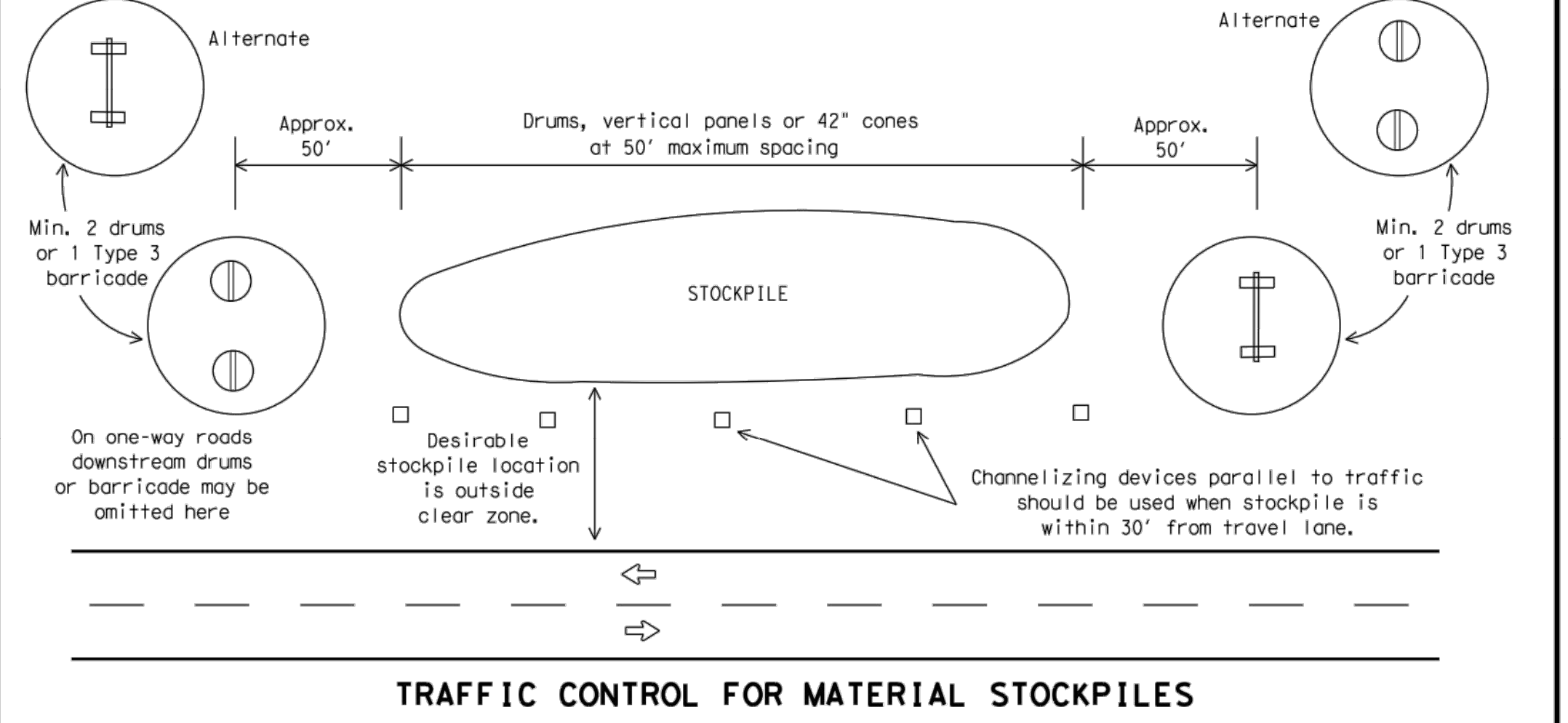
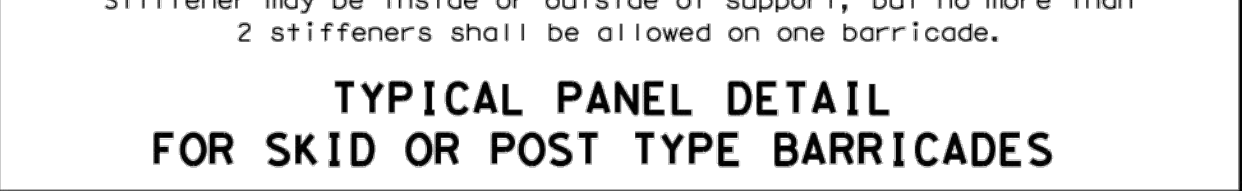
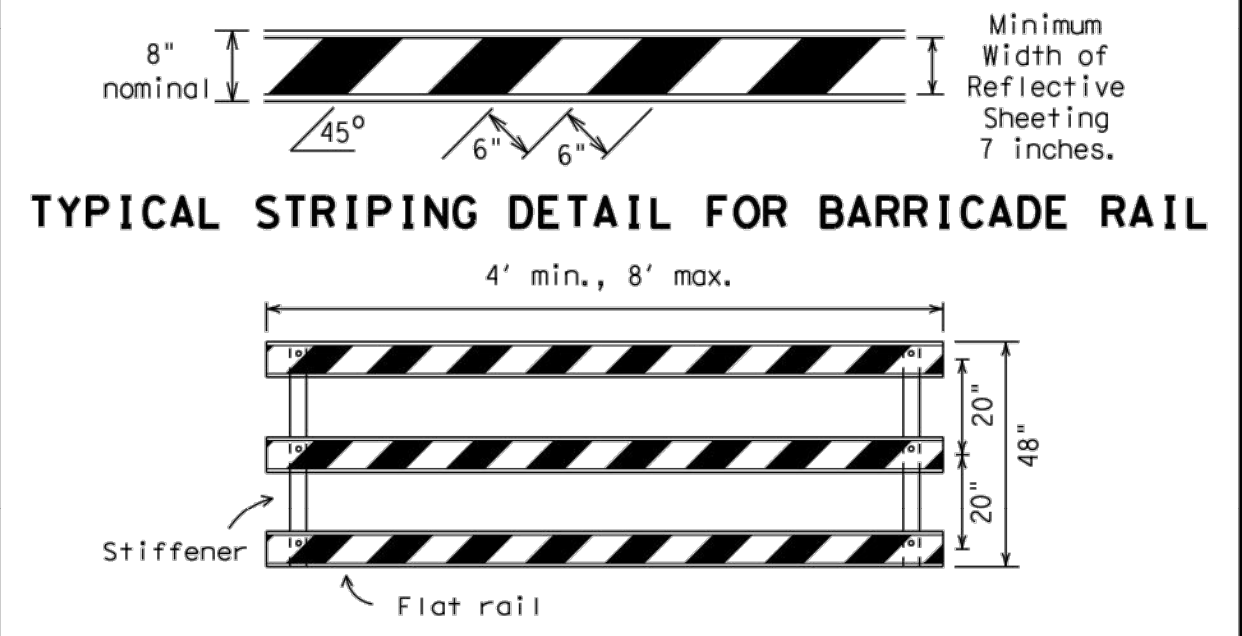
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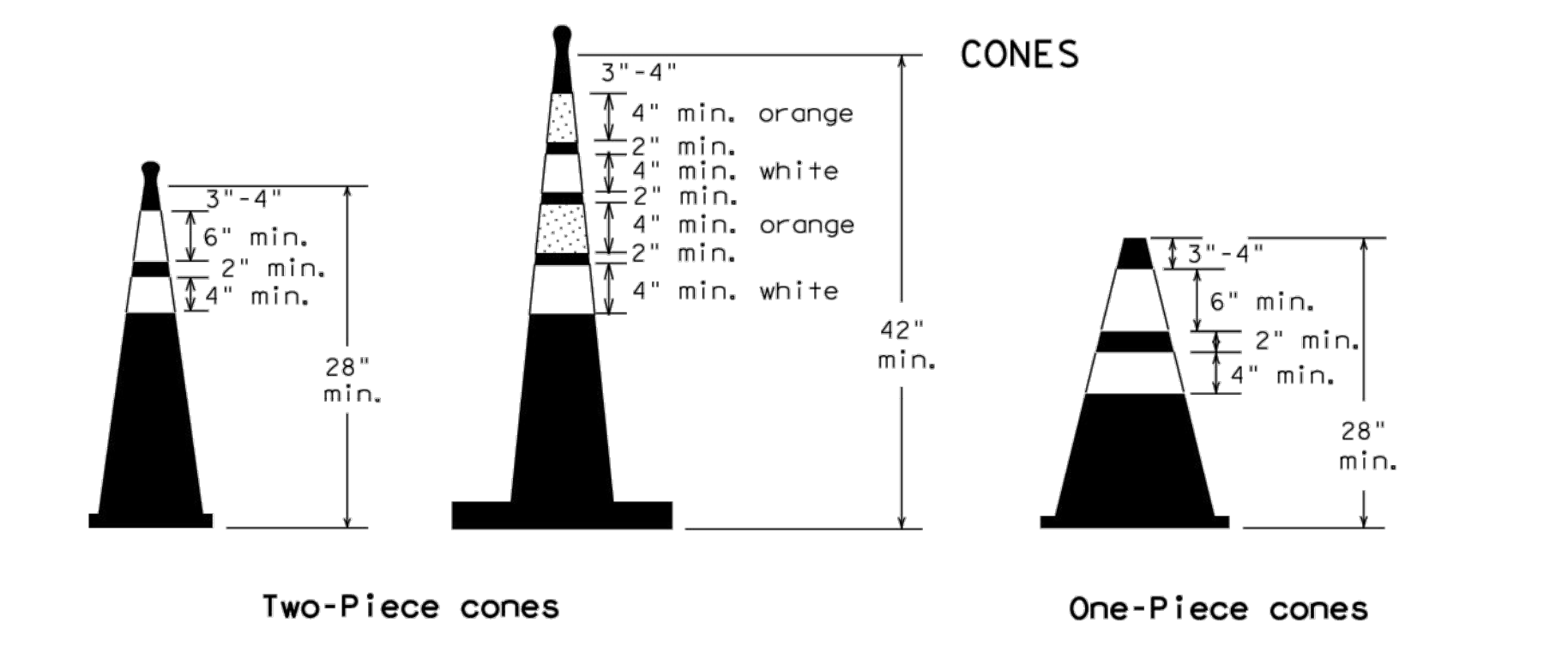
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- TYPE 3 BARRICADES**
1. Refer to the Compliant Work Zone Traffic Control Devices List (CWZTCD) for details of the Type 3 Barricades and a list of all materials used in the construction of Type 3 Barricades.
 2. Type 3 Barricades shall be used at each end of construction projects closed to all traffic.
 3. Barricades extending across a roadway should have stripes that slope downward in the direction toward which traffic must turn in detouring. When both right and left turns are provided, the chevron striping may slope downward in both directions from the center of the barricade. Where no turns are provided at a closed road striping should slope downward in both directions toward the center of roadway.
 4. Striping of rails, for the right side of the roadway, should slope downward to the left. For the left side of the roadway, striping should slope downward to the right.
 5. Identification markings may be shown only on the back of the barricade rails. The maximum height of letters and/or company logos used for identification shall be 1".
 6. Barricades shall not be placed parallel to traffic unless an adequate clear zone is provided.
 7. Warning lights shall NOT be installed on barricades.
 8. Where barricades require the use of weights to keep from turning over, the use of sandbags with dry, cohesionless sand is recommended. The sandbags will be tied shut to keep the sand from spilling and to maintain a constant weight. Sand bags shall not be stacked in a manner that covers any portion of a barricade rails reflective sheeting. Rock, concrete, iron, steel or other solid objects will NOT be permitted. Sandbags should weigh a minimum of 35 lbs and a maximum of 50 lbs. Sandbags shall be made of a durable material that tears upon vehicular impact. Rubber (such as tire inner tubes) shall not be used for sandbags. Sandbags shall only be placed along or upon the base supports of the device and shall not be suspended above ground level or hung with rope, wire, chains or other fasteners.
 9. Sheeting for barricades shall be retroreflective Type A conforming to Departmental Material Specification DMS-8300 unless otherwise noted.

Barricades shall NOT be used as a sign support.

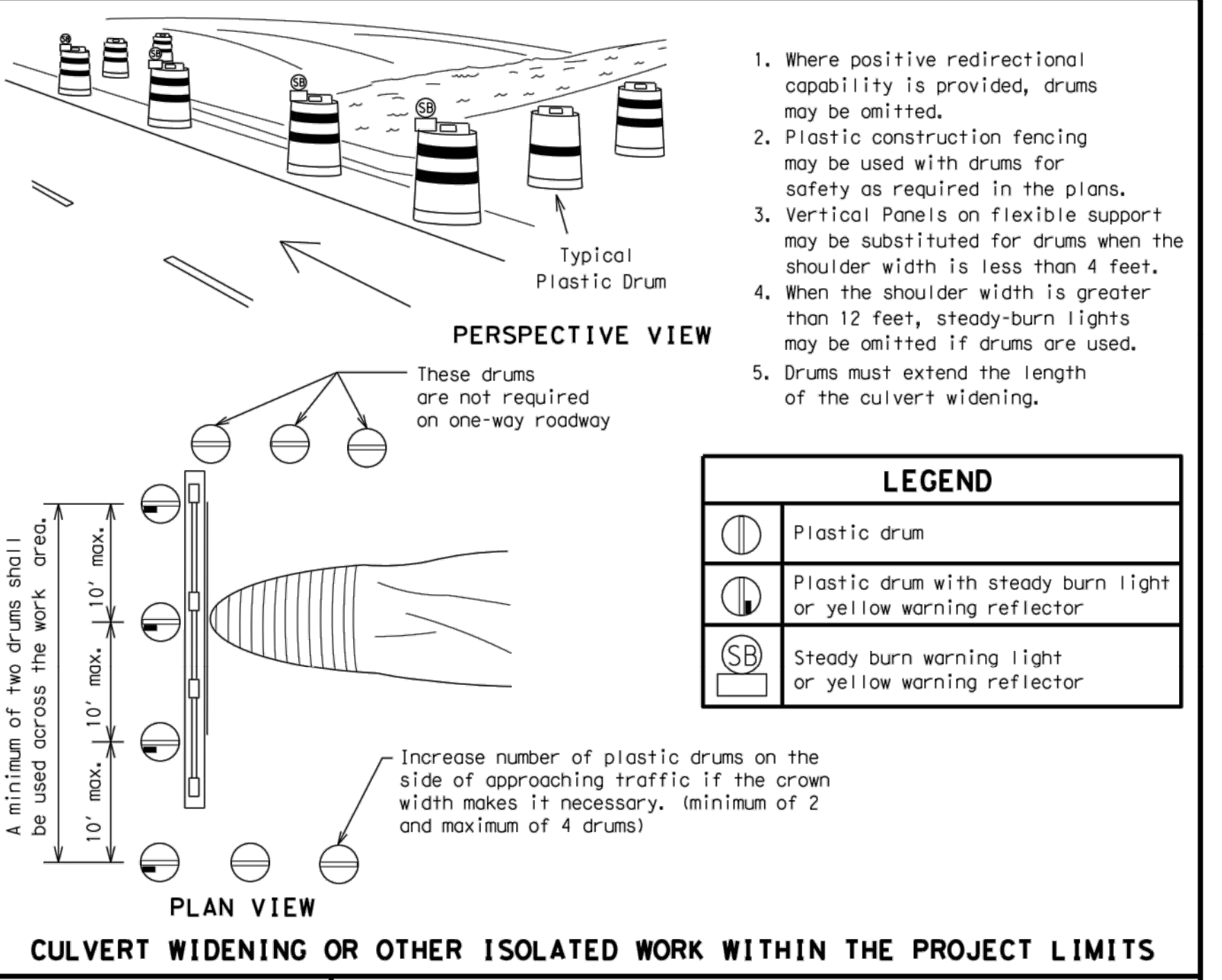


TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION



28" Cones shall have a minimum weight of 9 1/2 lbs.
42" 2-piece cones shall have a minimum weight of 30 lbs. including base.

1. Traffic cones and tubular markers shall be predominantly orange, and meet the height and weight requirements shown above.
2. One-piece cones have the body and base of the cone molded in one consolidated unit. Two-piece cones have a cone shaped body and a separate rubber base, or ballast, that is added to keep the device upright and in place.
3. Two-piece cones may have a handle or loop extending up to 8" above the minimum height shown, in order to aid in retrieving the device.
4. Cones or tubular markers used at night shall have white or white and orange reflective bands as shown above. The reflective bands shall have a smooth, sealed outer surface and meet the requirements of Departmental Material Specification DMS-8300 Type A.
5. 28" cones and tubular markers are generally suitable for short duration and short-term stationary work as defined on BC(4). These should not be used for intermediate-term or long-term stationary work unless personnel is on-site to maintain them in their proper upright position.
6. 42" two-piece cones, vertical panels or drums are suitable for all work zone durations.
7. Cones or tubular markers used on each project should be of the same size and shape.

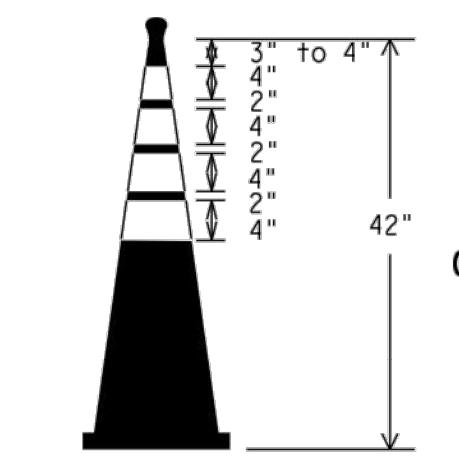


LEGEND

	Plastic drum
	Plastic drum with steady burn light or yellow warning reflector
	Steady burn warning light or yellow warning reflector

1. Where positive redirection capability is provided, drums may be omitted.
2. Plastic construction fencing may be used with drums for safety as required in the plans.
3. Vertical Panels on flexible support may be substituted for drums when the shoulder width is less than 4 feet.
4. When the shoulder width is greater than 12 feet, steady-burn lights may be omitted if drums are used.
5. Drums must extend the length of the culvert widening.

THIS DEVICE SHALL NOT BE USED ON PROJECTS LET AFTER MARCH 2014.



1. This device is intended only for use in place of a vertical panel to channelize traffic by indicating the edge of the travel lane. It is not intended to be used in transitions or tapers.
2. This device shall not be used to separate lanes of traffic (opposing or otherwise) or warn of objects.
3. This device is based on a 42 inch, two-piece cone with an alternate striping pattern: four 4 inch retroreflective bands, with an approximate 2 inch gap between bands. The color of the band should correspond to the color of the edgeline (yellow for left edgeline, white for right edgeline) for which the device is substituted or for which it supplements. The reflectorized bands shall be retroreflective Type A conforming to Departmental Material Specification DMS-8300, unless otherwise noted.
4. The base must weigh a minimum of 30 lbs.

SHEET 10 OF 12

Texas Department of Transportation Traffic Operations Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC (10) - 14

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REVISIONS

NO.	DESCRIPTION	DATE BY

WILLIAM P. HOBBY AIRPORT / HOUSTON (HOU)
METRO BUS DRIVE LANE RECONSTRUCTION
TRAFFIC CONTROL DETAILS

PROJECT MGR: JLV
DESIGNER: EW
DRAWN BY: KJV
CHECK BY: RE
SCALE:
DATE: 06/29/2020

STATE OF TEXAS
EDMOND S. WOODS
122123
LICENSED PROFESSIONAL ENGINEER
Edmond Woods, 06/29/2020

APPROVED BY:

DIRECTOR
HOUSTON AIRPORT SYSTEM

PROJECT NO.
100068156

A.I.P. NO.

C.I.P. NO.

H.A.S. NO.
236

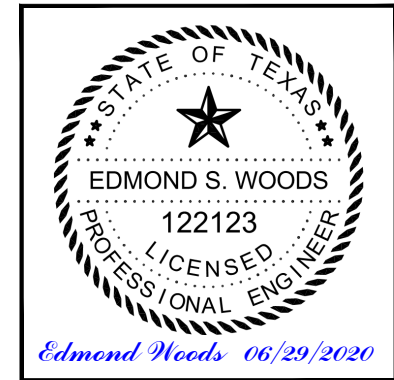
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REVISIONS

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WILLIAM P. HOBBY AIRPORT / HOUSTON (HOU)
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PROJECT MGR: JLV
 DESIGNER: EW
 DRAWN BY: KJV
 CHECK BY: RE
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 DATE: 06/29/2020



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 DIRECTOR
 HOUSTON AIRPORT SYSTEM

PROJECT NO.
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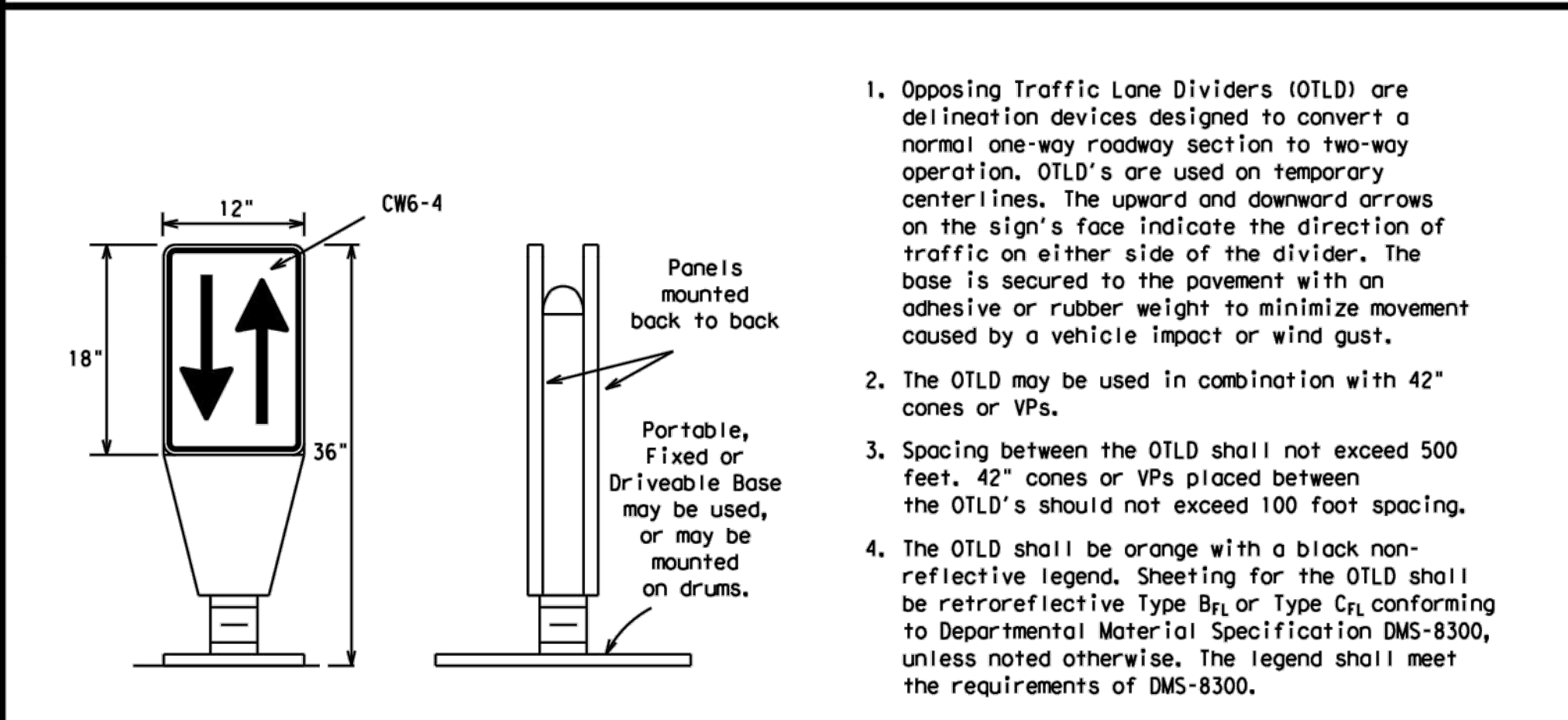
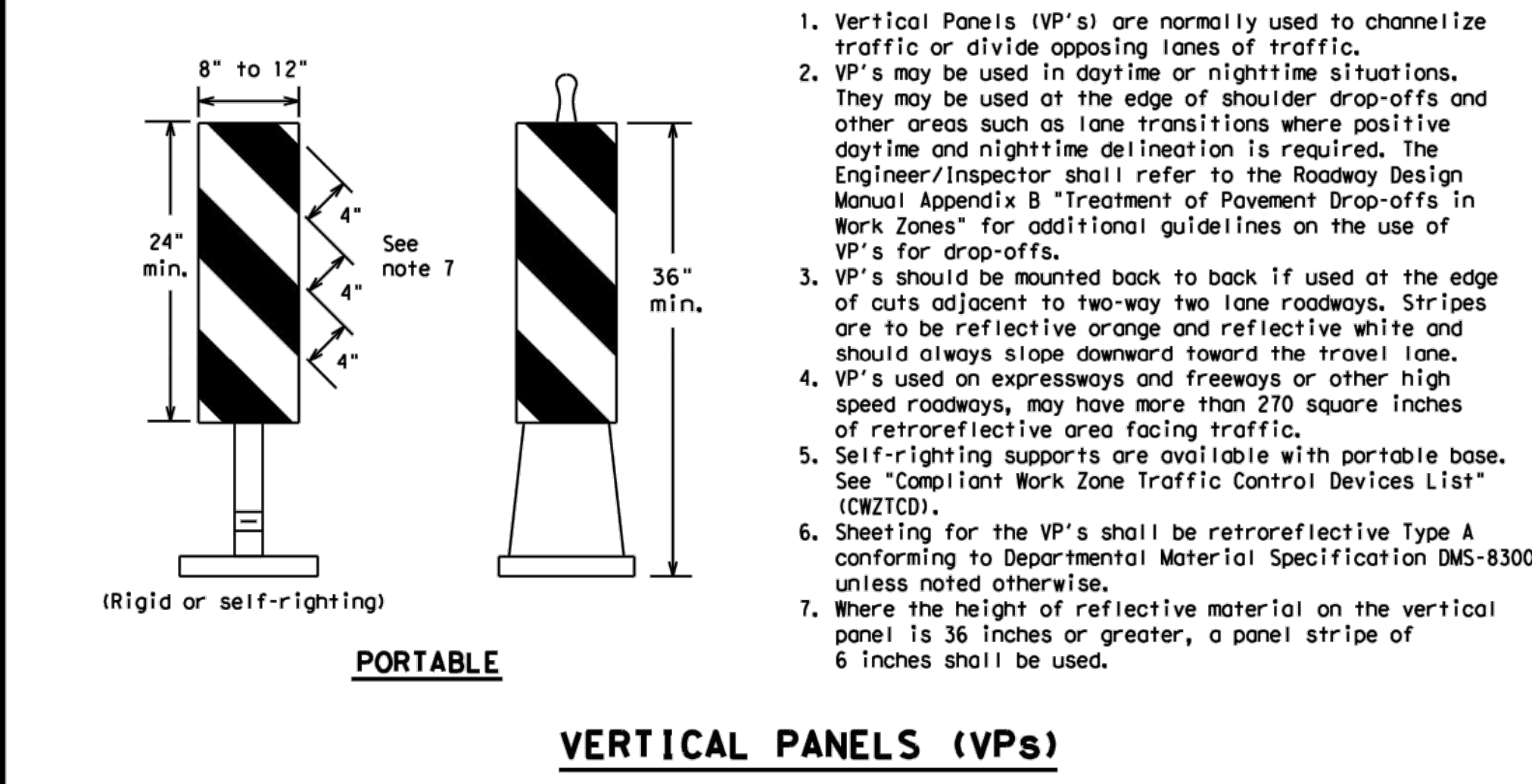
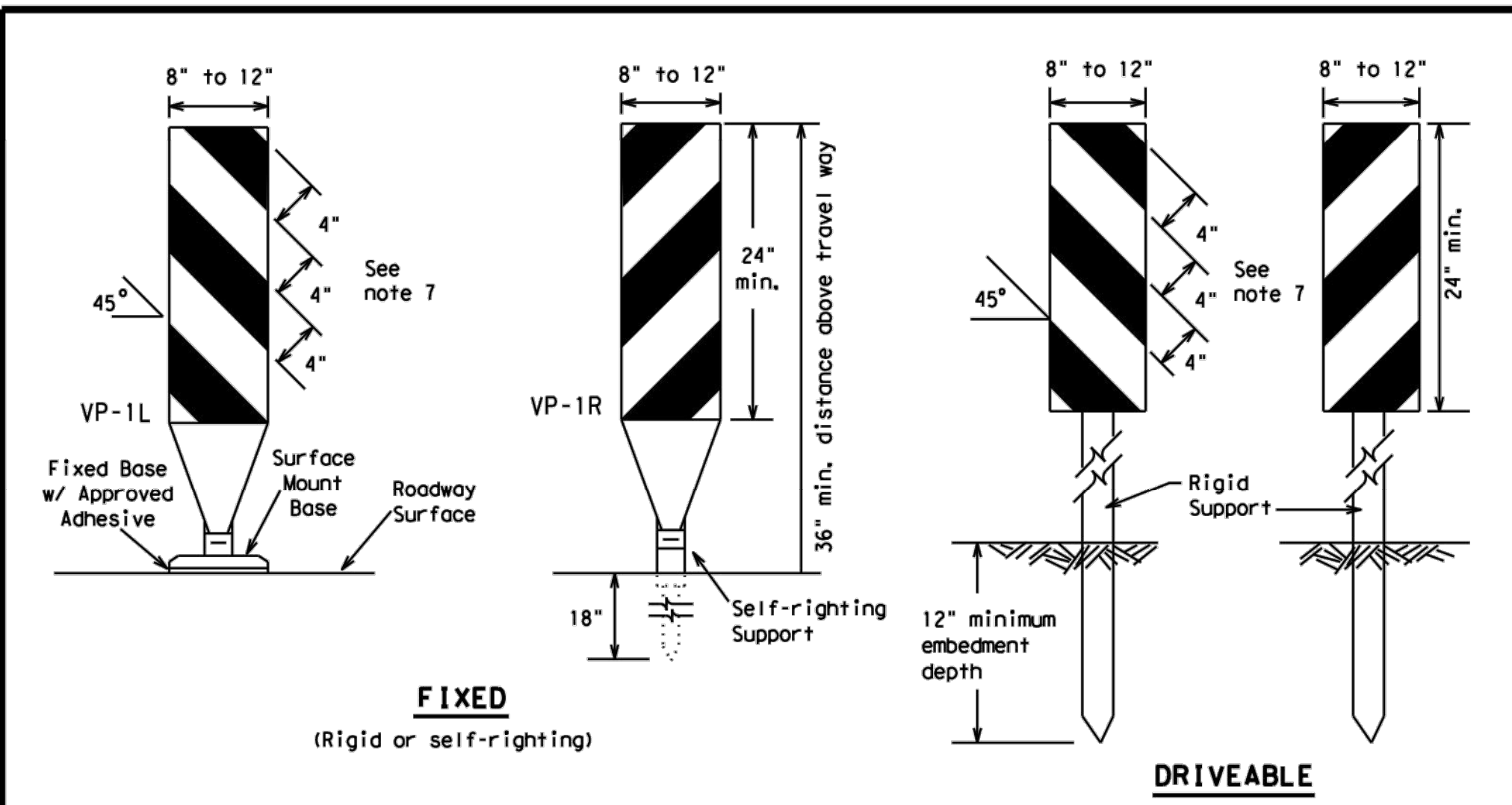
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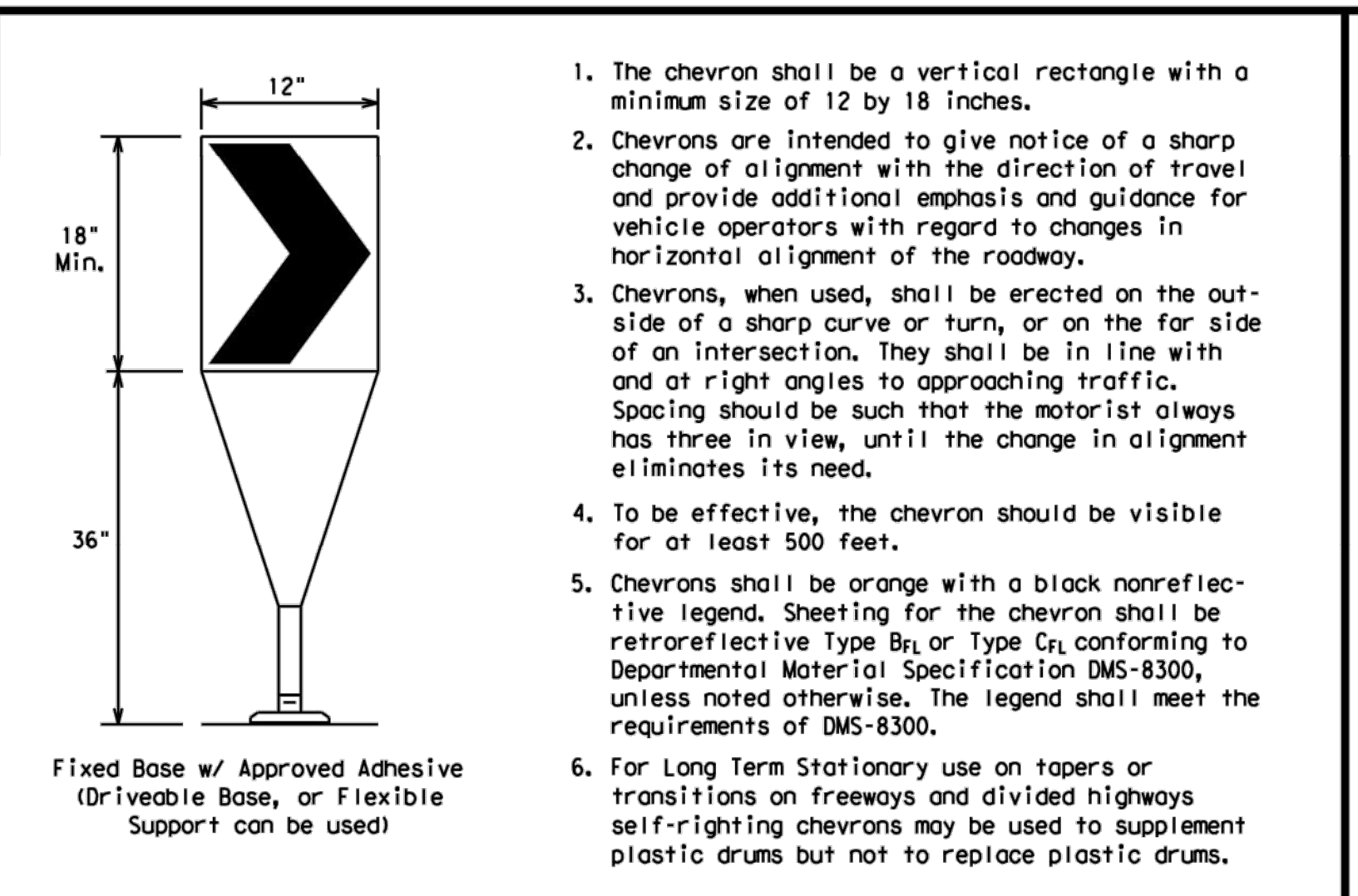
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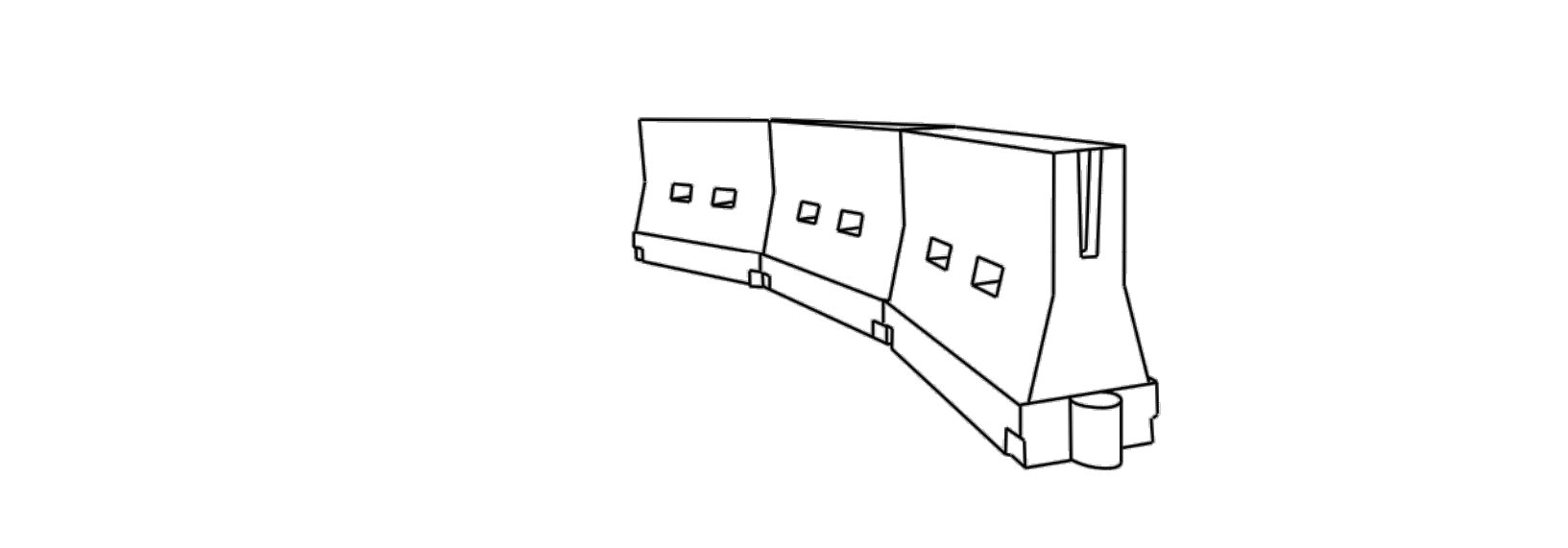


- Vertical Panels (VP's) are normally used to channelize traffic or divide opposing lanes of traffic.
- VP's may be used in daytime or nighttime situations. They may be used at the edge of shoulder drop-offs and other areas such as lane transitions where positive daytime and nighttime delineation is required. The Engineer/Inspector shall refer to the Roadway Design Manual Appendix B "Treatment of Pavement Drop-offs in Work Zones" for additional guidelines on the use of VP's for drop-offs.
- VP's should be mounted back to back if used at the edge of cuts adjacent to two-way two lane roadways. Stripes are to be reflective orange and reflective white and should always slope downward toward the travel lane.
- VP's used on expressways and freeways or other high speed roadways, may have more than 270 square inches of retroreflective area facing traffic.
- Self-righting supports are available with portable base. See "Compliant Work Zone Traffic Control Devices List" (CWZTCD).
- Sheeting for the VP's shall be retroreflective Type A conforming to Departmental Material Specification DMS-8300, unless noted otherwise.
- Where the height of reflective material on the vertical panel is 36 inches or greater, a panel stripe of 6 inches shall be used.

- Opposing Traffic Lane Dividers (OTLD) are delineation devices designed to convert a normal one-way roadway section to two-way operation. OTLD's are used on temporary centerlines. The upward and downward arrows on the sign's face indicate the direction of traffic on either side of the divider. The base is secured to the pavement with an adhesive or rubber weight to minimize movement caused by a vehicle impact or wind gust.
- The OTLD may be used in combination with 42" cones or VPs.
- Spacing between the OTLD shall not exceed 500 feet. 42" cones or VPs placed between the OTLD's should not exceed 100 foot spacing.
- The OTLD shall be orange with a black non-reflective legend. Sheeting for the OTLD shall be retroreflective Type B₁ or Type C₁ conforming to Departmental Material Specification DMS-8300, unless noted otherwise. The legend shall meet the requirements of DMS-8300.



- The chevron shall be a vertical rectangle with a minimum size of 12 by 18 inches.
- Chevrons are intended to give notice of a sharp change of alignment with the direction of travel and provide additional emphasis and guidance for vehicle operators with regard to changes in horizontal alignment of the roadway.
- Chevrons, when used, shall be erected on the outside of a sharp curve or turn, or on the far side of an intersection. They shall be in line with and at right angles to approaching traffic. Spacing should be such that the motorist always has three in view, until the change in alignment eliminates its need.
- To be effective, the chevron should be visible for at least 500 feet.
- Chevrons shall be orange with a black nonreflective legend. Sheeting for the chevron shall be retroreflective Type B₁ or Type C₁ conforming to Departmental Material Specification DMS-8300, unless noted otherwise. The legend shall meet the requirements of DMS-8300.
- For Long Term Stationary use on tapers or transitions on freeways and divided highways self-righting chevrons may be used to supplement plastic drums but not to replace plastic drums.



- LONGITUDINAL CHANNELIZING DEVICES (LCD)**
- LCDs are crashworthy, lightweight, deformable devices that are highly visible, have good target value and can be connected together. They are not designed to contain or redirect a vehicle on impact.
 - LCDs may be used instead of a line of cones or drums.
 - LCDs shall be placed in accordance to application and installation requirements specific to the device, and used only when shown on the CWZTCD list.
 - LCDs should not be used to provide positive protection for obstacles, pedestrians or workers.
 - LCDs shall be supplemented with retroreflective delineation as required for temporary barriers on BC(7) when placed roughly parallel to the travel lanes.
 - LCDs used as barricades placed perpendicular to traffic should have at least one row of reflective sheeting meeting the requirements for barricade rails as shown on BC(10) placed near the top of the LCD along the full length of the device.

- WATER BALLASTED SYSTEMS USED AS BARRIERS**
- Water ballasted systems used as barriers shall not be used solely to channelize road users, but also to protect the work space per the appropriate NCHRP 350 crashworthiness requirements based on roadway speed and barrier application.
 - Water ballasted systems used to channelize vehicular traffic shall be supplemented with retroreflective delineation or channelizing devices to improve daytime/nighttime visibility. They may also be supplemented with pavement markings.
 - Water ballasted systems used as barriers shall be placed in accordance to application and installation requirements specific to the device, and used only when shown on the CWZTCD list.
 - Water ballasted systems used as barriers should not be used for a merging taper except in low speed (less than 45 MPH) urban areas. When used on a taper in a low speed urban area, the taper shall be delineated and the taper length should be designed to optimize road user operations considering the available geometric conditions.
 - When water ballasted systems used as barriers have blunt ends exposed to traffic, they should be attenuated as per manufacturer recommendations or flared to a point outside the clear zone.

If used to channelize pedestrians, longitudinal channelizing devices or water ballasted systems must have a continuous detectable bottom for users of long cones and the top of the unit shall not be less than 32 inches in height.

HOLLOW OR WATER BALLASTED SYSTEMS USED AS LONGITUDINAL CHANNELIZING DEVICES OR BARRIERS

GENERAL NOTES

- Work Zone channelizing devices illustrated on this sheet may be installed in close proximity to traffic and are suitable for use on high or low speed roadways. The Engineer/Inspector shall ensure that spacing and placement is uniform and in accordance with the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD).
- Channelizing devices shown on this sheet may have a driveable, fixed or portable base. The requirement for self-righting channelizing devices must be specified in the General Notes or other plan sheets.
- Channelizing devices on self-righting supports should be used in work zone areas where channelizing devices are frequently impacted by errant vehicles or vehicle related wind gusts making alignment of the channelizing devices difficult to maintain. Locations of these devices shall be detailed elsewhere in the plans. These devices shall conform to the TMUTCD and the "Compliant Work Zone Traffic Control Devices List" (CWZTCD).
- The Contractor shall maintain devices in a clean condition and replace damaged, nonreflective, faded, or broken devices and bases as required by the Engineer/Inspector. The Contractor shall be required to maintain proper device spacing and alignment.
- Portable bases shall be fabricated from virgin and/or recycled rubber. The portable bases shall weigh a minimum of 30 lbs.
- Pavement surfaces shall be prepared in a manner that ensures proper bonding between the adhesives, the fixed mount bases and the pavement surface. Adhesives shall be prepared and applied according to the manufacturer's recommendations.
- The installation and removal of channelizing devices shall not cause detrimental effects to the final pavement surfaces, including pavement surface discoloration or surface integrity. Driveable bases shall not be permitted on final pavement surfaces. The Engineer/Inspector shall approve all application and removal procedures of fixed bases.

Posted Speed *	Formula	Minimum Desirable Taper Lengths **			Suggested Maximum Spacing of Channelizing Devices	
		10' Offset	11' Offset	12' Offset	On a Taper	On a Tangent
30	L = WS ² / 60	150'	165'	180'	30'	60'
35		205'	225'	245'	35'	70'
40		265'	295'	320'	40'	80'
45	L = WS	450'	495'	540'	45'	90'
50		500'	550'	600'	50'	100'
55		550'	605'	660'	55'	110'
60		600'	660'	720'	60'	120'
65		650'	715'	780'	65'	130'
70	700'	770'	840'	70'	140'	
75	750'	825'	900'	75'	150'	
80	800'	880'	960'	80'	160'	

**Taper lengths have been rounded off.
 L=Length of Taper (FT.) W=Width of Offset (FT.)
 S=Posted Speed (MPH)

SUGGESTED MAXIMUM SPACING OF CHANNELIZING DEVICES AND MINIMUM DESIRABLE TAPER LENGTHS

SHEET 9 OF 12



BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC (9) - 13

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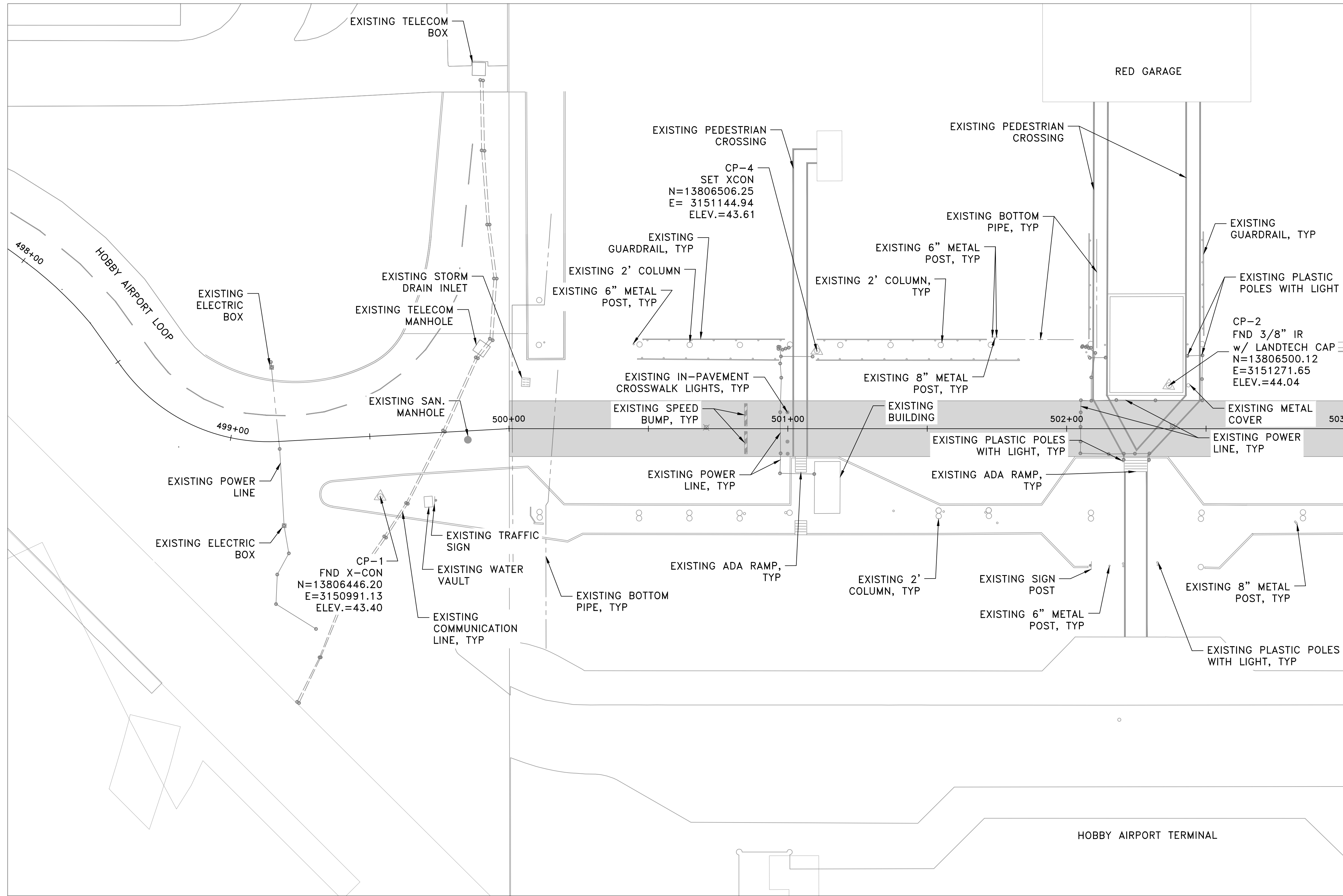
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A

B

C

D

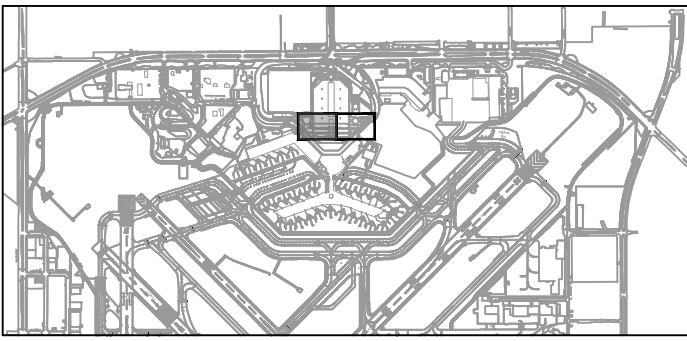


LEGEND

EXISTING TWO LANE METRO DRIVE PAVEMENT

NOTES

1. CONTRACTOR IS RESPONSIBLE FOR THE REMOVAL AND LEGAL DISPOSAL OF ALL MATERIAL RESULTING FROM THE WORK EFFORTS, FROM THE PROJECT SITE.
2. CONTRACTOR TO PROTECT ALL EXISTING CONCRETE PANELS TO REMAIN.
3. THE CONTRACTOR WILL BE RESPONSIBLE FOR IMPLEMENTING AND MAINTAINING ADEQUATE DUST CONTROL MEASURES DURING ALL CONSTRUCTION ACTIVITIES.
4. CONTRACTOR SHALL BE RESPONSIBLE FOR GENERAL CLEANUP AT THE END OF EACH WORK SHIFT PRIOR TO OPENING THE AREA TO PUBLIC TRAFFIC. THE SUITABILITY OF THE READINESS OF THE SITE TO PUBLIC TRAFFIC SHALL BE SUBJECT TO APPROVAL BY HAS PERSONNEL.
5. REFER TO SHEETS CD101 TO CD201 FOR DEMOLITION INFORMATION AND DETAILS.

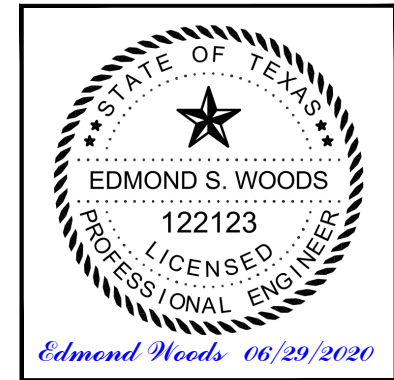


REVISIONS

NO.	DESCRIPTION	DATE	BY

WILLIAM P. HOBBY AIRPORT / HOUSTON (HOU)
METRO BUS DRIVE LANE RECONSTRUCTION
EXISTING CONDITIONS PLAN

PROJECT MGR:	JLV
DESIGNER:	EW
DRAWN BY:	KJV
CHECK BY:	RE
SCALE:	
DATE:	06/29/2020



APPROVED BY: _____
DIRECTOR
HOUSTON AIRPORT SYSTEM

PROJECT NO.	100068156
A.I.P. NO.	
C.I.P. NO.	
H.A.S. NO.	236
SHEET NO.	

HAS FILE:
PLOT DATE:

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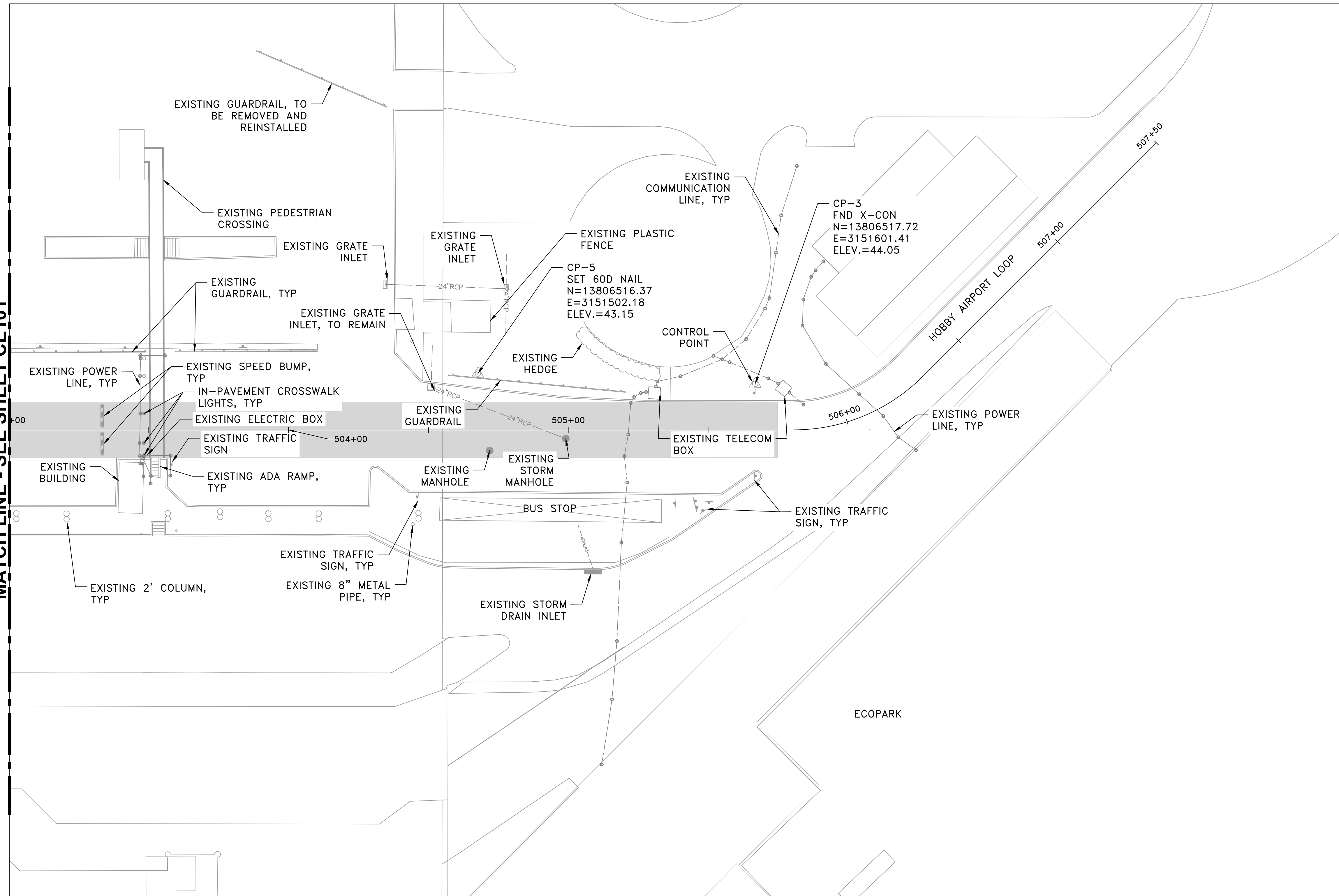
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MATCH LINE - SEE SHEET CE101

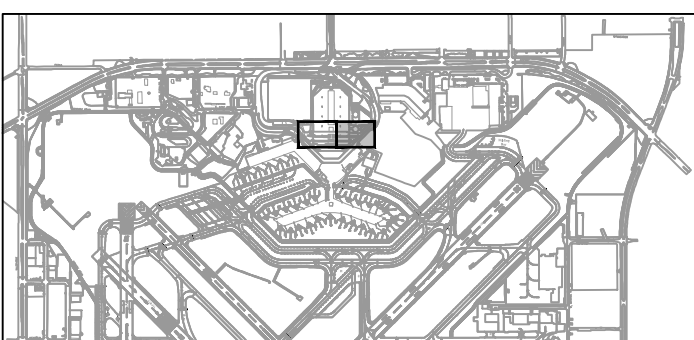


LEGEND

EXISTING TWO LANE METRO DRIVE PAVEMENT

NOTES

1. CONTRACTOR IS RESPONSIBLE FOR THE REMOVAL AND LEGAL DISPOSAL OF ALL MATERIAL RESULTING FROM THE WORK EFFORTS, FROM THE PROJECT SITE.
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5. REFER TO SHEETS CD101 TO CD201 FOR DEMOLITION INFORMATION AND DETAILS.

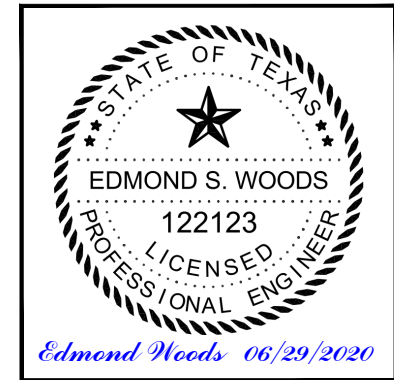


REVISIONS

NO.	DESCRIPTION	DATE	BY

WILLIAM P. HOBBY AIRPORT / HOUSTON (HOU)
**METRO BUS DRIVE LANE RECONSTRUCTION
EXISTING CONDITIONS PLAN**

PROJECT MGR:	JLV
DESIGNER:	EW
DRAWN BY:	KJV
CHECK BY:	RE
SCALE:	
DATE:	06/29/2020



APPROVED BY:

DIRECTOR
HOUSTON AIRPORT SYSTEM

PROJECT NO.	100068156
A.I.P. NO.	
C.I.P. NO.	
H.A.S. NO.	236
SHEET NO.	

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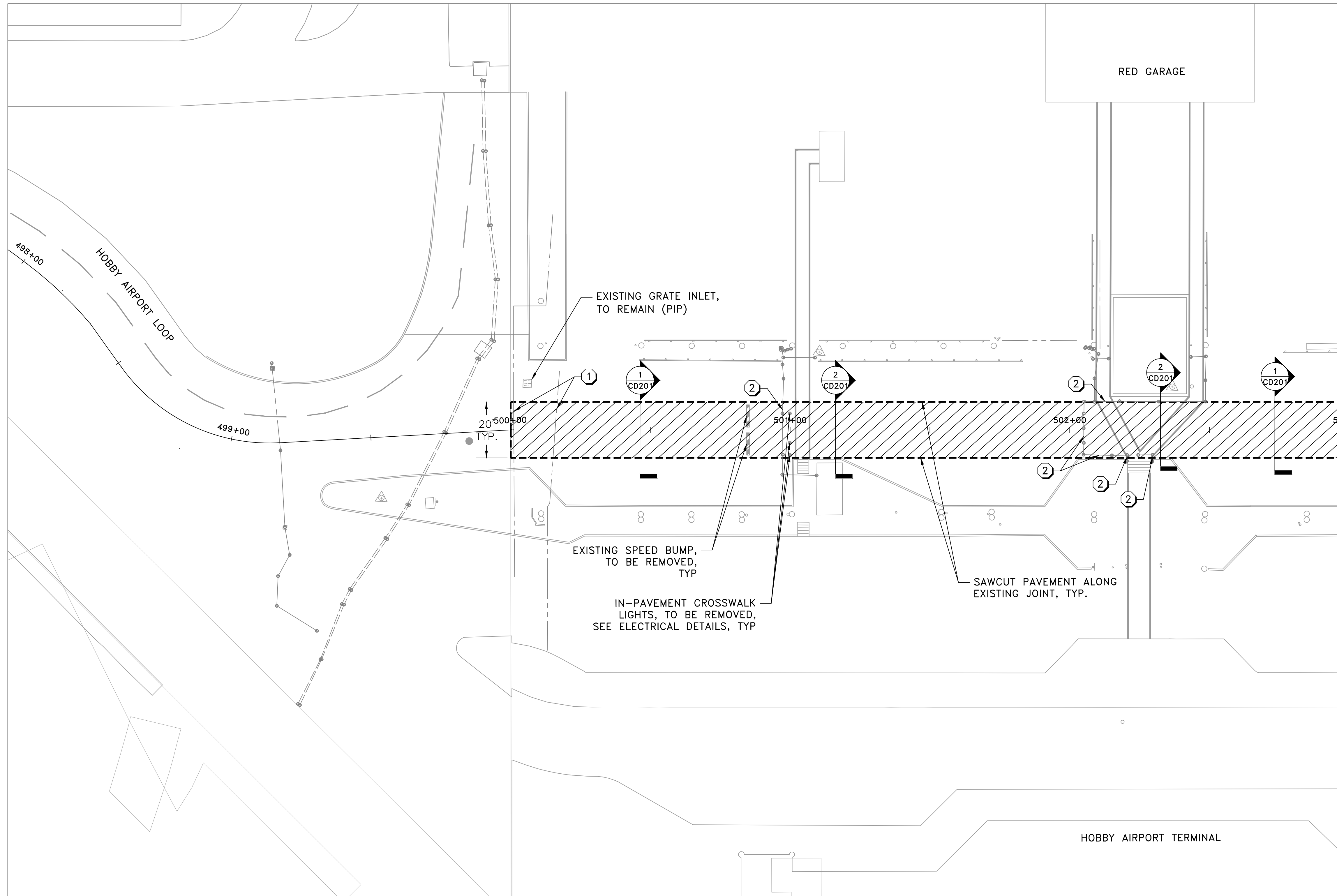
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MATCH LINE - SEE SHEET CD102

LEGEND

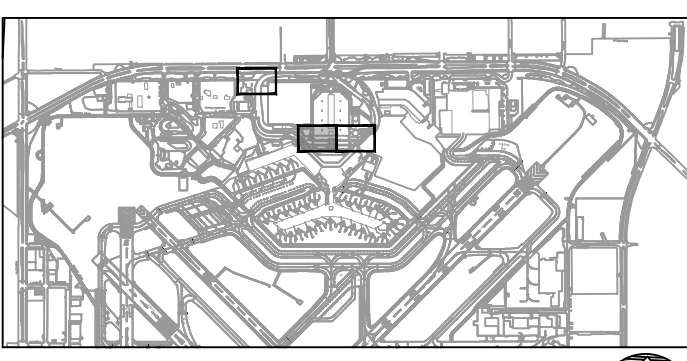
Full depth Pavement Removal symbol

KEYNOTE LEGEND

- ① PROTECT EXISTING
- ② SEE ELECTRICAL SERIES SHEETS

NOTES

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6. REFER TO SHEET CD201 FOR ADDITIONAL DEMOLITION INFORMATION AND DETAILS.



REVISIONS

NO.	DESCRIPTION	DATE	BY

WILLIAM P. HOBBY AIRPORT / HOUSTON (HOU)
METRO BUS DRIVE LANE RECONSTRUCTION
CIVIL DEMOLITION PLAN

PROJECT MGR: JLW
 DESIGNER: EW
 DRAWN BY: KJV
 CHECK BY: RE
 SCALE:
 DATE: 06/29/2020



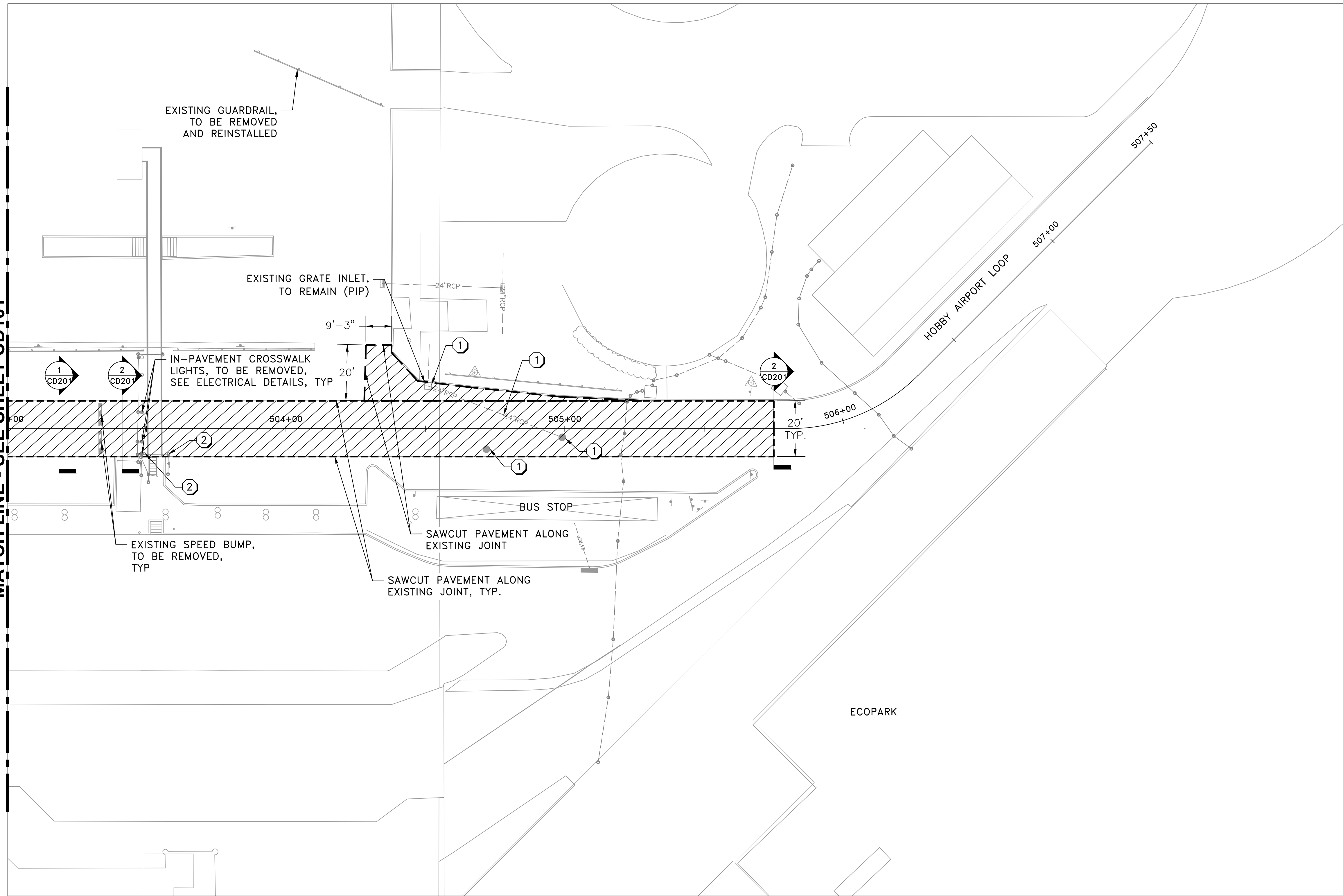
APPROVED BY:

 DIRECTOR
 HOUSTON AIRPORT SYSTEM

PROJECT NO. 100068156
 A.I.P. NO. _____
 C.I.P. NO. _____
 H.A.S. NO. 236
 SHEET NO. _____

HAS FILE:
PLOT DATE:

MATCH LINE - SEE SHEET CD101



LEGEND

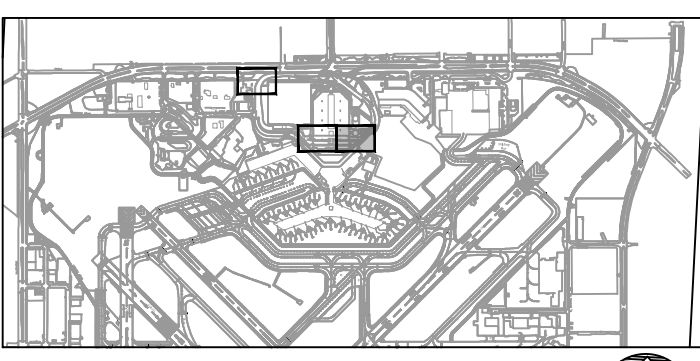
FULL DEPTH PAVEMENT REMOVAL

KEYNOTE LEGEND

- ① PROTECT EXISTING
- ② SEE ELECTRICAL SERIES SHEETS

NOTES

1. CONTRACTOR IS RESPONSIBLE FOR THE REMOVAL AND LEGAL DISPOSAL OF ALL MATERIAL RESULTING FROM THE WORK EFFORTS, FROM THE PROJECT SITE.
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6. REFER TO SHEET CD201 FOR ADDITIONAL DEMOLITION INFORMATION AND DETAILS.



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AMERICA PE FIRM REG.
#F-000474
WWW.ATKINSGLOBAL.COM

REVISIONS

NO.	DESCRIPTION	DATE BY

**WILLIAM P. HOBBY AIRPORT / HOUSTON (HOU)
METRO BUS DRIVE LANE RECONSTRUCTION
CIVIL DEMOLITION PLAN**

PROJECT MGR:	JLV
DESIGNER:	EW
DRAWN BY:	KJV
CHECK BY:	RE
SCALE:	
DATE:	06/29/2020



APPROVED BY: _____
DIRECTOR
HOUSTON AIRPORT SYSTEM

PROJECT NO.	100068156
A.I.P. NO.	
C.I.P. NO.	
H.A.S. NO.	236
SHEET NO.	

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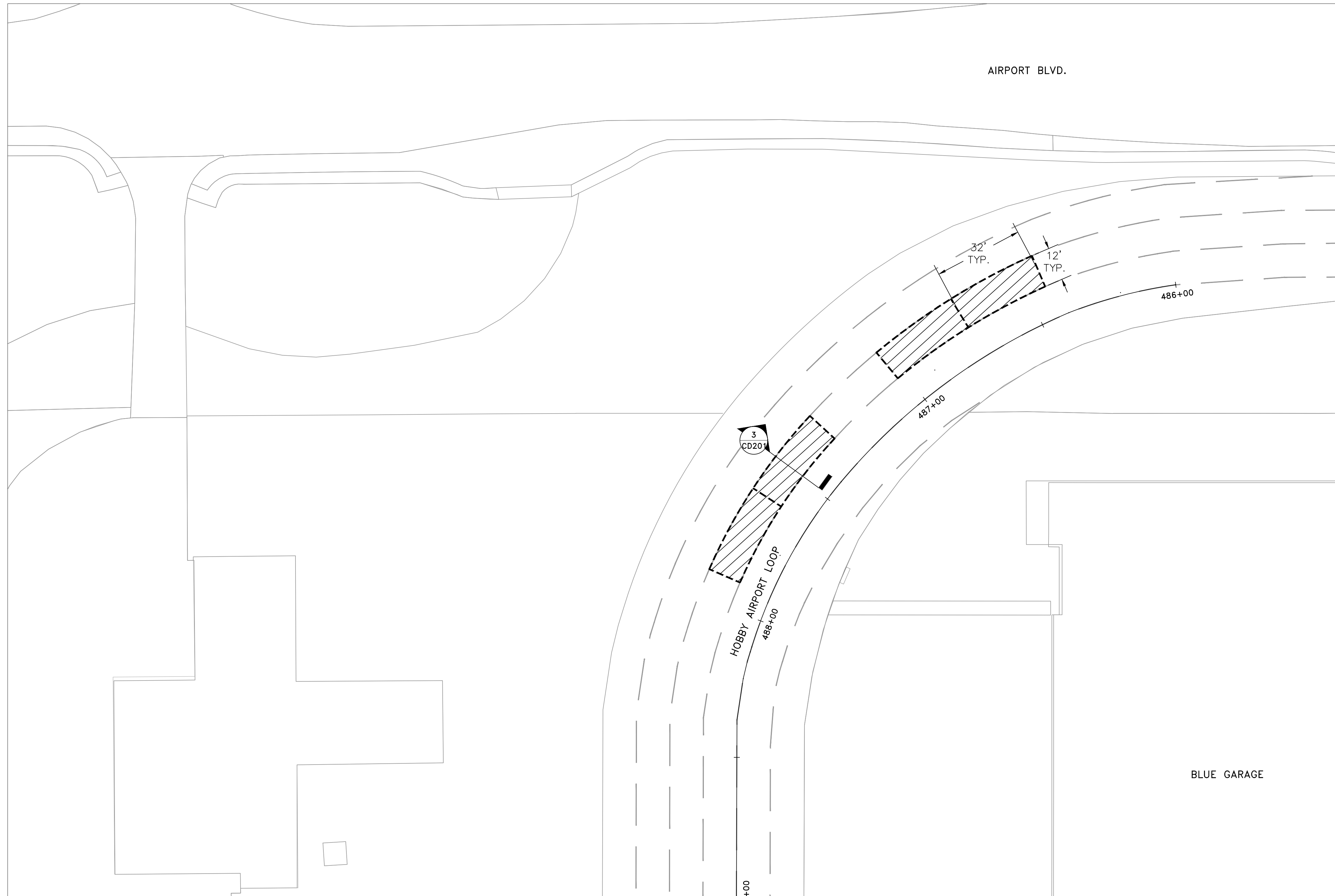
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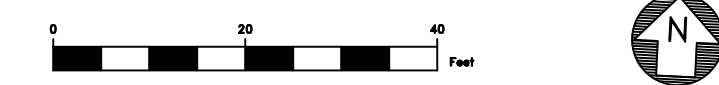
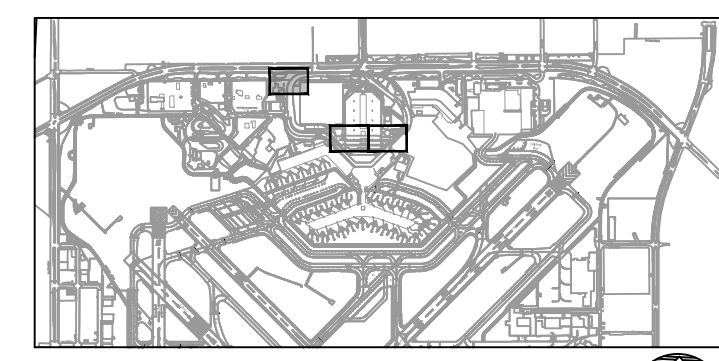


LEGEND

FULL DEPTH PAVEMENT REMOVAL

NOTES

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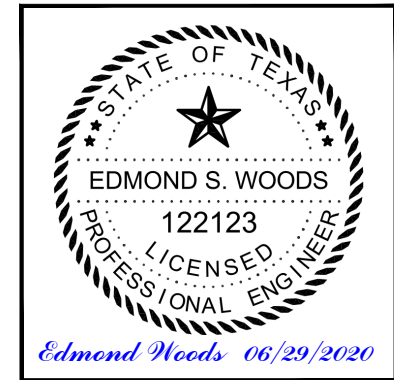
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REVISIONS

NO.	DESCRIPTION	DATE	BY

WILLIAM P. HOBBY AIRPORT / HOUSTON (HOU)
**METRO BUS DRIVE LANE RECONSTRUCTION
CIVIL DEMOLITION PLAN**

PROJECT MGR:	JLV
DESIGNER:	EW
DRAWN BY:	KJV
CHECK BY:	RE
SCALE:	
DATE:	06/29/2020



APPROVED BY:

DIRECTOR
HOUSTON AIRPORT SYSTEM

PROJECT NO.	100068156
A.I.P. NO.	
C.I.P. NO.	
H.A.S. NO.	236
SHEET NO.	

HAS FILE:
PLOT DATE:

REVISIONS		
NO.	DESCRIPTION	DATE BY

WILLIAM P. HOBBY AIRPORT / HOUSTON (HOU)
METRO BUS DRIVE LANE RECONSTRUCTION
DEMOLITION DETAILS

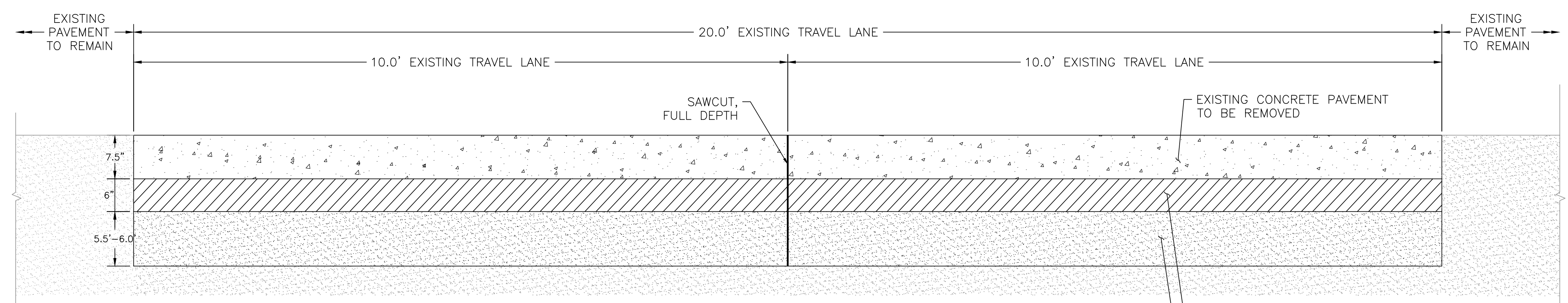
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DESIGNER:	EW
DRAWN BY:	KJV
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SCALE:	
DATE:	06/29/2020



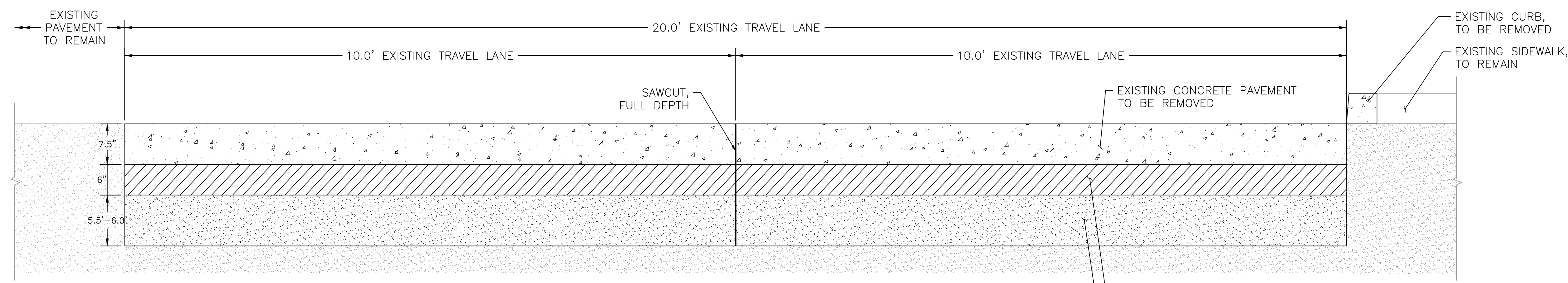
APPROVED BY: _____
 DIRECTOR
 HOUSTON AIRPORT SYSTEM

PROJECT NO.	100068156
A.I.P. NO.	
C.I.P. NO.	
H.A.S. NO.	236
SHEET NO.	

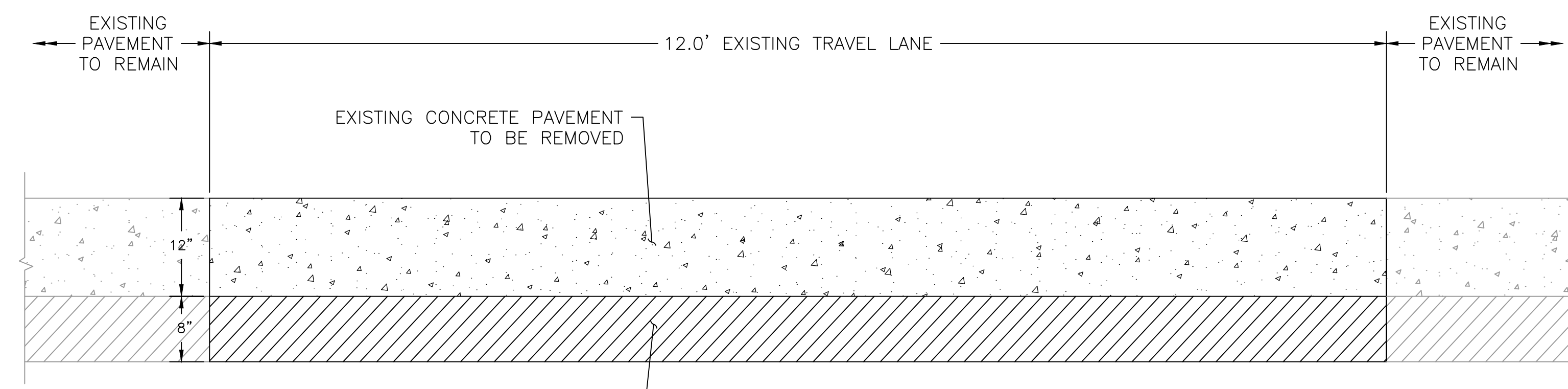
CD201



1 PROPOSED DEMOLITION PAVEMENT
 CD201 SCALE: NTS



2 PROPOSED PAVEMENT DEMOLITION - AT CURB
 CD201 SCALE: NTS



3 PROPOSED DEMOLITION PAVEMENT
 CD201 SCALE: NTS

HAS FILE:
 PLOT DATE:

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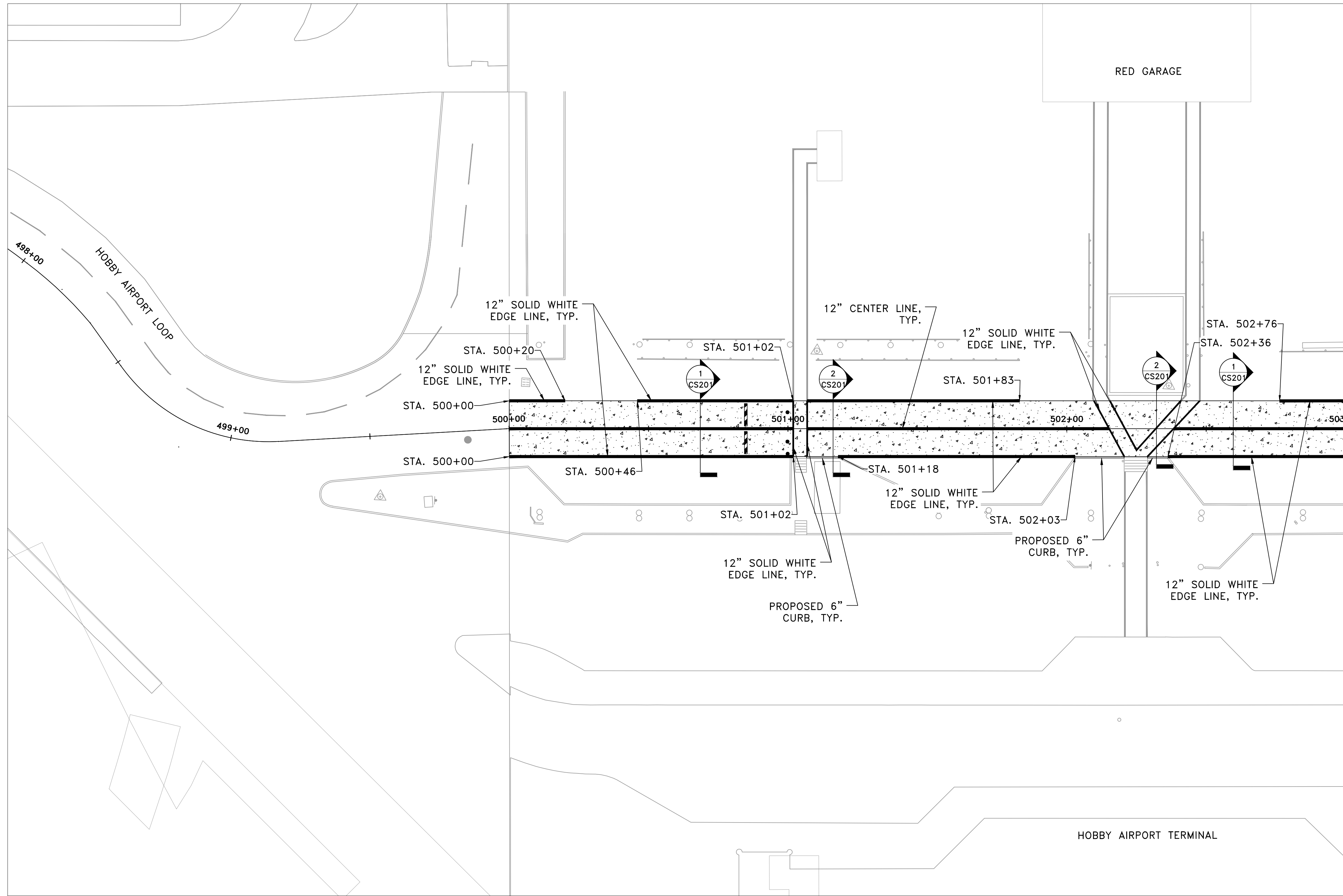
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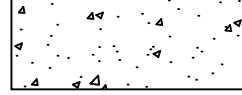
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LEGEND

-  12" SOLID WHITE LINE
-  PROPOSED CONCRETE PAVEMENT RECONSTRUCTION

NOTES

1. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGES TO THE ADJACENT PAVEMENT THAT IS TO REMAIN.



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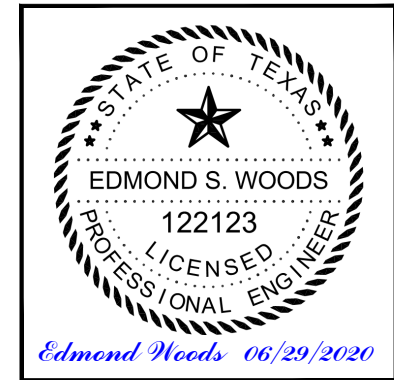
REVISIONS

NO.	DESCRIPTION	DATE	BY

WILLIAM P. HOBBY AIRPORT / HOUSTON (HOU)

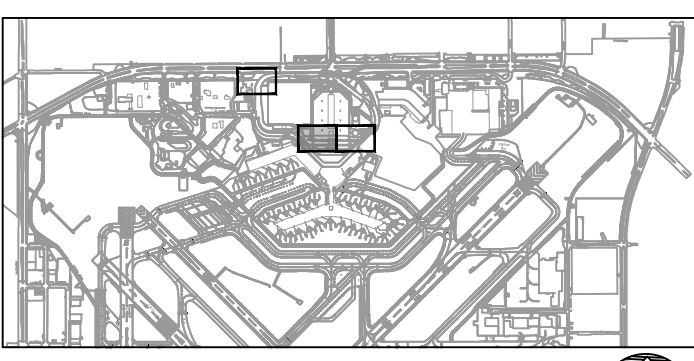
**METRO BUS DRIVE LANE RECONSTRUCTION
PAVEMENT AND MARKING PLAN**

PROJECT MGR:	JLV
DESIGNER:	EW
DRAWN BY:	KJV
CHECK BY:	RE
SCALE:	
DATE:	06/29/2020



APPROVED BY: _____
DIRECTOR
HOUSTON AIRPORT SYSTEM

PROJECT NO.	100068156
A.I.P. NO.	
C.I.P. NO.	
H.A.S. NO.	236
SHEET NO.	



HAS FILE:
PLOT DATE:

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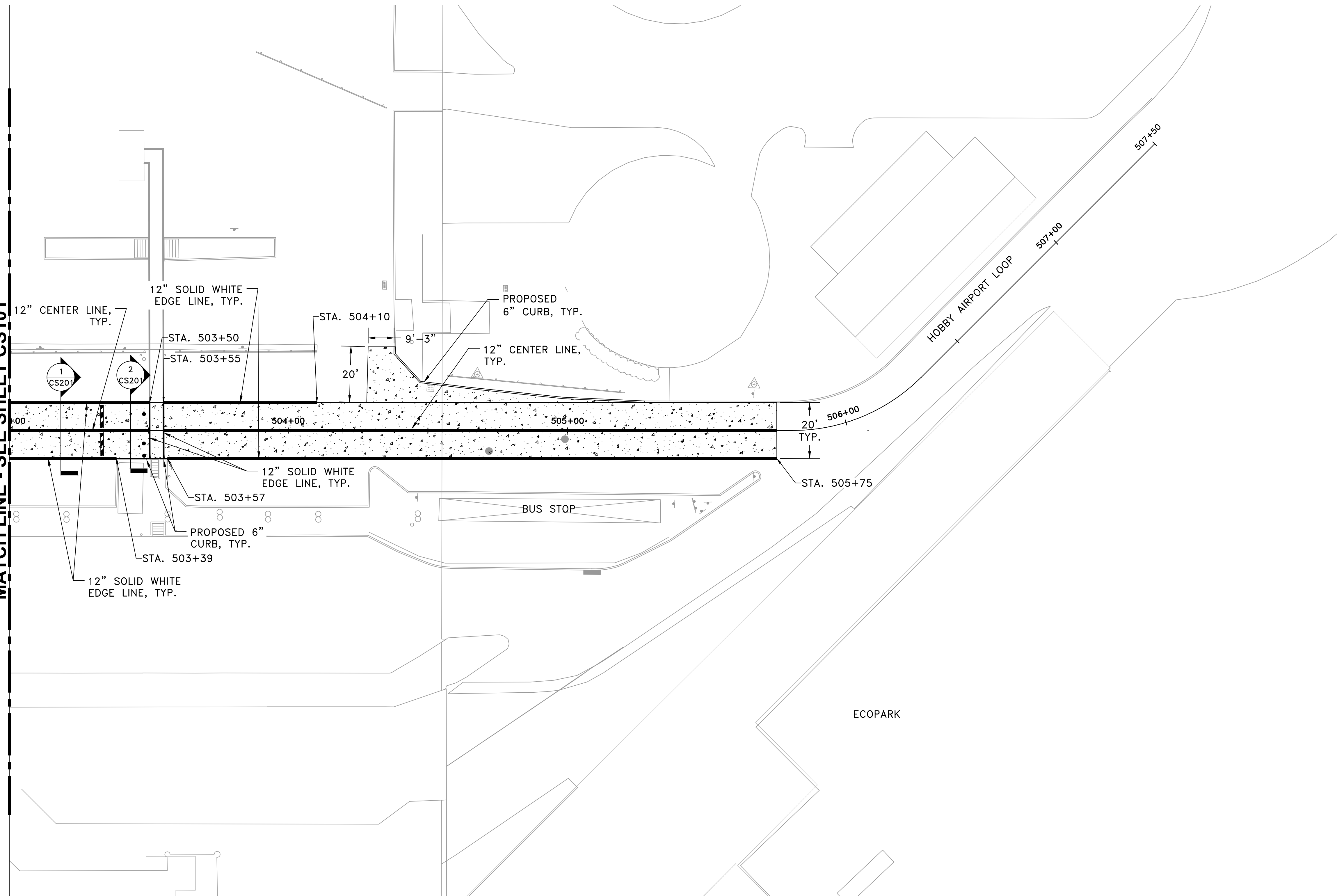
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MATCH LINE - SEE SHEET CS101



LEGEND

- 12" SOLID WHITE LINE
- PROPOSED CONCRETE PAVEMENT RECONSTRUCTION

NOTES

- CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGES TO THE ADJACENT PAVEMENT THAT IS TO REMAIN.



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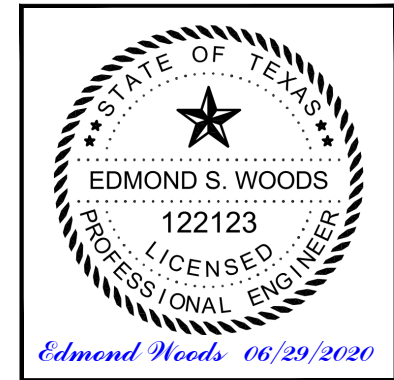
LOCAL OFFICE:
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REVISIONS

NO.	DESCRIPTION	DATE	BY

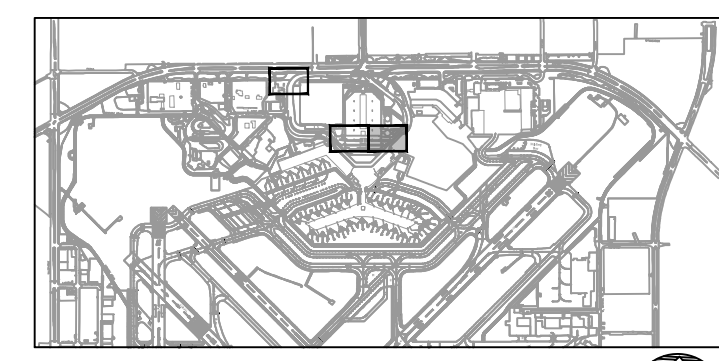
WILLIAM P. HOBBY AIRPORT / HOUSTON (HOU)
**METRO BUS DRIVE LANE RECONSTRUCTION
PAVEMENT AND MARKING PLAN**

PROJECT MGR:	JLV
DESIGNER:	EW
DRAWN BY:	KJV
CHECK BY:	RE
SCALE:	
DATE:	06/29/2020



APPROVED BY: _____
DIRECTOR
HOUSTON AIRPORT SYSTEM

PROJECT NO.	100068156
A.I.P. NO.	
C.I.P. NO.	
H.A.S. NO.	236
SHEET NO.	



HAS FILE:
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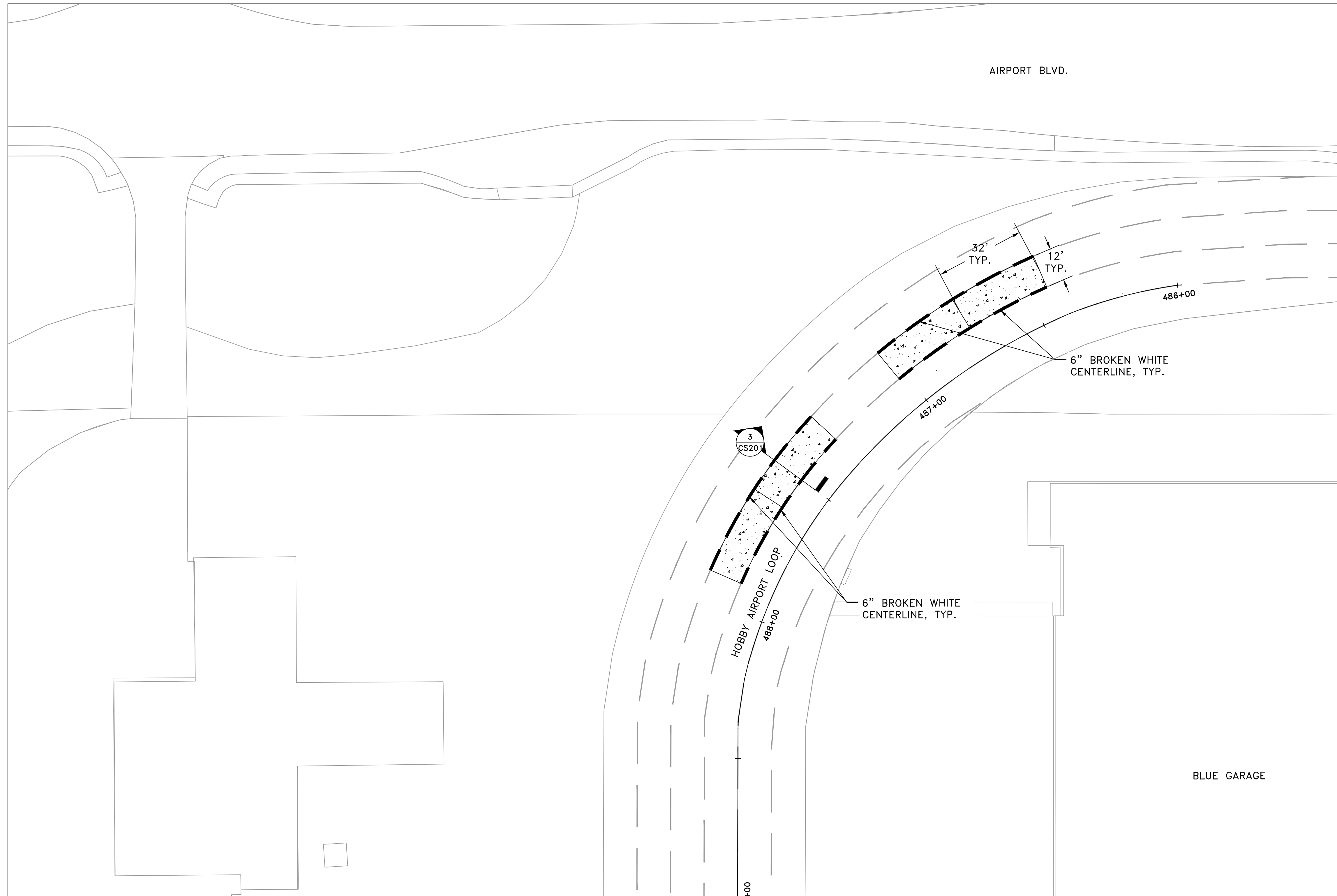
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LEGEND

- 6" BROKEN WHITE CENTERLINE
- PROPOSED CONCRETE PAVEMENT RECONSTRUCTION

NOTES

1. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGES TO THE ADJACENT PAVEMENT THAT IS TO REMAIN.



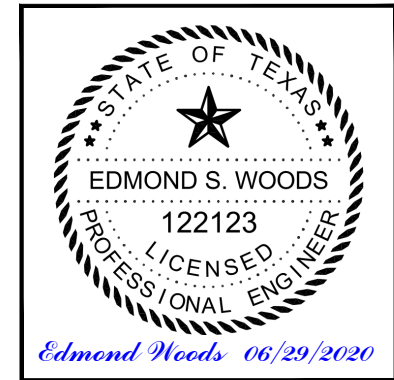
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REVISIONS

NO.	DESCRIPTION	DATE	BY

**WILLIAM P. HOBBY AIRPORT / HOUSTON (HOU)
METRO BUS DRIVE LANE RECONSTRUCTION
PAVEMENT AND MARKING PLAN**

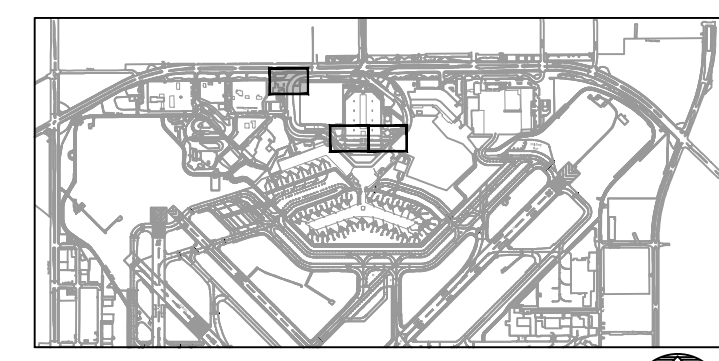
PROJECT MGR: JLJ
DESIGNER: EW
DRAWN BY: KJV
CHECK BY: RE
SCALE:
DATE: 06/29/2020



APPROVED BY:

DIRECTOR
HOUSTON AIRPORT SYSTEM

PROJECT NO. 100068156
A.I.P. NO. _____
C.I.P. NO. _____
H.A.S. NO. 236
SHEET NO. _____



HAS FILE:
PLOT DATE:

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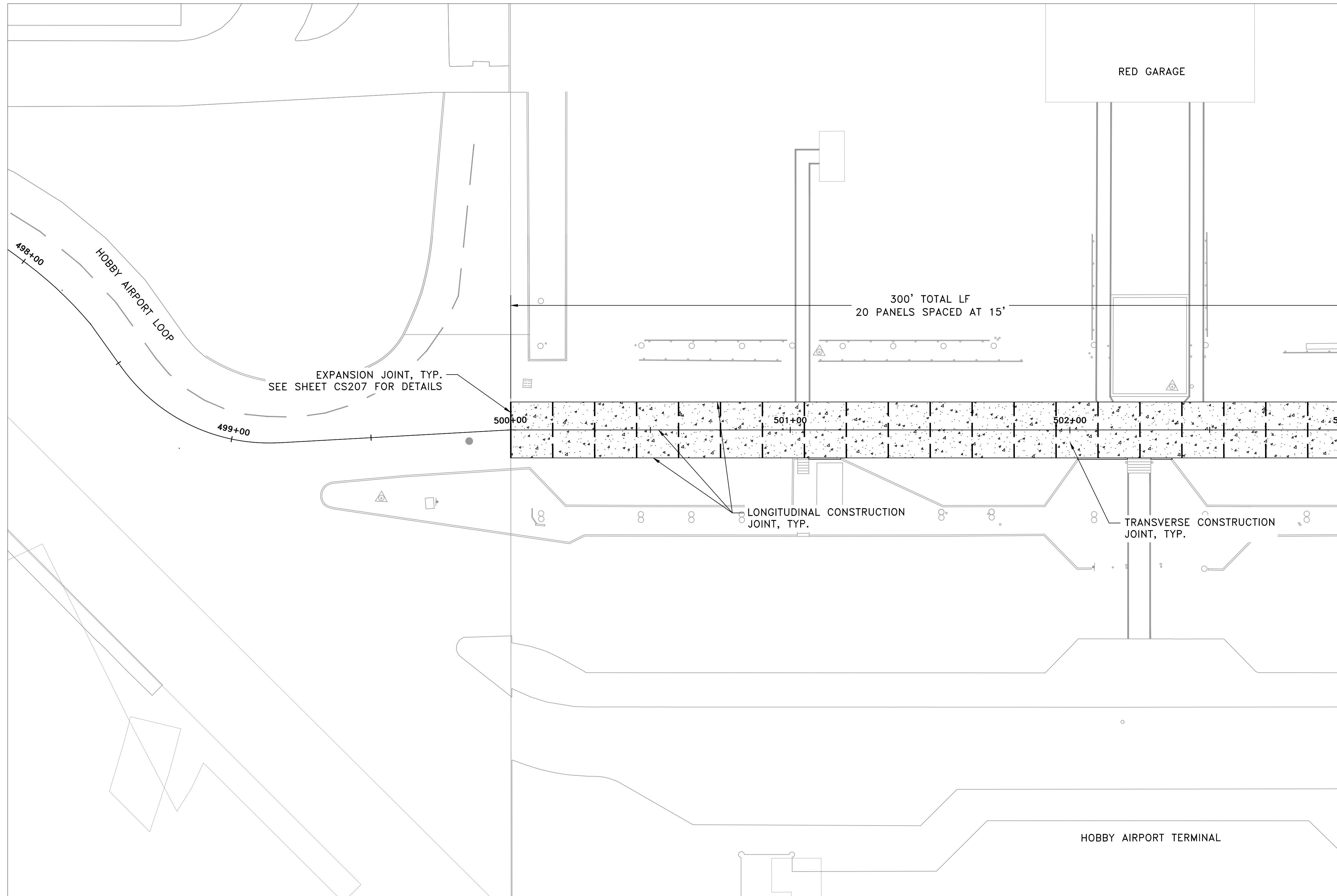
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LEGEND

- EXPANSION JOINT
- LONGITUDINAL CONSTRUCTION JOINT
- TRANSVERSE CONSTRUCTION JOINT
- PROPOSED CONCRETE PAVEMENT RECONSTRUCTION

NOTES

- CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGES TO THE ADJACENT PAVEMENT THAT IS TO REMAIN.

MATCH LINE - SEE SHEET CS105



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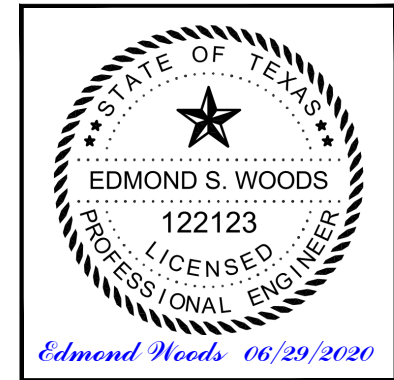
LOCAL OFFICE:
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REVISIONS

NO.	DESCRIPTION	DATE	BY

WILLIAM P. HOBBY AIRPORT / HOUSTON (HOU)
**METRO BUS DRIVE LANE RECONSTRUCTION
PAVEMENT AND JOINT LAYOUT PLAN**

PROJECT MGR:	JLV
DESIGNER:	EW
DRAWN BY:	KJV
CHECK BY:	RE
SCALE:	
DATE:	06/29/2020



APPROVED BY: _____
DIRECTOR
HOUSTON AIRPORT SYSTEM

PROJECT NO.	100068156
A.I.P. NO.	
C.I.P. NO.	
H.A.S. NO.	236
SHEET NO.	

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HAS FILE:
PLOT DATE:

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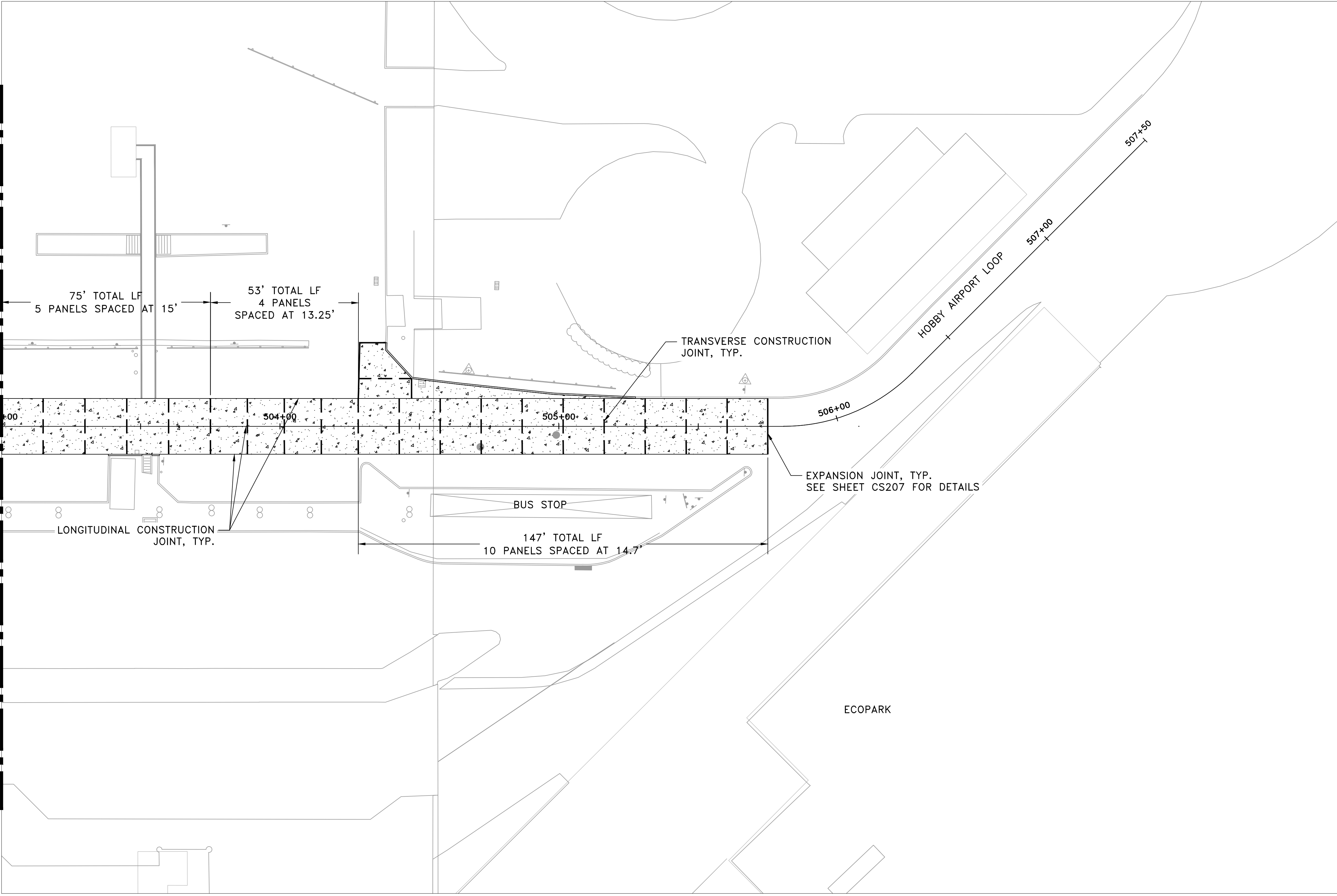
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MATCH LINE - SEE SHEET CS104



LEGEND

- EXPANSION JOINT
- LONGITUDINAL CONSTRUCTION JOINT
- - - TRANSVERSE CONSTRUCTION JOINT
- ▨ PROPOSED CONCRETE PAVEMENT RECONSTRUCTION

NOTES

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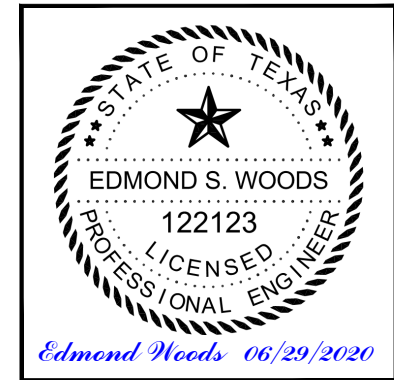
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REVISIONS

NO.	DESCRIPTION	DATE	BY

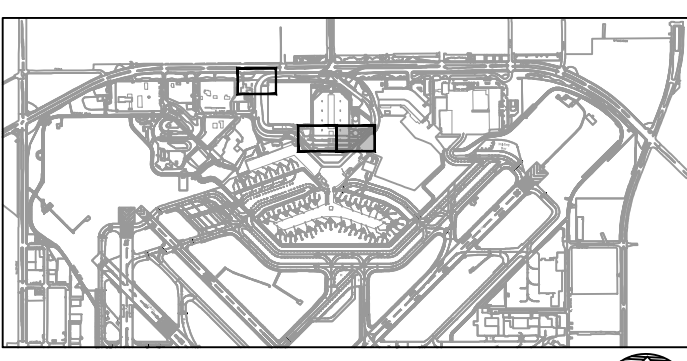
WILLIAM P. HOBBY AIRPORT / HOUSTON (HOU)
**METRO BUS DRIVE LANE RECONSTRUCTION
PAVEMENT AND JOINT LAYOUT PLAN**

PROJECT MGR:	JLV
DESIGNER:	EW
DRAWN BY:	KJV
CHECK BY:	RE
SCALE:	
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APPROVED BY: _____
DIRECTOR
HOUSTON AIRPORT SYSTEM

PROJECT NO.	100068156
A.I.P. NO.	
C.I.P. NO.	
H.A.S. NO.	236
SHEET NO.	



HAS FILE:
PLOT DATE:

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REVISIONS		
NO.	DESCRIPTION	DATE BY

WILLIAM P. HOBBY AIRPORT / HOUSTON (HOU)
METRO BUS DRIVE LANE RECONSTRUCTION
TYPICAL PAVEMENT SECTION

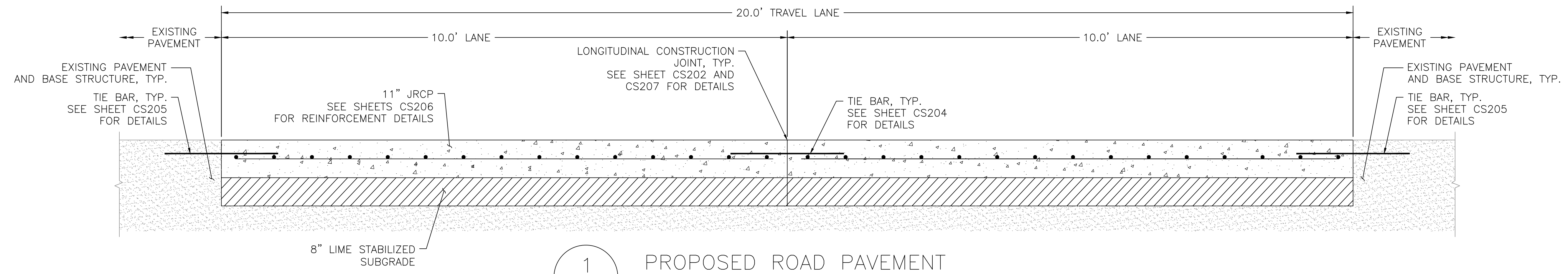
PROJECT MGR:	JLV
DESIGNER:	EW
DRAWN BY:	KJV
CHECK BY:	RE
SCALE:	
DATE:	06/29/2020



APPROVED BY:	
DIRECTOR	HOUSTON AIRPORT SYSTEM
PROJECT NO.	100068156
A.I.P. NO.	
C.I.P. NO.	
H.A.S. NO.	236
SHEET NO.	

NOTE:

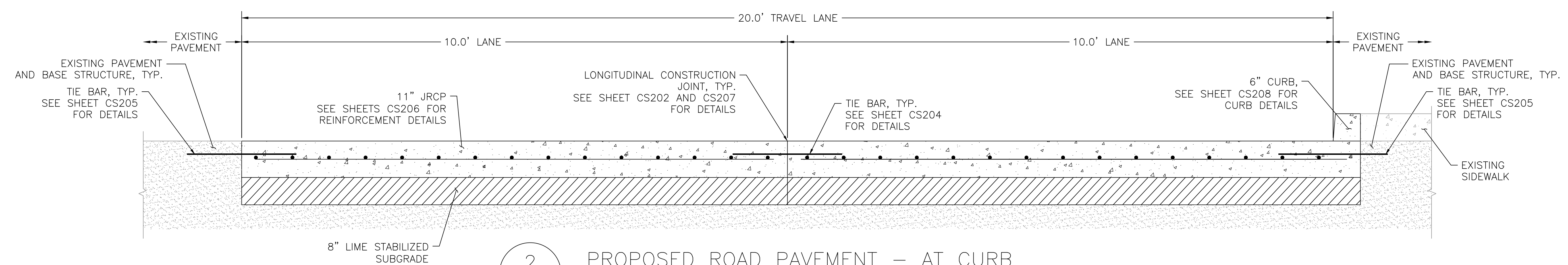
1. CONCRETE PAVEMENT SHALL HAVE A MINIMUM 28-DAY CONCRETE COMPRESSIVE STRENGTH OF 4,000 PSI AND A 28-DAY FLEXURAL STRENGTH OF 630 PSI.FINAL DESIGN.



1
 PROPOSED ROAD PAVEMENT
 SCALE: NTS
CS201

NOTE:

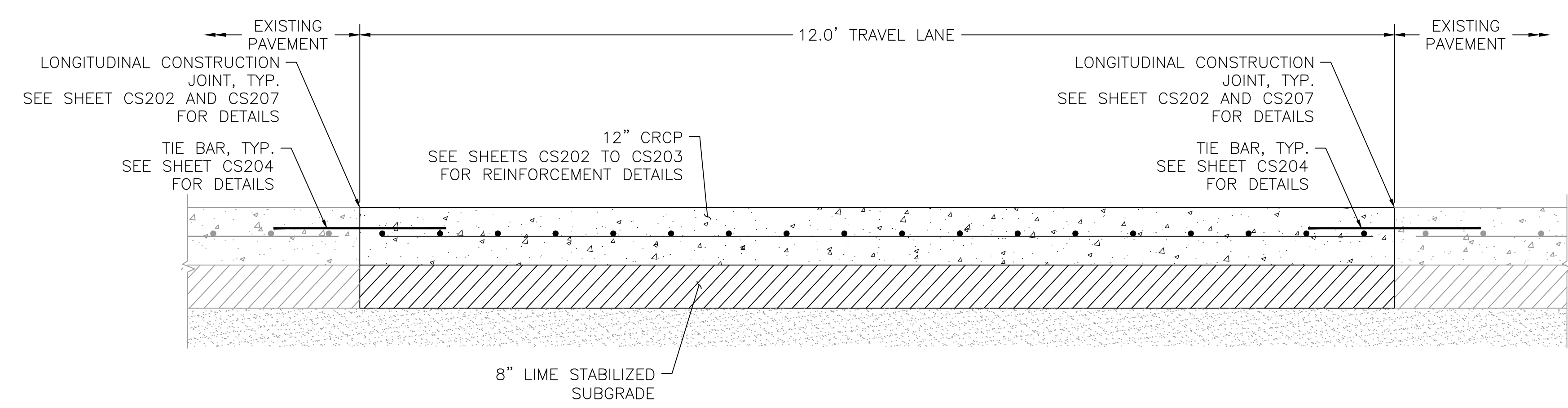
1. CONCRETE PAVEMENT SHALL HAVE A MINIMUM 28-DAY CONCRETE COMPRESSIVE STRENGTH OF 4,000 PSI AND A 28-DAY FLEXURAL STRENGTH OF 630 PSI.FINAL DESIGN.



2
 PROPOSED ROAD PAVEMENT - AT CURB
 SCALE: NTS
CS201

NOTE:

1. CONCRETE PAVEMENT SHALL HAVE A MINIMUM 28-DAY CONCRETE COMPRESSIVE STRENGTH OF 4,000 PSI AND A 28-DAY FLEXURAL STRENGTH OF 630 PSI.FINAL DESIGN.

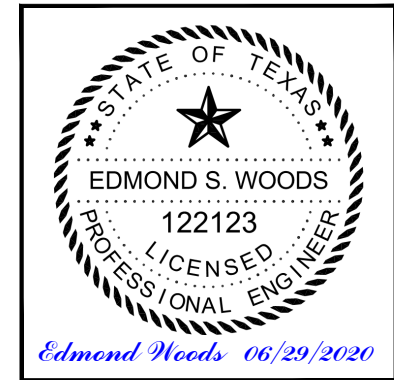


3
 PROPOSED ROAD PAVEMENT
 SCALE: NTS
CS201

REVISIONS		
NO.	DESCRIPTION	DATE BY

WILLIAM P. HOBBY AIRPORT / HOUSTON (HOU)
METRO BUS DRIVE LANE RECONSTRUCTION
TYPICAL PAVEMENT DETAILS

PROJECT MGR:	JLV
DESIGNER:	EW
DRAWN BY:	KJV
CHECK BY:	RE
SCALE:	
DATE:	06/29/2020



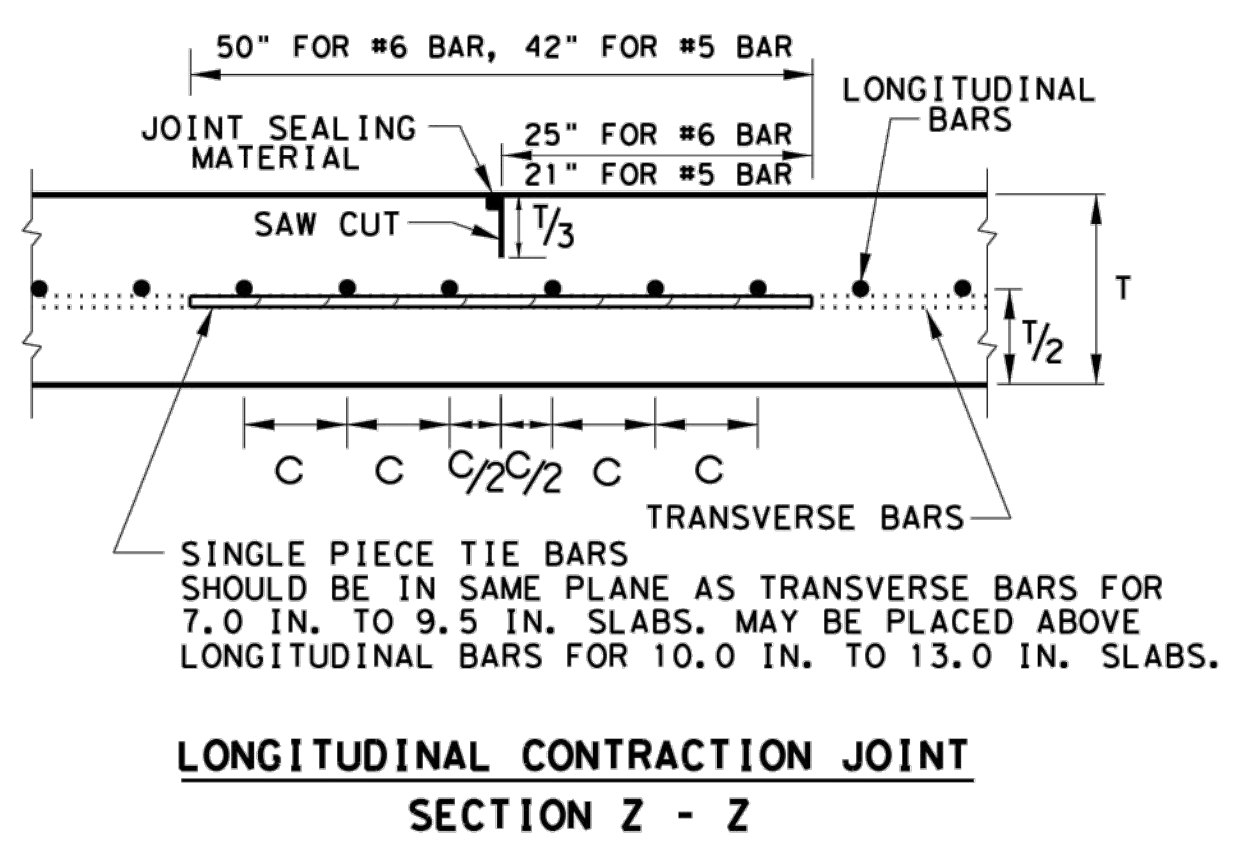
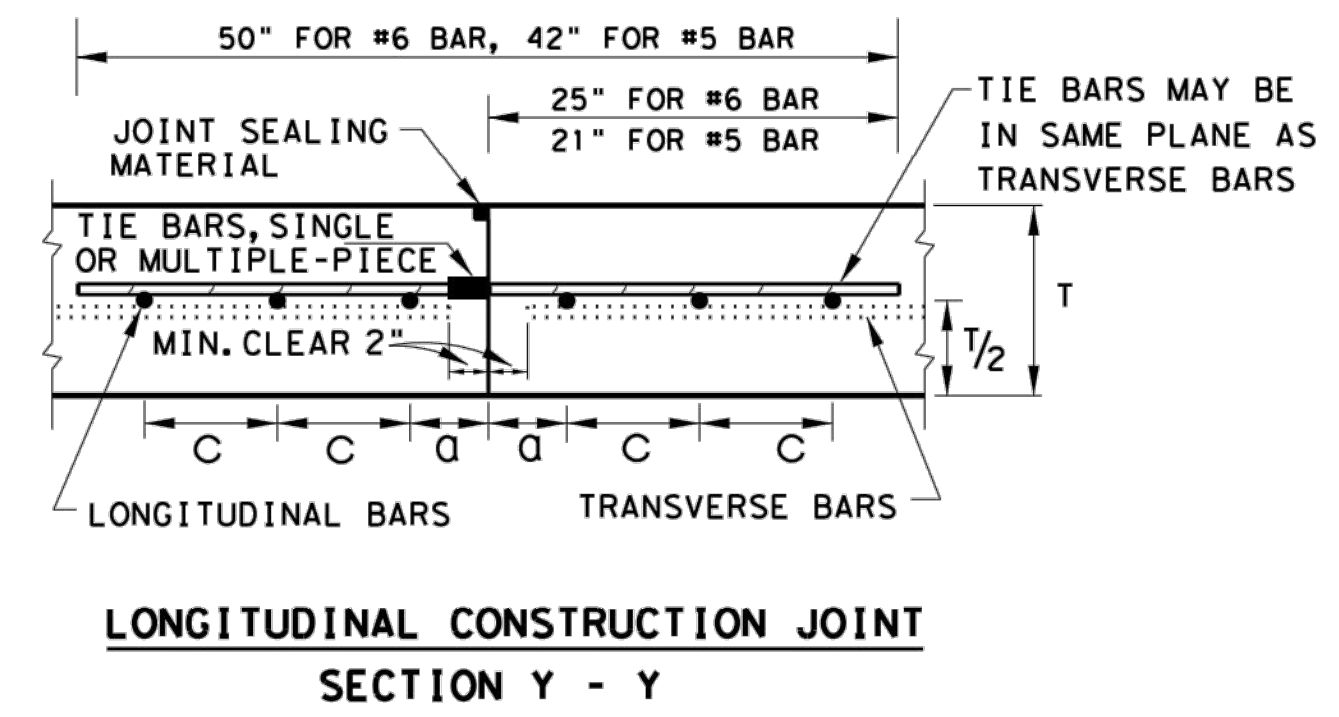
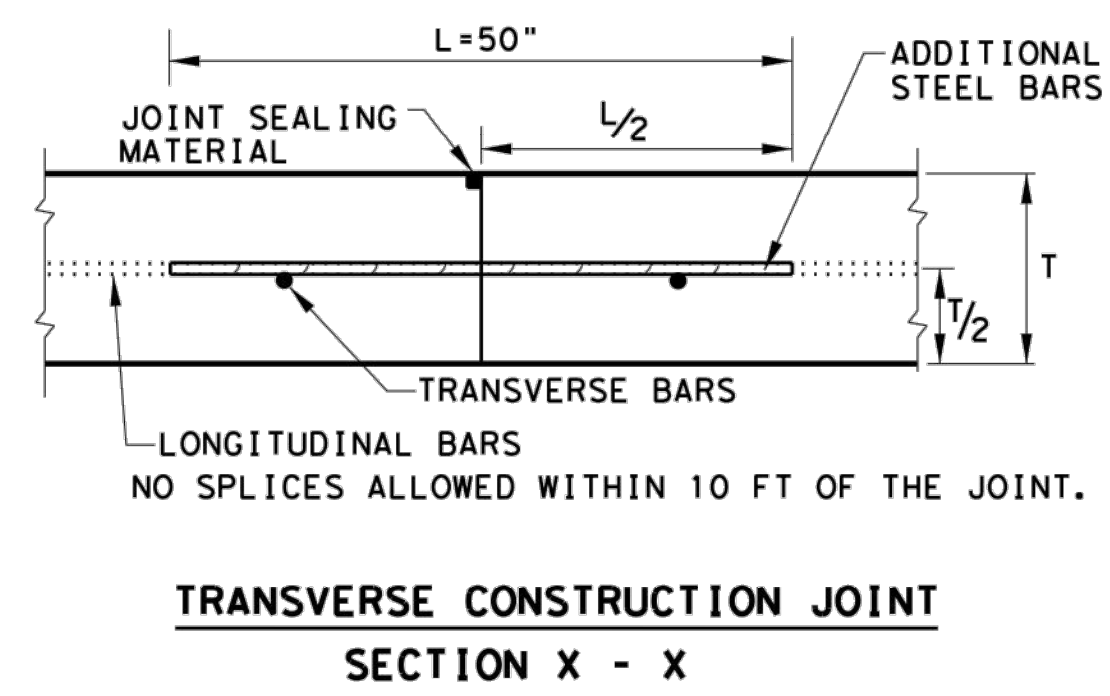
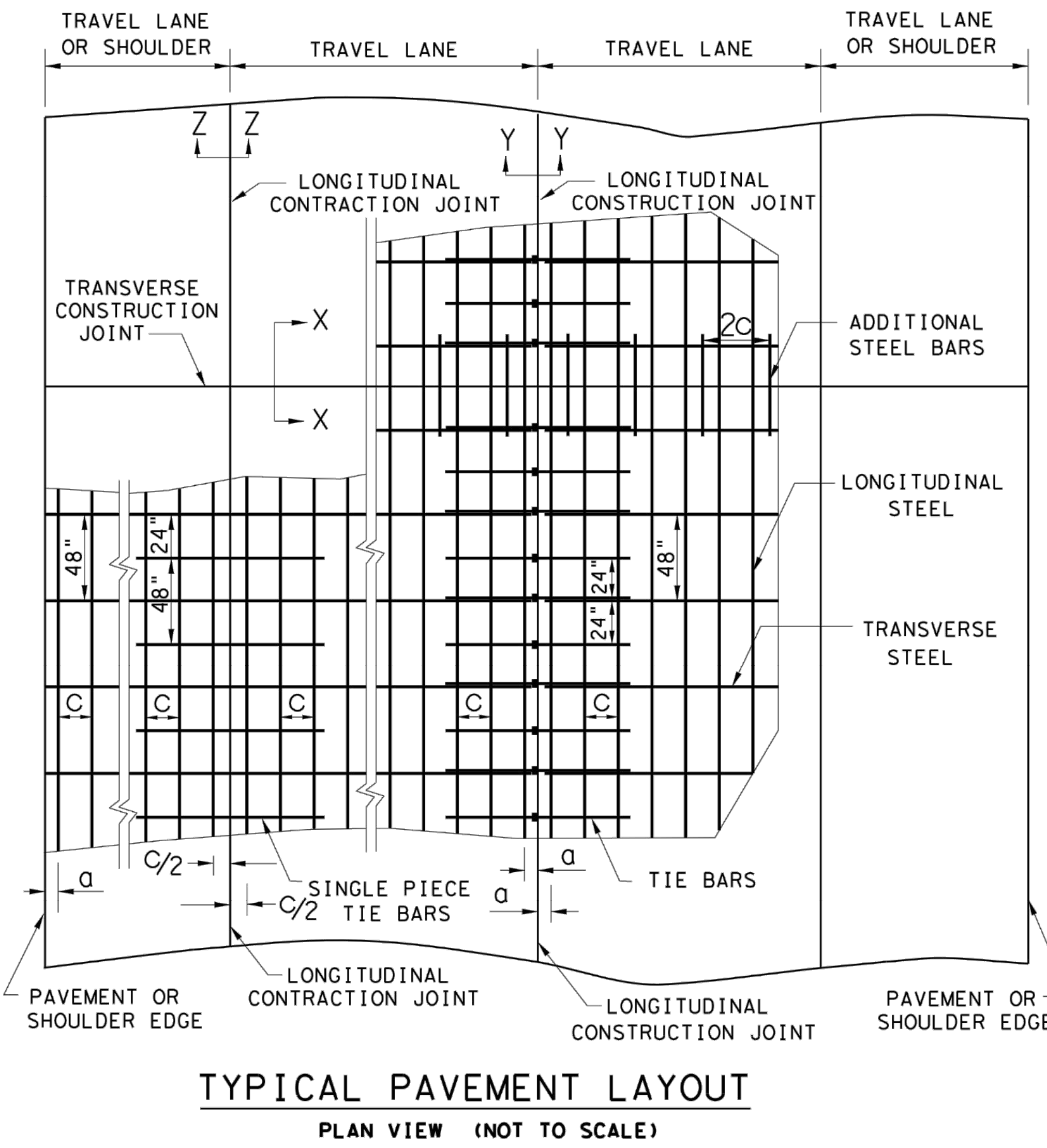
APPROVED BY:	
DIRECTOR	HOUSTON AIRPORT SYSTEM
PROJECT NO.	100068156
A.I.P. NO.	
C.I.P. NO.	
H.A.S. NO.	236
SHEET NO.	

GENERAL NOTES

1. DETAILS FOR PAVEMENT WIDTH, PAVEMENT THICKNESS AND THE CROWN CROSS-SLOPE SHALL BE SHOWN ELSEWHERE IN THE PLANS. PAVEMENTS WIDER THAN 100 FT. WITHOUT A FREE LONGITUDINAL JOINT ARE NOT COVERED BY THIS STANDARD.
2. USE COARSE AGGREGATES WITH A RATED COEFFICIENT OF THERMAL EXPANSION (COTE) OF NOT MORE THAN 5.5×10^{-6} IN/IN/°F AS LISTED IN THE CONCRETE RATED SOURCE QUALITY CATALOG (CRSQC).
3. ALL THE REINFORCING STEEL AND TIE BARS SHALL BE DEFORMED STEEL BARS CONFORMING TO ASTM A 615 (GRADE 60) OR ASTM A 996 (GRADE 60) OR ABOVE. STEEL BAR SIZES AND SPACINGS SHALL CONFORM TO TABLE NO.1 AND TABLE NO.2.
4. WHEN COARSE AGGREGATE WITH A RATED COTE OF NOT MORE THAN 4.3×10^{-6} IN/IN/°F IS USED, TABLE NO.1A MAY BE USED FOR LONGITUDINAL STEEL AS APPROVED BY THE ENGINEER.
5. STEEL BAR PLACEMENT TOLERANCE SHALL BE +/- 1 IN. HORIZONTALLY AND +/- 0.5 IN. VERTICALLY. CALCULATED AVERAGE BAR SPACING (CONCRETE PLACEMENT WIDTH / NUMBER OF LONGITUDINAL BARS) SHALL CONFORM TO TABLE NO.1 OR TABLE NO.1A.
6. PAVEMENT WIDTHS OF MORE THAN 15 FT. SHALL HAVE A LONGITUDINAL JOINT (SECTION Z-Z OR SECTION Y-Y). THESE JOINTS SHALL BE LOCATED WITHIN 6 IN. OF THE LANE LINE UNLESS THE JOINT LOCATION IS SHOWN ELSEWHERE ON THE PLANS.
7. THE SAW CUT DEPTH FOR THE LONGITUDINAL CONTRACTION JOINT (SECTION Z-Z) SHALL BE ONE THIRD OF THE SLAB THICKNESS (T/3).
8. WHEN TYING CONCRETE GUTTER AT A LONGITUDINAL JOINT, THE TIE BAR LENGTH OR POSITION MAY BE ADJUSTED. PROVIDE 3 IN. OF CONCRETE COVER FROM THE BACK OF GUTTER TO THE END OF TIE BAR.
9. REPLACE MISSING OR DAMAGED TIE BARS WITHOUT ADDITIONAL COMPENSATION BY DRILLING MIN.10 IN. DEEP AND GROUTING TIE BARS WITH TYPE III, CLASS C EPOXY. MEET THE PULL-OUT TEST REQUIREMENTS IN ITEM 361.
10. OMIT TIE BARS LOCATED WITHIN 18-IN. OF THE TRANSVERSE CONSTRUCTION JOINTS (SECTION X-X). USE HAND-OPERATED IMMERSION VIBRATORS TO CONSOLIDATE THE CONCRETE ADJACENT TO ALL FORMED JOINTS.
11. LONGITUDINAL REINFORCING STEEL SPLICES SHALL BE A MINIMUM OF 25 IN. STAGGER THE LAP LOCATIONS SO THAT NO MORE THAN 1/3 OF THE LONGITUDINAL STEEL IS SPLICED IN ANY GIVEN 12-FT. WIDTH AND 2-FT. LENGTH OF THE PAVEMENT.
12. THE DETAIL FOR THE JOINT SEALANT AND RESERVOIR IS SHOWN ON STANDARD SHEET "CONCRETE PAVING DETAILS, JOINT SEALS."

SLAB THICKNESS AND BAR SIZE		REGULAR STEEL BARS	FIRST SPACING AT EDGE OR JOINT	ADDITIONAL STEEL BARS AT TRANSVERSE CONSTRUCTION JOINT (SECTION X-X)	
T (IN.)	BAR SIZE	SPACING C (IN.)	SPACING a (IN.)	SPACING 2 x C (IN.)	LENGTH L (IN.)
7.0	#5	6.5	3 TO 4	13	50
7.5	#5	6.0	3 TO 4	12	50
8.0	#6	9.0	3 TO 4	18	50
8.5	#6	8.5	3 TO 4	17	50
9.0	#6	8.0	3 TO 4	16	50
9.5	#6	7.5	3 TO 4	15	50
10.0	#6	7.0	3 TO 4	14	50
10.5	#6	6.75	3 TO 4	13.5	50
11.0	#6	6.5	3 TO 4	13	50
11.5	#6	6.25	3 TO 4	12.5	50
12.0	#6	6.0	3 TO 4	12	50
12.5	#6	5.75	3 TO 4	11.5	50
13.0	#6	5.5	3 TO 4	11	50

SLAB THICKNESS (IN.)	TRANSVERSE STEEL		TIE BARS AT LONGITUDINAL CONTRACTION JOINT (SECTION Z-Z)		TIE BARS AT LONGITUDINAL CONTRACTION JOINT (SECTION Y-Y)	
	BAR SIZE	SPACING (IN.)	BAR SIZE	SPACING (IN.)	BAR SIZE	SPACING (IN.)
7.0 - 7.5	#5	48	#5	48	#5	24
8.0 - 13.0	#5	48	#6	48	#6	24



SHEET 1 OF 2

CONTINUOUSLY REINFORCED CONCRETE PAVEMENT
ONE LAYER STEEL BAR PLACEMENT
T - 7 to 13 INCHES
CRCP (1) - 17

FILE: crcp17.dgn	DW: TxDOT	CK: AN	DW: HC	CK: VP/KM
© TxDOT: May 2017	CONT	SECT	JOB	HIGHWAY
REVISIONS	DIST	COUNTY	SHEET NO.	
10/10/2011 ADD GN #12				
04/09/2013 REMOVE 6" AND 6.5" ADD CTE REQUIREMENTS				
05/05/2017 COTE AS RATED 4.3				

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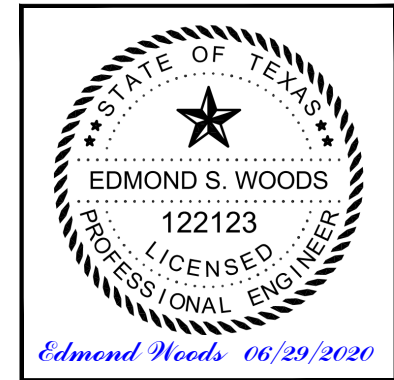
HAS FILE: PLOT DATE:

REVISIONS

NO.	DESCRIPTION	DATE BY

WILLIAM P. HOBBY AIRPORT / HOUSTON (HOU)
METRO BUS DRIVE LANE RECONSTRUCTION
TYPICAL PAVEMENT DETAILS

PROJECT MGR: JLV
 DESIGNER: EW
 DRAWN BY: KJV
 CHECK BY: RE
 SCALE:
 DATE: 06/29/2020



APPROVED BY: _____
 DIRECTOR
 HOUSTON AIRPORT SYSTEM

PROJECT NO.
 100068156

A.I.P. NO.

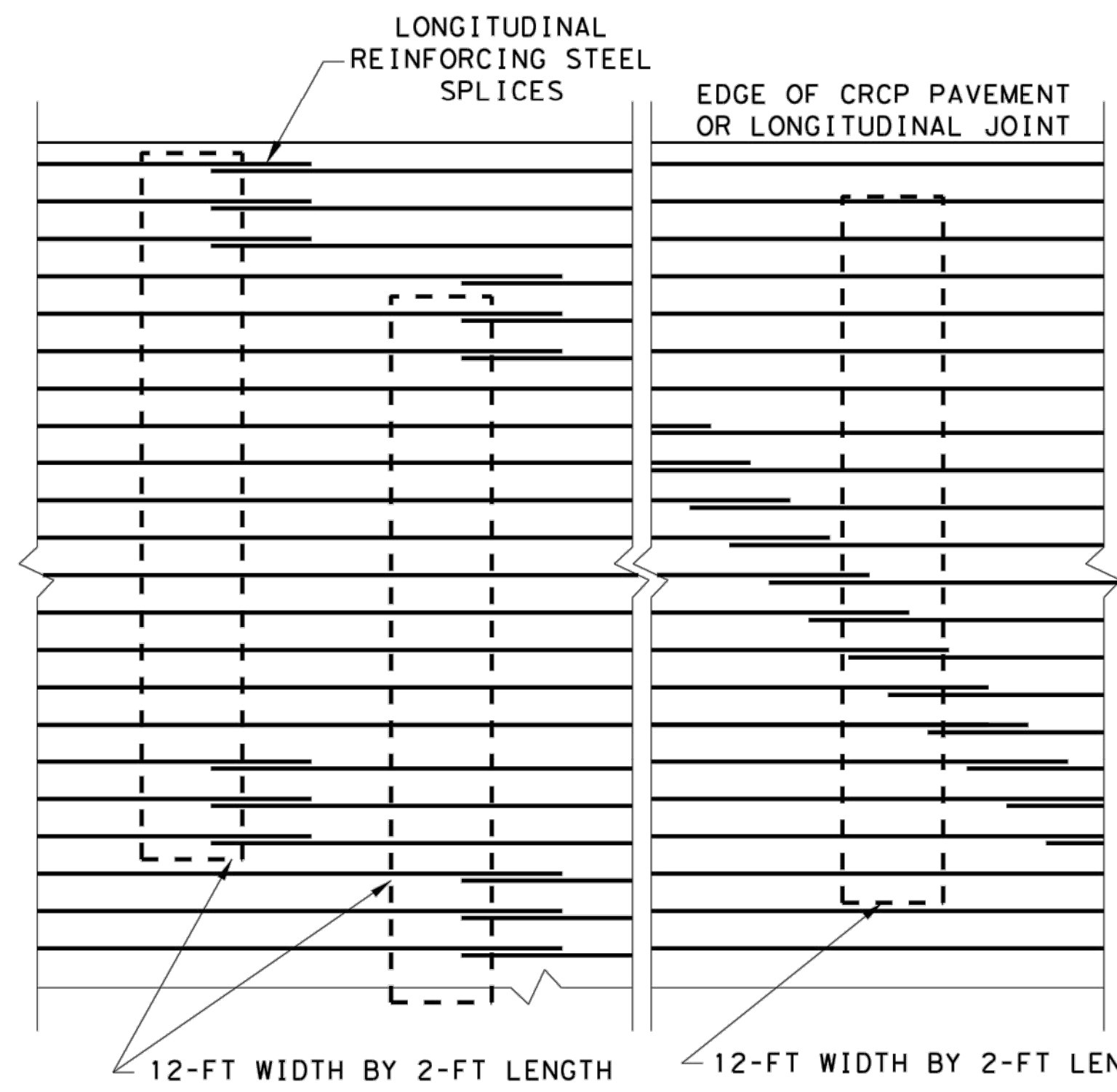
C.I.P. NO.

H.A.S. NO.
 236

SHEET NO.

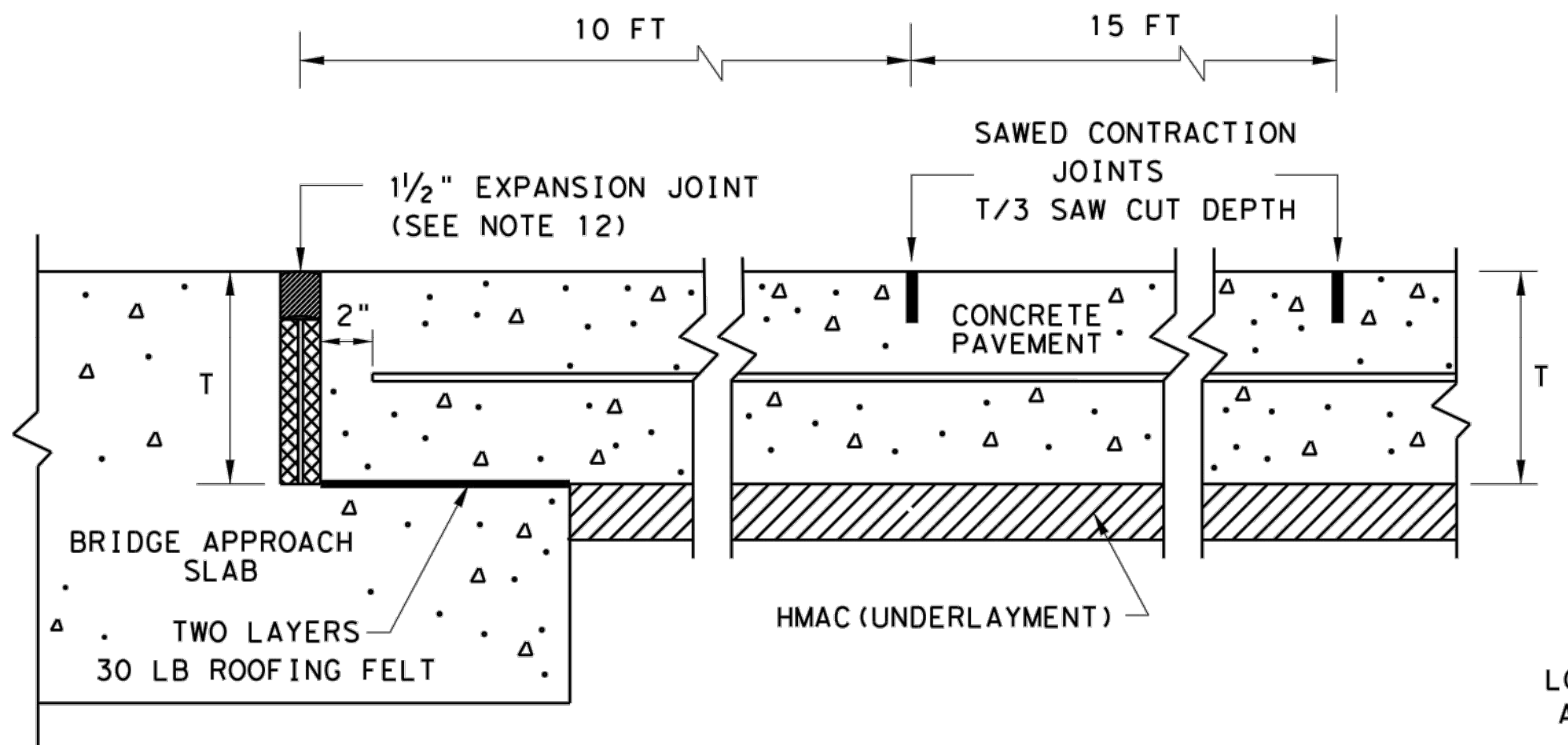
TABLE NO. 1A LONGITUDINAL STEEL FOR LOW COTE CONCRETE AS APPROVED BY THE ENGINEER

SLAB THICKNESS AND BAR SIZE		REGULAR STEEL BARS	FIRST SPACING AT EDGE OR JOINT	ADDITIONAL STEEL BARS AT TRANSVERSE CONSTRUCTION JOINT (SECTION X-X)	
T (IN.)	BAR SIZE	SPACING C (IN.)	SPACING D (IN.)	SPACING 2 x c (IN.)	LENGTH L (IN.)
7.0	#5	7.5	3 TO 4	15	50
7.5	#5	7.0	3 TO 4	14	50
8.0	#6	10.0	3 TO 4	20	50
8.5	#6	9.5	3 TO 4	19	50
9.0	#6	9.0	3 TO 4	18	50
9.5	#6	8.5	3 TO 4	17	50
10.0	#6	8.0	3 TO 4	16	50
10.5	#6	7.5	3 TO 4	15	50
11.0	#6	7.0	3 TO 4	14	50
11.5	#6	6.75	3 TO 4	13.5	50
12.0	#6	6.50	3 TO 4	13	50
12.5	#6	6.25	3 TO 4	12.5	50
13.0	#6	6.0	3 TO 4	12	50

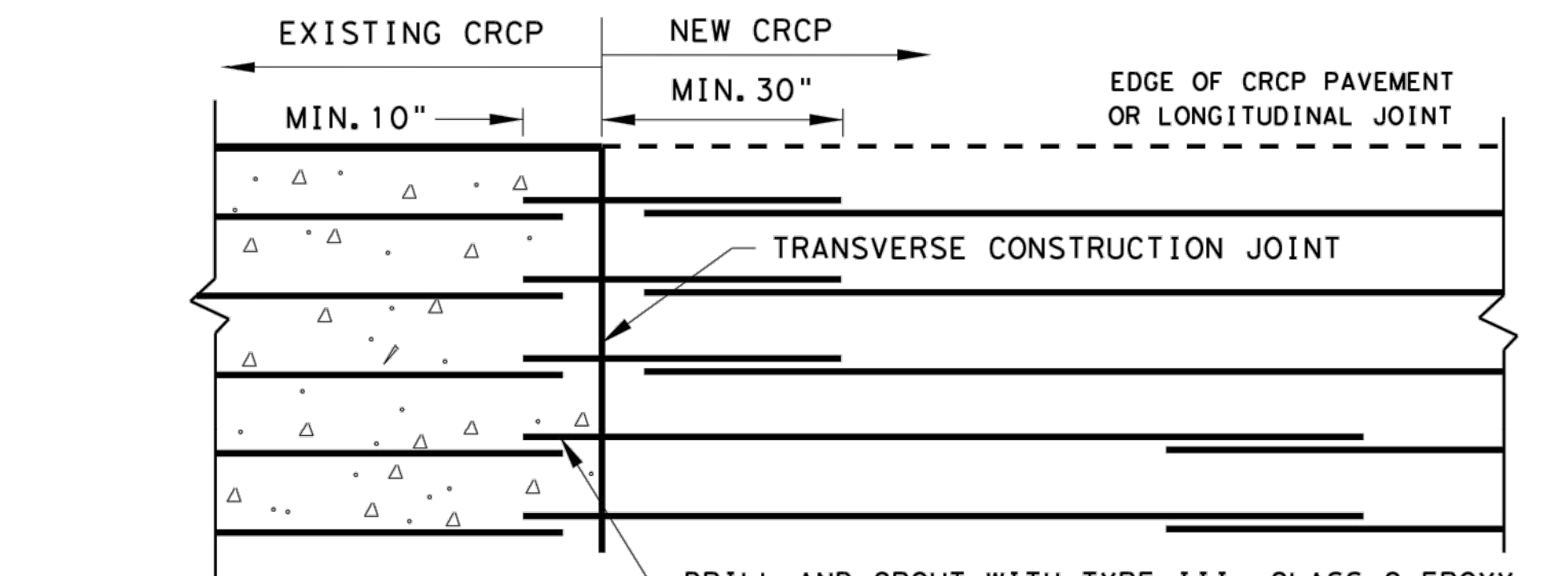


STAGGER THE LAP LOCATIONS SO THAT NO MORE THAN 1/3 OF THE LONGITUDINAL STEEL IS SPLICED IN ANY GIVEN 12-FT. WIDTH AND 2-FT. LENGTH OF THE PAVEMENT. ANY OTHER LAP CONFIGURATION MEETING THIS REQUIREMENT WILL BE ALLOWED.

EXAMPLES OF LAP CONFIGURATION
 PLAN VIEW (NOT TO SCALE)

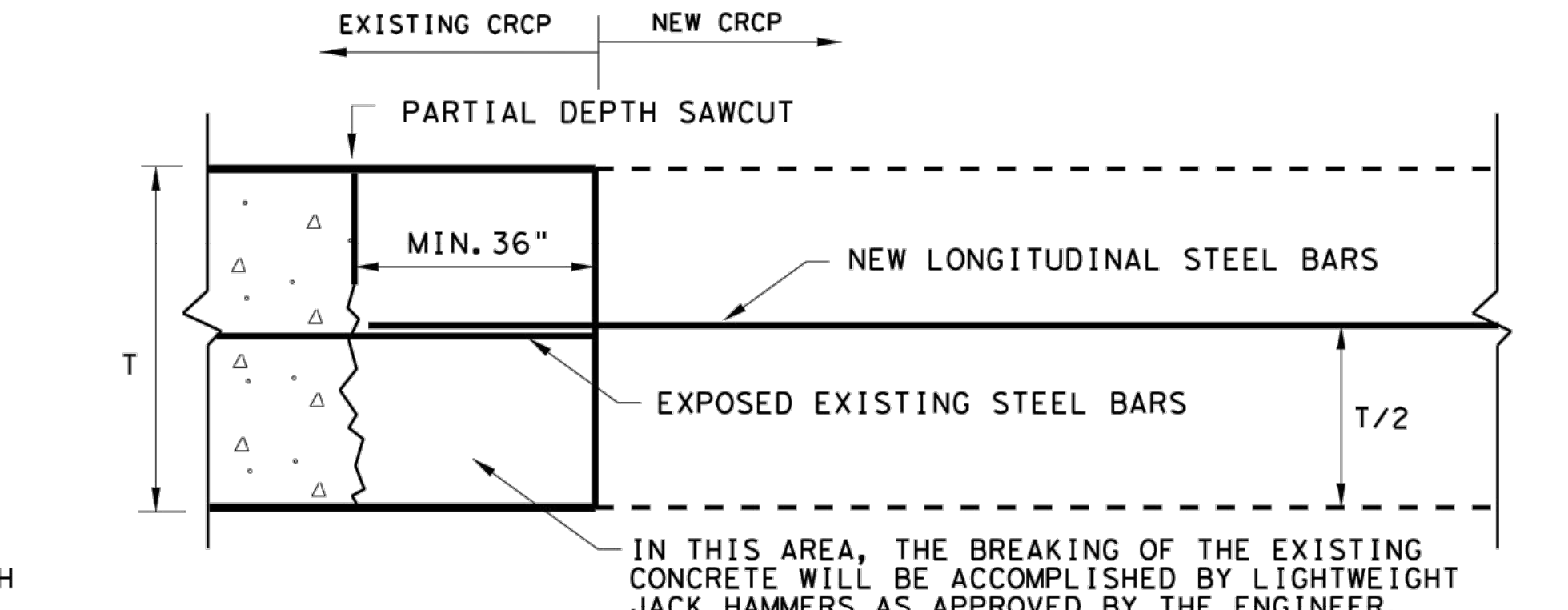


TRANSVERSE EXPANSION JOINT DETAIL AT BRIDGE APPROACH



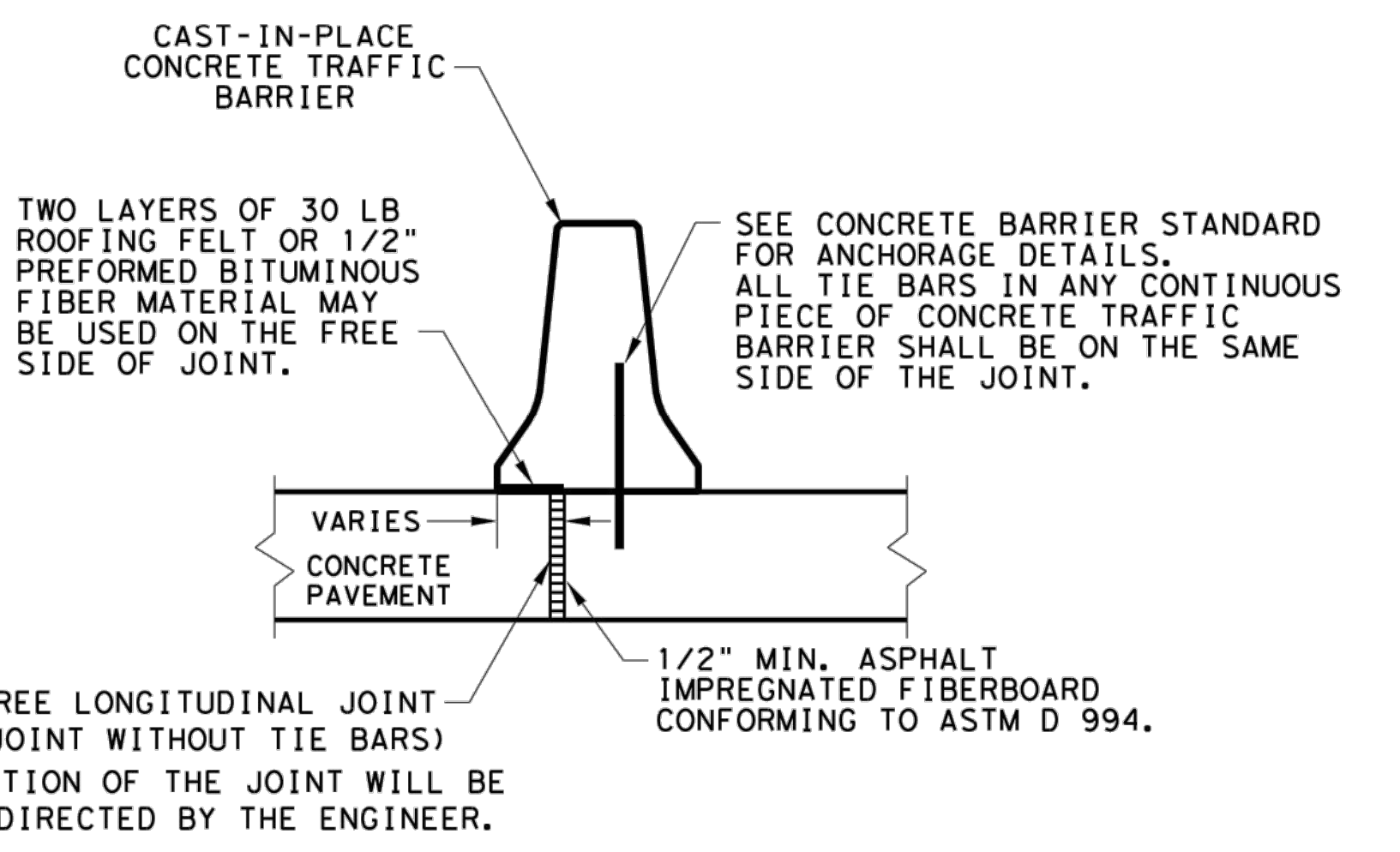
DRILL AND GROUT WITH TYPE III, CLASS C EPOXY. DEMONSTRATE THAT THE BOND STRENGTH OF THE EPOXY-GROUTED LONGITUDINAL BARS MEETS THE REQUIREMENTS OF PULL-OUT TEST SPECIFIED IN ITEM 361.

OPTION A: DRILL AND EPOXY
 PLAN VIEW (NOT TO SCALE)

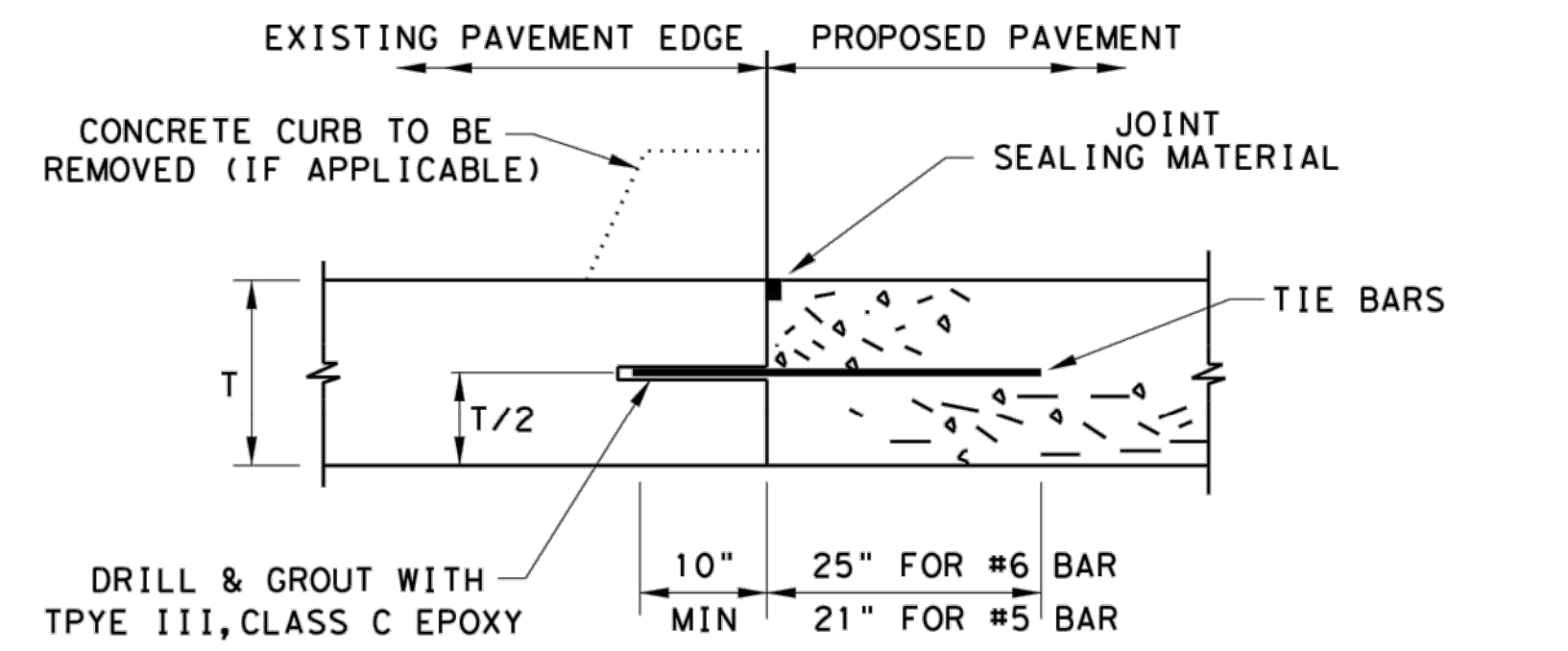


IN THIS AREA, THE BREAKING OF THE EXISTING CONCRETE WILL BE ACCOMPLISHED BY LIGHTWEIGHT JACK HAMMERS AS APPROVED BY THE ENGINEER.

OPTION B: BREAKBACK AND LAP
 TRANSVERSE TIE JOINT DETAIL
 EXISTING CRCP TO NEW CRCP



FREE LONGITUDINAL JOINT DETAIL



- BEFORE WIDENING WORK, DEMONSTRATE THAT THE BOND STRENGTH OF THE EPOXY-GROUTED TIE BARS MEETS THE REQUIREMENTS OF PULL-OUT TEST SPECIFIED IN ITEM 361.
- SPACE TIE BARS AT 24" SPACING. USE #6 TIE BARS FOR 8" AND THICKER SLABS, USE #5 TIE BARS FOR LESS THAN 8" THICK SLABS.

LONGITUDINAL WIDENING JOINT DETAIL

SHEET 2 OF 2

Texas Department of Transportation
 Design Division Standard

CONTINUOUSLY REINFORCED CONCRETE PAVEMENT
ONE LAYER STEEL BAR PLACEMENT
T - 7 TO 13 INCHES
CRCP (1) - 17

FILE: crcp117.dgn	DW: TxDOT	CK: AN	DW: HC	CK: VP/KM
© TxDOT: May 2017	CONT	SECT	JOB	HIGHWAY
REVISIONS				
DIST	COUNTY		SHEET NO.	

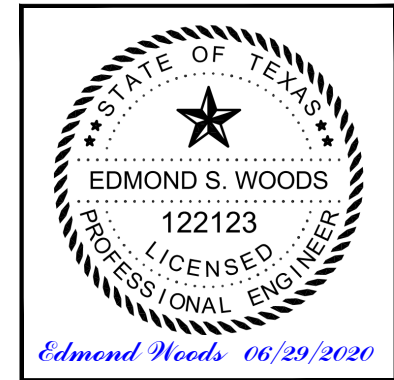
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 FILE: _____
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REVISIONS

NO.	DESCRIPTION	DATE BY

WILLIAM P. HOBBY AIRPORT / HOUSTON (HOU)
METRO BUS DRIVE LANE RECONSTRUCTION
TYPICAL PAVEMENT DETAILS

PROJECT MGR.: JLV
 DESIGNER: EW
 DRAWN BY: KJV
 CHECK BY: RE
 SCALE:
 DATE: 06/29/2020



APPROVED BY: _____
 DIRECTOR
 HOUSTON AIRPORT SYSTEM

PROJECT NO.
 100068156

A.I.P. NO.

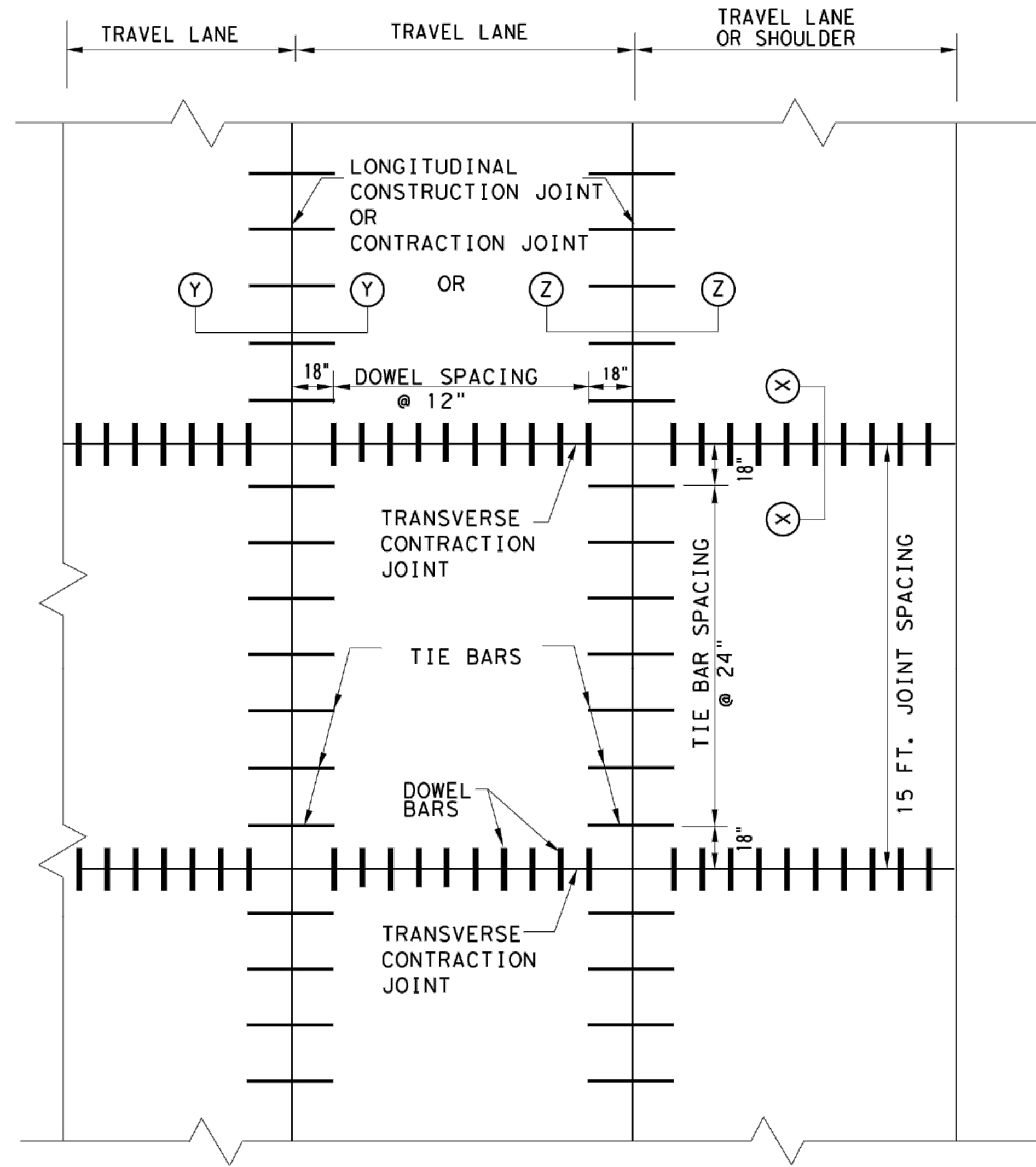
C.I.P. NO.

H.A.S. NO.
 236

SHEET NO.

GENERAL NOTES

1. DETAILS FOR PAVEMENT WIDTH, PAVEMENT THICKNESS AND THE CROWN CROSS-SLOPE SHALL BE SHOWN ELSEWHERE IN THE PLANS. PAVEMENTS WIDER THAN 100 FT. WITHOUT A FREE LONGITUDINAL JOINT ARE NOT COVERED BY THIS STANDARD.
2. FOR FURTHER INFORMATION REGARDING THE PLACEMENT OF CONCRETE AND LOAD TRANSFER DEVICES REFER TO THE GOVERNING SPECIFICATION FOR "CONCRETE PAVEMENT".
3. THE SPACING BETWEEN TRANSVERSE CONTRACTION JOINTS SHALL BE 15 FT. UNLESS OTHERWISE SHOWN IN THE PLANS.
4. TRANSVERSE CONSTRUCTION JOINTS MAY BE FORMED BY USE OF METAL OR WOOD FORMS EQUAL IN DEPTH TO THE DEPTH OF PAVEMENT, OR BY METHODS APPROVED BY THE ENGINEER.
5. USE HAND-OPERATED IMMERSION VIBRATORS TO CONSOLIDATE THE CONCRETE ADJACENT TO ALL THE FORMED JOINTS.
6. PAVEMENT WIDTHS OF MORE THAN 15 FT. SHALL HAVE A LONGITUDINAL JOINT (SECTION Z-Z OR SECTION Y-Y). THESE JOINTS SHALL BE LOCATED WITHIN 6 IN. OF THE LANE LINE UNLESS THE JOINT LOCATION IS SHOWN ELSEWHERE ON THE PLANS.
7. THE JOINT BETWEEN OUTSIDE LANE AND SHOULDER SHALL BE A LONGITUDINAL CONTRACTION JOINT (SECTION Z-Z) UNLESS OTHERWISE SHOWN IN THE PLANS. THE SAW CUT DEPTH FOR THE LONGITUDINAL CONTRACTION JOINT (SECTION Z-Z) SHALL BE ONE THIRD OF THE SLABTHICKNESS (T/3).
8. WHEN TYING CONCRETE GUTTER AT A LONGITUDINAL JOINT, THE TIE BAR LENGTH OR POSITION MAY BE ADJUSTED. PROVIDE 3 IN. OF CONCRETE COVER FROM THE BACK OF GUTTER TO THE END OF TIE BAR.
9. REPLACE MISSING OR DAMAGED TIE BARS WITHOUT ADDITIONAL COMPENSATION BY DRILLING MIN. 10 IN. DEEP AND GROUTING TIE BARS WITH TYPE III, CLASS C EPOXY. MEET THE PULL-OUT TEST REQUIREMENTS IN ITEM 361.
10. WHEN AN MONOLITHIC CURB IS SPECIFIED, THE JOINT IN THE CURB SHALL COINCIDE WITH PAVEMENT JOINTS AND MAY BE FORMED BY ANY MEANS APPROVED BY THE ENGINEER.
11. DOWEL BAR PLACEMENT TOLERANCE SHALL BE +/- 1/4 IN. HORIZONTALLY AND VERTICALLY UNLESS OTHERWISE SPECIFIED. WHERE DOWEL BAR BASKETS ARE USED, REMOVE THE SHIPPING WIRES.
12. THE DETAIL FOR JOINT SEALANT AND RESERVOIR IS SHOWN ON STANDARD SHEET "CONCRETE PAVING DETAILS, JOINT SEALS."



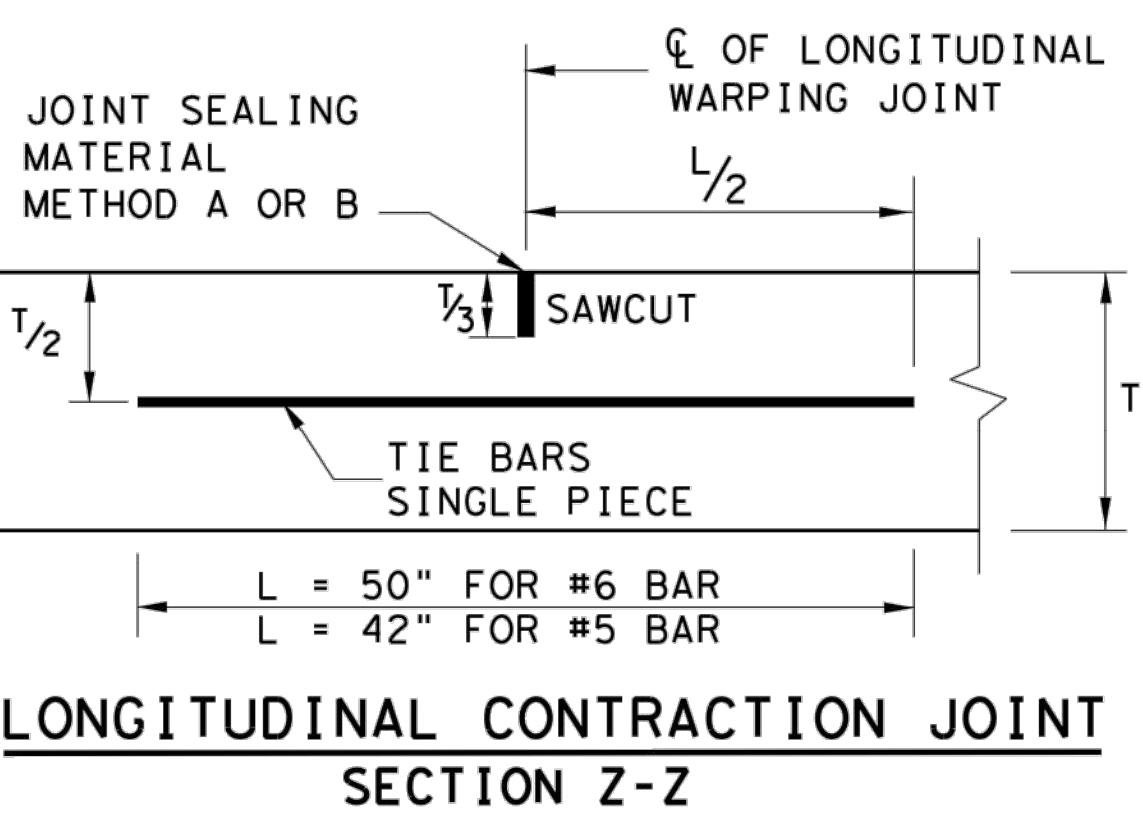
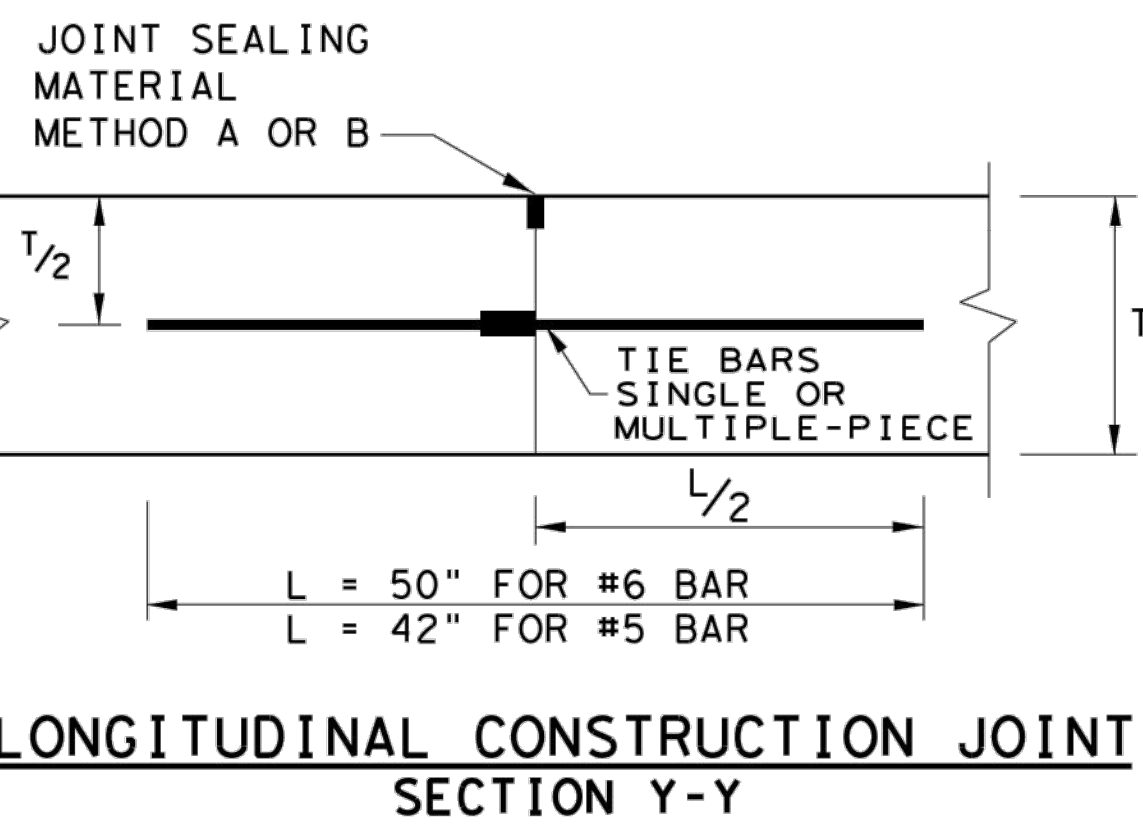
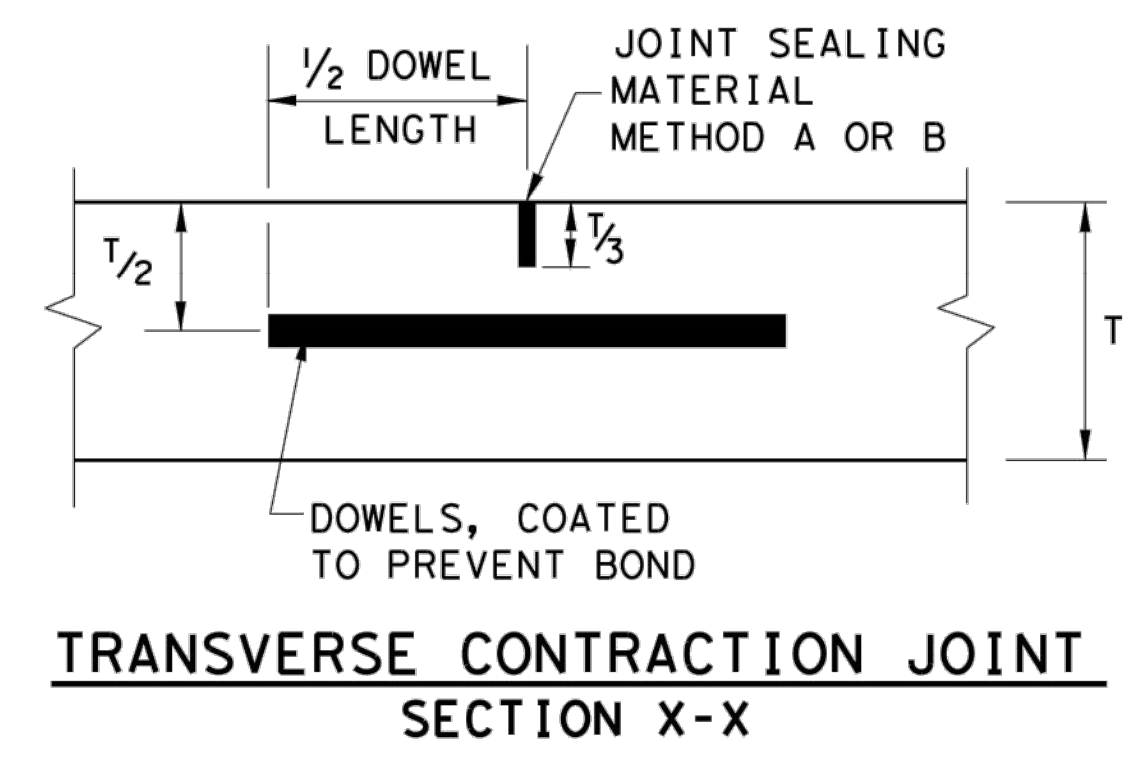
TYPICAL PAVEMENT LAYOUT
 PLAN VIEW (NOT TO SCALE)

TABLE NO.1 DOWELS (SMOOTH BARS)

SLAB THICKNESS T (IN.)	BAR DIA. AND LENGTH	AVERAGE SPACING (IN.)
6 to 7.5	1" X 18"	12
8 to 10	1 1/4" X 18"	12
>= 10.5	1 1/2" X 18"	12

TABLE NO.2 TIE BARS (DEFORMED BARS)

SLAB THICKNESS T (IN.)	BAR SIZE	AVERAGE SPACING (IN.)
6 to 7.5	#5	24
>= 8	#6	24



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DATE: _____
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 PLOT DATE: _____

SHEET 1 OF 2

Design Division Standard

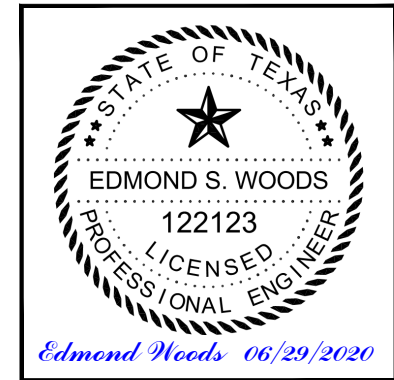
CONCRETE PAVEMENT DETAILS
CONTRACTION DESIGN
T-6 to 12 INCHES
CPCD-14

FILE: cpcd14.dgn	DN: TxDOT	DN: HC	DW: HC	CK: AN
© TxDOT: DECEMBER 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS				
	DIST	COUNTY	SHEET NO.	

NO.	DESCRIPTION	DATE BY

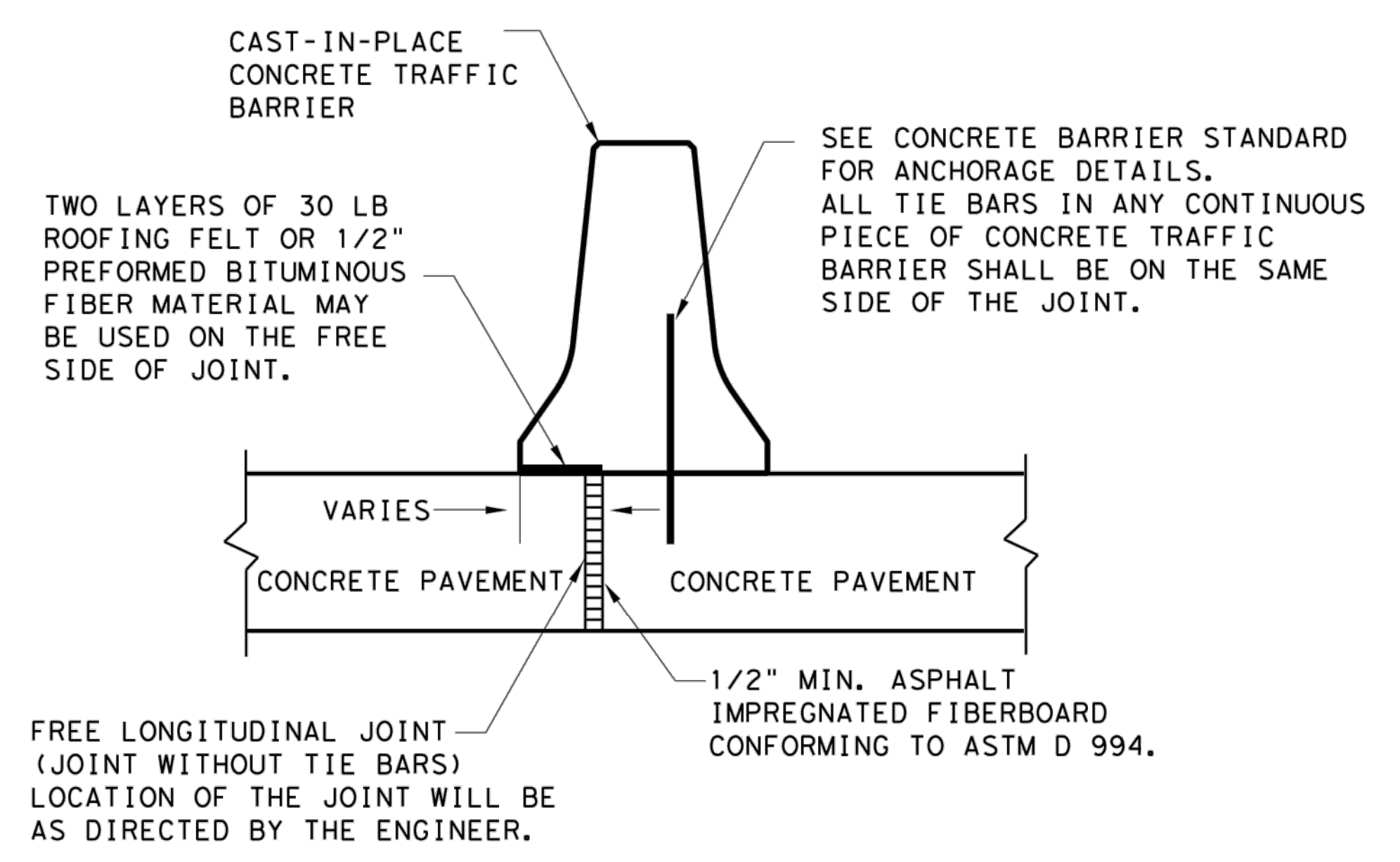
WILLIAM P. HOBBY AIRPORT / HOUSTON (HOU)
METRO BUS DRIVE LANE RECONSTRUCTION
TYPICAL PAVEMENT DETAILS

PROJECT MGR:	JLV
DESIGNER:	EW
DRAWN BY:	KJV
CHECK BY:	RE
SCALE:	
DATE:	06/29/2020

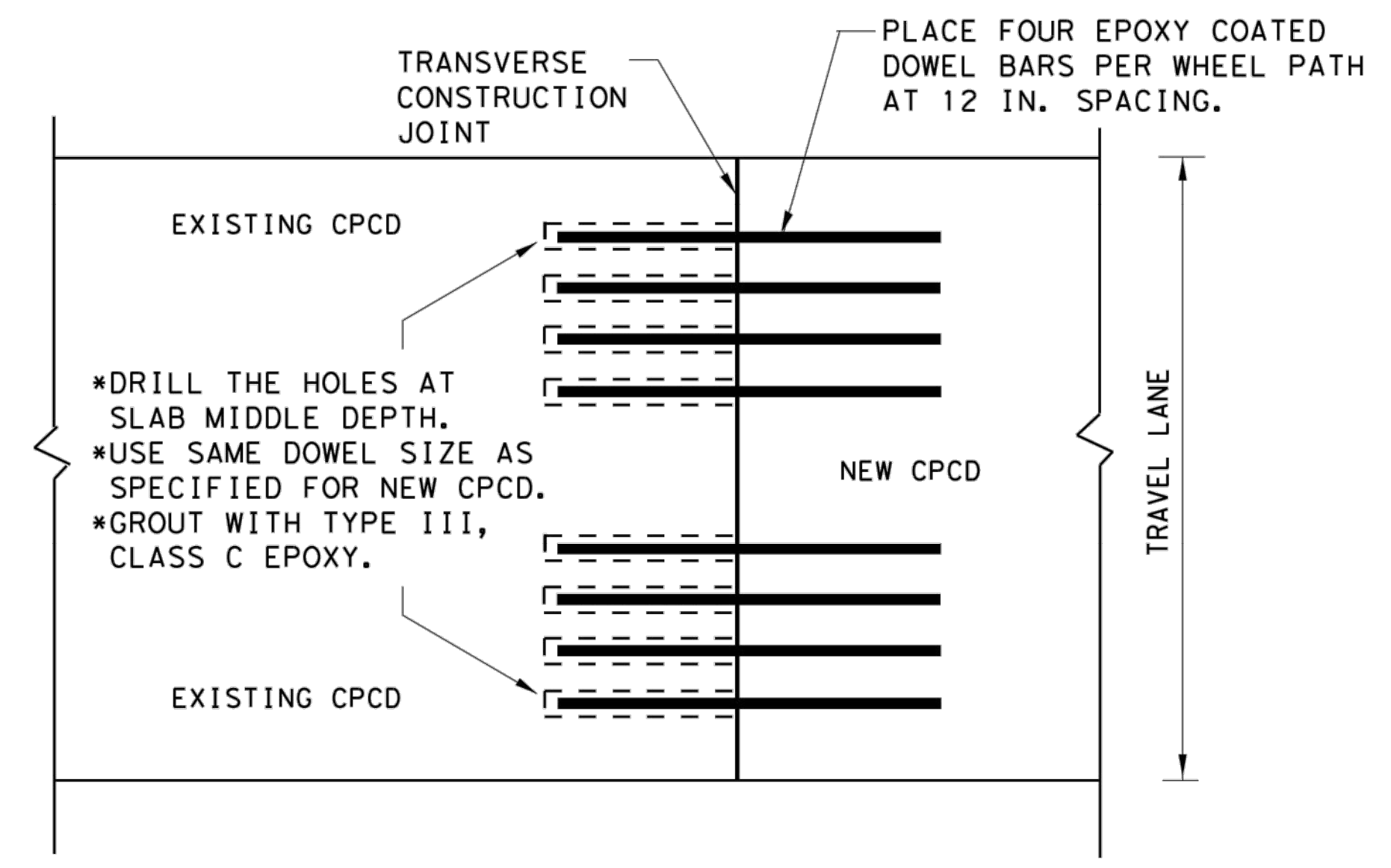


APPROVED BY:	
DIRECTOR	HOUSTON AIRPORT SYSTEM
PROJECT NO.	100068156
A.I.P. NO.	
C.I.P. NO.	
H.A.S. NO.	236
SHEET NO.	

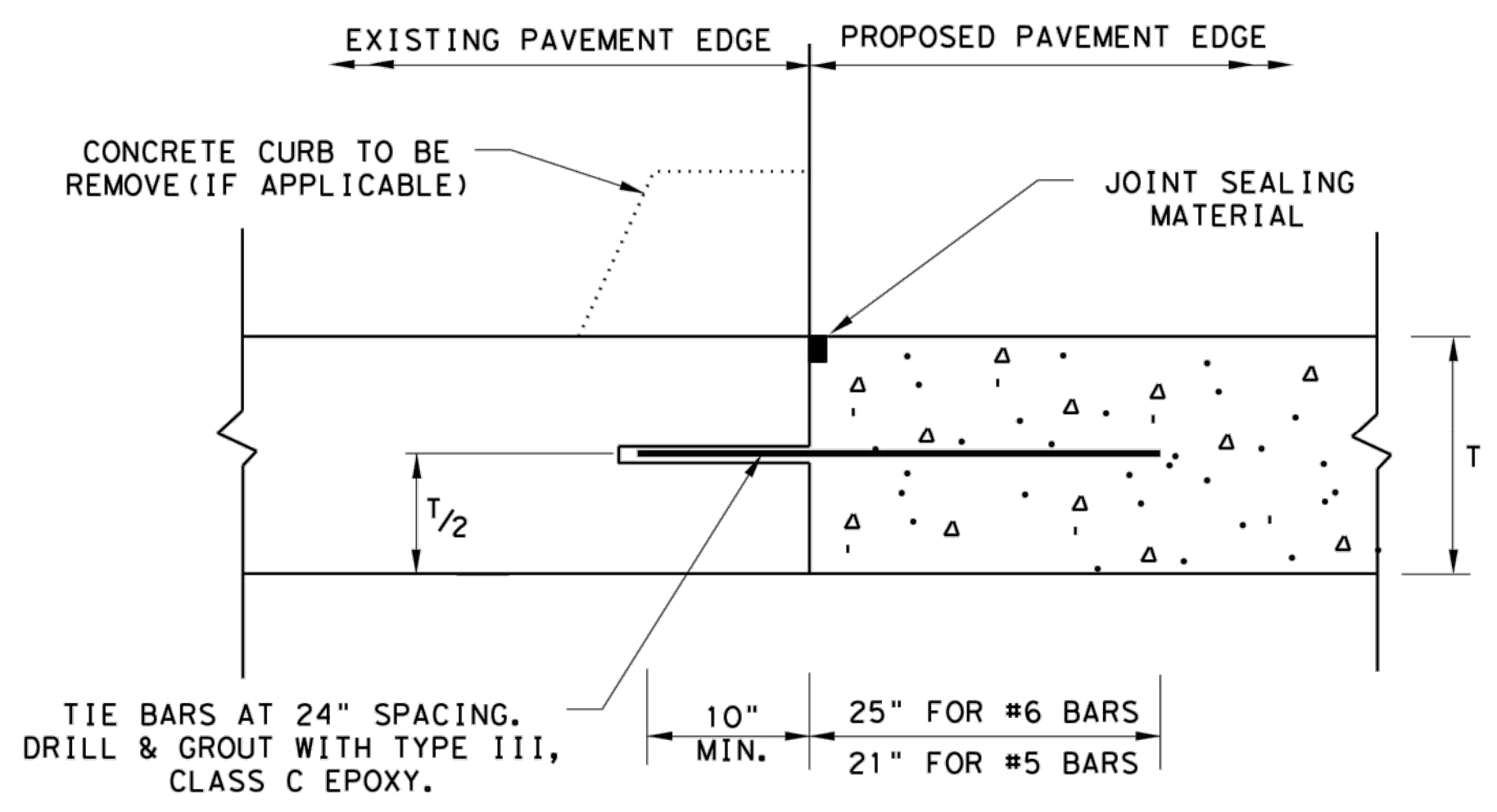
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FREE LONGITUDINAL JOINT DETAIL

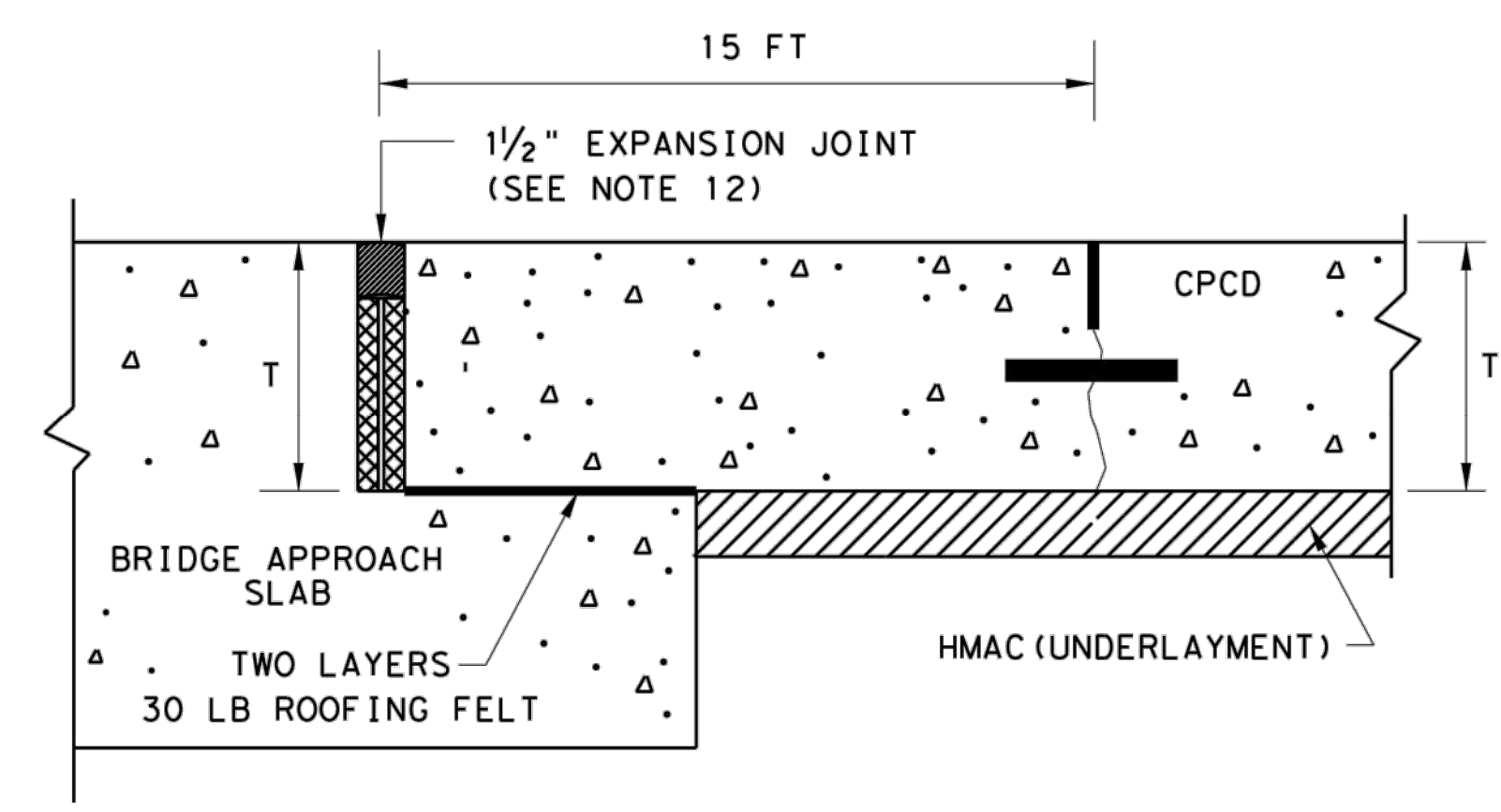


TRANSVERSE JOINT DETAIL
EXISTING CPCD TO NEW CPCD
 PLAN VIEW (NOT TO SCALE)



LONGITUDINAL WIDENING JOINT DETAIL

- BEFORE WIDENING WORK, DEMONSTRATE THAT THE BOND STRENGTH OF THE EPOXY-GROUTED TIE BARS MEETS THE REQUIREMENTS OF PULL-OUT TEST SPECIFIED IN ITEM 361.
- SPACE TIE BARS AT 24" SPACING. USE #6 BARS FOR 8" AND THICKER SLABS, USE #5 BARS FOR LESS THAN 8" THICK SLABS.
- THE TRANSVERSE JOINTS OF PROPOSED PAVEMENT SHALL COINCIDE WITH EXISTING PAVEMENT JOINTS UNLESS OTHERWISE SHOWN ON THE PLANS.



TRANSVERSE EXPANSION JOINT DETAIL
AT BRIDGE APPROACH

SHEET 2 OF 2

Texas Department of Transportation
 Design Division Standard

CONCRETE PAVEMENT DETAILS
CONSTRUCTION DESIGN
T-6 to 12 INCHES
CPCD-14

FILE: cpcd14.dgn	DW: TxDOT	DN: HC	DW: HC	CK: AN
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REVISIONS	DIST	COUNTY	SHEET NO.	

REVISIONS

NO.	DESCRIPTION	DATE BY

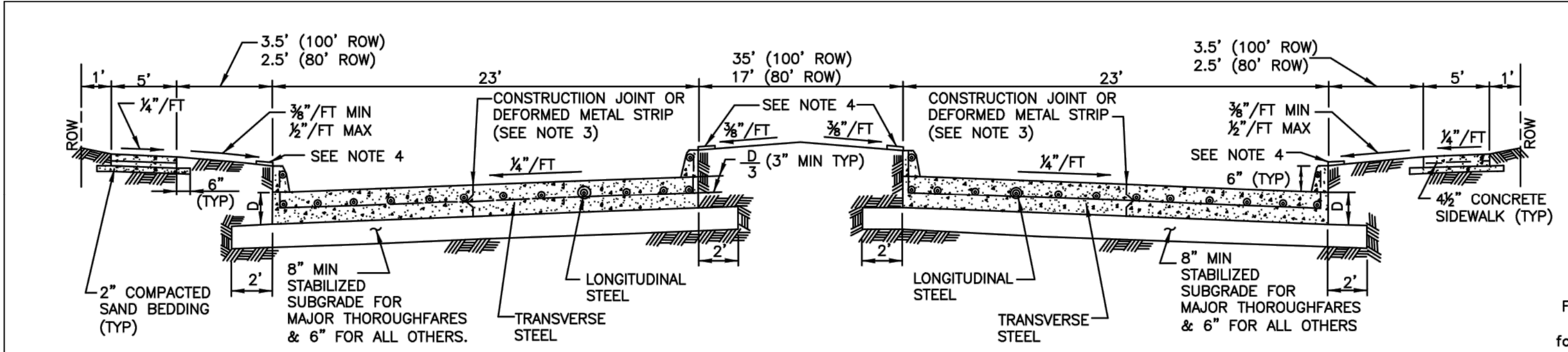


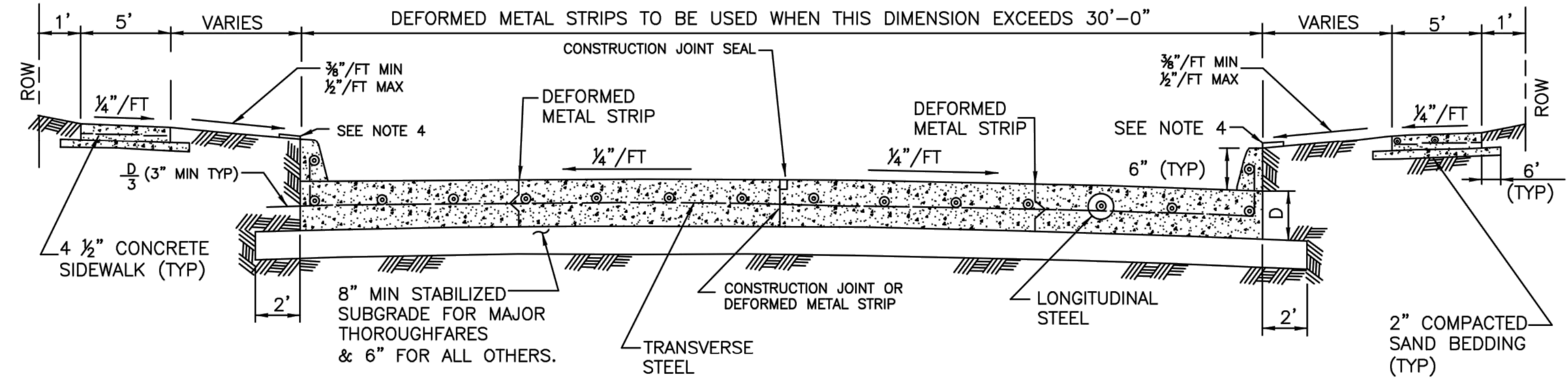
TABLE 1
 REINFORCING STEEL BAR SIZES AND SPACINGS
 FOR VARIOUS PAVEMENT THICKNESSES (D) WITH:
 MAXIMUM EXPANSION JOINT SPACING = 80 FT.
 f_c' = 4,000 PSI/28 DAYS AND F_y = 60,000 PSI

PAVEMENT THICKNESS D (IN)	PAVEMENT WIDTH (FT)	LONGITUDINAL STEEL						TRANSVERSE STEEL		
		# 4 BARS		# 5 BARS		# 6 BARS		# 4 BARS	# 5 BARS	# 6 BARS
		NUMBER OF BARS	SPACING (IN)	NUMBER OF BARS	SPACING (IN)	NUMBER OF BARS	SPACING (IN)	SPACING (IN)	SPACING (IN)	SPACING (IN)
6	28	17	20.50	4	—	—	—	—	—	36
7	25	17	18.25	4	—	—	—	—	—	36
7	35	24	18.00	3	—	—	—	—	—	36
7	36	25	17.75	3	—	—	—	—	—	36
7	37	25	18.25	3	—	—	—	—	—	36
7	41	28	18.00	3	—	—	—	—	—	36
7	45	31	17.75	3.75	—	—	—	—	—	36
8	25	20	15.50	2.75	13	24.50	3	—	—	36
8	34	27	15.50	2.5	17	25.00	4	—	—	36
8	35	27	16.00	2	18	24.25	4	—	—	36
8	36	28	15.75	3.25	18	25.00	3	—	—	30
8	44	24	15.75	4	22	24.75	4	—	—	30
8	45	35	15.75	2.25	23	24.25	3	—	—	30
9	25	22	14.00	3	14	22.50	4	—	—	36
9	34	31	13.50	2	19	22.25	3.5	—	—	30
9	35	31	13.75	3.75	20	21.75	3.5	—	—	30
9	36	32	13.75	3	21	21.25	3.5	—	—	30
9	44	39	13.75	2.75	25	21.75	3	—	—	24
9	45	39	14.00	4	26	21.25	4.5	—	—	24
10	25	24	12.75	3.5	17	18.25	4	—	—	36
10	34	33	12.50	4	21	20.00	4	—	—	30
10	35	34	12.50	3.75	23	18.75	4	—	—	30
10	36	35	12.50	3.5	24	18.50	3	—	—	30
10	44	44	12.00	4	29	18.50	4.5	—	—	24
10	45	44	12.50	3	29	19.00	3	—	—	24
11	25	27	11.25	3	17	18.25	4	12	26.75	3
11	34	36	11.50	2.75	24	17.50	2.5	17	25.00	4
11	35	37	11.50	3	24	18.00	3	17	25.75	4
11	36	40	11.00	2	25	17.75	3	17	26.50	4
11	44	48	11.125	2.5	30	18.00	3	21	26.00	4
11	45	49	11.125	3	31	17.75	4	22	25.50	3
12	25	—	—	—	19	16.25	4	13	24.50	3
12	34	—	—	—	26	16.00	4	18	23.50	4
12	35	—	—	—	26	16.50	4	19	23.00	3
12	36	—	—	—	27	16.25	4.5	20	22.25	4.5
12	44	—	—	—	33	16.25	4	24	22.50	5
12	45	—	—	—	35	15.75	3	25	22.25	3

MINIMUM LAP LENGTHS (L):
 A. # 4 BARS; L = 22 INCHES
 B. # 5 BARS; L = 27 INCHES
 C. # 6 BARS; L = 32 INCHES

TYPICAL DOUBLE ROADWAY SECTION FOR CONCRETE PAVEMENT WITH CURBS NOTES:

1. THE MAXIMUM WIDTH BETWEEN LONGITUDINAL JOINTS SHALL NOT EXCEED 15'-0".
2. ALL EARTHEN AREAS ARE TO BE HYDROMULCHED UNLESS SHOWN OTHERWISE ON DRAWINGS.
3. CONTRACTOR MAY SAW CUT IN LIEU OF DEFORMED METAL STRIP.
4. USE STRIP OF SOD GRASS TO PREVENT EROSION UNTIL STAND OF GRASS IS ESTABLISHED.
5. AN EQUAL OR LARGER AREA OF WELDED REINFORCEMENT BAR CONFORMING TO ASTM A497, MAY BE SUBSTITUTED FOR REBARS LISTED IN TABLE 1.
6. IF AVAILABLE ROW IS NOT SUFFICIENT TO ACCOMMODATE A 5-FOOT SIDEWALK, ENGINEER SHALL OBTAIN A VARIANCE FROM THE CITY ENGINEER FOR A 4-FOOT WIDE SIDEWALK.



TYPICAL SINGLE ROADWAY SECTION FOR CONCRETE PAVEMENT WITH CURBS

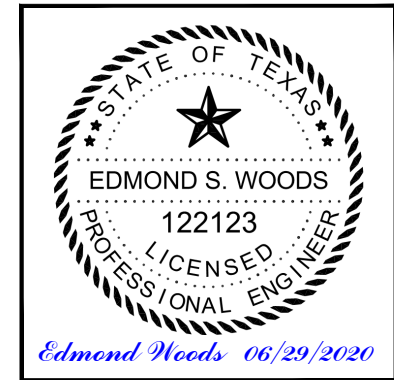
CITY OF HOUSTON
 DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

CONCRETE PAVEMENT DETAILS
 (NOT TO SCALE)

APPROVED BY:	APPROVED BY:
CITY ENGINEER	DIRECTOR OF PUBLIC WORKS AND ENGINEERING
EFF DATE: NOV-04-2016	DWG NO: 02751-01

WILLIAM P. HOBBY AIRPORT / HOUSTON (HOU)
METRO BUS DRIVE LANE RECONSTRUCTION
TYPICAL PAVEMENT DETAILS

PROJECT MGR: JLW
 DESIGNER: EW
 DRAWN BY: KJV
 CHECK BY: RE
 SCALE:
 DATE: 06/29/2020

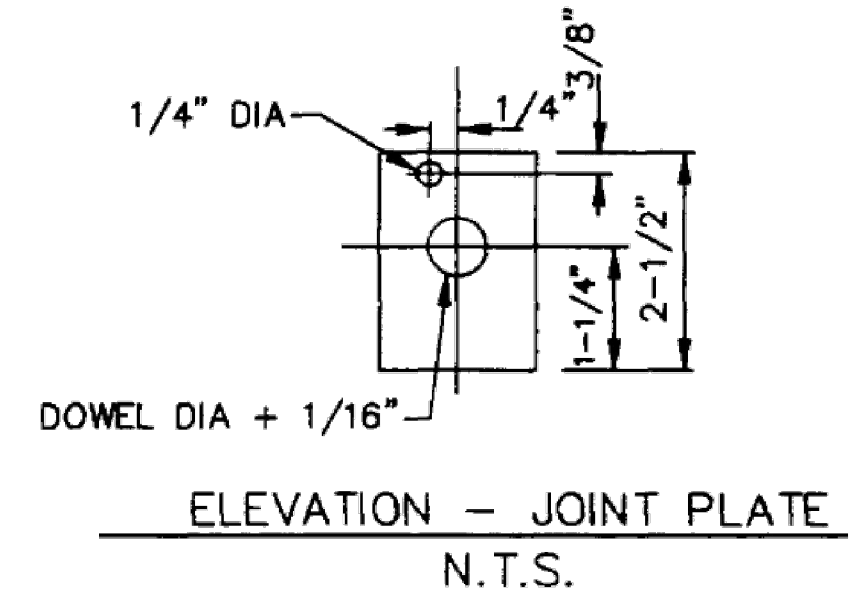
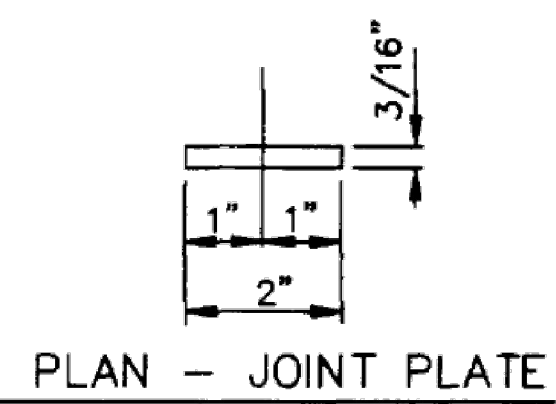
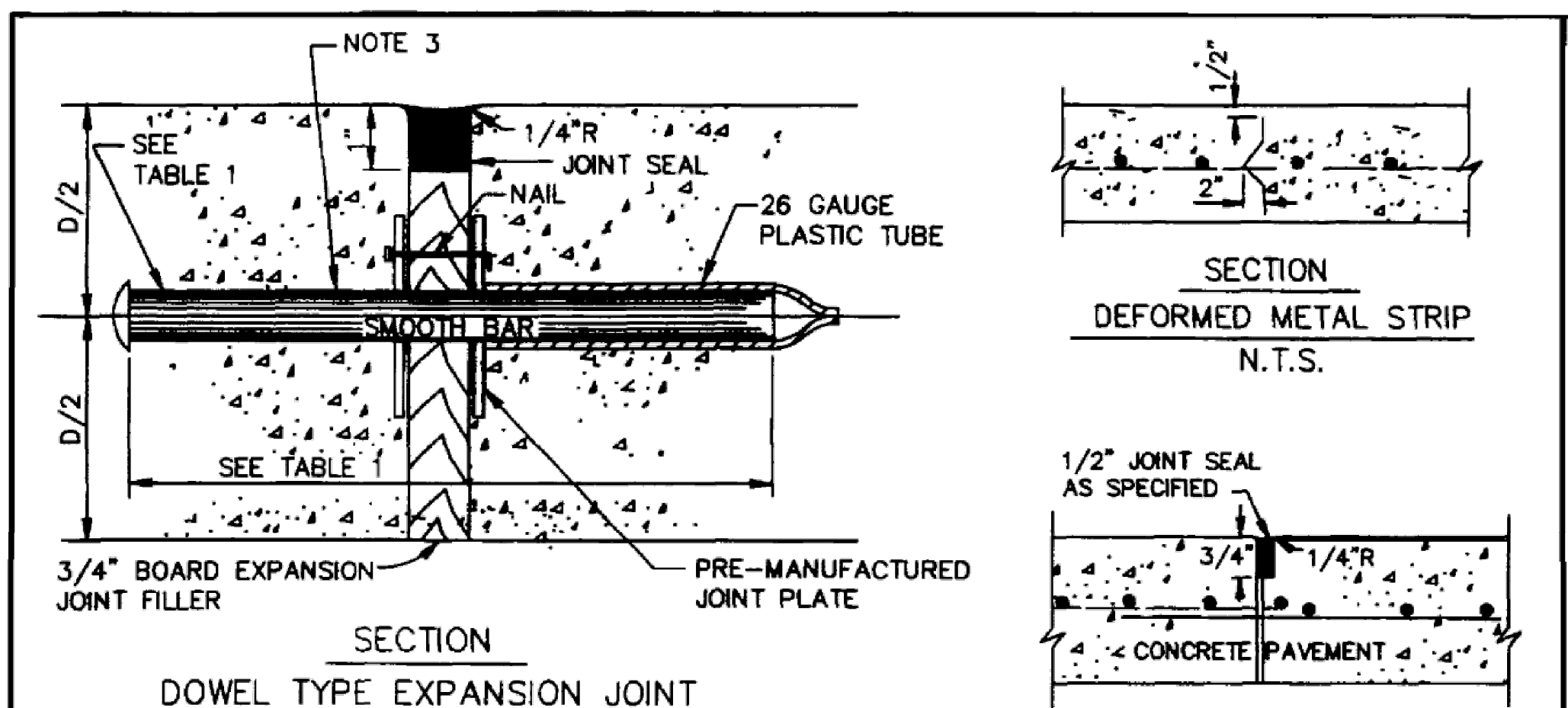


APPROVED BY:
 DIRECTOR
 HOUSTON AIRPORT SYSTEM

PROJECT NO.
 100068156
 A.I.P. NO.
 C.I.P. NO.
 H.A.S. NO.
 236
 SHEET NO.

GENERAL NOTES FOR CONCRETE PAVING

- FOR FURTHER INFORMATION REGARDING THE PLACEMENT OF CONCRETE AND REINFORCEMENT, REFER TO SPECIFICATION ITEM NOS: 02751 CONCRETE PAVING, 02752 CONCRETE PAVEMENT JOINTS, AND 02753 CONCRETE PAVEMENT CURING.
- ALL REINFORCING STEEL SHALL BE GRADE 60.
- AN EQUAL OR LARGER AREA OF WELDED REINFORCEMENT BAR CONFORMING TO ASTM A497 MAY BE SUBSTITUTED FOR REBARS LISTED IN TABLE.
- THE JOINT RESERVOIR FOR SEALANT SHALL BE SAWED.



- NOTES:**
- STEEL TO MEET ASTM STANDARD SPECIFICATIONS FOR CONCRETE REINFORCING BARS. UNITS TO BE SPACED ON 12" CENTERS.
 - EXPANSION JOINT TO BE PLACED AT THE END OF EACH CURB RADIUS.
 - CENTER DOWEL HORIZONTALLY ON JOINT.
 - CENTER DOWEL VERTICALLY IN CONCRETE BASE. EXTEND THICKENED CONCRETE AS NEEDED TO MAINTAIN 3" MIN. COVER.
 - CITY OF HOUSTON APPROVED PRODUCTS MAY BE USED AS JOINT PLATE ALTERNATIVE

TABLE 1

PAVEMENT THICKNESS (IN)	DOWEL SIZES AND SPACINGS		
	DIAMETER (IN)	LENGTH (IN)	SPACING (IN)
6	3/4	18	12
7	1	18	12
8	1	18	12
9	1 1/4	18	12
10	1 1/4	18	12
11	1 1/4	18	12
12	1 1/4	18	12

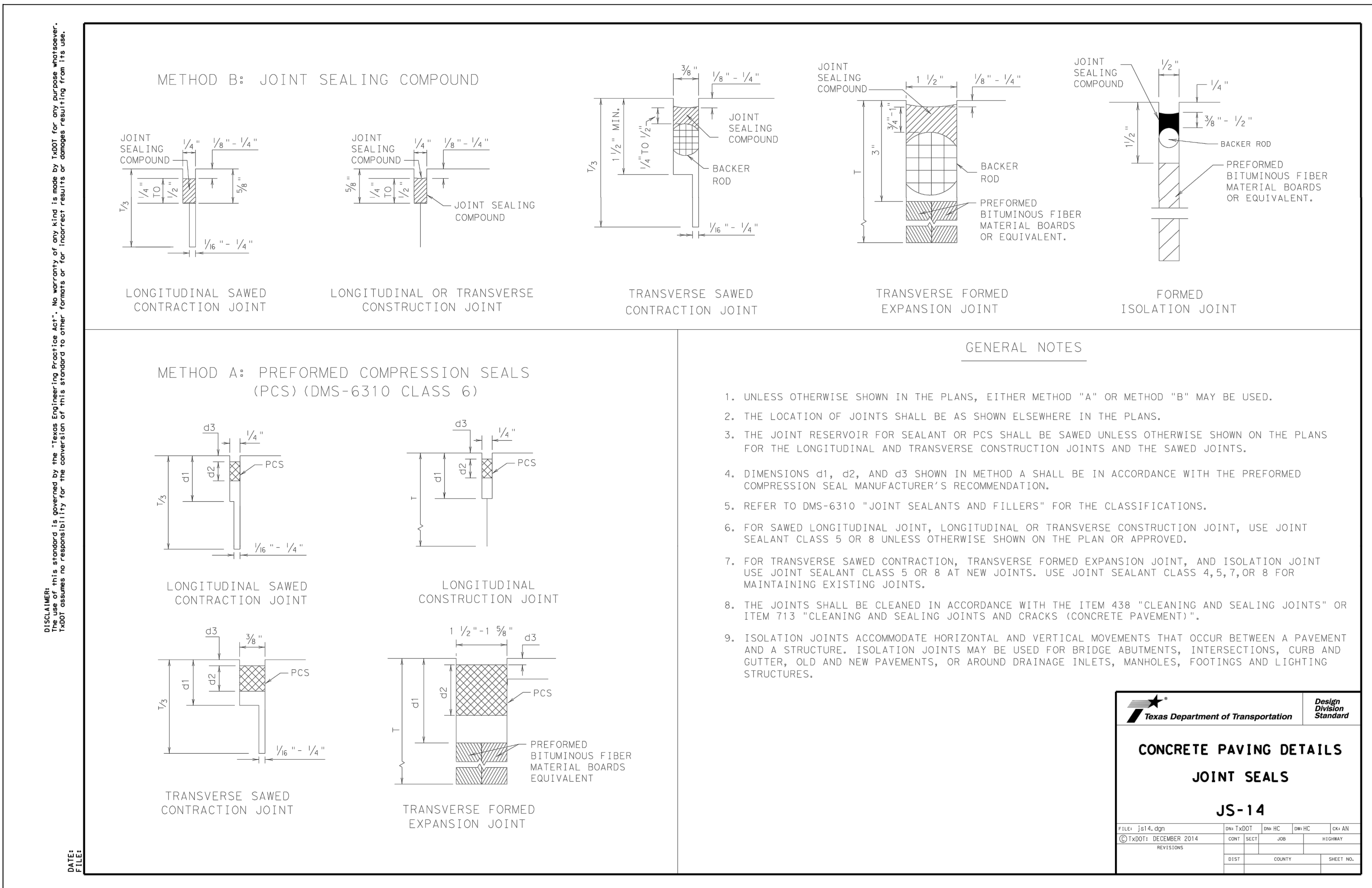
CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING
ENGINEERING, CONSTRUCTION AND REAL ESTATE DIVISION

PAVEMENT EXPANSION AND CONSTRUCTION JOINT DETAILS (NOT TO SCALE)

APPROVED BY: *[Signature]*
CITY ENGINEER

APPROVED BY: *[Signature]*
DIRECTOR OF PUBLIC WORKS AND ENGINEERING

EFF DATE: June-01-2003 DWG NO: 02752-01



Texas Department of Transportation
Design Division Standard

CONCRETE PAVING DETAILS
JOINT SEALS
JS-14

FILE: js14.dgn DATE: 12/01/2014

ATKINS
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200 WESTLAKE PARK BLVD.,
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TEL: (713) 576-8500
ATKINS NORTH
AMERICA PE FIRM REG.
#F-000474
WWW.ATKINSGLOBAL.COM

REVISIONS

NO.	DESCRIPTION	DATE

WILLIAM P. HOBBY AIRPORT / HOUSTON (HOU)
METRO BUS DRIVE LANE RECONSTRUCTION
TYPICAL PAVEMENT DETAILS

PROJECT MGR: JLV
DESIGNER: EW
DRAWN BY: KJV
CHECK BY: RE
SCALE:
DATE: 06/29/2020

STATE OF TEXAS
EDMOND S. WOODS
122123
LICENSED PROFESSIONAL ENGINEER
Edmond Woods, 06/29/2020

APPROVED BY:
DIRECTOR
HOUSTON AIRPORT SYSTEM

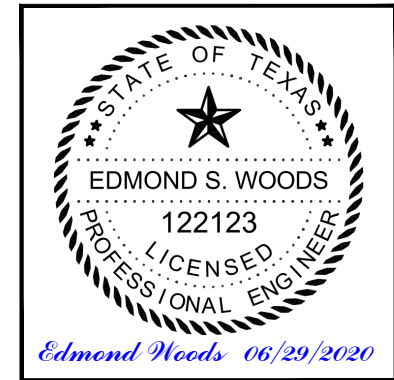
PROJECT NO.
100068156

A.I.P. NO.
C.I.P. NO.
H.A.S. NO.
236
SHEET NO.

REVISIONS		
NO.	DESCRIPTION	DATE BY

WILLIAM P. HOBBY AIRPORT / HOUSTON (HOU)
METRO BUS DRIVE LANE RECONSTRUCTION
TYPICAL PAVEMENT DETAILS

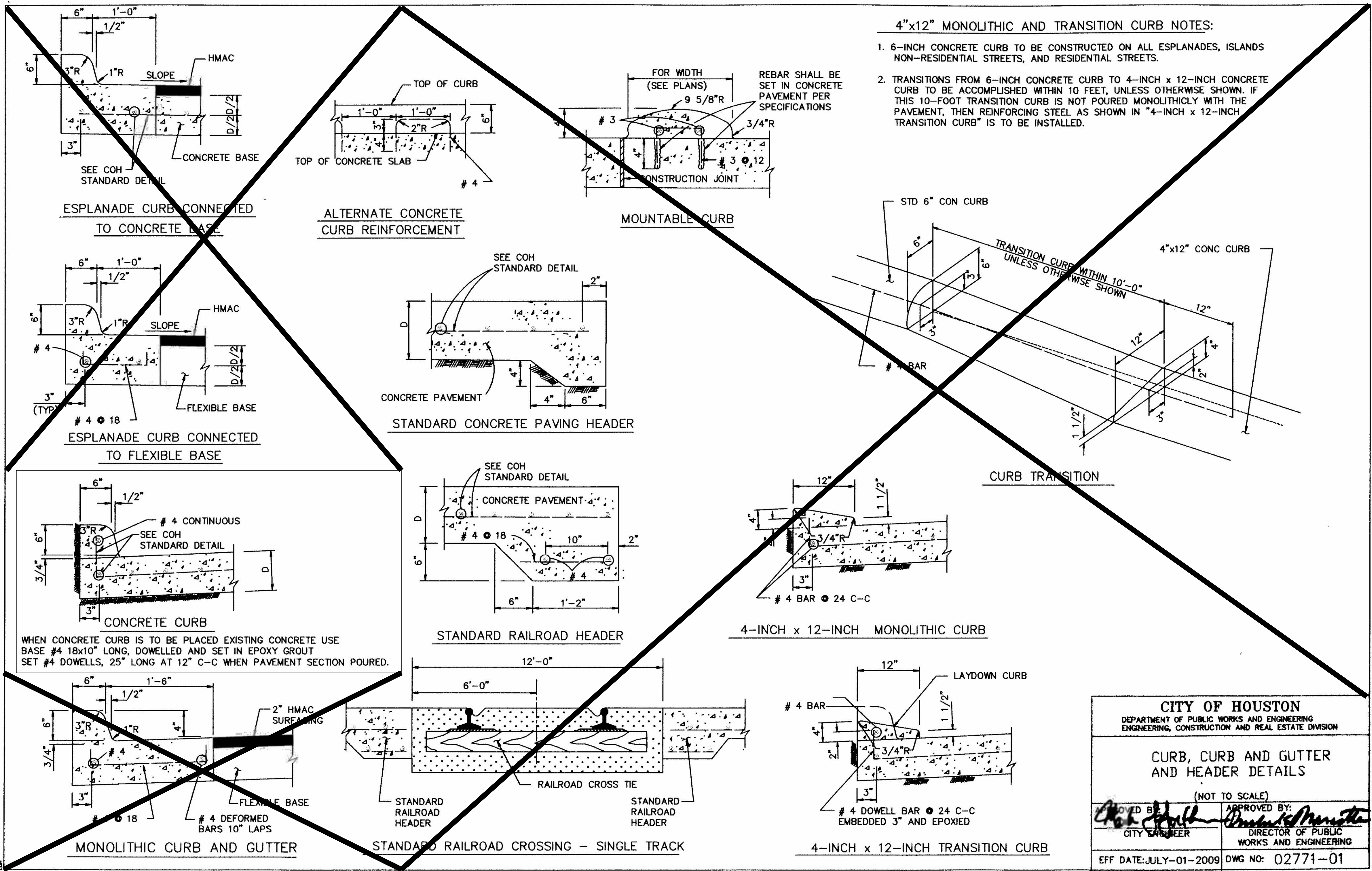
PROJECT MGR:	JLV
DESIGNER:	EW
DRAWN BY:	KJV
CHECK BY:	RE
SCALE:	
DATE:	06/29/2020



APPROVED BY:	
DIRECTOR	HOUSTON AIRPORT SYSTEM
PROJECT NO.	100068156
A.I.P. NO.	
C.I.P. NO.	
H.A.S. NO.	236
SHEET NO.	

4"x12" MONOLITHIC AND TRANSITION CURB NOTES:

- 6-INCH CONCRETE CURB TO BE CONSTRUCTED ON ALL ESPLANADES, ISLANDS NON-RESIDENTIAL STREETS, AND RESIDENTIAL STREETS.
- TRANSITIONS FROM 6-INCH CONCRETE CURB TO 4-INCH x 12-INCH CONCRETE CURB TO BE ACCOMPLISHED WITHIN 10 FEET, UNLESS OTHERWISE SHOWN. IF THIS 10-FOOT TRANSITION CURB IS NOT POURED MONOLITHICLY WITH THE PAVEMENT, THEN REINFORCING STEEL AS SHOWN IN "4-INCH x 12-INCH TRANSITION CURB" IS TO BE INSTALLED.



CITY OF HOUSTON
 DEPARTMENT OF PUBLIC WORKS AND ENGINEERING
 ENGINEERING, CONSTRUCTION AND REAL ESTATE DIVISION

CURB, CURB AND GUTTER AND HEADER DETAILS

(NOT TO SCALE)

APPROVED BY: <i>Edmond S. Woods</i> CITY ENGINEER	APPROVED BY: <i>Edmond S. Woods</i> DIRECTOR OF PUBLIC WORKS AND ENGINEERING
EFF DATE: JULY-01-2009	DWG NO: 02771-01

1

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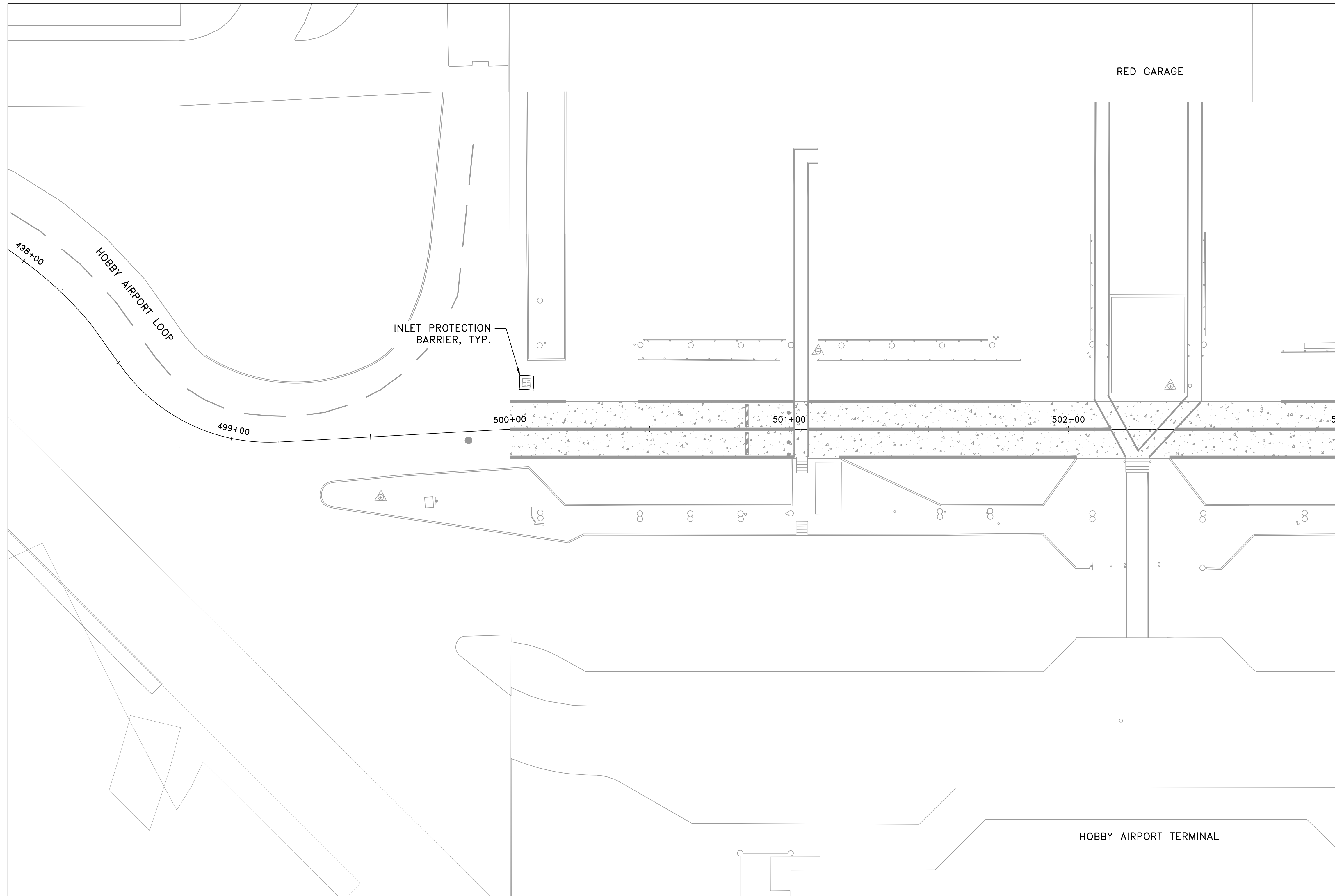
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LEGEND

- INLET PROTECTION BARRIER (SEE SHEET CG-201)
- EXISTING GRATE INLET
- ▭ EXISTING CURB INLET

NOTES

1. CONTRACTOR SHALL IMPLEMENT INLET PROTECTION DEVICES AND REINFORCED FILTER FABRIC BARRIER ALONG ROAD AND INLET AT LOCATIONS SHOWN ON THE TYPICAL STORM WATER POLLUTION PREVENTION PLANS (SWPPP) TO KEEP SILT AND/OR DEMOLITION MATERIAL FROM ENTERING INTO THE STORM WATER INLETS, EVENTUALLY POLLUTING THE RECEIVING STORM.
2. CONTRACTOR SHALL FOLLOW GOOD HOUSEKEEPING PRACTICES DURING THE CONSTRUCTION OF THE PROJECT, ALWAYS CLEANING UP DIRT AND LOOSE MATERIAL AS CONSTRUCTION PROGRESSES.
3. EROSION CONTROL SHALL BE IN ACCORDANCE WITH THE SWPPP DRAWINGS.
4. PROVIDE AND MAINTAIN SILT FENCE AROUND THE SITE ACCESS FOR EROSION CONTROL.
5. CONTRACTOR SHALL INSTALL ALL EROSION AND SEDIMENT CONTROL MEASURE PRIOR TO DEMOLITION ACTIVITIES.
6. DEMOLITION ACTIVITIES SHALL NOT START UNTIL THE EROSION AND SEDIMENT CONTROL MEASURES HAVE BEEN ACCEPTED.
7. CONTRACTORS SHALL BE RESPONSIBLE FOR MAINTENANCE OF ALL EROSION AND SEDIMENT CONTROL MEASURES REQUIRED.
8. CONTRACTOR SHALL NOT INITIATE CONSTRUCTION UNLESS APPROVED BY RESIDENT ENGINEER.
9. EXCAVATED MATERIAL OF FILL SHALL NOT BE STOCKPILED WITHIN THE 100-YEAR FEMA FLOOD PLAN.
10. TEMPORARY CONCRETE WASHOUT TUB TO BE PROVIDED BY CONTRACTOR, AND LOCATED WITHIN THE STAGING YARD.
11. NO AREA SHALL BE LEFT UNSTABILIZED OVERNIGHT UNLESS RUNOFF IS DIRECTED TO AN APPROVED SEDIMENT CONTROL DEVICE.
12. SEE SHEET CG-201 FOR EROSION AND SEDIMENT CONTROL NOTES AND DETAILS.
13. ALL LITTER, TRASH, AND FLOATABLE DEBRIS WILL BE CONTAINED.
14. INLET PROTECTION BARRIERS SHALL PROVIDE PROPER PROTECTION FROM EROSION AND SEDIMENT. CONTRACTOR SHALL MONITOR THE PERFORMANCE OF INLET PROTECTION DURING EACH RAINFALL EVENT. REMOVE SEDIMENT DEPOSIT WHEN THE SEDIMENT HAS ACCUMULATED TO ONE-THIRD OF THE HEIGHT OF THE BARRIER.
15. IF DAMAGED OR RENDERED INEFFECTIVE, THE EROSION AND SEDIMENT CONTROLS WILL BE REPAIRED OR REPLACED IMMEDIATELY. EROSION AND SEDIMENT CONTROL MEASURES THAT HAVE BEEN IMPROPERLY INSTALLED OR HAVE BEEN DISABLED, RUN-OVER, REMOVED, OR OTHERWISE RENDERED INEFFECTIVE MUST BE REPLACED OR CORRECTED IMMEDIATELY.

MATCH LINE - SEE SHEET CG102

SWPPP GENERAL NOTES

1. SEDIMENT WILL BE RETAINED ON SITE TO THE MAXIMUM EXTENT PRACTICABLE.
2. IF DAMAGED OR RENDERED INEFFECTIVE, THE EROSION AND SEDIMENT CONTROLS WILL BE REPAIRED OR REPLACE IMMEDIATELY.
3. WHEN PUMPING (DEWATERING) STANDING STORM WATER FROM THE SITE, THE OPERATOR SHALL USE APPROPRIATE BEST MANAGEMENT PRACTICES (BMPS) FROM THE STORM WATER MANAGEMENT HANDBOOK FOR CONSTRUCTION ACTIVITIES THAT ADDRESS DEWATERING ACTIVITIES. UNTREATED/DIRECT DISCHARGE INTO A STORM SEWER WILL NOT BE ALLOWED.
4. IF THE INTERIM PERIOD BETWEEN CONSTRUCTION OF UTILITIES AND STREET CONSTRUCTION WILL BE MORE THAN 21 DAYS, THE STREETS RIGHTS-OF-WAY WILL BE MULCHED OR OTHERWISE STABILIZED WITHIN 14 DAYS.
5. AFTER PAVING COMPLETION, NEWLY GRADED AREAS AND ALL EXPOSED SOILS WILL BE COMPLETELY STABILIZED.
6. CONCRETE TRUCKS WILL NOT BE ALLOWED TO WASH OUT OR DISCHARGE SURPLUS CONCRETE OR DRUM WASH WATER ON THE SITE, UNLESS THEY ARE USING A PROPERLY DESIGNED AND DESIGNATED CONCRETE WASHOUT AREA AND APPROVED BY THE HAS PROJECT ENGINEER.
7. EROSION AND SEDIMENT CONTROL MEASURES THAT HAVE BEEN IMPROPERLY INSTALLED OR HAVE BEEN DISABLED, RUN-OVER, REMOVED, OR OTHERWISE RENDERED INEFFECTIVE MUST BE REPLACE OR CORRECT IMMEDIATELY.
8. MAINTENANCE AND REPAIRS WILL BE CONDUCTED WITHIN 24 HOURS OF INSPECTION REPORT.
9. ALL LITTER, TRASH AND FLOATABLE DEBRIS WILL BE CONTAINED.



ATKINS
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#F-000474
WWW.ATKINSGLOBAL.COM

REVISIONS

NO.	DESCRIPTION	DATE BY

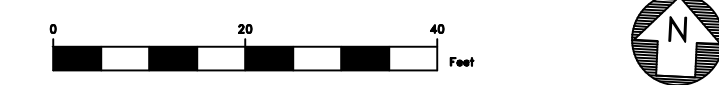
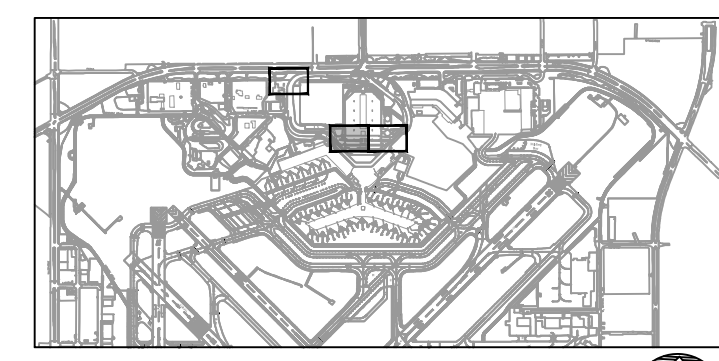
WILLIAM P. HOBBY AIRPORT / HOUSTON (HOU)
**METRO BUS DRIVE LANE RECONSTRUCTION
SWPPP PLAN**

PROJECT MGR:	JLV
DESIGNER:	EW
DRAWN BY:	KJV
CHECK BY:	RE
SCALE:	
DATE:	06/29/2020



APPROVED BY: _____
DIRECTOR
HOUSTON AIRPORT SYSTEM

PROJECT NO.	100068156
A.I.P. NO.	
C.I.P. NO.	
H.A.S. NO.	236
SHEET NO.	



HAS FILE:
PLOT DATE:

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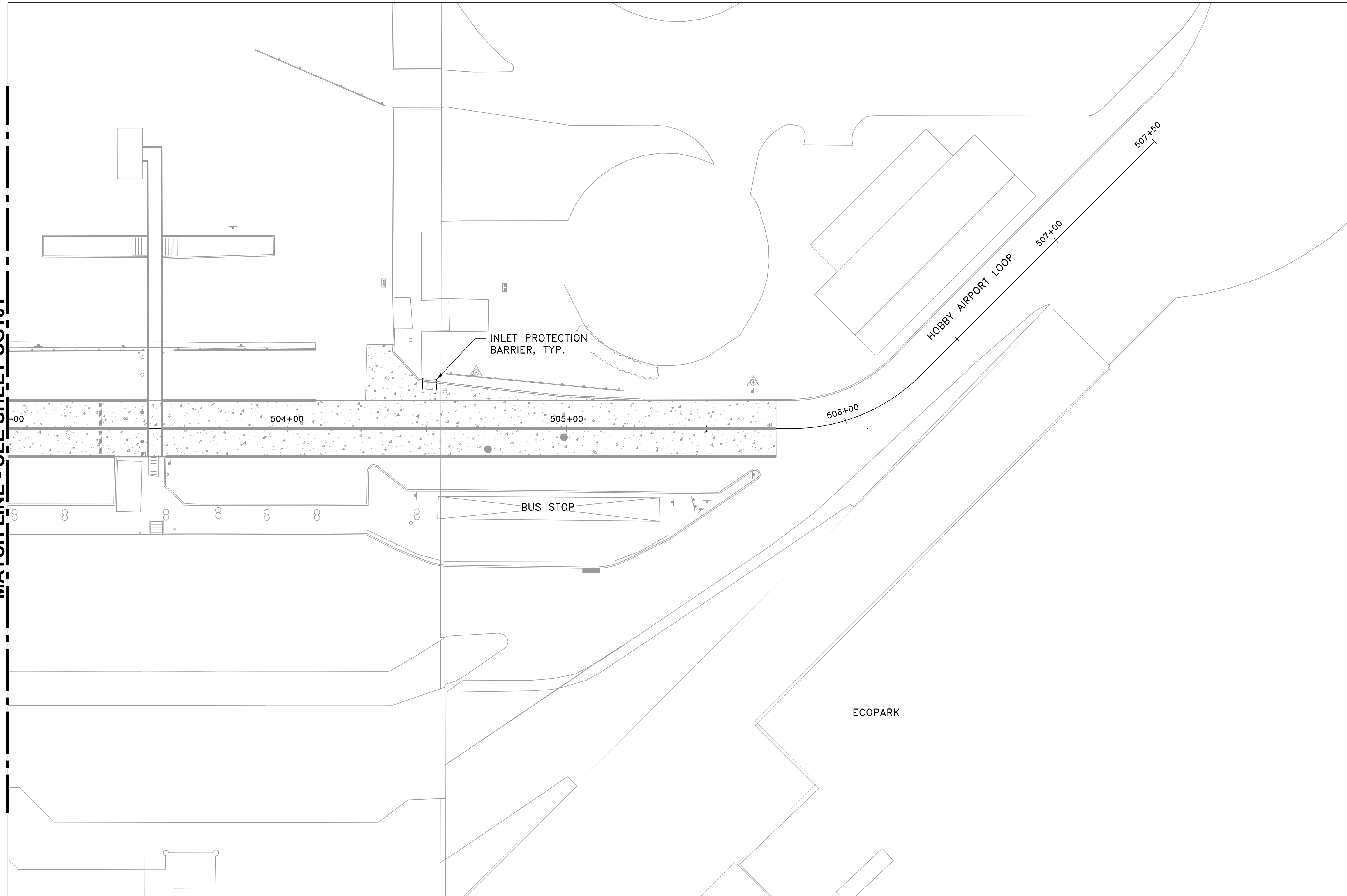
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MATCH LINE - SEE SHEET CG101



LEGEND

- INLET PROTECTION BARRIER (SEE SHEET CG-201)
- EXISTING GRATE INLET
- EXISTING CURB INLET

NOTES

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REVISIONS

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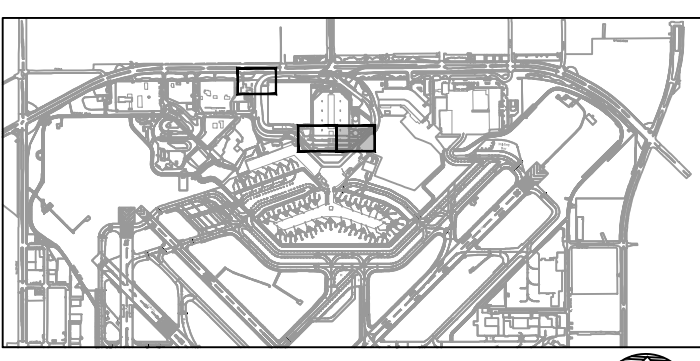
WILLIAM P. HOBBY AIRPORT / HOUSTON (HOU)
**METRO BUS DRIVE LANE RECONSTRUCTION
SWPPP PLAN**

PROJECT MGR:	JLV
DESIGNER:	EW
DRAWN BY:	KJV
CHECK BY:	RE
SCALE:	
DATE:	06/29/2020



APPROVED BY: _____
DIRECTOR
HOUSTON AIRPORT SYSTEM

PROJECT NO.	100068156
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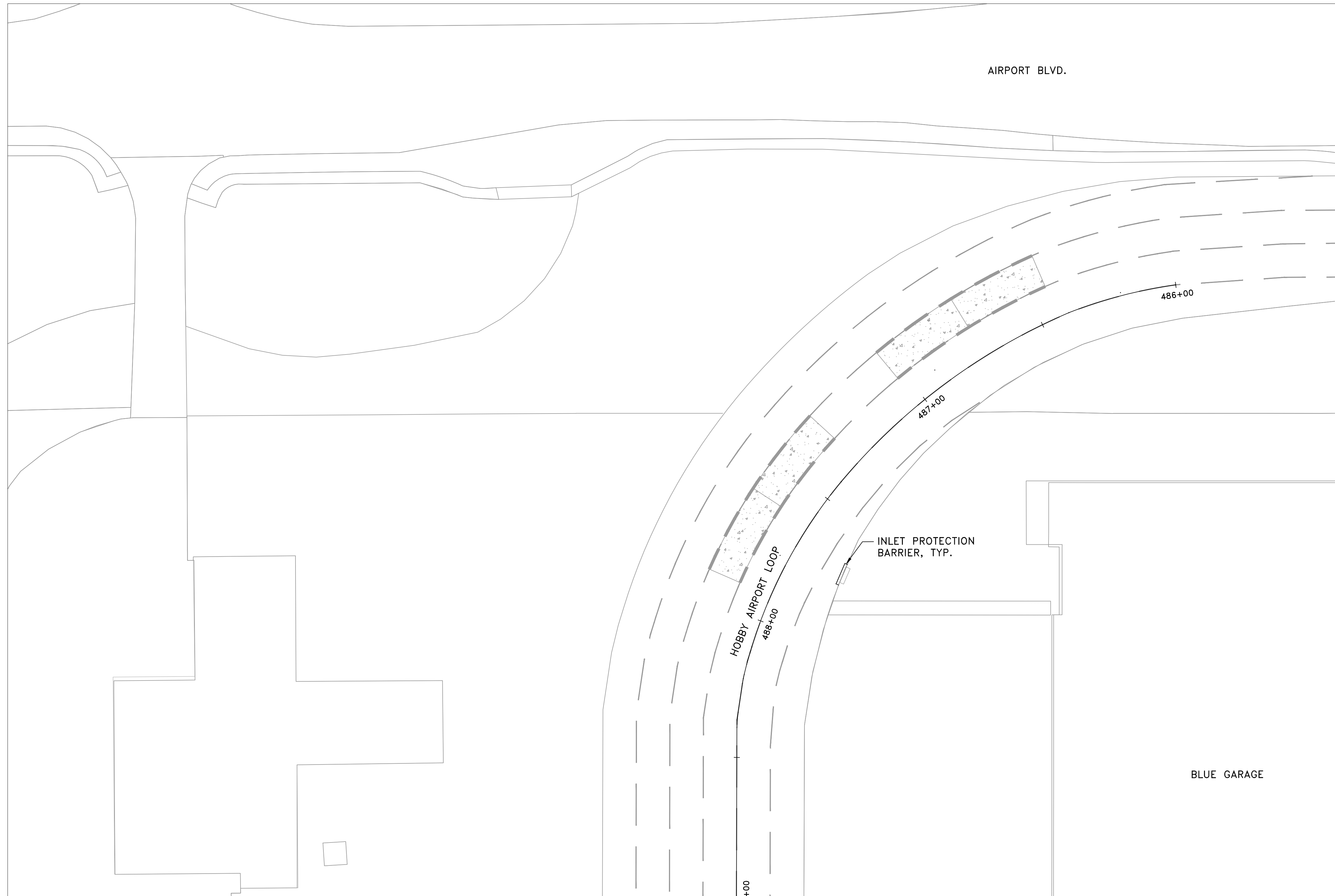
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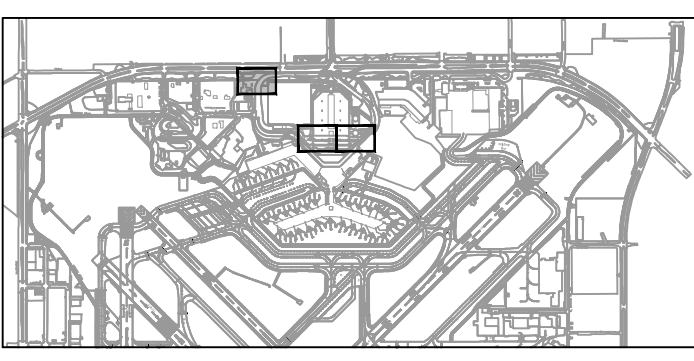


LEGEND

- INLET PROTECTION BARRIER (SEE SHEET CG-201)
- ☐ EXISTING GRATE INLET
- ▭ EXISTING CURB INLET

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REVISIONS

NO.	DESCRIPTION	DATE BY

WILLIAM P. HOBBY AIRPORT / HOUSTON (HOU)
**METRO BUS DRIVE LANE RECONSTRUCTION
 SWPPP PLAN**

PROJECT MGR:	JLV
DESIGNER:	EW
DRAWN BY:	KJV
CHECK BY:	RE
SCALE:	
DATE:	06/29/2020



APPROVED BY: _____
 DIRECTOR
 HOUSTON AIRPORT SYSTEM

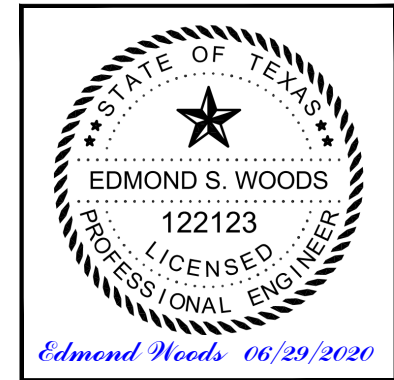
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C.I.P. NO.	
H.A.S. NO.	236
SHEET NO.	

HAS FILE:
PLOT DATE:

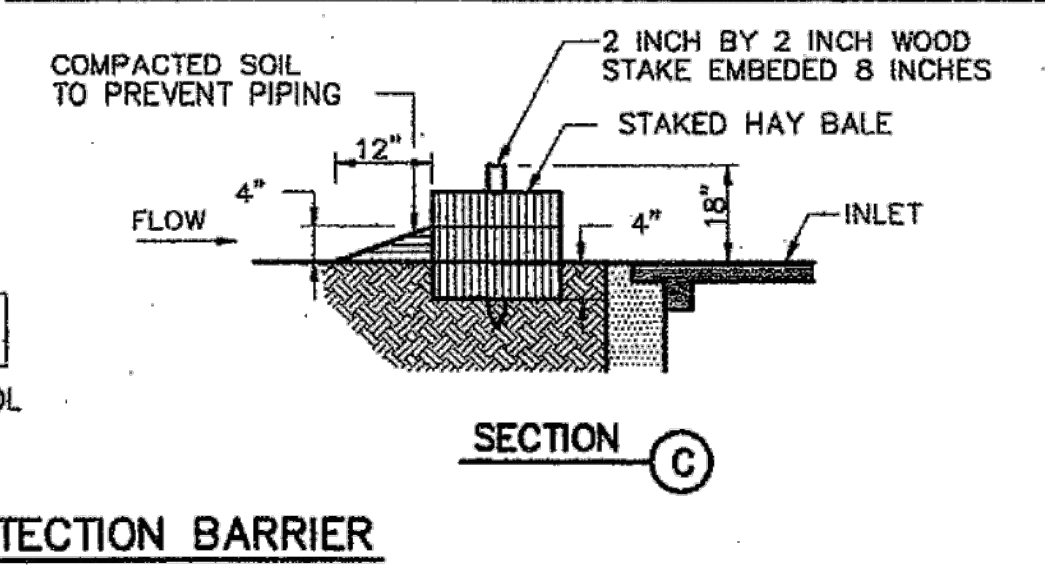
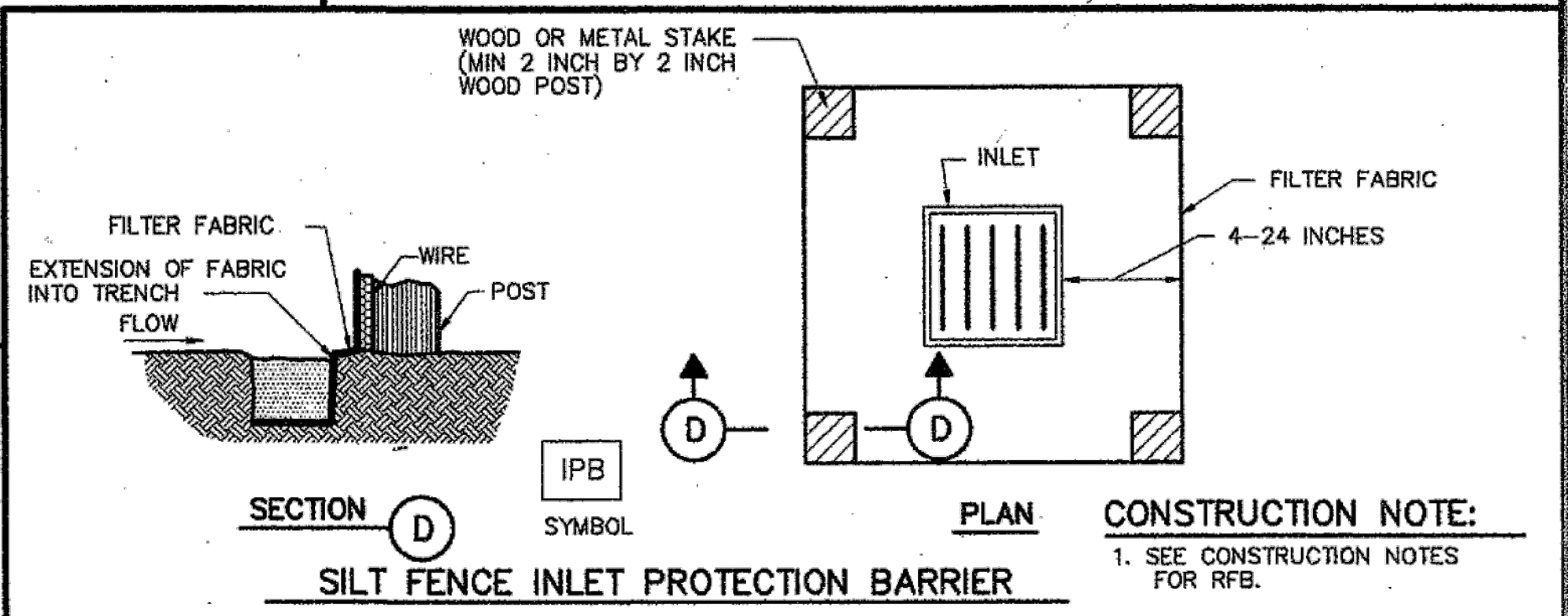
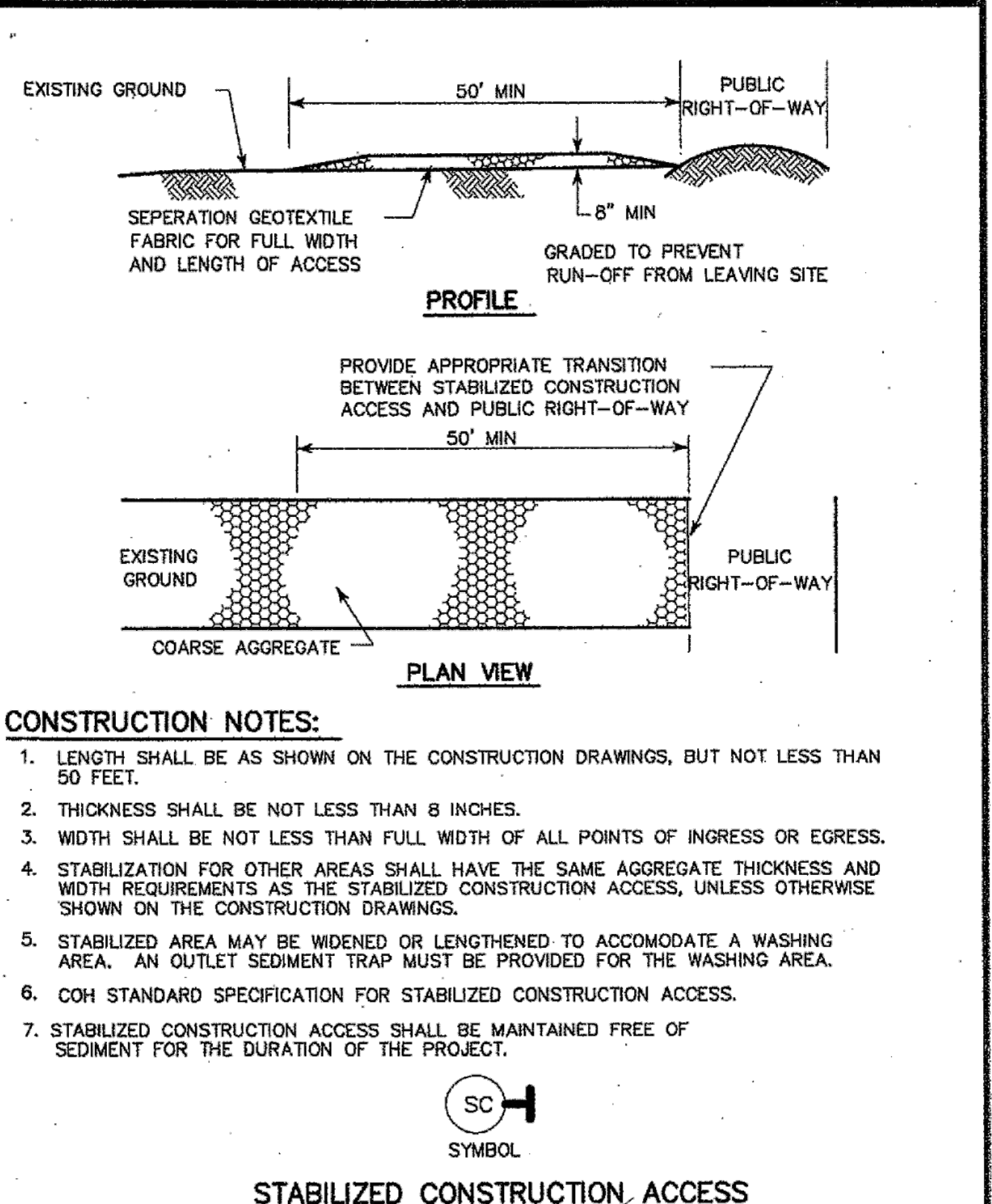
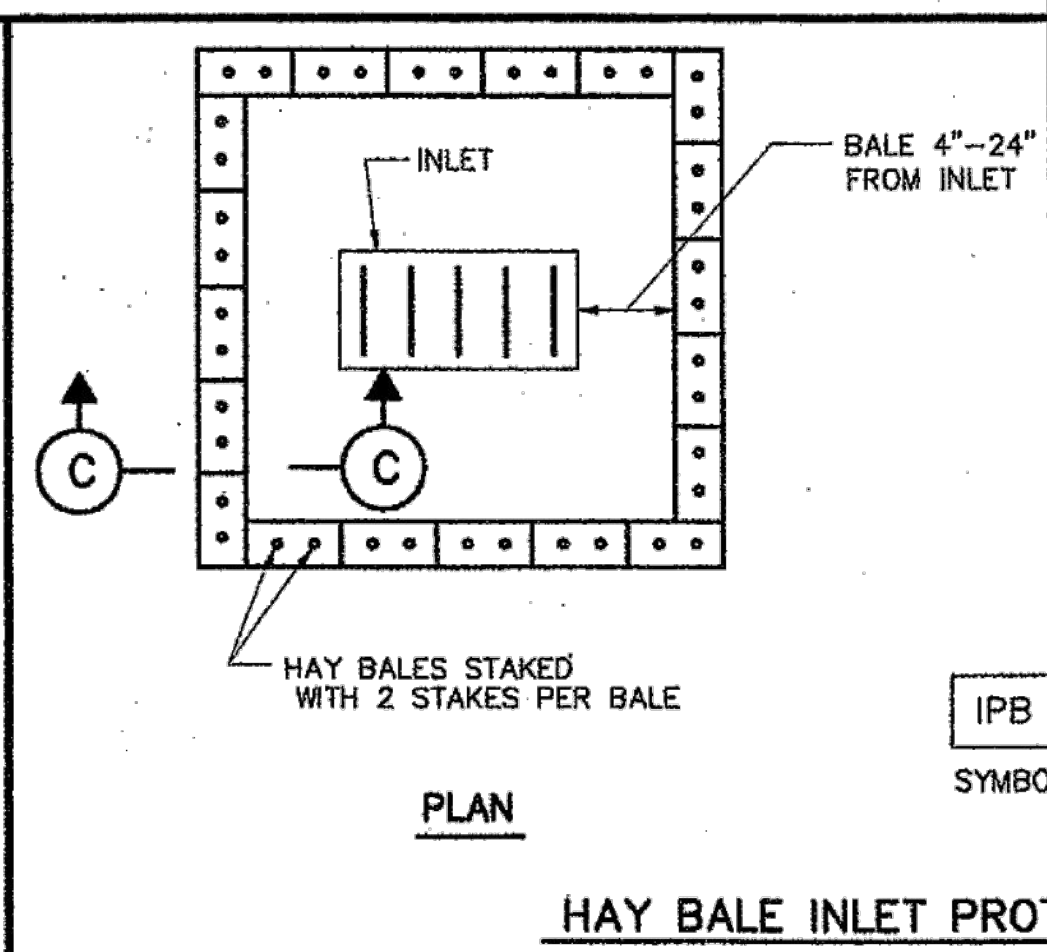
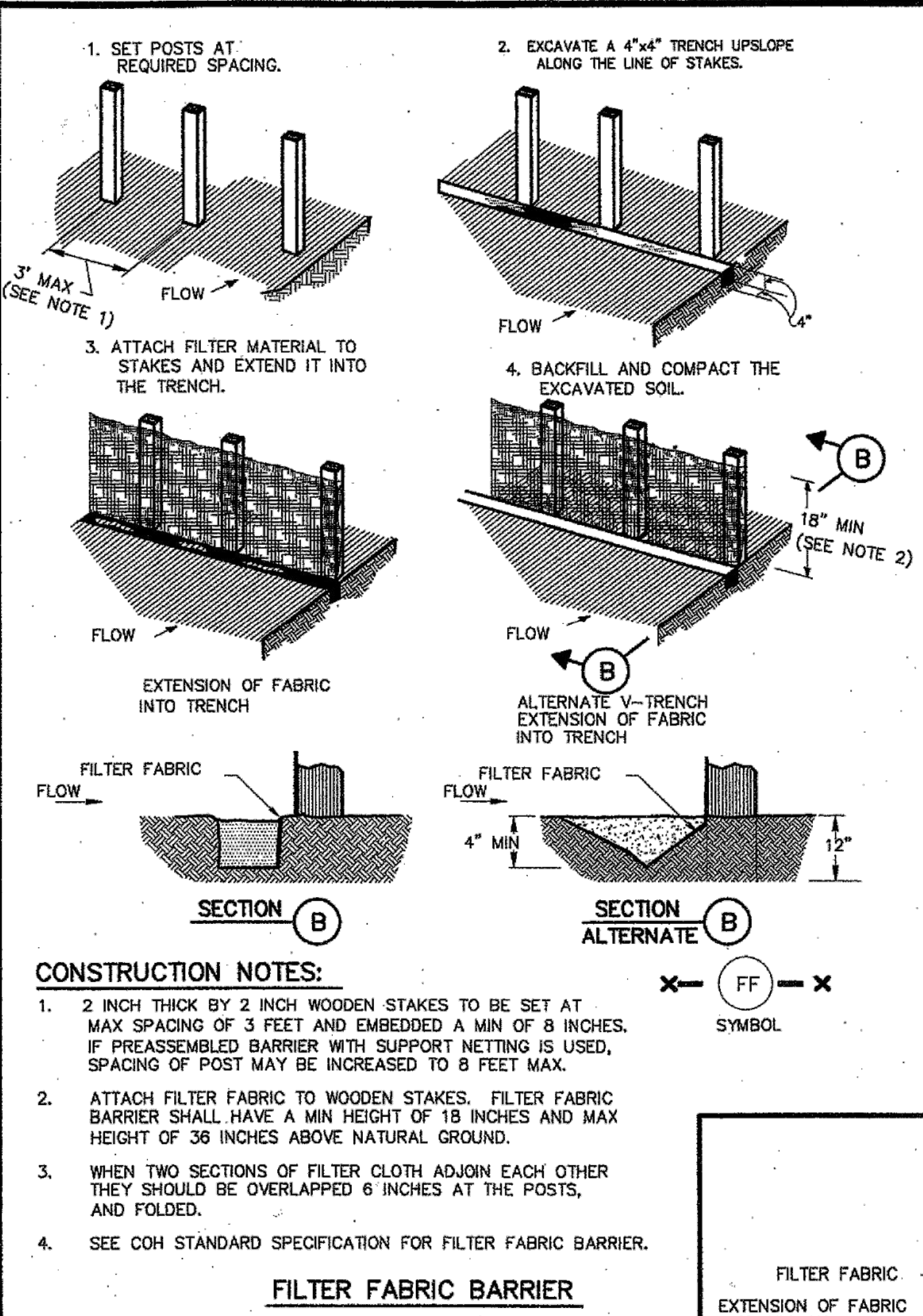
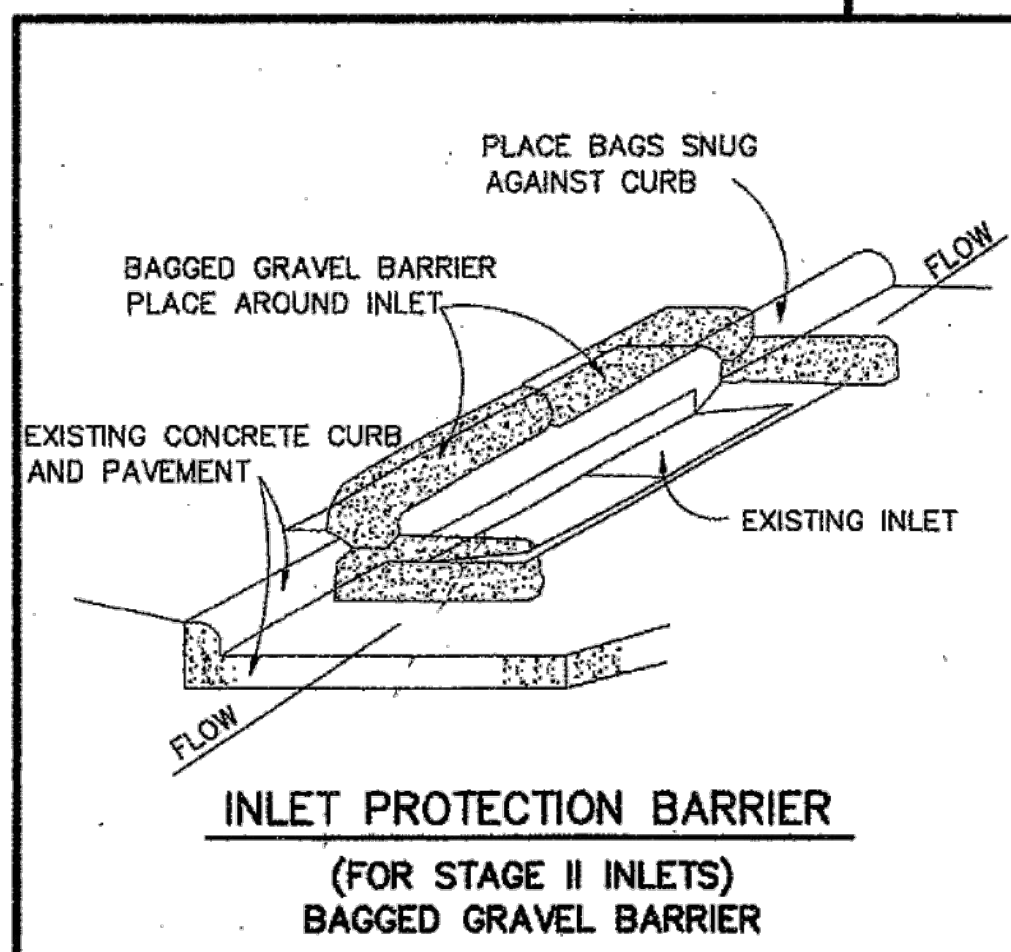
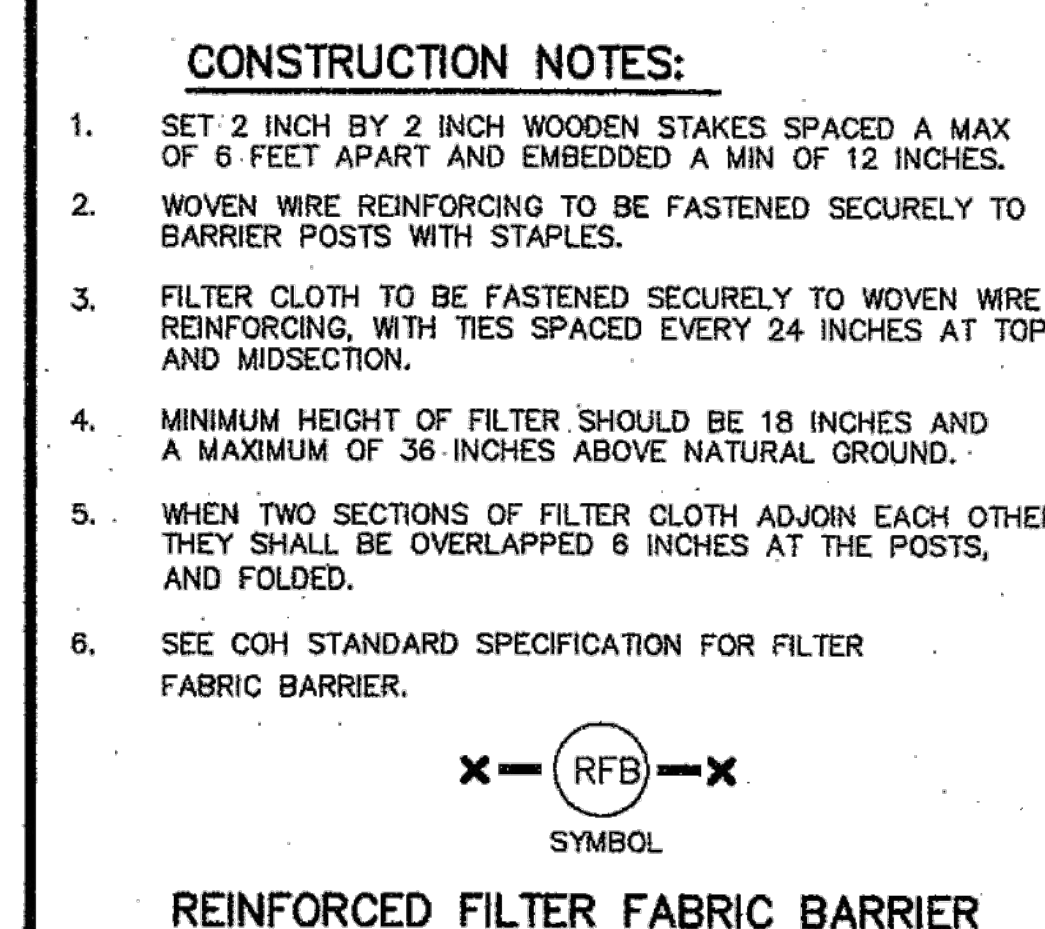
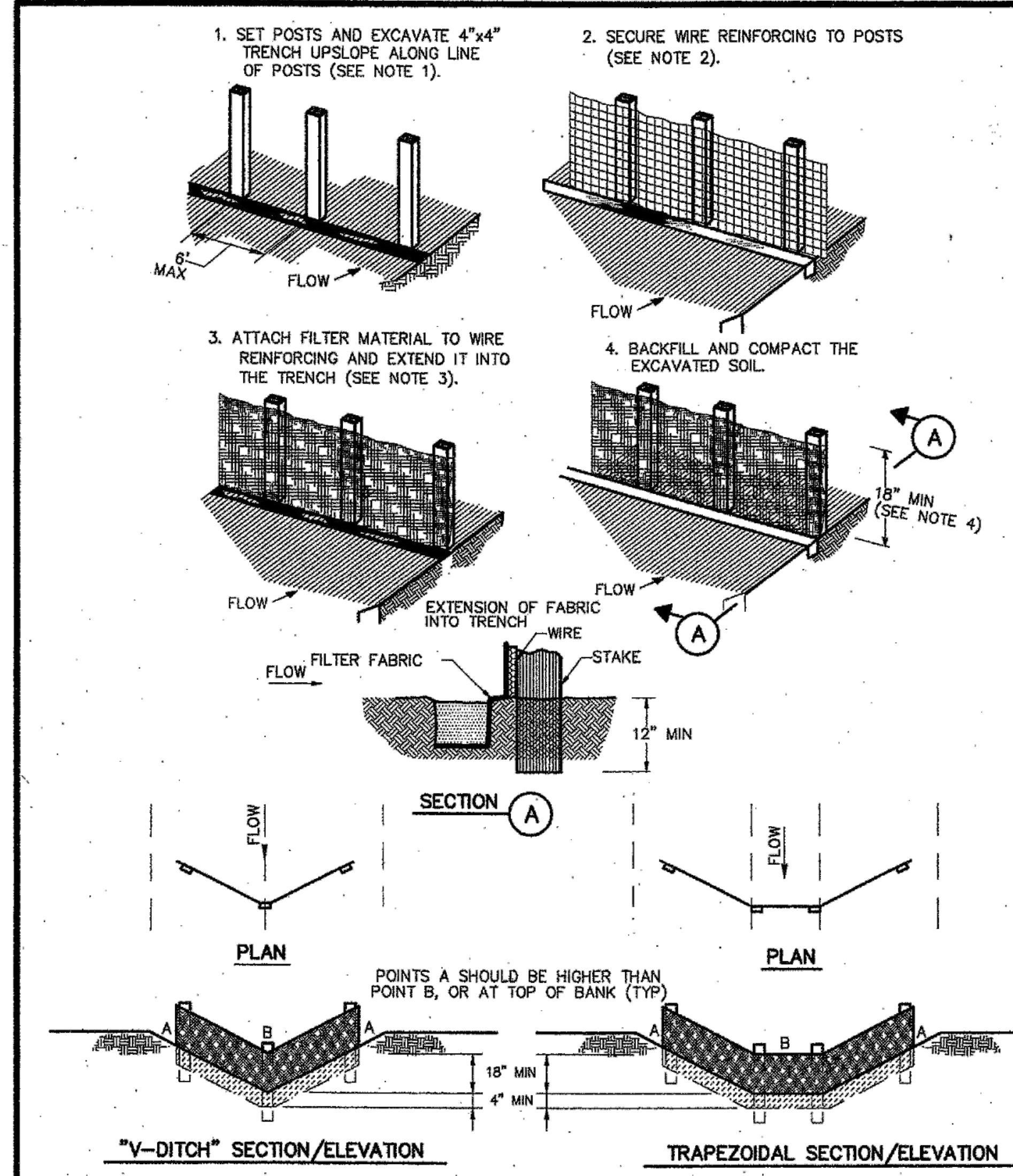
REVISIONS		
NO.	DESCRIPTION	DATE BY

WILLIAM P. HOBBY AIRPORT / HOUSTON (HOU)
METRO BUS DRIVE LANE RECONSTRUCTION
SWPPP DETAILS

PROJECT MGR:	JLV
DESIGNER:	EW
DRAWN BY:	KJV
CHECK BY:	RE
SCALE:	
DATE:	06/29/2020



APPROVED BY:	
DIRECTOR	HOUSTON AIRPORT SYSTEM
PROJECT NO.	100068156
A.I.P. NO.	
C.I.P. NO.	
H.A.S. NO.	236
SHEET NO.	



CITY OF HOUSTON
 DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

STORM WATER POLLUTION PREVENTION PLAN DETAILS
 (NOT TO SCALE)

APPROVED BY: [Signature] CITY ENGINEER

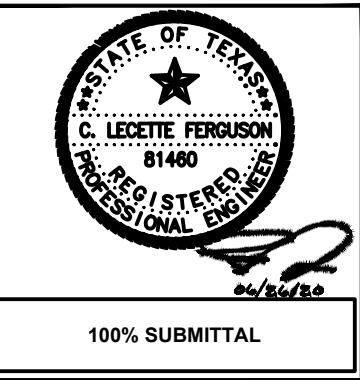
APPROVED BY: [Signature] DIRECTOR OF PUBLIC WORKS AND ENGINEERING

EFF DATE: JULY-01-2010 DWG NO: 01571-01

REVISIONS		
NO.	DESCRIPTION	DATE BY

WILLIAM P. HOBBY AIRPORT / HOUSTON (HOU)
METRO BUS DRIVE LANE RECONSTRUCTION
OVERALL ELECTRICAL PLAN

PROJECT MGR: **JLV**
 DESIGNER: **RCF**
 DRAWN BY: **RCF**
 CHECK BY: **CLF**
 SCALE:
 DATE: **06/26/2020**




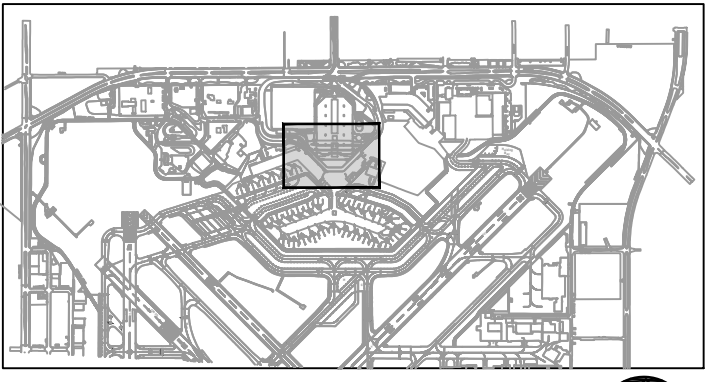
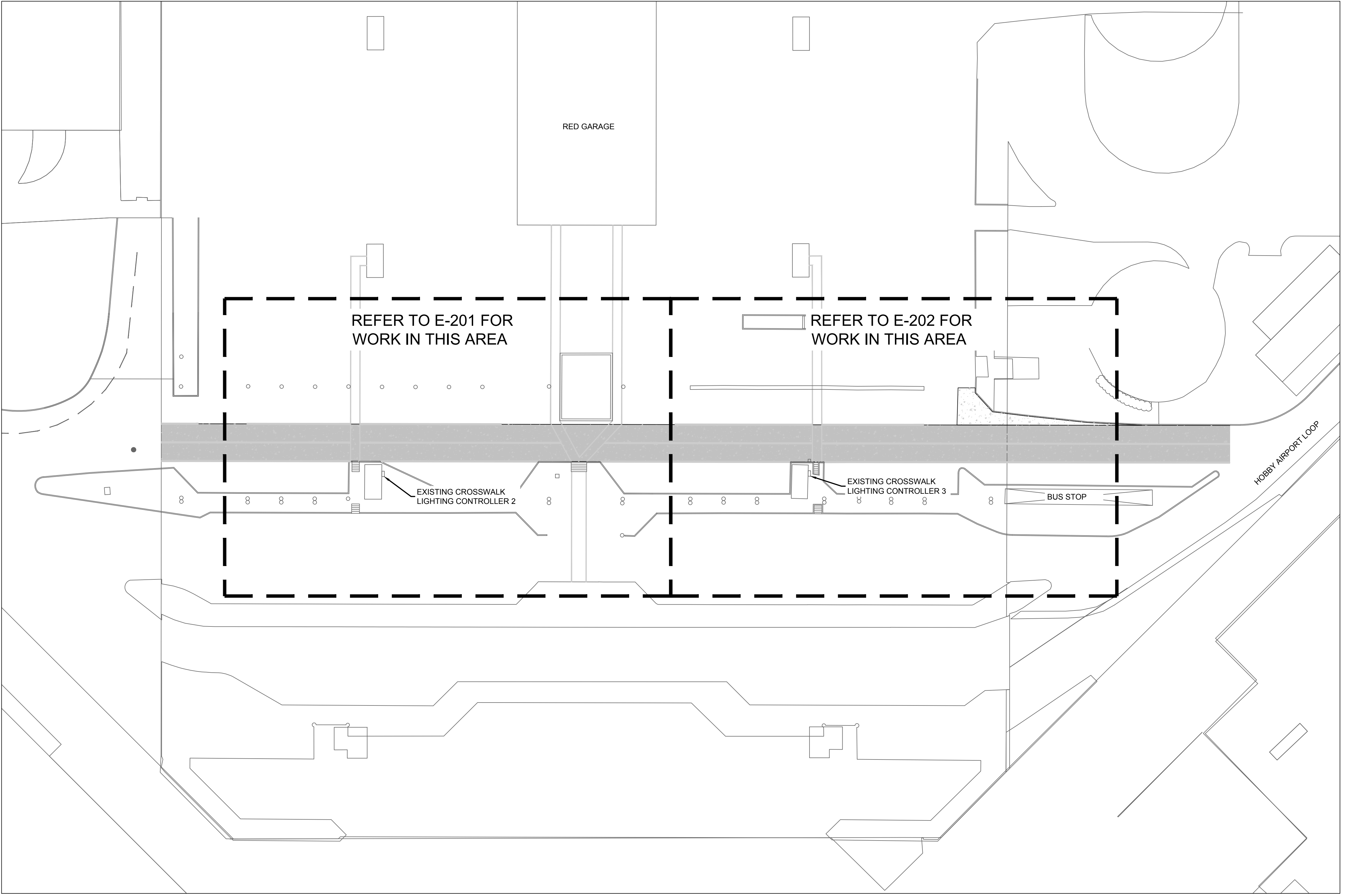
APPROVED BY:

 DIRECTOR
 HOUSTON AIRPORT SYSTEM

PROJECT NO. **100068156**
 A.I.P. NO. _____
 C.I.P. NO. _____
 H.A.S. NO. **236**
 SHEET NO. _____

LEGEND

 EXISTING TWO LANE METRO DRIVE PAVEMENT



1

2

3

4

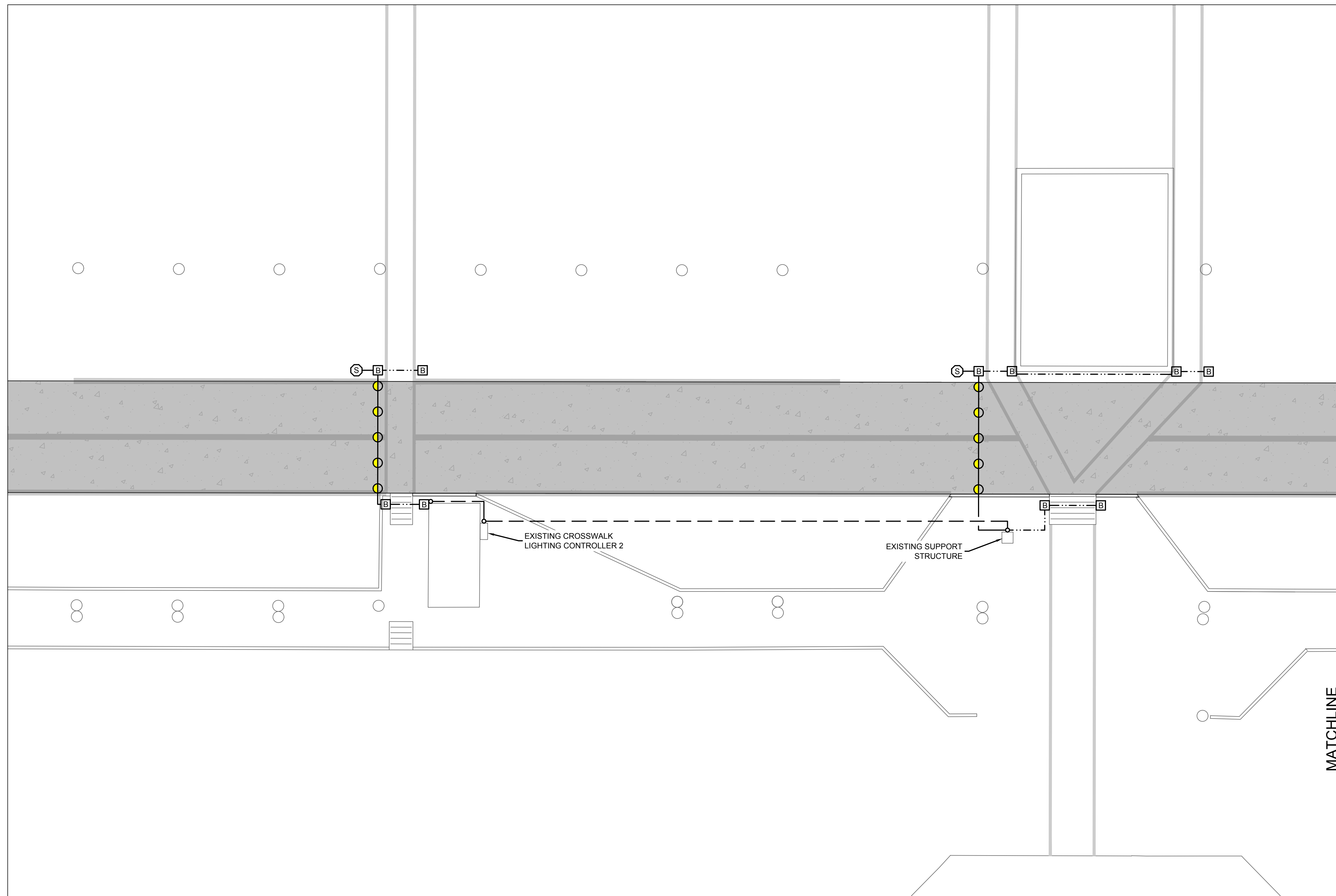
5

A

B

C

D



LEGEND	
	PROPOSED LED IN-ROADWAY WARNING LIGHT INSTALLED ON COMPOSITE BASE PLATE
	PROPOSED LIGHTED BOLLARD
	PROPOSED LED LIGHTED STOP SIGN
	PROPOSED 3/4" C INSTALLED VIA SAW KERF
	CIRCUIT ROUTED IN EXISTING OVERHEAD CONDUIT
	PROPOSED 3/4" C INSTALLED IN NEW ROADWAY PAVEMENT



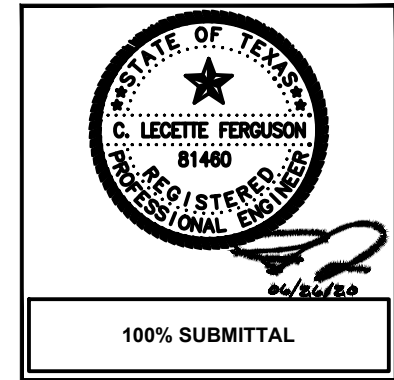
TEXAS FIRM F-6864

Ferguson Consulting
Action Specialists for Electrical, Telecommunications and Security Systems
FERGUSON CONSULTING, INC.
10200 GROCANS MILL RD, SUITE #420
THE WOODLANDS, TEXAS 77380
(281) 252-9232 FIRM No. 6864

REVISIONS		
NO.	DESCRIPTION	DATE BY

WILLIAM P. HOBBY AIRPORT / HOUSTON (HOU)
METRO BUS DRIVE LANE RECONSTRUCTION
PROPOSED ELECTRICAL PLAN

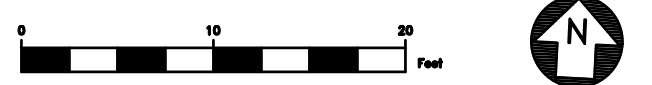
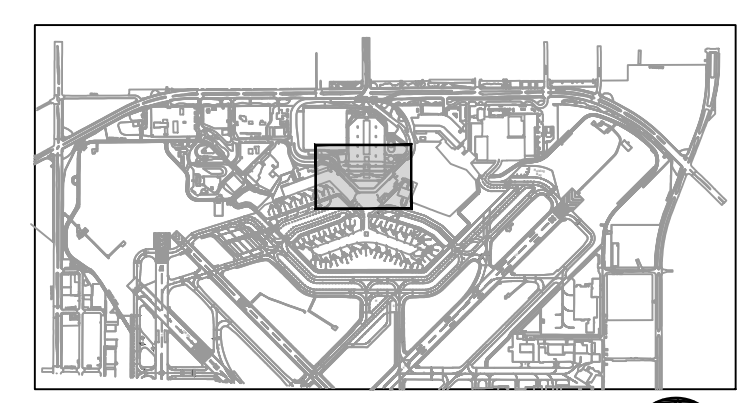
PROJECT MGR: JLV
DESIGNER: RCF
DRAWN BY: RCF
CHECK BY: CLF
SCALE:
DATE: 06/26/2020



APPROVED BY: _____
DIRECTOR
HOUSTON AIRPORT SYSTEM

PROJECT NO. 100068156
A.I.P. NO. _____
C.I.P. NO. _____
H.A.S. NO. 236
SHEET NO. _____

MATCHLINE
(RE: SHEET E-202 FOR CONTINUATION)



HAS FILE:
PLOT DATE:

1

2

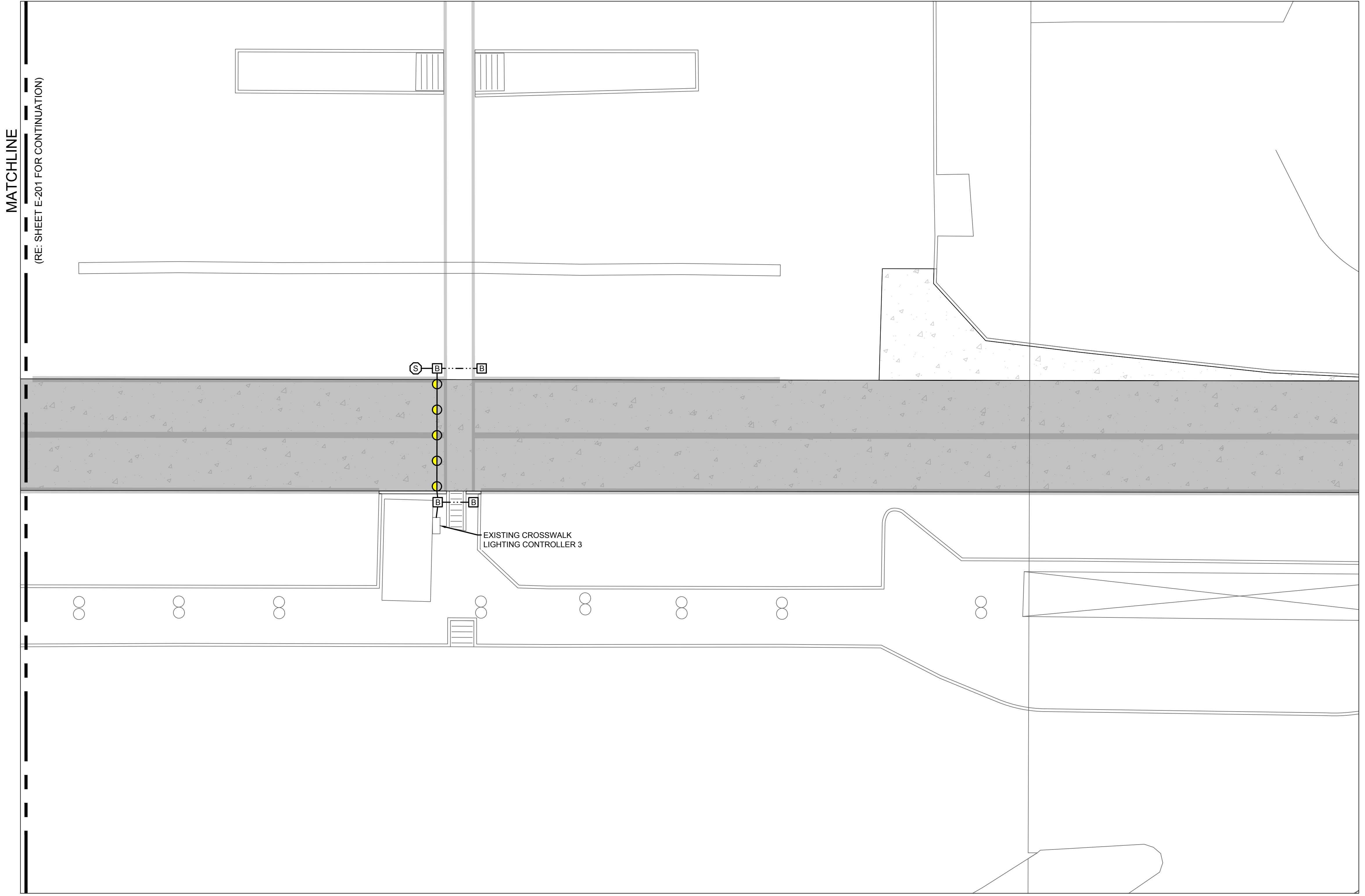
3

4

5

1 2 3 4 5

A B C D



MATCHLINE
(RE: SHEET E-201 FOR CONTINUATION)

LEGEND	
	PROPOSED LED IN-ROADWAY WARNING LIGHT INSTALLED ON COMPOSITE BASE PLATE
	PROPOSED LIGHTED BOLLARD
	PROPOSED LED LIGHTED STOP SIGN
	PROPOSED 3/4" C INSTALLED VIA SAW KERF
	CIRCUIT ROUTED IN EXISTING OVERHEAD CONDUIT
	PROPOSED 3/4" C INSTALLED IN NEW ROADWAY PAVEMENT



TEXAS FIRM F-6864

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THE WOODLANDS, TEXAS 77380
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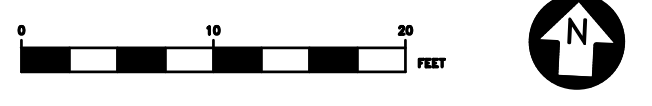
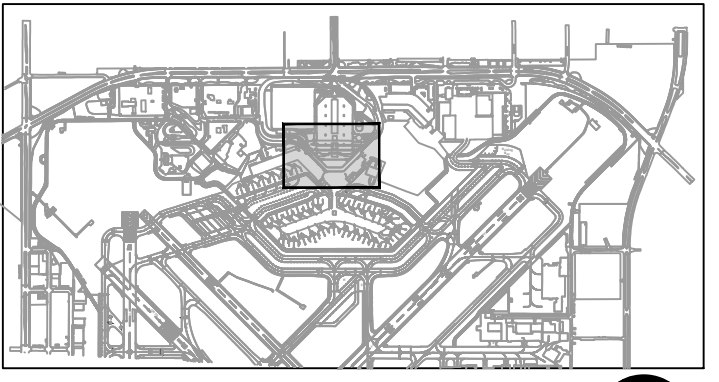
REVISIONS		
NO.	DESCRIPTION	DATE BY

WILLIAM P. HOBBY AIRPORT / HOUSTON (HOU)
**METRO BUS DRIVE LANE RECONSTRUCTION
PROPOSED ELECTRICAL PLAN**

PROJECT MGR:	JLV
DESIGNER:	RCF
DRAWN BY:	RCF
CHECK BY:	CLF
SCALE:	
DATE:	06/26/2020

100% SUBMITTAL

APPROVED BY:	
DIRECTOR HOUSTON AIRPORT SYSTEM	
PROJECT NO.	100068156
A.I.P. NO.	
C.I.P. NO.	
H.A.S. NO.	236
SHEET NO.	

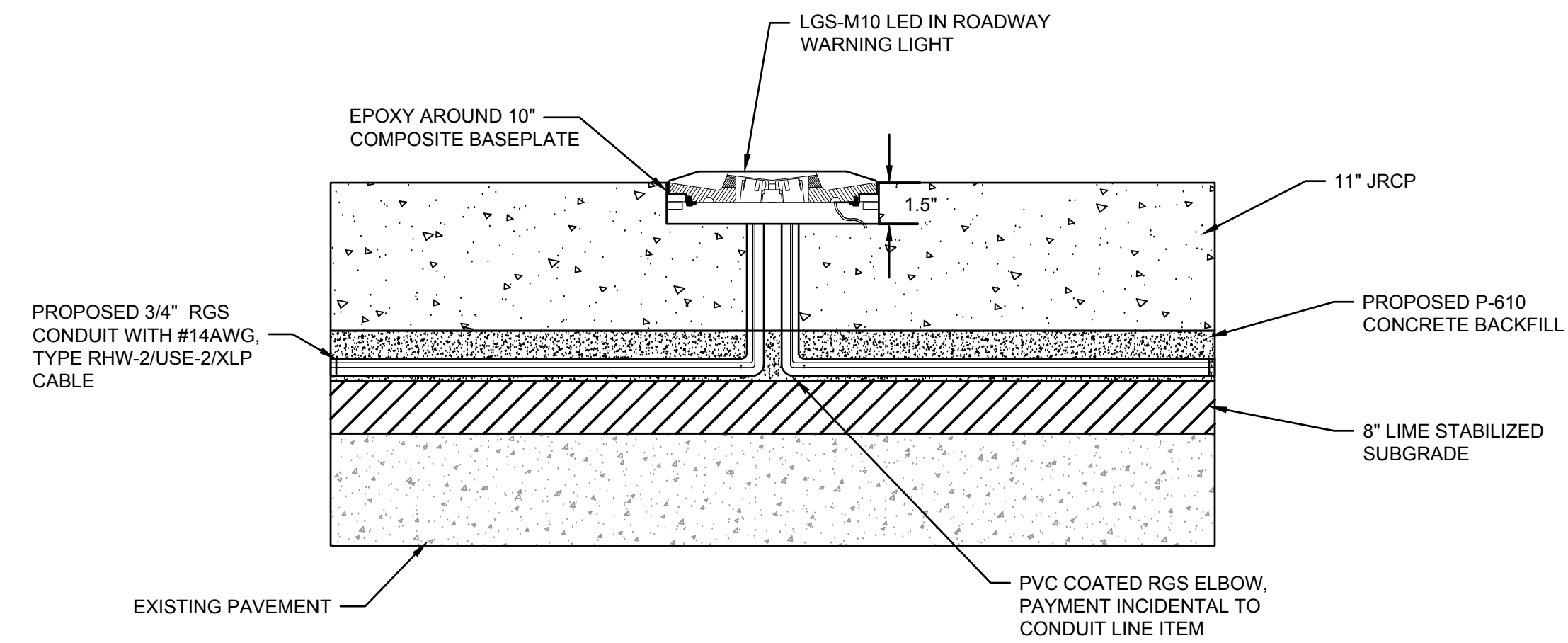


HAS FILE:
PLOT DATE:

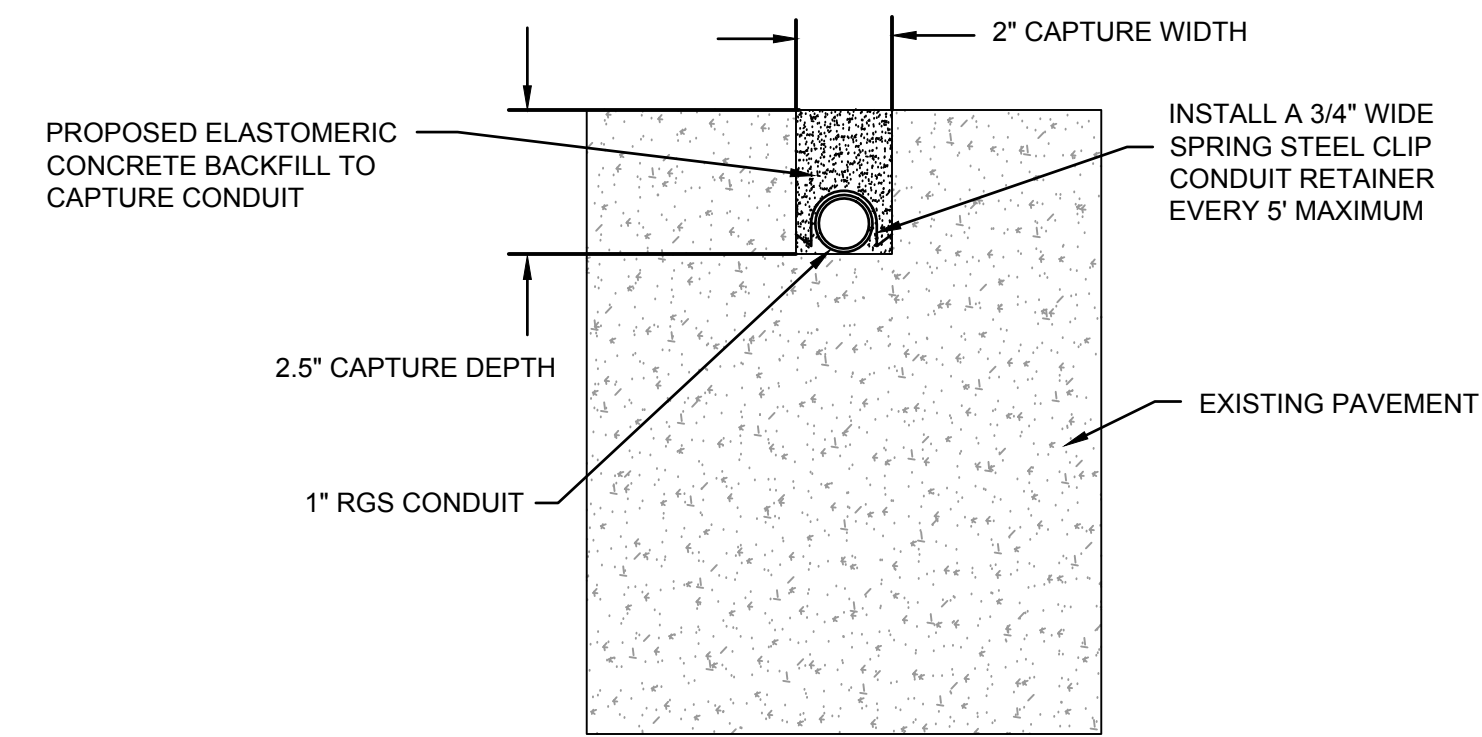
1 2 3 4 5

REVISIONS

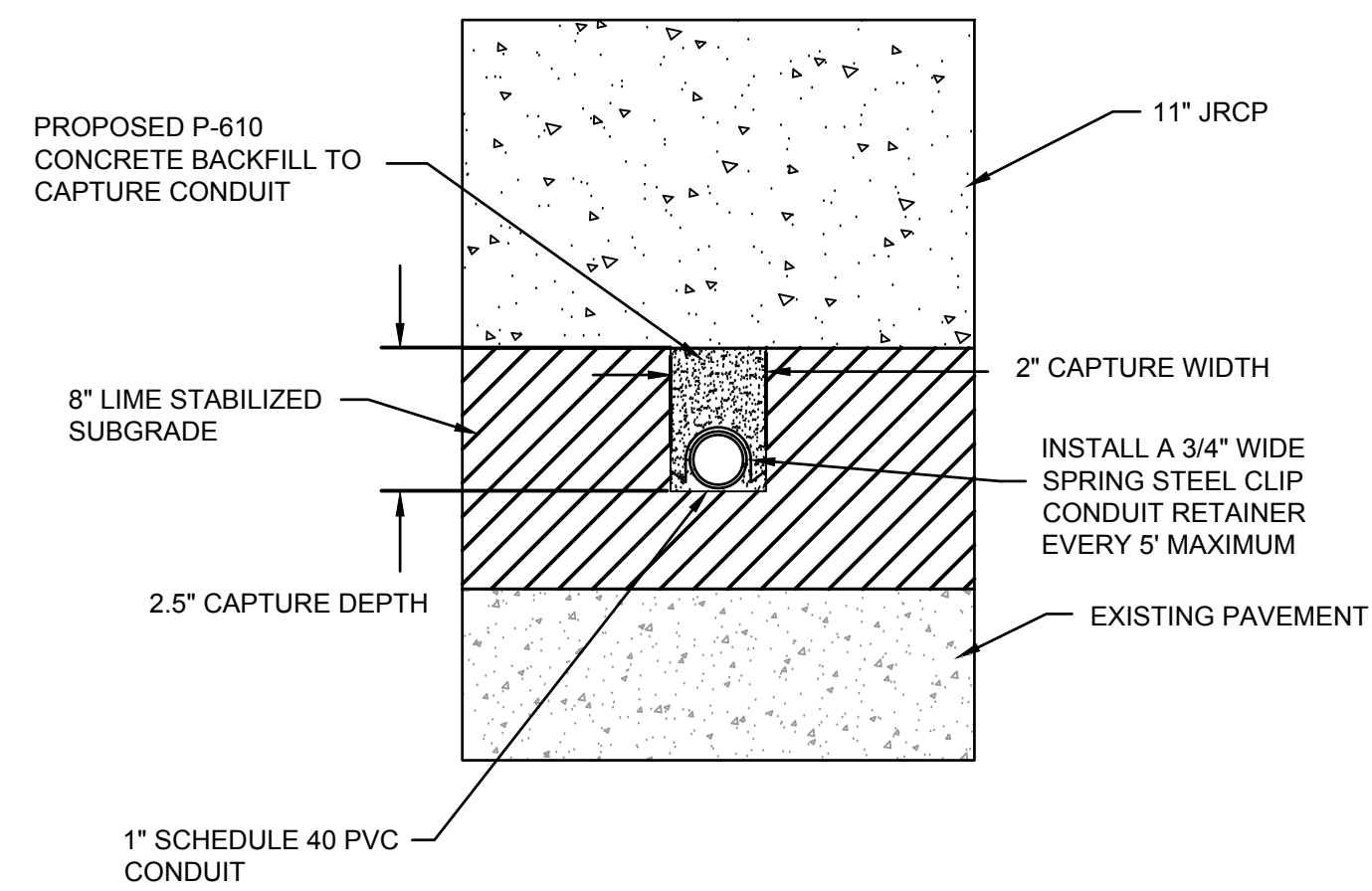
NO.	DESCRIPTION	DATE	BY



1 IN-ROADWAY WARNING LIGHT INSTALLATION
 E-301 SCALE: N.T.S.



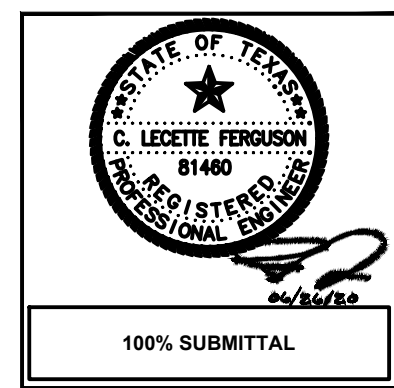
2 CONDUIT SECTION - SAW KERF
 E-301 SCALE: N.T.S.



3 CONDUIT SECTION - NEW ROADWAY PAVEMENT
 E-301 SCALE: N.T.S.

WILLIAM P. HOBBY AIRPORT / HOUSTON (HOU)
METRO BUS DRIVE LANE RECONSTRUCTION
ELECTRICAL DETAILS

PROJECT MGR: **JLV**
 DESIGNER: **RCF**
 DRAWN BY: **RCF**
 CHECK BY: **CLF**
 SCALE:
 DATE: **06/26/2020**



APPROVED BY: _____
 DIRECTOR
 HOUSTON AIRPORT SYSTEM

PROJECT NO. **100068156**
 A.I.P. NO. _____
 C.I.P. NO. _____
 H.A.S. NO. **236**
 SHEET NO. _____